Comprehensive Land Use Control (LUC) Management Plan

Former Longhorn Army Ammunition Plant (LHAAP)
Karnack, Texas

Date: October 4, 2019

COMPREHENSIVE LUC & NOTIFICATION MANAGEMENT PLAN REVISION LOG

Fiscal Year	Date	Reason for Revision	Approved*		
			Army	EPA	TCEQ
Original	9-13-07	N/A			
2008		None Required			
2009		None Required			
2010		None Required			
2011		None Required			
2012	2-4-13	Add LHAAP-06,-07,-08,-35/36,-35B (37)/67, -46, -49, -50,-51,-55,-35A (58),-59,-60,-66,-68, Pistol Range, LHAAP-001-R-01 and LHAAP-003-R-01			
2013	10-1-13	None Required			
2014	12-17-14	Add LHAAP-02, -03, -19, -56, -65, -68, -69 and Notices for LHAAP-46, and -67			
2015	9-14-15	Add Notices for LHAAP-35B(37), -50 and -35A(58) (LHAAP-02, -03, -56, -59, -60, -65, -68, and -69 are contained within the LHAAP-58 LUC boundary)			
2016	10-20-16	None Required			
2017	10-30-17	Add LUCs for LHAAP-16			

Fiscal Year	Date	Reason for Revision	Approved*		
			Army	EPA	TCEQ
2018	9-5-18	Add LUCs and Notices for LHAAP-001-R-01 and LHAAP-003-R-01			
2019	10-3-19	Add LHAAP-04 and LHAAP-17 and Notices for LHAAP-001-R-01 and LHAAP-003-R-01	10-23-2019	10-23-2019	10-23-2019

* Approval by all three parties required during the first quarter of each fiscal year.

Date: October 4, 2019

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LHAAP-03 Former Waste Collection Pad Building 722-P Paint Shop (LHAAP-03)

Nonresidential Land Use site included within the groundwater use restriction

LUC boundary for LHAAP-35A(58)- see LHAAP-35A(58)

LHAAP-04 Former Pilot Wastewater Treatment Plant (LHAAP-04)

4-1 RAO Inspection and Maintenance Checklist

4-2 LUCs from Draft Final Remedial Design

4-3 Notice of Land Use Controls and Nonresidential Land Use at LHAAP-04 Filed in Public Records of Harrison County, Texas (including survey plat) (Pending)

4-4 Land Use Control Compliance Inspection Form

LHAAP-06 Building 54F Solvent (LHAAP-06)

Notice of Nonresidential Land Use for LHAAP-06 Filed in Public Records of Harrison County, Texas (including survey plat)

LHAAP-07 Building 50G Drum Processing (LHAAP-07)

Notice of Nonresidential Land Use for LHAAP-07 Filed in Public Records of Harrison County, Texas (including survey plat)

LHAAP-08 Former Sewage Treatment Plant (LHAAP-08)

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LHAAP-12 Landfill 12 (LHAAP-12)
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46-1 LUCs from Final Remedial Design
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50-3 Land Use Control Compliance Inspection Form
LHAAP-51 Building 60-B Photo Lab (LHAAP-51)
Notice of Nonresidential Land Use at LHAAP-51 Filed in Public Records of Harrison County, Texas (including survey plat)
LHAAP-55 Septic Tanks (LHAAP-55)
Notice of Nonresidential Land Use at Septic Tank locations Filed in Public Records of Harrison County, Texas (including survey plat)

LHAAP-56 Grease Rack (LHAAP-56)
Nonresidential Land Use site included within the groundwater use restriction LUC boundary for LHAAP-35A(58)- see LHAAP-35A(58)
LHAAP-58 Shops Area (LHAAP-35A (58))
58-1 LUCs from Final Remedial Design
58-2 Notice of Land Use Controls and Nonresidential Land Use at LHAAP-35A (58) Filed in Public Records of Harrison County, Texas (including survey plat)
58-3 Land Use Control Compliance Inspection Form
LHAAP-59 Former Pesticide Storage Building 725 (LHAAP-59)
Notice of Nonresidential Land Use for LHAAP-59 Filed in Public Records of Harrison County, Texas (including survey plat)
Site included within the groundwater use restriction LUC boundary for LHAAP-35A(58)- see LHAAP-35A(58)
LHAAP-60 Former Storage Building 411 & 714 (LHAAP-60)
Notice of Nonresidential Land Use at LHAAP-60 Filed in Public Records of Harrison County, Texas (including survey plat)
Building 714 included within the groundwater use restriction LUC boundary for LHAAP-35A(58)- see LHAAP-35A(58)
LHAAP-64 Transformer Storage (LHAAP-64)
Notice of Nonresidential Land Use at LHAAP-64 Filed in Public Records of Harrison County, Texas (including survey plat)
LHAAP-65 Flammable Materials Storehouse Building 209 (LHAAP-65)
Nonresidential Land Use site included within the groundwater use restriction LUC boundary for LHAAP-35A(58)- see LHAAP-35A(58)
LHAAP-66 405-L Transformer Yard (LHAAP-66)
Notice of Nonresidential Land Use at LHAAP-66 Filed in Public Records of Harrison County, Texas (including survey plat)

LHAAP-67 Aboveground Storage Tank Farm (LHAAP-67)
67-1 LUCs from Final Remedial Design
67-2 Notice of Land Use Controls and Nonresidential Land Use at LHAAP-67 Filed in Public Records of Harrison County, Texas (including survey plat)
67-3 Land Use Control Compliance Inspection Form
LHAAP-68 Transformer Storage (LHAAP-68)
Notice of Nonresidential Land Use at LHAAP-68 Filed in Public Records of Harrison County, Texas (including survey plat)
Site included within the groundwater use restriction LUC boundary for LHAAP-35A(58)- see LHAAP-35A(58)
LHAAP-69 Service Station Underground Storage Tank (LHAAP-69)
Nonresidential Land Use site included within the groundwater use restriction LUC boundary for LHAAP-35A(58)- see LHAAP-35A(58)
Pistol Range
Notice of Nonresidential Land Use at Pistol Range Filed in Public Records of Harrison County, Texas (including survey plat)
LHAAP-001-R-01/LHAAP-003-R-01 South Test Area (LHAAP-001-R-01) and Ground Signal Test Area (LHAAP-003-R-01)
MMRP-1 Long Term Management Inspection and Maintenance Checklist
MMRP-2 LUCs from Final Remedial Design
MMRP-3 Notice of Land Use Controls and Nonresidential Land Use at LHAAP-001-R-01 and LHAAP-003-R-01 Filed in Public Records of Harrison County, Texas (including survey plat)
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Table 1 Summary of Land Use Controls and Notifications

Figure 1 Sites with Land Use Controls

Figure 2 Sites with Nonresidential Use Notifications

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Appendix A GSA Transfer Letters

Comprehensive Land Use Control (LUC) & Notification Management Plan, Former Longhorn Army Ammunition Plant (LHAAP), Texas

The purpose of this management plan is to ensure that all site-specific LUCs are compiled into one comprehensive location for both pre-transfer and post-transfer use. Additionally, all nonresidential use notifications required under 30 TAC §335.560(b) are included. This management plan shall be accessible to the property owner, regulators, local government, and the public and will accompany LHAAP's Administrative Record. This plan will be updated as LUC and notification requirements for additional environmental sites are identified; the revision number, date, reason for revision, and author will be documented in the Revision Log. As a document control measure, an annual approval by the three FFA parties, Army, EPA and TCEQ within the first quarter of the fiscal year will confirm the effective date. This approval is required whether or not a revision took place.

Land Use Controls

Land use controls (LUCs) include any type of physical, legal, or administrative mechanism that restricts the use of, or limits access to, real property. LUCs may be a component of an interim or final remedy selected under CERCLA and used to protect human health, the environment, and/or the integrity of an engineered remedy. The LUC performance objectives are established in the site-specific Record of Decision (ROD). The specific LUCs and implementation details are outlined in the corresponding site-specific Remedial Design (RD), a primary document of the Federal Facilities Agreement.

The land use control area is depicted on Figure 1, the site-specific performance objectives and LUCs are presented in Table 1, and the site-specific section contains a LUC Inspection and Maintenance Log, a copy of an approved LUC Remedial Design, Notice of Land Use Controls (including a survey plat) filed in Harrison County public records, and LUC compliance inspection form. Upon USEPA and TCEQ approval of each LUC RD, the LUC requirements will be effective immediately and this management plan will be updated. Once property is transferred, the plan will be amended to include a copy of the transfer letter describing specific LUC obligations assigned to the transferee.

LUCs will remain in place until applicable or relevant and appropriate requirements (ARARs) as established in accordance with the NCP (40 CFR 300) are met; or in the case of a landfill remedy it will remain in place for perpetuity unless otherwise removed by the U.S. Army per agreement with the USEPA and TCEQ. The continued effectiveness of the selected remedy, including LUCs, will be evaluated with the CERCLA 121(c) five-year review process.

Notifications

The future anticipated use of LHAAP is industrial/refuge and is, therefore, consistent with a nonresidential/industrial reuse under the Risk Reduction Rules. As required by 30 TAC §335.560(b) and in accordance with 30 TAC §335.566, a notification must be filed in the Harrison County records stating that the land is considered suitable for future non-residential use. Limited monitoring will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of the sites is consistent with the non-residential use. The non-residential use notification will remain in place until it is demonstrated that the levels of COCs in soil and groundwater allow for unlimited use and unrestricted exposure.

Table 1 –Summary of Land Use Controls and Notifications

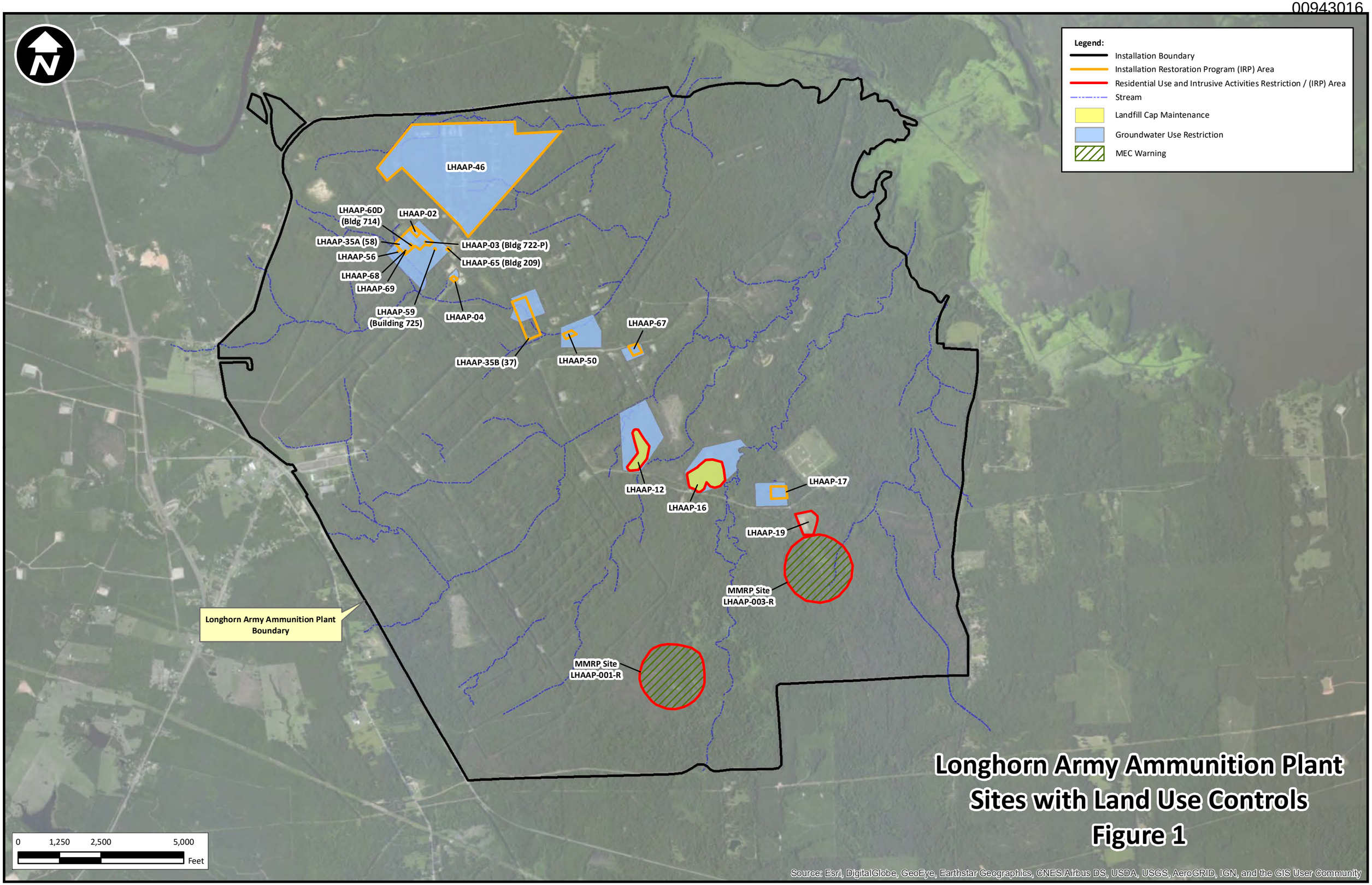
Site Name	Transfer Documents		Decision Documents		Land Use Controls					Notifications
IRP MMRP* LHAAP-	GSA Transfer To USFWS	ECP/ ECOP	ROD	DD	Groundwater Use Restriction	Nonresidential Land Use Restriction	Intrusive Activities Prohibition	MEC Warning	Landfill Cap Maintenance	Nonresidential Use Notification
2					**					**
3					**					**
4			2016		√	√				√
6				2008						√
7				2008						√
8	2015	VI		2008						√
12	2014	V	2007		√	Cap Only	Cap Only		√	√
16			2016		√	√	Cap Only		√	√
17			2016		√	√				√
19		VII		2014		Cap Only	Cap Only			√
35/36	2015	VI		2010						√
37			2010		√					√
46			2010		√					√
49	2015	VI	2010							√
50			2010		√					√
51				2008						√
55	2015	VI		2008						√
56				2014	**					**
58			2010		√					√
59				2008	**					√
60				2008	**					√
64				2008						√
65				2014	**					**

Date October 4, 2019

Site Name	Transfer Documents		Decision Documents		Land Use Controls					Notifications
IRP MMRP* LHAAP-	GSA Transfer To USFWS	ECP/ ECOP	ROD	DD	Groundwater Use Restriction	Nonresidential Land Use Restriction	Intrusive Activities Prohibition	MEC Warning	Landfill Cap Maintenance	Nonresidential Use Notification
66				2008						√
67			2010							√
68				2008	**					√
69				2014	**					**
Pistol Range		VII	2010							√
001-R-01/003-R-01		VII	2016			√	√	√		√

** Nonresidential Land Use site included within the groundwater use restriction LUC boundary for LHAAP-35A(58)-see LHAAP-35A(58)

FIGURES


Legend:
Installation Boundary
Installation Restoration Program (IRP) Area
Residential Use and Intrusive Activities Restriction / (IRP) Area
Stream
Landfill Cap Maintenance
Groundwater Use Restriction
MEC Warning
LHAAP-46
LHAAP-60D (Bldg 714)
LHAAP-02
LHAAP-35A (58)
LHAAP-03 (Bldg 722-P)
LHAAP-56
LHAAP-65 (Bldg 209)
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LHAAP-16
LHAAP-17
LHAAP-19
MMRP Site LHAAP-003-R
MMRP Site LHAAP-001-R
Longhorn Army Ammunition Plant Boundary
0 1,250 2,500 5,000
Feet
Longhorn Army Ammunition Plant
Sites with Land Use Controls
Figure 1
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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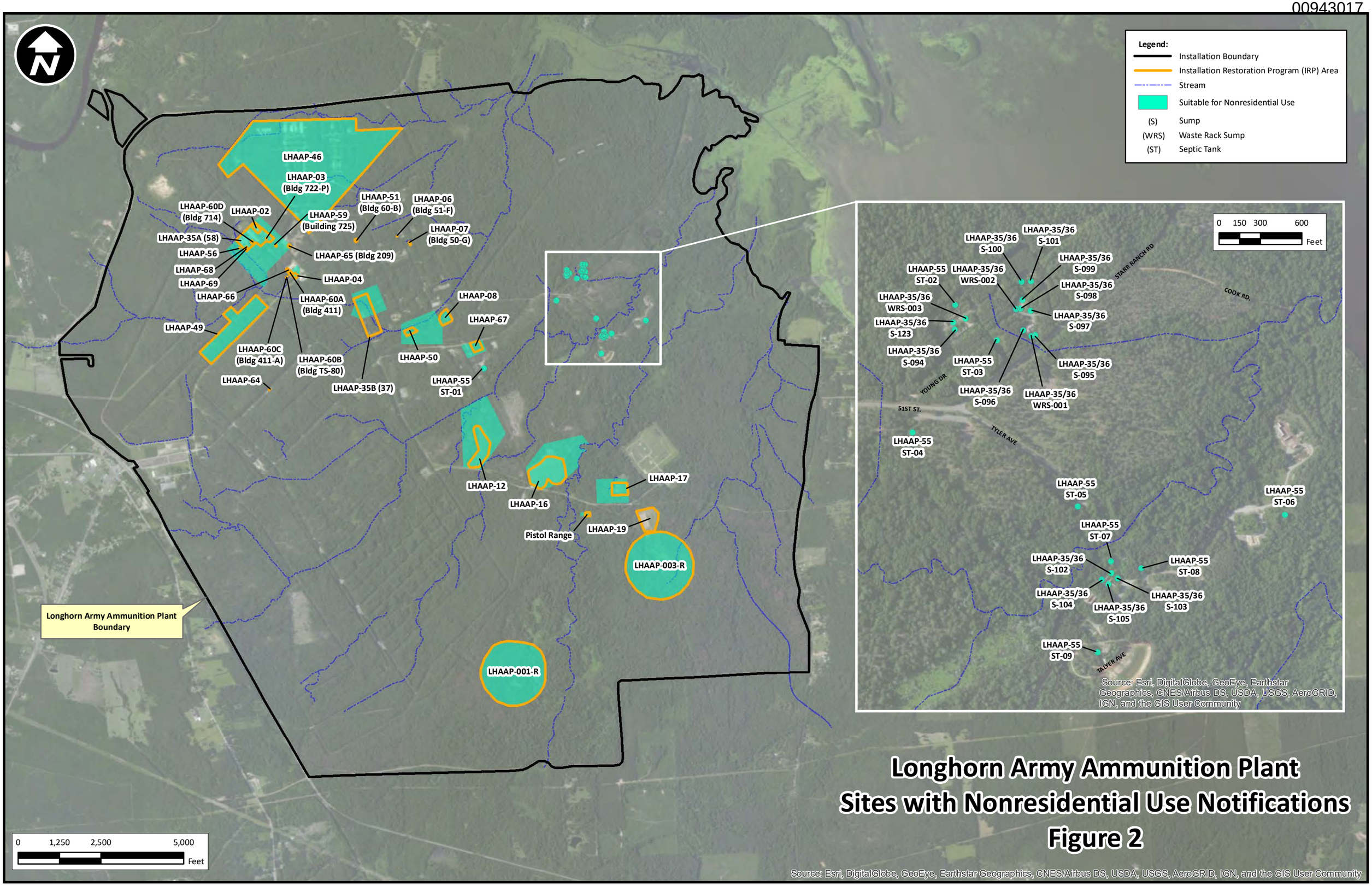

Longhorn Army Ammunition Plant
Sites with Nonresidential Use Notifications
Figure 2

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LHAAP – 04, 4-1
DRAFT LUC INSPECTION AND MAINTENANCE LOG

(RAO Inspection and Maintenance Checklist)
(Well Inspection Form)

Date October 4, 2019

RAO Inspection and Maintenance Checklist

General Information	
Project Name	RAO Inspection and Maintenance, LHAAP-04 Longhorn Army Ammunition Plant, Karnack, TX
Contractor	
Inspector's Name	
Inspector's Title	
Inspector's Signature	
Inspector's Contact Number	
Inspection Date	
Type of Inspection	☐ Quarterly ☐ Semiannual ☐ Annual ☐ Prior to forecast rain ☐ After a rain event ☐ Other ----------

A. Groundwater Monitoring Wells						
A.1	Are the installed groundwater monitoring wells in poor condition?					
A.2	Is the well cleared of vegetation and accessible?					
A.3	Any other relevant observations?					
A.4	Are there any significant cracks present?					
A.5	Are there any damaged areas?					

00943020

WELL INSPECTION FORM

Job Name: _____ Well ID: _____

Job No.: _____ Completed Date: _____

Client: _____ Measured Depth: _____

Site Location: _____ Inspector: _____

☐ **ABOVE GROUND**

Protective casing? ☐ Yes ☐ No

Material _____

Condition: ☐ Good ☐ Broken ☐ Cracked

Lid Condition: ☐ Good ☐ Broken ☐ Cracked

Hinge Condition: ☐ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ **FLUSH MOUNTED**

Well cover present? ☐ Yes ☐ No

Condition: ☐ Good ☐ Broken ☐ Cracked

Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Visible? ☐ Yes ☐ No

Dimensions _____ Thickness _____

Sloped away from casing? ☐ Yes ☐ No

Check any of the following features that apply:

☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

CONCRETE PAD:

Inner Diameter (inches) _____

Condition: ☐ Good ☐ Broken ☐ Cracked ☐ Other (describe) _____

Cap present? ☐ Yes ☐ No

Well lock present? ☐ Yes ☐ No

Lock functioning properly? ☐ Yes ☐ No

Bump post? ☐ Yes ☐ No

Well ID visible? ☐ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☐ No

Visual obstruction? ☐ Yes ☐ No

Is well open to completed depth? ☐ Yes ☐ No

Is silt present in well? ☐ Yes ☐ No

Is silt greater than 25% of well screen length? ☐ Yes ☐ No

COMMENTS:

LHAAP – 04, 4-2

LUCs FROM DRAFT FINAL REMEDIAL DESIGN

Date October 4, 2019

Draft Final
Remedial Design and Remedial Action Work Plan, LHAAP-04 Former Pilot Wastewater Treatment Plant

Longhorn Army Ammunition Plant
Karnack, Texas

Prepared for U.S. Army Corps of Engineers, Tulsa District
Contracting Division
2488 East 81st Street
Tulsa, Oklahoma 74137-4290

Prepared by

bhate ENVIRONMENT & INFRASTRUCTURE

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Prepared by

APTIM

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Houston, Texas 77042

Contract No. W9128F-13-D-0012
Task Order No. W9128BV17F0150
Project No. 501032
Rev 0
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Acronyms and Abbreviations

µg/L	micrograms per liter
APTIM	Aptim Federal Services, LLC
Bhate	Bhate Environmental Associates, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	constituent of concern
DAP	diammonium phosphate
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DPT	direct-push technology
ECP	Environmental Condition of Property
EDS-ER™	Electron Donor Solution – Extended Release
EPA	see USEPA
EVO	emulsified vegetable oil
ft bgs	feet below ground surface
GPS	global positioning system
GWTP	groundwater treatment plant
ISB	in situ bioremediation
IWWP	Installation-Wide Work Plan
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
LOE	lines of evidence
LTM	long-term monitoring
LUC	land use controls
MATOC	Multiple Award Task Order Contract
MCL	maximum contaminant level
MEGA	Multiple Environmental Government Acquisition
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement
mV	millivolts
NCP	National Contingency Plan
O&M	operation and maintenance
O_2	oxygen
ORP	oxidation-reduction potential

Acronyms and Abbreviations (continued)

PCL	Protective Concentration Level
psi	pounds per square inch
RA	remedial action
RACR	Response Action Completion Report
RA-O	Remedial Action-Operation
RAOs	remedial action objectives
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RD	remedial design
ROD	Record of Decision
ROI	radius of influence
Shaw	Shaw Environmental, Inc.
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TOC	total organic carbon
TRRP	Texas Risk Reduction Program
U.S. Army	U.S. Department of the Army
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

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4.0 LAND USE CONTROLS REMEDIAL DESIGN/PLAN

This section describes the LUC RD for LHAAP-04. In accordance with the Final ROD (AECOM 2016), the LUC RD will be finalized as the land use component of the RD.

Per the Final ROD (AECOM 2016), LUCs' performance objectives are to:

- Prohibit the use of groundwater (except for environmental testing and monitoring) as a potable water source
- Restrict land use to nonresidential
- Maintain the integrity of any current or future remedial or monitoring systems

The implementation, maintenance, and inspection requirements associated with each of the performance objectives that comprise this LUC RD are described below. The proposed actions to be taken to implement the LUC objectives during the RA phase are described in **Section 6.0**. The implementation activities, as well as ongoing maintenance, monitoring and reporting requirements will be presented in the Remedial Action Completion Report (RACR), as the final LUC RD. Upon regulatory review and concurrence with the final LUC RD, it will be included as part of the Comprehensive LUC Management Plan.

For portions of the Site subject to LUCs that are not owned by the Army, the Army will monitor and report on the implementation, maintenance, and enforcement of LUCs, and coordinate with federal, state, and local governments and owners and occupants of properties subject to LUCs. The Army remains responsibility for ensuring that the remedy remains protective of human health and the environment.

4.1 LUC Implementation

The actions required to implement the LUCs for LHAAP-04 are described below. The first of these, the initial notice of LUCs, was completed on June 26, 2017. The June 26, 2017, Notice letters that were sent to relevant government officials (U.S. Army 2017) included a preliminary LUC boundary shown on **Figure 4-1**. The following actions will be undertaken to implement the LUCs for LHAAP-04:

- Finalize the boundary for the LUCs as a part of the RA.
  - Revise the boundary, if necessary, based on perchlorate results from the baseline groundwater sampling. The final boundary of the groundwater LUCs (prevent the use of groundwater contaminated above cleanup levels as a potable water source and prohibit access to the contaminated groundwater except for environmental monitoring and testing only); the remedial or monitoring system

LUCs (maintain the integrity of any current or future remedial or monitoring systems); and, the nonresidential land use LUC (restrict land use to nonresidential) will be reviewed during RA activities after an evaluation of the baseline data has been completed and revised if necessary.

  - Survey the LUC Boundaries. The boundaries will be finalized after concurrence by USEPA and TCEQ, and the LUC boundaries will be surveyed by a State-licensed surveyor. A legal description of the surveyed areas will be appended to the survey plat.

- Record the LUCs in Harrison County. The LUC plat, legal description and LUC restriction language will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566.
- Notify the Texas Department of Licensing and Regulation of the groundwater LUCs. The Texas Department of Licensing and Regulation will be notified of the groundwater restrictions, which include the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ. The survey plat, legal boundary and description of the groundwater restriction LUCs, in conjunction with a locator map, will be provided in hard and electronic copy.
- Provide notice of the LUCs with the revised LUC boundary.
  - Prepare the notice of the groundwater and soil (surface and subsurface) contamination and any land use restrictions referenced in the ROD. The notice will consist of a brief description of the contaminants in groundwater and soil, a written description of the LUCs and a figure depicting the revised LUC boundary.
  - Transmit the notice to federal, state, and local governments involved at this site and the owners and occupants of the properties subject to those use restrictions and LUCs within 90 days of RACR acceptance by the regulators. The notices will be sent to federal, state and local officials including: both U.S. Senators, U.S. Congressman (Texas District 1), State Senator (District 1), State Representative (District 9), Harrison County Judge, Harrison County Commissioner Precinct 1, City of Uncertain Mayor, Leigh Water Supply Corporation Board Members, Caddo Lake Water Supply Corporation Board of Directors, and the Caddo Lake National Wildlife Refuge Manager.

4.2 Maintenance and Monitoring Requirements

The LUCs will be maintained in place as follows:

- The LUCs restricting the use of groundwater to environmental monitoring and testing only and the LUC restricting land use to nonresidential will remain in place until the levels of COCs (i.e., including all hazardous substances, pollutants, and contaminants found at the Site at cleanup levels as listed in Table 2-3 of the ROD) in surface and subsurface soil and groundwater allow for unlimited use and unrestricted exposure.
- The LUC to maintain the integrity of any current or future remedial or monitoring systems will remain in place until groundwater cleanup levels of COCs (i.e., including all hazardous substances, pollutants and contaminants found at the Site at cleanup levels as listed in Table 2-3 of the ROD) are met.

Remedial or Monitoring System LUCs include physical components that require repair and maintenance. These are described in **Section 8.0**. The RAO and Extraction System Inspection and Maintenance Checklists is provided in **Appendix E**.

The administrative maintenance required to ensure the LUCs remain in place and effective until the cleanup levels of the COCs are at levels that allow unrestricted use and unlimited exposure are:

- Annual field inspections of the site to confirm that no violations of the LUCs have occurred. Documentation of the inspection will be included in the Inspection and Maintenance Checklist (see **Appendix E**).
- Annual certifications that no LUC-restricted activities have been authorized and that site conditions and use are consistent with the LUCs. The Certification Form is presented in **Appendix E**.
- Periodic transmittal of a LUC Notice to federal, state, and local authorities and to owners and occupants of LHAAP-04. The notice will include the groundwater and soil (surface and subsurface) contamination and any land use restrictions referenced in the ROD, a written description of the LUCs and a figure depicting the LUC boundaries. The transmittal will coincide with each Five-Year Review and will be documented in the report.
- The final LUC RD appendix of the RACR will be added to the Comprehensive LUC Management Plan and the plan will be provided to the owner or occupant of LHAAP-04.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • April 2019

The U.S. Army will address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable.

4.3 LUC Inspection and Monitoring

Beginning with finalization of this RD/RAWP and approval of the Inspection form and the Annual Certification Form, the U.S. Army will undertake inspections and certify continued compliance with the LUC objectives. The U.S. Army, or the transferee after transfer, will retain the LUC Inspection and Certification documents in the project files for incorporation into the five-year review reports, and these documents will be made available to USEPA and TCEQ upon request. In addition, should any violations be found during the certification, the U.S. Army will provide to USEPA and TCEQ, along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations. The need to continue inspections and certifications will be revisited at five-year reviews.

4.3.1 Notice of Planned Property Conveyances

Upon transfer of Army-owned property, the Army will provide written notice to the transferee of the LHAAP-04 groundwater contamination and any land use restrictions. Within 15 days of transfer, the U.S. Army will provide written notice to USEPA and TCEQ of the division of implementation, maintenance, and enforcement responsibilities unless the information has already been provided in the LUC RD. The notice will describe the mechanism by which the LUC will continue to be implemented, maintained, inspected, reported, and enforced. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental document for transfer. Although the U.S. Army may transfer responsibility for various implementation actions, the U.S. Army will also retain ultimate responsibility for the remedy integrity. This means that the U.S. Army is responsible for addressing substantive violations of the LUC performance objectives that would undermine the U.S. Army's CERCLA remedy. The U.S. Army also will be responsible for incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation. In the event property is transferred out of Federal control, the LUCs relating to property and groundwater restrictions shall be recorded in the deed and shall be enforceable by the United States and the state of Texas.

4.3.2 Opportunity to Review Text of Intended Land Use Controls

The U.S. Army will provide a copy of the groundwater and land use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. USEPA will also receive a copy for review. The U.S. Army will produce an ECP or other environmental document for transfer of LHAAP-04, but before executing transfer, the U.S. Army will provide USEPA and TCEQ with a copy of the ECP or other environmental document for transfer so

that they may have reasonable opportunity, before transfer, to review all LUC-related provisions.

4.3.3 Notification Should Action(s) which Interfere with Land Use Control Effectiveness be Discovered Subsequent to Conveyance

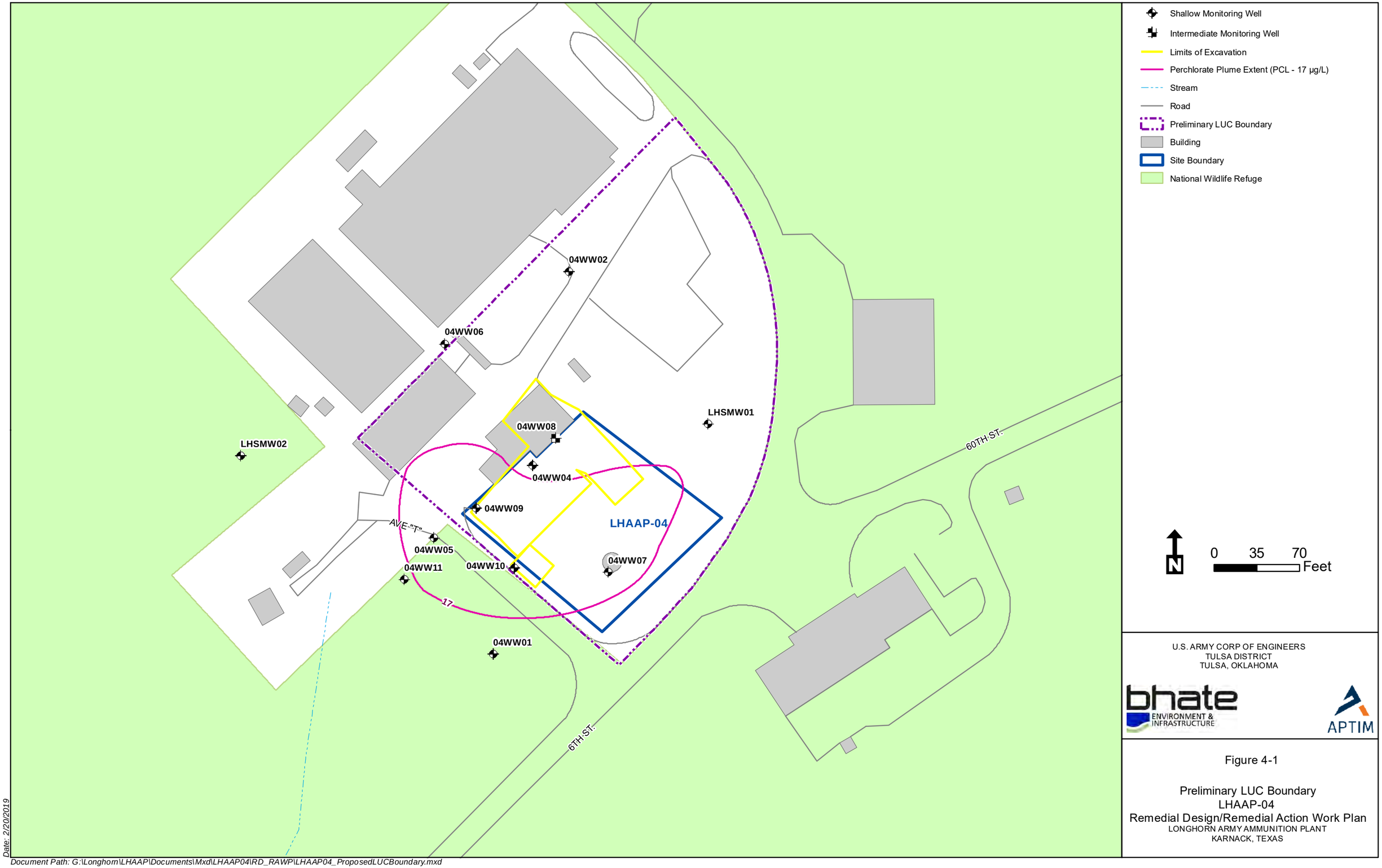
Should the U.S. Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objectives, the U.S. Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with **Section 4.3.5** below, the U.S. Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the U.S. Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

4.3.4 Land Use Control Enforcement

Should the LUC remedy reflected in this RD fail, the U.S. Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the USFWS or its lessee, to the institution of judicial action against non-federal third parties. Alternatively, should the circumstances warrant such, the U.S. Army could choose to exercise its response authorities under CERCLA. Should the U.S. Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the U.S. Army may notify those agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUC.

4.3.5 Modification or Termination of Land Use Controls

The LUCs shall remain in effect until such time as the U.S. Army and USEPA agree that the concentrations of perchlorate in groundwater have met cleanup levels and allow unrestricted use. When this occurs, the LUC will be terminated as needed. The decision to terminate the LUC will be documented consistent with the NCP process for post-ROD changes, potentially including an Explanation of Significant Difference or a Remedial Action Completion Report. If the property has been transferred and a determination by the U.S. Army and USEPA has been made to terminate the LUC, the U.S. Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate ENVIRONMENT & INFRASTRUCTURE

APTIM

Figure 4-1

Preliminary LUC Boundary
LHAAP-04
Remedial Design/Remedial Action Work Plan
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/20/2019

Document Path: G:\Longhorn\LHAAP\Documents\Mxd\LHAAP04\RD_RAWP\LHAAP04_ProposedLUCBoundary.mxd

LHAAP – 04, 4-3

NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-04 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT) (PENDING)

Date October 4, 2019

LHAAP – 04, 4-4
LAND USE CONTROL COMPLIANCE INSPECTION FORM

Date October 4, 2019

Annual Land Use Control Compliance Certification Form

In accordance with the Remedial Design dated_____for LHAAP-04 an inspection of the site was conducted by_____[indicate transferee] on _____.

The land use control mechanisms are:

- Groundwater restrictions - prohibit access to the contaminated groundwater except for environmental monitoring and testing only until cleanup goals are met;
- Land use restrictions - restrict land use to nonresidential;
- Integrity of remedial and monitoring systems - maintain the integrity of any current or future remedial or monitoring systems until cleanup goals are met.

No unauthorized activities or uses have occurred. Compliance with land use controls and restrictions is as follows:

- No use of groundwater (other than environmental testing and monitoring), installation of new groundwater wells, or tampering with existing monitoring wells;
- No land use other than nonresidential; and
- No activities that would compromise the integrity of the remedial or monitoring systems.

I, the undersigned, do document that the inspection was conducted as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year, retained in the file and provided to Army, EPA and TCEQ upon request.

LHAAP - 06

NOTICE OF NONRESIDENTIAL LAND USE FOR LHAAP-06 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005555

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005555 **Receipt No:** 1006195 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-06, is the area of a demolished building location known as Building 51-F located within the Plant 3 production area of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-06 is not itself considered an NPL site. Environmental activities at LHAAP-06 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-06 (Building 51-F) was a collection point for waste acids and solvents. Its three-sided shed contained a rack that held a single 55-gallon drum set on a 50-square foot pie-shaped concrete pad. Beginning in 1985, the drum was used to collect waste acids and solvents from bench-scale manufacture of the explosive cyclotetramethylenetetranitramine. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to

5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-06 parcel is 119 square foot, more or less, or 0.00273 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-06 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-06. Contaminants in soil samples from LHAAP-06 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-06 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-06 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
Or
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10th day of March, 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-06" TRACT
(REMAINS OF DEMOLISHED BUILDING 51-F)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-06" being defined by the four external corners of the three concrete walls remaining at demolished Building 51-F (wall defining the West edge of said building is either gone or never existed) in the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-06" being more particularly described as follows :

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "HORSE" (N=6960008.269 feet E=3309591.340 feet). Said traverse indicates a surface distance of 4895.70 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation E.C.C.W. indicates External Corner of Concrete Wall,

Commencing at monument "HORSE" referenced above,

THENCE N 59deg52'55"W 597.03' to an E.C.C.W. found for the S.E.C. of this tract and this POINT OF BEGINNING,

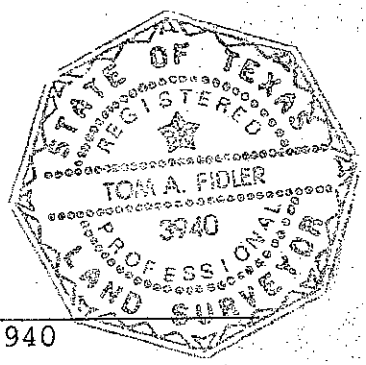
THENCE S 67deg37'19"W 10.93' along the S.B.L. of this tract to an E.C.C.W. found for this tract's S.W.C. ,

THENCE N 22deg14'24"W 10.92' along the W.B.L. of this tract to an E.C.C.W. found for this tract's N.W.C. ,

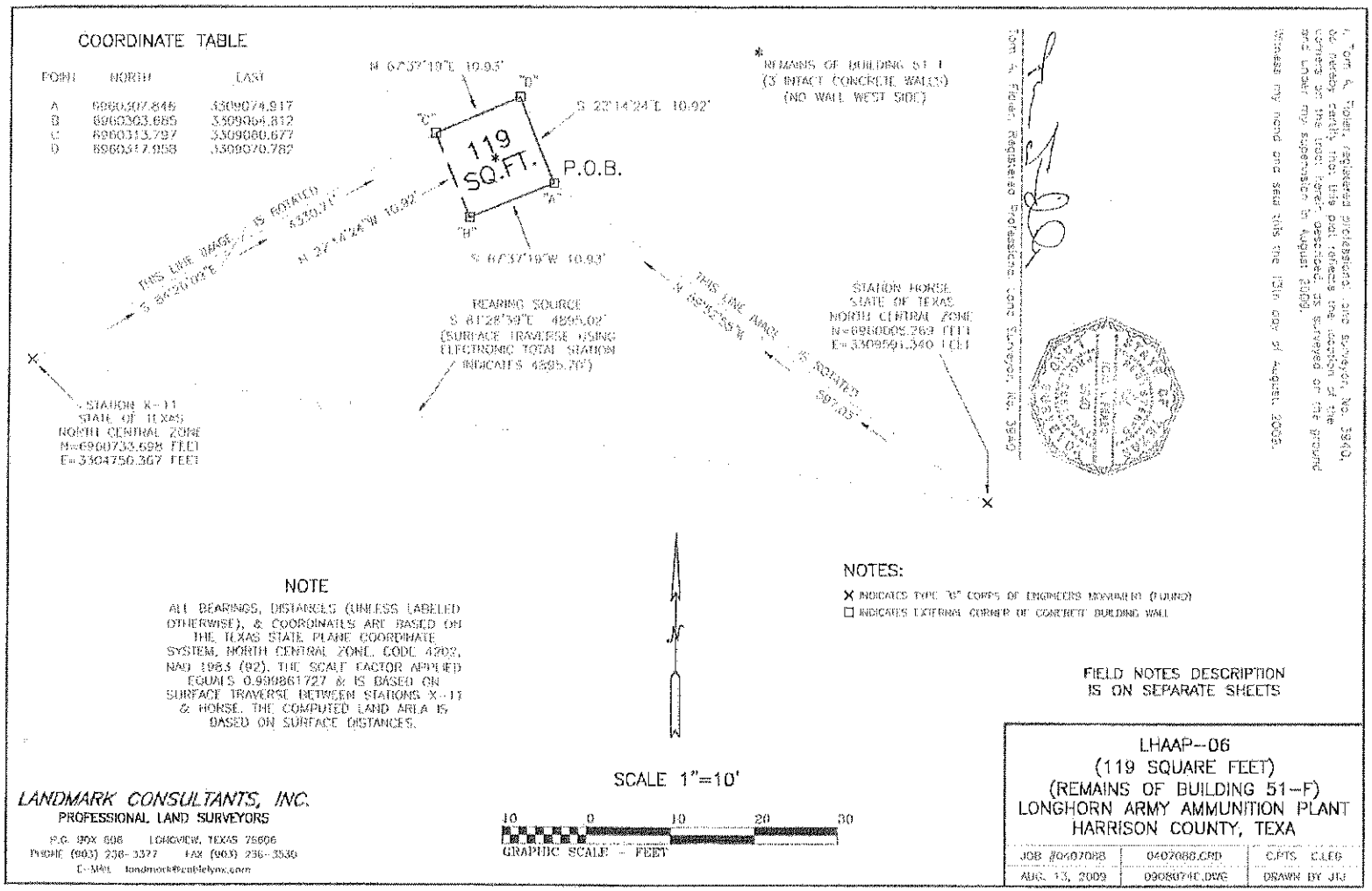
THENCE N 67deg37'19"E 10.93' along the N.B.L. of this tract to an E.C.C.W. found for this tract's N.E.C. ,

THENCE S 22deg14'24"E 10.92' along the E.B.L. of this tract to this POINT OF BEGINNING. This tract contains 119 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & HORSE. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES:

X INDICATES TYPE "B" CORPS OF ENGINEERS MONUMENT (FUTURE)
□ INDICATES EXTERNAL CORNER OF CONCRETE BUILDING WALL

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 238-3377 FAX (903) 236-3536
E-MAIL landmark@cableone.com

LHAAP--06
(119 SQUARE FEET)
(REMAINS OF BUILDING 51--F)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXA

JOB #0407088	0407088.CRD	CPTS. CLED
AUG. 13, 2009	0908074C.DWG	DRAWN BY JAY

LHAAP-07

NOTICE OF NONRESIDENTIAL LAND USE FOR LHAAP-07 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005556

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7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005556 **Receipt No:** 1006195 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-07, is the area of a demolished building location known as Building 50-G located within the Plant 3 production area of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-07 is not itself considered an NPL site. Environmental activities at LHAAP-07 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-07 (Building 50-G) was the former drum processing building which consisted of a wooden frame building 30 feet by 100 feet in size set on a concrete pad located within the boundary of LHAAP-47. Beginning in 1985, Building 50-G had a separate bay (20 by 30 feet in size) used as a washdown area for empty drums and casting equipment used in ammunition production. The washdown area was an above-grade concrete vault where empty drums were rinsed with hot water and spent sulfuric acid neutralized with limestone. The wastes handled included solvents, oils, and organic liquids. The site ceased operation in 1995. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd,

Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-07 parcel is 3,078 square foot, more or less, or 0.07066 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-07 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-07. Contaminants in soil samples from LHAAP-07 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-07 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-07 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
or
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10 th day of March, 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

NOTARY PUBLIC STATE OF TEXAS
ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-07" TRACT
(REMAINS OF DEMOLISHED BUILDING 50-G)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-07" being defined by the four external corners of the concrete foundation stem wall of demolished Building 50-G in the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-07" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "HORSE" (N=6960008.269 feet E=3309591.340 feet). Said traverse indicates a surface distance of 4895.70 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation E.C.C.F.S.W. indicates External Corner of Concrete Foundation Stem Wall,

Commencing at monument "HORSE" referenced above,

THENCE N 87deg11'48"W 103.14' to an E.C.C.F.S.W. found for the S.E.C. of this tract and this POINT OF BEGINNING,

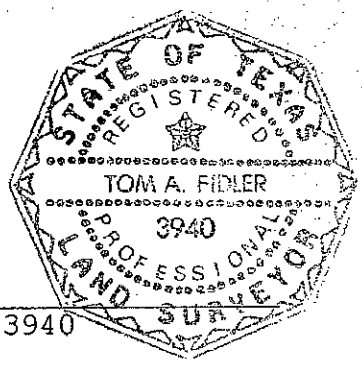
THENCE S 69deg02'55"W 30.36' along the S.B.L. of this tract to an E.C.C.F.S.W. found for this tract's S.W.C. ,

THENCE N 21deg59'26"W 101.90' along the W.B.L. of this tract to an E.C.C.F.S.W. found for this tract's N.W.C. , and being S 82deg14'17"E 4714.65' from monument "X-11" referenced above,

THENCE N 71deg43'04"E 30.53' along the N.B.L. of this tract to an E.C.C.F.S.W. found for this tract's N.E.C. ,

THENCE S 21deg55'35"E 100.48' along the E.B.L. of this tract to this POINT OF BEGINNING. This tract contains 3,078 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

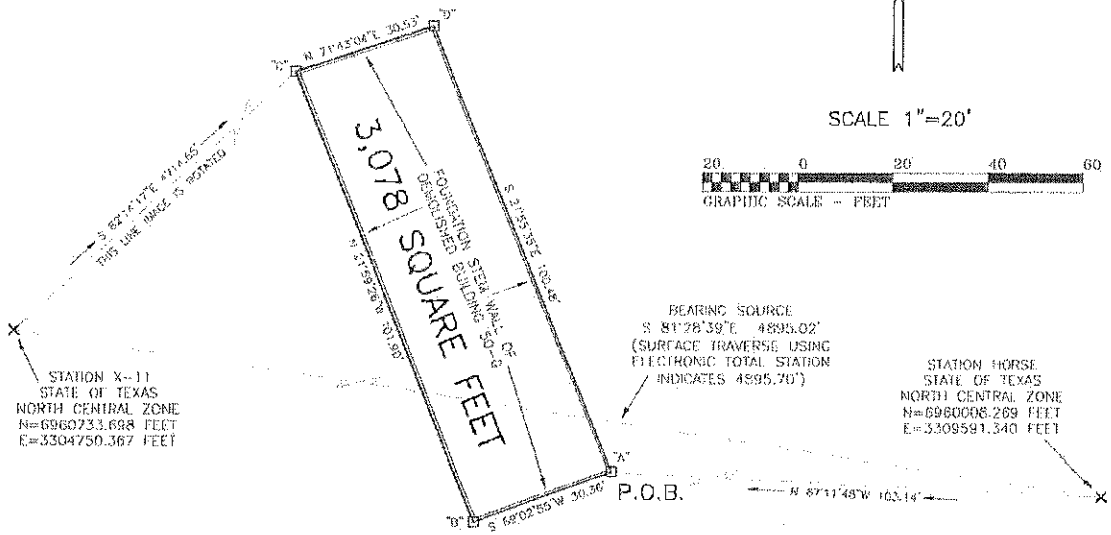
NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)

□ INDICATES EXTERNAL CORNER OF FOUNDATION STEM WALL

COORDINATE TABLE

POINT	NORTH	EAST
A	6960013.313	3309488.323
B	6960002.458	3309459.972
C	6960096.944	3309421.815
D	6960106.521	3309450.803



SCALE 1"=20'

20 0 20 40 60

GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August, 2009.

Witness my hand and seal this the 13th day of August, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & HORSE. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cableone.com

LHAAP-07
(3,078 SQUARE FEET)
(REMAINS OF BUILDING 50-G)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	B.PTS B.LCG
AUG. 13, 2009	09080748.DWG	DRAWN BY JTJ

LHAAP-08

NOTICE OF NONRESIDENTIAL LAND USE FOR LHAAP-08 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2011-000003377

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

NOTICE

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 03/24/2011 03:52 PM **Document Number:** 2011-000003377 **Receipt No:** 1103745 **Amount:** $ 32.00 **By:** Lauren Boyd, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT CDO OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AARON WILLIAMS EC-ER
1645 SOUTH 101ST EAST AVENUE

TULSA, OK 74128

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remedial investigation of the land described herein. The site, LHAAP-08, the former Sewage Treatment Plant, operated from 1942 to 1997. LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-08 is not itself considered an NPL site. Environmental activities at LHAAP-08 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-08 included stabilization ponds, Dunbar filters, sludge drying beds, and an Imhoff tank. The plant received storm water, boiler blow down, laundry waste, vehicle wash rack waste, and effluent from film development at the X-ray facility. Treated effluent was discharged into Goose Prairie Creek and Caddo Lake. Soil and groundwater investigations in 2000, 2001, and 2005 included sampling for explosives compounds, metals, semivolatile organic compounds, volatile organic compounds, dioxins and furans, pesticides and PCBs. Soil results included detections of low levels of metals, perchlorate and dioxin. Low levels of metals, dioxin and furan compounds and perchlorate were detected in groundwater. An assessment of risk to exposure to soil and groundwater at LHAAP-08, based on the

nonresidential use scenario, indicated that potential human health risks are within the acceptable range established by EPA. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-08 parcel is a 2.974 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-08 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-08. Contaminants in soil samples from LHAAP-08 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-08 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-08 is consistent with the non-residential use scenario evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through
12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 25 th day of January, ~~2010~~ 2011.

BEFORE ME, on this the 25 th day of Jan 2011, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 25 day of January.

Notary Public in and for the State of Texas,
County of Harrison

NOTARY PUBLIC STATE OF TEXAS
ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-08" TRACT
(PROPOSED INDUSTRIAL USE NOTIFICATION AREA)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-08" being 2.974 acre of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-08" being more particularly described as follows :

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998636625, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "IGNATIUS-1" (N=6957090.304 feet E=3311081.788 feet) and "IGNATIUS-2" (N=6955582.752 feet E=3311851.704 feet). Said traverse indicates a surface distance of 1693.005 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940", and the abbreviation C.N.I.B.C. indicates concrete nail in bottle cap.

Commencing at monument "IGNATIUS-1" referenced above,

THENCE N 52deg56'26"W 814.32' to an I.R.O.P.C. set for the Southmost corner of this tract and this POINT OF BEGINNING,

THENCE N 28deg08'32"W 374.05' along the S.W. B.L. of this tract to an I.R.O.P.C. set for this tract's Westmost corner,

THENCE N 62deg03'14"E 348.01' along the N.W. B.L. of this tract to a C.N.I.B.C. set (in the asphalt pavement of South Houston Road) for this tract's Northmost corner,

THENCE S 27deg43'38"E 328.00' along the N.E. B.L. of this tract to a C.N.I.B.C. set (in the asphalt pavement of South Houston Road) for the North end of a curve,

THENCE along a curve to the right (having a radius of 48.04' and an arc length of 75.57', being subtended by a chord of S 17deg20'14"W 68.02') to a C.N.I.B.C. set (in the asphalt pavement of South Houston Road) for the South end of said curve,

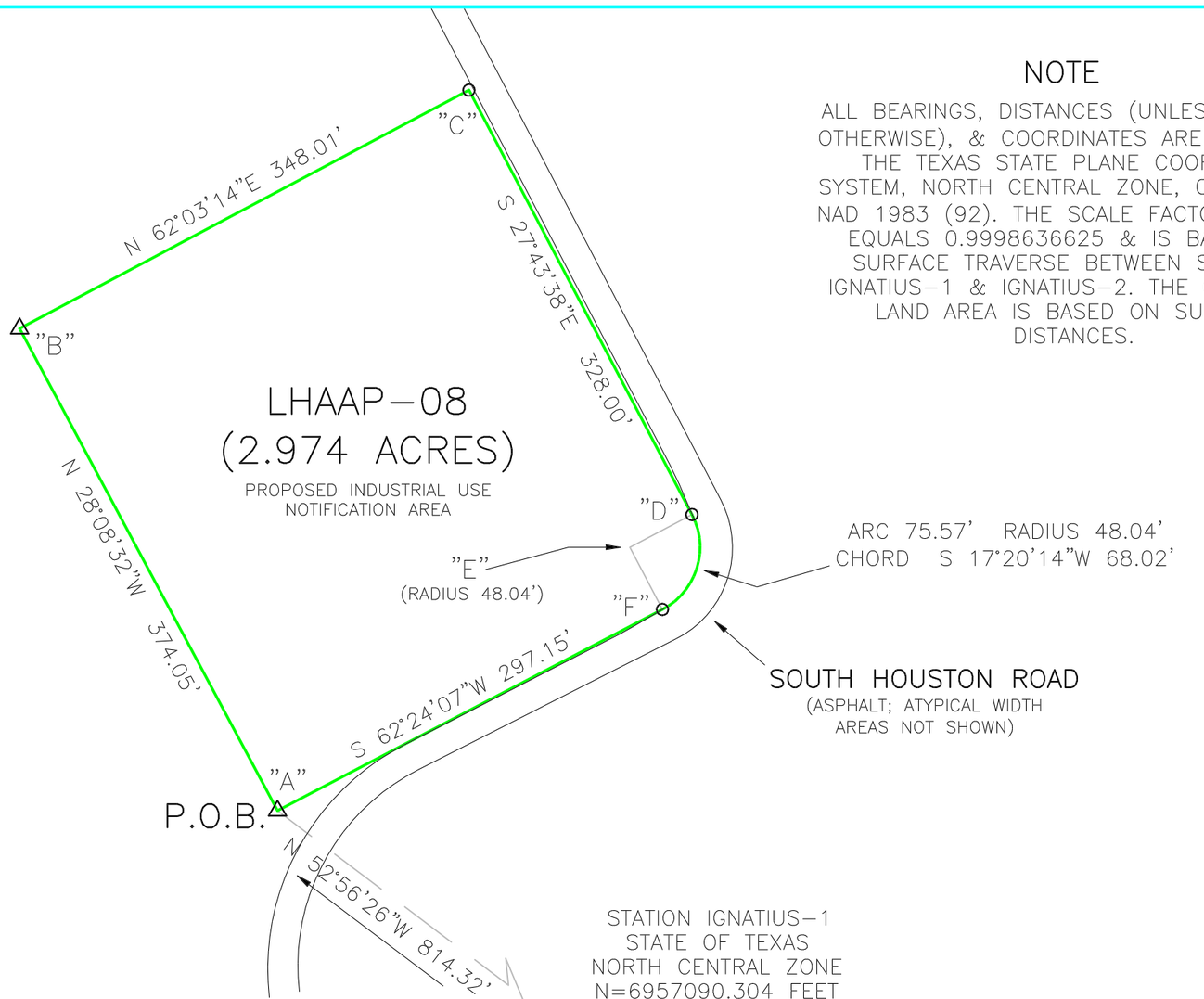
THENCE S 62deg24'07"W 297.15' along the S.E. B.L. of this tract to this POINT OF BEGINNING, containing 2.974 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler

Tom A. Fidler, R.P.L.S. Number 3940

00943060

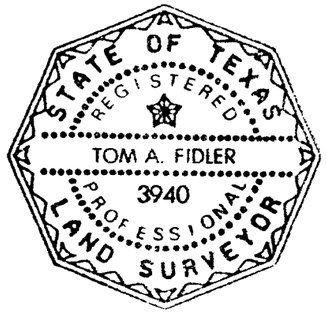


NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998636625 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS IGNATIUS–1 & IGNATIUS–2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in July 2008.

Witness my hand and seal this the 29th day of July, 2008



Tom A. Fidler

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

N

SCALE 1"=100'

100 0 100 200 300

GRAPHIC SCALE – FEET

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- O INDICATES CONCRETE NAIL IN BOTTLE CAP (SET IN ASPHALT)
- △ INDICATES 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- ——— INDICATES BOUNDARY OF PROPOSED INDUSTRIAL USE NOTIFICATION AREA

COORDINATE TABLE

POINT	NORTH	EAST
A	6957581.048	3310431.952
B	6957910.879	3310255.527
C	6958073.970	3310562.954
D	6957783.633	3310715.561
E	6957761.282	3310673.037
F	6957718.708	3310695.292

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236–3377 FAX (903) 236–3530
E–MAIL landmark@cablelynx.com

LHAAP–8
(2.974 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	0605063F.DWG
07/29/2008	0605063.CRD	DRAWN BY JTJ

LHAAP-12, 12-1

LUC INSPECTION AND MAINTENANCE LOG

September 14, 2015

LUC Inspection and Maintenance Log – LHAAP 12

Date	Inspected by:	Inspection / Maintenance Activities					Corrective action or repairs required?	Repairs / Action Taken
		Protect landfill cover integrity				Prevent human exposure to groundwater		
		Vegetative Cover maintained: i.e. grass mowed	Fence and signage maintained	Observance of landfill cover degradation –e.g. desiccation cracks, erosion, or gullying	Continued compliance verified for no digging or disturbance of landfill cover or contents	Verified no withdrawal or use of groundwater (other than environmental testing)		

LHAAP-12, 12-2

LUCs FROM FINAL REMEDIAL DESIGN ADDENDUM

September 14, 2015

FINAL

REMEDIAL DESIGN ADDENDUM
LANDFILL 12 (LHAAP-12)
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared for
U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma

Prepared by
Shaw Environmental, Inc.
3010 Briarpark Drive, Suite 400
Houston, Texas 77042

Contract Number DACA56-94-D-0020
Task Order No. 0109

June 2007

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Acronyms and Abbreviations ii

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4.0 Land Use Controls for the Site 4-1
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Figure 2 LHAAP-12 Land Use Control & Maintenance Map

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Appendix A Groundwater Monitoring Plan
Appendix B Sample Annual Land Use Control Compliance Inspection Documentation

4.0 Land Use Controls for the Site

The LUCs to be implemented by the Army or its representatives for LHAAP-12 include:

- Maintenance of the integrity of the landfill cap, including, at a minimum, repairs to desiccation cracks, erosion, or gullying upon observance.
- Maintenance of a vegetative cover on the landfill cap including regular mowing.
- Maintenance of fence line and signage around landfill cap.
- Prohibition of any activities that would affect the integrity of cap.
- Prohibition of any activities that would cause exposure to the contaminated groundwater.

Although groundwater monitoring is not a LUC, it was included as a component of the remedy for LHAAP-12 identified in the 2006 ROD to evaluate the effectiveness of the landfill cap (Shaw, 2006b). The groundwater monitoring plan is included in **Appendix A**.

6.0 Remedy Implementation Actions

6.1 Land Use Control Implementation Actions

Until LHAAP-12 is transferred, the Army or its representatives will be responsible for LUC implementation, maintenance, inspection, reporting and enforcement. The Army shall address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable. If periodic LUC inspections and maintenance are required to address site-specific risks, the Army will be responsible for making the results available to the appropriate regulators.

As a condition of property transfer, the Army may require the transferee to assume responsibility for various implementation actions, as indicated below. Although the Army may transfer responsibility for various implementation actions, the Army shall retain its responsibility for remedy integrity. This means that the Army is responsible for addressing substantive violations of performance objectives that would undermine the Army's CERCLA remedy. The Army also will be responsible for: 1) incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation; 2) recording survey plat and notice of restrictions for both the landfill cap and cover system boundary at the Harrison County Courthouse; 3) recording groundwater use restriction and survey plat at the Harrison County Courthouse; and 4) notifying Texas Department of Licensing and Regulation of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ.

The following LUC implementation actions shall be undertaken by the Army in order to ensure that the aforementioned LUC performance objectives for LHAAP 12 are met and maintained:

6.1.1 Comprehensive Base-wide Land Use Control Management Plan

Within 30 days of receiving USEPA and TCEQ approval of this RD Addendum, the Army will develop a Comprehensive Base-wide LUC Management Plan which shall initially consist of this document and a survey plat showing the locations where the LHAAP-12 LUCs are applied. The purpose of this Comprehensive Base-wide LUC Management Plan is to ensure the all site-specific LUCs are compiled into one comprehensive location for both pre-transfer use by the installation and for post-transfer use by the transferee. This document is also accessible to regulators, the local government and the public. The Army will locate the Comprehensive Base-wide LUC Management Plan in the City of Marshall Public Library to accompany LHAAP's Administrative Record.

As LUC RD documents for additional environmental sites are approved by USEPA and TCEQ, the Army shall likewise add those documents and survey plats to the Comprehensive Base-wide LUC Management Plan as well as update the previous copy of the plan placed in the City of Marshall Public Library.

6.1.2 Site Inspections and Reporting

Beginning with finalization of this RD Addendum, the Army will undertake annual physical inspections and reporting to confirm continued compliance with all LUC objectives. The Army will provide USEPA and TCEQ with an annual LUC Compliance Inspection document consistent with the form attached hereto as **Appendix B**. In addition, should any deficiency(ies) be found during the annual inspection, the Army will provide to USEPA and TCEQ along with the document, a separate written explanation indicating the specific deficiency(ies) found and what efforts or measures have or will be taken to correct those deficiencies. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECOP). The need to continue annual inspections will be revisited at five year reviews.

6.1.3 Notice of Planned Property Conveyances

Planned conveyance of LHAAP-12 acreage is to U.S. Fish and Wildlife Service for incorporation into the Caddo Lake National Wildlife Refuge. The Army shall provide notice to USEPA and TCEQ of such intended conveyance. The notice shall describe the mechanism by which LUCs will continue to be implemented, maintained, inspected, reported, and enforced.

6.1.4 Opportunity to Review Text of Intended Land Use Controls

The Army will produce an ECOP for LHAAP-12, but before executing the letter of transfer, the Army will provide USEPA and TCEQ with a draft copy of that ECOP so that they may have reasonable opportunity, before document execution, to review all LUC-related provisions.

6.1.5 Notification Should Action(s) Which Interfere with Land Use Control Effectiveness Be Discovered Subsequent to Conveyance

Should the Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objectives, the Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with **Section 6.1.6** below, the Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

6.1.6 Land Use Control Enforcement

Should the LUC remedy reflected in this LUC RD fail, the Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These

actions may range from informal resolutions with the owner or violator, to the institution of judicial action under the auspices of Texas property law or CERCLA. Alternatively, should the circumstances warrant such, the Army could choose to exercise its response authorities under CERCLA, and then seek cost recovery after the fact from the person(s) or entity(ies) who violated a given LUC. Should the Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the Army will notify these agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUCs.

6.1.7 Modification or Termination of Land Use Controls

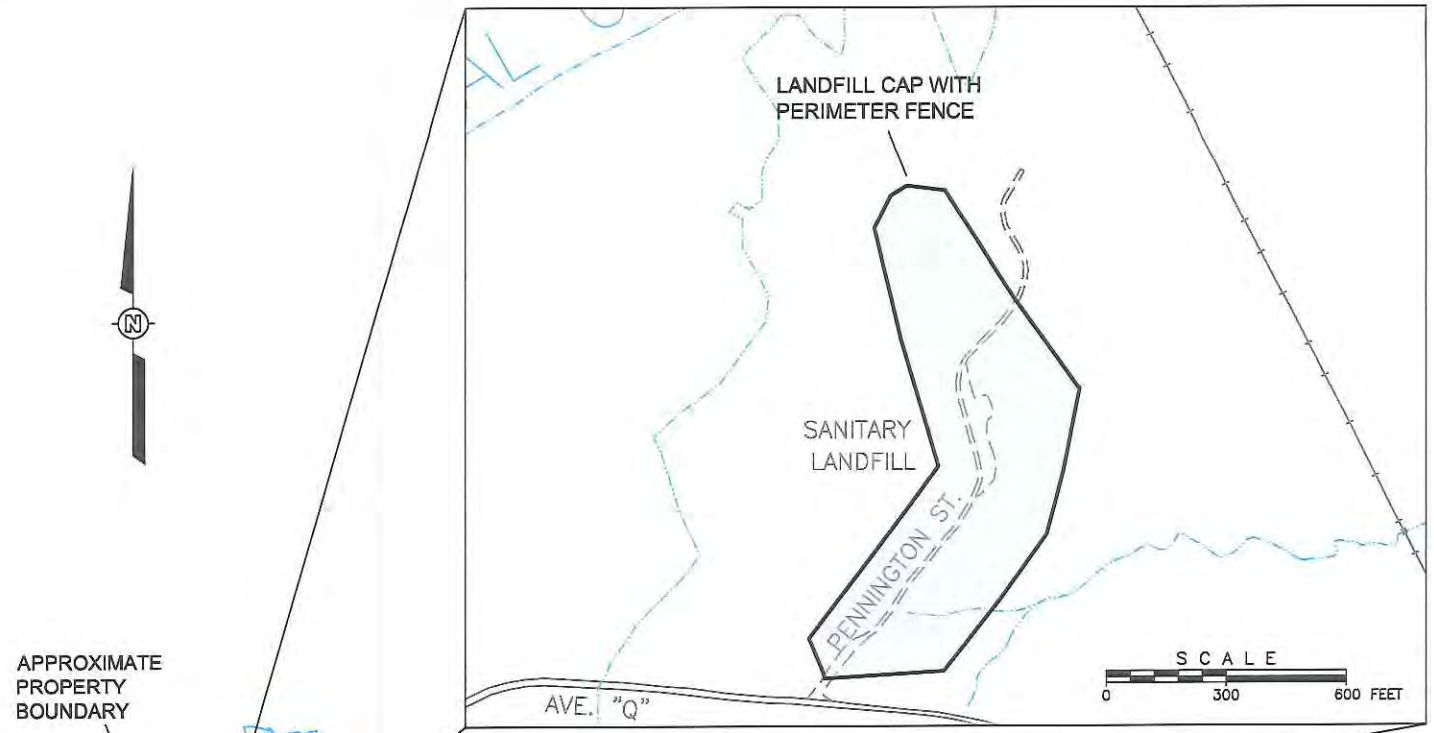
The Army shall not, without USEPA concurrence, make a significant modification to, or terminate a LUC, or make a land use change inconsistent with the LUC objectives and use assumptions of the selected remedy. Likewise, the Army shall seek prior USEPA concurrence before commencing actions that may impact remedy integrity. In the case of an emergency action, the Army shall obtain prior USEPA concurrence as appropriate to the exigencies of the situation.

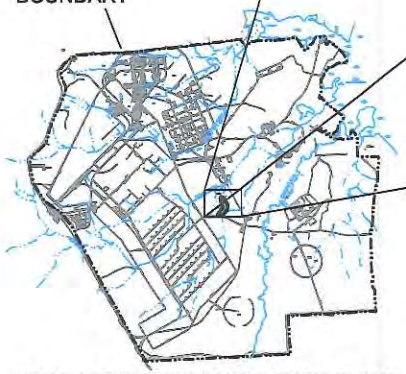
The LUCs shall remain in effect until such time as the Army and USEPA agree that the concentrations of hazardous substances have been reduced to levels that allow for unlimited exposure and unrestricted use. When this occurs, the LUCs will be terminated as needed. The decision to terminate LUCs will be documented consistent with the NCP process for post-ROD changes, potentially including an explanation of significant differences or a remedial action completion report. If the property has been transferred and a determination by the Army and USEPA has been made to terminate one or more of the LUCs, the Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

6.2 Monitored Natural Attenuation Implementation Actions

Implementation actions include development of a groundwater monitoring plan, monitoring, and reporting. Groundwater monitoring will be conducted to monitor the effectiveness of MNA in reducing contaminant concentrations over time. Monitoring will also be conducted to evaluate plume migration and ensure that TCE-contaminated groundwater does not impact nearby surface water at unacceptable levels. The Groundwater Monitoring Plan, attached as **Appendix A**, describes the wells, their locations, analytical parameters, and the frequency of the monitoring.

Annual reports will be prepared to document the monitoring program. The first year annual report will include a review of the first four quarters of data which include natural attenuation parameters and provide an evaluation for the evidence of MNA as a remedial method. The TCEQ provides guidance for MNA as a remedial action in *Monitored Natural Attenuation*





LONGHORN ARMY AMMUNITION PLANT

LEGEND:

- CREEK/BAYOU
- PAVED ROADS
- UNIMPROVED ROAD

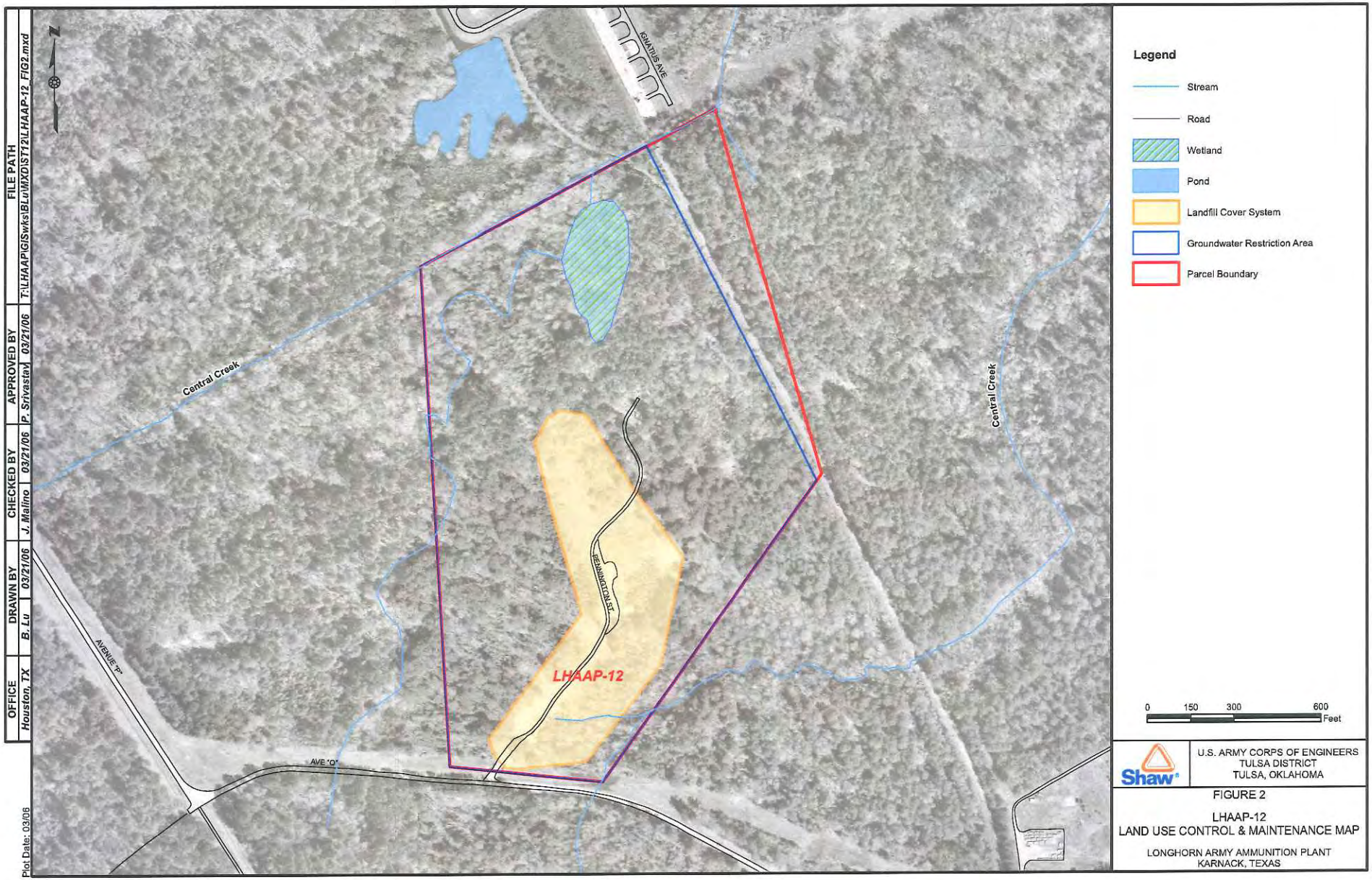
IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	Houston, Texas	D. DAY 2/14/04	K. EVERETT 6/30/05	P. SRIVASTAV 6/30/05	845714-B44

PLOT DATE: 7/05/05
FORMAT REVISION 3/25/99

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1
SITE LOCATION MAP
LHAAP-12
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00943071


Legend
Stream
Road
Wetland
Pond
Landfill Cover System
Groundwater Restriction Area
Parcel Boundary
Central Creek
Central Creek
IGNATIUS AVE
REMINGTON ST
AVENUE "P"
AVE "O"
LHAAP-12
0 150 300 600
Feet
Shaw
U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA
FIGURE 2
LHAAP-12
LAND USE CONTROL & MAINTENANCE MAP
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
OFFICE Houston, TX
DRAWN BY B. Lu 03/21/06
CHECKED BY J. Malino 03/21/06
APPROVED BY P. Srivastav 03/21/06
FILE PATH T:\LHAAP\GIS\wrks\BLu\MXD\ST12\LHAAP-12_FIG2.mxd
Plot Date: 03/06

Appendix B

Sample Annual Land Use Control Compliance Inspection Documentation

Sample Annual Land Use Control Compliance Inspection Documentation

In accordance with the Remedial Design Addendum dated _____ for LHAAP-12, an inspection of site was conducted by _____ [indicate transferee] on_____.

A summary of land use control mechanisms is as follows:

- Land use and restriction covenants included in ECOP – [Indicate whether the ECOP is on file with the notice of transfer]
- Groundwater restriction – [Indicate whether groundwater restrictions are still required at LHAAP-12]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-12
- No reuse activity at LHAAP-12 that would adversely affect the integrity of the landfill cap
- The fence and posted signs are properly maintained at LHAAP-12
- The vegetative cover is properly maintained over the landfill
- Landfill cap is properly maintained with no evidence of erosion, cracking, settlement, or other damage to engineered components

I, the undersigned, do document that the inspection was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title _____

Signature: _____

Completed annual compliance inspection forms, with relevant annual compliance certification forms, shall be sent no later than March 1 of each year for the previous calendar year.

U.S. Department of the Army
TCEQ
USEPA Region 6

LHAAP-12, 12-3

NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-12 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

Doc 7009064 Bk OR Vol 3640 Pg 00943075

FILED FOR RECORD

07 JUN 13 AM 10: 09

PATSY COX
CO CLERK, HARRISON CO

BY _____ DEPUTY

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROLS AT LHAAP-12

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The remediation site is a capped landfill located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-12. The site is included in TCEQ Notice of Registration No. 30990 as Unit Number 001. LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-12 were performed in accordance with the FFA requirements.

The landfill was used intermittently for the disposal of industrial solid waste, possibly containing small quantities of hazardous constituents generated at LHAAP. A Record of Decision (ROD) for LHAAP-12 was signed by USEPA in 1995 establishing the construction of a cap as an interim remedial action for the site to mitigate potential risks posed by the burial of landfill waste. Construction of the landfill cap was completed in 1998. The final remedy consists of land use controls (LUCs) in conjunction with monitored natural attenuation as documented in the Final ROD signed by USEPA on July 24, 2006. The site was not remediated to levels suitable for unrestricted use. LUCs at LHAAP-12 are required to ensure the integrity of the landfill cap and cover system and prevent human exposure to contaminated groundwater. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the

Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-12 parcel is a 50.541 acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Within the LHAAP-12 parcel are designated LUC boundaries including a 9.429 acre tract, more or less, and a 45.939 acre tract, more or less, as described in Exhibit A. The LUC boundaries are also presented in the attached Figure 1.

Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. The United States Department of the Army has undertaken careful environmental study of the LHAAP-12 site and concluded that the LUCs set forth below are required to ensure protection of human health and the environment.

(1) **Landfill Restriction**. A closed non-hazardous landfill (LHAAP-12) of approximately 7 acres is located within the 9.429 acre tract. The landfill restriction boundary consists of the 7-acre capped landfill and an area extending to the surrounding fence. LUCs have been established to protect the integrity of the remedy. No activity shall be conducted or permitted that would damage the integrity of the landfill cover (i.e. digging or disturbing the existing cover or contents of the landfill). The LUCs will remain in place for perpetuity unless otherwise removed by the U.S. Army per agreement with the USEPA and TCEQ.

(2) **Residential Use Restriction**. The residential use restriction boundary consists of the 9.429 acre-tract, more or less, and includes the 7-acre capped landfill and an area extending to the surrounding fence. This tract shall be used solely for the purpose of a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

(3) **Groundwater Restriction.** The groundwater use restriction boundary consists of the 45.939 acre tract, more or less, and extends beyond the landfill

boundary. Groundwater underlying this land is contaminated with trichloroethene (TCE) and other volatile organic compounds and shall not be accessed or used for any purpose without the prior written approval of U.S. Army, the USEPA and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA and the TCEQ. The LUC will remain in place until applicable or relevant and appropriate requirements (ARARs) as established in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulation 300) are met. Due to the potential for TCE-contaminated groundwater to migrate, monitored natural attenuation will be implemented to assure that TCE-contaminated groundwater will not migrate to nearby surface water at levels that may present an unacceptable risk to human health and the environment. The monitoring and reporting associated with this remedy will continue until ARARs are achieved.

The owner of the site is the Department of the Army, and its address where more specific information may be obtained from is as follows:

ATTN: DAIM-BD-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 13th day of June, 2007.

BEFORE ME, on this the 13th day of June, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 13 day of June, 2007.

LYNDA G. HAYS
Notary Public State of Texas
COMM. EXP. 5-02-2010

Lynda G. Hays
Notary Public in and for the State of Texas,
County of Harrison

Doc Bk Vol Pg
7009064 OR 3640 4

EXHIBIT A

NOTE

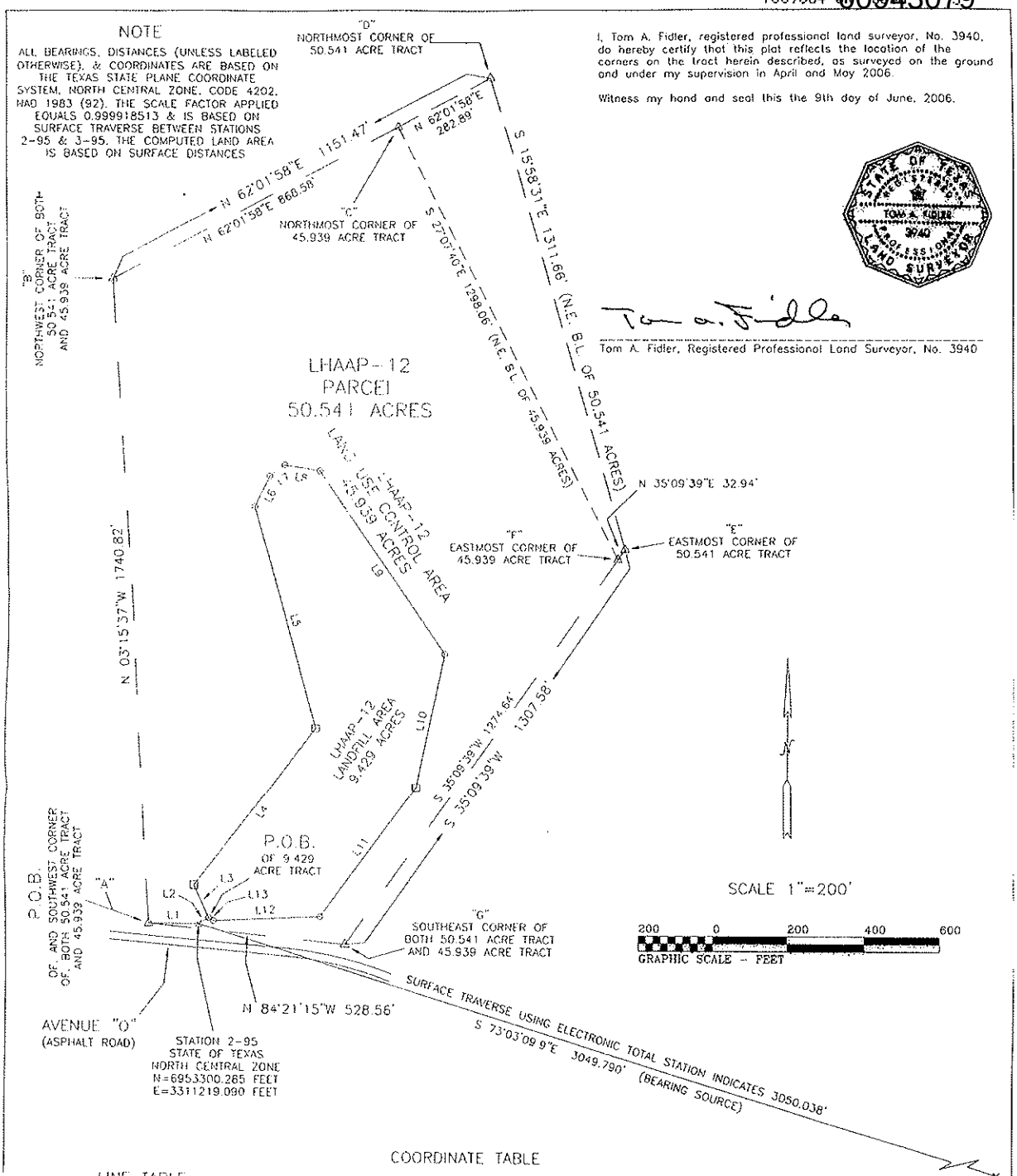
ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999918513 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS 2-95 & 3-95. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in April and May 2006.

Witness my hand and seal this the 9th day of June, 2006.

STATE OF TEXAS REGISTERED TOM A. FIDLER 3940 PROFESSIONAL LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940



LINE TABLE

COURSE	BEARING	DISTANCE
L1	S 89°52'35"W	132.09'
L2	N 58°35'33"E	31.72'
L3	N 23°52'43"W	96.81'
L4	N 37°07'57"E	537.87'
L5	N 15°28'17"W	618.92'
L6	N 26°16'28"E	90.81'
L7	N 54°00'30"E	50.67'
L8	S 81°02'29"E	96.24'
L9	S 34°25'01"E	596.16'
L10	S 12°11'35"W	370.18'
L11	S 36°09'00"W	434.64'
L12	S 87°15'04"W	286.47'
L13	N 57°18'20"W	15.33'

COORDINATE TABLE

POINT	NORTH	EAST
A	6953300.000	3311087.000
B	6955038.000	3310988.000
C	6955445.333	3311755.144
D	6955578.000	3312005.000
E	6954317.000	3312366.000
F	6954290.070	3312347.030
G	6953248.000	3311613.000

NOTES:

- O INDICATES 12" DIAMETER WOODEN FENCE CORNER POST (FOUND)
- □ INDICATES 10" DIAMETER WOODEN FENCE CORNER POST (FOUND)
- × INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- △ INDICATES 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET IN CONCRETE)
- ——— INDICATES BARBED WIRE FENCE AND PERIMETER OF 9.429 ACRE TRACT
- — — — INDICATES PERIMETER OF 50.541 ACRE TRACT ONLY
- — · — · — INDICATES PERIMETER OF 45.939 ACRE TRACT ONLY
- ——— ——— INDICATES PERIMETER OF BOTH 50.541 ACRE TRACT AND 45.939 ACRE TRACT

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

SHEET 1 OF 4

50.541 ACRES
45.939 ACRES
9.429 ACRES
LONGHORN army AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	0605063A.DWG
06/09/2006	0605063.CRD	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
"LHAAP-12 PARCEL"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Parcel" being 50.541 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-12 Parcel" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95"(N=6953300.285 feet & E=3311219.090 feet) and "3-95"(N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE S 89deg52'35"W 132.09' to an I.R.O.P.C. set in concrete for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 03deg15'37"W 1740.82' along the W.B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northwest corner,

THENCE N 62deg01'58"E 1151.47' along the N.W. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northmost corner,

THENCE S 15deg58'31"E 1311.66' along the N.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Eastmost corner,

THENCE S 35deg09'39"W 1307.58' along the S.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Southeast corner,

THENCE N 84deg21'15"W 528.56' along the S.B.L. of this tract to this POINT OF BEGINNING, containing 50.541 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

FIELD NOTES DESCRIPTION OF
"LHAAP-12 LAND USE CONTROL AREA"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Land Use Control Area" being 45.939 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said "LHAAP-12 Land Use Control Area" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95"(N=6953300.285 feet & E=3311219.090 feet) and "3-95"(N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE S 89deg52'35"W 132.09' to an I.R.O.P.C. set in concrete for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 03deg15'37"W 1740.82' along the W.B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northwest corner,

THENCE N 62deg01'58"E 868.58' along the N.W. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northmost corner,

THENCE S 27deg07'40"E 1298.06' along the N.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Eastmost corner,

THENCE S 35deg09'39"W 1274.64' along the S.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Southeast corner,

THENCE N 84deg21'15"W 528.56' along the S.B.L. of this tract to this POINT OF BEGINNING, containing 45.939 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

FIELD NOTES DESCRIPTION OF
"LHAAP-12 LANDFILL AREA"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Landfill Area" being 9.429 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said "LHAAP-12 Landfill Area" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95"(N=6953300.285 feet & E=3311219.090 feet) and "3-95"(N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE N 58deg35'33"E 31.72' to a 12" diameter wooden fence corner post found for a Southwest corner of this tract and this POINT OF BEGINNING,

THENCE generally along a barbed wire fence the following eleven courses,

N 23deg52'43"W 96.81' to a 10" diameter wooden fence corner post found for the Westmost corner of this tract,

N 37deg07'57"E 537.87' to a 10" diameter wooden fence corner post,

N 15deg28'17"W 618.92' to a 12" diameter wooden fence corner post,

N 26deg16'28"E 90.81' to a 12" diameter wooden fence corner post,

N 54deg00'30"E 50.67' to a 12" diameter wooden fence corner post found for the Northmost corner of this tract,

SHEET 4b OF 4

S 81deg02'29"E 96.24' to a 12" diameter wooden fence corner post,

S 34deg25'01"E 596.16' to a 12" diameter wooden fence corner post found for the Eastmost corner of this tract,

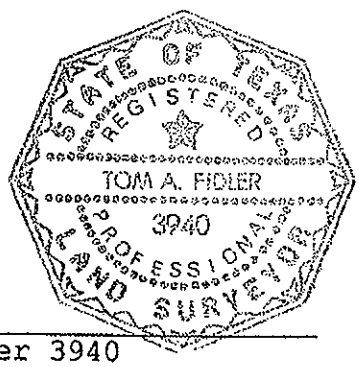
S 12deg11'35"W 370.18' to a 10" diameter wooden fence corner post,

S 36deg09'00"W 434.64' to a 12" diameter wooden fence corner post,

S 87deg15'04"W 286.47' to a 12" diameter wooden fence corner post,

N 57deg18'20"W 15.33' to this POINT OF BEGINNING, containing 9.429 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

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7009064 OR 3640 10

FIGURE 1

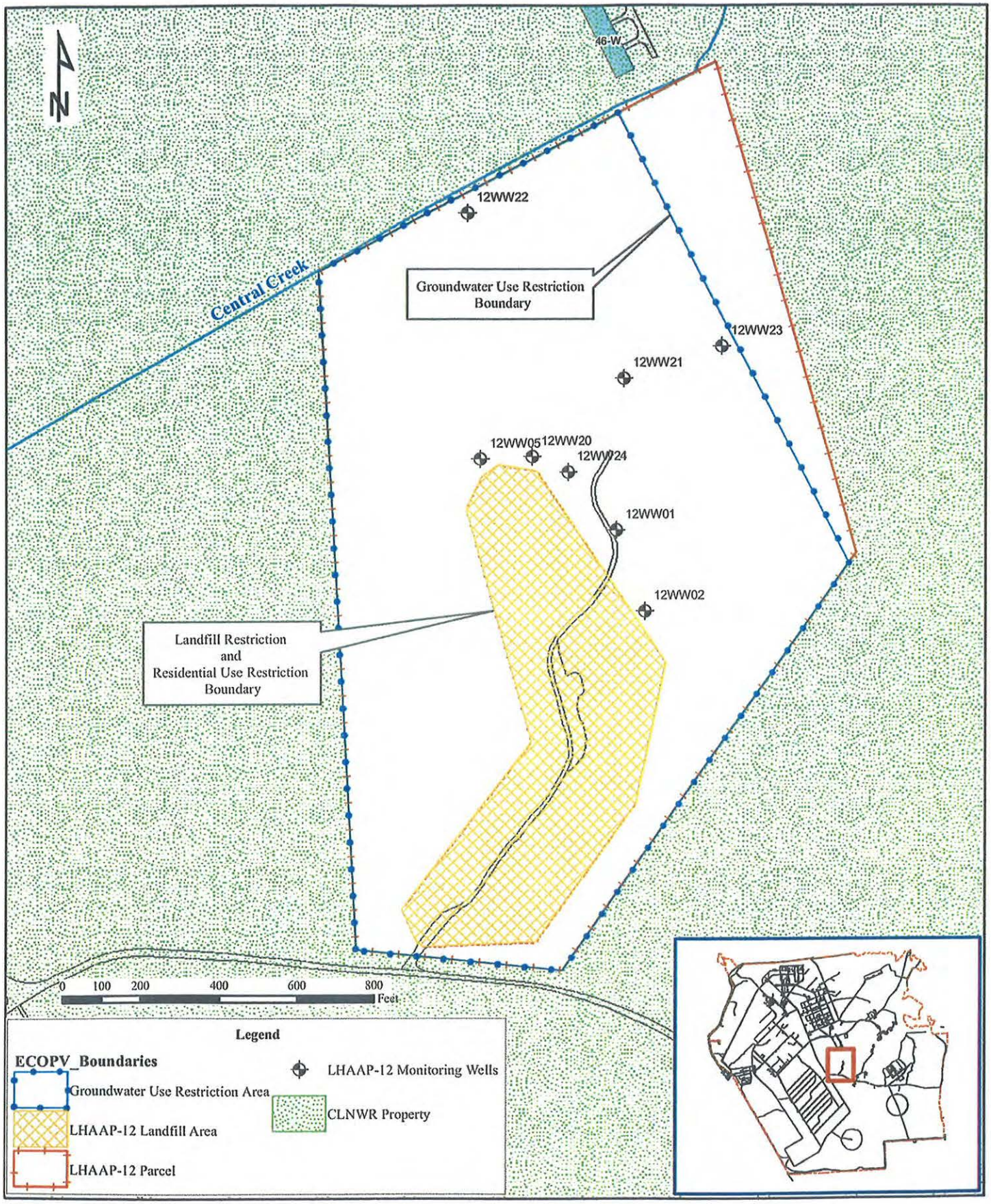

FIGURE 1

Land Use Control Boundaries

00943086

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7009064	OR	3640	12

STATE OF TEXAS COUNTY OF HARRISON

I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the volume and page of the named records of:

Harrison County

as stamped hereon by me.

Jun 13,2007

HONORABLE PATSY COX, COUNTY CLERK
Harrison County

LHAAP-12, 12-4

LAND USE CONTROL COMPLIANCE INSPECTION FORM

September 14, 2015

LHAAP-12, Landfill 12 Parcel
Annual Land Use Control Compliance Certification

Land use controls (LUC) at LHAAP-12 in the Landfill 12 Parcel:

• Land use restriction – Prohibition of any activities that would affect the integrity of the cap (i.e. no digging or disturbing the existing cover or contents of the landfill) and of residential use or residential development of the property

• Groundwater use restriction – Prohibition of any activities that would cause exposure to contaminated groundwater (i.e. no withdrawal or use of groundwater for other than environmental monitoring and testing)

Compliance with land use controls:

• No use of groundwater or installation of new groundwater wells (except that required for environmental monitoring and testing), or tampering with existing wells at LHAAP-12

• No reuse activity at LHAAP-12 that would adversely affect the integrity of the landfill cap (i.e no digging or disturbing the existing cover or contents of the landfill) and cap protective components (fencing and signage), and no residential use or residential development of the property

Inspection: In accordance with the LHAAP-12 Remedial Design Addendum dated 21 June 2007, an inspection of LHAAP-12 was conducted by _____ on_____ to visually confirm compliance with the LUCs.

I, the undersigned, do document that the inspection was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title _____

Signature: _____

Completed annual compliance form, to be kept on file at the Administrative Office of the Caddo Lake National Wildlife Refuge by the Refuge staff and available to EPA, TCEQ and Army upon request. The certification shall be conducted no later than March 1 of each year for the previous calendar year.

LHAAP – 16, 16-1
DRAFT LUC INSPECTION AND MAINTENANCE LOG
(RAO Inspection and Maintenance Checklist)
(Well Inspection Form)

November 28, 2017

RAO Inspection and Maintenance Checklist

General Information	
Project Name	RAO Inspection and Maintenance, LHAAP-16 Landfill, Longhorn Army Ammunition Plant, Karnack, TX
Contractor	
Inspector's Name	
Inspector's Title	
Inspector's Signature	
Inspector's Contact Number	
Inspection Date	
Type of Inspection	☐ Quarterly ☐ Semiannual ☐ Annual ☐ Prior to forecast rain ☐ After a rain event ☐ Other ----------

Description		Yes	No	N/A	**Comments** (Attach photos/location sketches)	**Corrective Action** (Attach photos)
A. CAP Cover Surface						
A.1	Are there any significant cracks present?					
A.2.	Are there any damaged areas?					
A.3	Is there any ponded water present?					
A.4	Any other relevant observations?					
B. CAP Vegetation and Animal Burrows						
B.1	Are there signs of stressed/ dead vegetation?					
B.2	Are there any significant bare spots?					
B.3	Are deep-rooted plants present?					
B.4	Are there signs of animal burrows?					
B. 5	Any other relevant observations?					

DRAFT

Description		Yes	No	N/A	**Comments** (Attach photos/location sketches)	**Corrective Action** (Attach photos)
C. CAP Erosion and Drainage System						
C.1	Is there any evidence of significant/ clearly visible erosion, settlement, or other deterioration?					
C.2	Are the drainage systems in poor condition?					
C.3	Is there excessive silting or debris clogging?					
C.4	Is there erosion of banks and slopes?					
C.5	Are there areas of choking by overgrown vegetation?					
C.7	Is there pooling of water in or along side a channel or berm?					
C.8	Any other relevant observations?					
D. Groundwater Monitoring Wells						
D.1	Are the installed groundwater monitoring wells in poor condition?					
D.2	Are there any signs of damage, unusual wear, rust and corrosion, vandalism, unauthorized entry/use, or settlement?					
D.3	Is well cap and/or locking mechanism not properly functioning?					
D.4	Are the well heads and protective casings damaged?					
D.5	Is the well cleared of vegetation and accessible?					
D.6	Any other relevant observations?					

DRAFT

Description		Yes	No	N/A	**Comments** (Attach photos/location sketches)	**Corrective Action** (Attach photos)
E. Site Access Features						
E.1	Are the perimeter fence and gates damaged?					
E.2	Gate(s) damaged?					
E.3	Litter encountered within the area?					
E.4	Are the gate locks missing?					
E.4	Are signs to prevent unauthorized entry missing?					
E.5	Are the access roads in unusable or poor condition?					
E.6	Any other relevant observations?					
F. Concrete Aprons and Bollards						
F.1	Are there any significant cracks present?					
F.2	Are there any damaged areas?					
F.3	Any other relevant observations?					

DRAFT

00943093

WELL INSPECTION FORM

Job Name: _____ Well ID: _____

Job No.: _____ Completed Date: _____

Client: _____ Measured Depth: _____

Site Location: _____ Inspector: _____

☐ **ABOVE GROUND**

Protective casing? ☐ Yes ☐ No

Material _____

Condition: ☐ Good ☐ Broken ☐ Cracked

Lid Condition: ☐ Good ☐ Broken ☐ Cracked

Hinge Condition: ☐ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ **FLUSH MOUNTED**

Well cover present? ☐ Yes ☐ No

Condition: ☐ Good ☐ Broken ☐ Cracked

Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Visible? ☐ Yes ☐ No

Dimensions _____ Thickness _____

Sloped away from casing? ☐ Yes ☐ No

Check any of the following features that apply:

☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

CONCRETE PAD:

Inner Diameter (inches) _____

Condition: ☐ Good ☐ Broken ☐ Cracked ☐ Other (describe) _____

Cap present? ☐ Yes ☐ No

Well lock present? ☐ Yes ☐ No

Lock functioning properly? ☐ Yes ☐ No

Bump post? ☐ Yes ☐ No

Well ID visible? ☐ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☐ No

Visual obstruction? ☐ Yes ☐ No

Is well open to completed depth? ☐ Yes ☐ No

Is silt present in well? ☐ Yes ☐ No

Is silt greater than 25% of well screen length? ☐ Yes ☐ No

COMMENTS:

LHAAP-16, 16-2
LUCs FROM DRAFT-FINAL REMEDIAL DESIGN

November 28, 2017

DRAFT FINAL
REMEDIAL DESIGN
LHAAP-16 LANDFILL
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared For:

U.S. Army Corps of Engineers
Tulsa District

Prepared By:

AECOM

AECOM Technical Services

January 2017

DRAFT FINAL
REMEDIAL DESIGN LHAAP-16 LANDFILL
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared For:

U.S. Army Corps of Engineers

Tulsa District

Prepared By:

AECOM Technical Services

Contract No. W912DY-09-D-0059

Task Order No. DS01

January 2017

4.2.1.2 Substrate Loading and Injection 4-6
4.2.1.3 Bioaugmentation Culture Injection 4-6
4.2.2 Landfill Biobarrier #2 4-7
4.2.2.1 Injection and Monitoring Well Placement and Design 4-7
4.2.2.2 Substrate Loading and Injection 4-7
4.2.2.3 Bioaugmentation Culture Injection 4-8
4.2.3 Landfill Biobarrier #3 4-8
4.2.3.1 Injection Point and Monitoring Well Placement and Design 4-8
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4.3 Bayou Biobarrier 4-9
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4.3.2 Substrate Loading and Injection 4-10
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4.4 Mid-Plume ISB 4-10
4.4.1 Well Placement and Design 4-10
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Acronyms and Abbreviations

µg/L	microgram per liter
ABC+	Anaerobic Biochem Plus
API	American Petroleum Institute
ARAR	applicable or relevant and appropriate requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm/sec	centimeters per second
COC	contaminant of concern
DCA	Dichloroethane
DCE	Dichloroethene
DO	dissolved oxygen
DPT	direct push technology
ECP	Environmental Condition of Property
EDS-ER	Electron Donor Solution - Extended Release
ESD	Explanation of Significant Difference
ESTCP	Environmental Security Technology Certification Program
EVO	emulsified vegetable oil
FFA	Federal Facilities Agreement
FS	Feasibility Study
HDPE	high-density polyethyelene
HFCS	high-fructose corn syrup
HSA	hollow stem auger
IRA	Interim Remedial Action
ISB	in-situ bioremediation
IWWP	Installation-Wide Work Plan
lbs	pounds
LHAAP	Longhorn Army Ammunition Plant
LTM	long-term monitoring
LUC	land use control
mg/L	milligrams per liter

MNA	monitored natural attenuation
MOA	Memorandum of Agreement
msl	mean sea level
mV	millivolt
NPL	National Priorities List
O&M	operation and maintenance
ORP	Oxidation-Reduction Potential
RACR	Remedial Action Completion Report
RAO	Remedial Action Objectives
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
ROI	Radius of Influence
SARA	Superfund Amendment and Reauthorization Act
TAC	Texas Administrative Code
TCA	Trichloroethane
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
U.S.	United States
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
VC	Vinyl chloride
ZVI	zero valent iron

5 LAND USE CONTROL REMEDIAL DESIGN

This section describes the LUC RD for LHAAP-16. In accordance with the Final ROD (U.S. Army, 2016), the LUC RD will be finalized as the land use component of the Remedial Design.

Per the Final ROD (U.S. Army, 2016), LUCs' performance objectives are to:

- Prohibit access to the contaminated groundwater except for environmental monitoring and testing only;
- Preserve the integrity of the landfill cap, and to restrict intrusive activities (e.g., digging) that would degrade or alter the cap;
- Restrict land use to nonresidential;
- Maintain the integrity of any current or future remedial or monitoring systems; and

The implementation, maintenance, and inspection requirements associated with each of the performance objectives that comprise this LUC RD are described below. The actions taken to implement the LUC objectives during the RA phase, as well as ongoing maintenance, monitoring and reporting requirements will be presented in the Remedial Action Completion Report (RACR), as the final LUC RD. Upon regulatory review and concurrence with the final LUC RD, it will be distributed as part of the Comprehensive LUC Management Plan.

For portions of the Site subject to land use controls that are not owned by the Army, the Army will monitor and report on the implementation, maintenance, and enforcement of land use controls, and coordinate with federal, state, and local governments and owners and occupants of properties subject to land use controls. The Army remains responsible for ensuring that the remedy remains protective of human health and the environment.

5.1 LUC Implementation

The actions required to implement the LUCs for LHAAP-16 are described below. The first of these, the initial notice of LUCs, has been completed. A figure depicting the preliminary LUC boundaries is presented in **Figure 5-1**. The following actions will be undertaken to implement the LUCs for LHAAP-16:

- Provide initial notice of the LUCs before remedial action is implemented.
    - Develop the initial notice of the groundwater and soil (surface and subsurface) contamination and any land use restrictions referenced in the ROD. The notice will consist of a brief description of the contaminants in groundwater and soil, a written description of the LUCS and a figure depicting the preliminary LUC boundaries presented in **Figure 5-1**.
    - Transmit the notice to federal, state and local governments involved at this site and the owners and occupants of the properties subject to those use restrictions and land use controls within 90 days of ROD signature, which is on or before December 12, 2016. The notices will be sent to federal, state and local officials including: U.S. Senator Ted Cruz, U.S. Senator John Cornyn, U.S. Congressman Louie Gohmert, State Senator Kevin Eltiffe, State Representative Chris Paddie, Harrison County

Judge Hugh Taylor, Harrison County Commissioner Precinct 1 William D. Hatfield, City of Uncertain Mayor Sam Canup, and Karnack Water Supply Corporation Board Members. Notice will also be sent to the Caddo Lake National Wildlife Refuge Manager.

- Finalize the Boundaries for the LUCs as a part of the remedial action.
    - Revise the boundaries if necessary. The LUC boundary presented in this RD is subject to change, based on COC results from the two proposed wells to be installed on the east side of Harrison Bayou. The final boundaries of the groundwater LUCs (prevent the use of groundwater contaminated above cleanup levels as a potable water source and prohibit access to the contaminated groundwater except for environmental monitoring and testing only); the landfill LUCs (preserve the integrity of the landfill cap, and to restrict intrusive activities (e.g., digging) that would degrade or alter the cap); the remedial or monitoring system LUCs (maintain the integrity of any current or future remedial or monitoring systems); and, the nonresidential land use LUC (restrict land use to nonresidential) will be reviewed during remedial action activities after an evaluation of new data has been completed and revised if necessary.
    - Survey the LUC Boundaries. The boundaries will be finalized after concurrence by USEPA and TCEQ, and the LUC boundaries will be surveyed by a State-licensed surveyor. A legal description of the surveyed areas will be appended to the survey plat.
- Record the LUCs in Harrison County. The LUC plat, legal description and LUC restriction language will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566.
- Notify the Texas Department of Licensing and Regulation of the groundwater LUCs. The Texas Department of Licensing and Regulation will be notified of the groundwater restrictions, which include the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ. The survey plat, legal boundary and description of the groundwater restriction LUCs, in conjunction with a locator map, will be provided in hard and electronic copy.

5.2 Maintenance and Monitoring Requirements

The LUCs will be maintained in place as follows:

- The landfill LUCs will remain in place as long as the landfill waste remains at the site or until the levels of Contaminants of Concern (i.e., including all hazardous substances, pollutants, and contaminants found at the Site at cleanup levels as listed in **Table 1-1**) allow for unlimited use and unrestricted exposure;
- The LUCs restricting the use of groundwater to environmental monitoring and testing only and the LUC restricting land use to nonresidential will remain in place until the levels of COCs (i.e., including all hazardous substances, pollutants, and contaminants found at the Site

at cleanup levels as listed in **Table 1-1**) in surface and subsurface soil and groundwater allow for unlimited use and unrestricted exposure;

- The LUC to maintain the integrity of any current or future remedial or monitoring systems will remain in place until groundwater cleanup levels of COCs (i.e., including all hazardous substances, pollutants and contaminants found at the Site at cleanup levels as listed in **Table 1-1**) are met; and,
- The LUC prohibiting groundwater use (except for environmental monitoring and testing) as a potable source will remain in place until the levels of COCs (i.e., all hazardous substances, pollutants, and contaminants found at the Site at cleanup levels as listed in **Table 1-1**) in soil and groundwater allow for unlimited use and unrestricted exposure.

Landfill and Remedial or Monitoring System LUCs include physical components that require repair and maintenance. These are described in **Section 3.0.** The Inspection and Maintenance Checklist is provided in **Appendix A.**

The administrative maintenance required to ensure the five LUCs remain in place and effective until the cleanup levels of the COCs are at levels that allow unrestricted use and unlimited exposure are:

- Annual field inspections of the site to confirm that no violations of the LUCs have occurred. Documentation of the inspection will be included in the Inspection and Maintenance Checklist (see **Appendix A).**
- Annual certifications that no LUC-restricted activities have been authorized and that site conditions and use are consistent with the LUCs. The Certification Form is presented in **Appendix E).**
- Periodic transmittal of a LUC Notice to federal, state, and local authorities and to owners and occupants of LHAAP-16. The notice will include the groundwater and soil (surface and subsurface) contamination and any land use restrictions referenced in the ROD, a written description of the LUCs and a figure depicting the LUC boundaries. The transmittal will coincide with each Five Year Review and will be documented in the report.
- The final LUC RD appendix of the RACR will be added to the Comprehensive LUC Management Plan and the plan will be provided to the owner or occupant of LHAAP-16.

The U.S. Army will address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable.

5.3 Reporting of LUC Inspection and Monitoring

Beginning with finalization of this RD and approval of the Inspection and Maintenance forms and the Annual Certification Form, the U.S. Army will undertake inspections and certify continued compliance with the LUC objectives. The U.S. Army, or the transferee after transfer, will retain the LUC Inspection and Certification documents in the project files for incorporation into the five-year review reports, and these documents will be made available to USEPA and TCEQ upon request. In addition, should any violations be found during the certification, the U.S. Army will provide to USEPA and TCEQ, along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be

taken to correct those violations. The need to continue inspections and certifications will be revisited at five year reviews.

5.3.1 Notice of Planned Property Conveyances

Upon transfer of Army-owned property, the Army will provide written notice to the transferee of the LHAAP-16 groundwater and soil (surface and subsurface) contamination and any land use restrictions. Within 15 days of transfer, the U.S. Army will provide written notice to USEPA and TCEQ of the division of implementation, maintenance, and enforcement responsibilities unless the information has already been provided in the LUC RD. The notice will describe the mechanism by which the LUC will continue to be implemented, maintained, inspected, reported, and enforced. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental document for transfer. Although the US Army may transfer responsibility for various implementation actions, the U.S. Army will also retain ultimate responsibility for the remedy integrity. This means that the U.S. Army is responsible for addressing substantive violations of the LUC performance objectives that would undermine the U.S. Army's CERCLA remedy. The US Army also will be responsible for incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation. In the event property is transferred out of Federal control, the land use controls relating to property and groundwater restrictions shall be recorded in the deed and shall be enforceable by the United States and the state of Texas.

5.3.2 Opportunity to Review Text of Intended Land Use Controls

The US Army will provide a copy of the groundwater and land use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. USEPA will also receive a copy for review. The US Army will produce an ECP or other environmental document for transfer of LHAAP-16, but before executing transfer, the US Army will provide USEPA and TCEQ with a copy of the ECP or other environmental document for transfer so that they may have reasonable opportunity, before transfer, to review all LUC-related provisions.

5.3.3 Notification Should Action(s) which Interfere with land Use Control Effectiveness be Discovered Subsequent to Conveyance

Should the US Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objectives, the US Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with Section 5.2.5 below, the US Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the US Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

5.3.4 Land Use Control Enforcement

Should the LUC remedy reflected in this RD fail, the US Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the USFWS or its lessee, to the institution of judicial action against non-federal third

parties. Alternatively, should the circumstances warrant such, the US Army could choose to exercise its response authorities under CERCLA. Should the US Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the US Army may notify those agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUC.

5.3.5 Modification or Termination of Land Use Controls

The LUCs shall remain in effect until such time as the US Army and USEPA agree that the concentrations of COCs in groundwater have met cleanup levels in groundwater and that surface and subsurface soil concentrations allow unrestricted use. When this occurs, the LUC will be terminated as needed. The decision to terminate the LUC will be documented consistent with the NCP process for post-ROD changes, potentially including an explanation of significant differences or a remedial action complete report. If the property has been transferred and a determination by the US Army and USEPA has been made to terminate the LUC, the US Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

00943107

N

Central Creek

Groundwater Use Restriction
Land Use Control Boundary

Landfill Cap Protection
Land Use Control Boundary

LHAAP-16

5 µg/L

17 µg/L

16WW31 16WW32 16WW46 16WW33 16WW34 16WW44 16WW45 16WW22 16WW41 16WW17 16WW21 16WW20 16WW15 16WW14 16EW01 16EW05 16WW39 16WW40 16WW12 16EW02 16EW06 16WW37 16WW38 16WW35 16WW16 16WW36 16EW07 16EW03 16WW30 16WW29 16EW04 16EW08 16WW26 16WW25 16WW04 16WW03 16WW18 16WW01 16WW02 16WW19 16WW42 16WW13 16WW43 16WW27 16WW28 16WW05 16WW06 16WW11 122 16WW24 16WW23 16WW08 16WW07 16WW09 16WW10

Harrison Bayou

AVE "Q"

Approximate Limits of Old Landfill

0 125 250 500 Feet

Legend

- Existing Shallow Monitoring Well
- Existing Intermediate Monitoring Well
- Existing Upper Deep Monitoring Well
- Existing Lower Deep Monitoring Well
- Abandoned or Plugged Well
- Extent of Perchlorate Contamination > 17 ug/L in Intermediate and Shallow Zones (May 2013)
- Extent of TCE Contamination > 5 ug/L in Intermediate and Shallow Zones (Dashed Where Inferred) (May 2013)
- Location of Semi-Passive Biobarrier Demonstration (February 2004 through June 2006 [ESTCP 2009]).
- Road
- Stream
- Remedial and Monitoring System Boundary
- Groundwater Use Restriction Land Use Control Boundary
- LHAAP-16 Landfill Fence

AECOM

Figure 5-1
Land Use Contol Boundaries
LHAAP-16 Remedial Design

Longhorn Army Ammunition Plant
Karnack, Texas

60256135

January 2017

Path: L:\AGE\GIS\AUS GIS\GIS_Projects\Longhorn_AAP\01_Reports\LHAAP-16\RAWP\Fig 5-1 LHAAP-16 Land Use Control Boundaries.mxd

LHAAP – 16, 16-3
NOTICE OF LAND USE CONTROL AND NONRESIDENTIAL LAND USE FOR LHAAP-16 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT) (PENDING)

Date October 4, 2019

LHAAP – 16, 16-4
LAND USE CONTROL COMPLIANCE INSPECTION FORM

November 28, 2017

Annual Land Use Control Compliance Inspection Form

In accordance with the Remedial Design dated _____ for LHAAP-16 an inspection of the site was conducted by _____ [indicate transferee] on _____.

The land use control mechanisms are:

- Groundwater restrictions - prohibit access to the contaminated groundwater except for environmental monitoring and testing only until cleanup goals are met;
- Landfill integrity - preserve the integrity of the landfill cap and restrict intrusive activities (e.g., digging) that would degrade or alter the cap;
- Land use restrictions - restrict land use to nonresidential;
- Integrity of remedial and monitoring systems - maintain the integrity of any current or future remedial or monitoring systems until cleanup goals are met.

No unauthorized activities or uses have occurred. Compliance with land use controls and restrictions is as follows:

- No use of groundwater (other than environmental testing and monitoring), installation of new groundwater wells, or tampering with existing monitoring wells;
- No landfill intrusive activities (e.g., digging) that would degrade or alter the landfill cap; maintenance of vegetative cover and repair of soil subsidence or erosion areas on the cap;
- No land use other than nonresidential; and
- No activities that would compromise the integrity of the remedial or monitoring systems.

I, the undersigned, do document that the inspection was conducted as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year, retained in the file and provided to Army, EPA and TCEQ upon request.

LHAAP – 17, 17-1
DRAFT LUC INSPECTION AND MAINTENANCE LOG
(RAO Inspection and Maintenance Checklist)
(Well Inspection Form)

Date October 4, 2019

RAO Inspection and Maintenance Checklist

General Information	
Project Name	RAO Inspection and Maintenance, LHAAP-17 Longhorn Army Ammunition Plant, Karnack, TX
Contractor	
Inspector's Name	
Inspector's Title	
Inspector's Signature	
Inspector's Contact Number	
Inspection Date	
Type of Inspection	☐ Quarterly ☐ Semiannual ☐ Annual ☐ Prior to forecast rain ☐ After a rain event ☐ Other ----------

A. Groundwater Monitoring Wells						
A.1	Are the installed groundwater monitoring wells in poor condition?					
A.2	Is the well cleared of vegetation and accessible?					
A.3	Any other relevant observations?					
A.4	Are there any significant cracks present?					
A.5	Are there any damaged areas?					

WELL INSPECTION FORM

Job Name: _____ Well ID: _____

Job No.: _____ Completed Date: _____

Client: _____ Measured Depth: _____

Site Location: _____ Inspector: _____

☐ **ABOVE GROUND**

Protective casing? ☐ Yes ☐ No

Material _____

Condition: ☐ Good ☐ Broken ☐ Cracked

Lid Condition: ☐ Good ☐ Broken ☐ Cracked

Hinge Condition: ☐ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ **FLUSH MOUNTED**

Well cover present? ☐ Yes ☐ No

Condition: ☐ Good ☐ Broken ☐ Cracked

Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Visible? ☐ Yes ☐ No

Dimensions _____ Thickness _____

Sloped away from casing? ☐ Yes ☐ No

Check any of the following features that apply:

☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

CONCRETE PAD:

Inner Diameter (inches) _____

Condition: ☐ Good ☐ Broken ☐ Cracked ☐ Other (describe) _____

Cap present? ☐ Yes ☐ No

Well lock present? ☐ Yes ☐ No

Lock functioning properly? ☐ Yes ☐ No

Bump post? ☐ Yes ☐ No

Well ID visible? ☐ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☐ No

Visual obstruction? ☐ Yes ☐ No

Is well open to completed depth? ☐ Yes ☐ No

Is silt present in well? ☐ Yes ☐ No

Is silt greater than 25% of well screen length? ☐ Yes ☐ No

COMMENTS:

LHAAP – 17, 17-2
LUCs FROM DRAFT FINAL REMEDIAL DESIGN

Date October 4, 2019

Draft Final
Remedial Design and Remedial Action Work Plan, LHAAP-17 Burning Ground No. 2 / Flashing Area, Group 2

Longhorn Army Ammunition Plant
Karnack, Texas

Prepared for U.S. Army Corps of Engineers, Tulsa District
Contracting Division
2488 East 81st Street
Tulsa, Oklahoma 74137-4290

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APTIM

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Project No. 501032
Rev 0
March 2019

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2019

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Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2019

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Acronyms and Abbreviations

µg/L	micrograms per liter
AECOM	AECOM Engineering Company
APTIM	Aptim Federal Services, LLC
Bgs	below ground surface
Bhate	Bhate Environmental, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	chemical of concern
COPEC	chemical of potential ecological concern
CY	cubic yards
DCE	dichloroethene
DNT	dinitrotoluene
ESD	Explanation of Significant Differences
FFA	Federal Facility Agreement
gpm	gallons per minute
GPS	global positioning system
GWTP	groundwater treatment plant
HDPE	high density polyethylene pipe
IWWP	Installation-Wide Work Plan
LHAAP	Longhorn Army Ammunition Plant
LOE	line of evidence
LTM	long-term monitoring
LUC	land use control
mg/kg	milligrams per kilogram
MNA	monitored natural attenuation
MOA	Memorandum of Agreement
NCP	National Contingency Plan
NPL	National Priorities List
O&M	operation and maintenance
PDI	Pre-Design Investigation
RA	remedial action
RACR	Response Action Completion Report
RA-O	Remedial Action-Operation
RAOs	remedial action objectives
RAWP	Remedial Action Work Plan
RD	remedial design
ROD	Record of Decision
Shaw	Shaw Environmental, Inc.
TAC	Texas Administrative Code
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin

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Acronyms and Abbreviations (continued)

TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TNT	2,4,6-trinitrotoluene
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • March 2019

6.0 LAND USE CONTROL PLAN

The U.S. Army or its representative will be responsible for LUC implementation and certification, reporting and enforcement. The U.S. Army will address the LUC problems within its control that are likely to impact remedy integrity and will address problems as soon as practicable. Per the Final ROD (Shaw 2016), the LUCs' performance objectives are to:

- Prohibit the use of groundwater contaminated as a potable water source;
- Restrict land use to nonresidential; and
- Maintain the integrity of any current or future remedial or monitoring systems.

The implementation, maintenance, and inspection requirements associated with each of the performance objectives that comprise this LUC RD are described below. The proposed actions to be taken to implement the LUC objectives during the RA phase are described in **Section 8.0**. The implementation activities, as well as ongoing maintenance, monitoring, and reporting requirements will be presented in the Remedial Action Completion Report (RACR), as the final LUC RD. Upon regulatory review and concurrence with the final LUC RD, it will be included as part of the Comprehensive LUC Management Plan.

For portions of the Site subject to land use controls that are not owned by the Army, the Army will monitor and report on the implementation, maintenance, and enforcement of land use controls, and coordinate with federal, state, and local governments and owners and occupants of properties subject to land use controls. The Army retains responsibility for ensuring that the remedy remains protective of human health and the environment.

6.1 LUC Implementation

The actions required to implement the LUCs for LHAAP-17 are described below. The first of these, the initial notice of LUCs was completed on December 8, 2016. The December 8, 2016 notice letters that were sent to relevant officials (U.S. Army 2016) included a preliminary LUC boundary. The proposed LUC boundary for the groundwater use restriction is shown in red on **Figure 6-1**. The LUC boundary for the non-residential site use will be the "Site Boundary" shown in blue on **Figure 6-1**. The following actions will be undertaken to implement the LUCs for LHAAP-17:

- Finalize the boundary for the LUCs as a part of the remedial action.
  - Revise the boundary, if necessary, based on groundwater sampling results. The final boundary of the groundwater LUCs (prevent the use of groundwater contaminated above cleanup levels as a potable water source and prohibit access to the contaminated groundwater except for environmental monitoring and testing

only); the remedial or monitoring system LUCs (maintain the integrity of any current or future remedial or monitoring systems); and the nonresidential land use LUC (restrict land use to nonresidential) will be reviewed during RA activities after an evaluation of the monitoring data has been completed and revised if necessary.

  - Survey the groundwater use and land use restriction LUC boundaries. The boundaries will be finalized after concurrence by USEPA and TCEQ, and will be surveyed by a State-licensed surveyor. A legal description of the surveyed areas will be appended to the survey plat.

- Record the LUCs in Harrison County. The LUC plat, legal description, and LUC restriction language will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566.
- Notify the Texas Department of Licensing and Regulation of the groundwater LUCs. The Texas Department of Licensing and Regulation will be notified of the groundwater restrictions, which include the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ. The survey plat, legal boundary, and description of the groundwater restriction LUCs, in conjunction with a locator map, will be provided in hard and electronic copy.
- Provide notice after finalizing LUC boundary as part of the RA. The notice will consist of a brief description of the contaminants in groundwater and soil, a written description of the LUCs and a figure depicting the revised LUC boundaries. The notices will be sent to federal, state, and local officials including: U.S. Senators, U.S. Congressman, State Senator, State Representative, Harrison County Judge, Harrison County Commissioner Precinct 1, City of Uncertain Mayor, and Karnack Water Supply Corporation Board Members. Notice will also be sent to the Caddo Lake National Wildlife Refuge Manager.
- Periodically transmit the notice to federal, state, and local governments involved at this site and the owners and occupants of the properties subject to those use restrictions and LUCs. The transmittal will coincide with each Five Year Review and will be documented in the report.

6.2 Maintenance and Monitoring Requirements

The LUCs will be maintained in place as follows:

- The LUCs restricting the use of groundwater to environmental monitoring and testing only and the LUC restricting land use to nonresidential will remain in place until the levels of COCs (i.e., including all hazardous substances, pollutants, and contaminants found at the Site at cleanup levels as listed in **Tables 1-2 and 1-3**) in surface and subsurface soil and groundwater allow for unlimited use and unrestricted exposure;

- The LUC to maintain the integrity of any current or future remedial or monitoring systems will remain in place until groundwater cleanup levels of COCs (i.e., including all hazardous substances, pollutants and contaminants found at the Site at cleanup levels as listed in **Table 1-2**) are met; and,

- The LUC prohibiting groundwater use (except for environmental monitoring and testing) as a potable source will remain in place until the levels of COCs (i.e., all hazardous substances, pollutants, and contaminants found at the Site at cleanup levels as listed in **Tables 1-2 and 1-3**) in soil and groundwater allow for unlimited use and unrestricted exposure.

Remedial or Monitoring System LUCs include physical components that require repair and maintenance. These are described in **Section 10.0.** The RAO and Extraction System Inspection and Maintenance Checklists is provided in **Appendix D.**

The administrative maintenance required to ensure the LUCs remain in place and effective until the cleanup levels of the COCs are at levels that allow unrestricted use and unlimited exposure are:

- Annual field inspections of the site to confirm that no violations of the LUCs have occurred. Documentation of the inspection will be included in the Inspection and Maintenance Checklist (see **Appendix D).**

- Annual certifications that no LUC-restricted activities have been authorized and that site conditions and use are consistent with the LUCs. The Certification Form is presented in **Appendix E).**

- Periodic transmittal of a LUC Notice to federal, state, and local authorities and to owners and occupants of LHAAP-17. The notice will include the groundwater and soil (surface and subsurface) contamination and any land use restrictions referenced in the ROD, a written description of the LUCs and a figure depicting the LUC boundaries. The transmittal will coincide with each Five Year Review and will be documented in the report.

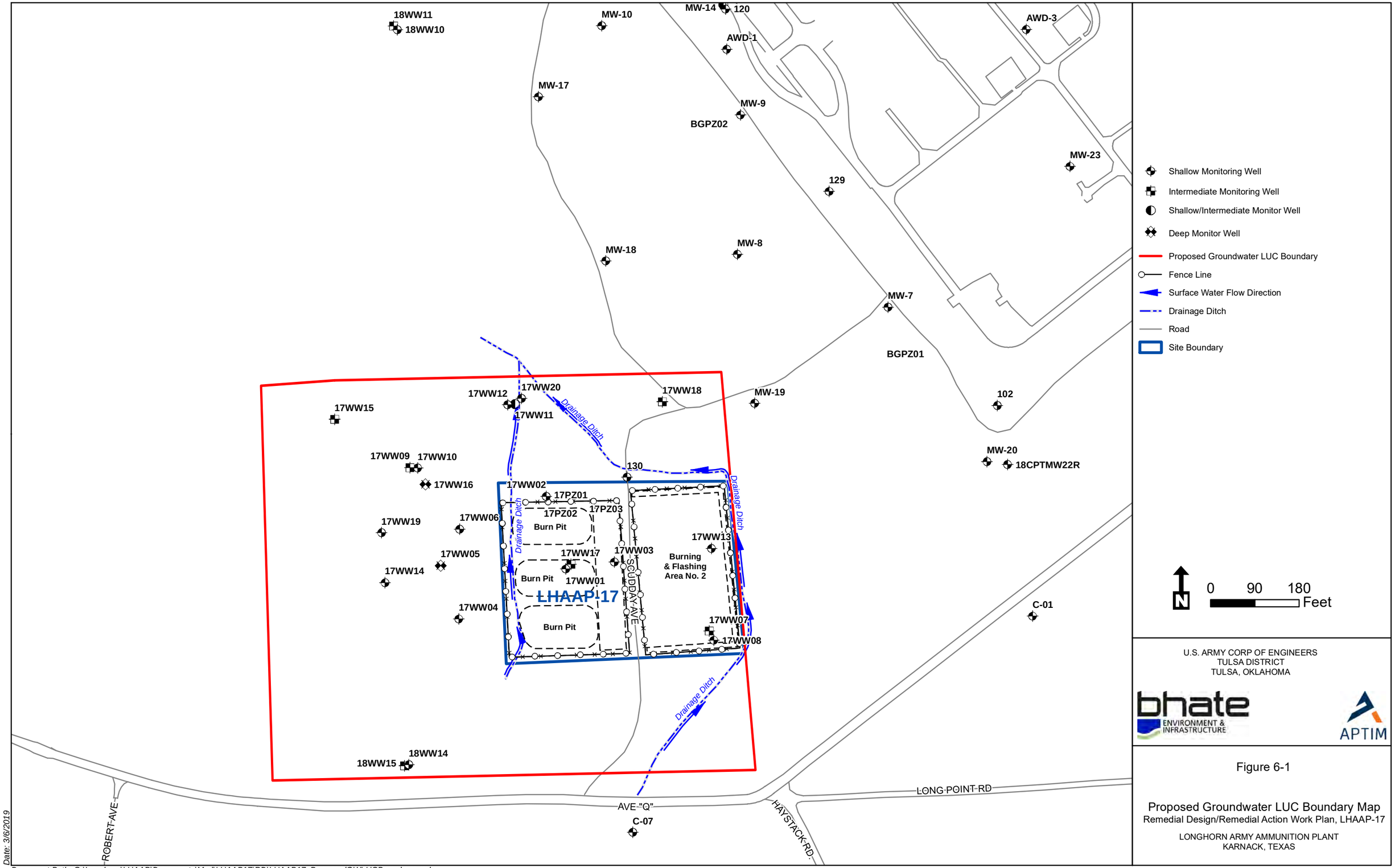
- The final LUC RD appendix of the RACR will be added to the Comprehensive LUC Management Plan and the plan will be provided to the owner or occupant of LHAAP-17.

The U.S. Army will address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable.

6.3 LUC Inspection and Monitoring

Upon finalization of this LUC RA, the amended LUC boundary map and legal description recordation will be inserted into the Comprehensive LUC Management Plan for LHAAP. The Comprehensive LUC Management Plan figure and table will be updated to reflect the inclusion of LHAAP-17.

Beginning with finalization of this RD/RAWP and approval of the Inspection and Maintenance form and the Annual Certification Form, the U.S. Army will undertake inspections and certify continued compliance with the LUC objectives. The U.S. Army, or the transferee after transfer, will retain the LUC Inspection and Certification documents in the project files for incorporation into the Five Year Review reports, and these documents will be made available to USEPA and TCEQ upon request. In addition, should any violations be found during the certification, the U.S. Army will provide to USEPA and TCEQ, along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations. The need to continue inspections and certifications will be revisited at Five Year Reviews.



U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate ENVIRONMENT & INFRASTRUCTURE

APTIM

Figure 6-1

Proposed Groundwater LUC Boundary Map
Remedial Design/Remedial Action Work Plan, LHAAP-17

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 3/6/2019

Document Path: G:\Longhorn\LHAAP\Documents\Mxd\LHAAP17\RD\LHAAP17_ProposedGWLUCBoundary.mxd

LHAAP – 17, 17-3
NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-17 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT) (PENDING)

Date October 4, 2019

LHAAP – 17, 17-4
LAND USE CONTROL COMPLIANCE INSPECTION FORM

Date October 4, 2019

Annual Land Use Control Compliance Certification Form

In accordance with the Remedial Design dated_____for LHAAP-17 an inspection of the site was conducted by_____[indicate transferee] on _____.

The land use control mechanisms are:

- Groundwater restrictions - prohibit access to the contaminated groundwater except for environmental monitoring and testing only until cleanup goals are met;
- Land use restrictions - restrict land use to nonresidential;
- Integrity of remedial and monitoring systems - maintain the integrity of any current or future remedial or monitoring systems until cleanup goals are met.

No unauthorized activities or uses have occurred. Compliance with land use controls and restrictions is as follows:

- No use of groundwater (other than environmental testing and monitoring), installation of new groundwater wells, or tampering with existing monitoring wells;
- No land use other than nonresidential; and
- No activities that would compromise the integrity of the remedial or monitoring systems.

I, the undersigned, do document that the inspection was conducted as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year, retained in the file and provided to Army, EPA and TCEQ upon request.

LHAAP-19

NOTICE OF NONRESIDENTIAL LAND USE AT LHAAP-19 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2013-000013785

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

5 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 11/14/2013 04:23 PM **Document Number:** 2013-000013785 **Receipt No:** 1313735 **Amount:** $ 28.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AARON WILLIAMS
1645 SOUTH 100 FIRST EAST AVE

TULSA, OK 74128

STATE OF TEXAS
HARRISON COUNTY

INDUSTRIAL SOLID WASTE
CERTIFICATION OF REMEDIATION

KNOW ALL MEN BY THESE PRESENT THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-19, is a C&D Landfill located within the former Longhorn Army Ammunition Plant (LHAAP) in the northeast corner of Harrison County, Texas approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of Shreveport, Louisiana. LHAAP was placed on the National Priorities (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-19 is not itself considered an NPL site. The TCEQ, the lead regulatory agency concurs that the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 3.

The C&D landfill, designated LHAAP-19, covers a 7.91 acre tract of land. The maximum depth of the landfill is believed to be less than 15 feet below ground surface. The C&D landfill was sporadically active from 1985 until recent closure activities were conducted. The C&D landfill was permitted by rule to receive non-friable asbestos and other demolition debris. During periods of activity, the monthly disposal rate ranged from 35 to 400 cubic yards of waste. The C&D landfill (formerly referred to as LHAAP-26) was evaluated in 1988. From the landfill evaluation dated 1988, and the buildings description dated 2004, it is concluded that all of the materials deposited in this landfill were what is normally classified as Construction and Demolition Debris (C&D) consisting of wood and metal studs, corrugated metal walls and roofs, concrete rubble, steel re-bar, dry-wall, transite (non-friable asbestos) siding, cardboard, Class 2 paper, packing, plastics, foil, wood packaging, wood debris, bricks, cement and other inert constituents. Records provided by the site manager indicate that hazardous materials such as friable asbestos were disposed of in other permitted landfills. Based on this information and certification of process knowledge by the owner, this landfill is classified as Non-Hazardous Class 2. The final closure assessment report and its supporting documentation demonstrate that the threat to human health or the environment is at or below those required for Risk Reduction Standard Number 2. However, due to the fact that waste was left in place, a cap was constructed to cover the footprint of the landfill and closure of the landfill meets Risk Reduction Standard Number 3.

Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The Texas Commission on Environmental Quality requires certain persons to provide certification and/or recordation in the real property records to notify the public of the conditions of the land and/or the

occurrence of remediation. This certification is not a representation or warranty by the Texas Commission on Environmental Quality of the suitability of this land for any purpose.

II

Being a 7.91 acre tract of land situated in Harrison County, Texas, being out of and a part of a 8,493 acres tract of land known as the former Longhorn Army Ammunition Plant, situated between Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake, and being more particularly described by metes and bounds as follows:

(All coordinates shown here on are NAD 83, Texas State Plane North Central Zone 4202, based on GPS Static Processing verified with OPUS).

Beginning at the northwest corner of the herein described tract with coordinates of North: 6951971.54, East: 3316288.74, from which an iron pin set for a GPS Base Point with coordinates of North 6951987.74, East 3316281.35 bears N 24-31-50 E a distance of 17.81 feet;

Thence N 78-23-54 E, 504.61 feet to a point for an angle point with coordinates of North: 6952073.02, East: 3316783.04

Thence S 52-47-27 E, 137.20 feet to a point for an angle point with coordinates of North: 6951990.05, East: 3316892.31;

Thence S 44-12-24 E, 108.04 feet to a point for an angle point with coordinates of North: 6951912.60, East: 3316967.64;

Thence S 01-33-58 W, 110.10 feet to a point for an angle point with coordinates of North: 6951802.55, East: 3316964.63;

Thence S 11-28-04 W, 121.11 feet to a point for an angle point with coordinates of North: 6951683.85, East: 3316940.56;

Thence S 17-11-28 W, 349.04 feet to a point for the southeast corner of the herein described tract with coordinates of North: 6951350.41, East: 3316837.39;

Thence N 89-11-23 W, 294.12 feet to a point for the southwest corner of the herein described tract with coordinates of North: 6951354.57, East: 3316543.30;

Thence N 22-57-01 W, 332.88 feet to an angle point with coordinates of North: 6951661.10, East: 3316413.50;

Thence N 21-53-42 W , 334.57 feet to the place of beginning and containing 7.91 acres of land according to a survey made on the ground on November 12, 2009 by Ace Surveying, Inc.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-19 site and the TCEQ concluded that no further investigation or remedial action is required for LHAAP-19.

Limited monitoring will take place in the form of inspections of the landfill cap and any maintenance required to maintain the cap integrity for a period of five years. The Army shall correct, as needed, erosion of cover material, lack of vegetative growth, and subsidence or ponding of water. If any of these problems occur after the end of the five-year post-closure period or persist for longer than the first five years of post-closure care, the owner or operator shall be responsible for their correction until all problems have been adequately resolved. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multifamily residences;

child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

Institutional controls placed on the property to ensure appropriate future use include: (1) Use must remain non-residential as described above; and (2) No activity shall be conducted or permitted that would damage the integrity of the landfill cover (i.e. unauthorized digging or disturbing the existing cover or contents of the landfill). These restrictions will be placed in the deed transferring any part of the property out of federal ownership.

III

The owner of the site is the Department of the Army and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington, D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 14th day of November 2013.

STATE OF TEXAS
COUNTY OF Gregg

BEFORE ME, on this the 14th day of Nov, 2013, personally appeared Rose M. Zeiler, of The United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

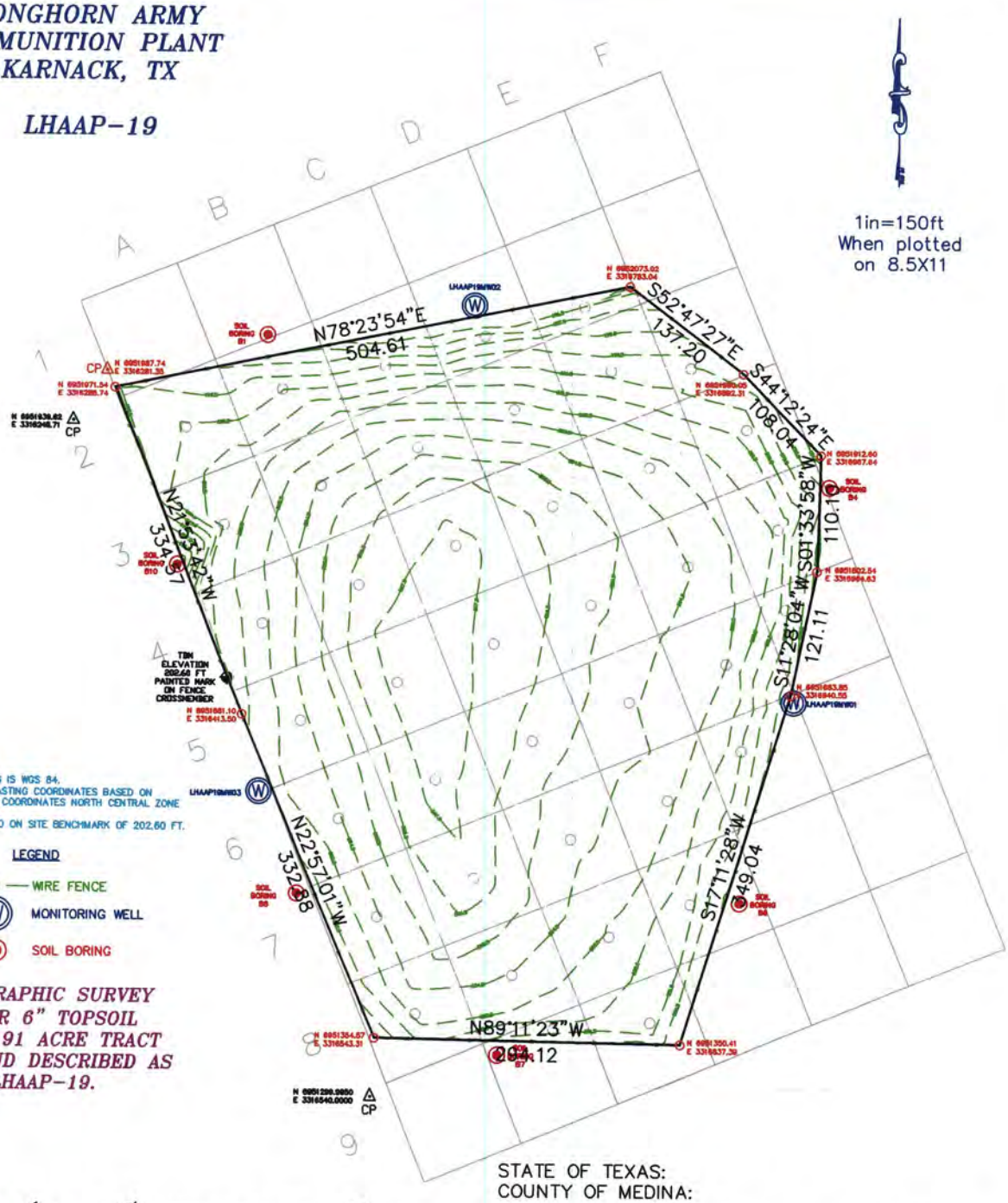
GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 14th day of Nov, 2013.

Notary Public in and for the State of Texas,
County of Harrison

BRENDA McBRIDE
Notary Public State of Texas
COMM. EXP. 5-4-2014

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TX

LHAAP-19



NOTES:
1) BASIS OF BEARING IS WGS 84.
2) NORTHING AND EASTING COORDINATES BASED ON TEXAS STATE PLANE COORDINATES NORTH CENTRAL ZONE #4202, NAD83.
3) ELEVATIONS BASED ON SITE BENCHMARK OF 202.60 FT.

LEGEND

— x — WIRE FENCE

(W) MONITORING WELL

SOIL BORING

TOPOGRAPHIC SURVEY AFTER 6" TOPSOIL OF A 7.91 ACRE TRACT OF LAND DESCRIBED AS LHAAP-19.

Ace Surveying, Inc.
P. O. BOX 597
DEVINE, TEXAS 78016
830-334-7264
830-665-5796 FAX
acesurveying@sbcglobal.net

THIS DRAWING IS THE PROPERTY OF ACE LAND SERVICES AND SHALL NOT BE USED FOR ANY PURPOSE WITHOUT THE WRITTEN CONSENT OF AN AUTHORIZED AGENT OF ACE LAND SERVICES. ACE LAND SERVICES ACCEPTS NO RESPONSIBILITY FOR THE USE OF THIS DRAWING FOR ANY PURPOSE AFTER SIX MONTHS FROM THE DATE SHOWN HEREON. ALL RIGHTS RESERVED. COPYRIGHT 2009, ACE SURVEYING, INC. ©

STATE OF TEXAS
REGISTERED
RHONDA K. BUTLER
5409
PROFESSIONAL
LAND SURVEYOR

STATE OF TEXAS:
COUNTY OF MEDINA:

I, RHONDA K. BUTLER, DO HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM AN ACTUAL SURVEY MADE ON THE GROUND BY MEN WORKING UNDER MY SUPERVISION.

RHONDA K. BUTLER
REGISTERED PROFESSIONAL LAND SURVEYOR #5409

SURVEYED: NOVEMBER 12, 2009
FILE NO: ALAMO 1, KARNACK

LHAAP-35/36

NOTICE OF NONRESIDENTIAL LAND USE AT SUMPS/WASTE RACK SUMP LOCATIONS (LHAAP-35/36) FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2012-000000706

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6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000706 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump094 (called Sump 094 on the attached Exhibit A) is part of LHAAP-35/36. Sump094 is a former sump location near Building 16-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump094 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump094) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump094 parcel is 64 square feet, more or less, or 0.00146 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump094 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump094 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump094 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump094 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the ____th day of _____, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 094
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 64.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

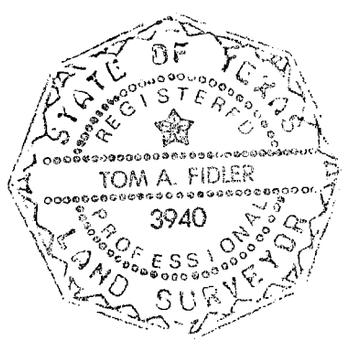
THENCE N 07deg59'31"W 569.56' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 8.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 8.00' to this POINT OF BEGINNING.

This tract contains 64.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943142

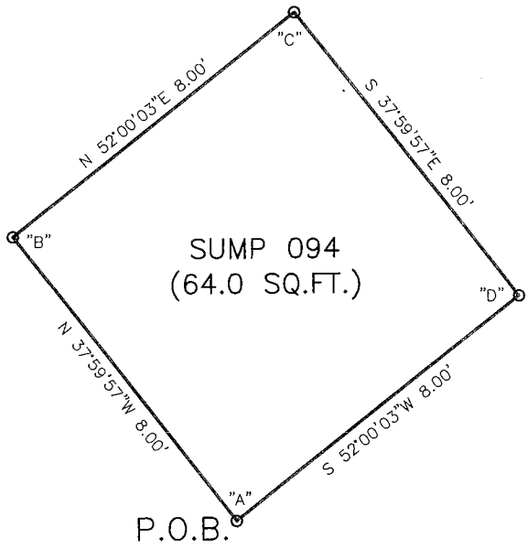
LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP



COORDINATE TABLE

POINT	NORTH	EAST
A	6959071.485	3314200.311
B	6959077.789	3314195.385
C	6959082.715	3314201.689
D	6959076.411	3314206.615

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

N 07°59'31"W 569.56'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 094
(64.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	H.PTS H.LEG
03/14/2011	1103025H.DWG	DRAWN BY JTJ

2012-000000707

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000707 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump095 (called Sump 095 on the attached Exhibit A) is part of LHAAP-35/36. Sump095 is a former sump location near Building 34-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump095 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump095) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump095 parcel is 69.6 square feet, more or less, or 0.00159 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump095 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump095 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump095 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump095 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM- ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 095
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 69.6 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

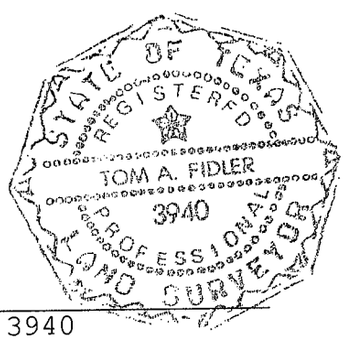
THENCE N 43deg48'28"E 725.22' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following eight courses :

(01)	N 37deg59'57"W	12.00'	to a point for tract corner,
(02)	S 52deg00'03"W	3.10'	to a point for tract corner,
(03)	N 37deg59'57"W	6.00'	to a point for the Westmost corner of this tract,
(04)	N 52deg00'03"E	8.00'	to a point for the Northmost corner of this tract,
(05)	S 37deg59'57"E	6.00'	to a point for tract corner,
(06)	S 52deg00'03"W	3.10'	to a point for tract corner,
(07)	S 37deg59'57"E	12.00'	to a point for the Eastmost corner of this tract,
(08)	S 52deg00'03"W	1.80'	to this POINT OF BEGINNING.

This tract contains 69.6 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



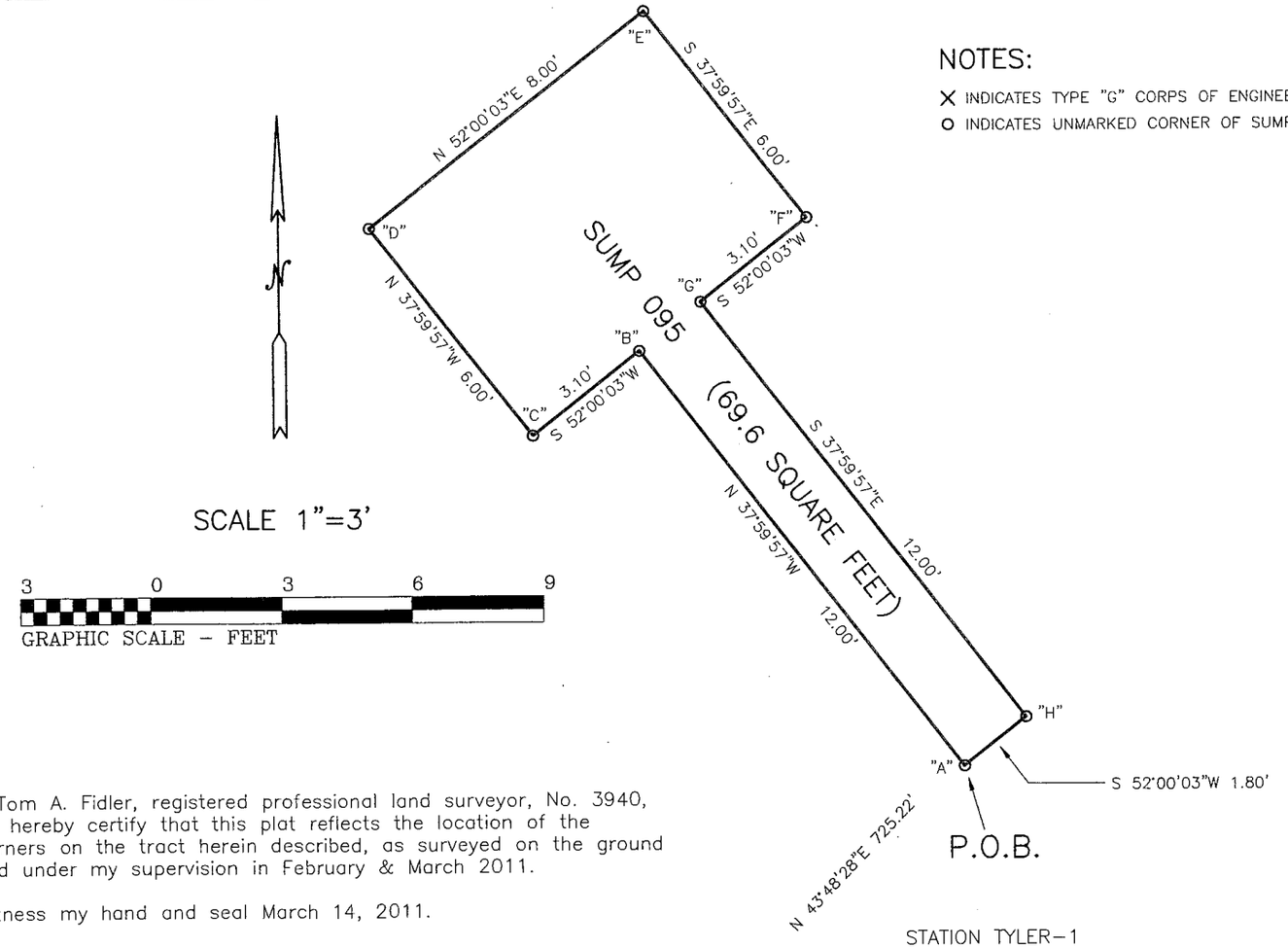
Tom A. Fidler, R.P.L.S. Number 3940

00943148

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@coblelynx.com

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP



NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959030.826	3314781.526
B	6959040.282	3314774.138
C	6959038.373	3314771.695
D	6959043.101	3314768.001
E	6959048.027	3314774.305
F	6959043.299	3314777.999
G	6959041.390	3314775.556
H	6959031.934	3314782.944

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 095
(69.6 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	F.PTS F.LEG
03/14/2011	1103025F.DWG	DRAWN BY JTJ

2012-000000708

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000708 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump096 (called Sump 096 on the attached Exhibit A) is part of LHAAP-35/36. Sump096 is a former sump location near Building 34-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump096 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump096) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump096 parcel is 64 square feet, more or less, or 0.00146 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump096 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump096 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump096 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump096 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

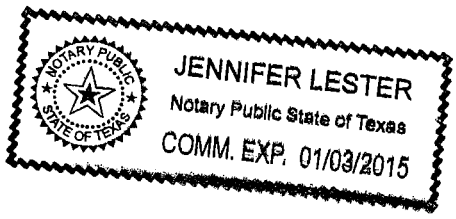
Assistant Chief of Staff for Installation Management
ATTN: DAIM- ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.



Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 096
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 64.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

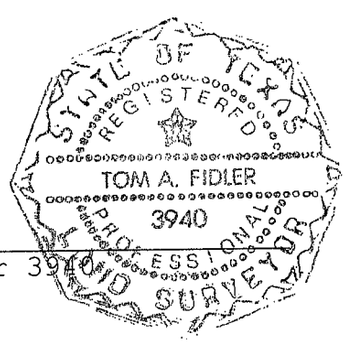
THENCE N 36deg34'53"E 696.04' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 8.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 8.00' to this POINT OF BEGINNING.

This tract contains 64.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



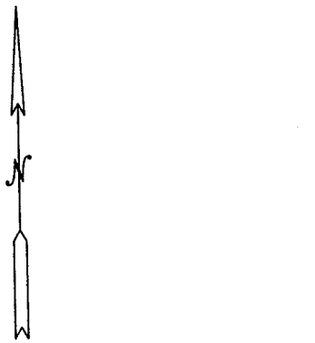
Tom A. Fidler, R.P.L.S. Number 3940

00943154

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

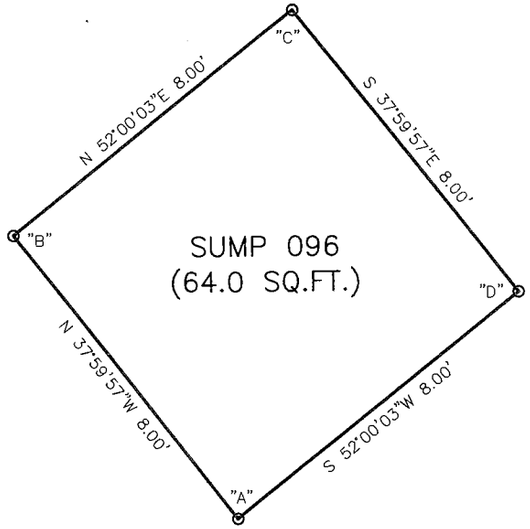
NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP



SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE – FEET



P.O.B.

N 36°34'53"E 696.04'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959066.385	3314694.311
B	6959072.689	3314689.385
C	6959077.615	3314695.689
D	6959071.311	3314700.615

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 096
(64.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	G.PTS G.LEG
03/14/2011	1103025G.DWG	DRAWN BY JTJ

2012-000000709

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000709 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump097 (called Sump 097 on the attached Exhibit A) is part of LHAAP-35/36. Sump097 is a former sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump097 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump097) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump097 parcel is 76.6 square feet, more or less, or 0.00175 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump097 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump097 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump097 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump097 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 097
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 76.6 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

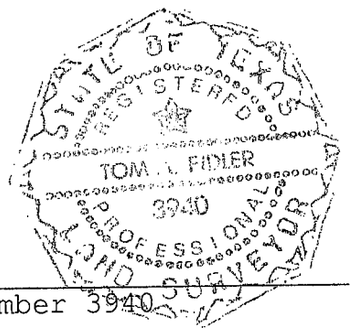
THENCE N 33deg53'28"E 842.86' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete which defines this sump,

THENCE along the external face of the concrete which defines this sump the following four courses, each course ending at a corner of the external face of said concrete :

(01)	N 58deg18'32"W	6.20',	being this sump's Westmost corner,
(02)	N 37deg53'34"E	12.45',	being this sump's Northmost corner,
(03)	S 58deg06'49"E	6.18',	being this sump's Eastmost corner,
(04)	S 37deg47'39"W	12.43',	being the aforementioned POINT OF BEGINNING.

This tract contains 76.6 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943160

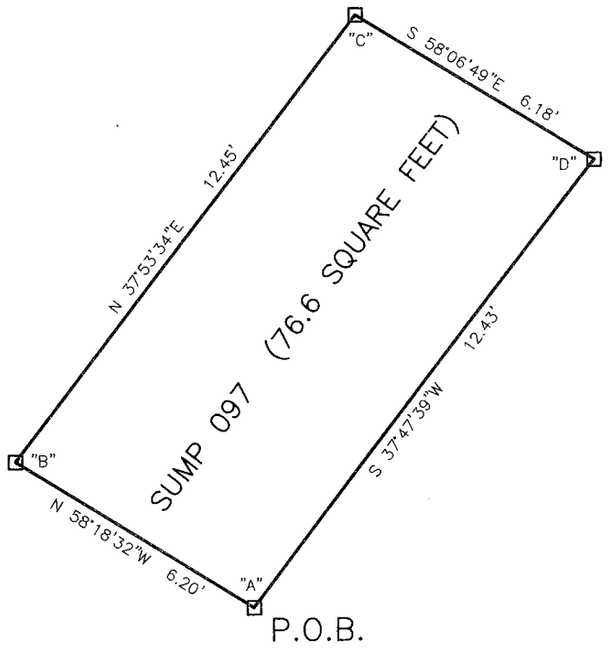
LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE
- O INDICATES UNMARKED POINT



COORDINATE TABLE

POINT	NORTH	EAST
A	6959207.120	3314749.495
B	6959210.377	3314744.219
C	6959220.206	3314751.868
D	6959216.943	3314757.113

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 4, 2011.

N 33°53'28"E 842.86'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 097
(76.6 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	Z.PTS Z.LEG
MAR. 4, 2011	0908074Z.DWG	DRAWN BY JTJ

2012-000000710

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000710 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump098 (called Sump 098 on the attached Exhibit A) is part of LHAAP-35/36. Sump098 is a former sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump098 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump098) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump098 parcel is 39.4 square feet, more or less, or 0.0009 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump098 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump098 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump098 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump098 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 098
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 39.4 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

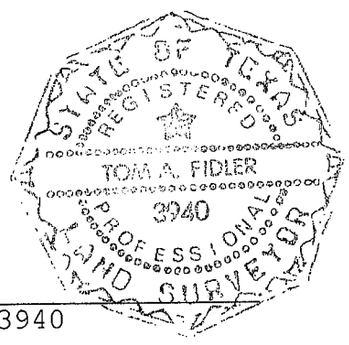
THENCE N 28deg58'18"E 815.98' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete which defines this sump,

THENCE along the external face of the concrete which defines this sump the following four courses, each course ending at a corner of the external face of said concrete :

(01)	N 51deg59'37"W	9.74',	being this sump's Westmost corner,
(02)	N 43deg01'55"E	4.05',	being this sump's Northmost corner,
(03)	S 52deg06'01"E	9.75',	being this sump's Eastmost corner,
(04)	S 43deg15'56"W	4.07',	being the aforementioned POINT OF BEGINNING.

This tract contains 39.4 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



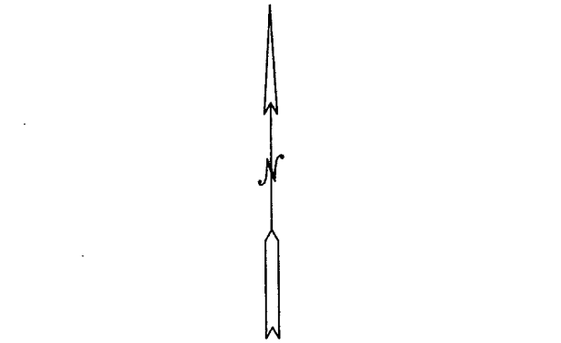
Tom A. Fidler, R.P.L.S. Number 3940

00943166

NOTES:

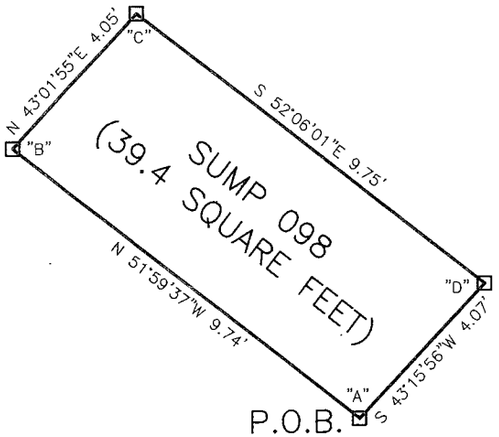
X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE
O INDICATES UNMARKED POINT

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com



SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE – FEET



NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959221.331	3314674.744
B	6959227.327	3314667.072
C	6959230.288	3314669.837
D	6959224.296	3314677.534

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 4, 2011.

N 28°58'18"E 815.98'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 098
(39.4 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	Y.PTS Y.LEG
MAR. 4, 2011	0908074Y.DWG	DRAWN BY JTJ

2012-000000711

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000711 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

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I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump099 (called Sump 099 on the attached Exhibit A) is part of LHAAP-35/36. Sump099 is a former sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump099 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump099) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

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The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump099 parcel is 48 square feet, more or less, or 0.0011 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump099 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump099 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump099 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump099 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 099
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 48.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

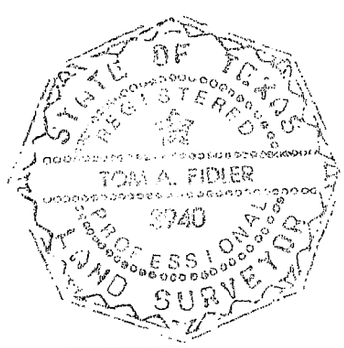
THENCE N 27deg36'35"E 879.49' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 6.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 6.00' to this POINT OF BEGINNING.

This tract contains 48.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943172

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

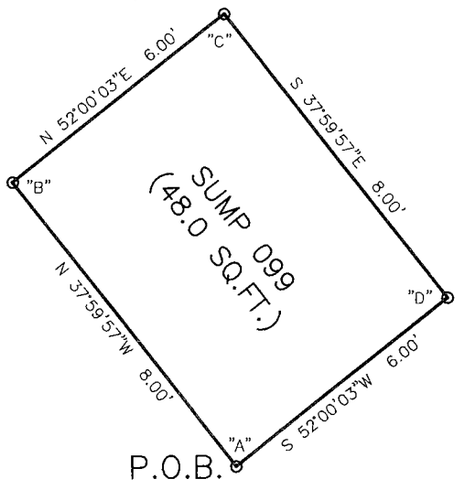
ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

COORDINATE TABLE

POINT	NORTH	EAST
A	6959286.801	3314687.099
B	6959293.105	3314682.173
C	6959296.799	3314686.901
D	6959290.495	3314691.827

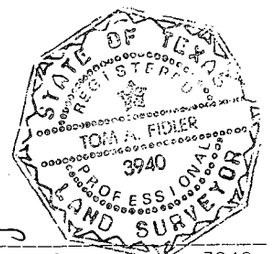


SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.



Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

N 27°36'35"E 879.49'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

SUMP 099
(48.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	J.PTS J.LEG
03/14/2011	1103025J.DWG	DRAWN BY JTJ

2012-000000712

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000712 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump100 (called Sump 100 on the attached Exhibit A) is part of LHAAP-35/36. Sump100 is a former sump location near Building 45-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump100 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump100) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump100 parcel is 80 square feet, more or less, or 0.00183 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump100 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump100 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump100 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump100 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of JUNE, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 100
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 80.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

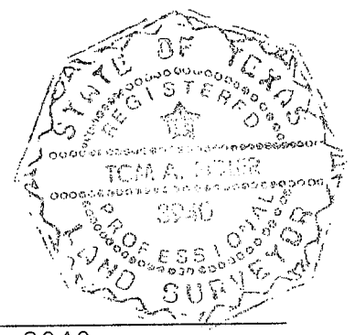
THENCE N 23deg52'16"E 995.90' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 8.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 10.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 8.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 10.00' to this POINT OF BEGINNING.

This tract contains 80.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



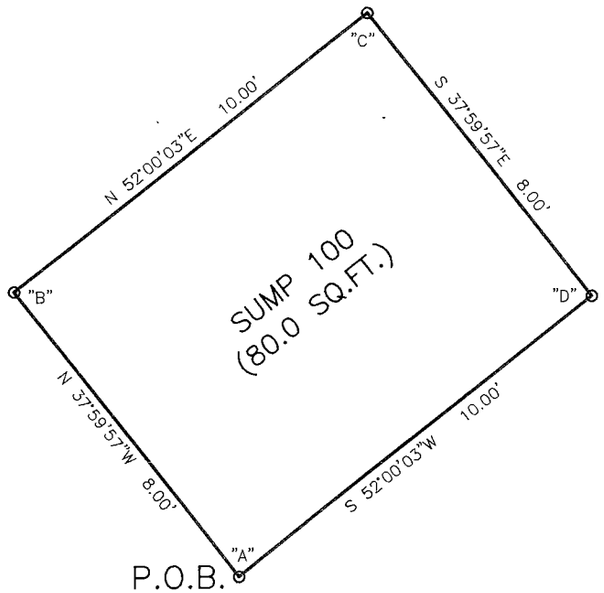
Tom A. Fidler, R.P.L.S. Number 3940

00943178

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



NOTES

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

COORDINATE TABLE

POINT	NORTH	EAST
A	6959418.170	3314682.523
B	6959424.474	3314677.597
C	6959430.630	3314685.477
D	6959424.326	3314690.403

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE – FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

N 23°52'16"E 995.90'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 100
(80.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	K.PTS K.LEG
03/14/2011	1103025K.DWG	DRAWN BY JTJ

2012-000000713

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6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000713 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump101 (called Sump 101 on the attached Exhibit A) is part of LHAAP-35/36. Sump101 is a former sump location near Building 45-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump101 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump101) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump101 parcel is 67 square feet, more or less, or 0.00153 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump101 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump101 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump101 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump101 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 101
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 67.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

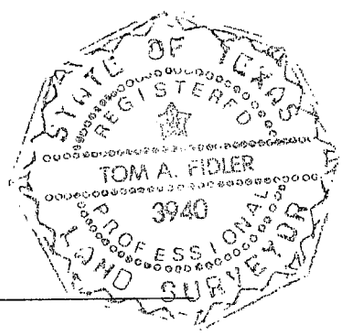
THENCE N 27deg18'47"E 1027.58' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete which defines this sump,

THENCE along the external face of the concrete which defines this sump the following four courses, each course ending at a corner of the external face of said concrete :

(01)	N 38deg59'52"W	11.24',	being this sump's Westmost corner,
(02)	N 57deg48'20"E	5.99',	being this sump's Northmost corner,
(03)	S 39deg05'42"E	11.26',	being this sump's Eastmost corner,
(04)	S 57deg59'19"W	6.01',	being the aforementioned POINT OF BEGINNING.

This tract contains 67.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



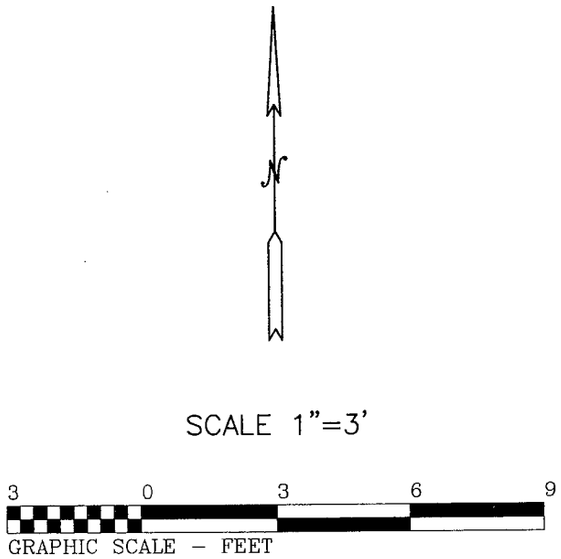
Tom A. Fidler, R.P.L.S. Number 3940

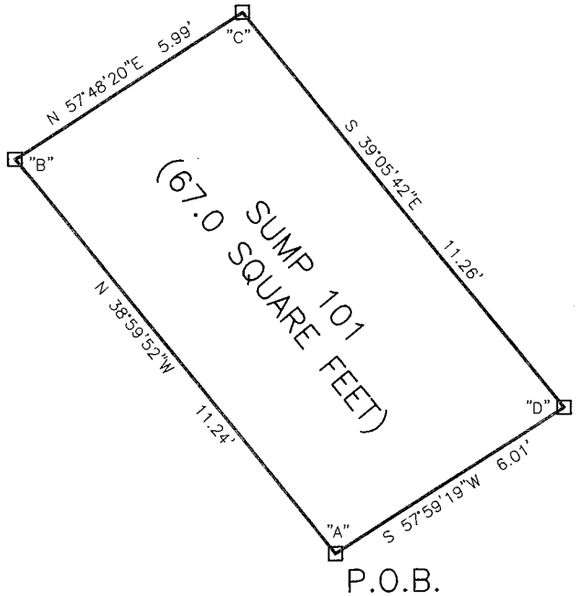
00943184

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE
- O INDICATES UNMARKED POINT





NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959420.476	3314751.003
B	6959429.211	3314743.930
C	6959432.404	3314749.001
D	6959423.663	3314756.102

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 4, 2011.

N 27°18'47"E 1027.58'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 101
(67.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	A.PTS A.LEG
MAR. 4, 2011	1103025A.DWG	DRAWN BY JTJ

2012-000000714

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000714 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump102 (called Sump 102 on the attached Exhibit A) is part of LHAAP-35/36. Sump102 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump102 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump102) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the

Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump102 parcel is 154.4 square feet, more or less, or 0.00354 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump102 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump102 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump102 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump102 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 102
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 154.4 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

THENCE S 17deg29'41"E 550.28' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following ten courses :

(01)	S 15deg52'38"E	7.67'	to a point for the Eastmost corner of this tract,
(02)	S 74deg07'22"W	6.94'	to a point for tract corner,
(03)	N 15deg52'38"W	5.54'	to a point for tract corner,
(04)	S 74deg07'22"W	12.94'	to a point for tract corner,
(05)	S 36deg37'46"W	24.51'	to a point for tract corner,
(06)	S 53deg22'14"E	7.10'	to a point for tract corner,
(07)	S 36deg37'46"W	2.10'	to a point for the Southmost corner of this tract,
(08)	N 53deg22'14"W	9.25'	to a point for the Westmost corner of this tract,
(09)	N 36deg37'46"E	27.31'	to a point for tract corner,
(10)	N 74deg07'22"E	20.63'	to this POINT OF BEGINNING.

This tract contains 154.4 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

00943190

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)

O INDICATES UNMARKED CORNER OF SUMP

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

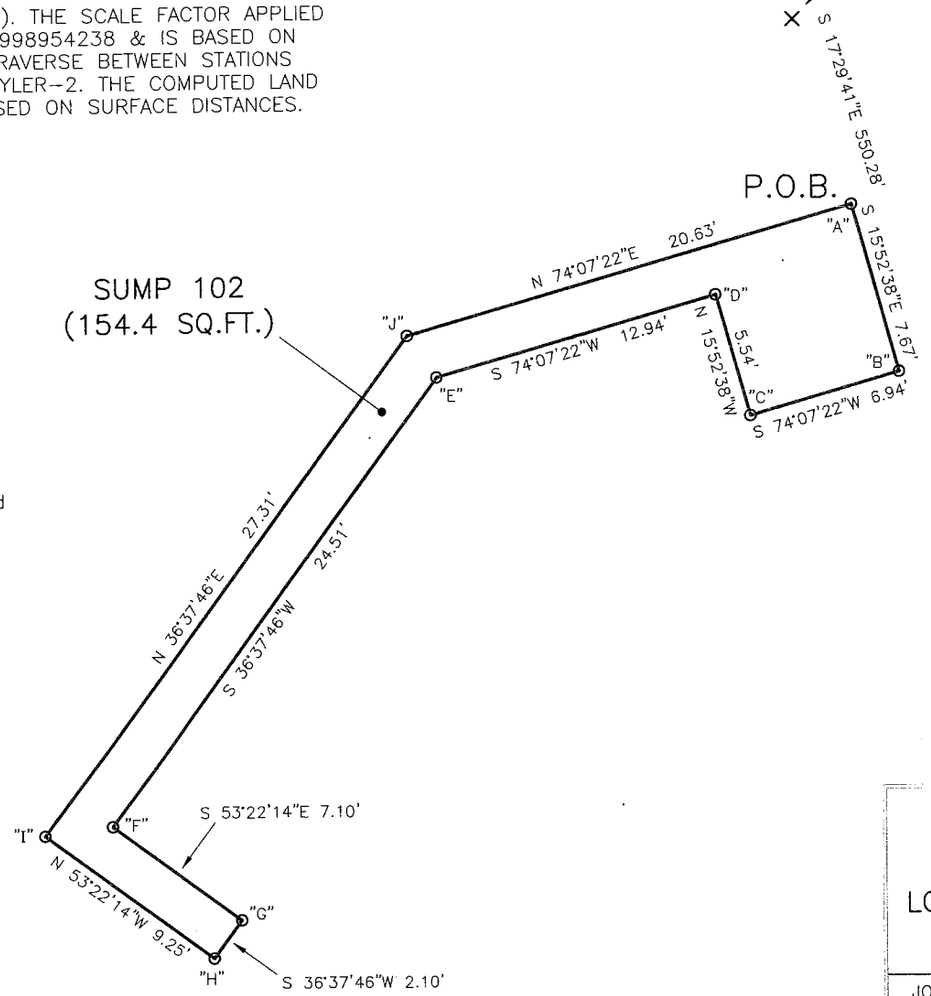
NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

SCALE 1"=6'

6 0 6 12 18

GRAPHIC SCALE - FEET



COORDINATE TABLE

POINT	NORTH	EAST
A	6957307.354	3315333.565
B	6957299.975	3315335.664
C	6957298.077	3315328.991
D	6957303.409	3315327.474
E	6957299.870	3315315.030
F	6957280.203	3315300.409
G	6957275.965	3315306.110
H	6957274.278	3315304.856
I	6957279.797	3315297.433
J	6957301.711	3315313.725

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

SUMP 102
(154.4 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	B.PTS B.LEG
MAR. 11, 2011	1103025B.DWG	DRAWN BY JTJ

2012-000000715

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000715 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump103 (called Sump 103 on the attached Exhibit A) is part of LHAAP-35/36. Sump103 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump103 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump103) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the

Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump103 parcel is 209.1 square feet, more or less, or 0.0048 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump103 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump103 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump103 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump103 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 103
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 209.1 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

THENCE S 20deg31'34"E 601.43' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following ten courses :

(01)	S 16deg10'14"E	10.01'	to a point for the Eastmost corner of this tract,
(02)	S 73deg49'46"W	9.99'	to a point for tract corner,
(03)	N 16deg10'14"W	2.67'	to a point for tract corner,
(04)	S 36deg37'46"W	27.57'	to a point for the Southmost corner of this tract,
(05)	N 53deg22'14"W	29.02'	to a point for the Westmost corner of this tract,
(06)	N 36deg37'46"E	2.10'	to a point for tract corner,
(07)	S 53deg22'14"E	27.18'	to a point for tract corner,
(08)	N 36deg37'46"E	26.86'	to a point for tract corner,
(09)	N 16deg10'14"W	5.03'	to a point for tract corner,
(10)	N 73deg49'46"E	9.99'	to this POINT OF BEGINNING.

This tract contains 209.1 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

00943196

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@coblelynx.com

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

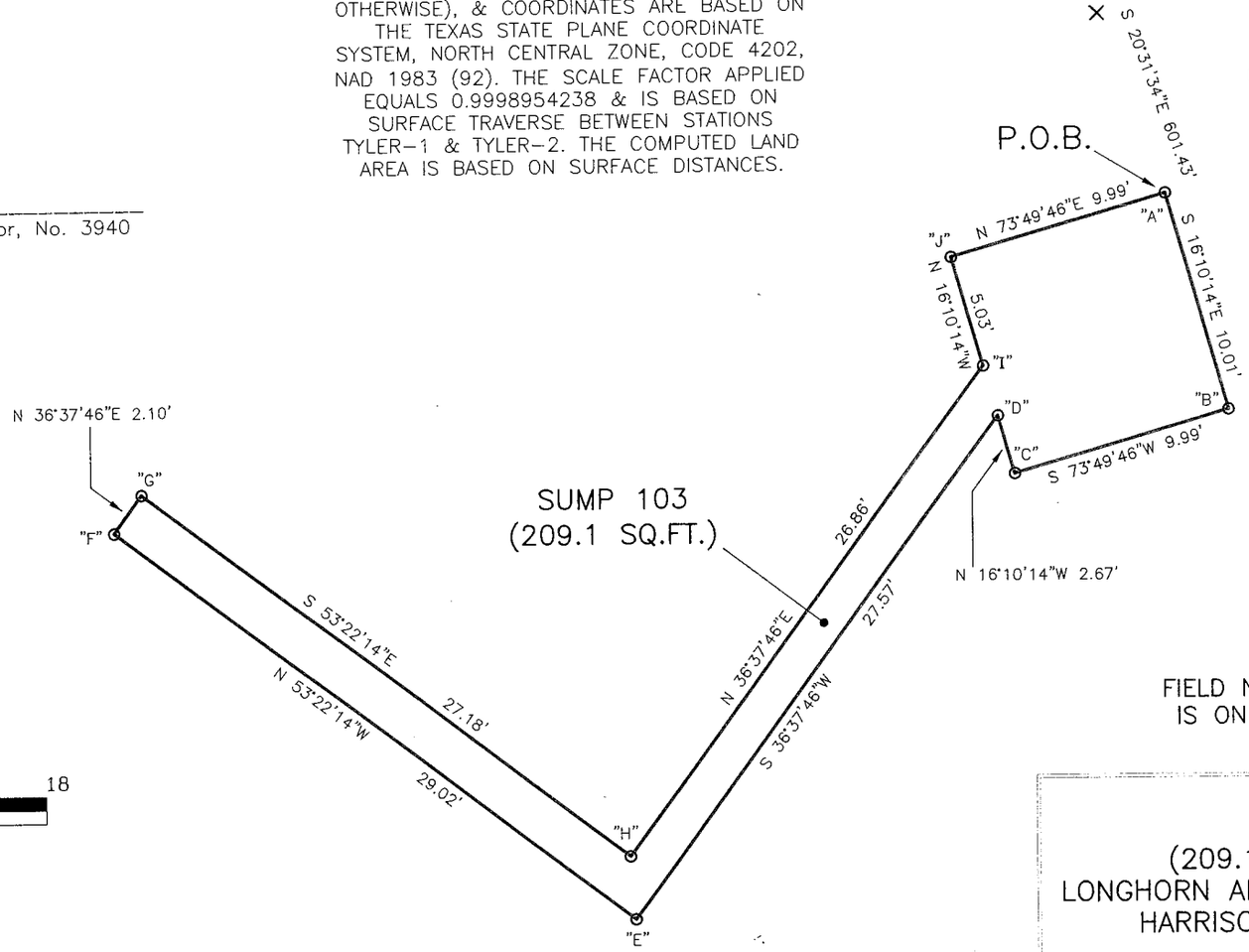
STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6957268.937	3315379.021
B	6957259.319	3315381.810
C	6957256.536	3315372.213
D	6957259.104	3315371.468
E	6957236.982	3315355.021
F	6957254.297	3315331.731
G	6957255.984	3315332.985
H	6957239.765	3315354.800
I	6957261.320	3315370.825
J	6957266.154	3315369.424



FIELD NOTES DESCRIPTION IS ON SEPARATE SHEET

SCALE 1"=6'

6 0 6 12 18
GRAPHIC SCALE - FEET

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

SUMP 103
(209.1 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	C.PTS C.LEG
MAR. 11, 2011	1103025C.DWG	DRAWN BY JTJ

2012-000000716

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000716 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump104 (called Sump 104 on the attached Exhibit A) is part of LHAAP-35/36. Sump104 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump104 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump104) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the

Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump104 parcel is 149.2 square feet, more or less, or 0.00342 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump104 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump104 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump104 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump104 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of JUNE, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 104
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 149.2 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

THENCE S 09deg38'40"E 580.62' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following eight courses :

(01)	S 53deg22'14"E	23.26'	to a point for the Eastmost corner of this tract,
(02)	S 36deg37'46"W	2.24'	to a point for tract corner,
(03)	N 53deg22'14"W	20.93'	to a point for tract corner,
(04)	S 36deg37'46"W	24.04'	to a point for the Southmost corner of this tract,
(05)	N 53deg22'14"W	7.69'	to a point for the Westmost corner of this tract,
(06)	N 36deg37'46"E	7.70'	to a point for tract corner,
(07)	S 53deg22'14"E	5.37'	to a point for tract corner,
(08)	N 36deg37'46"E	18.58'	to this POINT OF BEGINNING.

This tract contains 149.2 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

00943202

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

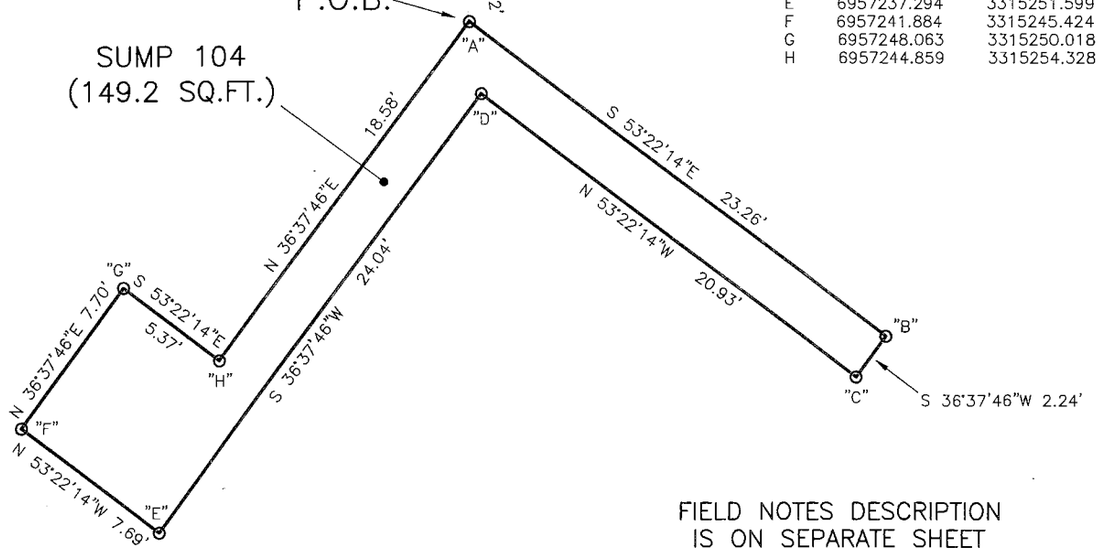
BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

S 09°38'40"E 580.62'

COORDINATE TABLE

POINT	NORTH	EAST
A	6957259.767	3315265.412
B	6957245.891	3315284.077
C	6957244.097	3315282.743
D	6957256.587	3315265.943
E	6957237.294	3315251.599
F	6957241.884	3315245.424
G	6957248.063	3315250.018
H	6957244.859	3315254.328



FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

SCALE 1"=6'

6 0 6 12 18
GRAPHIC SCALE - FEET

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

SUMP 104
(149.2 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	D.PTS D.LEG
MAR. 11, 2011	1103025D.DWG	DRAWN BY JTJ

2012-000000717

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000717 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump105 (called Sump 105 on the attached Exhibit A) is part of LHAAP-35/36. Sump105 is a former sump location near Building 16-T physically located within site boundary of LHAAP-35C(53) of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump105 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump105) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump105 parcel is 201.7 square feet, more or less, or 0.00463 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump105 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump105 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump105 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump105 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 105
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 201.7 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-2" referenced above,

THENCE S 13deg17'42"E 623.38' to a point for the Northmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following eight courses :

(01)	S 53deg22'14"E	26.51'	to a point for the Eastmost corner of this tract,
(02)	S 36deg37'46"W	15.65'	to a point for tract corner,
(03)	S 53deg22'14"E	8.85'	to a point for tract corner,
(04)	S 36deg37'46"W	10.63'	to a point for the Southmost corner of this tract,
(05)	N 53deg22'14"W	10.86'	to a point for tract corner,
(06)	N 36deg37'46"E	24.04'	to a point for tract corner,
(07)	N 53deg22'14"W	24.50'	to a point for the Westmost corner of this tract,
(08)	N 36deg37'46"E	2.24'	to this POINT OF BEGINNING.

This tract contains 201.7 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

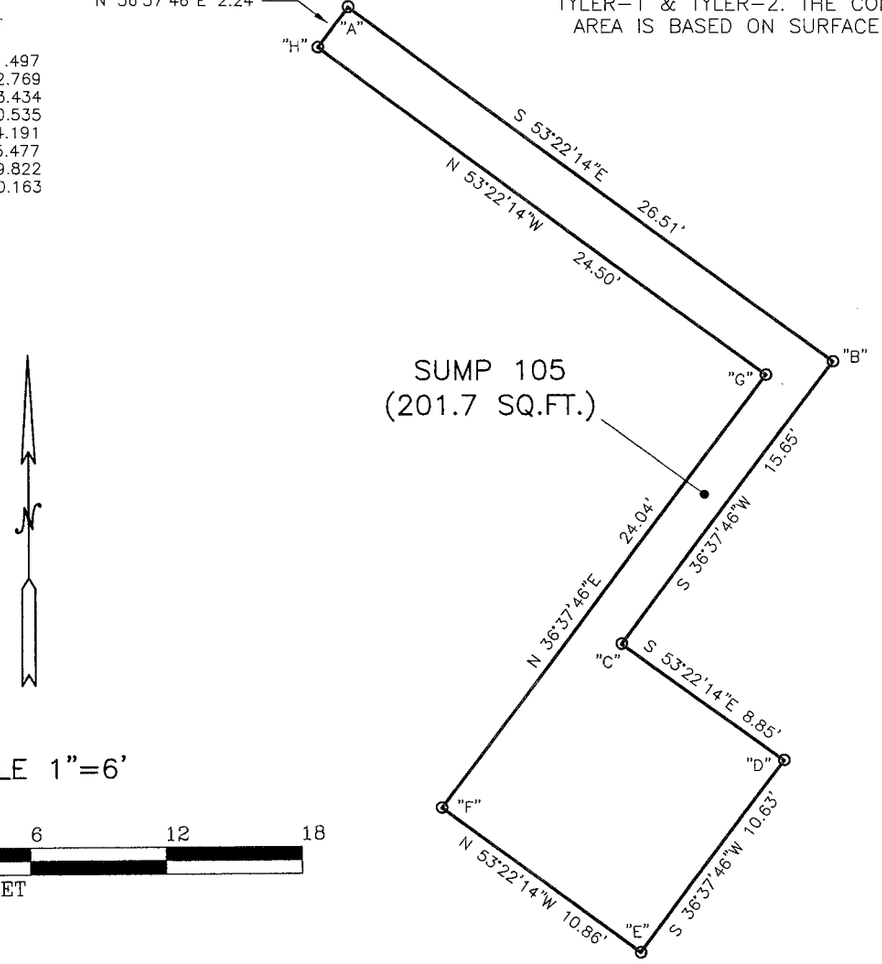
S 13°17'42"E 623.38'

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6957225.505	3315311.497
B	6957209.690	3315332.769
C	6957197.135	3315323.434
D	6957191.856	3315330.535
E	6957183.323	3315324.191
F	6957189.801	3315315.477
G	6957209.095	3315329.822
H	6957223.711	3315310.163



SCALE 1"=6'

6 0 6 12 18
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 11, 2011.

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

SUMP 105
(201.7 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1101007	0407088.CRD	E.PTS E.LEG
MAR. 11, 2011	1103025E.DWG	DRAWN BY JTJ

2012-000000718

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6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000718 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. Sump123 (called Sump 123 on the attached Exhibit A) is part of LHAAP-35/36. Sump123 is a former sump location near Building 18-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which Sump123 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps (including Sump123) were also associated with wash racks (waste rack sumps) where containers were cleaned and stored. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at

TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The Sump123 parcel is 60 square feet, more or less, or 0.00137 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the Sump123 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from Sump123 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of Sump123 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of Sump123 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
SUMP 123
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 60.0 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

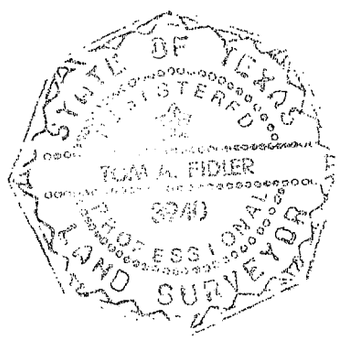
THENCE N 07deg59'31"W 569.56' to a point for the Southmost corner of this sump and this POINT OF BEGINNING,

THENCE along the boundary of this tract the following four courses :

(01) N 37deg59'57"W 6.00' to a point for the Westmost corner of this tract,
(02) N 52deg00'03"E 10.00' to a point for the Northmost corner of this tract,
(03) S 37deg59'57"E 6.00' to a point for the Eastmost corner of this tract,
(04) S 52deg00'03"W 10.00' to this POINT OF BEGINNING.

This tract contains 60.0 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943214

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

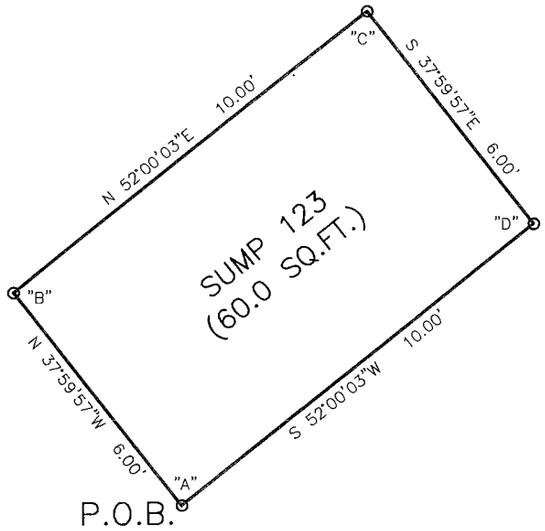
ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES

X INDICATES TYPE "C" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES UNMARKED CORNER OF SUMP

COORDINATE TABLE

POINT	NORTH	EAST
A	6959122.758	3314187.907
B	6959127.486	3314184.213
C	6959133.642	3314192.093
D	6959128.914	3314195.787



SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 14, 2011.

N 08°25'00"W 622.08'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

SUMP 123
(60.0 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	I.PTS I.LEG
03/14/2011	1103025I.DWG	DRAWN BY JTJ

2012-000000719

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000719 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. WRSump001 (called W.R. Sump 001 on the attached Exhibit A) is part of LHAAP-35/36. WRSump001 is a former waste rack sump location near Building 34-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36 of which WRSump001 is a part is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2, no further action.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps were also associated with wash racks (waste rack sumps including WRSump001) where containers were cleaned and stored. Further information may be found in the

Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The WRSump001 parcel is 57.1 square feet, more or less, or 0.00131 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the WRSump001 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from WRSump001 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of WRSump001 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of WRSump001 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
W.R. SUMP 001
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 57.1 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

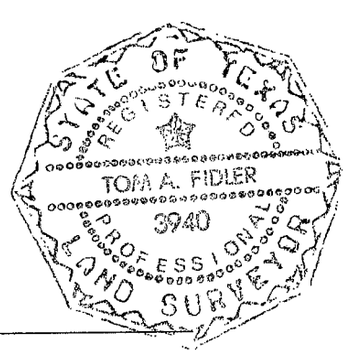
THENCE N 42deg37'08"E 700.32' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete wall which defines this sump,

THENCE along the external face of the concrete wall which defines this sump the following twelve courses, each course ending at a corner of the external face of said concrete wall :

(01)	N 36deg36'16"W	4.50',	
(02)	N 51deg51'25"E	1.07',	
(03)	N 38deg08'35"W	2.46',	
(04)	S 63deg07'08"W	0.85',	
(05)	N 38deg08'35"W	7.98',	being this sump's Westmost corner,
(06)	N 51deg51'25"E	3.70',	being this sump's Northmost corner,
(07)	S 39deg59'44"E	8.17',	
(08)	S 52deg07'09"W	1.00',	
(09)	S 39deg59'44"E	2.34',	
(10)	N 50deg00'16"E	1.14',	
(11)	S 39deg59'44"E	4.67',	being this sump's Eastmost corner,
(12)	S 52deg10'33"W	4.68',	being the aforementioned POINT OF BEGINNING.

This tract contains 57.1 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



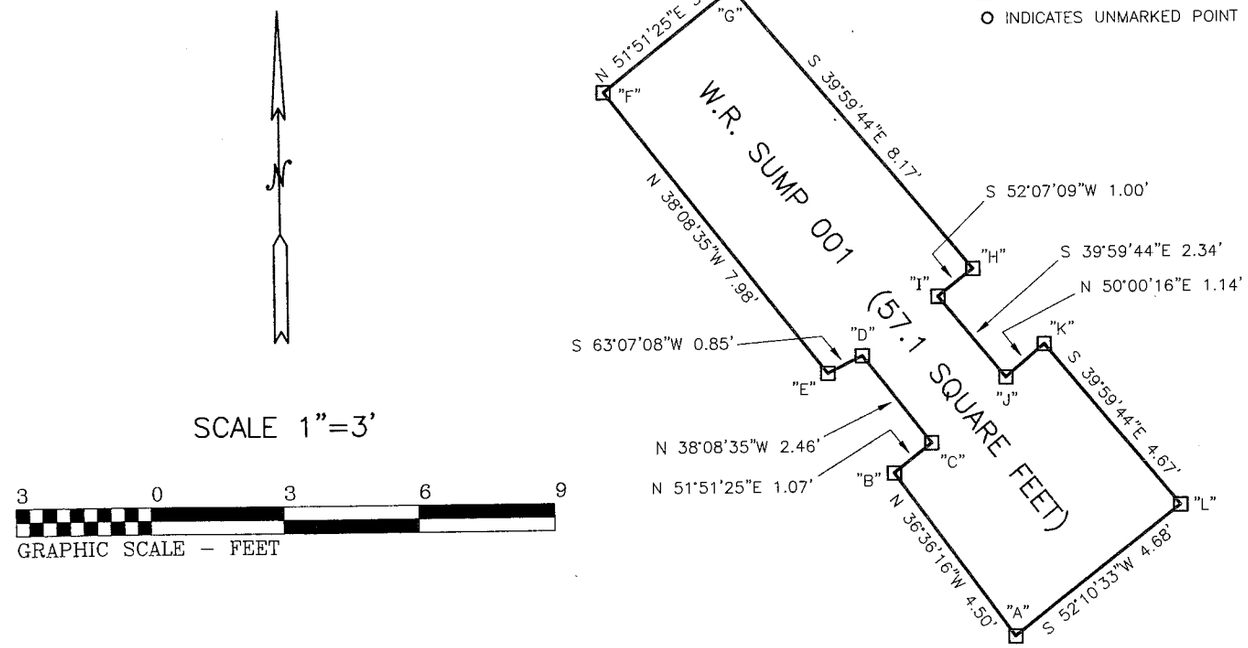
Tom A. Fidler, R.P.L.S. Number 3940

00943220

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE WALL
- O INDICATES UNMARKED POINT



NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6959022.804	3314753.696
B	6959026.415	3314751.014
C	6959027.074	3314751.854
D	6959029.012	3314750.332
E	6959028.627	3314749.573
F	6959034.899	3314744.647
G	6959037.183	3314747.555
H	6959030.925	3314752.805
I	6959030.313	3314752.018
J	6959028.519	3314753.523
K	6959029.252	3314754.396
L	6959025.676	3314757.396
M	6959022.804	3314753.696

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 1, 2011.

N 42°37'08"E 700.32'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

W.R. SUMP 001
(57.1 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	W.PTS W.LEG
MAR. 1, 2011	0908074W.DWG	DRAWN BY JTJ

2012-000000720

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000720 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. WRSump002 (called W.R. Sump 002 on the attached Exhibit A) is part of LHAAP-35/36. WRSump002 is a former waste rack sump location near Building 38-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which WRSump002 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2, no further action.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps were also associated with wash racks (waste rack sumps including WRSump002) where containers were cleaned and stored. Further information may be found in the

Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The WRSump002 parcel is 61.1 square feet, more or less, or 0.00140 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the WRSump002 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from WRSump002 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of WRSump002 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of WRSump002 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30th day of June, 2011.

BEFORE ME, on this the 30th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
W.R. SUMP 002
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 61.1 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

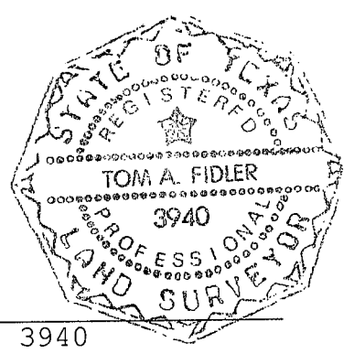
THENCE N 27deg03'19"E 797.78' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete wall which defines this sump,

THENCE along the external face of the concrete wall which defines this sump the following twelve courses, each course ending at a corner of the external face of said concrete wall :

(01)	N 50deg15'02"W	4.01',	being this sump's Westmost corner,
(02)	N 38deg19'51"E	7.83',	
(03)	S 58deg29'13"E	0.84',	
(04)	N 41deg11'11"E	3.09',	
(05)	N 51deg30'19"W	1.32',	
(06)	N 40deg19'40"E	4.55',	being this sump's Northmost corner,
(07)	S 54deg31'45"E	4.65',	being this sump's Eastmost corner,
(08)	S 38deg16'58"W	4.65',	
(09)	N 53deg12'50"W	1.23',	
(10)	S 39deg42'05"W	3.32',	
(11)	S 51deg04'42"E	0.79',	
(12)	S 38deg16'58"W	7.89',	being the aforementioned POINT OF BEGINNING.

This tract contains 61.1 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943226

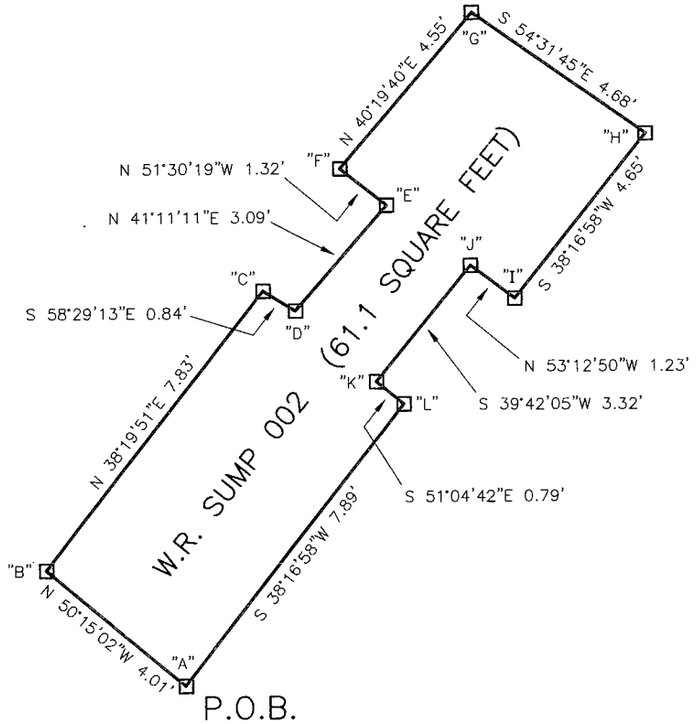
LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE WALL
- O INDICATES UNMARKED POINT

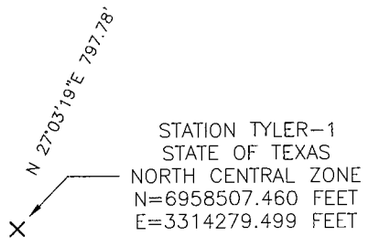


COORDINATE TABLE

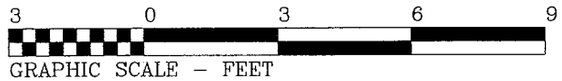
POINT	NORTH	EAST
A	6959217.937	3314642.369
B	6959220.500	3314639.287
C	6959226.642	3314644.143
D	6959226.201	3314644.863
E	6959228.524	3314646.896
F	6959229.343	3314645.866
G	6959232.815	3314648.814
H	6959230.097	3314652.628
I	6959226.443	3314649.744
J	6959227.177	3314648.763
K	6959224.624	3314646.643
L	6959224.129	3314647.256
M	6959217.937	3314642.369

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground ond under my supervision in February & March 2011.

Witness my hand and seal March 1, 2011.



SCALE 1"=3'



FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

W.R. SUMP 002
(61.1 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	X.PTS X.LEG
MAR. 1, 2011	0908074X.DWG	DRAWN BY JTJ

2012-000000721

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000721 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. WRSump003 (called W.R. Sump 003 on the attached Exhibit A) is part of LHAAP-35/36. WRSump003 is a former waste rack sump location near Building 16-Y physically located within site boundary of LHAAP-48 of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-35/36, of which WRSump003 is a part, is not considered an NPL site. Environmental activities at LHAAP-35/36 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ, the lead regulatory agency, no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2, no further action.

LHAAP-35/36 is a collection of 125 process sumps and 20 waste rack sumps found in multiple locations across the installation and predominantly associated with process areas. All of the production buildings had sumps that collected wash down water. Sumps were also associated with wash racks (waste rack sumps including WRSump003) where containers were cleaned and stored. Further information may be found in the

Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The WRSump003 parcel is 69.5 square feet, more or less, or 0.00159 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the WRSump003 site and USEPA and TCEQ concluded that no further investigation or action is required. Contaminants in soil samples from WRSump003 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of WRSump003 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of WRSump003 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 30 th day of June, 2011.

BEFORE ME, on this the 30 th day of June, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 30 day of June, 2011.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 01/03/2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
W.R. SUMP 003
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 69.5 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "TYLER-1" referenced above,

THENCE N 00deg06'48"W 643.61' to this POINT OF BEGINNING, said point being at the Southmost corner of the external face of the concrete wall which defines this sump,

THENCE along the external face of the concrete wall which defines this sump the following twelve courses, each course ending at a corner of the external face of said concrete wall :

(01)	N 37deg49'35"W 4.09',	being this sump's	Westmost corner,
(02)	N 48deg49'52"E 10.08',		
(03)	S 40deg22'17"E 0.96',		
(04)	N 51deg37'59"E 1.64',		
(05)	N 32deg53'50"W 1.27',		
(06)	N 49deg58'25"E 4.65',	being this sump's	Northmost corner,
(07)	S 41deg50'19"E 4.65',	being this sump's	Eastmost corner,
(08)	S 43deg56'08"W 4.79',		
(09)	N 44deg10'19"W 1.61',		
(10)	S 52deg56'11"W 1.74',		
(11)	S 39deg31'31"E 1.01',		
(12)	S 49deg33'58"W 10.21',	being the aforementioned POINT OF BEGINNING.	

This tract contains 69.5 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

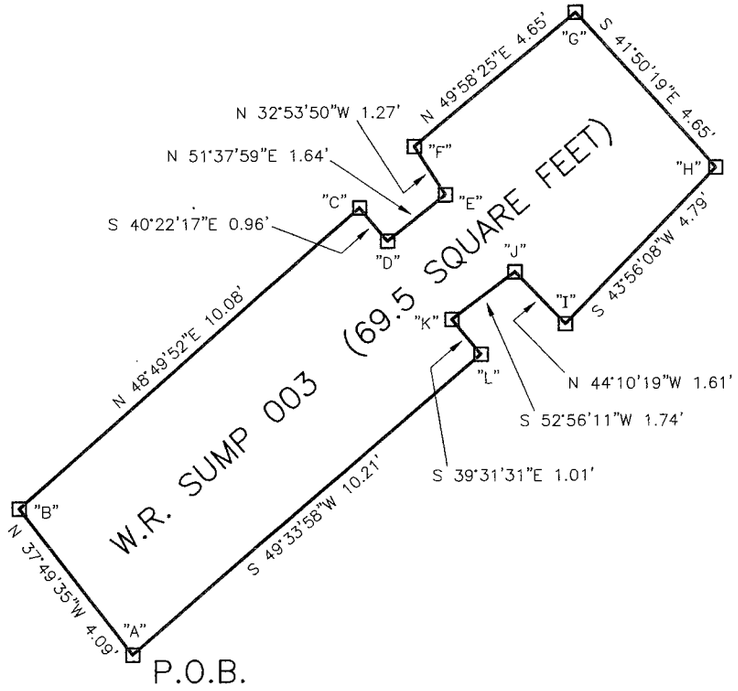
Tom A. Fidler, R.P.L.S. Number 3940

00943232

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES CORNER OF EXTERNAL FACE OF CONCRETE WALL
- O INDICATES UNMARKED POINT

COORDINATE TABLE

POINT	NORTH	EAST
A	6959151.071	3314278.227
B	6959154.302	3314275.719
C	6959160.937	3314283.306
D	6959160.202	3314283.931
E	6959161.221	3314285.218
F	6959162.288	3314284.528
G	6959165.278	3314288.088
H	6959161.816	3314291.188
I	6959158.365	3314287.863
J	6959159.516	3314286.744
K	6959158.468	3314285.356
L	6959157.691	3314285.996

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in February & March 2011.

Witness my hand and seal March 1, 2011.

N 00°06'48"W 643.61'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

SCALE 1"=3'

3 0 3 6 9
GRAPHIC SCALE - FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

W.R. SUMP 003
(69.5 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	V.PTS V.LEG
MAR. 1, 2011	0908074V.DWG	DRAWN BY JTJ

LHAAP-37, 37-1

LUCs FROM FINAL REMEDIAL DESIGN

September 14, 2015

FINAL
REMEDIAL DESIGN
LHAAP-35B (37), CHEMICAL LABORATORY AND LHAAP-67, ABOVEGROUND STORAGE TANK FARM
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared by

U.S. Army Corps of Engineers
Tulsa District
1645 South 101st East Avenue
Tulsa, Oklahoma

August 1, 2011

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4.0 Land Use Controls for the Site

The LUCs to be implemented by the Army or its representatives for LHAAP-35B(37) and LHAAP-67 to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health include:

- Ensure no withdrawal or use of groundwater beneath the sites for anything other than environmental monitoring and testing until cleanup goals are met

Notification of the groundwater use restriction will accompany all transfer documents and will be recorded at the Harrison County Courthouse in accordance with Texas Administrative Code (TAC) Title 30, §335.566.The LUC addresses the areas of LHAAP-35B(37) and LHAAP-67 that include groundwater plumes at LHAAP-35B(37) and LHAAP-67 with levels of contamination that require implementation of a remedy (see **Section 2.0**). The U.S. Army is responsible for implementing, maintaining, monitoring, reporting on, and enforcing the LUC.

U.S. Army and regulators will consult to determine appropriate enforcement actions should there be a failure of an LUC objective at this site after it has transferred. U.S. Army shall obtain USEPA and TCEQ concurrence prior to termination or significant modification of the LUC, or implementation of a change in land use inconsistent with the LUC objectives and use assumptions of the remedy. Although not a remedy, the land use assumption for LHAAP-35B(37) and LHAAP-67 forms the basis for the remedy. The reasonably anticipated future use of the site as part of a national wildlife refuge is consistent with an industrial risk exposure scenario. Notification of the land use assumption of this site will be made in transfer documentation, will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566 and compliance with the use assumption will be documented in the Five-Year Review reports.

6.2 Land Use Control Implementation Actions

The Army or its representatives will be responsible for LUC implementation and certification, reporting and enforcement. The Army shall address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable.

As a condition of property transfer, the Army may require the transferee to assume responsibility for various implementation actions, as indicated below. Although the Army may transfer responsibility for various implementation actions, the Army shall retain its responsibility for remedy integrity. This means that the Army is responsible for addressing substantive violations of performance objectives that would undermine the Army's CERCLA remedy. The Army also will be responsible for: 1) incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation; 2) recording groundwater use restriction and survey plat at the Harrison County Courthouse; and 3) notifying Texas Department of Licensing and Regulation of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ. The following LUC implementation actions shall be undertaken by the Army in order to ensure that the aforementioned LUC performance objectives for LHAAP-35B(37) and LHAAP-67 are met and maintained:

6.2.1 Comprehensive Land Use Control Management Plan

Within 30 days of receiving USEPA and TCEQ approval of this RD, the Army will incorporate this document into the Comprehensive LUC Management Plan. The Comprehensive LUC Management Plan consists of LHAAP RD documents and a survey plat showing the locations where LUCs being implemented at LHAAP are applied. The purpose of this Comprehensive LUC Management Plan is to ensure all site specific LUCs are compiled into one comprehensive location for both pre-transfer use by the installation and for post-transfer use by the transferee. This document is also accessible to regulators, the local government and the public. The Comprehensive LUC Management Plan is located in the Marshall Public Library to accompany LHAAP's Administrative Record. As LUC RD documents for additional environmental sites are approved by USEPA and TCEQ, the Army shall likewise add those documents and survey plats to the Comprehensive LUC Management Plan as well as update the previous copy of the plan placed in the Marshall Public Library.

6.2.2 Site Certifications and Reporting

Beginning with finalization of this RD, the Army will undertake annual certifications to confirm continued compliance with the LUC objectives. The Army will retain the annual LUC Compliance Certification documents in the project files for incorporation into the Five-Year Review Reports, and these documents will be made available to USEPA and TCEQ upon request. The certification form will be consistent with the form attached as **Appendix B**. In addition, should any violations be found during the annual certification, the Army will provide to USEPA and TCEQ along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations**.** Upon transfer, such responsibilities may shift to the transferee via

appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental transfer document. The need to continue annual certifications will be revisited at Five-Year Reviews.

6.2.3 Notice of Planned Property Conveyances

The Army shall provide notice to USEPA and TCEQ of plans to convey LHAAP-35B(37) and LHAAP-67 acreage. The notice shall describe the mechanism by which LUCs will continue to be implemented, maintained, inspected, reported, and enforced.

6.2.4 Opportunity to Review Text of Intended Land Use Controls

Army will provide a copy of the groundwater use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. In addition, the Army will produce an ECP or other environmental document for transfer of LHAAP-35B(37) and LHAAP-67, but before executing transfer, the Army will provide USEPA and TCEQ with a draft copy of the ECP or other environmental document for transfer so that they may have reasonable opportunity, before document execution, to review all LUC-related provisions.

6.2.5 Notification Should Action(s) Which Interfere with Land Use Control Effectiveness Be Discovered Subsequent to Conveyance

Should the Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objectives, the Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with **Section 6.2.6** below, the Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

6.2.6 Land Use Control Enforcement

Should the LUC remedy reflected in this LUC RD fail, the Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the owner or violator, to the institution of judicial action under the auspices of Texas property law or CERCLA. Alternatively, should the circumstances warrant such, the Army could choose to exercise its response authorities under CERCLA, and then seek cost recovery after the fact from the person(s) or entity(ies) who violated a given LUC. Should the Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the Army will notify these agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUCs.

6.2.7 Modification or Termination of Land Use Controls

The Army shall not, without USEPA and TCEQ concurrence, make a significant modification to, or terminate a LUC, or make a land use change inconsistent with the LUC objectives and use assumptions of the selected remedy. Likewise, the Army shall seek prior USEPA and TCEQ concurrence before commencing actions that may impact remedy integrity. In the case of an emergency action, the Army shall obtain prior USEPA and TCEQ concurrence as appropriate to the exigencies of the situation.

The LUCs shall remain in effect until such time as the Army, TCEQ and USEPA agree that the concentrations of COCs have met cleanup levels. When this occurs, the LUCs will be terminated as needed. The decision to terminate LUCs will be documented consistent with the NCP process for post-ROD changes, potentially including an explanation of significant differences or a remedial action completion report. If the property has been transferred and a determination by the Army, TCEQ and USEPA has been made to terminate one or more of the LUCs, the Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

6.3 Monitored Natural Attenuation Implementation Actions

Implementation actions include installation of additional monitoring wells, plugging and abandonment of monitoring wells not designated for long-term monitoring, implementation of a groundwater monitoring plan, monitoring, and reporting. The project schedule and cost summary for implementation actions are provided in **Appendix H**. Groundwater monitoring will be conducted to monitor the effectiveness of MNA in reducing contaminant concentrations over time. Monitoring will also be conducted to evaluate plume migration and ensure that chlorinated solvents-contaminated groundwater does not impact nearby surface water at unacceptable levels. Surface water sampling will be conducted to confirm contaminated groundwater is not migrating to surface water. The Groundwater Monitoring Plan, attached as **Appendix A**, describes the wells, their locations, analytical parameters, the frequency of the monitoring, surface water sampling, and presents a list of the monitored constituents and their respective MCLs. Groundwater monitoring and surface water sampling conducted at LHAAP-35B(37) and LHAAP-67 will follow the Health and Safety Plan (**Appendix E**), the Contractor Quality Control Plan (**Appendix F**), the Chemical Data Acquisition Plan (**Appendix G**), Field Activities (**Appendix C**) and Field Procedures (**Appendix D**) as contained in the appendices of the Remedial Design LHAAP-35B(37) and LHAAP-67.

Annual reports will be prepared for any year in which sampling occurs to document the monitoring program. The first year's annual report will include a review of the first four quarters of data, which include natural attenuation parameters and provide an evaluation for the evidence of MNA as a remedial method and a review of the first year's surface water sample data. The TCEQ provides guidance for MNA as a remedial action in *Monitored Natural Attenuation Demonstrations* (Texas Natural Resource Conservation Commission [TNRCC], RG-366/TRRP-33, October 2001). Although LHAAP is being addressed under the Risk Reduction Standards rather than Texas Risk Reduction Program (TRRP), this guidance is comparable to USEPA guidance and may be used as a guideline for the evaluation of the groundwater data. TRRP guidance specifies recommended lines of evidence to document the occurrence of natural attenuation at a site. For the first annual report, primary and secondary lines of evidence will be evaluated to document that attenuation is occurring at LHAAP-35B(37) and LHAAP-67. The primary line

00943240

LHAAP-35B(37)
LHAAP-67
0 350 700 1,400 Feet
0 250 500 1,000 Feet
LEGEND
Road
Stream
Site
Approximate LHAAP Boundary
LHAAP Water Supply Well
U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA
FIGURE 2-2
SITE LOCATION MAP
REMEDIAL DESIGN
LHAAP-35B(37) AND LHAAP-67, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
OFFICE Houston, TX
DRAWN BY B. Lu 10/12/07
CHECKED BY N. Olson 10/31/07
APPROVED BY P. Srivastav 10/31/07
FILE PATH T:\GIS\Longhorn\MXD\ST35B67\ROD\SiteLocs.mxd

LHAAP-37, 37-2

NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-35B (37) FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

00943242

2015-000002401

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

NOTICE

8 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 03/16/2015 11:17 AM **Document Number:** 2015-000002401 **Receipt No:** 1502837 **Amount:** $ 50.00 **By:** Denise Kio, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AECOM
112 E. PECAN ST,STE 400
FED-EX ENVELOPE
SAN ANTONIO, TX 78205

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROL AT LHAAP-35B (37)

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed remedial activities at the land described herein. The remediation site is in a former industrial area, located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-35B (37) (Chemical Laboratory). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-35B (37) were performed in accordance with the FFA requirements.

The LHAAP-35B (37) was built during the construction of Plant 3 (1953-1955) and was originally used to support the production activities at LHAAP. A Record of Decision (ROD) for LHAAP-35B (37) was signed by the USEPA in 2010 establishing the final remedy which consists of land use control (LUC) in conjunction with monitored natural attenuation (MNA). The site was not remediated to levels suitable for unrestricted use. The LUC at LHAAP-35B (37) is required to prevent human exposure to contaminated groundwater. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-35B (37) parcel is a 12.2-acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Within the LHAAP-35B (37) parcel is designated a LUC boundary which is a 16.578-acre tract, more or less, as described in Exhibit A. The LUC boundary is also presented in the attached Figure 1.

Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. For purposes of this certification, residential use includes, but is not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12. The United States Department of the Army has undertaken careful environmental study of the LHAAP-35B (37) site and concluded that the LUC set forth below is required to ensure protection of human health and the environment.

(1) Groundwater Restriction. The groundwater use restriction boundary consists of the 16.578-acre tract, more or less. Groundwater underlying this land is contaminated with trichloroethene (TCE), tetrachloroethene (PCE), and 1,1-dichloroethene (1,1-DCE) and shall not be accessed or used for any purpose without the prior written approval of the U.S. Army, the USEPA, and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA, and the TCEQ. A restriction against the residential use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE).

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

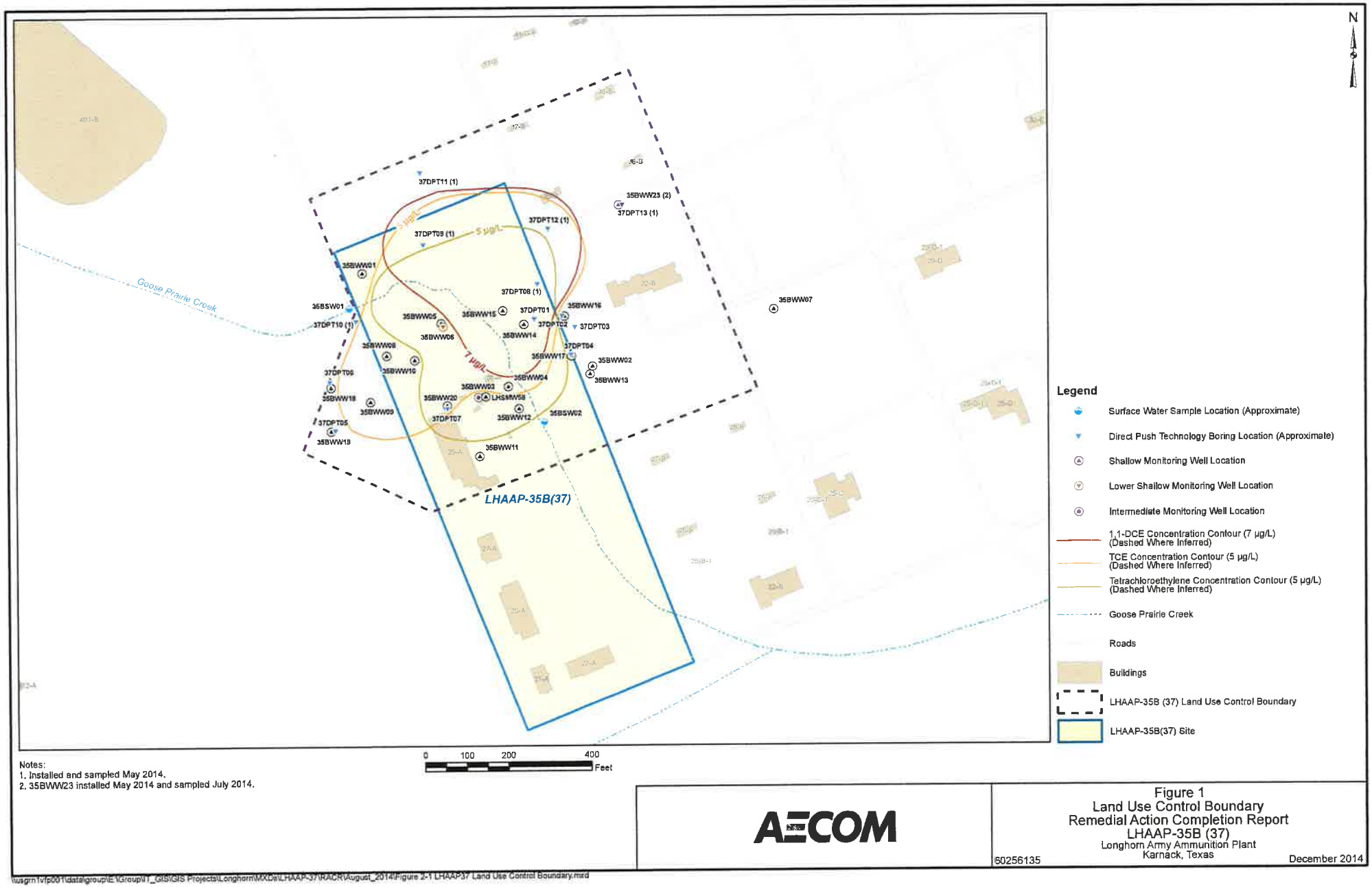
EXECUTED this the 19 th day of February, 2015.

BEFORE ME, on this the 19 th day of February 2015 personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 19th day of February, 2015.

Notary Public in and for the State of Texas,
County of Harrison

GENIE WARNER
Notary Public State of Texas
COMM. EXP. 8/1/2018



Notes:
1. Installed and sampled May 2014.
2. 35BWW23 installed May 2014 and sampled July 2014.

AECOM

Figure 1
Land Use Control Boundary
Remedial Action Completion Report
LHAAP-35B (37)
Longhorn Army Ammunition Plant
Karnack, Texas

60256135 December 2014

\\usgrn1vfp001\data\group\E:\Group\IT_GIS\GIS Projects\Longhorn\MXDs\LHAAP-37\RACR\August_2014\Figure 2-1 LHAAP37 Land Use Control Boundary.mxd

EXHIBIT A
SURVEY PLAT

FIELD NOTES DESCRIPTION OF
"LHAAP-35B(37)" LAND USE CONTROL AREA
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, "LHAAP-35B(37)" Land Use Control Area being 16.578 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), "LHAAP-35B(37)" Land Use Control Area being more particularly described as follows :

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.99986172702, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "C-21" (N=6956579.781 feet E=3308499.969 feet) and "X-11" (N=6960733.698 feet E=3304750.367 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on State Plane distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" and "RPLS 3940" .

Commencing at monument "C-21" referenced above,

THENCE N 22deg47'20"W 1290.84' to a concrete nail set (near the centerline of the asphalt pavement of "Avenue P") for the Southmost corner of this tract and this POINT OF BEGINNING,

THENCE N 67deg25'22"W 354.97' along a S.B.L. of this tract to an I.R.O.P.C. set for this tract's Westmost corner,

THENCE N 20deg54'22"E 363.80' along a W.B.L. of this tract to a concrete nail set (near the centerline of the asphalt pavement of "Avenue P") for this tract's Westerly reentrant corner,

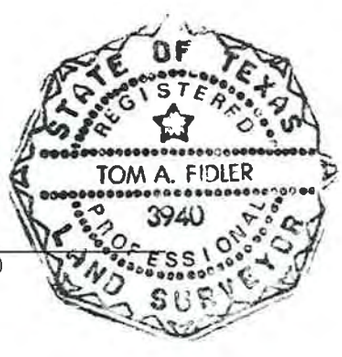
THENCE N 22deg33'04"W 285.83' along a W.B.L. of this tract to a concrete nail set (near the centerline of the asphalt pavement of "Avenue P") for this tract's N.W.C., said nail being S 52deg54'59"E 3687.90' from the aforementioned "X-11" monument,

THENCE N 68deg33'30"E 817.56' along the N.B.L. of this tract to a concrete nail set (near the centerline of the asphalt pavement of "Bowie Avenue") for this tract's Northmost corner,

THENCE S 21deg48'41"E 817.92' along the E.B.L. of this tract to a concrete nail set (near the centerline of the asphalt pavement of "Bowie Avenue") for this tract's Eastmost corner,

THENCE S 69deg44'08"W 807.28' along a S.B.L. of this tract to this POINT OF BEGINNING, containing 16.578 acres, more or less.

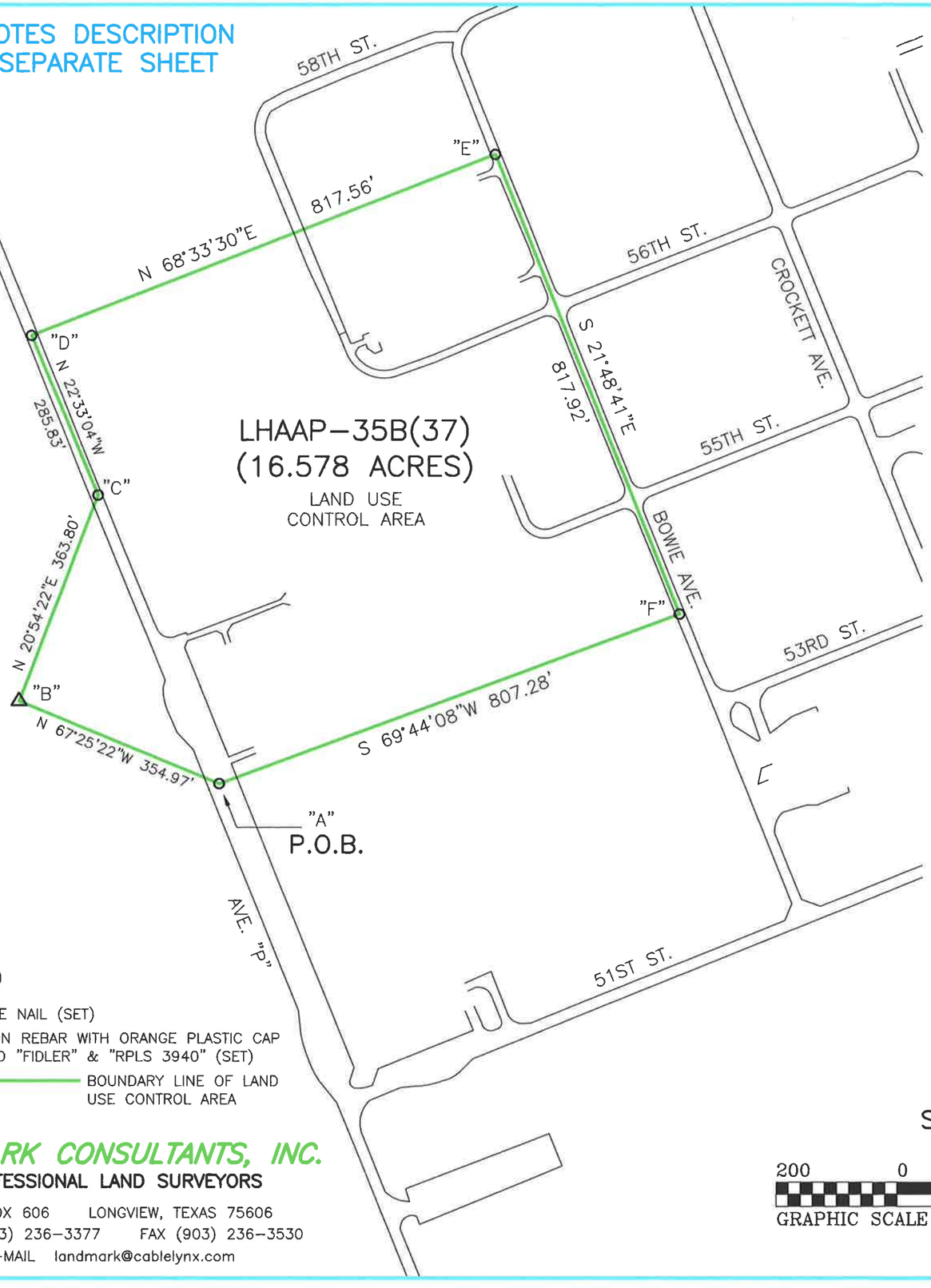
I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943249

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET



I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in January, 2015.

Witness my hand and seal this the 21st day of January, 2015.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), AND COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.99986172702 & IS BASED ON CALCULATED DISTANCE BETWEEN PUBLISHED STATE PLANE COORDINATES OF STATIONS C-21 & X-11 DIVIDED BY SURFACE TRAVERSE CALCULATED DISTANCE BETWEEN SAME TWO STATIONS. THE COMPUTED LAND AREA IS BASED ON STATE PLANE DISTANCES.

COORDINATE TABLE

POINT	NORTH	EAST
A	6957769.855	3307999.979
B	6957906.138	3307672.216
C	6958245.983	3307802.032
D	6958509.961	3307692.413
E	6958808.823	3308453.390
F	6958049.461	3308757.289

LEGEND

- ○ CONCRETE NAIL (SET)
- △ 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- BOUNDARY LINE OF LAND USE CONTROL AREA

SCALE 1"=200'

200 0 200 400 600

GRAPHIC SCALE - FEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

LHAAP-35B(37) L.U.C.A.
(16.578 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	I.PTS I.LEG
01/21/2015	0605063I.DWG	DRAWN BY JTJ

LHAAP-37, 37-3

LAND USE CONTROL COMPLIANCE INSPECTION FORM

September 14, 2015

Sample Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated 8/1/11 for LHAAP-35B (37), a certification of site was conducted by _____ [indicate transferee] on _____.

A summary of land use control mechanisms is as follows:

- Groundwater restriction – A restriction against use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE). [Indicate whether groundwater restrictions are still required at LHAAP-35B (37)]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-35B (37).

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year.

LHAAP-46, 46-1

LUCs FROM FINAL REMEDIAL DESIGN

September 14, 2015

Final
Remedial Design
LHAAP-46, Plant 2 Area, Group 4
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared for U.S. Army Corps of Engineers – Tulsa District
1645 South 101st, East Avenue
Tulsa, Oklahoma 74128

Prepared by Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. W912QR-04-D-0027, Task Order No. DS02
Shaw Project No. 117591
Rev 0
September 2011

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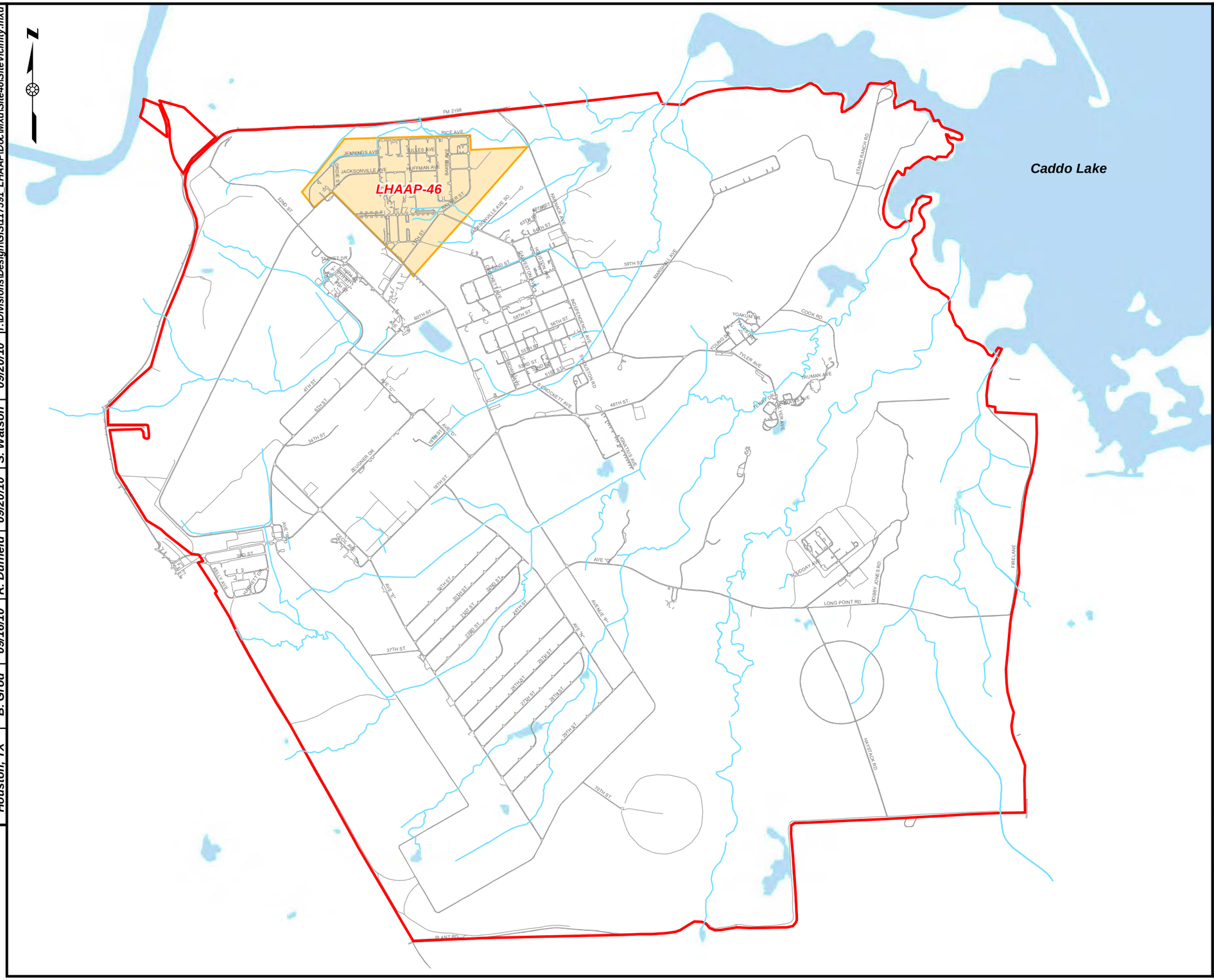

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-2

SITE VICINITY MAP
LHAAP-46, REMEDIAL DESIGN

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

2.0 LAND USE CONTROL

The objective of the LUC at LHAAP-46 is to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the sites for anything other than environmental monitoring and testing until cleanup goals are met Notification of the groundwater use restriction will accompany all transfer documents and will be recorded at the Harrison County Courthouse in accordance with Texas Administrative Code (TAC) Title 30, §335.566. **Appendix A** provides sample LUC compliance certification documentation.

The LUC addresses the area of LHAAP-46 that includes two groundwater plumes at LHAAP-46 with levels of contamination that require implementation of a remedy (see **Section 1.3**). The U.S. Army is responsible for implementing, maintaining, monitoring, reporting on, and enforcing the LUC.

U.S. Army and regulators will consult to determine appropriate enforcement actions should there be a failure of an LUC objective at this site after it has transferred. U.S. Army shall obtain USEPA and Texas Commission on Environmental Quality (TCEQ) concurrence prior to termination or significant modification of the LUC, or implementation of a change in land use inconsistent with the LUC objectives and use assumptions of the remedy. Although not a remedy, the land use assumption for LHAAP-46 forms the basis for the remedy. The future use of the site as part of a national wildlife refuge is consistent with an industrial risk exposure scenario. Notification of the land use assumption of this site will be made in transfer documentation and will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566. Compliance with the use assumption will be documented in the five-year review reports.

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4.0 LAND USE CONTROL DESIGN AND IMPLEMENTATION PLAN

This section describes the LUC design and implementation activities for LHAAP-46. The activities will result in a surveyed and recorded groundwater use restriction boundary and an operation and maintenance plan for the LUC.

The objective of the LUC at LHAAP-46 is to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the sites for anything other than environmental monitoring and testing until cleanup goals are met. Notification of the groundwater use restriction will accompany all transfer documents. The U.S. Army is responsible for long-term implementation, maintenance, inspection, reporting, and enforcement of the LUC.

The LUC will address the area of LHAAP-46 that includes two groundwater plumes with levels of contamination that require implementation of a remedy (see **Section 1.3**). The Land Use Control Operation and Maintenance (LUC O&M) Plan will identify the measures required for the monitoring and enforcement of the groundwater use restriction.

Upon review and concurrence of this RD, the LUC O&M Plan will be coordinated with regulators, finalized and distributed as part of the Comprehensive LUC Management Plan.

4.1 Land Use Control Implementation

The U.S. Army will undertake the following actions to implement the groundwater restriction LUC for LHAAP-46:

- Define the Area of the Groundwater Use Restriction. The groundwater use restriction boundary will be defined based on the review of the first round of groundwater sampling data in conjunction with historic data. The extent of plume will be bounded by a buffer and may extend to natural groundwater and surface water boundaries.
- Survey the LUC Boundary. The proposed boundary will be finalized after all wells are installed and sampled. Concurrence by USEPA and TCEQ will be obtained, and the LUC boundary will be surveyed by a State-licensed surveyor. A legal description of the surveyed area will be appended to the survey plat.
- Record the LUC in Harrison County. The LUC plat, legal description and groundwater use restriction language will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.56.

- Notify the Texas Department of Licensing and Regulation of the LUC. The Texas Department of Licensing and Regulation will be notified of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the U.S. Army, the USEPA, and the TCEQ. The survey plat, legal boundary and description of the groundwater restriction, in conjunction with a locator map, will be provided in hard and electronic copy.

- Develop the LUC O&M Plan. A LUC O&M Plan for LHAAP-46 will be developed. It will include the elements presented in **Section 4.2** below, the county recordation of the LUC survey plat, legal description and restriction language and the annual inspection/certification form.

4.2 Land Use Control Operation and Maintenance

The U.S. Army or its representatives will be responsible for the operation and maintenance of the LHAAP-46 LUC. This includes certification, reporting and enforcement activities. The U.S. Army shall address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable. To facilitate long-term operation and maintenance of the groundwater use restriction LUC remedy, U.S. Army will develop a plan that will encompass the elements described in the following subsections.

4.2.1 Site Certification and Reporting

Beginning with finalization of this RD and approval of the annual inspection form, the U.S. Army will undertake annual inspections and certify continued compliance with the LUC objectives. The U.S. Army, or the transferee after transfer, will retain the annual LUC Inspection/Certification documents in the project files for incorporation into the Five Year Review Reports, and these documents will be made available to USEPA and TCEQ upon request. In addition, should any violations be found during the annual certification, the U.S. Army will provide to USEPA and TCEQ along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations. The need to continue annual certifications will be revisited at five year reviews.

4.2.2 Notice of Planned Property Conveyances

The U.S. Army shall provide notice to USEPA and TCEQ of plans to convey the LHAAP-46 acreage. The notice shall describe the mechanism by which the LUC will continue to be implemented, maintained, inspected, reported, and enforced. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental document for transfer. Although the U.S. Army may transfer responsibility for various implementation actions, the

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U.S. Army shall retain its responsibility for remedy integrity. This means that the U.S. Army is responsible for addressing substantive violations of the LUC performance objective that would undermine the U.S. Army's CERCLA remedy. The U.S. Army also will be responsible for incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation.

4.2.3 Opportunity to Review Text of Intended Land Use Controls

U.S. Army will provide a copy of the groundwater use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. USEPA will also receive a copy for review. In addition, the U.S. Army will produce an ECP or other environmental document for transfer of LHAAP-46, but before executing transfer, the U.S. Army will provide USEPA and TCEQ with a copy of the ECP or other environmental document for transfer so that they may have reasonable opportunity, before transfer, to review all LUC-related provisions.

4.2.4 Notification Should Action(s) which Interfere with Land Use Control Effectiveness be Discovered Subsequent to Conveyance

Should the U.S. Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objective, the U.S. Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with **Section 4.2.5** below, the U.S. Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the U.S. Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

4.2.5 Land Use Control Enforcement

Should the LUC remedy reflected in this LUC RD fail, the U.S. Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the U.S. Fish and Wildlife Service or its lessee, to the institution of judicial action against nonfederal third parties. Alternatively, should the circumstances warrant such, the U.S. Army could choose to exercise its response authorities under CERCLA. Should the U.S. Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the U.S. Army may notify those agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUC.

4.2.6 Modification or Termination of Land Use Controls

The U.S. Army shall not, without USEPA and TCEQ concurrence, make a significant modification to, or terminate a LUC, or make a land use change inconsistent with the LUC objective. Likewise, the U.S. Army shall seek prior USEPA and TCEQ concurrence before commencing actions that may impact remedy integrity. In the case of an emergency action, the U.S. Army shall obtain prior USEPA and TCEQ concurrence as appropriate to the exigencies of the situation.

The LUCs shall remain in effect until such time as the U.S. Army and USEPA agree that the concentrations of COCs have met cleanup levels. When this occurs, the LUC will be terminated as needed. The decision to terminate the LUC will be documented consistent with the NCP process for post-ROD changes, potentially including an explanation of significant differences or a remedial action completion report. If the property has been transferred and a determination by the U.S. Army and USEPA has been made to terminate the LUC, the U.S. Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

4.2.7 Comprehensive Land Use Control Management Plan

Upon finalization of the LUC O&M Plan a copy will be inserted into the Comprehensive LUC Management Plan for Longhorn. The Comprehensive LUC Management Plan figure and table will be updated to reflect the inclusion of LHAAP-46.

The Comprehensive LUC Management Plan consists of LHAAP RD documents and a survey plat showing the locations where LUCs being implemented at LHAAP are applied. The purpose of this Comprehensive LUC Management Plan is to ensure all site-specific LUCs are compiled into one comprehensive location for both pre-transfer use by the installation and for post-transfer use by the transferee. This document will be provided to USEPA and TCEQ, and will also be accessible to the local government and the public. The Comprehensive LUC Management Plan is located in the Marshall Public Library to accompany LHAAP's Administrative Record.

The land use assumption of industrial reuse as part of a national wildlife refuge forms the basis for the remedy at LHAAP-46 and this land use assumption will be in included in the Comprehensive LUC Management Plan with supporting documentation.

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LHAAP-46, 46-2

NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-46 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

00943262

2014-000013307

*****DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT*****

NOTICE

8 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 12/09/2014 10:42 AM **Document Number:** 2014-000013307 **Receipt No:** 1415412 **Amount:** $ 50.00 **By:** Pam Rockwell, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AECOM
ATTN: AMANDA LAGARDE (FEDEX ENV)
112 E PECAN ST., SUITE 400
SAN ANTONIO, TX 78205

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROL AT LHAAP-46

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed remedial activities at the land described herein. The remediation site is in a former industrial area, located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-46 (Plant 2 Area). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-46 were performed in accordance with the FFA requirements.

The LHAAP-46 site was used for production of pyrotechnic and illumination devices until 1997. A Record of Decision (ROD) for LHAAP-46 was signed by U.S. Army and USEPA with TCEQ concurrence in 2010 establishing the final remedy which consists of land use control (LUC) in conjunction with monitored natural attenuation (MNA). The LUC will ensure protection of human health by restricting the use of groundwater to environmental monitoring and testing only. MNA will be implemented to establish confidence in attenuation trends and verify that the constituents of concern (COCs) are stable or shrinking and will not migrate to nearby surface water at levels that may present an unacceptable risk to human health or the environment. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at

the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-46 parcel is a 190 acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Within the LHAAP-46 parcel are designated LUC boundaries including a 63.772-acre tract, more or less, as described in Exhibit A. The LUC boundaries are also presented in the attached Figure 1.

Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. The United States Department of the Army has undertaken careful environmental study of the LHAAP-46 site and concluded that the LUC set forth below is required to ensure protection of human health and the environment.

(1) Groundwater Restriction. The groundwater use restriction boundary consists of the 63.772-acre tract, more or less. Groundwater underlying this land is contaminated with trichloroethene (TCE) and other volatile organic compounds (VOCs) and shall not be accessed or used for any purpose without the prior written approval of the U.S. Army, the USEPA, and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA, and the TCEQ. A restriction against the residential use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE).

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 20 th day of November, 2014.

BEFORE ME, on this the 20 th day of November, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 20 day of November, 2014.

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 03-17-2015

Notary Public in and for the State of Texas,
County of Harrison

EXHIBIT A

COUNTY CLERK'S MEMO
PORTIONS OF THIS
DOCUMENT NOT
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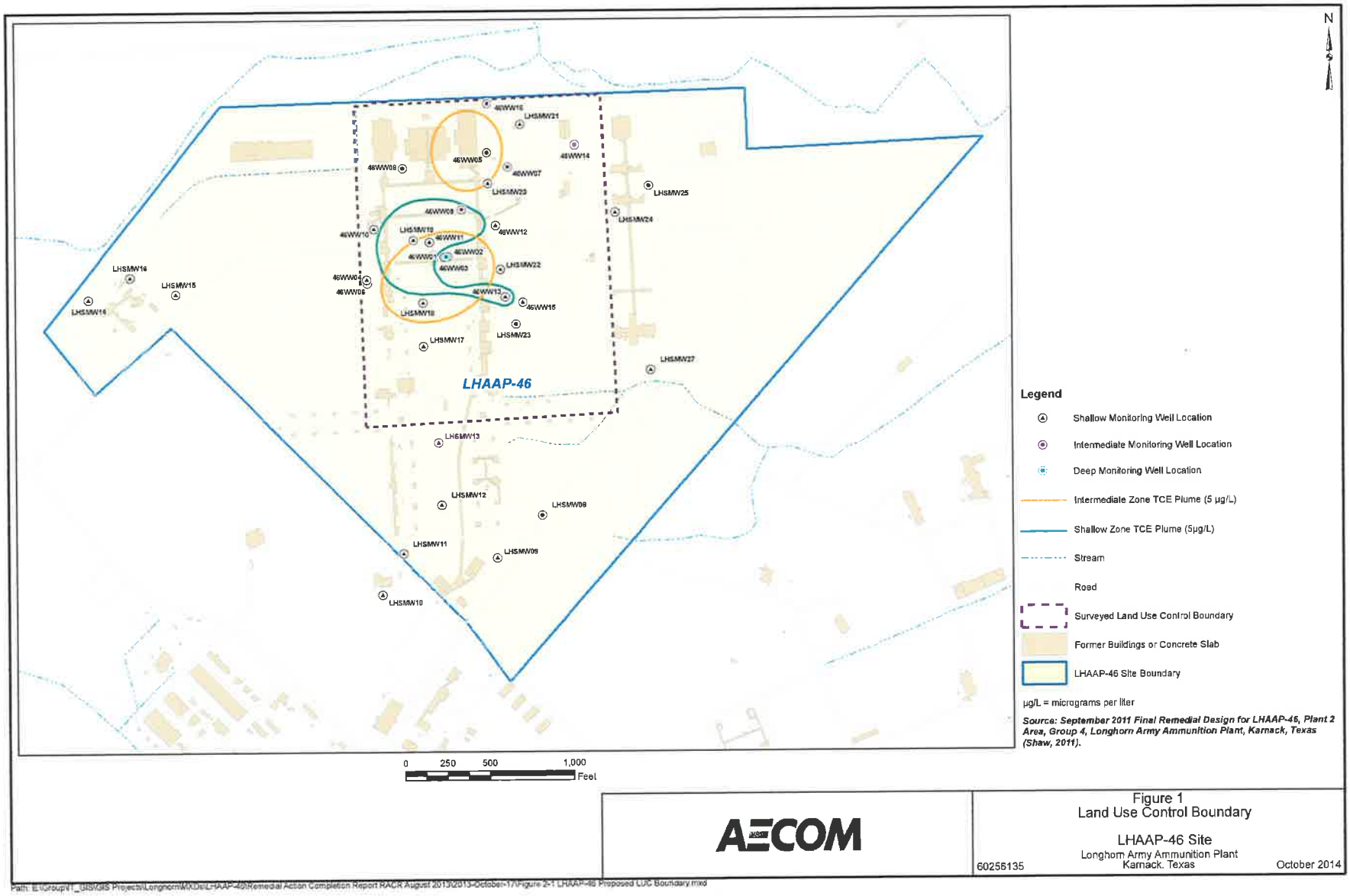
WHEN RECORDED



AECOM

Figure 1
Land Use Control Boundary

LHAAP-46 Site
Longhorn Army Ammunition Plant
Karnack, Texas

60256135 October 2014

Path: E:\Group\1_GIS\GIS Projects\LonghornMXDs\LHAAP-46\Remedial Action Completion Report RACR August 2013\2013-October-17\Figure 2-1 LHAAP-46 Proposed LUC Boundary.mxd

FIELD NOTES DESCRIPTION OF
"LHAAP-46" LAND USE CONTROL AREA
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, "LHAAP-46" Land Use Control Area being 63.772 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), "LHAAP-46" Land Use Control Area being more particularly described as follows :

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861858, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "HORSE" (N=6960008.269 feet E=3309591.340 feet). Said traverse indicates a surface distance of 4895.701 feet between said monuments. The computed land area is based on grid distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940" .

Commencing at monument "X-11" referenced above,

THENCE N 36deg34'22"E 1386.89' to a concrete nail set (in white paint on asphalt) for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 01deg52'33"W 1886.35' along the W.B.L. of this tract to an I.R.O.P.C. set (in a 6' tall chain link fence running Easterly and Westerly) for this tract's N.W.C. ,

THENCE along said fence, which defines the Northerly Boundary Lines of this tract, the following eleven courses :

(01) N 86deg41'48"E 82.30' to a fence corner post,
(02) N 39deg20'47"E 18.62' to a bent fence corner post,
(03) N 86deg29'33"E 97.31' to a fence corner post,
(04) S 38deg05'14"E 19.89' to a fence corner post,
(05) N 87deg17'05"E 337.52' to a point in said fence,
(06) N 87deg22'07"E 699.24' to a point in said fence,
(07) N 87deg22'02"E 139.25' to a fence corner post,
(08) S 59deg03'44"E 20.98' to a fence corner post,
(09) N 86deg53'55"E 29.32' to a fence corner post,
(10) N 55deg19'37"E 21.12' to a fence corner post,
(11) N 86deg05'43"E 16.55' to an I.R.O.P.C. set in said fence for this tract's N.E.C. ,

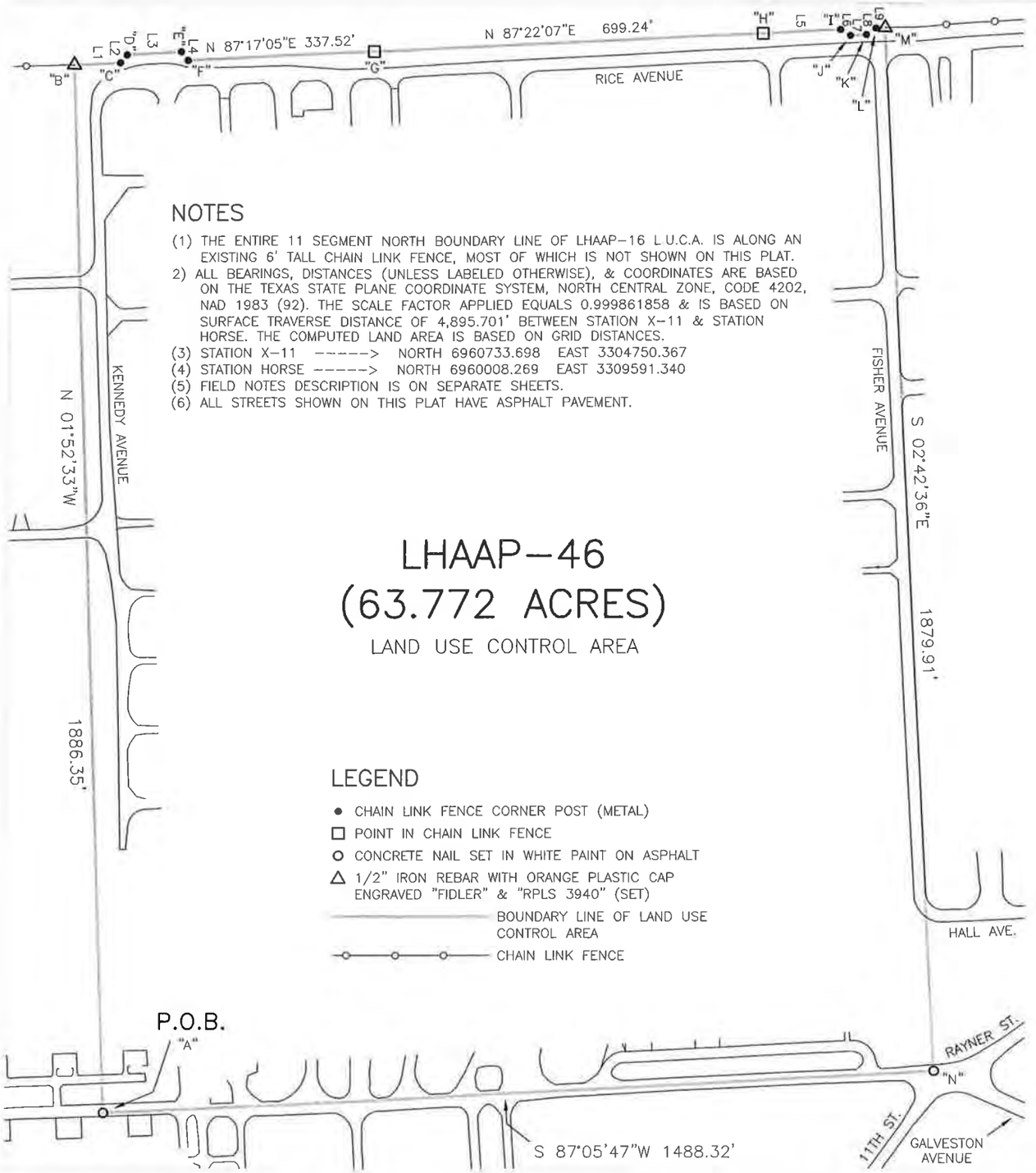
THENCE S 02deg42'36"E 1879.91' along the E.B.L. of this tract to a concrete nail set (in white paint on asphalt) for this tract's S.E.C., from which monument "HORSE" referenced above bears S 52deg51'46"E 3171.37',

THENCE S 87deg05'47"W 1488.32' along the S.B.L. of this tract to this POINT OF BEGINNING. This tract contains 63.772 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

00943269



NOTES

(1) THE ENTIRE 11 SEGMENT NORTH BOUNDARY LINE OF LHAAP-16 L.U.C.A. IS ALONG AN EXISTING 6' TALL CHAIN LINK FENCE, MOST OF WHICH IS NOT SHOWN ON THIS PLAT.
2) ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861858 & IS BASED ON SURFACE TRAVERSE DISTANCE OF 4,895.701' BETWEEN STATION X-11 & STATION HORSE. THE COMPUTED LAND AREA IS BASED ON GRID DISTANCES.
(3) STATION X-11 -----> NORTH 6960733.698 EAST 3304750.367
(4) STATION HORSE -----> NORTH 6960008.269 EAST 3309591.340
(5) FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS.
(6) ALL STREETS SHOWN ON THIS PLAT HAVE ASPHALT PAVEMENT.

LHAAP-46
(63.772 ACRES)
LAND USE CONTROL AREA

LEGEND

- ● CHAIN LINK FENCE CORNER POST (METAL)
- □ POINT IN CHAIN LINK FENCE
- ○ CONCRETE NAIL SET IN WHITE PAINT ON ASPHALT
- △ 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- BOUNDARY LINE OF LAND USE CONTROL AREA
- CHAIN LINK FENCE

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in October, 2014.

Witness my hand and seal this the 20th day of October, 2014.

STATE OF TEXAS REGISTERED TOM A. FIDLER 3940 PROFESSIONAL LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LINE TABLE

LINE	BEARING	DISTANCE
L1	N 86°41'48"E	82.30'
L2	N 39°20'47"E	18.62'
L3	N 86°29'33"E	97.31'
L4	S 38°05'14"E	19.89'
L5	N 87°22'02"E	139.25'
L6	S 59°03'44"E	20.98'
L7	N 86°53'55"E	29.32'
L8	N 55°19'37"E	21.12'
L9	N 86°05'43"E	16.55'

N

SCALE 1"=200'

200 0 200 400 600
GRAPHIC SCALE - FEET

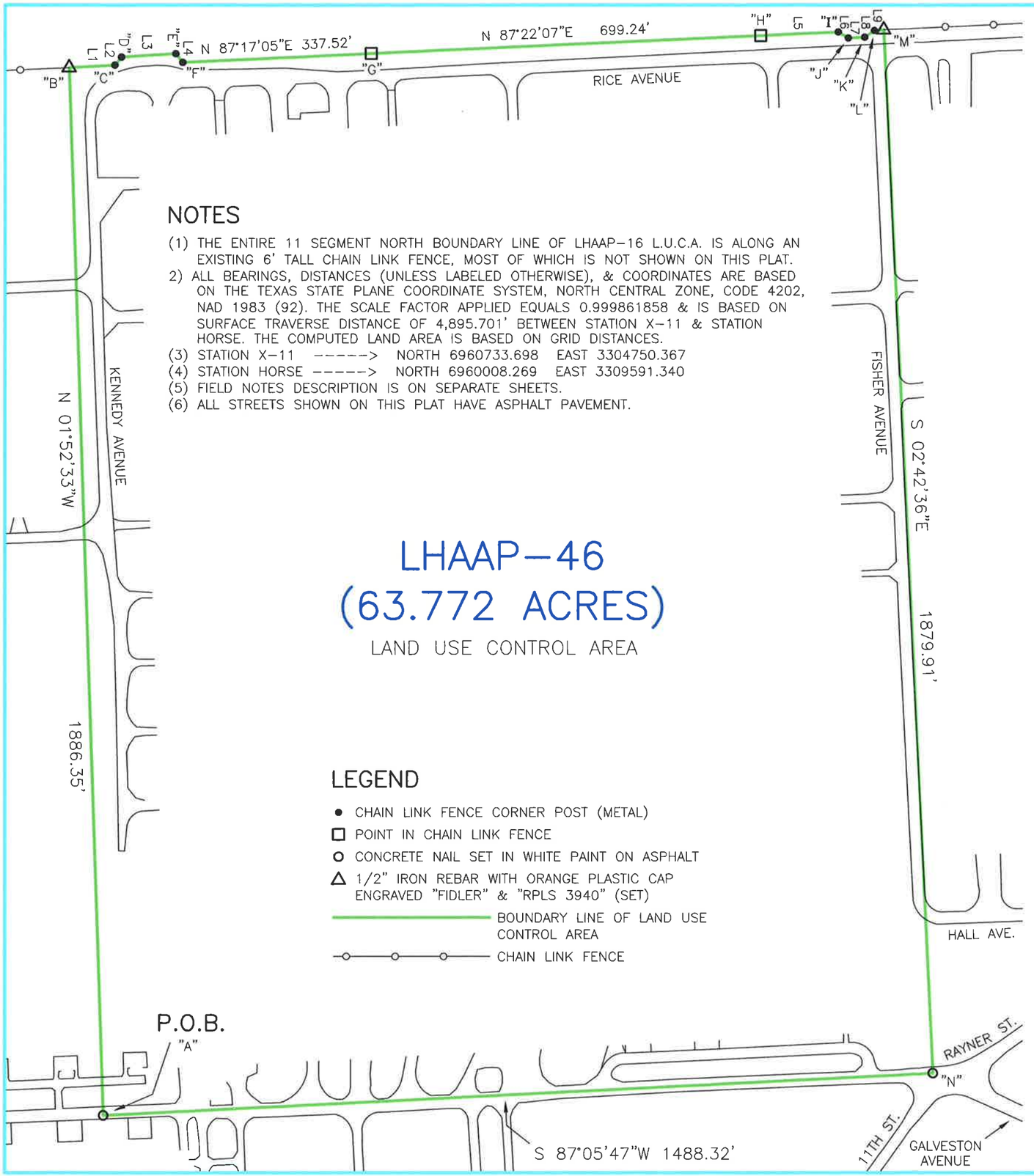
COORDINATE TABLE

POINT	NORTH	EAST
A	6961847.512	3305576.740
B	6963732.849	3305514.995
C	6963737.591	3305597.161
D	6963751.988	3305608.964
E	6963757.942	3305706.095
F	6963742.285	3305718.366
G	6963758.275	3306055.508
H	6963790.379	3306754.008
I	6963796.775	3306893.111
J	6963785.987	3306911.111
K	6963787.573	3306940.387
L	6963799.588	3306957.756
M	6963800.715	3306974.265
N	6961922.907	3307063.146

LHAAP-46 L.U.C.A.
(63.772 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	U.PTS U.LEG
10/20/2014	1103025U.DWG	DRAWN BY JTJ

00943270



LHAAP-46
(63.772 ACRES)
LAND USE CONTROL AREA

NOTES

(1) THE ENTIRE 11 SEGMENT NORTH BOUNDARY LINE OF LHAAP-16 L.U.C.A. IS ALONG AN EXISTING 6' TALL CHAIN LINK FENCE, MOST OF WHICH IS NOT SHOWN ON THIS PLAT.
2) ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861858 & IS BASED ON SURFACE TRAVERSE DISTANCE OF 4,895.701' BETWEEN STATION X-11 & STATION HORSE. THE COMPUTED LAND AREA IS BASED ON GRID DISTANCES.
(3) STATION X-11 -----> NORTH 6960733.698 EAST 3304750.367
(4) STATION HORSE -----> NORTH 6960008.269 EAST 3309591.340
(5) FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS.
(6) ALL STREETS SHOWN ON THIS PLAT HAVE ASPHALT PAVEMENT.

LEGEND

- ● CHAIN LINK FENCE CORNER POST (METAL)
- □ POINT IN CHAIN LINK FENCE
- ○ CONCRETE NAIL SET IN WHITE PAINT ON ASPHALT
- △ 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- BOUNDARY LINE OF LAND USE CONTROL AREA
- CHAIN LINK FENCE

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in October, 2014.

Witness my hand and seal this the 20th day of October, 2014.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LINE TABLE

LINE	BEARING	DISTANCE
L1	N 86°41'48"E	82.30'
L2	N 39°20'47"E	18.62'
L3	N 86°29'33"E	97.31'
L4	S 38°05'14"E	19.89'
L5	N 87°22'02"E	139.25'
L6	S 59°03'44"E	20.98'
L7	N 86°53'55"E	29.32'
L8	N 55°19'37"E	21.12'
L9	N 86°05'43"E	16.55'

SCALE 1"=200'

200 0 200 400 600
GRAPHIC SCALE - FEET

COORDINATE TABLE

POINT	NORTH	EAST
A	6961847.512	3305576.740
B	6963732.849	3305514.995
C	6963737.591	3305597.161
D	6963751.988	3305608.964
E	6963757.942	3305706.095
F	6963742.285	3305718.366
G	6963758.275	3306055.508
H	6963790.379	3306754.008
I	6963796.775	3306893.111
J	6963785.987	3306911.111
K	6963787.573	3306940.387
L	6963799.588	3306957.756
M	6963800.715	3306974.265
N	6961922.907	3307063.146

LHAAP-46 L.U.C.A.
(63.772 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	U.PTS U.LEG
10/20/2014	1103025U.DWG	DRAWN BY JTJ

LHAAP-46, 46-3

LAND USE CONTROL COMPLIANCE INSPECTION FORM

September 14, 2015

Sample Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated 9/30/11 for LHAAP-46 a certification of site was conducted by _____ [indicate transferee] on _____.

A summary of land use control mechanisms is as follows:

- Groundwater restriction – A restriction against use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE). [Indicate whether groundwater restrictions are still required at LHAAP-46]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-46.

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year.

LHAAP-49

NOTICE OF NONRESIDENTIAL LAND USE AT LHAAP-49 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2012-000000704

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000704 **Receipt No:** 1200645 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas, in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. LHAAP-49 is a former Acid Storage location at the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA) became effective on December 30, 1991. LHAAP-49 is considered an NPL listed site, and remedial activities at LHAAP-49 were performed in accordance with the FFA requirements.

LHAAP-49 is located in the west-central portion of LHAAP. LHAAP-49 is the former Acid Storage Area, which was used from 1942 to 1945 for storage and formulation of acids and acid mixtures in support of trinitrotoluene production during World War II. Nitric acid and sulfuric acid were manufactured and handled in large quantities in this area. A no further action Record of Decision for LHAAP-49 was signed by USEPA in 2010 establishing no remedy was required. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or

in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

LHAAP-49 is a 30.540 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of LHAAP-49 and USEPA and TCEQ concluded that no further investigation or action is required.

Limited monitoring of LHAAP-49 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-49 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

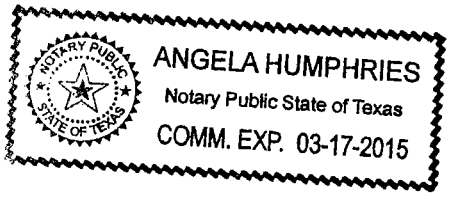
Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 21 th day of July, 2011.

BEFORE ME, on this the 21 th day of July, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 21 day of July, 2011.



Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
LHAAP-49
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 30.540 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998768897, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "HMX-3" (N=6956487.252 feet E=3303483.509 feet) and "HMX-5" (N=6958206.213 feet E=3305201.721 feet). Said traverse indicates a surface distance of 2430.748 feet between said monuments. The computed land area is based on grid (State Plane) distances.

BEGINNING at a 60d nail set for the Southmost corner of this tract, said nail being in asphalt pavement at the intersection of 6th Street and 4th Street, from which nail the monument "HMX-3" referenced above bears N 09deg00'02"E 74.61' ,

THENCE N 46deg42'14"W crossing some of said asphalt pavement, then generally along 4th Street's Northeast edge of asphalt, then crossing a curved section of 4th Street's asphalt, and continuing beyond 4th Street's asphalt, for a total distance of 509.81', to a 60d nail set for the Southmost West corner of this tract,

THENCE N 45deg04'42"E eventually crossing 4th Street's asphalt, then generally along 4th Street's Southeast edge of asphalt, for a total distance of 1323.80', to a 60d nail set (in the Southeast edge of said asphalt pavement) for the Westerly reentrant corner of this tract,

THENCE N 45deg22'03"W crossing 4th Street's asphalt pavement and continuing for a total distance of 308.18' to a point (in the Southeasterly edge of flowing water [May 3, 2011] of Goose Prairie Creek) for the Northmost West corner of this tract, from which point a 1/2" iron rod with Tom Fidler orange plastic cap set for reference bears S 45deg22'03"E 11.34', said rod being at the top of the Southeasterly bank of Goose Prairie Creek,

THENCE N 47deg40'44"E 331.25' along a N.W. B.L. of this tract to a point (in the Southeasterly edge of flowing water [May 3, 2011] of Goose Prairie Creek) for the Westmost North corner of this tract, from which point a 1/2" iron rod with Tom Fidler orange plastic cap set for reference bears S 44deg45'45"E 13.46', said rod being at the top of the Southeasterly bank of Goose Prairie Creek,

THENCE S 44deg45'45"E along a N.E. B.L. of this tract, and eventually crossing 4th Street's asphalt pavement, for a total distance of 292.85' to a 60d nail set in the Southeast edge of said asphalt pavement for the Northerly reentrant corner of this tract,

THENCE N 44deg47'09"E generally along 4th Street's Southeast edge of asphalt pavement, then entering said pavement at the

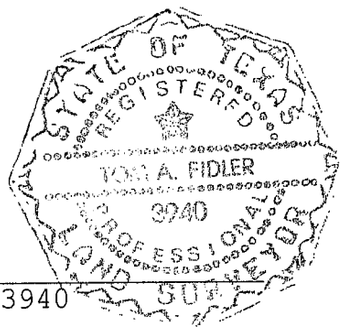
intersection of 4th Street and Avenue "C", for a total distance of 781.21' to a 60d nail set in said asphalt pavement for the Eastmost North corner of this tract,

THENCE S 45deg47'29"E crossing some of said pavement, then generally along the Southwest edge of the asphalt pavement of Avenue "C", then entering said pavement at the intersection of Avenue "C" and 6th Street, for a total distance of 507.27' to a 60d nail set for the Eastmost corner of this tract, from which the monument "HMX-5" referenced above bears N 13deg12'58"E 77.94' ,

THENCE S 44deg55'17"W crossing some of said pavement, then generally along the Northwest edge of the asphalt pavement of 6th Street, then entering said pavement at the aforementioned intersection of 6th Street and 4th Street, for a total distance of 2424.55' to this POINT OF BEGINNING.

This tract contains 30.540 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943280

LANDMARK CONSULTANTS, INC
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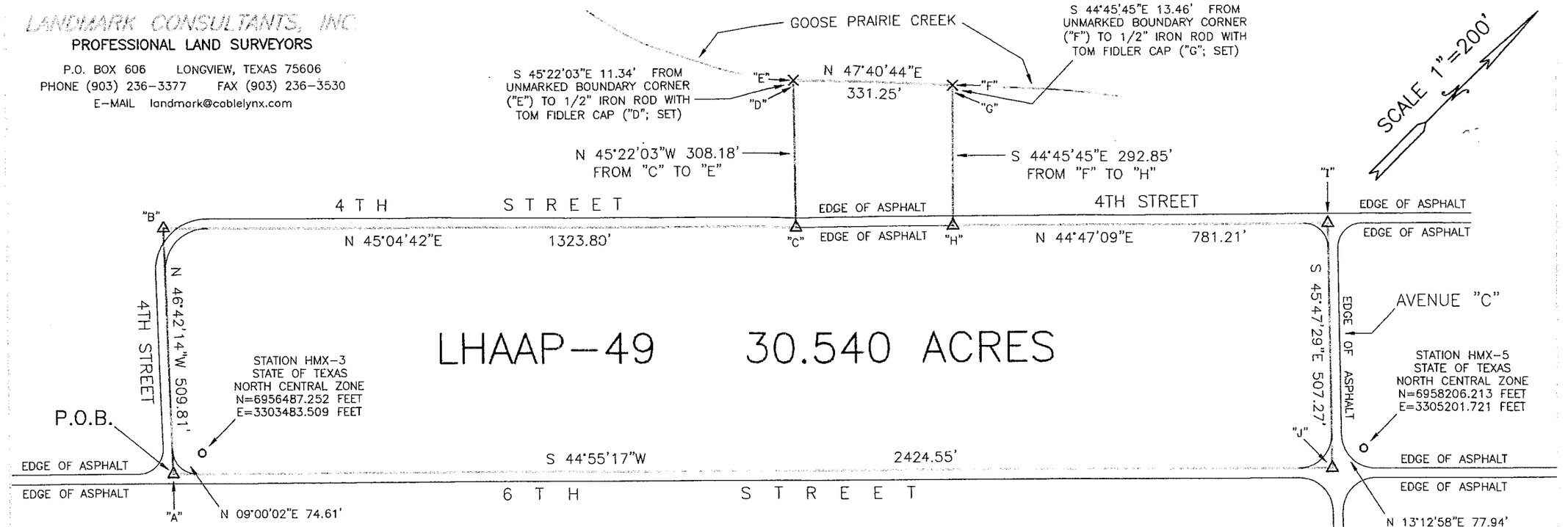
E-MAIL landmark@cablelynx.com



LEGEND

- o INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- △ INDICATES 60d NAIL (SET)
- + INDICATES UNMARKED POINT AT SOUTHEASTERLY EDGE OF CREEK WATER MAY 3, 2011 (GOOSE PRAIRIE CREEK)

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998768897 & IS BASED ON GRID DISTANCE (BETWEEN STATIONS HMX-3 AND HMX-5) DIVIDED BY SURFACE TRAVERSE DISTANCE (BETWEEN SAME MONUMENTS). THE COMPUTED LAND AREA IS BASED ON GRID DISTANCES.

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in April 2011.

Witness my hand and seal May 5, 2011.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

COORDINATE TABLE

POINT	NORTH	EAST
A	6956413.564	3303471.837
B	6956763.174	3303100.790
C	6957697.967	3304038.137
D(ROD)	6957906.516	3303826.894
E	6957914.483	3303818.824
F	6958137.506	3304063.741
G(ROD)	6958127.951	3304073.216
H	6957929.573	3304269.956
I	6958484.036	3304820.288
J	6958130.332	3305183.901

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

LHAAP-49
(30.540 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1104040	0407088.CRD	M.PTS M.LEG
MAY 5, 2011	1103025M.DWG	DRAWN BY JTJ

LHAAP-50, 50-1

LUCs FROM FINAL REMEDIAL DESIGN

September 14, 2015

Final

Remedial Design
LHAAP-50
Former Sump Water Tank, Group 4
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared for U.S. Army Corps of Engineers – Tulsa District
1645 South 101st East Avenue
Tulsa, Oklahoma 74128

Prepared by Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. W912QR-04-D-0027, Task Order No. DS02
Project No. 117591
Rev 0
September 2011

Shaw® a world of Solutions™

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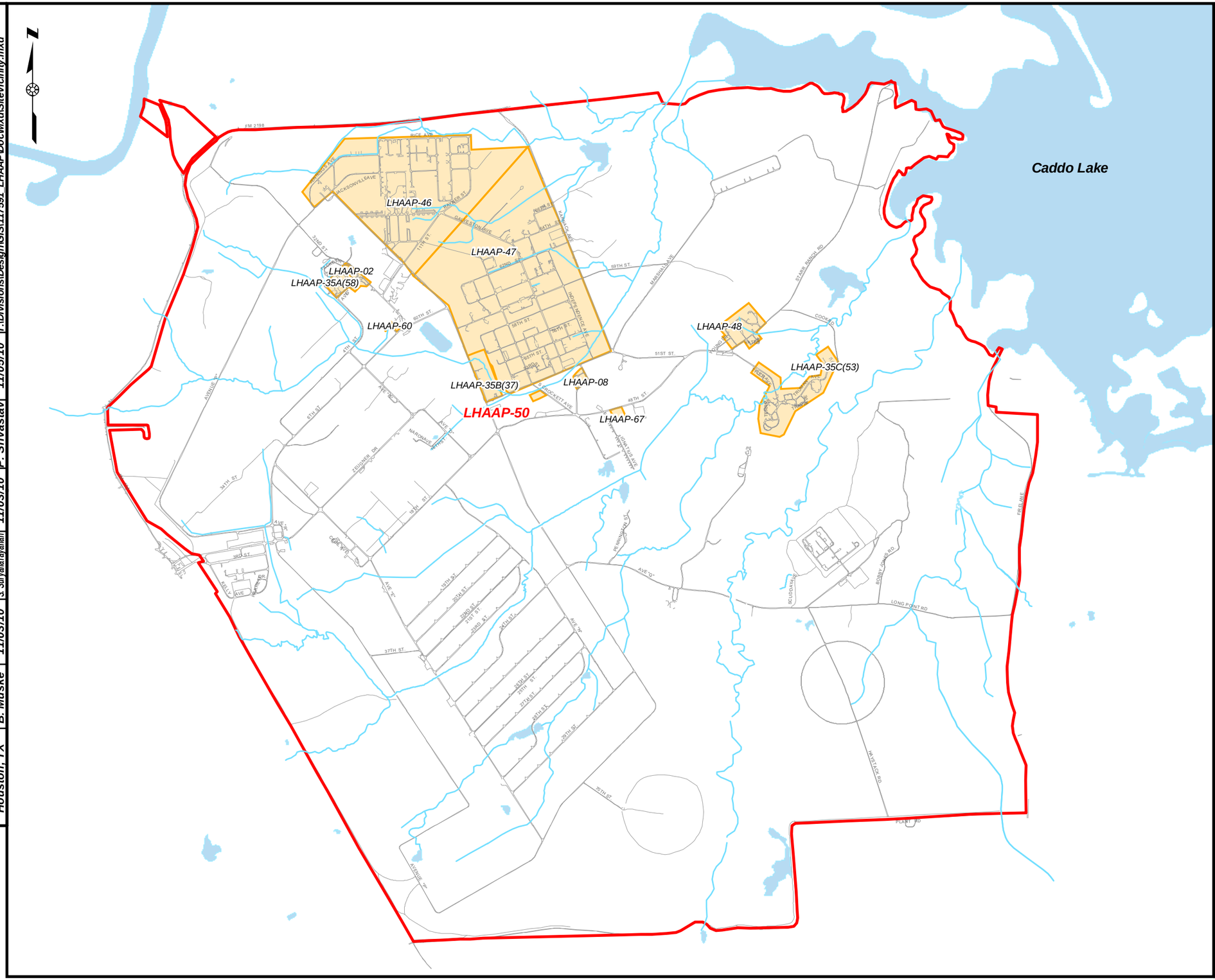
00943284

FILE PATH	T:\Divisions\Design\GIS\117591_LHAAP\Doc\Mxd\SiteVicinity.mxd
APPROVED BY	P. Srivastav 11/05/10
CHECKED BY	S. Suryanarayanan 11/03/10
DRAWN BY	B. Muske 11/03/10
OFFICE	Houston, TX



Shaw

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-2

SITE VICINITY MAP
LHAAP-50 REMEDIAL DESIGN

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

3.0 LAND USE CONTROL

The objective of LUC at LHAAP-50 is to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the sites for anything other than environmental monitoring and testing until cleanup levels are met. Notification of the groundwater use restriction will accompany all transfer documents and will be recorded at the Harrison County Courthouse in accordance with Texas Administrative Code (TAC) Title 30, §335.566. **Appendix B** provides sample LUC compliance certification documentation.

The LUC addresses the area of LHAAP-50 that has groundwater plumes (in both the shallow and intermediate groundwater zones) with levels of contamination that require implementation of a remedy (see **Section 2.3**). The groundwater restriction LUC would be maintained until the concentration of contaminants and by-product contaminants have been reduced to below their respective cleanup levels.

The U.S. Army and regulators will consult to determine appropriate enforcement actions should there be a failure of an LUC objective at this site after it has transferred. The U.S. Army shall obtain USEPA and TCEQ concurrence prior to termination or significant modification of the LUC, or implementation of a change in land use inconsistent with the LUC objectives and use assumptions of the remedy. Although not a remedy, the land use assumption for LHAAP-50 forms the basis for the remedy. The future use of the site as part of a national wildlife refuge is consistent with an industrial risk exposure scenario. Notification of the land use assumption of this site will be made in transfer documentation and will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566. Compliance with the use assumption will be documented in the five-year review reports.

Contract No. W912QR-04-D-0027, Task Order No. DS02• Final • Rev 0 • September 2011

Contract No. W912QR-04-D-0027, Task Order No. DS02• Final • Rev 0 • September 2011

6.0 LAND USE CONTROL DESIGN AND IMPLEMENTATION PLAN

This section describes the LUC design and implementation activities for LHAAP-50. The activities will result in a surveyed and recorded groundwater use restriction boundary and an operation and maintenance plan for the LUC.

The objective of the LUC at LHAAP-50 is to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing until cleanup levels are met. Notification of the groundwater use restriction will accompany all transfer documents. The U.S. Army is responsible for long-term implementation, maintenance, inspection, reporting, and enforcement of the LUC.

The LUC will address the area of LHAAP-50 that includes two groundwater plumes with levels of contamination that require implementation of a remedy (see **Section 1.3**). The Land Use Control Operation and Maintenance Plan (LUC O&M) will identify the measures required for monitoring and enforcement of the groundwater use restriction. Upon review and concurrence of this RD, the LUC O&M Plan will be coordinated with regulators, finalized, and distributed as part of the Comprehensive LUC Management Plan for LHAAP.

6.1 Land Use Control Implementation

The U.S. Army will undertake the following actions to implement the groundwater restriction LUC for LHAAP-50:

- ***Define the Area of the Groundwater Use Restriction.*** The groundwater use restriction boundary will be defined based on the review of the first round of groundwater sampling data in conjunction with historic data. The extent of plume will be bounded by a buffer and may extend to natural groundwater and surface water boundaries.
- ***Survey the LUC Boundary.*** The proposed boundary will be finalized after all wells are installed and sampled. Concurrence by USEPA and TCEQ will be obtained, and the LUC boundary will be surveyed by a State-licensed surveyor. A legal description of the surveyed area will be appended to the survey plat.
- ***Record the LUC in Harrison County.*** The LUC plat, legal description and groundwater use restriction language will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566.

- ***Notify the Texas Department of Licensing and Regulation of the LUC.*** The Texas Department of Licensing and Regulation will be notified of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the U.S. Army, the USEPA, and the TCEQ. The survey plat, legal boundary and description of the groundwater restriction, in conjunction with a locator map, will be provided in hard and electronic copy.
- ***Develop the LUC O&M Plan.*** An LUC O&M Plan for LHAAP-50 will be developed. It will include the elements presented in **Section 6.2**, the county recordation of the LUC survey plat, legal description and restriction language, and the inspection/certification form.

6.2 Land Use Control Operation and Maintenance

The U.S. Army or its representatives will be responsible for the operation and maintenance of the LHAAP-50 LUC. This includes certification, reporting, and enforcement activities. The U.S. Army shall address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable. To facilitate long-term operation and maintenance of the groundwater use restriction LUC remedy, the U.S. Army will develop a plan that will encompass the elements described in the following subsections.

6.2.1 Site Certification and Reporting

Beginning with finalization of this RD and approval of the inspection form, the U.S. Army will undertake inspections and certify continued compliance with the LUC objectives. The U.S. Army or the transferee after transfer will retain the LUC Inspection Certification documents in the project files for incorporation into the five-year review reports, and these documents will be made available to USEPA and TCEQ upon request. In addition, should any violations be found during the certification, the U.S. Army will provide to USEPA and TCEQ, along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations. The need to continue certifications will be revisited at five year reviews.

6.2.2 Notice of Planned Property Conveyances

The U.S. Army shall provide notice to USEPA and TCEQ of plans to convey the LHAAP-50 acreage. The notice shall describe the mechanism by which the LUC will continue to be implemented, maintained, inspected, reported, and enforced. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental document for transfer. Although the U.S. Army may transfer responsibility for various implementation actions, the U.S. Army shall retain its responsibility for remedy integrity. This means that the U.S. Army

is responsible for addressing substantive violations of the LUC performance objective that would undermine the U.S. Army's CERCLA remedy. The U.S. Army also will be responsible for incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation.

6.2.3 Opportunity to Review Text of Intended Land Use Controls

The U.S. Army will provide a copy of the groundwater use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. The USEPA will also receive a copy for review. In addition, the U.S. Army will produce an ECP or other environmental document for transfer of LHAAP-50, but before executing transfer, the U.S. Army will provide USEPA and TCEQ with a copy of the ECP or other environmental document for transfer so that they may have reasonable opportunity, before transfer, to review all LUC-related provisions.

6.2.4 Notification Should Action(s) which Interfere with Land Use Control Effectiveness be Discovered Subsequent to Conveyance

Should the U.S. Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objective, the U.S. Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with **Section 6.2.5** below, the U.S. Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the U.S. Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

6.2.5 Land Use Control Enforcement

Should the LUC remedy reflected in this RD fail, the U.S. Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the USFWS or its lessee, to the institution of judicial action against non-federal third parties. Alternatively, should the circumstances warrant such, the U.S. Army could choose to exercise its response authorities under CERCLA. Should the U.S. Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction; the U.S. Army may notify those agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUC.

6.2.6 Modification or Termination of Land Use Controls

The U.S. Army shall not, without USEPA and TCEQ concurrence, make a significant modification to, or terminate an LUC, or make a land use change inconsistent with the LUC objective. Likewise, the U.S. Army shall seek prior USEPA and TCEQ concurrence before

commencing actions that may impact remedy integrity. In the case of an emergency action, the U.S. Army shall obtain prior USEPA and TCEQ concurrence as appropriate to the exigencies of the situation.

The LUC shall remain in effect until such time as the U.S. Army and USEPA agree that the concentrations of COCs have met cleanup levels. When this occurs, the LUC will be terminated as needed. The decision to terminate the LUC will be documented consistent with the NCP process for post-ROD changes, potentially including an explanation of significant differences or a remedial action completion report. If the property has been transferred and a determination by the U.S. Army and USEPA has been made to terminate the LUC, the U.S. Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

6.2.7 Comprehensive Land Use Control Management Plan

Upon finalization of the LUC O&M Plan, a copy will be inserted into the Comprehensive LUC Management Plan for Longhorn. The Comprehensive LUC Management Plan figure and table will be updated to reflect the inclusion of LHAAP-50.

The Comprehensive LUC Management Plan consists of LHAAP RD documents and a survey plat showing the locations where LUC being implemented at LHAAP are applied. The purpose of this Comprehensive LUC Management Plan is to ensure all site-specific LUC are compiled into one comprehensive location for both pre-transfer use by the installation and for post-transfer use by the transferee. This document will be provided to USEPA and TCEQ and is also accessible to the public. The Comprehensive LUC Management Plan is located in the Marshall Public Library to accompany LHAAP's Administrative Record.

The land use assumption of industrial use as part of a national wildlife refuge forms the basis for the remedy at LHAAP-50 and this land use assumption will be included in the Comprehensive LUC Management Plan with supporting documentation.

LHAAP-50, 50-2

NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-50 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

00943291

2015-000006109

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

NOTICE

8 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 06/18/2015 01:32 PM **Document Number:** 2015-000006109 **Receipt No:** 1507040 **Amount:** $ 50.00 **By:** Vickie Gagnard, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

AMANDA LAGARDE
112 EAST PECAN ST
SUITE 400
SAN ANTONIO, TX 78205

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROL AT LHAAP-50

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed remedial activities at the land described herein. The remediation site is in a former industrial area, located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-50 (Former Sump Water Tank). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-50 were performed in accordance with the FFA requirements.

The LHAAP-50 site, when operational, contained a 47,000-gallon capacity aboveground storage tank (AST) which received industrial wastewater from various industrial waste production sumps throughout LHAAP from 1955 to 1988. After the solids were filtered, the storage tank contents were discharged up stream of the bridge on Crockett Avenue, south of 51st Street into Goose Prairie Creek. The AST has been removed. A Record of Decision (ROD) for LHAAP-50 was signed by the U.S. Army and USEPA with TCEQ concurrence in 2010 establishing the final remedy which consists of a land use control (LUC) in conjunction with monitored natural attenuation (MNA) and limited perchlorate-impacted soil removal. The soil was removed to non-residential levels. The site was not remediated to levels suitable for unrestricted use. The LUC at LHAAP-50 will ensure protection of human health by restricting the use of contaminated groundwater to environmental monitoring and testing only. MNA will be implemented to establish confidence in attenuation trends and verify that the constituents of

concern (COCs) are stable or shrinking and will not migrate to nearby surface water at levels that may present an unacceptable risk to human health or the environment. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8:00 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-50 parcel is a 1 acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in **Exhibit A**. Within the LHAAP-50 parcel is designated a LUC boundary which is a 23.891-acre tract, more or less, as described in **Exhibit A**. The LUC boundary is also presented in the attached **Figure 1**.

Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. For purposes of this certification, residential land use includes, but is not limited to, single family to multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12. The United States Department of the Army has undertaken careful environmental study of the LHAAP-50 site and concluded that the LUC set forth below is required to ensure protection of human health and the environment.

(1) Groundwater Restriction. The groundwater use restriction boundary consists of the 23.891-acre tract, more or less. Groundwater underlying this land is contaminated with tetrachloroethylene (PCE), trichloroethylene (TCE), 1,1-dichloroethylene (1,1-DCE), 1,2-dichloroethane (1,2-DCA), cis-1,2-dichloroethylene (cis-1,2-DCE), vinyl chloride and other volatile organic compounds (VOCs) and perchlorate and shall not be accessed or used for any purpose without the prior written approval of the U.S. Army, the USEPA, and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA, and the TCEQ. A restriction against the residential use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE).

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

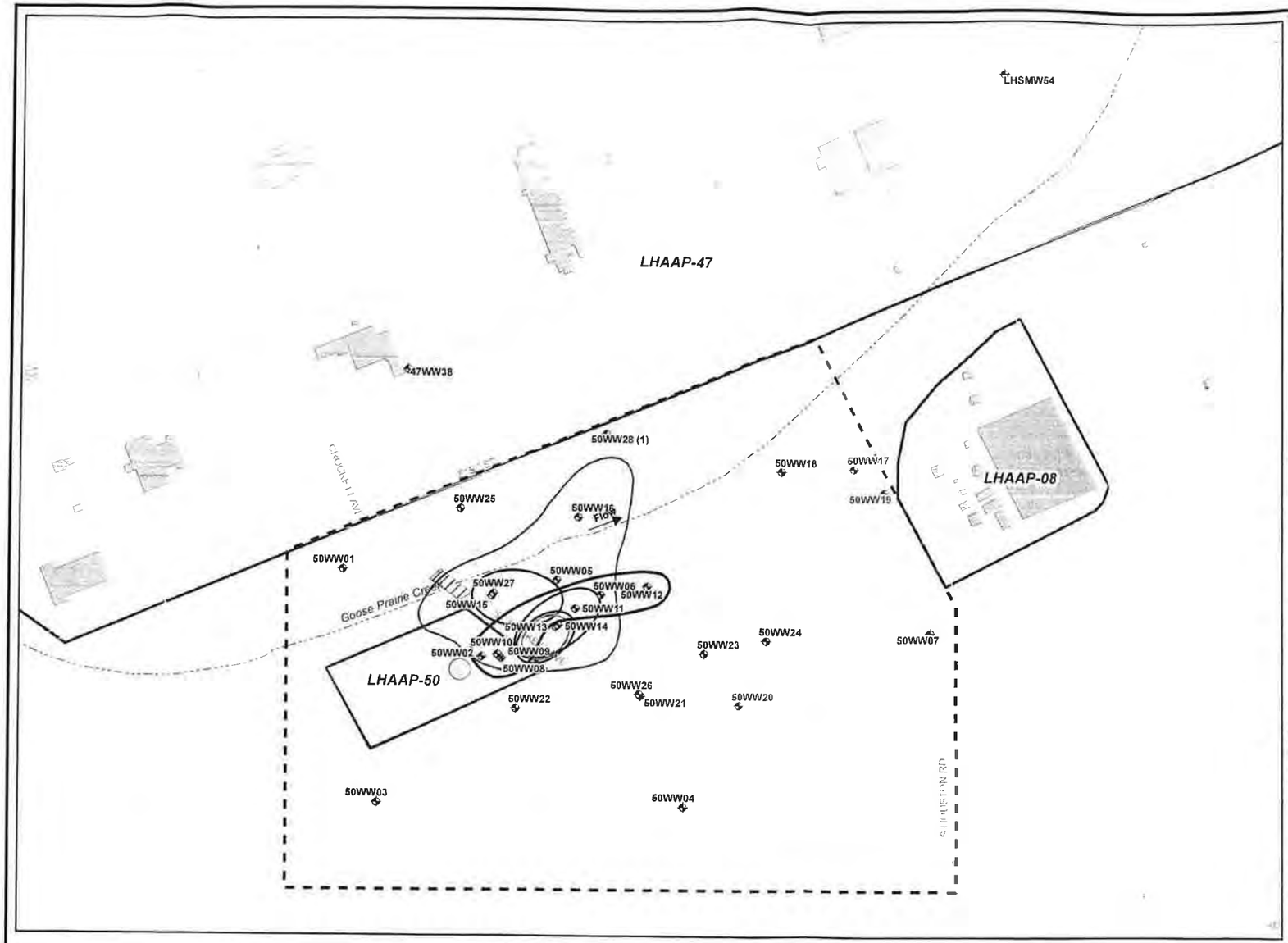
EXECUTED this the 18 th day of June, 2015.

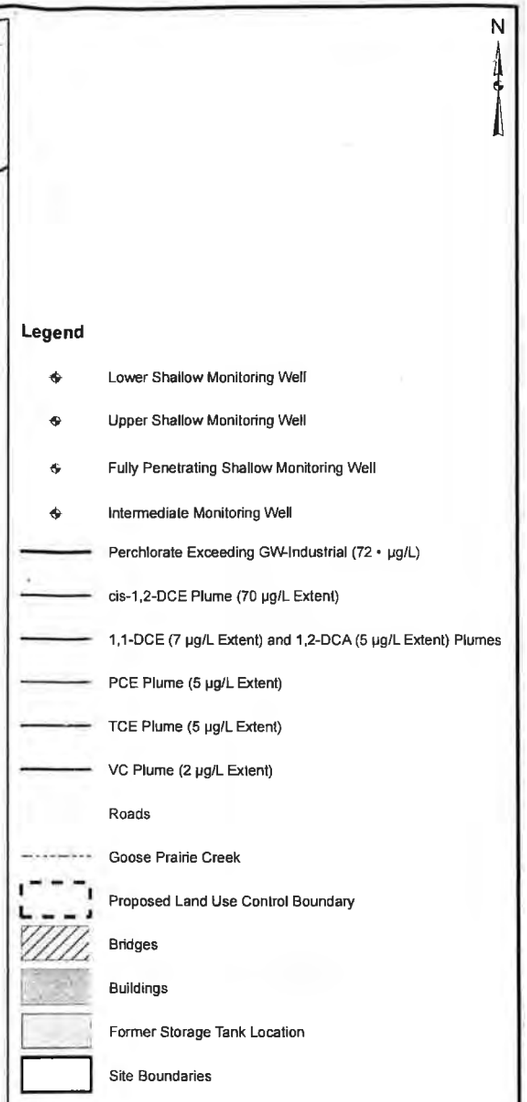
BEFORE ME, on this the 18 th day of June, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 18th day of June, 2015.

GENIE WARNER
Notary Public State of Texas
COMM. EXP. 8/1/2018

Notary Public in and for the State of Texas,
County of Harrison





Note:
1. 50WW28 installed in May 2014 and sampled in July 2014.

AECOM

Figure 1
Land Use Control Boundary
LHAAP-50 Site
Longhorn Army Ammunition Plant
Karnack, Texas

60256135

June 2015

Path: E:\Group\T_GIS\GIS Projects\Longhorn\MXDs\LHAAP-50\RAO Report\2015-Jan-20\Figure 2-1_LHAAP50_Land Use Control Boundary.mxd

EXHIBIT A

FIELD NOTES DESCRIPTION OF
"LHAAP-50" LAND USE CONTROL AREA
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, "LHAAP-50" Land Use Control Area being 23.891 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), "LHAAP-50" Land Use Control Area being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999968791070, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "C-21" (N=6956579.781 feet E=3308499.969 feet), "IGNATIUS-1" (N=6957090.304 feet E=3311081.788 feet), and "RACE" (N=6958817.935 feet E=3310081.598 feet). The computed land area is based on State Plane distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" and "RPLS 3940" .

Commencing at monument "C-21" referenced above,

THENCE N 59deg10'26"E 819.91' to an I.R.O.P.C. set for the Southwest corner of this tract and this POINT OF BEGINNING,

THENCE N 00deg00'15"E 644.05' along the W.B.L. of this tract to a concrete nail set in asphalt pavement for this tract's N.W.C.,

THENCE N 67deg57'46"E 1061.76' along the N.W. B.L. of this tract to a 60d nail set in asphalt pavement for the Northmost corner of this tract,

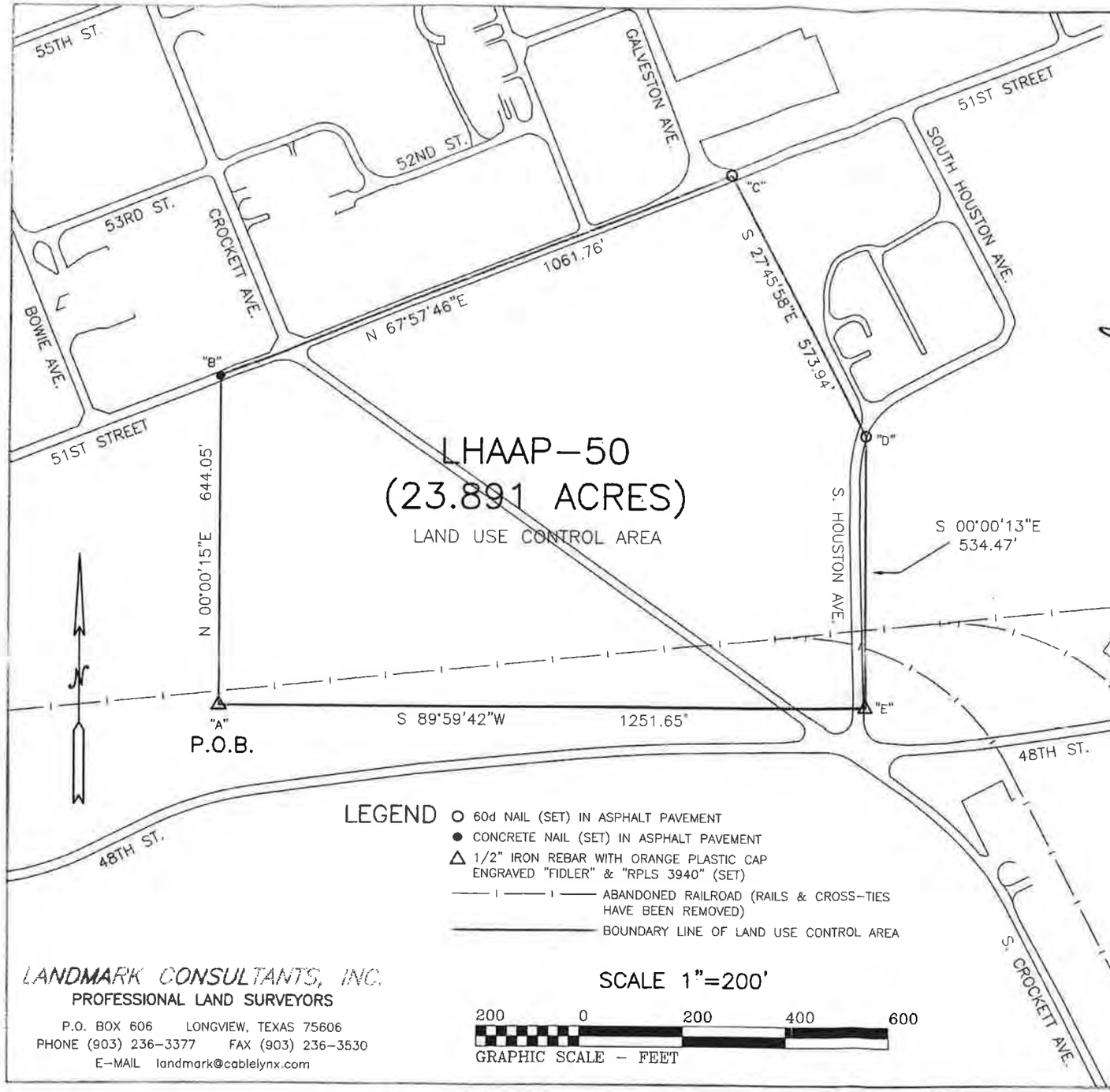
THENCE S 27deg45'58"E 573.94' along the N.E. B.L. of this tract to a 60d nail set for one of this tract's two Eastmost corners,

THENCE S 00deg00'13"E 534.47' along the E.B.L. of this tract to an I.R.O.P.C. set for this tract's S.E.C., from which "IGNATIUS-1" referenced above bears N 81deg47'47"E 632.57',

THENCE S 89deg59'42"W 1251.65' along the S.B.L. of this tract to this POINT OF BEGINNING, containing 23.891 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940



I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision on April 29 & 30, 2015.

Witness my hand and seal this the 4th day of May, 2015.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), AND COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999968791070 AND IS BASED ON CALCULATED DISTANCE BETWEEN PUBLISHED STATE PLANE COORDINATES (OF STATIONS C-21, IGNATIUS-1, & RACE) DIVIDED BY SURFACE TRAVERSE CALCULATED DISTANCE BETWEEN SAME THREE STATIONS. THE COMPUTED LAND AREA IS BASED ON STATE PLANE DISTANCES.

COORDINATE TABLE

	NORTH	EAST
A	6956999.929	3309204.044
B	6957643.979	3309204.091
C	6958042.360	3310188.284
D	6957534.507	3310455.661
E	6957000.041	3310455.696

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEET

LEGEND
- O 60d NAIL (SET) IN ASPHALT PAVEMENT
- ● CONCRETE NAIL (SET) IN ASPHALT PAVEMENT
- △ 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- ABANDONED RAILROAD (RAILS & CROSS-TIES HAVE BEEN REMOVED)
- BOUNDARY LINE OF LAND USE CONTROL AREA

SCALE 1"=200'

200 0 200 400 600
GRAPHIC SCALE - FEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

LHAAP-50 L.U.C.A.
(23.891 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	W.PTS W.LEG
05/04/2015	1103025W.DWG	DRAWN BY JTJ

LHAAP-50, 50-3

LAND USE CONTROL COMPLIANCE INSPECTION FORM

September 14, 2015

Sample Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated 9/30/11 for LHAAP-50 a certification of site was conducted by _____ [indicate transferee] on _____.

A summary of land use control mechanisms is as follows:

- Groundwater restriction – A restriction against use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE). [Indicate whether groundwater restrictions are still required at LHAAP-50]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-50.

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year.

LHAAP-51

NOTICE OF NONRESIDENTIAL LAND USE AT LHAAP-51 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005557

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005557 **Receipt No:** 1006195 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-51, is the area of a demolished building location known as Building 60-B, former photographic lab, located within the Plant 3 production area of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-51 is not itself considered an NPL site. Environmental activities at LHAAP-51 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-51 (Building 60-B) was constructed in 1945 for the processing of X-ray film. The building had a concrete floor without a floor drain. Spent developing waste was drummed and transferred to another building for disposal. Small quantities of black and white developer and fixer solutions were generated by the X-ray lab. Activities ceased in the late 1970s or early 1980s. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-51 parcel is 5,754 square foot, more or less, or 0.13209 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-51 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-51. Contaminants in soil samples from LHAAP-51 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-51 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-51 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
or
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10th day of March, 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-51" TRACT
(INCLUDES THE REMAINS OF A DEMOLISHED BUILDING)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-51" including, but not being limited to, the concrete slab of a demolished building in the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-51" being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "HORSE" (N=6960008.269 feet E=3309591.340 feet). Said traverse indicates a surface distance of 4895.70 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied (in the form of an Autocad DXF file) by Shaw Environmental & Infrastructure Group.

Commencing at monument "HORSE" referenced above,

THENCE N 86deg33'08"W 1716.42' to a concrete nail with head dimple set for the S.E.C. of this tract and this POINT OF BEGINNING,

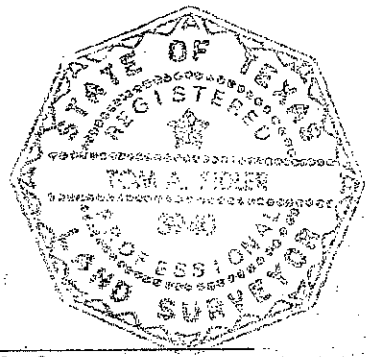
THENCE S 68deg51'01"W 68.17' along the S.B.L. of this tract to a 60d nail set for this tract's S.W.C. ,

THENCE N 21deg08'59"W 84.39' along the W.B.L. of this tract to a 60d nail set for this tract's N.W.C. , said nail being S 79deg23'36"E 3086.37' from said monument "X-11" ,

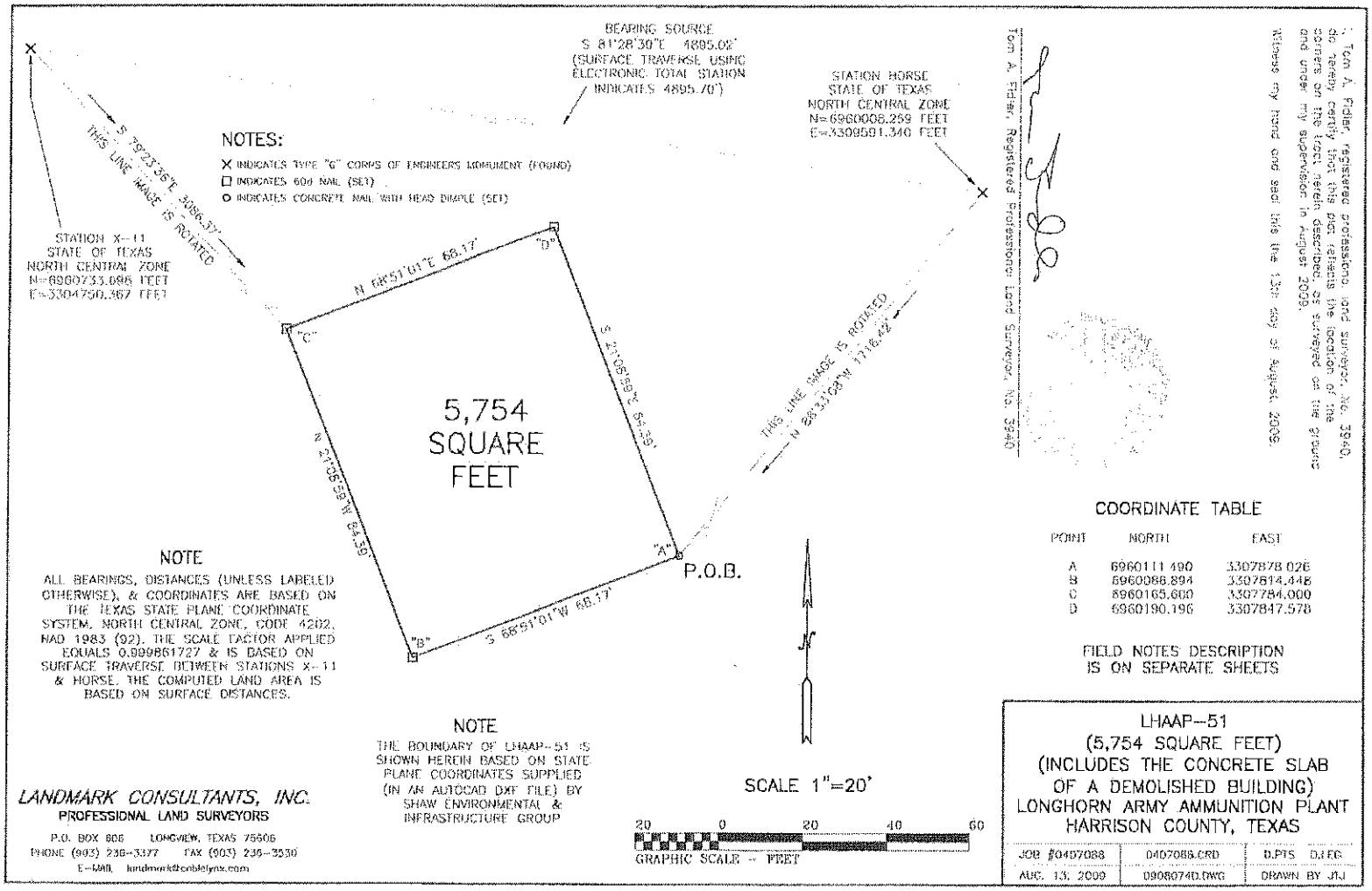
THENCE N 68deg51'01"E 68.17' along the N.B.L. of this tract to a 60d nail set for this tract's N.E.C. ,

THENCE S 21deg08'59"E 84.39' along the E.B.L. of this tract to this POINT OF BEGINNING. This tract contains 5,754 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 806 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

LHAAP-55

NOTICE OF NONRESIDENTIAL LAND USE AT SEPTIC TANK LOCATIONS FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005562

*****DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT*****

MISCELLANEOUS

34 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005562 **Receipt No:** 1006195 **Amount:** $ 144.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify tbat this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-55, consisted of 10 septic tank and leachate field systems that served outlying areas of the former Longhorn Army Ammunition Plant (LHAAP) within or near LHAAP-48 and LHAAP-35C(53). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-55 is not itself considered an NPL site. Environmental activities at LHAAP-55 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-55 consisted of 10 septic tank and leachate field systems that served outlying areas of LHAAP that could not be connected to the plant sanitary sewer system. Although there was no history of industrial waste being placed into these septic tanks, soil samples were collected from borings installed at septic systems that were associated with industrial processes and analyzed for metals, explosives, semi volatile organic compounds, and volatile organic compounds where appropriate. Further information

may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-55 parcel include: ST-01 with 1,807 square feet, more or less, or 0.04148 acre tract; ST-02 with 1,791 square feet, more or less, or 0.04111 acre tract; ST-03 with 1,784 square feet, more or less, or 0.04095 acre tract; ST-04 with 1,789 square feet, more or less, or 0.04106 acre tract; ST-05 with 1,825 square feet more or less, or 0.04189 acre tract; ST-06 with 1,800 square feet, more or less, or 0.04132 acre tract; ST-07 with 1,865 square feet, more or less, or 0.04281 acre tract; ST-08 with 1,785 square feet, more or less, or 0.04097 acre tract; ST-09 with 2,004 square feet, more or less, or 0.04600 acre tract; and ST-10 with 1,804 square feet, more or less, or 0.04141 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-55 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-55. Contaminants in soil samples from LHAAP-55 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-55 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-55 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
or
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10 th day of March, 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-01, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,807 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998636625, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "IGNATIUS-1" (N=6957090.304 feet E=3311081.788 feet) and "IGNATIUS-2" (N=6955582.752 feet E=3311851.704 feet). Said traverse indicates a surface distance of 1693.005 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-01, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "IGNATIUS-1" referenced above,

THENCE S 37deg17'23"E 1017.21' to a 60d nail set for the Westmost N.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 63deg19'52"E 19.74' along a N.B.L. of this tract to a 60d nail set for this tract's Westmost N.E.C. ,

THENCE S 26deg40'08"E 4.90' along an E.B.L. of this tract to a 60d nail set for this tract's Northeast reentrant corner ,

THENCE N 89deg25'37"E 24.40' along a N.B.L. of this tract to a 60d nail set for this tract's Northwest reentrant corner ,

THENCE N 00deg00'00"E 18.03' along a W.B.L. of this tract to a 60d nail set for this tract's Eastmost N.W.C. ,

THENCE N 90deg00'00"E 46.53' along a N.B.L. of this tract to a 60d nail set for this tract's Eastmost N.E.C. ,

THENCE S 00deg00'00"E 32.43' along an E.B.L. of this tract to a 60d nail set for this tract's Eastmost S.E.C. ,

THENCE N 90deg00'00"W 46.53' along a S.B.L. of this tract to a 60d nail set for this tract's Eastmost S.W.C. ,

THENCE N 00deg00'00"E 12.40' along a W.B.L. of this tract to a 60d nail set for this tract's Southwest reentrant corner,

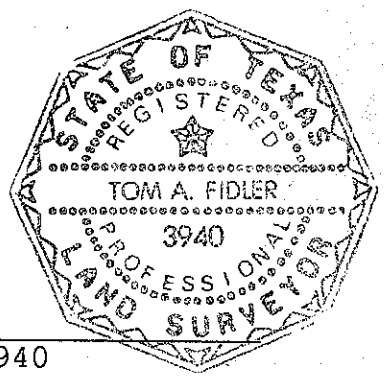
THENCE S 89deg25'37"W 23.40' along a S.B.L. of this tract to a 60d nail set for this tract's Southeast reentrant corner,

THENCE S 26deg40'08"E 5.57' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost S.E.C. ,

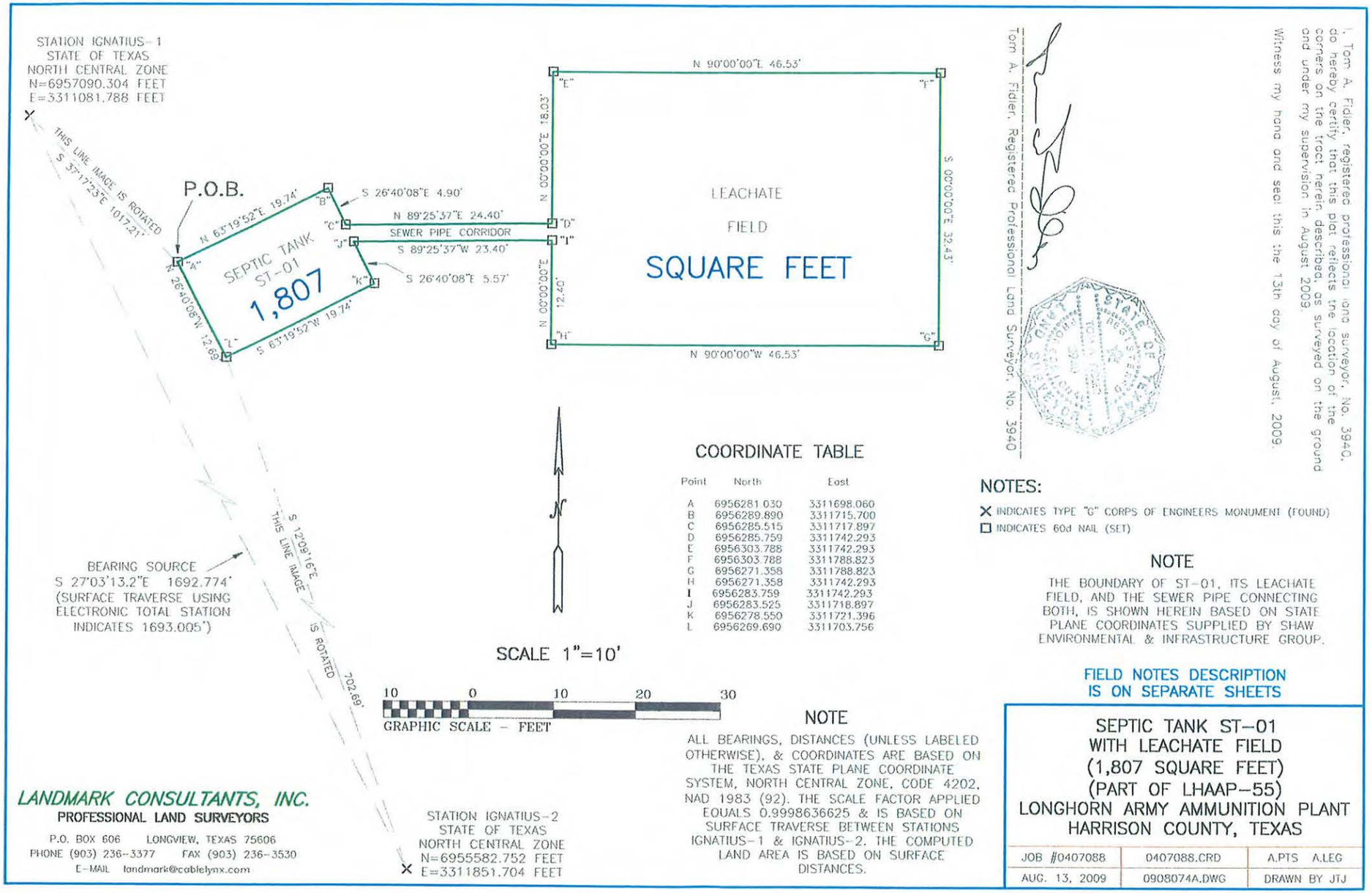
THENCE S 63deg19'52"W 19.74' along a S.B.L. of this tract to a 60d nail set for this tract's Westmost S.W.C., from which station "IGNATIUS-2" referenced above bears S 12deg09'16"E 702.69' ,

THENCE N 26deg40'08"W 12.69' along a W.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,807 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



COORDINATE TABLE

Point	North	East
A	6956281.030	3311698.060
B	6956289.890	3311715.700
C	6956285.515	3311717.897
D	6956285.759	3311742.293
E	6956303.788	3311742.293
F	6956303.788	3311788.823
G	6956271.358	3311788.823
H	6956271.358	3311742.293
I	6956283.759	3311742.293
J	6956283.525	3311718.897
K	6956278.550	3311721.396
L	6956269.690	3311703.756

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August 2009.

Witness my hand and seal this the 13th day of August, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTES:

X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)

☐ INDICATES 60d NAIL (SET)

NOTE

THE BOUNDARY OF ST-01, ITS LEACHATE FIELD, AND THE SEWER PIPE CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998636625 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS IGNATIUS-1 & IGNATIUS-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

SEPTIC TANK ST-01 WITH LEACHATE FIELD (1,807 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	A.PTS A.LEG
AUG. 13, 2009	0908074A.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-02, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,791 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-02, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-1" referenced above,

THENCE N 05deg57'31"W 746.36' to a 60d nail set for the Eastmost S.E.C. of this tract and this POINT OF BEGINNING,

THENCE N 90deg00'00"W 19.74' along a S.B.L. of this tract to a 60d nail set (in an abandoned utility pole lying on the ground) for this tract's Eastmost S.W.C. ,

THENCE N 00deg00'00"E 5.36' along a W.B.L. of this tract to a 60d nail set for this tract's Southwest reentrant corner,

THENCE N 90deg00'00"W 15.73' along a S.B.L. of this tract to a 60d nail set for this tract's Southeast reentrant corner,

THENCE S 00deg00'00"W 15.91' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost S.E.C. ,

THENCE N 90deg00'00"W 46.53' along a S.B.L. of this tract to a 60d nail set for this tract's Westmost S.W.C. ,

THENCE N 00deg00'00"E 32.43' along a W.B.L. of this tract to a 60d nail set for this tract's Westmost N.W.C. ,

THENCE N 90deg00'00"E 46.53' along a N.B.L. of this tract to a 60d nail set for this tract's Westmost N.E.C. ,

THENCE S 00deg00'00"E 14.52' along an E.B.L. of this tract to a 60d nail set for this tract's Northeast reentrant corner,

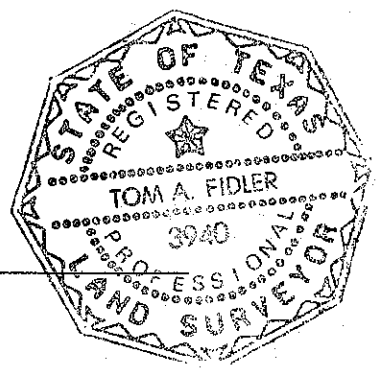
THENCE S 90deg00'00"E 15.73' along a N.B.L. of this tract to a 60d nail set for this tract's Northwest reentrant corner,

THENCE N 00deg00'00"W 5.33' along a W.B.L. of this tract to a 60d nail set for this tract's Eastmost N.W.C. ,

THENCE N 90deg00'00"E 19.74' along a N.B.L. of this tract to a 60d nail set for this tract's Eastmost N.E.C. ,

THENCE S 00deg00'00"E 12.69' along an E.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,791 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



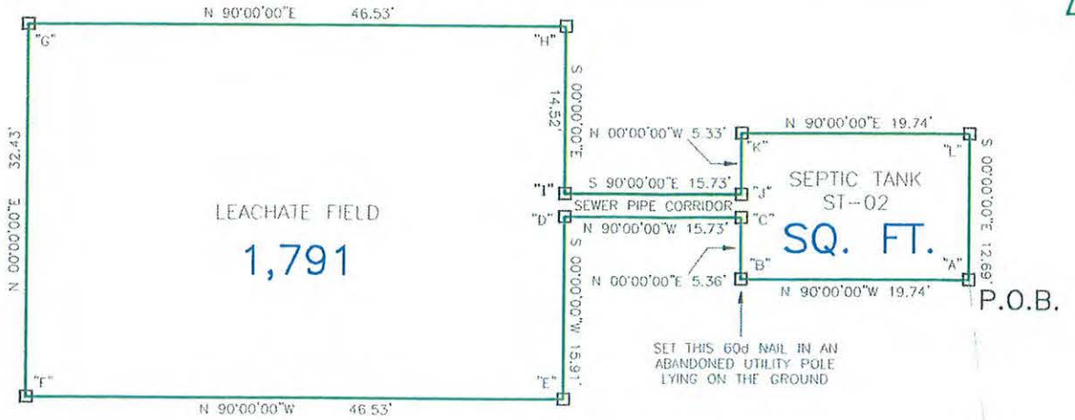
Tom A. Fidler, R.P.L.S. Number 3940

00943319

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P O BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202. NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



COORDINATE TABLE

Point	North	East
A	6959249.790	3314202.020
B	6959249.790	3314182.280
C	6959255.150	3314182.280
D	6959255.150	3314166.552
E	6959239.240	3314166.552
F	6959239.240	3314120.022
G	6959271.670	3314120.022
H	6959271.670	3314166.552
I	6959257.150	3314166.552
J	6959257.150	3314182.280
K	6959262.480	3314182.280
L	6959262.480	3314202.020

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES 60d NAIL (SET)
- o INDICATES UNMARKED POINT

NOTE

THE BOUNDARY OF ST-02, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SCALE 1"=10'

N 05°57'31"W 746.36'

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

SEPTIC TANK ST-02
WITH LEACHATE FIELD
(1,791 SQUARE FEET)
(PART OF LHAAP-55)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	J.PTS J.LEG
10/26/2009	0908074J.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-03, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,784 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-03, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-1" referenced above,

THENCE N 24deg50'41"E 537.01' to a 60d nail set for the Southmost South corner of this tract and this POINT OF BEGINNING,

THENCE N 35deg57'31"W 30.43' along a S.W. B.L. of this tract to a 60d nail set for a South reentrant corner of this tract,

THENCE S 54deg02'29"W 1.92' along a S.E. B.L. of this tract to a 60d nail set for a South corner of this tract,

THENCE N 38deg10'26"W 12.26' along a S.W. B.L. of this tract to a 60d nail set for a South reentrant corner of this tract,

THENCE S 50deg49'08"W 5.10' along a S.E. B.L. of this tract to a 60d nail set for this tract's Northmost South corner,

THENCE N 39deg10'52"W 19.74' along a S.W. B.L. of this tract to a 60d nail set for this tract's Westmost corner,

THENCE N 50deg49'08"E 12.69' along a N.W. B.L. of this tract to a 60d nail set for this tract's Westmost North corner,

THENCE S 39deg10'52"E 19.74' along a N.E. B.L. of this tract to a 60d nail set for this tract's Westmost East corner,

THENCE S 50deg49'08"W 5.58' along a S.E. B.L. of this tract to a 60d nail set for this tract's East reentrant corner,

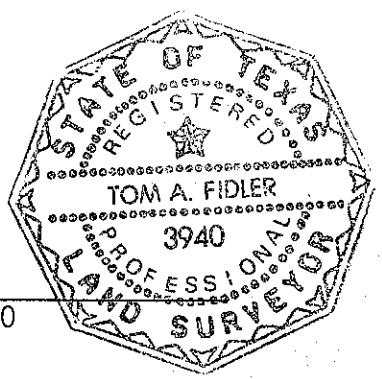
THENCE S 38deg10'26"E 10.37' along a N.E. B.L. of this tract to a 60d nail set for this tract's North reentrant corner,

THENCE N 54deg02'29"E 46.53' along a N.W. B.L. of this tract to a 60d nail set for this tract's Eastmost North corner,

THENCE S 35deg57'31"E 32.43' along a N.E. B.L. of this tract to a 60d nail set for this tract's Eastmost East corner,

THENCE S 54deg02'29"W 46.53' along a S.E. B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,784 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



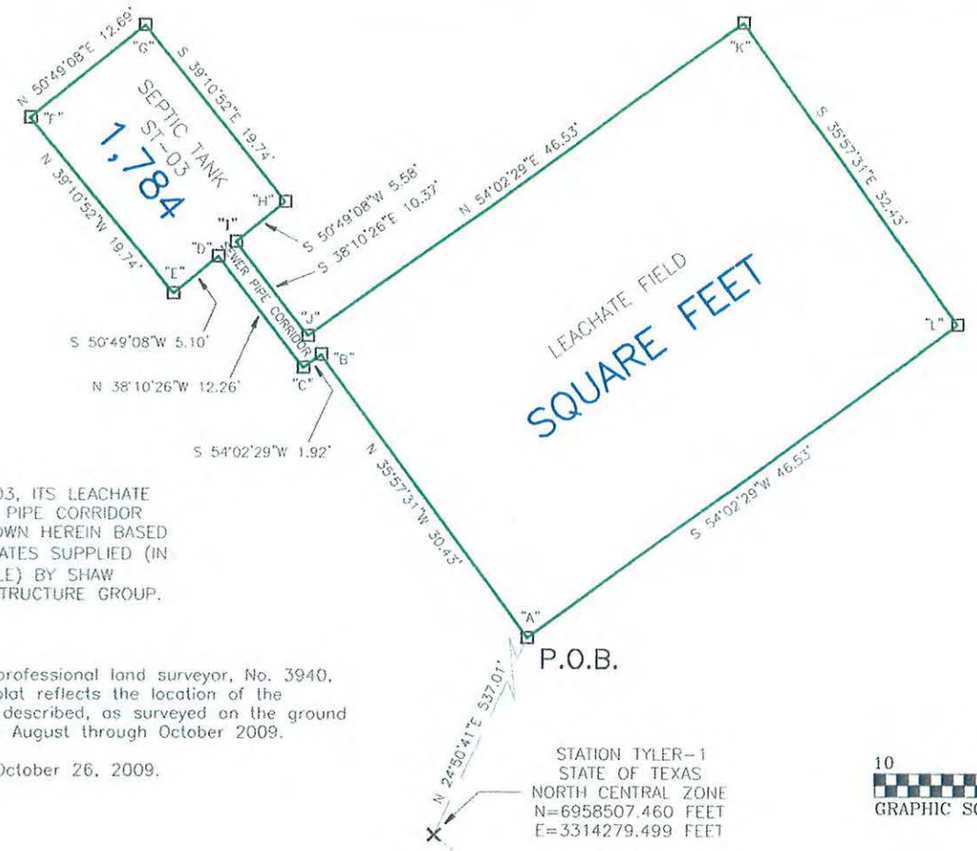
Tom A. Fidler, R.P.L.S. Number 3940

00943322

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.99989954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



NOTE

THE BOUNDARY OF ST-03, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES 60d NAIL (SET)
- O INDICATES UNMARKED POINT

COORDINATE TABLE

Point	North	East
A	6958994.769	3314505.128
B	6959019.400	3314487.259
C	6959018.270	3314485.702
D	6959027.905	3314478.127
E	6959024.680	3314474.170
F	6959039.982	3314461.699
G	6959047.999	3314471.535
H	6959032.697	3314484.007
I	6959029.169	3314479.678
J	6959021.019	3314486.085
K	6959048.342	3314523.748
L	6959022.091	3314542.791

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October 2009.

Witness my hand and seal October 26, 2009.

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 1116.219')

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SEPTIC TANK ST-03 WITH LEACHATE FIELD (1,784 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	K.PTS K.LEG
10/26/2009	0908074K.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-04, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,789 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-04, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-1" referenced above,

THENCE S 64deg44'32"W 426.66' to a 60d nail set for the Southmost S.E.C. of this tract and this POINT OF BEGINNING,

THENCE N 89deg51'08"W 32.43' along a S.B.L. of this tract to a 60d nail set for this tract's Southmost S.W.C. ,

THENCE N 00deg08'52"E 46.53' along a W.B.L. of this tract to a 60d nail set for this tract's Southmost N.W.C. ,

THENCE S 89deg51'08"E 14.56' along a N.B.L. of this tract to a 60d nail set for this tract's Northwest reentrant corner,

THENCE N 00deg00'00"W 14.73' along a W.B.L. of this tract to a 60d nail set for this tract's Southwest reentrant corner,

THENCE N 89deg42'35"W 5.65' along a S.B.L. of this tract to a 60d nail set for this tract's Northmost S.W.C. ,

THENCE N 00deg17'25"E 19.74' along a W.B.L. of this tract to a concrete nail with head dimple set (in old asphalt) for this tract's Northmost N.W.C. ,

THENCE S 89deg42'35"E 12.69' along a N.B.L. of this tract to a 60d nail set for this tract's Northmost N.E.C. ,

THENCE S 00deg17'25"W 19.74' along an E.B.L. of this tract to a 60d nail set for this tract's Northmost S.E.C. ,

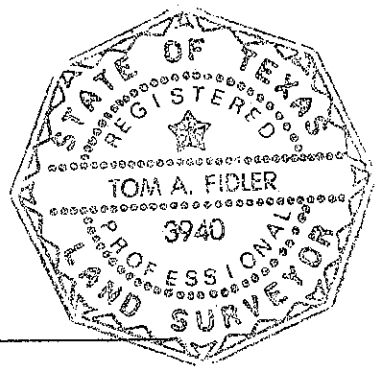
THENCE N 89deg42'35"W 5.04' along a S.B.L. of this tract to a 60d nail set for this tract's Southeast reentrant corner,

THENCE S 00deg00'00"E 14.73' along an E.B.L. of this tract to a 60d nail set for this tract's Northeast reentrant corner,

THENCE S 89deg51'08"E 15.87' along a N.B.L. of this tract to a 60d nail set for this tract's Southmost N.E.C. ,

THENCE S 00deg08'52"W 46.53' along an E.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,789 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943325

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October 2009.

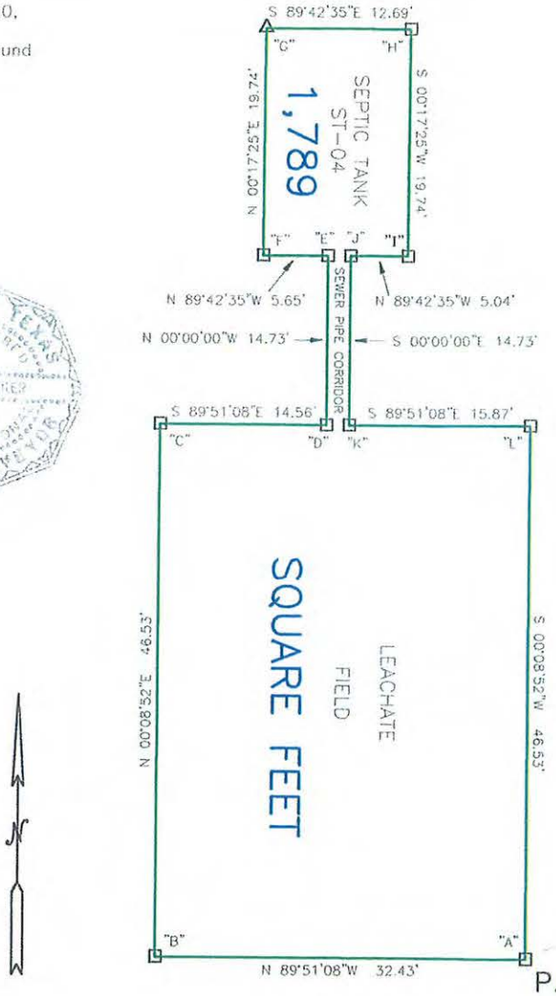
Witness my hand and seal October 26, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.



COORDINATE TABLE

Point	North	East
A	6958325.408	3313893.629
B	6958325.492	3313861.199
C	6958372.022	3313861.319
D	6958371.984	3313875.880
E	6958386.716	3313875.880
F	6958386.744	3313870.230
G	6958406.484	3313870.330
H	6958406.420	3313883.020
I	6958386.680	3313882.920
J	6958386.706	3313877.880
K	6958371.979	3313877.880
L	6958371.938	3313893.749

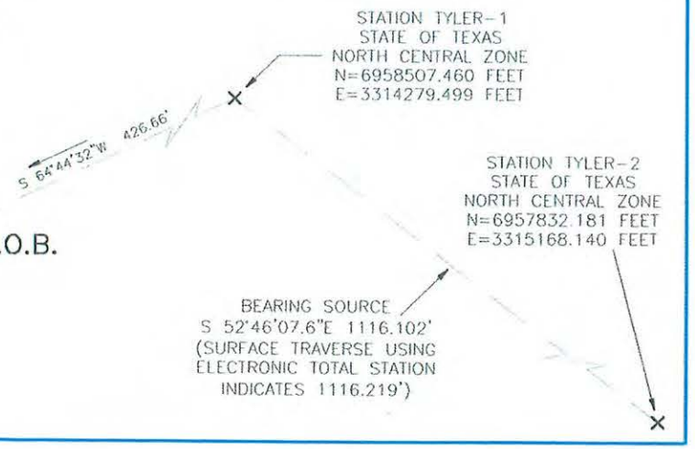
NOTE

THE BOUNDARY OF ST-04, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- □ INDICATES 60d NAIL (SET)
- △ INDICATES CONCRETE NAIL WITH HEAD DIMPLE (SET)

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS



SCALE 1"=10'

SEPTIC TANK ST-04 WITH LEACHATE FIELD (1,789 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS		
JOB #0407088	0407088.CRD	1.PTS 1.LEG
10/26/2009	09080741.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-05, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,825 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-05, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE N 52deg46'07.6"W 36.82' to a point, said point being S 52deg46'07.6"E 1079.28' from said monument "TYLER-1" ,

THENCE S 37deg13'52"W 81.68' to a 60d nail set for the Northmost East corner of this tract and this POINT OF BEGINNING ,

THENCE S 33deg39'28"W 12.69' along a S.E. B.L. of this tract to a 60d nail set for this tract's Northmost South corner,

THENCE N 56deg20'32"W 17.74' along a S.W. B.L. of this tract to a chisled "X" set in concrete for this tract's South reentrant corner,

THENCE S 36deg51'06"W 32.79' along a S.E. B.L. of this tract to a 60d nail set for this tract's East reentrant corner,

THENCE S 57deg33'12"E 44.52' along a N.E. B.L. of this tract to a 60d nail set for this tract's Southmost East corner,

THENCE S 32deg26'48"W 32.43' along a S.E. B.L. of this tract to a 60d nail set for this tract's Southmost South corner,

THENCE N 57deg33'12"W 46.53' along a S.W. B.L. of this tract to a 60d nail set for this tract's West corner,

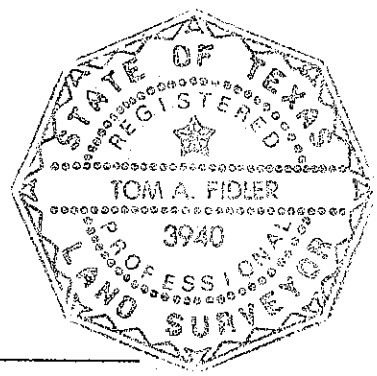
THENCE N 32deg26'48"E 32.43' along a N.W. B.L. of this tract to a 60d nail set for deflection corner,

THENCE N 36deg51'06"E 32.84' along a N.W. B.L. of this tract to a chisled "X" set in concrete for deflection corner,

THENCE N 33deg39'28"E 12.69' along a N.W. B.L. of this tract to a 60d nail set for this tract's North corner,

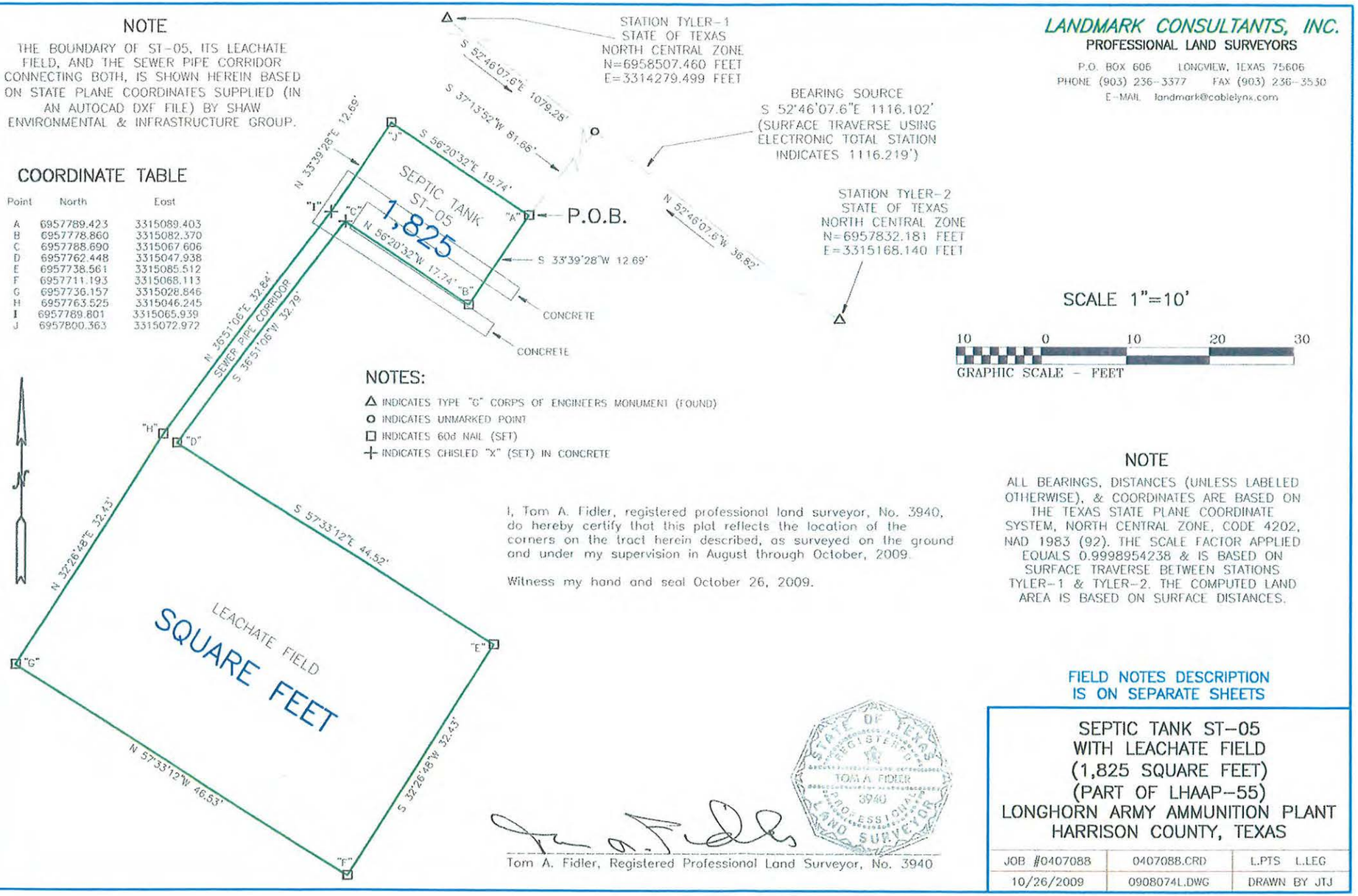
THENCE S 56deg20'32"E 19.74' along a N.E. B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,825 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943328



LANDMARK CONSULTANTS, INC.
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P.O. BOX 606 LONGVIEW, TEXAS 75606
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SEPTIC TANK ST-05 WITH LEACHATE FIELD (1,825 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	L.PTS L.LEG
10/26/2009	0908074L.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-06, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,800 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-06, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 85deg57'52"E 1425.64' to a 60d nail set for the Northmost N.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 67deg08'12"E 12.69' along a N.B.L. of this tract to a 60d nail set for this tract's Northmost N.E.C. ,

THENCE S 22deg51'48"E 19.74' along an E.B.L. of this tract to a 60d nail set for this tract's Northmost S.E.C. ,

THENCE S 67deg08'12"W 4.97' along a S.B.L. of this tract to a 60d nail set for this tract's S.E. reentrant corner,

THENCE S 22deg49'50"E 19.87' along an E.B.L. of this tract to a 60d nail set for this tract's N.E. reentrant corner,

THENCE N 64deg30'12"E 16.55' along a N.B.L. of this tract to a

60d nail set for this tract's Southmost N.E.C. ,

THENCE S 25deg29'48"E 46.53' along an E.B.L. of this tract to a 60d nail set for this tract's Southmost S.E.C. ,

THENCE S 64deg30'12"W 32.43' along a S.B.L. of this tract to a 60d nail set for this tract's Southmost S.W.C. ,

THENCE N 25deg29'48"W 46.53' along a W.B.L. of this tract to a 60d nail set for this tract's Southmost N.W.C. ,

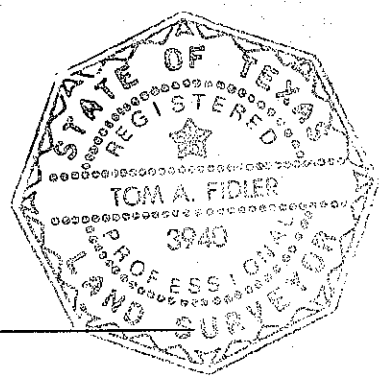
THENCE N 64deg30'12"E 13.88' along a N.B.L. of this tract to a 60d nail set for this tract's N.W. reentrant corner,

THENCE N 22deg49'50"W 19.96' along a W.B.L. of this tract to a 60d nail set for this tract's S.W. reentrant corner,

THENCE S 67deg08'12"W 5.72' along a S.B.L. of this tract to a 60d nail set for this tract's Northmost S.W.C. ,

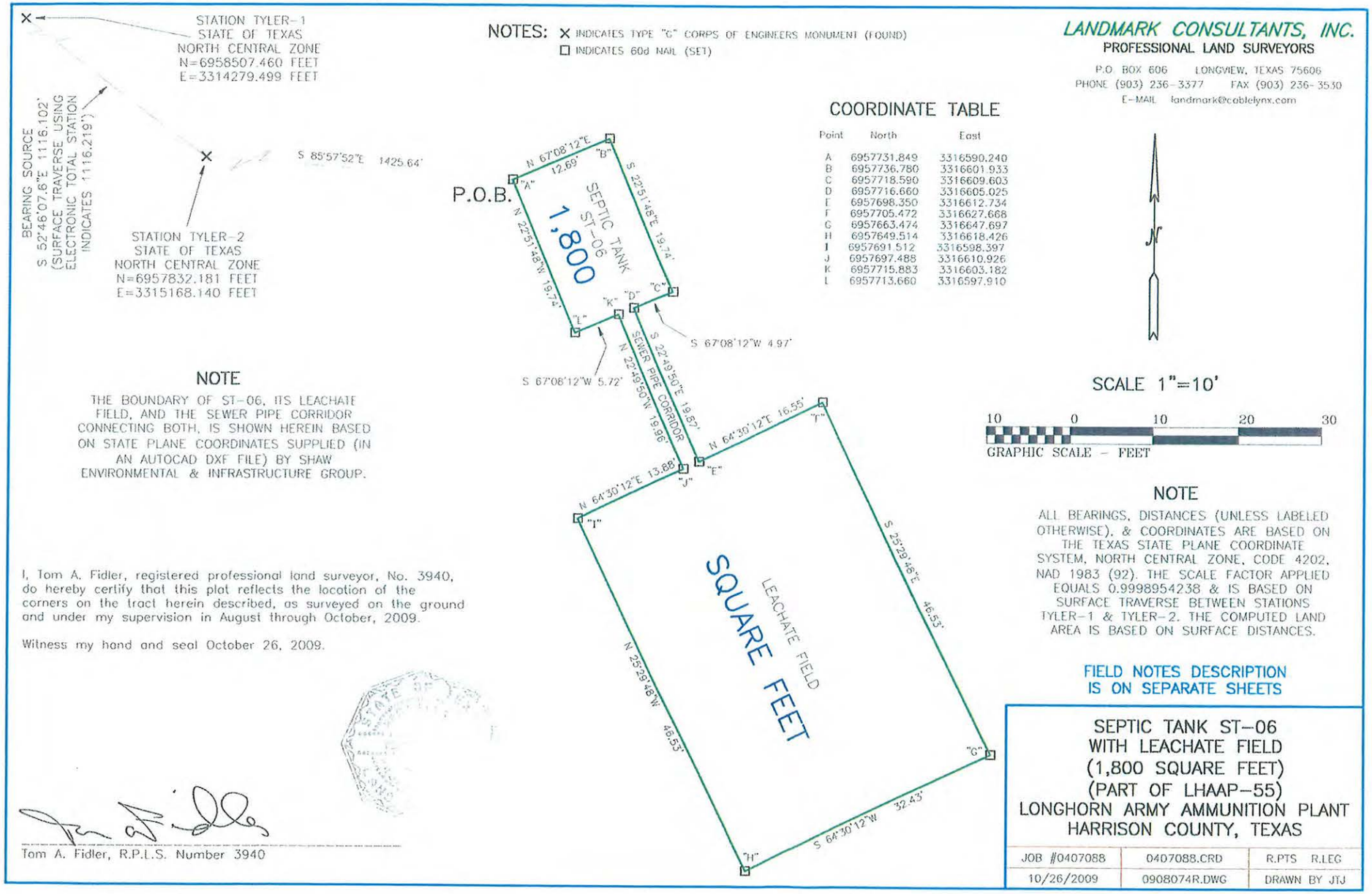
THENCE N 22deg51'48"W 19.74' along a W.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,800 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943331



COORDINATE TABLE

Point	North	East
A	6957731.849	3316590.240
B	6957736.780	3316601.933
C	6957718.590	3316609.603
D	6957716.660	3316605.025
E	6957698.350	3316612.734
F	6957705.472	3316627.668
G	6957663.474	3316647.697
H	6957649.514	3316618.426
I	6957691.512	3316598.397
J	6957697.488	3316610.926
K	6957715.883	3316603.182
L	6957713.660	3316597.910

NOTE

THE BOUNDARY OF ST-06, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

NOTE

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I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, R.P.L.S. Number 3940

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

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PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
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E-MAIL landmark@cablelynx.com

SEPTIC TANK ST-06 WITH LEACHATE FIELD (1,800 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	R.PTS R.LEG
10/26/2009	0908074R.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-07, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,865 square feet of land out of the Longhorn Ordance Works Reservation, (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-07, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 20deg14'47"E 467.25' to a 60d nail set for the N.E.C. corner of this tract and this POINT OF BEGINNING ,

THENCE S 13deg37'37"E 32.43' along an E.B.L. of this tract to a 60d nail set for this tract's S.E.C. ,

THENCE S 76deg22'23"W 46.53' along a S.B.L. of this tract to a 60d nail set for this tract's S.W.C. ,

THENCE N 13deg37'37"W 14.74' along a W.B.L. of this tract to a 60d nail set for this tract's Eastmost reentrant corner,

THENCE S 77deg04'57"W 23.21' along a S.B.L. of this tract to a 60d nail set for a somewhat reentrant corner of this tract,

THENCE S 29deg56'20"W 28.62' along a S.E. B.L. of this tract

to a 60d nail set for this tract's Southmost reentrant corner,

THENCE S 54deg24'06"E 5.82' along a N.E. B.L. of this tract to a 60d nail set for this tract's East corner,

THENCE S 35deg35'54"W 19.74' along a S.E. B.L. of this tract to a 60d nail set for this tract's South corner,

THENCE N 54deg24'06"W 12.69' along a S.W. B.L. of this tract to a 60d nail set for this tract's West corner,

THENCE N 35deg35'54"E 19.74' along a N.W. B.L. of this tract to a 60d nail set for this tract's North corner,

THENCE S 54deg24'06"E 4.86' along a N.E. B.L. of this tract to a 60d nail set for this tract's Westmost reentrant corner,

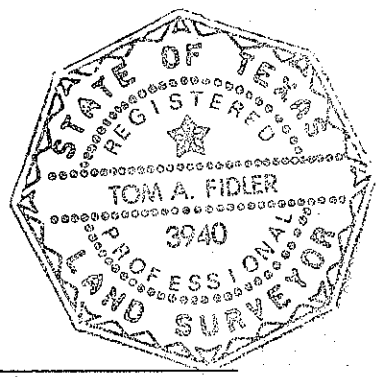
THENCE N 29deg56'20"E 29.29' along a N.W. B.L. of this tract to a 60d nail set for this tract's Southmost N.W.C. ,

THENCE N 77deg04'57"E 24.06' along a N.B.L. of this tract to a 60d nail set for this tract's Northmost reentrant corner,

THENCE N 13deg37'37"W 15.69' along a W.B.L. of this tract to a 60d nail set for this tract's Northmost N.W.C. ,

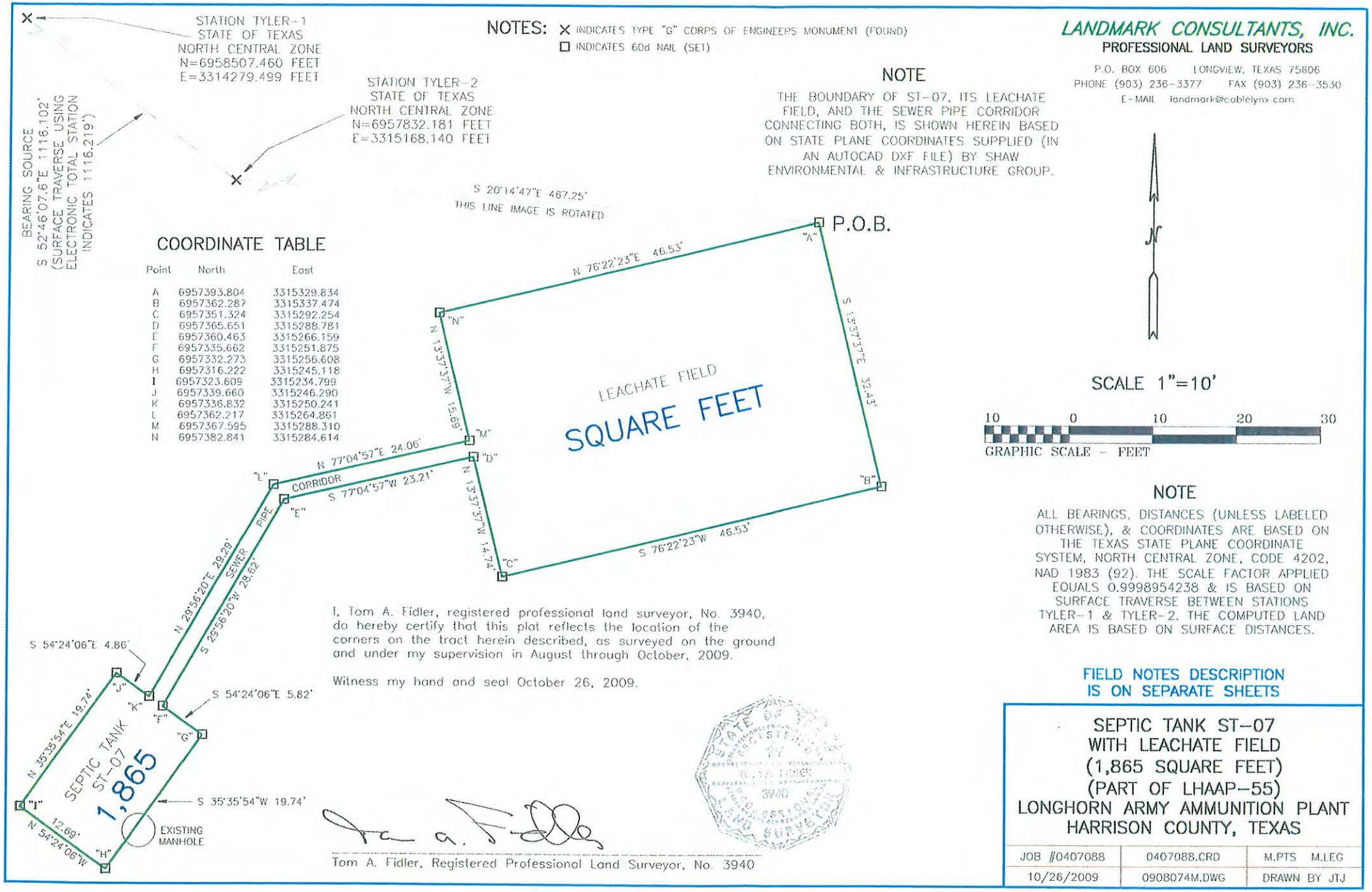
THENCE N 76deg22'23"E 46.53' along a N.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,865 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00943334



NOTES: ✕ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)

COORDINATE TABLE

Point	North	East
A	6957393.804	3315329.834
B	6957362.287	3315337.474
C	6957351.324	3315292.254
D	6957365.651	3315288.781
E	6957360.463	3315266.159
F	6957335.662	3315251.875
G	6957332.273	3315256.608
H	6957316.222	3315245.118
I	6957323.609	3315234.799
J	6957339.660	3315246.290
K	6957336.832	3315250.241
L	6957362.217	3315264.861
M	6957367.595	3315288.310
N	6957382.841	3315284.614

NOTE

THE BOUNDARY OF ST-07, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

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P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

NOTE

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I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SEPTIC TANK ST-07 WITH LEACHATE FIELD (1,865 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	M.PTS M.LEG
10/26/2009	0908074M.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-08, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,785 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-08, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 37deg52'57"E 620.24' to a 60d nail set for the Northmost N.E.C. corner of this tract and this POINT OF BEGINNING,

THENCE S 16deg08'12"E 46.53' along an E.B.L. of this tract to a 60d nail set for this tract's Eastmost S.E.C. ,

THENCE S 73deg51'48"W 32.43' along a S.B.L. of this tract to a 60d nail set for slight deflection corner,

THENCE S 70deg49'57"W 12.79' along a S.B.L. of this tract to a 60d nail set for this tract's Southmost reentrant corner,

THENCE S 17deg16'09"E 6.37' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost S.E.C. ,

THENCE S 72deg43'51"W 19.74' along a S.B.L. of this tract to a 60d nail set for this tract's only S.W.C. ,

THENCE N 17deg16'09"W 12.69' along a W.B.L. of this tract to a chisled "X" set in concrete for this tract's Southmost N.W.C. ,

THENCE N 72deg43'51"E 19.74' along a N.B.L. of this tract to a 60d nail set for this tract's Southmost N.E.C. ,

THENCE S 17deg16'09"E 4.32' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost reentrant corner,

THENCE N 70deg49'57"E 12.83' along a N.B.L. of this tract to a 60d nail set for this tract's Eastmost reentrant corner,

THENCE N 16deg08'12"W 44.52' along a W.B.L. of this tract to a 60d nail set for this tract's Northmost N.W.C. ,

THENCE N 73deg51'03"E 32.43' along a N.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,785 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, R.P.L.S. Number 3940

00943337

STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

S 37°52'57"E 620.24'
THIS LINE IMAGE IS ROTATED

NOTES: o INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)
X INDICATES CHISLED "X" SET IN CONCRETE

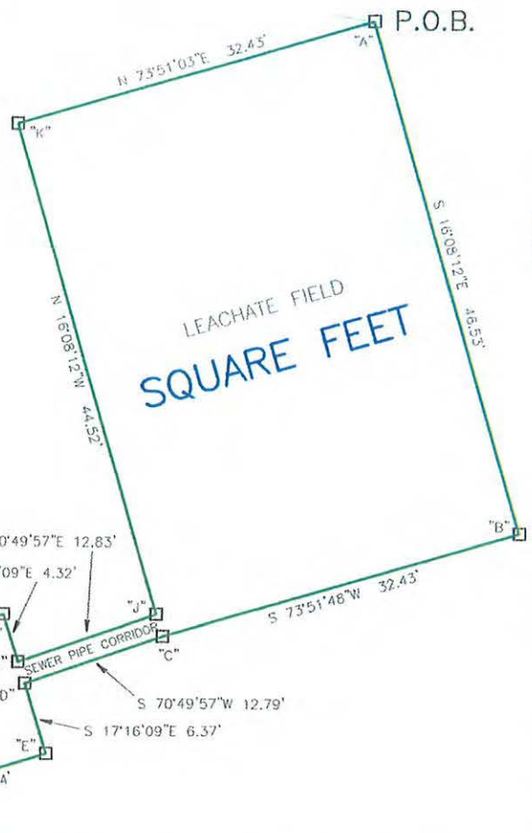
NOTE

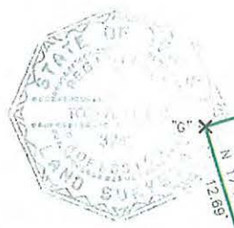
THE BOUNDARY OF ST-08, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

COORDINATE TABLE

Point	North	East
A	6957342.644	3315548.994
B	6957297.947	3315561.926
C	6957288.934	3315530.774
D	6957284.733	3315518.689
E	6957278.650	3315520.580
F	6957272.790	3315501.730
G	6957284.908	3315497.963
H	6957290.768	3315516.813
I	6957286.644	3315518.095
J	6957290.858	3315530.217
K	6957333.624	3315517.844





I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plot reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, R.P.L.S. Number 3940

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

SEPTIC TANK ST-08
WITH LEACHATE FIELD
(1,785 SQUARE FEET)
(PART OF LHAAP-55)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	N.PTS N.LEG
10/26/2009	0908074N.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-09, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 2,004 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-09, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 03deg30'04"E 1101.12' to a 60d nail set for the North corner of this tract and this POINT OF BEGINNING,

THENCE S 47deg56'14"E 12.69' along a N.E. B.L. of this tract to a 60d nail set for this tract's East corner,

THENCE S 42deg03'46"W 19.74' along a S.E. B.L. of this tract to a 60d nail set for this tract's South corner,

THENCE N 47deg56'14"W 4.08' along a S.W. B.L. of this tract to a 60d nail set for this tract's S.E. reentrant corner,

THENCE S 18deg07'53"E 120.09' along an E.B.L. of this tract to a 60d nail set for this tract's N.E. reentrant corner,

THENCE N 67deg40'46"E 15.01' along a N.B.L. of this tract to a

60d nail set for this tract's N.E.C. ,

THENCE S 22deg19'14"E 46.53' along an E.B.L. of this tract to a 60d nail set for this tract's S.E.C. ,

THENCE S 67deg40'46"W 32.43' along a S.B.L. of this tract to a 60d nail set for this tract's S.W.C. ,

THENCE N 22deg19'14"W 46.53' along a W.B.L. of this tract to a 60d nail set for this tract's N.W.C. ,

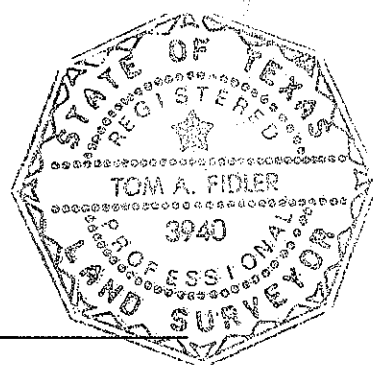
THENCE N 67deg40'46"E 15.42' along a N.B.L. of this tract to a 60d nail set for this tract's N.W. reentrant corner,

THENCE N 18deg07'53"W 123.73' along a W.B.L. of this tract to a 60d nail set for this tract's S.W. reentrant corner,

THENCE N 47deg56'14"W 4.59' along a S.W. B.L. of this tract to a 60d nail set for this tract's West corner,

THENCE N 42deg03'46"E 19.74' along a N.W. B.L. of this tract to this POINT OF BEGINNING. This tract contains 2,004 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

SEPTIC TANK ST-09
WITH LEACHATE FIELD
(2,004 SQUARE FEET)
(PART OF LHAAP-55)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	P.PTS P.LEG
10/26/2009	0908074P.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, R.P.L.S. Number 3940

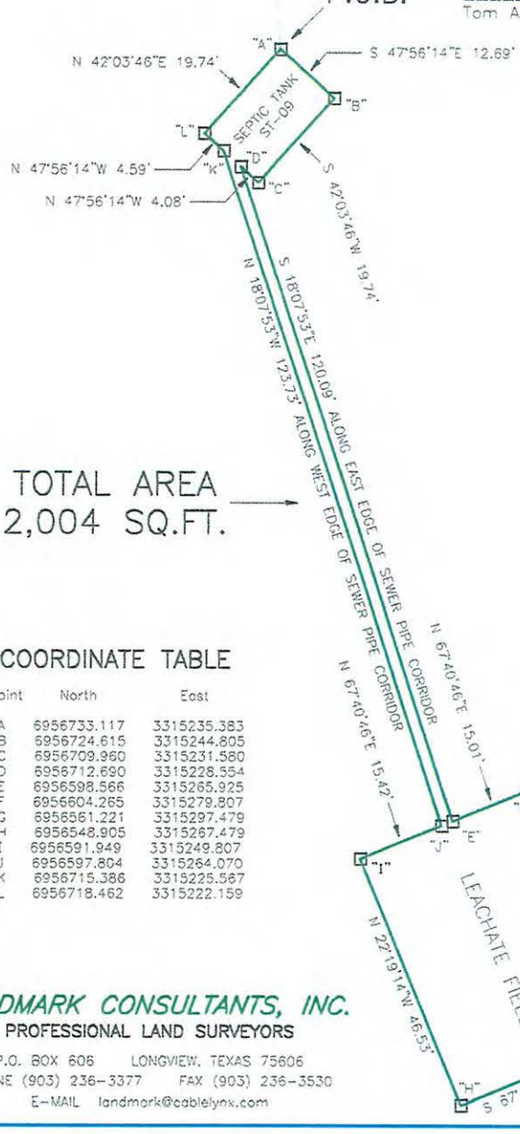
STATION TYLER-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6958507.460 FEET
E=3314279.499 FEET

STATION TYLER-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6957832.181 FEET
E=3315168.140 FEET

BEARING SOURCE
S 52°46'07.6"E 1116.102'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1116.219')

S 03°39'04"E 1101.12'

P.O.B.



TOTAL AREA
2,004 SQ.FT.

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

NOTE

THE BOUNDARY OF ST-09, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

COORDINATE TABLE

Point	North	East
A	6956733.117	3315235.383
B	6956724.615	3315244.805
C	6956709.960	3315231.580
D	6956712.690	3315228.554
E	6956598.566	3315265.925
F	6956604.265	3315279.807
G	6956561.221	3315297.479
H	6956548.905	3315267.479
I	6956591.949	3315249.807
J	6956597.804	3315264.070
K	6956715.386	3315225.567
L	6956718.462	3315222.159

SCALE 1"=20'

20 0 20 40 60
GRAPHIC SCALE - FEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
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NOTES: × INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)

FIELD NOTES DESCRIPTION OF
SEPTIC TANK ST-10, ITS LEACHATE FIELD, AND A 2' WIDE
CORRIDOR CENTERED ON THE SEWER PIPE CONNECTING THE TWO

CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 1,804 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note #1: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998954238, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "TYLER-1" (N=6958507.460 feet E=3314279.499 feet) and "TYLER-2" (N=6957832.181 feet E=3315168.140 feet). Said traverse indicates a surface distance of 1116.219 feet between said monuments. The computed land area is based on surface distances.

Surveyor's Note #2: This field notes description is based on State Plane coordinates supplied by Shaw Environmental & Infrastructure Group. Landmark Consultants, Inc. has not probed the ground surface in this area in an attempt to determine the location of Septic Tank ST-10, its leachate field, or the sewer pipe connecting the two.

Commencing at monument "TYLER-2" referenced above,

THENCE S 34deg34'49"E 861.93' to a 60d nail set for the Westmost N.W.C. of this tract and this POINT OF BEGINNING,

THENCE S 81deg33'36"E 46.53' along a N.B.L. of this tract to a 60d nail set for this tract's Westmost N.E.C. ,

THENCE S 08deg26'24"W 13.21' along an E.B.L. of this tract to a 60d nail set for this tract's N.E. reentrant corner,

THENCE S 82deg30'08"E 21.87' along a N.B.L. of this tract to a 60d nail set for this tract's N.W. reentrant corner,

THENCE N 08deg55'06"E 4.34' along a W.B.L. of this tract to a 60d nail set for this tract's Eastmost N.W.C. ,

THENCE S 81deg04'54"E 19.74' along a N.B.L. of this tract to a 60d nail set for this tract's Eastmost N.E.C. ,

THENCE S 08deg55'06"W 12.69' along an E.B.L. of this tract to a 60d nail set for this tract's Eastmost S.E.C. ,

THENCE N 81deg04'54"W 19.74' along a S.B.L. of this tract to a 60d nail set for this tract's Eastmost S.W.C. ,

THENCE N 08deg55'06"E 6.34' along a W.B.L. of this tract to a 60d nail set for this tract's S.W. reentrant corner,

THENCE N 82deg30'08"W 21.85' along a S.B.L. of this tract to a 60d nail set for this tract's S.E. reentrant corner,

THENCE S 08deg26'24"W 17.22' along an E.B.L. of this tract to a 60d nail set for this tract's Westmost S.E.C. ,

THENCE N 81deg33'36"W 46.53' along a S.B.L. of this tract to a 60d nail set for this tract's Westmost S.W.C. ,

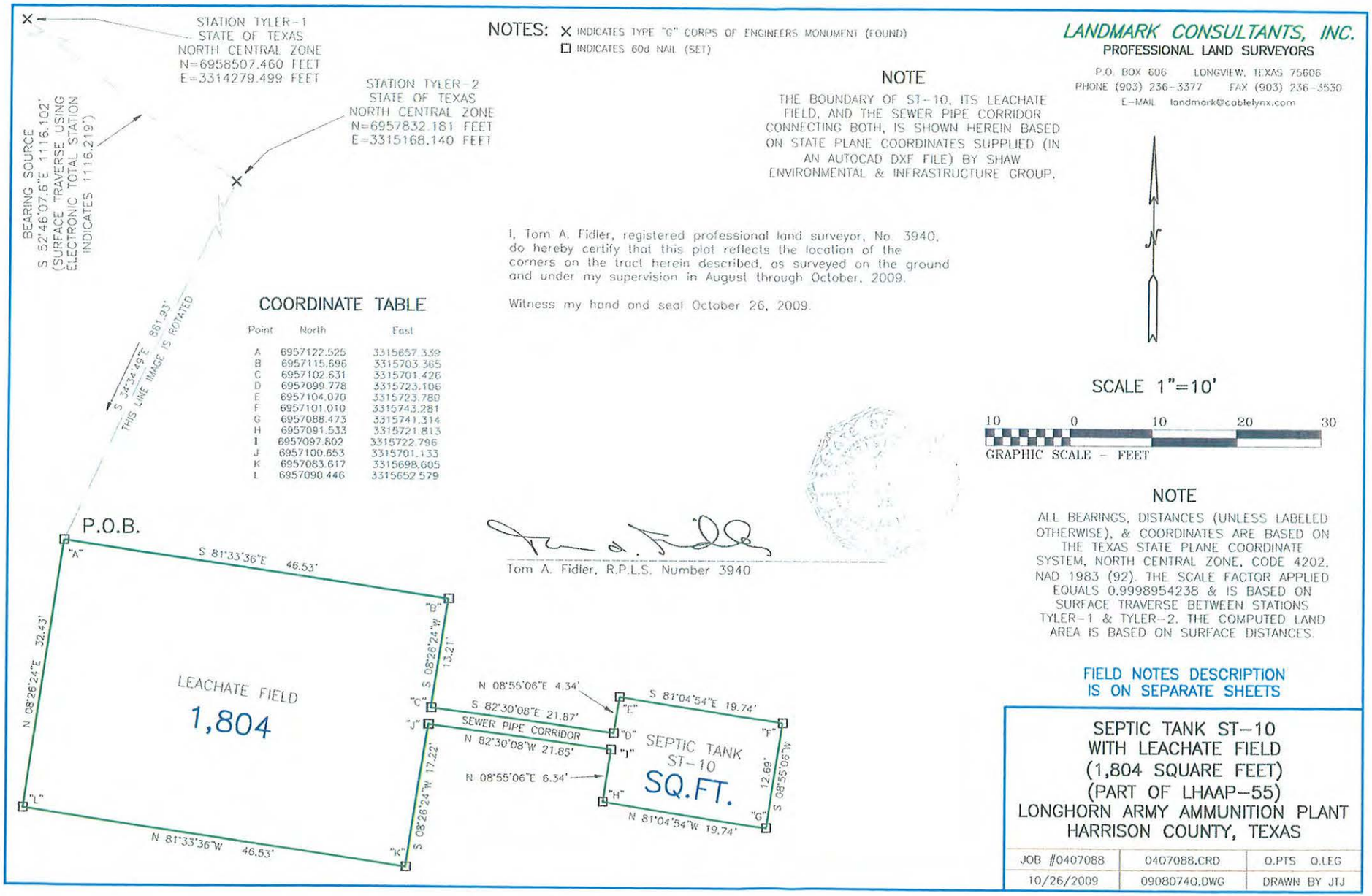
THENCE N 08deg26'24"E 32.43' along a W.B.L. of this tract to this POINT OF BEGINNING. This tract contains 1,804 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, R.P.L.S. Number 3940

00943343



NOTES: X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
□ INDICATES 60d NAIL (SET)

NOTE

THE BOUNDARY OF ST-10, ITS LEACHATE FIELD, AND THE SEWER PIPE CORRIDOR CONNECTING BOTH, IS SHOWN HEREIN BASED ON STATE PLANE COORDINATES SUPPLIED (IN AN AUTOCAD DXF FILE) BY SHAW ENVIRONMENTAL & INFRASTRUCTURE GROUP.

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

COORDINATE TABLE

Point	North	East
A	6957122.525	3315657.359
B	6957115.896	3315703.365
C	6957102.631	3315701.426
D	6957099.778	3315723.106
E	6957104.070	3315723.780
F	6957101.010	3315743.281
G	6957088.473	3315741.314
H	6957091.533	3315721.813
I	6957097.802	3315722.796
J	6957100.653	3315701.133
K	6957083.617	3315698.605
L	6957090.446	3315652.579

Tom A. Fidler, R.P.L.S. Number 3940

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998954238 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS TYLER-1 & TYLER-2. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

SEPTIC TANK ST-10 WITH LEACHATE FIELD (1,804 SQUARE FEET) (PART OF LHAAP-55) LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	O.PTS O.LEG
10/26/2009	09080740.DWG	DRAWN BY JTJ

LHAAP-35A(58), 58-1

LUCs FROM FINAL REMEDIAL DESIGN

September 14, 2015

Final

Remedial Design
LHAAP-35A(58), Shops Area, Group 4
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared for U.S. Army Corps of Engineers – Tulsa District
1645 South 101st East Avenue
Tulsa, Oklahoma 74128

Prepared by Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. W912QR-04-D-0027, Task Order No. DS02
Project No. 117591
Rev 0
September 2011

Shaw® a world of Solutions™

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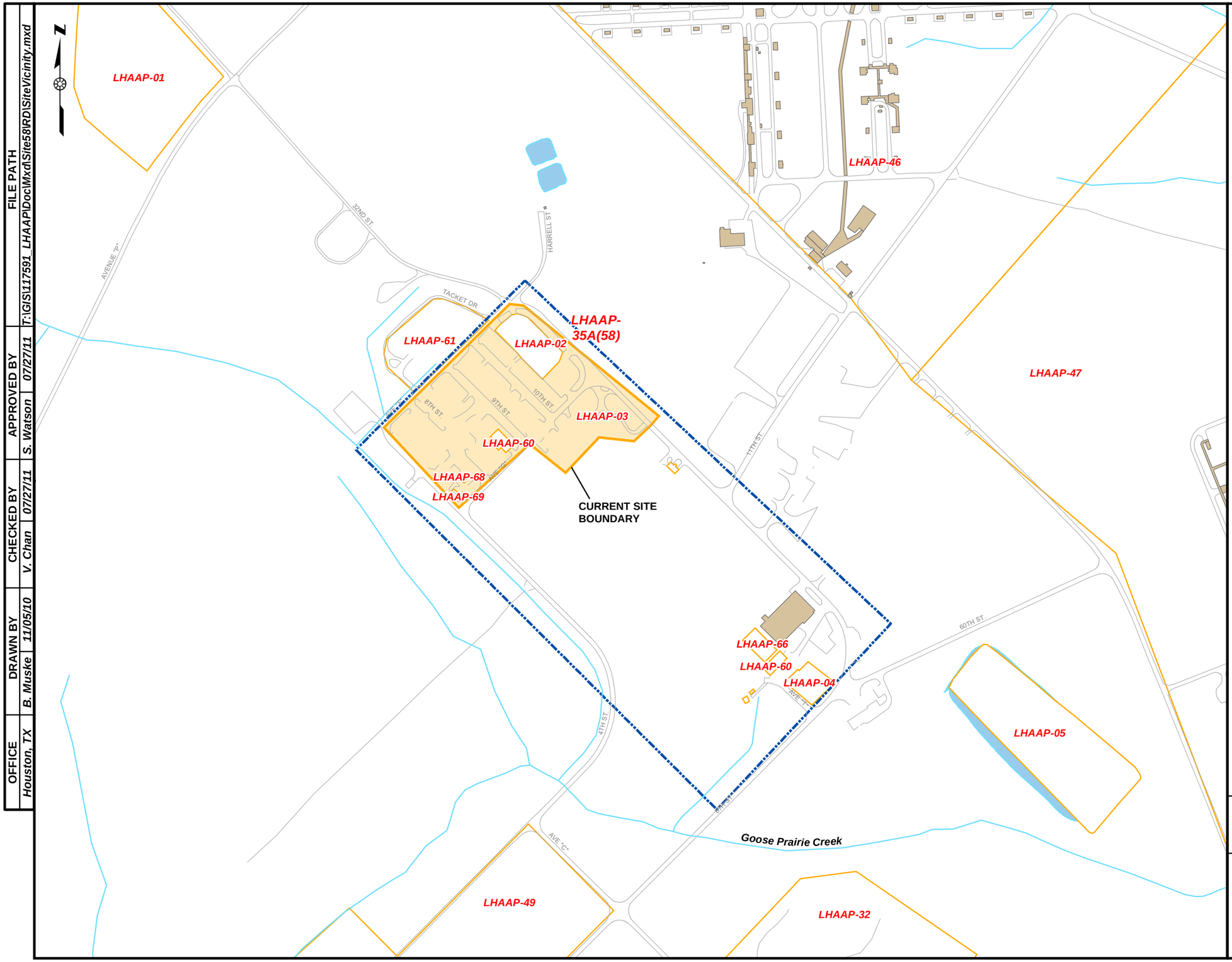
Contract No. W912QR-04-D-0027, Task Order No. DS02• Final • Rev 0 • September 2011

00943347

OFFICE	DRAWN BY	CHECKED BY	FILE PATH
Houston, TX	B. Muske 11/05/10	V. Chan 07/27/11	T:\GIS\117591_LHAAP\Doc\Mxd\Site58\RD\SiteVicinity.mxd
		APPROVED BY	
		S. Watson 07/27/11	



LEGEND

- Stream
- Road
- Existing Building
- Historic LHAAP-35A(58) Site Boundary
- Other LHAAP Site
- LHAAP-35A(58) Site
- Lake/Pond

0 200 400 800 Feet

Shaw

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-2

SITE VICINITY MAP
LHAAP-35A(58) GROUP 4

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

2.0 LAND USE CONTROL

The objective of the LUC at LHAAP-35A(58) is to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing until cleanup goals are met. Notification of the groundwater use restriction will accompany all transfer documents and will be recorded at the Harrison County Courthouse in accordance with Texas Administrative Code (TAC) Title 30, §335.566. **Appendix A** provides sample LUC compliance certification documentation.

The LUC addresses the two groundwater plumes at LHAAP-35A(58) with levels of contamination that require implementation of a remedy (see **Section 1.3**). The U.S. Army is responsible for implementing, maintaining, monitoring, reporting on, and enforcing the LUC.

U.S. Army and regulators will consult to determine appropriate enforcement actions should there be a failure of an LUC objective at this site after it has transferred. U.S. Army shall obtain USEPA and Texas Commission on Environmental Quality (TCEQ) concurrence prior to termination or significant modification of the LUC, or implementation of a change in land use inconsistent with the LUC objectives and use assumptions of the remedy. Although not a remedy, the land use assumption for LHAAP-35A(58) forms the basis for the remedy. The future use of the site as part of a national wildlife refuge is consistent with the industrial risk exposure scenario. Notification of the land use assumption of this site will be made in transfer documentation and will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566. Compliance with the use assumption will be documented in the five-year review reports.

4.0 LAND USE CONTROL DESIGN AND IMPLEMENTATION PLAN

This section describes the LUC design and implementation activities for LHAAP-35A(58). The activities will result in a surveyed and recorded groundwater use restriction boundary and an operation and maintenance plan for the LUC.

The objective of the LUC at LHAAP-35A(58) is to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health and ensure that there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing until cleanup goals are met. Notification of the groundwater use restriction will accompany all transfer documents. The U.S. Army is responsible for long-term implementation, maintenance, inspection, reporting, and enforcement of the LUC.

The LUC will address the area of LHAAP-35A(58) that includes two groundwater plumes with levels of contamination that require implementation of a remedy (see **Section 1.3**). The Land Use Control Operation and Maintenance (LUC O&M) Plan will identify the measures required for monitoring and enforcement of the groundwater use restriction. Upon review and concurrence of this RD, the LUC O&M Plan will be coordinated with regulators, finalized, and distributed as part of the Comprehensive LUC Management Plan.

4.1 Land Use Control Implementation

The U.S. Army will undertake the following actions to implement the groundwater restriction LUC for LHAAP-35A(58):

- Define the Area of the Groundwater Use Restriction. The groundwater use restriction boundary will be defined based on the review of the first round of groundwater sampling data in conjunction with historic data. The extent of plume will be bounded by a buffer and may extend to natural groundwater and surface water boundaries.

- Survey the LUC Boundary. The proposed boundary will be finalized after all wells are installed and sampled. Concurrence by USEPA and TCEQ will be obtained, and the LUC boundary will be surveyed by a State-licensed surveyor. A legal description of the surveyed area will be appended to the survey plat.

- Record the LUC in Harrison County. The LUC plat, legal description and groundwater use restriction language will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566.

Contract No. W912QR-04-D-0027, Task Order No. DS02• Final • Rev 0 • September 2011

- Notify the Texas Department of Licensing and Regulation of the LUC. The Texas Department of Licensing and Regulation will be notified of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ. The survey plat, legal boundary and description of the groundwater restriction, in conjunction with a locator map, will be provided in hard and electronic copy.

- Develop the LUC O&M Plan. A LUC O&M Plan for LHAAP-35A(58) will be developed. It will include the elements presented in **Section 4.2**, the county recordation of the LUC survey plat, legal description and restriction language, and the inspection/certification form.

4.2 Land Use Control Operation and Maintenance

The U.S. Army or its representatives will be responsible for the operation and maintenance of the LHAAP-35A(58) LUC. This includes certification, reporting and enforcement activities. The U.S. Army shall address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable. To facilitate long-term operation and maintenance of the groundwater use restriction LUC remedy, the U.S. Army will develop a plan that will encompass the elements described in the following subsections.

4.2.1 Site Certification and Reporting

Beginning with finalization of this RD and approval of the inspection form, the U.S. Army will undertake inspections and certify continued compliance with the LUC objectives. The U.S. Army, or the transferee after transfer, will retain the LUC Inspection Certification documents in the project files for incorporation into the five-year review reports, and these documents will be made available to USEPA and TCEQ upon request. In addition, should any violations be found during the certification, the U.S. Army will provide to USEPA and TCEQ, along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations. The need to continue certifications will be revisited at five year reviews.

4.2.2 Notice of Planned Property Conveyances

The U.S. Army shall provide notice to USEPA and TCEQ of plans to convey the LHAAP-35A(58) acreage. The notice shall describe the mechanism by which the LUC will continue to be implemented, maintained, inspected, reported, and enforced. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental document for transfer. Although the U.S. Army may transfer responsibility for various implementation actions, the U.S. Army shall retain its responsibility for remedy integrity. This means that the U.S. Army

Contract No. W912QR-04-D-0027, Task Order No. DS02• Final • Rev 0 • September 2011

is responsible for addressing substantive violations of the LUC performance objective that would undermine the U.S. Army's CERCLA remedy. The U.S. Army also will be responsible for incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation.

4.2.3 Opportunity to Review Text of Intended Land Use Controls

U.S. Army will provide a copy of the groundwater use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. USEPA will also receive a copy for review. In addition, the U.S. Army will produce an ECP or other environmental document for transfer of LHAAP-35A(58), but before executing transfer, the U.S. Army will provide USEPA and TCEQ with a copy of the ECP or other environmental document for transfer so that they may have reasonable opportunity, before transfer, to review all LUC-related provisions.

4.2.4 Notification Should Action(s) Which Interfere with Land Use Control Effectiveness be Discovered Subsequent to Conveyance

Should the U.S. Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objective, the U.S. Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with **Section 4.2.5** below, the U.S. Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the U.S. Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

4.2.5 Land Use Control Enforcement

Should the LUC remedy reflected in this RD fail, the U.S. Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the United States Fish and Wildlife Service (USFWS) or its lessee, to the institution of judicial action against non-federal third-parties. Alternatively, should the circumstances warrant such, the U.S. Army could choose to exercise its response authorities under CERCLA. Should the U.S. Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the U.S. Army may notify those agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUC.

4.2.6 Modification or Termination of Land Use Controls

The U.S. Army shall not, without USEPA and TCEQ concurrence, make a significant modification to, or terminate a LUC, or make a land use change inconsistent with the LUC

objective. Likewise, the U.S. Army shall seek prior USEPA and TCEQ concurrence before commencing actions that may impact remedy integrity. In the case of an emergency action, the U.S. Army shall obtain prior USEPA and TCEQ concurrence as appropriate to the exigencies of the situation.

The LUC shall remain in effect until such time as the U.S. Army and USEPA agree that the concentrations of COCs have met cleanup levels. When this occurs, the LUC will be terminated as needed. The decision to terminate the LUC will be documented consistent with the NCP process for post-ROD changes, potentially including an explanation of significant differences or a remedial action completion report. If the property has been transferred and a determination by the U.S. Army and USEPA has been made to terminate the LUC, the U.S. Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

4.2.7 Comprehensive Land Use Control Management Plan

Upon finalization of the LUC O&M Plan, a copy will be inserted into the Comprehensive LUC Management Plan for Longhorn. The Comprehensive LUC Management Plan figure and table will be updated to reflect the inclusion of LHAAP-35A(58).

The Comprehensive LUC Management Plan consists of LHAAP RD documents and a survey plat showing the locations where LUCs being implemented at LHAAP are applied. The purpose of this Comprehensive LUC Management Plan is to ensure all site specific LUCs are compiled into one comprehensive location for both pre-transfer use by the installation and for post-transfer use by the transferee. This document will be provided to USEPA and TCEQ, and is also accessible to the local government and the public. The Comprehensive LUC Management Plan is located in the Marshall Public Library to accompany LHAAP's Administrative Record.

The land use assumption of industrial use as part of a national wildlife refuge forms the basis for the remedy at LHAAP-35A(58) and this land use assumption will be included in the Comprehensive LUC Management Plan with supporting documentation.

LHAAP-35A(58), 58-2

NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-35A (58) FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

00943354

2015-000002402

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

NOTICE

8 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 03/16/2015 11:17 AM **Document Number:** 2015-000002402 **Receipt No:** 1502837 **Amount:** $ 50.00 **By:** Denise Kio, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AECOM
112 E. PECAN ST,STE 400
FED-EX ENVELOPE
SAN ANTONIO, TX 78205

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROL AT LHAAP-35A (58)

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed remedial activities at the land described herein. The remediation site is in a former industrial area, located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-35A (58) (Shops Area). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-35A (58) were performed in accordance with the FFA requirements.

The Shops Area now designated as LHAAP-35A (58) was established in 1942 as part of the installation's initial construction (Shaw, 2011). The facility was used to provide plant-operated laundry, automotive, woodworking, metalworking, painting, refrigeration, and electrical services. The site was active throughout LHAAP's mission and was deactivated along with the rest of the installation in 1996-1997. A Record of Decision (ROD) for LHAAP-35A (58) was signed by the U.S. Army and USEPA with TCEQ concurrence in 2010 establishing the final remedy which is separated into two areas: 1) eastern plume; and 2) western plume. The eastern plume remedy includes land use control (LUC); enhanced in-situ bioremediation (EISB) in the area of highest levels of constituents of concern (COCs) followed by monitored natural attenuation (MNA). The western plume remedy consists of LUC and MNA. The site was not remediated to levels suitable for unrestricted use. The LUC at LHAAP-35A (58) is required to prevent human exposure to contaminated groundwater. Further information may be found by

examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-35A (58) parcel is a 11-acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Associated with the LHAAP-35A (58) parcel is designated a LUC boundary which is a 46.524-acre tract, more or less, as described in Exhibit A. The LUC boundary is also presented in the attached Figure 1. Contained within the LHAAP-35A (58) LUC boundary are sites LHAAP-02, LHAAP-03, LHAAP-56, LHAAP-59, LHAAP-60, LHAAP-65, LHAAP-68 and LHAAP-69.

Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. For purposes of this certification, residential use includes, but is not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12. The United States Department of the Army has undertaken careful environmental study of the LHAAP-35A (58) site and concluded that the LUC set forth below is required to ensure protection of human health and the environment.

(1) Groundwater Restriction. The groundwater use restriction boundary consists of the 46.524-acre tract, more or less. Groundwater underlying this land is contaminated with tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), cis-1,2-DCE), trans-1,2-DCE, and vinyl chloride (VC) and shall not be accessed or used for any purpose without the prior written approval of the U.S. Army, the USEPA, and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA, and the TCEQ. A restriction against the residential use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE).

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

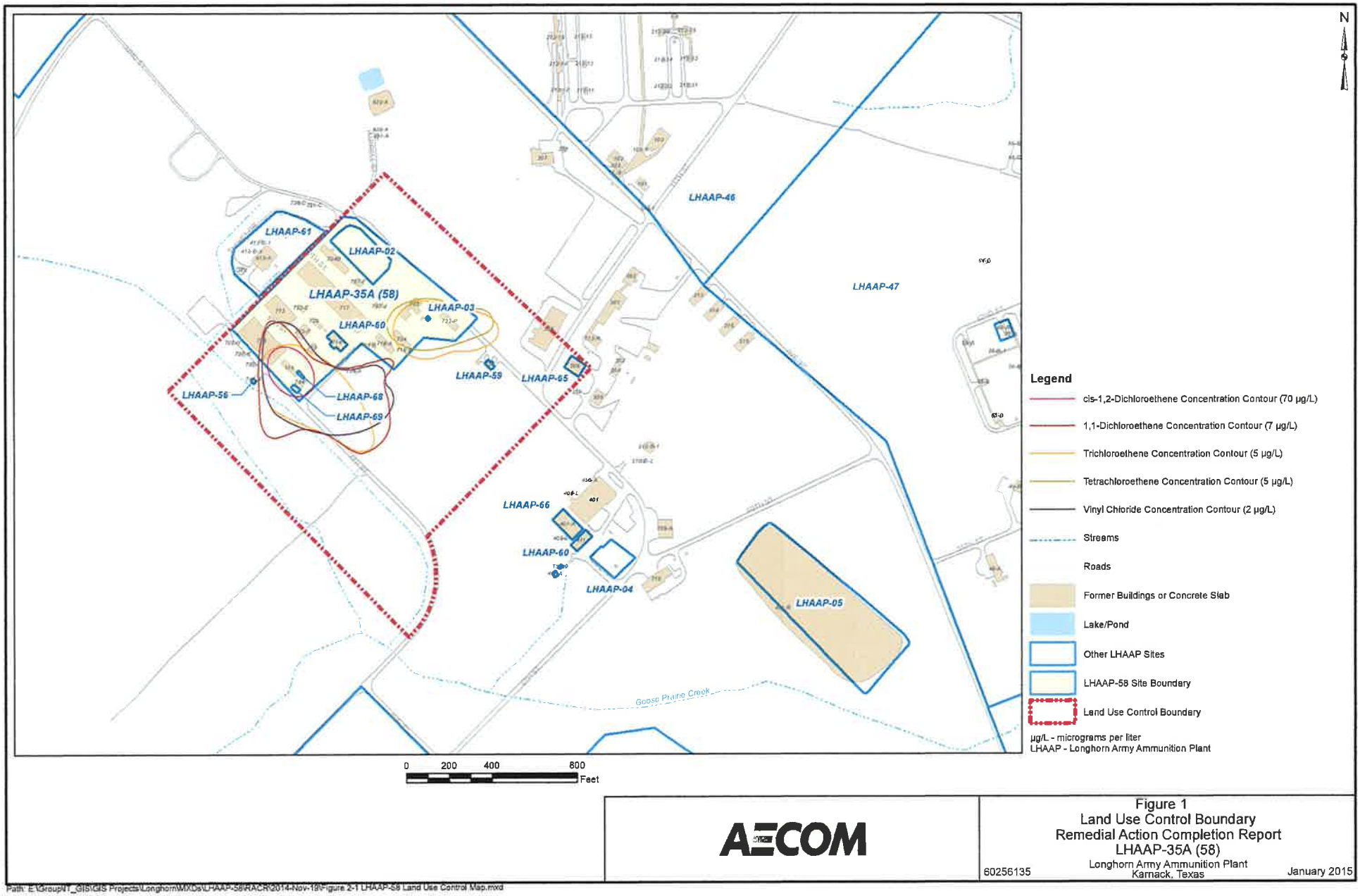
EXECUTED this the ____th day of _____, 2015.

BEFORE ME, on this the 19 th day of February 2015, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 19th day of February, 2015.

Notary Public in and for the State of Texas,
County of Harrison

GENIE WARNER
Notary Public State of Texas
COMM. EXP. 8/1/2018



AECOM

Figure 1
Land Use Control Boundary
Remedial Action Completion Report
LHAAP-35A (58)
Longhorn Army Ammunition Plant
Karnack, Texas

60256135

January 2015

Path: E:\Group\IT_GIS\GIS Projects\Longhorn\MXDs\LHAAP-58\RACR\2014-Nov-19\Figure 2-1 LHAAP-58 Land Use Control Map.mxd

EXHIBIT A
SURVEY PLAT

FIELD NOTES DESCRIPTION OF
"LHAAP-35A(58)" LAND USE CONTROL AREA
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, "LHAAP-35A(58)" Land Use Control Area being 46.524 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), "LHAAP-35A(58)" Land Use Control Area being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.99991470929, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "HMX-5" (N=6958206.213 feet E=3305201.721 feet). Said traverse indicates a surface distance of 2567.689 feet between said monuments. The computed land area is based on State Plane distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" and "RPLS 3940" .

Commencing at monument "X-11" referenced above,

THENCE N 52deg16'47"E 216.98' to an I.R.O.P.C. set for the North corner of this tract and this POINT OF BEGINNING,

THENCE S 47deg09'34"E 1327.84' along the N.E. B.L. of this tract to an I.R.O.P.C. set for this tract's East corner,

THENCE S 44deg05'45"W 1089.57' along a S.E. B.L. of this tract to a 60d nail set (near the Easterly edge of the asphalt pavement of "4th Street") for this tract's only reentrant corner,

THENCE along a curve to the right (having a radius of 397.10' and an arc length of 496.33', being subtended by a chord of S 09deg27'29"W 464.64') defining this tract's E.B.L., said curve approximating the curved Easterly edge of the asphalt pavement of "4th Street", to a 60d nail found for the South end of said curve,

THENCE S 45deg14'57"W 21.48' along a S.E. B.L. of this tract to a point for this tract's Southmost corner, said point being N 17deg16'14"W 525.07' from the aforementioned "HMX-5" monument and S 44deg25'14"E 8.86' from a concrete nail set for reference near the centerline of the asphalt pavement of "4th Street",

THENCE N 44deg25'14"W 1614.70' along the S.W. B.L. of this tract to an I.R.O.P.C. set for this tract's West corner,

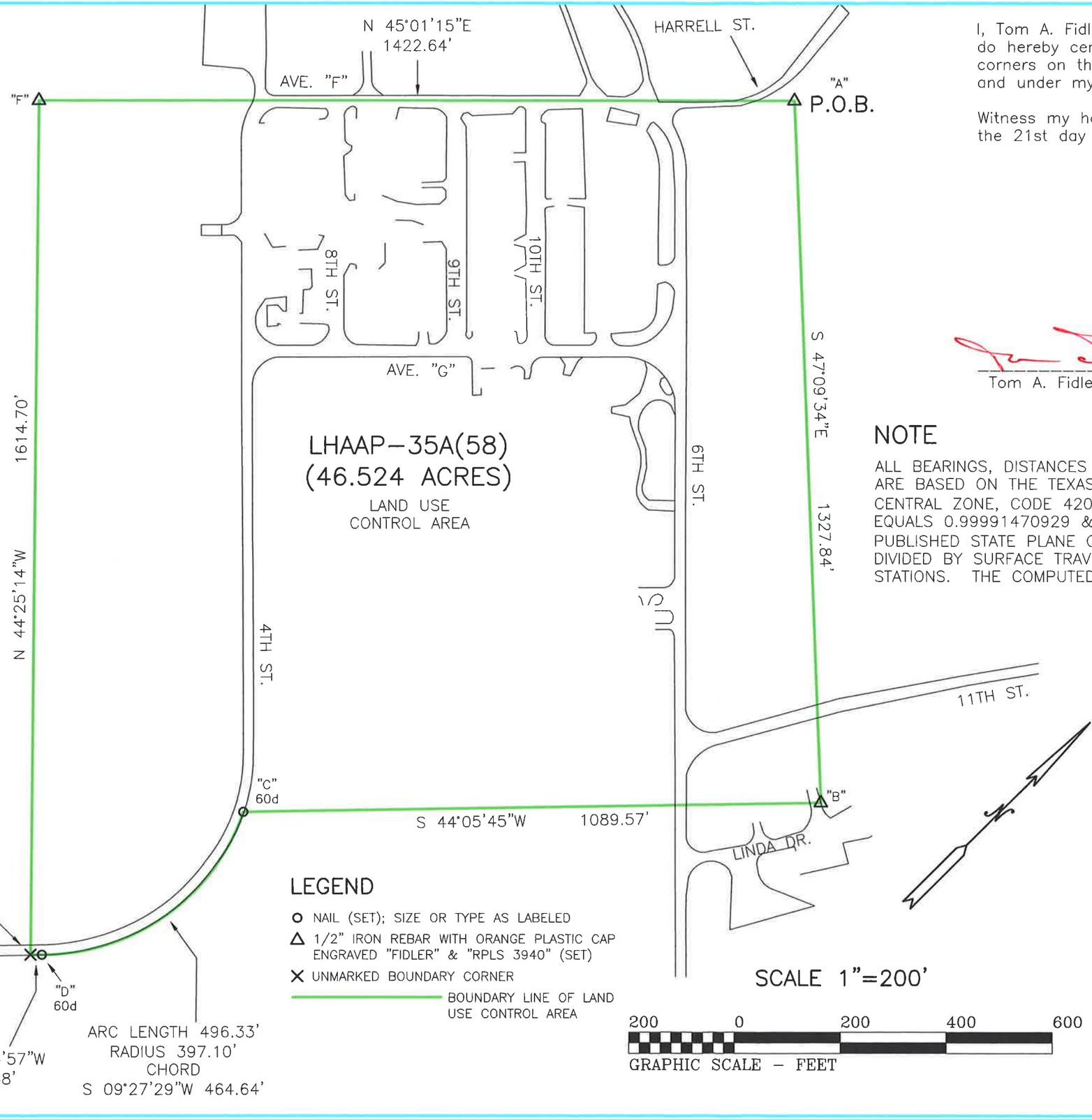
THENCE N 45deg01'15"E 1422.64' along the N.W. B.L. of this tract to this POINT OF BEGINNING, containing 46.524 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.

Tom A. Fidler, R.P.L.S. Number 3940

00943361

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com



LEGEND

- NAIL (SET); SIZE OR TYPE AS LABELED
- △ 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- X UNMARKED BOUNDARY CORNER
- BOUNDARY LINE OF LAND USE CONTROL AREA

SCALE 1"=200'

200 0 200 400 600
GRAPHIC SCALE – FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in January, 2015.

Witness my hand and seal this the 21st day of January, 2015.

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), AND COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.99991470929 & IS BASED ON CALCULATED DISTANCE BETWEEN PUBLISHED STATE PLANE COORDINATES (OF STATIONS X-11 & HMX-5) DIVIDED BY SURFACE TRAVERSE CALCULATED DISTANCE BETWEEN SAME TWO STATIONS. THE COMPUTED LAND AREA IS BASED ON STATE PLANE DISTANCES.

COORDINATE TABLE

	NORTH	EAST
A	6960866.446	3304921.998
B	6959963.566	3305895.634
C	6959181.058	3305137.444
D	6958722.729	3305061.091
E	6958707.606	3305045.836
F	6959860.854	3303915.676

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

LHAAP-35A(58) L.U.C.A.
(46.524 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	V.PTS V.LEG
01/21/2015	1103025V.DWG	DRAWN BY JTJ

LHAAP-35A(58), 58-3

LAND USE CONTROL COMPLIANCE INSPECTION FORM

September 14, 2015

Sample Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated 9/30/11 for LHAAP-35A (58) a certification of site was conducted by _____ [indicate transferee] on _____.

A summary of land use control mechanisms is as follows:

- Groundwater restriction – A restriction against use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE). [Indicate whether groundwater restrictions are still required at LHAAP-35A (58)]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-35A (58).

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year.

LHAAP-59

NOTICE OF NONRESIDENTIAL LAND USE FOR LHAAP-59 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

00943365

2011-000003378

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

NOTICE

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 03/24/2011 03:52 PM **Document Number:** 2011-000003378 **Receipt No:** 1103745 **Amount:** $ 32.00 **By:** Lauren Boyd, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AARON WILLIAMS EC-ER
1645 SOUTH 101ST EAST AVENUE

[redacted]

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remedial investigation of the land described herein. The site, LHAAP-59, the former Pesticide Storage Building 725, was constructed in 1984 to support maintenance activities at the plant as a pesticide storage building. LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-59 is not itself considered an NPL site. Environmental activities at LHAAP-59 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-59 consists of a Building 725 and the surrounding area. The building, now removed, contained a concrete floor with floor drains that discharged to two nearby sumps. Soil samples were collected near the building and sumps and analyzed for metals, semivolatile organic compounds, volatile organic compounds, dioxins and furans in the 1990s and in 2007 additional samples were collected and analyzed for pesticides and herbicides near the sumps and at the building. Low levels of pesticides were detected. An analysis demonstrated that

these chemicals in soil did not exhibit a potential for release to the groundwater in excess of the groundwater MSC (GW-Ind) and were considered to be protective for nonresidential worker exposure, as specified in 30 TAC §335.559(g)(2)(B). Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30
p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-59 parcel is a 0.2537 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-59 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-59. Contaminants in soil samples from LHAAP-59 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-59 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-59 is consistent with the non-residential use scenario evaluated in the risk screening. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through
12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 25 th day of January, 2011.

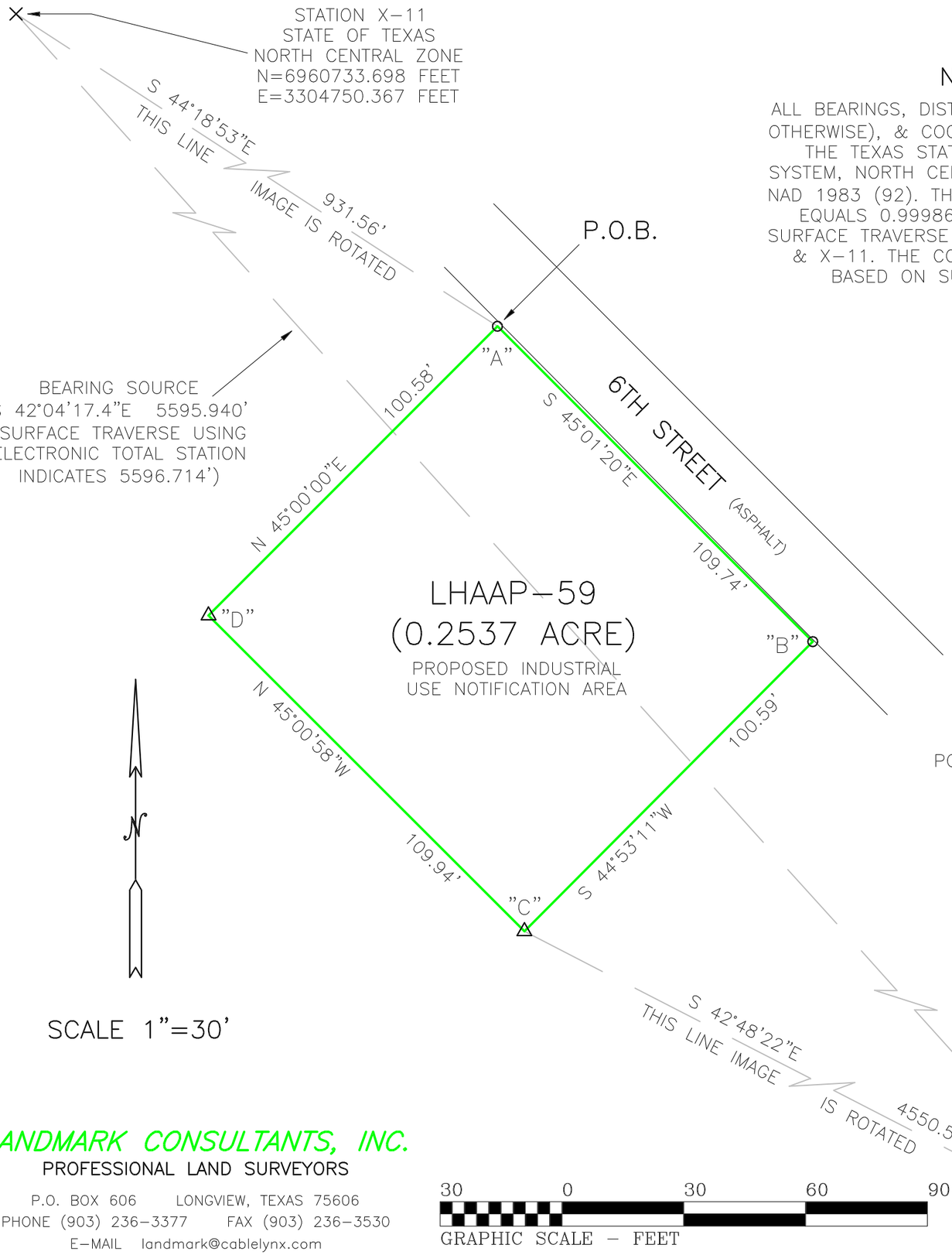
BEFORE ME, on this the 25 th day of Jan 2011, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 25 day of January, 2011.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA I UMPHRIES
Notary Public State of Texas
COMM EXP. 3-17-2011

00943369

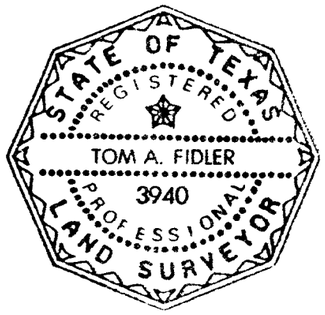


NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS C–21 & X–11. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in July 2008.

Witness my hand and seal this the 29th day of July, 2008



Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

COORDINATE TABLE

POINT	NORTH	EAST
A	6960067.154	3305401.154
B	6959989.588	3305478.780
C	6959918.320	3305407.794
D	6959996.035	3305330.035

NOTES:

- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- O INDICATES CONCRETE NAIL IN BOTTLE CAP (SET IN ASPHALT)
- △ INDICATES 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- ——— INDICATES BOUNDARY OF PROPOSED INDUSTRIAL USE NOTIFICATION AREA

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236–3377 FAX (903) 236–3530
E–MAIL landmark@cablelynx.com

LHAAP–59
(0.2537 ACRE)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	0605063D.DWG
07/29/2008	0605063.CRD	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
"LHAAP–59" TRACT
(PROPOSED INDUSTRIAL USE NOTIFICATION AREA)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP–59" being 0.2537 acre of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP–59" being more particularly described as follows :

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X–11" (N=6960733.698 feet E=3304750.367 feet) and "C–21" (N=6956579.781 feet E=3308499.969 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940", and the abbreviation C.N.I.B.C. indicates concrete nail in bottle cap.

Commencing at monument "X–11" referenced above,

THENCE S 44deg18'53"E 931.56' to a C.N.I.B.C. set (in the asphalt pavement of the road known as 6th Street) for the North corner of this tract and this POINT OF BEGINNING,

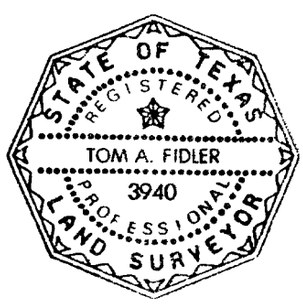
THENCE S 45deg01'20"E 109.74' along the N.E. B.L. of this tract to a C.N.I.B.C. set (in the asphalt pavement of the road known as 6th Street) for this tract's East corner,

THENCE S 44deg53'11"W 100.59' along the S.E. B.L. of this tract to an I.R.O.P.C. set for this tract's South corner, from which the monument "C–21" referenced above bears S 42deg48'22"E 4550.54',

THENCE N 45deg00'58"W 109.94' along the S.W. B.L. of this tract to an I.R.O.P.C. set for this tract's West corner,

THENCE N 45deg00'00"E 100.58' along the N.W. B.L. of this tract to this POINT OF BEGINNING, containing 0.2537 acre, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler

Tom A. Fidler, R.P.L.S. Number 3940

LHAAP-60

NOTICE OF NONRESIDENTIAL LAND USE AT LHAAP-60 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005561

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

16 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005561 **Receipt No:** 1006195 **Amount:** $ 72.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-60, consisted of four pesticide storage buildings located in the steam plant and shops area of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-60 is not itself considered an NPL site. Environmental activities at LHAAP-60 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-60 consisted of buildings 411, 411-A, 714, and shed TS-80, which were located in the northwestern portion of LHAAP near the steam plant and shops area in the general vicinity of sites LHAAP-02, LHAAP-04, LHAAP-35A(58), and LHAAP-66. Pesticides and herbicides were stored in the now demolished buildings. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at

the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-60 parcels include: Building 411 with 4,242 square feet, more or less, or 0.09738 acre tract; Building TS-80 with 186 square feet, more or less, or 0.00426 acre tract; Building 411-A with 484 square feet, more or less, or 0.01111 acre tract; and Building 714 with 4,468 square feet, more or less, or 0.10463 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-60 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-60. Contaminants in soil samples from LHAAP-60 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-60 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-60 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
or
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10 th day of March 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-60A" TRACT
(FOUNDATION SLAB OF DEMOLISHED BUILDING 411)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-60A" being the concrete foundation slab of demolished Building 411, "LHAAP-60A" being located within the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-60A" being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "C-21" (N=6956579.781 feet E=3308499.969 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "X-11" referenced above,

THENCE S 42deg04'17.4"E 1875.89' to a point, from which point monument "C-21" referenced above bears S 42deg04'17.4"E 3720.05',

(as used below, the abbreviation C.C.F.S. indicates corner of concrete foundation slab)

THENCE S 47deg55'43"W 188.47' to a C.C.F.S. found for the Northmost corner of this tract and this description's POINT OF BEGINNING,

THENCE S 45deg09'46"E 41.80' along the Northeast B.L. of this tract to a C.C.F.S. found for this tract's Eastmost corner,

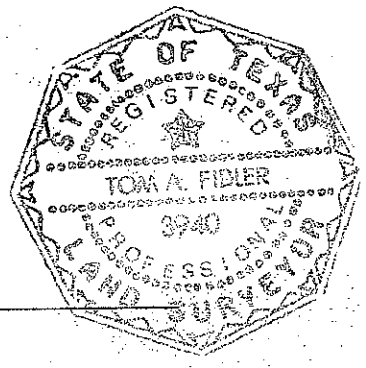
THENCE S 44deg51'53"W 101.29' along the Southeast B.L. of this

tract to a C.C.F.S. found for this tract's Southmost corner,

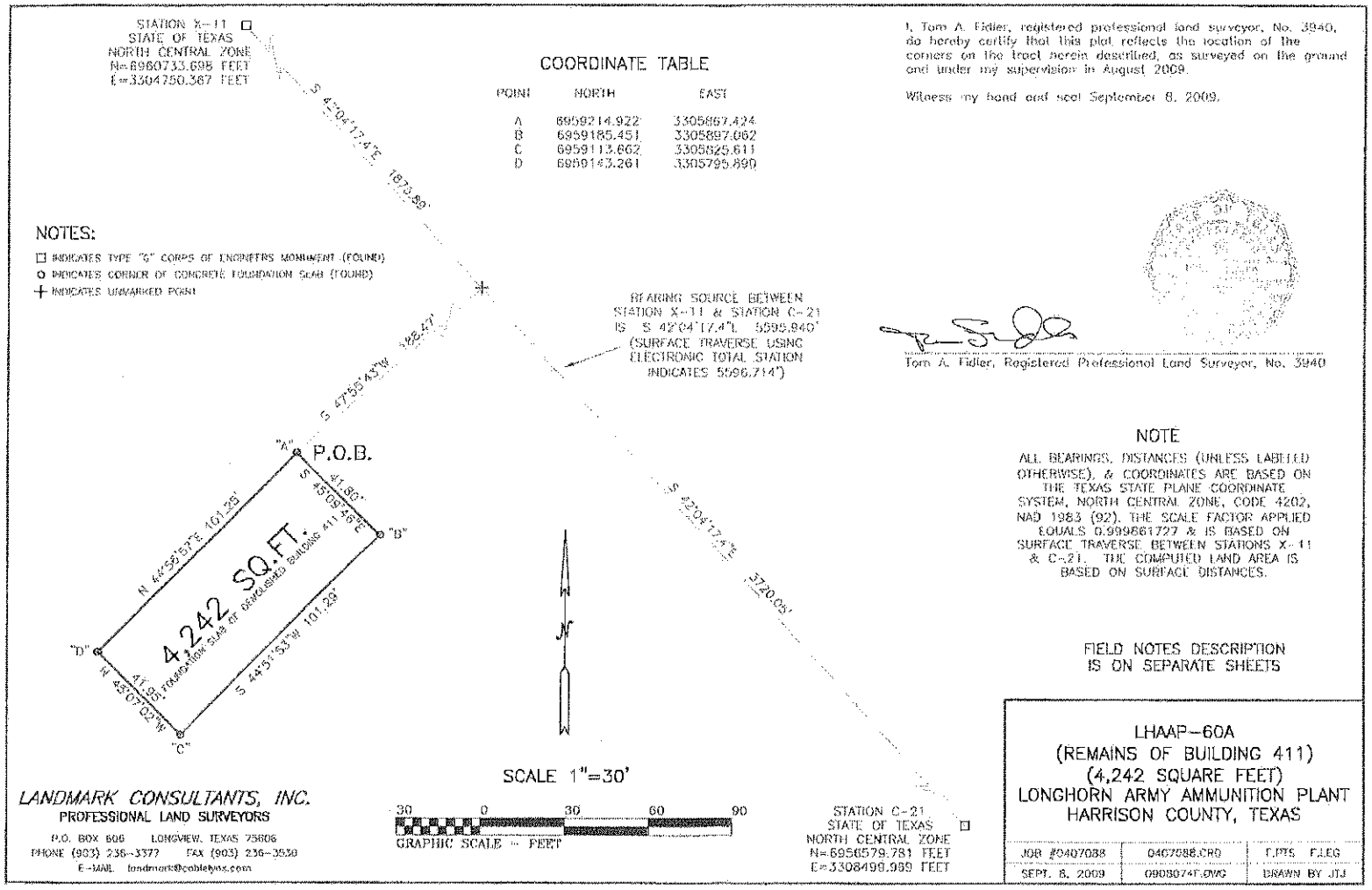
THENCE N 45deg07'02"W 41.95' along the Southwest B.L. of this tract to a C.C.F.S. found for this tract's Westmost corner,

THENCE N 44deg56'57"E 101.25' along the Northwest B.L. of this tract to this POINT OF BEGINNING. This tract contains 4,242 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



COORDINATE TABLE

POINT	NORTH	EAST
A	6959214.922	3305867.424
B	6959185.451	3305897.062
C	6959113.662	3305825.611
D	6959143.261	3305795.890

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August 2009.

Witness my hand and seal September 8, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTES:

- ☐ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- O INDICATES CORNER OF CONCRETE FOUNDATION SLAB (FOUND)
- + INDICATES UNMARKED POINT

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.99986727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & C-21. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 806 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cableone.com

LHAAP-60A
(REMAINS OF BUILDING 411)
(4,242 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	F.PTS F.LEG
SEPT. 8, 2009	0908074F.DWG	DRAWN BY JTJ

"LHAAP-60B" TRACT
(BUILDING TS-80)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, the perimeter of tract "LHAAP-60B" being defined by the four corners of the external face of the exterior walls of Building TS-80 (said Building is constructed of galvanized corrugated sheet metal), tract "LHAAP-60B" being located within the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-60B" being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "C-21" (N=6956579.781 feet E=3308499.969 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "X-11" referenced above,

THENCE S 42deg04'17.4"E 1919.72' to a point, from which point monument "C-21" referenced above bears S 42deg04'17.4"E 3676.22',

(as used below, the abbreviation C.E.F.E.W. indicates Corner of the External Face of the Exterior Walls of Building TS-80)

THENCE S 47deg55'43"W 378.14' to a C.E.F.E.W. found for the Northmost corner of this tract and this description's POINT OF BEGINNING,

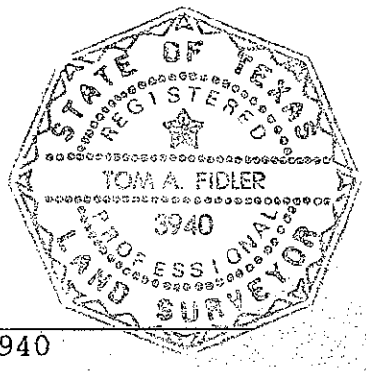
THENCE S 41deg54'33"E 8.55' along the Northeast B.L. of this tract to a C.E.F.E.W. found for this tract's Eastmost corner,

THENCE S 48deg12'22"W 22.54' along the Southeast B.L. of this tract to a C.E.F.E.W. found for this tract's Southmost corner,

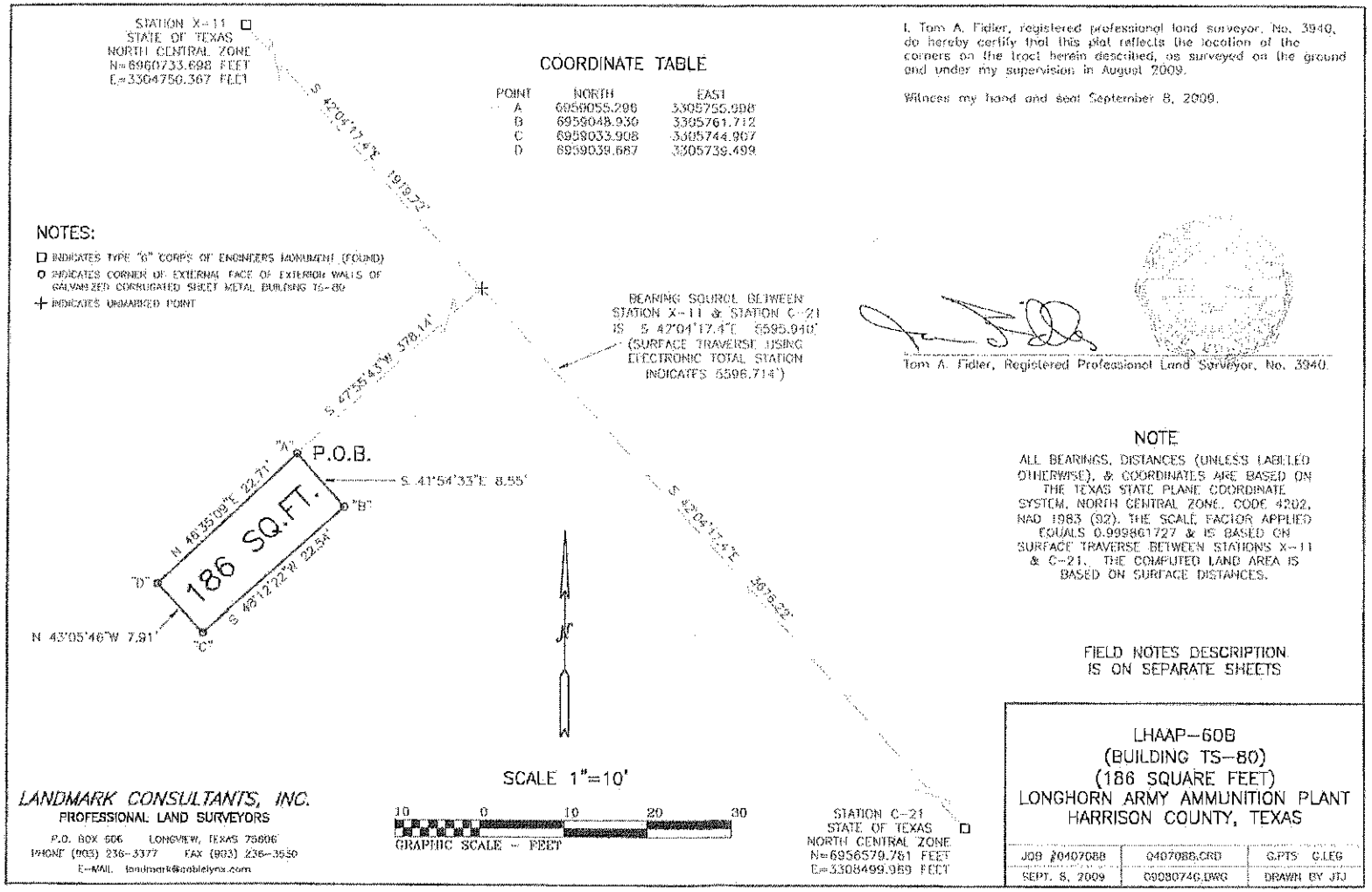
THENCE N 43deg05'46"W 7.91' along the Southwest B.L. of this tract to a C.E.F.E.W. found for this tract's Westmost corner,

THENCE N 46deg35'09"E 22.71' along the Northwest B.L. of this tract to this POINT OF BEGINNING. This tract contains 186 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



COORDINATE TABLE

POINT	NORTH	EAST
A	6959055.296	3305755.988
B	6959048.930	3305761.712
C	6959033.908	3305744.907
D	6959039.687	3305739.499

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August 2009.

Witness my hand and seal September 8, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940.

NOTES:

- ☐ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- O INDICATES CORNER OF EXTERNAL FACE OF EXTERIOR WALLS OF GALVANIZED CORRUGATED SHEET METAL BUILDING TS-80
- + INDICATES UNMARKED POINT

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & C-21. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 506 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3550
E-MAIL landmark@cablelynx.com

LHAAP-60B
(BUILDING TS-80)
(186 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	G.PTS C.LEG
SEPT. 8, 2009	0908074C.DWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
"LHAAP-60C" TRACT
(FOUNDATION SLAB OF DEMOLISHED BUILDING 411-A)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-60C" being the concrete foundation slab of demolished Building 411-A, tract "LHAAP-60C" being located within the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-60C" being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "C-21" (N=6956579.781 feet E=3308499.969 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "X-11" referenced above,

THENCE S 42deg04'17.4"E 1924.12' to a point, from which point monument "C-21" referenced above bears S 42deg04'17.4"E 3671.82',

(as used below, the abbreviation C.C.F.S. indicates corner of concrete foundation slab)

THENCE S 47deg55'43"W 418.77' to a C.C.F.S. found for the Northmost corner of this tract and this description's POINT OF BEGINNING,

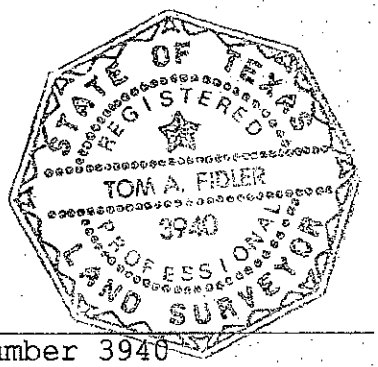
THENCE S 28deg26'16"E 24.08' along the Northeast B.L. of this tract to a C.C.F.S. found for this tract's Eastmost corner,

THENCE S 61deg38'48"W 20.15' along the Southeast B.L. of this tract to a C.C.F.S. found for this tract's Southmost corner,

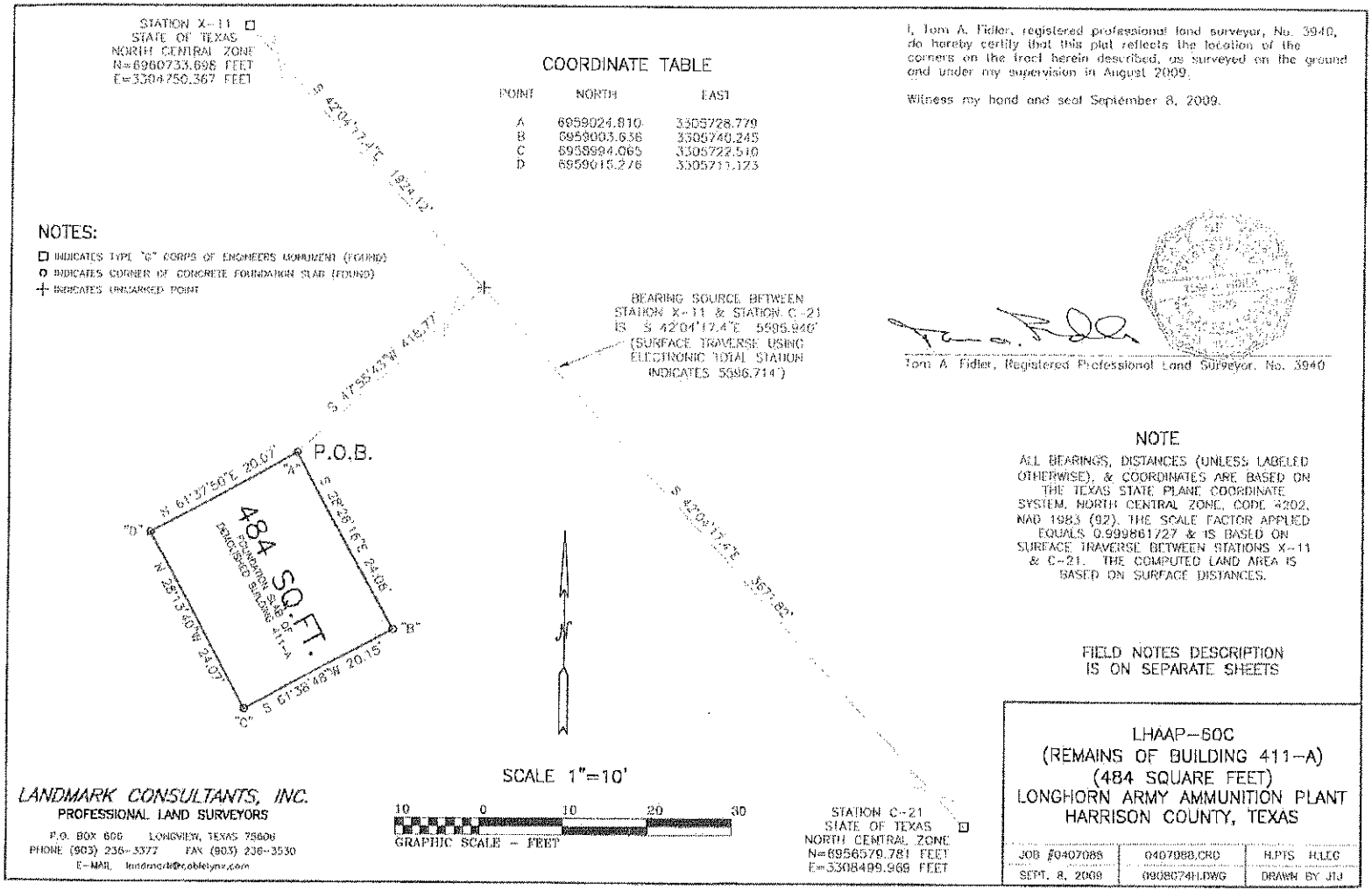
THENCE N 28deg13'40"W 24.07' along the Southwest B.L. of this tract to a C.C.F.S. found for this tract's Westmost corner,

THENCE N 61deg37'50"E 20.07' along the Northwest B.L. of this tract to this POINT OF BEGINNING. This tract contains 484 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



COORDINATE TABLE

POINT	NORTH	EAST
A	6959024.810	3305728.779
B	6959003.636	3305740.245
C	6958994.065	3305722.510
D	6959015.276	3305711.173

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August 2009.

Witness my hand and seal September 8, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTES:

- ☐ INDICATES TYPE "C" CORPS OF ENGINEERS MONUMENT (FOUND)
- O INDICATES CORNER OF CONCRETE FOUNDATION SLAB (FOUND)
- ⊕ INDICATES UNMARKED POINT

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & C-21. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cobblynx.com

LHAAP-60C
(REMAINS OF BUILDING 411-A)
(484 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	H.PTS H.LLG
SEPT. 8, 2009	0908074HLDWG	DRAWN BY JTJ

FIELD NOTES DESCRIPTION OF
"LHAAP-60D" TRACT
(INCLUDES FOUNDATION SLAB OF DEMOLISHED BUILDING #714)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-60D" including the concrete foundation slab of demolished Building #714 plus an area adjacent to the Southwest edge of said slab, "LHAAP-60D" being located within the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-60D" being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "C-21" (N=6956579.781 feet E=3308499.969 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "X-11" referenced above,

THENCE S 42deg04'17.4"E 395.512' to a point, from which point monument "C-21" referenced above bears S 42deg04'17.4"E 5200.428'

(as used below, the abbreviation C.C.F.S. indicates corner of concrete foundation slab)

THENCE S 47deg55'43"W 442.92' to a C.C.F.S. found for the Northmost corner of this tract and this description's POINT OF BEGINNING,

THENCE S 44deg51'26"E 91.43' along the Northeast B.L. of this tract, and generally along the Northeast edge of said concrete slab, to a C.C.F.S. found for this tract's Eastmost corner,

THENCE S 44deg50'54"W 44.35' along a Southeast B.L. of this tract, and generally along the Southeast edge of said concrete slab, to a C.C.F.S. found for this tract's Southmost corner,

THENCE N 44deg59'57"W 29.43' along a Southwest B.L. of this tract, and generally along the Southwest edge of said concrete slab, to a point for this tract's Southmost reentrant corner,

THENCE S 45deg00'03"W 14.90' along a Southeast B.L. of this tract to a 60d nail set for this tract's Westmost South corner,

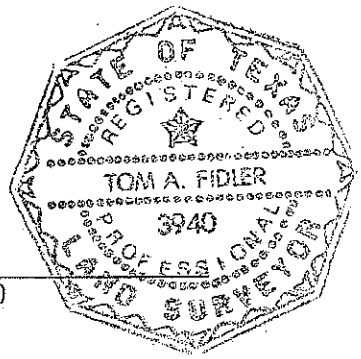
THENCE N 44deg59'57"W 32.36' along a Southwest B.L. of this tract to a 60d nail set for this tract's Southmost West corner,

THENCE N 45deg00'03"E 14.90' along a Northwest B.L. of this tract to a point for this tract's Northmost reentrant corner,

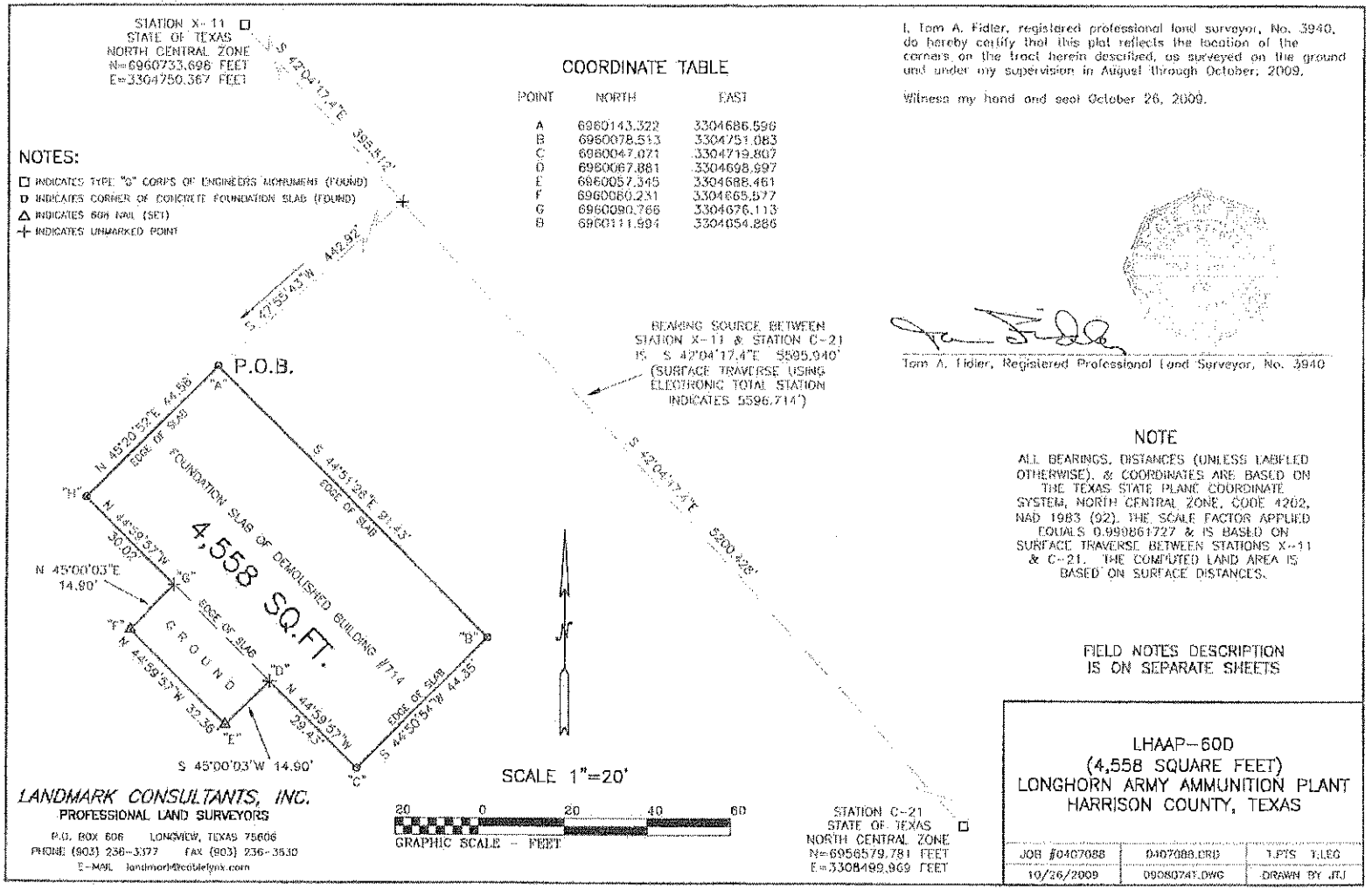
THENCE N 44deg59'57"W 30.02' along a Southwest B.L. of this tract, and generally along the Southwest edge of said concrete slab, to a C.C.F.S. found for this tract's Northmost West corner,

THENCE N 45deg20'52"E 44.58' along a Northwest B.L. of this tract, and generally along the Northwest edge of said concrete slab, to this POINT OF BEGINNING. This tract contains 4,558 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



NOTES:

- □ INDICATES TYPE "B" CORPS OF ENGINEERS MONUMENT (FOUND)
- ■ INDICATES CORNER OF CONCRETE FOUNDATION SLAB (FOUND)
- △ INDICATES 60d NAIL (SET)
- ┼ INDICATES UNMARKED POINT

COORDINATE TABLE

POINT	NORTH	EAST
A	6960143.322	3304686.596
B	6960078.513	3304751.083
C	6960047.071	3304719.807
D	6960067.881	3304698.997
E	6960057.345	3304688.461
F	6960080.231	3304665.577
G	6960090.766	3304676.113
B	6960111.994	3304654.886

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October, 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & C-21. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cebridgelynx.com

LHAAP-60D
(4,558 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.DRJ	1 PTS 1 LEG
10/26/2009	09080747.DWG	DRAWN BY JRJ

LHAAP-64

NOTICE OF NONRESIDENTIAL LAND USE AT LHAAP-64 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005558

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005558 **Receipt No:** 1006195 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-64, is the location of a former transformer storage area located in the western portion of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-64 is not itself considered an NPL site. Environmental activities at LHAAP-64 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-64 is located next to site LHAAP-29. Polychlorinated biphenyl (PCB)-containing transformers were stored on a pad on Zeugner Drive immediately southwest of Building 707-B. Approximately 20 out-of-service non-PCB transformers were stored on pallets with no curbs or other containment. The site was used for the storage of transformer oil. The contaminants of concern were petroleum and oil lubricants and PCBs. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas

75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-64 parcel is 847 square feet, more or less, or 0.01944 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-64 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-64. Contaminants in soil samples from LHAAP-64 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-64 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-64 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
or
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10th day of March, 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-64" TRACT
(ADJACENT TO FOUNDATION SLAB OF DEMOLISHED BUILDING #707-B)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-64" being located within the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), tract "LHAAP-64" being adjacent to the Southwest edge of the concrete foundation slab of demolished Building #707-B, tract "LHAAP-64" being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998463585, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "C-1" (N=6955947.067 feet E=3305400.600 feet) and "C-22" (N=6955892.461 feet E=3307823.958 feet). Said traverse indicates a surface distance of 2424.346 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "C-1" referenced above,

THENCE S 32deg52'16"W 338.58' to the West corner of the concrete slab of demolished building 707-B, said slab corner marking the North corner of this tract and this POINT OF BEGINNING,

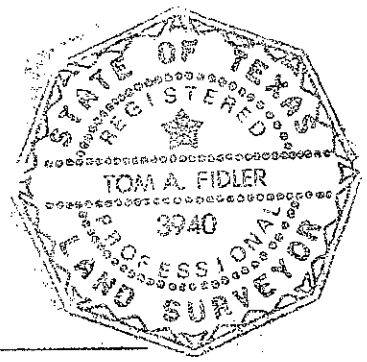
THENCE S 45deg00'47"E 29.76' along the N.E. B.L. of this tract, and generally along the Southwest edge of said concrete slab, to the South corner of said concrete slab, said slab corner marking the East corner of this tract,

THENCE S 44deg55'45"W 28.44' along the S.E. B.L. of this tract to a concrete nail with head dimple set (in asphalt) for the South corner of this tract,

THENCE N 45deg00'47"W 29.75' along the S.W. B.L. of this tract to a concrete nail with head dimple set (in asphalt) for the West corner of this tract,

THENCE N 44deg54'27"E 28.44' along the N.W. B.L. of this tract to this POINT OF BEGINNING. This tract contains 847 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

NOTES:

□ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
O INDICATES CORNER OF CONCRETE FOUNDATION SLAB (FOUND)
△ INDICATES 60d NAIL (SET)
+ INDICATES CONCRETE NAIL WITH HEAD DIMPLE (SET)

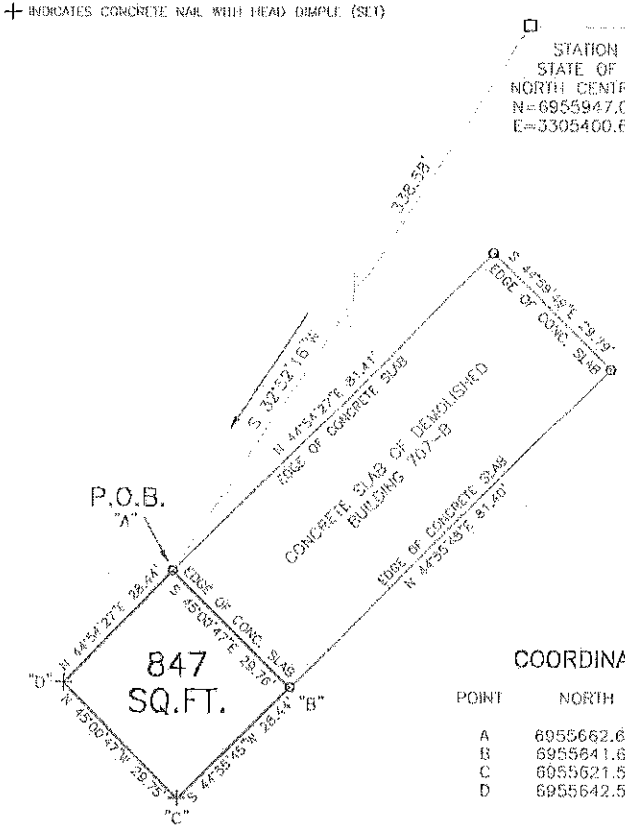
I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through November, 2009.

Witness my hand and seal November 12, 2009.

STATION C-1
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6955947.067 FEET
E=3305400.600 FEET

BEARING SOURCE BETWEEN
STATION C-1 & STATION C-22
IS S 88°42'33.0"E 2423.973'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 2424.346')

STATION C-22
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6955892.461 FEET
E=3307823.958 FEET



Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

COORDINATE TABLE

POINT	NORTH	EAST
A	6955662.694	3305216.833
B	6955641.654	3305237.884
C	6955621.519	3305217.798
D	6955642.552	3305196.756

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999846358S & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS C-1 & C-22. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

SCALE 1"=20'

20 0 20 40 60
GRAPHIC SCALE – FEET

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-5377 FAX (903) 236-5530
E-MAIL landmark@cableone.com

LHAAP-64
(847 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	0 PTS 0 LEG
NOV. 12, 2009	090807AU.DWG	DRAWN BY JDJ

LHAAP-66

NOTICE OF NONRESIDENTIAL LAND USE AT LHAAP-66 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005559

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005559 **Receipt No:** 1006195 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-66, is the location of a leaking transformer from the electric power substation and transformer area, near Building 401. Building 401 housed gas-fired boilers that generated steam for distribution throughout the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-66 is not itself considered an NPL site. Environmental activities at LHAAP-66 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-66 is located at the electric power substation and includes several transformers. One of these transformers was reported to be leaking, but subsequent environmental activities confirmed there was no release to the soil from polychlorinated biphenyls. The electric power substation still provides power to parts of LHAAP. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465,

Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-66 parcel is 8,616 square foot, more or less, or 0.19779 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-66 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-66. Contaminants in soil samples from LHAAP-66 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-66 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-66 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
or
Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D:C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10th day of March, 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-66" TRACT
(CONTAINS AN ELECTRIC POWER SUBSTATION)
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-66" containing an electric power substation, including transformers, "LHAAP-66" being located within the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-66" being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "C-21" (N=6956579.781 feet E=3308499.969 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "X-11" referenced above,

THENCE S 42deg04'17.4"E 1722.19' to a point, from which point monument "C-21" referenced above bears S 42deg04'17.4"E 3873.75',

(as used below, the abbreviation F.C.P. indicates 2-1/2" diameter chain link fence corner pipe)

THENCE S 47deg55'43"W 210.22' to an F.C.P. found (leaning approximately 15 degrees) for the Northmost corner of this tract and this description's POINT OF BEGINNING,

THENCE S 45deg10'23"E 130.14' along a chain link fence found for the Northeast B.L. of this tract to an F.C.P. found for this tract's Eastmost corner,

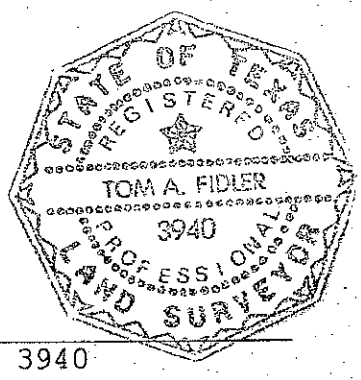
THENCE S 44deg46'19"W 65.93' along a chain link fence found for

the Southeast B.L. of this tract to an F.C.P. found for this tract's Southmost corner,

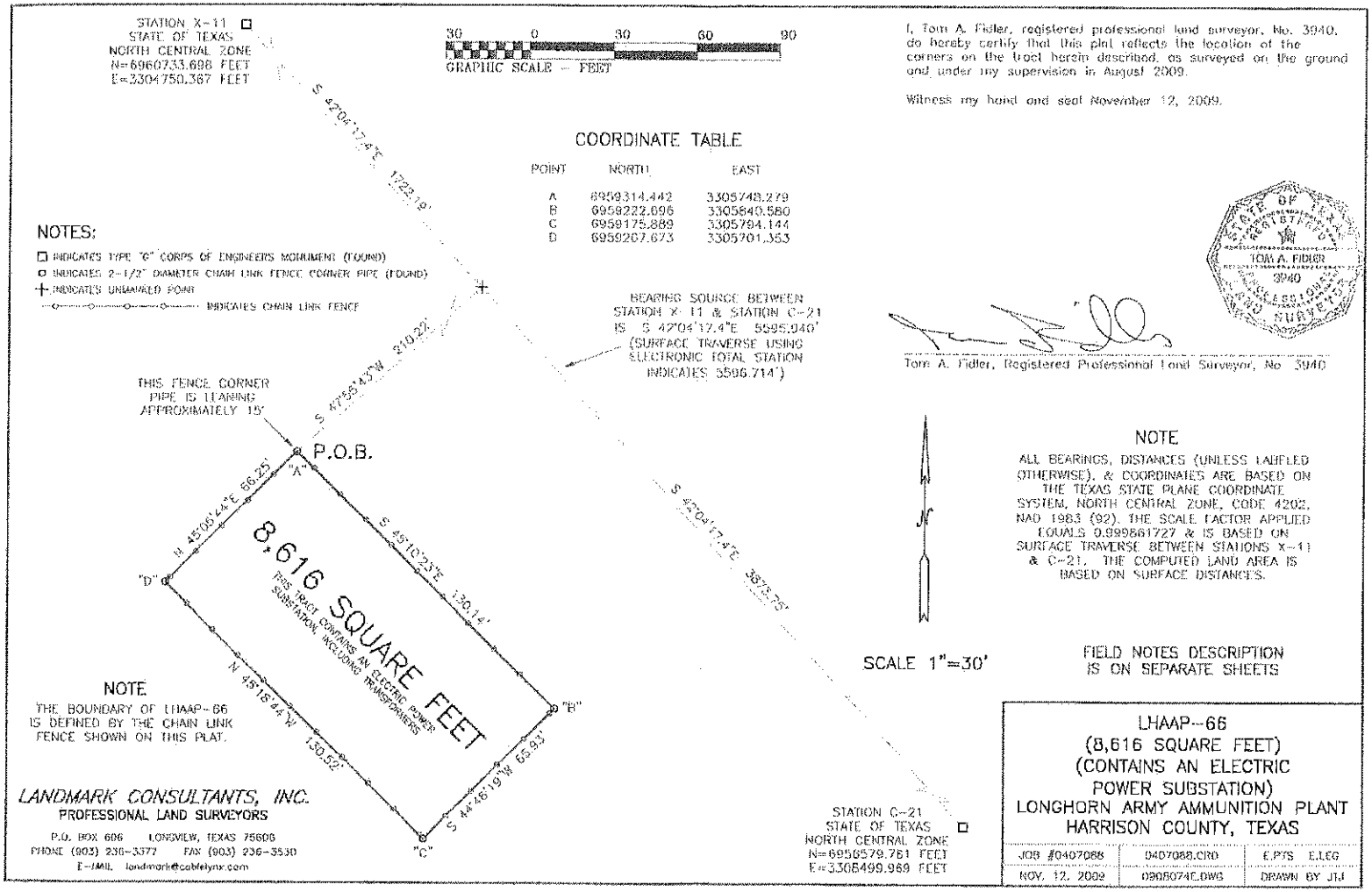
THENCE N 45deg18'44"W 130.52' along a chain link fence found for the Southwest B.L. of this tract to an F.C.P. found for this tract's Westmost corner,

THENCE N 45deg05'44"E 66.25' along a chain link fence found for the Northwest B.L. of this tract to this POINT OF BEGINNING. This tract contains 8,616 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940



COORDINATE TABLE

POINT	NORTH	EAST
A	6959314.442	3305748.279
B	6959222.696	3305840.580
C	6959175.889	3305794.144
D	6959267.673	3305701.353

NOTES:

- ☐ INDICATES TYPE "C" CORPS OF ENGINEERS MONUMENT (FOUND)
- ○ INDICATES 2-1/2" DIAMETER CHAIN LINK FENCE CORNER PIPE (FOUND)
- ┼ INDICATES UNMARKED POINT
- ○—○—○—○— INDICATES CHAIN LINK FENCE

NOTE

THE BOUNDARY OF LHAAP-66 IS DEFINED BY THE CHAIN LINK FENCE SHOWN ON THIS PLAT.

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August 2009.

Witness my hand and seal November 12, 2009.

STATE OF TEXAS REGISTERED TOM A. FIDLER 3940 LICENSED LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & C-21. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

SCALE 1"=30'

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEETS

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

LHAAP-66
(8,616 SQUARE FEET)
(CONTAINS AN ELECTRIC POWER SUBSTATION)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	E.PTS E.LEG
NOV. 12, 2009	0908074C.DWG	DRAWN BY JTJ

LHAAP-67, 67-1

LUCs FROM FINAL REMEDIAL DESIGN

September 14, 2015

FINAL
REMEDIAL DESIGN
LHAAP-35B (37), CHEMICAL LABORATORY AND LHAAP-67, ABOVEGROUND STORAGE TANK FARM
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared by

U.S. Army Corps of Engineers
Tulsa District
1645 South 101st East Avenue
Tulsa, Oklahoma

August 1, 2011

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4.0 Land Use Controls for the Site

The LUCs to be implemented by the Army or its representatives for LHAAP-35B(37) and LHAAP-67 to prevent human exposure to residual groundwater contamination presenting an unacceptable risk to human health include:

- Ensure no withdrawal or use of groundwater beneath the sites for anything other than environmental monitoring and testing until cleanup goals are met

Notification of the groundwater use restriction will accompany all transfer documents and will be recorded at the Harrison County Courthouse in accordance with Texas Administrative Code (TAC) Title 30, §335.566.The LUC addresses the areas of LHAAP-35B(37) and LHAAP-67 that include groundwater plumes at LHAAP-35B(37) and LHAAP-67 with levels of contamination that require implementation of a remedy (see **Section 2.0**). The U.S. Army is responsible for implementing, maintaining, monitoring, reporting on, and enforcing the LUC.

U.S. Army and regulators will consult to determine appropriate enforcement actions should there be a failure of an LUC objective at this site after it has transferred. U.S. Army shall obtain USEPA and TCEQ concurrence prior to termination or significant modification of the LUC, or implementation of a change in land use inconsistent with the LUC objectives and use assumptions of the remedy. Although not a remedy, the land use assumption for LHAAP-35B(37) and LHAAP-67 forms the basis for the remedy. The reasonably anticipated future use of the site as part of a national wildlife refuge is consistent with an industrial risk exposure scenario. Notification of the land use assumption of this site will be made in transfer documentation, will be recorded in the Harrison County Courthouse in accordance with TAC Title 30, §335.566 and compliance with the use assumption will be documented in the Five-Year Review reports.

6.2 Land Use Control Implementation Actions

The Army or its representatives will be responsible for LUC implementation and certification, reporting and enforcement. The Army shall address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable.

As a condition of property transfer, the Army may require the transferee to assume responsibility for various implementation actions, as indicated below. Although the Army may transfer responsibility for various implementation actions, the Army shall retain its responsibility for remedy integrity. This means that the Army is responsible for addressing substantive violations of performance objectives that would undermine the Army's CERCLA remedy. The Army also will be responsible for: 1) incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation; 2) recording groundwater use restriction and survey plat at the Harrison County Courthouse; and 3) notifying Texas Department of Licensing and Regulation of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ. The following LUC implementation actions shall be undertaken by the Army in order to ensure that the aforementioned LUC performance objectives for LHAAP-35B(37) and LHAAP-67 are met and maintained:

6.2.1 Comprehensive Land Use Control Management Plan

Within 30 days of receiving USEPA and TCEQ approval of this RD, the Army will incorporate this document into the Comprehensive LUC Management Plan. The Comprehensive LUC Management Plan consists of LHAAP RD documents and a survey plat showing the locations where LUCs being implemented at LHAAP are applied. The purpose of this Comprehensive LUC Management Plan is to ensure all site specific LUCs are compiled into one comprehensive location for both pre-transfer use by the installation and for post-transfer use by the transferee. This document is also accessible to regulators, the local government and the public. The Comprehensive LUC Management Plan is located in the Marshall Public Library to accompany LHAAP's Administrative Record. As LUC RD documents for additional environmental sites are approved by USEPA and TCEQ, the Army shall likewise add those documents and survey plats to the Comprehensive LUC Management Plan as well as update the previous copy of the plan placed in the Marshall Public Library.

6.2.2 Site Certifications and Reporting

Beginning with finalization of this RD, the Army will undertake annual certifications to confirm continued compliance with the LUC objectives. The Army will retain the annual LUC Compliance Certification documents in the project files for incorporation into the Five-Year Review Reports, and these documents will be made available to USEPA and TCEQ upon request. The certification form will be consistent with the form attached as **Appendix B**. In addition, should any violations be found during the annual certification, the Army will provide to USEPA and TCEQ along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations**.** Upon transfer, such responsibilities may shift to the transferee via

appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental transfer document. The need to continue annual certifications will be revisited at Five-Year Reviews.

6.2.3 Notice of Planned Property Conveyances

The Army shall provide notice to USEPA and TCEQ of plans to convey LHAAP-35B(37) and LHAAP-67 acreage. The notice shall describe the mechanism by which LUCs will continue to be implemented, maintained, inspected, reported, and enforced.

6.2.4 Opportunity to Review Text of Intended Land Use Controls

Army will provide a copy of the groundwater use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. In addition, the Army will produce an ECP or other environmental document for transfer of LHAAP-35B(37) and LHAAP-67, but before executing transfer, the Army will provide USEPA and TCEQ with a draft copy of the ECP or other environmental document for transfer so that they may have reasonable opportunity, before document execution, to review all LUC-related provisions.

6.2.5 Notification Should Action(s) Which Interfere with Land Use Control Effectiveness Be Discovered Subsequent to Conveyance

Should the Army discover after conveyance of the site any activity on the property inconsistent with the LUC performance objectives, the Army shall notify USEPA and TCEQ within 72 hours of such discovery. Consistent with **Section 6.2.6** below, the Army will then work with USEPA, TCEQ and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment.

6.2.6 Land Use Control Enforcement

Should the LUC remedy reflected in this LUC RD fail, the Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the owner or violator, to the institution of judicial action under the auspices of Texas property law or CERCLA. Alternatively, should the circumstances warrant such, the Army could choose to exercise its response authorities under CERCLA, and then seek cost recovery after the fact from the person(s) or entity(ies) who violated a given LUC. Should the Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the Army will notify these agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUCs.

6.2.7 Modification or Termination of Land Use Controls

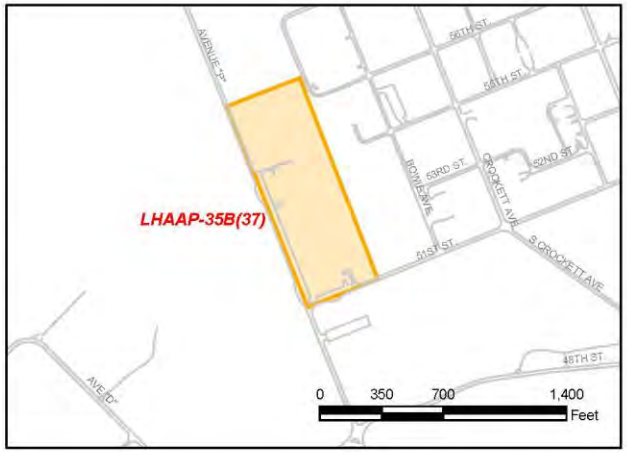
The Army shall not, without USEPA and TCEQ concurrence, make a significant modification to, or terminate a LUC, or make a land use change inconsistent with the LUC objectives and use assumptions of the selected remedy. Likewise, the Army shall seek prior USEPA and TCEQ concurrence before commencing actions that may impact remedy integrity. In the case of an emergency action, the Army shall obtain prior USEPA and TCEQ concurrence as appropriate to the exigencies of the situation.

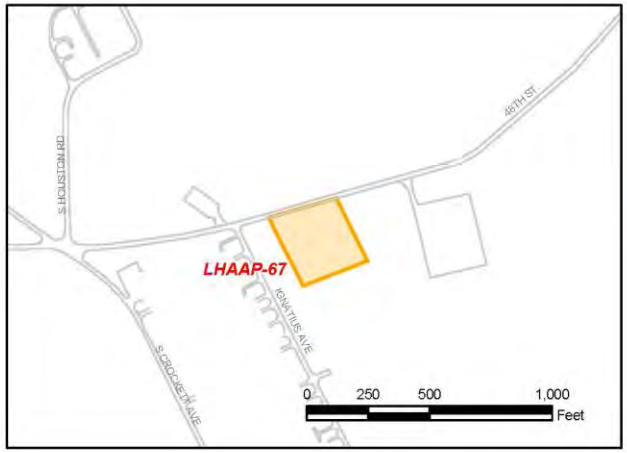
The LUCs shall remain in effect until such time as the Army, TCEQ and USEPA agree that the concentrations of COCs have met cleanup levels. When this occurs, the LUCs will be terminated as needed. The decision to terminate LUCs will be documented consistent with the NCP process for post-ROD changes, potentially including an explanation of significant differences or a remedial action completion report. If the property has been transferred and a determination by the Army, TCEQ and USEPA has been made to terminate one or more of the LUCs, the Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

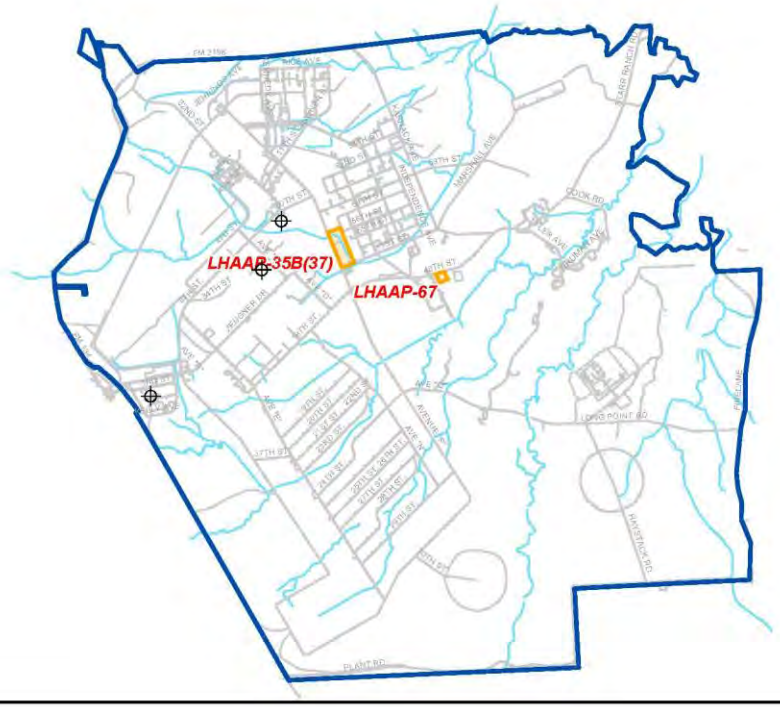
6.3 Monitored Natural Attenuation Implementation Actions

Implementation actions include installation of additional monitoring wells, plugging and abandonment of monitoring wells not designated for long-term monitoring, implementation of a groundwater monitoring plan, monitoring, and reporting. The project schedule and cost summary for implementation actions are provided in **Appendix H**. Groundwater monitoring will be conducted to monitor the effectiveness of MNA in reducing contaminant concentrations over time. Monitoring will also be conducted to evaluate plume migration and ensure that chlorinated solvents-contaminated groundwater does not impact nearby surface water at unacceptable levels. Surface water sampling will be conducted to confirm contaminated groundwater is not migrating to surface water. The Groundwater Monitoring Plan, attached as **Appendix A**, describes the wells, their locations, analytical parameters, the frequency of the monitoring, surface water sampling, and presents a list of the monitored constituents and their respective MCLs. Groundwater monitoring and surface water sampling conducted at LHAAP-35B(37) and LHAAP-67 will follow the Health and Safety Plan (**Appendix E**), the Contractor Quality Control Plan (**Appendix F**), the Chemical Data Acquisition Plan (**Appendix G**), Field Activities (**Appendix C**) and Field Procedures (**Appendix D**) as contained in the appendices of the Remedial Design LHAAP-35B(37) and LHAAP-67.

Annual reports will be prepared for any year in which sampling occurs to document the monitoring program. The first year's annual report will include a review of the first four quarters of data, which include natural attenuation parameters and provide an evaluation for the evidence of MNA as a remedial method and a review of the first year's surface water sample data. The TCEQ provides guidance for MNA as a remedial action in *Monitored Natural Attenuation Demonstrations* (Texas Natural Resource Conservation Commission [TNRCC], RG-366/TRRP-33, October 2001). Although LHAAP is being addressed under the Risk Reduction Standards rather than Texas Risk Reduction Program (TRRP), this guidance is comparable to USEPA guidance and may be used as a guideline for the evaluation of the groundwater data. TRRP guidance specifies recommended lines of evidence to document the occurrence of natural attenuation at a site. For the first annual report, primary and secondary lines of evidence will be evaluated to document that attenuation is occurring at LHAAP-35B(37) and LHAAP-67. The primary line







LEGEND

- Approximate LHAAP Boundary
- Road
- Stream
- Site
- LHAAP Water Supply Well

LEGEND

- Road
- Stream
- Site
- Approximate LHAAP Boundary
- LHAAP Water Supply Well

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Houston, TX	B. Lu 10/12/07	N. Olson 10/31/07	P. Srivastav 10/31/07	T:\GIS\Longhorn\MXD\ST35B67\ROD\SiteLocs.mxd

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2-2
SITE LOCATION MAP
REMEDIAL DESIGN
LHAAP-35B(37) AND LHAAP-67, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

LHAAP-67, 67-2

NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-67 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2014-000013308

*****DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT*****

NOTICE

8 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 12/09/2014 10:42 AM **Document Number:** 2014-000013308 **Receipt No:** 1415412 **Amount:** $ 50.00 **By:** Pam Rockwell, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

AECOM
ATTN: AMANDA LAGARDE (FEDEX ENV)
112 E PECAN ST., SUITE 400
SAN ANTONIO, TX 78205

STATE OF TEXAS HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROL AT LHAAP-67

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed remedial activities at the land described herein. The remediation site is in a former industrial area, located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-67 (Underground Storage Tank Farm Area). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-67 were performed in accordance with the FFA requirements.

The LHAAP-67 site, when operational, consisted of seven aboveground storage tanks used for storage of No. 2 fuel oil, kerosene, and solvents. The tanks were surrounded by earthen dikes designed to contain potential spills. A Record of Decision (ROD) for LHAAP-67 was signed by the U.S. Army and USEPA with TCEQ concurrence in 2010 establishing the final remedy which consists of a land use control (LUC) in conjunction with monitored natural attenuation (MNA). The site was not remediated to levels suitable for unrestricted use. The LUC at LHAAP-67 is required to prevent human exposure to contaminated groundwater. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public

Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-67 parcel is a 4 acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Within the LHAAP-67 parcel is designated a LUC boundary which is a 6.088-acre tract, more or less, as described in Exhibit A. The LUC boundary is also presented in the attached Figure 1.

Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. For purposes of this certification, residential use includes, but is not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.The United States Department of the Army has undertaken careful environmental study of the LHAAP-67 site and concluded that the LUC set forth below is required to ensure protection of human health and the environment.

(1) Groundwater Restriction. The groundwater use restriction boundary consists of the 6.088-acre tract, more or less. Groundwater underlying this land is contaminated with trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethane (1,2-DCA), 1,1,1-trichloroethane (1,1,1-TCA), and 1,1,2-trichloroethane (1,1,2-TCA), and other volatile organic compounds (VOCs) and shall not be accessed or used for any purpose without the prior written approval of the U.S. Army, the USEPA, and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA, and the TCEQ. A restriction against the residential use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE).

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 20 th day of November, 2014.

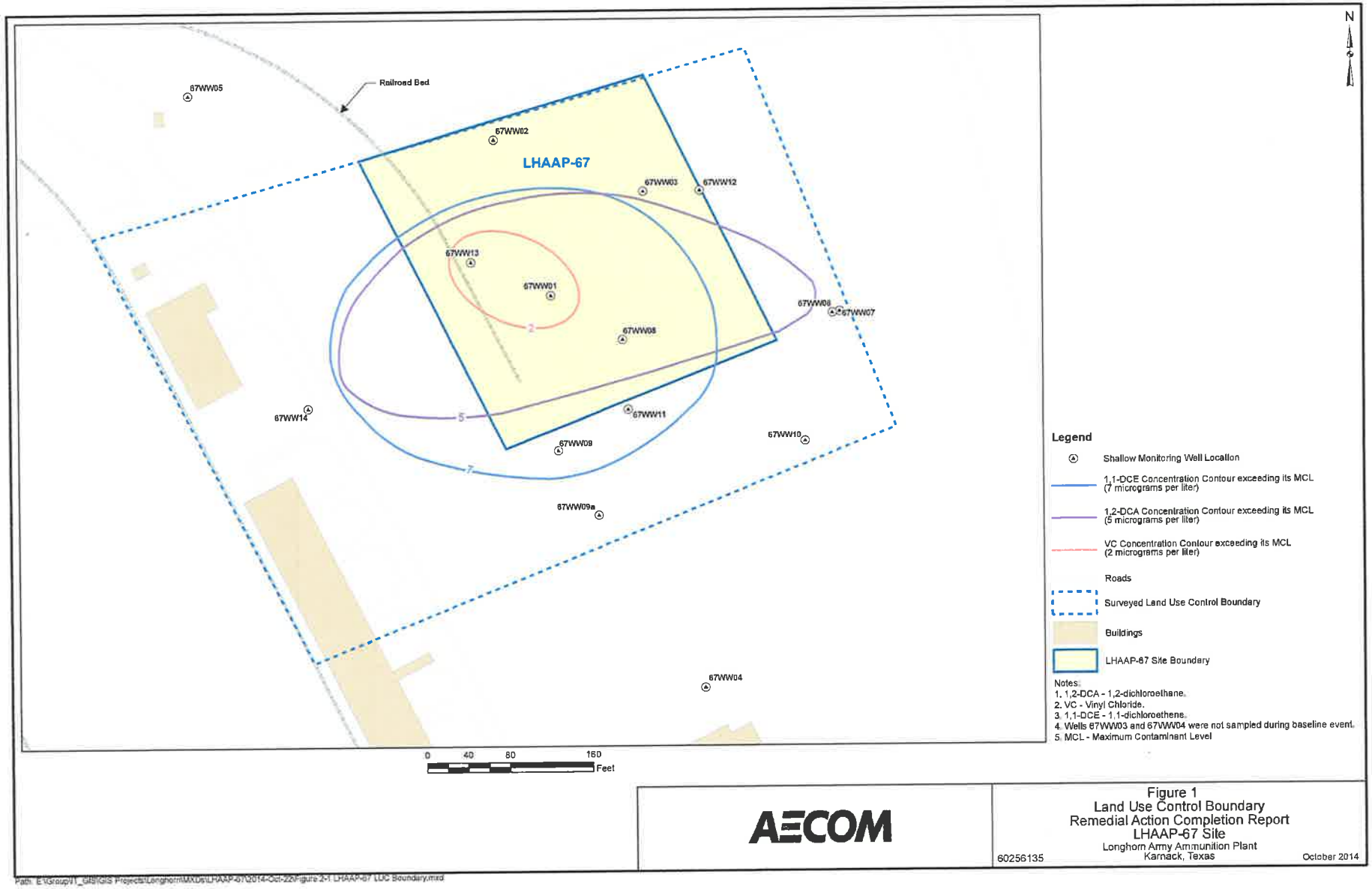
BEFORE ME, on this the 20 th day of November, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 20 day of November, 2014.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 03-17-2015

EXHIBIT A
SURVEY PLAT



AECOM

Figure 1
Land Use Control Boundary
Remedial Action Completion Report
LHAAP-67 Site
Longhorn Army Ammunition Plant
Karnack, Texas

60256135

October 2014

Path: E:\Group\1_GIS\GIS Projects\Longhorn\MXDs\LHAAP-67\2014-Oct-22\Figure 2-1 LHAAP-67 LUC Boundary.mxd

COUNTY CLERK'S MEMO
PORTIONS OF THIS
DOCUMENT NOT
REPRODUCIBLE
WHEN RECORDED

FIELD NOTES DESCRIPTION OF
"LHAAP-67" LAND USE CONTROL AREA
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, "LHAAP-67" Land Use Control Area being 6.088 acres of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), "LHAAP-67" Land Use Control Area being more particularly described as follows :

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9998636625, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "IGNATIUS-1" (N=6957090.304 feet E=3311081.788 feet) and "IGNATIUS-2" (N=6955582.752 feet E=3311851.704 feet). Said traverse indicates a surface distance of 1693.005 feet between said monuments. The computed land area is based on grid distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940" .

Commencing at monument "IGNATIUS-1" referenced above,

THENCE S 32deg49'15"W 145.39' to an I.R.O.P.C. set for the N.W.C. of this tract and this POINT OF BEGINNING,

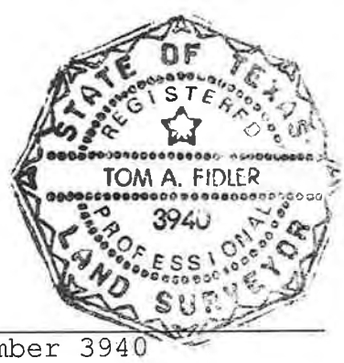
THENCE N 74deg08'33"E 654.97' along the N.B.L. of this tract to an I.R.O.P.C. set for this tract's N.E.C. ,

THENCE S 21deg34'17"E 390.25' along the E.B.L. of this tract to an I.R.O.P.C. set for this tract's S.E.C. ,

THENCE S 68deg21'49"W 605.17' along the S.B.L. of this tract to an I.R.O.P.C. set for this tract's S.W.C., from which monument "IGNATIUS-2" referenced above bears S 33deg05'59"E 1167.80' ,

THENCE N 27deg23'51"W 458.51' along the W.B.L. of this tract to this POINT OF BEGINNING, containing 6.088 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

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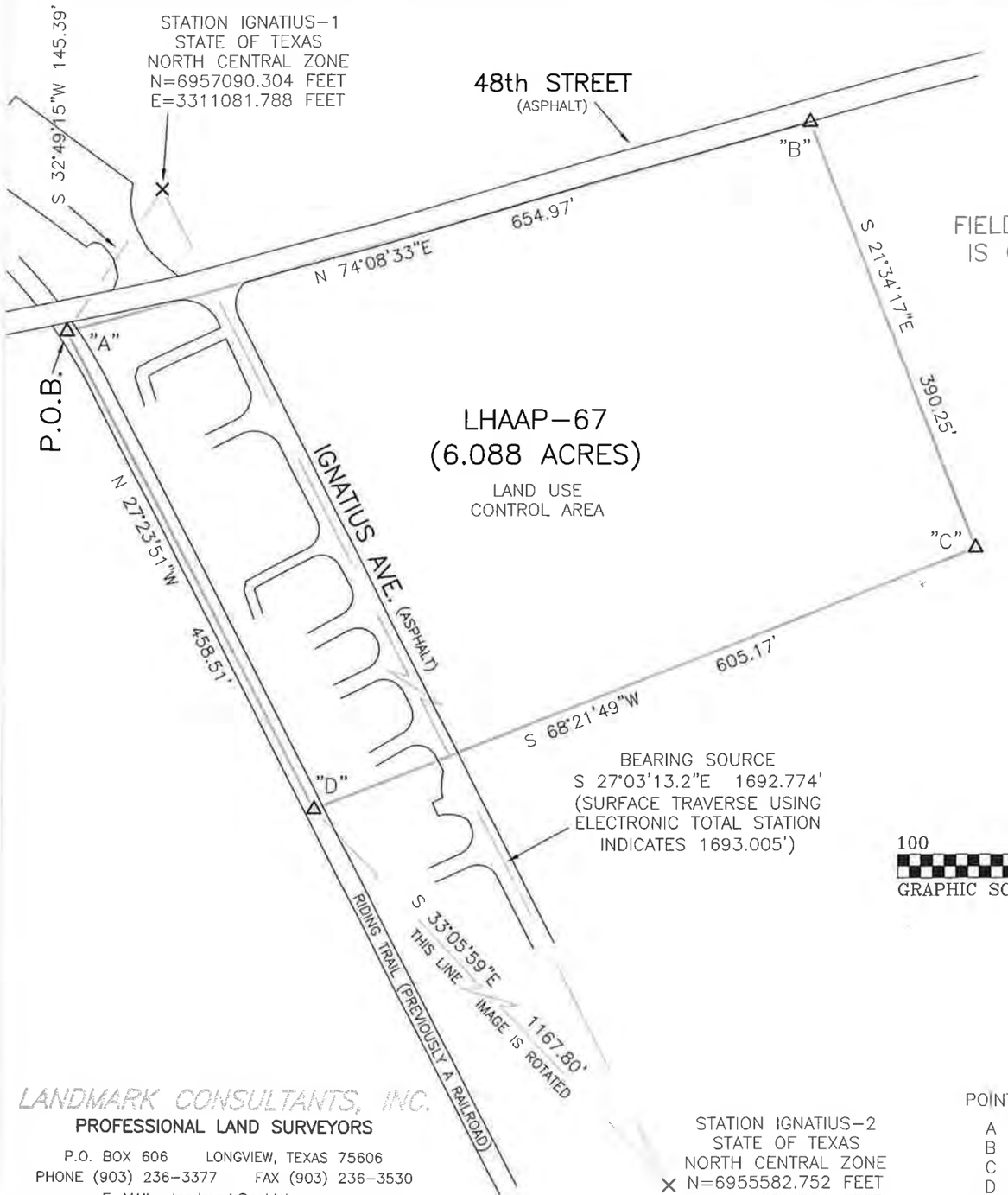


I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in October, 2014.

Witness my hand and seal this the 16th day of October, 2014.

FIELD NOTES DESCRIPTION IS ON SEPARATE SHEET

STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.9998636625 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS IGNATIUS-1 & IGNATIUS-2. THE COMPUTED LAND AREA IS BASED ON GRID DISTANCES.

SCALE 1"=100'

100 0 100 200 300

GRAPHIC SCALE - FEET

LEGEND

- X TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- O CONCRETE NAIL IN BOTTLE CAP (SET IN ASPHALT)
- △ 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "FIDLER" & "RPLS 3940" (SET)
- BOUNDARY LINE OF LAND USE CONTROL AREA

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

STATION IGNATIUS-2
STATE OF TEXAS
NORTH CENTRAL ZONE
X N=6955582.752 FEET
E=3311851.704 FEET

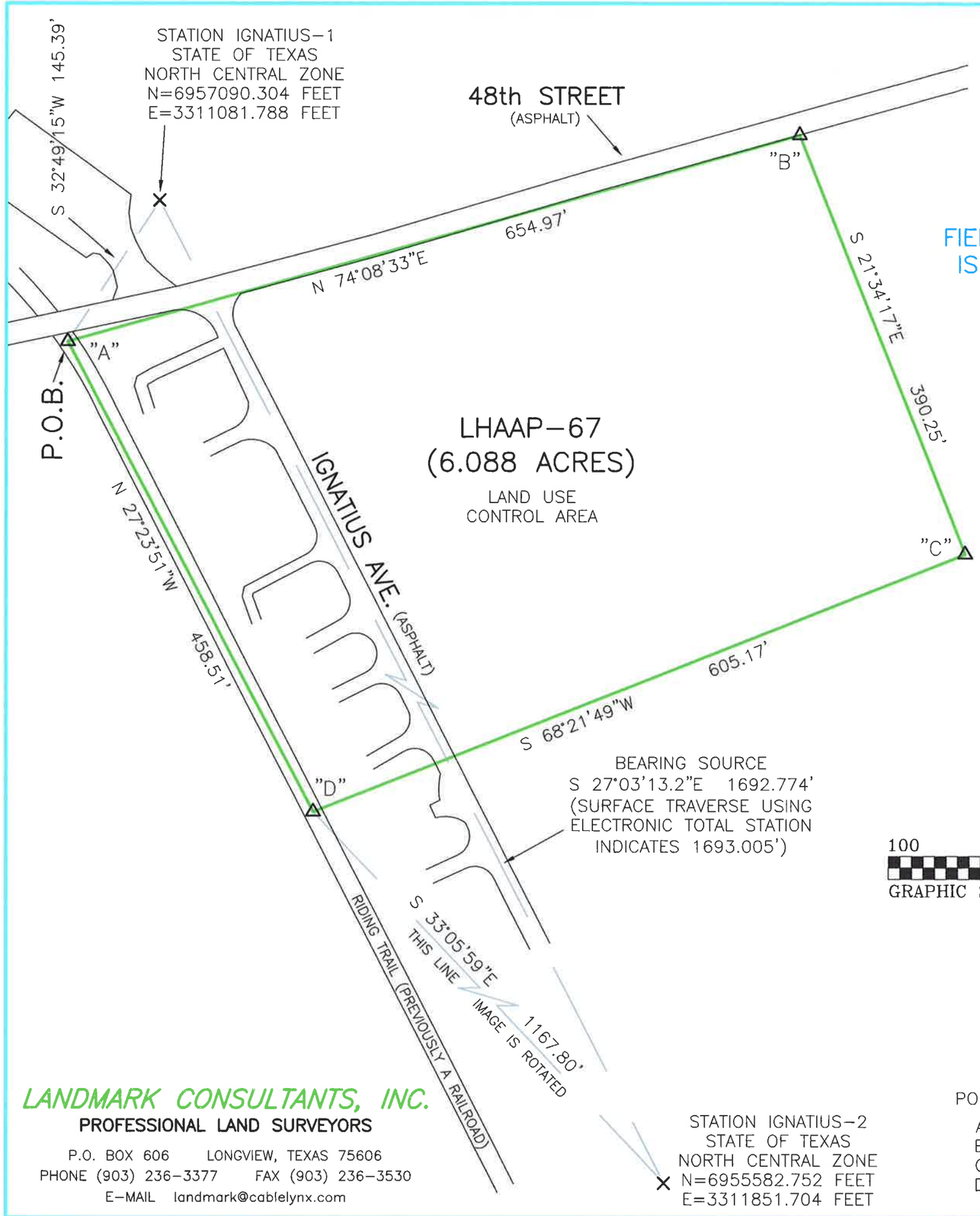
COORDINATE TABLE

POINT	NORTH	EAST
A	6956968.123	3311002.985
B	6957147.091	3311633.031
C	6956784.178	3311776.509
D	6956561.041	3311213.974

LHAAP-67 L.U.C.A.
(6.088 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	H.PTS H.LEG
10/16/2014	0605063H.DWG	DRAWN BY JTJ

00943421



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STATE OF TEXAS
REGISTERED
TOM A. FIDLER
3940
PROFESSIONAL
LAND SURVEYOR

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

SCALE 1"=100'

100 0 100 200 300
GRAPHIC SCALE - FEET

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LHAAP-67 L.U.C.A.
(6.088 ACRES)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	H.PTS H.LEG
10/16/2014	0605063H.DWG	DRAWN BY JTJ

LHAAP-67, 67-3

LAND USE CONTROL COMPLIANCE INSPECTION FORM

September 14, 2015

Sample Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated 8/1/11 for LHAAP-67, a certification of site was conducted by _____ [indicate transferee] on _____.

A summary of land use control mechanisms is as follows:

- Groundwater restriction - A restriction against use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UUUE). [Indicate whether groundwater restrictions are still required at LHAAP-67]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-67.

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title: _____

Signature: _____

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year.

LHAAP-68

NOTICE OF NONRESIDENTIAL LAND USE AT LHAAP-68 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2010-000005560

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

7 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/27/2010 04:08 PM **Document Number:** 2010-000005560 **Receipt No:** 1006195 **Amount:** $ 36.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW E & I
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, LHAAP-68, is located near the service station in the maintenance shops and power area of the former Longhorn Army Ammunition Plant (LHAAP). LHAAP-68 consisted of two mobile 600-gallon storage tanks on trucks that were parked on the asphalt surface at the service station of the maintenance complex. LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as the Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Although there are many sites at LHAAP that are specifically NPL listed, LHAAP-68 is not itself considered an NPL site. Environmental activities at LHAAP-68 progressed through the site investigation, at which point it was agreed by the Army and the TCEQ as the lead regulatory agency that no significant releases had occurred and the site could be closed under Texas Administrative Code (TAC) Risk Reduction Rule Standard 2.

LHAAP-68 is located at the maintenance complex next to the service station. Two mobile 600-gallon storage tanks on trucks were parked on the asphalt surface with no curb or other containment present. The mobile storage tanks contained No. 2 diesel and gasoline fuel. In 2006, six soil samples were collected, two from each of three borings that were installed at the site, and analyzed for semi volatile organic compounds, volatile organic compounds, and total petroleum hydrocarbons. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday

through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-68 parcel is 426 square foot, more or less, or 0.00977 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the LHAAP-68 site and USEPA and TCEQ concluded that no further investigation or action is required for LHAAP-68. Contaminants in soil samples from LHAAP-68 meet non-residential soil criteria in accordance with 30TAC§335.560(b).

Limited monitoring of LHAAP-68 will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-68 is consistent with the non-residential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951
or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-BDO (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 10 th day of March, 2010.

BEFORE ME, on this the 10 th day of March, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 10 day of March, 2010.

Notary Public in and for the State of Texas,
County of Harrison

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 3-17-2011

FIELD NOTES DESCRIPTION OF
"LHAAP-68" TRACT
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-68" being located within the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-68" being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999861727, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "X-11" (N=6960733.698 feet E=3304750.367 feet) and "C-21" (N=6956579.781 feet E=3308499.969 feet). Said traverse indicates a surface distance of 5596.714 feet between said monuments. The computed land area is based on surface distances.

Commencing at monument "X-11" referenced above,

THENCE S 42deg04'17.4"E 428.46' to a point, from which point monument "C-21" referenced above bears S 42deg04'17.4"E 5167.48',

THENCE S 47deg55'43"W 686.07' to a concrete nail (with head dimple) set in asphalt for the Northmost corner of this tract and this description's POINT OF BEGINNING,

THENCE S 44deg35'24"E 41.58' along the Northeast B.L. of this tract to an "X" set (chisled in concrete) for this tract's Eastmost corner,

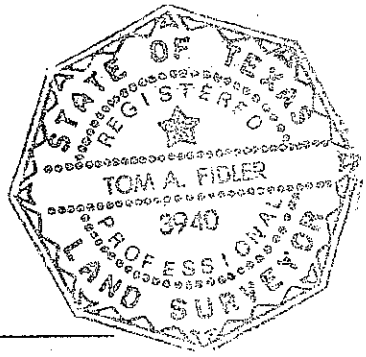
THENCE S 41deg38'18"W 9.34' along the Southeast B.L. of this tract to an "X" set (chisled in concrete) for this tract's Southmost corner,

THENCE N 46deg59'28"W 41.90' along the Southwest B.L. of this tract to a concrete nail (with head dimple) set in asphalt for this tract's Westmost corner,

THENCE N 43deg41'50"E 11.08' along the Northwest B.L. of this

tract to this POINT OF BEGINNING. This tract contains 426 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

STATION X-11 □
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6960733.696 FEET
E=3304750.367 FEET

S 42°04'17.4"E 428.46'

COORDINATE TABLE

POINT	NORTH	EAST
A	6959955.942	3304528.186
B	6959926.330	3304557.376
C	6959919.350	3304551.170
D	6959947.931	3304520.531

S 47°55'43"W 626.07'

"A" P.O.B.

N 42°04'17.4"W 14.68'

"D"

S 42°35'24"E 41.58'

426 SQ. FT.

N 46°55'29"W 41.90'

"B"

S 47°38'12"W 9.34'

"C"

NOTES:

□ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
△ INDICATES CONCRETE NAIL WITH LEAD DIMPLE (SET)
X INDICATES X CHISLED IN CONCRETE (SET)
O INDICATES UNMARKED POINT
* INDICATES BORE HOLE AS MARKED BY SHAW ENVIRONMENTAL

BEARING SOURCE BETWEEN
STATION X-11 & STATION C-21
IS S 42°04'17.4"E 5595.940'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 5596.714')

S 42°04'17.4"E 5167.48'

SCALE 1"=10'

10 0 10 20 30
GRAPHIC SCALE - FEET

STATION C-21
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6956579.781 FEET
E=3308490.969 FEET

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plot reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in August through October 2009.

Witness my hand and seal October 26, 2009.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999861727 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS X-11 & C-21. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES.

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-5377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

LHAAP-68
(426 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #0407088	0407088.CRD	S.PTS S.LEG
10/26/2009	09080745.DWG	DRAWN BY JTF

PISTOL RANGE

NOTICE OF NONRESIDENTIAL LAND USE AT PISTOL RANGE FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

September 14, 2015

2012-000000705

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

MISCELLANEOUS

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 01/19/2012 10:41 AM **Document Number:** 2012-000000705 **Receipt No:** 1200645 **Amount:** $ 32.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

SHAW ENVIRONMENTAL & INFRASTRUCTION GROUP
1401 ENCLAVE PARKWAY, SUITE 250

HOUSTON, TX 77077

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF NONRESIDENTIAL LAND USE

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas, in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The site, the former Pistol Range is located at the former Longhorn Army Ammunition Plant (LHAAP). LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA) became effective on December 30, 1991. The former Pistol Range is an NPL site and a removal action was performed in 2009 in accordance with the FFA requirements. As a result of the removal action, the lead agency has determined that no further CERCLA action is necessary at the former Pistol Range to protect public health, welfare or the environment.

The former Pistol Range is located in the southeastern portion of LHAAP, approximately 280 feet south of Avenue Q at the end of Robert Avenue. The site is the eastern portion of a rectangular field and is approximately 110 feet north to south by 150 feet east to west. The former Pistol Range was known to have been used by LHAAP security personnel for small arms target qualification and recertification. The former Pistol Range was established in the 1950s and was used intermittently through 2004. A no further action Record of Decision for the former Pistol Range was signed by USEPA in 2010

establishing no remedy was required. Further information may be found in the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or in the Administrative Record available at the Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The former Pistol Range is a 0.3879 acre tract located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A.

The United States Department of the Army has undertaken careful environmental study of the former Pistol Range and USEPA and TCEQ concluded that no further investigation or action is required.

Limited monitoring of the former Pistol Range will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of the former Pistol Range is consistent with the nonresidential use scenarios evaluated in the risk assessment. Future use of the parcel is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

III

The owner of the site is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951

or

Assistant Chief of Staff for Installation Management
ATTN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington D.C. 20310-0600

Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 21 th day of July, 2011.

BEFORE ME, on this the 21 th day of July, personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 21 day of July, 2011.

ANGELA HUMPHRIES
Notary Public State of Texas
COMM. EXP. 03-17-2015

Notary Public in and for the State of Texas,
County of Harrison

FIELD NOTES DESCRIPTION OF
FORMER PISTOL RANGE
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

The herein described tract of land is located in Harrison County, Texas, near the town of Karnack, being 16,897 square feet of land out of the Longhorn Ordance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract being more particularly described as follows :

Surveyor's Note : All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.9999146277, and is based on surface traverse using electronic total station between type "G" Corps of Engineers monuments "C-19-2" (N=6952844.320 feet E=3312839.019 feet) and "3-95" (N=6952411.298 feet E=3314136.438 feet). Said traverse indicates a surface distance of 1367.890 feet between said monuments. The computed land area is based on grid (State Plane) distances.

Commencing at monument "3-95" referenced above,

(As used herein, the abbreviation I.R.C. indicates 1/2" iron rod with R.P.L.S. #3940 orange plastic cap)

THENCE S 45deg51'27"E 855.98' to an I.R.C. set for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 00deg00'20"W 107.99' along the W.B.L. of this tract to an I.R.C. set for this tract's N.W.C. ,

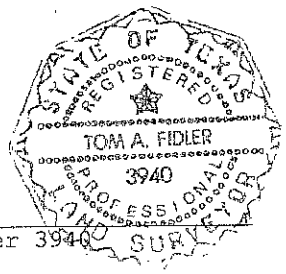
THENCE N 89deg59'47"E 155.96' along the N.B.L. of this tract to an I.R.C. set for this tract's N.E.C. ,

THENCE S 00deg32'56"E 107.99' along the E.B.L. of this tract to an I.R.C. set for this tract's S.E.C. ,

THENCE S 89deg59'43"W 156.98' along the S.B.L. of this tract to this POINT OF BEGINNING.

This tract contains 16,897 square feet, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

STATION C-19-2
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6952844.320 FEET
E=3312839.019 FEET

BEARING SOURCE BETWEEN
STATION C-19-2 & STATION 3-95
IS S 71°32'35.6"E 1367.773'
(SURFACE TRAVERSE USING
ELECTRONIC TOTAL STATION
INDICATES 1367.890')

STATION 3-95
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6952411.298 FEET
E=3314136.438 FEET

S 45°51'27"E
855.98'

COORDINATE TABLE

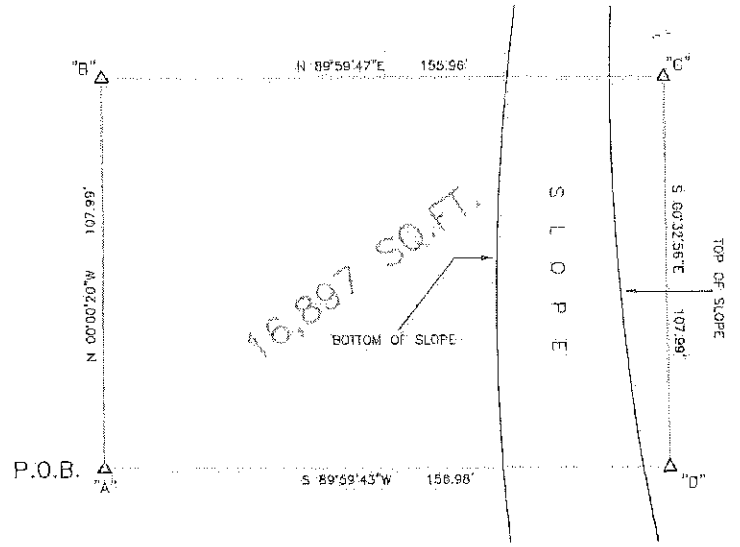
POINT	NORTH	EAST
A	6951923.143	3314750.686
B	6951815.153	3314750.697
C	6951815.166	3314907.681
D	6951923.153	3314906.647

LEGEND

□ INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
△ INDICATES 1/2" IRON ROD WITH R.P.L.S. #3940 CAP (SET)

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, NAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999914277 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS C-19-2 AND 3-95. THE COMPUTED LAND AREA IS BASED ON GRID DISTANCES.



LANDMARK SURVEYS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (903) 236-3377 FAX (903) 236-3530
E-MAIL landmark@cablelynx.com

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in April 2011.

Witness my hand and seal May 2, 2011.

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

SCALE 1"=30'

30 0 30 60 90
GRAPHIC SCALE - FEET

FIELD NOTES DESCRIPTION
IS ON SEPARATE SHEETS

FORMER PISTOL RANGE
(16,897 SQUARE FEET)
LONGHORN ARMY AMMUNITION PLANT
HARRISON COUNTY, TEXAS

JOB #1104040	0407088.CRD	L.PTS L.LEG
MAY 2, 2011	1103025L.DWG	DRAWN BY JTJ

LHAAP-001-R-01/LHAAP-003-R-01South Test Area (LHAAP-001-R-01) and Ground Signal Test Area (LHAAP-003-R-01), MMRP-1

LONG TERM MANAGEMENT INSPECTION AND MAINTENANCE CHECKLIST

October 15, 2018

LTM Inspection and Maintenance Checklist

General Information	
Project Name	LTM Inspection and Maintenance, LHAAP-001-R and LHAAP-003-R MMRP, Longhorn Army Ammunition Plant, Karnack, TX
Contractor	
Inspector's Name	
Inspector's Title	
Inspector's Signature	
Inspector's Contact Number	
Inspection Date	
Type of Inspection	☐ Quarterly ☐ Semiannual ☐ Annual ☐ Prior to forecast rain ☐ After rain event ☐ Other_____

	Description	Yes	No	N/A	**Comments** (Attach photos/location sketches)	**Corrective Action** (Attach photos)
A. Perimeter Signage						
A.1	Are there any damaged signs?					
A.2	Are there any missing signs?					
A.3	Are all signs legible?					
A.4	Is perimeter boundary mowed?					

A.5	Are signs visible from one sign to the next sign?					
B. LUC Boundary						
B.1	Is the LUC Boundary identifiable?					
C. Dig and Intrusive Activities restriction						
C.1	Any observed digging activities or similar intrusive activities within the site boundaries?					

Note: Annual compliance inspections shall be conducted no later than March 1 of each year for the previous calendar year and filed onsite.

LHAAP-001-R-01/LHAAP-003-R-01
South Test Area (LHAAP-001-R-01) and Ground Signal Test Area (LHAAP-003-R-01), MMRP-2
LUCs FROM FINAL REMEDIAL DESIGN

October 15, 2018

FINAL
LAND USE CONTROL REMEDIAL DESIGN/ REMEDIAL ACTION CONSTRUCTION REPORT LHAAP-001-R-01 AND LHAAP-003-R-01 LONGHORN ARMY AMMUNITION PLANT

May 2018

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

Performance Based Remediation (PBR)
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

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Figures

Figure 1-1 LHAAP Site Map
Figure 1-2 LHAAP-001-R and LHAAP-003-R Site Location Map with LUC Boundaries
Figure 3-1 Danger UXO Warning Sign

Attachment

Attachment 1 - Initial Notice of Land Use Controls Including 2008 LUC Boundary Maps for LHAAP-001-R and LHAAP-003-R
Attachment 2 - Initial Notice of Land Use Controls for Four Environmental Sites at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas Transmittal Letters

Attachment 3 - Notice of Land Use Controls Including Final LUC Boundary Maps for LHAAP-001-R and LHAAP-003-R
Attachment 4 - Notice of Land Use Controls for Two Environmental Sites at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas Transmittal Letters

Appendices

Appendix A LTM Inspection and Maintenance Checklist
Appendix B LUC Compliance Certification Form
Appendix C Recordation of Land Use Controls for LHAAP-001-R and LHAAP-003-R

ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
BIP	Blow-in-place
CD	Cultural debris
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CTT	Closed, Transferring, and Transferred
DNT	Dinitrotoluene
DoD	Department of Defense
ECP	Environmental Condition of Property
EE/CA	Engineering Evaluation/Cost Analysis
e2M	Engineering-Environmental Management
FFA	Federal Facility Agreement
GW-Ind	Groundwater-Industrial
HMX	1,3,5,7-Tetranitro-1,3,5,7-tetrazocane
IRP	Installation Restoration Program
LHAAP	Longhorn Army Ammunition Plant
LUC	Land use control
µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
MC	Munitions constituent
MCL	Maximum Contaminant Level
MD	Munitions debris
MEC	Munitions and Explosives of Concern
mm	Millimeter
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement
MPPEH	Material potentially presenting explosive hazard
MRS	Munitions response site
MSC	Medium Specific Concentration
NCP	National Contingency Plan
NFA	No Further Action
NPL	National Priorities List
OB/OD	Open burn/open detonation
O&M	Operation and maintenance
PCL	Protective Concentration Level
RACR	Remedial Action Completion Report
RAO	Remedial action objective
RD	Remedial design
RDX	1,3,5-Trinitro-1,3,5-triazinane
ROD	Record of Decision

SARA	Superfund Amendments and Reauthorization Act
§	Section
SI	Site Inspection
STEP	Solutions to Environmental Problems
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TNT	Trinitrotoluene
TRRP	Texas Risk Reduction Program
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UU/UE	Unlimited Use/Unlimited Exposure
UXO	Unexploded Ordnance
WP	White phosphorus

3 LAND USE CONTROL REMEDIAL DESIGN/REMEDIAL ACTION CONSTRUCTION

The remedial action objective for LHAAP-001-R and LHAAP-003-R is protection of human health and safety from explosive hazards that may have remained at the sites after the MEC removal action. The duration for the LUCs specified in the MEC ROD for this purpose must remain in place until it is demonstrated that the MEC no longer presents a threat to public/human safety.

This section describes the LUC RD/RAC for LHAAP-001-R and LHAAP-003-R. Per the Final ROD, the LUCs' performance objectives are to:

- Prohibit the development and use of the property for residential housing, elementary and secondary schools, child care facilities, and playgrounds.
- Restrict land use to nonresidential
- Prohibit intrusive activities such as digging or any other activity which could result in explosive safety risk.
- Maintain existing MEC warning signs at the perimeter of each site to physically demarcate controlled areas.

The implementation, maintenance, and inspection requirements associated with each of the performance objectives that comprise this LUC RD/RAC are described below. The actions taken to implement the LUC objectives during the remedial action phase, as well as ongoing maintenance, monitoring, and reporting requirements are presented in Section 3.1 below. Upon regulatory review and concurrence with the final LUC RD/RACR, it will be distributed as part of the Comprehensive LUC Management Plan.

For portions of LHAAP-001-R and LHAAP-003-R subject to LUCs that are not owned by the Army, the Army will monitor and report on the implementation, maintenance, and enforcement of LUCs, and coordinate with federal, state, and local governments and owners and occupants of properties subject to LUCs. The Army remains responsible for ensuring that the remedy remains protective of human health and safety.

3.1 LUC Implementation (Completed)

The actions required to implement the LUCs for LHAAP-001-R and LHAAP-003-R are described below. An initial notice of LUCs, was completed on December 8, 2016 (**Attachments 1 and 2**), within 90 days of ROD signature as required. The notice of LUCs including the final LUC boundary maps and description of the LUCs were completed on May 9, 2018 (**Attachments 3 and 4**). The preliminary LUC boundaries presented in the initial notice are considered the final LUC boundaries presented in the notice of final LUCs and are presented on **Figure 1-2.** The following actions were undertaken to implement LUCs for LHAAP-001-R and LHAAP-003-R:

- Finalize the boundaries of the LUCs as part of the remedial action (completed). The preliminary LUC boundaries are considered the final LUC boundaries, as referenced on **Figure 1-2**.
- Survey the LUC boundaries (completed). The boundaries were finalized based on USEPA and TCEQ concurrence, and the LUC boundaries were surveyed by a State of Texas licensed surveyor. A legal description of the surveyed area accompanies the survey plat.
- Record the LUCs in Harrison County. The LUC plats and legal descriptions and LUC restriction language was recorded in the Harrison County Courthouse in accordance with Title 30 TAC §335.566 on April 19, 2018 (**Appendix C**).
- Provide notice of LUCs with finalization of the RD/RACR (completed).
    - Prepare the notice of land use restrictions including prohibiting development/use for residential housing, elementary and secondary schools, child care facilities and play grounds; prohibit intrusive activities, and maintenance of existing MEC warning signs along the perimeter of each site to physically demarcate controlled areas. The notice consists of a brief description of the LUCs and a figure depicting the LUC boundaries.
    - Transmit the notice to federal, state, and local governments involved at LHAAP-001-R and LHAAP-003-R and owners and occupants of the property subject to restrictions and LUCs. The notices have been sent to federal, state, and local officials including: State Representatives, the Harrison County Judge, Harrison County Historical Courthouse, the City of Uncertain Mayor, and Caddo Lake and Leigh Water Supply Corporations' Presidents. Notice has also been sent to the Caddo Lake National Wildlife Refuge Manager, as a representative of the USFWS, the future transferee of the property.

3.2 Maintenance and Monitoring

Components of the final remedy at LHAAP-001-R and LHAAP-003-R require repair and maintenance and those activities are described in this section, along with other routine maintenance activities. The following subsections present the maintenance and monitoring requirements of the final remedy.

3.2.1 Maintenance of Existing MEC Warning Signs

MEC warning signs have been installed at the perimeter of LHAAP-001-R and LHAAP-003-R (64 signs at each site), that serve as a physical demarcation of the controlled areas. The signs have visibility from one sign to the next with a maximum spacing of 100 feet. The signs include warning of potential presence of MEC and state the restriction against intrusive activities.

These signs will be visually inspected annually, or as needed, to ensure they remain intact, undamaged, and visible from one sign to the next. Maintenance will be conducted, as needed, and may include the following activities:

- Mowing and brush clearing around MEC warning signs to ensure that they are visible from one sign location to the next sign location.
- Rehanging/affixing MEC warning signs or replacing MEC warning sign(s), if they become damaged or illegible. Figure 3-1 presents an example of the Unexploded Ordnance (UXO) Danger signs that are required. The specifications for sign replacement are found in Appendix N of the MEC Removal Action report (EODT, 2009).
- Repairing existing MEC warning sign posts, which may require the reestablishment of the concrete base or post replacement.

The Inspection and Maintenance Checklist is provided in **Appendix A.** Repairs will also be documented via photographs and field notes.

3.2.2 Administrative Maintenance

Administrative maintenance required to ensure LUCs remain in place and effective include:

- Annual field inspections of LHAAP-001-R and LHAAP-003-R to confirm that no violations of the LUCs have occurred. Documentation of the inspection will be included on the Inspection and Maintenance Checklist (see **Appendix A**).
- Annual certifications that no LUC-restricted activities have been authorized and that LHAAP-001-R and LHAAP-003-R conditions and use are consistent with the LUCs. The Annual LUC Compliance Certification Form is presented in **Appendix B**.
- Periodic transmittal of a LUC Notice to federal, State, and local authorities and to owners and occupants of LHAAP-001-R and LHAAP-003-R. The notice will include the land use restrictions referenced in the ROD, a written description of the LUCs, and a figure depicting the LUC boundaries. The transmittal will coincide with each Five Year Review and will be documented in the report.
- The final LUC RD/RACR will be added to the Comprehensive LUC Management Plan and the plan will be provided to the owner or occupant of LHAAP-001-R and LHAAP-003-R. This update to the Comprehensive LUC Management Plan will be completed during the next annual update, which will be in the fourth quarter of 2018.

The U.S. Army will address LUC problems within its control that are likely to impact remedy integrity and shall address problems as soon as practicable.

3.3 Reporting of LUC Inspection and Monitoring

Beginning with finalization of this RD/RACR and approval of the Inspection and Maintenance forms and the Annual Certification Form, the U.S. Army will undertake inspections and certify continued compliance with the LUC objectives. The U.S. Army, or the transferee after transfer, will retain the LUC Inspection and Certification documents in the project files for incorporation into the Five Year Review reports, and these documents will be made available to USEPA and TCEQ upon request. In addition, should any violations be found during the certification, the U.S. Army will provide to USEPA and TCEQ, along with the document, a separate written explanation indicating the specific violations found and what efforts or measures have or will be taken to correct those violations. The need to continue inspections and certifications will be revisited during each Five Year Review.

3.3.1 Notice of Planned Property Conveyances

Upon transfer of Army-owned property, the Army will provide written notice of the LUCs to the transferee of the potential presence of MEC and any land use restrictions referenced in the ROD. Within 15 days of transfer, the U.S. Army will provide written notice to USEPA and TCEQ of the division of implementation, maintenance, and enforcement responsibilities unless such information has already been provided in the LUC RD/RACR. The notice will describe the mechanism by which the LUC will continue to be implemented, maintained, inspected, reported, and enforced. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the Environmental Condition of Property (ECP) or other environmental document for transfer. Although the U.S. Army may transfer responsibility for various implementation actions, the U.S. Army will also retain ultimate responsibility for the remedy integrity. This means that the U.S. Army is responsible for addressing substantive violations of the LUC performance objectives that would undermine the U.S. Army's CERCLA remedy. The U.S. Army also will be responsible for incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation. In the event property is transferred out of Federal control, the LUCs relating to property restrictions shall be recorded in the deed and shall be enforceable by the U.S. and the state of Texas.

3.3.2 Opportunity to Review Text of Intended LUCs

The U.S. Army provided a copy of the land use restriction notification to TCEQ for review and approval prior to its recordation in Harrison County. The USEPA also received a copy for review. The U.S. Army will produce an ECP or other environmental document for transfer of LHAAP-001-R and LHAAP-003-R, but before executing transfer, the U.S. Army will provide the USEPA and TCEQ with a copy of the ECP or other environmental document for transfer so that they may have reasonable opportunity, before transfer, to review all LUC-related provisions.

3.3.3 Notification Should Action(s) which Interfere with LUC Effectiveness be Discovered Subsequent to Conveyance

Should the U.S. Army discover, after conveyance of the site, any activity on the property inconsistent with the LUC performance objectives, the U.S. Army shall notify the USEPA and TCEQ within 72 hours of such discovery. Consistent with Section 4.3.4 below, the U.S. Army will then work with the USEPA, TCEQ, and the transferee to correct the problem(s) discovered. This reporting requirement does not preclude the U.S. Army from taking immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health and safety.

3.3.4 LUC Enforcement

Should the LUC remedy reflected in this LUC RD/RACR fail, the U.S. Army will coordinate with the USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the USFWS or its lessee, to the institution of judicial action against non-federal third parties. Alternatively, should the circumstances warrant such, the U.S. Army could choose to exercise its response authorities under CERCLA. Should the U.S. Army become aware that any future owner or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction, the U.S. Army may notify those agencies of such violation(s) and work cooperatively with them to re-achieve owner/user compliance with the LUC.

3.3.5 Modification or Termination of LUCs

The LUCs shall remain in effect until such time as the U.S. Army and USEPA agree that it has been demonstrated that MEC no longer presents a threat to public/human safety, allowing unrestricted property use. When this occurs, the LUCs will be terminated, as needed. The decision to terminate the LUC will be documented consistent with the National Contingency Plan (NCP) process for post-ROD changes, potentially including an explanation of significant differences or a RACR. If the property has been transferred and a determination by the U.S. Army and USEPA has been made to terminate the LUC, the U.S. Army shall provide to the owner of the property an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

SOUTH TEST AREA (LHAAP-001-R-01) AND GROUND SIGNAL TEST AREA (LHAAP-003-R-01), MMRP-3
NOTICE OF LAND USE CONTROLS AND NONRESIDENTIAL LAND USE AT LHAAP-001-R-01 AND LHAAP-003-R-01 FILED IN PUBLIC RECORDS OF HARRISON COUNTY, TEXAS (INCLUDING SURVEY PLAT)

Date October 4, 2019

00943455

DATE

DAIM-ODB-LO

John Doe
1234 Any Street
Anywhere, TX 56789

Re: Notice of Land Use Controls for two environmental sites at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas

The final Land Use Control (LUC) Remedial Design (RD)/Remedial Action Construction Report (RACR) for two sites at LHAAP was completed in 2018. The two sites are: LHAAP-001-R South Test Area/South Bomb Area and LHAAP-003-R Ground Signal Test Area.

The attached information is provided to fulfill a requirement of the LUC RD/RACR to give notice of the groundwater and soil (surface and subsurface) contamination and any land use restrictions referenced in the ROD. The selected remedy of land use controls has been implemented at both sites. The notices are being sent to federal, state and local governments involved at these sites and the owners and occupants of the properties subject to the use restrictions and land use controls.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Three Enclosures
Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX
A. Palmie, TCEQ, Austin, TX
Administrative Record

EXAMPLE

00943456

2018-000004040

DO NOT REMOVE THIS PAGE – IT IS A PART OF THIS INSTRUMENT

NOTICE

6 Pages

FILED AND RECORDED – OPR	CLERKS NOTES
On: 04/19/2018 02:27 PM **Document Number:** 2018-000004040 **Receipt No:** 1804258 **Amount:** $ 42.00 **By:** Ann Turner, **Deputy** **Patsy Cox, County Clerk** **Harrison County, Texas**	

COUNTY COURT
COUNTY OF HARRISON, TEXAS

STATE OF TEXAS
COUNTY OF HARRISON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Harrison County, Texas.

Patsy Cox

Patsy Cox, Harrison County Clerk

Record and Return To:

KIM NEMMERS
4085 ASPEN LANE

EVERGREEN, CO 80439

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROLS

KNOW ALL MEN BY THESE PRESENTS THAT:
Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a removal of munitions and explosives of concern on the land described herein. Longhorn Army Ammunition Plant (LHAAP) Munition Response Sites (MRSs) LHAAP-001-R (South Test Area/Bomb Test Area) and LHAAP-003-R (Ground Signal Test Area) are former military test areas located in the southern and southeastern portions of LHAAP, respectively. LHAAP was placed on the National Priorities List (NPL) in August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA) and the TCEQ entered into an agreement under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. MRSs LHAAP-001-R and LHAAP-003-R are co-located with NPL sites LHAAP-27 and LHAAP-54, respectively and are also considered NPL sites. Remedial activities at these sites were performed in accordance with the FFA requirements.

MRS LHAAP-01-R was constructed in 1954 and was used for testing photoflash bombs produced at the facility until approximately 1956. During the late 1950s, illuminating signal devises were also demilitarized within pits excavated in the vicinity of the test pad. During the 1960s, leaking production items may have been demilitarized by detonation. LHAAP-001-R was identified as an MRS based on the visual confirmation of MEC.

MRS LHAAP-003-R was used intermittently in April 1963 for aerial and on-ground testing and destruction of a variety of devices, including pyrotechnic signal devices, red phosphorus smoke wedges, infrared flares, illuminating mortar shells and cartridges, button bombs and various types of explosive simulators. The site was used intermittently over a 20-year period for testing and burn-out of rocket motors. From late 1988 through 1991, the site was used for the burn-out of Pershing missile rocket motors and, occasionally, leaking white phosphorus munitions were burned at the site as a demilitarization activity. LHAAP-003-R was identified as an MRS based on the reported presence of MEC.

Non-time critical removal actions (NTCRAs) for MEC removal were conducted at both sites in 2008. A Final Record of Decision (ROD) for LHAAP-001-R and LHAAP-003-R was issued in August 2016, which documents the final selected remedy for the sites, including the implementation of Land Use Controls (LUCs) designed to promote ongoing protection of human safety against potential explosive hazards that may have remained at the sites following the MEC removal actions. The LUCs' performance objectives are to prohibit residential use, to restrict land use to non-residential, and to prohibit intrusive activities such as digging or any other activity which could result in explosive safety risks.

Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E (Room 103. first floor) 12100 Park 35 Circle, Austin, Texas 78753, (512) 239-2900, Monday through Friday 8:00 am to 5:00 pm, or the Administrative Record available at the Marshall Public Library, 300 South Alamo Boulevard, Marshall, Texas 75670, (903) 935-4465, Monday, Tuesday and Thursday 9:30AM – 7:30PM, Wednesday and Friday 9:30AM – 5:30PM, and Saturday 9:30AM – 3:30PM.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public on the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

MRS LHAAP-001-R covers an area of approximately 72.14 acre-tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in **Exhibit A**. The entire LHAAP-001-R parcel is within a LUC boundary which is described in **Exhibit A**.

MRS LHAAP-003-R covers an area of approximately 79.53 acre-tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in **Exhibit B**. The entire LHAAP-003-R parcel is within a LUC boundary which is described in **Exhibit B**.

The United States Department of the Army has undertaken careful environmental study of MRSs LHAAP-001-R and LHAAP-003-R and the USEPA and TCEQ concluded that LUCs should remain in place until it is demonstrated that MEC no longer presents an explosive hazard.

Future use of these sites is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. The LUCs placed on the property to ensure appropriate future use include:

(1) Use must remain non-residential as described above. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences, child care facilities, nursing home or assisted living facilities, and any type of educational purpose for children/young adults in grades kindergarten through 12. This LUC will remain in place until it is demonstrated that the MEC no longer present a threat to human safety/health.

(2) No intrusive activity shall be permitted, which includes digging or any other activity which could result in explosive safety risks, without prior consent. This LUC will remain in place until it is demonstrated that the MEC no longer present an explosive hazard. Intrusive subsurface activities may occur provided that the Army and the EPA approve such intrusive subsurface activities before they are commenced and provided that they are undertaken by qualified personnel who are trained in explosives safety measures.

III

The owner of these sites is the Department of the Army, and its address where more specific information may be obtained is as follows:

ATTN: DAIM-ODB-LO (R. Zeiler)
Post office Box 220
Ratcliff, AR 72951
Or
Assistant Chief of Staff for Installation Management
ATN: DAIM-ODB (T. Lederle)
600 Army Pentagon
Washington, D.C. 20310-0600

Rose M. Zeiler
Longhorn AP Site Manager

EXECUTED this the 19th day of April, 2018.

BEFORE ME, on this 19th day of April personally appeared Rose M. Zeiler, of the United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 19th day of April, 2018.

JENNIFER LESTER
Notary Public State of Texas
COMM. EXP. 1/3/2019
NO. 128484987

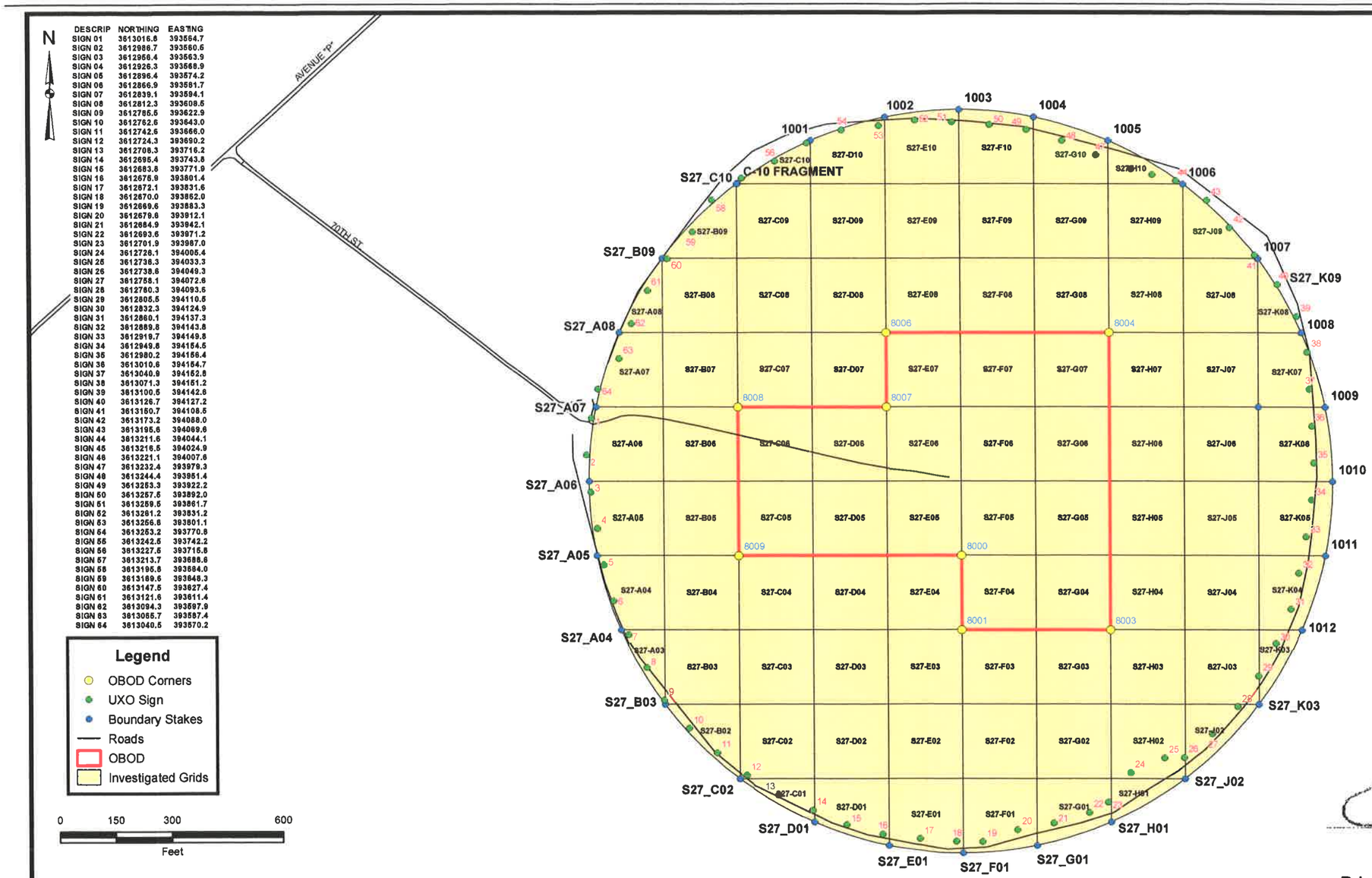
Notary Public in and for the State of Texas,
County of Harrison

Exhibit A
LHAAP-001-R, South Test Area/South Bomb Area
Longhorn Army Ammunition Plant, Karnack, Texas

DESCRIP	NORTHING	EASTING
SIGN 01	3613016.8	393564.7
SIGN 02	3612986.7	393560.5
SIGN 03	3612956.4	393563.9
SIGN 04	3612926.3	393568.9
SIGN 05	3612896.4	393574.2
SIGN 06	3612866.9	393581.7
SIGN 07	3612839.1	393594.1
SIGN 08	3612812.3	393608.5
SIGN 09	3612785.6	393622.9
SIGN 10	3612762.6	393643.0
SIGN 11	3612742.6	393666.0
SIGN 12	3612724.3	393690.2
SIGN 13	3612708.3	393716.2
SIGN 14	3612695.4	393743.6
SIGN 15	3612683.8	393771.9
SIGN 16	3612676.9	393801.4
SIGN 17	3612672.1	393831.6
SIGN 18	3612670.0	393862.0
SIGN 19	3612669.6	393893.3
SIGN 20	3612679.6	393912.1
SIGN 21	3612684.9	393942.1
SIGN 22	3612693.6	393971.2
SIGN 23	3612701.9	393987.0
SIGN 24	3612726.1	394005.4
SIGN 25	3612736.3	394033.3
SIGN 26	3612738.6	394049.3
SIGN 27	3612758.1	394072.6
SIGN 28	3612780.3	394093.5
SIGN 29	3612805.5	394110.5
SIGN 30	3612832.3	394124.9
SIGN 31	3612860.1	394137.3
SIGN 32	3612889.8	394143.8
SIGN 33	3612918.7	394149.8
SIGN 34	3612949.8	394154.5
SIGN 35	3612980.2	394156.4
SIGN 36	3613010.6	394154.7
SIGN 37	3613040.9	394152.8
SIGN 38	3613071.3	394151.2
SIGN 39	3613100.5	394142.6
SIGN 40	3613126.7	394127.2
SIGN 41	3613150.7	394108.5
SIGN 42	3613173.2	394088.0
SIGN 43	3613195.6	394069.6
SIGN 44	3613211.6	394044.1
SIGN 45	3613216.5	394024.9
SIGN 46	3613221.1	394007.6
SIGN 47	3613232.4	393979.3
SIGN 48	3613244.4	393951.4
SIGN 49	3613253.3	393922.2
SIGN 50	3613257.5	393892.0
SIGN 51	3613259.5	393861.7
SIGN 52	3613261.2	393831.2
SIGN 53	3613256.6	393801.1
SIGN 54	3613253.2	393770.8
SIGN 55	3613242.5	393742.2
SIGN 56	3613227.5	393715.6
SIGN 57	3613213.7	393688.6
SIGN 58	3613195.8	393664.0
SIGN 59	3613189.5	393648.3
SIGN 60	3613147.5	393627.4
SIGN 61	3613121.6	393611.4
SIGN 62	3613094.3	393597.9
SIGN 63	3613065.7	393587.4
SIGN 64	3613040.5	393570.2

DESCRIP	NORTHING	EASTING
8000	3612904.2	393867.3
8001	3612843.2	393867.3
8003	3612843.2	393989.2
8004	3613087.0	393989.2
8006	3613087.1	393806.4
8007	3613026.1	393806.4
8008	3613026.1	393684.4
8009	3612904.2	393684.4

DESCRIP	NORTHING	EASTING
1001	393745.4	3613244.5
1002	393806.4	3613263.8
1003	393867.3	3613269.9
1004	393928.3	3613263.8
1005	393989.2	3613244.5
1006	394050.1	3613209.0
1007	394111.0	3613148.0
1008	394146.5	3613087.0
1009	394165.8	3613026.1
1010	394171.9	3612965.1
1011	394165.8	3612904.2
1012	394146.5	3612843.2
C-10 FRAGMENT	393685.2	3613209.4
S27_A04	393568.0	3612843.2
S27_A05	393568.7	3612904.2
S27_A06	393562.5	3612965.1
S27_A07	393568.6	3613026.1
S27_A08	393687.9	3613087.1
S27_B03	393623.8	3612782.3
S27_B09	393623.8	3613148.0
S27_C02	393684.6	3612721.3
S27_C10	393684.4	3613209.0
S27_D01	393745.4	3612885.9
S27_E01	393806.4	3612666.6
S27_F01	393867.3	3612660.5
S27_G01	393928.3	3612666.7
S27_H01	393989.3	3612886.0
S27_J02	394049.9	3612721.3
S27_K03	394110.9	3612782.3
S27_K07	394111.2	3613026.1
S27_K09	394111.2	3613147.9



Datum: NAD83 UTM
Monument: Longhorn Army Ammunition Plant
Monument BG-1 with coordinates
NORTHING-3614801.46,
EASTING-395385.09

I, David R. Collins, Registered Professional Land Surveyor No. 1954, do hereby certify that this plat correctly represents the results of a survey made under my supervision August 4 through September 23, 2008.

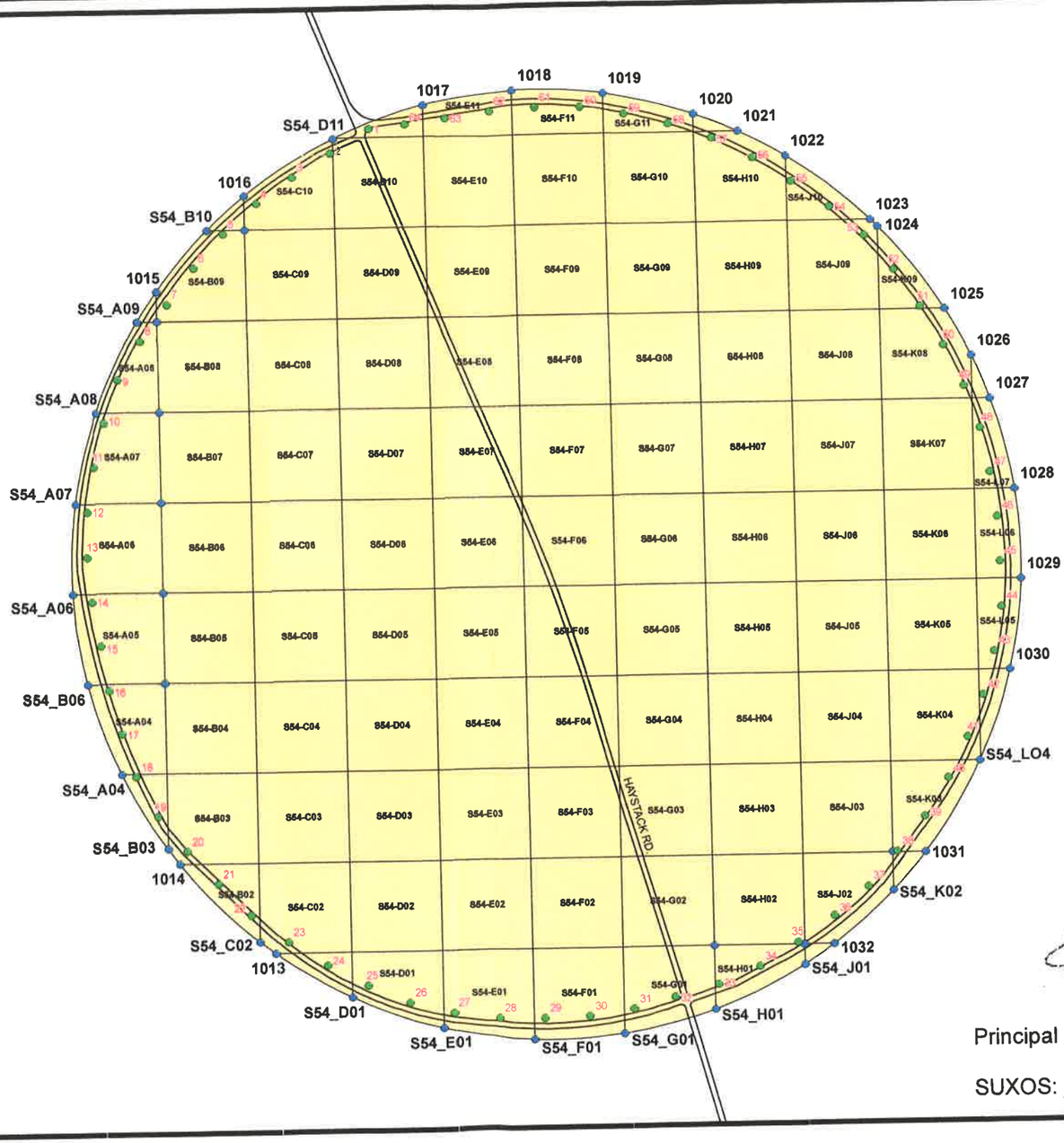
Principal of the firm: _____

SUXOS: _____

Exhibit B
LHAAP-003-R, Ground Signal Test Area
Longhorn Army Ammunition Plant, Karnack, Texas

DESCRIP	NORTH	EAST
SIGN 1	3614179.4	395143.2
SIGN 10	3613984.2	394959.8
SIGN 11	3613954.6	394952.4
SIGN 12	3613924.6	394947.4
SIGN 13	3613894.1	394947
SIGN 14	3613863.7	394949.6
SIGN 15	3613833.8	394956.1
SIGN 16	3613803.8	394959.8
SIGN 17	3613774.4	394967.8
SIGN 18	3613745.2	394976.7
SIGN 19	3613718.3	394991.2
SIGN 2	3614163.4	395117.3
SIGN 20	3613694.6	395010.3
SIGN 21	3613672.4	395031.1
SIGN 22	3613651.1	395052.8
SIGN 23	3613632.6	395077
SIGN 24	3613616.8	395103.1
SIGN 25	3613602.8	395130
SIGN 26	3613591	395158.1
SIGN 27	3613583.5	395187.5
SIGN 28	3613579.1	395217.8
SIGN 29	3613578.7	395248.2
SIGN 3	3614147.8	395091.2
SIGN 30	3613579.8	395278.7
SIGN 31	3613584.2	395308.8
SIGN 32	3613591.4	395336.3
SIGN 33	3613599.6	395365.6
SIGN 34	3613611	395393.8
SIGN 35	3613626.8	395419.8
SIGN 36	3613644.2	395444.8
SIGN 37	3613663.5	395469.2
SIGN 38	3613686.5	395488.2
SIGN 39	3613710.2	395507.8
SIGN 4	3614130.2	395066.2
SIGN 40	3613735.9	395523.8
SIGN 41	3613763	395537.5
SIGN 42	3613791.2	395546.8
SIGN 43	3613820.6	395556.7
SIGN 44	3613850.5	395562.3
SIGN 45	3613880.9	395562.2
SIGN 46	3613911.3	395561
SIGN 47	3613941.4	395556.7
SIGN 48	3613971.3	395550.8
SIGN 49	3613999.9	395540.6
SIGN 5	3614110.1	395043.4
SIGN 50	3614027.4	395527.6
SIGN 51	3614053.7	395512.2
SIGN 52	3614076.9	395498.2
SIGN 53	3614102.3	395478.8
SIGN 54	3614122	395452.6
SIGN 55	3614139.3	395427.5
SIGN 56	3614155.8	395401.9
SIGN 57	3614169.5	395374.8
SIGN 58	3614179.6	395346
SIGN 59	3614186.8	395316.6
SIGN 6	3614087.5	395032.9
SIGN 60	3614191.9	395286.4
SIGN 61	3614192.1	395255.9
SIGN 62	3614190.3	395226.5
SIGN 63	3614186.9	395195.4
SIGN 64	3614182	395167.9
SIGN 7	3614063.3	395004.4
SIGN 8	3614039.1	394988.8
SIGN 9	3614013.1	394969.9

DESCRIP	NORTHIN	EASTING
1013	395068.8	3613625.2
1014	395005.1	3613686.2
1015	394997.4	3614072.1
1016	395058.4	3614135.6
1017	395180.3	3614195.0
1018	395241.3	3614203.9
1019	395302.2	3614200.9
1020	395363.2	3614185.9
1021	395392.4	3614173.9
1022	395424.1	3614156.7
1023	395480.2	3614112.9
1024	395485.1	3614108.0
1025	395528.9	3614061.9
1026	395546.1	3614020.2
1027	395558.0	3613991.0
1028	395573.1	3613930.0
1029	395576.0	3613869.1
1030	395567.2	3613808.1
1031	395507.7	3613686.2
1032	395444.2	3613625.2
S54_A04	394967.3	3613747.1
S54_A06	394936.8	3613869.1
S54_A07	394939.8	3613930.0
S54_A08	394954.8	3613991.0
S54_A09	394983.9	3614051.9
S54_B03	394997.4	3613998.4
S54_B06	394997.4	3613808.1
S54_B06	394997.4	3613869.1
S54_B07	394997.4	3613930.0
S54_B08	394997.4	3613991.0
S54_B09	394997.4	3614051.9
S54_B10	395032.6	3614112.9
S54_C02	395068.4	3613633.0
S54_C10	395058.4	3614112.9
S54_D01	395119.3	3613696.1
S54_D11	395119.4	3614173.3
S54_E01	395180.3	3613573.5
S54_F01	395241.3	3613564.6
S54_G01	395302.2	3613567.6
S54_H01	395363.2	3613582.6
S54_H02	395363.1	3613625.2
S54_J01	395424.1	3613611.8
S54_J02	395424.1	3613625.2
S54_K02	395485.1	3613680.5
S54_K03	395485.1	3613686.2
S54_LO4	395545.5	3613747.1



Legend
- UXO Signs
- Boundary Stakes
- Roads
- Investigated Grids

0 150 300 600
Feet

Datum: NAD83 UTM
Monument: Longhorn Army Ammunition Plant
Monument BG-1 with coordinates
NORTHING-3614801.46,
EASTING-395385.09

STATE OF TEXAS
REGISTERED
DAVID R COLLINS
1954
PROFESSIONAL
LAND SURVEYOR

I, David R. Collins, Registered Professional Land Surveyor No. 1954, do hereby certify that this plat correctly represents the results of a survey made under my supervision August 4 through September 28, 2008.

Principal of the firm: _____

SUXOS: _____

South Test Area (LHAAP-001-R-01) and Ground Signal Test Area (LHAAP-003-R-01), MMRP-4

LAND USE CONTROL COMPLIANCE INSPECTION FORM

October 15, 2018

LAND USE CONTROL COMPLIANCE CERTIFICATION FORM

In accordance with the LUC Plan dated _____ for LHAAP-001-R and LHAAP-003-R, an inspection of the sites was conducted by _____ on _____.

A summary of land use control mechanisms is as follows:

- Land use restrictions - restrict land use to non-residential.
- Integrity of LUC signage by ensuring signs are present, legible and have visibility from one sign to the next.

A summary of compliance with land use and restriction covenants is as follows:

- The posted signs are properly maintained at LHAAP-001-R and LHAAP-003-R.
- No digging or intrusive activities have taken place within the boundaries identified for LHAAP-001-R and LHAAP-003-R.
- No land use other than non-residential.
- Pamphlets and safety awareness video are being used to educate visitors.

I, the undersigned, do document that the inspections were performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name: _____

Signature: _____

Completed annual compliance inspections shall be conducted no later than March 1 of each year for the previous calendar year and filed on site.

APPENDIX A

GSA TRANSFER LETTERS

GSA Public Buildings Service
Tel: (817) 978-3856
Fax: (817) 978-2063
melvin.freeman@gsa.gov

February 21, 2014

Mr. Thomas E. Lederle
Chief, ACSIM BRAC Division
600 Army Pentagon
Washington D.C. 20310-0600

Dear Mr. Lederle:

Your report of excess dated July 29, 2002, covered 8,492.02 acres of land (later corrected to 8,416 acres), more or less, and improvements at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. GSA Control No. 7-D-TX-0692.

As set forth in the enclosed letter, an additional 50.54 acres of land, more or less, of the LHAAP property known as Tract No. 7 – Landfill 12 Area, described in Attachment 1 of the transfer letter has been transferred without reimbursement to the U.S. Department of the Interior, Fish and Wildlife Service (FWS) under the authority of 16 U.S.C. 667b. Additional transfers will be made when approvals are obtained from the Army on lands currently not suitable for transfer. Future requests for transfers will identify requested land by legal description or map overlay.

Upon finalization of transfer of the total land requested by FWS, a complete boundary legal description will be provided by FWS identifying all former Army land that had been transferred. Any map overlays used in the interim to identify previously transferred land will be voided for use to identify former Army land at LHAAP subsequently controlled by FWS.

Custody and accountability of the property identified by legal description in Attachment 1 to the transfer letter, together with any necessary documentation, should be transferred to FWS by your agency as soon as practicable. We will appreciate your prompt advice as to the date such action is accomplished. We understand that the FWS, Region 2 Acting Regional Director, Ms. Joy Nicholopoulos, P.O. Box 1306, Albuquerque, NM 87103 will represent the FWS in this matter.

Please acknowledge receipt of this communication in the space provided on the enclosed copy of this letter and return it to this office. You may contact Veronica Capron Vorva, Realty Specialist at telephone 817-978-4246 if there are questions.

U.S. General Services Administration
Real Property Utilization and Disposal
Division (7PZ)
819 Taylor Street, Room 11A30
Fort Worth, TX 76102-6112

Sincerely,

Melvin E. Freeman, Director
Real Property Utilization and Disposal
Division (7PZ)

Enclosures

Receipt acknowledged:

Name THOMAS E LEDERLE

Title Chief, ACSIM BRAC DIV

Date 03/07/2014

cc: Ms. Joy Nicholopoulos, Acting Regional Director
U.S. Fish and Wildlife Service, Region 2
Division of Realty
P.O. Box 1306
Albuquerque, NM 87103-1306

GSA Public Buildings Service
Tel (817) 978-3856
Fax (817) 978-2063
melvin.freeman@gsa.gov

February 21, 2014

Joy Nicholopoulos, Acting Regional Director
U.S. Fish and Wildlife Service, Region 2
Division of Realty
P.O. Box 1306
Albuquerque, NM 87103-1306

RE: Transfer of 50.54 acres of land at the Longhorn Army Ammunition Plant, Harrison County, Texas

Dear Ms. Nicholopoulos:

Your letter of April 27, 2004, requested transfer to the U.S. Department of the Interior, Fish and Wildlife Service (FWS), under the authority of P.L. 80-537, 16 U.S.C. 667b, a total of 8,404 acres of land (later corrected to 8,416 acres, more or less), at the Longhorn Army Ammunition Plant (LHAAP), City of Karnack, Harrison County, State of Texas, together with all the improvements found on the real estate, and all related personal property located thereon (hereinafter referred to as the "Property"), reported July 29, 2002, as excess to the needs of the U.S. Army. The first transfer of 5,031.75 acres was accepted into primary jurisdiction by FWS on April 30, 2004. It was agreed that as parcels met the specifications of transfer, additional parcels would be transferred by means of a letter request, a map, and a legal description to GSA.

All the rights to be transferred herein have heretofore been declared excess to the needs of the United States Department of the Army. The respective interests to be transferred hereby have been reported to the General Services Administration (GSA) and have been determined to be excess for disposal pursuant to P.L. 107-217, (40 U.S.C. §§550, et. seq.) as amended.

In accordance with your subsequent letter of February 4, 2014, an additional 50.54 acres, more or less, known as Tract No. 7 – Landfill 12 Area (hereinafter referred to as the "Property") are now suitable for transfer to add to the 6,364.35 acres, more or less, previously transferred on nine separate occasions. A true and complete legal description of Tract No. 7 – Landfill 12 Area is included in **Attachment 1**.

Accordingly, pursuant to 40 U.S.C. 501, et seq. and Public Law 80-537, 16 U.S.C. 667b, and acting under authority delegated to me, I hereby transfer 50.54 acres, more

U.S. General Services Administration
Real Property Utilization and Disposal
Division (7PZ)
819 Taylor Street, Room 11A30
Fort Worth, TX 76102-6112

or less, as described in **Attachment 1** to the custody and accountability of the U.S. Department of Interior, Fish and Wildlife Service.

Additional transfers covering the remainder of the real estate comprising the LHAAP will be made when approvals are obtained from the Army on lands currently not suitable for transfer. Future requests for other transfers will specifically identify such requested land by legal description and/or map overlay.

This transfer is expressly made subject to all environmental notices, exceptions, restrictions, agreements, and covenants affecting the Property identified in the Environmental Condition of Property V, Longhorn Army Ammunition Plant, Karnack, Texas, dated September 2007 and revised December 6, 2013, (hereinafter referred to as the "ECOP V") which is incorporated herein by reference and amends the "ECOP" previously described in and made a part of the original transfer of April 26, 2004, and subsequent transfers, and the "ECOP II" dated October 2004, "ECOP III" dated August 2005, and "ECOP IV" dated March 2007 to the extent and only to the extent the same are valid and affect the Property conveyed herein. FWS covenants and agrees that the Property is hereby transferred subject to the use restrictions and covenants which run with the land as identified in Attachment 2 of the ECOP V previously described. FWS further covenants and agrees that in the event that the Property, or any part thereof, is sold, conveyed, transferred, leased, or otherwise disposed of, the following notices, covenants, and restrictions shall be inserted in any instrument of conveyance.

Upon finalization of transfer of the total land requested by FWS, a complete boundary legal description will be provided by FWS identifying all former Army land that had been transferred. Any map overlays used in the interim to identify previously transferred land will be voided for use to identify former Army land at LHAAP subsequently controlled by FWS.

The property transferred is subject to compliance by the FWS with the provisions of the National Environmental Policy Act of 1969, as amended, including the preparation of an environmental impact statement if required. The Property is transferred subject to compliance by the FWS with Section 106 of the National Historic Preservation Act of 1966, and Executive Order 11593.

Mr. Thomas E. Lederle, Chief, ACSIM BRAC Division, U.S. Army, 600 Army Pentagon, Washington D.C. 20310 will act for the U.S. Army in arranging for the transfer of custody and accountability of the Property and in other matters related to the transfer.

A copy of our letter of same date to the U.S. Army is enclosed for your information. It is requested that you acknowledge receipt of this communication on the enclosed copy of this letter in the space provided, return it to this office, and that such steps as necessary be taken by your Agency to consummate the transaction.

Sincerely,

Melvin E. Freeman

Melvin E. Freeman, Director
Real Property Utilization and Disposal
Division (7PZ)

Enclosures

Receipt acknowledged:

Name Robert R. Bruer

Title Realty Officer

Date 3-3-2014

cc: Mr. Thomas E. Lederle
Chief, ACSIM BRAC Division
600 Army Pentagon
Washington D.C. 20310-0600

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
DIVISION OF REALTY

TRACT REPORT

OF THE

UNITED STAES OF AMERICA

TRACT (100q)

CONTAINING 50.54 ACRES

CADDO LAKE NATIONAL WILDLIFE REFUGE

HARRRISON COUNTY, TEXAS

Report Prepared By

Louis J. duBois, Jr.
Land Surveyor

January 2014

Tract Description of the
United States of America Tract (100q)
Caddo Lake National Wildlife Refuge
Harrison County, Texas

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract (100q) being 50.54 acres of land out of the Longhorn Ordnance Works Reservation, also known as the Longhorn Army Ammunition Plant, Karnack, Texas, said 50.54 acres of land being that certain 50.54 acre tract described as Parcel No. 7 – Landfill 12 Area excepted from United States of America tract (100a) as surveyed by Entz Engineering and Associates, Inc. & Huffman Surveying Company, A Joint Venture, of Muskogee, Oklahoma, delineated on a map tracing designated "United States of America Tracts (100a,b)" bearing the date of May, 2004, of record in the files of the United States Department of the Interior, Fish and Wildlife Service, Region 2, Albuquerque, New Mexico, said tract (100q) being more particularly described by metes and bounds as follows:

SURVEYOR'S NOTE:

All bearings and distances are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92), Survey Feet. The average Combined Scale Factor applied equals 0.99988410; Convergence equals 02° 21' 53". The computed land area is based on surface distances.

Parcel No. 7 - Landfill 12 Area

BEGINNING at the southwest corner of the Landfill 12 Area, described as Parcel No. 7, said point being described as "Landfill 12 Area Point No. 1" and having a coordinate value of N=6953300.238, E=3311087.540;

THENCE, along the boundary line of said Parcel No. 7,

N. 03°15'36" W., 1741.41 feet

to a point for a corner of this tract, said point being described as "Landfill 12 Area Point No. 2";

THENCE, along the boundary line of said Parcel No. 7,

N. 62°03'32" E., 1151.75 feet

to a point for a corner of this tract, said point being described as "Landfill 12 Area Point No. 3";

THENCE, along the boundary line of said Parcel No. 7,

S. 15°55'59" E., 1311.85 feet

to a point for a corner of this tract, said point being described as "Landfill 12 Area Point No. 4";

THENCE, along the boundary line of said Parcel No. 7,

S. 35°09'33" W., 1306.48 feet

to a point for a corner of this tract, said point being described as "Landfill 12 Area Point No. 5";

THENCE, along the boundary line of said Parcel No. 7,

N. 84°25'54" W., 528.74 feet

to the **POINT OF BEGINNING**, and containing 50.54 acres, more or less.

Bounded on the north, east, south and west by USA tract (100a).

The hereinbefore-described tract of land is delineated on a plat designated "United States of America Tract (100q)" bearing the date of January 15, 2014, of record in the files of the United States Department of the Interior, Fish and Wildlife Service.

GSA Public Buildings Service
Tel: (817) 978-3856
Fax: (817) 978-2063
melvin.freeman@gsa.gov

January 29, 2015

Mr. Thomas E. Lederle
Chief, ACSIM BRAC Division
600 Army Pentagon
Washington D.C. 20310-0600

Dear Mr. Lederle:

Your report of excess dated July 29, 2002, covered 8,492.02 acres of land (later corrected to 8,416 acres), more or less, and improvements at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. GSA Control No. 7-D-TX-0692.

As set forth in the enclosed letter, an additional 109.91 acres of land, more or less, in five parcels of the LHAAP property, described in Attachment 1 and Attachment 2 of the transfer letter, including: three portions of the "Production Area Parcel," consisting of Tract 100r, containing 31.73 acres in and around the Former Acid Storage Area, Tract 100s, containing 18.80 acres in and around the Former TNT Waste Disposal Plant, and Tract 100t, containing 3.82 acres in and around the Former Sewage Treatment Plant; the "Y-Area Parcel," Tract 100u, containing 17.24 acres; and a portion of the 40.37 acre "Static Test Area Parcel," Tract 100v, containing 38.32 acres, have been transferred without reimbursement to the U.S. Department of the Interior, Fish and Wildlife Service (FWS) under the authority of 16 U.S.C. 667b. Additional transfers will be made when approvals are obtained from the Army on lands currently not suitable for transfer. Future requests for transfers will identify requested land by legal description or map overlay.

Upon finalization of transfer of the total land requested by FWS, a complete boundary legal description will be provided by FWS identifying all former Army land that had been transferred. Any map overlays used in the interim to identify previously transferred land will be voided for use to identify former Army land at LHAAP subsequently controlled by FWS.

Custody and accountability of the property identified by legal description in Attachment 1 and Attachment 2 to the transfer letter, together with any necessary documentation, should be transferred to FWS by your agency as soon as practicable. We will appreciate your prompt advice as to the date such action is accomplished. We understand that the FWS, Region 2 Acting Regional Director, Ms. Joy Nicholopoulos, P.O. Box 1306, Albuquerque, NM 87103 will represent the FWS in this matter.

U.S. General Services Administration
Real Property Utilization and Disposal Division (7PZ)
819 Taylor Street, Room 11A30
Fort Worth, TX 76102-6112

Please acknowledge receipt of this communication in the space provided on the enclosed copy of this letter and return it to this office. You may contact Veronica Vorva, Realty Specialist, at telephone 817-978-4246 if there are questions.

Sincerely,

Melvin E. Freeman

Melvin E. Freeman, Director
Real Property Utilization and Disposal
Division (7PZ)

Enclosures

Receipt acknowledged:

Name THOMAS E LEDERLE

Title Chief, ACSIM BRAC DIV

Date 20 APR 2015

cc: Ms. Joy Nicholopoulos, Acting Regional Director
U.S. Fish and Wildlife Service, Region 2
Division of Realty
P.O. Box 1306
Albuquerque, NM 87103-1306

GSA Public Buildings Service
Tel: (817) 978-3856
Fax: (817) 978-2063
melvin.freeman@gsa.gov

January 29, 2015

Joy Nicholopoulos, Acting Regional Director
U.S. Fish and Wildlife Service, Region 2
Division of Realty
P.O. Box 1306
Albuquerque, NM 87103-1306

RE: Transfer of 109.91 acres of land at the Longhorn Army Ammunition Plant, Karnack, Harrison County, Texas

Dear Ms. Nicholopoulos:

Your letter of April 27, 2004, requested transfer to the U.S. Department of the Interior, Fish and Wildlife Service (FWS), under the authority of P.L. 80-537, 16 U.S.C. 667b, a total of 8,404 acres of land (later corrected to 8,416 acres, more or less), at the Longhorn Army Ammunition Plant (LHAAP), City of Karnack, Harrison County, State of Texas, together with all the improvements found on the real estate, and all related personal property located thereon (hereinafter referred to as the "Property"), reported July 29, 2002, as excess to the needs of the U.S. Army. The first transfer of 5,031.75 acres was accepted into primary jurisdiction by FWS on April 30, 2004. It was agreed that as parcels met the specifications of transfer, additional parcels would be transferred by means of a letter request, a map, and a legal description to GSA.

All the rights to be transferred herein have heretofore been declared excess to the needs of the United States Department of the Army. The respective interests to be transferred hereby have been reported to the General Services Administration (GSA) and have been determined to be excess for disposal pursuant to P.L. 107-217, (40 U.S.C. §§550, et. seq.) as amended.

In accordance with your subsequent letter of December 2, 2014, an additional 109.91 acres, more or less, in five parcels of the LHAAP property including: three portions of the "Production Area Parcel," consisting of Tract 100r, containing 31.73 acres in and around the Former Acid Storage Area, Tract 100s, containing 18.80 acres in and around the Former TNT Waste Disposal Plant, and Tract 100t, containing 3.82 acres in and around the Former Sewage Treatment Plant; the "Y-Area Parcel," Tract 100u, containing 17.24 acres; and a portion of the 40.37 acre "Static Test Area Parcel," Tract 100v, containing 38.32 acres (hereinafter referred to as the "Properties") is now suitable

U.S. General Services Administration
Real Property Utilization and Disposal
Division (7PZ)
819 Taylor Street, Room 11A30
Fort Worth, TX 76102-6112

for transfer to add to the 6,414.89 acres, more or less, previously transferred on ten separate occasions. True and complete legal descriptions of the Properties are included in **Attachment 1** and **Attachment 2**.

Accordingly, pursuant to 40 U.S.C. 501, et seq. and Public Law 80-537, 16 U.S.C. 667b, and acting under authority delegated to me, I hereby transfer 109.91 acres, more or less, as described in **Attachment 1** and **Attachment 2** to the custody and accountability of the U.S. Department of Interior, Fish and Wildlife Service.

Additional transfers covering the remainder of the real estate comprising the LHAAP will be made when approvals are obtained from the Army on lands currently not suitable for transfer. Future requests for other transfers will specifically identify such requested land by legal description and/or map overlay.

This transfer is expressly made subject to all environmental notices, exceptions, restrictions, agreements, and covenants affecting the Property identified in the Environmental Condition of Property VI, Longhorn Army Ammunition Plant, Karnack, Texas, dated January 2014, (hereinafter referred to as the "ECOP VI") which is incorporated herein by reference and amends the "ECOP" previously described in and made a part of the original transfer of April 26, 2004, and subsequent transfers, and the "ECOP II" dated October 2004, "ECOP III" dated August 2005, "ECOP IV" dated March 2007, and "ECOP V" dated September 2007 and revised December 6, 2013 to the extent and only to the extent the same are valid and affect the Property conveyed herein. FWS covenants and agrees that the Property is hereby transferred subject to the use restrictions and covenants which run with the land as identified in Attachment 3 of the ECOP VI previously described. FWS further covenants and agrees that in the event that the Property, or any part thereof, is sold, conveyed, transferred, leased, or otherwise disposed of, the following notices, covenants, and restrictions shall be inserted in any instrument of conveyance.

Upon finalization of transfer of the total land requested by FWS, a complete boundary legal description will be provided by FWS identifying all former Army land that had been transferred. Any map overlays used in the interim to identify previously transferred land will be voided for use to identify former Army land at LHAAP subsequently controlled by FWS.

The property transferred is subject to compliance by the FWS with the provisions of the National Environmental Policy Act of 1969, as amended, including the preparation of an environmental impact statement if required. The Property is transferred subject to compliance by the FWS with Section 106 of the National Historic Preservation Act of 1966, and Executive Order 11593.

Mr. Thomas E. Lederle, Chief, ACSIM BRAC Division, U.S. Army, 600 Army Pentagon, Washington D.C. 20310 will act for the U.S. Army in arranging for the transfer of custody and accountability of the Property and in other matters related to the transfer.

A copy of our letter of same date to the U.S. Army is enclosed for your information. It is requested that you acknowledge receipt of this communication on the enclosed copy of this letter in the space provided, return it to this office, and that such steps as necessary be taken by your Agency to consummate the transaction.

Sincerely,

Melvin E. Freeman, Director
Real Property Utilization and Disposal
Division (7PZ)

Enclosures

Receipt acknowledged:

Name David Allard

Title Realty Specialist

Date 2/2/2015

cc: Mr. Thomas E. Lederle
Chief, ACSIM BRAC Division
600 Army Pentagon
Washington D.C. 20310-0600

Subject:	**Final Minutes, Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**LHAAP Site Trailer**
Date of Meeting:	**23 October 2019– 10:30 AM Central Daylight Time (CDT)**

Attendees:

Army BRAC:	Rose M. Zeiler (RMZ)
USEPA:	Rich Mayer (RM), Dorelle Harrison and Kent Becher (KB)-USGS Liaison
AEC:	Troy Darr (TD) and Amanda Sherman (AS)
TCEQ:	April Palmie (AP)
USFWS:	Paul Bruckwicki (PB)
USACE:	Aaron Williams (AW) – on the phone
Bhate:	Kim Nemmers (KN) and Scott Beesinger (SB)
APTIM:	Bill Foss (BF), Praveen Srivastav (PS), and Greg Jones

Action Items

Bhate/APTIM: Line to 18WW17 Line Replacement - KN stated that the replacement would occur the first full week in November 2019. KN stated that the line would be double-walled. SB stated that approximately 350 feet of line would be replaced.

Defense Environmental Restoration Program (DERP) Performance-Based Remediation (PBR) Update

RM stated that Ms. Caroline Baier-Anderson from the U.S. Environmental Protection Agency (USEPA) Headquarters would be at LHAAP during the first full week of November to see field work. RM wondered if HDR, Inc. (HDR) might be out doing the additional investigation at LHAAP-47. RMZ stated that HDR might be out then.

KN explained that the Groundwater Treatment Plant (GWTP) is currently being run in a batch fashion since the blower broke. KN stated that a sample is collected between the ion exchange vessels for rush turn around for volatile organic compounds. KN stated that the results are compared to the maximum contaminant levels or protective concentration limits prior to discharge. KN stated that only compounds being detected are trichloroethene (TCE); cis-1,2-dichloroethene (DCE); and trichloroethane. KN stated that the water is then treated by the second ion exchange vessel prior to discharge to the INF Pond. KN stated that the blower is going to be shipped on November 8, 2019. KN stated that a crane will need to be delivered to move the blower into place. RMZ asked if the data for the effluent was in the MMM data package or if it had yet to be validated. KN confirmed that the data was not validated. RM asked where the water was being discharged. KN and SB stated that the treated groundwater was being discharged to the INF Pond. SB stated that the INF Pond has sufficient volume.

PS provided a field work update. PS explained that the original excavation extent planned for LHAAP-17 was mostly dug and that the site is secured and signs are up. PS stated that soil piles onsite were covered up. PS confirmed that sufficient backfill sources have been identified and that backfilling was planned for the week of November 4, 2019. PS stated that installation of the extraction system above ground, without invasive activities, is being evaluated. PS stated that David Poole, with APTIM Federal Services, Inc. (APTIM), is coming out to LHAAP-17 to evaluate how to build the system above ground. RMZ asked PS about the freeze plan to which PS stated will be part of the evaluation by Mr. Pool when he arrives. BF explained that flexible tubing is planned to be used for much of the piping and that the system may be shut down when freezing temperatures are

expected. BF explained that hard lines near the power drop at the road would be covered with heat tape. PS explained that the area needs to be brush cleared. BF stated that it needs to be determined if anything planned is considered intrusive. AW stated that a detailed plan needed to be prepared so that the Ordnance and Explosives Safety Specialist could review. RMZ asked if the EPA and TCEQ needed to review to which RM stated that the EPA wanted to have a copy. PS stated that he did not think a work plan would be necessary to which BF and RMZ concurred that the document would be more like a drawing showing the plan.

SB explained that the Sherriff's office does a weekly spot on the radio and Sherriff Tom McCool said that a large number of calls came in the day that the first blown in place (BIP) was done. TD asked about the process in place. SB explained that the Sheriff was called and then the Sheriff called the explosive ordnance disposal (EOD) folks. AS asked if information about the BIPs completed (e.g. dates or date range for BIPs) could be placed on the website in a ticker. RMZ said that maybe the website could be updated to state that the BIPs were done and when. AP asked if alerts could be sent out from the website to the public. RMZ said that a public mailing list is available. PS said that he would need to check with his Information Technology Group. TD explained that there are services available free to send group emails if the list is small, to which AP suggested the use of MailChimp. RMZ stated that BIPs sometimes have to occur quickly so post-BIP notification will need to be done. RM stated that the suggestion box might be used in the case that people wanted to be added to a mailing list. PB cautioned notifying of BIPs in advance because it could draw people to come out. RM asked if any of the rounds were considered live. RMZ stated that the EOD personnel were looking for an additive charge or a sulfur smell. RMZ stated that none of the items had these characteristics with the exception of the last item BIP that had an added charge. RMZ explained that the EOD personnel always consider the munitions to be live when they come out. AP asked if the piles of soil onsite were going to be sieved. AW explained that he is scoping the acquisition for sifting of the soil and removal and recycling of the two drums with munitions and explosives of concern (MEC) onsite. AW explained that Ordnance and Explosives Safety Specialist (OESS) personnel were not available so the work had to be contracted out. AS asked when the award date was expected. AW stated February 2020 award.

Action Item: Explore adding a sign-up for updates on the LHAAP website.

PS discussed that excavation to the limits at LHAAP-03 was completed. PS stated that a soil sample was collected at 03WW01 from 6-7 feet depth, which was clean. Area C (original contaminant source) was excavated to 8 feet deep. PS stated that the floor sample was below the cleanup level. However, the composite of the walls was over the limits for arsenic so an additional 1-foot was excavated. A composite sample of the walls was again collected but that was also elevated. PS explained that an additional 2 feet will be excavated but that each wall will be sampled to determine if the elevated metals detections is from one particular wall. PS stated that there is water in the excavation so no digging was completed today.

PS discussed that all injection work was completed at LHAAP-16, except for recirculation of the Mid-Plume and Biobarrier 2. PS stated that bromide was just above baseline in 16EW05 and similar to the baseline results in 16EW07. So, PS explained that a second, 3 day recirculation is occurring. RMZ asked where the issues were at the Biobarrier 1. PS stated that emulsified vegetable oil (EVO) was observed coming up at the tree roots but reducing the injection pressure stopped the issue. PS stated that Biobarrier 3 injections were able to be completed in one day.

PS explained that the direct push technology (DPT) rig was moved to LHAAP-04, which has been slow due to the shallow injections and the requirement of 1,400 gallons in each point. BF stated that the injection pressures were backed down to 5 pounds per square inch. BF stated that EVO was

coming up from one of the steel wells. BF explained that the expandable cap was not good so this became the path of least resistance. After fixing the cap, PS explained that the area is now taking the EVO. PS said that once LHAAP-04 is done, the DPT rig will be demobilized and the injection trailer will be brought back to finish LHAAP-16. BF stated that Mike Martinez took dissolved oxygen (DO) readings in the creek on Tuesday, 10/22/19, and that no issues were identified. PS stated that performance monitoring along the Bayou Biobarrier was just started and SB collected those samples for analysis the day before (October 22, 2019).

PS stated that Remedial Action Operation (RA[O]) sampling is occurring in November 2019 at sites LHAA-67, LHAAP-50, and LHAAP-37. PS asked about moving the groundwater sampling at LHAAP-67 to October. RM and AP concurred. SB stated that RA(O) sampling at LHAAP-50 and LHAAP-37 is tentatively planned for the week of November 18, 2019.

Upon RMZ's request, KN discussed the issue with regard to documenting the depth of pump placement on field forms while collecting groundwater samples. KN explained that SB collects the data on a hard copy for the data to be entered into the database. During this process, an error within the system occurred so that the printed sampling forms showed the wrong depth of the pump inlet. KN asked if the preference was to provide a memorandum for the Administrative Record (AR) that explained the errors and provided the corrected forms or if the revised forms should be provided in the next report with an explanation. AP suggested that both of these occur with an errata to explain the issue and then have the report reference the errata and revised forms in the next report. BF explained that a field tablet was used for some of the past sampling events to record field data. The field tablet had pre-populated screen interval from the database but Bhate Environmental Associates, Inc. (Bhate)/APTIM found that the screen interval from the database was not always correct when compared to screen interval in well construction diagrams and reports. RMZ asked where the pump was placed during sampling when this occurred. SB stated that he always checks the screen interval against his spreadsheet and tables provided by task leads and makes corrections as needed on the forms and in pump placement depth. He always places the pump mid-screen if the water level is above the screen or mid-way between the water level and the bottom of the screen if the water is below the top of the screen (*Note: APTIM's lead sampler Michael Martinez confirmed that he used the spreadsheet/tables to cross-check data in field tablets*). Another issue was that some of the sampling forms printed from the database was showing depth to water in the space for Sample Interval, which would otherwise be the pump inlet depth. SB added that the revised sampling form now contains a spot for pump inlet. PS stated that no tablets will be used going forward and only paper forms will be used, with screen interval space blank so it can be filled in by field staff based on the tables provided by task leads. RMZ stated that this came about because she noticed during the review of the Remedial Action Work Plan (RAWP) for LHAAP-50 that concentrations had significantly decreased in certain wells and the Army wanted to make sure that the same intervals are being sampled. She also noticed that some of the LHAAP-58 Year 4 RAO sampling forms did not have a location to record the pump placement. KN clarified that the forms were revised to include pump placement following comments from the USEPA in October 2018. So, the forms for LHAAP-58 did not have pump placement information until December 2018.

RMZ pointed out that LHAAP-17 had this issue in the original hot spot. SB stated that LHAAP-46, Well 05 had this issue also. RM requested a memorandum to document the issues and then the reports will also discuss the issues. The group then discussed the sampling process based upon the variability of concentrations in some wells depending upon the depth of the pump inlet. RMZ stated that she would like to stop low flow sampling because the samples are not representative of the full 10-foot screened interval. AP agreed. KB then stated that he had completed a pump study at Longhorn which showed increasing concentrations at depth, in particular at MW-14 at LHAAP-18/24. RMZ stated

that low flow was being used due to turbidity issues and we should begin looking at alternatives and include that requirement in the next environmental contract PWS.

BF asked everyone to refer to the Document and Issues Tracking Table dated October 23, 2019.

- **Task 1** (Project Management) - KN stated that the September 2019 MMM minutes were issued final on October 9, 2019. KN stated that the July 2019 Restoration Advisory Board (RAB) minutes would be finalized after the October 2019 meeting later in the day. KN discussed that a new co-chair would be elected at the RAB meeting. RMZ asked if KN had forms for the voting of the new co-chair. KN stated that she did not but that she would get some made before the meeting.
- **Task 3** (LHAAP-03) – PS stated that no documents were in progress but that soil excavation was underway as previously discussed.
- **Task 4** (LHAAP-04) – PS stated that there are no documents in progress but that in-situ bioremediation injections had begun as previously discussed.
- **Task 5** (LHAAP-12) – PS stated that the next RA(O) sampling event would be completed in December 2019 and will include the new well installed in August 2019. PS stated that the data would be available for the February 2020 MMM.
- **Task 6** (LHAAP-16) – PS stated that the baseline sampling data would be provided for the November 2019 MMM and that the initial performance samples for Bayou Biobarrier were collected per the RAWP. BF stated that the Remedial Action Completion Report (RACR) will be prepared following the in-situ bioremediation field work.
- **Task 7** (LHAAP-17) – PS stated that the soil backfilling is planned for the week of November 4, 2019, as previously discussed. BF asked about the RACR for this site. RMZ stated that the RACR discussion needed AW input. AP asked about what document will be provided to the Regulators and recommended that the soil excavation be broken away from the groundwater treatment for the RACR. PS stated that the contracted scope of work includes a RACR. AP stated that once the piping is in for the groundwater extraction system that a RACR should be prepared. RMZ pointed out that the issue is that the RACR approval signifies construction complete, which cannot be obtained for the soils. The team discussed preparing a technical memorandum or separate report for the soil portion. RMZ asked RM whether the EPA could approve remedy construction complete for just groundwater, to which RM concurred. AP stated that there are portions of the soil excavation that can be considered complete also. RMZ stated that PS was preparing documentation for the soil removal for the USACE. AW asked if there could be two separate RACRs under one cover sheet but RMZ pointed out that was not in the contract. RMZ stated that the report could be RACR for Groundwater and progress or status report for soil removal or similar but that AW was working on this documentation requirement.
- **Task 9** (LHAAP-37) – PS stated that the Year 2, 4th quarter validated data, from the August 2019 sampling event, was provided for the October 2019 MMM. PS stated that the next sampling event will be completed in November 2019 and then again in May 2020 because groundwater sampling will become semi-annual going forward.
- **Task 10** (LHAAP-46) – PS stated that the validated data from groundwater sampling completed in August 2019 was provided with the October 2019 data package. PS stated that sampling will become annual with the November 2019 sampling event. RMZ stated that the Operating Properly and Successfully (OPS) Report will not be prepared this year because the dry well (LHSMW20) replaced to the northeast (LHSMW21) had elevated TCE and cis-1,2-DCE. RMZ stated that she was hoping that the well would be reclassified to intermediate. BF stated that the well is slightly deeper but is still considered shallow. BF

said that LHSMW20 was bounding the plume to the north and so the plume is no longer bounded based upon the results for LHSMW21.

- **Task 11** (LHAAP-50) – PS stated that the Draft RAWP/Remedial Design (RD) is planned for distribution to the Regulators in October 2019 with the last set of Army comments currently being addressed. PS stated that the Year 5 RA(O) Report is being prepared and should be delivered to the Regulators in December 2019 following Army Review. PS stated that the annual RA(O) sampling is scheduled for November 2019 with the validated data to be provided at the January 2020 MMM.
- **Task 12** (LHAAP-58) – KN stated that the Year 5 RA(O) Report was still planned for delivery to the Regulators in October 2019. KN stated that the quarterly RA(O) sampling completed in September 2019 was provided with the October 2019 MMM data package.
- **Task 13** (LHAAP-67) – PS stated that the draft Year 5 RA(O) Report was being prepared for Army review. PS asked if the annual RA(O) sampling schedule for November 2019 could be moved up to October 2019 to help with scheduling given the field work underway particularly in November. KN clarified that RA(O) sampling for LHAAP-67 had been completed in October the previous year. RMZ stated that the idea is to obtain samples at approximately the same time (plus or minus 2 weeks) each year so this schedule met those goals. AP, RM, RMZ, and AW concurred with moving the schedule for LHAAP-67 sampling to the last week in October 2019.
- **Task 14** (LHAAP-001-R and –003-R) - KN stated that the Annual Long Term Monitoring Report was submitted to the Regulators on September 23, 2019, and that comments or concurrence had been received. KN asked how the document should be issued. RMZ stated that RM had a comment so the document should be issued as draft final with the comment addressed.
- **Task 16** (GWTP) **–** KN indicated that the 2nd Quarter 2019 GWTP was under Army review and that the 3rd Quarter 2019 GWTP Report was being prepared.
- **Task 17** (LHAAP-18/24) – KN stated that the 2nd Quarter 2019 GWTP Report would have the June and July 2019 groundwater data for LHAAP-18/24.
- **Task 18** (Surface Water) – KN stated that no new surface water data had been collected due to lack of flow.
- **Task 19** (LUC Management Plan) – KN stated that the LUC Management Plan Update was issued to the regulators on October 4, 2019. RMZ discussed how the plan gets signed, and it was determined that the USEPA, Texas Commission on Environmental Quality (TCEQ), and Army would sign in person to avoid the electronic signature. All agreed that the signed page would be discarded if comments were identified by the USEPA or TCEQ.
- **Administrative Record –** PS stated that the next AR update is being prepared with a cutoff of April 1 through June 30, 2019. PS stated that the list would be sent to the Army for review.

Update on other DERP Sites:

- **LHAAP 18/24** – AW stated that the Record of Decision (ROD) review time was extended for the regulators until October 30, 2019. AW stated that the Proposed Plan (PP) was being placed into the AR.
- **LHAAP-29** – AW stated that the PP was being included in the AR. AW stated that the ROD notification was placed in the Marshall News Messenger and Shreveport Times. RMZ explained that no contract will be in place to prepare the RAWP/RD so the requirement to be in the field within 180 days following the ROD will not be able to be done. AP pointed out that this was explained in RMZ's letter.

- **LHAAP-47** – AW stated that the 1st Post-Screening Investigation (PSI) Addendum would be included in the next AR update. AW stated that the 2nd Addendum to the PSI Report was issued to the regulators and that Responses to Comments (RTCs) were underway. AW stated that the draft Work Plan for 10 DPT points around MW25R was issued to the regulators on October 11, 2019. AW stated that the 1,4-dioxane method will be changed, and two intervals will also be sampled at 47WW25R with one of the intervals for dense non-aqueous phase liquids. AW established that the field work is planned for November 4, 2019. AW pointed out that with the field work being completed in early November that issuing a draft Addendum to the PSI Report was too tight and that the schedule for submittal to the regulators needed to be revised. RMZ stated that the report was a secondary document and that a letter would probably not be needed for the schedule revision since none of the submittal dates for the subsequent primary documents would change. However, RMZ stated that she would verify what the Federal Facilities Agreement stated.
- **Five Year Review (FYR)** – AW stated that the FYR was ready to post to the AR. BF asked if a link needs to be placed on the website for the FYR. RMZ concurred that the FYR should be posted with a link. RM asked if documents are missing by sites to which BF concurred. AW said he did not recall the LHAAP Installation Action Plan (IAP) being approved. TD stated that the IAP is a public document that needs to be posted onto the website, but the Community Involvement Plan is not public. TD stated that the IAP is also posted to the AEC website. TD stated that AEC was not able to review all of the IAPs and that this review must be completed prior to putting the IAP on the website.
- **New Contact Update** - LHAAP-18/24, 29, and 47 and continued maintenance for LHAAP-19 landfill and the pipe at LHAAP-46 is being scoped. AW stated that he is trying to see if the additional soil excavation for LHAAP-17 should be included in the new contract scope. RMZ wondered whether it might be called just a MEC action and not an investigation to reduce the process documents and shorten the timeframe. AW stated that the anomalies would be investigated and then the additional soil would be removed. AW asked if the data was available for what remains to assist with scoping of this work. AP stated that this was a good reason to split the documentation of the soil from the groundwater. RMZ stated that this discussion would be taken offline. AS asked if the fill stand at LHAAP-46 would be included in the scope of work also. AW stated that it would be included in the new contract also. AS asked if the munitions debris would be included in the new contract scope and AW concurred. RMZ stated that LHAAP-47 is holding up the contract but that it needs to be wrapped into the contract.

  For LHAAP-46, RMZ said that one of the buildings identified with potential fill pipes had a fire suppression system because of explosives handling. RMZ stated that the site would have had a toluene tank. SB stated that he didn't remember toluene storage and that the tank would have held methylene chloride (MC). RMZ said that she meant MC. PB and SB concurred that the boxes could have contained electrical conduits. RMZ confirmed with PB that the transfer of the site would be held up due to an unresolved issue with the stand pipes to which PB concurred. PB said that he can point out where the fill stands are located. RMZ asked if there was any update on the transfer of the Environmental Condition of Property VII parcels or to the surface water transfer, to which PB stated that there was nothing to report. AW dropped off the call.

USFWS

KN stated that the area had been seeded with a blue stem mixture last spring following application of a herbicide last fall. SB stated that he had discussed LHAAP-19 with Vanessa Neace from Texas

Park and Wildlife and that she had visited the site. SB stated that Vanessa indicated that the site had good cover but that the native grasses we are looking for are not present in sufficient amount. SB stated that Vanessa indicated that grass restoration takes a period of time but that she recommended burning the site in the spring. SB stated that there is no magical number for how long it will take for the grass restoration. SB stated that Vanessa told him that the site was very burnable. RMZ asked if there was any information about the new growth. SB stated that new stuff is growing including a little bit of blue stem, but that there is still too much bahia grass. SB stated that the site was sprayed for bahia grass. RMZ wondered why big blue stem grass is found at site LHAAP-18/24 but not at LHAAP-19. SB stated that the backfill/cap soils used at LHAAP-19 was not topsoil making growth of this type of vegetation difficult. PB concurred that USFWS will complete the burning LHAAP-19 in the spring.

Schedule Next Managers' Meeting

The next MMM will be held on Wednesday, November 20, 2019, at 1:00 pm Central Standard Time (CST) via conference call.

Meeting concluded at 12:45 pm CDT.

ACRONYM LIST

AEC	Army Environmental Command
AP	April Palmie
APTIM	APTIM Federal Services, LLC
AR	Administrative Record
AS	Amanda Sherman
AW	Aaron Williams
BF	Bill Foss
Bhate	Bhate Environmental Associates, Inc.
BIP	Blown in place
BRAC	Base Realignment and Closure
CDT	Central Daylight Time
CST	Central Standard Time
DCE	Dichloroethelene
DERP	Defense Environmental Restoration Program
DO	Dissolved Oxygen
DPT	Direct push technology
EOD	Explosive ordnance disposal
EVO	Emulsified vegetable oil
FYR	Five Year Review
GWTP	Groundwater Treatment Plant
HDR	HDR, Inc.
IAP	Installation Action Plan
KB	Kent Becher
KN	Kim Nemmers
LHAAP	Longhorn Army Ammunition Plant
MC	Methylene chloride
MEC	Munitions and explosives of concern
MMM	Monthly Managers' Meeting
MMRP	Military Munitions Response Program
OESS	Ordnance and Explosives Safety Specialist
OPS	Operating Properly and Successfully

PB	Paul Bruckwicki
PBR	Performance-Based Remediation
PP	Proposed Plan
PS	Praveen Srivastav
PSI	Post-Screening Investigation
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RA(O)	Remedial Action – Operation
RAWP	Remedial Action Work Plan
RD	Remedial Design
RM	Rich Mayer
RMZ	Rose M. Zeiler
ROD	Record of Decision
RTC	Response to Comment
SB	Scott Beesinger
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
TD	Troy Darr
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

LHAAP Data Validated
October MMM Validated Data

GWTP Effluent	*Weekly Perchlorate Sampling – September 2019* Perchlorate (6850)
GWTP Effluent	*Weekly, Bi-Weekly, and Monthly Sampling – September 2019* Ammonia (350.3) Ortho-Phosphate (365.3) Total Organic Carbon (SM5310C) VOC (8260C) Metals (6020A) Hexavalent Chromium (7196A) 1,4-Dioxane (8270D-SIM) Anions (9056)
GWTP Influent	*Monthly Sampling – September 2019* Metals (6020A) Perchlorate (6850) Hexavalent Chromium (7196A)
GWTP Quarterly	*Influent and Effluent – September 2019* Oil and Grease (1664A) Perchlorate (6850) Metals (6020A) 1,4-Dioxane (8270D-SIM) Chemical Oxygen Demand (410.4) VOC (8260C) Anions (9056)
LHAAP-35B(37)	*Year 2 Quarter 4 Remedial Action Operation Sampling - August 2019* VOCs (SW8260)
LHAAP-46	*Year 5 Semiannual Remedial Action Operation Sampling Event #2 - August-September 2019* VOCs (SW8260)
LHAAP-58	*West Plume Quarterly Sampling Event– September 2019* Anions (9056) VOC (8260C) Total Organic Carbon (SM5310C) Metabolic Acids (HPLC-METACIDS) Dechlorinating Bacteria (CENSUS) Dissolved Gases (RSK-175)

GWTP Weekly/Effluent Perchlorate Sampling -September 2019

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_090419_AIX 9/4/19	LH18/24-SP650_091019_ AIX 9/10/19	LH18/24-SP650_091019_AIX 9/10/19	LH18/24-SP650_091719_AIX 9/17/19	LH18/24-SP650_092419_AIX 9/24/19	LH18/24-SP650_092419_AIX 9/24/19
Location Description			**Collected from a spigot on the discharge of effluent TK-650.**					
			Weekly	Monthly EFF	Weekly	Weekly	Weekly	Quarterly EFF
Perchlorate (6850)								
Perchlorate	µg/L	589	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U

µg/L - micrograms per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

AIX - after ion exchange

GWTP Weekly Sampling - September 2019

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_090419 9/4/19	LH18/24-SP650_091019 9/10/19	LH18/24-SP650_091719 9/17/19	LH18/24-SP650_092419 9/24/19
Location Description			**GWTP–Collected from a spigot on the discharge of effluent TK-650. Sampled Weekly.**			
Ammonia as N (350.3)						
Ammonia as N	mg/L	NV	**7.9**	**9.1**	**6.1**	**10**
Ortho-Phosphate (365.3)						
Ortho-Phosphate	mg/L	NV	**3.03**	**2.83**	**1.9**	**2.23**
Organic Carbon (415.1)						
Total Organic Carbon (TOC)	mg/L	NV	**0.81**	**1.5**	**1.14**	**1.64 J**

mg/L - milligrams per liter

NV - No Value

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

GWTP Bi-Weekly Sampling - September 2019

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_090419 9/4/19	LH18/24-SP650_091719 9/17/19
Location Description			**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Biweekly.**	
Volatile Organic Compounds (8260C)				
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	181	**0.51 J**	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U
Acetone	µg/L	2,395	< 1.0 U	< 1.0 U
Benzene	µg/L	181	< 0.5 U	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	1,699	< 1.0 U	< 1.0 U
o-Xylene	µg/L	83.6	< 0.5 U	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U	< 0.5 U
Toluene	µg/L	4,189	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	181	**1.2**	**1.0**
Vinyl chloride	µg/L	72	< 0.5 U	< 0.5 U
Anions (9056)				
Chloride	mg/L	NV	**557**	**606**
Sulfate	mg/L	NV	**113**	**214**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

NV - No Value

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

GWTP Monthly Effluent Sampling - September 2019

Location ID: / Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_091019 9/10/19
Location Description			**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled monthly**
Volatile Organic Compounds (8260C)			
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U
1,2-Dichloroethane	µg/L	181	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U
Acetone	µg/L	2,395	< 1.0 U
Benzene	µg/L	181	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U
Methylene chloride	µg/L	1,699	< 1.0 U
o-Xylene	µg/L	83.6	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U
Toluene	µg/L	4,189	< 0.5 U
Trichloroethene	µg/L	181	**1.1**
Vinyl chloride	µg/L	72	< 0.5 U
Metals (6020A)			
Barium	mg/L	2	**0.155**
Lead	mg/L	0.0046	< 0.00100 U
Selenium	mg/L	0.012	< 0.00250 U
Silver	mg/L	0.003	< 0.000500 U
Hexavalent Chromium (7196A)			
Hexavalent Chromium	mg/L	0.1244	< 0.0100 U
Semi-Volatile Organic Compounds (8270D SIM)			
1,4-Dioxane	µg/L	134.2	**13**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

GWTP Monthly Influent Sampling - September 2019

Location ID: Sample Date:	Units	LH18/24-SP140_091019 9/10/19
Location Description		**GWTP – Collected from a spigot on the influent to TK-140. Sampled Monthly.**
Metals (6020A)		
Selenium	mg/L	< 0.00250 U
Silver	mg/L	< 0.00050 U
Hexavalent Chromium (7196A)		
Hexavalent Chromium	mg/L	< 0.0100 U
Perchlorate (6850)		
Perchlorate	µg/L	**4,900**

mg/L - milligrams per liter

µg/L - micrograms per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

GWTP Quarterly Effluent Sampling - September 2019

Location ID: / Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_092419 9/24/19
Location Description			GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Quarterly.
Oil and Grease (1664A)			
Oil & Grease	mg/L	15	< 1.00 U
Chemical Oxygen Demand (410.4)			
Chemical Oxygen Demand	mg/L	200	**6.0 J**
Volatile Organic Compounds (8260C)			
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U
1,2-Dichloroethane	µg/L	181	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U
Acetone	µg/L	2,395	< 2.0 U
Benzene	µg/L	181	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U
Methylene chloride	µg/L	1,699	< 0.5 U
o-Xylene	µg/L	83.6	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U
Toluene	µg/L	4,189	< 0.5 U
Trichloroethene	µg/L	181	**1.0**
Vinyl chloride	µg/L	72	< 0.5 U
Metals (6020A)			
Aluminum	mg/L	1.644	**0.0117**
Antimony	mg/L	NV	**0.00251**
Arsenic	mg/L	0.722	**0.000691 J**
Barium	mg/L	2	**0.104**
Beryllium	mg/L	NV	< 0.00100 U
Cadmium	mg/L	0.0034	< 0.00100 U
Calcium	mg/L	NV	**6.84**
Chromium	mg/L	0.752	**0.000534 J**
Cobalt	mg/L	11.495	**0.000436 J**
Iron	mg/L	2.395	**0.0772 J**
Lead	mg/L	0.0046	< 0.00100 U
Magnesium	mg/L	NV	**20.4**
Manganese	mg/L	15.494	**0.0231**

Nickel	mg/L	0.184	**0.00102 J**
Potassium	mg/L	NV	**1.61**
Selenium	mg/L	0.012	< 0.00250 U
Silver	mg/L	0.003	< 0.00100 U
Sodium	mg/L	NV	**504**
Thallium	mg/L	NV	**0.000337 J**
Vanadium	mg/L	3.592	< 0.00100 U
Zinc	mg/L	0.31	**0.00863**
Mercury	mg/L	NV	< 0.000100 U
Anions (9056)			
Chloride	mg/L	NV	**538**
Sulfate	mg/L	NV	**172**
Semi-Volatile Organic Compounds (8270D SIM)			
1,4-Dioxane	µg/L	134.2	**12.0**

µg/L - micrograms per liter

mg/L - milligrams per liter

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

NV - No Value

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

GWTP Quarterly Influent Sampling - September 2019

Location ID: / Sample Date:	Units	LH18/24-SP140_092419 9/24/19
Location Description		**GWTP – Collected from a spigot on the influent to TK-140. Sampled Quarterly.**
Oil and Grease (1664A)		
Oil & Grease	mg/L	< 1.00 U
Chemical Oxygen Demand (410.4)		
Chemical Oxygen Demand	mg/L	**18**
Perchlorate (6850)		
Perchlorate	µg/L	**15,000**
Volatile Organic Compounds (8260C)		
1,1,1,2-Tetrachloroethane	µg/L	< 12 U
1,1,1-Trichloroethane	µg/L	< 12 U
1,1,2,2-Tetrachloroethane	µg/L	< 12 U
1,1,2-Trichloroethane	µg/L	< 12 U
1,1-Dichloroethane	µg/L	< 12 U
1,1-Dichloroethene	µg/L	< 12 U
1,1-Dichloropropene	µg/L	< 12 U
1,2,3-Trichlorobenzene	µg/L	< 12 U
1,2,3-Trichloropropane	µg/L	< 12 U
1,2,4-Trichlorobenzene	µg/L	< 12 U
1,2,4-Trimethylbenzene	µg/L	< 12 U
1,2-Dibromo-3-chloropropane	µg/L	< 12 U
1,2-Dibromoethane	µg/L	< 12 U
1,2-Dichlorobenzene	µg/L	< 12 U
1,2-Dichloroethane	µg/L	**53**
1,2-Dichloropropane	µg/L	< 12 U
1,3,5-Trimethylbenzene	µg/L	< 12 U
1,3-Dichlorobenzene	µg/L	< 12 U
1,3-Dichloropropane	µg/L	< 12 U
1,4-Dichlorobenzene	µg/L	< 12 U
2,2-Dichloropropane	µg/L	< 12 U
2-Butanone	µg/L	< 25 U
2-Chlorotoluene	µg/L	< 12 U
2-Hexanone	µg/L	< 25 U
4-Chlorotoluene	µg/L	< 12 U
4-Isopropyltoluene	µg/L	< 12 U
4-Methyl-2-pentanone	µg/L	< 25 U
Acetone	µg/L	< 25 U
Benzene	µg/L	< 12 U
Bromobenzene	µg/L	< 12 U
Bromochloromethane	µg/L	< 12 U
Bromodichloromethane	µg/L	< 12 U

Bromoform	µg/L	< 12 U
Bromomethane	µg/L	< 12 U
Carbon disulfide	µg/L	< 25 U
Carbon tetrachloride	µg/L	< 12 U
Chlorobenzene	µg/L	< 12 U
Chloroethane	µg/L	< 12 U
Chloroform	µg/L	< 12 U
Chloromethane	µg/L	< 12 U
cis-1,2-Dichloroethene	µg/L	**3,600**
cis-1,3-Dichloropropene	µg/L	< 12 U
Dibromochloromethane	µg/L	< 12 U
Dibromomethane	µg/L	< 12 U
Dichlorodifluoromethane	µg/L	< 12 U
Ethylbenzene	µg/L	< 12 U
Hexachlorobutadiene	µg/L	< 25 U
Isopropylbenzene	µg/L	< 12 U
m,p-Xylene	µg/L	< 25 U
Methylene chloride	µg/L	**10,000**
Naphthalene	µg/L	< 12 U
n-Butylbenzene	µg/L	< 12 U
n-Propylbenzene	µg/L	< 12 U
o-Xylene	µg/L	< 12 U
sec-Butylbenzene	µg/L	< 12 U
Styrene	µg/L	< 12 U
tert-Butylbenzene	µg/L	< 12 U
Tetrachloroethene	µg/L	**73**
Toluene	µg/L	< 12 U
trans-1,2-Dichloroethene	µg/L	**12 J**
trans-1,3-Dichloropropene	µg/L	< 12 U
Trichloroethene	µg/L	**8,900**
Trichlorofluoromethane	µg/L	< 12 U
Vinyl chloride	µg/L	**49**
Metals (6020A)		
Aluminum	mg/L	**0.0495**
Antimony	mg/L	**0.000427 J**
Arsenic	mg/L	**0.00102 J**
Barium	mg/L	**0.973**
Beryllium	mg/L	< 0.00100 U
Cadmium	mg/L	**0.000289 J**
Calcium	mg/L	**44.1**
Chromium	mg/L	**0.00146 J**
Cobalt	mg/L	**0.0120**
Iron	mg/L	**1.00**
Lead	mg/L	< 0.00100 U
Magnesium	mg/L	**35.3**
Manganese	mg/L	**0.714**

Nickel	mg/L	**0.0141**
Potassium	mg/L	**1.29**
Selenium	mg/L	< 0.00250 U
Silver	mg/L	< 0.00100 U
Sodium	mg/L	**223**
Thallium	mg/L	**0.000424 J**
Vanadium	mg/L	< 0.00100 U
Zinc	mg/L	**0.0354**
Mercury	mg/L	< 0.000100 U
Anions (9056)		
Chloride	mg/L	**439**
Sulfate	mg/L	**39.2**
Semi-Volatile Organic Compounds (8270D SIM)		
1,4-Dioxane	µg/L	**20**

µg/L - micrograms per liter

mg/L - milligrams per liter

J -estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

LHAAP-37 Year 2 Quarter 4
August 2019

			Location Code	35BWW01				35BWW04		35BWW05	
			Sample ID	35BWW01-190805		35BWW01-190805-FD		35BWW04-190805		35BWW05-190806	
			Sample Date	8/5/2019		8/5/2019		8/5/2019		8/6/2019	
			Location Description	Shallow zone, unimpacted, within site boundary		Shallow zone, unimpacted, within site boundary		Shallow zone, impacted, within site boundary		Shallow zone, impacted, within site boundary	
Parameter	Units	MCL		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs											
1,1-Dichloroethene	µg/L	7		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5		< 0.5	U	< 0.5	U	**7.9**		1.9	
Trichloroethene	µg/L	5		< 0.5	U	< 0.5	U	0.93	J	**8.6**	
Vinyl Chloride	µg/L	2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-37 Year 2 Quarter 4
August 2019

			Location Code	35BWW07		35BWW08		35BWW09		35BWW10	
			Sample ID	35BWW07-190805		35BWW08-190805		35BWW09-190805		35BWW10-190806	
			Sample Date	8/5/2019		8/5/2019		8/5/2019		8/6/2019	
			Location Description	Shallow zone, unimpacted downgradient		Shallow zone, unimpacted, within site boundary		Shallow zone, impacted outside site boundary		Shallow, unimpacted, within site boundary	
Parameter	Units	MCL		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs											
1,1-Dichloroethene	µg/L	7		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	1.6	
Trichloroethene	µg/L	5		< 0.5	U	< 0.5	U	**70**	J	2.6	
Vinyl Chloride	µg/L	2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-37 Year 2 Quarter 4
August 2019

			Location Code	35BWW11		35BWW12				35BWW13	
			Sample ID	35BWW11-190807		35BWW12-190805		35BWW12-190805-FD		35BWW13-190806	
			Sample Date	8/7/2019		8/5/2019		8/5/2019		8/6/2019	
			Location Description	Shallow zone, unimpacted, within site boundary		Shallow zone, impacted, within site boundary		Shallow zone, impacted, within site boundary		Shallow zone, unimpacted, crossgradient	
Parameter	Units	MCL		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs											
1,1-Dichloroethene	µg/L	7		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5		< 0.5	U	5.8		6.3		< 0.5	U
Trichloroethene	µg/L	5		< 0.5	U	< 0.5	U	0.53	J	< 0.5	U
Vinyl Chloride	µg/L	2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-37 Year 2 Quarter 4
August 2019

Location Code			35BWW14		35BWW15		35BWW16		35BWW17	
Sample ID			35BWW14-190806		35BWW15-190807		35BWW16-190807		35BWW17-190807	
Sample Date			8/6/2019		8/7/2019		8/7/2019		8/7/2019	
Location Description			Shallow zone, impacted, within site boundary		Shallow zone, impacted, within site boundary		Shallow zone, impacted, outside site boundary		Shallow zone, unimpacted, within site boundary	
Parameter	Units	MCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs										
1,1-Dichloroethene	µg/L	7	4.2		1.1		0.79	J	< 0.5	UJ
cis-1,2-Dichloroethene	µg/L	70	1.3		0.39	J	< 0.5	U	< 0.5	UJ
Tetrachloroethene	µg/L	5	**38**		**9.7**		**9.8**		< 0.5	U
Trichloroethene	µg/L	5	**15**		**7.6**		3.5		< 0.5	UJ
Vinyl Chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-37 Year 2 Quarter 4
August 2019

			Location Code	35BWW18		35BWW19		35BWW20		
			Sample ID	35BWW18-190805		35BWW19-190805		35BWW20-190806	35BWW20-190806-FD	
			Sample Date	8/5/2019		8/5/2019		8/6/2019	8/6/2019	
			Location Description	Shallow zone, unimpacted, outside site boundary		Shallow zone, unimpacted, outside site boundary		Shallow zone, impacted, within site boundary	Shallow zone, impacted, within site boundary	
Parameter	Units	MCL		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs											
1,1-Dichloroethene	µg/L	7		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5		< 0.5	U	< 0.5	U	7.5		7.6	
Trichloroethene	µg/L	5		< 0.5	U	< 0.5	U	2.1		2	
Vinyl Chloride	µg/L	2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-37 Year 2 Quarter 4
August 2019

			Location Code	35BWW23		35BWW24		35BWW25		35BWW26	
			Sample ID	35BWW23-190806		35BWW24-190807		35BWW25-190807		35BWW26-190806	
			Sample Date	8/6/2019		8/7/2019		8/7/2019		8/6/2019	
			Location Description	Shallow zone, unimpacted, outside site boundary		Shallow zone, unimpacted, outside site boundary		Shallow zone, impacted, outside site boundary		Shallow zone, unimpacted, within site boundary	
Parameter	Units	MCL		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs											
1,1-Dichloroethene	µg/L	7		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5		< 0.5	U	< 0.5	U	0.33	J	< 0.5	U
Trichloroethene	µg/L	5		< 0.5	U	1.7		**15**		< 0.5	U
Vinyl Chloride	µg/L	2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-37 Year 2 Quarter 4
August 2019

			Location Code	LHSMW58
			Sample ID	LHSMW58-190807
			Sample Date	8/7/2019
			Location Description	Shallow zone, impacted, within site boundary
Parameter	Units	MCL	Result	Val Qual
VOCs				
1,1-Dichloroethene	µg/L	7	< 0.5	UJ
cis-1,2-Dichloroethene	µg/L	70	< 0.5	UJ
Tetrachloroethene	µg/L	5	6.8	
Trichloroethene	µg/L	5	0.59	J
Vinyl Chloride	µg/L	2	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-46 Year 5 Semiannual Sampling Event #2
August-September 2019

		Location Code	46WW02		46WW03		46WW05		46WW06	
		Sample ID	46WW02-190812		46WW03-190812		46WW05-190813		46WW06-190813	
		Sample Date	8/12/2019		8/12/2019		8/13/2019		8/13/2019	
		Location Description:	Site 46 - Central, inside site boundary. Intermediate Zone.		Site 46 - Central, inside site boundary.		Site 46 - N, inside site boundary. Intermediate Zone.		Site 46 - W, inside site boundary. Intermediate Zone.	
Parameter	Units	MCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs										
1,1-Dichloroethene	µg/L	7	1.5		< 0.5	U	5.3		< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	1.1		< 0.5	U	4.8		< 0.5	U
Trichloroethene	µg/L	5	17		< 0.5	U	62		< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	1.2		< 0.5	U

Notes:

Blue highlighted/bold results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-46 Year 5 Semiannual Sampling Event #2
August-September 2019

			Location Code	46WW07		46WW08				46WW09
			Sample ID	46WW07-190812		46WW08-190813		46WW08-190813-FD		46WW09-190812
			Sample Date	8/12/2019		8/13/2019		8/13/2019		8/12/2019
			Location Description:	Site 46 - N, inside site boundary. Intermediate Zone.		Site 46 - NNW, inside site boundary. Intermediate Zone.		Site 46 - NNW, inside site boundary. Intermediate Zone.		Site 46 - Central, within site boundary. Intermediate Zone.
Parameter	Units	MCL		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs											
1,1-Dichloroethene	µg/L	7		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/bold results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-46 Year 5 Semiannual Sampling Event #2
August-September 2019

		Location Code	46WW11				46WW16		LHSMW19	
		Sample ID	46WW11-190812		46WW11-190812-FD		46WW16-190813		LHSMW19-190812	
		Sample Date	8/12/2019		8/12/2019		8/13/2019		8/12/2019	
		Location Description:	Site 46 - Central, within site boundary.		Site 46 - Central, within site boundary.		Site 46 - N, within site boundary. Intermediate Zone.		Site 46 - Central, within site boundary.	
Parameter	Units	MCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs										
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	4.2	
Trichloroethene	µg/L	5	**24**		**24**		< 0.5	U	**13**	
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-46 Year 5 Semiannual Sampling Event #2
August-September 2019

			Location Code	LHSMW21		LHSMW23R		LHSMW25	
			Sample ID	LHSMW21-190813		LHSMW23R-190903		LHSMW25-190812	
			Sample Date	8/13/2019		9/3/2019		8/12/2019	
			Location Description:	Site 46 - North Central, within site boundary. Shallow zone.		Site 46 - SE, within site boundary. Intermediate, Replacement for LHSMW23		Site 46 - E, within site boundary. Intermediate zone.	
Parameter	Units	MCL		Result	Val Qual	Result	Val Qual	Result	Val Qual
VOCs									
1,1-Dichloroethene	µg/L	7		0.87	J	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		170		< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5		41		< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2		0.97	J	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/bold results indicate concentrations above the MCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

LHAAP-58 Remedial Action Operation Validated Data - September 2019

Location ID: / Sample Date:	Units	MCL/MSC	35AWW06_091119 9/11/19	35AWW06_091119_a 9/11/19	35AWW11_091119 9/11/19	35AWW19_091119 9/11/19	35AWW20_091119 9/11/19	35AWW23_091119 9/11/19	LHSMW07_091119 9/11/19
Location Description			Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary. Duplicate	Site 58 - SE, inside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary.	Downgradient Western Plume well	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS19090511						
Total Organic Carbon (415.1/SM5310C)									
Total Organic Carbon	mg/L	NV	**84.9**	**83.8**	**28 J**	**1.19**	**15**	**108**	**3.42**
Volatile Organic Compounds (8260C)									
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**72**	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10000	< 0.5 U	< 0.5 U	< 0.5 U	**0.92 J**	**550 J**	< 0.5 U	**11**
1,1-Dichloroethene	µg/L	7	**0.92 J**	**0.88 J**	< 0.5 U	**5.3**	**3,900**	**0.70 J**	**46**
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**16**	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	**1.2**	**19**	< 0.5 U	**0.67 J**
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.95 J**	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**2.9**	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61000	**46**	**48**	**67**	< 1.0 U	< 1.0 U	**340**	< 1.0 U
2-Chlorotoluene	µg/L	2000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6100	**1.6 J**	**1.5 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92000	**280**	**280**	**75**	< 1.0 U	< 1.0 U	**380**	< 1.0 U
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**8.3**	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6.0**	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**110**	**7.8**	**1.1**
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2000	**0.77 J**	**0.81 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**14**	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**350**	**3.8**	**3.1**
Trichlorofluoromethane	µg/L	31000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride		2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**790**	< 0.5 U	**49**
Volatile Fatty Acids (HPLC-METACIDS)									
Acetic Acid	mg/L	NV	NA	**36**	**54**	< 2.0 U	< 2.0 U	**250**	< 2.0 U
Butyric Acid	mg/L	NV	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**180**	< 1.0 U
Lactic Acid	mg/L	NV	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U
Propionic Acid	mg/L	51	NA	**170**	**31**	< 1.0 U	< 1.0 U	**1100**	< 1.0 U
Pyruvic Acid	mg/L	NV	NA	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 1.0 U	< 0.10 U
Anions (9056A)									
Chloride	mg/L	NV	**917**	**921**	**1,990**	**1,050**	**902**	**857**	**1,820**
Nitrate	mg/L	10	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U
Nitrite	mg/L	1	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U
Sulfate	mg/L	NV	**1.28 J**	**0.790 J**	**259**	**1,010**	**1,200**	**4.63**	**2,530**
Dissolved Gases (RSK-175)									
Carbon Dioxide	µg/L	NV	**320,000**	**350,000**	**690,000**	**230,000**	**290,000 J**	**590,000**	**340,000**
Ethane	µg/L	NV	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	**0.24 J**	< 0.47 U	**0.20 J**
Ethene	µg/L	NV	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	**5.9**	< 0.55 U	**6.1**
Methane	µg/L	NV	**2,900**	**3,300**	**1300**	**3.0**	**640 J**	**2,700**	**240**
Dechlorinating Bacteria									
BAV1 Vinyl Chloride Reductase	cells/mL	NV	**0.70 J**	NA	< 0.90 U	< 0.5 U	**10300**	**1.10 J**	< 0.5 U
Dehalobacter spp.	cells/mL	NV	< 25.6 U	NA	**115000**	**23600**	**386**	< 13.9 U	**1320**
Dehalococoides	cells/mL	NV	**28.6**	NA	**1240**	**18.4**	**16000**	**326**	**49.8**
tceA Reductase	cells/mL	NV	< 2.60 U	NA	< 0.90 U	**0.70**	< 0.5 U	**3.40**	**0.30 J**
Vinyl Chloride Reductase	cells/mL	NV	< 2.60 U	NA	**80.1**	**1.10**	< 0.5 U	**32.1**	**274**

Blue Highlighting Indicates concentrations above the MCL/MSC

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

NV - No Value

Subject: Draft Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting
Longhorn Army Ammunition Plant (LHAAP)
Location of Meeting: Karnack Community Center, Karnack, Texas
Date of Meeting: October 23, 2019, 6:00 PM Central Daylight Time (CDT)

Meeting Participants:

Army BRAC:	Rose M. Zeiler
USACE:	Aaron Williams
USAEC:	Amanda Sherman and Troy Darr
Bhate:	Kim Nemmers
APTIM:	Bill Foss
USEPA Region 6:	Rich Mayer, Dorelle Harrison, and Kent Becher (KB)-USGS Liaison
TCEQ:	April Palmie
RAB:	Present: Judy VanDeventer, Deon Hall, John Fortune, Charles Dixon, Richard LeTourneau, and Sharron McAvoy Absent: Nigel R. Shivers, Carol Fortune; Terry Britt; John Pollard, Jr.; Tom Walker
Public:	Laura-Ashley Overdyke (Executive Director of the Caddo Lake Institute [CLI])

An agenda for the RAB meeting, a color copy of the Bhate Environmental Associates, Inc. (Bhate) slide presentation, and handouts (see list at end of meeting minutes) were provided for meeting attendees.

Welcome and Introduction

Ms. Rose Zeiler, RAB Installation Co-Chair, called the RAB meeting to order at 6:05 pm CDT. Ms. Zeiler welcomed everyone and asked if there was anyone present that had not attended before. Mr. Troy Darr stated that he was from the U.S. Army Environmental Command (USAEC) Public Affairs office and that he is in training to support environmental restoration. Mr. Darr stated that he also came to assist a person from the University of North Texas (UNT) in case he was at the meeting to shoot some video. However, the person from UNT was not at the meeting.

Ms. Zeiler explained the RAB meets every 3 months and that the purpose is to promote community awareness and obtain constructive community review and comments on environmental restoration activities. Ms. Zeiler stated that the Army is committed to protecting human health and the environment. Ms. Zeiler stated the importance of engaging the community and increasing public participation in the RAB. Ms. Zeiler explained that the RAB is expected to inform the community and hear the concerns. Ms. Zeiler asked if anyone had heard from John Pollard, one of the RAB members, who had not attended a meeting in the past year. Ms. Zeiler stated that she probably needed to send him a letter to find out if he was still interested in being on the board. Ms. Zeiler stated to let her know if anyone knew of someone interested in being on the RAB board also.

Ms. Zeiler stated that Paul Fortune had stepped down as RAB co-chair and the RAB needed to select a new co-chair. Ms. Zeiler then handed out sheets of paper with the names of each of the RAB members. Ms. Zeiler asked the RAB members present to select their 1st and 2nd choices for RAB co-chair and then hand them to Mr. Aaron Williams for tally. Ms. Zeiler explained the role of the new co-chair is speak for the RAB, generally starts the meeting and coordinate opinions from RAB members. Ms. Zeiler stated that concerns or issues by the public or other RAB members (e.g. frequency of RAB meeting) should be brought to the RAB co-chair.

Defense Environmental Restoration

Ms. Kim Nemmers stated that the RAB meeting slides were available along with handouts for the groundwater treatment plant (GWTP) and surface water samples. Ms. Nemmers pointed out that the slide packet contains a map of the installation sites along with a list of abbreviations and acronyms for reference.

LHAAP-50

Mr. Bill Foss presented LHAAP-50 and explained that the site is a small site south of LHAAP-47. Mr. Foss explained the site history for LHAAP-50, including that a remedy has been in place since the Record of Decision (ROD) was signed in 2010. Mr. Foss stated that the remedy has been monitored since that time. Mr. Foss explained that the site had a 47,000 gallon aboveground storage tank that received industrial waste water from sumps throughout LHAAP from the 1950s through the late 1980s. Mr. Foss stated that the constituents of concern were chlorinated solvents and perchlorate in groundwater and perchlorate in soil. Mr. Foss indicated that the remedy selected was monitored natural attenuation (MNA) for the groundwater, excavation of soil contamination that could leach into the groundwater, and land use controls (LUCs). The ROD also had a contingency remedy of enhanced in-situ bioremediation (EISB) if the MNA was not effective.

Mr. Foss explained that MNA was found to be ineffective based upon lines of evidence (in a process developed by the U.S. Environmental Protection Agency [USEPA]) in 2018 following years of groundwater monitoring. Mr. Foss explained that the concentrations of trichloroethylene (TCE) and perchlorate increased from 2013 to 2018. Based upon these increasing concentrations and other lines of evidence, Mr. Foss explained that the Army, Texas Commission on Environmental Quality (TCEQ), and USEPA agreed that the contingency remedy was needed to address the site plumes. Mr. Foss stated that initiation of the contingency remedy was documented in the Explanation of Significant Differences (ESD), which was co-signed by the USEPA and received concurrence from TCEQ.

Mr. Foss explained that, due to the expansion of the plume, an additional well was installed in July 2019. Mr. Foss stated that the groundwater collected from the new monitoring well did not have TCE or perchlorate above the screening levels such that the plume extent is now smaller than previously depicted. Mr. Foss stated that the Remedial Action Work Plan (RAWP) is being prepared to implement the contingency remedy. Mr. Foss stated that the remedy planned is injection of emulsified vegetable oil (EVO) along with microbial culture to enhance the degradation process of TCE and perchlorate. Mr. Foss stated that the goal is to treat the most

impacted portions of the plume. Mr. Foss stated that the implementation is planned for later 2019 or early 2020 depending on the time to get the RAWP approved by the USEPA and TCEQ.

Overview of Sites

Ms. Nemmers discussed the field work completed the previous 3 months. She explained that the area had received a large amount of rainfall for an extended period of time and that this has delayed implementation of several remedies until the past 3 months. Ms. Nemmers stated that remedies are being implemented at LHAAP-03, -04, -16, and -17. Ms. Nemmers stated bioremediation approaches, similar to what Mr. Foss presented for LHAAP-50, were being implemented at LHAAP-04 and LHAAP-16. Ms. Nemmers stated that soil excavation was being completed at LHAAP-03 and LHAAP-17. Ms. Nemmers stated that monitoring of the selected remedy has occurred at LHAAP-37, LHAAP-58, and LHAAP-18/24. Ms. Nemmers stated that new monitoring wells were installed at LHAAP-12, -16, -50, and -67 to confirm delineation of the site plumes. Ms. Nemmers stated that the extraction system, installed at LHAAP-18/24, has double-walled piping to transfer the extracted groundwater to the treatment plant. Based upon observed leaks, replacement of portions of this double-walled piping has been completed.

LHAAP-16

For LHAAP-16, Mr. Foss explained the site has perchlorate and TCE impacted groundwater similar to LHAAP-50, which he presented earlier. Mr. Foss then pointed out the location of the site. Mr. Foss explained that the plume emanates from a former landfill towards the bayou. Mr. Foss explained that the site had an extraction system for the plume. When LHAAP lost power in late December 2018, the outage continued into late August 2019 and the extraction system did not operate. Mr. Foss explained that when power was restored in August, the extraction system was operated for a couple of weeks and then the sampling was completed in September 2019 to confirm the October 2018 baseline results. Mr. Foss explained that two monitoring wells were installed on the east side of the Harrison Bayou at the beginning of August 2019. Ms. Zeiler stated that the installation of these wells was difficult and took a long time to get proper conditions for installation. Ms. Zeiler said that these wells were necessary to evaluate the performance of the remedy being implemented and determine if there was TCE across the Bayou in the groundwater.

Mr. Foss stated that injections have started at the site. Mr. Foss explained that the injections started with the Bayou Biobarrier, pointing out the location of this area on slide 13. Mr. Foss also pointed out the two new wells installed on slide 13 (16WW57 and 16WW58). Mr. Foss stated that these wells allow for evaluation of the plume along the downgradient edge. Mr. Foss explained that the area in yellow includes injection of EVO in a grid pattern using direct push technology (DPT) with recirculation to treat this area of elevated perchlorate and TCE. Mr. Foss explained that Biobarriers 1 and 3 have also used DPT for delivery of the EVO. Mr. Foss explained that Biobarrier 2 does not require DPT so the DPT rig has moved over to LHAAP-04. Mr. Richard LeTourneau asked if this site will respond better than others. Mr. Foss stated that everything went in well but the first round of groundwater monitoring, completed after all the injections are done, will help assess the performance. Ms. Laura-Ashley Overdyke asked about the data from the new wells. Mr. Foss stated that the groundwater results from the new wells will be presented in the Remedial Action Completion Report (RACR) that will be produced in 2020. Ms. Zeiler stated

that the groundwater results show that the TCE plume crosses the bayou and will be used to evaluate the effectiveness of the injections. Ms. Zeiler stated that surface water sampling will continue and that contamination is not being observed downgradient of the site. Ms. Zeiler pointed out that the field team is checking for injectate in the bayou which could be observed as a white milky material and could take away oxygen in surface water. Ms. Nemmers pointed out that the initial groundwater sampling results may not be representative of whether the site responds well because often it takes a year to observe microbial growth resulting in reduction of the TCE and perchlorate. Ms. Zeiler pointed out that the yellow area, shown on Slide 13 for LHAAP-16, is where the extraction system was located, which is now turned off, and that the area is a treatment area and not a barrier. High concentrations of TCE are found in the area in both the shallow and intermediate zone groundwater. Ms. Zeiler explained that a grid of injections is used in the shallow zone of the ISB treatment area to treat the contamination and existing extraction wells are used in the intermediate zone to recirculate injectate to get as much contact as possible with the TCE contamination in that zone. Ms. Zeiler pointed out that with the landfill being the source of the plume, additional injections will likely be needed in the future along the landfill biobarriers.

LHAAP-17

Mr. Foss explained that LHAAP-17 is located across the Bayou and southeast of LHAAP-16. Mr. Foss stated that LHAAP-17 was a burning ground and flashing site. Mr. Foss explained that the site was excavated beginning in August 2019 for explosives in the soil and that approximately 5,300 cubic yards of soil was expected to be removed. However, munition items were found during the excavation, which was unanticipated. The Army provided Ordnance and Explosives Safety Specialist (OESS) support. Mr. Foss stated that the initial rounds found were not live so the excavation continued under OESS supervision. Mr. Foss stated that the excavation was nearly completed but then additional munitions debris and munitions and explosives of concern (MEC) were found. Therefore, work has been stopped to be able to provide additional ordnance support and ensure safety of intrusive activities. Mr. Foss explained that as a safety measure the currently excavated areas will be backfilled in early November 2019.

Mr. Foss explained that the second part of the remedy involves the installation of a groundwater extraction system to treat perchlorate in groundwater. Mr. Foss stated that placement of that system will be above ground to avoid intrusive activities. Mr. Foss explained that this will allow the remedy to move forward. Ms. Judy VanDeventer asked if the remaining excavation will be done under this contract. Ms. Zeiler stated that the work will be under a separate contract. Mr. Foss stated that a report will be prepared to document the excavation and backfilling work completed at the site to date to support the scoping of follow-on excavation work. Ms. Nemmers pointed out that the dashed lines on slide 16 show the extent of the excavation. Ms. Nemmers stated that over excavation was necessary for some sidewalls as shown by dashed lines that move away from the planned excavation and that most of the planned excavation was completed.

Look Ahead

Ms. Nemmers then discussed the 3 month look ahead for LHAAP field work. Ms. Nemmers stated that the documents in the coming months include annual Remedial Action Operations [RA(O)]

Reports that document the progress of the remedies implemented. Ms. Nemmers stated that the RAWP for the injections at LHAAP-50 is going through the review process as previously discussed. Ms. Nemmers stated that the quarterly evaluation reports for the GWTP are in process for the second and third quarter of 2019.

Ms. Nemmers stated that the field work look ahead includes the four sites discussed throughout the meeting. Ms. Nemmers stated that LHAAP-03 is a small site with arsenic and lead in the soil that requires a little additional excavation based upon the soil sample results and then backfilling. Ms. Nemmers stated that LHAAP-17 field work will hopefully include installation of the extraction system in addition to backfilling the excavation. Ms. Nemmers stated that the injections will be completed at LHAAP-04 and LHAAP-16 in the coming weeks and then the sites will enter the performance monitoring phase. Ms. Nemmers stated that the other sites listed on slide 18 are the sites with remedies in place that have on-going RA(O) sampling. Ms. Zeiler reminded everyone that the field schedules are posted on the website and encouraged everyone to check for this information. Ms. Nemmers pointed out that the look ahead for documents is the same list that are currently being completed because the documents take time to get reviewed and approved. Ms. Zeiler pointed out that the Contingency RAWP is the document for the injection field work at LHAAP-50, discussed early on in the meeting.

Groundwater Treatment Plant

Ms. Nemmers stated that there were handouts with the information on the slides for the GWTP that provide more details. Ms. Nemmers pointed out that the chart depicts discharge of treated water that includes water from the INF Pond so the peaks and valleys of the chart indicate discharge to the Bayou from both the GWTP and the INF Pond if able. Ms. Nemmers explained that when the Bayou is not flowing that the treated groundwater is discharged to the INF Pond. Ms. Nemmers also stated that more water can be extracted from the ground when there is more precipitation. Mr. Charles Dixon asked if the purpose of discharging in this way was to keep the minerals low. Ms. Zeiler stated that chloride and sulfate is tested prior to discharge to the Bayou.

Surface Water Sampling

Ms. Nemmers presented the five locations sampled for surface water. Ms. Nemmers stated that surface water samples are collected on a quarterly basis when the Bayou is flowing. Ms. Nemmers explained that one of the surface water samples exceeded the screening criteria of 17 parts per billion (ppb) for perchlorate. Ms. Nemmers stated that the surface water location was resampled a couple of weeks later. Ms. Nemmers stated that the result from the resample was 1.2 J ppb, with J meaning that the result was estimated. Ms. Nemmers explained that the detection limit is typically 2 ppb and so the detection was seen by the laboratory but below the detection limit. Ms. Nemmers stated that the location of the surface water sample was the furthest downgradient sample location but has historically had detections of perchlorate. Ms. Nemmers stated that LHAAP-18/24 was sampled in this same time period and that monitoring wells upgradient of this surface water sample did not have detections of perchlorate. Ms. Nemmers stated that the surface water will be sampled in the fourth quarter but has not been sampled in October 2019 to date due to lack of surface water flow. Ms. Zeiler pointed out that the screening criteria is the groundwater drinking level. Ms. Nemmers stated that this

information is also provided in a handout.

LHAAP-18/24, LHAAP-29, and LHAAP-47

Mr. Williams explained that HDR, Inc., has a separate contract for sites that do not have a ROD and is responsible for selection of the final remedy at three sites (LHAAP-18/24, LHAAP-29, and LHAAP-47). Mr. Williams explained that the LHAAP-18/24 ROD is being reviewed by the regulators and that comments are expected later in October 2019. Mr. Williams hoped that the ROD could be signed in late 2019.

Mr. Williams stated that the Final ROD for LHAAP-29 was signed and is on compact disc (CD) at the Marshall Public Library. On October 13, 2019, Mr. Williams stated that the notice that the final ROD was available for review was put into the Marshall News Messenger and the Shreveport Times.

Mr. Williams stated that LHAAP-47 had old data so additional data was obtained. A new well installed had an elevated detection of TCE such that the remedy selected would not be effective at those high levels. Currently, Work Plan Addendum 2 is being completed. The additional investigation planned will focus on the area around monitoring well 47MW25R. Monitoring well 47MW25R had TCE detected at 120,000 ppb. Mr. Williams explained the field work planned included both soil and groundwater samples.

Ms. Overdyke asked if LHAAP-17 excavation could have contributed to the perchlorate detected in HBW-7. Ms. Zeiler stated that the excavation commenced after the surface water sampling was completed. Ms. Zeiler stated that groundwater results and water levels were evaluated but no reason for the detection could be identified. Ms. Zeiler pointed out that implementation of the remedies such as at LHAAP-18/24 makes the Army feel better about the overall progress at this site.

Next RAB Meeting Schedule and Closing Remarks

Ms. Zeiler then discussed the next meeting with the RAB members. It was decided that the next RAB Meeting will be held on **January 16, 2020,** with the **meeting starting at 6:00 pm Central Standard Time (CST)** at the Karnack Community Center.

Ms. Zeiler announced that Ms. VanDeventer was selected as the new co-chair. Ms. VanDeventer accepted the position. Mr. Kent Becher mentioned that Mr. Rich Mayer was retiring. Mr. Mayer said that he had been at the USEPA since January 1987 and will be retiring on December 31, 2019. Mr. Mayer stated that he's been with the EPA since January 1987. Mr. Mayer said that he had been reviewing documents, like those for LHAAP, for 33 years. Mr. Mayer said that he'd enjoyed working with the RAB and that a replacement had not yet been selected for him by the EPA.

Adjourn

Ms. VanDeventer made the motion to adjourn and Mr. Dixon seconded the motion. The meeting adjourned at 6:55 pm CDT.

October 2019 Meeting Attachments and Handouts:

- Color Copy of Bhate Presentation Slides
- GWTP – Processed Groundwater Volumes Handout
- Surface Water Sampling Handout

Longhorn Army Ammunition Plant Quarterly Restoration Advisory Board Meeting

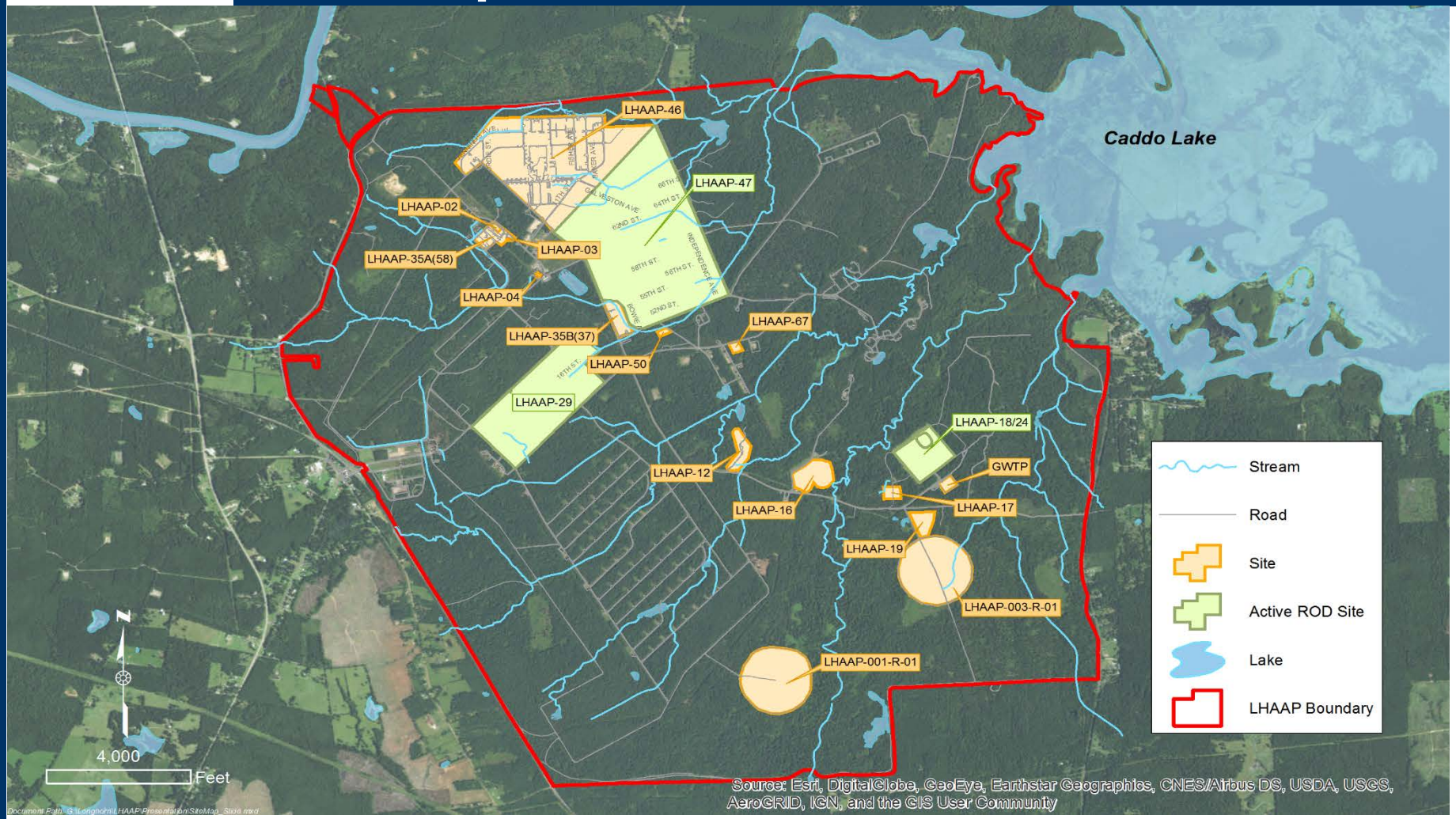
Karnack Community Center
October 23, 2019
6:00 PM CDT

APTIM

bhate

Restoration Advisory Board Meeting

Site Map



Restoration Advisory Board Meeting

Abbreviations and Acronyms

µg/L	Micrograms per liter
DERP	Defense Environmental Restoration Program
DPT	Direct Push Technology
ESD	Explanation of Significant Differences
GPW	Goose Prairie Creek Water Sample
GW-Res	Residential Groundwater
GWTP	Groundwater Treatment Plant
HBW	Harrison Bayou Water Sample
ISB	In-situ bioremediation
LHAAP	Longhorn Army Ammunition Plant
MEC	Munitions and Explosives of Concern
MNA	Monitored natural attenuation
PCL	Protective Concentration Level
PSI	Pre-Screening Investigation
RAB	Restoration Advisory Board
RA(O)	Remedial Action Operation
RAWP	Remedial Action Work Plan
ROD	Record of Decision
TCE	Trichloroethylene
TCEQ	Texas Commission on Environmental Quality
TRRP	Texas Risk Reduction Program
USEPA	U.S. Environmental Protection Agency

Restoration Advisory Board Meeting

Agenda

06:00	Welcome and Introduction
06:05	Open Items Purpose of the Restoration Advisory Board (RAB) Meeting Ongoing Outreach/Website RAB Administrative Issues - Membership Update - Minutes (July 2019 RAB Meeting) - Election of new Co-Chair
06:15	Defense Environmental Restoration Program (DERP) Update LHAAP-50 Remedial Action Work Plan (RAWP) Documents and Field Work Completed Since Last RAB - LHAAP-16 - LHAAP-17 3 Month Look Ahead Groundwater Treatment Plant (GWTP) Update
06:45	Other DERP Update LHAAP-18/24 Record of Decision (ROD) and Responsiveness Summary - LHAAP-29 ROD and Responsiveness Summary - LHAAP-47 Additional Pre-Screening Investigation (PSI) Data & Revised ROD Schedule - Five Year Review Update – Recommendations for Sites 12, 50, and 67
06:55	Next RAB Meeting Schedule and Closing Remarks {RMZ}

Purpose of the RAB Meeting

- Held every 3 months
- The mission of the Longhorn Army Ammunition Plant (LHAAP) RAB is to promote community awareness and obtain constructive community review and comments on environmental restoration activities at the former LHAAP

The Army Wants You to be Informed

- The Army is committed to protecting human health and the environment; key to that commitment is engaging the community and increasing public participation in environmental restoration at LHAAP
- You are encouraged to:
  - Attend RAB Meetings and/or become a member of the RAB
  - Visit the Longhorn environmental website at www.longhornaap.com
    - Website is regularly updated to indicate the upcoming field events at each site including groundwater sampling, monitoring well installations, soil sampling, or remediation activities
  - Make suggestions for improving communication – the Army welcomes and appreciates community feedback

RAB Administrative Issues

- Membership Update
- Minutes (July 2019 RAB Meeting)
- Election of new Co-Chair

Restoration Advisory Board Meeting

LHAAP-50 Contingency RAWP

- **Site Background**
  - **LHAAP-50 had a 47,000-gallon aboveground storage tank receiving industrial wastewater from various production sumps throughout LHAAP between 1955 and 1988.**
  - **After solids were filtered, the water was discharged to Goose Prairie Creek.**
  - **Constituents of concern at LHAAP-50 were chlorinated solvents and perchlorate in groundwater and perchlorate in soil.**
  - **The selected remedy in the 2010 ROD was monitored natural attenuation (MNA), excavation of soil to eliminate groundwater contamination from contaminated soil, and land use controls as the remedy for groundwater. The ROD also included a contingency remedy for groundwater if MNA was not effective.**

Restoration Advisory Board Meeting

LHAAP-50 Contingency RAWP

- Site Background-Continued
  - In 2018, MNA was found to be ineffective based on evaluation of several lines of evidence.
  - Concentrations of trichloroethylene (TCE) and perchlorate increased from 2013 to 2018, and the TCE plume has expanded beyond its baseline footprint.
  - Final Explanation of Significant Differences (ESD) to the ROD for a contingency remedy was published in July 2019 and co-signed by the U.S. Environmental Protection Agency (USEPA) and Army and concurred by Texas Commission on Environmental Quality (TCEQ) in August 2019.
  - In July 2019, one additional monitoring well (50WW29) was installed and sampled.
  - Sample results confirmed the extent of the TCE and perchlorate plumes in groundwater.

Restoration Advisory Board Meeting

LHAAP-50 Contingency RAWP Continued

Contingency RAWP

- RAWP is still in development and will undergo USEPA and TCEQ review and concurrence before implementation.
- The RAWP will include injection of emulsified vegetable oil, a microbial culture (SDC-9™), and nutrients to enhance biological degradation of perchlorate and TCE hot spots.
- Monitoring of the contingency remedy will include quarterly performance monitoring of selected wells for 2 years, as well as continued long-term monitoring of the larger plume area.
- Implementation of the Contingency RAWP is anticipated in late 2019.

Restoration Advisory Board Meeting

Completed Field Work Since Last RAB Meeting

Site	Activity
LHAAP-03	Implementation of Remedial Action (Soil Excavation)
LHAAP-04	Implementation of Remedial Action (In-situ bioremediation [ISB] Injections)
LHAAP-16	Implementation of Remedial Action (ISB Injections)
LHAAP-17	Implementation of Remedial Action (Soil Excavation)
LHAAP-37	Remedial Action Operation [RA(O)] Sampling – August 2019
LHAAP-46	RA(O) Sampling – August 2019
LHAAP-58	RA(O) Sampling of Western Plume – September 2019
LHAAP-18/24	RA(O) Sampling – Maintenance/repairs
LHAAP-12/16/50/67	Installation of New Monitoring Wells

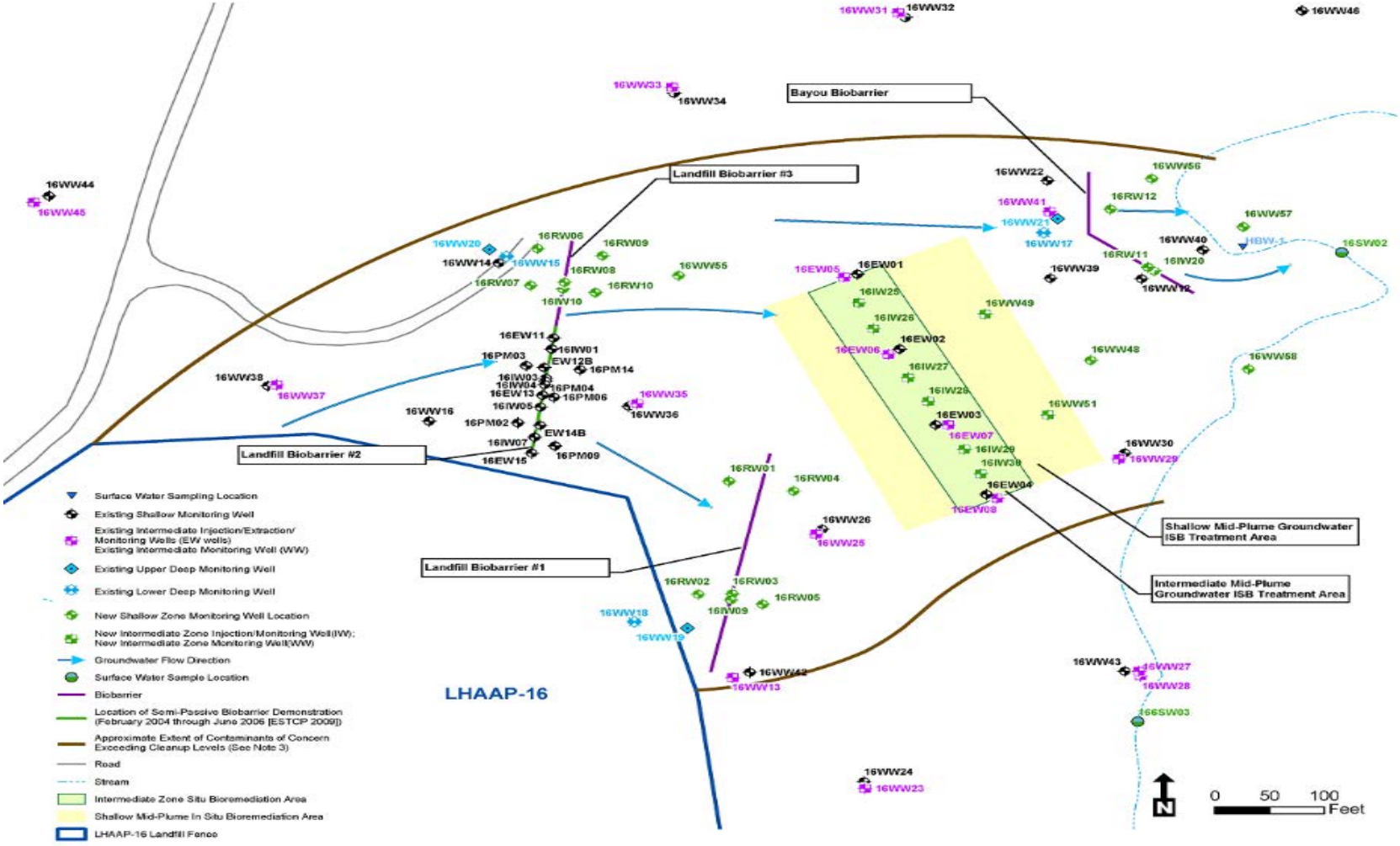
Restoration Advisory Board Meeting

LHAAP-16 Remedial Action Update

- Power restored to site in late August 2019 and extraction system restarted.
- Two wells on east side of Harrison Bayou (16WW57 & 16WW58) and one remaining intermediate zone well (16WW49) installed in July/August 2019
- Baseline samples collected from selected wells in September 2019 to complement October 2018 Baseline Sampling
- Injections completed in the Bayou Biobarrier, Mid-Plume Area, Biobarrier #1, Biobarrier #2, and Biobarrier #3
- 80,874 gallons of ISB solution injected starting on September 24, 2019 with 102 injection locations

Restoration Advisory Board Meeting

LHAAP-16 Remedial Action Update



Restoration Advisory Board Meeting

LHAAP-17 Remedial Action Update

- Excavation of contaminated soil initiated on August 21, 2019
- During excavation, unanticipated munitions items were discovered and addressed by Army Explosive Ordnance Disposal teams
- Excavation continued with support from an Army Ordnance and Explosives Safety Specialist
- Approximately 6,000 cubic yards of soil was excavated between August 21 and September 28, 2019

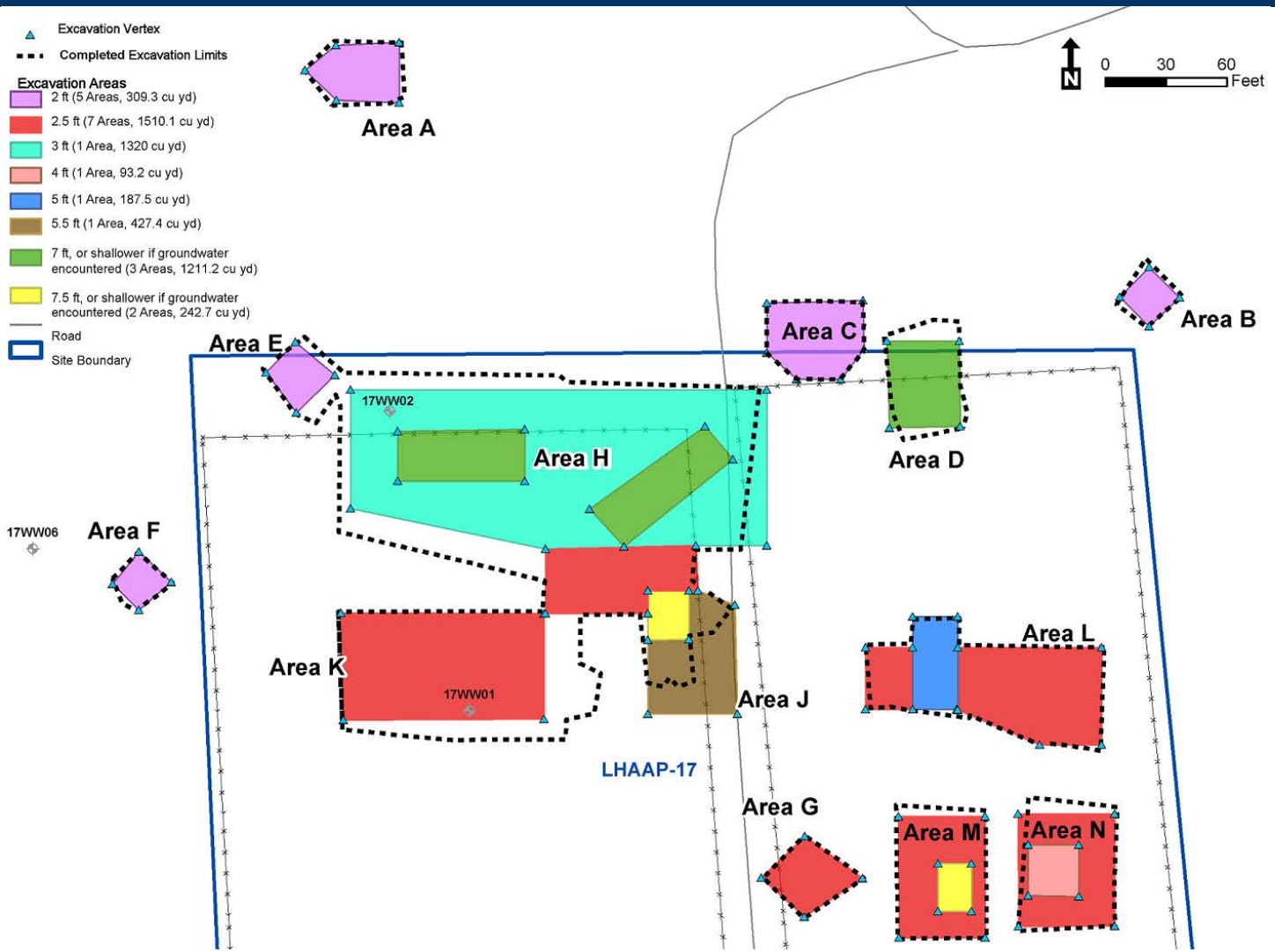
Restoration Advisory Board Meeting

LHAAP-17 Remedial Action Update

- On September 28, additional munitions debris and potential munitions and explosives of concern (MEC)were discovered and excavation work was halted for further site evaluation
  - At Army direction, excavation work has ceased and open areas will be backfilled and no intrusive activities will be performed at the site.
  - Remaining excavation work will need to be completed under a separate contract that includes munitions response support.
- Existing excavation areas will be backfilled as a safety measure
- Options for constructing the LHAAP-17 groundwater extraction system without requiring intrusive activities are currently being considered

Restoration Advisory Board Meeting

LHAAP-17 Remedial Action Update



Restoration Advisory Board Meeting

Documents in Process

Site	Document
LHAAP-46	Annual RA(O) Report
LHAAP-50	Contingency RAWP
LHAAP-58	Annual RA(O) Report
LHAAP-67	Annual RA(O) Report
GWTP	Quarterly Evaluation Report: Second Quarter (April – June 2019) Quarterly Evaluation Report: Third Quarter (July – September 2019)

Restoration Advisory Board Meeting

3 Month Look Ahead - Field Work by Bhate Team

Site	Activity
LHAAP-03	Complete excavation backfill
LHAAP-04	Performance monitoring
LHAAP-16	Performance monitoring
LHAAP-17	Complete excavation backfill and extraction system installation
LHAAP-37	RA(O) Sampling – November 2019
LHAAP-50	RA(O) Sampling – November 2019
LHAAP-58	RA(O) Sampling – December 2019
LHAAP-67	RA(O) Sampling – November 2019
LHAAP-18/24	RA(O) Sampling – December 2019

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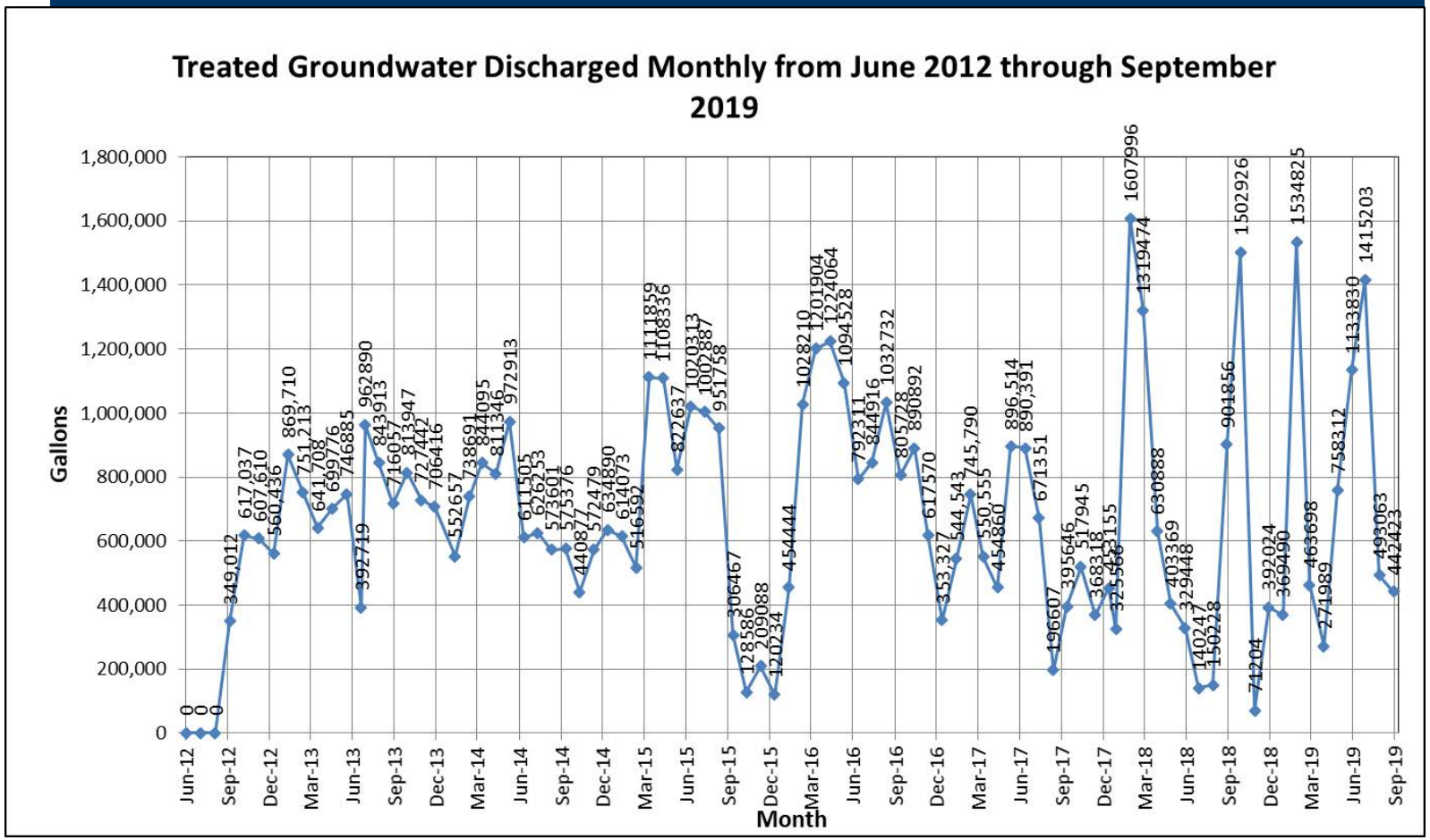
3 Month Look Ahead – Documents by Bhate Team

Site	Document
LHAAP-50	Finalize the Contingency RAWP
LHAAP-58	Finalize the Year 5 RA(O) Report
GWTP, LHAAP-16, and LHAAP-18/24	Quarterly Evaluation Report: Second Quarter (April –June 2019) Quarterly Evaluation Report: Third Quarter (July –September 2019)

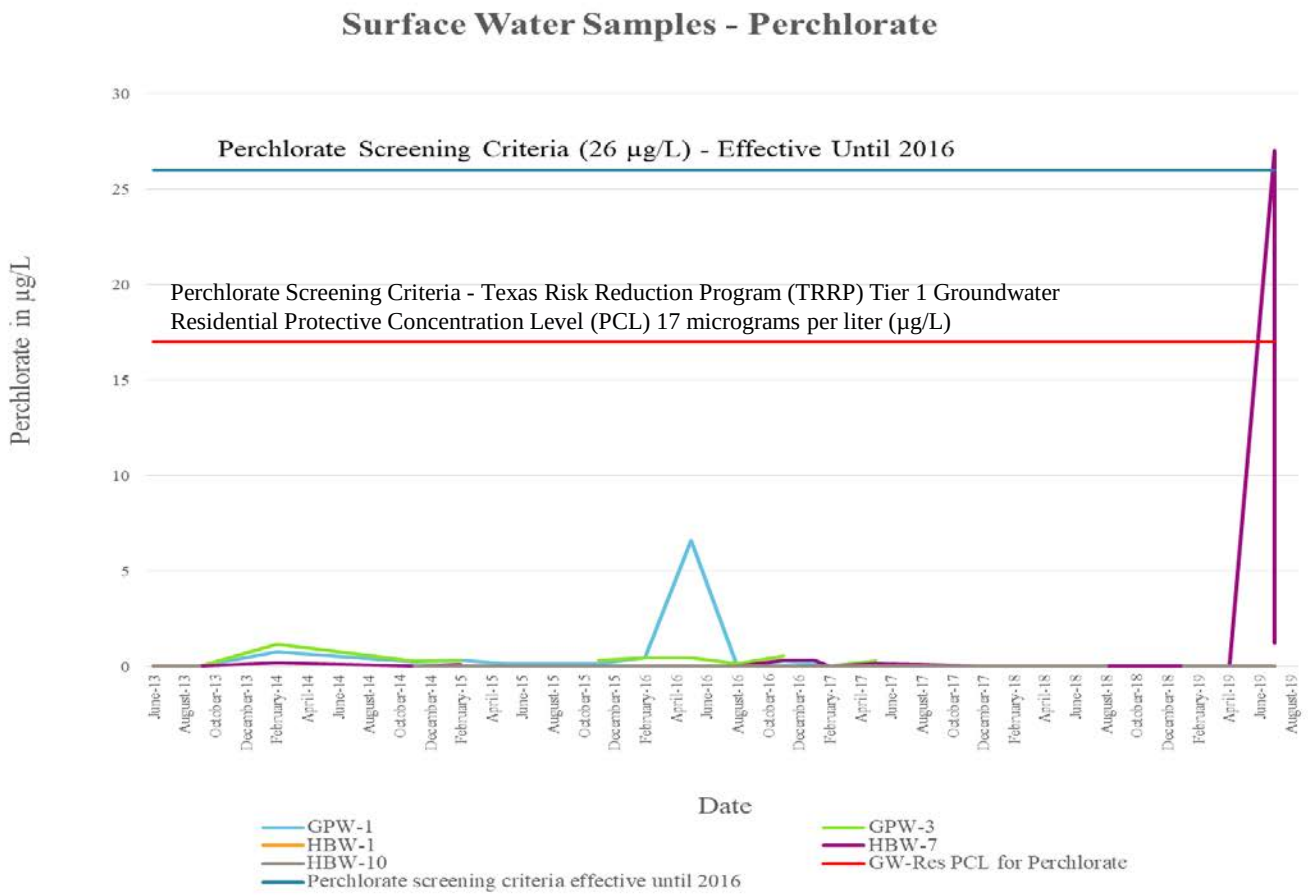
Restoration Advisory Board Meeting

GWTP Update



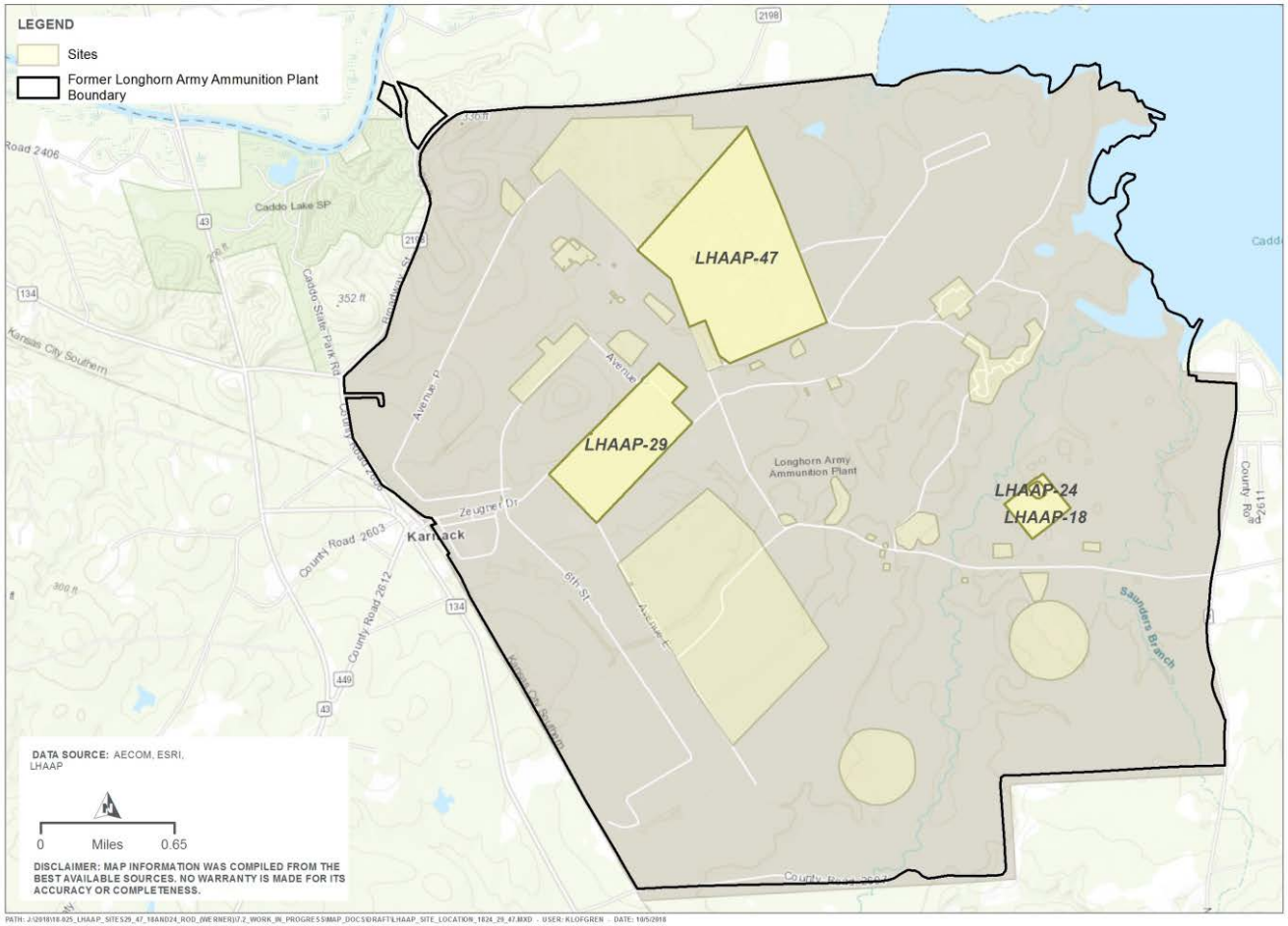
Restoration Advisory Board Meeting

Surface Water Sample Results



Note: Surface water at HBW-7 had a detection of 27 µg/L from a sample collected on 11 July 2019. Surface water at HBW-7 was resampled 19 days later (30 July 2019) with a detection of 1.2 J µg/L.

LHAAP-18/24, 29, 47 Status Update



LHAAP-18/24 & 29 Document Status

- **LHAAP-18/24**
  - **Draft Record of Decision submitted to the Regulators September 6, 2019**
- **LHAAP-29**
  - **Final Record of Decision signed September 19, 2019**
  - **Notice of Availability published in the Marshall News Messenger and Shreveport Times on October 13, 2019 and October 9, 2019 respectively. The ROD is available for public review at the Marshall Public Library.**
- **LHAAP-47**
  - **Draft PSI Work Plan Addendum No. 2 in Regulator review- Fieldwork to support the Record of Decision anticipated in early November 2019.**

LHAAP-47 Field Work Plan

- **Work Planned**
  - 11 Direct Push Technology (DPT) borings
  - 33 soil samples and 11 groundwater samples collected from DPT borings to identify source and extent
  - Collect groundwater samples from 3 existing wells for confirmation of results

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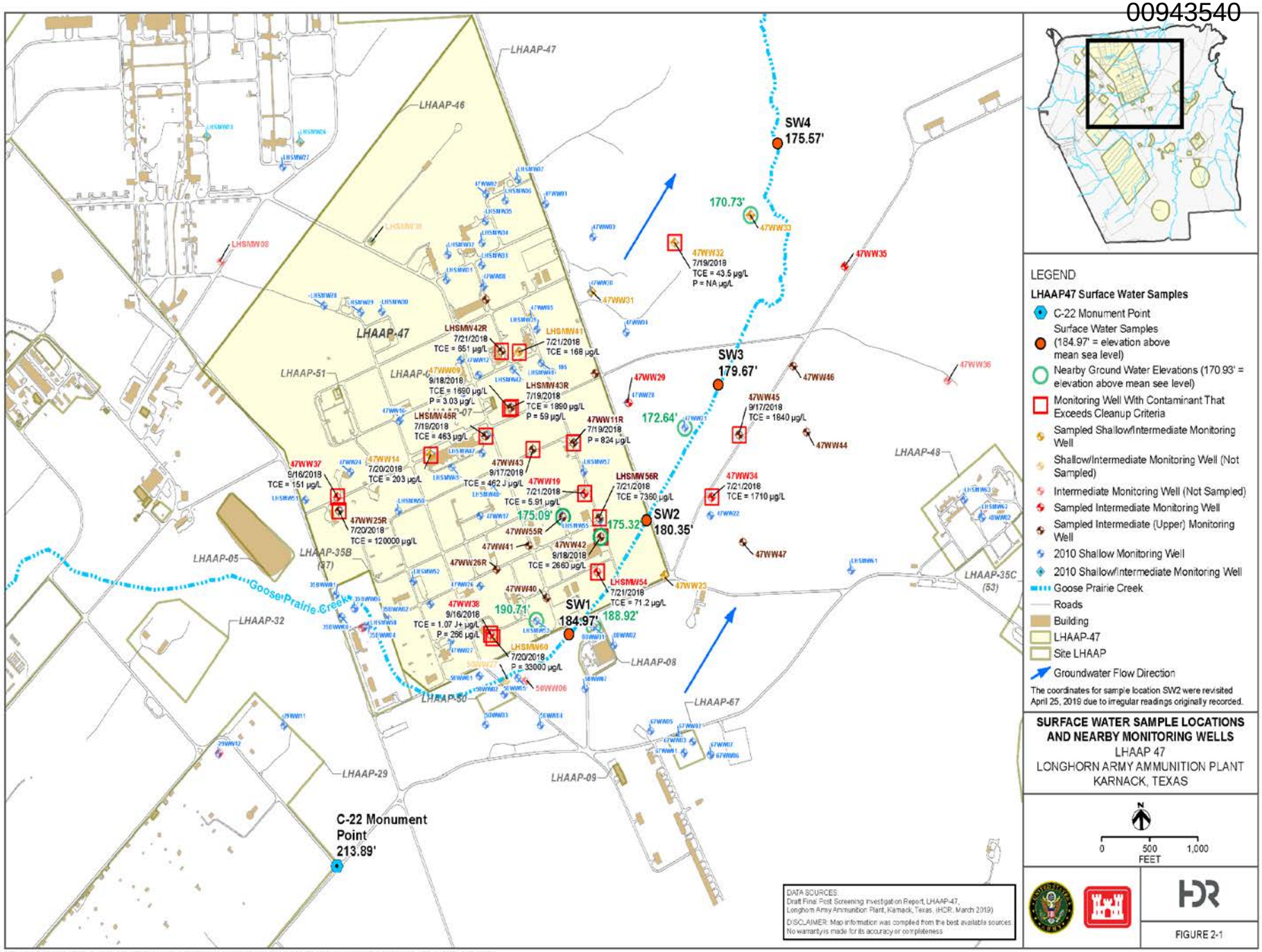


LEGEND

LHAAP47 Surface Water Samples

- C-22 Monument Point
- Surface Water Samples (184.97' = elevation above mean sea level)
- Nearby Ground Water Elevations (170.93' = elevation above mean see level)
- Monitoring Well With Contaminant That Exceeds Cleanup Criteria
- Sampled Shallow/Intermediate Monitoring Well
- Shallow/Intermediate Monitoring Well (Not Sampled)
- Intermediate Monitoring Well (Not Sampled)
- Sampled Intermediate Monitoring Well
- Sampled Intermediate (Upper) Monitoring Well
- 2010 Shallow Monitoring Well
- 2010 Shallow/Intermediate Monitoring Well
- Goose Prairie Creek
- Roads
- Building
- LHAAP-47
- Site LHAAP
- Groundwater Flow Direction

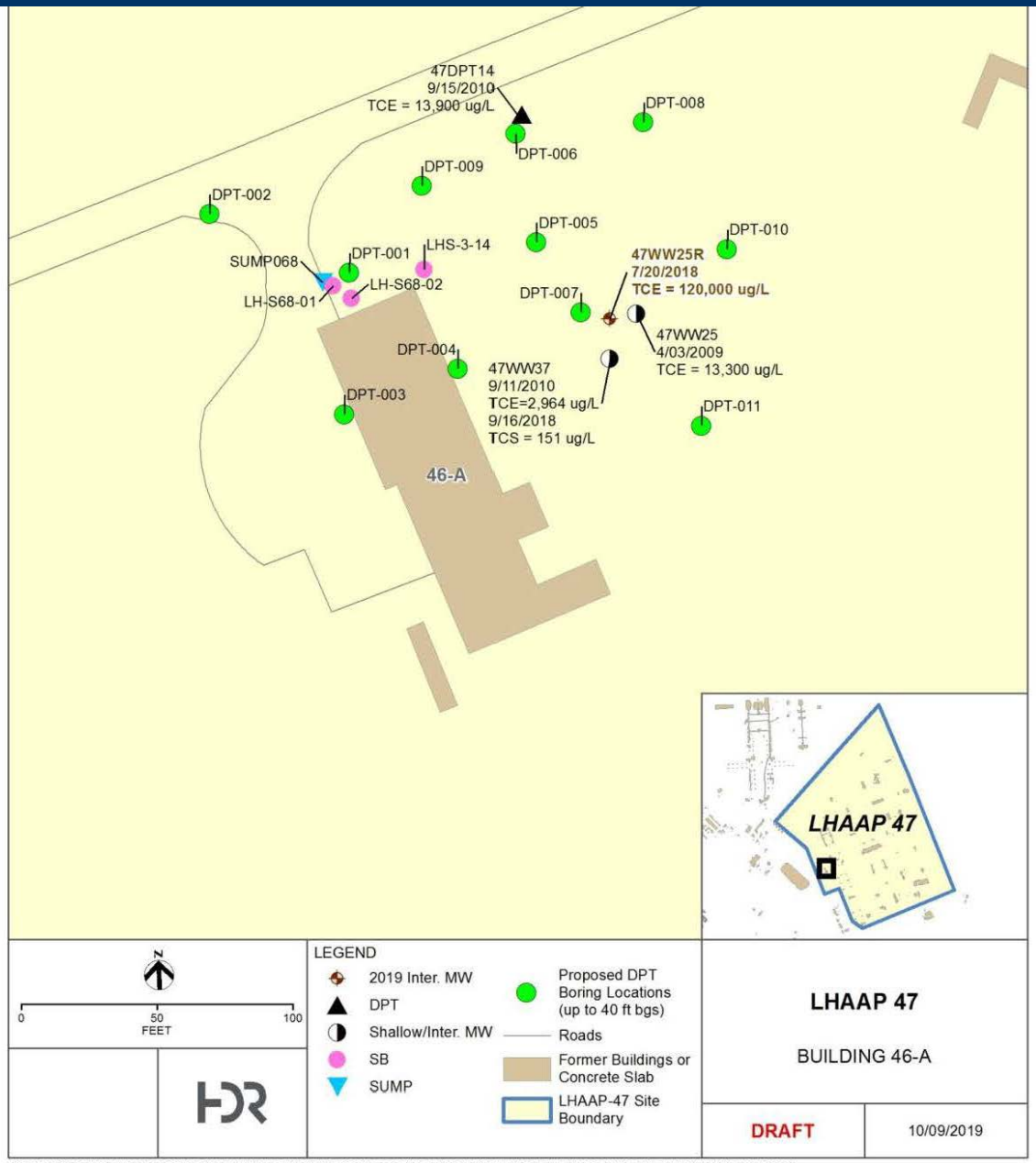
The coordinates for sample location SW2 were revisited April 25, 2019 due to irregular readings originally recorded.

SURFACE WATER SAMPLE LOCATIONS AND NEARBY MONITORING WELLS
LHAAP 47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

N
0 500 1,000
FEET

FIGURE 2-1

LHAAP-47 Field Work Plan



Next RAB Meeting Schedule & Closing Remarks

- Schedule January 2020 RAB Meeting
- Other Issues/Remarks
- Thank you for coming

Groundwater Treatment Plant - Processed Groundwater Volumes

The amount of groundwater treated is determined by measuring the number of gallons of processed water discharged.

Processed Water Discharged Data

(in gallons)

Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08
1,041,491	848,356	804,822	792,148	665,883	818,872	791,306	568,812	776,904	748,377	690,052	617,199

Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09
655,059	619,274	726,118	552,299	598,144	433,800	488,807	526,958	387,644	0	414,853	735,716

Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10
808,322	636,306	727,492	391,898	695,343	802,656	894,731	962,121	1,257,977	1,314,924	1,041,495	1,136,547

Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11
956,567	705,805	849,712	811,679	668,281	1,090,348	817,325	900,338	916,552	784,369	652,524	733,456

Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12
748,102	658,250	684,903	865,453	725,000*	730,000*	980,000*	630,000*	0	0	0	349,012

Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13
617,037	607,610	560,436	869,710	751,213	641,708	699,776	746,885	392,719	962,890	843,913	716,057

Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
813,974	727,442	706,416	552,657	738,691	844,095	811,346	972,913	611,505	626,253	573,601	575,376

Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15
440,877	572,479	634,890	614,073	516,592	1,111,859	1,108,336	822,637	1,020,313	1,002,887	951,758	306,467

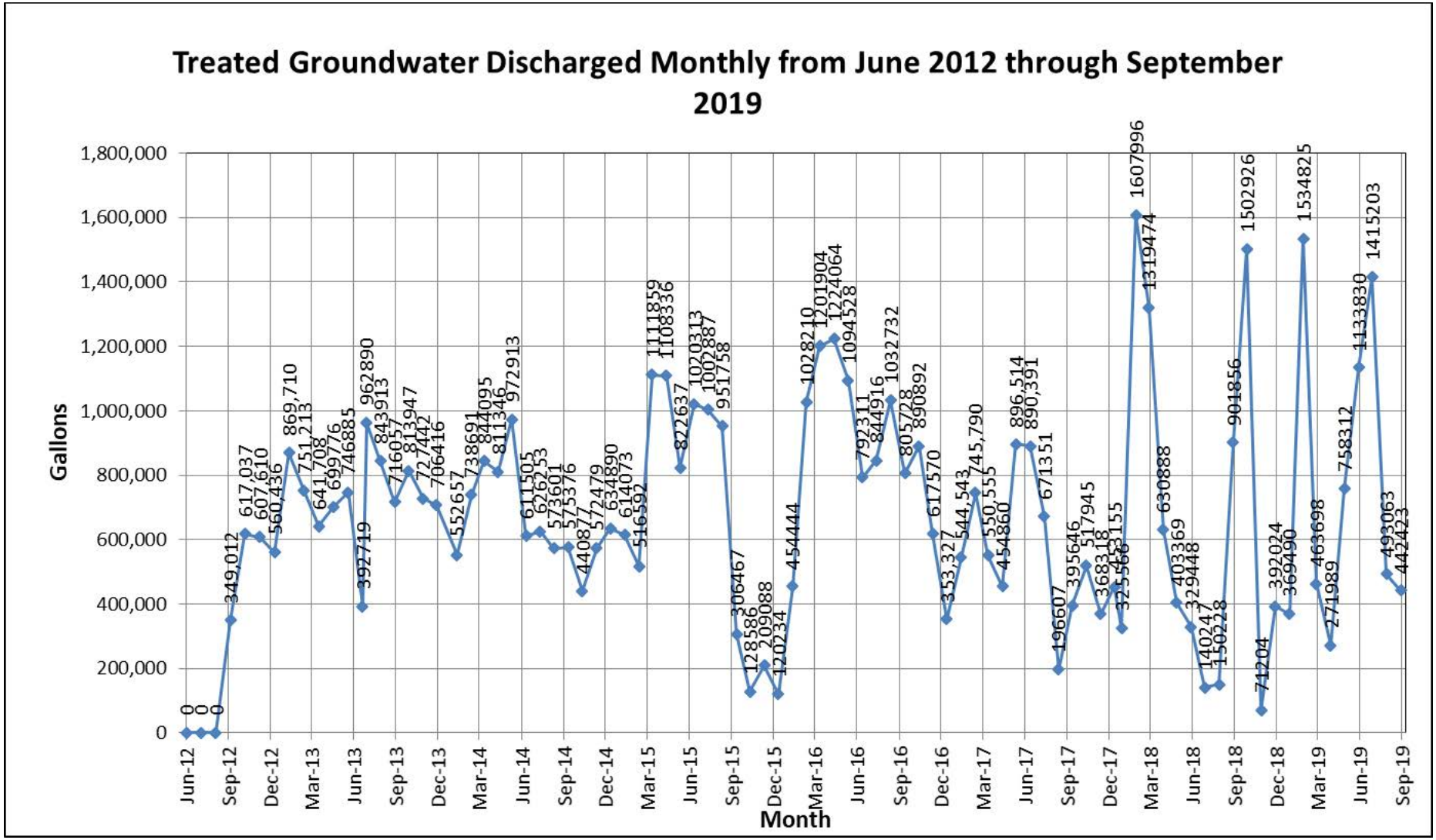
Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
128,586	209,088	120,234	454,444	1,028,210	1,201,904	1,224,064	1,094,528	792,311	844,916	1,032,732	805,728

Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
890,892	617,570	353,327	544,543	745,790	550,555	454,860	896,514	890,391	528,538	195,198	961,324

Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul - 18	Aug-18	Sep-18
517,945	368,318	453,155	325,566	1,607,996	1,319,474	630,888	403,369	329,448	140,247	150,228	901,856

Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	June-19	Jul - 19	Aug-19	Sep-19
1,502,926	71,204	392,024	369,490	1,534,825	463,698	271,989	758,312	1,133,830	1,415,203	493,063	442,423

*Indicates Estimate


Treated Groundwater Discharged Monthly from June 2012 through September 2019
Gallons
Month
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Jun-12
Sep-12
Dec-12
Mar-13
Jun-13
Sep-13
Dec-13
Mar-14
Jun-14
Sep-14
Dec-14
Mar-15
Jun-15
Sep-15
Dec-15
Mar-16
Jun-16
Sep-16
Dec-16
Mar-17
Jun-17
Sep-17
Dec-17
Mar-18
Jun-18
Sep-18
Dec-18
Mar-19
Jun-19
Sep-19

Water Discharge Location and Volume (Gallons)

Month	Total Combined to Harrison Bayou	LHAAP-18/24 Sprinklers	GWTP To INF Pond	INF Pond to Harrison Bayou	Contract Hauled Off-Site
Dec-16	0	236,688	0	0	0
Jan-17	0	0	0	0	0
Feb-17	0	0	0	0	14,355
Mar-17	127,242	0	0	0	14,400
Apr-17	113,038	0	236,821	0	0
May-17	0	0	534,155	0	0
Jun-17	958,404	0	294,550	490,574	0
Jul-17	0	0	528,538	0	0
Aug-17	0	0	195,197	0	0
Sep-17	651,434	0	309,980	651,434	0
Oct-17	0	0	517,945	0	0
Nov-17	0	0	368,318	0	0
Dec-17	560,350	0	453,155	560,350	0
Jan-18	325,566	0	253,177	325,566	0
Feb-18	1,607,996	0	62,017	1,430,634	0
Mar-18	1,319,474	0	0	870,816	0
Apr-18	630,888	0	0	630,888	0
May-18	403,369	0	0	403,369	0
Jun-18	193,669	0	135,779	0	0
Jul -18	0	0	140,247	0	0
Aug -18	49,409	0	100,819	0	0
Sep-18	585,397	0	316,459	524,484	0
Oct-18	1,409,106	0	93,820	1,016,285	0
Nov-18	71,204	0	0	0	0
Dec-18	392,024	0	0	0	0
Jan-19	369,490	0	0	369,490	0
Feb-19	1,534,825	0	0	1,326,485	0
Mar-19	463,698	0	0	83,250	0
Apr-19	271,989	0	0	0	0
May-19	758,312	0	0	253,817	0

Month	Total Combined to Harrison Bayou	LHAAP-18/24 Sprinklers	GWTP To INF Pond	INF Pond to Harrison Bayou	Contract Hauled Off-Site
Jun-19	1,133,830	0	0	847,918	0
Jul -19	1,415,203	0	0	903,001	0
Aug-19	374,629	0	118,434	0	0
Sep-19	0	0	442,423	0	0

Harrison Bayou and Goose Prairie Creek – Perchlorate Data

Surface water samples are collected quarterly from each location in Harrison Bayou and Goose Prairie Creek, unless the sampling location is dry.

Surface Water Sample Data (in micrograms per liter)

Quarter	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st
Creek Sample ID	**Jul 1999**	**Sep 1999**	**Feb 2000**	**Apr 2000**	**Aug 2000**	**Dec 2000**	**Feb 2001**	**Apr 2001**	**July 2001**	**Oct 2001**	**Jan 2002**
GPW-1	<1.0U	-	4	<4.0 U	<4.0 U	<4.0 U	-	2.65	<4.0 U	<4.0 U	<4.0 U
GPW-3	<1.0U	<4.0 U	17	8	<4.0 U	<4.0 U	-	2.28	<4.0 U	<4.0 U	<4.0 U
HBW-1	-	<80.0 U	310	23	-	-	<4.0 U	-	<4.0 U	<4.0 U	<4.0 U
HBW-7	-	<8.0 U	370	110	-	-	<4.0 U	-	<4.0 U	<4.0 U	<4.0 U
HBW-10	-	<8.0 U	905	650	<4.0 U	-	<4.0 U	-	<4.0 U	-	-

Quarter	2nd	3rd	4th	1st	2nd	3rd	3rd	4th	2nd	3rd	4th
Creek Sample ID	**June 2002**	**Sept 2002**	**Dec 2002**	**Feb 2003**	**June 2003**	**Aug 2003**	**July 2004**	**Dec 2006**	**May 2007**	**Aug 2007**	**Dec 2007**
GPW-1	<4.0 U	<4.0 U	18.3	18.6	59.9	-	2.25	-	<1.0 U	<1.0 U	10.7
GPW-3	<4.0 U	<4.0 U	5.49	12.6	14.7	-	2.2	-	<1.0 U	<1.0 U	7.48
HBW-1	<4.0 U	<4.0 U	<4.0 U	-	<4.0 U	99.3	<0.2U	<1.0 U	<1.0 U	122	<1.0 U
HBW-7	<4.0 U	<4.0 U	<4.0 U	-	<4.0 U	<4.0 U	<0.2U	<1.0 U	<1.0 U	1.02	<1.0 U
HBW-10	<4.0 U	<4.0 U	<4.0 U	-	<4.0 U	-	<0.2U	<1.0 U	<1.0 U	<1.0 U	<1.0 U

Quarter	1st	2nd	3rd	4th	2nd	3rd	3rd	3rd	4th	1st	2nd
Creek Sample ID	**Mar 2008**	**Jun 2008**	**Sep 2008**	**Dec 2008**	**May 2009**	**Jul 2009**	**Aug 2009**	**Sep 2009**	**Dec 2009**	**Mar 2010**	**Jun 2010**
GPW-1	27	<0.5U	<0.5U	<0.22U	16	<4U	NS	<1.2U	3.7	1.3J	<0.6U
GPW-3	21.9	9.42	1.1	<0.22U	8.9	<4U	NS	<0.6U	2.8	1.8J	<0.6U
HBW-1	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	NS	<1.5U	<0.275U	1.5U	<0.6U
HBW-7	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	24	<1.2U	<0.275U	1.5U	<0.6U
HBW-10	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	NS	<1.5U	<0.275U	1.2U	<0.6U

Quarter	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st
Creek Sample ID	**Sep 2010**	**Dec 2010**	**Mar 2011**	**Jun 2011**	**Sep 2011**	**Dec 2011**	**Mar 2012**	**Jun 2012**	**Not Applicable**	**Jan & Feb 2013**	**Mar 2013**
GPW-1	dry	<0.1U	8.7	dry	dry	1.76	0.163J	dry	NS	1.65	0.735
GPW-3	dry	0.199J	0.673	dry	dry	1.31	0.261	dry	NS	1.74	0.754
HBW-1	dry	<0.1U	<0.2U	dry	dry	<0.1U	0.1U	dry	NS	<0.2U	<0.2U
HBW-7	dry	<0.1U	<0.2U	dry	dry	0.171J	0.1U	dry	NS	<0.2U	<0.2U
HBW-10	dry	<0.1U	<0.2U	dry	dry	<0.1U	0.1U	dry	NS	<0.2U	<0.2U

Quarter	2nd	3rd	4th	1st	2nd	3nd	4th	1st	2nd	3rd	4th
Creek Sample ID	**Jun 2013**	**Sept 2013**	**Dec 2013**	**Feb 2014**	**May 2014**	**Aug 2014**	**Nov 2014**	**Feb 2015**	**May 2015**	**Aug 2015**	**Nov 2015**
GPW-1	dry	<0.2 U	dry	0.766	dry	dry	0.244 J	0.311 J	0.156J	dry	0.142 J
GPW-3	dry	<0.2 U	dry	1.15	dry	dry	0.276 J	0.344 J	dry	dry	0.311 J
HBW-1	<0.2U	<0.2 U	dry	<0.2 U	dry	dry	<0.2 U	<0.2 U	dry	dry	<0.2 U
HBW-7	<0.2U	<0.2 U	dry	0.201 J	dry	dry	<0.2 U	0.124 J	dry	dry	<0.2 U
HBW-10	<0.2U	<0.2 U	dry	<0.2 U	dry	dry	<0.2 U	<0.2 U	dry	dry	<0.2 U

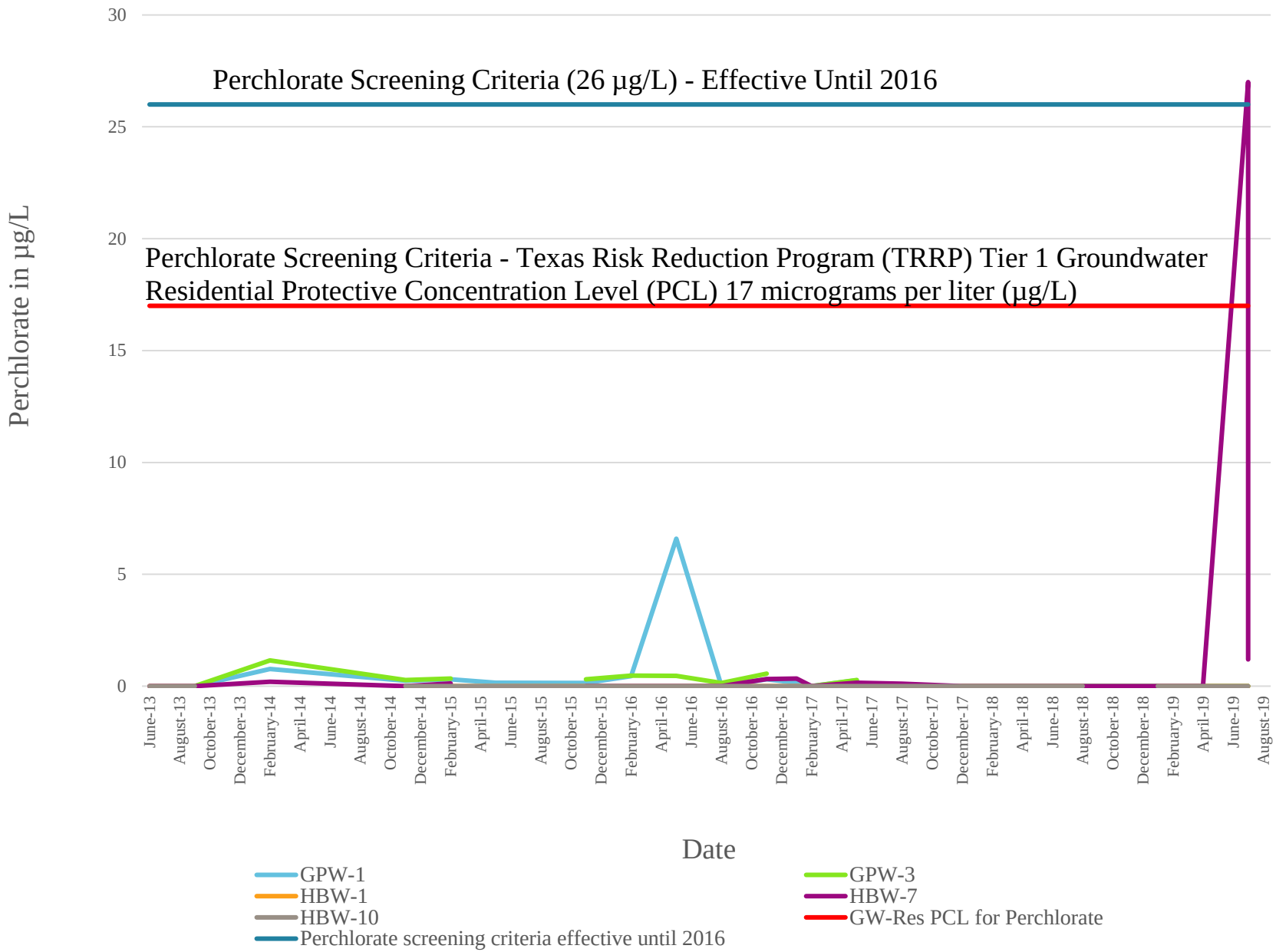
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd
Creek Sample ID	**Feb 2016**	**May 2016**	**Aug 2016**	**Nov 2016**	**Feb 2017**	**May 2017**	**Aug 2017**	**Dec 2017**	**Mar 2018**	**June 2018**	**August 2018**
GPW-1	0.447	6.59	<0.2 U	0.301 J	<1 U	0.263	dry	<4.0 U	<4.0 U	dry	<2.0 U
GPW-3	0.474	0.457	0.141	0.563	<1 U	0.274	dry	<4.0 U	<4.0 U	dry	<2.0 U
HBW-1	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<1 U	<0.2 U	<0.2 U	1.1 J	<4.0 U	dry	<2.0 U
HBW-7	<0.2 U	<0.2 U	<0.2 U	0.318 J	<1 U	0.155	<0.2 U	<4.0 U	<4.0 U	dry	<2.0 U
HBW-10	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<1 U	<0.2 U	0.111J	<4.0 U	<4.0 U	dry	<2.0 U

NS – not sampled U – non-detect J – Estimated Dry – no surface water

Quarter	4th	1st	2nd	3rd
Creek Sample ID	**Oct 2018**	**Jan 2019**	**April 2019**	**July 2019**
GPW-1	<2.0 U	<2.0 U	<2.0 U	<2.0 U
GPW-3	<2.0 U	<2.0 U	<2.0 U	<2.0 U
HBW-1	<2.0 U	<2.0 U	<2.0 U	<2.0 U
HBW-7	<2.0 U	<2.0 U	<2.0 U	27 (initial))/ 1.2 J (re-sample)
HBW-10	<2.0 U	<2.0 U	<2.0 U	<2.0 U

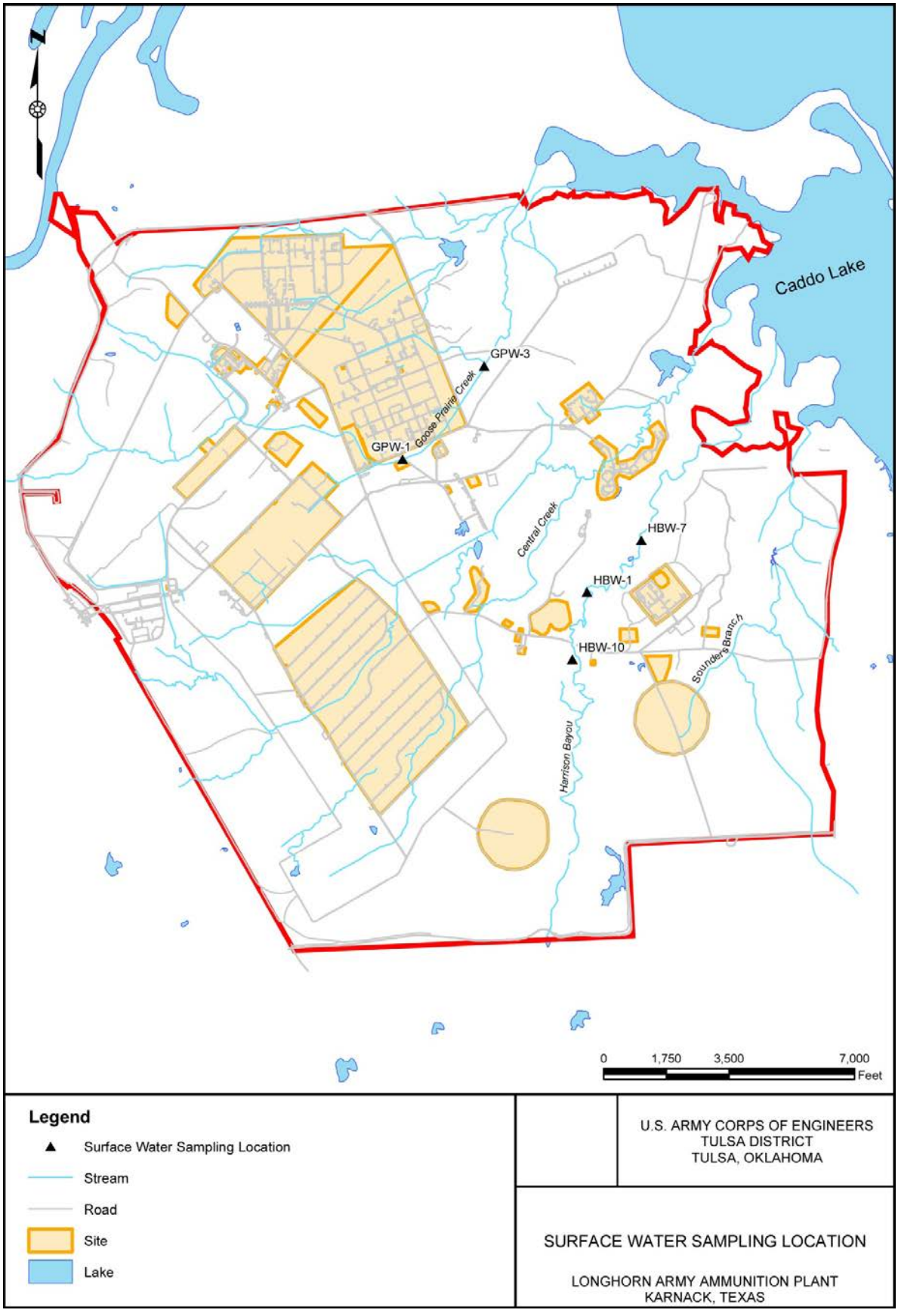
NS – not sampled U – non-detect J – Estimated Dry – no surface water

Surface Water Samples - Perchlorate



Note: Surface water at HBW-7 had a detection of 27 µg/L from a sample collected on 11 July 2019. Surface water at HBW-7 was resampled 19 days later (30 July 2019) with a detection of 1.2 J µg/L.

Longhorn Army Ammuntion Plant Creek Sampling Locations



DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

December 5, 2019

DAIM-ODB-LO

Mr. Rich Mayer
US Environmental Protection Agency
Federal Facilities Section R6
1201 Elm Street, Suite 500
Dallas, Texas 75270-2102

Re: Draft Final 5th Annual Remedial Action Operations Report (September 2018-August 2019) LHAAP-35A (58), Shops Area Longhorn Army Ammunition Plant, Karnack, Texas, December 2019

Dear Mr. Mayer,

The above-referenced document is being transmitted to you for your records and includes revisions based upon your comments on the Draft. In accordance with the FFA, the Draft Final will be considered Final after 30 days without further comment.

The document was revised by Bhate Environmental Associates, Inc., (Bhate) on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
A. Palmie, TCEQ, Austin, TX
P. Bruckwicki, Caddo Lake NWR, TX
A. Williams, USACE, Fort Worth District, (Located in Tulsa, OK)
A. Sherman, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO (for project files)

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

December 5, 2019

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Draft Final 5th Annual Remedial Action Operations Report (September 2018-August 2019) LHAAP-35A (58), Shops Area Longhorn Army Ammunition Plant, Karnack, Texas, December 2019

Dear Ms. Palmie,

The above-referenced document is being transmitted to you for your records and includes revisions based upon EPA comments on the Draft. In accordance with the FFA, the Draft Final will be considered Final after 30 days without further comment.

The document was revised by Bhate Environmental Associates, Inc., (Bhate) on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX
P. Bruckwicki, Caddo Lake NWR, TX
A. Williams, USACE, Fort Worth District, (Located in Tulsa, OK)
A. Sherman, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO (for project files)

Responses to Comments on
Draft 5th Annual Remedial Action Operations (September 2018 – August 2019) at LHAAP-35A(58), Shops Area
Longhorn Ammunition Plant, Karnack, Texas
October 2019

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response or Does not Agree (D) with response.

Comment #	Section/ Paragraph	Comment (December 2, 2019)	C, D, E or X[1]	Response (December 4, 2019)	A or D[2]	Comment	C, D, E or X[1]	Response	A or D[2]
Reviewer: Rich Mayer, USEPA **Respondent:** Kim Nemmers, Bhate									
1	Figure 7	Please include the well results for the wells that were sampled but there were no VOCs detections. From the reviewing the figure, it appears that certain wells were not sampled, such as monitoring well 35AWW12, even though they were.	E	Figure 7 shows only the two Intermediate wells. Figure 6 shows shallow wells including 35AWW12. No changes made.					
2	Table 1	The table is missing the heading information for the 4th column. EPA assumes it is the screened interval depths.	C	Missing heading is corrected to state: "Screen Intervals (ft from Top of Casing)" in Draft Final Table 1.					
3	General Comment	It should be noted that monitoring wells 35AWW20 and LHSMW07 in the Western Plume contain 1,4-dioxane above the TCEQ residential PCL. This contaminant is not currently a COC but may be added in the future. The effect of EISB on this potential contaminant has not been shown in any reporting to date.	C	Noted. The effect of EISB on 1,4-dioxane will be evaluated in the next 5YR.					
		END of USEPA Comments							
Reviewer: April Palmie, TCEQ **Respondent:** Kim Nemmers, Bhate									
		TCEQ reviewed the Draft 5th Annual RAO for LHAAP 35A(58) and didn't have any comments on the report. TCEQ accepts the recommendations on page 5-3.		Noted.					
		END of TCEQ Comments							

DRAFT FINAL
YEAR 5 ANNUAL REMEDIAL ACTION OPERATION REPORT (SEPTEMBER 2018-AUGUST 2019) LHAAP-35A (58) SHOPS AREA LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

December 2019

Prepared For:

U.S. Army Corps of Engineers
Tulsa District
1645 S 101 E Avenue
Tulsa, Oklahoma 74128-4609

Contract No: W9128F-13-D-0012
Delivery Order No: W912BV17F0150
Bhate Project No.: NWO1312.0150.012.0001.03

Prepared By:

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YEAR 5 ANNUAL REMEDIAL ACTION OPERATION REPORT (SEPTEMBER 2018-AUGUST 2019) LHAAP-35A (58) SHOPS AREA LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

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ACRONYMS AND ABBREVIATIONS

<	Less than
%	Percent
AECOM	AECOM Technical Services, Inc.
APTIM	APTIM Federal Services, LLC
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
COC(s)	Contaminant(s) of concern
CSM	Conceptual site model
DCA	Dichloroethane
DCE	Dichloroethene
DHB	Dehalobacter
DHC	Dehalococcoides
DO	Dissolved oxygen
EISB	Enhanced In-situ Bioremediation
ESD	Explanation of Significant Differences
ft	Feet (or foot)
HPLC	High Performance Liquid Chromatography
IWWP	Installation-Wide Work Plan
J	Data qualifier denoting an estimated concentration
LHAAP	Longhorn Army Ammunition Plant
LUC	Land Use Control
MC	Methylene chloride
MCL	Maximum contaminant level
µg/L	Micrograms per liter
mg/L	Milligrams per liter
mL	Milliliter
MNA	Monitored Natural Attenuation
MSC	Medium-specific concentration

msl	Mean sea level
mV	Millivolt
No.	Number
ORP	Oxidation-reduction potential
PCE	Tetrachloroethene
PCBs	Polychlorinated biphenyls
pH	Potential of hydrogen
RA(O)(s)	Remedial Action Operation(s)
RAO(s)	Remedial Action Objective(s)
RACR	Remedial Action Completion Report
RAWP	Remedial Action Work Plan
RD	Remedial Design
ROD	Record of Decision
Shaw	Shaw Environmental, Inc.
SVOC(s)	Semi-volatile Organic Compound(s)
TCA	Trichloroethane
TCE	Trichloroethene
TM	Technical Memorandum
TOC	Total organic carbon
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VC	Vinyl chloride
VFA	Volatile Fatty Acids
VOC(s)	Volatile Organic Compound(s)

1 INTRODUCTION

The United States (U.S.) Army Corps of Engineers (USACE), Tulsa District, contracted Bhate Environmental Associates, Inc. (Bhate), to perform remedial actions at multiple sites at the former Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas, under the Huntsville District's Architect-Engineer Indefinite Delivery Contract Number (No.) W9128F-13-D-0012, Delivery Order No. W912BV17F0150. Bhate is performing groundwater and surface water monitoring as part of Remedial Action Operations (RA(O)s) for the Enhanced In-situ Bioremediation (EISB) and Monitored Natural Attenuation (MNA) groundwater remedy at LHAAP-35A (58). Remedial activities are required under the Record of Decision (ROD) issued for LHAAP-35A (58) in September 2010 (Shaw Environmental, Inc. [Shaw], September 2010).

The Remedial Action Work Plan (RAWP) for the entire site was prepared in August 2013 in accordance with the ROD and was implemented in September 2013 (AECOM Technical Services, Inc. [AECOM], August 2013). Within the eastern plume, EISB was performed in September 2013. The MNA remedy for the western plume at this site, as presented in the ROD, calls for an evaluation of the remedy after 2 years of implementation. The ROD also provides for implementation of a contingency remedy to enhance MNA if it is found to be ineffective. RA(O) implementation for the western plume was completed between October 2013 and October 2015 and the Year 2 RA(O) report was finalized in May 2016 (AECOM, May 2016). After 2 years of MNA, the Year 2 RA(O) report concluded that MNA was ineffective and implementation of a contingency remedy was appropriate. A RAWP for the contingency remedy for the western plume was developed and finalized (Bhate, January 2018). The contingency remedy for the western plume is EISB injections, which was implemented in March and April 2018, as documented in the Remedial Action Completion Report (RACR) (Bhate, August 2018).

Groundwater monitoring at LHAAP-35A (58) was conducted quarterly following EISB injections at the eastern plume for 2 years but is now semi-annual. The contingency remedy within the western plume requires that quarterly sampling be completed in select performance monitoring wells for 2 years. This report includes the second, third, fourth, and fifth quarterly sampling events in the western plume completed in September 2018, December 2018, April 2019, and June 2019 with future quarterly events to be included in the Annual RA(O) Reports. This RA(O) report documents Year 5 of RA(O) implementation and summarizes the Land Use Control (LUC) compliance inspection; monitoring well inspection, maintenance, and repair activities; results of groundwater and surface water sampling; and an evaluation of EISB and MNA between September 2018 and July 2019.

LHAAP is located in east-central Texas in the northeastern corner of Harrison County between State Highway 43 in Karnack, Texas, and the western shore of Caddo Lake (**Figure 1**). The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the east. Caddo Lake is a large freshwater lake that bounds LHAAP to the north and east. The eastern fence of the LHAAP installation is 3.5 miles from the Texas-Louisiana border (AECOM, May 2016).

1.1 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for LHAAP-35A (58), consistent with the reasonably anticipated future use of the site as a national wildlife refuge, as presented in the ROD (Shaw, September 2010) are:

- Protection of human health by preventing human exposure to the contaminated groundwater;
- Protection of human health and the environment by preventing contaminated groundwater from migrating into nearby surface water; and,
- Returning groundwater to its potential beneficial use as a drinking water source, wherever practicable.

An Explanation of Significant Differences (ESD) was prepared and finalized for LHAAP-35A (58), Shops Area, Group 4 (Bhate/APTIM Federal Services, LLC [APTIM], July 2018) to formalize that the LUCs and groundwater monitoring required for LHAAP-03, a small site entirely contained in the LHAAP-35A (58) eastern Volatile Organic Compound (VOC) and LUC boundaries, will be captured under LHAAP-35A (58). This 2018 ESD identifies that well 03WW01 be sampled for arsenic within the LHAAP-35A (58) RA(O)and clarifies that LUCs will remain in place until the levels of the contaminants of concern (COCs) in soil and groundwater allow for unrestricted use and unlimited exposure

1.2 Performance Objectives

The LHAAP-35A (58) site has groundwater plumes in two distinct areas: 1) eastern plume and 2) western plume. The current remedies selected for the two areas are: LUC; EISB in the area of highest levels of contamination; and MNA for the remainder of the plume, beyond the influence of the EISB treatment area. EISB was implemented as a contingency remedy within the western plume in 2018 as documented in the Final ESD ROD for the Western Plume Contingency Remedy at LHAAP-35A(58) Shops Area (Bhate, March 2018). EISB was previously completed in the eastern plume in 2013.

The performance objectives at LHAAP-35A (58) consist of two components: physical inspections and groundwater/surface water monitoring. As a component of the LUC implementation, a civil survey of the LUC boundary was conducted in November 2014 and recorded in the Harrison County Courthouse in March 2015 (AECOM, May 2016). Physical inspections are conducted annually to confirm compliance with the LUC objectives. These objectives include preventing human exposure to groundwater contamination at levels that pose an unacceptable risk to a future maintenance worker and ensuring that there is no withdrawal or use of groundwater from the site for anything other than environmental monitoring and testing until the cleanup levels (maximum contaminant levels [MCLs]) are attained. Groundwater monitoring conducted at the site since October 2013 was included in the facility-wide fourth Longhorn Five-Year Review Report, completed in 2019 (USACE, June 2019).

Groundwater and surface water monitoring is being performed to demonstrate that EISB in conjunction with MNA of the eastern and western plumes are effective remedies to:

- Detect changes in environmental conditions that may reduce the efficacy of the remedial processes,
- Identify potentially toxic and/or mobile transformation products,
- Verify that the plumes are not expanding,
- Verify that no unacceptable impacts to downgradient receptors are occurring, such as discharges of contaminated groundwater to surface water,
- Detect new releases of contaminants to the environment that could impact the effectiveness of the remedies, and
- Verify attainment of the RAOs.

Groundwater monitoring completed as part of the Year 5 RA(O) activities consisted of two semi-annual groundwater sampling events conducted in December 2018 and June 2019 as specified in the Eastern Plume RAWP (AECOM, August 2013). Quarterly sampling of the western plume is required for 2 years following the EISB treatment and this Year 5 Annual RA(O) Report includes the 2nd through 5th quarters of sampling conducted in September 2018, December 2018, March 2019, and June 2019. Semi-annual surface water sampling at 35ASW03, located adjacent to the western groundwater plume in a ditch that runs parallel to 4th Street, was completed in December 2018 and June 2019, and is also included in this Report.

1.3 Site Description

The LHAAP-35A (58) site, also known as the Shops Area, is located in the north-central portion of LHAAP and currently covers an area of approximately 11 acres (**Figure 1**) (Shaw, September 2010). The surface features include asphalt-paved roads, a parking area, and areas that are wooded and overgrown with grasses and other vegetation (**Figure 2**). The topography is relatively flat with the surface drainage flowing into the tributaries of Goose Prairie Creek, which eventually discharges into Caddo Lake.

The Shops Area, which is now designated as LHAAP-35A (58), was established in 1942 as part of the installation's initial construction (Shaw, September 2011). The facility was used to provide plant-operated laundry, automotive, woodworking, metalworking, painting, refrigeration, and electrical services. The site was active throughout the LHAAP's mission and was deactivated along with the rest of the installation in 1996-1997. The LHAAP-35A (58) site boundary has changed over the years. Earlier investigations for LHAAP-35A (58) were performed in areas to the south that are no longer included within the site boundary (AECOM, May 2016). LHAAP-35A (58) encompasses the following sites:

- LHAAP-02, vacuum truck overnight parking
- LHAAP-03, the Paint Shop Building 722 (waste collection)
- LHAAP-60, Former Storage Building 714
- LHAAP-68, a mobile storage tank parking area
- LHAAP-69, service station with underground storage tanks

The following sites were within the historical LHAAP-35A (58) site boundary, but are not included within the current site boundary:

- LHAAP-04, former Pilot Wastewater Treatment Plant
- LHAAP-56, a vehicle wash rack and oil/water separator, Building 744-A
- LHAAP-59, Storage Building 725
- LHAAP-60, Building 411
- LHAAP-61, Water Treatment Plant
- LHAAP-66, 405-L Transformer Yard

The following sites are within the LUC boundary for LHAAP-35A (58):

- LHAAP-02, vacuum truck overnight parking
- LHAAP-03, the Paint Shop Building 722 (waste collection)
- LHAAP-56, a vehicle wash rack and oil/water separator, Building 744-A
- LHAAP-59, Storage Building 725
- LHAAP-60, Former Storage Building 714
- LHAAP-65, Former Building 209 (flammable materials storehouse)
- LHAAP-68, a mobile storage tank parking area
- LHAAP-69, service station with underground storage tanks

LHAAP-60, Building 411, which is located within the historical site boundary of LHAAP-35A (58) is included within the LUC boundary for LHAAP-04.

1.4 Conceptual Site Model

Much of the following conceptual site model (CSM) information has previously been presented in the 2nd Annual RA(O) Report (January 2015 – October 2015) (AECOM, May 2016). **Figure 3** presents the CSM from the ROD (Shaw, September 2010). Between 1992 and 2008, multiple investigations were conducted in a phased approach to evaluate the nature and extent of contamination at the LHAAP-35A (58) site. The findings from these investigations were that the shallow zone groundwater was impacted with VOCs, while the soil and former sump/waste rack sump areas (LHAAP-56) posed no unacceptable threat to human health or the environment (Shaw, September 2011). **Figure 2** shows the locations of all the shallow, intermediate, and deep zone monitoring wells, as well as surface water sampling locations, present at the site. The sources of contamination at LHAAP-35A (58) were surface spills associated with the various support services that occurred in the area. The spills resulted in minor soil contamination and the COCs released to the surface soil subsequently migrated downward through leaching, to the groundwater.

Overland flow does not appear to be a complete pathway for migration of contaminants to surface water, as none of the COCs (VOCs, Semi-volatile Organic Compounds [SVOCs], explosives,

pesticides, or polychlorinated biphenyls [PCBs]) were detected in water samples from the on-site ditch. Likewise, no VOCs, SVOCs, explosives, or pesticides were detected in samples of the ditch sediment. Some metals were detected in surface water and sediment at concentrations in the naturally occurring background range.

Investigation results indicate that the shallow zone groundwater is impacted with VOCs, but soil and former sump/waste rack areas pose no unacceptable risk to human health or the environment (Shaw, September 2011). There have been no previous remedial actions at LHAAP-35A (58). The nearest surface water body to LHAAP-35A (58) is a ditch that runs parallel to 4th Street on the western boundary of the site and flows to the southeast. The depth of groundwater in wells adjacent to the ditch is well below the bottom of the ditch at 18 to 25 feet (ft) below ground surface (bgs) (e.g., in wells 35AWW16, 35AWW18, and LHSMW07).

The potentially complete exposure pathways are groundwater use as drinking water and potential migration of impacted groundwater into surface water. Shallow groundwater is not used as drinking water at the refuge and this potential exposure pathway is eliminated from any hypothetical future receptor because LUCs are in place that prohibit the use of groundwater for any purpose other than for environmental monitoring and testing. **Figure 2** shows the groundwater use restrictions area established for this site.

The hydrogeology beneath the site, as presented in the Draft Final RACR (AECOM, October 2015), consists of three water-bearing zones; identified as shallow, intermediate, and deep. The shallow zone extends to approximately 40 ft bgs. The lithology of the shallow zone is characterized by discontinuous layers of fine grained soils consisting of interbedded silt, sand, and clay. According to the groundwater gauging data conducted in October 2013 (First Performance Monitoring Sampling Event), the depth to groundwater ranged from 17.53 ft bgs to 30.13 ft bgs. Groundwater elevations in the shallow zone in October 2013 ranged from 184.21 ft above mean sea level (msl) to 202.32 ft above msl.

Data from boring log 35AWW02, which was drilled in the deep zone to a depth of 140 ft bgs, and 35AWW05, which was drilled in the intermediate zone to a depth of 75.75 ft bgs, indicate the soils in the intermediate and deep zones consist mostly of clay with the occasional presence of silt and sand layers. The occurrence of predominantly clay soil beneath the shallow zone impedes the vertical migration of groundwater, which is corroborated by the difference in groundwater elevations between the shallow zone and the intermediate and deep zones (AECOM, May 2016). Based on groundwater surface measurements obtained in October 2013, groundwater elevation for the intermediate zone was approximately 178 ft above msl, and the elevation of deep zone groundwater was 175.75 ft above msl.

Based on previous investigations, the shallow groundwater COCs at LHAAP-35A (58) are tetrachloroethene (PCE); trichloroethene (TCE); 1,1,2-trichloroethane (TCA); 1,1-dichloroethene (DCE); 1,2-dichloroethane (1,2-DCA); cis-1,2-DCE; trans-1,2-DCE; vinyl chloride (VC); methylene chloride (MC); and benzene. In addition, low concentrations of 1,1-DCA were detected in the shallow zone groundwater, but were below the groundwater medium-specific concentration

(MSC) so 1,1-DCA is not considered a groundwater COC at this site. No COCs were detected in samples from the intermediate and deep groundwater zones.

Although arsenic has not been designated as a COC, it is included in the shallow zone groundwater monitoring program in accordance with the Revised Technical Memorandum, Steps to Remedy-in-Place for LHAAP-03/LHAAP-58 (AECOM, November 2012); the ESD for LHAAP-03 groundwater and LUCs (Bhate/APTIM, July 2018); and the 2013 RAWP (AECOM, August 2013).

2 SITE ACTIVITIES AT LHAAP-35A (58)

2.1 Annual LUC Compliance Inspection, Maintenance, and Repairs

2.1.1 Annual LUC Compliance Inspection

The objectives of the LUCs at LHAAP-35A (58) are to prevent human exposure to groundwater contamination presenting an unacceptable risk to human health, and to ensure that there is no withdrawal or use of groundwater beneath the site for any purpose other than environmental monitoring and testing until the cleanup levels are attained (AECOM, August 2013). The ESD for LHAAP-03 groundwater and LUCs formally changed the duration of the LUCs, which will remain in effect until COC concentrations in groundwater and soil are reduced to levels that allow unrestricted use and unlimited exposure (Bhate/APTIM, July 2018). As depicted on **Figure 2**, the sites that are included in the LUC boundary under LHAAP-58 include LHAAP-02, LHAAP-03, LHAAP-35A, LHAAP-56, LHAAP-59, LHAAP-60D, LHAAP-65, LHAAP-68, and LHAAP-69. Notices of the groundwater use restrictions accompany all property transfer documents and were recorded at the Harrison County Courthouse in March 2015 in accordance with the Texas Administrative Code Title 30, §335.566. Additional details regarding the implementation of the LUC are presented in the RACR (AECOM, October 2015).

Bhate performed the annual LUC compliance inspection for LHAAP-35A (58) on May 13, 2019. The Annual Land Use Control Compliance Certification Documentation form for the Year 5 RA(O) period is presented in **Appendix A**. No compliance issues or concerns were noted during the annual inspection in 2019.

2.1.2 Well Field Operation & Maintenance

Inspections of the conditions/integrity of monitoring wells were conducted in June 2019 and were documented in a photographic log (**Appendix B**) and during each sampling event with the information recorded on the field sampling forms. Monitoring well 35AWW04 required painting as noted in the August 2018 inspection from the Year 4 RA(O) inspections, which was completed on October 4, 2018. Maintenance items for the upcoming period, noted during the June inspection, includes painting of wells LHSMW04 and LHSMW07. Mowing the area to control brush and weeds was conducted on a routine basis and as needed to allow access to the wells, typically before sampling events. During the Year 5 annual reporting period, mowing was conducted prior to the semi-annual groundwater sampling events (December 2018 and June 2019). **Appendix B** provides photos of the June 2019 monitoring well conditions, and **Appendix C** provides information about the individual well surface conditions observed during each of the Year 5 sampling events.

2.2 Groundwater Monitoring for RA(O)

During the Year 5 RA(O) period, 24 monitoring wells were gauged for depth to water in December 2018 and June 2019. The RAWP (AECOM, August 2013) proposed inclusion of 20 monitoring wells in the MNA program (18 shallow groundwater zone wells [35AWW06, 35AWW08,

35AWW10, 35AWW11, 35AWW12, 35AWW13, 35AWW14, 35AWW15, 35AWW16, 35AWW17, 35AWW18, 35AWW19, 35AWW20, 35AWW21, 35AWW22, LHSMW04, LHSMW06, and LHSMW07] and 2 intermediate groundwater zone wells [35AWW01 and 35AWW05]).

The following 23 monitoring wells were sampled in December 2018: 03WW01, 35AWW01, 35AWW05, 35AWW06, 35AWW08, 35AWW09, 35AWW10, 35AWW11, 35AWW12, 35AWW13, 35AWW14, 35AWW15, 35AWW16, 35AWW17, 35AWW18, 35AWW19, 35AWW20, 35AWW21, 35AWW22, 35AWW23, 35AWW24, LHSMW06, and LHSMW07. As indicated on **Figure 6**, LHSMW04 was dry in December 2018, and therefore was not sampled. LHSMW04 was also dry in October 2016, November 2017, and July 2018. Two intermediate groundwater zone wells (35AWW01 and 35AWW05) were sampled in December 2018. Before collecting groundwater samples, the wells were gauged using a water level probe and the depth to water was recorded to the nearest 0.01 ft from the top of casing. Groundwater samples were collected using the low-flow sampling technique described in the Groundwater Sampling Procedures in the Installation-Wide Work Plan (IWWP) (Bhate, May 2018). After water quality parameters stabilized and were within acceptable ranges, samples were collected at the same low flow rate. Although no record of the location of the pump inlet in the well was made on sampling logs compiled during the September 2018 groundwater sampling event or for Year 4 beginning November 2017, it is typically placed in the middle of the screen when water levels are sufficient. A technical memorandum describing the sampling process and lack of data on these forms will be prepared and placed into the Administrative Record. The samples were analyzed by ALS Environmental for alkalinity (SM2320B); phosphorus (E365.3); dissolved gases (RSK-175); Total Organic Carbon (TOC) (SM5310C); VOCs (SW8260C); ferrous iron (SM3500-Fe); total and dissolved metals (iron and manganese) and total arsenic (SW6020A); chloride, nitrate, nitrite, and sulfate (SW9056A); sulfide (E376.1); Volatile Fatty Acids (VFAs) (High Performance Liquid Chromatography [HPLC]-METACIDS); and dechlorinating bacteria (dehalococcoides [DHC]/dehalobacter [DHB]) (CENSUS).

The following 21 shallow zone wells were sampled in June 2019: 03WW01, 35AWW06, 35AWW08, 35AWW09, 35AWW10, 35AWW11, 35AWW12, 35AWW13, 35AWW14, 35AWW15, 35AWW16, 35AWW17, 35AWW18, 35AWW19, 35AWW20, 35AWW21, 35AWW22, 35AWW23, 35AWW24, LHSMW06, and LHSMW07. LHSMW04 was dry in June 2019, and therefore was not sampled during the Year 5 RA(O) event. Intermediate groundwater zone wells, 35AWW01 and 35AWW05, were sampled in June 2019. Before collecting groundwater samples, the wells were gauged using a water level probe and the depth to water was recorded to the nearest 0.01 ft from the top of casing. Groundwater samples were collected using the low-flow sampling technique described in the Groundwater Sampling Procedures in the IWWP (Bhate, May 2018) for the June 2019 sampling event. After water quality parameters stabilized and were within acceptable ranges, samples were collected at the same low flow rate. The MNA analyte list was modified for the June 2019 sampling event to follow the recommendations put forth in the Final Technical Memorandum (TM) - MNA Parameters (Bhate/APTIM, February 2019) (**Appendix D**). The TM modified the MNA analyte list for consistency across several sites and to reduce redundant or non-essential parameters. Analytes eliminated in the June 2019 semi-annual sampling event were alkalinity; nitrite; sulfide; TOC; total iron; dissolved iron and manganese; and total phosphorous. The samples were analyzed by ALS Environmental for dissolved gases

(RSK-175); VOCs (SW8260C); total metals (iron and manganese) and total arsenic (SW6020A); chloride, nitrate, and sulfate (SW9056A); VFAs (HPLC-METACIDS); and dechlorinating bacteria (DHC/DHB) (CENSUS). Select wells continued to be evaluated for TOC (SM5310C) due to the recent injections within the western plume.

Six wells within the western plume are required to be sampled quarterly for 2 years. Per the Western Plume RAWP (Bhate, January 2018), these wells include 35AWW06, 35AWW11, 35AWW19, 35AWW20, 35AWW23, and LHSMW07. However, the master sampling plan for the Year 5 RA(O) sampling indicated that well 35AWW23 was to be sampled semi-annually and well 35AWW24 was to be sampled quarterly, which is what was implemented and is documented in this report. In addition, monitoring well LHSMW06 was sampled semi-annually and is used to define the western plume though it is considered an MNA well and not associated with performance monitoring of the Western Plume Contingency RAWP. Also, monitoring well 35AWW15 was sampled semi-annually and is used to delineate the upgradient extent of the western plume though it is not considered a performance monitoring well for the Western Plume RAWP. The western plume monitoring wells were sampled in September 2018, December 2019, March 2019, and June 2019 and were analyzed for VOCs, MNA parameters, volatile fatty acids, and DHB/DHC. Analytes eliminated in March and June 2019, per the Draft TM – MNA Parameters (Bhate/APTIM, January 2019) were alkalinity; nitrite; sulfide; TOC; total iron; dissolved iron and manganese; and total phosphorous.

The LHAAP-35A (58) monitoring wells are depicted on **Figure 2**. **Table 1** presents the monitoring wells that were gauged during the Year 5 RA(O) period. Each of the monitoring wells were secure and sampled with no technical issues encountered.

During the 5 years of RA(O) sampling, only monitoring well LHSMW04, located to the east of the eastern groundwater plume, has been periodically dry. However, the absence of data from this well has had no effect on evaluating EISB or MNA. Monitoring well LHSMW04 is located between 35AWW09 and 35AWW12 and the results for these two wells provide ample data to evaluate this area.

Groundwater sampling forms are presented in **Appendix C**. Chain of custody forms, laboratory reports, and quality control summary reports are presented with the laboratory results in **Appendix E**.

2.2.1 Groundwater Elevation and Flow Direction

2.2.1.1 Shallow Groundwater Zone

Groundwater levels for the Year 5 RA(O) were measured in December 2018 and June 2019. The groundwater flow direction in the shallow water bearing unit during the Year 5 RA(O) monitoring period at LHAAP-35A (58) is interpreted to the southeast in the western portion of the site and to the east-southeast in the eastern portion of the site (see **Figures 4 and 5**). This corresponds well with the flow directions presented in the Remedial Design (RD) document (Shaw, September 2011), which was interpreted to the southeast in the westernmost area, and to the east for the remainder of the site. Groundwater elevation data are presented in **Table 1**.

The shallow zone groundwater elevations generally increased across the site between December 2018 and June 2019. The greatest increase, 2.70 ft, occurred in shallow monitoring well 35AWW10. A total of 11 wells had increases greater than 1 ft. Only two wells, 35AWW15 and 35AWW23 had decreases in groundwater elevations at 1.22 ft and 3.26 ft, respectively.

2.2.1.2 Intermediate Groundwater Zone

Wells 35AWW01 and 35AWW05 (**Figure 2**) are completed in the intermediate groundwater zone. Groundwater elevations decreased in each well; 2.53 ft in 35AWW05 and 4.25 ft in 35AWW01 between December 2018 and June 2019. Because there are only two wells screened in the intermediate groundwater zone, a potentiometric surface map cannot be constructed to determine the groundwater flow direction. The groundwater elevations are presented in **Table 1**.

2.2.1.3 Deep Groundwater Zone

Well 35AWW02 (**Figure 2**) is the only well screened in the deep groundwater zone. This well is not included in the sampling program, in accordance with the RAWP (AECOM, August 2013). Therefore, this monitoring well was not gauged during the Year 5 RA(O) sampling events. The groundwater elevation at 35AWW02 was relatively static (within 0.44 ft) in measurements between October 2013 and October 2016 (**Table 1**).

2.2.2 Vertical Gradient

There are two pairs of shallow and intermediate zone co-located wells, which include monitoring wells 35AWW08 (shallow) and 35AWW01 (intermediate); and LHSMW07 (shallow) and 35AWW05 (intermediate). During the Year 5 RA(O) monitoring period, the elevation difference between wells 35AWW08 and 35AWW01 was 9.64 ft in December 2018 and 14.49 ft in June 2019. The elevation differences between wells LHSMW07 and 35AWW05 was over 24 ft in both the December 2018 and June 2019 sampling events. These elevation differences are consistent with those observed in the first 4 years of RA(O) monitoring. This difference in elevation between the shallow groundwater zone and the intermediate groundwater zone indicates that there is hydraulic separation between these two water bearing zones. Because the potentiometric level of the shallow zone groundwater is higher than the potentiometric level of the intermediate zone groundwater, a potential downward vertical gradient exists at this site.

2.3 Groundwater Analytical Results

2.3.1 Shallow Zone

The COCs for shallow zone groundwater are 1,1,2-TCA; 1,1-DCE; 1,2-DCA; benzene; cis-1,2-DCE; trans-1,2-DCE; TCE; PCE; methylene chloride, and VC (AECOM, May 2016). Analytical results for the December 2018 and the June 2019 semi-annual samples in the eastern plume are presented in **Table 2**, and analytical results for the quarterly sampling events from the western plume are presented in **Table 3**. **Figure 6** presents the COC analytical data for September 2018 through June 2019.

Twenty-three wells were sampled for COCs during the Year 5 RA(O), not including well LHSMW04, which was dry during the Year 5 RA(O) sampling events. Select wells were also sampled for MNA parameters per the RAWP (AECOM, August 2013) and the TM - MNA Parameters (Bhate/APTIM, February 2019).

During the December 2018 event, wells 03AWW01, 35AWW06, 35AWW08, 35AWW09, 35AWW11, 35AWW14, 35AWW18, 35AWW19, 35AWW20, 35AWW23, LHSMW06, and LHSMW07 had one or more COCs reported at concentrations above the laboratory detection limits. Only wells 03WW01, 35AWW08, 35AWW09, 35AWW14, 35AWW19, 35AWW20, 35AWW23, and LHSMW06 had concentrations of COCs exceeding the MCLs. Additional MCL exceedances were reported for the VFA, propionic acid (MCL of 51 milligrams per liter [mg/L]), in 35AWW06, 35AWW11, and 35AWW23. Propionic acid is present due to fermentation of the carbon substrate as part of the reductive dechlorination process.

During the June 2019 event, monitoring wells 03WW01, 35AWW08, 35AWW09, 35AWW14, 35AWW18, 35AWW19, 35AWW20, 35AWW23, LHSMW06, and LHSMW07 had one or more COCs listed above reported at concentrations above laboratory detection limits. Only wells 03WW01, 35AWW08, 35AWW09, 35AWW14, 35AWW20, LHSMW06, and LHSMW07 had concentrations exceeding COC MCLs. Additional MCL exceedances were reported for the VFA, propionic acid (MCL of 51 milligrams per liter [mg/L]), in 35AWW06, 35AWW11, and 35AWW23.

Groundwater monitoring well sampling forms were completed for each well sampled and are included in **Appendix C**. The laboratory analytical results are included in **Appendix E**.

2.3.2 Intermediate Zone

Wells 35AWW01 and 35AWW05 (**Figure 7**) are completed in the intermediate groundwater zone. Both monitoring wells were sampled during the Year 5 RA(O) monitoring period. Analytical results for these two wells were below laboratory detection limits for all analytes in both the December 2018 and June 2019 events. The laboratory analytical results are shown in **Table 2** and laboratory analytical reports are included in **Appendix E**.

2.3.3 Deep Zone

Well 35AWW02 is completed in the deep groundwater zone. This well is not included in the sampling program in accordance with the Eastern Plume RAWP (AECOM, August 2013) and was not sampled during the Year 5 RA(O). Deep well 35AWW02 was sampled only during the October 2013 sampling event and the COC concentrations were below the laboratory detection limits. The laboratory analytical results for 35AWW02 are included in **Table 4** (Historical Monitoring Well COC Concentrations).

2.3.4 Arsenic Monitoring

Although arsenic has not been designated as a COC, groundwater was analyzed for arsenic from the Year 1 RA(O) monitoring period through July 2015 of the Year 2 RA(O) monitoring period, as described in the Revised Technical Memorandum, Steps to Remedy-in-Place for LHAAP-03/LHAAP-58 (AECOM, November 2012). The four quarters of arsenic monitoring were

completed to be compliant with the Eastern Plume RAWP (AECOM, August 2013). However, per the Year 2 RA(O) Report (AECOM, May 2016), monitoring arsenic was recommended for wells within the eastern plume (03WW01, 35AWW08, and 35AWW09). Continuation of the arsenic sampling program during the period of implementation and monitoring of EISB effectiveness within the western plume was also recommended based upon the recommendation to implement EISB for the western plume. However, arsenic sampling at LHAAP-58 was inadvertently left out of the Year 3 RA(O) monitoring period and no arsenic monitoring was conducted during the Year 3 reporting period. During Year 4 RA(O), arsenic was sampled in 35AWW01, 35AWW06, 35AWW07, 35AWW08, 35AWW09, LHSMW03, LHSMW06, LHSMW07, and 1004TW001 in November 2017 and 35AWW01, 35AWW08, 35AWW09, and LHSMW06 in July 2018.

During the Year 5 Year RA(O) monitoring period, arsenic sampling was completed in select monitoring wells. In December 2018, groundwater from the following monitoring wells was analyzed for arsenic: 35AWW01, 35AWW08, 35AWW09, and LHSMW06. In June 2019, groundwater from the following monitoring wells was analyzed for arsenic: 03WW01, 35AWW08, 35AWW09, 35AWW20, and LHSMW06.

Arsenic was reported at concentrations above the MCL during the Year 1 RA(O) monitoring period and during the July 2015 sampling event of the Year 2 RA(O) monitoring period in wells 03WW01, 1004TW001, 1004TW006, 35AWW08, 35AWW20, and LHSMW07 (AECOM, May 2016). Background concentrations of arsenic at Site LHAAP-58 were reported up to 62.1 micrograms per liter (µg/L) in November 2008 for perimeter well 110 in a filtered sample that was collected on December 16, 2004 (Shaw, June 2007). Therefore, the presence of arsenic in site groundwater cannot be attributed solely to reductive conditions caused by EISB, although these conditions could have contributed to an increase in arsenic concentrations in groundwater observed in the first 2 years of RA(O).

In December 2018, only monitoring well 35AWW08 (0.0593 mg/L) exceeded the MCL of 0.010 mg/L. The three other monitoring wells sampled did not have arsenic detected in the groundwater above the MCL. In June 2019, arsenic was reported above the MCL in 03WW01 (0.0133 mg/L) and 35AWW08 (0.116 mg/L). The three additional wells sampled for arsenic had reported concentrations below the MCL in June 2019.

2.4 Surface Water Sampling

The Eastern Plume RAWP (AECOM, August 2013) specifies that surface water monitoring for COCs (1,1,2-TCA; 1,1-DCA; 1,1-DCE; 1,2-dichloroethane; benzene; cis-1,2-DCE; TCE; PCE; and VC) will be performed at surface water sample location 35ASW03, which is in a ditch that runs parallel to 4th Street, on the western boundary of the site and adjacent to the western groundwater plume. **Figure 2** depicts the surface water sampling location. One surface water sample was collected at location 35ASW03 in both the December 2018 and June 2019 sampling events. The above listed VOCs were not detected in either collected sample.

The Draft Final RACR for LHAAP-35A (58) (AECOM, October 2015) states that *the water level in 35AWW18 will be gauged for comparison with the ditch bottom elevation at 35BSW03*. The

surveyed bottom of the ditch at the lowest point is 213.58 ft above msl. The gauged water levels in the nearest upgradient monitoring well 35AWW18 in December 2018 and June 2019 were 196.16 ft above msl and 196.90 ft above msl, respectively. Even though the groundwater elevations at LHAAP were elevated due to high precipitation occurring over the fall, winter, and spring months, the groundwater surface was significantly below the base of the ditch, and groundwater was not discharging to surface water in the ditch.

Surface water samples are collected to evaluate the potential effect of the plume on surface water. The analytical results demonstrate that none of the LHAAP-58 COCs are present in surface water. Therefore, it is not likely that the groundwater at LHAAP-58 is or will contribute to the nearby surface water.

2.5 Well Abandonment

No additional wells are recommended for removal from the monitoring program beyond those previously recommended in the Year 2 RA(O) Report (AECOM, May 2016), which included 35AWW02, 35AWW03, and 1004TW0001,. As noted in the Year 3 RA(O) Report (Bhate, April 2018), well 1004TW006 was recommended for abandonment but could not be located.

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3 PERFORMANCE MONITORING OF EISB

The EISB target area is located within the vicinity of wells 03WW01 and 35AWW08 within the eastern groundwater plume. Well 35AWW10 is considered an upgradient clean well and well 35AWW09 is located downgradient of the EISB area, but within the groundwater plume. Groundwater monitoring was performed in August 2013 prior to EISB implementation (baseline event), in October 2013 after the EISB injections, and in January 2014, May 2014, October 2014, January 2015, April 2015, July 2015, October 2015, April 2016, October 2016, November 2017, June/July 2018, December 2018, and June 2019. Within the western groundwater plume, groundwater sampling completed in July 2018 was the first sampling event following EISB implementation. **Figure 6** presents the EISB treatment locations within the western groundwater plume. A total of six monitoring wells are to be evaluated via a total of eight quarterly performance monitoring events, over the 2 years following injections, to assess the EISB in the western plume (Bhate, January 2018). This report presents the results of quarterly sampling events 2 through 5 completed from September 2018 through June 2019. The EISB performance and key parameters are discussed below and much of the information is provided in **Tables 2, 3, 5, and 6**.

The monitoring program is intended to track the biologic degradation of the chlorinated solvents from PCE through VC and finally to ethene (PCE to TCE to cis-1,2-DCE to VC and finally ethene), while also monitoring the in-situ conditions for favorable biologic activity. Analytes eliminated in March and June 2019, per the Draft TM – MNA Parameters (Bhate/APTIM, January 2019), were alkalinity; nitrite; sulfide; total iron; dissolved iron and manganese; and total phosphorous.

3.1 Analysis of VOCs

3.1.1 Eastern Plume

Major reductions have been observed in PCE in the eastern two monitoring wells, 03WW01 and 35AWW08, located within the influence of the EISB treatment area. Between August 2013 (baseline sampling event) and June 2019, PCE concentrations reported for well 35AWW08 have decreased from 1,640 µg/L to 4.8 J (data qualifier denoting an estimated concentration) µg/L (**Table 4**). This difference in PCE concentrations in well 35AWW08 is a decrease of approximately 99.7%. PCE concentrations in well 35AWW08 have remained below the MCL of 5 µg/L through three semi-annual sampling events since July 2018. From August 2013 to June 2019, PCE concentrations in well 03WW01 decreased from 368 µg/L to 3.2 J µg/L (**Table 4**). This is a decrease of approximately 97.6% of PCE in well 03WW01. PCE concentrations in well 03WW01 have remained below the MCL of 5 µg/L since October 2016, except for the December 2018 sampling event when a concentration of 15 µg/L was reported.

TCE, a degradation product of PCE, initially decreased between August 2013 and October 2013 (following EISB injections), but subsequently increased (due to reduction of PCE into TCE) indicating the occurrence of early stages of dechlorination. In monitoring well, 03WW01, TCE dropped below the MCL of 5 µg/L in October 2016 and has remained below the MCL through June 2019, except for a reported concentration of 5.7 µg/L in December 2018. The maximum

detected TCE concentration in either the December 2018 or June 2019 sampling events was in well 35AWW09 in December 2018 at a concentration of 150 µg/L (**Table 2**).

The concentrations of cis-1,2-DCE remained below the MCL of 70 µg/L in the eastern plume monitoring wells (**Table 2**) during the December 2018 and June 2019 sampling events. VC was detected above the MCL of 2 µg/L in well 03WW01 during both the December 2018 and June 2019 sampling events at concentrations of 7.6 µg/L and 11 µg/L, respectively. The lack of increase in the cis-1,2-DCE and VC is likely due to the low levels of PCE and TCE currently remaining and degrading to these daughter products. Ethene is being produced which indicates that complete degradation is occurring.

3.1.2 Western Plume

PCE was not detected above the MCL of 5 µg/L in the western plume wells during the Year 5 RA(O) sampling events (**Table 3**). Well 35AWW20 had reported concentrations of TCE; cis-1,2-DCE; and VC above MCLs (**Table 3**). Concentration ranges for the three compounds were comparable to historical concentrations. However, in December 2018, the TCE concentration was 570 µg/L. The December 2018 detection of TCE in well 35AWW20 is considered elevated when compared to the previous sampling event in September 2018 at 170 µg/L and the following sampling event in March 2019 at 180 µg/L. Also, the cis-1,2-DCE in December 2018 was 120 µg/L, which is also considered elevated when compared to the previous sampling event in September 2018 at 45 µg/L and the following sampling event in March 2019 at 49 J µg/L. TCE was detected above the MCL in well 35AWW23 in December 2018 at a concentration of 5.3 µg/L, but was below the MCL in June 2019. TCE was also detected above the MCL in LHSMW06 in December 2018 and June 2019 at concentrations of 16 µg/L and 7.5 µg/L, respectively. VC was detected above the MCL of 2 µg/L in well LHSMW06 in the December 2018 sampling event at 5.0 µg/L, but was below the MCL in the June 2019 sampling event.

3.2 Analysis of Field Parameters

The field parameters (potential of hydrogen [pH], dissolved oxygen [DO], oxidation-reduction potential [ORP], temperature, and specific conductivity) were measured in the LHAAP-35A (58) wells during the monitoring events. Wells 03WW01 and 35AWW08 are sampled using a bailer, the ORP and DO concentrations are not considered accurate though the information is recorded on the field forms. Therefore, as these concentrations are not representative of true field conditions, they are not included in **Table 5**. In the future, the field parameters will be collected, when able, prior to using the bailer to collect the rest of the sample. The pH in these two wells initially decreased, potentially related to substrate fermentation and organic acid production. However, since October 2014, and continuing through this Year 5 monitoring period, the pH in both wells has generally increased, indicating a self-buffering capacity of the aquifer.

3.3 TOC Levels

TOC is an indicator of the presence of carbon substrate. The background level of TOC is typically less than 10 mg/L. Therefore, TOC present above the background level are indicative of the substrates presence in groundwater near the sampled monitoring well.

3.3.1 Eastern Plume

After injection of the carbon substrate, there was an initial spike of the TOC levels in both wells (03WW01 and 35AWW08), indicating effective substrate distribution from the injection points to the impacted zone. TOC levels have since decreased. Over the course of the Year 5 monitoring period, the TOC levels have continued to decrease, which is expected as the carbon substrate is consumed and due to migration away from the injection area. The most recent residual TOC levels (June 2019) of 66 mg/L in 03WW01 and 306 mg/L in 35AWW08 indicate that TOC remains at sufficiently high concentrations to support reductive dechlorination, albeit at much reduced amounts compared to the period immediately after injection in October 2013 (**Table 5**). The June 2019 TOC levels were higher than background TOC concentrations in nearby wells such as 35AWW09 and 35AWW10 with October 2016 TOC concentrations of 5.76 mg/L and 3.21 mg/L, respectively.

3.3.2 Western Plume

Within the western plume, TOC increased in the sampled monitoring wells following the EISB injections when compared to the baseline sampling results, within the influence of the injection points with the exception of 35AWW19. The greatest increases were observed in 35AWW06 and 35AWW11. The June 2019 data indicate elevated TOC concentrations are present in wells 35AWW06, 35AWW11, and 35AWW23 (**Table 6**).

3.4 Analysis of Anions

Although sulfate reduction occurs through competing reactions to reductive dechlorination, the decrease in sulfate concentration is indicative of reducing aquifer conditions.

3.4.1 Eastern Plume

Decreased sulfate concentrations in the two EISB wells relative to levels in nearby wells that did not receive EISB treatment such as 35AWW09 and 35AWW10, indicate the development of reducing conditions conducive to reductive dechlorination occurred following initial injections. Sulfate concentrations increased in monitoring well 03WW01 in June 2019 to 239 mg/L from 42.8 mg/L in December 2018, which is the highest sulfate concentration measured since May 2014. Sulfate concentrations remain low in monitoring well 35AWW08 at a concentration of 1.42 J mg/L in June 2019 (**Table 5**).

3.4.2 Western Plume

Following the EISB injections, sulfate decreased in each of the wells influenced by the EISB injections by approximately 50 percent (%). Monitoring well 35AWW19 was the exception with a decrease in sulfate but to a lesser extent than observed in the other wells. In June 2019, sulfate concentrations increased in 35AWW20, the one well with COCs above MCLs within the western plume, to 1,240 mg/L, maintaining an increasing trend since the July 2018 concentration of 882 mg/L (**Table 6**).

3.5 Dissolved Gases

3.5.1 Eastern Plume

The methane concentration during the Year 5 monitoring period in 03WW01 increased in both sampling events (2,900 µg/L in June 2019) reversing a decreasing trend observed in the previous three semi-annual sampling events. (**Table 5**). The methane concentration in 35AWW08 decreased to non-detectable levels (less than [<] 1.0 µg/L) in December 2018 but rebounded to 3,000 µg/L in June 2019. Methane concentrations are still representative of strong reducing conditions due to methanogenesis.

Concurrently, carbon dioxide levels remain elevated in both 03WW01 and 35AWW08, supporting the continued metabolism of the carbon substrate. Ethene was detected at low levels in both 03WW01 and 35AWW08, indicating that complete dechlorination is occurring.

3.5.2 Western Plume

Methane following the EISB treatment of the western plume remained stable or decreased. In June 2019, methane concentrations had increased in 35AWW20, the one well with COCs above MCLs in the western plume, to 920 µg/L, the highest concentration reported since injections. Carbon dioxide levels have remained relatively stable in 35AWW20 at over 700,000 µg/L since September 2018 (**Table 6**). Ethene increased slightly in 35AWW20 in December 2018 to 1.94 J µg/L but returned to previous levels June 2019 (1.3 µg/L). Ethene production indicates complete reduction of the COCs is occurring.

3.6 Dechlorinating Bacteria

3.6.1 Eastern Plume

The dechlorinating bacteria count spiked after the bioaugmentation event (November 2013) in wells 03WW01 and 35AWW08, indicating effective distribution of the introduced culture within the eastern plume per the RAWP. The introduced bacterial cultures then decreased in October 2014, in particular the concentrations of DHC species, the bacteria responsible for degrading cis-1,2-DCE to VC, which decreased to 10.9 cells/milliliter (mL) in 03WW01 and to 70.4 cells/mL in 35AWW08. However, during the Year 3 RA(O) sampling event, DHC species spiked to the highest levels yet observed, to 9,460,000 cells/mL in 03WW01 and to 25,600,000 cells/mL in 35AWW08. During the Year 4 RA(O) sampling events, DHC species decreased in 03WW01 to 7.5 cells/mL in July 2018 and in 35AWW08 to 1,410,000 cells/mL in July 2018. Concentrations rebounded in the Year 5 RA(O) to 6,040 cells/mL in June 2019 in 03WW01 and to 3,790,000 cells/mL in 35AWW08 (**Table 5**). DHC species counts are still adequate for the continued degradation of PCE/TCE to VC.

3.6.2 Western Plume

The DHB population increased significantly after injection in the western plume in each of the monitoring wells influenced by the EISB treatment. DHC increased in a few of the monitoring wells but not significantly. The critical performance monitoring well in the western plume, 35AWW20, has had a decreasing trend of DHB from a maximum of 5,970,000 cells/mL in July

2018 to < 21.7 cells/mL in June 2019. DHC was not detected in 35AWW20 from September 2018 through December 2018, but did have a reported cell count of 15,500 cells/mL in June 2019 (**Table 6**).

3.7 Summary

In summary, the EISB treatment has been effective in reducing the VOC concentrations (PCE by as much as 99.7%) and the conditions are still conducive for continued reductions. Although biologic activity has slowed and substrate mass is decreasing, the COC mass requiring treatment is also greatly diminished. Therefore, continued reductions of COC concentrations do not require robust biologic activity. Reductions of VOCs have been observed throughout both the eastern and western plume areas as presented on **Figure 9**. The individual COC lateral extents comparing October 2016 MCL exceedances and those documented in June 2019 show a greatly contracted plume footprint. Combining the reduction in maximum concentrations and the reduction in areal extent indicate significant remediation progress.

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4 NATURAL ATTENUATION EVALUATION

This section presents the results of the natural attenuation evaluation in accordance with the three lines of evidence discussed in the Final Remedial Design (Shaw, September 2011) for LHAAP-35A (58) groundwater COCs. The discussion below pertains only to the shallow aquifer where COCs are detected above cleanup levels. Analytes eliminated in March and June 2019, per the Draft TM – MNA Parameters (Bhate/APTIM, January 2019) were alkalinity, nitrite, sulfide, total iron, dissolved manganese, total phosphorous, and dissolved iron (lab analysis).

4.1 First Line of Evidence: Change in COC Concentrations over Time and with Distance

Natural attenuation is the combination of multiple mechanisms, including biodegradation, volatilization, dilution, advection, and absorption that reduce contaminant concentrations. The decrease of COC concentrations over time and distance in the absence of any other treatment is evidence of natural attenuation (AECOM, May 2016). The change in groundwater COC concentrations over time and with distance was evaluated at LHAAP-35A (58). COC exceedances for the Year 5 RA(O) monitoring period are presented on **Figure 6**.

Per the August 2013 RAWP (AECOM, August 2013), eighteen shallow monitoring wells were included in the MNA monitoring program for VOCs (35AWW06, 35AWW08, 35AWW10, 35AWW11, 35AWW12, 35AWW13, 35AWW14, 35AWW15, 35AWW16, 35AWW17, 35AWW18, 35AWW19, 35AWW20, 35AWW21, 35AWW22, LHSMW04, LHSMW06, and LHSMW07). Wells 35AWW01 and 35AWW05 are the intermediate groundwater wells evaluated for MNA. Note that LHSMW04 was not sampled because it was dry. However, following the 2018 EISB treatment within the western plume, wells 35AWW20, LHSMW07, and 35AWW19 are performance monitoring wells for the contingency remedy.

The only wells where COCs were detected above their respective MCLs during the Year 5 RA(O) groundwater sampling events are 03WW01, 35AWW08, 35AWW09, 35AWW14, 35AWW19, 35AWW20, 35AWW23, LHSMW06, and LHSMW07 (**Tables 2 and 3**). The only wells where COCs were detected above their respective MCLs during the June 2019 groundwater sampling event are 03WW01, 35AWW08, 35AWW09, 35AWW14, 35AWW20, LHSMW06, and LHSMW07 (**Tables 2 and 3**).

Wells 35AWW06, 35AWW11, and 35AWW23 exceeded the MCL for propionic acid during the Year 5 RA(O), which is not a COC. Arsenic was analyzed during Year 5 RA(O) in selected wells and exceeded the MCL of 0.01 mg/L in 03WW01 at a concentration of 0.0133 mg/L in June 2019 and in 35AWW08 at a concentration of 0.0593 mg/L in December 2018 and 0.116 mg/L in June 2019.

The Draft Final RACR for LHAAP-35A (58) (AECOM, October 2015) states that historical groundwater data indicates that monitoring wells 35AWW20 and LHSMW07 in the western plume, and wells 35AWW08 and 35AWW09 in the eastern plume, will be the primary focus of COC trend analysis as they contain the highest relative COC concentrations. Additionally, well

03WW01, located in the eastern plume, had COC exceedances during this monitoring period and is therefore discussed herein.

Mann-Kendall analysis for the available historical data in each well (typically starting in 2008) through the end of the Year 5 RA(O) period (June 2019) was completed for various COCs for monitoring wells 03WW01, 35AWW08, 35AWW09, 35AWW20, LHSMW06, and LHSMW07. The results are presented in **Appendix F** in graphical format with statistical results presented on the right hand side. The USEPA's ProUCL version 5.1 software was used for this analysis. Data used to generate the Mann-Kendall analysis is presented in **Tables 2 through 4.** The dates are displayed in numerical format (elapsed days) rather than in a date format as required by the program. The concentration of COCs are presented on the data points on the graph in µg/L. The level of significance was 5 %. A summary table of the Mann-Kendall results is presented below.

Mann-Kendall Trend Summary

Monitoring Well	PCE	TCE	cis-1,2-DCE	1,1-DCE	VC
03WW01	**Significant Decrease***	**Significant Decrease***	**Significant Increase***	--	--
35AWW08	**Significant Decrease***	**Significant Decrease**	No significant trend*	--	--
35AWW09	**Significant Increase**	**Significant Increase**	No significant trend*	--	--
35AWW20	--	**Significant Decrease**	No significant trend	**Significant Decrease**	No significant trend
LHSMW06	--	**Significant Increase**	--	**Significant Increase***	**Significant Increase***
LHSMW07	--	No significant trend*	--	**Significant Decrease**	No significant trend*

Note:
* Most recent concentrations have achieved MCLs

Of the analyzed parameters and wells using Mann-Kendall statistical analysis set, three monitoring wells, 03WW01 and 35AWW08 within the eastern plume and 35AWW20 in the western plume, showed a significant decrease in concentration over time. ProUCL software was used to determine the best fit regression curve for the dataset from which the first order rate constant was determined (**Appendix G**). PCE at 03WW01, has achieved the MCL of 5 µg/L as of October 2016 (reported as non-detect). For 35AWW08, PCE was not detected and below the MCL for the first time in July 2018.

4.1.1 Eastern Plume

Well 03WW01

This well is located within the active EISB area. PCE and TCE previously detected in this well at concentrations above their respective MCLs were not detected during the Year 3 or Year 4 RA(O) monitoring periods. Detections in the Year 5 RA(O) were 15 µg/L in December 2018 and 3.2 J µg/L in June 2019 for PCE, and 5.7 µg/L in December 2018 and 2.9 J µg/L in June 2019 for TCE. Although the PCE and TCE concentrations were detected above the MCLs in December 2018, these detections reduced to below MCLs in the following semi-annual sampling event in June 2019. The decrease in PCE concentration is 99.1% between August 2013 and June 2019 and the decrease in TCE is 96.9% over the same time period.

Degradation of TCE resulted in the accumulation of cis-1,2-DCE to a high of 117 µg/L in April 2016, but declined in the Year 5 RA(O) to 41 µg/L in June 2019. Some limited accumulation of VC has also been observed in the Year 5 RA(O), with a concentration of 11 µg/L in 03WW01 in June 2019.

The Mann-Kendall trend analysis in 03WW01 was conducted for PCE; TCE; and cis-1,2-DCE for analytical results from 2008 through the end of the Year 5 RA(O) period (June 2019) (**Appendix F**). The Mann-Kendall results indicate statistically significant evidence of a decreasing trend in concentrations for PCE and TCE. The cis-1,2-DCE results indicate an increasing trend; however, the detected concentration is currently below the MCL.

Well 35AWW08

This well is located within the active EISB area. PCE concentrations decreased rapidly after the introduction of the carbon substrate and bacterial augmentation, with no detections above the MCL during the Year 5 RA(O) sampling events. TCE concentrations increased after substrate injection and more rapidly after bioaugmentation, reaching a peak of 953 µg/L in May 2014 followed by a decrease to 13 µg/L in June 2019, which exceeds the associated MCL. The initial increase in TCE concentrations is a reflection of PCE degradation.

Degradation of TCE resulted in a temporary increase in cis-1,2-DCE concentrations, especially during the Year 2 monitoring period, reaching a high of 79.6 µg/L in October 2015. However, neither cis-1,2-DCE or VC were detected in the June 2019 sampling event.

The Mann-Kendall trend analysis in 35AWW08 was conducted for PCE; TCE; and cis-1,2-DCE for analytical results from 2008 through the end of the Year 5 RA(O) period (June 2019) (**Appendix F**). The results provide statistically significant evidence of a decreasing trend in concentrations for PCE and TCE. The cis-1,2-DCE results indicate no significant trend, however, concentrations are currently below the MCL.

Well 35AWW09

This well is located downgradient of the active EISB area. PCE and TCE were detected in this well at concentrations above their respective MCLs throughout the Year 5 RA(O) monitoring period. PCE concentrations increased from 57.6 J µg/L in October 2013 to 450 µg/L in December 2018, but decreased in June 2019 to 130 µg/L. Similarly, TCE concentrations exhibited a significant

increase from 8.97 J µg/L in October 2013 to 150 µg/L in December 2018, but decreased during the second sampling event of the Year 5 RA(O) back to 38 µg/L. It should be noted that cis-1,2-DCE was not detected or was below 1 µg/L during the Year 5 RA(O) period.

The Mann-Kendall trend analysis in 35AWW09 was conducted for PCE; TCE; and cis-1,2-DCE for analytical results from 2008 through the end of the Year 5 RA(O) monitoring period (June 2019) (**Appendix F**). The results provide statistically significant evidence of an increasing trend in PCE and TCE concentrations, but no significant trend in cis-1,2-DCE concentrations, which are below the MCL.

The cause of the increase in COCs in well 35AWW09 appears to be migration of COCs in groundwater from the upgradient contaminated area (e.g., 35AWW08 and 03WW01). The initial increase in concentrations in 35AWW09 is likely associated with continued plume migration downgradient. The influence of biodegradation associated with EISB appears to remain within the area targeted for EISB (area of monitoring wells 35AWW08 and 03WW01) with little to no influence observed in 35AWW09. **Figure 8** shows COC concentration profiles in wells 03WW01, 35AWW08, and 35AWW09, and the table above summarizes the Mann-Kendall trend results for these same wells.

4.1.2 Western Plume

Well 35AWW20

The COCs 1,1-DCE; cis-1,2-DCE; TCE; and VC were detected in this well at concentrations above their respective MCLs during the quarterly Year 5 RA(O) monitoring events (**Table 3**). During the December 2018 sampling event, these COCs were elevated. However, concentrations of the COCs returned to the September 2018 levels in March 2019. EISB injections were completed in the Western Plume in March and April 2018 (Bhate, August 2018). Concentrations of TCE have decreased by approximately 55% between October 2013 and June 2019, while the concentrations of 1,1-DCE and cis-1,2-DCE have decreased by 44% and 28%, respectively, between October 2013 and June 2019. Degradation product VC increased between October 2013 and June 2019 from 105 µg/L to 140 µg/L.

In addition to the above constituents, well 35AWW20 contained 1,1,2-TCA and 1,2-DCA (daughter product of degradation of 1,1,2-TCA) above the MCLs (5 µg/L for 1,1,2-TCA and also for 1,2-DCA) throughout the Year 5 monitoring period. Prior to EISB treatment, the COC 1,1,2-TCA fluctuated between a minimum of 48.3 µg/L in February 2014 and a maximum of 82.7 µg/L in October 2016. Additionally, the 1,1,2-TCA daughter product, 1,2-DCA, fluctuated between a minimum of 13.2 µg/L in February 2014 and a maximum of 20.3 µg/L in October 2013. Concentrations of both COCs during the period following EISB treatment (November 2017 through June 2019) fluctuated between a minimum of 38 J µg/L in March 2019 and a maximum of 88 µg/L in December 2018 for 1,1,2-TCA and between a minimum of 8.7 µg/L (duplicate) in November 2017 and a maximum of 26 µg/L in December 2018 for 1,2-DCA.

The Mann-Kendall trend analysis in 35AWW20 was conducted for TCE; cis-1,2-DCE; 1,1-DCE; and VC for analytical results from 2008 through the end of the Year 5 RA(O) period (June 2019)

(**Appendix F**). The results indicate no significant trend in concentrations for cis-1,2-DCE and VC. Concentrations of TCE and 1,1-DCE indicate significant evidence of a decreasing trend over time at 35AWW20. These results support that attenuation is occurring in the vicinity of 35AWW20.

Well LHSMW06

The COCs TCE; 1,1-DCE; and VC slightly exceeded the MCLs in the December 2018 sampling event (**Table 3**). VC and 1,1-DEC returned to concentrations below the MCLs in June 2019. TCE remained above the MCL of 5 µg/L in June 2019 at 7.5 µg/L.

The Mann-Kendall trend analysis in LHSMW06 was conducted for TCE; 1,1-DCE; and VC for analytical results from 2008 through the end of the Year 5 RA(O) period (June 2019). The results indicate statistically significant increasing trends in concentrations for TCE; 1,1-DCE; and VC over time. However, VC and 1,1-DCE concentrations were below the associated MCLs in June 2019, and TCE slightly exceeded the MCL in the June 2019 sampling event.

Well LHSMW07

During the initial 3-year monitoring period, the COCs 1,1-DCE; TCE; and VC were detected in this well at concentrations above their respective MCLs as well as the first sampling event in Year 4 (November 2017). However, during the four sampling events in Year 5, only 1,1-DCE exceeded the MCL of 5 µg/L in June 2019, at a concentration of 16 µg/L.

The Mann-Kendall trend analysis in LHSMW07 was conducted for TCE; 1,1-DCE; and VC for analytical results from 2008 through the end of the Year 5 RA(O) period (June 2019). The results indicate no statistically significant trend in concentrations for TCE and VC over time. The results provide statistically significant evidence of a decreasing trend in concentrations for 1,1-DCE.

The COC, 1,1,2-TCA was detected above the MCL of 5 µg/L for the first time in April 2014 at 5.68 µg/L and was also above the MCL in October 2016 at a concentration of 7.72 µg/L. However, 1,1,2-TCA was not detected in December 2018, March 2019, or June 2019. It was detected at a concentration of 0.73 J µg/L in September 2018, below the MCL of 5 µg/L. The 1,1,2-TCA daughter product, 1,1-DCA while detected below the MCL, had concentrations between 9.6 µg/L in June 2019 and 42 µg/L in December 2018.

Figure 8 shows COC concentration profiles in wells 35AWW20 and LHSMW07 only, and the table above summarizes the Mann-Kendall trend results for these same wells.

4.1.3 Plume Stability

Contaminant concentration data for the December 2018 and June 2019 (eastern plume) sampling events and the September 2018, December 2018, March 2019, and June 2019 (western plume) sampling events are presented on **Figure 6** (shallow zone) and **Figure 7** (intermediate zone), respectively. EISB treatment of the western plume was implemented in March and April 2018, which has resulted in a decreasing shift compared to previous RA(O) event trends.

4.1.3.1 Eastern Plume

Based on the southeasterly direction of groundwater flow over the 5-year RA(O) monitoring period, the following wells are considered to be along the groundwater flow path: 35AWW10, 35AWW08, 03WW01, 35AWW09, and 35AWW21. The COC concentrations in the upgradient well, 35AWW10, remained below detection limits during the Year 5 RA(O) events. The in-plume wells (35AWW08 and 35AWW09) exhibit the highest concentrations of COCs in the eastern plume. Monitoring well 03WW01, which is hydraulically downgradient of 35AWW08 and upgradient of 35AWW09, has a Mann-Kendall significant decreasing trend for PCE and TCE and a significant increasing trend for cis-1,2-DCE, although the concentrations are below the MCLs for all three COCs.

Monitoring well 35AWW08 has a Mann-Kendall significant decreasing trend for both PCE and TCE and no significant trend for cis-1,2-DCE. Only TCE had a detected concentration above the MCL in June 2019, at 13 µg/L. The October 2016 TCE concentration at 35AWW08 was 235 µg/L.

There is a statistically significant increasing trend in concentrations of PCE and TCE in 35AWW09. Monitoring well 35AWW09 is located approximately 75 ft downgradient from 03WW01. The increase in concentrations in 35AWW09 is likely associated with downgradient dissolved phase migration from higher concentration areas near well 35AWW08.

The concentrations of COCs in downgradient wells 35AWW12 and 35AWW21 remained below the detection limits. No increased concentrations or detections of new COCs at boundary area wells 35AWW10, 35AWW13, 35AWW22, 35AWW12, and 35AWW21 occurred, therefore, the extent of the eastern plume is stable.

A review of the data in 35AWW09 over the course of the Year 5 monitoring period does not indicate any correlation between groundwater elevations and COC concentrations. COC concentration changes in 03WW01 and 35AWW08 could not be correlated with groundwater elevation because of EISB implementation in this area of the plume. **Figure 8** provides plots of groundwater COC concentrations and groundwater elevation changes over time in wells 03WW01, 35AWW08, and 35AWW09.

4.1.3.2 Western Plume

Based on the southeasterly direction of groundwater flow, the following wells can be considered to be along the groundwater flow path: 35AWW15, 35AWW20, 35AWW23, LHSMW07, and 35AWW19. The COC concentrations in upgradient well 35AWW15 have remained below detection limits throughout the Year 5 reporting period. The in-plume well (35AWW20) exhibits the highest levels of COCs, which have, based on the Mann-Kendall analysis, a decreasing trend or no significant trend. The concentrations of COCs in the in-plume downgradient well LHSMW07, based on Mann-Kendall, have a decreasing trend or no significant trend.

The TCE and 1,1-DCE concentrations in monitoring well 35AWW14 located in a downgradient direction of the western plume, have increased from below the MCL in October 2013 to above the MCL in October 2016, and remained above the MCL through June 2019. The 1,1-DCE concentration in monitoring well 35AWW19, located in a downgradient direction of the western

plume, has increased from below the MCL in October 2013 to above the MCL in January 2014 and remained above the MCL through December 2018. Detections of 1,1-DCE in monitoring wells 35AWW14 and 35AWW19 were stable or decreasing in the Year 5 RA(O) sampling events suggesting that migration of the plume is no longer occurring following EISB treatment of the western plume.

Evidence that plume expansion is not occurring is the decrease in concentrations of 1,1-DCE and VC in LHSMW06, located east and cross-gradient of 35AWW20, to below their MCLs in the June 2019 sampling event. However, it should be noted that elevated COCs were detected in LHSMW06 in the December 2018 sampling event. Further, concentrations of COCs in perimeter wells, including boundary area wells 35AWW15, 35AWW16, 35AWW17, and 35AWW18, exhibited no detections of COCs.

A review of the analytical data for individual wells over the course of the monitoring period for the western plume suggests potential correlation between non-remediation influences; i.e. groundwater elevations or rainfall and COC concentrations. **Figure 8** provides concentration profiles with groundwater levels for monitoring wells 35AWW20 and LHSMW07, located in the western plume.

4.2 Second Line of Evidence: Geochemical Indicators

Table 2 includes the geochemical indicator parameters that are useful for MNA evaluation. Some geochemical parameters are measured in the field and are recorded for all sampling events for all wells. The field parameters for LHAAP-35A (58) wells include: DO, ORP, pH, conductivity, turbidity, and temperature. DO and ORP measurements from bailed wells are not considered representative and are not included in **Tables 5 and 6**. The other geochemical indicators analyzed in the laboratory include: alkalinity, chloride, nitrate, nitrite, iron, sulfate, sulfide, methane, ethane, ethene, TOC, phosphorous, manganese, and dechlorinating bacteria. The following discussion examines the geochemical indicators recorded during the Year 5 RA(O) monitoring period. Analytes eliminated in March and June 2019 per the Draft TM – MNA Parameters (Bhate/APTIM, January 2019) were alkalinity, nitrite, sulfide, total iron, dissolved manganese, total phosphorous, and dissolved iron (lab analysis). TOC continues to be evaluated due to the recent EISB treatment with the western plume.

4.2.1 Eastern Plume

- Alkalinity – There is a positive correlation between zones of microbial activity and increased alkalinity (USEPA, September 1998). Alkalinity was one of the analytes eliminated in 2019 samples (Bhate/APTIM, 2018). During the Year 5 reporting period, alkalinity levels in the shallow zone groundwater within the eastern plume, EISB area, were 3,420 mg/L (35AWW08) and 282 mg/L (35AWW09) in December 2018. Outside the EISB area, alkalinity levels were lower (55.1 mg/L in 35AWW10). The higher alkalinity in 03WW01 and 35AWW08 is associated with biodegradation of organic substrate added to the groundwater and generation of carbon dioxide.

- Chloride – During biodegradation of chlorinated hydrocarbons in groundwater, chloride is released. This results in higher chloride concentrations in the contaminant plume as compared to background levels in upgradient wells or in un-impacted downgradient wells (USEPA, September 1998). Chloride levels in the shallow zone ranged between 6.59 mg/L in background well 35AWW10 and 2,510 mg/L in plume performance monitoring well 35AWW08 in June 2019. Additionally, chloride levels within eastern plume EISB treatment area wells 03WW01 (809 mg/L in June 2019) and 35AWW09 (1,340 mg/L in June 2019) provide evidence of biodegradation in the eastern plume. These levels can be compared to background chloride concentrations in upgradient well 35AWW10 with a chloride concentration of 6.59 mg/L in June 2019.
- Dissolved Oxygen – DO is the most thermodynamically favored electron acceptor used by microbes for biodegradation of organic carbon, whether natural or anthropogenic (USEPA, September 1998). Anaerobic bacteria generally cannot function at DO concentrations greater than about 0.5 mg/L and hence, reductive dechlorination will not occur. During the course of the monitoring period, the wells in the eastern plume (03WW01 and 35AWW08) were bailed, making the DO measurements in these wells unreliable. The DO level observed in eastern plume well 35AWW09 was 0.94 mg/L (June 2019); this DO level is not low enough to adequately support anaerobic conditions outside of the EISB treatment area (35AWW09).
- Oxidation-Reduction Potential – The ORP levels indicate how oxidative or reductive the groundwater is in the aquifer matrix and provide real-time data to determine if conditions are conducive for anaerobic biodegradation. ORP values less than 50 millivolts (mV) indicate that the aquifer is reaching anaerobic conditions that are favorable for the biological reductive dechlorination of chlorinated ethenes and ethanes. During the monitoring period, wells in the eastern plume (03WW01 and 35AWW08) were bailed, making the ORP measurements in these wells unreliable. The ORP measured outside of the EISB area was 272 mV in June 2019 at well 35AWW09. This indicates that conditions in the eastern plume outside of the EISB treatment area (35AWW09), are generally aerobic and not supportive of anaerobic degradation.
- Nitrate – After DO has been depleted in the microbiological treatment zone, nitrate may be used as an electron acceptor for anaerobic biodegradation of organic carbon by denitrification. In order for reductive dechlorination to occur, nitrate concentrations in the contaminated portion of the aquifer must be less than 1.0 mg/L (USEPA, September 1998). Nitrate was detected in 35AWW08 at 0.219 J mg/L in June 2019 and at 0.196 J mg/L in 03WW01. Based on these observations, nitrate reduction in the shallow aquifer is not a likely mode of microbial respiration at the site, and the lack of nitrate is favorable for achieving the reducing conditions ideal for anaerobic reductive dechlorination.
- Iron – In some cases, iron (III) (ferric iron) is used as an electron acceptor during anaerobic biodegradation of organic carbon. During this process, iron (III) is reduced to iron (II) (ferrous iron), which may be soluble in water. Ferrous iron concentrations can be used as

an indicator of anaerobic degradation of organic compounds. Ferrous iron concentrations in LHAAP-35A (58) wells during the December 2018 sampling event were as follows: 27.5 J mg/L in 03WW01; 21 J mg/L in 35AWW08; 0.13 J mg/L in 35AWW09; and 0.09 J mg/L in 35AWW10. Ferrous iron was not an analyzed compound in the June 2019 sampling event. The relatively high concentrations of ferrous iron in monitoring wells 03WW01 and 35AWW08 indicate active reductive conditions in the eastern plume around these wells as a result of EISB. However, ferrous iron concentrations in the remaining wells indicate limited reductive conditions in the portion of the eastern plume outside the influence of EISB.

- Sulfate – After DO and nitrate have been depleted in the microbiological treatment zone, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed "sulfate reduction" and results in the production of sulfide. Concentrations of sulfate greater than 20 mg/L may cause competitive exclusion of dechlorination. However, in many plumes with high concentrations of sulfate, reductive dechlorination still occurs (USEPA, September 1998). Sulfate concentrations were 239 mg/L in 03WW01 (June 2019) and 1.42 J mg/L in 35AWW08 (June 2019). The sulfate concentration in 35AWW09, outside the influence of EISB, was 908 mg/L in June 2019. Sulfate levels were above 20 mg/L in the wells sampled within the eastern plume, except 35AWW08.
- Dissolved gases – Methanogenesis occurs in highly reducing conditions and generally occurs after oxygen, nitrate, and sulfate have been depleted. Ethane and ethene are the end products of reductive dechlorination of chlorinated VOCs, and their levels increase if complete reductive dechlorination takes place. Methane levels above 500 µg/L are considered to indicate methanogenic conditions (USEPA, September 1998). Methane concentrations in well 03WW01 have increased from pre-EISB concentrations of 3.22 µg/L in August 2013 to 2,900 µg/L in June 2019. Similarly, methane concentrations in 35AWW08 increased from 10.1 µg/L in August 2013 to 3,000 µg/L in June 2019. However, methane was not detected in the December 2018 sample (**Table 5**). These wells are influenced by EISB and the production of methane is a strong indicator of anaerobic conditions. Ethene was detected at concentrations of 1.6 µg/L in 03WW01 and 4.1 µg/L in 35AWW08 in June 2019.
- TOC – Regardless of the electron acceptor being used, organic carbon is a required source of reduced carbon and energy to sustain microbial activity. TOC is utilized as a carbon and energy source to support the reductive dechlorination of the chlorinated COCs. TOC concentrations greater than 20 mg/L are considered adequate to support microbial activity (USEPA, September 1998). TOC concentrations in eastern plume area wells 03WW01 and 35AWW08, influenced by injected substrate, exceeded this threshold with December 2018 concentrations of 42 mg/L and 392 mg/L respectively. The TOC remained relatively stable in the June 2019 sampling event with detections for 03WW01 and 35AWW08 being 66.1 mg/L and 306 mg/L respectively. These concentrations indicate that sufficient TOC remains in the aquifer to support reductive dechlorination in the eastern plume. However, TOC is decreasing towards the lower end of the threshold.

- Phosphorus – Phosphorus in groundwater is a nutrient available to microbes for their metabolic processes during reductive dechlorination. Phosphorus is generally present at very low concentrations in the aquifer. Phosphorous was one of the analytes eliminated in 2019 samples (Bhate/APTIM, 2018). However, phosphorus was introduced with the injected substrate in the area of 03WW01 and 35AWW08. In 03WW01, phosphorous was reported at 243 mg/L in October 2013 but decreased to 3.05 mg/L in December 2018, indicating consumption of phosphorous by bacteria. Similarly, phosphorous was detected at 361 mg/L in 35AWW08 in October 2013, but decreased to 2.43 mg/L in December 2018. These levels continue to support microbial activities, but could become rate limiting quickly. Detected phosphorus levels in other sampled wells were generally low, indicating that groundwater does not have naturally available phosphorus to support biological degradation.
- Manganese – Manganese is a naturally occurring potential electron acceptor under anaerobic conditions. During anaerobic biological activity, manganese is solubilized from the aquifer matrix material. Manganese was one of the analytes eliminated in 2019 samples (Bhate/APTIM, 2018). Dissolved manganese concentrations in December 2018 were relatively low ranging from 0.0512 mg/L in 35AWW10 to 8.96 mg/L in 35AWW08. Both wells 03WW01 (4.22 mg/L in December 2018) and 35AWW08 (8.96 mg/L in December 2018), which are inside the EISB treatment area, had dissolved manganese concentrations above 1.0 mg/L, which are sufficient for continued biological activity.
- Dechlorinating bacteria – Dechlorinating bacteria, DHC and DHB, and associated functional genes were analyzed in groundwater samples from wells 03WW01, 35AWW08, 35AWW09, and 35AWW10, within and outside the eastern plume. Generally, the microbial population counts and the functional gene counts were at or below the laboratory reporting limits in areas not influenced by bioaugmentation (wells 35AWW09 and 35AWW10), indicating a limited natural population of the bacteria and the absence of gene expression necessary for anaerobic biological degradation of the COCs. At monitoring well 35AWW08, the microbial population counts were considered high at 3,790,000 cells/mL for DHC and 139,000 cells/mL for DHB in June 2019, indicating the proliferation of the microbial population during the Year 5 reporting period. The microbial population count in 03WW01 (6,040 cells/mL for DHC and 292 cells for DHB in June 2019) was low compared to the cell counts in 35AWW08, but elevated compared to 03WW01 cells counts in July 2018 (7.5 cells/mL for DHC and 5.5 cells/mL for DHB). The presence of the VC reductase in both 03WW01 and 35AWW08 indicates that complete reductive dechlorination can occur to allow VC to reduce to ethene over time.

The qualitative assessment of geochemical indicators in the shallow groundwater zone at LHAAP-35A (58) indicates naturally occurring geochemical conditions are not supportive of MNA. However, the areas influenced by the EISB treatment continue to allow for MNA.

4.2.2 Western Plume

- Alkalinity – There is a positive correlation between zones of microbial activity and increased alkalinity (USEPA, September 1998). Alkalinity was one of the analytes eliminated in 2019 samples (Bhate/APTIM, 2018). During the Year 5 reporting period, alkalinity levels in the shallow zone groundwater in the western plume ranged between 50.8 mg/L (35AWW24) and 2,060 mg/L (LHSMW07) in September 2018 and between 45.9 mg/L (35AWW24) and 1,640 mg/L (LHSMW07) in December 2018. The higher alkalinity following the EISB treatment is associated with biodegradation of organic substrate added to the groundwater and generation of carbon dioxide.
- Chloride – During biodegradation of chlorinated hydrocarbons in groundwater, chloride is released to groundwater. This results in higher chloride concentrations in the contaminant plume as compared to background levels in upgradient wells or in unimpacted downgradient wells (USEPA, September 1998). Prior to EISB injection, the chloride levels in the shallow zone detected in November 2017 ranged from 1,040 mg/L in 35AWW06 to 2,650 mg/L in 35AWW11. Chloride levels in 35AWW11 were slightly lower than the pre-EISB injection results but still elevated (approximately 2,000 mg/L). Chloride levels in the shallow zone were also elevated in LHSMW07, where chloride decreased over the Year 5 RA(O) from 2,180 mg/L in September 2018 to 1,780 mg/L in June 2019. The only other well with chloride greater than 1,000 mg/L was 35AWW20, which had chloride increase slightly over the Year 5 RA(O) reporting period. Additionally, chloride levels within the other western plume EISB treatment area wells provide evidence of biodegradation in the western plume. These levels can be compared to background chloride concentrations in downgradient wells such as 35AWW24 with a chloride concentration below 120 mg/L.
- Dissolved Oxygen – DO is the most thermodynamically favored electron acceptor used by microbes for biodegradation of organic carbon, whether natural or anthropogenic (USEPA, September 1998). Anaerobic bacteria generally cannot function at DO concentrations greater than about 0.5 mg/L and hence, reductive dechlorination will not occur. The DO levels observed in the western plume wells, 35AWW06, 35AWW11, 35AWW19, 35AWW20, 35AWW23, 35AWW24, and LHSMW07 were 0.1 mg/L or less in June 2019 (**Table 6**). These DO levels are adequate to support anaerobic conditions within the EISB treatment area.
- Oxidation-Reduction Potential – The ORP levels indicate how oxidative or reductive the groundwater is in the aquifer matrix and provide real-time data to determine if conditions are conducive for anaerobic biodegradation. ORP values less than 50 mV indicate that the aquifer is reaching anaerobic conditions that are favorable for the biological reductive dechlorination of chlorinated ethenes and ethanes. During the monitoring period, wells within proximity of the EISB treatment area (35AWW06, 35AWW11, 35AWW20, 35AWW23, and LHSMW07) exhibited a negative ORP. Areas outside of the treatment area (LHSMW06, 35AWW16, 35AWW18, 35AWW19, and 35AWW24) continued to have a positive ORP. These results indicate that conditions in the western plume outside of the EISB treatment

area are generally aerobic and not supportive of anaerobic degradation. The western plume EISB treatment area remains under reducing conditions.

- Nitrate – After DO has been depleted in the microbiological treatment zone, nitrate may be used as an electron acceptor for anaerobic biodegradation of organic carbon by denitrification. In order for reductive dechlorination to occur, nitrate concentrations in the contaminated portion of the aquifer must be less than 1.0 mg/L (USEPA, September 1998). Nitrate concentrations were non-detect or below 1 mg/L in the western plume monitoring wells in each of the four quarterly sampling events during the Year 5 Year monitoring period. Based on these observations, nitrate reduction in the shallow aquifer is not a likely mode of microbial respiration at the site, and the lack of nitrate is favorable for achieving the reducing conditions ideal for anaerobic reductive dechlorination.
- Iron – In some cases, iron (III) (ferric iron) is used as an electron acceptor during anaerobic biodegradation of organic carbon. During this process, iron (III) is reduced to iron (II) (ferrous iron), which may be soluble in water. Ferrous iron concentrations can be used as an indicator of anaerobic degradation of organic compounds. Ferrous iron concentrations in western plume wells during the Year 5 period ranged from 0.31 J mg/L (35AWW24, September 2018) to 88.1 J mg/L (35AWW06, December 2018). Starting in late 2019, this data will be collected in the field to ensure a more accurate result since the reaction from ferric to ferrous iron occurs quickly if exposed to oxygen. The relatively high concentrations of ferrous iron in monitoring wells outside of the main contaminant plume areas (35AWW06) and lower within the plume areas (LHSMW07) indicates active reducing conditions exist in the western plume and that ferric iron may be utilized as an electron acceptor in some areas of the plume generating elevated ferrous iron concentrations.
- Sulfate – After DO and nitrate have been depleted in the microbiological treatment zone, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed “sulfate reduction” and results in the production of sulfide. Concentrations of sulfate greater than 20 mg/L may cause competitive exclusion of dechlorination. However, in many plumes with high concentrations of sulfate, reductive dechlorination still occurs (USEPA, September 1998). Sulfate concentrations decreased significantly downgradient of the main plume in 35AWW06 from 1,560 mg/L in November 2017 to 2.08 J mg/L in June 2019 (**Table 6**). Concentrations have fluctuated within the plume (35AWW20) decreasing from 2,150 mg/L in November 2017 to 882 mg/L in July 2018 and increasing again to 1,240 mg/L in June 2019.
- Dissolved gases – Methanogenesis occurs in highly reducing conditions and generally occurs after oxygen, nitrate, and sulfate have been depleted. Ethane and ethene are the end products of reductive dechlorination of chlorinated VOCs and their levels increase if complete reductive dechlorination takes place. Methane levels above 500 µg/L are considered to indicate methanogenic conditions (USEPA, September 1998). Methane concentrations above 500 µg/L in June 2019 were present in wells 35AWW06, 35AWW11, 35AWW20, and 35AWW23. Ethene and ethane were detected within the western plume in

wells LHSMW07 and 35AWW20 in June 2019; the two wells with highest detected VOC concentrations. This indicates complete degradation of VOCs within the wells containing the highest VOC detections in the western plume.

- Total Organic Carbon – Regardless of the electron acceptor being used, organic carbon is a required source of reduced carbon and energy to sustain microbial activity. TOC is utilized as a carbon and energy source to support the reductive dechlorination of the chlorinated COCs. TOC concentrations greater than 20 mg/L are considered adequate to support microbial activity (USEPA, 1998). TOC concentrations in the western plume increased following EISB injections, which is to be expected. The two wells within the main portion of the VOC plume, LHSMW07 and 35AWW20, had TOC concentrations below 20 mg/L Although TOC concentrations are low in these two wells, ethene was detected, indicating that complete reductive dechlorination is occurring.
- Phosphorus – Phosphorus in groundwater is a nutrient available to microbes for their metabolic processes during reductive dechlorination. Phosphorus is generally present at very low concentrations in the aquifer. Phosphorous was one of the analytes eliminated in 2019 samples (Bhate/APTIM, 2018). The detected phosphorous levels within the sampled western plume wells were below 1 mg/L in September and December 2018, except for a concentration of 2.67 mg/L in well 35AWW06 in September 2018. The phosphorous levels present within the residual western plume are relatively low and could be rate limiting.
- Manganese – Manganese is a naturally occurring potential electron acceptor under anaerobic conditions. During anaerobic biological activity, manganese is solubilized from the aquifer matrix material. Manganese was one of the analytes eliminated in 2019 samples (Bhate/APTIM, 2018). Dissolved manganese concentrations in September and December 2018 ranged from 0.127 J mg/L (35AWW24, September 2018) to 9.5 mg/L (LHSMW07, September 2018), a general increase from the Year 4 concentrations. Therefore biological activity associated with the treatment appears to be occurring.
- Dechlorinating bacteria – Dechlorinating bacteria, DHC ethenogenes, DHB, and associated functional genes were analyzed in groundwater samples from wells within and outside the western plume. Monitoring wells 35AWW20 and LHSMW07 had significant changes in detections of DHB over the Year 5 reporting period with decreases from over 3 million cells/mL in each of these two monitoring wells to less than non-detected microbial counts. DHC increased in 35AWW20 from non-detected counts in September 2018 to 15,500 cells/mL in June 2019, while remaining fairly consistent in LHSMW07 in the 7,000 cells/mL to 11,000 cells/mL range over the past year of quarterly monitoring. The presence of the VC reductase in LHSMW07 at cell counts ranging from 1,620 cells/mL (June 2019) to 8,040 cells/mL (December 2018) over the four reported quarters of the Year 5 RA(O) is an increase over the 3.9 cells/mL reported in July 2018. An increase in VC reductase indicates that complete reductive dechlorination can occur to allow VC to reduce to ethene over time.

The qualitative assessment of geochemical indicators in the shallow groundwater zone at LHAAP-35A (58) indicates that geochemical conditions in many areas of the plume are supportive of MNA, both within the areas influenced by the EISB treatment and also downgradient of that area.

4.3 Third Line of Evidence: Predictive Modeling and Microbial Analysis

If the first two lines of evidence for MNA are deemed inadequate or inconclusive, and/or if the need for a contingency remedy is evaluated, data from field or microcosm studies will be necessary to establish the third line of evidence for MNA.

Dechlorinating bacteria, DHC ethenogenes, and associated functional genes were analyzed in wells within and outside the eastern and western plumes. Generally, outside the bioaugmentation area (35AWW09 and 35AWW10), the microbial population count and the functional gene counts were very low (less than 100 cells/mL) and in most cases below the laboratory reporting limits, indicating a limited population of the bacteria and an absence of gene expression necessary for anaerobic biological degradation of the COCs. Areas that were bioaugmented reflected higher concentrations of microbial population. It is recommended that microbial population analyses be discontinued in 35AWW10 and 35AWW24, located outside of the EISB areas, in future sampling events. It has been established that the microbial populations are limited and unaffected by the EISB injections in these areas.

5 CONCLUSIONS AND RECOMMENDATIONS

COC concentration data and geochemical indicator measurements were collected over the course of the monitoring period at LHAAP-35A (58) to evaluate the effectiveness of EISB and MNA groundwater remedy. A tiered approach based on assessment of three lines of evidence was used to evaluate the occurrence of natural attenuation in site groundwater. The first line of evidence evaluated reductions in COC concentrations over time and with increasing distance from source areas, including evaluation of Mann-Kendall tests for trends; the second line of evidence evaluated geochemical indicators; and the third line of evidence evaluated microbial conditions in the aquifer. The results of the tiered evaluation and the conclusions are summarized below.

Data for Year 5 RA(O) were collected between September 2018 and June 2019. The groundwater flow direction at the site is interpreted to the southeast in the western portion of the site and to the east-southeast in the eastern portion of the site (see **Figures 4 and 5**).

The EISB treatment in the eastern and western plume area appears to be effectively reducing the VOC concentrations and the current groundwater conditions are conducive to continued reductions of VOCs. **Figure 8** presents the graphical depiction of the decreasing trends of the COCs of various monitoring wells within LHAAP-58. **Figure 9** presents the change in the plumes from October 2016 to June 2019, which demonstrates the reduced lateral extent of the plumes.

The primary initial influence of EISB within the eastern plume was a reduction of PCE in 03WW01 and 35AWW08. TCE concentrations were observed to increase at each well after substrate injection, as PCE was degraded to TCE, followed by a decrease in concentration as the rate of TCE formation became lower than the rate of TCE biodegradation. Generally, cis-1,2-DCE was observed to increase in these two wells due to formation of cis-1,2-DCE from biodegradation of TCE. PCE; TCE; cis-1,2-DCE; and VC had reduced to non-detect at well 03WW01 by the end of the Year 3 RA(O) (October 2016). Throughout 2018 and 2019, cis-1,2-DCE and VC concentrations have increased gradually in 03WW01 until detected concentrations in June 2019 were 41 µg/L (cis-1,2-DCE) and 11 µg/L (VC). PCE and TCE concentrations increased in 03WW01 in December 2018 to 15 µg/L and 5.7 µg/L, respectively; but returned to levels below MCLs in June 2019. A significant reduction in PCE and TCE concentrations was observed in well 35AWW08, with PCE below detection limits since July 2018. Only TCE remained above MCL in June 2019 at 13 µg/L. Based upon the presence of ethene in both wells, complete degradation is occurring.

Concentrations of PCE and TCE in 35AWW09, located within the eastern plume but outside the EISB area, have fluctuated since July 2015. The June 2018 results were the lowest PCE and TCE results since 2014, however the December 2018 results were the highest over the same period. Continued monitoring of 35AWW09 will allow for further evaluation of the COC concentration trends. The concentrations of COCs in downgradient well 35AWW21, which is located outside the eastern plume, have remained below the detection limits. Therefore, based on the inferred east-southeastern groundwater flow path, COC levels are not increasing with distance from the source area. Concentrations of COCs away from the monitoring wells 35AWW08, 03WW01, and 35AWW09 have exhibited no increase in COC concentrations or new detections of COCs.

Specifically, the boundary area wells 35AWW10, 35AWW13, 35AWW22, 35AWW12, and 35AWW21 do not have increasing COC trends. Therefore, it appears that the lateral extent of the eastern plume is stable.

In the western plume, the EISB treatment was completed in March and April 2018 per the Final RAWP (Bhate, January 2018). The concentrations of COCs (PCE; TCE; cis-1,2-DCE; and VC), in upgradient well 35AWW15 have remained below detection limits during this monitoring period. Concentrations of COCs in perimeter wells, 35AWW15, 35AWW16, 35AWW17, and 35AWW18, which are located well away from the most impacted wells, 35AWW20 and LHSMW07, remain non-detect or below MCLs. PCE concentrations in LHSMW07 and 35AWW20, wells within the influence of the EISB treatment, were non-detect before EISB treatment and have remained below detection limits through the June 2019 sampling event. TCE; cis-1,2-DCE; and VC have been non-detect or below MCLs since September 2018 in LHSMW07. TCE; cis-1,2-DCE; and VC concentrations have fluctuated in 35AWW20 and remain above MCLs in June 2019.

The qualitative assessment of geochemical indicators and the absence of dechlorinating bacteria in the shallow groundwater zone (outside of the EISB zone) at LHAAP-35A (58) indicates current naturally occurring geochemical conditions are not optimal for, but may not preclude, MNA.

Historically the highest arsenic concentrations were detected in samples from 03WW01 at 89.1 µg/L in May 2014, and from 35AWW08 at 160 µg/L in January 2014. These wells are within the EISB area in the eastern groundwater plume. The presence of arsenic in groundwater above the MCL was reported in the past in samples from onsite wells and background wells, up to a maximum concentration of 62.1 µg/L in a filtered sample collected on December 16, 2004, from perimeter well 110. Therefore, the presence of arsenic in groundwater cannot be attributed solely to reductive conditions caused by EISB, although it may have contributed to an increase in arsenic concentrations. In December 2018 and June 2019, select monitoring wells were analyzed for arsenic. Only 03WW01 (0.0133 mg/L) and 35AWW08 (0.116 mg/L), within the eastern plume, exceeded the MCL of 0.010 mg/L. Monitoring for arsenic in the eastern plume is to be included in the Year 6 RA(O).

Groundwater monitoring continues to be performed at LHAAP-35A (58) on a semi-annual basis in compliance with the Eastern Plume RAWP (AECOM, August 2013). However, performance monitoring of the western plume will continue with quarterly sampling for the Year 6 RA(O) per the Western Plume RAWP (Bhate, January 2018). No change in land or groundwater use has occurred at the site, and current land use complies with the ROD.

Surface water samples were collected at surface water sample location 35ASW03 during the Year 5 RA(O) monitoring period. No COCs were detected in the surface water samples collected in December 2018 or June 2019. Surface water sampling will be conducted when the groundwater elevation in 35AWW18 is at or above the surveyed ditch elevation.

A LUC compliance inspection was conducted on May 13, 2019. No compliance issues or concerns were noted during the annual inspection (**Appendix A**). Well conditions, are documented in the photographic log presented in **Appendix B**. The operation and maintenance inspection information is documented in the well field sampling forms (**Appendix C**). Mowing the well areas

is conducted regularly, as part of routine maintenance at the site, particularly before sampling events.

Recommendations following the Year 5 RA(O), as discussed earlier in the report, are to reduce or eliminate microbial count analysis for wells 35AWW09 and 35AWW10. Monitoring well 35AWW10 is upgradient of the eastern plume injections, where no VOCs are detected. Therefore, continued evaluation of microbial analysis does not provide useful information. Monitoring well 35AWW09 is downgradient of the eastern plume injections and not directly influenced by the EISB injections such that reduction of microbial count analysis to annual is recommended. Per the Revised Final RAWP Contingency Remedy for the Western Plume, monitoring well 35AWW23 should be sampled quarterly instead of 35AWW24. Sampling of 35AWW24 is recommended to be continued semi-annually for VOCs only.

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FIGURES

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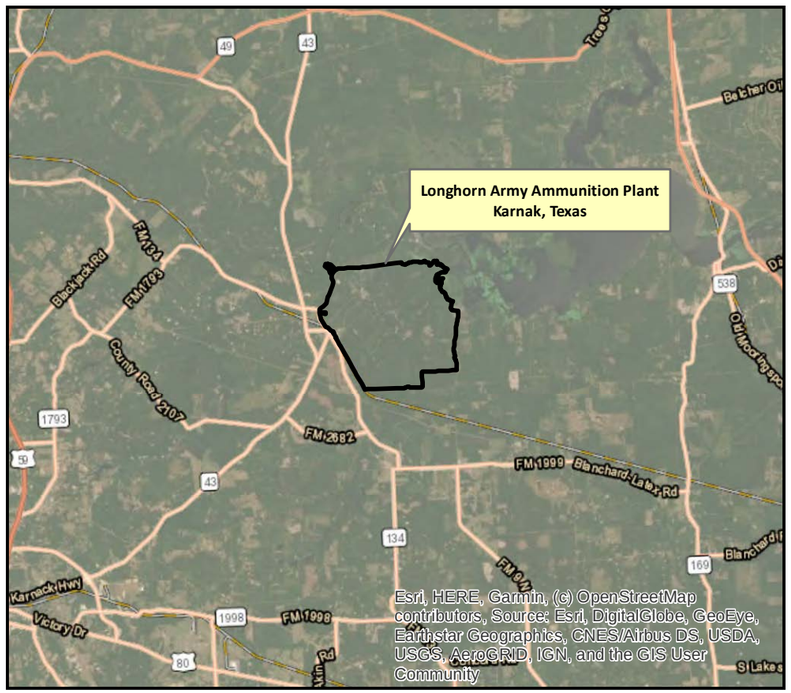

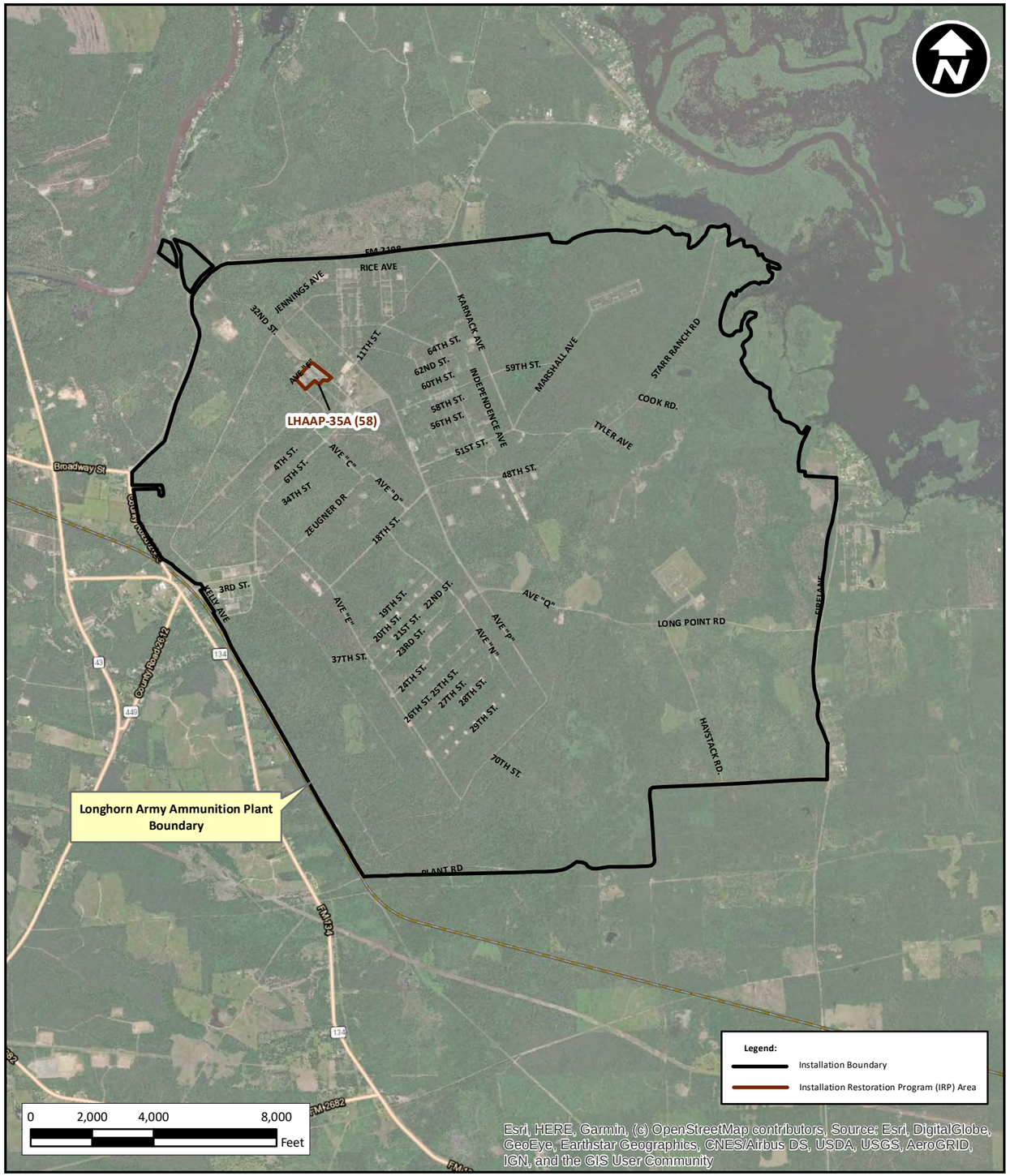

Longhorn Army Ammunition Plant
Location and Site Vicinity Map

Figure 1

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/10/2019

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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00943605

Monitoring Well Location Map

Figure 2

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/10/2019

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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LHAAP-61
LHAAP-02
LHAAP-35A (58)
LHAAP-03
LHAAP-60D
LHAAP-68
LHAAP-69
LHAAP-56
LHAAP-59
LHAAP-65

32ND ST.
HARRELL ST.
TACKET DR.
TWR #1
10TH ST.
9TH ST.
8TH ST.
AVE. "G"
6TH ST.
4TH ST.
11TH ST.

35AWW01
35AWW02
35AWW03
35AWW04
35AWW05
35AWW06
35AWW07
35AWW07R
35AWW08
35AWW09
35AWW10
35AWW11
35AWW12
35AWW13
35AWW14
35AWW15
35AWW16
35AWW17
35AWW18
35AWW19
35AWW20
35AWW21
35AWW22
35AWW23
35AWW24
03WW01
1004TW001
1004TW006
35ASW03
LHSMW03
LHSMW04
LHSMW05
LHSMW06
LHSMW07

Aerial Photography Source: Google Earth, April 2018

0 75 150 300 Feet

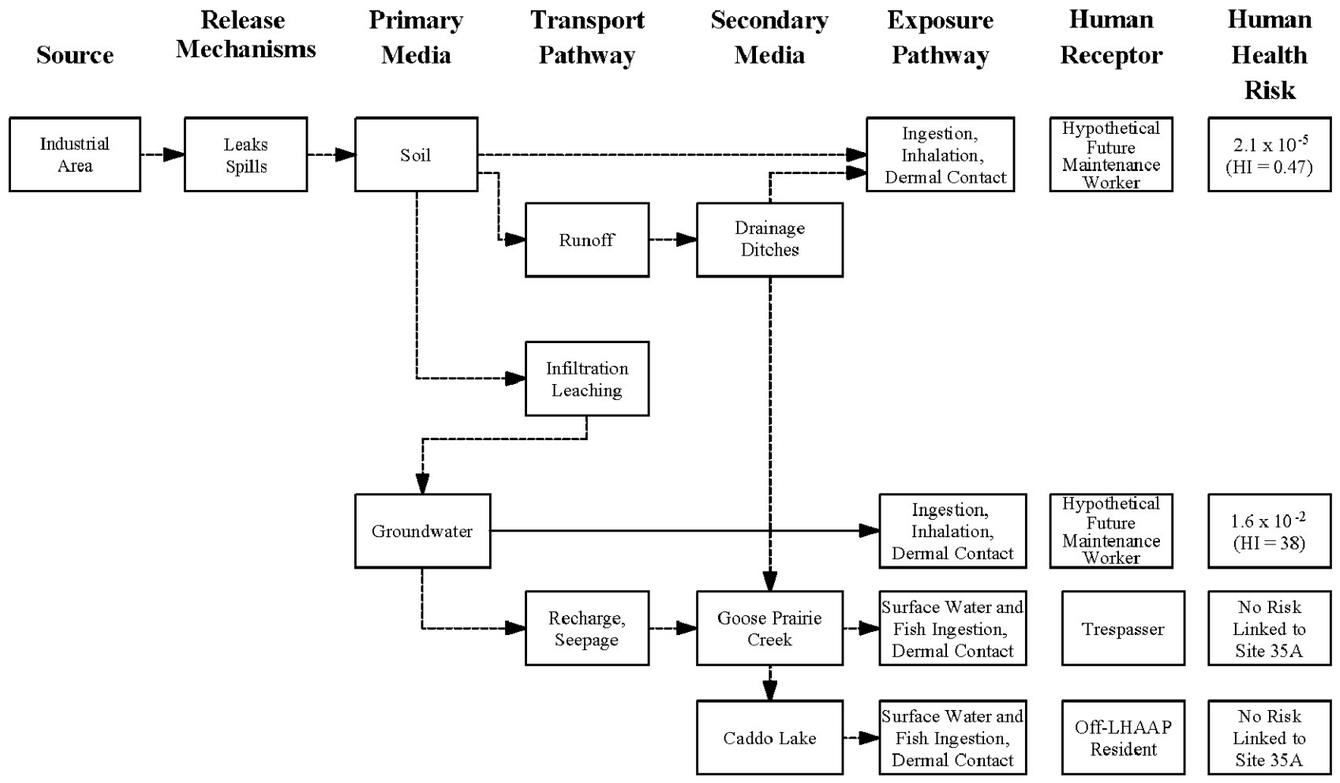
Legend:

- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- Intermediate Monitoring Well Location
- Deep Monitoring Well Location
- Surface Water Sample Location
- Groundwater Use Restrictions Area
- Installation Restoration Program (IRP) Area
- Stream
- 401 Building Number

00943606

Conceptual Site Model

Figure 3



Pathway considered for remediation

Pathway *not* considered for remediation

Source: Shaw, May 2010

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/10/2019

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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32ND ST.
HARRELL ST
TACKET DR
AVE "F"
AVE "G"
LHAAP-35A (58)
8TH ST.
9TH ST.
10TH ST.
4TH ST.
6TH ST.
11TH ST.

35AWW15 (206.42)
35AWW10 (202.01)
35AWW03 (NM)
35AWW13 (194.09)
LHSMW05 (NM)
35AWW22 (186.42)
35AWW08 (187.40)
35AWW07R (NM)
LHSMW04 (Dry)
35AWW12 (186.33)
03WW01 (186.29)
35AWW09 (185.26)
LHSMW06 (204.00)
1004TW006 (NM)
35AWW20 (203.02)
35AWW21 (186.15)
1004TW001 (NM)
35AWW11 (189.10)
LHSMW03 (NM)
35AWW16 (202.62)
LHSMW07 (202.06)
35AWW23 (202.36)
35AWW14 (188.86)
35AWW06 (200.47)
35AWW18 (196.16)
35AWW17 (196.66)
35AWW19 (192.13)
35AWW24 (192.29)

205.00
203.00
201.00
199.00
197.00
195.00
193.00
191.00
189.00
187.00

Aerial Photography Source: Google Earth, April 2018

0 75 150 300 Feet

Legend:

- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- (202.36) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- (NM) Not Measured
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- 401 Building Number

December 2018 Shallow Potentiometric Map

Figure 4

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/10/2019

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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June 2019 Shallow Potentiometric Map

Figure 5

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/10/2019

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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LHAAP-35A (58)

32ND ST.
HARRELL ST
TACKET DR
AVE "F"
AVE "G"
9TH ST.
8TH ST.
6TH ST.
4TH ST.
11TH ST.

35AWW03 (NM)
LHSMW05 (NM)
35AWW13 (196.04)
35AWW22 (186.74)
35AWW07R (NM)
35AWW10 (204.71)
35AWW08 (188.00)
LHSMW04 (Dry)
35AWW12 (187.40)
35AWW15 (205.20)
03WW01 (186.84)
35AWW09 (185.87)
LHSMW06 (206.25)
35AWW21 (187.67)
LHSMW03 (NM)
1004TW006 (NM)
35AWW20 (205.10)
1004TW001 (NM)
35AWW11 (190.88)
35AWW16 (203.58)
35AWW14 (189.76)
LHSMW07 (203.59)
35AWW23 (199.10)
35AWW06 (201.48)
35AWW18 (196.90)
35AWW17 (197.16)
35AWW19 (193.26)
35AWW24 (193.57)

206.00
204.00
202.00
200.00
198.00
196.00
194.00
192.00
190.00
188.00
186.00

Aerial Photography Source: Google Earth, April 2018

0 75 150 300
Feet

Legend:

- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- (187.67) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- (NM) Not Measured
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- *401* Building Number

00943609

Legend
J = Estimated value
U = Result is less than (<) the laboratory detection limit
COC = Contaminant of Concern
MCL = Maximum Contaminant Level
DCE = Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
NS = Not Sampled
Bold Red values exceed the United States Environmental Protection Agency MCL
All results and MCLs are reported in micrograms per liter (µg/L)

COCs shown on this figure	
COC	MCL
1,1-DCE	7
cis-1,2-DCE	70
PCE	5
trans-1,2-DCE	100
TCE	5
VC	2

LHSMW06		12/13/2018	12/13/2018	6/7/2019
COC	MCL	Result	Dup. Result	Result
1,1-DCE	7	**19**	**20**	4.3
TCE	5	**16**	**16**	**7.5**
VC	2	**5**	**5**	1.2

03WW01		12/12/2018	6/4/2019
COC	MCL	Result	Result
PCE	5	**15**	3.2J
TCE	5	**5.7**	2.9J
VC	2	**7.6**	**11**

35AWW20		9/26/2018	9/26/2018	12/10/2018	3/19/2019	6/4/2019
COC	MCL	Result	Dup. Result	Result	Result	Result
1,1-DCE	7	**1,100**	**970**	**2,700**	**1,500**	**1,800**
cis-1,2-DCE	70	45	40	**120**	49J	79
TCE	5	**170**	**150**	**570**	**180**	**230**
VC	2	<0.5U	<0.5U	**110**	**54J**	**140**

35AWW09		12/11/2018	6/3/2019
COC	MCL	Result	Result
PCE	5	**450**	**130**
TCE	5	**150**	**38**

LHSMW07		9/26/2018	12/10/2018	3/19/2019	6/3/2019
COC	MCL	Result	Result	Result	Result
1,1-DCE	7	3.1	<0.5U	<0.5U	**16**

35AWW08		12/12/2018	6/4/2019
COC	MCL	Result	Result
TCE	5	**12**	**13**

35AWW23		12/10/2018	6/3/2019
COC	MCL	Result	Result
TCE	5	**5.3**	1.8

35AWW14		12/13/2018	6/7/2019
COC	MCL	Result	Result
1,1-DCE	7	**10**	**12**
TCE	5	**9.4**	**12**

35AWW19		9/27/2018	12/10/2018	3/19/2019	6/3/2019
COC	MCL	Result	Result	Result	Result
1,1-DCE	7	**8.8**	**7.5**	3.6	2.6

Aerial Photography Source: Google Earth, April 2018

0 100 200 400 Feet

Legend:
- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- Shallow Monitoring Well Location No exceedances above MCLs for listed COCs
- Shallow Monitoring Well Location - Removed from RA(O)
- KB1® Plus Injection Point Locations (March 2018)
- KB1® Injection Point Locations (March 2018)
- Installation Restoration Program (IRP) Area
- Stream
- 401 Building Number

COC Exceedances in Shallow Groundwater (September 2018 - June 2019)

Figure 6

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/25/2019

SCALE: As Shown

PROJECT NO.: NW013 12.0150. 012.0001.03

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00943610

Legend
COC = Contaminant of Concern
MCL = Maximum Contaminant Level
DCE = Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
All results and MCLs are reported in micrograms per liter (µg/L)

COCs shown on this figure

COC	MCL
1,1-DCE	7
cis-1,2-DCE	70
PCE	5
trans-1,2-DCE	100
TCE	5
VC	2

HARRELL ST.
32ND ST.
TACKET DR
AVE "P"
LHAAP-35A (58)
8TH ST.
9TH ST.
10TH ST.
11TH ST.
6TH ST.
AVE "G"
4TH ST.
35AWW01
35AWW05
103
102-R
102
102
207
L-6
101
GH-1
401

Aerial Photography Source: Google Earth, April 2018

0 100 200 400 Feet

Legend:
- Intermediate Monitoring Well Location, No exceedances above MCLs for listed COCs
- Installation Restoration Program (IRP) Area
- Stream
- 401 Building Number

COC Exceedances in Intermediate Groundwater (December 2018 and June 2019)

Figure 7

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM
DATE: 9/10/2019
SCALE: As Shown
PROJECT NO: NWO1312.0150.012.0001.03

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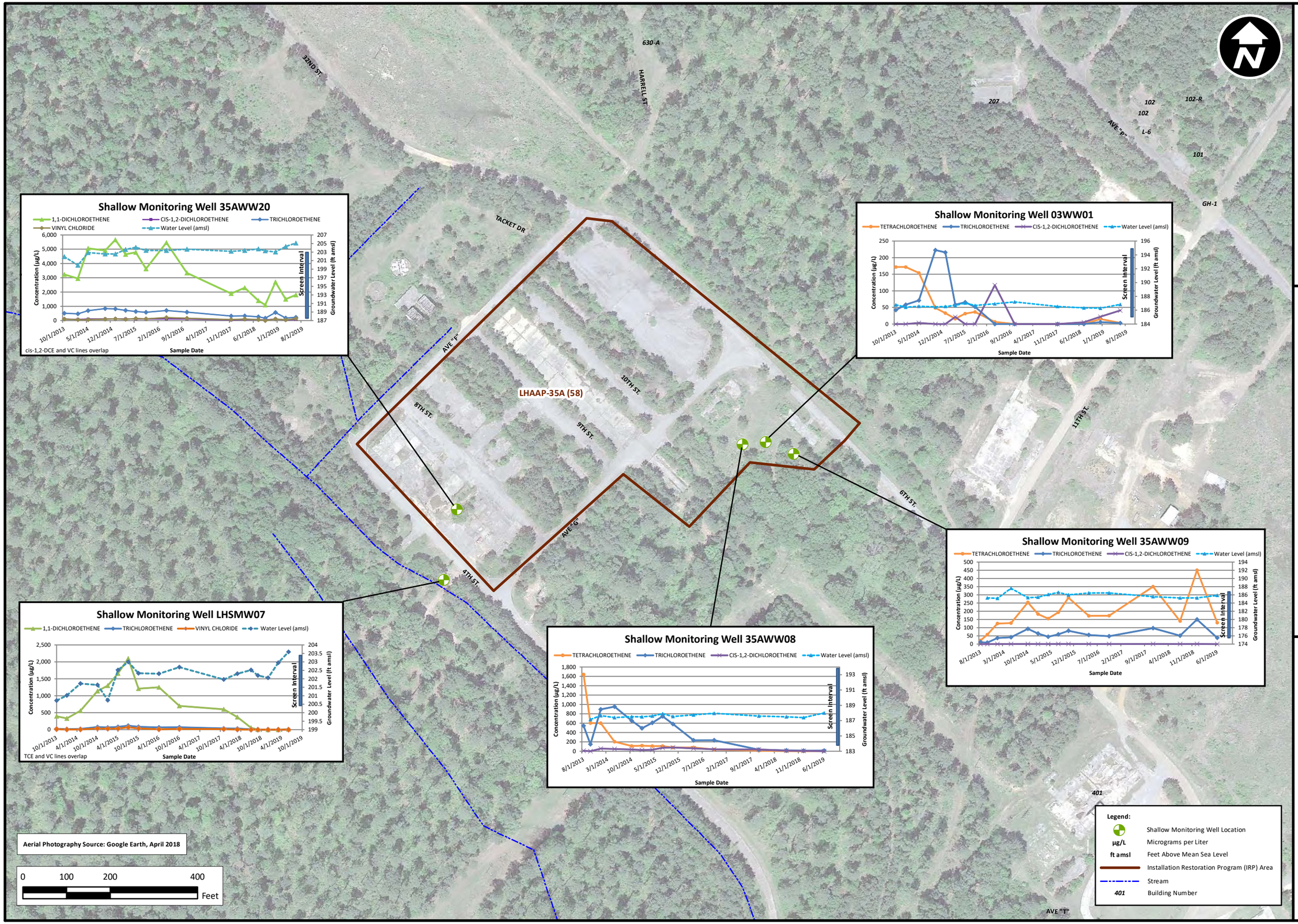

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

COC Concentration Trends

Figure 8

DRAWN BY: MRM

DATE: 9/10/2019

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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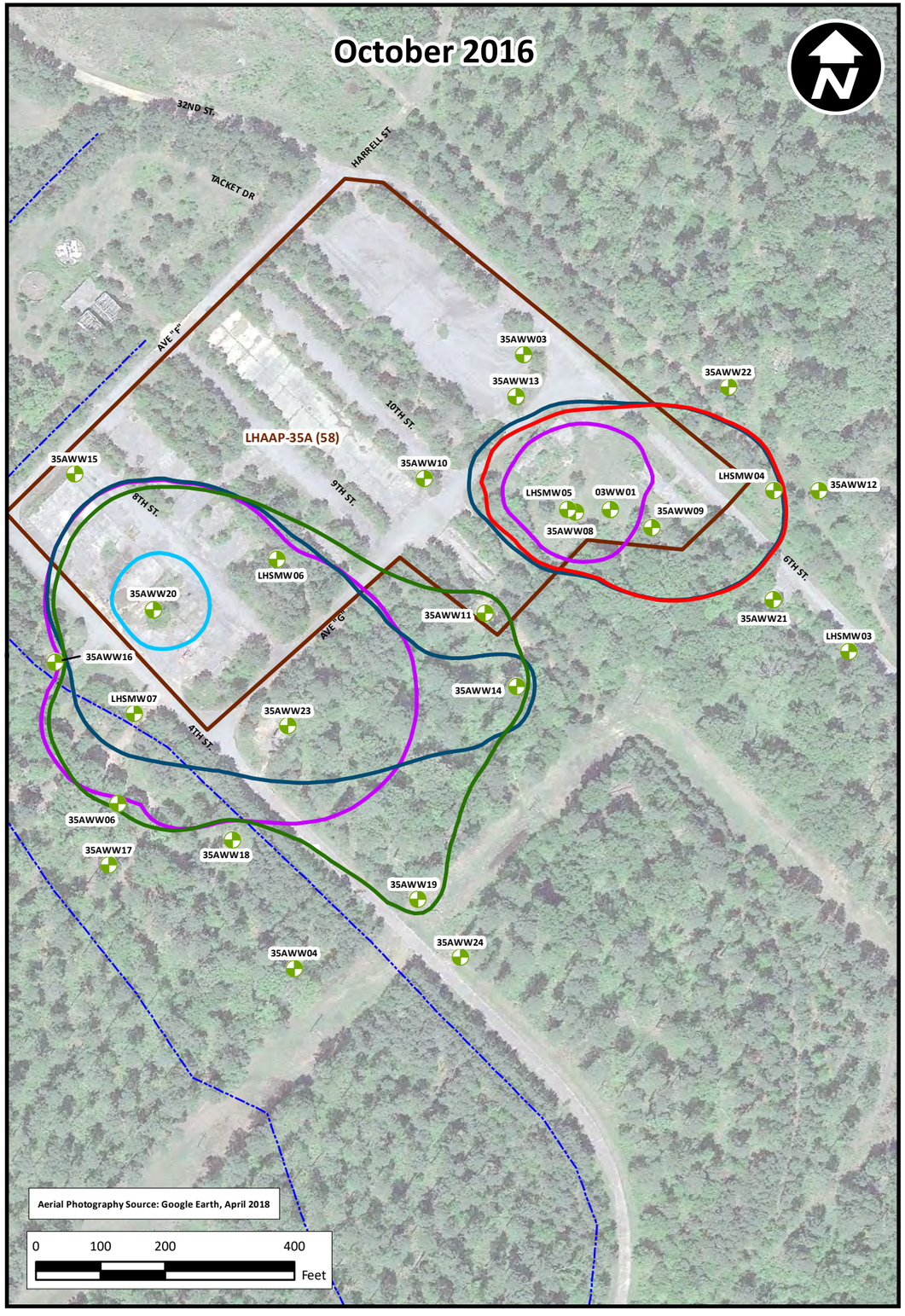

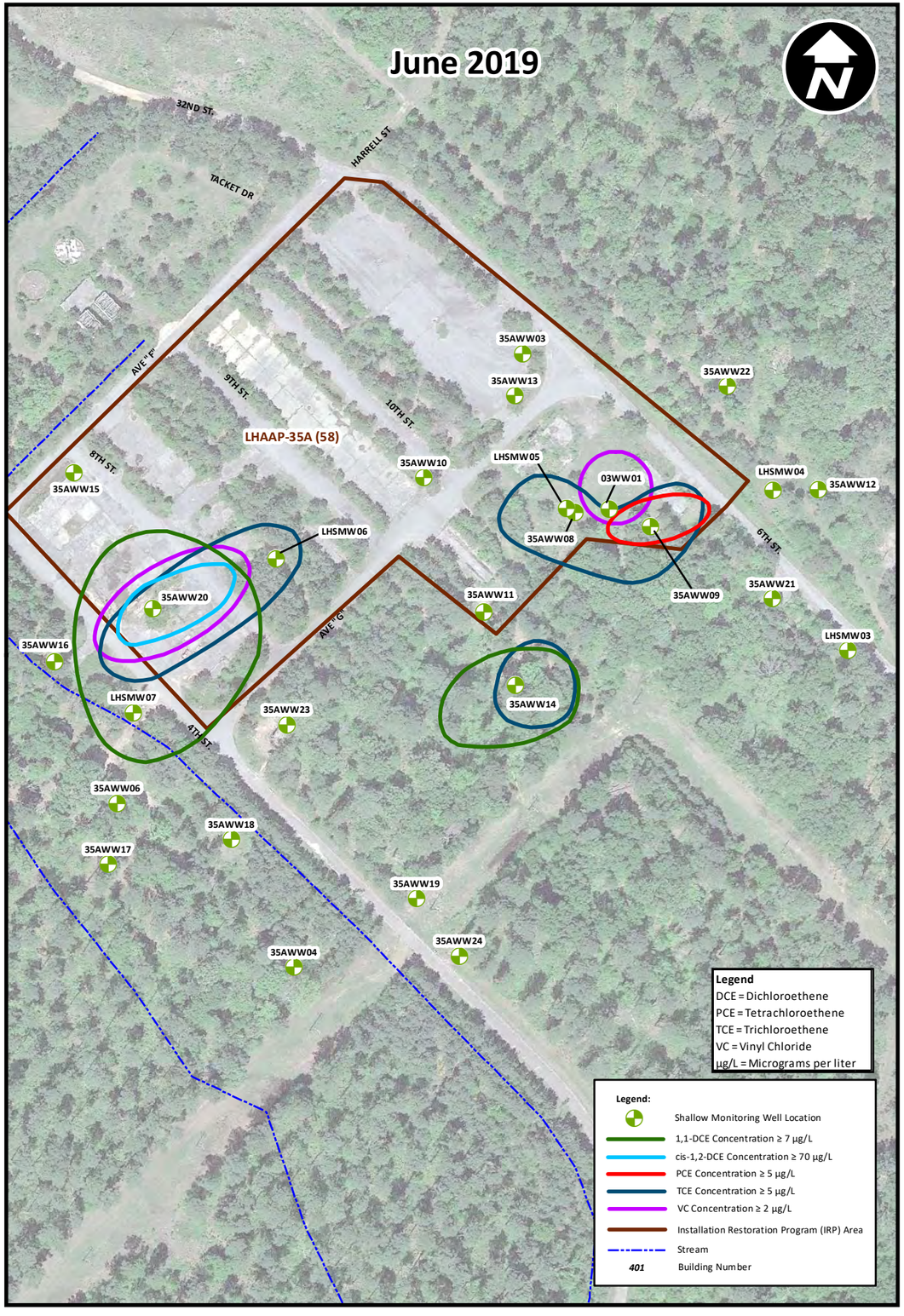

Lateral Extent of Plume Comparison (October 2016 and June 2019)

Figure 9

Year 5 Annual Remedial Action Operation Report (September 2018 – August 2019)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/10/2019

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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TABLES

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Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Well Identification	Aquifer	Sampling Date	Screen Intervals (ft from Top of Casing)	Top of Casing Elevation (ft)	Depth to Water (ft from Top of Casing)	Groundwater Elevation (ft above msl)
03WW01	Shallow	10/9/2013	21.53 - 31.53	216.29	29.51	186.78
		1/29/2014	21.53 - 31.53	216.29	29.86	186.43
		5/20/2014	21.53 - 31.53	216.29	29.72	186.57
		10/27/2014	21.53 - 31.53	216.29	29.81	186.48
		1/20/2015	21.53 - 31.53	216.29	29.75	186.54
		4/14/2015	21.53 - 31.53	216.29	29.60	186.69
		7/7/2015	21.53 - 31.53	216.29	29.25	187.04
		10/7/2015	21.53 - 31.53	216.29	29.60	186.69
		4/12/2016	21.53 - 31.53	216.29	29.36	186.93
		10/3/2016	21.53 - 31.53	216.29	29.09	187.20
		11/15/2017	21.53 - 31.53	216.29	29.75	186.54
		7/18/2018	21.53 - 31.53	216.29	29.96	186.33
		12/11/2018	21.53 - 31.53	216.29	30.00	186.29
		6/3/2019	21.53 - 31.53	216.29	29.45	186.84
1004TW001	Shallow	5/28/2014	NA	NM	18.05	NC
		10/30/2014	NA	NM	18.40	NC
		7/8/2015	NA	NM	17.00	NC
		4/14/2016	NA	NM	17.75	NC
		10/4/2016	NA	NM	17.46	NC
		11/17/2017	NA	NM	17.84	NC
1004TW006	Shallow	1/31/2014	NA	NM	19.17	NC
35AWW01	Intermediate	10/11/2013	62.69 - 72.69	218.03	40.58	177.45
		1/31/2014	62.69 - 72.69	218.03	40.21	177.82
		5/29/2014	62.69 - 72.69	218.03	39.31	178.72
		10/31/2014	62.69 - 72.69	218.03	40.17	177.86
		1/27/2015	62.69 - 72.69	218.03	39.40	178.63
		4/10/2015	62.69 - 72.69	218.03	40.06	177.97
		7/10/2015	62.69 - 72.69	218.03	39.10	178.93
		10/6/2015	62.69 - 72.69	218.03	39.79	178.24
		4/12/2016	62.69 - 72.69	218.03	38.86	179.17
		10/5/2016	62.69 - 72.69	218.03	39.01	179.02
		11/16/2017	62.69 - 72.69	218.03	44.29	173.74
		7/2/2018	62.69 - 72.69	218.03	43.00	175.03
		12/13/2018	62.69 - 72.69	218.03	40.27	177.76
		6/10/2019	62.69 - 72.69	218.03	44.52	173.51
35AWW02	Deep	10/22/2013	128.59 - 138.59	218.05	42.30	175.75
		4/13/2016	128.59 - 138.59	218.05	42.26	175.79
		10/4/2016	128.59 - 138.59	218.05	42.70	175.35
35AWW03	Shallow	2/1/2014	11.75 - 21.75	219.66	DRY	NC
		5/29/2014	11.75 - 21.75	219.66	DRY	NC
		10/30/2014	11.75 - 21.75	219.66	DRY	NC
		7/9/2015	11.75 - 21.75	219.66	DRY	NC
		4/13/2016	11.75 - 21.75	219.66	DRY	NC
		10/4/2016	11.75 - 21.75	219.66	DRY	NC
		11/16/2017	11.75 - 21.75	219.66	DRY	NC
35AWW05	Intermediate	10/16/2013	62.4 - 72.4	221.41	43.70	177.71
		2/1/2014	62.4 - 72.4	221.41	37.70	183.71
		5/22/2014	62.4 - 72.4	221.41	43.12	178.29
		10/21/2014	62.4 - 72.4	221.41	43.60	177.81
		1/23/2015	62.4 - 72.4	221.41	42.90	178.51
		4/8/2015	62.4 - 72.4	221.41	42.55	178.86
		7/10/2015	62.4 - 72.4	221.41	42.67	178.74
		10/5/2015	62.4 - 72.4	221.41	43.31	178.10
		4/14/2016	62.4 - 72.4	221.41	41.40	180.01
		10/5/2016	62.4 - 72.4	221.41	42.43	178.98
		11/13/2017	62.4 - 72.4	221.41	45.72	175.69
		7/2/2018	62.4 - 72.4	221.41	45.47	175.94
		12/12/2018	62.4 - 72.4	221.41	43.67	177.74
		6/10/2019	62.4 - 72.4	221.41	46.20	175.21

Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Well Identification	Aquifer	Sampling Date	Screen Intervals (ft from Top of Casing)	Top of Casing Elevation (ft)	Depth to Water (ft from Top of Casing)	Groundwater Elevation (ft above msl)
35AWW06	Shallow	10/15/2013	19.05 - 29.05	220.43	21.50	198.93
		1/30/2014	19.05 - 29.05	220.43	21.14	199.29
		5/21/2014	19.05 - 29.05	220.43	20.65	199.78
		10/29/2014	19.05 - 29.05	220.43	20.55	199.88
		1/28/2015	19.05 - 29.05	220.43	20.58	199.85
		4/15/2015	19.05 - 29.05	220.43	18.95	201.48
		7/7/2015	19.05 - 29.05	220.43	19.47	200.96
		10/7/2015	19.05 - 29.05	220.43	19.97	200.46
		4/11/2016	19.05 - 29.05	220.43	19.95	200.48
		10/3/2016	19.05 - 29.05	220.43	19.53	200.90
		11/14/2017	19.05 - 29.05	220.43	19.78	200.65
		7/18/2018	19.05 - 29.05	220.43	19.67	200.76
		9/26/2018	19.05 - 29.05	220.43	20.35	200.08
		12/11/2018	19.05 - 29.05	220.43	19.96	200.47
		3/19/2019	19.05 - 29.05	220.43	19.50	200.93
		6/4/2019	19.05 - 29.05	220.43	18.95	201.48
35AWW07R	Shallow	10/16/2013	21.55 - 31.25	212.11	27.90	184.21
		2/3/2014	21.55 - 31.25	212.11	28.90	183.21
		5/29/2014	21.55 - 31.25	212.11	25.83	186.28
		10/30/2014	21.55 - 31.26	212.11	26.55	185.56
		7/10/2015	21.55 - 31.26	212.11	24.08	188.03
		4/13/2016	21.55 - 31.26	212.11	24.34	187.77
		10/4/2016	21.55 - 31.26	212.11	24.82	187.29
		11/17/2017	21.55 - 31.26	212.11	26.14	185.97
35AWW08	Shallow	10/9/2013	21.83 - 31.83	216.95	29.80	187.15
		1/29/2014	21.83 - 31.83	216.95	29.30	187.65
		5/20/2014	21.83 - 31.83	216.95	29.55	187.40
		10/27/2014	21.83 - 31.83	216.95	29.43	187.52
		1/20/2015	21.83 - 31.83	216.95	29.45	187.50
		4/14/2015	21.83 - 31.83	216.95	29.35	187.60
		7/7/2015	21.83 - 31.83	216.95	29.05	187.90
		10/7/2015	21.83 - 31.83	216.95	29.41	187.54
		4/12/2016	21.83 - 31.83	216.95	29.20	187.75
		10/3/2016	21.83 - 31.83	216.95	29.00	187.95
		11/15/2017	21.83 - 31.83	216.95	29.35	187.60
		7/18/2018	21.83 - 31.83	216.95	29.45	187.50
		12/11/2018	21.83 - 31.83	216.95	29.55	187.40
		6/3/2019	21.83 - 31.83	216.95	28.95	188.00
35AWW09	Shallow	10/10/2013	26.69 - 41.29	217.47	32.21	185.26
		1/29/2014	26.69 - 41.29	217.47	32.32	185.15
		5/20/2014	26.69 - 41.29	217.47	29.87	187.60
		10/27/2014	26.69 - 41.29	217.47	32.15	185.32
		1/21/2015	26.69 - 41.29	217.47	32.04	185.43
		4/14/2015	26.69 - 41.29	217.47	31.38	186.09
		7/7/2015	26.69 - 41.29	217.47	30.87	186.60
		10/7/2015	26.69 - 41.29	217.47	31.46	186.01
		4/12/2016	26.69 - 41.29	217.47	31.02	186.45
		10/3/2016	26.69 - 41.29	217.47	31.00	186.47
		11/15/2017	26.69 - 41.29	217.47	31.91	185.56
		7/16/2018	26.69 - 41.29	217.47	32.22	185.25
		12/11/2018	26.69 - 41.29	217.47	32.21	185.26
		6/3/2019	26.69 - 41.29	217.47	31.60	185.87
35AWW10	Shallow	10/10/2013	18.16 - 32.76	220.76	20.15	200.61
		1/29/2014	18.16 - 32.76	220.76	18.85	201.91
		5/20/2014	18.16 - 32.76	220.76	17.10	203.66
		10/28/2014	18.16 - 32.76	220.76	19.55	201.21
		1/27/2015	18.16 - 32.76	220.76	17.78	202.98
		4/14/2015	18.16 - 32.76	220.76	16.45	204.31
		7/7/2015	18.16 - 32.76	220.76	17.17	203.59
		10/7/2015	18.16 - 32.76	220.76	19.45	201.31
		4/13/2016	18.16 - 32.76	220.76	17.41	203.35
		10/3/2016	18.16 - 32.76	220.76	18.98	201.78
		11/15/2017	18.16 - 32.76	220.76	19.68	201.08
		7/12/2018	18.16 - 32.76	220.76	18.95	201.81
		12/12/2018	18.16 - 32.76	220.76	18.75	202.01
		6/4/2019	18.16 - 32.76	220.76	16.05	204.71

Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
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Well Identification	Aquifer	Sampling Date	Screen Intervals (ft from Top of Casing)	Top of Casing Elevation (ft)	Depth to Water (ft from Top of Casing)	Groundwater Elevation (ft above msl)
35AWW11	Shallow	10/15/2013	22.24 - 36.84	220.15	31.36	188.79
		2/3/2014	22.24 - 36.84	220.15	31.80	188.35
		5/21/2014	22.24 - 36.84	220.15	31.55	188.60
		10/29/2014	22.24 - 36.84	220.15	31.73	188.42
		1/27/2015	22.24 - 36.84	220.15	31.60	188.55
		4/14/2015	22.24 - 36.84	220.15	31.25	188.90
		7/8/2015	22.24 - 36.84	220.15	30.72	189.43
		10/7/2015	22.24 - 36.84	220.15	31.20	188.95
		4/12/2016	22.24 - 36.84	220.15	31.03	189.12
		10/3/2016	22.24 - 36.84	220.15	30.48	189.67
		11/14/2017	22.24 - 36.84	220.15	30.91	189.24
		7/16/2018	22.24 - 36.84	220.15	30.60	189.55
		9/27/2018	22.24 - 36.84	220.15	31.10	189.05
		12/11/2018	22.24 - 36.84	220.15	31.05	189.10
		3/19/2019	22.24 - 36.84	220.15	30.00	190.15
		6/3/2019	22.24 - 36.84	220.15	29.27	190.88
35AWW12	Shallow	10/18/2013	22.17 - 36.77	215.99	30.05	185.94
		1/31/2014	22.17 - 36.77	215.99	28.10	187.89
		5/29/2014	22.17 - 36.77	215.99	29.00	186.99
		10/30/2014	22.17 - 36.77	215.99	30.11	185.88
		1/28/2015	22.17 - 36.77	215.99	29.45	186.54
		4/7/2015	22.17 - 36.77	215.99	28.70	187.29
		7/9/2015	22.17 - 36.77	215.99	28.22	187.77
		10/5/2015	22.17 - 36.77	215.99	29.35	186.64
		4/12/2016	22.17 - 36.77	215.99	28.54	187.45
		10/5/2016	22.17 - 36.77	215.99	28.87	187.12
		11/16/2017	22.17 - 36.77	215.99	29.97	186.02
		6/29/2018	22.17 - 36.77	215.99	30.05	185.94
		12/14/2018	22.17 - 36.77	215.99	29.66	186.33
		6/10/2019	22.17 - 36.77	215.99	28.59	187.40
35AWW13	Shallow	10/11/2013	24.72 - 39.32	219.12	25.07	194.05
		2/3/2014	24.72 - 39.32	219.12	24.91	194.21
		5/22/2014	24.72 - 39.32	219.12	23.80	195.32
		10/21/2014	24.72 - 39.32	219.12	24.85	194.27
		1/23/2015	24.72 - 39.32	219.12	24.70	194.42
		4/8/2015	24.72 - 39.32	219.12	23.72	195.40
		7/9/2015	24.72 - 39.32	219.12	23.39	195.73
		10/6/2015	24.72 - 39.32	219.12	24.61	194.51
		4/13/2016	24.72 - 39.32	219.12	24.10	195.02
		10/6/2016	24.72 - 39.32	219.12	24.41	194.71
		11/16/2017	24.72 - 39.32	219.12	25.06	194.06
		6/29/2018	24.72 - 39.32	219.12	24.37	194.75
		12/11/2018	24.72 - 39.32	219.12	25.03	194.09
		6/7/2019	24.72 - 39.32	219.12	23.08	196.04
35AWW14	Shallow	10/18/2013	17.06 - 31.76	218.41	30.80	187.61
		1/31/2014	17.06 - 31.76	218.41	30.95	187.46
		5/28/2014	17.06 - 31.76	218.41	30.57	187.84
		10/29/2014	17.06 - 31.76	218.41	31.00	187.41
		1/20/2015	17.06 - 31.76	218.41	30.85	187.56
		4/7/2015	17.06 - 31.76	218.41	30.48	187.93
		7/8/2015	17.06 - 31.76	218.41	29.75	188.66
		10/1/2015	17.06 - 31.76	218.41	30.19	188.22
		4/12/2016	17.06 - 31.76	218.41	29.67	188.74
		10/5/2016	17.06 - 31.76	218.41	29.31	189.10
		11/16/2017	17.06 - 31.76	218.41	29.63	188.78
		7/18/2018	17.06 - 31.76	218.41	29.58	188.83
		12/13/2018	17.06 - 31.76	218.41	29.55	188.86
		6/7/2019	17.06 - 31.76	218.41	28.65	189.76

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Well Identification	Aquifer	Sampling Date	Screen Intervals (ft from Top of Casing)	Top of Casing Elevation (ft)	Depth to Water (ft from Top of Casing)	Groundwater Elevation (ft above msl)
35AWW15	Shallow	10/16/2013	25.67 - 40.37	222.97	20.65	202.32
		2/1/2014	25.67 - 40.37	222.97	20.40	202.57
		5/28/2014	25.67 - 40.37	222.97	19.64	203.33
		10/21/2014	25.67 - 40.37	222.97	20.18	202.79
		1/23/2015	25.67 - 40.37	222.97	20.15	202.82
		4/10/2015	25.67 - 40.37	222.97	19.31	203.66
		7/10/2015	25.67 - 40.37	222.97	18.95	204.02
		10/6/2015	25.67 - 40.37	222.97	19.56	203.41
		4/14/2016	25.67 - 40.37	222.97	19.51	203.46
		10/5/2016	25.67 - 40.37	222.97	19.34	203.63
		11/16/2017	25.67 - 40.37	222.97	19.72	203.25
		7/18/2018	25.67 - 40.37	222.97	19.50	203.47
		12/12/2018	25.67 - 40.37	222.97	16.55	206.42
		6/7/2019	25.67 - 40.37	222.97	17.77	205.20
35AWW16	Shallow	10/22/2013	21.75 - 36.45	220.88	19.58	201.30
		1/31/2014	21.75 - 36.45	220.88	19.28	201.60
		5/28/2014	21.75 - 36.45	220.88	18.60	202.28
		10/30/2014	21.75 - 36.45	220.88	19.96	200.92
		1/27/2015	21.75 - 36.45	220.88	18.90	201.98
		4/7/2015	21.75 - 36.45	220.88	18.22	202.66
		7/9/2015	21.75 - 36.45	220.88	17.79	203.09
		10/6/2015	21.75 - 36.45	220.88	18.20	202.68
		4/12/2016	21.75 - 36.45	220.88	18.43	202.45
		10/4/2016	21.75 - 36.45	220.88	17.90	202.98
		11/13/2017	21.75 - 36.45	220.88	18.52	202.36
		6/29/2018	21.75 - 36.45	220.88	18.10	202.78
		12/12/2018	21.75 - 36.45	220.88	18.26	202.62
		6/10/2019	21.75 - 36.45	220.88	17.30	203.58
35AWW17	Shallow	10/18/2013	26.97 - 41.67	221.44	28.00	193.44
		2/1/2014	26.97 - 41.67	221.44	36.90	184.54
		5/29/2014	26.97 - 41.67	221.44	26.60	194.84
		10/31/2014	26.97 - 41.67	221.44	26.80	194.64
		1/28/2015	26.97 - 41.67	221.44	26.00	195.44
		4/10/2015	26.97 - 41.67	221.44	25.65	195.79
		7/10/2015	26.97 - 41.67	221.44	25.42	196.02
		10/5/2015	26.97 - 41.67	221.44	25.93	195.51
		4/11/2016	26.97 - 41.67	221.44	25.60	195.84
		10/3/2016	26.97 - 41.67	221.44	25.30	196.14
		11/13/2017	26.97 - 41.67	221.44	24.87	196.57
		6/29/2018	26.97 - 41.67	221.44	25.07	196.37
		12/17/2018	26.97 - 41.67	221.44	24.78	196.66
		6/10/2019	26.97 - 41.67	221.44	24.28	197.16
35AWW18	Shallow	10/18/2013	26.85 - 41.55	221.75	28.35	193.40
		2/1/2014	26.85 - 41.55	221.75	27.90	193.85
		5/29/2014	26.85 - 41.55	221.75	27.65	194.10
		10/31/2014	26.85 - 41.55	221.75	27.50	194.25
		1/28/2015	26.85 - 41.55	221.75	27.11	194.64
		4/10/2015	26.85 - 41.55	221.75	25.90	195.85
		7/10/2015	26.85 - 41.55	221.75	26.42	195.33
		10/5/2015	26.85 - 41.55	221.75	26.67	195.08
		4/11/2016	26.85 - 41.55	221.75	26.40	195.35
		10/5/2016	26.85 - 41.55	221.75	25.93	195.82
		11/13/2017	26.85 - 41.55	221.75	25.85	195.90
		6/29/2018	26.85 - 41.55	221.75	24.55	197.20
		12/17/2018	26.85 - 41.55	221.75	25.59	196.16
		6/4/2019	26.85 - 41.55	221.75	24.85	196.90

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35AWW19	Shallow	10/22/2013	16.99 - 31.09	219.71	30.65	189.06
		1/31/2014	16.99 - 31.09	219.71	30.68	189.03
		5/28/2014	16.99 - 31.09	219.71	30.30	189.41
		10/29/2014	16.99 - 31.09	219.71	30.45	189.26
		1/20/2015	16.99 - 31.09	219.71	30.15	189.56
		4/7/2015	16.99 - 31.09	219.71	29.84	189.87
		7/8/2015	16.99 - 31.09	219.71	29.16	190.55
		10/1/2015	16.99 - 31.09	219.71	29.46	190.25
		4/12/2016	16.99 - 31.09	219.71	28.87	190.84
		10/5/2016	16.99 - 31.09	219.71	28.13	191.58
		11/17/2017	16.99 - 31.09	219.71	27.81	191.90
		7/18/2018	16.99 - 31.09	219.71	27.37	192.34
		9/27/2018	16.99 - 31.09	219.71	27.79	191.92
		12/10/2018	16.99 - 31.09	219.71	27.58	192.13
		3/19/2019	16.99 - 31.09	219.71	27.00	192.71
		6/3/2019	16.99 - 31.09	219.71	26.45	193.26
35AWW20	Shallow	10/15/2013	20.94 - 35.64	223.05	21.12	201.93
		2/3/2014	20.94 - 35.64	223.05	23.12	199.93
		5/21/2014	20.94 - 35.64	223.05	20.18	202.87
		10/29/2014	20.94 - 35.64	223.05	20.50	202.55
		1/27/2015	20.94 - 35.64	223.05	20.50	202.55
		4/15/2015	20.94 - 35.64	223.05	19.45	203.60
		7/8/2015	20.94 - 35.64	223.05	18.95	204.10
		10/8/2015	20.94 - 35.64	223.05	19.67	203.38
		4/13/2016	20.94 - 35.64	223.05	19.69	203.36
		10/4/2016	20.94 - 35.64	223.05	19.38	203.67
		11/14/2017	20.94 - 35.64	223.05	19.87	203.18
		7/16/2018	20.94 - 35.64	223.05	19.31	203.74
		9/26/2018	20.94 - 35.64	223.05	19.75	203.30
		12/10/2018	20.94 - 35.64	223.05	20.03	203.02
		3/19/2019	20.94 - 35.64	223.05	18.76	204.29
		6/4/2019	20.94 - 35.64	223.05	17.95	205.10
35AWW21	Shallow	10/16/2013	27.56 - 42.26	219.05	34.36	184.69
		2/4/2014	27.56 - 42.26	219.05	33.55	185.50
		5/22/2014	27.56 - 42.26	219.05	32.40	186.65
		10/21/2014	27.56 - 42.26	219.05	33.90	185.15
		1/23/2015	27.56 - 42.26	219.05	33.06	185.99
		4/8/2015	27.56 - 42.26	219.05	31.73	187.32
		7/9/2015	27.56 - 42.26	219.05	31.11	187.94
		10/6/2015	27.56 - 42.26	219.05	32.74	186.31
		4/13/2016	27.56 - 42.26	219.05	31.44	187.61
		10/4/2016	27.56 - 42.26	219.05	32.10	186.95
		11/13/2017	27.56 - 42.26	219.05	33.77	185.28
		6/29/2018	27.56 - 42.26	219.05	33.77	185.28
		12/13/2018	27.56 - 42.26	219.05	32.90	186.15
		6/10/2019	27.56 - 42.26	219.05	31.38	187.67
35AWW22	Shallow	10/22/2013	22.27 - 36.77	219.14	32.13	187.01
		1/31/2014	22.27 - 36.77	219.14	32.08	187.06
		5/28/2014	22.27 - 36.77	219.14	32.00	187.14
		10/29/2014	22.27 - 36.77	219.14	32.45	186.69
		1/20/2015	22.27 - 36.77	219.14	33.32	185.82
		4/8/2015	22.27 - 36.77	219.14	32.09	187.05
		7/9/2015	22.27 - 36.77	219.14	31.72	187.42
		10/5/2015	22.27 - 36.77	219.14	32.30	186.84
		4/12/2016	22.27 - 36.77	219.14	32.00	187.14
		10/5/2016	22.27 - 36.77	219.14	31.91	187.23
		11/17/2017	22.27 - 36.77	219.14	32.47	186.67
		7/18/2018	22.27 - 36.77	219.14	33.80	185.34
		12/14/2018	22.27 - 36.77	219.14	32.72	186.42
		6/10/2019	22.27 - 36.77	219.14	32.40	186.74
35AWW23	Shallow	7/17/2018	25.2 - 40.2	223.07	23.55	199.52
		12/10/2018	25.2 - 40.2	223.07	20.71	202.36
		6/3/2019	25.2 - 40.2	223.07	23.97	199.10
35AWW24	Shallow	7/17/2018	22.10 - 32.10	219.04	26.60	192.44
		9/27/2018	22.10 - 32.10	219.04	20.11	198.93
		12/10/2018	22.10 - 32.10	219.04	26.75	192.29
		3/19/2019	22.10 - 32.10	219.04	26.06	192.98
		6/3/2019	22.10 - 32.10	219.04	25.47	193.57

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Well Identification	Aquifer	Sampling Date	Screen Intervals (ft from Top of Casing)	Top of Casing Elevation (ft)	Depth to Water (ft from Top of Casing)	Groundwater Elevation (ft above msl)
LHSMW03	Shallow	10/9/2013	22.54 - 35.54	217.26	DRY	NC
		2/3/2014	22.54 - 35.54	217.26	31.00	186.26
		5/28/2014	22.54 - 35.54	217.26	29.40	187.86
		10/29/2014	22.54 - 35.54	217.26	31.20	186.06
		7/8/2015	22.54 - 35.54	217.26	28.21	189.05
		4/13/2016	22.54 - 35.54	217.26	28.75	188.51
		10/4/2016	22.54 - 35.54	217.26	29.51	187.75
		11/17/2017	22.54 - 35.54	217.26	31.36	185.90
LHSMW04	Shallow	10/9/2013	21.11 - 31.11	216.95	DRY	NC
		1/31/2014	21.11 - 31.11	216.95	DRY	NC
		5/20/2014	21.11 - 31.11	216.95	DRY	NC
		10/30/2014	21.11 - 31.11	216.95	DRY	NC
		1/20/2015	21.11 - 31.11	216.95	DRY	NC
		4/7/2015	21.11 - 31.11	216.95	DRY	NC
		7/8/2015	21.11 - 31.11	216.95	DRY	NC
		10/1/2015	21.11 - 31.11	216.95	DRY	NC
		3/28/2016	21.11 - 31.11	216.95	29.72	187.23
		4/12/2016	21.11 - 31.11	216.95	29.65	187.30
		10/4/2016	21.11 - 31.11	216.95	DRY	NC
		11/16/2017	21.11 - 31.11	216.95	DRY	NC
		7/17/2018	21.11 - 31.11	216.95	DRY	NC
		12/11/2018	21.11 - 31.11	216.95	DRY	NC
		6/4/2019	21.11 - 31.11	216.95	DRY	NC
LHSMW05	Shallow	10/9/2013	14.08 - 24.08	217.59	DRY	NC
		1/31/2014	14.08 - 24.08	217.59	DRY	NC
		5/20/2014	14.08 - 24.08	217.59	DRY	NC
		10/30/2014	14.08 - 24.08	217.59	DRY	NC
		1/20/2015	14.08 - 24.08	217.59	DRY	NC
		4/7/2015	14.08 - 24.08	217.59	DRY	NC
		7/10/2015	14.08 - 24.08	217.59	DRY	NC
		10/1/2015	14.08 - 24.08	217.59	DRY	NC
		4/12/2016	14.08 - 24.08	217.59	DRY	NC
		10/4/2016	14.08 - 24.08	217.59	DRY	NC
LHSMW06	Shallow	10/16/2013	13.32 - 23.32	223.18	20.97	202.21
		1/30/2014	13.32 - 23.32	223.18	20.50	202.68
		5/28/2014	13.32 - 23.32	223.18	19.30	203.88
		10/29/2014	13.32 - 23.32	223.18	19.81	203.37
		1/20/2015	13.32 - 23.32	223.18	19.92	203.26
		4/7/2015	13.32 - 23.32	223.18	18.92	204.26
		7/8/2015	13.32 - 23.32	223.18	18.21	204.97
		10/1/2015	13.32 - 23.32	223.18	18.98	204.20
		4/12/2016	13.32 - 23.32	223.18	19.11	204.07
		10/5/2016	13.32 - 23.32	223.18	18.91	204.27
		11/17/2017	13.32 - 23.32	223.18	19.31	203.87
		7/2/2018	13.32 - 23.32	223.18	18.80	204.38
		12/13/2018	13.32 - 23.32	223.18	19.18	204.00
		6/7/2019	13.32 - 23.32	223.18	16.93	206.25
LHSMW07	Shallow	10/15/2013	19.73 - 29.73	221.27	20.55	200.72
		1/30/2014	19.73 - 29.73	221.27	20.25	201.02
		5/22/2014	19.73 - 29.73	221.27	19.55	201.72
		10/29/2014	19.73 - 29.73	221.27	19.63	201.64
		1/28/2015	19.73 - 29.73	221.27	20.53	200.74
		4/15/2015	19.73 - 29.73	221.27	18.75	202.52
		7/7/2015	19.73 - 29.73	221.27	18.27	203.00
		10/8/2015	19.73 - 29.73	221.27	18.94	202.33
		4/14/2016	19.73 - 29.73	221.27	18.97	202.30
		10/4/2016	19.73 - 29.73	221.27	18.58	202.69
		11/14/2017	19.73 - 29.73	221.27	19.00	202.27
		7/17/2018	19.73 - 29.73	221.27	18.75	202.52
		9/26/2018	19.73 - 29.73	221.27	19.07	202.20
		12/10/2018	19.73 - 29.73	221.27	19.21	202.06
		3/19/2019	19.73 - 29.73	221.27	18.32	202.95
		6/3/2019	19.73 - 29.73	221.27	17.68	203.59

Notes:
ft - feet
msl = mean sea level
NA - not available
NC - not calculated
NM - not measured

Table 2, Eastern Plume Semi-Annual Analytical Data, December 2018 and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	03WW01_121218 12/12/18	03WW01_060419 6/4/19	35AWW01_121318 12/13/18	35AWW01_061019 6/10/19	35AWW05_121218 12/12/18	35AWW05_061019 6/10/19	35AWW08_121218 12/12/18	35AWW08_060419 6/4/19	35AWW09_121118 12/11/18	35AWW09_060319 6/3/19	35AWW10_121218 12/12/18	35AWW10_121218_a 12/12/18	35AWW10_060419 6/4/19	35AWW10_060419_a 6/4/19
Location Description			Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - SW, outside the site boundary.	Site 58 - SW, outside the site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - ESE, inside site boundary.	Site 58 - ESE, inside site boundary. Duplicate	Site 58 - ESE, inside site boundary.	Site 58 - ESE, inside site boundary. Duplicate
Location Depth			Shallow	Shallow	Intermediate	Intermediate	Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18120736	HS19060185	HS18120913	HS19060573	HS18120736	HS19060573	HS18120736	HS19060185	HS18120642/HS18120736	HS19060123	HS18120736	HS18120736	HS19060185	HS19060185
Alkalinity (SM2320B)																
Alkalinity, Total	mg/L	NV	**862**	NA	NA	NA	NA	NA	**3,420**	NA	**282**	NA	**50.4**	**55.1**	NA	NA
Phosphorus (365.3)																
Phosphorus	mg/L	NV	**3.05**	NA	NA	NA	NA	NA	**2.43**	NA	**0.112**	NA	**0.244**	**0.253**	NA	NA
Total Organic Carbon (415.1/SM5310C)																
Total Organic Carbon	mg/L	NV	**42.2**	**66.1**	NA	NA	NA	NA	**392**	**306**	**4.5**	**3.96**	**3.97**	**4.03**	**4.69**	**4.11**
Metals (6020A)																
Total Iron	mg/L	NV	**32.9**	NA	NA	NA	NA	NA	**39.9**	NA	**0.553**	NA	**0.340 J**	**0.166 J**	NA	NA
Total Manganese	mg/L	14	**4.82**	NA	NA	NA	NA	NA	**9.01**	NA	**0.128**	NA	**0.0474**	**0.0530**	NA	NA
Dissolved Iron	mg/L	NV	**32.1**	NA	NA	NA	NA	NA	**38.2**	NA	**0.437**	NA	**0.332 J**	**0.227 J**	NA	NA
Dissolved Manganese	mg/L	14	**4.22**	NA	NA	NA	NA	NA	**8.96**	NA	**0.14**	NA	**0.0512**	**0.0567**	NA	NA
Total Arsenic	mg/L	0.01	NA	**0.0133**	< 0.00100 U	NA	NA	NA	**0.0593**	**0.116**	**0.000964 J**	**0.00308**	NA	NA	NA	NA
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	**1.2**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	**25**	< 5.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 1.0 U	**76**	13 UB	**2.1**	< 1.0 U	< 2.0 U	< 2.0 U	< 1.0 U	2.7 UB
Benzene	µg/L	5	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	**22**	**41**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	**8.9 J**	< 2.5 U	**0.94 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

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Location Identification: / Sample Date:	Units	MCL/MSC	03WW01_121218 12/12/18	03WW01_060419 6/4/19	35AWW01_121318 12/13/18	35AWW01_061019 6/10/19	35AWW05_121218 12/12/18	35AWW05_061019 6/10/19	35AWW08_121218 12/12/18	35AWW08_060419 6/4/19	35AWW09_121118 12/11/18	35AWW09_060319 6/3/19	35AWW10_121218 12/12/18	35AWW10_121218_a 12/12/18	35AWW10_060419 6/4/19	35AWW10_060419_a 6/4/19
Location Description			Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - SW, outside the site boundary.	Site 58 - SW, outside the site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - ESE, inside site boundary.	Site 58 - ESE, inside site boundary. Duplicate	Site 58 - ESE, inside site boundary.	Site 58 - ESE, inside site boundary. Duplicate
Location Depth			Shallow	Shallow	Intermediate	Intermediate	Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18120736	HS19060185	HS18120913	HS19060573	HS18120736	HS19060573	HS18120736	HS19060185	HS18120642/HS18120736	HS19060123	HS18120736	HS18120736	HS19060185	HS19060185
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 5.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 5.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000	< 0.5 U	< 5.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 5.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 0.5 U	< 5.0 U	< 0.5 U	< 1.0 UJ	< 0.5 U	< 1.0 U	< 0.5 U	< 5.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Naphthalene	µg/L	2,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	**15**	**3.2 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**4.8 J**	**450**	**130**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	**0.62 J**	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	**5.7**	**2.9 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**12**	**13**	**150**	**38**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	µg/L	2	**7.6**	**11**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Volatile Fatty Acids (HPLC-METACIDS)																
Acetic Acid	mg/L	NV	< 2.0 U	NA	NA	NA	NA	NA	**120**	**20**	< 2.0 U	< 1.0 U	< 2.0 U	< 2.0 U	< 1.0 U	< 1.0 U
Butyric Acid	mg/L	NV	< 1.0 U	NA	NA	NA	NA	NA	< 1.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 2.0 U
Lactic Acid	mg/L	NV	< 1.0 U	NA	NA	NA	NA	NA	< 1.0 U	**12**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionic Acid	mg/L	51	< 1.0 U	NA	NA	NA	NA	NA	**9.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Pyruvic Acid	mg/L	NV	< 0.10 U	NA	NA	NA	NA	NA	**0.48**	< 0.5 U	< 0.10 U	< 0.5 U	< 0.10 U	< 0.10 U	< 0.50 U	< 0.50 U
Anions (9056A)																
Chloride	mg/L	NV	**336**	**809**	NA	NA	NA	NA	**2,240**	**2,510**	**1,320**	**1,340**	**4.83**	**5.17**	**6.59**	**6.56**
Nitrate	mg/L	10	< 0.100 U	**0.196 J**	NA	NA	NA	NA	**0.147 J**	**0.219 J**	< 0.100 U	< 0.500 U	**0.131**	**0.159**	**0.0497 J**	**0.0480 J**
Nitrite	mg/L	1	< 0.100 U	NA	NA	NA	NA	NA	< 0.100 U	NA	< 0.100 U	NA	< 0.100 U	< 0.100 U	NA	NA
Sulfate	mg/L	NV	**42.8**	**239**	NA	NA	NA	NA	**4.76**	**1.42 J**	**903**	**908**	**50.3**	**53.4**	**68.4**	**68.2**
Dissolved Gases (RSK-175)																
Carbon Dioxide	µg/L	NV	**390,000**	**520,000**	NA	NA	NA	NA	**290,000**	**260,000**	**420,000**	**620,000**	**430,000**	**450,000**	**670,000**	**620,000**
Ethane	µg/L	NV	< 0.47 U	< 0.47 U	NA	NA	NA	NA	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U
Ethene	µg/L	NV	**2.3**	**1.6**	NA	NA	NA	NA	< 0.55 U	**4.1**	< 0.55 U	< 0.55 U	**2.8**	< 0.55 U	< 0.55 U	< 0.55 U
Methane	µg/L	NV	**1,800**	**2,900**	NA	NA	NA	NA	< 1.0 U	**3,000**	**1,000**	**2.3**	**3,500**	< 1.0 U	< 1.0 U	< 1.0 U
Ferrous Iron (SM3500Fe)																
Ferrous Iron	mg/L	NV	**27.5 J**	NA	NA	NA	NA	NA	**21 J**	NA	**0.13 J**	NA	**0.09 J**	**0.07 J**	NA	NA
Sulfide (376.1)																
Sulfide	mg/L	NV	< 1.0 U	NA	NA	NA	NA	NA	< 1.0 U	NA	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	NA
Dechlorinating Bacteria																
BAV1 Vinyl Chloride Reductase	cells/mL	NV	< 0.80 U	< 0.50 U	NA	NA	NA	NA	< 3.1 U	< 3.0 U	< 0.90 U	< 0.7 U	< 0.80 U	NA	< 0.5 U	NA
Dehalobacter spp.	cells/mL	NV	**599**	**292**	NA	NA	NA	NA	**173,000**	**139,000**	< 8.6 U	**73.3**	**13.6**	NA	**261**	NA
Dehalococoides	cells/mL	NV	**10,100**	**6,040**	NA	NA	NA	NA	**1,200,000**	**3,790,000**	< 0.90 U	**5.8**	**15.8**	NA	**96.6**	NA
tceA Reductase	cells/mL	NV	**6.2**	**2.1**	NA	NA	NA	NA	**313,000**	**480,000**	< 0.90 U	< 0.7 U	**1.1**	NA	**6.5**	NA
Vinyl Chloride Reductase	cells/mL	NV	**24,400**	**2,020**	NA	NA	NA	NA	**366,000**	**265,000**	< 0.90 U	< 0.7 U	**15.2**	NA	**6.4**	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC

MCL/MSC-Maximum Contaminant Limit/Medium-Specific Concentration

NA - Not Analyzed, NV - No Value

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

Table 2, Eastern Plume Semi-Annual Analytical Data, December 2018 and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW12_121418 12/14/18	35AWW12_061019 6/10/19	35AWW12_061019a 6/10/19	35AWW13_121118 12/11/18	35AWW13_060719 6/7/19	35AWW14_121318 12/13/18	35AWW14_060719 6/7/19	35AWW16_121218 12/12/18	35AWW16_061019 6/10/19	35AWW17_121718 12/17/18	35AWW17_061019 6/10/19	35AWW18_121718 12/17/18	35AWW18_121718_a 12/17/18	35AWW18_060419 6/4/19
Location Description			Site 58 - E, outside site boundary.	Site 58 - E, outside site boundary.	Site 58 - E, outside site boundary. Field duplicate.	Site 58 - SE, outside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SW, outside site boundary, near Building 744-A.	Site 58 - SW, outside site boundary, near Building 744-A.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SSW, outside site boundary.	Site 58 - SSW, outside site boundary. Duplicate	Site 58 - SSW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18120913	HS19060573	HS19060573	HS18120642	HS19060461	HS18120913	HS19060461	HS18120736	HS19060573	HS18121030	HS19060573	HS18121030	HS18121030	HS19060185
Alkalinity (SM2320B)																
Alkalinity, Total	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus (365.3)																
Phosphorus	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (415.1/SM5310C)																
Total Organic Carbon	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (6020A)																
Total Iron	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Manganese	mg/L	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Iron	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Manganese	mg/L	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Arsenic	mg/L	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**15**	**11**	< 0.5 U	**1.4**	< 0.5 U	< 0.5 U	**0.70 J**	**0.73 J**	**0.76 J**
1,1-Dichloroethene	µg/L	7	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**10**	**12**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**2.0**	**2.3**	**3.5**
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	3.2 UB	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 2.0 U	< 1.0 U
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**4.6**	**5.2**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

Table 2, Eastern Plume Semi-Annual Analytical Data, December 2018 and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW12_121418 12/14/18	35AWW12_061019 6/10/19	35AWW12_061019a 6/10/19	35AWW13_121118 12/11/18	35AWW13_060719 6/7/19	35AWW14_121318 12/13/18	35AWW14_060719 6/7/19	35AWW16_121218 12/12/18	35AWW16_061019 6/10/19	35AWW17_121718 12/17/18	35AWW17_061019 6/10/19	35AWW18_121718 12/17/18	35AWW18_121718_a 12/17/18	35AWW18_060419 6/4/19
Location Description			Site 58 - E, outside site boundary.	Site 58 - E, outside site boundary.	Site 58 - E, outside site boundary. Field duplicate.	Site 58 - SE, outside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SW, outside site boundary, near Building 744-A.	Site 58 - SW, outside site boundary, near Building 744-A.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SSW, outside site boundary.	Site 58 - SSW, outside site boundary. Duplicate	Site 58 - SSW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18120913	HS19060573	HS19060573	HS18120642	HS19060461	HS18120913	HS19060461	HS18120736	HS19060573	HS18121030	HS19060573	HS18121030	HS18121030	HS19060185
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Methylene chloride	µg/L	5	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Naphthalene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**9.4**	**12**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	µg/L	2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.3**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Volatile Fatty Acids (HPLC-METACIDS)																
Acetic Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic Acid	mg/L	51	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyruvic Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions (9056A)																
Chloride	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/L	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite	mg/L	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Gases (RSK-175)																
Carbon Dioxide	µg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethane	µg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ferrous Iron (SM3500Fe)																
Ferrous Iron	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide (376.1)																
Sulfide	mg/L	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dechlorinating Bacteria																
BAV1 Vinyl Chloride Reductase	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dehalobacter spp.	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dehalococoides	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tceA Reductase	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride Reductase	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC

MCL/MSC-Maximum Contaminant Limit/Medium-Specific Concentration

NA - Not Analyzed, NV - No Value

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

Table 2, Eastern Plume Semi-Annual Analytical Data, December 2018 and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	34AWW21_121318 12/13/18	34AWW21_061019 6/10/19	34AWW21_061019_a 6/10/19	35AWW22_121418 12/14/18	35AWW22_061019 6/10/19	35ASW03_121718 12/17/18	35ASW03_060719 6/7/19
Location Description			Site 58 - ESE, outside site boundary, beside Building 725.	Site 58 - ESE, outside site boundary, beside Building 725.	Site 58 - ESE, outside site boundary, beside Building 725. Field Duplicate.	Site 58 - ENE, outside site boundary.	Site 58 - ENE, outside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.
Location Depth			Shallow	Shallow		Shallow	Shallow	Surface Water	Surface Water
Lab Package			HS18120913	HS19060573	HS19060573	HS18120913	HS19060573	HS18121030	HS19060461
Alkalinity (SM2320B)									
Alkalinity, Total	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Phosphorus (365.3)									
Phosphorus	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (415.1/SM5310C)									
Total Organic Carbon	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Metals (6020A)									
Total Iron	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Total Manganese	mg/L	14	NA	NA	NA	NA	NA	NA	NA
Dissolved Iron	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Dissolved Manganese	mg/L	14	NA	NA	NA	NA	NA	NA	NA
Total Arsenic	mg/L	0.01	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (8260C)									
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	< 2.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	**4.5**	< 2.0 U
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

Table 2, Eastern Plume Semi-Annual Analytical Data, December 2018 and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	34AWW21_121318 12/13/18	34AWW21_061019 6/10/19	34AWW21_061019_a 6/10/19	35AWW22_121418 12/14/18	35AWW22_061019 6/10/19	35ASW03_121718 12/17/18	35ASW03_060719 6/7/19
Location Description			Site 58 - ESE, outside site boundary, beside Building 725.	Site 58 - ESE, outside site boundary, beside Building 725.	Site 58 - ESE, outside site boundary, beside Building 725. Field Duplicate.	Site 58 - ENE, outside site boundary.	Site 58 - ENE, outside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.
Location Depth			Shallow	Shallow		Shallow	Shallow	Surface Water	Surface Water
Lab Package			HS18120913	HS19060573	HS19060573	HS18120913	HS19060573	HS18121030	HS19060461
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U
Methylene chloride	µg/L	5	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Naphthalene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	µg/L	2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Volatile Fatty Acids (HPLC-METACIDS)									
Acetic Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Propionic Acid	mg/L	51	NA	NA	NA	NA	NA	NA	NA
Pyruvic Acid	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Anions (9056A)									
Chloride	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/L	10	NA	NA	NA	NA	NA	NA	NA
Nitrite	mg/L	1	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Dissolved Gases (RSK-175)									
Carbon Dioxide	µg/L	NV	NA	NA	NA	NA	NA	NA	NA
Ethane	µg/L	NV	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/L	NV	NA	NA	NA	NA	NA	NA	NA
Methane	µg/L	NV	NA	NA	NA	NA	NA	NA	NA
Ferrous Iron (SM3500Fe)									
Ferrous Iron	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Sulfide (376.1)									
Sulfide	mg/L	NV	NA	NA	NA	NA	NA	NA	NA
Dechlorinating Bacteria									
BAV1 Vinyl Chloride Reductase	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA
Dehalobacter spp.	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA
Dehalococoides	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA
tceA Reductase	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride Reductase	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC

MCL/MSC-Maximum Contaminant Limit/Medium-Specific Concentration

NA - Not Analyzed, NV - No Value

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

Table 3 - Western Plume Analytical Data, September 2018, December 2018, March 2019, and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW06_092618 9/26/18	35AWW06_121118 12/11/18	35AWW06_031919 03/19/19	35AWW06_031919_a 03/19/19	35AWW06_060419 6/4/19	35AWW11_092718 9/27/18	35AWW11_121118 12/11/18	35AWW11_031919 03/19/19	35AWW11_060319 6/3/19	35AWW15_121218 12/12/18	35AWW15_060719 6/7/19
Location Description			Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary. Duplicate	Site 58 - SW, outside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - W, inside site boundary.	Site 58 - W, inside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18091438-01	HS18120642	HS19031013	HS19031013	HS19060185	HS18091510-03	HS18120642	HS19031013	HS19060123	HS18120736	HS19060461
Alkalinity (SM2320B)													
Alkalinity, Total	mg/L	NV	**775**	**1,210**	NA	NA	NA	**1,190**	**1,430**	NA	NA	NA	NA
Phosphorus (365.3)													
Phosphorus	mg/L	NV	**2.67**	**0.467**	NA	NA	NA	**0.341**	**0.169**	NA	NA	NA	NA
Total Organic Carbon (415.1/SM5310C)													
Total Organic Carbon	mg/L	NV	**2,860**	**685**	**407**	**386**	**331**	**1,120**	**701**	**485**	**94.6**	NA	NA
Metals (6020A)													
Total Iron	mg/L	NV	**27.9**	**91**	NA	NA	NA	**31.7**	**59**	NA	NA	NA	NA
Total Manganese	mg/L	14	**9.44**	**8.52**	NA	NA	NA	**6.21**	**8**	NA	NA	NA	NA
Dissolved Iron	mg/L	NV	**26.5**	**85.8**	NA	NA	NA	**31.7**	**55.3**	NA	NA	NA	NA
Dissolved Manganese	mg/L	14	**9.26**	**9.29**	NA	NA	NA	**6.53**	**7.91**	NA	NA	NA	NA
Total Arsenic	mg/L	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (8260C)													
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	**1.3**	< 0.5 U	< 0.5 U	< 0.5 U	**1.0**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	**3.4**	< 0.5 U	**1.4**	< 0.5 U	**2.3**	**1.6**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	**210**	**120**	**62**	**59**	< 1.0 U	**330**	**200**	**240**	**70**	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	**1.7 J**	**18**	**6.6**	**5.9**	**1.8 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	**6,600**	**420**	**250**	**240**	**220**	**590**	**190**	**260**	**77**	**1.9 J**	< 1.0 U
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	**2.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**5.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

Table 3 - Western Plume Analytical Data, September 2018, December 2018, March 2019, and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW06_092618 9/26/18	35AWW06_121118 12/11/18	35AWW06_031919 03/19/19	35AWW06_031919_a 03/19/19	35AWW06_060419 6/4/19	35AWW11_092718 9/27/18	35AWW11_121118 12/11/18	35AWW11_031919 03/19/19	35AWW11_060319 6/3/19	35AWW15_121218 12/12/18	35AWW15_060719 6/7/19
Location Description			Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary. Duplicate	Site 58 - SW, outside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - W, inside site boundary.	Site 58 - W, inside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18091438-01	HS18120642	HS19031013	HS19031013	HS19060185	HS18091510-03	HS18120642	HS19031013	HS19060123	HS18120736	HS19060461
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000	< 1.0 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U
Methylene chloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 1.0 U	< 0.5 U	< 1.0 U
Naphthalene	µg/L	2,000	< 0.5 U	**1.1**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.87 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride		2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Volatile Fatty Acids (HPLC-METACIDS)													
Acetic Acid	mg/L	NV	**1,400**	**920**	**250**	**230**	**120**	**1,100**	**540**	**180**	**110**	NA	NA
Butyric Acid	mg/L	NV	**1,400**	**97**	**61**	**56**	**7.7 J**	< 10 U	< 5.0 U	< 5.0 U	**3.1 J**	NA	NA
Lactic Acid	mg/L	NV	< 10 U	< 10 U	< 2.5 U	< 2.5 U	< 2.5 U	< 10 U	< 5.0 U	< 5.0 U	< 1.0 U	NA	NA
Propionic Acid	mg/L	51	**600**	**390**	**320**	**310**	**380**	**520**	**420**	**620**	**170**	NA	NA
Pyruvic Acid	mg/L	NV	**0.20 J**	< 1.0 U	< 0.25 UJ	< 0.25 UJ	< 1.3 U	< 1.0 U	< 0.5 U	< 0.50 UJ	< 0.5 U	NA	NA
Anions (9056A)													
Chloride	mg/L	NV	**910**	**858**	**919**	**900**	**964**	**2,110**	**2,120**	**2,150**	**1,920**	NA	NA
Nitrate	mg/L	10	< 0.200 U	< 0.200 U	< 0.500 U	< 0.500 U	**0.180 J**	< 0.200 U	< 0.200 U	< 0.500 U	< 0.500 U	NA	NA
Nitrite	mg/L	1	< 0.200 U	< 0.200 U	NA	NA	NA	< 0.200 U	< 0.200 U	NA	NA	NA	NA
Sulfate	mg/L	NV	**508**	**13.4**	**2.33 J**	**2.13 J**	**2.08 J**	**285**	**127**	**172**	**210**	NA	NA
Dissolved Gases (RSK-175)													
Carbon Dioxide	µg/L	NV	**860,000**	**790,000**	**720,000**	**670,000**	**750,000**	**320,000**	**820,000**	**940,000**	**750,000**	NA	NA
Ethane	µg/L	NV	< 0.47 UJ	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	**0.63**	< 0.47 U	< 0.47 U	< 0.47 U	NA	NA
Ethene	µg/L	NV	< 0.55 UJ	**0.44 J**	< 0.55 U	< 0.55 U	< 0.55 U	**2.1**	< 0.55 U	< 0.55 U	< 0.55 U	NA	NA
Methane	µg/L	NV	**3.0 J**	**890**	**3,100**	**2,900**	**1,500**	**1,300**	**5.5**	**450**	**590**	NA	NA
Ferrous Iron (SM3500Fe)													
Ferrous Iron	mg/L	NV	**27.8 J**	**88.1 J**	NA	NA	NA	**36.5 J**	**20.6 J**	NA	NA	NA	NA
Sulfide (376.1)													
Sulfide	mg/L	NV	**1.96 J**	< 1.0 U	NA	NA	NA	**22.4**	**7.84**	NA	NA	NA	NA
Dechlorinating Bacteria													
BAV1 Vinyl Chloride Reductase	cells/mL	NV	< 2.50 U	< 0.90 U	< 0.80 U	NA	**0.80 J**	< 0.70 U	< 0.50 U	< 0.90 U	< 0.5 U	NA	NA
Dehalobacter spp.	cells/mL	NV	**705,000**	**144,000**	**21,200**	NA	**159**	**394,000**	**220,000**	**818,000**	**2,570,000**	NA	NA
Dehalococoides	cells/mL	NV	**3.60**	**2.50**	**12.3**	NA	**26.8**	**2.10**	**10.6**	**231**	**2,100**	NA	NA
tceA Reductase	cells/mL	NV	< 2.50 U	**1.30**	< 0.80 U	NA	< 1.6 U	< 0.70 U	**0.2 J**	< 0.90 U	< 0.5 U	NA	NA
Vinyl Chloride Reductase	cells/mL	NV	**1.40 J**	< 0.90 U	**0.20 J**	NA	**0.90 J**	**1.10**	< 0.50 U	**42.2**	**174**	NA	NA

Notes:

Blue Highlighting Indicates concentrations above the MCL/MSC

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations

NA - Not Analyzed, NV - No Value

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

Table 3 - Western Plume Analytical Data, September 2018, December 2018, March 2019, and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW19_092718 9/27/18	35AWW19_121018 12/10/18	35AWW19_031919 03/19/19	35AWW19_060319 6/3/19	35AWW20_092618 9/26/18	35AWW20_092618-a 9/26/18	35AWW20_121018 12/10/18	35AWW20_031919 03/19/19	35AWW20_060419 6/4/19	35AWW23_121018 12/10/18	35AWW23_060319 6/3/19
Location Description			Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18091510-02	HS18120569	HS19031013	HS19060123	HS18091438-02	HS18091438-03	HS18120569	HS19031013	HS19060185	HS18120569	HS19060123
Alkalinity (SM2320B)													
Alkalinity, Total	mg/L	NV	**213**	**198**	NA	NA	**1,450**	**1,470**	**1,190**	NA	NA	**1,110**	NA
Phosphorus (365.3)													
Phosphorus	mg/L	NV	**0.0340 J**	**0.101**	NA	NA	**0.144**	**0.192**	**0.101**	NA	NA	**1.08**	NA
Total Organic Carbon (415.1/SM5310C)													
Total Organic Carbon	mg/L	NV	**2.21**	**2.17**	**2.20**	**1.88**	**53**	**53**	**19**	**12**	**12.9**	**879**	**1,360**
Metals (6020A)													
Total Iron	mg/L	NV	**4.24**	**4.63**	NA	NA	**1.40**	**1.49**	**5.32**	NA	NA	**50.8**	NA
Total Manganese	mg/L	14	**6.39**	**6.65**	NA	NA	**6.23**	**6.15**	**6.19**	NA	NA	**8.04**	NA
Dissolved Iron	mg/L	NV	**4.22**	**4.75**	NA	NA	**1.33**	**1.41**	**4.93**	NA	NA	**46.4**	NA
Dissolved Manganese	mg/L	14	**6.27**	**6.88**	NA	NA	**6.00**	**6.26**	**5.32**	NA	NA	**7.73**	NA
Total Arsenic	mg/L	0.01	NA	NA	NA	NA	NA	NA	NA	NA	**0.00194 J**	NA	NA
Volatile Organic Compounds (8260C)													
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**48**	**44**	**88**	**38 J**	**45**	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	**1.8**	**1.8**	**0.97 J**	**0.65 J**	**200**	**170**	**690**	**190**	**270**	**1.6**	< 0.5 U
1,1-Dichloroethene	µg/L	7	**8.8**	**7.5**	**3.6**	**2.6**	**1,100**	**970**	**2,700**	**1,500**	**1,800**	**2.5**	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	**22**	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**10**	**9.3**	**20**	**7.6 J**	**13**	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	**2.4**	**2.1**	**1.5**	**1.1**	**14**	**13**	**26**	**14 J**	**21**	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.99 J**	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**3.5**	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	**300**	**220**
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 5.0 U	**6.0 J**	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 5.0 U	**3.9 J**	< 1.0 U
Acetone	µg/L	92,000	< 2.0 U	< 2.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 5.0 U	**120**	**210**
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	**3.3**	**2.9**	**9.0**	**3.0 J**	**4.4 J**	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	**1.8**	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 2.5 U	< 0.5 UJ	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**45**	**40**	**120**	**49 J**	**79**	**20**	**4.3**
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 2.5 U	**3.3 J**	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U

Table 3 - Western Plume Analytical Data, September 2018, December 2018, March 2019, and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW19_092718 9/27/18	35AWW19_121018 12/10/18	35AWW19_031919 03/19/19	35AWW19_060319 6/3/19	35AWW20_092618 9/26/18	35AWW20_092618-a 9/26/18	35AWW20_121018 12/10/18	35AWW20_031919 03/19/19	35AWW20_060419 6/4/19	35AWW23_121018 12/10/18	35AWW23_060319 6/3/19
Location Description			Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18091510-02	HS18120569	HS19031013	HS19060123	HS18091438-02	HS18091438-03	HS18120569	HS19031013	HS19060185	HS18120569	HS19060123
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 1.0 UJ	< 5.0 U	< 0.5 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000	< 1.0 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 UJ	< 5.0 U	< 0.5 U	< 1.0 U
Methylene chloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 5.0 U	< 0.5 U	< 1.0 U
Naphthalene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.81 J**	**0.71 J**	**1.3**	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.8**	**1.7**	**6.1**	**4.9 J**	**13**	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 U	**4.7**	< 0.5 U
Trichloroethene	µg/L	5	**0.59 J**	**0.59 J**	< 0.5 U	< 0.5 U	**170**	**150**	**570**	**180**	**230**	**5.3**	**1.8**
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Vinyl chloride		2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**110**	**54 J**	**140**	< 0.5 U	< 0.5 U
Volatile Fatty Acids (HPLC-METACIDS)													
Acetic Acid	mg/L	NV	< 2.0 U	< 2.0 U	< 2.0 U	< 1.0 U	**110**	**100**	**8.3**	< 2.0 U	< 1.0 U	**570**	**430**
Butyric Acid	mg/L	NV	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	**140**	**370 J**
Lactic Acid	mg/L	NV	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3 J**	< 1.0 U	< 1.0 U	< 10.0 U	< 10 U
Propionic Acid	mg/L	51	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**850**	**1,000**
Pyruvic Acid	mg/L	NV	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.50 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.50 U	< 1.0 U	< 5.0 U
Anions (9056A)													
Chloride	mg/L	NV	**1,230**	**1,190**	**1,140**	**1,080**	**1,220**	**1,220**	**1,010**	**1,090**	**1,180**	**578**	**732**
Nitrate	mg/L	10	< 0.200 U	< 0.200 U	< 0.500 U	< 0.500 U	< 0.200 U	< 0.200 U	< 0.200 U	< 0.500 U	**0.194 J**	< 0.200 U	< 0.500 U
Nitrite	mg/L	1	< 0.200 U	< 0.200 U	NA	NA	< 0.200 U	< 0.200 U	< 0.200 U	NA	NA	< 0.200 U	NA
Sulfate	mg/L	NV	**989**	**998**	**994**	**966**	**922**	**894**	**1,010**	**1,120**	**1,240**	**4.19**	**14.1**
Dissolved Gases (RSK-175)													
Carbon Dioxide	µg/L	NV	**250,000**	**330,000**	**790,000**	**560,000**	**740,000**	**770,000**	**720,000**	**890,000**	**730,000**	**810,000**	**750,000**
Ethane	µg/L	NV	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 UJ	**0.19 J**	< 0.47 U	< 0.47 U
Ethene	µg/L	NV	**0.32 J**	< 0.55 U	< 0.55 U	< 0.55 U	**0.66 J**	**0.50 J**	**1.3**	**0.94 J**	**1.3**	< 0.55 U	< 0.55 U
Methane	µg/L	NV	**27**	**5.7**	**1.3 J**	**1.4**	**37**	**30**	**440**	**840 J**	**920**	**2,200**	**1,300**
Ferrous Iron (SM3500Fe)													
Ferrous Iron	mg/L	NV	**3.99 J**	**4.19 J**	NA	NA	**1.38 J**	**1.41 J**	**5.01 J**	NA	NA	**50 J**	NA
Sulfide (376.1)													
Sulfide	mg/L	NV	< 1.0 U	< 1.00 U	NA	NA	**17**	**13**	**21.4**	NA	NA	< 1.00 U	NA
Dechlorinating Bacteria													
BAV1 Vinyl Chloride Reductase	cells/mL	NV	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 1.30 U	NA	< 1.90 U	< 1.50 U	**2,370**	**5.4**	**2.5 J**
Dehalobacter spp.	cells/mL	NV	**148,000**	**99,000**	**91.5**	**62,700**	**3,770,000**	NA	**283,000**	**14,000**	< 21.7 U	< 25.0 U	< 38.5 U
Dehalococoides	cells/mL	NV	**0.80**	**0.50 J**	< 0.50 U	**3.30**	< 1.30 U	NA	< 1.90 U	< 1.50 U	**15,500**	**149**	**652**
tceA Reductase	cells/mL	NV	**0.10 J**	< 0.50 U	< 0.50 U	< 0.50 U	< 1.30 U	NA	< 1.90 U	< 1.50 U	< 2.20 U	< 2.50 U	< 3.8 U
Vinyl Chloride Reductase	cells/mL	NV	< 0.50 U	< 0.50 U	< 0.50 U	**0.10 J**	< 1.30 U	NA	< 1.90 U	< 1.50 U	< 2.20 U	**60.7**	**72.7**

Notes:

Blue Highlighting Indicates concentrations above the MCL/MSC

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations

NA - Not Analyzed, NV - No Value

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

Table 3 - Western Plume Analytical Data, September 2018, December 2018, March 2019, and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW24_092718 9/27/18	35AWW24_121018 12/10/18	35AWW24_031919 03/19/19	35AWW24_060319 6/3/19	LHSMW06_121318 12/13/18	LHSMW06_121318_a 12/13/18	LHSMW06_060719 6/7/19	LHSMW07_092618 9/26/18	LHSMW07_121018 12/10/18	LHSMW07_031919 03/19/19	LHSMW07_060319 6/3/19
Location Description			Downgradient Western Plume well	Downgradient Western Plume well	Downgradient Western Plume well	Downgradient Western Plume well	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, inside site boundary, beside Building 715. Duplicate	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18091510-01	HS18120569	HS19031013	HS19060123	HS18120913	HS18120913	HS19060461	HS18091438-04	HS18120569	HS19031013	HS19060123
Alkalinity (SM2320B)													
Alkalinity, Total	mg/L	NV	**50.8**	**45.9**	NA	NA	NA	NA	NA	**2,060**	**1,640**	NA	NA
Phosphorus (365.3)													
Phosphorus	mg/L	NV	**0.0620**	**0.316**	NA	NA	NA	NA	NA	**0.331**	**0.125**	NA	NA
Total Organic Carbon (415.1/SM5310C)													
Total Organic Carbon	mg/L	NV	**0.87**	**1.67**	**1.68 J**	**1.55 J**	NA	NA	NA	**14.2**	**7.53**	**4.11**	**4.13**
Metals (6020A)													
Total Iron	mg/L	NV	**1.06 J**	**11.4**	NA	NA	NA	NA	NA	**1.78**	**0.773**	NA	NA
Total Manganese	mg/L	14	**0.108**	**0.134**	NA	NA	NA	NA	NA	**9.5**	**9.4**	NA	NA
Dissolved Iron	mg/L	NV	**6.55 J**	**11.1**	NA	NA	NA	NA	NA	**1.85**	**0.785**	NA	NA
Dissolved Manganese	mg/L	14	**0.127 J**	**0.142**	NA	NA	NA	NA	NA	**9.56**	**9.06**	NA	NA
Total Arsenic	mg/L	0.01	NA	NA	NA	NA	< 0.00100 U	< 0.00100 U	**0.00123 J**	NA	NA	NA	NA
Volatile Organic Compounds (8260C)													
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.73 J**	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**8.2**	**8.1**	**2.2**	**11**	**42**	**15**	**9.6**
1,1-Dichloroethene	µg/L	7	< 0.5 U	< 0.5 U	**0.81 J**	< 0.5 U	**19**	**20**	**4.3**	**3.1**	< 0.5 U	< 0.5 U	**16**
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.92 J**	**1.9**	**0.95 J**	**0.62 J**
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**5.3**	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 1.0 U	**12**	< 2.0 U	< 2.0 U	**3.4**
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 UJ	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.75 J**	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**55**	**55**	**29**	**1.1**	< 0.5 U	< 0.5 U	**0.70 J**
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U

Table 3 - Western Plume Analytical Data, September 2018, December 2018, March 2019, and June 2019
LHAAP 58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	35AWW24_092718 9/27/18	35AWW24_121018 12/10/18	35AWW24_031919 03/19/19	35AWW24_060319 6/3/19	LHSMW06_121318 12/13/18	LHSMW06_121318_a 12/13/18	LHSMW06_060719 6/7/19	LHSMW07_092618 9/26/18	LHSMW07_121018 12/10/18	LHSMW07_031919 03/19/19	LHSMW07_060319 6/3/19
Location Description			Downgradient Western Plume well	Downgradient Western Plume well	Downgradient Western Plume well	Downgradient Western Plume well	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, inside site boundary, beside Building 715. Duplicate	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18091510-01	HS18120569	HS19031013	HS19060123	HS18120913	HS18120913	HS19060461	HS18091438-04	HS18120569	HS19031013	HS19060123
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 0.50 U	< 0.5 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 0.50 U	< 0.5 U	< 0.5 U	< 1.0 U
Naphthalene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.6**	**1.5**	**1.4**	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 UJ	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.91 J**	**0.94 J**	**0.46 J**	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**16**	**16**	**7.5**	**2.4**	< 0.5 U	**1.1**	**1.8**
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride		2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**5.0**	**5.0**	**1.2**	< 0.50 U	< 0.5 U	< 0.5 U	< 0.5 U
Volatile Fatty Acids (HPLC-METACIDS)													
Acetic Acid	mg/L	NV	< 2.0 U	< 2.0 U	< 2.0 U	< 1.0 U	NA	NA	NA	**140**	< 2.0 U	< 2.0 U	< 1.0 U
Butyric Acid	mg/L	NV	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	NA	NA	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U
Lactic Acid	mg/L	NV	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	NA	< 1.0 U	**1.3 J**	< 1.0 U	< 1.0 U
Propionic Acid	mg/L	51	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	NA	**0.78 J**	< 1.0 U	< 1.0 U	< 1.0 U
Pyruvic Acid	mg/L	NV	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.50 U	NA	NA	NA	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.50 U
Anions (9056A)													
Chloride	mg/L	NV	**110**	**109**	**115**	**106**	NA	NA	NA	**2,180**	**2,030**	**1,980**	**1,780**
Nitrate	mg/L	10	< 0.100 U	**0.157 J**	< 0.100 U	< 0.100 U	NA	NA	NA	< 0.200 U	< 0.200 U	< 0.500 U	< 0.500 U
Nitrite	mg/L	1	< 0.100 U	< 0.100 U	NA	NA	NA	NA	NA	< 0.200 U	< 0.200 U	NA	NA
Sulfate	mg/L	NV	**69.9**	**69.9**	**70**	**74.9**	NA	NA	NA	**1,120**	**1,530**	**2,390**	**2,470**
Dissolved Gases (RSK-175)													
Carbon Dioxide	µg/L	NV	**330,000**	**660,000**	**680,000**	**530,000**	NA	NA	NA	**760,000**	**460,000**	**440,000**	**660,000**
Ethane	µg/L	NV	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	NA	NA	NA	< 0.47 U	**0.46 J**	**0.52 J**	**0.20 J**
Ethene	µg/L	NV	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	NA	NA	NA	**4.0**	**28**	**25**	**3.9**
Methane	µg/L	NV	**190**	**68**	**7.8**	**4.2**	NA	NA	NA	**27**	**170**	**270**	**78**
Ferrous Iron (SM3500Fe)													
Ferrous Iron	mg/L	NV	**0.31 J**	**0.54 J**	NA	NA	NA	NA	NA	**0.93 J**	**0.43 J**	NA	NA
Sulfide (376.1)													
Sulfide	mg/L	NV	< 1.0 U	< 1.00 U	NA	NA	NA	NA	NA	**26**	**14.8**	NA	NA
Dechlorinating Bacteria													
BAV1 Vinyl Chloride Reductase	cells/mL	NV	< 0.50 U	< 1.20 U	< 0.80 U	< 0.5 U	NA	NA	NA	**0.80 J**	< 2.10 U	**2.5**	< 1.0 U
Dehalobacter spp.	cells/mL	NV	**4.6 J**	**1.50 J**	< 8.30 U	**24.7**	NA	NA	NA	**3,540,000**	**166,000**	**61,400**	< 9.5 U
Dehalococoides	cells/mL	NV	< 0.50 U	< 1.20 U	< 0.80 U	**0.90**	NA	NA	NA	**11,600**	**6,080**	**10,000**	**7,580**
tceA Reductase	cells/mL	NV	< 0.50 U	< 1.20 U	< 0.80 U	< 0.5 U	NA	NA	NA	< 1.60 U	< 2.10 U	< 1.40 U	< 1.0 U
Vinyl Chloride Reductase	cells/mL	NV	< 0.50 U	< 1.20 U	< 0.80 U	< 0.5 U	NA	NA	NA	**5,990**	**8,040**	**4,840**	**1,620**

Notes:

Blue Highlighting Indicates concentrations above the MCL/MSC

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations

NA - Not Analyzed, NV - No Value

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	03WW01-112408 11/24/2008	03WW01-110509 5/9/2011	03WW01-082013 8/20/2013	03WW01-101013 10/10/2013	03WW01-12914 1/29/2014	03WW01-052114 5/21/2014	03WW01-102814 10/28/2014	03WW01-012115 1/21/2015	03WW01-041515 4/15/2015	03WW01-070815 7/8/2015	03WW01-100815 10/8/2015	03WW01-041316 4/13/2016	03WW01-100416 10/4/2016
1,1-DICHLOROETHENE	µg/L	7	<20 U	<2.5 U	<2 U	<5 U	<10 U	<10 U	<100 U	<100 U	<50 U	<100 U	<100 U	<25 U	<10 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<20 U	1.1 J	0.978 J	<2.5 U	<5 U	3.3 J	<50 U	<50 U	21.4 J	<50 U	<50 U	117	<5 U
TETRACHLOROETHENE	µg/L	5	2,570	418	368	172 J	172	154	48.6 J	32.8 J	15.9 J	31.4 J	36.4 J	6.49 J	<5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<20 U	<2.5 U	<1 U	<2.5 U	<5 U	<5 U	<50 U	<50 U	<25 U	<50 U	<50 U	<12.5 U	<5 U
TRICHLOROETHENE	µg/L	5	196	69.1	94.8	42.1 J	58.4	71.2	223	216	131	65.6 J	51.8 J	<12.5 U	<5 U
VINYL CHLORIDE	µg/L	2	<20 U	<2.5 U	<1 U	<2.5 U	<5 U	<5 U	<50 U	<50 U	<25 U	<50 U	<50 U	<12.5 U	<5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

U - Analyte was not detected.

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	03WW01-111517 11/15/2017	03WW01-071818 7/18/2018	35ASW03-101713 10/17/2013	35ASW03-020314 2/3/2014	35ASW03-052814 5/28/2014	35ASW03-012315 1/23/2015	35ASW03-041015 4/10/2015	35ASW03-041316 4/13/2016	35AWW01-981108 11/8/1998	35AWW01-981108FD 11/8/1998	35AWW01-040909 9/9/2004	35AWW01-020608 2/6/2008	35AWW01-111908 11/19/2008
1,1-DICHLOROETHENE	µg/L	7	<2.5 U	<0.5 UJ	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<5 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<2.5 U	5.3 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<1 U	<5 U	<1 U	<1 U
TETRACHLOROETHENE	µg/L	5	<2.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<1 U	<5 U	<1 U	<1 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<2.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<1 U	<5 U	<1 U	<1 U
TRICHLOROETHENE	µg/L	5	<2.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.259 J	<0.5 U	<1 U	<1 U	<5 U	<1 U	<1 U
VINYL CHLORIDE	µg/L	2	<2.5 U	4.8 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<1 U	<5 U	<1 U	<1 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW01-101113 10/11/2013	35AWW01-013114 1/31/2014	35AWW01FD-013114 1/31/2014	35AWW01-052914 5/29/2014	35AWW01-103114 10/31/2014	35AWW01-012715 1/27/2015	35AWW01-041015 4/10/2015	35AWW01FD-041015 4/10/2015	35AWW01-071015 7/10/2015	35AWW01FD-071015 7/10/2015	35AWW01-100615 10/6/2015	35AWW01FD-100615 10/6/2015	35AWW01-041216 4/12/2016
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

U - Analyte was not detected.

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW01FD-041216 4/12/2016	35AWW01-100516 10/5/2016	35WW01-111617 11/16/2017	35AWW01-070218 7/2/2018	35AWW02-981108 11/8/1998	35AWW02-040910 9/10/2004	35AWW02-112608 11/26/2008	35AWW02-112608-FD 11/26/2008	35AWW02-102213 10/22/2013	35AWW05-040908 9/8/2004	35AWW05-112108 11/21/2008	35AWW05-101613 10/16/2013	35AWW05-020114 2/1/2014
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<0.5 U	<0.5 U	<1 U	<5 U	<1 U	<1 U	<1 U	<5 U	0.551 J	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<5 U	<1 U	<1 U	<0.5 U	<5 U	<1 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<5 U	<1 U	<1 U	<0.5 U	<5 U	<1 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<5 U	<1 U	<1 U	<0.5 U	<5 U	<1 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<5 U	<1 U	<1 U	<0.5 U	<5 U	<1 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<5 U	<1 U	<1 U	<0.5 U	<5 U	<1 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW05-052214 5/22/2014	35AWW05FD-052214 5/22/2014	35AWW05-102114 10/21/2014	35AWW05-012315 1/23/2015	35AWW05FD-012315 1/23/2015	35AWW05-040815 4/8/2015	35AWW05-071015 7/10/2015	35AWW05-100515 10/2/2015	35AWW05-041416 4/14/2016	35AWW05-100516 10/5/2016	35AWW05-111317 11/13/2017	35AWW05-070218 7/2/2018	35AWW05-070218_a 7/2/2018
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U	<0.5 U	<0.5 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

U - Analyte was not detected.

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW06-120308 12/3/2008	35AWW06-110509 5/9/2011	35AWW06-101513 10/15/2013	35AWW06-013014 1/30/2014	35AWW06-052114 5/21/2014	35AWW06-102914 10/29/2014	35AWW06-012815 1/28/2015	35AWW06-041515 4/15/2015	35AWW06-070715 7/7/2015	35AWW06-100715 10/7/2015	35AWW06-041116 4/11/2016	35AWW06-100316 10/3/2016	35AWW06-111417 11/14/2017
1,1-DICHLOROETHENE	µg/L	7	57.6	21.3	15.8	14.2	12	16	13.5	4.17	18.6	12.8	13	7.48	3.9
CIS-1,2-DICHLOROETHENE	µg/L	70	0.37 J	<1 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	7.19	<1 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<1 U	<1 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	0.811 J	<1 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<1 U	<1 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW06-71818 7/18/2018	35AWW07R-101613 10/16/2013	35AWW08-112408 11/24/2008	35AWW08-110509 5/9/2011	35AWW08-082013 8/20/2013	35AWW08-101013 10/10/2013	35AWW08-012914 1/29/2014	35AWW08-052014 5/20/2014	35AWW08-102714 10/27/2014	35AWW08-012115 1/21/2015	35AWW08-041515 4/15/2015	35AWW08-070815 7/8/2015	35AWW08-100815 10/8/2015
1,1-DICHLOROETHENE	µg/L	7	<0.5 UJ	<1 U	<100 U	<25 U	<10 U	<10 U	<10 U	<10 U	<50 U	<50 U	<50 U	<100 U	<25 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 UJ	0.709 J	<100 U	13.4 J	9.35 J	<5 U	55.9	47.2	38.6 J	27.2 J	30.7 J	73.5 J	79.6
TETRACHLOROETHENE	µg/L	5	<0.5 UJ	0.586 J	9,590	6,480	1,640	603 J	599	204	112	119	110	110	79
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 UJ	<0.5 U	<100 U	<25 U	<5 U	<5 U	<5 U	2.82 J	<25 U	<25 U	<25 U	<50 U	<12.5 U
TRICHLOROETHENE	µg/L	5	<0.5 UJ	1.03	675	1,150	544	149 J	895	953	653	491	607	746	581
VINYL CHLORIDE	µg/L	2	<0.5 UJ	<0.5 U	<100 U	<25 U	<5 U	<5 U	<5 U	<5 U	<25 U	<25 U	<25 U	<50 U	<12.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW08-041316 4/13/2016	35AWW08-100416 10/4/2016	35AWW08-111517 11/15/2017	35AWW08-071818 7/18/2018	35AWW09-082913 8/29/2013	35AWW09-101013 10/10/2013	35AWW09-012914 1/29/2014	35AWW09-052014 5/20/2014	35AWW09-102714 10/27/2014	35AWW09-012115 1/21/2015	35AWW09-041415 4/14/2015	35AWW09-070715 7/7/2015	35AWW09-100715 10/7/2015
1,1-DICHLOROETHENE	µg/L	7	<25 U	<10 U	<5 U	<2.5 UJ	<1 U	<1 UJ	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	60.9	41.7	38	12 J	<0.5 U	<0.5 UJ	0.317 J	0.502 J	0.703 J	0.486 J	0.483 J	0.622 J	0.717 J
TETRACHLOROETHENE	µg/L	5	80.1	36.9	12	<2.5 UJ	21.9	57.6 J	125	128	254	183	155	194	283
TRANS-1,2-DICHLOROETHENE	µg/L	100	<12.5 U	<5 U	<5 U	<2.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	234	235	33	19 J	11.9	8.97 J	37.3	41.7	93	64.3	45	59.5	81.3
VINYL CHLORIDE	µg/L	2	14.2 J	7.46 J	<5 U	9.0 J	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW09-041216 4/12/2016	35AWW09-100316 10/3/2016	35AWW09-100316 10/3/2016	35AWW09-111517 11/15/2017	35AWW09-071618 7/12/2018	35AWW10-082913 8/29/2013	35AWW10-101013 10/10/2013	35AWW10-012914 1/29/2014	35AWW10-052014 5/20/2014	35AWW10-102814 10/28/2014	35AWW10-012715 1/27/2015	35AWW10-041415 4/14/2015	35AWW10-070715 7/7/2015
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<0.5 U	2.7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	0.515 J	0.437 J	0.437 J	0.78 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	172	173	173	350	140	<0.5 U	<0.5 U	<0.5 U	0.401 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	55.7	48.2	48.2	97	51	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

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J - Estimated value; analyte concentration was less than the limit of quantification

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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW10-100715 10/7/2015	35AWW10-041316 4/13/2016	35AWW10-100316 10/3/2016	35AWW10-111517 11/15/2017	35AWW10-071218 07/12/2018	35AWW11-101513 10/15/2013	35AWW11-020314 2/3/2014	35AWW11-052114 5/21/2014	35AWW11-102914 10/29/2014	35AWW11-012715 1/27/2015	35AWW11-041415 4/14/2015	35AWW11-070815 7/8/2015	35AWW11-100715 10/7/2015
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<0.5 U	<0.5 U	7.7	10.1	11.6	21.9	12.5	13.5	16.8	14.7
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.292 J	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.442 J	<0.5 U	<0.5 U	0.369 J	<0.5 U	0.273 J	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

U - Analyte was not detected.

UJ - The analysis was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. 'UJ' not detects are not definite; the analyte may be present.

µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW11-041216 4/12/2016	35AWW11-100316 10/3/2016	35AWW11-111417 11/14/2017	35AWW11-071618 07/16/2018	35AWW12-101813 10/18/2013	35AWW12FD-101813 10/18/2013	35AWW12-013114 1/31/2014	35AWW12FD-013114 1/31/2014	35AWW12-052914 5/29/2014	35AWW12-103014 10/30/2014	35AWW12-012815 1/28/2015	35AWW12-040715 4/7/2015	35AWW12FD-040715 4/7/2015
1,1-DICHLOROETHENE	µg/L	7	21.3	16	12	9	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.343 J	0.326 J	0.279 J	0.251 J
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	0.532 J	0.328 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW12-070915 7/9/2015	35AWW12-100515 10/5/2015	35AWW12FD-100515 10/5/2015	35AWW12-041216 4/12/2016	35AWW12-100516 10/5/2016	35AWW12FD-100516 10/5/2016	35AWW12-111617 11/16/2017	35AWW12-062918 06/29/2018	35AWW13-101113 10/11/2013	35AWW13FD-101113 10/11/2013	35AWW13-020314 2/3/2014	35AWW13-052214 5/22/2014	35AWW13-102114 10/21/2014
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U	<0.5 U	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	0.511 J	0.426 J	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

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J - Estimated value; analyte concentration was less than the limit of quantification

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW13FD-102114 10/21/2014	35AWW13-012315 1/23/2015	35AWW13-040815 4/8/2015	35AWW13-070915 7/9/2015	35AWW13-100615 10/6/2015	35AWW13-041316 4/13/2016	35AWW13-100616 10/6/2016	35AWW13-111617 11/16/2017	35AWW13-062818 06/29/2018	35AWW14-101813 10/18/2013	35AWW14-013114 1/31/2014	35AWW14-052814 5/28/2014	35AWW14FD-052814 5/28/2014
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U	<0.5 U	1.63 J	1.63 J	1.22 J	1.07 J
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	2.04	1.75	1.46	1.47
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.663 J	0.669 J	0.612 J	0.565 J
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.272 J	<0.5 U	<0.5 U	<0.5 U

Notes:

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW14-103014 10/30/2014	35AWW14-012115 1/21/2015	35AWW14-040715 4/7/2015	35AWW14-070915 7/9/2015	35AWW14-100215 10/2/2015	35AWW14-041316 4/13/2016	35AWW14-100616 10/6/2016	35AWW14-111717 11/17/2017	35AWW14-071818 07/18/2018	35AWW15-101613 10/16/2013	35AWW15FD-101613 10/16/2013	35AWW15-020114 2/1/2014	35AWW15-052814 5/28/2014
1,1-DICHLOROETHENE	µg/L	7	1.57 J	1.8 J	1.78 J	1.7 J	2.47	3.25	10.4	8.7	9.7 J	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	1.94	1.91	2.08	1.7	1.96	1.78	5.09	3.5	4.0 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	0.806 J	0.707 J	0.786 J	0.632 J	1.06	1.79	10.2	7.4	8.4 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.303 J	0.303 J	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U

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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW15-102114 10/21/2014	35AWW15-012315 1/23/2015	35AWW15-041015 4/10/2015	35AWW15-071015 7/10/2015	35AWW15-100615 10/6/2015	35AWW15-041416 4/14/2016	35AWW15-100516 10/5/2016	35AWW15-111617 11/16/2017	35AWW15-071818 07/18/2018	35AWW15-071818_a 07/18/2018	35AWW16-102213 10/22/2013	35AWW16-013114 1/31/2014	35AWW16-052814 5/28/2014
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U	<0.5 UJ	<0.5 UJ	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW16-103014 10/30/2014	35AWW16-012715 1/27/2015	35AWW16FD-012715 1/27/2015	35AWW16-040715 4/7/2015	35AWW16-070915 7/9/2015	35AWW16FD-070915 7/9/2015	35AWW16-100615 10/6/2015	35AWW16-041216 4/12/2016	35AWW16-100416 10/4/2016	35AWW16FD-100416 10/4/2016	35AWW16-111317 11/13/2017	35AWW16-111317_a 11/13/2017	35AWW16-062918 06/29/2018
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U	<0.5 U	<0.5 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

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Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW16-062918_a 06/29/2018	35AWW17-101813 10/18/2013	35AWW17-020114 2/1/2014	35AWW17-052914 5/29/2014	35AWW17-103114 10/31/2014	35AWW17-012815 1/28/2015	35AWW17-041015 4/10/2015	35AWW17-071015 7/10/2015	35AWW17-100515 10/2/2015	35AWW17-041116 4/11/2016	35AWW17-100316 10/3/2016	35AWW17-111317 11/13/2017	35AWW17-062918 06/29/2018
1,1-DICHLOROETHENE	µg/L	7	<0.5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 UJ	<1 U	<1 U	<1 U	<0.5 U	<0.5 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW18-101813 10/18/2013	35AWW18-020114 2/1/2014	35AWW18-052914 5/29/2014	35AWW18-103114 10/31/2014	35AWW18-012815 1/28/2015	35AWW18-041015 4/10/2015	35AWW18-071015 7/10/2015	35AWW18-100515 10/2/2015	35AWW18-041116 4/11/2016	35AWW18FD-041116 4/11/2016	35AWW18-100516 10/5/2016	35AWW18-111317 11/13/2017	35AWW18-062918 06/29/2018
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	0.792 J	0.726 J	0.78 J	<1 UJ	<1 U	2.13	2.09	0.97 J	<0.5 U	1.2
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

U - Analyte was not detected.

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW19-102213 10/22/2013	35AWW19-013114 1/31/2014	35AWW19-052814 5/28/2014	35AWW19-103014 10/30/2014	35AWW19-012115 1/21/2015	35AWW19-040715 4/7/2015	35AWW19-070915 7/9/2015	35AWW19FD-070915 7/9/2015	35AWW19-100215 10/2/2015	35AWW19-041216 4/13/2016	35AWW19-100616 10/6/2016	35AWW19-111717 11/17/2017	35AWW19-071818 07/18/2018
1,1-DICHLOROETHENE	µg/L	7	6.45	9.31	9.98	10.9	17.4	17.5	13.4	11.7	14.7	13.5	12.9	7.7	13 J
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ
TRICHLOROETHENE	µg/L	5	0.379 J	0.619 J	0.596 J	0.81 J	0.941 J	1.13	0.807 J	0.751 J	0.939 J	0.899 J	0.754 J	<0.5 U	<0.5 UJ
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW20-101513 10/15/2013	35AWW20-020314 2/3/2014	35AWW20-052114 5/21/2014	35AWW20-102914 10/29/2014	35AWW20-012715 1/27/2015	35AWW20-041515 4/15/2015	35AWW20-070815 7/8/2015	35AWW20-100815 10/8/2015	35AWW20-041316 4/13/2016	35AWW20-100416 10/4/2016	35AWW20-111417 11/14/2017	35AWW20-111417_a 11/14/2017	35AWW20-071618 07/16/2018
1,1-DICHLOROETHENE	µg/L	7	3,230	2,950	5,060	4,910	5,660	4,640	4,780	3,630	5,460	3,440	1,900	2,000	1,400
CIS-1,2-DICHLOROETHENE	µg/L	70	110	87.7	110	119	123	120	118	105	126	115	53	50	69
TETRACHLOROETHENE	µg/L	5	1.65	1.53	<10 U	<10 U	<10 U	<12.5 U	<12.5 U	<12.5 U	<12.5 U	<10 U	0.80 J	0.77 J	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	3.77	3.52	<10 U	<10 U	<10 U	<12.5 U	<12.5 U	<12.5 U	5.16 J	<10 U	6.7	5.6	2.9
TRICHLOROETHENE	µg/L	5	513	479	695	843	820	718	636	582	707	594	320	320	270
VINYL CHLORIDE	µg/L	2	105	62.4	65.7	102	122	90.6	151	126	216	166	78	75	71

Notes:

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW21-101613 10/16/2013	35AWW21-020414 2/4/2014	35AWW21-052214 5/22/2014	35AWW21-102114 10/21/2014	35AWW21-012315 1/23/2015	35AWW21-040815 4/8/2015	35AWW21-070915 7/9/2015	35AWW21-100615 10/6/2015	35AWW21-041316 4/13/2016	35AWW21FD-041316 4/13/2016	35AWW21-100416 10/4/2016	35AWW21FD-100416 10/4/2016	35AWW21-111317 11/13/2017
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

NA - not analyzed

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW21-062918 06/29/2018	35AWW22-102213 10/22/2013	35AWW22-013114 1/31/2014	35AWW22-052914 5/29/2014	35AWW22-103014 10/30/2014	35AWW22FD-103014 10/30/2014	35AWW22-012115 1/21/2015	35AWW22FD-012115 1/21/2015	35AWW22-040715 4/7/2015	35AWW22-070915 7/9/2015	35AWW22-100515 10/5/2015	35AWW22-041316 4/13/2016	35AWW22-100616 10/6/2016
1,1-DICHLOROETHENE	µg/L	7	<0.5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

J - Estimated value; analyte concentration was less than the limit of quantification

MCL - Maximum Contaminant Level

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW22-111717 11/17/2017	35AWW22-071818 07/18/2018	35AWW23-071718 07/17/2018	35AWW24-071718 07/17/2018	LHSMW04-941201 12/1/1994	LHSMW04-960812 8/12/1996	LHSMW04-980513 5/13/1998	LHSMW04-040909 9/9/2004	LHSMW04-FEB2007 2/20/2007	LHSMW04-013008 1/30/2008	LHSMW04-112508 11/25/2008	LHSMW04-032916 3/29/2016	LHSMW04-041316 4/13/2016
1,1-DICHLOROETHENE	µg/L	7	<0.5 U	<0.5 UJ	2.1	<0.5 U	<5 U	<0.2 U	<1 U	<5 U	<2 U	<1 U	<1 U	<1 U	<2.5 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 UJ	12	<0.5 U	NA	<0.2 U	<1 U	<5 U	<2 U	<1 U	0.292 J	0.666 J	0.851 J
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<5 U	<0.25 U	<1 U	<5 U	6.4	8.74	25.7	419	397
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	NA	<0.29 U	<1 U	<5 U	<2 U	<1 U	<1 U	<0.5 U	<1.25 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 UJ	2.6	<0.5 U	<5 U	<0.25 U	<1 U	<5 U	4.6	5.74	11.3	106	86.1
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	NA	<0.24 U	<1 U	<5 U	<2 U	<1 U	<1 U	<0.5 U	<1.25 U

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	LHSMW05-941201 12/1/1994	LHSMW05-960131 1/31/1996	LHSMW05-960812 8/12/1996	LHSMW05-980513 5/13/1998	LHSMW05-040909 9/9/2004	LHSMW06-941201 12/1/1994	LHSMW06-960813 8/13/1996	LHSMW06-980513 5/13/1998	LHSMW06-040908 9/8/2004	LHSMW06-FEB2007 2/21/2007	LHSMW06-111908 11/19/2008	LHSMW06-101713 10/17/2013	LHSMW06-013114 1/31/2014	LHSMW06-052814 5/28/2014
1,1-DICHLOROETHENE	µg/L	7	<5 U	<1 U	<0.2 U	<40 U	<5 U	<5 U	2	1.3	<5 U	<2 U	<1 U	1.23 J	0.884 J	1.68 J
CIS-1,2-DICHLOROETHENE	µg/L	70	NA	<1 U	0.21	<40 U	<5 U	NA	0.98	1.4	<5 U	5.1	2.26	4.01	1.85	2.59
TETRACHLOROETHENE	µg/L	5	870	4,884	2,700	4,900	5,100 J	<5 U	0.27	0.69	2 J	<2 U	<1 U	0.663 J	<0.5 U	0.255 J
TRANS-1,2-DICHLOROETHENE	µg/L	100	NA	<1 U	<0.29 U	<40 U	<5 U	NA	<0.29 U	<1 U	<5 U	<2 U	<1 U	<0.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	49	99	39.7	160	230 J	<5 U	0.43	0.53	<5 U	0.77 J	0.486 J	1.87	0.751 J	1.41
VINYL CHLORIDE	µg/L	2	NA	<1 U	<0.24 U	<40 U	<5 U	NA	0.62	<1 U	<5 U	<2 U	<1 U	0.627 J	0.5 J	0.597 J

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	LHSMW06-103014 10/30/2014	LHSMW06-012115 1/21/2015	LHSMW06-040715 4/7/2015	LHSMW06-070915 7/9/2015	LHSMW06-100215 10/2/2015	LHSMW06-041316 4/13/2016	LHSMW06-100616 10/6/2016	LHSMW06-111717 11/17/2017	LHSMW06-070218 07/02/2018	LHSMW07-941201 12/1/1994	LHSMW07-941201FD 12/1/1994	LHSMW07-960131 1/31/1996	LHSMW07-960812 8/12/1996	LHSMW07-980513 5/13/1998	LHSMW07-040908 9/8/2004
1,1-DICHLOROETHENE	µg/L	7	4.03	3.28	5.95	8.2	12.1	13.7	19.2	12.0	2.3	750	660	1,341	311	950	590 J
CIS-1,2-DICHLOROETHENE	µg/L	70	5.2	3.25	5.52	7.24	10.4	11.9	19	14	12	NA	NA	NA	2.5	11	6
TETRACHLOROETHENE	µg/L	5	0.381 J	0.255 J	0.454 J	0.443 J	0.518 J	0.563 J	0.9 J	<0.5 U	<0.5 U	<5 U	<5 U	7	2.7	<1 U	<5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.391 J	<0.5 U	<0.5 U	NA	NA	NA	<0.29 U	0.73	<5 U
TRICHLOROETHENE	µg/L	5	2.77	1.75	3.02	3.23	5.66	6.5	9.06	5.8	2.8	16	19	24	5.9	25	24
VINYL CHLORIDE	µg/L	2	1.15	0.924 J	0.967 J	1.36	2.1	2.38	2.94	2.2	<0.5 U	NA	NA	10	1.1	7.2	9

Notes:

Blue Highlighting Indicates Analyte Detected Above MCL

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µg/L - micrograms per liter

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 5 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	LHSMW07-FEB2007 2/21/2007	LHSMW07-111908 11/21/2008	LHSMW07-110509 5/9/2011	LHSMW07-101513 10/15/2013	LHSMW07-013014 1/30/2014	LHSMW07-052214 5/22/2014	LHSMW07-102914 10/29/2014	LHSMW07-012815 1/28/2015	LHSMW07-041515 4/15/2015	LHSMW07-070715 7/7/2015	LHSMW07-100815 10/8/2015	LHSMW07-041416 4/14/2016	LHSMW07-100416 10/4/2016	LHSMW07-111417 11/14/2017	LHSMW07-071718 07/17/2018
1,1-DICHLOROETHENE	µg/L	7	394	576	669	396	334	558 J	1,140	1,300	1,660	2,100	1,210	1,250	701	600	56
CIS-1,2-DICHLOROETHENE	µg/L	70	3.6	7.96	10.1	6.1	4.66	7.17	21	19.3	31.4	32.4	22.5	19.6	22.1	11	5.0
TETRACHLOROETHENE	µg/L	5	<2 U	<1 U	0.253 J	<0.5 U	<1 U	<0.5 U	<1 U	<2.5 U	<5 U	<2.5 U	<2.5 U	0.397 J	<2.5 U	<0.5 U	<0.5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<2 U	0.421 J	0.384 J	0.282 J	<1 U	0.296 J	1.06 J	<2.5 U	<5 U	1.29 J	<2.5 U	0.681 J	<2.5 U	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	15.8	25	41.3	23.9	17.6	23.1	78.1	64.3	82.1	118	84.9	67.5	71.6	39.0	12
VINYL CHLORIDE	µg/L	2	3	14.4	9.47	15.9	5.43	7.98	35.4	28.8	34.1	69.4 J	37.1	10.8	21.8	15.0	<0.5 U

Notes:

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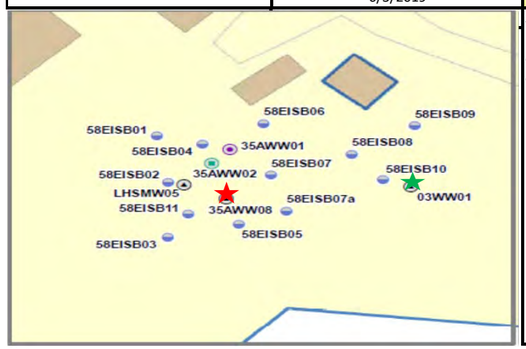
µg/L - micrograms per liter

Table 5
Enhanced In-situ Bioremediation Performance Data Summary - Eastern Plume
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Monitoring Location	Sample Date	Field Parameters					Electron Donor	cVOCs				Dissolved Gases				Wet Chemistry						Dechlorinating Bacteria	
		pH	DO	ORP	Spec Cond	Turb	TOC	PCE	TCE	cDCE	VC	Ethane	Methane	Ethene	CO_2	Fe^{2+}	NO_3	NO_2	SO_4	Cl^-	Alk	DHC	DHBt
		SU	mg/L	mV	ms/cm	NTU	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	cells/mL	cells/mL
★ 35AWW08	8/20/2013	6.05	NR	NR	8.23	26.9	16.5	1,640	544	9.35 J	< 5 U	< 2 U	10.1	< 2 U	143,000	0.04	< 4 U	< 4 U	1,480	2,510	174	< 0.9 U	< 5.3 U
	10/10/2013	6.7	NR	NR	47.7	4.1	66,400	603 J	149 J	<5	< 5 U	< 2 U	5.38	< 2 U	NA	52.4	12.3 J	<20	703	905	35,600	3.6	1,300
	1/29/2014	6.68	NR	NR	23.4	79.8	43,500	599	895	55.9	< 5 U	< 2 U	345	< 2 U	428,000	144	< 10 U	< 10 U	285	2,190	27,700	< 0.8 U	12,900
	5/20/2014	5.57	NR	NR	18.2	90.4	16,900	204	953	47.2	< 5 U	< 2 U	NA	< 2 U	NA	< 800 U	< 10 U	< 10 U	262	1,590	18,300	4,880	574,000
	10/27/2014	6.86	NR	NR	19.5	213	13,900	112	653	38.6 J	< 25 U	< 2 U	4,420	< 2 U	505,000	478	< 20 U	< 20 U	< 100 U	2,020	11,800 J	70.4	3,050,000 J
	1/21/2015	6.82	NR	NR	18.1	225	6,030	119	491	27.2 J	< 25 U	< 40 U	2,540	< 40 U	152,000 J	10.9 J	< 3 U	< 3 U	< 15 U	1,900	20,400	NA	NA
	4/15/2015	8.06	NR	NR	16.4	448	8,330	110	607	30.7 J	< 25 U	< 20 U	3,380	< 20 U	249,000	< 80 U	< 2 U	< 2 U	< 10 U	2,250	18,800 J	NA	NA
	7/8/2015	8.07	NR	NR	13.9	325	2,540	110	746	73.5 J	< 50 U	< 20 U	5,600	< 20 U	370,000	123	< 2 U	< 2 U	< 10 U	2,250	10,100 J	NA	NA
	10/8/2015	7.22	NR	NR	11.3	300	2,240	79	581	79.6	< 12.5 U	< 20 U	5,510	< 20 U	374,000	21.1	< 5 U	< 5 U	< 25 U	2,130 J	20,600	448	72,900
	4/13/2016	6.86	NR	-162	13.9	74.6	NA	80.1	234	60.9	14.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/4/2016	6.92	NR	NR	11.8	50.4	918	36.9	235	41.7	7.46 J	< 20 U	7,350	< 20 U	424,000	17.6	< 2 U	< 2 U	< 10 U	2000	9,160 J	25,600,000	625,000
	11/15/2017	6.58	NR[3]	NR[3]	11.8	63.6	581	12	33	38	< 5 U	< 0.23 U	670	0.56 J	190,000	17.4 J	0.249	< 0.05 U	2.03	2,060	4,360	3,060,000	< 38.5 U
	7/18/2018	7.15	NR[3]	NR[3]	14.9	31.4	484 J	< 2.5 UJ	19 J	12 J	9.0 J	< 0.47 U	920	0.49 J	350,000	13.7 J	< 0.200 UJ	< 0.200 UJ	0.9	2460	3,050 J	1,410,000	47,000
	12/11/2018	7.28	NR[3]	NR[3]	10.9	82.5	392	< 0.5 U	12	8.9 J	< 0.5 U	< 0.47 U	< 1.0 U	< 0.55 U	290,000	21 J	0.147 J	< 0.100 U	4.76	2,240	3,420	1,200,000	173,000
	6/3/2019	8.67	NR[3]	NR[3]	9.93	86.9	306	4.8 J	13	< 2.5 U	< 2.5 U	< 0.47 U	3,000	4.1	260,000	NA	0.219 J	NA	1.42 J	2510	NA	3,790,000	139,000
★ 03WW01	8/20/2013	6.18	NR	NR	3.64	33	10.5	368	94.8	0.978 J	< 1 U	< 2 U	3.22	< 2 U	143,000	0.04	< 1 U	< 1 U	534	892	142	1.2	0.4 J
	10/10/2013	6.55	NR	NR	39.2	10	49,200	172	42.1	< 2.5 U	< 2.5 U	< 2 U	4.35	< 2 U	NA	35.4	< 20 U	< 20 U	487	398	39,700	< 2.1 U	15.7 J
	1/29/2014	6.58	NR	NR	20.2	256	30,200	172	58.4	< 5 U	< 5 U	< 2 U	5.09	< 2 U	337,000	110	< 10 U	< 10 U	457	906	27,500	< 0.9 U	639,000
	5/21/2014	5.52	NR	NR	16	152	29,100	154	71.2	3.3 J	< 5 U	< 2 U	479	< 2 U	564,000	0.0217	< 10 U	< 10 U	376	780	25,700	2,870	2,700,000
	10/28/2014	5.87	NR	NR	14.2	171	8,440	48.6 J	223	< 50 U	< 50 U	< 2 U	910	< 2 U	564,000 J	107	< 1 U	< 1 U	11	940	12,300 J	10.9	192,000
	1/21/2015	6.51	NR	NR	13.6	93.3	7,720	32.8 J	216	< 50 U	< 50 U	< 10 U	393	< 10 U	333,000	40.6	< 2 U	< 2 U	10.2	881	19,000 J	NA	NA
	4/15/2015	7.11	NR	NR	12.8	387	7,800	15.9 J	131	21.4 J	< 25 U	< 20 U	3,170	< 20 U	396,000	27.8 J	< 1 U	< 1 U	18	976	24,100	NA	NA
	7/8/2015	7.62	NR	NR	11.8	847	3,640	31.4 J	65.6 J	< 50 U	< 50 U	< 20 U	16,100	< 20 U	408,000	96.1	< 1 U	< 1 U	3.62 J	1,020	12,400 J	NA	NA
	10/8/2015	6.65	NR	NR	11.4	525	1,700	36.4 J	51.8 J	< 50 U	< 50 U	< 20 U	5,880	< 20 U	500,000	0.835	< 5 U	< 5 U	< 25 U	1,200	20,300	78	8,800
	4/13/2016	7.19	NR	-127	7.99	127	NA	6.49 J	<12.5U	117	< 12.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/4/2016	6.81	NR	NR	6.38	70	292	< 5 U	< 5 U	< 5 U	< 5 U	<20	5,950	< 20 U	657,000	8.02	< 1 U	< 1 U	< 5 U	762	5,500 J	9,460,000	53,300
	11/15/2017	7.25	NR[3]	NR[3]	6.59	135	191	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U	< 0.23 U	620	1.2	310,000	18.9 J	< 0.05 U	< 0.05 U	40.8	1,020	3,310	35,300	< 20.8 U
	7/18/2018	6.8	NR[3]	NR[3]	6.23	9.5	118 J	< 0.5 UJ	< 0.5 UJ	5.3 J	4.8 J	< 0.47 U	590	0.89 J	490,000	40 J	< 0.200 UJ	< 0.200 UJ	161	977	2,290	7.5	6
	12/11/2018	6.24	NR[3]	NR[3]	2	54.1	42	15	5.7	22	7.6	< 0.47 U	1,800	2.3	390,000	27.5 J	< 0.100 U	< 0.100 U	42.8	336	862	10,100	599
	6/3/2019	8.1	NR[3]	NR[3]	4.95	14.8	66	3.2 J	2.9 J	41	11	< 0.47 U	2,900	1.6	520,000	NA	0.196 J	NA	239	809	NA	6,040	292
		Slight decrease in pH noted during May 2014 sampling event, potentially related to excessive substrate fermentation and organic acid production, need to monitor closely. System has continued to self buffer over time.					-Initial spike in TOC indicates effective substrate distribution. -Residual electron donor present to support desired biogeochemical reactions. -Declining TOC concentrations over time indicative of substrate consumption. -Electron donor nearly depleated.	PCE is degrading fully to VC. Residual degradation products of TCE, cDCE, and VC continue to degrade.				Reduced methane and ethene indicates slowing of reductive dechlorination due to limited substrate and eletron acceptors remaining.				Increasing sulfate concentration indicates that reductive dechlorination is starting to stall.				-Initial spike in dechlorinating bacteria counts suggest effective distribution of the bioaugmentation culture. -Sustained elevated counts indicate survival and possible proliferation of the bioaugmentation culture. -Elevated dechlorinating bacteria counts in 2016 indicate rapid proliferation is ongoing.	



Notes:

1. Electron donor injections completed in Sept. 2013
2. Bioaugmentation performed in Nov. 2013
3. Data recorded but not used since bailer was used to collect the sample.

pH = potential of hydrogen
SU = standard units
DO = dissolved oxygen
mg/L = milligrams per liter
ORP = oxidation-reduction potential
mV = millivolts
Spec Cond = specific conductivity
ms/cm = millisiemens per centimeter
Turb = turbidity
NTU = nephelometric turbidity units
TOC = total organic carbon
cVOC = chlorinated volatile organic compounds
PCE = tetrachloroethene
TCE = trichloroethene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride
µg/L = micrograms per liter
CO_2 = carbon dioxide
Fe^{2+} = ferrous iron
NO_3 = nitrate
NO_2 = nitrite
SO_4 = sulfate
Cl^- = chloride
Alk = alkalinity
DHC = dehalococcoides
DHBt = dehalobacter spp.
cells/mL = cells per milliliter
NA = not analyzed
NR = not recorded
U - Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection
U - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

Table 6
Enhanced In-situ Bioremediation Performance Data Summary-Western Plume
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 5 RA(O) Report

Monitoring Location	Sample Date	Field Parameters					Electron Donor	cVOCs				Dissolved Gases				Wet Chemistry						Dechlorinating Bacteria	
		pH	DO	ORP	Spec Cond	Turb	TOC	PCE	TCE	cDCE	VC	Ethane	Methane	Ethene	CO_2	Fe^{2+}	NO_3	NO_2	SO_4	Cl^-	Alk	DHC	DHBt
		SU	mg/L	mV	ms/cm	NTU	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	cells/mL	cells/mL
LHSMW07	11/14/2017	5.94	0.09	159	11	40.9	6.81	< 0.5 U	39	11	15	< 0.23 U	18	< 0.22 U	220,000	0.4 J	< 0.0500 U	< 0.100 U	2,940	2,540	750	NA	NA
	3/7/2018	6.1	0.65	180	12.1	5.1	6.67	< 1.0 U	34	11	5	< 0.47 U	3	< 0.55 U	350,000	0.07 J	< 0.0500 U	< 0.0500 U	2,700	2,420	757	11.8	< 4.8 U
	7/17/2018	6.23	0	-389	14.1	13.2	321	< 0.5 U	12	5	< 0.5 U	< 0.47 U	1.4	< 0.55 U	540,000	2.58 J	< 0.200 U	< 0.200 U	1,090	2,270	1,990	17.2	6,570,000
	9/26-27/2018	5.99	0	-222	9.24	20.3	14.2	< 0.50 U	2.4	1.1	< 0.50 U	< 0.47 U	27	4.0	760,000	0.93 J	< 0.200 U	< 0.200 U	1,120	2,180	2,060	11,600	3,540,000
	12/10/2018	6.7	0.02	-324	10.8	10.7	7.53	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	0.46 J	170	28	460,000	0.43 J	< 0.200 U	< 0.200 U	1,530	2,030	1,640	6,080	166,000
	3/19/2019	6.57	0.17	-311	11	27.5	4.11	< 0.5 U	1.1	< 0.5 U	< 0.5 U	0.52 J	270	25	440,000	NA	< 0.500 U	NA	2,390	1,980	NA	10,000	61,400
	6/3/2019	6.27	0.07	-96	10.4	17.5	4.13	< 0.5 U	1.8	0.70 J	< 0.5 U	0.20 J	78	3.9	660,000	NA	< 0.500 U	NA	2,470	1,780	NA	7,580	< 9.5 U
35AWW06	11/14/2017	5.86	0.06	197	5.87	8.7	2.29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.23 U	0.32 J	< 0.22 U	200,000	0.09 J	2.12	< 0.0500 U	1,560	1,040	666	NA	NA
	3/8/2018	5.67	0.26	136	5.91	4.4	2.32	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.47 U	< 1.0 U	< 0.55 U	500,000 J	0.12 J	< 0.0500 U	< 0.0500 U	1,480	1,000	666	1.5	291
	7/2/2018	4.9	0	-35	5.86	96.7	4,200 J	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.47 U	< 1.0 U	0.58 J	780,000 J	14 J	< 0.200 UJ	< 0.200 UJ	811	904	386	< 1.8 U	52,900
	9/26-27/2018	4.75	0	78	4.95	55.5	2860	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 UJ	3.0 J	< 0.55 UJ	860,000	27.8 J	< 0.200 U	< 0.200 U	508	910	775	3.60	705,000
	12/11/2018	5.9	0.02	-177	5.2	36.8	685	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	890	0.44 J	790,000	88.1 J	< 0.200 U	< 0.200 U	13.4	858	1,210	2.50	144,000
	3/19/2019	6.39	0.16	-234	5.09	31.8	407	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	3,100	< 0.55 U	720,000	NA	< 0.500 U	NA	2.33 J	919	NA	12.3	21,200
	6/4/2019	6.61	0.06	-99	5.15	46.1	331	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	1,500	< 0.55 U	750,000	NA	0.180 J	NA	2.08 J	964	NA	26.8	159
35AWW11	11/14/2017	5.64	0.37	278	8.88	65.2	5.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.23 U	< 0.63 U	< 0.22 U	230,000	0.08 J	< 0.0500 U	< 0.0500 U	1,290	2,650	452	NA	NA
	3/7/2018	5.94	0.59	211	9.49	90.8	5.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.47 U	16	0.38 J	360,000	0.10 J	< 0.0500 U	< 0.0500 U	1,260	2,530	446	0.6	< 5.0 U
	7/16/2018	5.31	0	-56	8.77	15.5	1,650	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	0.80 J	< 0.55 U	450,000	27.6 J	< 0.100 U	< 0.100 U	652	2,440	649	4.60	910,000
	9/26-27/2018	5.64	0	-194	8.4	116	1,120	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	0.63	1,300	2.1	320,000	36.5 J	< 0.200 U	< 0.200 U	285	2,110	1,190	2.10	394,000
	12/11/2018	6.02	0.05	-247	9.31	14.2	701	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	5.5	< 0.55 U	820,000	20.6 J	< 0.200 U	< 0.200 U	127	2,120	1,430	10.6	220,000
	3/19/2019	5.92	0.11	-142	9	36.2	485	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	450	< 0.55 U	940,000	NA	< 0.500 U	NA	172	2,150	NA	231	818,000
	6/3/2019	5.7	0.09	-136	7.81	54.6	94.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	590	< 0.55 U	750,000	NA	< 0.500 U	NA	210	1,920	NA	2100	2,570,000
35AWW19	11/17/2017	5.27	NR[3]	NR[3]	5.97	26.5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/8/2018	5.28	NA	NA	6.08	26.4	2.51	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.47 U	< 1.0 U	< 0.55 U	97,000	1.10 J	< 0.0500 U	< 0.0500 U	1,220	1,430	159	0.4 J	< 11.9 U
	7/18/2019	6.08	NR[3]	NR[3]	5.67	12	2.38 J	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.47 U	0.65 J	< 0.55 U	180,000 J	2.78 J	< 0.200 UJ	< 0.200 UJ	983	1,370	199	0.30 J	20,400
	9/26-27/2018	5.77	0.01	42	5.46	36.1	2.21	< 0.5 U	0.59 J	< 0.5 U	< 0.5 U	< 0.47 U	27	0.32 J	250,000	3.99 J	< 0.200 U	< 0.200 U	989	1,230	213	0.8	148,000
	12/10/2018	5.94	0.04	-72	5.7	5.2	2.17	< 0.5 U	0.59 J	< 0.5 U	< 0.5 U	< 0.47 U	5.7	< 0.55 U	330,000	4.19 J	< 0.200 U	< 0.200 U	998	1,190	198	0.50 J	99,000
	3/19/2019	5.37	0.14	70	5.67	80.1	2.20	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	1.3 J	< 0.55 U	790,000	NA	< 0.500 U	NA	994	1,140	NA	< 0.50 U	91.5
	6/3/2019	5.69	0.05	93	5.46	16.6	1.88	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	1.4	< 0.55 U	560,000	NA	< 0.500 U	NA	966	1080	NA	3.30	62,700
35AWW20	11/14/2017	5.97	0.04	138	7.71	27.5	13.8	0.80 J	320	53	78	< 0.23 U	18	0.41 J	230,000	0.45 J	< 0.0500 U	< 0.0500 U	2,150	1,730	834	NA	NA
	3/7/2018	6.16	0.6	106	7.97	21.3	14.5	< 5.0 U	330	76	110	< 0.47 U	< 1.3 U	< 0.55 U	370,000	0.69 J	< 0.0500 U	< 0.0500 U	1,840	1,510	848	5.5	1,120
	7/16/2018	6.18	0	-357	7.19	0	43	< 0.5 U	270	69	71	< 0.47 U	0.93 J	< 0.55 U	360,000	1.18 J	< 0.100 U	< 0.100 U	882	1,420	1,450	1.50	5,970,000
	9/26-27/2018	5.95	0	-206	6.34	11.1	53	0.81 J	170	45	< 0.5 U	< 0.47 U	37	0.66 J	770,000	1.41 J	< 0.200 U	< 0.200 U	922	1,220	1,470	< 1.30 U	3,770,000
	12/10/2018	6.21	0.07	-270	7.14	48.1	19	1.3	570	120	110	< 0.47 U	440	1.3	720,000	5.01 J	< 0.200 U	< 0.200 U	1,010	1,010	1,190	< 1.90 U	283,000
	3/19/2019	6.26	0.11	-247	6.94	28.1	12	< 0.5 UJ	180	49 J	54 J	< 0.47 UJ	840	1.94 J	890,000	NA	< 0.500 U	NA	1,120	1,090	NA	< 1.50 U	14,000
	6/4/2019	6.65	0.1	-56	6.79	47.1	12.9	< 2.5 U	230	79	140	0.19 J	920	1.3	730,000	NA	0.194 J	NA	1,240	1,180	NA	15,500	< 21.7 U
35AWW23	3/8/2018	5.92	0.76	185	3.58	89.5	3.31	< 1.0 U	27	21	3.1	< 0.47 U	< 1.0 U	< 0.55 U	500,000	0.13 J	1.2	< 0.0500 U	761	487	608	< 0.5 U	< 4.8 U
	7/17/2018	5.67	0	-167	3.4	178	856	< 0.5 U	2.6	12	< 0.5 U	< 0.47 U	49	0.38 J	370,000	25.1 J	< 0.100 U	< 0.100 U	< 0.500 U	482	914	45.1	9,530
	9/26-27/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2018	5.6	0.05	-86	3.99	32.5	879	< 0.5 U	5.3	20	< 0.5 U	< 0.47 U	2,200	< 0.55 U	810,000	50 J	< 0.200 U	< 0.200 U	4.19	578	1,110	149	< 25.0 U
	3/19/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/3/2019	5.74	0.02	-50	4.86	47.7	1,360	< 0.5 U	1.8	4.3	< 0.5 U	< 0.47 U	1,300	< 0.55 U	750,000	NA	< 0.500 U	NA	14.1	732	NA	652	< 38.5 U
35AWW24	3/8/2018	5.31	0.66	224	0.487	99.5	1.45	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.47 U	< 1.0 U	< 0.55 U	290,000	0.33 J	0.11	< 0.0500 U	85.7	119	66.5	< 2.0 U	79.9
	7/17/2018	4.98	0	71	0.484	449	1.58	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	< 1.0 U	< 0.55 U	430,000	0.16 J	0.0640 J	< 0.100 U	73.6	117	52.4	< 1.90 U	137
	9/26-27/2018	4.52	0	252	0.584	352	0.87	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	190	< 0.55 U	330,000	0.31 J	< 0.100 U	< 0.100 U	69.9	110	50.8	< 0.50 U	4.6 J
	12/10/2018	4.41	0.05	38	0.489	514	1.67	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	68	< 0.55 U	660,000	0.54 J	0.157 J	< 0.100 U	69.9	109	45.9	< 1.20 U	1.50 J
	3/19/2019	4.79	0.08	154	0.485	213	1.68 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	7.8	< 0.55 U	680,000	NA	< 0.100 U	NA	70	115	NA	< 0.80 U	< 8.30 U
	6/3/2019	4.53	0.06	347	0.574	74	1.55 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	4.2	< 0.55 U	530,000	NA	< 0.100 U	NA	74.9	106	NA	0.90	24.7

-Slight increase in pH following injection is favorable.

-Initial spike in TOC indicates effective substrate distribution to several of the areas.

-Decreasing concentrations of cVOCs.
-Additional time/monitoring necessary to observe complete dechlorination at 35AWW20.

-Increased carbon dioxide indicates metabolism of the injected substrate is occurring.

-Decreasing sulfate concentration indicates the onset/development of reducing conditions conducive to reductive dechlorination.

-Initial spike in dechlorinating bacteria counts suggest effective distribution of the bioaugmentation culture.

Notes:
1. Electron donor injections completed in March 2018
2. Bioaugmentation performed in April 2018
3. Data recorded but not used since bailer was used to collect the sample.

pH = potential of hydrogen
SU = standard units
DO = dissolved oxygen
mg/L = milligrams per liter
ORP = oxidation-reduction potential
mV = millivolts
Spec Cond = specific conductivity
ms/cm = millisiemens per centimeter
Turb = turbidity
NTU = nephelometric turbidity units
TOC = total organic carbon
cVOC = chlorinated volatile organic compounds
PCE = tetrachloroethene
TCE = trichloroethene
cDCE = cis-1,2-dichloroethene
VC = vinyl chloride
µg/L = micrograms per liter
CO_2 = carbon dioxide
Fe^{2+} = ferrous iron
NO_3 = nitrate
NO_2 = nitrite
SO_4 = sulfate
Cl^- = chloride
Alk = alkalinity
DHC = dehalococcoides
DHBt = dehalobacter spp.
cells/mL = cells per milliliter
NA = not analyzed
NR = not recorded
U - Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection
U - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

APPENDIX A
ANNUAL LAND USE CONTROL COMPLIANCE CERTIFICATION DOCUMENTATION

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Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated September 2011, for LHAAP-58, a certification of site was conducted by Bhate Environmental Associates, Inc. on MAY 13, 2019.

A summary of land use control mechanism is as follows:

- Groundwater restriction – restriction of the use of groundwater to environmental monitoring and testing until cleanup levels are met

A Summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-58.

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information and belief.

Date: MAY 13, 2019

Name/Title: SCOTT BEESINGER / SENIOR FIELD TECH

Signature: Scott Beesinger

APPENDIX B
PHOTOGRAPHIC LOG

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Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 1: 03WW01 in good condition.

Photo 2: Surface water sampling location 35ASW03.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 3: S35AWW01 in good condition.

Photo 4: 35AWW05 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 5: 35AWW06 in good condition.

Photo 6: 35AWW08 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 7: 35AWW09 in good condition.

Photo 8: 35AWW10 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 9: 35AWW11 in good condition.

Photo 10: 35AWW12 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 11: 35AWW13 in good condition.

Photo 12: 35AWW14 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 13: 35AWW15 in good condition.

Photo 14: 35AWW16 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 15: 35AWW17 in good condition.

Photo 16: 35AWW18 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 17: 35AWW19 in good condition.

Photo 18: 35AWW20 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 19: 35AWW21 in good condition.

Photo 20: 35AWW22 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 21: 35AWW23 in good condition.

Photo 22: 35AWW24 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 23: LHSMW04 needs painting.

Photo 24: LHSMW06 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-58 Photograph Log June 2019

Photo 25: LHSMW07 needs painting.

APPENDIX C
MONITORING WELL SAMPLE COLLECTION FORMS

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GROUNDWATER SAMPLE COLLECTION FORM

Page _____ of _____

LOCATION	Site: LHAAP - 58	Location ID: ~~35AWW06~~ 35AWW06	Date: 9/26/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 21345	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 20.35
	Total Well Depth (ft) (C): 30.32	Water Column Thickness (ft) (C-B): 9.97	Well Volume (gal) (A*(C-B)): 6.50
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: CLOUDY/OVERCAST	Well Condition: GOOD	Comments:

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
9/26/18	0850	20.42	.13	100	21.29	4.71	5.21	1.09	57.1	117	
	0855	20.49	.26	100	20.45	4.78	5.00	0.68	53.5	86	
	0900	20.53	.39	100	20.32	4.77	4.97	0.21	54.0	83	
	0905	20.55	.52	100	20.28	4.76	4.95	0.00	54.2	80	
	0910	20.57	.65	100	20.23	4.75	4.95	0.00	54.7	79	
	0915	20.58	.78	100	20.20	4.75	4.95	0.00	55.1	78	
	0920	20.58	.91	100	20.17	4.75	4.95	0.00	55.5	78	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**		3	40 ml glass	HCl	N		VOC
							MNA				

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: BSAWW06-092618 Sample Time: 0920

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GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: 35A WW11	Date: 9/27/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 21345	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC / 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 31.10
	Total Well Depth (ft) (C): 37.95	Water Column Thickness (ft) (C-B): 6.85	Well Volume (gal) (A*(C-B)): 1.10
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Cloudy / overcast	Well Condition: Good	Comments:

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
9/27/18	1125	31.18	.13	100	19.41	5.67	8.21	0.65	71.2	-161	
	1130	31.25	.26	100	19.26	5.74	8.23	0.14	105	-190	
	1135	31.30	.39	100	19.21	5.66	8.39	0.00	113	-191	
	1140	31.33	.52	100	19.18	5.65	8.40	0.00	114	-192	
	1145	31.35	.65	100	19.15	5.64	8.40	0.00	115	-193	
	1150	31.36	.78	100	19.13	5.64	8.40	0.00	116	-194	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml glass	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW11-092718 Sample Time: 1150

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A WW19	Date: 9/27/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 21345	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC / 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 27.79
	Total Well Depth (ft) (C): ~~33.42~~ 32.42	Water Column Thickness (ft) (C-B): 4.63	Well Volume (gal) (A*(C-B)): 0.74
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Cloudy / OVERCAST	Well Condition: GOOD	Comments:

CASING INFO	Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
	Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
9/27/18	1010	27.86	.13	100	19.31	5.54	5.37	0.96	52.3	72	
	1015	27.92	.26	100	19.62	5.62	5.43	0.29	41.8	50	
	1020	27.96	.39	100	19.63	5.75	5.46	0.02	37.9	43	
	1025	27.98	.52	100	19.64	5.76	5.46	0.02	37.2	43	
	1030	27.99	.65	100	19.65	5.77	5.46	0.01	36.7	42	
	1035	28.00	.78	100	19.65	5.77	5.46	0.01	36.1	42	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	3	40ml glass	HCl	N		VOC
		MNA				

Sample ID: 35A WW19-092718 Sample Time: 1035

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A WW20	Date: 9/26/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 21345	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 2"	Unit Casing Volume (gal/lin ft) (A): 0.65	Initial Depth to Water (ft) (B): 19.75
	Total Well Depth (ft) (C): 36.08	Water Column Thickness (ft) (C-B): 16.33	Well Volume (gal) (A*(C-B)): 10.65
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: CLOUDY/OVERCAST	Well Condition: GOOD	Comments:

CASING INFO	Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
	Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
9/26/18	1045	19.83	.13	100	23.73	6.01	6.32	0.77	12.6	-158	
	1050	19.89	.26	100	23.68	5.96	6.37	0.41	13.4	-186	
	1055	19.93	.39	100	23.63	5.94	6.32	0.20	12.8	-204	
	1100	19.96	.52	100	23.80	5.95	6.33	0.00	12.5	-204	
	1105	19.98	.65	100	23.86	5.95	6.34	0.00	12.1	-205	
	1110	19.99	.78	100	23.91	5.95	6.34	0.00	11.7	-206	
	1115	20.00	.91	100	23.95	5.95	6.34	0.00	11.1	-206	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml GLASS	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35A WW20_092618 Sample Time: 1115

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GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: 35AWW24	Date: 9/27/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 21345	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC / 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 20.11
	Total Well Depth (ft) (C): 35.01	Water Column Thickness (ft) (C-B): 14.90	Well Volume (gal) (A*(C-B)): 2.38
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: CLOUDY / OVERCAST	Well Condition: GOOD	Comments:

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
9/26/18	0905	20.19	.13	100	19.26	4.60	0.708	0.68	409	302	
	0910	20.25	.26	100	19.32	4.45	0.609	0.21	440	280	
	0915	20.30	.39	100	19.36	4.50	0.586	0.01	355	256	
	0920	20.33	.52	100	19.40	4.50	0.585	0.01	354	255	
	0925	20.35	.65	100	19.45	4.51	0.585	0.00	353	254	
	0930	20.36	.78	100	19.46	4.52	0.584	0.00	352	252	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW24_092718 Sample Time: 0930

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW07	Date: 9/26/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 21345	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 19.07
	Total Well Depth (ft) (C): 30.42	Water Column Thickness (ft) (C-B): 11.35	Well Volume (gal) (A*(C-B)): 7.40
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Cloudy	Well Condition: Good	Comments:

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
9/26/18	1205	19.15	.13	100	24.14	6.26	9.16	0.51	26.6	-242	
	1210	19.20	.26	100	22.50	6.10	9.18	0.19	24.3	-238	
	1215	19.23	.39	100	22.24	6.01	9.22	0.00	21.9	-225	
	1220	19.25	.52	100	22.19	6.00	9.23	0.00	21.4	-224	
	1225	19.26	.65	100	22.15	6.00	9.24	0.00	20.8	-223	
	1230	19.27	.78	100	22.11	5.99	9.24	0.00	20.3	-222	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	3	40ml GLASS	HCl	N		VOC
		MNA				

Sample ID: LHSMW07_092618 Sample Time: 1230

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 03WW01	Date: 12/11/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 30.00
	Total Well Depth (ft) (C): 33.43	Water Column Thickness (ft) (C-B): 3.43	Well Volume (gal) (A*(C-B)): 0.55
	Screened Interval: 23.43-33.43	Weather: CLEAR / COOL	Ambient PID (ppm): NA
	Pump placement: NA BAILER	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/11/18	1155	30.00		NA							BAILING WELL
12/11/18	1200	33.40	0.75	NA							BAILED 3/4 GALLON RANDRY
12/12/18	0820	30.00	NA	NA	17.77	6.24	2.00	9.44	54.1	-83	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 mL glass	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria										
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%							
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%							
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 03WW01-121218				Sample Time: 0820		

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bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: 35AWW01	Date: 12/13/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): SS 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 40.27
	Total Well Depth (ft) (C): 73.15	Water Column Thickness (ft) (C-B): 32.88	Well Volume (gal) (A*(C-B)): 21.44
	Screened Interval: 62.50 - 72.50	Weather: Cloudy / RAIN	Ambient PID (ppm): NA
	Pump placement: 67.50	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/13/18	1315	40.33	.13	100	19.84	6.35	0.592	0.67	135	41	
	1320	40.38	.26	100	20.36	6.25	0.583	0.31	87.3	55	
	1325	40.41	.39	100	20.42	6.28	0.579	0.14	75.1	54	
	1330	40.43	.52	100	20.49	6.28	0.578	0.14	74.5	54	
	1335	40.44	.65	100	20.55	6.29	0.578	0.13	73.9	53	
	1340	40.45	.78	100	20.61	6.29	0.578	0.13	73.5	53	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**		3	40 ml glass	HCl	N		VOC
						1	60 ml plastic	HNO3	N		ARSENIC

Conversions	**Stabilization Criteria**					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW01-121318	Sample Time: 1340

00943689

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW05	Date: 12/12/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 43.67
	Total Well Depth (ft) (C): 72.63	Water Column Thickness (ft) (C-B): 28.96	Well Volume (gal) (A*(C-B)): 18.88
	Screened Interval: 62.15-72.15	Weather: Cloudy / cool	Ambient PID (ppm): NA
	Pump placement: 67.15	Well Condition: Good	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/12/18	1310	43.72	.13	100	19.09	7.35	2.90	0.61	36.6	25	
	1315	43.76	.26	100	19.68	6.81	2.79	0.28	29.3	32	
	1320	43.79	.39	100	19.73	6.64	2.72	0.10	23.1	37	
	1325	43.81	.52	100	19.79	6.63	2.72	0.10	22.6	38	
	1330	43.82	.65	100	19.85	6.62	2.71	0.09	22.0	38	
	1335	43.83	.71	100	19.89	6.62	2.71	0.09	21.5	40	

Colorimeter Results				
Time	**Analyte**	**Dilution**	**Result**	**Units**

No. Containers/Volume/Type			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
	3	40 ml glass	HCL	N		VOC

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW05-12/12/18 Sample Time: 1335

00943690

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW06	Date: 12/11/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 19.96
	Total Well Depth (ft) (C): 30.37	Water Column Thickness (ft) (C-B): 10.41	Well Volume (gal) (A*(C-B)): 6.79
	Screened Interval: 20.50 - 30.50	Weather: CLEAR / COLD	Ambient PID (ppm): NA
	Pump placement: 25.50	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/11/18	0830	20.04	.13	100	14.41	5.95	5.36	0.65	47.0	-157	
	0835	20.10	.26	100	16.03	5.93	5.21	0.27	45.8	-170	
	0840	20.13	.39	100	16.77	5.91	5.20	0.03	38.0	-175	
	0845	20.15	.52	100	16.86	5.90	5.20	0.02	37.7	-176	
	0850	20.16	.65	100	16.95	5.90	5.20	0.02	37.2	-176	
	0855	20.16	.78	100	17.05	5.90	5.20	0.02	36.8	-177	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**		3	40ml glass	HCL	N		VOC
							MNA				

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW06-121118 Sample Time: 0855

00943691

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GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: 35AWW08	Date: 12/11/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 29.55
	Total Well Depth (ft) (C): 33.35	Water Column Thickness (ft) (C-B): 3.80	Well Volume (gal) (A*(C-B)): 0.61
	Screened Interval: 23.35 - 33.35	Weather: CLEAR/COOL	Ambient PID (ppm): NA
	Pump placement: NA BAILER	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/11/18	1207	29.55		NA							BAILING WELL
12/11/18	1212	33.30	1.0	NA							BAILED 1 GALLON RANDRY
12/12/18	0910	29.55	NA	NA	18.33	7.28	10.9	9.19	82.5	-168	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml glass VOA	HCL	N		VOC

Conversions	Stabilization Criteria						
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%			
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%			
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW08_121218		Sample Time: 0910

00943692

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW09	Date: 12/11/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 32.21
	Total Well Depth (ft) (C): 42.18	Water Column Thickness (ft) (C-B): 9.97	Well Volume (gal) (A*(C-B)): 1.60
	Screened Interval: 27.58 - 42.18	Weather: CLEAR/COLD	Ambient PID (ppm): NA
	Pump placement: 34.88	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/11/18	1105	32.29	.13	100	17.00	6.50	5.51	0.87	87.7	27	
↓	1110	32.35	.26	100	18.07	6.23	5.60	0.50	56.50	60	
	1115	32.39	.39	100	18.29	6.13	5.68	0.41	39.4	77	
	1120	32.41	.52	100	18.37	6.12	5.68	0.40	38.8	28	
	1125	32.43	.65	100	18.44	6.12	5.69	0.39	38.1	79	
↓	1130	32.45	.78	100	18.50	6.11	5.69	0.39	37.4	80	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 mL glass	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW09-121118 Sample Time: 1130

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW10	Date: 12/12/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 18.75
	Total Well Depth (ft) (C): 33.73	Water Column Thickness (ft) (C-B): 14.98	Well Volume (gal) (A*(C-B)): 2.40
	Screened Interval: 19.13-33.73	Weather: Cloudy / Cool	Ambient PID (ppm): NA
	Pump placement: 26.43	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/12/18	1000	18.83	.13	100	20.19	6.39	0.210	2.03	43.1	158	
	1005	18.89	.26	100	21.13	5.76	0.192	1.92	42.6	181	
	1010	18.93	.39	100	21.59	5.62	0.188	1.80	30.1	193	
	1015	18.95	.52	100	21.65	5.57	0.188	1.70	19.8	200	
	1020	18.97	.65	100	21.74	5.56	0.187	1.69	19.0	201	
	1025	18.98	.78	100	21.82	5.55	0.187	1.69	18.1	203	
	1030	18.98	.91	100	21.89	5.55	0.187	1.68	17.2	203	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		6	40 ml glass	HCL			VOC
							MNA				

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW10_121218	Sample Time: 1030

00943694

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW11	Date: 12/11/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 31.05
	Total Well Depth (ft) (C): 38.12	Water Column Thickness (ft) (C-B): 7.07	Well Volume (gal) (A*(C-B)): 1.13
	Screened Interval: 23.50 - 38.10	Weather: CLEAR / COLD	Ambient PID (ppm): NA
	Pump placement: 33.00	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/11/18	1000	31.13	.13	100	14.68	5.98	9.16	0.73	48.8	-198	
	1005	31.18	.26	100	16.40	5.99	9.27	0.29	22.2	-244	
	1010	31.22	.39	100	16.81	6.00	9.30	0.06	16.1	-245	
	1015	31.25	.52	100	16.92	6.01	9.31	0.06	15.5	-246	
	1020	31.27	.65	100	17.04	6.01	9.31	0.05	14.9	-247	
	1025	31.28	.78	100	17.15	6.02	9.31	0.05	14.2	-247	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria				
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%	
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%	
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW11_121118

Sample Time: 1025

00943695

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW12	Date: 12/14/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 29.66
	Total Well Depth (ft) (C): 37.65	Water Column Thickness (ft) (C-B): 7.99	Well Volume (gal) (A*(C-B)): 1.28
	Screened Interval: 23.01 – 37.61	Weather: Cloudy/Rain	Ambient PID (ppm): NA
	Pump placement: 34.00	Well Condition: Good	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE 12/14/18	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
~~0945~~	0945	29.73	.13	100	17.75	5.39	2.10	0.40	10.6	259	
~~0950~~	0950	29.77	.26	100	18.11	5.30	2.10	0.27	9.5	274	
~~0955~~	0955	29.80	.39	100	18.19	5.32	2.10	0.23	7.9	274	
~~1000~~	1000	29.84	.52	100	18.23	5.36	2.10	0.19	7.7	273	
~~1005~~	1005	29.86	.65	100	18.26	5.39	2.10	0.14	7.4	273	
~~1010~~	1010	29.86	.78	100	18.31	5.43	2.10	0.09	7.1	273	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCL	N		VOC

Conversions	Stabilization Criteria										
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%							
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%							
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW12-12/14/18				Sample Time: 1010		

00943696

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW13	Date: 12/11/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 25.03
	Total Well Depth (ft) (C): 40.30	Water Column Thickness (ft) (C-B): 15.27	Well Volume (gal) (A*(C-B)): 2.44
	Screened Interval: 25.68 - 40.28	Weather: CLEAR / COOL	Ambient PID (ppm): NA
	Pump placement: 32.98	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/11/18	1235	25.10	.13	100	21.09	5.87	1.44	0.77	92.1	94	
	1240	25.16	.26	100	21.67	5.75	1.55	0.74	48.3	105	
	1245	25.20	.39	100	21.85	5.78	1.70	0.70	40.1	106	
	1250	25.23	.52	100	21.96	5.79	1.71	0.69	39.5	106	
	1255	25.25	.65	100	22.04	5.79	1.71	0.69	38.9	107	
	1300	25.26	.28	100	22.13	5.79	1.72	0.68	38.6	107	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW13-121118 Sample Time: 1300

00943697

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW14	Date: 12/13/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 29.55
	Total Well Depth (ft) (C): 32.48	Water Column Thickness (ft) (C-B): 2.93	Well Volume (gal) (A*(C-B)): 0.47
	Screened Interval: 17.76 - 32.46	Weather: Cloudy / RAIN	Ambient PID (ppm): NA
	Pump placement:	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/13/18	1010	29.55		NA							BAILING WELL
12/13/18	1014	32.45	.75	NA							BAILED .75 GALLONS RAN DRY
12/13/18	1400	29.55	NA	NA	19.46	6.65	6.71	8.48	4.3	-10	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**		3	40 ml glass	HCl	N		VOC

Conversions	**Stabilization Criteria**					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW14_121318	Sample Time: 1400

00943698

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW15	Date: 12/12/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 16.55
	Total Well Depth (ft) (C): 41.48	Water Column Thickness (ft) (C-B): 24.93	Well Volume (gal) (A*(C-B)): 3.99
	Screened Interval: 26.78-41.48	Weather: Cloudy / cool	Ambient PID (ppm): NA
	Pump placement: 34.10	Well Condition: Good	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/12/18	1215	16.61	.13	100	20.68	6.77	13.9	0.59	141	45	
↓	1220	16.65	.26	100	21.65	6.39	13.9	0.21	116	88	
	1225	16.68	.39	100	21.65	6.35	13.9	0.07	99.5	89	
	1230	16.70	.52	100	21.66	6.34	13.9	0.06	98.6	90	
	1235	16.71	.65	100	21.65	6.34	13.9	0.06	97.8	91	
↓	1240	16.71	.71	100	21.66	6.34	13.9	0.06	97.2	92	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**		3	40 ml glass	HCl	N		VOC

Conversions	**Stabilization Criteria**					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW15_121218	Sample Time: 1240

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GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35AWW16	Date: 12/12/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 18.26
	Total Well Depth (ft) (C): 37.55	Water Column Thickness (ft) (C-B):	Well Volume (gal) (A*(C-B)):
	Screened Interval: 22.81 - 37.51	Weather: Cloudy / Cool	Ambient PID (ppm): NA
	Pump placement: 30.16	Well Condition: Good	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/12/18	1125	18.33	.13	100	19.57	6.67	12.1	0.71	102	48	
	1130	18.39	.26	100	19.80	6.51	12.2	0.25	80.3	43	
	1135	18.42	.39	100	19.84	6.53	12.1	0.09	74.1	41	
	1140	18.44	.52	100	19.87	6.53	12.0	0.09	73.5	40	
	1145	18.45	.65	100	19.90	6.53	12.0	0.08	72.9	40	
	1150	18.45	.71	100	19.93	6.53	12.0	0.08	72.3	39	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Method	Parameter(s)
3 40 ml glass	HCl	N		VOC

Sample ID: 35AWW16_12/12/18 Sample Time: 1150

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bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AMW17	Date: 12/17/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 24.78
	Total Well Depth (ft) (C): 42.50	Water Column Thickness (ft) (C-B): 17.72	Well Volume (gal) (A*(C-B)): 2.84
	Screened Interval: 22.78 - 42.48	Weather: CLEAR/COLD	Ambient PID (ppm): NA
	Pump placement: 32.63	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/17/18	0840	24.85	.13	100	15.15	6.26	10.9	0.71	34.0	125	
	0845	24.90	.26	100	16.40	6.27	10.7	0.29	18.3	140	
	0850	24.94	.39	100	16.42	6.28	10.7	0.11	8.2	141	
	0855	24.97	.52	100	16.43	6.29	10.8	0.11	6.0	141	
	0900	24.99	.65	100	16.45	6.29	10.8	0.11	4.5	142	
	0905	25.01	.78	100	16.46	6.29	10.8	0.10	3.9	142	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AMW17-121718 Sample Time: 0905

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW18	Date: 12/17/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 25.59
	Total Well Depth (ft) (C): 42.22	Water Column Thickness (ft) (C-B): 16.63	Well Volume (gal) (A*(C-B)): 2.66
	Screened Interval: 27.48 - 42.18	Weather: CLEAR / COLD	Ambient PID (ppm): NA
	Pump placement: 34.83	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/17/18	0930	25.67	.13	100	17.04	6.43	11.00	0.55	151	41	
	0935	25.72	.26	100	17.50	6.27	10.9	0.22	114	63	
	0940	25.75	.39	100	17.58	6.27	10.9	0.08	93.6	77	
	0945	25.77	.52	100	17.65	6.28	10.9	0.08	92.8	78	
	0950	25.79	.65	100	17.71	6.28	10.9	0.09	92.0	79	
	0955	25.80	.78	100	17.77	6.28	10.9	0.08	91.5	80	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		6	40ml glass	HCl	N		VOC

Conversions	Stabilization Criteria										
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%							
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%							
	Cond	+/- 10%	ORP	+/- 10	Sample ID:	35AWW18_121718			Sample Time:	0955	

00943702

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW19	Date: 12/10/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 27.58
	Total Well Depth (ft) (C): 32.52	Water Column Thickness (ft) (C-B): 4.94	Well Volume (gal) (A*(C-B)): 0.79
	Screened Interval: 17.96 - 32.46	Weather: CLEAR / COLD	Ambient PID (ppm): NA
	Pump placement: 29.00	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/10/18	1050	27.65	.13	100	18.48	5.81	5.82	0.63	40.1	-75	
	1055	27.71	.26	100	19.75	5.92	5.77	0.25	14.6	-78	
	1100	27.75	.39	100	19.80	5.93	5.72	0.05	8.3	-74	
	1105	27.77	.52	100	19.84	5.94	5.71	0.04	6.9	-73	
	1110	27.79	.65	100	19.88	5.94	5.71	0.04	6.1	-72	
	1115	27.81	.78	100	19.93	5.94	5.70	0.04	5.2	-72	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml glass	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria				
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%	
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%	
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW19_121018 Sample Time: 1115

00943703

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW20	Date: 12/10/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 28364	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 20.03
	Total Well Depth (ft) (C): 36.15	Water Column Thickness (ft) (C-B): 16.12	Well Volume (gal) (A*(C-B)): 2.58
	Screened Interval: 21.42 - 36.12	Weather: CLEAR / COLD	Ambient PID (ppm): NA
	Pump placement: 28.77	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/10/18	0845	20.10	.13	100	16.76	6.51	7.19	0.69	45.6	-247	
	0850	20.15	.26	100	18.60	6.40	7.22	0.23	53.6	-269	
	0855	20.18	.39	100	19.89	6.23	7.15	0.08	50.1	-269	
	0900	20.20	.52	100	19.97	6.22	7.15	0.08	49.5	-269	
	0905	20.22	.65	100	20.10	6.22	7.14	0.08	48.9	-270	
	0910	20.23	.78	100	20.16	6.21	7.14	0.07	48.1	-270	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40mL GLASS	HCl	N		VOC
							MNA				

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW20-02018	Sample Time: 0910

00943704

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW21	Date: 12/13/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 32.90
	Total Well Depth (ft) (C): 42.85	Water Column Thickness (ft) (C-B): 9.95	Well Volume (gal) (A*(C-B)): 1.59
	Screened Interval: 28.14 - 42.84	Weather: Cloudy / RAIN	Ambient PID (ppm): NA
	Pump placement: 35.49	Well Condition: Good	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/13/18	1130	32.97	.13	100	19.16	5.49	2.01	0.54	69.1	252	
↓	1135	33.04	.26	100	19.55	5.08	2.12	0.25	27.8	293	
	1140	33.09	.39	100	19.56	5.02	2.11	0.08	21.2	303	
	1145	33.12	.52	100	19.57	5.01	2.11	0.07	20.5	304	
	1150	33.14	.65	100	19.58	5.00	2.11	0.07	19.8	304	
↓	1155	33.15	.78	100	19.58	5.00	2.11	0.07	19.3	304	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		9	40 ml glass	HCl	N		VOC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW21-121318	Sample Time: 1155

00943705

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GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35AWW22	Date: 12/14/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 32.72
	Total Well Depth (ft) (C): 37.92	Water Column Thickness (ft) (C-B): 5.20	Well Volume (gal) (A*(C-B)): 0.83
	Screened Interval: 23.28 - 37.78	Weather: Cloudy / cool	Ambient PID (ppm): NA
	Pump placement: 30.58	Well Condition: Good	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/14/18	0850	32.78	.13	100	17.55	6.38	8.69	0.54	29.1	180	
	0855	32.81	.26	100	17.47	6.28	8.69	0.25	15.8	189	
	0900	32.85	.39	100	17.51	6.21	8.69	0.09	9.6	193	
	0905	32.88	.52	100	17.54	6.20	8.69	0.09	7.9	195	
	0910	32.90	.65	100	17.58	6.19	8.70	0.08	7.1	196	
	0915	32.92	.78	100	17.62	6.19	8.70	0.08	6.7	197	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml glass	HCL	N		VOC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW22-121418	Sample Time: 0915

00943706

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW23	Date: 12/10/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 20.71
	Total Well Depth (ft) (C): 43.82	Water Column Thickness (ft) (C-B): 23.11	Well Volume (gal) (A*(C-B)): 3.70
	Screened Interval: 28.50 - 43.50	Weather: CLEAR / COOL	Ambient PID (ppm): NA
	Pump placement: 36.00	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO	Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
	Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/10/18	1200	20.79	.13	100	18.31	5.65	4.09	0.59	45.7	-60	
	1205	20.85	.26	100	18.47	5.60	4.08	0.29	40.6	-67	
	1210	20.89	.39	100	18.54	5.52	4.03	0.14	32.9	-77	
	1215	20.92	.52	100	18.57	5.57	4.00	0.06	32.8	-83	
	1220	20.94	.65	100	18.60	5.58	4.00	0.06	32.7	-84	
	1225	20.95	.78	100	18.63	5.59	3.99	0.05	32.6	-85	
	1230	20.95	.91	100	18.65	5.60	3.99	0.05	32.5	-86	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCL	N		VOC
							MNA				

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW23-121018	Sample Time: 1230

00943707

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW24	Date: 12/10/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba 28364	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 26.75
	Total Well Depth (ft) (C): 35.10	Water Column Thickness (ft) (C-B): 8.35	Well Volume (gal) (A*(C-B)): 1.34
	Screened Interval: 24.68 - 34.68	Weather: CLEAR / COLD	Ambient PID (ppm): NA
	Pump placement: 29.68	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/10/18	0950	26.83	.13	100	17.82	5.13	0.590	0.77	601	52	
	0955	26.89	.26	100	18.61	4.59	0.508	0.22	541	43	
	1000	26.92	.39	100	19.23	4.42	0.490	0.06	517	39	
	1005	26.94	.52	100	19.35	4.42	0.489	0.05	516	39	
	1010	26.96	.65	100	19.42	4.41	0.489	0.05	515	38	
	1015	26.98	.78	100	19.53	4.41	0.489	0.05	514	38	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**		3	40ml glass	HCL	N		VOC
							MNA				

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW24-121018 Sample Time: 1015

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW04	Date: 12/11/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 31.14
	Total Well Depth (ft) (C): 31.16	Water Column Thickness (ft) (C-B): .02	Well Volume (gal) (A*(C-B)): 0.0006
	Screened Interval: 21.14-31.14	Weather: CLEAR/COOL	Ambient PID (ppm): NA
	Pump placement: NA	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
			DRY		WELL						

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units							

Conversions	Stabilization Criteria										
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%							
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%							
	Cond	+/- 10%	ORP	+/- 10	Sample ID:				Sample Time:		

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GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: LHSmw06	Date: 12/13/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 19.18
	Total Well Depth (ft) (C): 23.55	Water Column Thickness (ft) (C-B): 4.37	Well Volume (gal) (A*(C-B)): 2.85
	Screened Interval: 13.53-23.53	Weather: Cloudy / RAIN	Ambient PID (ppm): NA
	Pump placement: 21.00	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/13/18	1035	19.25	.13	100	18.93	6.37	2.99	0.63	9.8	106	
	1040	19.30	.26	100	19.43	6.34	2.54	0.29	7.2	125	
	1045	19.33	.39	100	19.50	6.30	2.49	0.11	7.0	134	
	1050	19.35	.52	100	19.56	6.30	2.49	0.11	6.6	135	
	1055	19.37	.65	100	19.63	6.29	2.49	0.11	5.9	136	
	1100	19.38	.78	100	19.68	6.29	2.48	0.10	5.4	137	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		6	40ml glass	HCl	N		VOC
						2	60ml plastic	HNO3	N		ARSENIC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: LHSmw06_12/13/18	Sample Time: 1100

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW07	Date: 12/10/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 19.21
	Total Well Depth (ft) (C): 30.52	Water Column Thickness (ft) (C-B): 11.31	Well Volume (gal) (A*(C-B)): 7.37
	Screened Interval: 19.73 - 29.73	Weather: CLEAR/COOL	Ambient PID (ppm): NA
	Pump placement: 24.73	Well Condition: GOOD	Well Mouth PID (ppm): NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
12/10/18	1305	19.28	.13	100	18.97	6.62	10.7	0.59	18.1	-304	
	1310	19.35	.26	100	19.66	6.68	10.8	0.19	12.2	-316	
	1315	19.40	.39	100	19.87	6.70	10.8	0.03	11.9	-320	
	1320	19.43	.52	100	19.96	6.70	10.8	0.02	11.4	-322	
	1325	19.45	.65	100	20.06	6.70	10.8	0.02	10.9	-323	
	1330	19.46	.78	100	20.12	6.70	10.8	0.02	10.7	-324	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	3	40 ml glass	HCl	N		VOC
		MNA				
Sample ID: LHSMW07_12/018				Sample Time: 1330		

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GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35A WW06	Date: 3/19/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 19.50
	Total Well Depth (ft) (C): 30.38	Water Column Thickness (ft) (C-B): 10.88	2nd Depth to Water(pre-purge): 19.50
	Screened Interval: 20.50-30.50	Weather: clear/sunny	Well Volume (gal) (A*(C-B)): 7.09
	Pump placement: 25.50	Well Condition: Good	Ferrous Iron: 0.44 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/19/19	1135	19.58	.13	100	18.53	6.52	5.23	1.01	34.9	-220	
	1140	19.65	.26	100	18.59	6.48	5.13	0.63	33.1	-221	
	1145	19.69	.39	100	18.59	6.45	5.10	0.33	32.7	-227	
	1150	19.72	.52	100	18.64	6.40	5.09	0.17	32.4	-231	
	1155	19.74	.65	100	18.69	6.40	5.09	0.16	32.1	-232	
	1200	19.75	.78	100	18.73	6.39	5.09	0.16	31.9	-233	
	1205	19.75	.91	100	18.78	6.39	5.09	0.16	31.8	-234	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		6	40mL GLASS	HCl	N		VOC
						4	40 mL GLASS	HCl	N		MEE
						4	40mL AMBER	H2SO4	N		TOC
						4	40mL GLASS	NA	N		CO2
Conversions	**Stabilization Criteria**					2	250 mL PLASTIC	NA	N		ANIONS
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		2	250 mL AMBER	Phosphoric	N		VFA
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		1	1 Liter PLASTIC	NA	N		DHC/DNB
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW06_031919				Sample Time: 1205		

00943712

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GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: 35AWW11	Date: 3/19/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.16	Initial Depth to Water (ft) (B): 30.00
	Total Well Depth (ft) (C): 38.04	Water Column Thickness (ft) (C-B): 8.04	2nd Depth to Water(pre-purge): 30.00
	Screened Interval: 23.50 - 38.10	Weather: CLEAR / COLD	Well Volume (gal) (A*(C-B)): 1.29
	Pump placement: 32.00	Well Condition: GOOD	Ferrous Iron: 0.43 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/19/19	0750	30.09	.13	100	15.26	5.87	8.50	0.90	42.5	-117	
	0755	30.15	.26	100	16.84	5.87	8.86	0.39	39.4	-131	
	0800	30.20	.39	100	16.87	5.90	8.98	0.12	37.9	-140	
	0805	30.23	.52	100	16.89	5.92	8.99	0.12	37.3	-141	
	0810	30.25	.65	100	16.92	5.92	9.00	0.11	36.6	-142	
	0815	30.26	.78	100	16.95	5.92	9.00	0.11	36.2	-142	

Colorimeter Results				
Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	3	40ml Glass	HCL	N		VOC
	2	40ml GLASS	HCL	N		MEE
	2	40ml Glass	H2SO4	N		TOC
	2	40ml GLASS	NA	N		CO2
	1	200ml plastic	NA	N		ANIONS
	1	250ml Amber	PHOSPHORIC	N		VFA
	1	1 Liter Plastic	NA	N		DHC/DHB

Sample ID: 35AWW11-031919 Sample Time: 0815

00943713

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW19	Date: 3/19/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 27.00
	Total Well Depth (ft) (C): 32.47	Water Column Thickness (ft) (C-B): 5.47	2nd Depth to Water(pre-purge): 27.00
	Screened Interval: 17.96 - 32.46	Weather: CLEAR / COOL	Well Volume (gal) (A*(C-B)): 0.88
	Pump placement: 29.00	Well Condition: Needs Hinge	Ferrous Iron: 0.38 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/19/19	0945	27.09	.13	100	16.94	5.55	5.60	0.79	103	59	
	0950	27.15	.26	100	17.93	5.36	5.68	0.32	90.2	72	
	0955	27.20	.39	100	17.97	5.36	5.67	0.15	81.9	71	
	1000	27.23	.52	100	18.02	5.37	5.67	0.15	81.3	71	
	1005	27.25	.65	100	18.06	5.37	5.67	0.14	80.7	70	
	1010	27.27	.78	100	18.10	5.37	5.67	0.14	80.1	70	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type		Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40mL GLASS	HCL	N		VOC
2	40 mL GLASS	HCL	N		MEE
2	40 mL AMBER	H_2SO_4	N		TOC
2	40 mL GLASS	NA	N		CO_2
1	200 mL PLASTIC	NA	N		ANIONS
1	250 mL AMBER	PHOSPHORIC	N		VFA
1	1 LITER PLASTIC	NA	N		DHC/DHB

Sample ID: 35AWW19-031919 Sample Time: 1010

00943714

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW20	Date: 3/19/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 18.76
	Total Well Depth (ft) (C): 36.08	Water Column Thickness (ft) (C-B): 17.32	2nd Depth to Water(pre-purge): 18.76
	Screened Interval: 21.42 - 36.12	Weather: CLEAR/ SUNNY	Well Volume (gal) (A*(C-B)): 2.77
	Pump placement: 28.77	Well Condition: GOOD	Ferrous Iron: 0.17 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/19/19	1245	18.84	.13	100	21.96	6.38	7.01	0.88	28.7	-238	
	1250	18.89	.26	100	22.08	6.28	6.97	0.35	28.5	-239	
	1255	18.93	.39	100	22.05	6.26	6.94	0.21	28.0	-243	
	1300	18.96	.52	100	22.01	6.26	6.94	0.12	28.3	-245	
	1305	18.97	.65	100	21.98	6.26	6.94	0.12	28.5	-246	
	1310	18.98	.78	100	21.94	6.26	6.94	0.11	28.4	-246	
	1315	18.98	.91	100	21.90	6.26	6.94	0.11	28.1	-247	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
9	40 mL GLASS	HCL	N		VOC
6	40mL GLASS	HCL	N		MEE
6	40 mL AMBER	H2SO4	N		TOC
6	40 mL GLASS	NA	N		CO2
3	250 mL PLASTIC	NA	N		ANIONS
1	250 mL AMBER	Phosphoric	N		VFA
1	1 LITER PLASTIC	NA	N		DHC/DHB

Sample ID: 35AWW20-031919 Sample Time: 1315

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AMW24	Date: 3/19/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 26.06
	Total Well Depth (ft) (C): 35.05	Water Column Thickness (ft) (C-B): 8.99	2nd Depth to Water(pre-purge): 26.06
	Screened Interval: 24.68 - 34.68	Weather: CLEAR / COOL	Well Volume (gal) (A*(C-B)): 1.44
	Pump placement: 29.68	Well Condition: GOOD	Ferrous Iron: 1.17 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/19/19	0850	26.13	.13	100	16.11	5.17	0.595	0.87	301	127	
	0855	26.19	.26	100	17.25	4.84	0.491	0.33	244	162	
	0900	26.23	.39	100	17.38	4.80	0.486	0.09	215	157	
	0905	26.25	.52	100	17.44	4.79	0.485	0.08	214	156	
	0910	26.27	.65	100	17.50	4.79	0.485	0.09	214	155	
	0915	26.28	.78	100	17.57	4.79	0.485	0.08	213	154	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers	Volume/Type	Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40mL GLASS	HCL	N		VOC
2	40mL GLASS	HCL	N		MEE
2	40mL Amber	H2SO4	N		TOC
2	40mL GLASS	NA	N		CO2
1	200mL plastic	NA	N		Anions
1	250mL Amber	Phosphoric	N		VFA
1	1 Liter PLASTIC	NA	N		DHC/DHB

Sample ID: 35AMW24-031919 Sample Time: 0915

00943716

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GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: LHSMW07	Date: 3/19/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 18.32
	Total Well Depth (ft) (C): 30.49	Water Column Thickness (ft) (C-B): 12.17	2nd Depth to Water(pre-purge): 18.32
	Screened Interval: 19.73-29.73	Weather: CLEAR/COOL	Well Volume (gal) (A*(C-B)): 7.93
	Pump placement: 24.73	Well Condition: Good	Ferrous Iron: 0.67 mg/L

CASING INFO										
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/19/19	1040	18.40	.13	100	17.02	6.78	10.9	0.91	26.2	-266	
	1045	18.45	.26	100	17.92	6.68	11.0	0.39	27.3	-295	
	1050	18.48	.39	100	18.20	6.60	11.0	0.18	27.1	-308	
	1055	18.50	.52	100	18.28	6.59	11.0	0.17	27.3	-309	
	1100	18.51	.65	100	18.35	6.58	11.0	0.17	27.7	-310	
↓	1105	18.52	.78	100	18.41	6.57	11.0	0.17	27.5	-311	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40 mL Glass		HCl	N		VOC
2	40 mL Glass		HCl	N		MEE
2	40 mL Amber		H_2SO_4	N		TOC
2	40 mL Glass		NA	N		CO2
1	250 mL Plastic		NA	N		Anions
1	250 mL Amber		Phosphoric	N		VFA
1	1 Liter Plastic		NA	N		DHC/DHB

Sample ID: LHSMW07-031919 Sample Time: 1105

00943717

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 03WW01	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 29.45
	Total Well Depth (ft) (C): 33.43	Water Column Thickness (ft) (C-B): 3.98	2nd Depth to Water(pre-purge): 29.45
	Screened Interval: 23.43 - 33.43	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 0.64
	Pump placement: NA	Well Condition: OK	Ferrous Iron: 0.84 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	1328	~~29.45~~		NA							BAILING WELL
6/3/19	1334	33.35	.75	NA							BAILED .75 gallons LAWDY
6/4/19	0745	29.45	NA	NA	21.53	8.10	4.95	16.68	14.8	-40	

Colorimeter Results				
Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 Gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type		Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40 mL GLASS	HCL	N		VOC
2	40 mL GLASS	HCL	N		~~MEE~~ MEE
2	40 mL GLASS	NA	N		CO2
2	40 mL AMBER	H2SO4	N		TOC
1	250 mL AMBER	H3PO4	N		VFA
1	1 Liter PLASTIC	NA	N		DHC/DHB
1	125 mL PLASTIC	HNO3	N		ARSENIC

Sample ID: 03WW01-060419 Sample Time: 0745

1 250 mL PLASTIC NA N ANIONS

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW01	Date: 6/10/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 44.52
	Total Well Depth (ft) (C): 72.53	Water Column Thickness (ft) (C-B): 28.01	2nd Depth to Water(pre-purge): 44.52
	Screened Interval: 62.50 - 72.50	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): 18.26
	Pump placement: 67.50	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/10/19	0955	44.57	.13	100	24.06	8.32	0.626	1.11	60.3	32	
	1000	44.61	.26	100	23.07	7.70	0.597	0.22	56.3	47	
	1005	44.65	.39	100	23.05	7.26	0.593	0.03	52.0	68	
	1010	44.67	.52	100	23.03	7.25	0.592	0.02	51.3	69	
	1015	44.69	.65	100	23.01	7.24	0.592	0.02	50.8	70	
	1020	44.70	.78	100	23.00	7.24	0.592	0.02	50.4	71	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		9	40 ml glass	HCl	N		VOC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW01_061019	Sample Time: 1020

00943719

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW05	Date: 6/10/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 46.20
	Total Well Depth (ft) (C): 72.15	Water Column Thickness (ft) (C-B): 25.95	2nd Depth to Water(pre-purge): 46.20
	Screened Interval: 62.15 - 72.15	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): 16.92
	Pump placement: 67.15	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/10/19	1045	46.28	.13	100	24.96	5.74	2.53	1.09	36.7	30	
	1050	46.33	.26	100	24.18	5.60	2.56	0.27	36.8	50	
	1055	46.36	.39	100	24.07	5.53	2.57	0.06	36.9	64	
	1100	46.38	.52	100	23.98	5.52	2.57	0.06	37.2	65	
	1105	46.39	.65	100	23.94	5.51	2.57	0.05	37.5	66	
↓	1110	46.39	.78	100	23.89	5.50	2.57	0.05	37.8	66	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml glass	HCL	N		VOC

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW05_061019 Sample Time: 1110

00943720

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GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35H MW06	Date: 6/4/19
	Project Name: LHAAP	Project No./Phase: NW01312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 18.95
	Total Well Depth (ft) (C): 30.50	Water Column Thickness (ft) (C-B): 11.55	2nd Depth to Water(pre-purge): 18.95
	Screened Interval: 20.50 - 30.50	Weather: CLEAR/ SUNNY	Well Volume (gal) (A*(C-B)): 7.53
	Pump placement: 25.50	Well Condition: OK	Ferrous Iron: 0.65 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/4/19	1110	19.02	.13	100	23.04	6.97	5.05	0.77	49.3	-118	
	1115	19.09	.26	100	22.07	6.84	5.17	0.25	48.6	-107	
	1120	19.13	.39	100	21.49	6.63	5.16	0.07	47.4	-101	
	1125	19.16	.52	100	21.37	6.62	5.15	0.07	47.1	-100	
	1130	19.18	.65	100	21.29	6.62	5.15	0.06	46.6	-99	
	1135	19.19	.78	100	21.23	6.61	5.15	0.06	46.1	-99	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type		Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40 ml glass	HCl	N		VOC
2	40 ml glass	HCl	N		MEE
2	40 ml glass	NA	N		CO2
2	40 ml Amber	H2SO4	N		TOC
1	250 ml Amber	H3PO4	N		VFA
1	250 ml plastic	NA	N		Anions
1	1 Liter Plastic	NA	N		DHC/DNB

Sample ID: 35A MW06-060419 Sample Time: 1135

00943721

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW08	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 28.95
	Total Well Depth (ft) (C): 33.35	Water Column Thickness (ft) (C-B): 4.40	2nd Depth to Water(pre-purge): 28.95
	Screened Interval: 23.35-33.35	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 0.70
	Pump placement: NA	Well Condition: OK	Ferrous Iron: 2.03 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	1338	28.95	~~NA~~	NA							BAILING WELL
6/3/19	1343	33.28	~~1.0~~	NA							BAILED 1 GALLON RANDY
6/4/19	0820	28.95	NA	NA	22.63	8.67	9.93	10.47	86.9	-181	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml GLASS	HCl	N		VOC
						3	40 ml GLASS	HCl	N		MEE
						2	40 ml GLASS	NA	N		CO2
						2	40 ml AMBER	H2SO4	N		TOC
						1	250 ml AMBER	H3PO4	N		VFA
Conversions	**Stabilization Criteria**					1	Liter Plastic	NA	N		DHC/DHB
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		1	250 ml Plastic	NA	N		ANIONS
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%							
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW08-060419				Sample Time: 0820		
						1	125 ml plastic	HNO3	N		ARSENIC

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GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35AWW09	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): RVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 31.60
	Total Well Depth (ft) (C): 42.18	Water Column Thickness (ft) (C-B): 10.58	2nd Depth to Water(pre-purge): 31.60
	Screened Interval: 27.58 - 42.18	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 1.69
	Pump placement: 34.88	Well Condition: OK	Ferrous Iron: 1.41 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	1225	31.68	.13	100	23.88	5.55	5.93	1.63	289	184	
	1230	31.74	.26	100	23.24	5.10	6.27	1.10	229	262	
	1235	31.78	.39	100	23.18	5.02	6.22	0.97	223	269	
	1240	31.81	.52	100	23.12	5.01	6.22	0.96	222	270	
	1245	31.83	.65	100	23.07	5.01	6.21	0.95	221	271	
↓	1250	31.84	.78	100	23.02	5.01	6.21	0.94	221	272	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	3	40 mL GLASS	HCL	N		VOC
	2	40 mL GLASS	HCL	N		MEE
	2	40 mL GLASS	NA	N		CO2
	2	40 mL AMBER	H_2SO_4	N		TOC
	1	250 mL AMBER	H_3PO_4	N		VFA
	1	1 LITER PLASTIC	NA	N		DHL/DHB
	1	125 mL PLASTIC	HNO_3	N		ARSENIC
Sample ID: 35AWW09-060319				Sample Time: 1250		
	1	250 mL PLASTIC	NA	N		ANIONS

00943723

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW10	Date: 6/4/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 16.05
	Total Well Depth (ft) (C): 33.70	Water Column Thickness (ft) (C-B): 17.65	2nd Depth to Water(pre-purge): 16.05
	Screened Interval: 19.13 - 33.73	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 2.82
	Pump placement: 26.43	Well Condition: OK	Ferrous Iron: 0.10 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/4/19	1000	16.12	.13	100	24.35	5.75	0.292	1.57	24.2	206	
	1005	16.18	.26	100	24.24	5.43	0.284	1.04	28.0	223	
	1010	16.21	.39	100	24.41	5.43	0.282	0.37	21.3	230	
	1015	16.23	.52	100	24.39	5.47	0.287	0.26	16.9	237	
	1020	16.24	.65	100	24.37	5.48	0.288	0.25	16.2	238	
	1025	16.25	.78	100	24.35	5.48	0.288	0.24	15.6	239	
	1030	16.25	.91	100	24.34	5.49	0.288	0.24	15.3	240	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		6	40 ml glass	HCl	N		VOC
						4	40 ml glass	HCl	N		mag
						4	40 ml glass	NA	N		CO2
						4	40 ml AMBER	H2SO4	N		TOC
Conversions	**Stabilization Criteria**					2	250 ml AMBER	H2PO4	N		VFA
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		2	250 ml plastic	NA	N		Anions
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		1	1 Liter Plastic	NA	N		DHC/DMB
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW10-060419				Sample Time: 1030		

00943724

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: 35AMW11	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 29.27
	Total Well Depth (ft) (C): 37.90	Water Column Thickness (ft) (C-B): 8.63	2nd Depth to Water(pre-purge): 29.27
	Screened Interval: 23.50 - 38.10	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 1.38
	Pump placement: 30.80	Well Condition: OK	Ferrous Iron: 1.33 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	1125	29.35	.13	100	24.29	5.70	7.50	0.75	76.3	-138	
	1130	29.41	.26	100	23.51	5.72	7.68	0.22	58.7	-142	
	1135	29.45	.39	100	23.29	5.71	7.80	0.09	56.2	-139	
	1140	29.48	.52	100	23.20	5.70	7.80	0.10	55.7	-138	
	1145	29.50	.65	100	23.12	5.70	7.81	0.09	55.1	-137	
↓	1150	29.51	.78	100	23.03	5.70	7.81	0.09	54.6	-136	

Colorimeter Results				
Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers	Volume/Type	Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40 mL GLASS	HCl	N		VOC
2	40 mL GLASS	HCl	N		MEE
2	40 mL GLASS	NA	N		CO2
2	40 mL AMBER	H2SO4	N		TOC
1	250 mL AMBER	H3PO4	N		VFA,
1	1 Liter PLASTIC	NA	N		DHC/DHB
1	250 mL PLASTIC	NA	N		Anions

Sample ID: 35AMW11-060319 Sample Time: 1150

00943725

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A WW12	Date: 6/10/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 28.59
	Total Well Depth (ft) (C): 37.61	Water Column Thickness (ft) (C-B): 9.02	2nd Depth to Water(pre-purge): 28.59
	Screened Interval: 23.01 - 37.61	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 1.44
	Pump placement: 30.31	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/10/19	0815	28.65	.13	100	20.19	6.47	2.12	0.89	28.9	327	
	0820	28.70	.26	100	19.59	6.21	1.89	0.23	19.5	404	
	0825	28.74	.39	100	19.58	6.27	1.89	0.05	11.7	429	
	0830	28.77	.52	100	19.56	6.28	1.90	0.05	11.4	430	
	0835	28.79	.65	100	19.54	6.29	1.90	0.04	10.9	431	
↓	0840	28.81	.78	100	19.52	6.29	1.90	0.04	10.5	432	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	6	40 mL Glass	HCL	N		VOC

Sample ID: 35A-WW12-061019

Sample Time: 0840

00943726

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW13	Date: 6/7/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 23.08
	Total Well Depth (ft) (C): 40.28	Water Column Thickness (ft) (C-B): 17.20	2nd Depth to Water(pre-purge): 23.08
	Screened Interval: 25.68 - 40.28	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 2.75
	Pump placement: 32.98	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/7/19	0925	23.15	.13	100	22.20	6.23	0.956	0.89	55.5	482	
	0930	23.21	.26	100	22.48	5.84	0.989	0.24	43.2	[redacted]376	
	0935	23.25	.39	100	22.71	5.67	0.999	0.04	37.9	325	
	0940	23.27	.52	100	22.79	5.66	0.999	0.04	37.3	323	
	0945	23.29	.65	100	22.85	5.65	1.00	0.04	36.7	322	
	0950	23.30	.78	100	22.91	5.65	1.00	0.03	36.1	321	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		9	40 ml glass	HCL	N		VOC

Conversions	Stabilization Criteria										
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%							
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%							
	Cond	+/- 10%	ORP	+/- 10	Sample ID:	35AWW13.060719			Sample Time:	0950	

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW14	Date: 6/7/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 28.65
	Total Well Depth (ft) (C): 32.56	Water Column Thickness (ft) (C-B): 3.91	2nd Depth to Water(pre-purge): 28.65
	Screened Interval: 17.76 - 32.46	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): 0.63
	Pump placement: NA	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/7/19	0730	28.65		NA							Bailing well
6/7/19	0734	32.48	.75	NA							Bailed .75 gallons DRY
6/7/19	1010	28.70	NA	NA	21.57	5.62	6.33	9.62	31.7	148	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW14	Sample Time: 1010

00943728

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW15	Date: 6/7/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 17.77
	Total Well Depth (ft) (C): 41.48	Water Column Thickness (ft) (C-B): 23.71	2nd Depth to Water(pre-purge): 17.77
	Screened Interval: 26.78 - 41.48	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): 3.79
	Pump placement: 34.10	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/7/19	0750	17.85	.13	100	22.18	6.35	13.0	1.01	653	362	
	0755	17.90	.26	100	22.13	5.65	12.9	0.38	608	353	
	0800	17.94	.39	100	22.19	5.45	12.9	0.10	596	352	
	0805	17.97	.52	100	22.23	5.45	12.8	0.10	595	351	
	0810	17.99	.65	100	22.28	5.44	12.8	0.09	595	350	
↓	0815	18.00	.78	100	22.32	5.44	12.8	0.09	594	350	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

Sample ID: 35AWW15_060719 Sample Time: 0815

00943729

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW16	Date: 6/10/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 17.30
	Total Well Depth (ft) (C): 37.52	Water Column Thickness (ft) (C-B): 20.22	2nd Depth to Water(pre-purge): 17.30
	Screened Interval: 22.81-37.51	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): 3.24
	Pump placement: 30.16	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/10/19	1130	17.37	.13	100	25.11	6.13	8.81	1.09	231	48	
	1135	17.43	.26	100	24.23	5.61	9.76	0.61	197	81	
	1140	17.46	.39	100	23.49	5.45	9.80	0.24	188	88	
	1145	17.48	.52	100	23.32	5.45	9.81	0.23	187	88	
	1150	17.50	.65	100	23.21	5.44	9.81	0.23	186	89	
	1155	17.51	.78	100	23.13	5.44	9.81	0.22	185	89	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW16-061019	Sample Time: 1155

00943730

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35AWW17	Date: 6/10/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 24.28
	Total Well Depth (ft) (C): 42.48	Water Column Thickness (ft) (C-B):	2nd Depth to Water(pre-purge): 24.28
	Screened Interval: 22.78 - 42.48	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)):
	Pump placement: 32.63	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/10/19	1225	24.35	.13	100	24.73	6.01	9.59	1.07	25.8	10	
↓	1230	24.41	.26	100	21.75	5.41	8.71	0.23	17.3	45	
↓	1235	24.45	.39	100	21.42	5.30	8.41	0.07	15.9	53	
↓	1240	24.48	.52	100	21.31	5.29	8.40	0.07	15.3	54	
↓	1245	24.50	.65	100	21.17	5.29	8.39	0.06	14.8	55	
↓	1250	24.51	.78	100	21.02	5.29	8.39	0.06	14.5	55	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40 ml glass	HCL	N		VOC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW17-06/019	Sample Time: 1250

00943731

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58		Location ID: 35A WW18		Date: 6/4/19
	Project Name: LHAAP		Project No./Phase: NWO1312.0150		Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro		Water Quality Meter/ID#: U-52 Horiba		PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101		Other Equipment/ID#: NA		Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"		Other Equipment/ID#: NA		PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 24		Unit Casing Volume (gal/lin ft) (A): 0.160		Initial Depth to Water (ft) (B): 24.85
	Total Well Depth (ft) (C): 42.18		Water Column Thickness (ft) (C-B):		2nd Depth to Water(pre-purge): 24.85
	Screened Interval: 27.48 - 42.18		Weather: CLEAR / SUNNY		Well Volume (gal) (A*(C-B)):
	Pump placement: 34.83		Well Condition: OK		Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/4/19	1155	24.93	.13	100	24.74	6.09	9.48	1.01	112	54	
	1200	24.99	.26	100	22.70	5.87	9.64	0.31	87.3	78	
	1205	25.03	.39	100	22.24	5.80	9.77	0.06	79.4	93	
	1210	25.06	.52	100	22.12	5.79	9.78	0.05	78.5	94	
	1215	25.07	.65	100	22.02	5.79	9.79	0.06	77.7	94	
	1220	25.08	.78	100	21.90	5.79	9.79	0.05	77.0	95	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	3	40 ml GLASS	HCL	N		VOC
Sample ID: 35AWW18_060419				Sample Time: 1220		

00943732

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A WW19	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 26.45
	Total Well Depth (ft) (C): 32.48	Water Column Thickness (ft) (C-B): 6.03	2nd Depth to Water(pre-purge): 26.45
	Screened Interval: 17.96 - 32.46	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): 0.96
	Pump placement: 27.50	Well Condition: OK	Ferrous Iron: 0.00 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	0740	26.53	.13	100	20.29	5.67	5.57	0.95	33.1	178	
	0745	26.59	.26	100	19.99	5.69	5.52	0.32	22.9	118	
	0750	26.63	.39	100	20.00	5.69	5.48	0.06	17.8	96	
	0755	26.66	.52	100	20.01	5.69	5.47	0.06	17.4	95	
	0800	26.68	.65	100	20.02	5.69	5.46	0.05	16.9	94	
	0805	26.70	.78	100	20.03	5.69	5.46	0.05	16.6	93	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40mL glass	HCL	N		VOC
						2	40 mL glass	HCL	N		MEE
						2	40 mL glass	NA	N		CO2
						2	40 mL Amber	H2SO4	N		TOC
Conversions	**Stabilization Criteria**					1	250mL Amber	H3PO4	N		VFA
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		1	1 Liter Plastic	NA	N		DHC/DHB
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		1	250 mL Plastic	NA	N		ANIONS
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW19_060319				Sample Time: 0805		

00943733

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: 35A MW20	Date: 6/4/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 17.95
	Total Well Depth (ft) (C): 36.10	Water Column Thickness (ft) (C-B): 18.15	2nd Depth to Water(pre-purge): 17.95
	Screened Interval: 21.42 - 36.12	Weather: CLEAR/ SUNNY	Well Volume (gal) (A*(C-B)): 2.90
	Pump placement: 28.77	Well Condition: OK	Ferrous Iron: 0.09 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/4/19	0900	18.03	.13	100	23.48	7.05	6.75	1.03	55.6	-42	
	0905	18.10	.26	100	23.18	6.69	6.75	0.31	52.1	-48	
	0910	18.14	.39	100	23.17	6.65	6.78	0.11	48.9	-54	
	0915	18.17	.52	100	23.15	6.65	6.79	0.10	48.3	-55	
	0920	18.19	.65	100	23.14	6.65	6.79	0.10	47.7	-56	
	0925	18.20	.78	100	23.13	6.65	6.79	0.10	47.1	-56	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCl	N		VOC
						2	40ml glass	HCl	N		MEE
						2	40ml glass	NA	N		CO2
						2	40ml Amber	H2SO4	N		TOC
Conversions	**Stabilization Criteria**					1	250ml Amber	H3PO4	N		VFA
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		1	250 ml plastic	NA	N		Anions
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		1	1 Liter Plastic	NA	N		DHE/DHB
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AMW20-060419				Sample Time: 0925		
						1	125ml Plastic	HNO3	N		ARSENIC

00943734

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW21	Date: 6/10/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 31.38
	Total Well Depth (ft) (C): 42.84	Water Column Thickness (ft) (C-B): 11.46	2nd Depth to Water(pre-purge): 31.38
	Screened Interval: 28.14 - 48.84	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): 1.83
	Pump placement: 35.49	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/10/19	0905	31.45	.13	100	21.78	5.99	2.33	1.16	71.3	361	
	0910	31.51	.26	100	21.46	5.87	2.33	0.26	62.5	384	
	0915	31.55	.39	100	21.45	5.47	2.32	0.07	50.9	375	
	0920	31.58	.52	100	21.44	5.46	2.32	0.06	50.4	374	
	0925	31.60	.65	100	21.43	5.46	2.32	0.07	49.8	374	
	0930	31.61	.78	100	21.42	5.46	2.32	0.06	49.2	373	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		6	40 ml glass	HCL	N		VOC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW21_061019	Sample Time: 0930

00943735

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AMW22	Date: 6/10/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 32.40
	Total Well Depth (ft) (C): 37.78	Water Column Thickness (ft) (C-B): 5.38	2nd Depth to Water(pre-purge): 32.40
	Screened Interval: 23.28 - 37.78	Weather: CLEAR / Sunny	Well Volume (gal) (A*(C-B)): 0.86
	Pump placement: ~~30-35~~ 34.50	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/10/19	0725	32.48	.13	100	21.37	6.51	8.28	0.81	25.6	312	
	0730	32.55	.26	100	20.41	6.35	8.43	0.41	19.9	364	
	0735	32.61	.39	100	20.17	6.36	8.45	0.24	14.5	386	
	0740	32.65	.52	100	20.08	6.37	8.46	0.23	14.1	388	
	0745	32.68	.65	100	19.96	6.37	8.46	0.23	13.7	389	
	0750	32.70	.78	100	19.86	6.37	8.46	0.22	13.0	390	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	3	40ml glass	HCl	N		VOC
Sample ID: 35AMW22-06/10/19				Sample Time: 0750		

00943736

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A WW23	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 23.97
	Total Well Depth (ft) (C): 43.75	Water Column Thickness (ft) (C-B): 19.78	2nd Depth to Water(pre-purge): 23.97
	Screened Interval: 28.50 - 43.50	Weather: Clear / Sunny	Well Volume (gal) (A*(C-B)): 3.16
	Pump placement: 36.00	Well Condition: OK	Ferrous Iron: 0.52 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	0935	24.04	.13	100	21.28	5.97	4.75	0.83	61.3	-62	
	0940	24.10	.26	100	20.95	5.80	4.73	0.25	52.1	-54	
	0945	24.14	.39	100	20.87	5.76	4.84	0.03	49.2	-51	
	0950	24.16	.52	100	20.79	5.75	4.85	0.03	48.6	-50	
	0955	24.18	.65	100	20.70	5.75	4.86	0.03	48.1	-50	
	1000	24.19	.78	100	20.63	5.74	4.86	0.02	47.7	-50	

Colorimeter Results				
Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type		Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40 ml glass	HCL	N		VOC
2	40 ml glass	HCL	N		MEE
2	40 ml glass	NA	N		CO2
2	40 mL Amber	H2SO4	N		TOC
1	250 ml Amber	H3PO4	N		VFA
1	1 Liter Plastic	NA	N		DHC/DHB
1	250 mL plastic	NA	N		ANIONS

Sample ID: 35A WW23 - 060319 Sample Time: 1000

00943737

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW24	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 25.47
	Total Well Depth (ft) (C): 35.05	Water Column Thickness (ft) (C-B): 9.58	2nd Depth to Water(pre-purge): 25.47
	Screened Interval: 24.68 - 34.68	Weather: CLEAR/ SUNNY	Well Volume (gal) (A*(C-B)): 1.53
	Pump placement: 29.68	Well Condition: OK	Ferrous Iron: 1.17 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	1030	25.55	.13	100	21.71	5.41	0.579	1.06	119	276	
	1035	25.61	.26	100	21.14	4.77	0.577	0.37	83.5	334	
	1040	25.65	.39	100	20.92	4.55	0.575	0.07	75.9	345	
	1045	25.68	.52	100	20.86	4.54	0.574	0.06	75.3	346	
	1050	25.70	.65	100	20.80	4.53	0.574	0.06	74.7	346	
	1055	25.72	.78	100	20.75	4.53	0.574	0.06	74.0	347	

Colorimeter Results				
Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40 ml glass		HCl	N		VOC
2	40 ml glass		HCl	N		MEK
2	40 ml glass		NA	N		CO2
2	40 ml Amber		H2SO4	N		TOC
1	250 ml Amber		H3PO4	N		VFA
1	1 Liter Plastic		NA	N		DHC/DHB
1	250 ml Plastic		NA	N		ANIONS

Sample ID: 35AWW24-060319 Sample Time: 1055

00943738

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSmw04	Date: 6/4/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): DRY
	Total Well Depth (ft) (C): 31.14	Water Column Thickness (ft) (C-B): NA	2nd Depth to Water(pre-purge): DRY
	Screened Interval: 21.14-31.14	Weather: CLEAR/SUNNY	Well Volume (gal) (A*(C-B)): NA
	Pump placement: NA	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)

DRY WELL

Colorimeter Results				
Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type	Preserv.	Filter (Y/N)	Method	Parameter(s)
Sample ID:		Sample Time:		

00943739

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: LHSMW06	Date: 6/7/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 16.93
	Total Well Depth (ft) (C): 23.53	Water Column Thickness (ft) (C-B): 6.60	2nd Depth to Water(pre-purge): 16.93
	Screened Interval: 13.53 - 23.53	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 4.30
	Pump placement: 18.53	Well Condition: OK	Ferrous Iron: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/7/19	0835	17.00	.13	100	19.50	6.01	1.90	0.75	133	440	
	0840	17.06	.26	100	19.12	5.63	1.80	0.31	120	542	
	0845	17.10	.39	100	19.10	5.42	1.80	0.09	113	565	
	0850	17.13	.52	100	19.07	5.41	1.80	0.08	112	566	
	0855	17.15	.65	100	19.05	5.40	1.80	0.09	111	567	
↓	0900	17.17	.78	100	19.03	5.40	1.80	0.08	111	568	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40ml glass	HCL	N		VOC
						1	125ml plastic	HNO3	N		ARSENIC

Conversions	Stabilization Criteria					
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		
	Cond	+/- 10%	ORP	+/- 10	Sample ID: LHSMW06-060719	Sample Time: 0900

00943740

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GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: LHSmw07	Date: 6/3/19
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 17.68
	Total Well Depth (ft) (C): 30.49	Water Column Thickness (ft) (C-B): 12.81	2nd Depth to Water(pre-purge): 17.68
	Screened Interval: 19.73 - 29.73	Weather: CLEAR / SUNNY	Well Volume (gal) (A*(C-B)): 8.35
	Pump placement: 24.73	Well Condition: OK	Ferrous Iron: 0.25 mg/L

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
6/3/19	0835	17.75	.13	100	21.60	6.69	10.4	0.91	26.3	-97	
	0840	17.80	.26	100	21.40	6.42	10.4	0.22	23.0	-88	
	0845	17.84	.39	100	21.45	6.28	10.4	0.08	19.0	-94	
	0850	17.87	.52	100	21.48	6.27	10.4	0.08	18.6	-95	
	0855	17.89	.65	100	21.51	6.27	10.4	0.07	18.0	-96	
	0900	17.90	.78	100	21.54	6.27	10.4	0.07	17.5	-96	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		3	40mL GLASS	HCL	N		VOC
						2	40mL GLASS	HCL	N		MEG
						2	40 mL GLASS	NA	N		CO2
						2	40 mL AMBER	H2SO4	N		TOC
Conversions	Stabilization Criteria					1	250 ml AMBER	H3PO4	N		VFA
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%		1	1 LITER PLASTIC	NA	N		DHC/DHB
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%		1	250 ml plastic	NA	N		Anions
	Cond	+/- 10%	ORP	+/- 10	Sample ID: LHSmw07-060319				Sample Time: 0900		

APPENDIX D
TECHNICAL MEMORANDUM - MONITORED NATURAL ATTENUATION MONITORING PARAMETERS

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DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

February 26, 2019

DAIM-ODB-LO

Mr. Rich Mayer
U.S. Environmental Protection Agency
Federal Facilities Section R6
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Technical Memorandum – Monitored Natural Attenuation Monitoring Parameters, Longhorn Army Ammunition Plant, Karnack, Texas, February 2019

Dear Mr. Mayer,

One hard copy and one compact disc (CD) of the above-referenced document is being transmitted to you for your records. Comments, not requiring revisions, were received on the Draft version of the document from Environmental Protection Agency (EPA) and from Texas Commission on Environmental Quality (TCEQ) on February 15, 2019.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
A. Palmie, TCEQ, Austin, TX (1 HC and 1 CD)
P. Bruckwicki, Caddo Lake NWR, TX (1 HC and 1 CD)
A. Williams, USACE, Fort Worth District, TX (1 CD)
A. Maly, USAEC, San Antonio, TX (1 CD)
K. Nemmers, Bhate, Lakewood, CO (1 HC and 1 CD)
P. Srivastav, APTIM, Houston, TX (letter)

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

February 26, 2019

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Technical Memorandum – Monitored Natural Attenuation Monitoring Parameters, Longhorn Army Ammunition Plant, Karnack, Texas, February 2019

Dear Ms. Palmie,

One hard copy and one compact disc (CD) of the above-referenced document is being transmitted to you for your records. Comments, not requiring revisions, were received on the Draft version of the document from Environmental Protection Agency (EPA) and from Texas Commission on Environmental Quality (TCEQ) on February 15, 2019.

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The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX (1 HC and 1 CD)
P. Bruckwicki, Caddo Lake NWR, TX (1 HC and 1 CD)
A. Williams, USACE, Fort Worth District, TX (1 CD)
A. Maly, USAEC, San Antonio, TX (1 CD)
K. Nemmers, Bhate, Lakewood, CO (1 HC and 1 CD)
P. Srivastav, APTIM, Houston, TX (letter)

Final
Technical Memorandum – Monitored Natural Attenuation Monitoring Parameters
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared for U.S. Army Corps of Engineers, Tulsa District
Contracting Division
2488 East 81st Street
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Prepared by

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Contract No. W9128F-13-D-0012
Task Order No. W9128BV17F0150
Project No. 501032
Rev 0
February 2019

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Acronyms and Abbreviations

APTIM	Aptim Federal Services, LLC
LHAAP	Longhorn Army Ammunition Plant
LUC	land use controls
MNA	monitored natural attenuation
RACR	Remedial Action Completion Report
RA-O	Remedial Action Operation
RAWP	Remedial Action Work Plan
TCE	trichloroethene

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Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Final • Rev 0 • February 2019

1.0 INTRODUCTION

The purpose of this Technical Memorandum is to create a standard list of monitored natural attenuation (MNA) parameters across Longhorn Army Ammunition Plant (LHAAP) sites and eliminate analysis that are either redundant or not useful for the evaluation of MNA effectiveness. MNA with land use controls (LUCs) is the selected remedy to remediate trichloroethene (TCE) plumes in the groundwater at sites LHAAP-37, LHAAP-67, LHAAP-50, LHAAP-46, and LHAAP-58. On **Table 1**, each site and the three documents, Remedial Action Work Plan (RAWP), Remedial Action Completion Report (RACR), and Remedial Action Operation (RA-O), are listed and cross-referenced with the MNA parameters cited in each document.

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2.0 CURRENT REMEDIAL ACTION OPERATION (RA-O) MONITORING

Currently the list of MNA analytical parameters inclusive of all the sites includes anions (sulfate, sulfide, nitrate, nitrite, and chloride), methane, ethane, ethene, carbon dioxide, total iron, dissolved iron (ferrous) conducted in the lab and in the field, dissolved manganese, total phosphorus, alkalinity, total organic and inorganic carbon as shown on **Table 1**. Some of these analyses are redundant or are not required for the evaluation of MNA at LHAAP sites.

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3.0 PROPOSED PATH FORWARD

The proposed path is to optimize the MNA analytical list so that it is consistent across all sites. The optimization of analytical list will make the sampling and evaluation more accurate and efficient. The optimization includes eliminating MNA parameters that are redundant or nonessential, including alkalinity, nitrite, sulfide, total inorganic carbon, total iron, the lab analysis for dissolved iron and dissolved manganese, and total phosphorous.

Rationale for eliminating these parameters is as follows:

- Alkalinity is used as an indicator of microbial growth, because it is affected by microbial respiration off gases like carbon dioxide. Since alkalinity is affected by carbon dioxide, which is currently being analyzed, it is recommended that alkalinity be removed from the analytical list.
- Nitrate and sulfate concentrations at LHAAP sites are below levels that may inhibit reductive dechlorination, and therefore the reduced states of these chemicals, nitrite and sulfide, are not expected to be observed, and are recommended to be removed from the analytical list. Nitrate and sulfate will remain on analytical list to evaluate increased levels that may inhibit biological reactions in the future.
- Total organic carbon is essential for the MNA analysis; however, total inorganic carbon does not provide useful data and is recommended to be removed from the analytical list.
- The analysis for ferrous iron is being conducted in the field during sample collection and provides the most representative data to determine if iron reducing conditions are present in the groundwater. Total iron analysis for groundwater includes both solid (ferric) and dissolved (ferrous) forms of iron and does not provide useful data in the evaluation of MNA. Therefore, it is recommended that the lab analysis for total iron, and dissolved iron be removed from the analytical list. The field analysis for ferrous iron will remain on the on the analytical list.
- Dissolved manganese is also used to evaluate the reduced state in groundwater, like dissolved iron. The dissolved manganese analysis is redundant, because field analysis for dissolved iron is being retained, and recommended be removed from the analytical list.
- Total phosphorus does not provide essential data the analysis of MNA and is recommended for removal from the analytical list.

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The proposed list of analysis which are consistent across each site include nitrate, sulfate, chloride, methane, ethane, ethene, carbon dioxide, total organic carbon, and field analyzed ferrous iron and is provided on **Table 2**.

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4.0 CONCLUSION

Currently, each of the sites where MNA and LUC are the selected remedy, there is a different list and some of the analyses are redundant or not useful. It is recommended that the following analyses are removed from the MNA parameter list for all sites: alkalinity, nitrite, sulfide, total inorganic carbon, total iron, lab analyzed ferrous iron, dissolved manganese, and total phosphorus. The updated list includes nitrate, sulfate, chloride, methane, ethane, ethene, carbon dioxide, total organic carbon, and field analyzed ferrous iron. The recommended list of parameters will remove redundancy and create more consistent evaluations of the MNA processes in the future.

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Tables

Table 1
MNA Parameter and LHAAP Site Comparison

	LHAAP-37			LHAAP-67			LHAAP-50			LHAAP-46			LHAAP-58		
MNA Parameter	RAWP	RACR	RA-O	RAWP	RACR	RA-O	RAWP	RACR	RA-O	RAWP	RACR	RA-O	RAWP	RACR	RA-O
Alkalinity							x	x	x	x	x	x	x	x	x
Nitrate	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Nitrite		x		x	x	x	x	x	x	x	x	x	x	x	x
Sulfate	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Sulfide		x				x	x	x	x	x	x	x	x	x	x
Chloride	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Methane	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Ethane	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Ethene	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Carbon Dioxide						x	x	x	x	x	x	x	x	x	x
Total Organic Carbon	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Total Inorganic Carbon	x	x		x	x	x									
Iron (dissolved) -field	x	x		x	x	x									x
Iron (dissolved) -lab							x	x	x	x	x	x	x	x	x
Total Iron							x	x	x	x	x	x	x	x	x
Manganese (dissolved)							x	x	x	x	x	x	x	x	x
Total Iron							x	x	x	x	x	x	x	x	x
Total Phosphorous							x	x	x	x	x	x	x	x	x

Notes:

LHAAP-37 RA-O does not list MNA parameters because the Y1Q1 report has not been finalized.

LHAAP - Longhorn Army Ammunition Plant

MNA - monitored natural attenuation

RAWP - Remedial Action Work Plan

RACR - Remedial Action Completion Report

RA-O - Remedial Action Operation

Table 2
Proposed LHAAP MNA Parameters

MNA Parameter	LHAAP-37	LHAAP-67	LHAAP-50	LHAAP-46	LHAAP-58
Nitrate	X	X	X	X	X
Sulfate	X	X	X	X	X
Chloride	X	X	X	X	X
Methane	X	X	X	X	X
Ethane	X	X	X	X	X
Ethene	X	X	X	X	X
Carbon Dioxide	X	X	X	X	X
Total Organic Carbon	X	X	X	X	X
Iron (dissolved) -field	X	X	X	X	X

Notes:

MNA - monitored natural attenuation

LHAAP - Longhorn Army Ammunition Plant

APPENDIX E
LABORATORY ANALYTICAL RESULTS
(PROVIDED ON CD)

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QUARTERLY CONTROL SUMMARY REPORT
LHAAP-58 SEPTEMBER 2018
WEST PLUME QUARTERLY SAMPLING EVENT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

October 2018

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

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Table 1: Field Sample Identification and Laboratory Packages
Table 2: Qualified Analytical Data
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1 INTRODUCTION

Bhate reviewed two data packages from ALS Environmental, Houston, Texas with the analyses for ferrous iron and volatile fatty acids subcontracted to ALS Rochester, NY; the analyses of dissolved gases to ALS Simi Valley, CA; and the analyses of total organic carbon to ALS Kelso, WA. The dechlorinating bacteria analysis was subcontracted to Microbial Insights in Knoxville, TN. Groundwater samples were collected on September 26-27, 2018, from Site LHAAP-58 at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [United States Environmental Protection Agency] *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the *Final Basewide Uniform Federal Policy (UFP) – Quality Assurance Project Plan (QAPP) Longhorn Army Ammunition Plant* (Bhate, May 2018).

1.1 Intended Use of Data

The objective of sampling at LHAAP-58 in September 2018 was to complete a western plume quarterly event.

Analyses performed include:

- SM2320B – Alkalinity
- E365.3 – Phosphorus
- RSK-175 – Dissolved Gases
- E415.1/SM5310C – Total Organic Carbon
- SW8260C - Volatile Organic Compounds (VOCs)
- SM3500Fe - Ferrous Iron
- SW6020A – Total and Dissolved Metals (Iron and Manganese)
- SW9056A – Anions (chloride, nitrate, nitrite, and sulfate)
- E376.1 – Sulfide
- High Performance Liquid Chromatography (HPLC)-METACIDS – Volatile Fatty Acids (VFAs)
- CENSUS – Dechlorinating Bacteria (dehalococcoides [DHC]/dehalobacter [DHB])

Table 1 lists the sample identification (ID) numbers and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample ID data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time with the following exception.

- The analysis for ferrous iron was outside the requisite 24-hour hold time and all results were qualified as estimated, "J".

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range.

1.3.1 Continuing Calibration Verifications

The calibrations must meet the following criteria otherwise the compound is qualified as J or UJ: the continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and 50% for closing CCVs. Metals and general chemistry - 10%D; VFAs, dissolved gases, and TOC - 15%D.

The CCV for all compounds were within control limits.

1.4 Blanks

If the analyte result for an associated sample was less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, that result was qualified "UB" and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5X the amount in the blank, no qualifier was applied.

No compounds were qualified due to blank contamination.

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

No surrogates were reported outside control limits.

1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD recoveries were evaluated using limits defined in the project-specific QAPP Worksheet 15.

1.6.1 VFAs

The LCS and LCSD recoveries of pyruvic acid (147%/148%) were above control limits. Only associated sample 35AWW06_092618 reported a detection and was qualified as estimated, "J".

1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)

MS/MSD recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4X the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data.

1.7.1 SW8260

The MS and MSD recoveries for bromomethane were below control limits in the spike samples 35AWW24_092718 (30.4%/37.3%) and 35WW06_092618 (21.2%/28.8%). Bromomethane was qualified as estimated non-detected, "UJ". Chloroethane reported MS and MSD recoveries above control limits but required no qualification as the compound was not detected in the spike sample (35AWW06_092618).

1.7.2 SW6020

The MS and MSD recoveries for dissolved iron (42%/24.8%) and dissolved manganese (60.6%/57.3%) were below control limits in the spiked sample 35AWW24_092718. The MS and MSD recoveries for total iron (156%/161%) were above control limits in the above mentioned parent sample. These compounds were qualified as estimated, "J".

1.7.3 SW376.1

The MS recovery of sulfide (78.4%) was slightly below control limits in spike sample 35AWW06_092618. This compound was qualified as estimated, "J".

1.7.4 RSK-175

Methane (63%/28%), ethane (63%/66%), and ethane (60%/59%) all reported MS and MSD recoveries below control limits in spike sample 35AWW06_092618. These compounds were qualified estimated "J/UJ".

1.7.5 VFAs

The MS and MSD recoveries for pyruvic acid (139%/139%) were above control limits in spike sample 35AWW06_092618 and was qualified estimated "J".

1.8 Internal Standards

If the percent recovery (%R) for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the errant internal standard(s).

Internal standards were within acceptance criteria for the associated compounds.

1.9 Field Precision

Precision is the measure of variability of individual sample measurements. Evaluation of field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater matrices.

All detected compounds were within RPD control limits.

2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (see Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package/ID	SM2320B	E365.3	E415.1/SM5310C	SW6020A	SW8260C	HPLC-METACIDS	SW9056A	RSK-175	SM3500Fe	E376.1	CENSUS
35AWW06_092618	HS18091438	X	X	X	X	X	X	X	X	X	X	X
35AWW11_092718	HS18091510	X	X	X	X	X	X	X	X	X	X	X
35AWW19_092718	HS18091510	X	X	X	X	X	X	X	X	X	X	X
35AWW20_092618	HS18091438	X	X	X	X	X	X	X	X	X	X	X
35AWW20_092618-a	HS18091438	X	X	X	X	X	X	X	X	X	X	X
35AWW24_092718	HS18091510	X	X	X	X	X	X	X	X	X	X	X
LHSMW07_092618	HS18091438	X	X	X	X	X	X	X	X	X	X	X

Notes:
MW – Monitoring Well
SM – Standard Method
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.
E – USEPA Method
HS - Houston

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier	Reason for Qualification
35AWW06_092618	HS18091438	Ferrous Iron (mg/L) Bromomethane (µg/L) Sulfide (mg/L) Methane (µg/L) Ethane (µg/L) Ethene (µg/L) Pyruvic acid (mg/L)	27.8 J < 0.5 UJ 1.96 J 3.0 J < 0.47 UJ < 0.55 UJ 0.20 J	HT MS/MSD < MS < MS/MSD < MS/MSD < MS/MSD < MS/MSD >/LCS/LCSD >
35AWW11_092718	HS18091510	Ferrous Iron (mg/L)	36.5 J	HT
35AWW19_092718	HS18091510	Ferrous Iron (mg/L)	3.99 J	HT
35AWW20_092618	HS18091438	Ferrous Iron (mg/L)	1.38 J	HT
35AWW20_092618-a	HS18091438	Ferrous Iron (mg/L)	1.41 J	HT
35AWW24_092718	HS18091510	Ferrous Iron (mg/L) Bromomethane (µg/L) Dissolved Iron (mg/L) Dissolved Manganese (mg/L) Total Iron (mg/L)	0.31 J < 0.5 UJ 6.55 J 0.127 J 1.06 J	HT MS/MSD < MS/MSD < MS/MSD < MS/MSD >

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier	Reason for Qualification
LHSMW07_092618	HS18091438	Ferrous Iron (mg/L)	0.93 J	HT

Notes:
mg/L – milligrams per liter
µg/L – micrograms per liter
J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ – The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
MS/MSD >/<– Matrix spike/duplicate recoveries above/below control limits
LCS/LCSD > – Laboratory control sample/duplicate recoveries above control limits
HT – exceeded recommended hold time

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
SM2320B	0	100
E365.3	0	100
E415.1/SM5310C	0	100
SW6020A	0	100
SW8260C	0	100
HPLC-METACIDS	0	100
SW9056A	0	100
RSK-175	0	100
SM3500Fe	0	100
E376.1	0	100
CENSUS	0	100

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October 12, 2018

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS18091438**

Laboratory Results for: **LHAAP-58**

Dear Marcia,

ALS Environmental received 5 sample(s) on Sep 27, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

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ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18091438

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18091438-01	35AWW06_092618	Groundwater		26-Sep-2018 09:20	27-Sep-2018 08:50	☐
HS18091438-02	35AWW20_092618	Groundwater		26-Sep-2018 11:15	27-Sep-2018 08:50	☐
HS18091438-03	35AWW20_092618_a	Groundwater		26-Sep-2018 11:15	27-Sep-2018 08:50	☐
HS18091438-04	LHSMW07_092618	Groundwater		26-Sep-2018 12:30	27-Sep-2018 08:50	☐
HS18091438-05	Trip Blank	Water	ALS 071918-82	26-Sep-2018 12:30	27-Sep-2018 08:50	☐

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP-58
Work Order: HS18091438

Work Order Comments

- The analyses for RSK-175 Dissolved Gases and CO2 were subcontracted to ALS Environmental in Simi Valley, CA. Final Report attached.

  The analyses for Ferrous Iron and Volatile Fatty Acids were subcontracted to ALS Environmental in Rochester, NY. Final Report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

  The analyses for DHC/DHB were subcontracted to Microbial Insights in Knoxville, TN. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R324990

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R324965

Sample ID: 35AWW06_092618 (HS18091438-01MS)

- MS/MSD failed QC limits for Bromomethane , Chloroethane due to suspect matrix. effect

Sample ID: 35AWW06_092618 (HS18091438-01MSD)

- The RPD between the MS and MSD was outside of the control limit for Chloroethane

Metals by Method SW6020

Batch ID: 132985

Sample ID: 35AWW06_092618 (HS18091438-01MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Manganese.

Sample ID: 35AWW06_092618 (HS18091438-01MSD)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Iron.

Sample ID: 35AWW06_092618 (HS18091438-01PDS)

- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Manganese.

Batch ID: 132987

Sample ID: 35AWW06_092618 (HS18091438-01MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Manganese.

Sample ID: 35AWW06_092618 (HS18091438-01PDS)

- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Manganese.

WetChemistry by Method E376.1

Batch ID: R324851

Sample ID: 35AWW06_092618 (HS18091438-01MS)

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18091438

CASE NARRATIVE

WetChemistry by Method E376.1

Batch ID: R324851

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

WetChemistry by Method SW9056

Batch ID: R324594

Sample ID: 35AWW06_092618 (HS18091438-01MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Chloride)

Sample ID: HS18091510-01MS

- MS and MSD are for an unrelated sample (Chloride)

Batch ID: R324811

Sample ID: HS18100126-01MS

- MS and MSD are for an unrelated sample (Sulfate)

WetChemistry by Method SM2320B

Batch ID: R324424

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: 133178

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_092618
Collection Date: 26-Sep-2018 09:20

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
2-Butanone	**210**		**0.50**	**1.0**	**2.0**	**ug/L**	1	08-Oct-2018 14:44
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
2-Hexanone	**1.7**	J	**1.0**	**1.0**	**2.0**	**ug/L**	1	08-Oct-2018 14:44
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	08-Oct-2018 14:44
Acetone	**6,600**		**20**	**100**	**100**	**ug/L**	50	09-Oct-2018 02:35
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Carbon disulfide	**2.6**		**0.60**	**1.0**	**2.0**	**ug/L**	1	08-Oct-2018 14:44
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_092618
Collection Date: 26-Sep-2018 09:20

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 14:44
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	08-Oct-2018 14:44
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:44
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:44
Surr: 1,2-Dichloroethane-d4	*96.0*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2018 14:44*
Surr: 1,2-Dichloroethane-d4	*93.8*			**0**	*81-118*	*%REC*	*50*	*09-Oct-2018 02:35*
Surr: 4-Bromofluorobenzene	*94.0*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2018 14:44*
Surr: 4-Bromofluorobenzene	*99.5*			**0**	*85-114*	*%REC*	*50*	*09-Oct-2018 02:35*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2018 14:44*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*50*	*09-Oct-2018 02:35*
Surr: Toluene-d8	*97.7*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2018 14:44*
Surr: Toluene-d8	*92.6*			**0**	*89-112*	*%REC*	*50*	*09-Oct-2018 02:35*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**27.9**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 12:53
Manganese	**9.44**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:29
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**26.5**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 12:29
Manganese	**9.26**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_092618
Collection Date: 26-Sep-2018 09:20

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 04-Oct-2018		Analyst: MZD
Phosphorus, Total (As P)	**2.67**		**0.200**	**0.250**	**0.500**	**mg/L**	10	04-Oct-2018 14:35
SULFIDE BY E376.1		**Method:E376.1**						Analyst: KVL
Sulfide	**1.96**		**1.00**	**1.00**	**1.00**	**mg/L**	1	03-Oct-2018 11:45
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**775**		**5.00**	**5.00**	**5.00**	**mg/L**	1	29-Sep-2018 10:39
ANIONS BY SW9056A		**Method:SW9056**						Analyst: AJH
Chloride	**910**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Sep-2018 04:24
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 04:09
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 04:09
Sulfate	**508**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Sep-2018 04:24
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Oct-2018 15:10
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2018 09:37
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Oct-2018 09:58
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_092618
Collection Date: 26-Sep-2018 11:15

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,1,2-Trichloroethane	**48**		**0.30**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
1,1-Dichloroethane	**200**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
1,1-Dichloroethene	**1,100**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Oct-2018 19:46
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,2-Dichlorobenzene	**10**		**0.50**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
1,2-Dichloroethane	**14**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 15:10
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	08-Oct-2018 15:10
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	08-Oct-2018 15:10
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Oct-2018 03:49
Benzene	**3.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	08-Oct-2018 15:10
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_092618
Collection Date: 26-Sep-2018 11:15

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
cis-1,2-Dichloroethene	**45**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 15:10
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	08-Oct-2018 15:10
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:10
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Tetrachloroethene	**0.81**	J	**0.30**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
trans-1,2-Dichloroethene	**1.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Trichloroethene	**170**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:10
Surr: 1,2-Dichloroethane-d4	*93.2*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2018 15:10*
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*10*	*08-Oct-2018 19:46*
Surr: 1,2-Dichloroethane-d4	*96.1*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2018 03:49*
Surr: 4-Bromofluorobenzene	*93.3*			**0**	*85-114*	*%REC*	*10*	*08-Oct-2018 19:46*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2018 15:10*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2018 03:49*
Surr: Dibromofluoromethane	*91.8*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2018 15:10*
Surr: Dibromofluoromethane	*86.8*			**0**	*80-119*	*%REC*	*10*	*08-Oct-2018 19:46*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2018 03:49*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*10*	*08-Oct-2018 19:46*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2018 15:10*
Surr: Toluene-d8	*92.5*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2018 03:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_092618
Collection Date: 26-Sep-2018 11:15

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**1.40**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 13:03
Manganese	**6.23**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:39
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**1.33**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 12:39
Manganese	**6.00**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:23
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 04-Oct-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.144**		**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	04-Oct-2018 14:35
SULFIDE BY E376.1		**Method:E376.1**						Analyst: KVL
Sulfide	**17.0**		**1.00**	**1.00**	**1.00**	**mg/L**	1	03-Oct-2018 11:45
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,450**		**5.00**	**5.00**	**5.00**	**mg/L**	1	29-Sep-2018 10:58
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,220**		**4.00**	**10.0**	**10.0**	**mg/L**	20	04-Oct-2018 20:43
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 06:20
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 06:20
Sulfate	**922**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Sep-2018 05:08
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Oct-2018 15:10
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2018 09:37
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Oct-2018 09:58
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_092618_a
Collection Date: 26-Sep-2018 11:15

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,1,2-Trichloroethane	**44**		**0.30**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
1,1-Dichloroethane	**170**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
1,1-Dichloroethene	**970**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Oct-2018 20:11
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,2-Dichlorobenzene	**9.3**		**0.50**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
1,2-Dichloroethane	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 15:35
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	08-Oct-2018 15:35
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	08-Oct-2018 15:35
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Oct-2018 04:14
Benzene	**2.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	08-Oct-2018 15:35
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18091438
Sample ID: 35AWW20_092618_a Lab ID:HS18091438-03
Collection Date: 26-Sep-2018 11:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
cis-1,2-Dichloroethene	**40**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 15:35
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	08-Oct-2018 15:35
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 15:35
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Tetrachloroethene	**0.71**	J	**0.30**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
trans-1,2-Dichloroethene	**1.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Trichloroethene	**150**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 15:35
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 15:35
Surr: 1,2-Dichloroethane-d4	*93.6*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2018 15:35*
Surr: 1,2-Dichloroethane-d4	*90.1*			**0**	*81-118*	*%REC*	*10*	*08-Oct-2018 20:11*
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2018 04:14*
Surr: 4-Bromofluorobenzene	*92.3*			**0**	*85-114*	*%REC*	*10*	*08-Oct-2018 20:11*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2018 15:35*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2018 04:14*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2018 15:35*
Surr: Dibromofluoromethane	*87.5*			**0**	*80-119*	*%REC*	*10*	*08-Oct-2018 20:11*
Surr: Dibromofluoromethane	*98.5*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2018 04:14*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2018 15:35*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*10*	*08-Oct-2018 20:11*
Surr: Toluene-d8	*92.9*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2018 04:14*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_092618_a
Collection Date: 26-Sep-2018 11:15

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**1.49**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 13:05
Manganese	**6.15**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:41
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**1.41**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 12:41
Manganese	**6.26**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:25
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 04-Oct-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.192**		**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	04-Oct-2018 14:35
SULFIDE BY E376.1		**Method:E376.1**						Analyst: KVL
Sulfide	**13.0**		**1.00**	**1.00**	**1.00**	**mg/L**	1	03-Oct-2018 11:45
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,470**		**5.00**	**5.00**	**5.00**	**mg/L**	1	29-Sep-2018 11:08
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,220**		**4.00**	**10.0**	**10.0**	**mg/L**	20	04-Oct-2018 20:57
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 06:35
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 06:35
Sulfate	**894**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Sep-2018 05:22
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Oct-2018 15:10
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2018 09:37
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Oct-2018 09:58
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_092618
Collection Date: 26-Sep-2018 12:30

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,1,2-Trichloroethane	**0.73**	J	**0.30**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 18:06
1,1-Dichloroethane	**11**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 18:06
1,1-Dichloroethene	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 18:06
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,2-Dichloroethane	**0.92**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 18:06
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
2-Butanone	**5.3**		**0.50**	**1.0**	**2.0**	**ug/L**	1	08-Oct-2018 18:06
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	08-Oct-2018 18:06
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	08-Oct-2018 18:06
Acetone	**12**		**0.40**	**2.0**	**2.0**	**ug/L**	1	09-Oct-2018 04:38
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	08-Oct-2018 18:06
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_092618
Collection Date: 26-Sep-2018 12:30

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
cis-1,2-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 18:06
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 18:06
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	08-Oct-2018 18:06
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 18:06
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Trichloroethene	**2.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Oct-2018 18:06
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 18:06
Surr: 1,2-Dichloroethane-d4	*88.7*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2018 18:06*
Surr: 1,2-Dichloroethane-d4	*98.1*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2018 04:38*
Surr: 4-Bromofluorobenzene	*92.8*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2018 18:06*
Surr: 4-Bromofluorobenzene	*99.8*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2018 04:38*
Surr: Dibromofluoromethane	*89.7*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2018 18:06*
Surr: Dibromofluoromethane	*99.6*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2018 04:38*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2018 18:06*
Surr: Toluene-d8	*93.1*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2018 04:38*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**1.78**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 13:07
Manganese	**9.50**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:43
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 28-Sep-2018		Analyst: JDE
Iron	**1.85**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	04-Oct-2018 12:43
Manganese	**9.56**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	04-Oct-2018 14:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_092618
Collection Date: 26-Sep-2018 12:30

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 04-Oct-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.331**		**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	04-Oct-2018 14:35
SULFIDE BY E376.1		**Method:E376.1**						Analyst: KVL
Sulfide	**26.0**		**1.00**	**1.00**	**1.00**	**mg/L**	1	03-Oct-2018 11:45
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**2,060**		**5.00**	**5.00**	**5.00**	**mg/L**	1	29-Sep-2018 11:21
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**2,180**		**10.0**	**25.0**	**25.0**	**mg/L**	50	04-Oct-2018 21:12
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 07:04
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 07:04
Sulfate	**1,120**		**10.0**	**25.0**	**25.0**	**mg/L**	50	04-Oct-2018 21:12
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Oct-2018 15:10
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2018 09:37
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Oct-2018 09:58
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 26-Sep-2018 12:30

ANALYTICAL REPORT
WorkOrder:HS18091438
Lab ID:HS18091438-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 14:19
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	08-Oct-2018 14:19
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	08-Oct-2018 14:19
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Oct-2018 02:08
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	08-Oct-2018 14:19
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18091438
Sample ID: Trip Blank Lab ID:HS18091438-05
Collection Date: 26-Sep-2018 12:30 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	08-Oct-2018 14:19
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	08-Oct-2018 14:19
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	08-Oct-2018 14:19
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Oct-2018 14:19
Surr: 1,2-Dichloroethane-d4	*95.7*			**0**	*81-118*	*%REC*	*1*	*08-Oct-2018 14:19*
Surr: 1,2-Dichloroethane-d4	*96.3*			**0**	*81-118*	*%REC*	*1*	*09-Oct-2018 02:08*
Surr: 4-Bromofluorobenzene	*93.9*			**0**	*85-114*	*%REC*	*1*	*08-Oct-2018 14:19*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*85-114*	*%REC*	*1*	*09-Oct-2018 02:08*
Surr: Dibromofluoromethane	*89.0*			**0**	*80-119*	*%REC*	*1*	*08-Oct-2018 14:19*
Surr: Dibromofluoromethane	*98.5*			**0**	*80-119*	*%REC*	*1*	*09-Oct-2018 02:08*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*08-Oct-2018 14:19*
Surr: Toluene-d8	*92.7*			**0**	*89-112*	*%REC*	*1*	*09-Oct-2018 02:08*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

Batch ID: 132985 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18091438-01	1	10	10 (mL)	1
HS18091438-02	1	10	10 (mL)	1
HS18091438-03	1	10	10 (mL)	1
HS18091438-04	1	10	10 (mL)	1

Batch ID: 132987 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18091438-01	1	10	10 (mL)	1
HS18091438-02	1	10	10 (mL)	1
HS18091438-03	1	10	10 (mL)	1
HS18091438-04	1	10	10 (mL)	1

Batch ID: 133178 **Method:** PHOSPHORUS BY E365.3 **Prep:** P_TW_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18091438-01	1	50	50 (mL)	1
HS18091438-02	1	50	50 (mL)	1
HS18091438-03	1	50	50 (mL)	1
HS18091438-04	1	50	50 (mL)	1

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 132985	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20		28 Sep 2018 14:00	04 Oct 2018 14:29	10
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20		28 Sep 2018 14:00	04 Oct 2018 12:53	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15		28 Sep 2018 14:00	04 Oct 2018 14:39	10
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15		28 Sep 2018 14:00	04 Oct 2018 13:03	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15		28 Sep 2018 14:00	04 Oct 2018 14:41	10
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15		28 Sep 2018 14:00	04 Oct 2018 13:05	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30		28 Sep 2018 14:00	04 Oct 2018 14:43	10
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30		28 Sep 2018 14:00	04 Oct 2018 13:07	1
Batch ID 132987	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20		28 Sep 2018 13:00	04 Oct 2018 14:17	10
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20		28 Sep 2018 13:00	04 Oct 2018 12:29	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15		28 Sep 2018 13:00	04 Oct 2018 14:23	10
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15		28 Sep 2018 13:00	04 Oct 2018 12:39	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15		28 Sep 2018 13:00	04 Oct 2018 14:25	10
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15		28 Sep 2018 13:00	04 Oct 2018 12:41	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30		28 Sep 2018 13:00	04 Oct 2018 14:27	10
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30		28 Sep 2018 13:00	04 Oct 2018 12:43	1
Batch ID 133178	**Test Name :** PHOSPHORUS BY E365.3			**Matrix:** Groundwater		
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20		04 Oct 2018 09:30	04 Oct 2018 14:35	10
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15		04 Oct 2018 09:30	04 Oct 2018 14:35	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15		04 Oct 2018 09:30	04 Oct 2018 14:35	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30		04 Oct 2018 09:30	04 Oct 2018 14:35	1
Batch ID R324424	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			29 Sep 2018 10:39	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			29 Sep 2018 10:58	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			29 Sep 2018 11:08	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			29 Sep 2018 11:21	1
Batch ID R324594	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			28 Sep 2018 04:24	10
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			28 Sep 2018 04:09	2
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			28 Sep 2018 06:20	2
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			28 Sep 2018 05:08	10
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			28 Sep 2018 06:35	2
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			28 Sep 2018 05:22	10
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			28 Sep 2018 07:04	2

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58 **DATES REPORT**
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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R324652	**Test Name :** SUBCONTRACT ANALYSIS - DHC/DHB				**Matrix:** Groundwater	
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			03 Oct 2018 15:10	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			03 Oct 2018 15:10	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			03 Oct 2018 15:10	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			03 Oct 2018 15:10	1
Batch ID R324680	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			04 Oct 2018 09:37	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			04 Oct 2018 09:37	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			04 Oct 2018 09:37	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			04 Oct 2018 09:37	1
Batch ID R324811	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			04 Oct 2018 20:43	20
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			04 Oct 2018 20:57	20
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			04 Oct 2018 21:12	50
Batch ID R324851	**Test Name :** SULFIDE BY E376.1				**Matrix:** Groundwater	
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			03 Oct 2018 11:45	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			03 Oct 2018 11:45	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			03 Oct 2018 11:45	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			03 Oct 2018 11:45	1
Batch ID R324965	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS18091438-05	Trip Blank	26 Sep 2018 12:30			08 Oct 2018 14:19	1
Batch ID R324965	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			08 Oct 2018 14:44	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			08 Oct 2018 19:46	10
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			08 Oct 2018 15:10	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			08 Oct 2018 20:11	10
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			08 Oct 2018 15:35	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			08 Oct 2018 18:06	1
Batch ID R324990	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS18091438-05	Trip Blank	26 Sep 2018 12:30			09 Oct 2018 02:08	1
Batch ID R324990	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			09 Oct 2018 02:35	50
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			09 Oct 2018 03:49	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			09 Oct 2018 04:14	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			09 Oct 2018 04:38	1

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DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R325206	**Test Name :** SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS				**Matrix:** Groundwater	
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			11 Oct 2018 12:51	1
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			11 Oct 2018 12:51	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			11 Oct 2018 12:51	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			11 Oct 2018 12:51	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			11 Oct 2018 12:51	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			11 Oct 2018 12:51	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			11 Oct 2018 12:51	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			11 Oct 2018 12:51	1
Batch ID R325282	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS18091438-01	35AWW06_092618	26 Sep 2018 09:20			12 Oct 2018 09:58	1
HS18091438-02	35AWW20_092618	26 Sep 2018 11:15			12 Oct 2018 09:58	1
HS18091438-03	35AWW20_092618_a	26 Sep 2018 11:15			12 Oct 2018 09:58	1
HS18091438-04	LHSMW07_092618	26 Sep 2018 12:30			12 Oct 2018 09:58	1

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: 132985 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-132985** Units: **mg/L** Analysis Date: **04-Oct-2018 12:50**
Client ID: Run ID: **ICPMS05_324696** SeqNo: **4754447** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.002139	0.00500								J

LCS Sample ID: **LCS-132985** Units: **mg/L** Analysis Date: **04-Oct-2018 12:52**
Client ID: Run ID: **ICPMS05_324696** SeqNo: **4754448** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.021	0.200	5	0	100	80 - 120				
Manganese	0.049	0.00500	0.05	0	98.0	80 - 120				

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **04-Oct-2018 12:57**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754451** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	32.15	0.200	5	27.87	85.7	80 - 120				O
Manganese	9.47	0.00500	0.05	9.533	-127	80 - 120				SEO

MSD Sample ID: **HS18091438-01MSD** Units: **mg/L** Analysis Date: **04-Oct-2018 12:59**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754452** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	31.84	0.200	5	27.87	79.4	80 - 120	32.15	0.976	20	SO
Manganese	9.401	0.00500	0.05	9.533	-265	80 - 120	9.47	0.735	20	SEO

PDS Sample ID: **HS18091438-01PDS** Units: **mg/L** Analysis Date: **04-Oct-2018 13:01**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754453** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	37.57	0.200	10	27.87	97.1	75 - 125				

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QC BATCH REPORT

Batch ID: 132985 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18091438-01PDS** Units: **mg/L** Analysis Date: **04-Oct-2018 14:33**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754492** PrepDate: **28-Sep-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	9.523	0.0500	1	9.436	8.72	75 - 125				SO

SD Sample ID: **HS18091438-01SD** Units: **mg/L** Analysis Date: **04-Oct-2018 12:55**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754450** PrepDate: **28-Sep-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	28.2	1.00					27.87	1.2	10	

SD Sample ID: **HS18091438-01SD** Units: **mg/L** Analysis Date: **04-Oct-2018 14:31**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754491** PrepDate: **28-Sep-2018** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Manganese	8.687	0.250					9.436	7.94	10	

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
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QC BATCH REPORT

Batch ID: 132987 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-132987** Units: **mg/L** Analysis Date: **04-Oct-2018 12:25**
Client ID: Run ID: **ICPMS05_324696** SeqNo: **4754435** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.002007	0.00500								J

LCS Sample ID: **LCS-132987** Units: **mg/L** Analysis Date: **04-Oct-2018 12:27**
Client ID: Run ID: **ICPMS05_324696** SeqNo: **4754436** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.12	0.200	5	0	102	80 - 120				
Manganese	0.0504	0.00500	0.05	0	101	80 - 120				

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **04-Oct-2018 12:33**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754439** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	32.5	0.200	5	26.51	120	75 - 125				O
Manganese	9.976	0.00500	0.05	9.696	561	75 - 125				SEO

MSD Sample ID: **HS18091438-01MSD** Units: **mg/L** Analysis Date: **04-Oct-2018 12:35**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754440** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	32.38	0.200	5	26.51	117	75 - 125	32.5	0.363	20	O
Manganese	9.971	0.00500	0.05	9.696	550	75 - 125	9.976	0.0521	20	SEO

PDS Sample ID: **HS18091438-01PDS** Units: **mg/L** Analysis Date: **04-Oct-2018 12:37**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754441** PrepDate: **28-Sep-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	37.18	0.200	10	26.51	107	75 - 125				

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Client: Bhate Environmental Associates, Inc.
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QC BATCH REPORT

Batch ID: 132987 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18091438-01PDS** Units: **mg/L** Analysis Date: **04-Oct-2018 14:21**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754486** PrepDate: **28-Sep-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	9.865	0.0500	1	9.257	60.8	75 - 125				SO

SD Sample ID: **HS18091438-01SD** Units: **mg/L** Analysis Date: **04-Oct-2018 12:31**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754438** PrepDate: **28-Sep-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	27.36	1.00					26.51	3.22	10	

SD Sample ID: **HS18091438-01SD** Units: **mg/L** Analysis Date: **04-Oct-2018 14:19**
Client ID: **35AWW06_092618** Run ID: **ICPMS05_324696** SeqNo: **4754485** PrepDate: **28-Sep-2018** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Manganese	8.988	0.250					9.257	2.9	10	

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04

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QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181008** Units: **ug/L** Analysis Date: **08-Oct-2018 13:54**
Client ID: Run ID: **VOA9_324965** SeqNo: **4762554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
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QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181008** Units: **ug/L** Analysis Date: **08-Oct-2018 13:54**
Client ID: Run ID: **VOA9_324965** SeqNo: **4762554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	0.50	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.98*	*1.0*	*50*	*0*	*96.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.78*	*1.0*	*50*	*0*	*93.6*	*85 - 114*				
Surr: Dibromofluoromethane	*44.64*	*1.0*	*50*	*0*	*89.3*	*80 - 119*				
Surr: Toluene-d8	*54.2*	*1.0*	*50*	*0*	*108*	*89 - 112*				

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-181008** Units: **ug/L** Analysis Date: **08-Oct-2018 13:04**
Client ID: Run ID: **VOA9_324965** SeqNo: **4762553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.03	1.0	20	0	95.1	78 - 124				
1,1,1-Trichloroethane	17.09	1.0	20	0	85.4	74 - 131				
1,1,2,2-Tetrachloroethane	21.06	1.0	20	0	105	71 - 121				
1,1,2-Trichloroethane	20.65	1.0	20	0	103	80 - 119				
1,1-Dichloroethane	19.24	1.0	20	0	96.2	77 - 125				
1,1-Dichloroethene	18.85	1.0	20	0	94.3	71 - 131				
1,1-Dichloropropene	19.88	1.0	20	0	99.4	78 - 125				
1,2,3-Trichlorobenzene	20.49	1.0	20	0	102	69 - 129				
1,2,3-Trichloropropane	19.62	1.0	20	0	98.1	73 - 122				
1,2,4-Trichlorobenzene	20.21	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	19.96	1.0	20	0	99.8	76 - 124				
1,2-Dibromo-3-chloropropane	16.99	1.0	20	0	85.0	62 - 128				
1,2-Dibromoethane	19.9	1.0	20	0	99.5	77 - 121				
1,2-Dichlorobenzene	20.65	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	20.12	1.0	20	0	101	73 - 128				
1,2-Dichloropropane	20.64	1.0	20	0	103	78 - 122				
1,3,5-Trimethylbenzene	19.81	1.0	20	0	99.0	75 - 124				
1,3-Dichlorobenzene	20.74	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	20.6	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	20.83	1.0	20	0	104	79 - 118				
2,2-Dichloropropane	18.03	1.0	20	0	90.1	60 - 139				
2-Butanone	40.96	2.0	40	0	102	56 - 143				
2-Chlorotoluene	20.25	1.0	20	0	101	79 - 122				
2-Hexanone	40.72	2.0	40	0	102	57 - 139				
4-Chlorotoluene	20.45	1.0	20	0	102	78 - 122				
4-Isopropyltoluene	20.03	1.0	20	0	100	77 - 127				
4-Methyl-2-pentanone	39.98	2.0	40	0	100.0	67 - 130				
Benzene	20.76	1.0	20	0	104	79 - 120				
Bromobenzene	19.19	1.0	20	0	95.9	80 - 120				
Bromochloromethane	19.95	1.0	20	0	99.8	78 - 123				
Bromodichloromethane	18.4	1.0	20	0	92.0	79 - 125				
Bromoform	15.98	1.0	20	0	79.9	66 - 130				
Bromomethane	18.48	1.0	20	0	92.4	53 - 141				
Carbon disulfide	48.72	2.0	40	0	122	64 - 133				

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-181008** Units: **ug/L** Analysis Date: **08-Oct-2018 13:04**
Client ID: Run ID: **VOA9_324965** SeqNo: **4762553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon tetrachloride	18.12	1.0	20	0	90.6	72 - 136				
Chlorobenzene	19.97	1.0	20	0	99.8	82 - 118				
Chloroethane	21.15	1.0	20	0	106	60 - 138				
Chloroform	18.85	1.0	20	0	94.3	79 - 124				
Chloromethane	19.67	1.0	20	0	98.3	50 - 139				
cis-1,2-Dichloroethene	18.54	1.0	20	0	92.7	78 - 123				
cis-1,3-Dichloropropene	18.57	1.0	20	0	92.8	75 - 124				
Dibromochloromethane	18.45	1.0	20	0	92.3	74 - 126				
Dibromomethane	19.43	1.0	20	0	97.1	79 - 123				
Dichlorodifluoromethane	22.85	1.0	20	0	114	32 - 152				
Ethylbenzene	19.12	1.0	20	0	95.6	79 - 121				
Hexachlorobutadiene	22.21	1.0	20	0	111	66 - 134				
Isopropylbenzene	19.46	1.0	20	0	97.3	72 - 131				
m,p-Xylene	39	2.0	40	0	97.5	80 - 121				
Methylene chloride	20.81	2.0	20	0	104	74 - 124				
Naphthalene	19.45	1.0	20	0	97.2	61 - 128				
n-Butylbenzene	20.58	1.0	20	0	103	75 - 128				
n-Propylbenzene	20.26	1.0	20	0	101	76 - 126				
o-Xylene	19.35	1.0	20	0	96.7	78 - 122				
sec-Butylbenzene	20	1.0	20	0	100	77 - 126				
Styrene	19.93	1.0	20	0	99.6	78 - 123				
tert-Butylbenzene	20.77	1.0	20	0	104	78 - 124				
Tetrachloroethene	19.2	1.0	20	0	96.0	74 - 129				
Toluene	20.68	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	19.24	1.0	20	0	96.2	75 - 124				
trans-1,3-Dichloropropene	18.29	1.0	20	0	91.4	73 - 127				
Trichloroethene	18.92	1.0	20	0	94.6	79 - 123				
Trichlorofluoromethane	18.51	1.0	20	0	92.6	65 - 141				
Vinyl chloride	20.07	1.0	20	0	100	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.23*	*1.0*	*50*	*0*	*92.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*46.69*	*1.0*	*50*	*0*	*93.4*	*80 - 119*				
Surr: Toluene-d8	*53.96*	*1.0*	*50*	*0*	*108*	*89 - 112*				

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18091438-01MS** Units: **ug/L** Analysis Date: **08-Oct-2018 16:25**
Client ID: **35AWW06_092618** Run ID: **VOA9_324965** SeqNo: **4762559** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.21	1.0	20	0	101	78 - 124				
1,1,1-Trichloroethane	17.01	1.0	20	0	85.1	74 - 131				
1,1,2,2-Tetrachloroethane	21.49	1.0	20	0	107	71 - 121				
1,1,2-Trichloroethane	19.4	1.0	20	0	97.0	80 - 119				
1,1-Dichloroethane	19.1	1.0	20	0	95.5	77 - 125				
1,1-Dichloroethene	20.51	1.0	20	0	103	71 - 131				
1,1-Dichloropropene	19.67	1.0	20	0	98.3	78 - 125				
1,2,3-Trichlorobenzene	17.67	1.0	20	0	88.3	69 - 129				
1,2,3-Trichloropropane	20.24	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	17.35	1.0	20	0	86.7	69 - 130				
1,2,4-Trimethylbenzene	19.39	1.0	20	0	97.0	76 - 124				
1,2-Dibromo-3-chloropropane	19.61	1.0	20	0	98.0	62 - 128				
1,2-Dibromoethane	19.77	1.0	20	0	98.8	77 - 121				
1,2-Dichlorobenzene	20.1	1.0	20	0	100	80 - 119				
1,2-Dichloroethane	20.85	1.0	20	0	104	73 - 128				
1,2-Dichloropropane	21.59	1.0	20	0	108	78 - 122				
1,3,5-Trimethylbenzene	18.31	1.0	20	0	91.5	75 - 124				
1,3-Dichlorobenzene	20.06	1.0	20	0	100	80 - 119				
1,3-Dichloropropane	19.59	1.0	20	0	97.9	80 - 119				
1,4-Dichlorobenzene	20.17	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	16.82	1.0	20	0	84.1	60 - 139				
2-Butanone	241.1	2.0	40	210.6	76.1	56 - 143				O
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122				
2-Hexanone	41.1	2.0	40	1.745	98.4	57 - 139				
4-Chlorotoluene	19.72	1.0	20	0	98.6	78 - 122				
4-Isopropyltoluene	17.51	1.0	20	0	87.5	77 - 127				
4-Methyl-2-pentanone	37.97	2.0	40	0	94.9	67 - 130				
Benzene	21.27	1.0	20	0	106	79 - 120				
Bromobenzene	19.27	1.0	20	0	96.3	80 - 120				
Bromochloromethane	17.71	1.0	20	0	88.5	78 - 123				
Bromodichloromethane	19.07	1.0	20	0	95.3	79 - 125				
Bromoform	16.6	1.0	20	0	83.0	66 - 130				
Bromomethane	4.24	1.0	20	0	21.2	53 - 141				S
Carbon disulfide	42.59	2.0	40	2.559	100	64 - 133				

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18091438-01MS** Units: **ug/L** Analysis Date: **08-Oct-2018 16:25**
Client ID: **35AWW06_092618** Run ID: **VOA9_324965** SeqNo: **4762559** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon tetrachloride	18.37	1.0	20	0	91.8	72 - 136				
Chlorobenzene	20.46	1.0	20	0	102	82 - 118				
Chloroethane	99.92	1.0	20	0	500	60 - 138				S
Chloroform	18.91	1.0	20	0	94.5	79 - 124				
Chloromethane	14.71	1.0	20	0	73.6	50 - 139				
cis-1,2-Dichloroethene	18.83	1.0	20	0	94.1	78 - 123				
cis-1,3-Dichloropropene	18.95	1.0	20	0	94.8	75 - 124				
Dibromochloromethane	18.59	1.0	20	0	92.9	74 - 126				
Dibromomethane	20.42	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	18.8	1.0	20	0	94.0	32 - 152				
Ethylbenzene	19.54	1.0	20	0	97.7	79 - 121				
Hexachlorobutadiene	14.32	1.0	20	0	71.6	66 - 134				
Isopropylbenzene	18.41	1.0	20	0	92.1	72 - 131				
m,p-Xylene	38.55	2.0	40	0	96.4	80 - 121				
Methylene chloride	20.49	2.0	20	0	102	74 - 124				
Naphthalene	20.67	1.0	20	0	103	61 - 128				
n-Butylbenzene	16.59	1.0	20	0	82.9	75 - 128				
n-Propylbenzene	19.17	1.0	20	0	95.8	76 - 126				
o-Xylene	19.1	1.0	20	0	95.5	78 - 122				
sec-Butylbenzene	17.05	1.0	20	0	85.3	77 - 126				
Styrene	19.51	1.0	20	0	97.5	78 - 123				
tert-Butylbenzene	18.78	1.0	20	0	93.9	78 - 124				
Tetrachloroethene	18.2	1.0	20	0	91.0	74 - 129				
Toluene	19.57	1.0	20	0	97.8	80 - 121				
trans-1,2-Dichloroethene	19.07	1.0	20	0	95.3	75 - 124				
trans-1,3-Dichloropropene	20.14	1.0	20	0	101	73 - 127				
Trichloroethene	20.51	1.0	20	0	103	79 - 123				
Trichlorofluoromethane	17.57	1.0	20	0	87.9	65 - 141				
Vinyl chloride	18.17	1.0	20	0	90.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.58*	*1.0*	*50*	*0*	*91.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.36*	*1.0*	*50*	*0*	*96.7*	*85 - 114*				
Surr: Dibromofluoromethane	*45.94*	*1.0*	*50*	*0*	*91.9*	*80 - 119*				
Surr: Toluene-d8	*48.88*	*1.0*	*50*	*0*	*97.8*	*89 - 112*				

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18091438-01MSD** Units: **ug/L** Analysis Date: **08-Oct-2018 16:50**
Client ID: **35AWW06_092618** Run ID: **VOA9_324965** SeqNo: **4762560** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.57	1.0	20	0	103	78 - 124	20.21	1.76	20	
1,1,1-Trichloroethane	17.43	1.0	20	0	87.2	74 - 131	17.01	2.43	20	
1,1,2,2-Tetrachloroethane	21.84	1.0	20	0	109	71 - 121	21.49	1.64	20	
1,1,2-Trichloroethane	19.7	1.0	20	0	98.5	80 - 119	19.4	1.53	20	
1,1-Dichloroethane	19.37	1.0	20	0	96.9	77 - 125	19.1	1.39	20	
1,1-Dichloroethene	19.4	1.0	20	0	97.0	71 - 131	20.51	5.55	20	
1,1-Dichloropropene	19.74	1.0	20	0	98.7	78 - 125	19.67	0.338	20	
1,2,3-Trichlorobenzene	18.47	1.0	20	0	92.3	69 - 129	17.67	4.41	20	
1,2,3-Trichloropropane	20.21	1.0	20	0	101	73 - 122	20.24	0.11	20	
1,2,4-Trichlorobenzene	18.38	1.0	20	0	91.9	69 - 130	17.35	5.79	20	
1,2,4-Trimethylbenzene	19.7	1.0	20	0	98.5	76 - 124	19.39	1.59	20	
1,2-Dibromo-3-chloropropane	19.75	1.0	20	0	98.7	62 - 128	19.61	0.722	20	
1,2-Dibromoethane	20.39	1.0	20	0	102	77 - 121	19.77	3.1	20	
1,2-Dichlorobenzene	20.63	1.0	20	0	103	80 - 119	20.1	2.61	20	
1,2-Dichloroethane	20.49	1.0	20	0	102	73 - 128	20.85	1.72	20	
1,2-Dichloropropane	21.52	1.0	20	0	108	78 - 122	21.59	0.319	20	
1,3,5-Trimethylbenzene	18.58	1.0	20	0	92.9	75 - 124	18.31	1.47	20	
1,3-Dichlorobenzene	20.51	1.0	20	0	103	80 - 119	20.06	2.22	20	
1,3-Dichloropropane	19.97	1.0	20	0	99.9	80 - 119	19.59	1.95	20	
1,4-Dichlorobenzene	20.42	1.0	20	0	102	79 - 118	20.17	1.24	20	
2,2-Dichloropropane	17.29	1.0	20	0	86.4	60 - 139	16.82	2.75	20	
2-Butanone	241.6	2.0	40	210.6	77.4	56 - 143	241.1	0.209	20	O
2-Chlorotoluene	19.73	1.0	20	0	98.7	79 - 122	19.58	0.774	20	
2-Hexanone	40.99	2.0	40	1.745	98.1	57 - 139	41.1	0.272	20	
4-Chlorotoluene	19.89	1.0	20	0	99.4	78 - 122	19.72	0.858	20	
4-Isopropyltoluene	17.78	1.0	20	0	88.9	77 - 127	17.51	1.55	20	
4-Methyl-2-pentanone	38.76	2.0	40	0	96.9	67 - 130	37.97	2.07	20	
Benzene	21.28	1.0	20	0	106	79 - 120	21.27	0.0405	20	
Bromobenzene	19.64	1.0	20	0	98.2	80 - 120	19.27	1.9	20	
Bromochloromethane	18.42	1.0	20	0	92.1	78 - 123	17.71	3.97	20	
Bromodichloromethane	18.8	1.0	20	0	94.0	79 - 125	19.07	1.4	20	
Bromoform	16.92	1.0	20	0	84.6	66 - 130	16.6	1.91	20	
Bromomethane	5.765	1.0	20	0	28.8	53 - 141	4.24	30.5	20	SR
Carbon disulfide	51.73	2.0	40	2.559	123	64 - 133	42.59	19.4	20	

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324965 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18091438-01MSD** Units: **ug/L** Analysis Date: **08-Oct-2018 16:50**
Client ID: **35AWW06_092618** Run ID: **VOA9_324965** SeqNo: **4762560** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon tetrachloride	18.42	1.0	20	0	92.1	72 - 136	18.37	0.285	20	
Chlorobenzene	20.62	1.0	20	0	103	82 - 118	20.46	0.771	20	
Chloroethane	75.02	1.0	20	0	375	60 - 138	99.92	28.5	20	SR
Chloroform	19.15	1.0	20	0	95.8	79 - 124	18.91	1.3	20	
Chloromethane	13.95	1.0	20	0	69.8	50 - 139	14.71	5.3	20	
cis-1,2-Dichloroethene	19.29	1.0	20	0	96.4	78 - 123	18.83	2.41	20	
cis-1,3-Dichloropropene	19.48	1.0	20	0	97.4	75 - 124	18.95	2.74	20	
Dibromochloromethane	18.75	1.0	20	0	93.7	74 - 126	18.59	0.871	20	
Dibromomethane	20.71	1.0	20	0	104	79 - 123	20.42	1.39	20	
Dichlorodifluoromethane	18.22	1.0	20	0	91.1	32 - 152	18.8	3.14	20	
Ethylbenzene	19.73	1.0	20	0	98.6	79 - 121	19.54	0.965	20	
Hexachlorobutadiene	14.68	1.0	20	0	73.4	66 - 134	14.32	2.53	20	
Isopropylbenzene	18.4	1.0	20	0	92.0	72 - 131	18.41	0.0918	20	
m,p-Xylene	39.14	2.0	40	0	97.9	80 - 121	38.55	1.54	20	
Methylene chloride	20.37	2.0	20	0	102	74 - 124	20.49	0.602	20	
Naphthalene	21.58	1.0	20	0	108	61 - 128	20.67	4.32	20	
n-Butylbenzene	16.87	1.0	20	0	84.4	75 - 128	16.59	1.71	20	
n-Propylbenzene	19.43	1.0	20	0	97.2	76 - 126	19.17	1.38	20	
o-Xylene	19.49	1.0	20	0	97.4	78 - 122	19.1	2.01	20	
sec-Butylbenzene	17.3	1.0	20	0	86.5	77 - 126	17.05	1.42	20	
Styrene	19.88	1.0	20	0	99.4	78 - 123	19.51	1.91	20	
tert-Butylbenzene	18.95	1.0	20	0	94.8	78 - 124	18.78	0.915	20	
Tetrachloroethene	18.61	1.0	20	0	93.0	74 - 129	18.2	2.23	20	
Toluene	19.57	1.0	20	0	97.8	80 - 121	19.57	0.00995	20	
trans-1,2-Dichloroethene	19.04	1.0	20	0	95.2	75 - 124	19.07	0.127	20	
trans-1,3-Dichloropropene	20.66	1.0	20	0	103	73 - 127	20.14	2.57	20	
Trichloroethene	20.01	1.0	20	0	100	79 - 123	20.51	2.46	20	
Trichlorofluoromethane	16.67	1.0	20	0	83.3	65 - 141	17.57	5.27	20	
Vinyl chloride	17.51	1.0	20	0	87.5	58 - 137	18.17	3.7	20	
Surr: 1,2-Dichloroethane-d4	*44.68*	*1.0*	*50*	*0*	*89.4*	*81 - 118*	*45.58*	*2*	*20*	
Surr: 4-Bromofluorobenzene	*48.27*	*1.0*	*50*	*0*	*96.5*	*85 - 114*	*48.36*	*0.184*	*20*	
Surr: Dibromofluoromethane	*46.24*	*1.0*	*50*	*0*	*92.5*	*80 - 119*	*45.94*	*0.658*	*20*	
Surr: Toluene-d8	*49.15*	*1.0*	*50*	*0*	*98.3*	*89 - 112*	*48.88*	*0.553*	*20*	

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04 HS18091438-05

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324990 **Instrument: VOA2** **Method: SW8260**

MBLK Sample ID: **VBLKW-181008** Units: **ug/L** Analysis Date: **09-Oct-2018 00:55**
Client ID: Run ID: **VOA2_324990** SeqNo: **4763226** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetone	2.0	2.0								U
Surr: 1,2-Dichloroethane-d4	*45.85*	*1.0*	*50*	*0*	*91.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.72*	*1.0*	*50*	*0*	*97.4*	*85 - 114*				
Surr: Dibromofluoromethane	*48.68*	*1.0*	*50*	*0*	*97.4*	*80 - 119*				
Surr: Toluene-d8	*47.19*	*1.0*	*50*	*0*	*94.4*	*89 - 112*				

LCS Sample ID: **VLCSW-181008** Units: **ug/L** Analysis Date: **09-Oct-2018 00:30**
Client ID: Run ID: **VOA2_324990** SeqNo: **4763225** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetone	44.42	2.0	40	0	111	39 - 160				
Surr: 1,2-Dichloroethane-d4	*47.84*	*1.0*	*50*	*0*	*95.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*46.88*	*1.0*	*50*	*0*	*93.8*	*80 - 119*				
Surr: Toluene-d8	*45.36*	*1.0*	*50*	*0*	*90.7*	*89 - 112*				

MS Sample ID: **HS18091438-01MS** Units: **ug/L** Analysis Date: **09-Oct-2018 03:00**
Client ID: **35AWW06_092618** Run ID: **VOA2_324990** SeqNo: **4763229** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetone	8489	100	2000	6605	94.2	39 - 160				
Surr: 1,2-Dichloroethane-d4	*2434*	*50*	*2500*	*0*	*97.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*2576*	*50*	*2500*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*2398*	*50*	*2500*	*0*	*95.9*	*80 - 119*				
Surr: Toluene-d8	*2283*	*50*	*2500*	*0*	*91.3*	*89 - 112*				

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324990 **Instrument: VOA2** **Method: SW8260**

MSD Sample ID: **HS18091438-01MSD** Units: **ug/L** Analysis Date: **09-Oct-2018 03:24**
Client ID: **35AWW06_092618** Run ID: **VOA2_324990** SeqNo: **4763230** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetone	8547	100	2000	6605	97.1	39 - 160	8489	0.68	20	
Surr: 1,2-Dichloroethane-d4	*2424*	*50*	*2500*	*0*	*97.0*	*81 - 118*	*2434*	*0.394*	*20*	
Surr: 4-Bromofluorobenzene	*2596*	*50*	*2500*	*0*	*104*	*85 - 114*	*2576*	*0.784*	*20*	
Surr: Dibromofluoromethane	*2406*	*50*	*2500*	*0*	*96.3*	*80 - 119*	*2398*	*0.328*	*20*	
Surr: Toluene-d8	*2277*	*50*	*2500*	*0*	*91.1*	*89 - 112*	*2283*	*0.285*	*20*	

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04 HS18091438-05

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: 133178 **Instrument: UV-2450** **Method: E365.3**

MBLK Sample ID: **MBLK-133178** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754626** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.0250	0.0500								U

LCS Sample ID: **LCS-133178** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754625** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.252	0.0500	0.25	0	101	80 - 120				

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754623** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.302	0.0500	0.25	0.062	96.0	80 - 120				

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: **35AWW06_092618** Run ID: **UV-2450_324727** SeqNo: **4754621** PrepDate: **04-Oct-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	5.18	0.500	2.5	2.67	100	80 - 120				

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754624** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.299	0.0500	0.25	0.062	94.8	80 - 120	0.302	0.998	20	

MSD Sample ID: **HS18091438-01MSD** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: **35AWW06_092618** Run ID: **UV-2450_324727** SeqNo: **4754622** PrepDate: **04-Oct-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	5.17	0.500	2.5	2.67	100	80 - 120	5.18	0.193	20	

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324424 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-180929** Units: **mg/L** Analysis Date: **29-Sep-2018 08:52**
Client ID: Run ID: **ManTech01_324424** SeqNo: **4748148** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS1-180929** Units: **mg/L** Analysis Date: **29-Sep-2018 09:01**
Client ID: Run ID: **ManTech01_324424** SeqNo: **4748149** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1072	5.00	1000	0	107	85 - 115				

LCSD Sample ID: **WLCSD1-180929** Units: **mg/L** Analysis Date: **29-Sep-2018 09:09**
Client ID: Run ID: **ManTech01_324424** SeqNo: **4748150** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1071	5.00	1000	0	107	85 - 115	1072	0.0541	20	

DUP Sample ID: **HS18091438-01DUP** Units: **mg/L** Analysis Date: **29-Sep-2018 10:47**
Client ID: **35AWW06_092618** Run ID: **ManTech01_324424** SeqNo: **4748164** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	764.5	5.00					775	1.36	20	

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324594 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW1-092718** Units: **mg/L** Analysis Date: **28-Sep-2018 03:26**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751753** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-092718** Units: **mg/L** Analysis Date: **28-Sep-2018 03:40**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751754** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.28	0.500	20	0	101	80 - 120				
Nitrogen, Nitrate (As N)	3.935	0.100	4	0	98.4	80 - 120				
Nitrogen, Nitrite (As N)	4.217	0.100	4	0	105	80 - 120				
Sulfate	20.06	0.500	20	0	100	80 - 120				

LCSD Sample ID: **WLCSDW1-092718** Units: **mg/L** Analysis Date: **28-Sep-2018 03:55**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751755** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.46	0.500	20	0	102	80 - 120	20.28	0.889	20	
Nitrogen, Nitrate (As N)	3.977	0.100	4	0	99.4	80 - 120	3.935	1.06	20	
Nitrogen, Nitrite (As N)	4.261	0.100	4	0	107	80 - 120	4.217	1.04	20	
Sulfate	20.25	0.500	20	0	101	80 - 120	20.06	0.962	20	

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **28-Sep-2018 16:43**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4765751** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	205.7	5.00	100	109.5	96.2	80 - 120				
Nitrogen, Nitrate (As N)	18.53	1.00	20	0	92.6	80 - 120				
Nitrogen, Nitrite (As N)	20.08	1.00	20	0	100	80 - 120				
Sulfate	161.2	5.00	100	65.28	95.9	80 - 120				

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324594 **Instrument: ICS2100** **Method: SW9056**

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **28-Sep-2018 15:59**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4765748** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	121.6	0.500	10	113.6	79.8	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.028	0.100	2	0	101	80 - 120				
Nitrogen, Nitrite (As N)	2.096	0.100	2	0	105	80 - 120				
Sulfate	78.31	0.500	10	69.87	84.4	80 - 120				O

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **28-Sep-2018 04:39**
Client ID: **35AWW06_092618** Run ID: **ICS2100_324594** SeqNo: **4751758** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1025	5.00	100	909.6	115	80 - 120				EO
Nitrogen, Nitrate (As N)	19.46	1.00	20	0	97.3	80 - 120				
Nitrogen, Nitrite (As N)	22.99	1.00	20	0	115	80 - 120				
Sulfate	599.9	5.00	100	507.7	92.3	80 - 120				O

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **28-Sep-2018 16:58**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4765752** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	205.3	5.00	100	109.5	95.8	80 - 120	205.7	0.187	20	
Nitrogen, Nitrate (As N)	18.36	1.00	20	0	91.8	80 - 120	18.53	0.905	20	
Nitrogen, Nitrite (As N)	20.1	1.00	20	0	101	80 - 120	20.08	0.11	20	
Sulfate	161.2	5.00	100	65.28	96.0	80 - 120	161.2	0.0192	20	

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **28-Sep-2018 16:14**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4765749** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	124.1	0.500	10	113.6	104	80 - 120	121.6	2.01	20	EO
Nitrogen, Nitrate (As N)	2.057	0.100	2	0	103	80 - 120	2.028	1.42	20	
Nitrogen, Nitrite (As N)	2.131	0.100	2	0	107	80 - 120	2.096	1.66	20	
Sulfate	79.53	0.500	10	69.87	96.6	80 - 120	78.31	1.54	20	O

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324594 **Instrument: ICS2100** **Method: SW9056**

MSD Sample ID: **HS18091438-01MSD** Units: **mg/L** Analysis Date: **28-Sep-2018 04:53**
Client ID: **35AWW06_092618** Run ID: **ICS2100_324594** SeqNo: **4751759** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1031	5.00	100	909.6	121	80 - 120	1025	0.584	20	SEO
Nitrogen, Nitrate (As N)	19.5	1.00	20	0	97.5	80 - 120	19.46	0.2	20	
Nitrogen, Nitrite (As N)	23.21	1.00	20	0	116	80 - 120	22.99	0.957	20	
Sulfate	607.2	5.00	100	507.7	99.5	80 - 120	599.9	1.2	20	O

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324811 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW-100418** Units: **mg/L** Analysis Date: **04-Oct-2018 14:40**
Client ID: Run ID: **ICS2100_324811** SeqNo: **4756226** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW-100418** Units: **mg/L** Analysis Date: **04-Oct-2018 14:54**
Client ID: Run ID: **ICS2100_324811** SeqNo: **4756227** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.48	0.500	20	0	97.4	80 - 120				
Sulfate	18.6	0.500	20	0	93.0	80 - 120				

LCSD Sample ID: **WLCSDW-100418** Units: **mg/L** Analysis Date: **04-Oct-2018 15:09**
Client ID: Run ID: **ICS2100_324811** SeqNo: **4756228** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.28	0.500	20	0	96.4	80 - 120	19.48	1.04	20	
Sulfate	18.01	0.500	20	0	90.0	80 - 120	18.6	3.25	20	

MS Sample ID: **HS18100126-01MS** Units: **mg/L** Analysis Date: **04-Oct-2018 15:45**
Client ID: Run ID: **ICS2100_324811** SeqNo: **4756230** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	628.7	25.0	500	128.1	100	80 - 120				
Sulfate	2104	25.0	500	1492	122	80 - 120				S

MSD Sample ID: **HS18100126-01MSD** Units: **mg/L** Analysis Date: **04-Oct-2018 15:59**
Client ID: Run ID: **ICS2100_324811** SeqNo: **4756231** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	622.7	25.0	500	128.1	98.9	80 - 120	628.7	0.96	20	
Sulfate	1973	25.0	500	1492	96.3	80 - 120	2104	6.42	20	

The following samples were analyzed in this batch: HS18091438-02 HS18091438-03 HS18091438-04

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091438

QC BATCH REPORT

Batch ID: R324851 **Instrument: WetChem_HS** **Method: E376.1**

MBLK Sample ID: **MBLK-R324851** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760404** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	1.00	1.00								U

LCS Sample ID: **LCS-R324851** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760403** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.36	1.00	25	0	85.4	80 - 120				

LCSD Sample ID: **LCSD-R324851** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760402** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.16	1.00	25	0	84.6	80 - 120	21.36	0.941	20	

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760401** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.36	1.00	25	0.36	84.0	80 - 120				

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: **35AWW06_092618** Run ID: **WetChem_HS_324851** SeqNo: **4760399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.56	1.00	25	1.96	78.4	80 - 120				S

The following samples were analyzed in this batch: HS18091438-01 HS18091438-02 HS18091438-03 HS18091438-04

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS18091438**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

ALS Houston, US Date: 12-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18091438

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	WET367
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	WET367
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	WET367
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	MET067
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	MET067
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	VOA197
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	Sub
HS18091438-01	35AWW06_092618	Login	9/27/2018 3:40:40 PM	JML	Sub
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	MET067
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	MET067
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	VOA197
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	Sub
HS18091438-02	35AWW20_092618	Login	9/27/2018 3:56:40 PM	JML	Sub
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	MET067
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	MET067
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	VOA197
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	Sub
HS18091438-03	35AWW20_092618_a	Login	9/27/2018 3:56:40 PM	JML	Sub
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	WET367
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	MET067
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	MET067
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	VOA197
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	Sub
HS18091438-04	LHSMW07_092618	Login	9/27/2018 3:56:40 PM	JML	Sub
HS18091438-05	Trip Blank	Login	9/27/2018 3:57:59 PM	JML	VOA197

ALS Houston, US Date: 12-Oct-18

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS18091438
Date/Time Received: **27-Sep-2018 08:50**
Received by: **NDR**

Checklist completed by: *Jared R. Makan* eSignature 27-Sep-2018 Date
Reviewed by: *RJ Modashia* eSignature 28-Sep-2018 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.2c/1.8c UC/C	IR11	
Cooler(s)/Kit(s):	44321		
Date/Time sample(s) sent to storage:	09/27/2018 18:10		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☑	N/A ☐
pH adjusted?	Yes ☑	No ☐	N/A ☐
pH adjusted by:	Si Ma		

Login Notes: pH>2 (5) for LHSMW07-092618 metals, dissolved metals & Phosphorus. Metals & Dissolved metals preserved with 0.25ml HNO3, Phosphorus preserved with 0.5ml H2SO4. Preserved 09/27/18 at 11:25.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate ENVIRONMENTAL ASSOCIATES, INC.

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Anions/Alkalinity	Total Phosphorous	Total Manganese & Iron	Dissolved Manganese & Iron	Sulfide	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Coder ID
35AMW06_092618		26 Sep 2018	0920	-		N	WG	12	X	X	X	X	X	X	X	X	X				
35AMW06_092618_MS		26 Sep 2018	0920	-		MS	WG	12	X	X	X	X	X	X	X	X	X				
35AMW06_092618_MSD		26 Sep 2018	0920	-		SD	WG	12	X	X	X	X	X	X	X	X	X				
35AMW20_092618		26Sep2018	1115			N	WG	12	X	X	X	X	X	X	X	X	X				
35AMW20_092618_a		26Sep2018	1115			FD	WG	12	X	X	X	X	X	X	X	X	X				
LHSMW07_092618		26Sep2018	1230	-		N	WG	12	X	X	X	X	X	X	X	X	X				
TRIPBLANK		26Sep2018		-		TB	W	2	X												
				-																	
				-																	
				-																	
				-																	

Sample Analysis Requested (5) | Quality Assurance Samples (6)

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
Scott Beesinger	9/26/18	1400	1. N/A	9/27/18	0830
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped _____ No.:

Method of Shipment: _____

_____ Fed Ex _____ Airbill Number: _____

_____ Analytical Lab: ALS 10450 Stanciff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONJA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

44321
Temp adc 2.2
Ice # 1
COC-04

Bhate Environmental Associates, Inc.
LHAAP-58

HS18091438

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 9/27/18 Time: 1400
Name: Scott Beeson-Wolf
Company: BHATE

Seal Broken By:
Date: 9/27/18

SEP 2 7 2018

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 58 – RJ
RMA:

FedEx Express

TRK# 0221 4380 9532 8289

RETURNS MON-SAT
PRIORITY OVERNIGHT
THU - 27 SEP 10:30A
PRIORITY OVERNIGHT

FedEx
TRK# 0221 4380 9532 8289

77099
TX-US
IAH

AB SGRA

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

October 11, 2018

Analytical Report for Service Request No: K1809385

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS18091438

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 28, 2018
For your reference, these analyses have been assigned our service request number **K1809385.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
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www.alsglobal.com

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Raw Data
    General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS18091438
Sample Matrix: Ground Water

Service Request: K1809385
Date Received: 09/28/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Four ground water samples were received for analysis at ALS Environmental on 09/28/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Bowsjoy Date 10/11/2018

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

K1809385

Subcontract Chain of Custody

COC ID: 9908

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18091438
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18091438-01**	**35AWW06_092618**	**Groundwater**	**26 Sep 2018 09:20**
	TOC Analysis for DOD Level IV			05 Oct 2018
2.	**HS18091438-02**	**35AWW20_092618**	**Groundwater**	**26 Sep 2018 11:15**
	TOC Analysis for DOD Level IV			05 Oct 2018
3.	**HS18091438-03**	**35AWW20_092618_a**	**Groundwater**	**26 Sep 2018 11:15**
	TOC Analysis for DOD Level IV			05 Oct 2018
4.	**HS18091438-04**	**LHSMW07_092618**	**Groundwater**	**26 Sep 2018 12:30**
	TOC Analysis for DOD Level IV			05 Oct 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

MS/MSD - HS18091438-01

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. WALKER Date/Time: 9/27/18 18:00

Received By: Date/Time: 9/28/18 1000

Cooler ID(s): Temperature(s):

00943829

PC Kelly

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request K18 09385

Received: 9/28/18 Opened: 9/28/18 By: CG Unloaded: 9/28/18 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.5	-0.5	2.2	2.2	0.0	325	9908	4380 9533 0142	

4. Packing material: *Inserts* (*Baggies*) *Bubble Wrap* *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: 6 vials for sample 1, 2 vials for samples 2, 3, 4

RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1809385
Project:	HS18091438	**Date Collected:**	09/26/18
Sample Matrix:	Ground Water	**Date Received:**	09/28/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
HS18091438-01 35AWW06_092618	K1809385-001	**2860**	130	50	20	250	10/10/18	
HS18091438-02 35AWW20_092618	K1809385-002	**53**	10	4	2	20	10/04/18	
HS18091438-03 35AWW20_092618_a	K1809385-003	**53**	10	4	2	20	10/10/18	
HS18091438-04 LHSMW07_092618	K1809385-004	**14.2**	0.50	0.20	0.07	1	10/05/18	
Method Blank	K1809385-MB1	ND U	0.50	0.20	0.07	1	10/04/18	
Method Blank	K1809385-MB2	ND U	0.50	0.20	0.07	1	10/05/18	
Method Blank	K1809385-MB4	ND U	0.50	0.20	0.07	1	10/10/18	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809385
Project	HS18091438	**Date Collected:**	09/26/18
Sample Matrix:	Ground Water	**Date Received:**	09/28/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
HS18091438-01 35AWW06_092618	K1809385-001DUP3	130	50	20	2860	2790	2820	2	10	10/10/18
HS18091438-02 35AWW20_092618	K1809385-002DUP	10	4	2	53	51	51.9	3	10	10/04/18
HS18091438-03 35AWW20_092618_a	K1809385-003DUP2	10	4	2	53	52	52.5	3	10	10/10/18
HS18091438-04 LHSMW07_092618	K1809385-004DUP	0.50	0.20	0.07	14.2	14.0	14.1	1	10	10/05/18

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809385
Project:	HS18091438	**Date Collected:**	09/26/18
Sample Matrix:	Ground Water	**Date Received:**	09/28/18
		Date Analyzed:	10/10/18
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	HS18091438-01 35AWW06_092618	**Units:**	mg/L
Lab Code:	K1809385-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1809385-001MS2

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2860	9300	6250	103	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809385
Project:	HS18091438	**Date Analyzed:**	10/04/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	609436

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1809385-LCS1	20.8	21.9	95	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809385
Project:	HS18091438	**Date Analyzed:**	10/05/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	609741

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1809385-LCS2	20.7	21.9	95	83-117
Lab Control Sample	K1809385-LCS3	20.2	21.9	92	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809385
Project:	HS18091438	**Date Analyzed:**	10/10/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	610329

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1809385-LCS4	21.8	21.9	99	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1809385
Project: HS18091438

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	609436	KQ1814370-23	10/04/18 10:29	25.0	24.3	97	90-110
CCV2	609436	KQ1814370-24	10/04/18 15:17	25.0	24.7	99	90-110
CCV3	609436	KQ1814370-25	10/04/18 20:22	25.0	24.4	98	90-110
CCV4	609436	KQ1814370-26	10/05/18 00:38	25.0	24.6	98	90-110
CCV5	609436	KQ1814370-27	10/05/18 05:10	25.0	24.0	96	90-110
CCV6	609741	KQ1814385-27	10/05/18 15:18	25.0	24.6	98	90-110
CCV7	609741	KQ1814385-28	10/05/18 19:21	25.0	24.8	99	90-110
CCV8	609741	KQ1814385-29	10/06/18 00:55	25.0	24.5	98	90-110
CCV9	609741	KQ1814385-30	10/06/18 05:59	25.0	25.2	101	90-110
CCV10	609741	KQ1814385-31	10/06/18 11:04	25.0	24.7	99	90-110
CCV11	610329	KQ1814465-14	10/09/18 22:57	25.0	24.5	98	90-110
CCV12	610329	KQ1814465-15	10/10/18 04:01	25.0	24.9	100	90-110
CCV13	610329	KQ1814465-16	10/10/18 08:19	25.0	24.4	97	90-110
CCV14	610329	KQ1814465-17	10/10/18 10:12	25.0	24.2	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1809385
Project: HS18091438

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	609436	KQ1814370-28	10/04/18 10:45	0.50	0.20	0.07	ND	U
CCB2	609436	KQ1814370-29	10/04/18 15:34	0.50	0.20	0.07	ND	U
CCB3	609436	KQ1814370-30	10/04/18 20:38	0.50	0.20	0.07	ND	U
CCB4	609436	KQ1814370-31	10/05/18 00:55	0.50	0.20	0.07	ND	U
CCB5	609436	KQ1814370-32	10/05/18 05:26	0.50	0.20	0.07	ND	U
CCB6	609741	KQ1814385-32	10/05/18 15:35	0.50	0.20	0.07	ND	U
CCB7	609741	KQ1814385-33	10/05/18 19:37	0.50	0.20	0.07	ND	U
CCB8	609741	KQ1814385-34	10/06/18 01:12	0.50	0.20	0.07	ND	U
CCB9	609741	KQ1814385-35	10/06/18 06:16	0.50	0.20	0.07	ND	U
CCB10	609741	KQ1814385-36	10/06/18 11:20	0.50	0.20	0.07	ND	U
CCB11	610329	KQ1814465-18	10/09/18 23:13	0.50	0.20	0.07	ND	U
CCB12	610329	KQ1814465-19	10/10/18 04:17	0.50	0.20	0.07	ND	U
CCB13	610329	KQ1814465-20	10/10/18 08:36	0.50	0.20	0.07	ND	U
CCB14	610329	KQ1814465-21	10/10/18 10:29	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
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General Chemistry

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Work Request # Original ( ) K1808614, 9036, 9040, 8827, 9156, 9024, 8614, 9491, 9489, 9385, 8765

Tier: IV III IV II III II IV IV IV IV IV

Date Analyzed: 10/3/18

Analyst: CES

Run # DOC: 609428, 609435
TOC: 609436

Analysis: DOC/TOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

9036-2, 3, 5, 9156-2, 3, 6, 7, 9 RPD not within acceptance limits. The sample results are less than 5x the MRL.

RA 9491-2 over diluted; 3-9491 over cal range; 9385-1 over cal range; 9385-3 RPD not within acceptance limit.

Final Approved by: [signature] Date: 10/9/18

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609428 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
1808614-002	Carbon, Dissolved Organic (DOC)	N/A		Water	5.14 mg/L	10 ml	5.14 mg/L	1	0.07	0.50			10/3/18 16:06	N	IV
1808614-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.53 mg/L	10 ml	2.53 mg/L	1	0.07	0.50			10/3/18 16:38	N	IV
1808614-008	Carbon, Dissolved Organic (DOC)	N/A		Water	1.02 mg/L	10 ml	1.02 mg/L	1	0.07	0.50			10/3/18 17:09	N	IV
1808827-001	Carbon, Dissolved Organic (DOC)	N/A		Water	2.29 mg/L	10 ml	2.29 mg/L	1	0.07	0.50			10/3/18 23:01	N	II
1808827-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.19 mg/L	10 ml	3.19 mg/L	1	0.07	0.50			10/4/18 00:55	N	II
1808827-003	Carbon, Dissolved Organic (DOC)	N/A		Water	3.03 mg/L	10 ml	3.03 mg/L	1	0.07	0.50			10/4/18 01:27	N	II
K1808827-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.17 mg/L	10 ml	2.17 mg/L	1	0.07	0.50			10/4/18 01:59	N	II
1808827-005	Carbon, Dissolved Organic (DOC)	N/A		Water	1.75 mg/L	10 ml	1.75 mg/L	1	0.07	0.50			10/4/18 02:30	N	II
K1808827-006	Carbon, Dissolved Organic (DOC)	N/A		Water	1.20 mg/L	10 ml	1.20 mg/L	1	0.07	0.50			10/4/18 03:02	N	II
K1808827-007	Carbon, Dissolved Organic (DOC)	N/A		Water	0.42 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 03:34	N	II
1808827-008	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 04:05	N	II
K1808827-009	Carbon, Dissolved Organic (DOC)	N/A		Water	1.59 mg/L	10 ml	1.59 mg/L	1	0.07	0.50			10/4/18 04:37	N	II
K1808827-010	Carbon, Dissolved Organic (DOC)	N/A		Water	1.29 mg/L	10 ml	1.29 mg/L	1	0.07	0.50			10/4/18 05:42	N	II
K1809036-001	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.21 mg/L	10 ml	0.21 mg/L J	1	0.07	0.50			10/3/18 17:57	Y	III
K1809036-002	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50			10/3/18 19:18	N	III
K1809036-003	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.90 mg/L	10 ml	0.90 mg/L	1	0.07	0.50			10/3/18 19:50	N	III
K1809036-004	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	2.15 mg/L	10 ml	2.15 mg/L	1	0.07	0.50			10/3/18 20:22	N	III
K1809036-005	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50			10/3/18 20:54	N	III
K1809040-001	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.99 mg/L	10 ml	0.99 mg/L	1	0.07	0.50			10/3/18 21:25	N	IV
K1809040-002	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	2.52 mg/L	10 ml	2.52 mg/L	1	0.07	0.50			10/3/18 22:30	N	IV
KQ1814032-01	Carbon, Dissolved Organic (DOC)	DUP	K1808614-002	Water	5.01 mg/L	10 ml	5.01 mg/L	1	0.07	0.50		3	10/3/18 16:06	N	IV
KQ1814032-02	Carbon, Dissolved Organic (DOC)	DUP	K1808614-004	Water	2.31 mg/L	10 ml	2.31 mg/L	1	0.07	0.50		9	10/3/18 16:38	N	IV
KQ1814032-03	Carbon, Dissolved Organic (DOC)	DUP	K1808614-008	Water	0.99 mg/L	10 ml	0.99 mg/L	1	0.07	0.50		4	10/3/18 17:09	N	IV

CES 10/9/18

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609428 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
Q1814032-04	Carbon, Dissolved Organic (DOC)	MS	K1809036-001	Ground Water	25.69 mg/L	10 ml	25.7 mg/L	1	0.07	0.50	102		10/3/18 18:29	N	III
Q1814032-05	Carbon, Dissolved Organic (DOC)	DUP	K1809036-001	Ground Water	0.22 mg/L	10 ml	0.22 mg/L J	1	0.07	0.50		6	10/3/18 17:57	N	III
Q1814032-06	Carbon, Dissolved Organic (DOC)	DUP	K1809036-002	Ground Water	0.22 mg/L	10 ml	0.22 mg/L J	1	0.07	0.50		19*	10/3/18 19:18	N	III
Q1814032-07	Carbon, Dissolved Organic (DOC)	DUP	K1809036-003	Ground Water	0.80 mg/L	10 ml	0.80 mg/L	1	0.07	0.50		12*	10/3/18 19:50	N	III
Q1814032-08	Carbon, Dissolved Organic (DOC)	DUP	K1809036-004	Ground Water	2.15 mg/L	10 ml	2.15 mg/L	1	0.07	0.50		<1	10/3/18 20:22	N	III
Q1814032-09	Carbon, Dissolved Organic (DOC)	DUP	K1809036-005	Ground Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50		26*	10/3/18 20:54	N	III
Q1814032-10	Carbon, Dissolved Organic (DOC)	MS	K1809040-001	Ground Water	26.73 mg/L	10 ml	26.7 mg/L	1	0.07	0.50	103		10/3/18 21:57	N	IV
Q1814032-11	Carbon, Dissolved Organic (DOC)	DUP	K1809040-001	Ground Water	0.92 mg/L	10 ml	0.92 mg/L	1	0.07	0.50		7	10/3/18 21:25	N	IV
Q1814032-12	Carbon, Dissolved Organic (DOC)	DUP	K1809040-002	Ground Water	2.52 mg/L	10 ml	2.52 mg/L	1	0.07	0.50		<1	10/3/18 22:30	N	IV
Q1814032-13	Carbon, Dissolved Organic (DOC)	MS	K1808827-001	Water	28.18 mg/L	10 ml	28.2 mg/L	1	0.07	0.50	104		10/3/18 23:33	N	II
Q1814032-14	Carbon, Dissolved Organic (DOC)	DUP	K1808827-001	Water	2.22 mg/L	10 ml	2.22 mg/L	1	0.07	0.50		3	10/3/18 23:01	N	II
Q1814032-15	Carbon, Dissolved Organic (DOC)	DUP	K1808827-002	Water	2.96 mg/L	10 ml	2.96 mg/L	1	0.07	0.50		7	10/4/18 00:55	N	II
KQ1814032-16	Carbon, Dissolved Organic (DOC)	DUP	K1808827-003	Water	2.95 mg/L	10 ml	2.95 mg/L	1	0.07	0.50		3	10/4/18 01:27	N	II
KQ1814032-17	Carbon, Dissolved Organic (DOC)	DUP	K1808827-004	Water	2.04 mg/L	10 ml	2.04 mg/L	1	0.07	0.50		6	10/4/18 01:59	N	II
KQ1814032-18	Carbon, Dissolved Organic (DOC)	DUP	K1808827-005	Water	1.72 mg/L	10 ml	1.72 mg/L	1	0.07	0.50		2	10/4/18 02:30	N	II
KQ1814032-19	Carbon, Dissolved Organic (DOC)	DUP	K1808827-006	Water	1.12 mg/L	10 ml	1.12 mg/L	1	0.07	0.50		7	10/4/18 03:02	N	II
KQ1814032-20	Carbon, Dissolved Organic (DOC)	DUP	K1808827-007	Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50		NC	10/4/18 03:34	N	II
KQ1814032-21	Carbon, Dissolved Organic (DOC)	DUP	K1808827-008	Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/4/18 04:05	N	II
KQ1814032-22	Carbon, Dissolved Organic (DOC)	DUP	K1808827-009	Water	1.52 mg/L	10 ml	1.52 mg/L	1	0.07	0.50		5	10/4/18 04:37	N	II
KQ1814032-23	Carbon, Dissolved Organic (DOC)	DUP	K1808827-010	Water	1.28 mg/L	10 ml	1.28 mg/L	1	0.07	0.50		<1	10/4/18 05:42	N	II
KQ1814032-24	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/3/18 15:17	N	IV
KQ1814032-25	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 00:23	N	IV
KQ1814032-26	Carbon, Dissolved Organic (DOC)	LCS		Water	21.11 mg/L	10 ml	21.1 mg/L	1	0.07	0.50	96		10/3/18 15:33	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609428 **Method/Testcode:** SM 5310 C/TOC D

La	Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
	Q1814032-27	Carbon, Dissolved Organic (DOC)	LCS		Water	20.84 mg/L	10 ml	20.8 mg/L	1	0.07	0.50	95		10/4/18 00:39	N	IV
	Q1814032-28	Carbon, Dissolved Organic (DOC)	CCV		Water	24.31 mg/L	10 ml	24.3 mg/L	1			97		10/3/18 14:43	N	IV
	Q1814032-29	Carbon, Dissolved Organic (DOC)	CCV		Water	24.84 mg/L	10 ml	24.8 mg/L	1			99		10/3/18 18:45	N	IV
	KQ1814032-30	Carbon, Dissolved Organic (DOC)	CCV		Water	24.54 mg/L	10 ml	24.5 mg/L	1			98		10/3/18 23:49	N	IV
	KQ1814032-31	Carbon, Dissolved Organic (DOC)	CCV		Water	24.74 mg/L	10 ml	24.7 mg/L	1			99		10/4/18 05:09	N	IV
	KQ1814032-32	Carbon, Dissolved Organic (DOC)	CCV		Water	24.32 mg/L	10 ml	24.3 mg/L	1			97		10/4/18 10:29	N	IV
	KQ1814032-33	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/3/18 15:00	N	IV
	KQ1814032-34	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/3/18 19:02	N	IV
	KQ1814032-35	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 00:06	N	IV
	KQ1814032-36	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 05:26	N	IV
	KQ1814032-37	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 10:45	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609435 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
1809024-001	Carbon, Dissolved Organic (DOC)	N/A		Water	5.93 mg/L	10 ml	5.93 mg/L	1	0.07	0.50			10/4/18 13:10	N	II
1809024-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.77 mg/L	10 ml	2.77 mg/L	1	0.07	0.50			10/4/18 14:14	N	II
1809156-001	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	2.37 mg/L	10 ml	2.37 mg/L	1	0.07	0.50			10/4/18 06:14	N	III
1809156-002	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.39 mg/L	10 ml	0.39 mg/L J	1	0.07	0.50			10/4/18 07:19	N	III
1809156-003	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.40 mg/L	10 ml	0.40 mg/L J	1	0.07	0.50			10/4/18 07:50	N	III
1809156-004	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	1.02 mg/L	10 ml	1.02 mg/L	1	0.07	0.50			10/4/18 08:22	N	III
1809156-005	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 08:54	N	III
1809156-006	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.58 mg/L	10 ml	0.58 mg/L	1	0.07	0.50			10/4/18 09:25	N	III
1809156-007	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.35 mg/L	10 ml	0.35 mg/L J	1	0.07	0.50			10/4/18 09:57	N	III
1809156-008	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.15 mg/L	10 ml	0.15 mg/L J	1	0.07	0.50			10/4/18 11:34	N	III
1809156-009	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			10/4/18 12:06	N	III
1809156-010	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.44 mg/L	10 ml	0.44 mg/L J	1	0.07	0.50			10/4/18 12:38	N	III
Q1814369-01	Carbon, Dissolved Organic (DOC)	MS	K1809156-001	Ground Water	28.40 mg/L	10 ml	28.4 mg/L	1	0.07	0.50	104		10/4/18 06:46	N	III
Q1814369-02	Carbon, Dissolved Organic (DOC)	DUP	K1809156-001	Ground Water	2.20 mg/L	10 ml	2.20 mg/L	1	0.07	0.50		7	10/4/18 06:14	N	III
Q1814369-03	Carbon, Dissolved Organic (DOC)	DUP	K1809156-002	Ground Water	0.45 mg/L	10 ml	0.45 mg/L J	1	0.07	0.50		15*	10/4/18 07:19	N	III
Q1814369-04	Carbon, Dissolved Organic (DOC)	DUP	K1809156-003	Ground Water	0.29 mg/L	10 ml	0.29 mg/L J	1	0.07	0.50		31*	10/4/18 07:50	N	III
KQ1814369-05	Carbon, Dissolved Organic (DOC)	DUP	K1809156-004	Ground Water	0.99 mg/L	10 ml	0.99 mg/L	1	0.07	0.50		4	10/4/18 08:22	N	III
KQ1814369-06	Carbon, Dissolved Organic (DOC)	DUP	K1809156-005	Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/4/18 08:54	N	III
KQ1814369-07	Carbon, Dissolved Organic (DOC)	DUP	K1809156-006	Ground Water	0.52 mg/L	10 ml	0.52 mg/L	1	0.07	0.50		11*	10/4/18 09:25	N	III
KQ1814369-08	Carbon, Dissolved Organic (DOC)	DUP	K1809156-007	Ground Water	0.27 mg/L	10 ml	0.27 mg/L J	1	0.07	0.50		27*	10/4/18 09:57	N	III
KQ1814369-09	Carbon, Dissolved Organic (DOC)	DUP	K1809156-008	Ground Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/4/18 11:34	N	III
KQ1814369-10	Carbon, Dissolved Organic (DOC)	DUP	K1809156-009	Ground Water	0.16 mg/L	10 ml	0.16 mg/L J	1	0.07	0.50		60*	10/4/18 12:06	N	III
KQ1814369-11	Carbon, Dissolved Organic (DOC)	DUP	K1809156-010	Ground Water	0.39 mg/L	10 ml	0.39 mg/L J	1	0.07	0.50		10	10/4/18 12:38	N	III

CES 10/9/18

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609435 **Method/Testcode:** SM 5310 C/TOC D

Lab ode	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
Q1814369-12	Carbon, Dissolved Organic (DOC)	MS	K1809024-001	Water	31.79 mg/L	10 ml	31.8 mg/L	1	0.07	0.50	103		10/4/18 13:41	N	II
Q1814369-13	Carbon, Dissolved Organic (DOC)	DUP	K1809024-001	Water	5.74 mg/L	10 ml	5.74 mg/L	1	0.07	0.50		3	10/4/18 13:10	N	II
′Q1814369-14	Carbon, Dissolved Organic (DOC)	DUP	K1809024-002	Water	2.68 mg/L	10 ml	2.68 mg/L	1	0.07	0.50		3	10/4/18 14:14	N	II
KQ1814369-15	Carbon, Dissolved Organic (DOC)	MB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 11:02	N	III
KQ1814369-16	Carbon, Dissolved Organic (DOC)	LCS		Ground Water	20.92 mg/L	10 ml	20.9 mg/L	1	0.07	0.50	96		10/4/18 11:18	N	III
KQ1814369-17	Carbon, Dissolved Organic (DOC)	CCV		Ground Water	24.74 mg/L	10 ml	24.7 mg/L	1			99		10/4/18 05:09	N	III
KQ1814369-18	Carbon, Dissolved Organic (DOC)	CCV		Ground Water	24.32 mg/L	10 ml	24.3 mg/L	1			97		10/4/18 10:29	N	III
KQ1814369-19	Carbon, Dissolved Organic (DOC)	CCV		Ground Water	24.68 mg/L	10 ml	24.7 mg/L	1			99		10/4/18 15:17	N	III
KQ1814369-20	Carbon, Dissolved Organic (DOC)	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 05:26	N	III
KQ1814369-21	Carbon, Dissolved Organic (DOC)	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 10:45	N	III
KQ1814369-22	Carbon, Dissolved Organic (DOC)	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 15:34	N	III

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609436 **Method/Testcode:** SM 5310 C/TOC T

b Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
1808614-002	Carbon, Total Organic	N/A		Water	5.41 mg/L	10 ml	5.41 mg/L	1	0.07	0.50			10/4/18 14:46	N	IV
1808614-004	Carbon, Total Organic	N/A		Water	2.38 mg/L	10 ml	2.38 mg/L	1	0.07	0.50			10/4/18 15:50	N	IV
1808614-008	Carbon, Total Organic	N/A		Water	0.88 mg/L	10 ml	0.88 mg/L	1	0.07	0.50			10/4/18 16:22	N	IV
1808765-001	Carbon, Total Organic	N/A		Water	0.66 mg/L	10 mL	13 mg/L	20	2	10			10/5/18 01:11:00	N	IV
1808765-002	Carbon, Total Organic	N/A		Water	1.24 mg/L	10 mL	25 mg/L	20	2	10			10/5/18 02:31:00	N	IV
1808765-003	Carbon, Total Organic	N/A		Water	0.69 mg/L	10 mL	14 mg/L	20	2	10			10/5/18 03:03:00	N	IV
1808765-004	Carbon, Total Organic	N/A		Water	3.28 mg/L	10 mL	13.1 mg/L	4	0.3	2.0			10/5/18 03:35:00	N	IV
1808765-005	Carbon, Total Organic	N/A		Water	1.09 mg/L	10 mL	22 mg/L	20	2	10			10/5/18 04:07:00	N	IV
1809385-001	Carbon, Total Organic	N/A		Ground Water	111.82 mg/L	10 mL	2240 mg/L	20	2	10	–		10/4/18 22:00:00	Y	IV
1809385-002	Carbon, Total Organic	N/A		Ground Water	2.64 mg/L	10 mL	53 mg/L	20	2	10			10/4/18 23:03:00	N	IV
1809385-003	Carbon, Total Organic	N/A		Ground Water	2.60 mg/L	10 mL	52 mg/L	20	2	10			10/4/18 23:35:00	N	IV
1809385-004	Carbon, Total Organic	N/A		Ground Water	14.19 mg/L	10 mL	14.2 mg/L	1	0.07	0.50			10/5/18 00:07:00	N	IV
1809489-001	Carbon, Total Organic	N/A		Water	11.93 mg/L	10 ml	11.9 mg/L	1	0.07	0.50			10/4/18 19:50	N	IV
1809491-001	Carbon, Total Organic	N/A		Ground Water	0.87 mg/L	10 ml	0.87 mg/L	1	0.07	0.50			10/4/18 17:10	N	IV
1809491-002	Carbon, Total Organic	N/A		Ground Water	0.05 mg/L	10 ml	2.0 mg/L U	4	0.3	2.0			10/4/18 18:14	N	IV
1809491-003	Carbon, Total Organic	N/A		Ground Water	116.17 mg/L	10 ml	465 mg/L	4	0.3	2.0			10/4/18 18:46	N	IV
Q1814370-01	Carbon, Total Organic	DUP	K1808614-002	Water	5.06 mg/L	10 ml	5.06 mg/L	1	0.07	0.50		7	10/4/18 14:46	N	IV
Q1814370-02	Carbon, Total Organic	DUP	K1808614-004	Water	2.33 mg/L	10 ml	2.33 mg/L	1	0.07	0.50		2	10/4/18 15:50	N	IV
Q1814370-03	Carbon, Total Organic	DUP	K1808614-008	Water	0.84 mg/L	10 ml	0.84 mg/L	1	0.07	0.50		4	10/4/18 16:22	N	IV
Q1814370-04	Carbon, Total Organic	MS	K1809491-001	Ground Water	26.41 mg/L	10 ml	26.4 mg/L	1	0.07	0.50	102		10/4/18 17:42	N	IV
Q1814370-05	Carbon, Total Organic	DUP	K1809491-001	Ground Water	0.85 mg/L	10 ml	0.85 mg/L	1	0.07	0.50		2	10/4/18 17:10	N	IV
Q1814370-06	Carbon, Total Organic	DUP	K1809491-002	Ground Water	0.08 mg/L	10 ml	0.3 mg/L J	4	0.3	2.0		NC	10/4/18 18:14	N	IV
Q1814370-07	Carbon, Total Organic	DUP	K1809491-003	Ground Water	115.70 mg/L	10 ml	463 mg/L	4	0.3	2.0		<1	10/4/18 18:46	N	IV
Q1814370-08	Carbon, Total Organic	MS	K1809489-001	Water	34.39 mg/L	10 ml	34.4 mg/L	1	0.07	0.50	90		10/4/18 21:27	N	IV
Q1814370-09	Carbon, Total Organic	DUP	K1809489-001	Water	11.56 mg/L	10 ml	11.6 mg/L	1	0.07	0.50		3	10/4/18 19:50	N	IV
Q1814370-10	Carbon, Total Organic	MS	K1809385-001	Ground Water		10 mL	U	1						N	IV
Q1814370-11	Carbon, Total Organic	DUP	K1809385-001	Ground Water	108.67 mg/L	10 mL	2170 mg/L	20	2	10		3	10/4/18 22:00:00	N	IV
Q1814370-12	Carbon, Total Organic	DUP	K1809385-002	Ground Water	2.56 mg/L	10 mL	51 mg/L	20	2	10		3	10/4/18 23:03:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

CES 10/9/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609436 **Method/Testcode:** SM 5310 C/TOC T

ab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
´Q1814370-13	Carbon, Total Organic	DUP	K1809385-003	Ground Water	2.32 mg/L	10 mL	46 mg/L	20	2	10		11*	10/4/18 23:35:00	N	IV
Q1814370-14	Carbon, Total Organic	DUP	K1809385-004	Ground Water	14.03 mg/L	10 mL	14.0 mg/L	1	0.07	0.50		1	10/5/18 00:07:00	N	IV
Q1814370-15	Carbon, Total Organic	MS	K1808765-001	Water	26.33 mg/L	10 mL	527 mg/L	20	2	10	103		10/5/18 01:43:00	N	IV
´Q1814370-16	Carbon, Total Organic	DUP	K1808765-001	Water	0.67 mg/L	10 mL	13 mg/L	20	2	10		2	10/5/18 01:11:00	N	IV
´Q1814370-17	Carbon, Total Organic	DUP	K1808765-002	Water	1.13 mg/L	10 mL	23 mg/L	20	2	10		10	10/5/18 02:31:00	N	IV
Q1814370-18	Carbon, Total Organic	DUP	K1808765-003	Water	0.68 mg/L	10 mL	14 mg/L	20	2	10		2	10/5/18 03:03:00	N	IV
´Q1814370-19	Carbon, Total Organic	DUP	K1808765-004	Water	3.17 mg/L	10 mL	12.7 mg/L	4	0.3	2.0		3	10/5/18 03:35:00	N	IV
´Q1814370-20	Carbon, Total Organic	DUP	K1808765-005	Water	1.00 mg/L	10 mL	20 mg/L	20	2	10		8	10/5/18 04:07:00	N	IV
´Q1814370-21	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 20:55	N	IV
´Q1814370-21	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 20:55	N	IV
Q1814370-22	Carbon, Total Organic	LCS		Water	20.85 mg/L	10 ml	20.8 mg/L	1	0.07	0.50	95		10/4/18 21:11	N	IV
Q1814370-22	Carbon, Total Organic	LCS		Water	20.85 mg/L	10 ml	20.8 mg/L	1	0.07	0.50	95		10/4/18 21:11	N	IV
´Q1814370-23	Carbon, Total Organic	CCV		Water	24.32 mg/L	10 ml	24.3 mg/L	1			97		10/4/18 10:29	N	IV
Q1814370-23	Carbon, Total Organic	CCV		Water	24.32 mg/L	10 ml	24.3 mg/L	1			97		10/4/18 10:29	N	IV
KQ1814370-24	Carbon, Total Organic	CCV		Water	24.68 mg/L	10 ml	24.7 mg/L	1			99		10/4/18 15:17	N	IV
KQ1814370-24	Carbon, Total Organic	CCV		Water	24.68 mg/L	10 ml	24.7 mg/L	1			99		10/4/18 15:17	N	IV
KQ1814370-25	Carbon, Total Organic	CCV		Water	24.45 mg/L	10 ml	24.4 mg/L	1			98		10/4/18 20:22	N	IV
KQ1814370-25	Carbon, Total Organic	CCV		Water	24.45 mg/L	10 ml	24.4 mg/L	1			98		10/4/18 20:22	N	IV
KQ1814370-26	Carbon, Total Organic	CCV		Water	24.60 mg/L	10 mL	24.6 mg/L	1			98		10/5/18 00:38:00	N	IV
KQ1814370-26	Carbon, Total Organic	CCV		Water	24.60 mg/L	10 mL	24.6 mg/L	1			98		10/5/18 00:38:00	N	IV
KQ1814370-27	Carbon, Total Organic	CCV		Water	23.96 mg/L	10 mL	24.0 mg/L	1			96		10/5/18 05:10:00	N	IV
KQ1814370-27	Carbon, Total Organic	CCV		Water	23.96 mg/L	10 mL	24.0 mg/L	1			96		10/5/18 05:10:00	N	IV
KQ1814370-28	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 10:45	N	IV
KQ1814370-28	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 10:45	N	IV
KQ1814370-29	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 15:34	N	IV
KQ1814370-29	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 15:34	N	IV
KQ1814370-30	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 20:38	N	IV
KQ1814370-30	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/4/18 20:38	N	IV
KQ1814370-31	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/5/18 00:55:00	N	IV
KQ1814370-31	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/5/18 00:55:00	N	IV
KQ1814370-32	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/5/18 05:26:00	N	IV
KQ1814370-32	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/5/18 05:26:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

StarLIMS Run: K1808614, 9036, 9040, 8827, 9156, 9024, 8614, 9491, 9489, 9385, 8765

Analysis: TOC, DOC

Method: SM 5310 C, 415.1

CCV: 11-GEN-05-69K 50 ppm LCS: 11-GEN-05-68N 21.9 ppm

ICAL Date: 3/13/18

ICAL ID: 11-GEN-05-65A

ICS ID: 11-GEN-05-67D

ICS TV: 25.0 ppm ICS % R = 0

Spike ID: 11-GEN-05-65K 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-69I

21 % H3PO4: 11-GEN-05-69J

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F

FILTER ID: 16808142

Analyzed By: CES	Date Analyzed: 10/3/18
Reviewed By: JC	Date Reviewed: 10/9/18

DOC: 609428, 609435
TOC: 609436

Schedule: 10032018

Version: 11
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2018/10/04 22:29 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	K1808614-002.08 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	K1808614-004.08 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1808614-008.08 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
8	Sample	K1809036-001.13 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K1809036-001.13 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1809036-002.03 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1809036-003.03 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1809036-004.03 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1809036-005.03 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	K1809040-001.03 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1809040-001.03 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
16	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
17	Sample	K1809040-002.03 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1808827-001.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1808827-001.01 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1808827-002.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1808827-003.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K1808827-004.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
24	Sample	K1808827-005.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1808827-006.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1808827-007.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1808827-008.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1808827-009.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1808827-010.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1809156-001.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1809156-001.14 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
32	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
33	Sample	K1809156-002.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1809156-003.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	K1809156-004.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
36	Sample	K1809156-005.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	K1809156-006.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	K1809156-007.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Schedule: 10032018

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	
40	Sample	K1809156-008.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
41	Sample	K1809156-009.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
42	Sample	K1809156-010.14 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
43	Sample	K1809024-001.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
44	Sample	K1809024-001.02 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
45	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
46	Sample	K1809024-002.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
47	Sample	K1808614-002.07	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K1808614-004.07	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K1808614-008.07	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
51	Sample	K1809491-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	K1809491-001.02 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
53	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
54	Sample	K1809491-002.02 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
55	Sample	K1809491-003.01 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	K1809489-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	K1809489-001.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
60	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
61	Sample	K1809385-001.0120x	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	K1809385-001.01 ms 20x	Extended Reaction 021711 (Extended Reaction 021711)	1
63	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	K1809385-002.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	K1809385-003.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K1809385-004.02 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1808765-001.03 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1808765-001.03 ms 20x	Extended Reaction 021711 (Extended Reaction 021711)	1
69	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1808765-002.03 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1808765-003.03 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1808765-004.03 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1808765-005.03 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Fusion Report - 10032018
Wednesday, October 03, 2018 12:47 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2018/10/05 11:08 - Friday

Re.ort Summar Information

Company Location:	Gen Chem Lab		
Schedule Name:	10032018	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v9) Fusion1 (Fusion1) (v10) Fusion1 (Fusion1) (v11)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/10/03 12:47

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.93	17.98	4.04	49.00	05:26
2	TC Clean	9.40	13.47	4.08	50.18	04:02
3	TC Clean	2.67	6.68	4.01	50.26	03:45
4	TC Clean	1.89	6.01	4.12	50.21	03:47

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/10/03 13:09

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.11	4.92	3.81	49.08	05:13

2	TC Clean	4.63	8.41	3.78	50.09	04:04
3	TC Clean	2.02	6.00	3.98	50.17	03:49
4	TC Clean	1.31	5.43	4.12	50.15	03:50

Sample Type: Clean From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/10/03 13:31

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.18	13.01	3.83	49.27	05:20
2	TC Clean	4.27	8.11	3.84	50.23	04:02
3	TC Clean	1.67	5.75	4.08	50.11	03:53
4	TC Clean	1.26	5.21	3.95	50.20	03:54

Sample Type: Blank (Creating v1155) From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2018/10/03 13:53

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.90	4.67	3.78	49.22	05:27
2	TC Clean	3.87	7.61	3.74	50.14	04:02
3	TC Clean	1.53	5.43	3.90	50.15	03:48
4	TC Clean	1.56	5.42	3.86	50.10	03:54
5	Reagent Blank	5.08	8.98	3.91	50.22	05:09
6	Acid Blank	1.66	5.40	3.74	49.24	05:34

Sample Type: Sample From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/03 14:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.96	16.77	3.81	50.18	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

ample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.3133 ppm (PASS)	0.0000 ppm	0%	2018/10/03 14:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3133	243.1331	188.58	192.49	3.91	50.17	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/03 15:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	12.21	16.00	3.79	50.15	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/03 15:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.23	15.12	3.89	50.15	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	21.1109 ppm (PASS)	0.0000 ppm	0%	2018/10/03 15:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressur	R Time
2	TOC	21.9 ppm	1	21.1109	211.1088	165.76	169.58	3.81	50.14	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/03 15:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.79	17.65	3.86	50.14	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1808614-002.08 doc	5.0786 ppm	0.0919 ppm	1.8100%	2018/10/03 16:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1436	51.4362	50.78	54.63	3.84	50.19	12:25
2	TOC	5.0137	50.1367	49.86	53.84	3.98	50.17	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1808614-004.08 doc	2.4172 ppm	0.1564 ppm	6.4700%	2018/10/03 16:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5278	25.2776	32.14	35.98	3.83	50.15	12:26
2	TOC	2.3066	23.0660	30.57	34.46	3.89	50.10	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1808614-008.08 doc	1.0051 ppm	0.0251 ppm	2.5000%	2018/10/03 17:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0229	10.2288	21.42	25.43	4.02	50.08	12:26
2	TOC	0.9874	9.8737	21.17	25.01	3.84	50.19	12:27

Dilution	Blank Contribution	Method	Calibration
. ^	TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/03 17:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.06	14.89	3.83	50.16	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1809036-001.13 doc	0.2158 ppm	0.0096 ppm	4.4600%	2018/10/03 17:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2090	2.0897	15.62	19.59	3.97	50.15	12:26
2	TOC	0.2226	2.2259	15.72	19.45	3.73	50.19	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1809036-001.13 ms doc	25.6867 ppm	0.0000 ppm	0.0000%	2018/10/03 18:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.6867	256.8670	197.18	201.08	3.91	50.15	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.8373 ppm (PASS)	0.0000 ppm	0%	2018/10/03 18:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

B	TOC	25 ppm	1	24.8373	248.3730	192.32	196.13	3.81	50.14	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/03 19:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	11.27	15.11	3.83	50.10	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1809036-002.03 doc	0.2409 ppm	0.0328 ppm	13.6300%	2018/10/03 19:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2641	2.6412	16.01	19.90	3.89	50.08	12:26
2	TOC	0.2177	2.1767	15.68	19.75	4.06	50.09	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1809036-003.03 doc	0.8483 ppm	0.0701 ppm	8.2600%	2018/10/03 19:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8978	8.9785	20.53	24.46	3.94	50.07	12:29
2	TOC	0.7988	7.9877	19.82	23.72	3.90	50.08	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1809036-004.03 doc	2.1522 ppm	0.0016 ppm	0.0700%	2018/10/03 20:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	2.1511	21.5112	29.46	33.39	3.93	50.07	12:24
2	TOC	2.1534	21.5336	29.48	33.37	3.89	50.08	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1809036-005.03 doc	0.2276 ppm	0.0416 ppm	18.2700%	2018/10/03 20:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2570	2.5697	15.96	19.60	3.64	50.07	12:27
2	TOC	0.1982	1.9817	15.54	19.34	3.80	50.08	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1809040-001.03 doc	0.9579 ppm	0.0508 ppm	5.3000%	2018/10/03 21:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9938	9.9383	21.21	24.96	3.75	50.07	12:27
2	TOC	0.9220	9.2198	20.70	24.44	3.74	50.05	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1809040-001.03 ms doc	26.7344 ppm	0.0000 ppm	0.0000%	2018/10/03 21:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.7344	267.3439	204.64	208.34	3.70	50.04	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/03 22:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.99	15.82	3.83	50.05	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	17	TOC	K1809040-002.03 doc	2.5170 ppm	0.0001 ppm	0.0000%	2018/10/03 22:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5171	25.1709	32.07	35.86	3.79	50.04	12:26
2	TOC	2.5170	25.1695	32.07	35.92	3.86	50.02	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1808827-001.01 doc	2.2546 ppm	0.0438 ppm	1.9400%	2018/10/03 23:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2856	22.8555	30.42	34.42	4.00	50.00	12:28
2	TOC	2.2237	22.2367	29.98	33.85	3.88	49.99	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1808827-001.01 ms doc	28.1837 ppm	0.0000 ppm	0.0000%	2018/10/03 23:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.1837	281.8370	214.97	218.84	3.87	49.98	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5394 ppm (PASS)	0.0000 ppm	0%	2018/10/03 23:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5394	245.3938	190.20	194.13	3.93	49.96	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 10

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/04 00:06

Pos	Base Analysis ype	ID	Rep	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	11.81	15.62	3.81	49.94	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample — From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 00:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.71	14.57	3.86	49.93	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER — From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.8374 ppm (PASS)	0.0000 ppm	0%	2018/10/04 00:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.8374	208.3738	163.81	167.67	3.85	49.91	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample — From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1808827-002.01 doc	3.0732 ppm	0.1607 ppm	5.2300%	2018/10/04 00:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1869	31.8688	36.84	40.75	3.91	49.92	12:26
2	TOC	2.9595	29.5955	35.22	39.24	4.02	49.91	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◇	22	TOC	K1808827-003.01.doc	2.9860 ppm	0.0557 ppm	1.8600%	2018/10/04 01:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0254	30.2536	35.69	39.70	4.01	49.90	12:28
2	TOC	2.9466	29.4664	35.13	39.08	3.95	49.91	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◇	23	TOC	K1808827-004.01.doc	2.1045 ppm	0.0892 ppm	4.2400%	2018/10/04 01:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1675	21.6754	29.58	33.44	3.87	49.88	12:24
2	TOC	2.0414	20.4138	28.68	32.56	3.89	49.87	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◇	24	TOC	K1808827-005.02.doc	1.7397 ppm	0.0214 ppm	1.2300%	2018/10/04 02:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7548	17.5483	26.64	30.43	3.79	49.88	12:28
2	TOC	1.7245	17.2452	26.42	30.27	3.85	49.87	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◇	25	TOC	K1808827-006.02.doc	1.1564 ppm	0.0575 ppm	4.9700%	2018/10/04 03:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1970	11.9703	22.66	26.35	3.69	49.86	12:25
2	TOC	1.1158	11.1578	22.08	26.03	3.95	49.85	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◇	26	TOC	K1808827-007.02.doc	0.3907 ppm	0.0383 ppm	9.8000%	2018/10/04 03:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4178	4.1778	17.11	21.02	3.92	49.84	12:25
2	TOC	0.3636	3.6362	16.72	20.50	3.78	49.84	12:26

Dilution	Blank Contribution	Method	Calibration
:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reactio 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1808827-008.02 doc	0.0164 ppm	0.0232 ppm	141.4200%	2018/10/04 04:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.10	17.90	3.80	49.83	12:29
2	TOC	0.0329	0.3286	14.36	18.09	3.73	49.82	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1808827-009.02 doc	1.5506 ppm	0.0493 ppm	3.1800%	2018/10/04 04:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5855	15.8545	25.43	29.10	3.67	49.82	12:26
2	TOC	1.5157	15.1571	24.93	28.77	3.84	49.80	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.7372 ppm (PASS)	0.0000 ppm	0%	2018/10/04 05:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7372	247.3724	191.60	195.47	3.86	49.81	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/04 05:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
	TOC	0.0 ppm	1	0.0000	0.0000	11.60	15.43	3.83	49.81	:3

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample — From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1808827-010.01 doc	1.2847 ppm	0.0071 ppm	0.5600%	2018/10/04 05:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2898	12.8978	23.32	27.21	3.89	49.79	12:27
2	TOC	1.2797	12.7968	23.25	27.09	3.84	49.81	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1809156-001.14 doc	2.2863 ppm	0.1167 ppm	5.1000%	2018/10/04 06:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3688	23.6877	31.01	34.77	3.76	49.78	12:28
2	TOC	2.2037	22.0374	29.83	33.77	3.94	49.76	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1809156-001.14 ms doc	28.3959 ppm	0.0000 ppm	0.0000%	2018/10/04 06:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.3959	283.9588	216.48	220.28	3.80	49.77	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 07:02

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	12.31	16.17	3.86	49.76	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1809156-002.14 doc	0.4192 ppm	0.0447 ppm	10.6500%	2018/10/04 07:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3876	3.8761	16.89	20.65	3.76	49.74	12:28
2	TOC	0.4508	4.5076	17.34	21.18	3.84	49.76	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1809156-003.14 doc	0.3472 ppm	0.0754 ppm	21.7200%	2018/10/04 07:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4005	4.0052	16.98	20.72	3.74	49.75	12:28
2	TOC	0.2939	2.9387	16.22	20.17	3.95	49.76	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1809156-004.14 doc	1.0056 ppm	0.0258 ppm	2.5700%	2018/10/04 08:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0239	10.2386	21.43	25.15	3.72	49.76	12:25
2	TOC	0.9874	9.8737	21.17	25.05	3.88	49.77	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1809156-005.14 doc	0.0051 ppm	0.0073 ppm	141.4200%	2018/10/04 08:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0103	0.1027	14.20	18.01	3.81	49.79	12:26
2	TOC	0.0000	0.0000	13.86	17.71	3.85	49.83	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1809156-006.14 doc	0.5536 ppm	0.0425 ppm	7.6700%	2018/10/04 09:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5837	5.8365	18.29	22.04	3.75	49.81	12:23
2	TOC	0.5236	5.2359	17.86	21.83	3.97	49.83	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1809156-007.14 doc	0.3063 ppm	0.0577 ppm	18.8200%	2018/10/04 09:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3471	3.4706	16.60	20.48	3.88	49.86	12:24
2	TOC	0.2655	2.6553	16.02	20.02	3.99	49.87	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.3229 ppm (PASS)	0.0000 ppm	0%	2018/10/04 10:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3229	243.2285	188.65	192.45	3.80	49.86	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/04 10:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	11.07	14.99	3.92	50.06	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample — From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. De . (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 11:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.43	14.15	3.72	50.00	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER — From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.9241 ppm (PASS)	0.0000 ppm	0%	2018/10/04 11:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.9241	209.2410	164.43	168.37	3.94	49.99	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample — From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1809156-008.14 doc	0.0893 ppm	0.0881 ppm	98.7000%	2018/10/04 11:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1516	1.5158	15.21	19.01	3.80	50.06	12:27
2	TOC	0.0270	0.2697	14.32	18.17	3.85	50.01	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1809156-009.14 doc	0.2325 ppm	0.0980 ppm	42.1600%	2018/10/04 12:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.3019	3.0187	16.28	20.14	3.86	50.15	12:26
2	TOC	0.1632	1.6323	15.29	19.10	3.80	50.11	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1809156-010.14 doc	0.4148 ppm	0.0292 ppm	7.0300%	2018/10/04 12:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4355	4.3546	17.23	20.97	3.74	50.23	12:27
2	TOC	0.3942	3.9421	16.94	20.66	3.73	50.14	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1809024-001.02 doc	5.8372 ppm	0.1348 ppm	2.3100%	2018/10/04 13:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9325	59.3254	56.41	60.21	3.80	50.17	12:25
2	TOC	5.7418	57.4184	55.05	59.05	4.01	50.09	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1809024-001.02 ms doc	31.7852 ppm	0.0000 ppm	0.0000%	2018/10/04 13:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.7852	317.8523	240.64	244.33	3.69	50.12	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 13:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.07	15.83	3.76	50.14	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	46	TOC	K1809024-002.02 doc	2.7272 ppm	0.0620 ppm	2.2700%	2018/10/04 14:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7711	27.7109	33.88	37.50	3.62	50.17	12:22
2	TOC	2.6834	26.8338	33.25	37.33	4.08	50.13	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1808614-002.07	5.2330 ppm	0.2449 ppm	4.6800%	2018/10/04 14:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.4062	54.0617	52.66	56.54	3.89	50.16	12:23
2	TOC	5.0598	50.5984	50.19	54.23	4.04	50.23	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.6820 ppm (PASS)	0.0000 ppm	0%	2018/10/04 15:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6820	246.8195	191.21	195.03	3.81	50.11	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/04 15:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	10.71	14.62	3.92	50.18	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1808614-004.07	2.3545 ppm	0.0317 ppm	1.3400%	2018/10/04 15:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3769	23.7691	31.07	34.92	3.86	50.23	12:23
2	TOC	2.3321	23.3214	30.75	34.48	3.73	50.18	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1808614-008.07	0.8581 ppm	0.0260 ppm	3.0300%	2018/10/04 16:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8765	8.7652	20.38	24.13	3.76	50.19	12:23
2	TOC	0.8397	8.3975	20.11	23.97	3.85	50.24	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 16:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.94	13.83	3.90	50.17	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1809491-001.02	0.8613 ppm	0.0136 ppm	1.5800%	2018/10/04 17:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8709	8.7090	20.34	24.20	3.87	50.23	12:21
2	TOC	0.8517	8.5168	20.20	24.06	3.86	50.36	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1809491-001.02 ms	26.4060 ppm	0.0000 ppm	0.0000%	2018/10/04 17:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	26.4060	264.0602	202.30	206.08	3.78	50.23	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

s	Analysis Type	ample ID	Result (ppmC)	Std. Dev. (ppmC	RSD	Start Time
53	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 17:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.82	14.66	3.84	50.30	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	K1809491-002.02 4x	0.0644 ppm	0.0206 ppm	32.0300%	2018/10/04 18:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0498	0.4984	14.49	18.36	3.87	50.23	12:21
2	TOC	0.0790	0.7903	14.69	18.61	3.92	50.26	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	K1809491-003.01 4x	115.9334 ppm	0.3311 ppm	0.2900%	2018/10/04 18:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	116.1676	1161.6758	841.96	845.92	3.97	50.20	12:24
2	TOC	115.6993	1156.9931	838.62	843.40	4.78	50.19	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
56	TOC	RB	0.6779 ppm	0.9587 ppm	141.4200%	2018/10/04 19:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3559	13.5588	23.79	28.16	4.37	50.18	12:26
2	TOC	0.0000	0.0000	13.59	17.53	3.95	50.18	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
57	TOC	K1809489-001.01	11.7456 ppm	0.2677 ppm	2.2800%	2018/10/04 19:50

K1809489-001.01

11.9349 ppm CES 10/5/18
11.5563 ppm

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◉	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.4486 ppm (PASS)	0.0000 ppm	0%	2018/10/04 20:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4486	244.4859	189.55	193.35	3.80	50.22	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◉	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/04 20:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	10.99	14.87	3.88	50.26	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 20:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.44	14.34	3.90	50.19	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER 1.9 ppm]	0 / infinity (NA / NA)	20.8497 ppm (PASS)	0.0000 m	0%	2018/10/04 21:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.8497	208.4973	163.90	167.75	3.85	50.07	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1809489-001.01 ms	34.3893 ppm	0.0000 ppm	0.0000%	2018/10/04 21:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	34.3893	343.8930	259.19	263.15	3.96	50.04	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/04 21:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.90	15.91	4.01	50.08	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	K1809385-001.0120x	110.2419 ppm	2.2247 ppm	2.0200%	2018/10/04 22:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	111.8150	1118.1502	810.94	814.63	3.69	50.16	12:27
2	TOC	108.6689	1086.6886	788.52	792.88	4.36	50.19	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	RB	0.2509 ppm	0.3549 ppm	141.4200%	2018/10/04 22:32

Rep	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run T
1	TOC	0.5018	5.0184	17.71	22.01	4.30	50.19	12:25
2	TOC	0.0000	0.0000	12.24	16.20	3.96	50.21	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	K1809385-002.01 20x	2.5969 ppm	0.0577 ppm	2.2200%	2018/10/04 23:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6376	26.3764	32.93	36.72	3.79	50.20	12:25
2	TOC	2.5561	25.5610	32.34	36.27	3.92	50.22	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	K1809385-003.01 20x	2.4556 ppm	0.1974 ppm	8.0400%	2018/10/04 23:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5951	25.9512	32.62	36.47	3.84	50.17	12:26
2	TOC	2.3160	23.1600	30.63	34.77	4.13	50.17	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K1809385-004.02 4x	14.1077 ppm	0.1142 ppm	0.8100%	2018/10/05 00:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.1885	141.8848	115.24	119.30	4.06	50.17	12:24
2	TOC	14.0270	140.2696	114.09	118.17	4.09	50.16	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
						104 of 380				

◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5965 ppm (PASS)	0.0000 ppm	0%	2018/10/05 00:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5965	245.9649	190.60	194.47	3.87	50.14	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/05 00:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	11.26	15.34	4.08	50.12	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1808765-001.03 20x	0.6606 ppm	0.0073 ppm	1.1100%	2018/10/05 01:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6554	6.5536	18.80	22.85	4.05	50.11	12:26
2	TOC	0.6657	6.6574	18.87	22.69	3.82	50.10	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1808765-001.03 ms 20x	26.3255 ppm	0.0000 ppm	0.0000%	2018/10/05 01:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.3255	263.2547	201.73	205.63	3.91	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 02:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
	TOC	0.000	0.0000	11.5	15.38	3.85	50.10	12:26
2	TOC	0.0000	0.0000	10.80	14.63	3.83	50.10	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1808765-002.03 20x	1.1830 ppm	0.0814 ppm	6.8800%	2018/10/05 02:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2405	12.4053	22.97	26.73	3.76	50.10	12:28
2	TOC	1.1255	11.2546	22.15	26.03	3.88	50.11	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1808765-003.03 20x	0.6863 ppm	0.0100 ppm	1.4600%	2018/10/05 03:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6934	6.9339	19.07	22.89	3.82	50.11	12:25
2	TOC	0.6792	6.7921	18.97	22.84	3.87	50.10	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1808765-004.03 4x	3.2232 ppm	0.0785 ppm	2.4400%	2018/10/05 03:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2787	32.7866	37.49	41.36	3.87	50.08	12:27
2	TOC	3.1677	31.6766	36.70	40.69	3.99	50.08	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1808765-005.03 20x	1.0477 ppm	0.0617 ppm	5.8900%	2018/10/05 04:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0914	10.9136	21.91	25.84	3.93	50.08	12:26

2	TOC	1.0041	10.0407	21.28	25.24	3.95	50.07	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	P	s	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74		TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 04:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.22	14.19	3.98	50.09	12:25
2	TOC	0.0000	0.0000	10.44	14.41	3.97	50.07	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1298 (IC) (v1155)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9597 ppm (PASS)	0.0000 ppm	0%	2018/10/05 05:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9597	239.5968	186.06	189.99	3.93	50.07	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/05 05:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	0.0 ppm	1	0.0000	0.0000	10.81	14.78	3.97	50.06	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
15	1.9667	1.3590	0.0000	0.0000	0.0000	2018/09/26 16:47	Fusion1 (Fusion
v1155	1.6920	1.6620	0.0000	0.0000	0.0000	2018/10/03 14:27	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version: v17

Ver Creation: 2018/03/13 21:33

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 7.126x + 15.324

r^2 value: TOC: r^2 = 0.99994

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	15.2500	0.0000		2018/03/13 19:55
0.50 ppm	18.8060	0.5000		2018/03/13 20:12
1.00 ppm	21.6980	1.0000		2018/03/13 20:28
5.00 ppm	50.8680	5.0000		2018/03/13 20:43
10.0 ppm	88.5720	10.0000		2018/03/13 21:00
25.0 ppm	192.2360	25.0000		2018/03/13 21:16
50.0 ppm	371.8790	50.0000		2018/03/13 21:32

Methods

Name: Extended Reaction 021711 (TOC)

Version: v3

Ver Creation: 2013/02/04 11:44

Comment:

Operator: Gen Chem Lab (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7

PreSpargeTime	4.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	7
		yringeSpeedU spira e	
		SyringeSpeedICDispense	7
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2018/10/05 05:46

Work Request # (Original) K1809036, 8731, 8732, 8850, 9491, 9385, 8852, 8870, 8891, 8911, 9017, 8910

Tier: III I IV IV IV IV II IV II IV IV IV

Date Analyzed: 10/5/18

Analyst: CES

Run # TOC: 609741, 609744, 609745

Analysis: TOC:

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

8852 Received past hold

9036-2, 5, 8732-3, 8870-13, 8911-12 RPD not within acceptance limits. The sample results are less than 5x the MRL.

RA Run 609745 - LCS fail

RA 9385-1 over cal range, 8732-1, 2 over diluted.

Final Approved by: [signature] Date: 10/10/18

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609741 **Method/Testcode:** SM 5310 C/TOC T

ab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
1808731-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 20:26	N	I
1808731-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 20:57	N	I
1808732-001	Carbon, Total Organic	N/A		Water	0.39 mg/L	10 ml	10 mg/L U	20	2	10			10/5/18 21:29	N	IV
1808732-002	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 ml	10 mg/L U	20	2	10			10/5/18 22:49	N	IV
1808732-003	Carbon, Total Organic	N/A		Water	1.00 mg/L	10 ml	1.00 mg/L	1	0.07	0.50			10/5/18 23:52	N	IV
1808850-004	Carbon, Total Organic	N/A		Water	3.88 mg/L	10 ml	78 mg/L	20	2	10			10/6/18 00:24	N	IV
1808850-005	Carbon, Total Organic	N/A		Water	2.11 mg/L	10 ml	42 mg/L	20	2	10			10/6/18 02:49	N	IV
1808850-006	Carbon, Total Organic	N/A		Water	5.30 mg/L	10 ml	21.2 mg/L	4	0.3	2.0			10/6/18 03:21	N	IV
1808850-007	Carbon, Total Organic	N/A		Water	3.74 mg/L	10 ml	75 mg/L	20	2	10			10/6/18 03:53	N	IV
1808850-008	Carbon, Total Organic	N/A		Water	2.09 mg/L	10 ml	20.9 mg/L	10	0.7	5.0			10/6/18 04:24	N	IV
1808850-009	Carbon, Total Organic	N/A		Water	1.03 mg/L	10 ml	10.3 mg/L	10	0.7	5.0			10/6/18 04:56	N	IV
1809036-001	Carbon, Total Organic	N/A		Ground Water	0.34 mg/L	10 ml	0.34 mg/L J	1	0.07	0.50			10/5/18 16:41	Y	III
1809036-002	Carbon, Total Organic	N/A		Ground Water	0.28 mg/L	10 ml	0.28 mg/L J	1	0.07	0.50			10/5/18 17:46	N	III
1809036-003	Carbon, Total Organic	N/A		Ground Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 18:18	N	III
1809036-004	Carbon, Total Organic	N/A		Ground Water	2.40 mg/L	10 ml	2.40 mg/L	1	0.07	0.50			10/5/18 18:49	N	III
1809036-005	Carbon, Total Organic	N/A		Ground Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50			10/5/18 19:54	N	III
1809385-001	Carbon, Total Organic	N/A		Ground Water	57.68 mg/L	10 ml	2880 mg/L	50	4	25			10/6/18 07:36	Y	IV
1809491-002	Carbon, Total Organic	N/A		Ground Water	2.21 mg/L	10 ml	2.21 mg/L	1	0.07	0.50			10/6/18 05:28	N	IV
1809491-003	Carbon, Total Organic	N/A		Ground Water	22.43 mg/L	10 ml	1120 mg/L	50	4	25			10/6/18 06:32	N	IV
Q1814385-01	Carbon, Total Organic	MS	K1809036-001	Ground Water	25.48 mg/L	10 ml	25.5 mg/L	1	0.07	0.50	101		10/5/18 17:13	N	III
Q1814385-02	Carbon, Total Organic	DUP	K1809036-001	Ground Water	0.32 mg/L	10 ml	0.32 mg/L J	1	0.07	0.50		7	10/5/18 16:41	N	III
Q1814385-03	Carbon, Total Organic	DUP	K1809036-002	Ground Water	0.22 mg/L	10 ml	0.22 mg/L J	1	0.07	0.50		26*	10/5/18 17:46	N	III
Q1814385-04	Carbon, Total Organic	DUP	K1809036-003	Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/5/18 18:18	N	III
KQ1814385-05	Carbon, Total Organic	DUP	K1809036-004	Ground Water	2.29 mg/L	10 ml	2.29 mg/L	1	0.07	0.50		4	10/5/18 18:49	N	III
KQ1814385-06	Carbon, Total Organic	DUP	K1809036-005	Ground Water	0.31 mg/L	10 ml	0.31 mg/L J	1	0.07	0.50		16*	10/5/18 19:54	N	III
KQ1814385-07	Carbon, Total Organic	DUP	K1808731-001	Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/5/18 20:26	N	I
KQ1814385-08	Carbon, Total Organic	DUP	K1808731-002	Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/5/18 20:57	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

10/9/18

10/10/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609741 **Method/Testcode:** SM 5310 C/TOC T

La	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1814385-09	Carbon, Total Organic	MS	K1808732-001	Water	26.05 mg/L	10 ml	521 mg/L	20	2	10	104		10/5/18 22:01	N	IV
′Q1814385-10	Carbon, Total Organic	DUP	K1808732-001	Water	0.34 mg/L	10 ml	7 mg/L J	20	2	10		NC	10/5/18 21:29	N	IV
KQ1814385-11	Carbon, Total Organic	DUP	K1808732-002	Water	0.00 mg/L	10 ml	10 mg/L U	20	2	10		NC	10/5/18 22:49	N	IV
Q1814385-12	Carbon, Total Organic	DUP	K1808732-003	Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50		12*	10/5/18 23:52	N	IV
KQ1814385-13	Carbon, Total Organic	DUP	K1808850-004	Water	3.75 mg/L	10 ml	75 mg/L	20	2	10		3	10/6/18 00:24	N	IV
KQ1814385-14	Carbon, Total Organic	DUP	K1808850-005	Water	2.12 mg/L	10 ml	42 mg/L	20	2	10		<1	10/6/18 02:49	N	IV
KQ1814385-15	Carbon, Total Organic	DUP	K1808850-006	Water	5.11 mg/L	10 ml	20.4 mg/L	4	0.3	2.0		4	10/6/18 03:21	N	IV
KQ1814385-16	Carbon, Total Organic	DUP	K1808850-007	Water	3.49 mg/L	10 ml	70 mg/L	20	2	10		7	10/6/18 03:53	N	IV
KQ1814385-17	Carbon, Total Organic	DUP	K1808850-008	Water	1.97 mg/L	10 ml	19.7 mg/L	10	0.7	5.0		6	10/6/18 04:24	N	IV
KQ1814385-18	Carbon, Total Organic	DUP	K1808850-009	Water	0.96 mg/L	10 ml	9.6 mg/L	10	0.7	5.0		7	10/6/18 04:56	N	IV
KQ1814385-19	Carbon, Total Organic	DUP	K1809491-002	Ground Water	2.14 mg/L	10 ml	2.14 mg/L	1	0.07	0.50		3	10/6/18 05:28	N	IV
KQ1814385-20	Carbon, Total Organic	DUP	K1809491-003	Ground Water	21.83 mg/L	10 ml	1090 mg/L	50	4	25		3	10/6/18 06:32	N	IV
KQ1814385-21	Carbon, Total Organic	MS	K1809385-001	Ground Water	80.16 mg/L	10 ml	4010 mg/L	50	4	25	90		10/6/18 08:07	N	IV
KQ1814385-22	Carbon, Total Organic	DUP	K1809385-001	Ground Water	55.17 mg/L	10 ml	2760 mg/L	50	4	25		4	10/6/18 07:36	N	IV
Q1814385-23	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 15:51	N	III
KQ1814385-23	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 15:51	N	III
KQ1814385-24	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 01:28	N	III
KQ1814385-24	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 01:28	N	III
KQ1814385-25	Carbon, Total Organic	LCS		Ground Water	20.74 mg/L	10 ml	20.7 mg/L	1	0.07	0.50	95		10/5/18 16:08	N	III
KQ1814385-25	Carbon, Total Organic	LCS		Ground Water	20.74 mg/L	10 ml	20.7 mg/L	1	0.07	0.50	95		10/5/18 16:08	N	III
KQ1814385-26	Carbon, Total Organic	LCS		Ground Water	20.23 mg/L	10 ml	20.2 mg/L	1	0.07	0.50	92		10/6/18 01:45	N	III
KQ1814385-26	Carbon, Total Organic	LCS		Ground Water	20.23 mg/L	10 ml	20.2 mg/L	1	0.07	0.50	92		10/6/18 01:45	N	III
KQ1814385-27	Carbon, Total Organic	CCV		Ground Water	24.60 mg/L	10 ml	24.6 mg/L	1			98		10/5/18 15:18	N	III
KQ1814385-27	Carbon, Total Organic	CCV		Ground Water	24.60 mg/L	10 ml	24.6 mg/L	1			98		10/5/18 15:18	N	III
KQ1814385-28	Carbon, Total Organic	CCV		Ground Water	24.85 mg/L	10 ml	24.8 mg/L	1			99		10/5/18 19:21	N	III
KQ1814385-28	Carbon, Total Organic	CCV		Ground Water	24.85 mg/L	10 ml	24.8 mg/L	1			99		10/5/18 19:21	N	III
KQ1814385-29	Carbon, Total Organic	CCV		Ground Water	24.54 mg/L	10 ml	24.5 mg/L	1			98		10/6/18 00:55	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609741 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
Q1814385-29	Carbon, Total Organic	CCV		Ground Water	24.54 mg/L	10 ml	24.5 mg/L	1			98		10/6/18 00:55	N	III
Q1814385-30	Carbon, Total Organic	CCV		Ground Water	25.17 mg/L	10 ml	25.2 mg/L	1			101		10/6/18 05:59	N	III
KQ1814385-30	Carbon, Total Organic	CCV		Ground Water	25.17 mg/L	10 ml	25.2 mg/L	1			101		10/6/18 05:59	N	III
KQ1814385-31	Carbon, Total Organic	CCV		Ground Water	24.67 mg/L	10 ml	24.7 mg/L	1			99		10/6/18 11:04	N	III
KQ1814385-31	Carbon, Total Organic	CCV		Ground Water	24.67 mg/L	10 ml	24.7 mg/L	1			99		10/6/18 11:04	N	III
KQ1814385-32	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 15:35	N	III
KQ1814385-32	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 15:35	N	III
KQ1814385-33	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 19:37	N	III
KQ1814385-33	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/5/18 19:37	N	III
KQ1814385-34	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 01:12	N	III
KQ1814385-34	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 01:12	N	III
KQ1814385-35	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 06:16	N	III
KQ1814385-35	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 06:16	N	III
KQ1814385-36	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 11:20	N	III
KQ1814385-36	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 11:20	N	III
KQ1814385-37	Carbon, Total Organic	MS	K1808850-004	Water	29.88 mg/L	10 ml	598 mg/L	20	2	10	104		10/6/18 02:01	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609744 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1808852-001	Carbon, Total Organic	N/A		Water	4.61 mg/L	10 ml	18.4 mg/L	4	0.3	2.0			10/6/18 08:56	N	II
K1808852-002	Carbon, Total Organic	N/A		Water	0.57 mg/L	10 ml	0.57 mg/L	1	0.07	0.50			10/6/18 10:01	N	II
K1808870-009	Carbon, Total Organic	N/A		Surface Water	2.85 mg/L	10 ml	2.85 mg/L	1	0.07	0.50			10/6/18 10:32	N	IV
K1808870-010	Carbon, Total Organic	N/A		Surface Water	3.06 mg/L	10 ml	3.06 mg/L	1	0.07	0.50			10/6/18 12:43	N	IV
K1808870-011	Carbon, Total Organic	N/A		Surface Water	0.85 mg/L	10 ml	0.85 mg/L	1	0.07	0.50			10/6/18 13:14	N	IV
K1808870-012	Carbon, Total Organic	N/A		Surface Water	0.75 mg/L	10 ml	0.75 mg/L	1	0.07	0.50			10/6/18 13:46	N	IV
K1808870-013	Carbon, Total Organic	N/A		Surface Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			10/6/18 14:18	N	IV
K1808870-014	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 14:49	N	IV
K1808870-015	Carbon, Total Organic	N/A		Surface Water	2.78 mg/L	10 ml	2.78 mg/L	1	0.07	0.50			10/6/18 15:21	N	IV
K1808870-016	Carbon, Total Organic	N/A		Surface Water	2.88 mg/L	10 ml	2.88 mg/L	1	0.07	0.50			10/6/18 16:26	N	IV
K1808891-008	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 16:57	N	II
K1808911-009	Carbon, Total Organic	N/A		Surface Water	0.95 mg/L	10 ml	0.95 mg/L	1	0.07	0.50			10/6/18 17:29	N	IV
K1808911-010	Carbon, Total Organic	N/A		Surface Water	16.04 mg/L	10 ml	64.2 mg/L	4	0.3	2.0			10/6/18 18:33	N	IV
K1808911-011	Carbon, Total Organic	N/A		Surface Water	2.16 mg/L	10 ml	2.16 mg/L	1	0.07	0.50			10/6/18 19:37	N	IV
K1808911-012	Carbon, Total Organic	N/A		Surface Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			10/6/18 20:08	N	IV
K1808911-013	Carbon, Total Organic	N/A		Surface Water	3.90 mg/L	10 ml	3.90 mg/L	1	0.07	0.50			10/6/18 20:40	N	IV
K1808911-014	Carbon, Total Organic	N/A		Surface Water	4.28 mg/L	10 ml	4.28 mg/L	1	0.07	0.50			10/6/18 22:18	N	IV
K1808911-015	Carbon, Total Organic	N/A		Surface Water	1.74 mg/L	10 ml	1.74 mg/L	1	0.07	0.50			10/6/18 22:50	N	IV
K1808911-016	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 23:21	N	IV
KQ1814386-01	Carbon, Total Organic	MS	K1808852-001	Water	30.11 mg/L	10 ml	120 mg/L	4	0.3	2.0	102		10/6/18 09:28	N	II
KQ1814386-02	Carbon, Total Organic	DUP	K1808852-001	Water	4.38 mg/L	10 ml	17.5 mg/L	4	0.3	2.0		5	10/6/18 08:56	N	II
KQ1814386-03	Carbon, Total Organic	DUP	K1808852-002	Water	0.54 mg/L	10 ml	0.54 mg/L	1	0.07	0.50		4	10/6/18 10:01	N	II
KQ1814386-04	Carbon, Total Organic	MS	K1808870-009	Surface Water	28.72 mg/L	10 ml	28.7 mg/L	1	0.07	0.50	104		10/6/18 12:10	N	IV
KQ1814386-05	Carbon, Total Organic	DUP	K1808870-009	Surface Water	2.70 mg/L	10 ml	2.70 mg/L	1	0.07	0.50		5	10/6/18 10:32	N	IV
KQ1814386-06	Carbon, Total Organic	DUP	K1808870-010	Surface Water	2.95 mg/L	10 ml	2.95 mg/L	1	0.07	0.50		4	10/6/18 12:43	N	IV

10/10/18 CES 10/9/18

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609744 **Method/Testcode:** SM 5310 C/TOC T

Lab de	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
Q1814386-07	Carbon, Total Organic	DUP	K1808870-011	Surface Water	0.85 mg/L	10 ml	0.85 mg/L	1	0.07	0.50		<1	10/6/18 13:14	N	IV
′Q1814386-08	Carbon, Total Organic	DUP	K1808870-012	Surface Water	0.70 mg/L	10 ml	0.70 mg/L	1	0.07	0.50		7	10/6/18 13:46	N	IV
′Q1814386-09	Carbon, Total Organic	DUP	K1808870-013	Surface Water	0.24 mg/L	10 ml	0.24 mg/L J	1	0.07	0.50		23*	10/6/18 14:18	N	IV
′Q1814386-10	Carbon, Total Organic	DUP	K1808870-014	Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/6/18 14:49	N	IV
Q1814386-11	Carbon, Total Organic	DUP	K1808870-015	Surface Water	2.70 mg/L	10 ml	2.70 mg/L	1	0.07	0.50		3	10/6/18 15:21	N	IV
′Q1814386-12	Carbon, Total Organic	DUP	K1808870-016	Surface Water	2.75 mg/L	10 ml	2.75 mg/L	1	0.07	0.50		5	10/6/18 16:26	N	IV
′Q1814386-13	Carbon, Total Organic	DUP	K1808891-008	Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/6/18 16:57	N	II
′Q1814386-14	Carbon, Total Organic	MS	K1808911-009	Surface Water	27.25 mg/L	10 ml	27.2 mg/L	1	0.07	0.50	105		10/6/18 18:01	N	IV
Q1814386-15	Carbon, Total Organic	DUP	K1808911-009	Surface Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50		7	10/6/18 17:29	N	IV
Q1814386-16	Carbon, Total Organic	DUP	K1808911-010	Surface Water	15.94 mg/L	10 ml	63.8 mg/L	4	0.3	2.0		<1	10/6/18 18:33	N	IV
Q1814386-17	Carbon, Total Organic	DUP	K1808911-011	Surface Water	2.08 mg/L	10 ml	2.08 mg/L	1	0.07	0.50		4	10/6/18 19:37	N	IV
Q1814386-18	Carbon, Total Organic	DUP	K1808911-012	Surface Water	0.22 mg/L	10 ml	0.22 mg/L J	1	0.07	0.50		31*	10/6/18 20:08	N	IV
Q1814386-19	Carbon, Total Organic	DUP	K1808911-013	Surface Water	3.77 mg/L	10 ml	3.77 mg/L	1	0.07	0.50		3	10/6/18 20:40	N	IV
Q1814386-20	Carbon, Total Organic	DUP	K1808911-014	Surface Water	4.11 mg/L	10 ml	4.11 mg/L	1	0.07	0.50		4	10/6/18 22:18	N	IV
Q1814386-21	Carbon, Total Organic	DUP	K1808911-015	Surface Water	1.64 mg/L	10 ml	1.64 mg/L	1	0.07	0.50		6	10/6/18 22:50	N	IV
′Q1814386-22	Carbon, Total Organic	DUP	K1808911-016	Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/6/18 23:21	N	IV
′Q1814386-23	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 11:37	N	II
Q1814386-24	Carbon, Total Organic	LCS		Water	18.35 mg/L	10 ml	18.4 mg/L	1	0.07	0.50	84		10/6/18 11:53	N	II
KQ1814386-25	Carbon, Total Organic	CCV		Water	25.17 mg/L	10 ml	25.2 mg/L	1			101		10/6/18 05:59	N	II
Q1814386-26	Carbon, Total Organic	CCV		Water	24.67 mg/L	10 ml	24.7 mg/L	1			99		10/6/18 11:04	N	II
′Q1814386-27	Carbon, Total Organic	CCV		Water	24.54 mg/L	10 ml	24.5 mg/L	1			98		10/6/18 15:53	N	II
′Q1814386-28	Carbon, Total Organic	CCV		Water	24.44 mg/L	10 ml	24.4 mg/L	1			98		10/6/18 21:12	N	II
KQ1814386-29	Carbon, Total Organic	CCV		Water	24.60 mg/L	10 ml	24.6 mg/L	1			98		10/7/18 02:17	N	II
KQ1814386-30	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 06:16	N	II
KQ1814386-31	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 11:20	N	II
KQ1814386-32	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 16:09	N	II
KQ1814386-33	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 21:28	N	II
KQ1814386-34	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/7/18 02:33	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609745 **Method/Testcode:** 415.1/TOC T

ab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
'1808910-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/7/18 04:26	Y	IV
'1808910-002	Carbon, Total Organic	N/A		Water	0.10 mg/L	10 ml	0.1 mg/L J	1	0.07	0.50			10/7/18 05:30	N	IV
'1808910-003	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/7/18 06:02	N	IV
1809017-001	Carbon, Total Organic	N/A		Surface Water	3.29 mg/L	10 ml	3.29 mg/L	1	0.07	0.50			10/6/18 23:53	N	IV
'1809017-002	Carbon, Total Organic	N/A		Surface Water	9.21 mg/L	10 ml	9.21 mg/L	1	0.07	0.50			10/7/18 00:25	N	IV
1809017-003	Carbon, Total Organic	N/A		Surface Water	11.73 mg/L	10 ml	11.7 mg/L	1	0.07	0.50			10/7/18 00:57	N	IV
1809017-004	Carbon, Total Organic	N/A		Surface Water	2.33 mg/L	10 ml	2.33 mg/L	1	0.07	0.50			10/7/18 01:28	Y	IV
K1809017-005	Carbon, Total Organic	N/A		Surface Water	2.74 mg/L	10 ml	2.74 mg/L	1	0.07	0.50			10/7/18 02:49	Y	IV
1809017-006	Carbon, Total Organic	N/A		Surface Water	1.17 mg/L	10 ml	1.17 mg/L	1	0.07	0.50			10/7/18 03:54	N	IV
KQ1814387-01	Carbon, Total Organic	DUP	K1809017-001	Surface Water	3.19 mg/L	10 ml	3.19 mg/L	1	0.07	0.50		3	10/6/18 23:53	N	IV
KQ1814387-02	Carbon, Total Organic	DUP	K1809017-002	Surface Water	8.78 mg/L	10 ml	8.78 mg/L	1	0.07	0.50		5	10/7/18 00:25	N	IV
KQ1814387-03	Carbon, Total Organic	DUP	K1809017-003	Surface Water	11.35 mg/L	10 ml	11.3 mg/L	1	0.07	0.50		3	10/7/18 00:57	N	IV
KQ1814387-04	Carbon, Total Organic	MS	K1809017-004	Surface Water	28.00 mg/L	10 ml	28.0 mg/L	1	0.07	0.50	103		10/7/18 02:00	N	IV
KQ1814387-05	Carbon, Total Organic	DUP	K1809017-004	Surface Water	2.20 mg/L	10 ml	2.20 mg/L	1	0.07	0.50		6	10/7/18 01:28	N	IV
KQ1814387-06	Carbon, Total Organic	MS	K1809017-005	Surface Water	28.67 mg/L	10 ml	28.7 mg/L	1	0.07	0.50	104		10/7/18 03:21	N	IV
KQ1814387-07	Carbon, Total Organic	DUP	K1809017-005	Surface Water	2.73 mg/L	10 ml	2.73 mg/L	1	0.07	0.50		<1	10/7/18 02:49	N	IV
KQ1814387-08	Carbon, Total Organic	DUP	K1809017-006	Surface Water	1.09 mg/L	10 ml	1.09 mg/L	1	0.07	0.50		7	10/7/18 03:54	N	IV
KQ1814387-09	Carbon, Total Organic	MS	K1808910-001	Water	25.62 mg/L	10 ml	25.6 mg/L	1	0.07	0.50	102		10/7/18 04:57	N	IV
KQ1814387-10	Carbon, Total Organic	DUP	K1808910-001	Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/7/18 04:26	N	IV
KQ1814387-11	Carbon, Total Organic	DUP	K1808910-002	Water	0.09 mg/L	10 ml	0.09 mg/L J	1	0.07	0.50		12	10/7/18 05:30	N	IV
KQ1814387-12	Carbon, Total Organic	DUP	K1808910-003	Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	10/7/18 06:02	N	IV
KQ1814387-13	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 21:45	N	IV
KQ1814387-13	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 21:45	N	IV
KQ1814387-14	Carbon, Total Organic	LCS		Surface Water	17.25 mg/L	10 ml	17.3 mg/L	1	0.07	0.50	79*		10/6/18 22:01	N	IV
KQ1814387-14	Carbon, Total Organic	LCS		Surface Water	17.25 mg/L	10 ml	17.3 mg/L	1	0.07	0.50	79*		10/6/18 22:01	N	IV
KQ1814387-15	Carbon, Total Organic	CCV		Surface Water	24.44 mg/L	10 ml	24.4 mg/L	1			98		10/6/18 21:12	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

10/10/18

CES 10/9/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 609745 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1814387-15	Carbon, Total Organic	CCV		Surface Water	24.44 mg/L	10 ml	24.4 mg/L	1			98		10/6/18 21:12	N	IV
KQ1814387-16	Carbon, Total Organic	CCV		Surface Water	24.60 mg/L	10 ml	24.6 mg/L	1			98		10/7/18 02:17	N	IV
KQ1814387-16	Carbon, Total Organic	CCV		Surface Water	24.60 mg/L	10 ml	24.6 mg/L	1			98		10/7/18 02:17	N	IV
KQ1814387-17	Carbon, Total Organic	CCV		Surface Water	24.43 mg/L	10 ml	24.4 mg/L	1			98		10/7/18 06:33	N	IV
KQ1814387-17	Carbon, Total Organic	CCV		Surface Water	24.43 mg/L	10 ml	24.4 mg/L	1			98		10/7/18 06:33	N	IV
KQ1814387-18	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 21:28	N	IV
KQ1814387-18	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/6/18 21:28	N	IV
KQ1814387-19	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/7/18 02:33	N	IV
KQ1814387-19	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/7/18 02:33	N	IV
KQ1814387-20	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/7/18 06:50	N	IV
KQ1814387-20	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/7/18 06:50	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

TOC: 609741, 609744, 609745

Schedule: 10052018

Version: 11
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2018/10/05 17:07 - Friday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	K1809036-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	K1809036-001.02 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
6	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
7	Sample	K1809036-002.08	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K1809036-003.08	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K1809036-004.08	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1809036-005.08	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1808731-001	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1808731-002	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1808732-001.08 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	K1808732-001.08 ms 20x	Extended Reaction 021711 (Extended Reaction 021711)	1
15	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1808732-002.08 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1808732-003.08	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1808850-004.03 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1808850-004.03 ms 20x	Extended Reaction 021711 (Extended Reaction 021711)	1
22	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K1808850-005.03 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
24	Sample	K1808850-006.03 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1808850-007.03 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1808850-008.03 10x	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1808850-009.03 10x	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1809491-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1809491-003.02 50x	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1809385-001.03 50x	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1809385-001.03 ms 50x	Extended Reaction 021711 (Extended Reaction 021711)	1
33	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1808852-001.01 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	K1808852-001.01 ms 4x	Extended Reaction 021711 (Extended Reaction 021711)	1
36	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
37	Sample	K1808852-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	K1808870-009.07	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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StarLIMS Run: K1809036, 8731, 8732, 8850, 9491, 9385, 8852, 8870, 8891, 8911, 9017, 8910

Analysis: TOC, DOC

Method: SM 5310 C, 415.1

CCV: 11-GEN-05-69K 50 ppm LCS: 11-GEN-05-68N 21.9 ppm

ICAL Date: 3/13/18

ICAL ID: 11-GEN-05-65A

ICS ID: 11-GEN-05-67D

ICS TV: 25.0 ppm ICS % R <1

Spike ID: 11-GEN-05-65K 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-69L

21 % H3PO4: 11-GEN-05-69M

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F

FILTER ID: NA

Analyzed By: CES	Date Analyzed: 10/5/18
Reviewed By: [signature]	Date Reviewed: 10/10/18

Schedule: 10052018

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
	heck Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711	
40	Sample	K1808870-009.07 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
41	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
42	Sample	K1808870-010.07	Extended Reaction 021711 (Extended Reaction 021711)	2
43	Sample	K1808870-011.07	Extended Reaction 021711 (Extended Reaction 021711)	2
44	Sample	K1808870-012.07	Extended Reaction 021711 (Extended Reaction 021711)	2
45	Sample	K1808870-013.07	Extended Reaction 021711 (Extended Reaction 021711)	2
46	Sample	K1808870-014.07	Extended Reaction 021711 (Extended Reaction 021711)	2
47	Sample	K1808870-015.07	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K1808870-016.07	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K1808891-008.04	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	K1808911-009.13	Extended Reaction 021711 (Extended Reaction 021711)	2
51	Sample	K1808911-009.13 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
52	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
53	Sample	K1808911-010.13 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
54	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
55	Sample	K1808911-011.13	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	K1808911-012.13	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	K1808911-013.13	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	K1808911-014.13	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	K1808911-015.13	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	K1808911-016.13	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	K1809017-001.06	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	K1809017-002.06	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	K1809017-003.06	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	K1809017-004.06	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K1809017-004.06 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1809017-005.15	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1809017-005.15 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
69	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
70	Sample	K1809017-006.06	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1808910-001.20	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1808910-001.20 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
73	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
74	Sample	K1808910-002.05	Extended Reaction 021711 (Extended Reaction 021711)	2
75	Sample	K1808910-003.05	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Fusion Report - 10052018
Friday, October 05, 2018 01:22 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2018/10/08 15:11 - Monday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	10052018	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v9) Fusion1 (Fusion1) (v11)		
Comment:			

10/10/18

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/10/05 13:22

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.72	17.11	4.39	49.15	05:26
2	TC Clean	4.55	8.60	4.05	49.97	04:04
3	TC Clean	1.66	5.64	3.98	50.10	03:51
4	TC Clean	1.13	5.15	4.02	50.10	03:50

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/10/05 13:44

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.60	4.54	3.94	49.18	05:18

2	TC Clean	3.72	7.60	3.88	50.09	04:05
3	TC Clean	1.66	5.74	4.08	50.07	03:50
4	TC Clean	1.31	5.42	4.12	50.05	03:48

ample Type: Clean From Schedule Versio

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/10/05 14:06

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.76	4.74	3.99	49.10	05:17
2	TC Clean	3.77	7.75	3.98	50.08	04:02
3	TC Clean	2.12	6.10	3.98	50.09	03:55
4	TC Clean	1.38	5.32	3.94	50.08	03:53

Sample Type: Blank (Creating v1156) From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2018/10/05 14:28

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.75	4.51	3.76	49.18	05:29
2	TC Clean	3.95	7.75	3.80	50.04	04:01
3	TC Clean	1.97	5.83	3.85	49.96	03:46
4	TC Clean	1.62	5.60	3.98	50.08	03:46
5	Reagent Blank	6.28	10.23	3.95	50.10	05:05
6	Acid Blank	1.18	5.19	4.01	49.26	05:34

Sample Type: Sample From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.65	17.56	3.91	50.13	12:31

Dilution **Blank Contribution** **Method** **Calibration**

1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	in / Ma (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5982 ppm (PASS)	0.0000 ppm	0%	2018/10/05 15:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5982	245.9818	190.61	194.72	4.10	50.12	12:26

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/05 15:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	12.45	16.39	3.95	50.12	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 15:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.74	15.54	3.80	50.12	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER — From Schedule Version 7

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.7401 ppm (PASS)	0.0000 ppm	0%	2018/10/05 16:08

Pos	Base Analysis ype	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.7401	207.4013	163.12	166.94	3.82	50.12	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	ICS	0.0930 ppm	0.0000 ppm	0.0000%	2018/10/05 16:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0930	0.9302	14.87	18.78	3.91	50.12	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1809036-001.02	0.3330 ppm	0.0157 ppm	4.7100%	2018/10/05 16:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3441	3.4406	16.66	20.49	3.83	50.11	12:26
2	TOC	0.3219	3.2189	16.50	20.34	3.84	50.12	12:21

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Sample — From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1809036-001.02 ms	25.4814 ppm	0.0000 ppm	0.0000%	2018/10/05 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.4814	254.8135	195.79	199.60	3.81	50.12	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC)	Extended Reaction	Extended Reaction

(v1156) 021711 (v3) 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 17:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.98	16.79	3.81	50.12	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1809036-002.08	0.2515 ppm	0.0467 ppm	18.5800%	2018/10/05 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2846	2.8456	16.24	20.09	3.86	50.13	12:27
2	TOC	0.2185	2.1847	15.77	19.72	3.95	50.14	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1809036-003.08	0.0043 ppm	0.0060 ppm	141.4200%	2018/10/05 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0085	0.0854	14.27	18.05	3.78	50.12	12:26
2	TOC	0.0000	0.0000	14.11	18.05	3.93	50.10	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1809036-004.08	2.3431 ppm	0.0733 ppm	3.1300%	2018/10/05 18:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3950	23.9496	31.28	35.18	3.91	50.03	12:25
2	TOC	2.2913	22.9126	30.54	34.41	3.87	50.00	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV	0 / infinity	24.8468	0.0000	0%	2018/10/05 19:21

					021711 [25 ppm]	(NA / NA)	ppm (PASS)	ppm			

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8468	248.4684	192.39	196.30	3.91	50.02	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/05 19:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	12.77	16.80	4.02	50.00	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1809036-005.08	0.3330 ppm	0.0386 ppm	11.5900%	2018/10/05 19:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3603	3.6034	16.78	20.78	4.00	49.99	12:26
2	TOC	0.3058	3.0575	16.39	20.40	4.01	49.97	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1808731-001	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 20:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.07	15.92	3.85	49.96	12:30
2	TOC	0.0000	0.0000	12.40	16.12	3.72	49.95	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1808731-002	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 20:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.80	15.57	3.77	49.93	[illegible]
2	TOC	0.0000	0.0000	12.09	15.91	3.83	49.92	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1808732-001.08 20x	0.3665 ppm	0.0397 ppm	10.8300%	2018/10/05 21:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3946	3.9458	17.02	20.90	3.88	49.90	12:23
2	TOC	0.3385	3.3845	16.62	20.48	3.86	49.92	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1808732-001.08 ms 20x	26.0469 ppm	0.0000 ppm	0.0000%	2018/10/05 22:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.0469	260.4688	199.82	203.58	3.75	49.92	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 22:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.16	16.98	3.82	49.91	12:27
2	TOC	0.0000	0.0000	12.30	16.34	4.04	49.89	12:21

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1808732-002.08 20x	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 22:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.89	16.82	3.92	49.88	12:26

2	TOC	0.0000	0.0000	12.92	16.94	4.02	49.87	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/05 23:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.07	15.99	3.93	49.90	12:28
2	TOC	0.0000	0.0000	12.49	16.33	3.84	49.89	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K1808732-003.08	0.9407 ppm	0.0776 ppm	8.2500%	2018/10/05 23:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9956	9.9561	21.30	25.21	3.91	49.87	12:29
2	TOC	0.8859	8.8587	20.52	24.48	3.95	49.87	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K1808850-004.03 20x	3.8140 ppm	0.0895 ppm	2.3500%	2018/10/06 00:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8772	38.7725	41.84	45.76	3.92	49.86	12:28
2	TOC	3.7507	37.5067	40.94	44.84	3.90	49.88	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	**24.5404** ppm (PASS)	0.0000 ppm	0%	2018/10/06 00:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5404	245.4036	190.20	194.20	4.00	49.88	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/06 01:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	13.28	17.09	3.81	49.85	12:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 01:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.53	16.42	3.89	49.84	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.2306 ppm (PASS)	0.0000 ppm	0%	2018/10/06 01:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.2306	202.3060	159.49	163.37	3.88	49.85	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1808850-004.03 ms 20x	29.8823 ppm	0.0000 ppm	0.0000%	2018/10/06 02:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.8823	298.8233	227.16	231.01	3.86	49.86	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 02:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.82	17.79	3.97	49.83	12:25
2	TOC	0.0000	0.0000	13.10	16.94	3.84	49.83	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1808850-005.03 20x	2.1168 ppm	0.0098 ppm	0.4600%	2018/10/06 02:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1098	21.0981	29.24	33.03	3.78	49.85	12:24
2	TOC	2.1237	21.2371	29.34	33.22	3.87	49.81	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1808850-006.03 4x	5.2043 ppm	0.1368 ppm	2.6300%	2018/10/06 03:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3010	53.0102	51.99	55.78	3.80	49.82	12:25
2	TOC	5.1075	51.0751	50.61	54.45	3.85	49.83	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1808850-007.03 20x	3.6160 ppm	0.1724 ppm	4.7700%	2018/10/06 03:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7379	37.3790	40.85	44.70	3.85	49.82	12:25

2	TOC	3.4942	34.9415	39.11	43.04	3.93	49.83	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1808850-008.03 10x	2.0307 ppm	0.0833 ppm	4.1000%	2018/10/06 04:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0896	20.8961	29.10	32.89	3.79	49.80	12:24
2	TOC	1.9719	19.7187	28.26	32.09	3.83	49.80	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1808850-009.03 10x	0.9964 ppm	0.0501 ppm	5.0300%	2018/10/06 04:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0318	10.3181	21.56	25.47	3.90	49.77	12:24
2	TOC	0.9609	9.6095	21.06	25.10	4.04	49.78	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1809491-002.01	2.1754 ppm	0.0473 ppm	2.1800%	2018/10/06 05:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2089	22.0889	29.95	34.01	4.06	49.80	12:23
2	TOC	2.1419	21.4195	29.47	33.64	4.16	49.79	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	25.1689 ppm (PASS)	0.0000 ppm	0%	2018/10/06 05:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1689	251.6889	194.68	198.59	3.91	49.80	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

ample Type: Check Standard --> CCB 21711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/06 06:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	13.16	17.03	3.87	49.80	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1809491-003.02 50x	22.1283 ppm	0.4264 ppm	1.9300%	2018/10/06 06:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.4298	224.2977	174.05	178.00	3.95	49.78	12:27
2	TOC	21.8268	218.2678	169.75	173.80	4.05	49.80	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 07:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.17	17.20	4.03	49.76	12:27
2	TOC	0.0000	0.0000	12.37	16.45	4.08	49.78	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1809385-001.03 50x	56.4251 ppm	1.7775 ppm	3.1500%	2018/10/06 07:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	57.6819	576.8193	425.26	429.17	3.91	49.78	12:28

2	TOC	55.1682	551.6823	407.35	411.44	4.09	49.77	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis ype	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	K1809385-001.03 ms 50x	80.1645 ppm	0.0000 ppm	0.0000%	2018/10/06 08:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	80.1645	801.6448	585.47	589.46	3.99	49.74	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	RB	0.1160 ppm	0.1641 ppm	141.4200%	2018/10/06 08:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2321	2.3208	15.86	19.90	4.03	49.85	12:26
2	TOC	0.0000	0.0000	13.11	17.06	3.95	49.89	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	K1808852-001.01 4x	4.4950 ppm	0.1568 ppm	3.4900%	2018/10/06 08:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6058	46.0583	47.03	50.96	3.93	49.93	12:24
2	TOC	4.3841	43.8411	45.45	49.35	3.90	49.97	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	K1808852-001.01 ms 4x	30.1097 ppm	0.0000 ppm	0.0000%	2018/10/06 09:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.1097	301.0966	228.78	232.57	3.80	49.99	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	36	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.14	18.09	3.95	49.99	12:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K1808852-002.01	0.5529 ppm	0.0174 ppm	3.1400%	2018/10/06 10:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5652	5.6522	18.24	22.23	3.99	50.01	12:22
2	TOC	0.5407	5.4066	18.06	21.91	3.84	50.03	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K1808870-009.07	2.7756 ppm	0.1011 ppm	3.6400%	2018/10/06 10:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8471	28.4710	34.50	38.46	3.96	50.03	12:27
2	TOC	2.7041	27.0410	33.48	37.41	3.93	50.04	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711

From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.6700 ppm (PASS)	0.0000 ppm	0%	2018/10/06 11:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6700	246.7002	191.13	195.00	3.88	50.04	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711

From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/06 11:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	12.72	16.74	4.03	50.04	12:29

Completion State: Success - Criteria met.

Success Action: Do Nothing

Method: Extended Reaction 021711 (v3)

Calibration: Extended Reaction 021711 (v17)

STD Conc - Pos D: 0 ppmC

Sample Type: Sample

From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 11:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.80	15.71	3.91	50.02	12:32

Dilution: 1:10

Blank Contribution: (TC) 14.2102 (IC) (v1156)

Method: Extended Reaction 021711 (v3)

Calibration: Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER

From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	18.3510 ppm (PASS)	0.0000 ppm	0%	2018/10/06 11:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	18.3510	183.5104	146.10	150.03	3.94	50.01	12:33

Completion State: Success - Criteria met.

Success Action: Do Nothing

Method: Extended Reaction 021711 (v3)

Calibration: Extended Reaction 021711 (v17)

STD Conc - Pos 2: 21.9 ppmC

Sample Type: Sample

From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1808870-009.07 ms	28.7231 ppm	0.0000 ppm	0.0000%	2018/10/06 12:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.7231	287.2308	218.90	222.92	4.03	50.01	12:33

Dilution: 1:10

Blank Contribution: (TC) 14.2102 (IC)

Method: Extended Reaction

Calibration: Extended Reaction

(v1156) 021711 (v3) 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 12:26

Rep #	Base Analysis Type	p	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run ime
1	TOC	0.0000	0.0000	13.52	17.49	3.97	49.99	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1808870-010.07	3.0056 ppm	0.0797 ppm	2.6500%	2018/10/06 12:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0619	30.6194	36.03	40.09	4.06	49.99	12:26
2	TOC	2.9493	29.4926	35.23	39.22	3.99	49.98	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1808870-011.07	0.8490 ppm	0.0046 ppm	0.5400%	2018/10/06 13:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8522	8.5219	20.28	24.24	3.96	49.97	12:28
2	TOC	0.8457	8.4574	20.24	24.25	4.01	49.97	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1808870-012.07	0.7265 ppm	0.0374 ppm	5.1500%	2018/10/06 13:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7530	7.5298	19.58	23.68	4.11	49.97	12:24
2	TOC	0.7001	7.0008	19.20	23.28	4.09	49.97	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1808870-013.07	0.2688 ppm	0.0435 ppm	16.1700%	2018/10/06 14:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.2996	2.9958	16.34	20.43	4.09	49.97	12:26
2	TOC	0.2381	2.3812	15.91	20.01	4.10	50.17	12:26

Dilution 1:10 | **Blank Contribution** (TC) 14.2102 (IC) (v1156) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1808870-014.07	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 14:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.66	17.66	4.00	49.94	12:28
2	TOC	0.0000	0.0000	13.78	17.58	3.80	49.94	12:27

Dilution 1:10 | **Blank Contribution** (TC) 14.2102 (IC) (v1156) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1808870-015.07	2.7384 ppm	0.0573 ppm	2.0900%	2018/10/06 15:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7789	27.7890	34.01	37.92	3.91	49.94	12:24
2	TOC	2.6979	26.9793	33.44	37.34	3.90	49.93	12:25

Dilution 1:10 | **Blank Contribution** (TC) 14.2102 (IC) (v1156) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5376 ppm (PASS)	0.0000 ppm	0%	2018/10/06 15:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5376	245.3755	190.18	194.01	3.83	49.92	12:32

Completion State Success - Criteria met. | **Success Action** Do Nothing | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v17) | **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/06 16:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	13.16	16.86	3.70	49.91	12:26

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothin.	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 . . mC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1808870-016.07	2.8186 ppm	0.0915 ppm	3.2500%	2018/10/06 16:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8833	28.8330	34.76	38.59	3.83	49.90	12:23
2	TOC	2.7539	27.5392	33.84	37.84	4.01	49.91	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1808891-008.04	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 16:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.57	16.59	4.02	49.94	12:23
2	TOC	0.0000	0.0000	12.61	16.56	3.95	49.93	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1808911-009.13	0.9203 ppm	0.0479 ppm	5.2100%	2018/10/06 17:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9542	9.5421	21.01	24.91	3.90	49.93	12:25
2	TOC	0.8864	8.8643	20.53	24.46	3.93	49.90	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1808911-009.13 ms	27.2481 ppm	0.0000 ppm	0.0000%	2018/10/06 18:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.2481	272.4809	208.38	212.29	3.91	49.90	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	QC	RB	0.0000 ppm	0.0000 ppm	0.0000%	018/10/06 18:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.91	16.82	3.91	49.90	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	K1808911-010.13 4x	15.9911 ppm	0.0657 ppm	0.4100%	2018/10/06 18:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.0375	160.3754	128.50	132.38	3.88	49.92	12:25
2	TOC	15.9446	159.4464	127.83	131.94	4.10	49.95	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 19:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.50	16.50	4.00	49.97	12:25
2	TOC	0.0000	0.0000	11.91	15.88	3.97	50.01	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	K1808911-011.13	2.1205 ppm	0.0558 ppm	2.6300%	2018/10/06 19:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1599	21.5991	29.60	33.51	3.91	50.05	12:26
2	TOC	2.0810	20.8105	29.04	32.84	3.80	50.06	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
56	TOC	K1808911-012.13	0.2597 ppm	0.0568 ppm	21.8500%	2018/10/06 20:08

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.2999	2.9986	16.35	20.18	3.83	50.09	12:25
2	TOC	0.2196	2.1959	15.78	19.78	4.00	50.12	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) 1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1808911-013.13	3.8340 ppm	0.0929 ppm	2.4200%	2018/10/06 20:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8997	38.9970	42.00	45.79	3.79	50.11	12:25
2	TOC	3.7684	37.6835	41.06	45.06	4.00	50.16	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.4421 ppm (PASS)	0.0000 ppm	0%	2018/10/06 21:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4421	244.4213	189.50	193.38	3.88	50.14	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/06 21:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	12.41	16.27	3.86	50.12	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 21:45

Rep	Base - nalysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig	Run Time
1	TOC	0.0000	0.0000	11.73	15.56	3.83	50.12	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	17.2534 ppm (PASS)	0.0000 ppm	0%	2018/10/06 22:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	17.2534	172.5339	138.27	142.29	4.02	50.12	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1808911-014.13	4.1972 ppm	0.1232 ppm	2.9400%	2018/10/06 22:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2843	42.8434	44.74	48.72	3.98	50.17	12:26
2	TOC	4.1101	41.1005	43.50	47.67	4.18	50.17	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	K1808911-015.13	1.6864 ppm	0.0691 ppm	4.1000%	2018/10/06 22:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7353	17.3528	26.58	30.53	3.95	50.12	12:26
2	TOC	1.6376	16.3761	25.88	29.70	3.82	50.11	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC)	Extended Reaction	Extended Reaction

(v1156) 021711 (v3) 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	K1808911-016.13	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/06 23:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	DIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.44	16.42	3.97	50.09	12:29
2	TOC	0.0000	0.0000	12.64	16.48	3.84	50.12	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	K1809017-001.06	3.2352 ppm	0.0709 ppm	2.1900%	2018/10/06 23:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2853	32.8534	37.62	41.45	3.82	50.12	12:23
2	TOC	3.1850	31.8501	36.91	40.91	4.01	50.08	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1809017-002.06	8.9949 ppm	0.3106 ppm	3.4500%	2018/10/07 00:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2145	92.1450	79.87	83.84	3.97	50.07	12:27
2	TOC	8.7753	87.7527	76.74	80.62	3.88	50.06	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	K1809017-003.06	11.5380 ppm	0.2674 ppm	2.3200%	2018/10/07 00:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.7271	117.2707	97.78	101.81	4.03	50.06	12:26
2	TOC	11.3489	113.4889	95.08	99.04	3.96	50.04	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	K1809017-004.06	2.2640 ppm	0.0930 ppm	4.1100%	2018/10/07 01:28

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	2.3297	23.2971	30.81	34.84	4.03	50.03	12:26
2	TOC	2.1982	21.9822	29.88	33.95	4.07	50.00	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) 156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K1809017-004.06 ms	28.0035 ppm	0.0000 ppm	0.0000%	2018/10/07 02:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0035	280.0347	213.77	217.71	3.94	50.01	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5976 ppm (PASS)	0.0000 ppm	0%	2018/10/07 02:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5976	245.9761	190.61	194.58	3.97	50.02	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/07 02:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	12.85	16.91	4.06	49.95	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1809017-005.15	2.7379 ppm	0.0090 ppm	0.3300%	2018/10/07 02:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7442	27.4424	33.77	37.77	4.00	49.96	12:27
2	TOC	2.7315	27.3147	33.67	37.61	3.94	49.96	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1809017-005.15 ms	28.6675 ppm	0.0000 ppm	0.0000%	2018/10/07 03:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.6675	286.6751	218.50	222.58	4.08	49.95	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/07 03:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.72	16.79	4.07	49.96	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1809017-006.06	1.1262 ppm	0.0569 ppm	5.0500%	2018/10/07 03:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1664	11.6639	22.52	26.53	4.01	49.97	12:21
2	TOC	1.0860	10.8598	21.95	25.79	3.85	49.94	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1808910-001.20	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/07 04:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.74	17.68	3.94	49.97	12:26
2	TOC	0.0000	0.0000	13.73	17.61	3.88	50.01	12:22

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1808910-001.20 ms	25.6234 ppm	0.0000 ppm	0.0000%	2018/10/07 04:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.6234	256.2336	196.81	200.80	4.00	49.98	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/07 05:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.33	16.40	4.07	50.00	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1808910-002.05	0.0932 ppm	0.0078 ppm	8.4100%	2018/10/07 05:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0988	0.9877	14.91	18.88	3.97	50.01	12:26
2	TOC	0.0877	0.8768	14.84	18.95	4.12	50.04	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	75	TOC	K1808910-003.05	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/07 06:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.18	16.18	4.00	50.03	12:26
2	TOC	0.0000	0.0000	12.11	16.06	3.95	50.06	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.2102 (IC) (v1156)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV	0 / infinity	24.4312	0.0000	0%	2018/10/07 06:33

					021711 [25 ppm]	(NA / NA)	ppm (PASS)	ppm				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4312	244.3118	189.42	193.48	4.05	50.09	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/07 06:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	0.0 ppm	1	0.0000	0.0000	12.28	16.20	3.92	50.10	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1155	1.6920	1.6620	0.0000	0.0000	0.0000	2018/10/03 14:27	Fusion1 (Fusion1)
v1156	2.0937	1.1800	0.0000	0.0000	0.0000	2018/10/05 15:01	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v17	Calibration curve formula:	TOC: y = 7.126x + 15.324
Ver Creation:	2018/03/13 21:33	r^2 value:	TOC: r^2 = 0.99994
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	15.2500	0.0000		2018/03/13 19:55
0.50 ppm	18.8060	0.5000		2018/03/13 20:12
1.00 ppm	21.6980	1.000		018/03
5.00 ppm	50.8680	5.0000		2018/03/13 20:43
10.0 ppm	88.5720	10.0000		2018/03/13 21:00
25.0 ppm	192.2360	25.0000		2018/03/13 21:16
50.0 ppm	371.8790	50.0000		2018/03/13 21:32

Methods

Name: Extended Reaction 021711 (TOC)

Version: v3 Operator: Gen Chem Lab (Fusion1)

Ver Creation: 2013/02/04 11:44

Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	7
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	7
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2018/10/07 07:09

Work Request # (Original) K1808907, 9163, 9164, 9385, 8732, 9040, 9166

Tier: III IV III IV IV III IV

Date Analyzed: 10/9/18

Analyst: CES

Run # DOC: 610327

Analysis: DOC/TOC

TOC: 610329

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

Final Approved by: [signature] Date: 10/10/18

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 610327 **Method/Testcode:** SM 5310 C/TOC D

d	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
1808907-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	6.57 mg/L	10 ml	6.57 mg/L	1	0.07	0.50			10/9/18 21:04	N	III
1809163-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.70 mg/L	10 ml	1.70 mg/L	1	0.07	0.50			10/9/18 22:09	N	IV
1809164-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.35 mg/L	10 ml	0.35 mg/L J	1	0.07	0.50			10/9/18 23:30	N	III
1809164-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.73 mg/L	10 ml	1.73 mg/L	1	0.07	0.50			10/10/18 00:02	Y	III
1809164-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.46 mg/L	10 ml	0.46 mg/L J	1	0.07	0.50			10/10/18 01:06	N	III
1809164-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.50 mg/L	10 ml	1.50 mg/L	1	0.07	0.50			10/10/18 01:38	N	III
Q1814464-01	Carbon, Dissolved Organic (DOC)	MS	K1808907-001	Surface Water	32.38 mg/L	10 ml	32.4 mg/L	1	0.07	0.50	103		10/9/18 21:36	N	III
Q1814464-02	Carbon, Dissolved Organic (DOC)	DUP	K1808907-001	Surface Water	6.21 mg/L	10 ml	6.21 mg/L	1	0.07	0.50		6	10/9/18 21:04	N	III
Q1814464-03	Carbon, Dissolved Organic (DOC)	MS	K1809163-001	Surface Water	27.42 mg/L	10 ml	27.4 mg/L	1	0.07	0.50	103		10/9/18 22:40	N	IV
KQ1814464-04	Carbon, Dissolved Organic (DOC)	DUP	K1809163-001	Surface Water	1.67 mg/L	10 ml	1.67 mg/L	1	0.07	0.50		1	10/9/18 22:09	N	IV
Q1814464-05	Carbon, Dissolved Organic (DOC)	DUP	K1809164-001	Surface Water	0.33 mg/L	10 ml	0.33 mg/L J	1	0.07	0.50		6	10/9/18 23:30	N	III
Q1814464-06	Carbon, Dissolved Organic (DOC)	MS	K1809164-002	Surface Water	27.38 mg/L	10 ml	27.4 mg/L	1	0.07	0.50	103		10/10/18 00:34	N	III
Q1814464-07	Carbon, Dissolved Organic (DOC)	DUP	K1809164-002	Surface Water	1.67 mg/L	10 ml	1.67 mg/L	1	0.07	0.50		4	10/10/18 00:02	N	III
Q1814464-08	Carbon, Dissolved Organic (DOC)	DUP	K1809164-003	Surface Water	0.43 mg/L	10 ml	0.43 mg/L J	1	0.07	0.50		9	10/10/18 01:06	N	III
KQ1814464-09	Carbon, Dissolved Organic (DOC)	DUP	K1809164-004	Surface Water	1.43 mg/L	10 ml	1.43 mg/L	1	0.07	0.50		5	10/10/18 01:38	N	III
KQ1814464-10	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/9/18 19:43	N	III
KQ1814464-11	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	21.71 mg/L	10 ml	21.7 mg/L	1	0.07	0.50	99		10/9/18 20:00	N	III
KQ1814464-12	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.45 mg/L	10 ml	24.5 mg/L	1			98		10/9/18 19:10	N	III
KQ1814464-13	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.51 mg/L	10 ml	24.5 mg/L	1			98		10/9/18 22:57	N	III
KQ1814464-14	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.95 mg/L	10 ml	24.9 mg/L	1			100		10/10/18 04:01	N	III
KQ1814464-15	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/9/18 19:27	N	III
KQ1814464-16	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/9/18 23:13	N	III
KQ1814464-17	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/10/18 04:17	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

10/10/18

CES 10/10/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 610329 **Method/Testcode:** SM 5310 C/TOC T

ode	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
1808732-001	Carbon, Total Organic	N/A		Water	12.85 mg/L	10 ml	12.8 mg/L	1	0.07	0.50			10/10/18 05:07	N	IV
1808732-002	Carbon, Total Organic	N/A		Water	1.51 mg/L	10 ml	1.51 mg/L	1	0.07	0.50			10/10/18 05:39	N	IV
1809040-001	Carbon, Total Organic	N/A		Ground Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50			10/10/18 06:43	N	IV
1809040-002	Carbon, Total Organic	N/A		Ground Water	2.30 mg/L	10 ml	2.30 mg/L	1	0.07	0.50			10/10/18 07:47	N	IV
1809166-001	Carbon, Total Organic	N/A		Water	1.48 mg/L	10 ml	370 mg/L	250	20	130			10/10/18 08:52	N	IV
1809385-001	Carbon, Total Organic	N/A		Ground Water	11.44 mg/L	10 ml	2860 mg/L	250	20	130			10/10/18 02:10	Y	IV
1809385-003	Carbon, Total Organic	N/A		Ground Water	2.67 mg/L	10 ml	53 mg/L	20	2	10			10/10/18 03:29	N	IV
Q1814465-01	Carbon, Total Organic	MS	K1809385-001	Ground Water	37.18 mg/L	10 ml	9300 mg/L	250	20	130	103		10/10/18 02:41	N	IV
Q1814465-02	Carbon, Total Organic	DUP	K1809385-001	Ground Water	11.16 mg/L	10 ml	2790 mg/L	250	20	130		2	10/10/18 02:10	N	IV
Q1814465-03	Carbon, Total Organic	DUP	K1809385-003	Ground Water	2.58 mg/L	10 ml	52 mg/L	20	2	10		3	10/10/18 03:29	N	IV
Q1814465-04	Carbon, Total Organic	DUP	K1808732-001	Water	12.27 mg/L	10 ml	12.3 mg/L	1	0.07	0.50		5	10/10/18 05:07	N	IV
Q1814465-05	Carbon, Total Organic	MS	K1808732-002	Water	27.66 mg/L	10 ml	27.7 mg/L	1	0.07	0.50	105		10/10/18 06:10	N	IV
Q1814465-06	Carbon, Total Organic	DUP	K1808732-002	Water	1.45 mg/L	10 ml	1.45 mg/L	1	0.07	0.50		4	10/10/18 05:39	N	IV
Q1814465-07	Carbon, Total Organic	MS	K1809040-001	Ground Water	26.12 mg/L	10 ml	26.1 mg/L	1	0.07	0.50	103		10/10/18 07:15	N	IV
Q1814465-08	Carbon, Total Organic	DUP	K1809040-001	Ground Water	0.34 mg/L	10 ml	0.34 mg/L J	1	0.07	0.50		4	10/10/18 06:43	N	IV
Q1814465-09	Carbon, Total Organic	DUP	K1809040-002	Ground Water	2.28 mg/L	10 ml	2.28 mg/L	1	0.07	0.50		<1	10/10/18 07:47	N	IV
Q1814465-10	Carbon, Total Organic	MS	K1809166-001	Water	26.27 mg/L	10 ml	6570 mg/L	250	20	130	99		10/10/18 09:24	N	IV
Q1814465-11	Carbon, Total Organic	DUP	K1809166-001	Water	1.43 mg/L	10 ml	360 mg/L	250	20	130		3	10/10/18 08:52	N	IV
Q1814465-12	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/10/18 04:34	N	IV
Q1814465-13	Carbon, Total Organic	LCS		Ground Water	21.75 mg/L	10 ml	21.8 mg/L	1	0.07	0.50	99		10/10/18 04:50	N	IV
Q1814465-14	Carbon, Total Organic	CCV		Ground Water	24.51 mg/L	10 ml	24.5 mg/L	1			98		10/9/18 22:57	N	IV
Q1814465-15	Carbon, Total Organic	CCV		Ground Water	24.95 mg/L	10 ml	24.9 mg/L	1			100		10/10/18 04:01	N	IV
Q1814465-16	Carbon, Total Organic	CCV		Ground Water	24.36 mg/L	10 ml	24.4 mg/L	1			98		10/10/18 08:19	N	IV
Q1814465-17	Carbon, Total Organic	CCV		Ground Water	24.24 mg/L	10 ml	24.2 mg/L	1			97		10/10/18 10:12	N	IV
Q1814465-18	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/9/18 23:13	N	IV
Q1814465-19	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/10/18 04:17	N	IV

' indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

10/10/18 CES 10/10/18

Analytical Results Summary

Instrument Name: K-TOC-0 **Analyst:** CSETHE **Analysis Lot:** 610329 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1814465-20	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/10/18 08:36	N	IV
KQ1814465-21	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/10/18 10:29	N	IV

# indicates Final Result is not yet adjust d for Solids because it has not yet been determined.

StarLIMS Run: K1808907, 9163, 9164, 9385, 8732, 9040, 9166

Analysis: TOC, DOC

Method: SM 5310 C, 415.1

CCV: 1 1-GEN-05-69K 50 ppm LCS: 11-GEN-05-69N 21.9 ppm

ICAL Date: 3/13/18

ICAL ID: 11-GEN-05-65A

ICS ID: 11-GEN-05-67D

ICS TV: 25.0 ppm ICS % R <1

Spike ID: 11-GEN-05-65K 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-69L

21 % H3PO4: 11-GEN-05-69M

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F

FILTER ID: 48878

Analyzed By: CES	Date Analyzed: 10/9/18
Reviewed By: [signature]	Date Reviewed: 10/10/18

DOC: 610327
TOC: 610329

Schedule: 10092018

Version: 7
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2018/10/10 14:29 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	FB 10/9/18	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	K1808907-001.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1808907-001.01 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
7	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
8	Sample	K1809163-001.06 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K1809163-001.06 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1809164-001.06 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1809164-002.27 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1809164-002.27 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
13	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
14	Sample	K1809164-003.06 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1809164-004.06 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1809385-001.03 250x	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1809385-001.03 ms 250x	Extended Reaction 021711 (Extended Reaction 021711)	1
18	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1809385-003.02 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1808732-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1808732-002.08	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K1808732-002.08 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
24	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
25	Sample	K1809040-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1809040-001.08 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
27	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
28	Sample	K1809040-002.08	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1809166-001.01 250x	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1809166-001.01 ms 250x	Extended Reaction 021711 (Extended Reaction 021711)	1
31	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Fusion Report - 10092018
Tuesday, October 09, 2018 04:20 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2018/10/10 14:25 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	10092018	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6)		
Comment:			

Report Results

10/10/18

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/10/09 16:20

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.48	17.24	3.76	49.13	08:00
2	TC Clean	7.08	10.95	3.86	49.69	07:18
3	TC Clean	2.26	6.26	4.01	49.68	07:02
4	TC Clean	1.84	5.67	3.83	49.68	07:00

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/10/09 16:54

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.84	4.63	3.79	49.11	07:59
2	TC Clean	4.12	7.93	3.81	49.68	07:18
3	TC Clean	1.74	5.70	3.96	49.69	07:02

4	TC Clean	1.53	5.35	3.82	49.69	07:01

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Typ	Sample ID	Start Time
◈	(clean)		Clean	2018/10/09 17:28

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.82	4.55	3.73	49.14	07:58
2	TC Clean	4.12	7.93	3.81	49.66	07:18
3	TC Clean	1.70	5.62	3.92	49.67	07:04
4	TC Clean	1.38	5.39	4.02	49.70	07:01

Sample Type: Blank (Creating v1157) — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2018/10/09 18:02

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.82	4.56	3.75	49.14	08:00
2	TC Clean	4.14	7.93	3.80	49.73	07:17
3	TC Clean	1.62	5.53	3.91	49.74	07:03
4	TC Clean	1.47	5.35	3.87	49.74	06:58
5	Reagent Blank	5.35	9.16	3.80	49.77	08:13
6	Acid Blank	1.54	5.28	3.74	49.22	08:04

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/09 18:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.50	16.31	3.81	49.97	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.4546 ppm (PASS)	0.0000 ppm	0%	2018/10/09 19:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4546	244.5462	189.59	193.45	3.86	50.00	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/09 19:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	11.50	15.50	3.99	49.98	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/09 19:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.95	14.99	4.04	50.02	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	21.7074 ppm (PASS)	0.0000 ppm	0%	2018/10/09 20:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	21.7074	217.0741	170.01	174.11	4.09	50.01	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 µ mC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	ICS	0.0098 ppm	0.0000 ppm	0.0000%	2018/10/09 20:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0098	0.0978	14.22	18.19	3.97	50.01	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	FB 10/9/18	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/09 20:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.82	14.83	4.00	50.01	12:29
2	TOC	0.0000	0.0000	11.22	15.28	4.06	50.01	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1808907-001.01 doc	6.3928 ppm	0.2544 ppm	3.9800%	2018/10/09 21:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5727	65.7266	60.99	64.88	3.89	50.04	12:24
2	TOC	6.2129	62.1285	58.42	62.48	4.06	50.01	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1808907-001.01 ms doc	32.3751 ppm	0.0000 ppm	0.0000%	2018/10/09 21:36

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	32.3751	323.7510	244.86	248.73	3.88	49.96	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/09 21:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.68	16.60	3.92	49.92	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1809163-001.06 doc	1.6872 ppm	0.0178 ppm	1.0500%	2018/10/09 22:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6998	16.9976	26.26	30.20	3.94	49.92	12:26
2	TOC	1.6746	16.7464	26.08	29.99	3.91	49.91	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1809163-001.06 ms doc	27.4181 ppm	0.0000 ppm	0.0000%	2018/10/09 22:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.4181	274.1814	209.53	213.52	3.99	49.89	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5140 ppm (PASS)	0.0000 ppm	0%	2018/10/09 22:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5140	245.1398	190.01	193.90	3.89	49.86	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B

Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/09 23:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	12.25	16.17	3.92	49.83	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample DOC CES 10/10/18 From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1809164-001.06	0.3438 ppm	0.0140 ppm	4.0700%	2018/10/09 23:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3537	3.5373	16.67	20.67	4.00	49.82	12:25
2	TOC	0.3339	3.3394	16.53	20.52	4.00	49.81	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1809164-002.27 doc	1.6981 ppm	0.0452 ppm	2.6600%	2018/10/10 00:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7301	17.3007	26.48	30.38	3.90	49.79	12:28
2	TOC	1.6661	16.6608	26.02	29.90	3.88	49.79	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1809164-002.27 ms doc	27.3818 ppm	0.0000 ppm	0.0000%	2018/10/10 00:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.3818	273.8180	209.28	212.99	3.72	49.79	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/10 00:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.82	16.58	3.76	49.78	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1809164-003.06 doc	0.4456 ppm	0.0270 ppm	6.0600%	2018/10/10 01:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4647	4.6473	17.46	21.27	3.81	49.75	12:26
2	TOC	0.4266	4.2656	17.19	21.09	3.90	49.76	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1809164-004.06 doc	1.4651 ppm	0.0509 ppm	3.4700%	2018/10/10 01:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5011	15.0105	24.84	28.68	3.84	49.74	12:26
2	TOC	1.4291	14.2906	24.33	28.24	3.91	49.71	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1809385-001.03 250x	11.2965 ppm	0.1990 ppm	1.7600%	2018/10/10 02:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.4373	114.3728	95.65	99.55	3.90	49.73	12:23
2	TOC	11.1558	111.5578	93.65	97.56	3.91	49.74	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1809385-001.03 ms 250x	37.1840 ppm	0.0000 ppm	0.0000%	2018/10/10 02:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	37.1840	371.8401	279.13	283.12	3.99	49.72	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/10 02:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.57	16.55	3.99	49.72	12:26
2	TOC	0.0000	0.0000	11.84	15.64	3.80	49.72	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1809385-003.02 20x	2.6256 ppm	0.0611 ppm	2.3300%	2018/10/10 03:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6689	26.6886	33.17	36.99	3.82	49.72	12:27
2	TOC	2.5824	25.8242	32.55	36.37	3.82	49.70	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.9486 ppm (PASS)	0.0000 ppm	0%	2018/10/10 04:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9486	249.4858	193.11	196.86	3.75	49.68	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm	0.0000 ppm	0%	2018/10/10 04:17

							(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	11.99	15.85	3.86	49.67	12:26

Completion State	Success Action	Method	Calibration	STD Conc - Pos
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/10 04:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	11.34	15.07	3.73	49.66	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	21.7516 ppm (PASS)	0.0000 ppm	0%	2018/10/10 04:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	21.7516	217.5162	170.33	174.25	3.92	49.65	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1808732-001.08	12.5615 ppm	0.4065 ppm	3.2400%	2018/10/10 05:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.8490	128.4898	105.71	109.76	4.04	49.64	12:28
2	TOC	12.2741	122.7405	101.62	105.61	4.00	49.64	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC)	Extended Reaction	Extended Reaction

(v1157) 021711 (v3) 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1808732-002.08	1.4844 ppm	0.0432 ppm	2.9100%	2018/10/10 05:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5149	15.1494	24.94	28.78	3.84	49.63	12:25
2	TOC	1.4539	14.5390	24.51	28.31	3.80	49.62	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1808732-002.08 ms	27.6619 ppm	0.0000 ppm	0.0000%	2018/10/10 06:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.6619	276.6190	211.27	215.26	3.99	49.63	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/10 06:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.02	16.88	3.86	49.62	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1809040-001.08	0.3481 ppm	0.0103 ppm	2.9600%	2018/10/10 06:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3554	3.5541	16.68	20.72	4.04	49.62	12:23
2	TOC	0.3408	3.4082	16.58	20.54	3.96	49.61	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1809040-001.08 ms	26.1179 ppm	0.0000 ppm	0.0000%	2018/10/10 07:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1179	261.1786	200.27	204.17	3.90	49.62	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/10 07:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.17	16.08	3.91	49.61	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1809040-002.08	2.2915 ppm	0.0119 ppm	0.5200%	2018/10/10 07:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2999	22.9994	30.54	34.39	3.85	49.61	12:29
2	TOC	2.2831	22.8310	30.42	34.21	3.79	49.77	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.3558 ppm (PASS)	0.0000 ppm	0%	2018/10/10 08:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3558	243.5583	188.89	192.91	4.03	49.89	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/10 08:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

D	TOC	0.0 ppm	1	0.0000	0.0000	11.96	15.87	3.91	49.92	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1809166-001.01 250x	1.4554 ppm	0.0293 ppm	2.0100%	2018/10/10 08:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4761	14.7607	24.67	28.36	3.69	49.94	12:27
2	TOC	1.4347	14.3468	24.37	28.13	3.76	49.96	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1809166-001.01 ms 250x	26.2735 ppm	0.0000 ppm	0.0000%	2018/10/10 09:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.2735	262.7349	201.38	205.41	4.03	49.98	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/10/10 09:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.10	16.13	4.04	49.99	12:27
2	TOC	0.0000	0.0000	11.20	15.15	3.95	49.98	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.1483 (IC) (v1157)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2351 ppm (PASS)	0.0000 ppm	0%	2018/10/10 10:12

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
B	TOC	25 ppm	1	24.2351	242.3515	188.03	191.84	3.81	50.00	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/10/10 10:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	11.44	15.47	4.03	50.00	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1156	2.0937	1.1800	0.0000	0.0000	0.0000	2018/10/05 15:01	Fusion1 (Fusion1)
v1157	1.7843	1.5390	0.0000	0.0000	0.0000	2018/10/09 18:54	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v17	Calibration curve formula:	TOC: y = 7.126x + 15.324
Ver Creation:	2018/03/13 21:33	r^2 value:	TOC: r^2 = 0.99994
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	15.2500	0.0000		2018/03/13 19:55

0.50 ppm	18.8060	0.5000		2018/03/13 20:12
1.00 ppm	21.6980	1.0000		2018/03/13 20:28
5.00 ppm	50.8680	5.0000		2018/03/13 20:43
10.0 ppm	88.5720	10.0000		2018/03/13 21:00
25.0 ppm	192.2360	25.0000		2018/03/13 21:16
50.0 ppm	371.8790	50.0000		2018/03/13 21:32

Methods

Name: Extended Reaction 021711 (TOC)

Version: v3 Operator: Gen Chem Lab (Fusion1)

Ver Creation: 2013/02/04 11:44

Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	7
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	7
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2018/10/10 10:47

LABORATORY REPORT

October 3, 2018

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS18091438

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on September 28, 2018. For your reference, these analyses have been assigned our service request number P1805135.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko
Project Manager

Client: ALS Laboratory Group Service Request No: P1805135
Project: HS18091438

CASE NARRATIVE

The samples were received intact under chain of custody on September 28, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

The Matrix Spike (MS) and Duplicate Matrix Spike (DMS) recoveries were outside the acceptance limits sue to suspected matrix interference. However, the Laboratory Control Sample (LCS) and Duplicate Laboratory Control Sample (DLCS) recoveries were within the acceptance limits indicating that the analysis was in control. The recoveries have been flagged accordingly. No further corrective action was taken.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1347317
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS18091438

Service Request: P1805135

Date Received: 9/28/2018
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
HS18091438-01	P1805135-001	Water	9/26/2018	09:20	X	X
HS18091438-02	P1805135-002	Water	9/26/2018	11:15	X	X
HS18091438-03	P1805135-003	Water	9/26/2018	11:15	X	X
HS18091438-04	P1805135-004	Water	9/26/2018	12:30	X	X

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

P1805135

Subcontract Chain of Custody

COC ID: 9909

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18091438
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18091438-01**	**35AWW06_092618**	**Groundwater**	**26 Sep 2018 09:20**
	MEE plus CO2 Sub to ALS SimiValley			05 Oct 2018
2.	**HS18091438-02**	**35AWW20_092618**	**Groundwater**	**26 Sep 2018 11:15**
	MEE plus CO2 Sub to ALS SimiValley			05 Oct 2018
3.	**HS18091438-03**	**35AWW20_092618_a**	**Groundwater**	**26 Sep 2018 11:15**
	MEE plus CO2 Sub to ALS SimiValley			05 Oct 2018
4.	**HS18091438-04**	**LHSMW07_092618**	**Groundwater**	**26 Sep 2018 12:30**
	MEE plus CO2 Sub to ALS SimiValley			05 Oct 2018

3°C Wt Ice

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

MS/MSD - HS18091438-01

Neat vials for CO2

QC Level: DOD IV (DoD Data Package)

Received by: 9/28/18 0930

P1805135

Subcontract Chain of Custody

COC ID: 9909

Relinquished By:	J. Juarez	Date/Time:	9/27/18 18:00
Received By:	[signature]	Date/Time:	9/28/18 0950
Cooler ID(s):		Temperature(s):	

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1805135

Project: RSK CO2 MEE DoD

Sample(s) received on: 9/28/18 Date opened: 9/28/18 by: AARON GONZALEZ

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 3° C Blank Temperature: ° C Thermometer ID CO907034581 Wet Ic			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1805135-001.01	40mL VOA NP		5			MR 10/1/18
P1805135-001.02	40mL VOA NP		5			MR 10/1/18
P1805135-001.03	40mL VOA NP		5			MR 10/1/18
P1805135-001.04	40ml VOA HCL		1			MR 10/2/18
P1805135-001.05	40ml VOA HCL		1			MR 10/2/18
P1805135-001.06	40ml VOA HCL		1			MR 10/2/18
P1805135-001.07	40mL VOA NP					
P1805135-001.08	40mL VOA NP					
P1805135-001.09	40mL VOA NP					
P1805135-001.10	40ml VOA HCL					
P1805135-001.11	40ml VOA HCL					
P1805135-001.12	40ml VOA HCL					
P1805135-002.01	40mL VOA NP		7			MR 10/1/18
P1805135-002.02	40mL VOA NP					
P1805135-002.04	40ml VOA HCL		1			MR 10/2/18

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1805135

Project: RSK CO2 MEE DoD

Sample(s) received on: 9/28/18 Date opened: 9/28/18 by: AARON GONZALEZ

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1805135-002.05	40ml VOA HCL					
P1805135-003.01	40mL VOA NP		7			MR 10/1/18
P1805135-003.02	40mL VOA NP					
P1805135-003.04	40ml VOA HCL		1			MR 10/2/18
P1805135-003.05	40ml VOA HCL					
P1805135-004.01	40mL VOA NP		7			MR 10/1/18
P1805135-004.02	40mL VOA NP					
P1805135-004.04	40ml VOA HCL		1			MR 10/2/18
P1805135-004.05	40ml VOA HCL					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS18091438** ALS Project ID: P1805135

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD Date(s) Collected: 9/26/18
Analyst: Wade Henton Date Received: 9/28/18
Matrix: Water Date Analyzed: 10/1/18
Test Notes:

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	**Result µg/L**	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
HS18091438-01	P1805135-001	0.050	**860,000**	2,000	1,700	740	
HS18091438-02	P1805135-002	0.050	**740,000**	2,000	1,700	740	
HS18091438-03	P1805135-003	0.050	**770,000**	2,000	1,700	740	
HS18091438-04	P1805135-004	0.050	**760,000**	2,000	1,700	740	
Method Control Sample	P181001-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **HS18091438-01**
Client Project ID: **HS18091438**

ALS Project ID: P1805135
ALS Sample ID: P1805135-001MS
P1805135-001DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 9/26/18
Date Received: 9/28/18
Date Analyzed: 10/1/18
Volume(s) Analyzed: 0.050 ml(s)

CAS #	Compound	Spike Amount MS / DMS ug/L	Sample Amount ug/L	Result MS ug/L	Result DMS ug/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	45,800	856,000	900,000	905,000	**96**	**107**	80-122	11	30	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P1805135
Client Project ID: **HS18091438** ALS Sample ID: P181001-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Wade Henton Date Analyzed: 10/01/18
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	18,500	18,400	**81**	**80**	80-122	1	15	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **HS18091438-01**
Client Project ID: **HS18091438**

ALS Project ID: P1805135
ALS Sample ID: P1805135-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 9/26/18
Date Received: 9/28/18
Date Analyzed: 10/2/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**3.0**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **HS18091438-02** ALS Project ID: P1805135
Client Project ID: **HS18091438** ALS Sample ID: P1805135-002

Test Code: RSK 175 Date Collected: 9/26/18
Instrument ID: HP5890A/GC10/FID Date Received: 9/28/18
Analyst: Wade Henton Date Analyzed: 10/2/18
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**37**	1.3	1.0	0.51	
74-85-1	Ethene	**0.66**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **HS18091438-03**
Client Project ID: **HS18091438**

ALS Project ID: P1805135
ALS Sample ID: P1805135-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 9/26/18
Date Received: 9/28/18
Date Analyzed: 10/2/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**30**	1.3	1.0	0.51	
74-85-1	Ethene	**0.50**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **HS18091438-04** ALS Project ID: P1805135
Client Project ID: **HS18091438** ALS Sample ID: P1805135-004

Test Code: RSK 175 Date Collected: 9/26/18
Instrument ID: HP5890A/GC10/FID Date Received: 9/28/18
Analyst: Wade Henton Date Analyzed: 10/2/18
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**27**	1.3	1.0	0.51	
74-85-1	Ethene	**4.0**	1.0	0.55	0.24	
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample** ALS Project ID: P1805135
Client Project ID: **HS18091438** ALS Sample ID: P181002-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Wade Henton Date Analyzed: 10/02/18
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **HS18091438-01**
Client Project ID: **HS18091438**

ALS Project ID: P1805135
ALS Sample ID: P1805135-001MS
P1805135-001DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 9/26/18
Date Received: 9/28/18
Date Analyzed: 10/2/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS µg/L	Sample Amount µg/L	Result MS µg/L	Result DMS µg/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.98	4.58	3.69	**63**	**28**	73-125	77	30	**N, R**
74-85-1	Ethene	4.40	ND	2.79	2.89	**63**	**66**	72-133	5	30	**N**
74-84-0	Ethane	4.72	ND	2.84	2.77	**60**	**59**	74-131	2	30	**N**

N = The matrix spike recovery is not within control limits. See case narrative.
R = Duplicate precision not met.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18091438**

ALS Project ID: P1805135
ALS Sample ID: P181002-LCS
P181002-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 10/02/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.50	2.66	2.82	**106**	**113**	73-125	6	12	
74-85-1	Ethene	4.37	4.45	4.41	**102**	**101**	72-133	1	7	
74-84-0	Ethane	4.69	4.73	4.68	**101**	**100**	74-131	1	6	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

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Client: RJ Modashia
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Phone: 281-575-2279

Fax:

Identifier: 114PI **Date Rec:** 09/27/2018 **Report Date:** 10/03/2018

Client Project #: NW01312.0150 **Client Project Name:** LHAAP-58

Purchase Order #:

Analysis Requested: CENSUS

Reviewed By:

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CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP-58

MI Project Number: **114PI**
Date Received: 09/27/2018

Sample Information

Client Sample ID:		**35AWW06_092618**	**35AWW20_092618**	**LHSMW07_092618**
Sample Date:		09/26/2018	09/26/2018	09/26/2018
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	**3.60E+00**	<1.30E+00	**1.16E+04**
tceA Reductase	TCE	<2.50E+00	<1.30E+00	<1.60E+00
BAV1 Vinyl Chloride Reductase	BVC	<2.50E+00	<1.30E+00	**8.00E-01 (J)**
Vinyl Chloride Reductase	VCR	**1.40E+00 (J)**	<1.30E+00	**5.99E+03**
Dehalobacter spp.	*DHBt*	**7.05E+05**	**3.77E+06**	**3.54E+06**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **9/27/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	09/27/2018	10/03/2018	0 °C	104%	non-detect	non-detect
BVC	09/27/2018	10/03/2018	0 °C	98%	non-detect	non-detect
DHBt	09/27/2018	10/03/2018	0 °C	101%	non-detect	non-detect
TCE	09/27/2018	10/03/2018	0 °C	99%	non-detect	non-detect
VCR	09/27/2018	10/03/2018	0 °C	104%	non-detect	non-detect

How to Retrieve and Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database

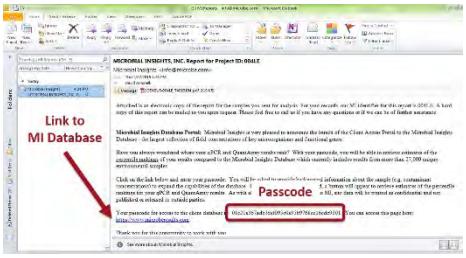
The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 40,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide.

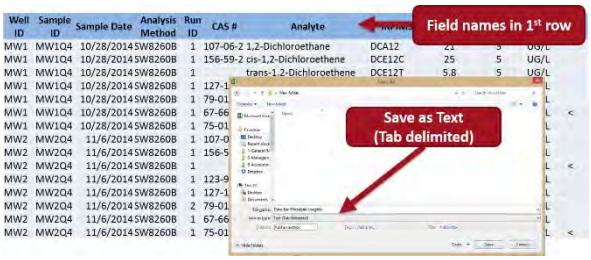
Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. The estimated percentile ranks retrieved from the MI Database answer the question "Is that low, medium or high?" by comparing your results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Retrieving Estimated Percentile Ranks

With your report, you were emailed a passcode and link enabling you to login to the Client Portal. Just enter basic information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations and you can retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge.





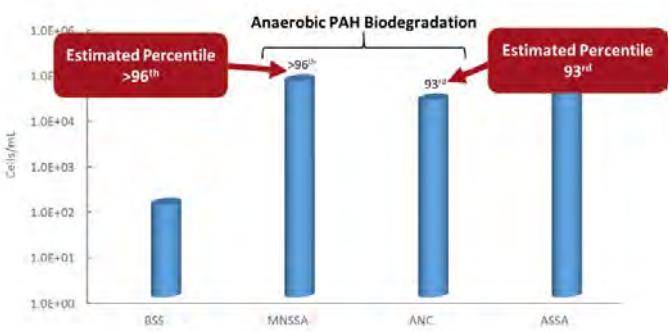
All site specific data will be treated as confidential and uploading is easy.

You can even upload chemical and geochemical data from EDDs. Just save as a Tab Delimited text file.

Example - Using Estimated Percentile for MNA Assessment at an MGP Site

CENSUS® qPCR was performed to quantify anaerobic naphthalene carboxylase (ANC) and naphthyl-2-methylsuccinate synthase (MNSSA) to assess anaerobic biodegradation of naphthalene and methyl-naphthalene under existing site conditions.

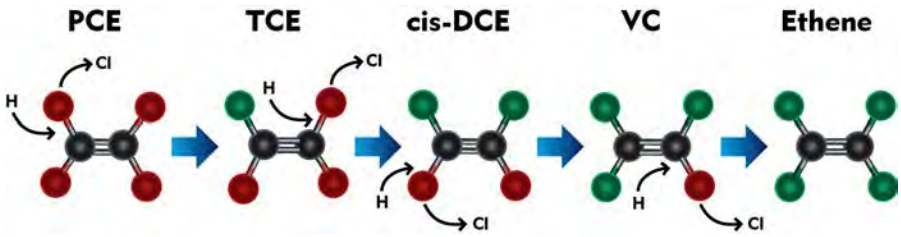
- Not only were ANC and MNSSA genes detected, but these functional genes responsible for anaerobic biodegradation of PAHs were present at concentrations "far better than average" based on the estimated percentile ranks.
- Demonstrating high concentrations of ANC and MNSSA gave an additional line of evidence indicating growth substantial populations of anaerobic PAH degraders and suggested a greater probability that monitored natural attenuation (MNA) will be successful.



DHC Interpretation

Dehalococcoides 16S rRNA gene (qDHC)

Under anaerobic conditions, tetrachloroethene (PCE) and trichloroethene (TCE) can undergo sequential reductive dechlorination through the daughter products *cis*-dichloroethene (*cis*-DCE) and vinyl chloride to nontoxic ethene (1,2).



While a number of bacterial cultures capable of utilizing PCE and TCE as growth supporting electron acceptors have been isolated (3-7), *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene (8). In fact, the presence of *Dehalococcoides* spp. has been associated with complete dechlorination to ethene at sites across North America and Europe (9).

Status	*Dehalococcoides spp.*	Observation
	≥ 10^4 (cells/mL)	Lu et al. proposed that a concentration of 1 x 10^4 DHC cells/mL could be used as a screening criterion to identify sites where reductive dechlorination will yield a generally useful biodegradation rate (10). Similarly, in an internal study conducted with nearly 1000 groundwater samples obtained from sites across the US, ethene production was observed in approximately 80% of samples in which CENSUS® qDHC results were greater than or equal to 10^4 DHC cells/mL.
	10^1 to < 10^4 (cells/mL)	When vinyl chloride reductase genes (See DHC functional genes discussion below) are also detected, complete reductive dechlorination of PCE and TCE to ethene may still occur even with moderate DHC concentrations. When the DHC population is below the 10^4 cells/mL criterion proposed by Lu et al. (10), project managers should carefully consider other site-specific data to determine whether subsurface conditions may be limiting reductive dechlorination. For example, the addition of an electron donor may be able to stimulate DHC growth and enhance anaerobic bioremediation.
	< 10^1 (cells/mL)	DHC concentrations are low suggesting that complete reductive dechlorination of PCE and TCE to ethene is unlikely to occur under existing conditions. Enhanced anaerobic bioremediation options (biostimulation or bioaugmentation) may need to be considered.

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DHC Interpretation

DHC Functional Genes (*tce*A, *bvc*A, *vcr*A)

A "stall" where daughter products *cis*-DCE and vinyl chloride accumulate can occur at PCE- and TCE-impacted sites especially under MNA conditions. The accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. Although elevated *Dehalococcoides* concentrations correspond to ethene production in numerous studies, the range of chlorinated ethenes metabolized and cometabolized varies among species and strains within the *Dehalococcoides* genus. For example, *Dehalococcoides ethenogenes* str. 195 metabolizes PCE, TCE, and *cis*-DCE and cometabolizes vinyl chloride (8) to produce ethene. Conversely, *Dehalococcoides* sp. CBDB1 utilizes PCE and TCE but does not cometabolize additional chloroethenes (11). Other *Dehalococcoides* strains, such as BAV1, GT and VS, are known to fully dechlorinate cis-DCE and VC to ethene (14,16,19). Quantification of reductive dehalogenase genes is used to more definitively confirm the potential for reductive dechlorination of TCE, cis-DCE, and vinyl chloride (12-15).

Functional Gene	Observation
TCE Reductase	
***tce*A gene**	The *tce*A gene encodes the enzyme responsible for reductive dechlorination of TCE to *cis*-DCE in some strains of *Dehalococcoides*. Absence of *tce*A does not preclude the potential for reductive dechlorination of TCE in the field since the *tce*A gene is not universally distributed among all DHC and is not present in other microorganisms capable of reductive dechlorination of TCE (e.g. *Dehalobacter*). Detection of the *tce*A gene provides an additional line of evidence indicating the potential for dechlorination of TCE.
Vinyl Chloride Reductase	
***bvc*A gene**	The *bvc*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of vinyl chloride to ethene by *Dehalococcoides* sp. str. BAV1 (16). Presence of *bvc*A gene indicates the potential for reductive dechlorination of VC to ethene. Absence of both *bvc*A and *vcr*A genes suggests VC may accumulate. An internal study with ~1,000 samples showed ethene production was observed in 80% of the samples that the DHC population was greater than or equal to 10^4 cells/mL. The *bvc*A gene was detected in over 50% of these samples. Van Der Zaan et al (17) noted that the bvcA gene was the only VC reductase gene detected at three of their sites. Alfred Spormann's laboratory at Stanford University (18) reported that the *bvc*A gene was the most abundant and active at the outflow of a PCE fed column study. This section of the column was in the DCE to VC stages of reductive dechlorination thus confirming the importance of the *bvc*A gene for complete reductive dechlorination.
***vcr*A gene**	The *vcr*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of *cis*-DCE and vinyl chloride by *Dehalococcoides* sp. strain VS (14). Presence of *vcr*A gene indicates the potential for reductive dechlorination of DCE and/or VC to ethene. Absence of both *bvc*A and *vcr*A genes suggest VC may accumulate. As with the *bvc*A gene, detection of the *vcr*A gene is associated with ethene production in internal studies (67%) and vinyl chloride reduction in independent studies (14, 17).

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DHC Interpretation

Reporting

Microbial Insights can provide a variety of data packages and reporting levels to suit the needs of any project. Data packages range from simple analytical reports with results only to more complex data packages that include a report narrative, analytical results, QC data, and supporting materials including all raw data and chain-of-custody documentation. The figure below shows our standard report and explains the way values are reported.

Microbial Insights, Inc.

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CENSUS

Client: Company Name
Project: Your Project Name

MI Project Number: Unique Laboratory Identifier
Date Received: Date Samples Arrived

Sample Information

Client Sample ID:		Sample A	Sample B	Sample C
Sample Date:		00/00/0000	00/00/0000	00/00/0000
Units:		cells/mL	cells/mL	cells/mL
Analyst:		Intials	Intials	Intials
Dechlorinating Bacteria				
Dehalococcoides spp.	DHC	**1.84E+05**	**2.76E+02**	**2.28E+01 (J)**
Functional Genes				
tceA Reductase	TCE	**6.00E+01**	**3.23E+01**	<4.00E-01
bvcA Reductase	BVC	**1.17E+04**	**1.81E+01**	<4.00E-01
vcrA Reducatase	VCR	**8.42E+04**	**1.74E+02**	<4.00E-01

"J" value
Result is an estimated value. This data qualifier (flag) is used when the target gene is detected but at a concentration or abundance below the practical quantification limit (PQL).

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

< value
The target gene was not detected at the limit of quantitation (LOQ) reported for that sample.

"I" value
QA Procedure indicated that the sample may have exhibited PCR inhibition. Although relatively rare, PCR inhibition can occur due to the presence of metals or humic acids at high concentrations in the sample.

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Quality Assurance

Microbial Insights' comprehensive Quality Assurance (QA) Program is the foundation of all laboratory analyses, ensuring that our clients receive high-quality analytical services that are timely, reliable, and meet their intended purpose in a cost effective manner. MI is committed to providing quality data that surpasses regulatory and industry standards, thus enabling the client to make well-informed decisions. MI maintains strict standard operating procedures and QA/QC measures throughout all of the analyses offered. The following Table details specific QA/QC procedures that are used for CENSUS.

QA/QC	Description
Date of Extraction	DNA and RNA extractions are performed the day the samples are received by MI to minimize the possibility of any changes to the microbial community prior to analysis.
Laboratory Method Blanks	An extraction blank (no sample added) is processed alongside each set of field samples from DNA extraction through CENSUS® analysis to ensure that cross contamination has not occurred. Although MI has never experienced this issue, the detection of the CENSUS® target (e.g. *Dehalococcoides*) in an extraction blank is direct evidence of cross contamination with a sample or contamination of a reagent and would invalidate the results. If this were to occur, MI would re-extract the sample. If not possible to re-extract, MI would contact the client immediately and notate it on the laboratory report.
Laboratory Control Samples (LCS)	A laboratory control sample (LCS) or positive control (target DNA) is included with each CENSUS® plate to confirm amplification and as a continuing calibration check.
Negative Controls	A negative control (no DNA) is included with each CENSUS plate to ensure that cross contamination has not occurred during amplification. As with the extraction blank, detection of CENSUS target (e.g. DHC) in a negative control is direct evidence of contamination and would invalidate the results. If this were to occur, MI would rerun the analysis.

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How to Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database and Client Portal

The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 32,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide. Driven by field samples, the database reflects the impacts of common contaminants, geochemical conditions, and site management practices on critical microbial populations.

With your report, you received a passcode enabling you to retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge. When accessing the database, you will be asked to provide background information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations. As with all client information provided to MI, site specific data will be treated as confidential.

Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. Simply put, qPCR and QuantArray results demonstrating high concentrations of target microorganisms or functional genes suggest in situ selection, enrichment and growth of those specific contaminant degraders and therefore a greater probability that monitored natural attenuation (MNA) or bioremediation will be successful.

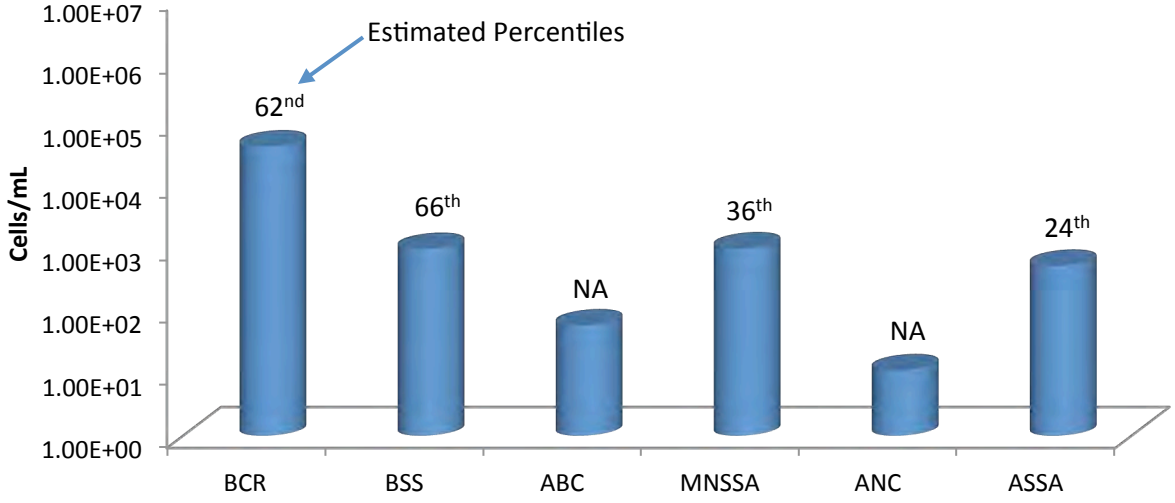
Is that a low, medium, or high concentration? The estimated percentile ranks retrieved from the MI Database answer that question by comparing your qPCR and QuantArray results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Using the Estimated Percentile - Interpretation Examples

MNA Assessment – Petroleum Hydrocarbon Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between samples obtained from background and impacted wells. The estimated percentile ranks however provide an additional avenue for comparison and evaluation of treatment options as shown below.

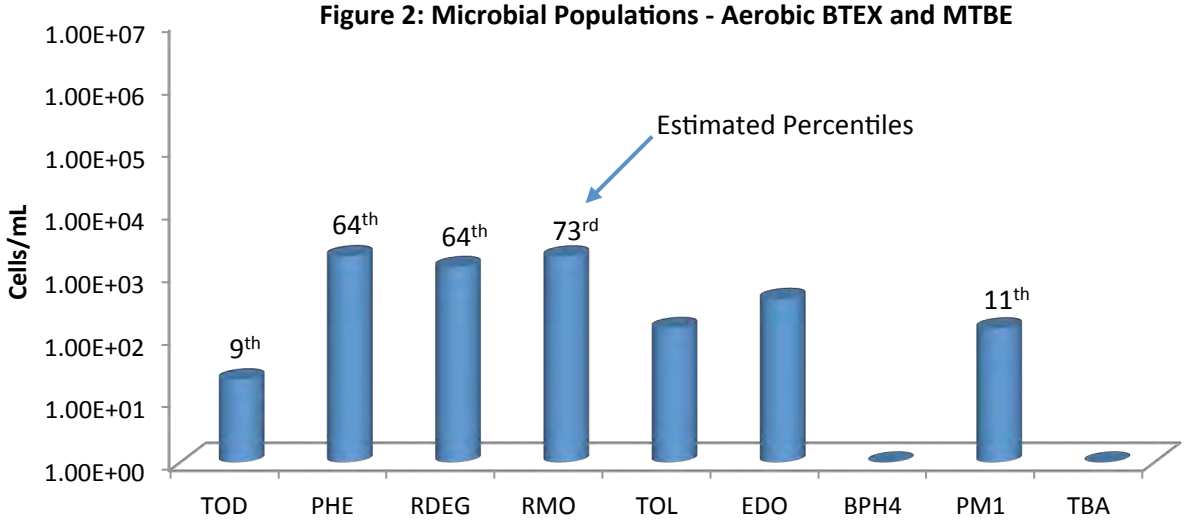
Figure 1: Microbial Populations - Anaerobic BTEX and PAHs



Anaerobic BTEX and PAH Biodegradation (Figure 1):

- With moderate concentrations of functional genes involved in anaerobic BTEX metabolism detected, the QuantArray-Petro® results were encouraging in terms of evaluating biodegradation potential under existing site conditions.
- More specifically, benzylsuccinate synthase (BSS) was detected on the order of nearly 10^3 cells/mL indicating the presence of a substantial population (66^{th} percentile) capable of anaerobic biodegradation of toluene and other alkyl substituted benzenes.
- Naphthyl-2-methylsuccinate synthase (MNSSA) and alkylsuccinate synthase (ASSA) genes were also detected indicating the potential for anaerobic biodegradation of 2-methylnaphthalene and normal alkanes.
- The concentration of MNSSA genes would be considered modest with an estimated percentile of 36^{th}.
- While the percentile rank for MNSSA would be "below average", a number of additional factors should be considered.
    - First, anaerobic hydrocarbon degraders are less prevalent than aerobic BTEX degraders and overall detection frequencies for many genes involved in anaerobic hydrocarbon biodegradation are less than 50%.
    - Therefore, the detection of genes like BSS, MNSSA, ASSA, anaerobic benzene carboxylase (ABC), and anaerobic naphthalene carboxylase (ANC) even at low concentrations is certainly noteworthy and inherently "better than average".
    - The estimated percentiles for all assays are based only on samples where the concentration of the target gene was greater than the practical quantitation limit (PQL).
    - For less commonly detected targets like many of the genes involved in anaerobic hydrocarbon biodegradation this is an especially important consideration.
    - Excluding samples where a gene target is below the PQL ensured that the median concentrations of less commonly detected targets would not be unduly biased low by the fact that the gene is not detected in most samples.
- Anaerobic benzene carboxylase (ABC) and naphthalene carboxylase (ANC) genes were also detected indicating the presence of bacterial populations capable of anaerobic biodegradation of benzene and naphthalene.
- For newly identified genes like ABC and ANC, estimated percentile ranks are not yet available due to the limited number of field samples that have been analyzed to date.
- However, like MNSSA and other genes involved in anaerobic hydrocarbon biodegradation, ABC and ANC detection frequencies are relatively low so the detection of these genes even at low concentrations should be considered when evaluating biodegradation potential under existing site conditions.

Figure 2: Microbial Populations - Aerobic BTEX and MTBE



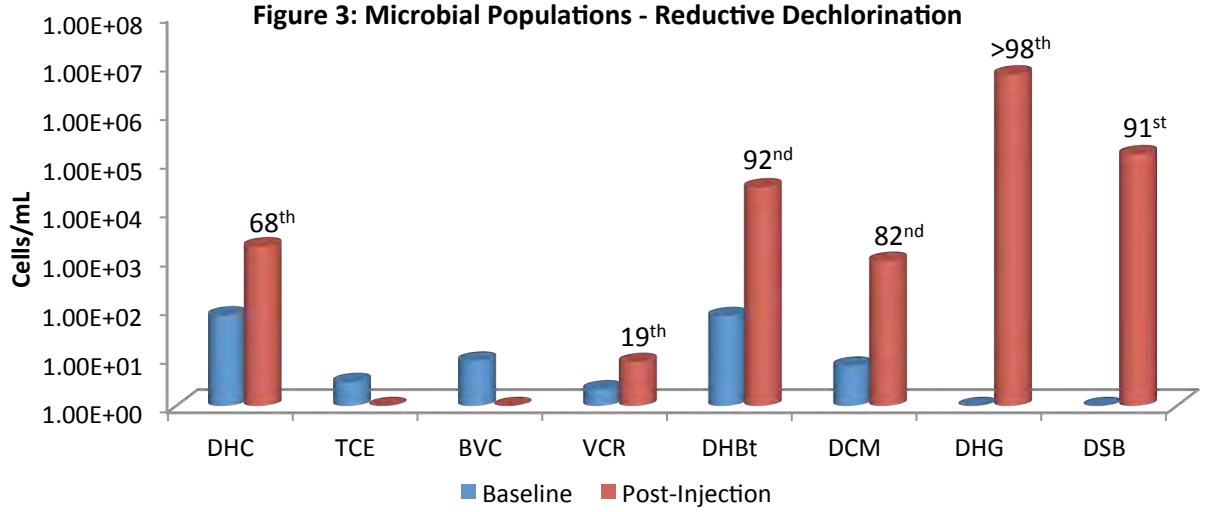
Aerobic BTEX and MTBE Biodegradation (Figure 2):

- With growing evidence that aromatic oxygenases function at low dissolved oxygen concentrations, aerobic BTEX biodegradation pathways should also be evaluated when considering MNA.
- Again, the QuantArray-Petro results were encouraging – genes encoding the first step in multiple pathways for aerobic BTEX biodegradation were detected indicating the presence of a diverse population of aerobic BTEX degraders.
- However, aerobic BTEX degraders are often considered ubiquitous. Therefore answering the question "Is that low, medium or high?" becomes especially important when evaluating aerobic BTEX biodegradation at petroleum hydrocarbon sites.
- In this case, the estimated percentile ranks of the concentrations of toluene/benzene monooxygenase (RMO and RDEG) and phenol hydroxylase (PHE) genes ranged from the 64th to 73rd percentile.
- In other words, the concentrations of RMO, RDEG, and PHE detected in this groundwater sample were greater than the concentrations detected in 64% to 73% of all other groundwater samples where these genes were analyzed and detected above the PQL.
- Aerobic BTEX degraders are common in the environment, but in this sample concentrations of toluene/benzene monooxygenase genes could be viewed as "better than average" when compared to the MI Database.

Biostimulation – Chlorinated Solvent Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between baseline and post-injection monitoring events as shown below (Figure 3). The estimated percentile ranks however provide an additional avenue for comparison and evaluation of remedy performance.

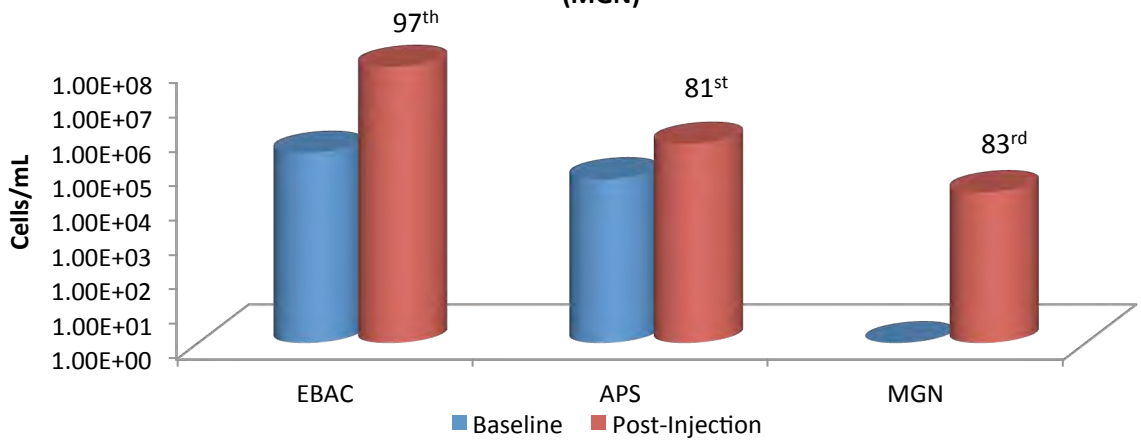
Figure 3: Microbial Populations - Reductive Dechlorination



- During the baseline groundwater sampling event, *Dehalococcoides* and vinyl chloride reductase genes were detected indicating the potential for complete reductive dechlorination of PCE and TCE to ethene.
- However, the *Dehalococcoides* concentration was well below the 10^4 cells/mL recommended by Lu et al. (2006) for generally effective rates of reductive dechlorination.
- Based on qPCR results as well as traditional groundwater monitoring, biostimulation with electron donor addition was selected as the site management plan.
- By the first monitoring event after injection, populations of halorespiring bacteria had increased substantially in response to electron donor addition.
    - *Dehalobacter* populations increased by more than two orders of magnitude to post-injection concentrations greater than 10^4 cells/mL (92^{nd} percentile).
    - *Dehalogenimonas* (10^6 cells/mL) and *Desulfitobacterium* (10^5 cells/mL) which had not been detected prior electron donor addition were present at concentrations greater than observed in over 90% of other groundwater samples where these halorespiring bacteria were detected.
- After injection, *Dehalococcoides* populations increased by more than an order of magnitude to a concentration of over 10^3 cells/mL (68^{th} percentile) demonstrating growth of this key group of halorespiring bacteria.
- Despite a substantial increase and a "better than average" concentration, the *Dehalococcoides* population was still below the 10^4 cells/mL threshold and vinyl chloride reductase gene copies were low (19^{th} percentile).
    - In terms of electron donors and acceptors, the metabolic capabilities of *Dehalococcoides* are rather specialized (hydrogen utilizing obligate halorespiring bacteria) so the median concentration is low. With a low median concentration across the database, a "better than average" *Dehalococcoides* concentration in a given sample may not exceed the 10^4 cells/mL threshold established for effective reductive dechlorination (Lu et al. 2006) and ethene production (Microbial Insights, unpublished data).

- In this case, the initial growth of *Dehalococcoides* was substantial but may have been somewhat hindered by competition with sulfate reducing bacteria (Figure 4 below).
    - The baseline population of sulfate reducing bacteria was moderate (10^4 cells/mL; 63rd percentile). Consistent with an observed decreased in dissolved sulfate concentrations, populations of sulfate reducing bacteria increased and were detected at a relatively high concentration (81st percentile) after electron donor addition.
    - After injection, methanogen populations also increased to a relatively high concentration (83rd percentile) suggesting generation of methanogenic conditions.
- With sulfate depletion and generation of highly anaerobic conditions more conducive to reductive dechlorination, *Dehalococcoides* populations may continue to increase and exceed the 10^4 *Dehalococcoides* cells/mL threshold in subsequent monitoring events.
- Overall, QuantArray analysis conclusively demonstrated that electron donor addition stimulated growth of halorespiring bacteria with the estimated percentiles retrieved from the MI Database providing the "low, medium or high" perspective to the observed changes in microbial populations.

Figure 4: Total Bacteria (EBAC), Sulfate Reducering Bacteria (APS) and Methanogens (MGN)



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Lu, X., J.T. Wilson, and D.H. Kampbell. 2006. Relationship between *Dehalococcoides* DNA in ground water and rates of reductive dechlorination at field scale. *Water Research* 40 no. 16: 3131-3140.

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INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)
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Project Manager: Kim Nemmers
Project Name: LITHAP-58
Project No.: NW01312.0150

Purchase Order No.
Subcontract No.
MI Quote No.

Please Check One:
☑ More samples to follow
☐ No Additional Samples

Report Type: ☐ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (30%)
EDD type: ☐ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information					Analyses					CENSUS: Please select the target organism/gene																							
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tca, vcr)	DHBt (Dehalobacter)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Denitrifiers-nirS and nirK)	AOB (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
114PI1	35AWW06_092618	9/26/18	0920								X	X																					
2	35AWW20_092618	9/26/18	1115								X	X																					
3	LHSmw07_092618	9/26/18	1230								X	X																					

Relinquished by: Scott Blesing 9/26/18 14:00
Received by: [signature] Date 9/27/18 10:42

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

October 10, 2018 Service Request No:R1809340

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: LHAAP / Site 58

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 27, 2018
For your reference, these analyses have been assigned our service request number **R1809340.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger
Project Manager

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Narrative Documents

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Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809340
Date Received: 09/27/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt:

Four water samples were received for analysis at ALS Environmental on 09/27/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

Semivoa GC:

Method Organic Acids, 10/04/2018: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.
Method Organic Acids, 10/05/2018: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.
Pyruvic acid fails high in the ms/msd aswell.

General Chemistry:

Ferrous Iron was not performed in the field as recommended by the EPA to meet an "immediate" or 15 minute Holding Time. Samples analyzed in the laboratory have been flagged with an "H" to indicate the "immediate" holding time has been exceeded.

Approved by _____ Date 10/10/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: 35AWW06_092618			Lab ID: R1809340-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	27.8		0.3	1.0	mg/L	SM 3500-Fe B.4.c
Pyruvic Acid	0.20	J	0.16	2.0	mg/L	Organic Acids
Acetic Acid	1400		10	40	mg/L	Organic Acids
Butanoic Acid (Butyric Acid)	1400		3.2	20	mg/L	Organic Acids
Propionic Acid	600		1.9	20	mg/L	Organic Acids

CLIENT ID: 35AWW20_092618			Lab ID: R1809340-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	1.38		0.03	0.10	mg/L	SM 3500-Fe B.4.c
Acetic Acid	110		1.0	4.0	mg/L	Organic Acids

CLIENT ID: 35AWW20_092618_a			Lab ID: R1809340-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	1.41		0.03	0.10	mg/L	SM 3500-Fe B.4.c
Acetic Acid	100		1.0	4.0	mg/L	Organic Acids

CLIENT ID: LHSMW07_092618			Lab ID: R1809340-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.93		0.03	0.10	mg/L	SM 3500-Fe B.4.c
Acetic Acid	140		1.0	4.0	mg/L	Organic Acids
Propionic Acid	0.78	J	0.19	2.0	mg/L	Organic Acids

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: ALS Environmental - US **Service Request:**R1809340
Project: LHAAP / Site 58/NWO1312.0150

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1809340-001	35AWW06_092618	9/26/2018	0920
R1809340-002	35AWW20_092618	9/26/2018	1115
R1809340-003	35AWW20_092618_a	9/26/2018	1115
R1809340-004	LHSMW07_092618	9/26/2018	1230

bhate ENVIRONMENTAL CONSTRUCTION LIMITED

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VFA	Ferrous Iron	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW06_092618		26 Sep 2018	0920	-		N	WG	2	X	X				
35AWW06_092618_MS		26 Sep 2018	0920	-		MS	WG	2	X	X				
35AWW06_092618_MSD		26 Sep 2018	0920	-		SD	WG	2	X	X				
35AWW20_092618		26 Sep 2018	1115			N	WG	2	X	X				
35AWW20_092618_a		26 Sep 2018	1115			FD	WG	2	X	X				
LHSMW07_092618		26 Sep 2018	1230	-		N	WG	2	X	X				
				-										
				-										
				-										
				-										
				-										

Sample Analyte Requested (5)

Quality Assurance Samples (6)

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	9/26/18	1100	1. Dwight	9/27/18	0915
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

____ Method of Shipment: ____

____ Fed Ex ____ Airbill Number:

____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment ...

R1809340 5
AL8 Group USA, Corp.
LHAAP / Site 58

Cooler Receipt and Preservation Check Form

R1809340 5
ALS Group USA, Corp.
LHAAP / Site 58

Project/Client Chute Folder Number

Cooler received on 9/27/18 by: @

COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	Y (N)	5a	**Perchlorate** samples have required headspace?	Y N (NA)
2	**Custody papers** properly completed (ink, signed)?	(Y) N	5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y N (NA)
3	Did all bottles arrive in good **condition** (unbroken)?	(Y) N	6	Where did the bottles originate? ALS/ROC	(CLIENT)
4	Circle: (Wet Ice) **Dry Ice Gel packs** present?	(Y) N	7	Soil VOA received as: Bulk Encore 5035set	(NA)

8. Temperature Readings Date: 9/27/18 Time: 0930 ID: IR#7 (IR#10) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	1.7						
Correction Factor (°C)	–						
Corrected Temp (°C)	1.7						
Temp from:Type of bottle	–						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-082 by @ on 9/27/18 at 0935
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown/Preservation Check**: Date: 9/27/18 Time: 2024 by: JW

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
10. Did all bottle labels and tags agree with custody papers? (YES) NO
11. Were correct containers used for the tests indicated? (YES) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO (N/A)
13. Air Samples: Cassettes / Tubes Intact with MS? Canisters Pressurized Tedlar® Bags Inflated (N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-			**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).			
		HCl	**	**						

Bottle lot numbers: client, client label

Explain all Discrepancies/ Other Comments:

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: JW

PC Secondary Review: MM 9/28/18

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

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Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1809340
Project: LHAAP / Site 58/NWO1312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1809340-001.01					
	SM 3500-Fe B.4.c				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2101	RT000299 / DWARD	
		9/27/2018	2102	R-015 / DWARD	
R1809340-001.02					
	Organic Acids				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2024	R-002 / DWARD	
		10/4/2018	1507	In Lab / BALLGEIER	
		10/4/2018	1507	R-002 / BALLGEIER	
R1809340-001.03					
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2024	R-002 / DWARD	
R1809340-001.04					
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2024	R-002 / DWARD	
		10/4/2018	1506	In Lab / BALLGEIER	
		10/4/2018	1508	R-002 / BALLGEIER	
R1809340-001.05					
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2101	RT000299 / DWARD	
		9/27/2018	2102	R-015 / DWARD	
R1809340-001.06					
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2102	RT000299 / DWARD	
		9/27/2018	2102	R-015 / DWARD	
R1809340-002.01					
	SM 3500-Fe B.4.c				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2101	RT000299 / DWARD	
		9/27/2018	2102	R-015 / DWARD	
R1809340-002.02					
	Organic Acids				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2024	R-002 / DWARD	
		10/4/2018	1507	In Lab / BALLGEIER	

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1809340
Project: LHAAP / Site 58/NWO1312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	Organic Acids				
		10/4/2018	1507	R-002 / BALLGEIER	
R1809340-003.01					
	SM 3500-Fe B.4.c				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2102	RT000299 / DWARD	
		9/27/2018	2102	R-015 / DWARD	
R1809340-003.02					
	Organic Acids				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2024	R-002 / DWARD	
		10/4/2018	1507	In Lab / BALLGEIER	
		10/4/2018	1507	R-002 / BALLGEIER	
R1809340-004.01					
	SM 3500-Fe B.4.c				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2102	RT000299 / DWARD	
		9/27/2018	2102	R-015 / DWARD	
R1809340-004.02					
	Organic Acids				
		9/27/2018	2024	SMO / DWARD	
		9/27/2018	2024	R-002 / DWARD	
		10/4/2018	1507	In Lab / BALLGEIER	
		10/4/2018	1507	R-002 / BALLGEIER	

Miscellaneous Forms

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REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.

Spike was diluted out.

\+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratoryôs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

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Analyst Summary report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Service Request: R1809340

Sample Name: 35AWW06_092618
Lab Code: R1809340-001
Sample Matrix: Water
Date Collected: 09/26/18
Date Received: 09/27/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW20_092618
Lab Code: R1809340-002
Sample Matrix: Water
Date Collected: 09/26/18
Date Received: 09/27/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW20_092618_a
Lab Code: R1809340-003
Sample Matrix: Water
Date Collected: 09/26/18
Date Received: 09/27/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: LHSMW07_092618
Lab Code: R1809340-004
Sample Matrix: Water
Date Collected: 09/26/18
Date Received: 09/27/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

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Semivolatile Organic Compounds by GC

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ALS Group USA, Corp.
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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 09:20
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW06_092618	**Units:**	mg/L
Lab Code:	R1809340-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	**0.20**	**J**	2.0	1.0	0.16	10	10/05/18 12:49	
Acetic Acid	**1400**		40	20	10	10	10/05/18 12:49	
Butanoic Acid (Butyric Acid)	**1400**		20	10	3.2	10	10/05/18 12:49	
Lactic Acid	ND	U	20	10	1.4	10	10/05/18 12:49	
Propionic Acid	**600**		20	10	1.9	10	10/05/18 12:49	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618	**Units:**	mg/L
Lab Code:	R1809340-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/04/18 21:21	
Acetic Acid	**110**		4.0	2.0	1.0	1	10/04/18 21:21	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/04/18 21:21	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/04/18 21:21	
Propionic Acid	ND	U	2.0	1.0	0.19	1	10/04/18 21:21	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618_a	**Units:**	mg/L
Lab Code:	R1809340-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/04/18 21:53	
Acetic Acid	**100**		4.0	2.0	1.0	1	10/04/18 21:53	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/04/18 21:53	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/04/18 21:53	
Propionic Acid	ND	U	2.0	1.0	0.19	1	10/04/18 21:53	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 12:30
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	LHSMW07_092618	**Units:**	mg/L
Lab Code:	R1809340-004	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/04/18 22:25	
Acetic Acid	**140**		4.0	2.0	1.0	1	10/04/18 22:25	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/04/18 22:25	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/04/18 22:25	
Propionic Acid	**0.78**	**J**	2.0	1.0	0.19	1	10/04/18 22:25	

General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 09:20
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW06_092618	**Basis:**	NA
Lab Code:	R1809340-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**27.8**	mg/L	1.0	0.8	0.3	10	09/27/18 20:00	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618	**Basis:**	NA
Lab Code:	R1809340-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**1.38**	mg/L	0.10	0.08	0.03	1	09/27/18 20:00	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618_a	**Basis:**	NA
Lab Code:	R1809340-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**1.41**	mg/L	0.10	0.08	0.03	1	09/27/18 20:00	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 12:30
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	LHSMW07_092618	**Basis:**	NA
Lab Code:	R1809340-004		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.93**	mg/L	0.10	0.08	0.03	1	09/27/18 20:00	*

QC Summary Forms

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Semivolatile Organic Compounds by GC

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/27/18
		Date Analyzed:	10/5/18

Duplicate Matrix Spike Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	35AWW06_092618	**Units:**	mg/L
Lab Code:	R1809340-001	**Basis:**	NA
Analysis Method:	Organic Acids		

		Matrix Spike RQ1810656-06			Duplicate Matrix Spike RQ1810656-07					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	0.20 J	28.3	20.2	139 *	28.4	20.2	139 *	73-122	<1	30
Acetic Acid	1400	1560	199	87 #	1560	199	85 #	80-130	<1	30
Butanoic Acid (Butyric Acid)	1400	1620	203	123 #	1620	203	121 #	86-128	<1	30
Lactic Acid	ND U	188	206	91	189	206	92	81-114	<1	30
Propionic Acid	600	785	200	92	782	200	90	63-153	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Analyzed:**	10/04/18 17:51
Sample Matrix:	Water		

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	Method Blank	**Instrument ID:**	R-HPLC-05
Lab Code:	RQ1810603-04	**File ID:**	I:\ACQUDATA\hplc05\data\100418\A0002377.D\
Analysis Method:	Organic Acids	**Analysis Lot:**	609639

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1810603-05	I:\ACQUDATA\hplc05\data\100418\A0002378.D\	10/04/18 18:26
Duplicate Lab Control Sample	RQ1810603-06	I:\ACQUDATA\hplc05\data\100418\A0002379.D\	10/04/18 19:00
35AWW20_092618	R1809340-002	I:\ACQUDATA\hplc05\data\100418\A0002383.D\	10/04/18 21:21
35AWW20_092618_a	R1809340-003	I:\ACQUDATA\hplc05\data\100418\A0002384.D\	10/04/18 21:53
LHSMW07_092618	R1809340-004	I:\ACQUDATA\hplc05\data\100418\A0002385.D\	10/04/18 22:25

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Analyzed:**	10/05/18 11:04
Sample Matrix:	Water		

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	Method Blank	**Instrument ID:**	R-HPLC-05
Lab Code:	RQ1810656-03	**File ID:**	I:\ACQUDATA\hplc05\data\100518\A0002393.D\
Analysis Method:	Organic Acids	**Analysis Lot:**	609806

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1810656-04	I:\ACQUDATA\hplc05\data\100518\A0002394.D\	10/05/18 11:39
Duplicate Lab Control Sample	RQ1810656-05	I:\ACQUDATA\hplc05\data\100518\A0002395.D\	10/05/18 12:02
35AWW06_092618	R1809340-001	I:\ACQUDATA\hplc05\data\100518\A0002396.D\	10/05/18 12:49
35AWW06_092618MS	RQ1810656-06	I:\ACQUDATA\hplc05\data\100518\A0002397.D\	10/05/18 13:24
35AWW06_092618DMS	RQ1810656-07	I:\ACQUDATA\hplc05\data\100518\A0002398.D\	10/05/18 13:59

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1810603-04	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	10/04/18 17:51	
Acetic Acid	ND U	4.0	2.0	1.0	1	10/04/18 17:51	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	10/04/18 17:51	
Lactic Acid	ND U	2.0	1.0	0.14	1	10/04/18 17:51	
Propionic Acid	ND U	2.0	1.0	0.19	1	10/04/18 17:51	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1810656-03	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	10/05/18 11:04	
Acetic Acid	ND U	4.0	2.0	1.0	1	10/05/18 11:04	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	10/05/18 11:04	
Lactic Acid	ND U	2.0	1.0	0.14	1	10/05/18 11:04	
Propionic Acid	ND U	2.0	1.0	0.19	1	10/05/18 11:04	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Analyzed:**	10/04/18 18:26
Sample Matrix:	Water		

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	Lab Control Sample	**Instrument ID:**	R-HPLC-05
Lab Code:	RQ1810603-05	**File ID:**	I:\ACQUDATA\hplc05\data\100418\A0002378.D\
Analysis Method:	Organic Acids	**Analysis Lot:**	609639

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1810603-04	I:\ACQUDATA\hplc05\data\100418\A0002377.D\	10/04/18 17:51
Duplicate Lab Control Sample	RQ1810603-06	I:\ACQUDATA\hplc05\data\100418\A0002379.D\	10/04/18 19:00
35AWW20_092618	R1809340-002	I:\ACQUDATA\hplc05\data\100418\A0002383.D\	10/04/18 21:21
35AWW20_092618_a	R1809340-003	I:\ACQUDATA\hplc05\data\100418\A0002384.D\	10/04/18 21:53
LHSMW07_092618	R1809340-004	I:\ACQUDATA\hplc05\data\100418\A0002385.D\	10/04/18 22:25

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1809340
Date Analyzed: 10/05/18 11:39

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Lab Control Sample
Lab Code: RQ1810656-04

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\100518\A0002394.D\

Analysis Method: Organic Acids
Analysis Lot:609806

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1810656-03	I:\ACQUDATA\hplc05\data\100518\A0002393.D\	10/05/18 11:04
Duplicate Lab Control Sample	RQ1810656-05	I:\ACQUDATA\hplc05\data\100518\A0002395.D\	10/05/18 12:02
35AWW06_092618	R1809340-001	I:\ACQUDATA\hplc05\data\100518\A0002396.D\	10/05/18 12:49
35AWW06_092618MS	RQ1810656-06	I:\ACQUDATA\hplc05\data\100518\A0002397.D\	10/05/18 13:24
35AWW06_092618DMS	RQ1810656-07	I:\ACQUDATA\hplc05\data\100518\A0002398.D\	10/05/18 13:59

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1809340
Date Analyzed: 10/04/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample			Duplicate Lab Control Sample					
		RQ1810603-05			RQ1810603-06					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	2.97	2.02	147 *	3.00	2.02	148 *	73-122	1	30
Acetic Acid	Organic Acids	20.7	19.9	104	20.9	19.9	105	80-130	<1	30
Butanoic Acid (Butyric Acid)	Organic Acids	18.2	20.3	90	17.5	20.3	86	86-128	4	30
Lactic Acid	Organic Acids	20.3	20.6	98	20.5	20.6	99	81-114	1	30
Propionic Acid	Organic Acids	18.8	20.0	94	18.9	20.0	95	63-153	<1	30

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1809340
Date Analyzed: 10/05/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample RQ1810656-04			Duplicate Lab Control Sample RQ1810656-05					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	2.99	2.02	148 *	2.97	2.02	147 *	73-122	<1	30
Acetic Acid	Organic Acids	20.7	19.9	104	20.8	19.9	105	80-130	<1	30
Butanoic Acid (Butyric Acid)	Organic Acids	18.4	20.3	90	17.8	20.3	88	86-128	3	30
Lactic Acid	Organic Acids	20.3	20.6	98	20.2	20.6	98	81-114	<1	30
Propionic Acid	Organic Acids	19.1	20.0	95	18.6	20.0	93	63-153	2	30

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1809340-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	ND U	mg/L	0.10	0.08	0.03	1	09/27/18 20:00	

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/27/18
		Date Analyzed:	09/27/18

Duplicate Matrix Spike Summary
Iron, Divalent (Ferrous Iron)

Sample Name:	35AWW06_092618	**Units:**	mg/L
Lab Code:	R1809340-001	**Basis:**	NA
Analysis Method:	SM 3500-Fe B.4.c		

		Matrix Spike R1809340-001MS			Duplicate Matrix Spike R1809340-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Iron, Divalent (Ferrous Iron)	27.8	30.7	4.0	73 #	29.9	4.0	54 #	67-129	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1809340
Date Analyzed: 09/27/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1809340-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	0.39	0.40	97	67-129

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dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**R1809340
Project: LHAAP / Site 58/NWO1312.0150

Continuing Calibration Blank (CCB) Summary
Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	609189	RQ1810495-02	09/27/18 20:00	0.10	0.08	0.03	ND	U
CCB2	609189	RQ1810495-05	09/27/18 20:00	0.10	0.08	0.03	ND	U

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QA/QC Report

Client: ALS Environmental - US **Service Request:** R1809340
Project: LHAAP / Site 58/NWO1312.0150

Continuing Calibration Verification (CCV) Summary

Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	609189	RQ1810495-01	09/27/18 20:00	2.00	1.99	99	90-110
CCV2	609189	RQ1810495-06	09/27/18 20:00	2.00	1.99	99	90-110

Raw Data

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Semivolatile Organic Compounds by GC

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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 09:20
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW06_092618	**Units:**	mg/L
Lab Code:	R1809340-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	**0.20**	**J**	2.0	1.0	0.16	10	10/05/18 12:49	
Acetic Acid	**1400**		40	20	10	10	10/05/18 12:49	
Butanoic Acid (Butyric Acid)	**1400**		20	10	3.2	10	10/05/18 12:49	
Lactic Acid	ND	U	20	10	1.4	10	10/05/18 12:49	
Propionic Acid	**600**		20	10	1.9	10	10/05/18 12:49	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618	**Units:**	mg/L
Lab Code:	R1809340-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/04/18 21:21	
Acetic Acid	**110**		4.0	2.0	1.0	1	10/04/18 21:21	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/04/18 21:21	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/04/18 21:21	
Propionic Acid	ND	U	2.0	1.0	0.19	1	10/04/18 21:21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618_a	**Units:**	mg/L
Lab Code:	R1809340-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/04/18 21:53	
Acetic Acid	**100**		4.0	2.0	1.0	1	10/04/18 21:53	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/04/18 21:53	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/04/18 21:53	
Propionic Acid	ND	U	2.0	1.0	0.19	1	10/04/18 21:53	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 12:30
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	LHSMW07_092618	**Units:**	mg/L
Lab Code:	R1809340-004	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/04/18 22:25	
Acetic Acid	**140**		4.0	2.0	1.0	1	10/04/18 22:25	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/04/18 22:25	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/04/18 22:25	
Propionic Acid	**0.78**	**J**	2.0	1.0	0.19	1	10/04/18 22:25	

1st BA 10/08/18
2nd BA 10/09/18

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002396.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 12:49:31
Operator : b.allgeier
Sample : r1809340-001|10
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	3.615	7921	0.017	ppm	m
3) T	Lactic Acid	0.000	0	N.D.	ppm	d
4) T	Acetic Acid	4.361	8200601	138.595	ppm	
5) T	Propionic Acid	9.106	3578822	60.056	ppm	
6) T	Butyric Acid	24.414	8636581	137.312	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

00944025

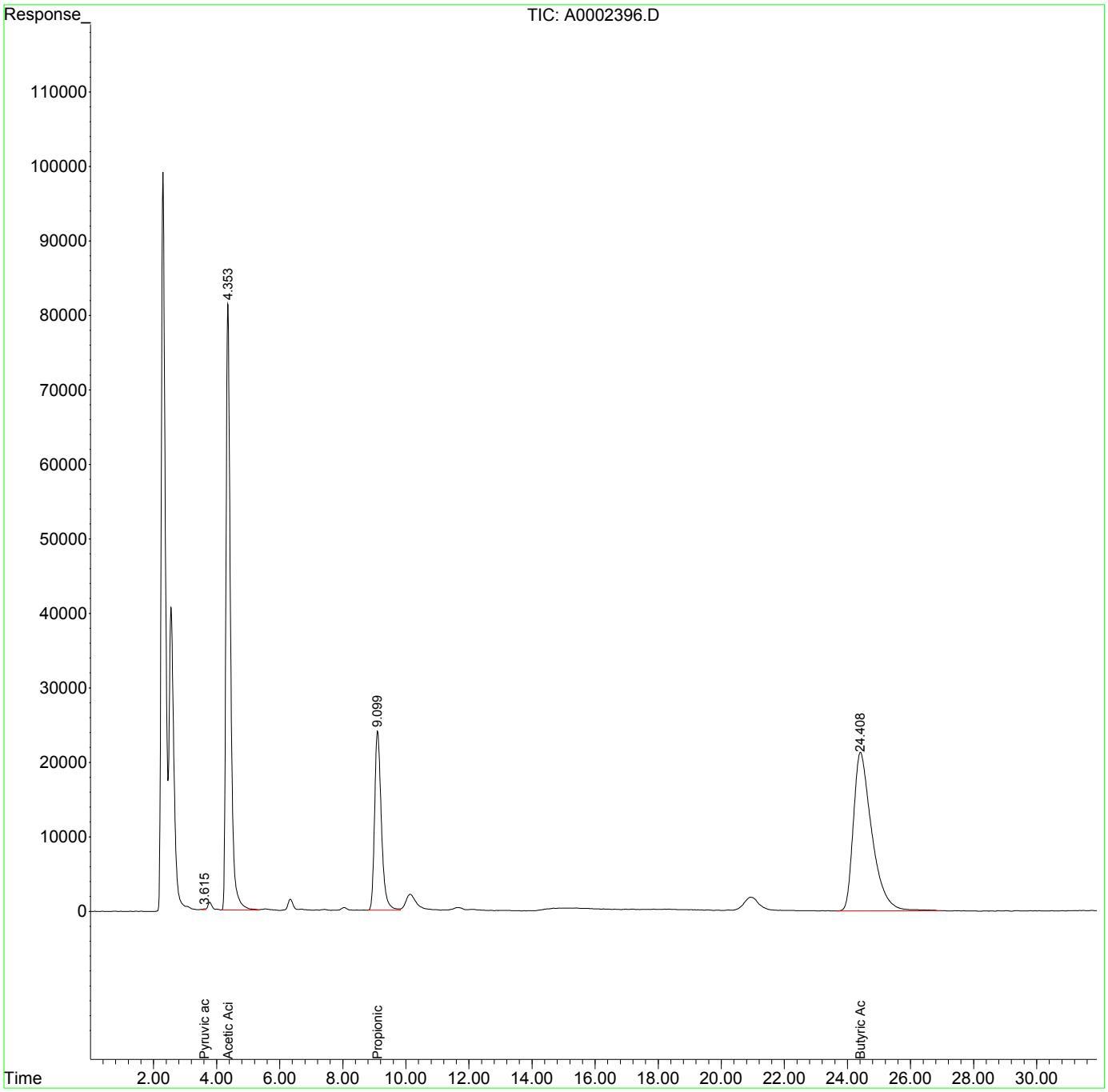
1st BA 10/08/18

2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002396.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 12:49:31
Operator : b.allgeier
Sample : r1809340-001|10
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002383.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 21:21:05
Operator : b.allgeier
Sample : r1809340-002
Misc :
ALS Vial : 17 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:09 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	d
3) T	Lactic Acid	0.000	0	N.D.	ppm	d
4) T	Acetic Acid	4.375	6435786	108.769	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	d
6) T	Butyric Acid	0.000	0	N.D.	ppm	d

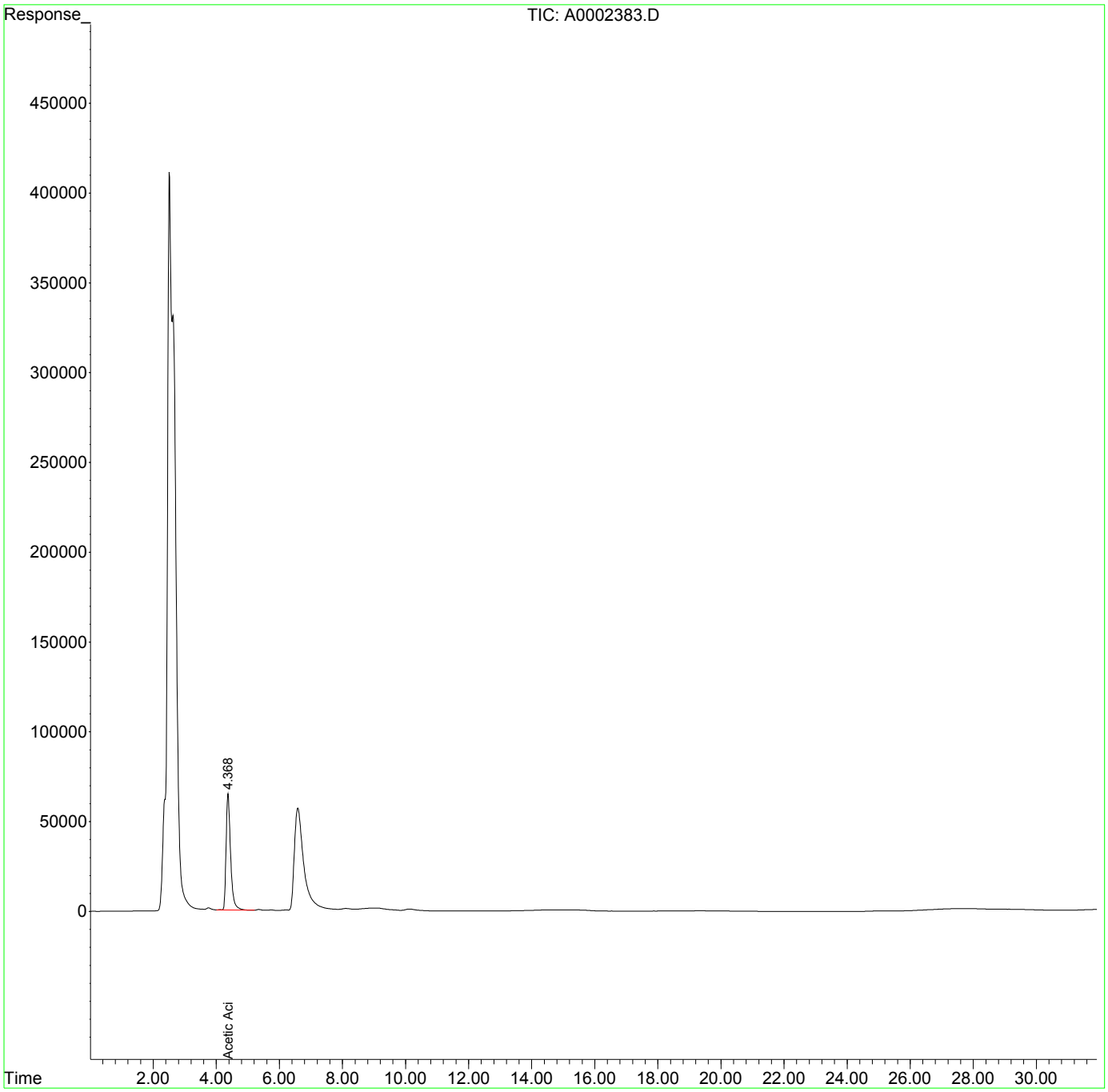
(f)=RT Delta > 1/2 Window (m)=manual int.

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002383.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 21:21:05
Operator : b.allgeier
Sample : r1809340-002
Misc :
ALS Vial : 17 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:09 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944028

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002384.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 16:48:23~~ 04-Oct-2018, 21:53:00
Operator : b.allgeier
Sample : r1809340-003
Misc :
ALS Vial : 18 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:11 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	d
3) T	Lactic Acid	0.000	0	N.D.	ppm	d
4) T	Acetic Acid	4.381	6103275	103.149	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

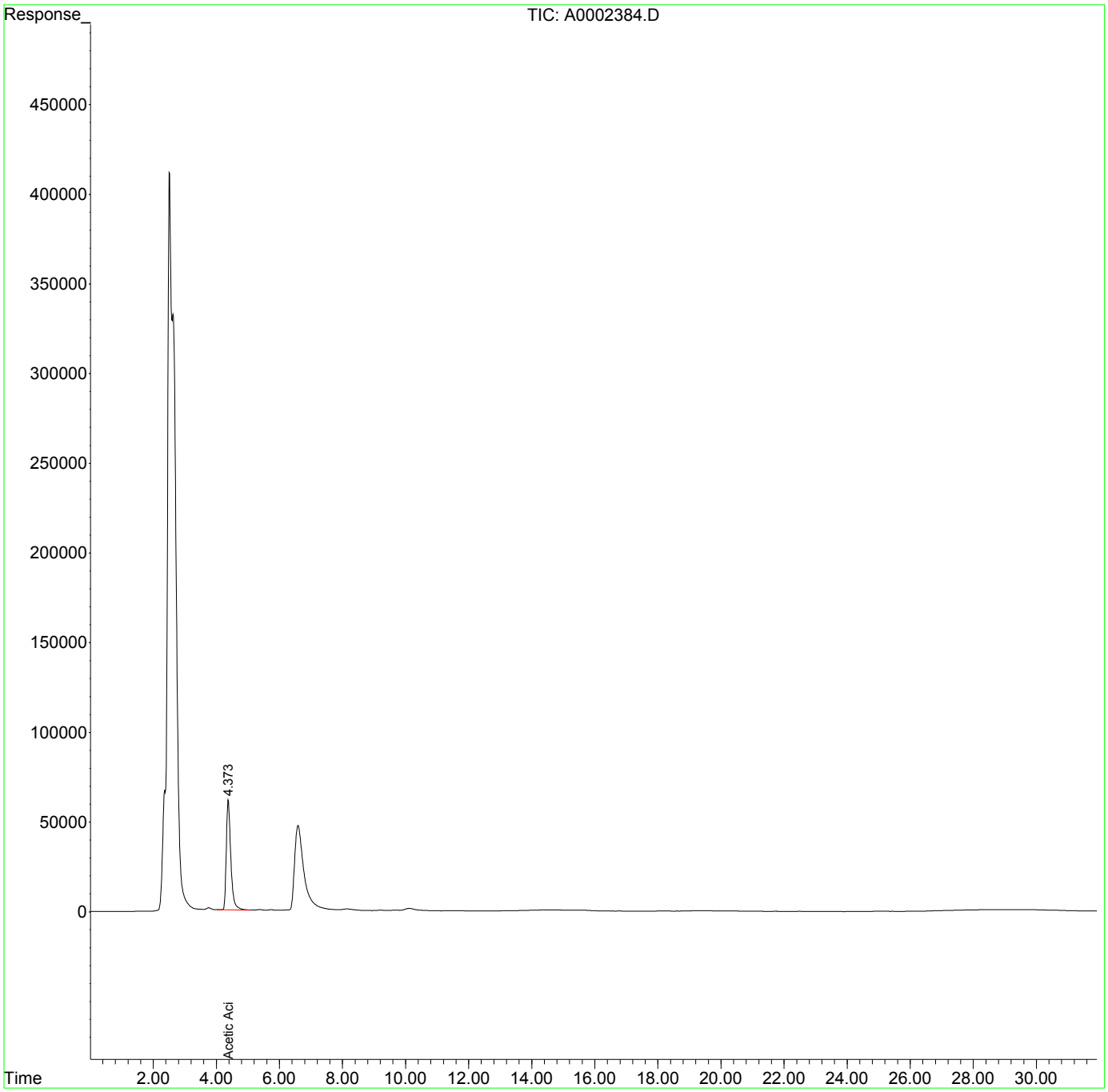
(f)=RT Delta > 1/2 Window (m)=manual int.

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002384.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:23
Operator : b.allgeier
Sample : r1809340-003
Misc :
ALS Vial : 18 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:11 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002385.D
Signal(s) : dad1A.ch
Acq On : ~~29-Dec-2000, 23:10:21~~ 04-Oct-2018, 22:25:00
Operator : b.allgeier
Sample : r1809340-004
Misc :
ALS Vial : 19 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	d
3) T	Lactic Acid	0.000	0	N.D.	ppm	d
4) T	Acetic Acid	4.370	8516321	143.931	ppm	
5) T	Propionic Acid	9.154	46233	0.776	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

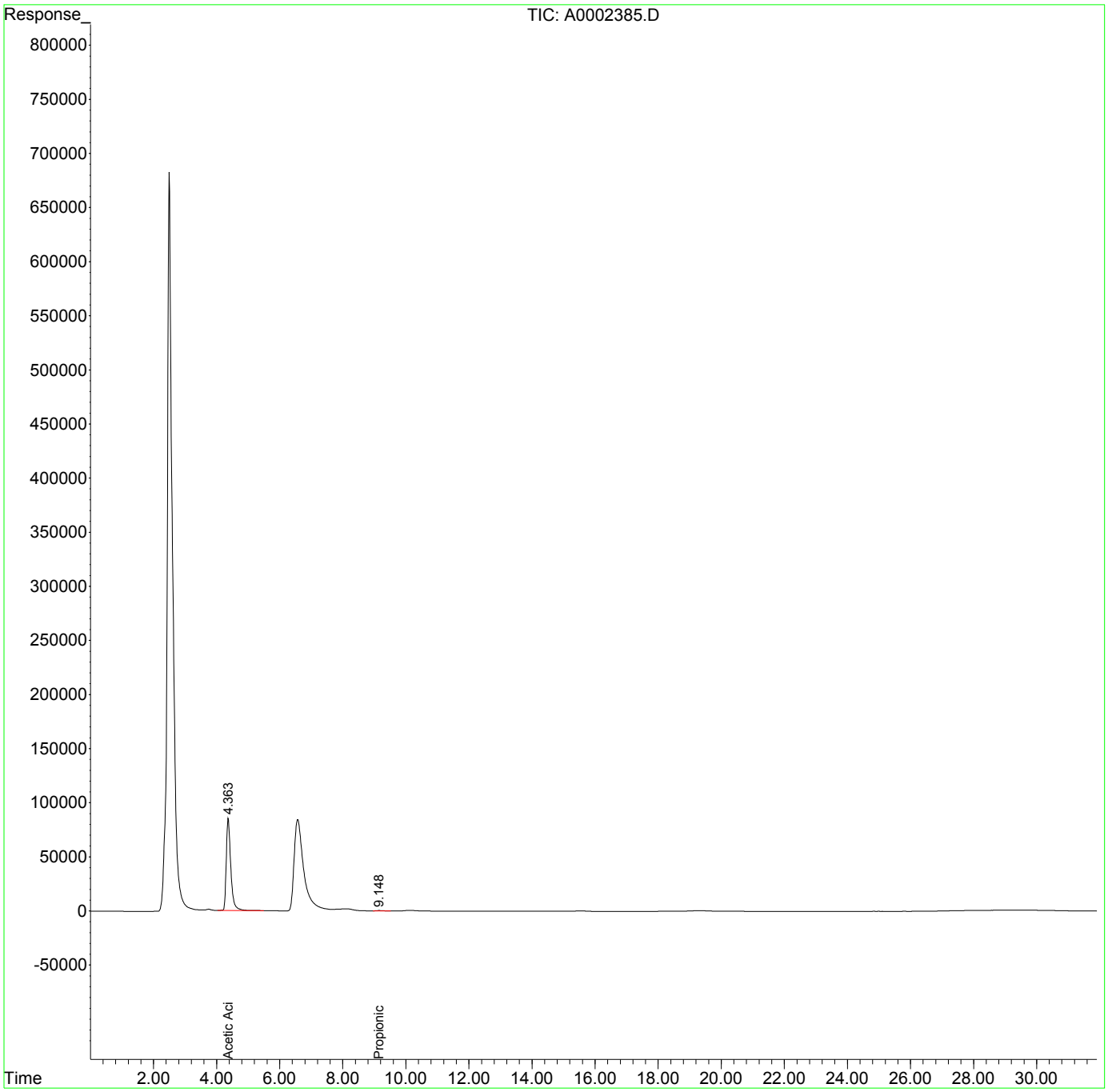
00944031

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002385.D
Signal(s) : dad1A.ch
Acq On : 29-Dec-2000, 23:10:21
Operator : b.allgeier
Sample : r1809340-004
Misc :
ALS Vial : 19 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944032

1st BA 10/05/18
2nd mcf 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002377.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:51:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

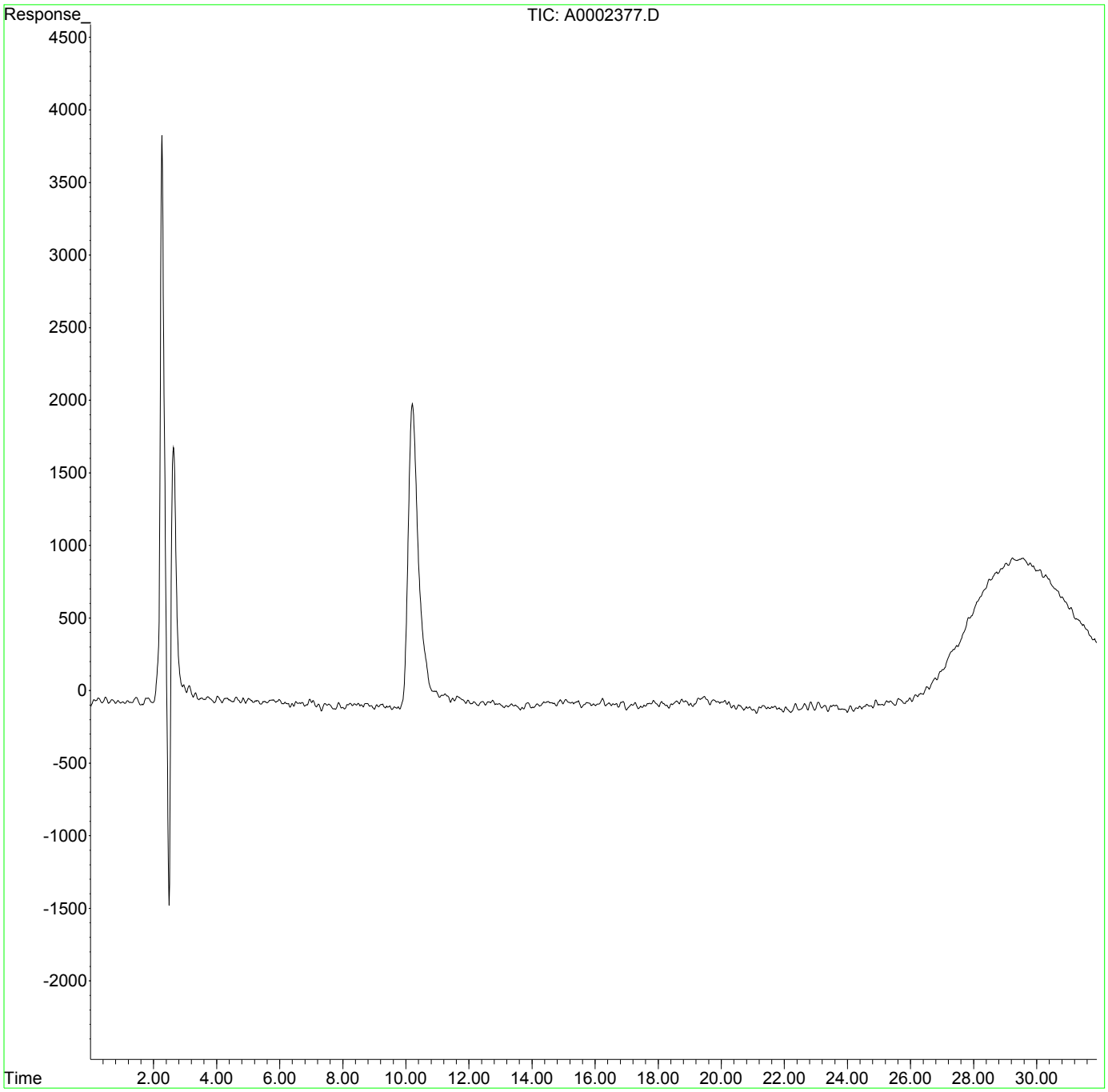
00944033

1st BA 10/05/18
2nd MLP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002377.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:51:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002393.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:04:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:11 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

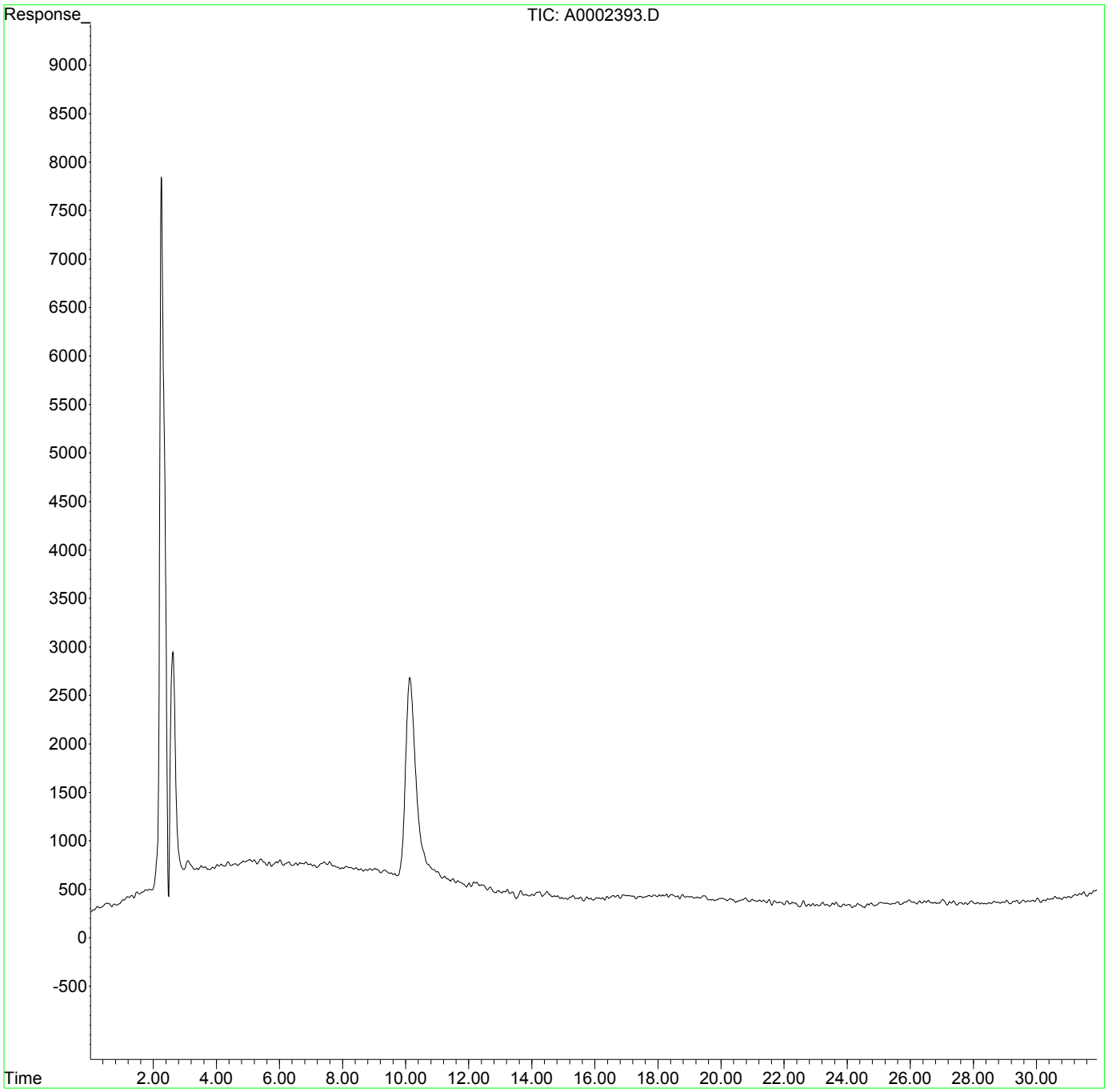
00944035

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002393.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:04:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:11 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



1st BA 10/05/18
2nd MCP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002378.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 18:26:33
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.133	1888113	19.598 ppm
2) T	Pyruvic acid	3.630	1345992	2.972 ppm
3) T	Lactic Acid	4.055	1088740	20.250 ppm
4) T	Acetic Acid	4.409	1224265	20.691 ppm
5) T	Propionic Acid	9.241	1120055	18.796 ppm
6) T	Butyric Acid	25.078	1146501	18.228 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

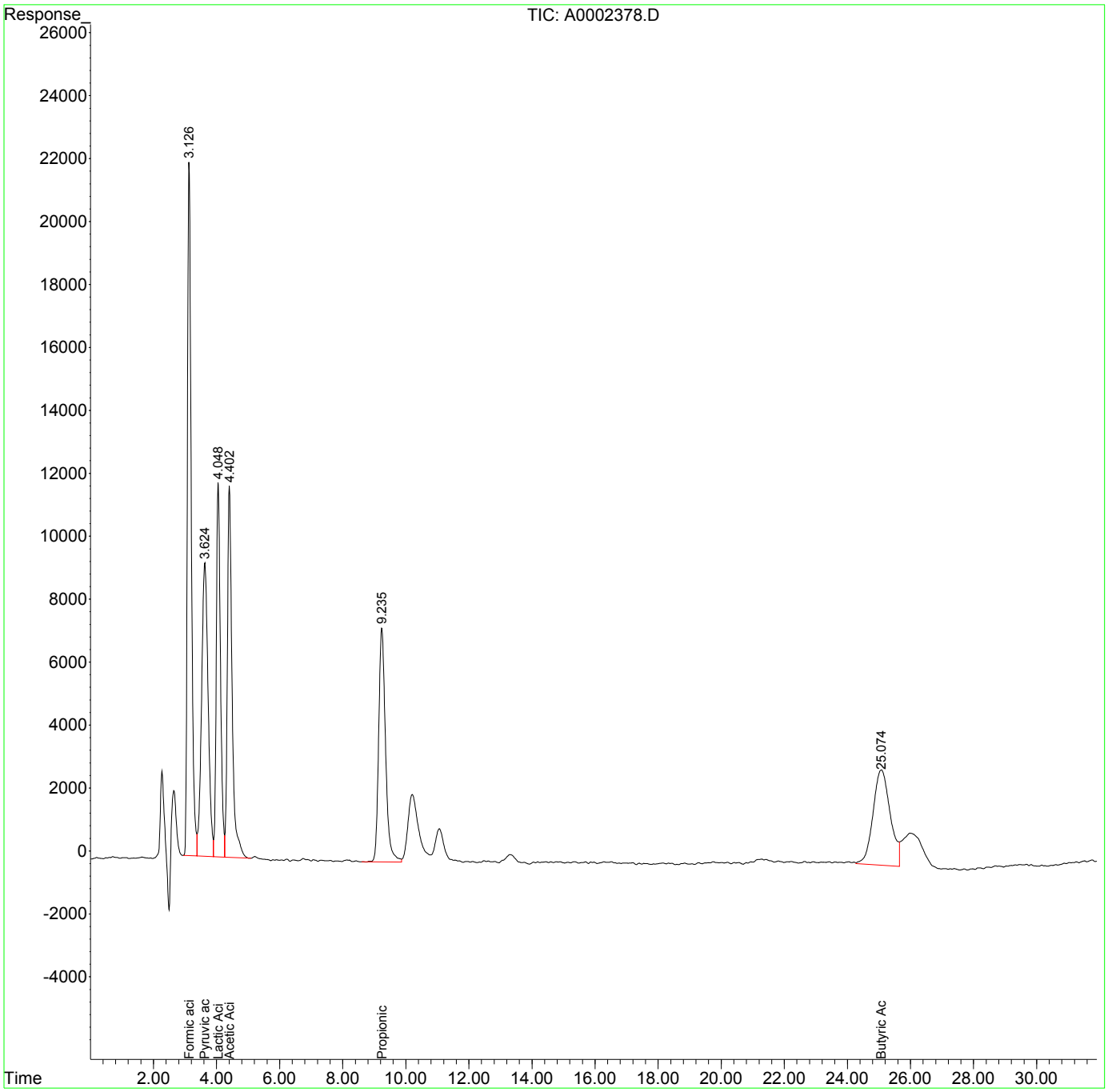
Quantitation Report (QT Reviewed)

1st BA 10/05/18
2nd MF 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002378.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 18:26:33
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



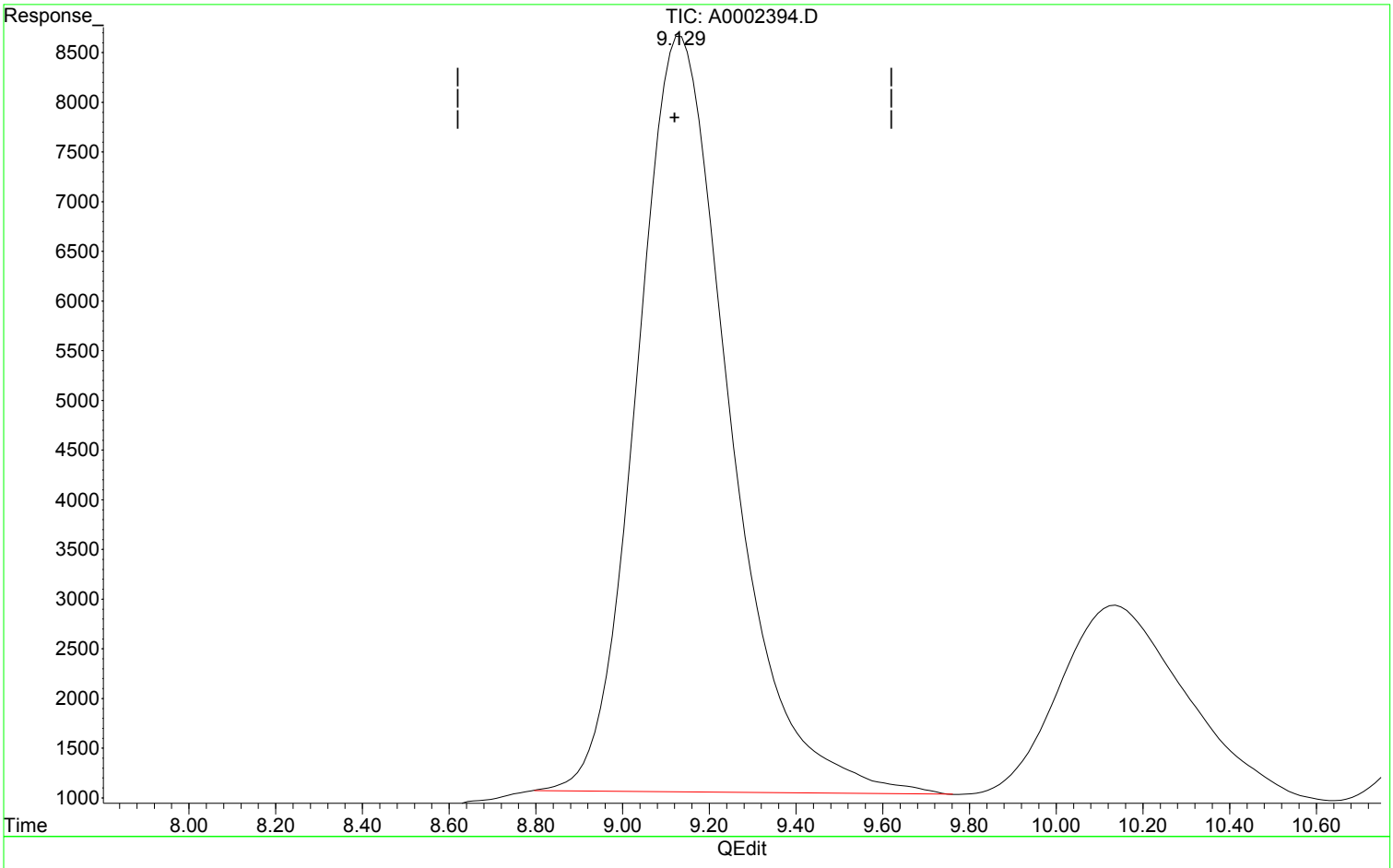
Quantitation Report (Qedit)

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002394.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:39:38
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.129min 19.053 ppm m

response 1135408

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002394.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:39:38
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.110	1910564	19.831	ppm	
2) T	Pyruvic acid	3.603	1352094	2.985	ppm	
3) T	Lactic Acid	4.020	1090336	20.280	ppm	
4) T	Acetic Acid	4.369	1227239	20.741	ppm	
5) T	Propionic Acid	9.129	1135408	19.053	ppm	m
6) T	Butyric Acid	24.710	1155592	18.373	ppm	

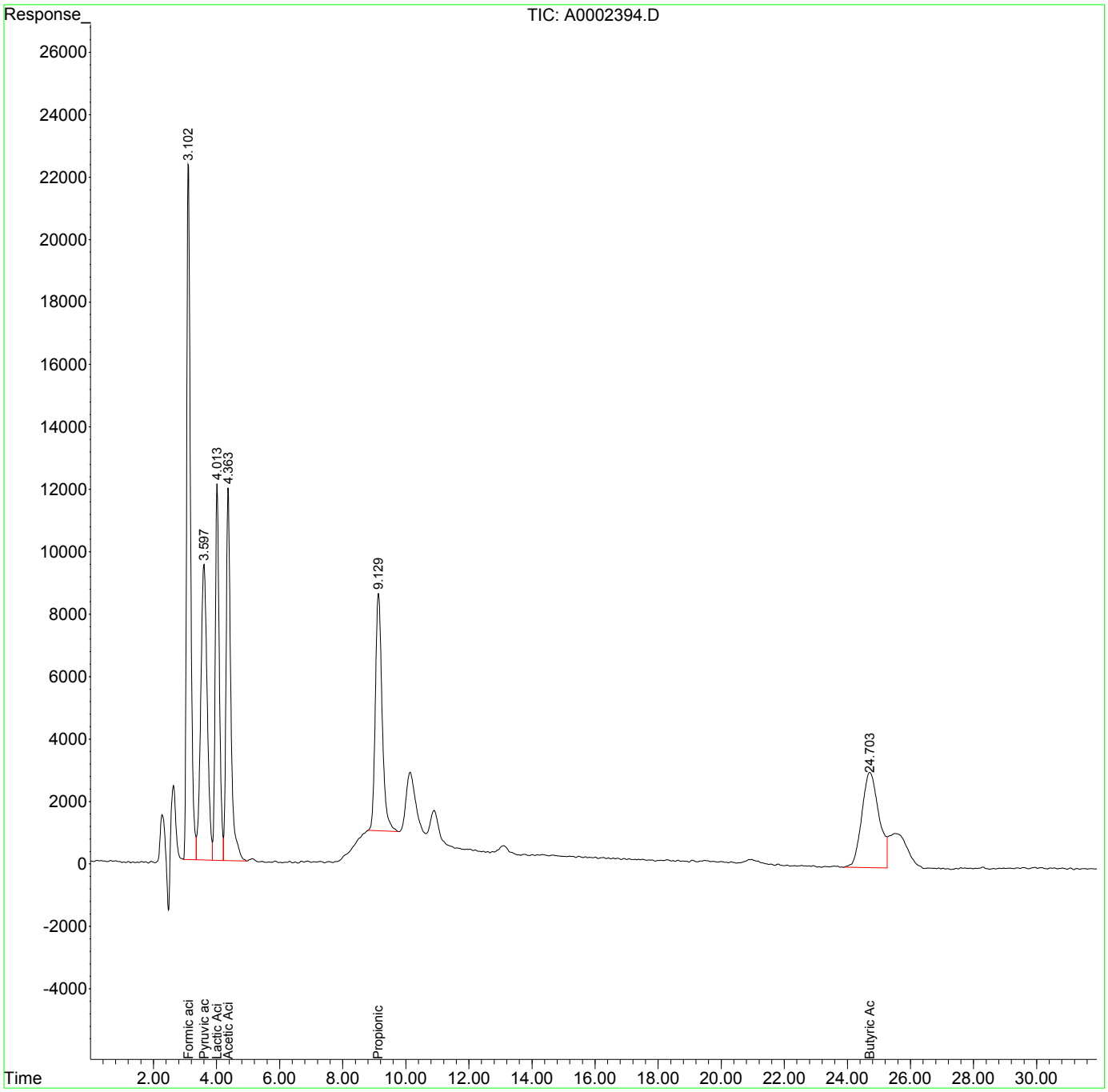
(f)=RT Delta > 1/2 Window (m)=manual int.

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002394.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:39:38
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



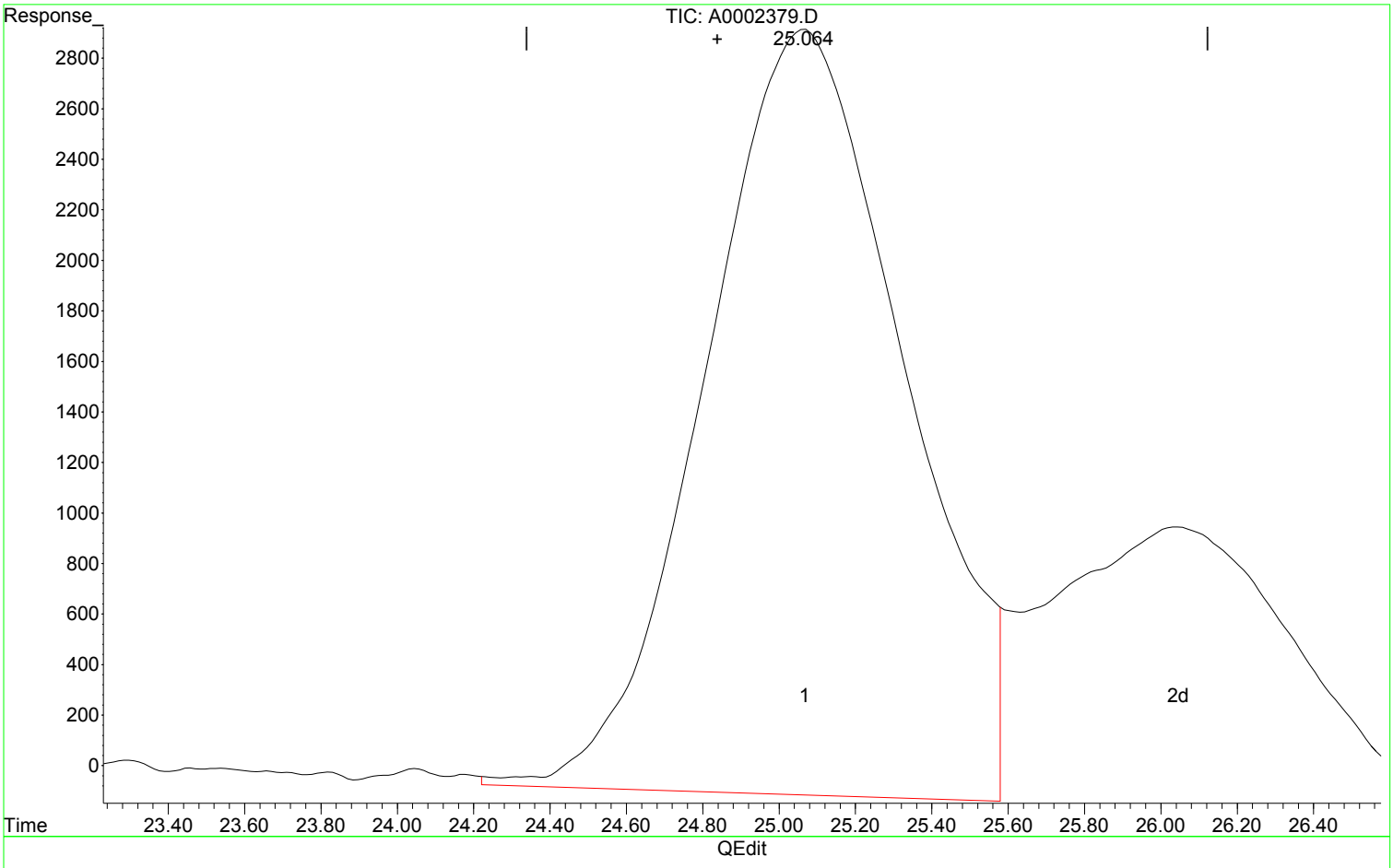
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002379.D
Signal(s) : dad1A.ch
Acq On : 29-Dec-2000, 23:47:53
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 13 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:01 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.064min 17.514 ppm m

response 1101604

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

1st BA 10/05/18
2nd MLP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002379.D
Signal(s) : dad1A.ch
Acq On : ~~29-Dec-2000, 23:47:53~~ 04-Oct-2018, 19:00:00
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 13 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:01 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	1909074	19.815	ppm	
2) T	Pyruvic acid	3.629	1357464	2.997	ppm	
3) T	Lactic Acid	4.056	1100466	20.468	ppm	
4) T	Acetic Acid	4.411	1236167	20.892	ppm	
5) T	Propionic Acid	9.244	1128333	18.934	ppm	
6) T	Butyric Acid	25.064	1101604	17.514	ppm	m

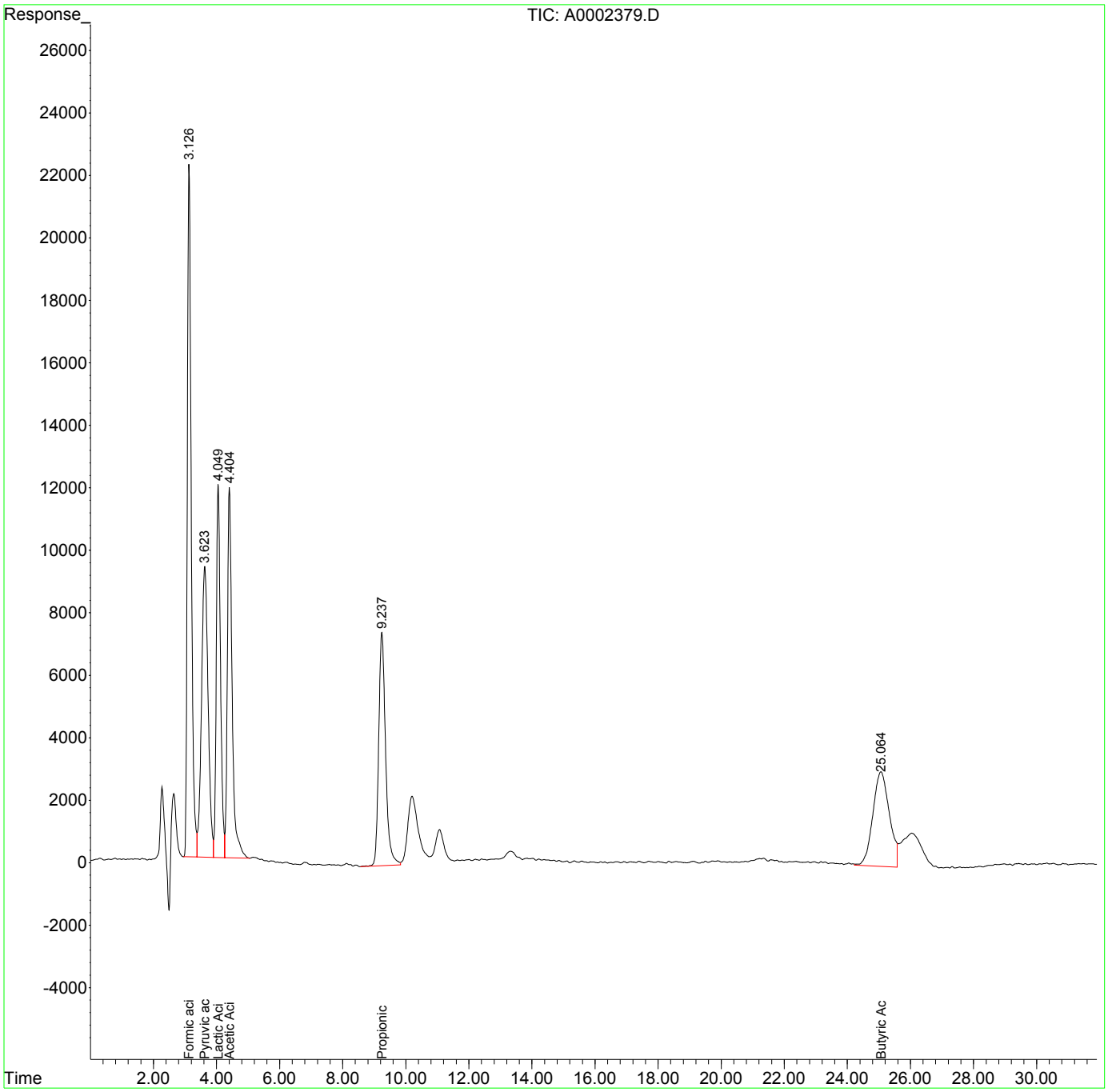
(f)=RT Delta > 1/2 Window (m)=manual int.

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002379.D
Signal(s) : dad1A.ch
Acq On : 29-Dec-2000, 23:47:53
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 13 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:01 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002395.D
Signal(s) : dad1A.ch
Acq On : ~~29-Dec-2000, 23:18:07~~ 05-Oct-2018, 12:02:00
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:30:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.109	1891515	19.633 ppm
2) T	Pyruvic acid	3.602	1344844	2.969 ppm
3) T	Lactic Acid	4.019	1087299	20.223 ppm
4) T	Acetic Acid	4.368	1231094	20.806 ppm
5) T	Propionic Acid	9.130	1108903	18.608 ppm
6) T	Butyric Acid	24.712	1120597	17.816 ppm

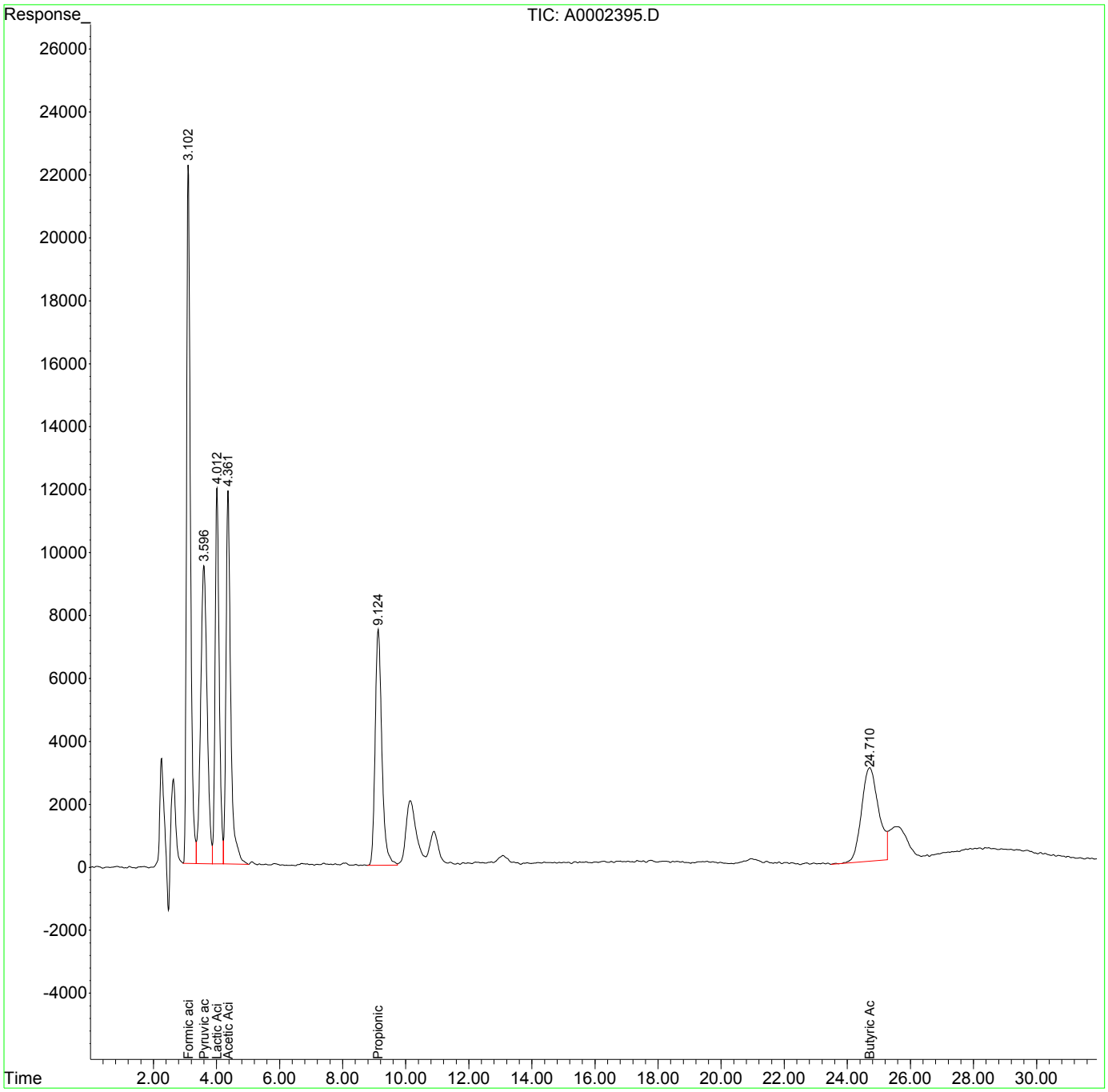
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002395.D
Signal(s) : dad1A.ch
Acq On : 29-Dec-2000, 23:18:07
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:30:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002397.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 13:24:22
Operator : b.allgeier
Sample : r1809340-001|10m
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:19 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	3.106	1807872	18.765	ppm
2) T	Pyruvic acid	3.598	1280859	2.828	ppm
3) T	Lactic Acid	4.015	1013087	18.843	ppm
4) T	Acetic Acid	4.360	9225886	155.923	ppm
5) T	Propionic Acid	9.100	4676222	78.471	ppm
6) T	Butyric Acid	24.411	10203381	162.223	ppm

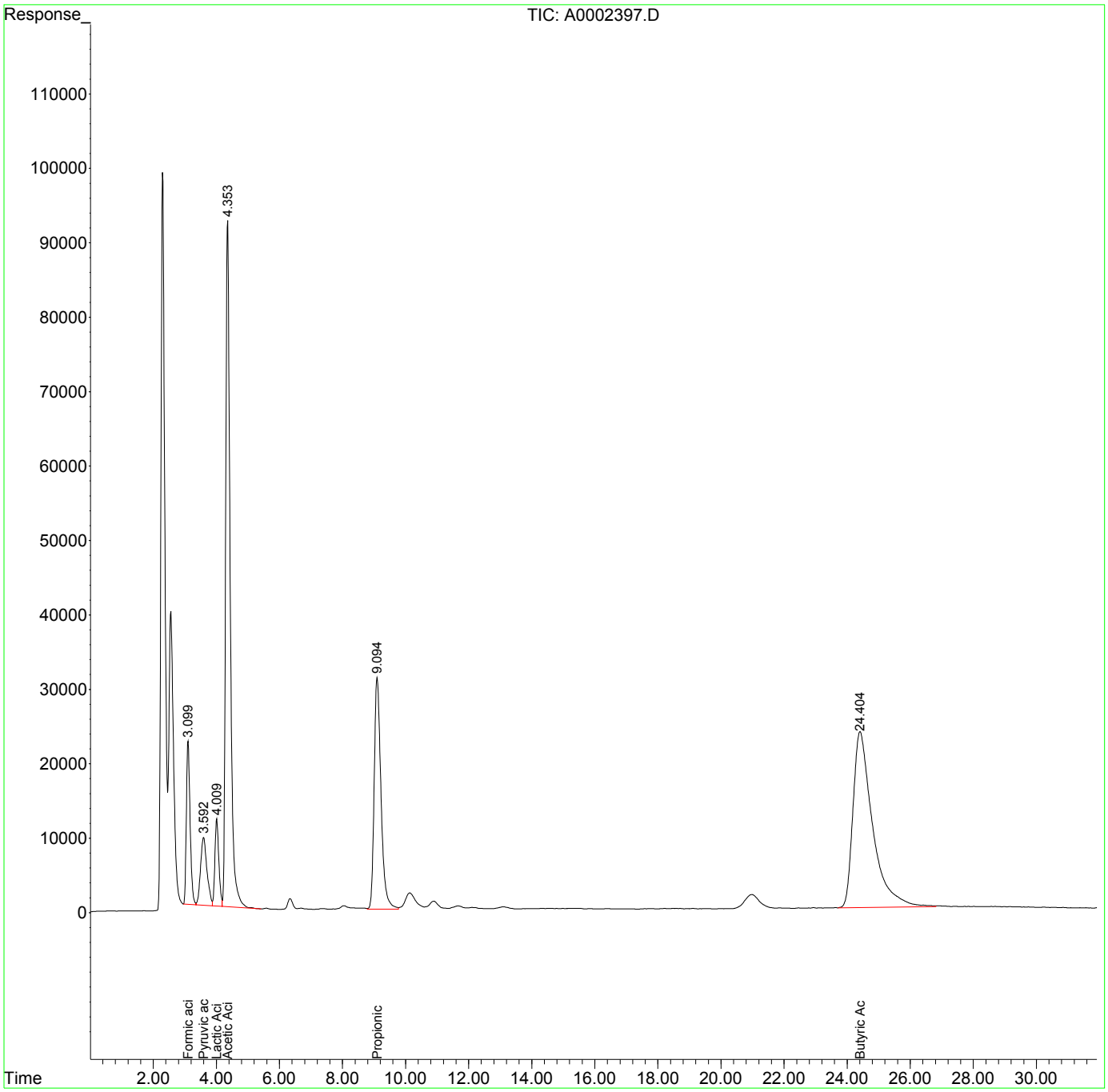
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002397.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 13:24:22
Operator : b.allgeier
Sample : r1809340-001|10m
Misc :
ALS Vial : 6 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:30:19 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002398.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 13:59:20
Operator : b.allgeier
Sample : r1809340-001|10m
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:30:21 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	3.107	1812062	18.808	ppm
2) T	Pyruvic acid	3.598	1285997	2.839	ppm
3) T	Lactic Acid	4.015	1016966	18.915	ppm
4) T	Acetic Acid	4.359	9204673	155.565	ppm
5) T	Propionic Acid	9.096	4656949	78.148	ppm
6) T	Butyric Acid	24.373	10181328	161.872	ppm

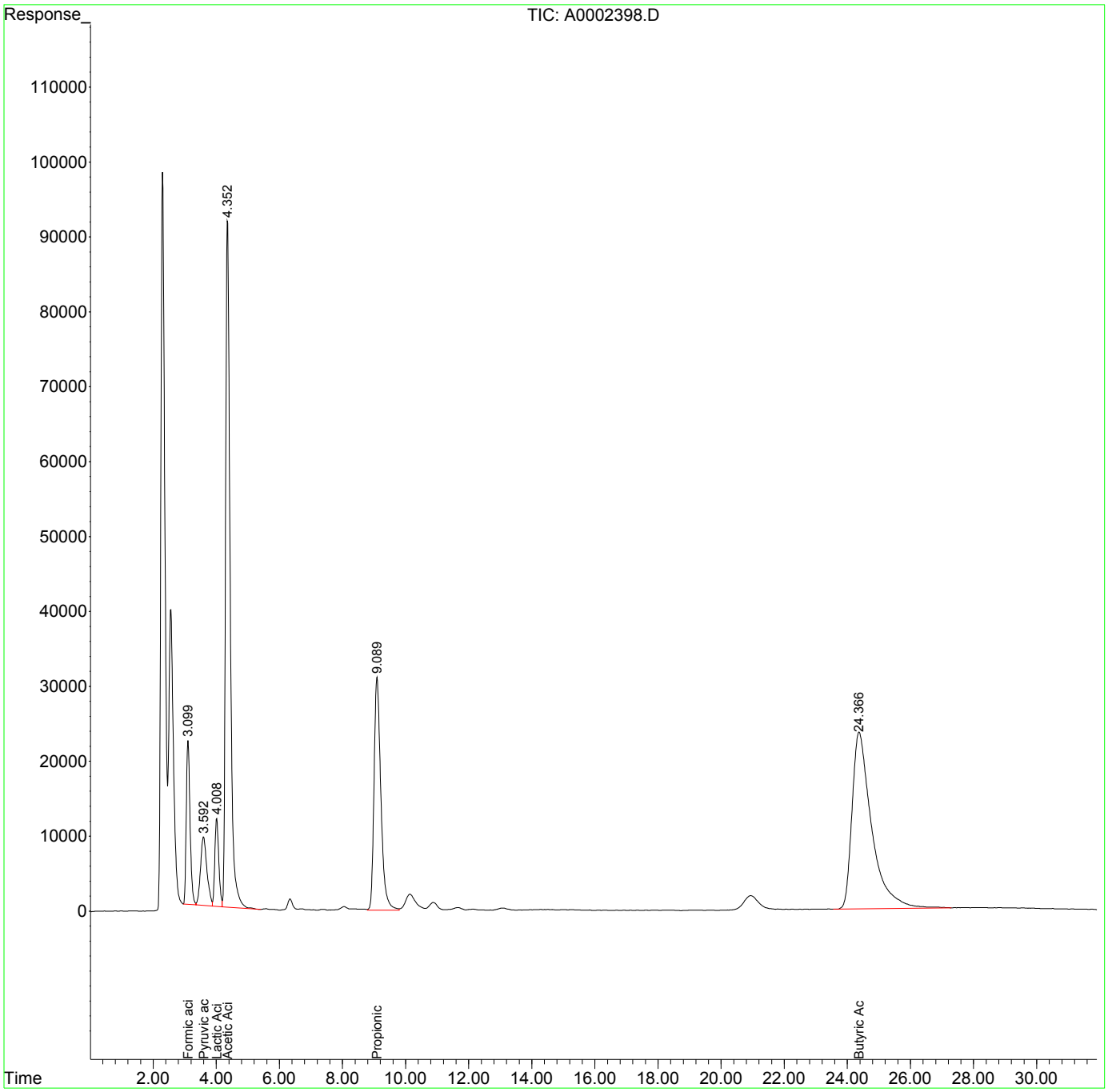
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002398.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 13:59:20
Operator : b.allgeier
Sample : r1809340-001|10m
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:30:21 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



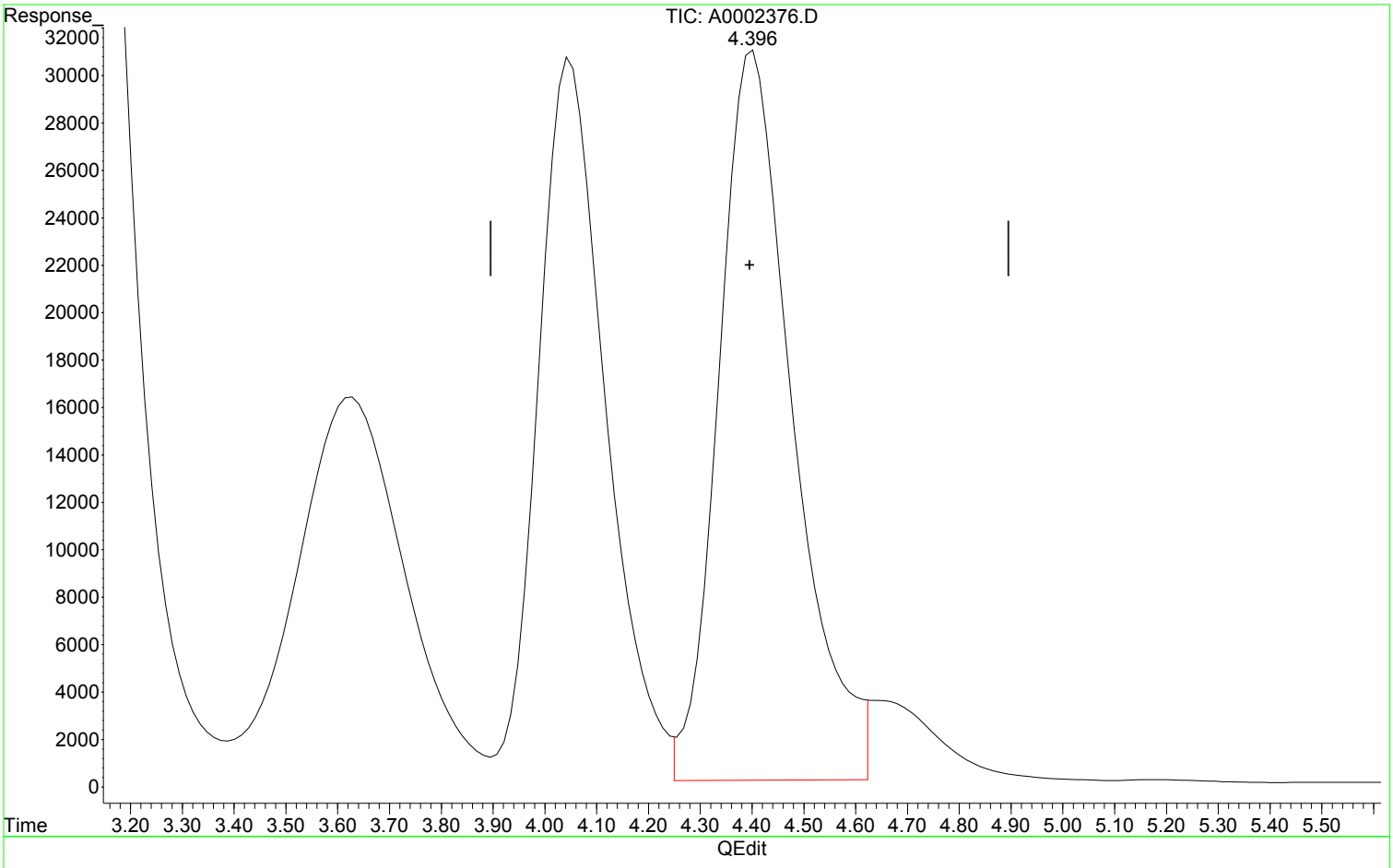
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.396min 51.650 ppm m

response 3056109

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

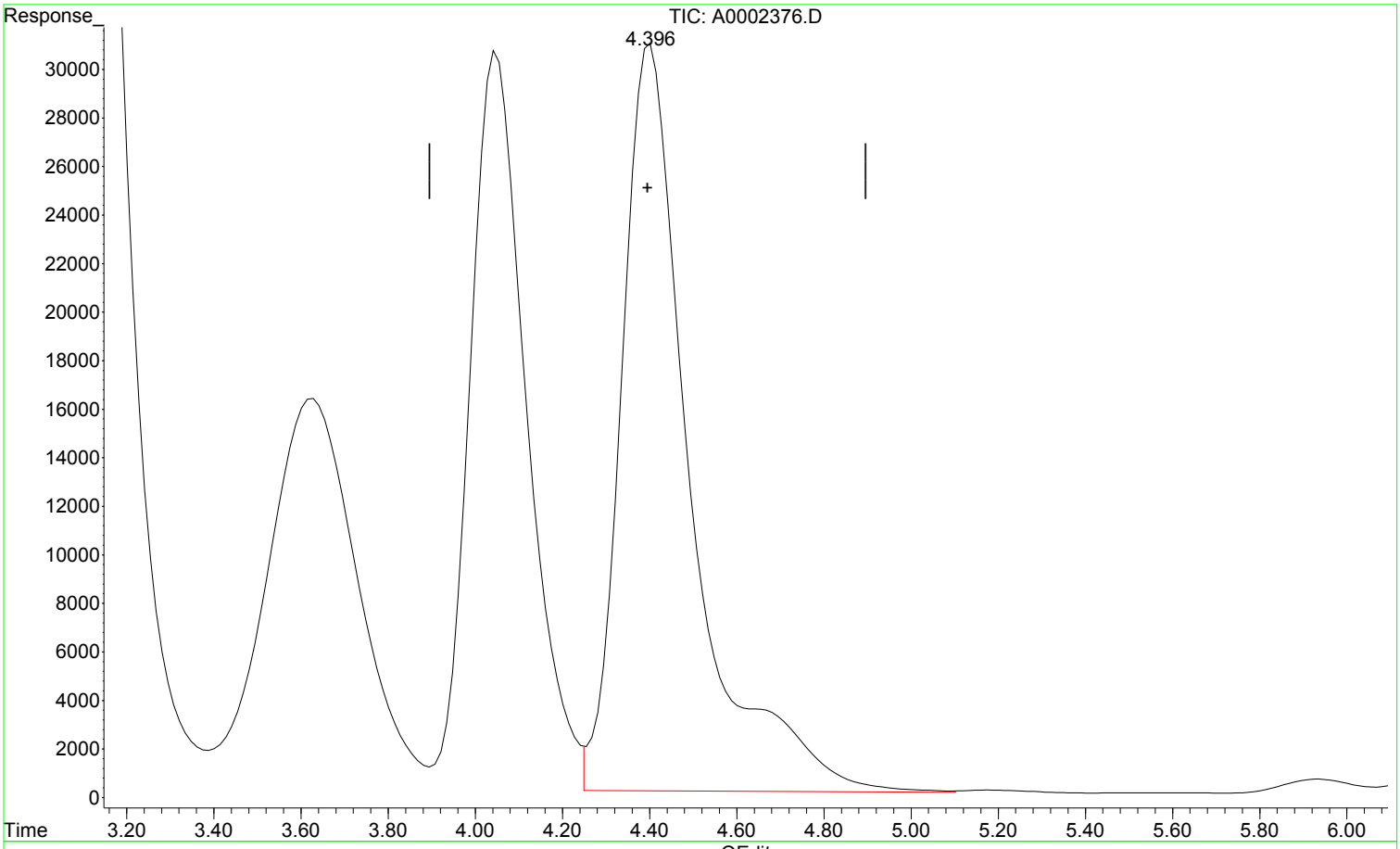
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.404min 57.452 ppm

response 3399396

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

Evaluate Continuing Calibration Report

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.119 E3	-0.8	101	0.00
2 T	Pyruvic acid	452.935	463.290 E3	-2.3	101	0.00
3 T	Lactic Acid	53.765	55.006 E3	-2.3	101	0.00
4 T	Acetic Acid	59.169	61.122 E3	-3.3	101	0.00
5 T	Propionic Acid	59.592	58.787 E3	1.4	100	0.02
6 T	Butyric Acid	62.897	57.717 E3	8.2	98	0.10

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.131	4855945	50.403	ppm	
2) T	Pyruvic acid	3.628	2316452	5.114	ppm	
3) T	Lactic Acid	4.051	2750282	51.154	ppm	
4) T	Acetic Acid	4.396	3056109	51.650	ppm	m
5) T	Propionic Acid	9.209	2939344	49.325	ppm	
6) T	Butyric Acid	24.941	2885862	45.882	ppm	

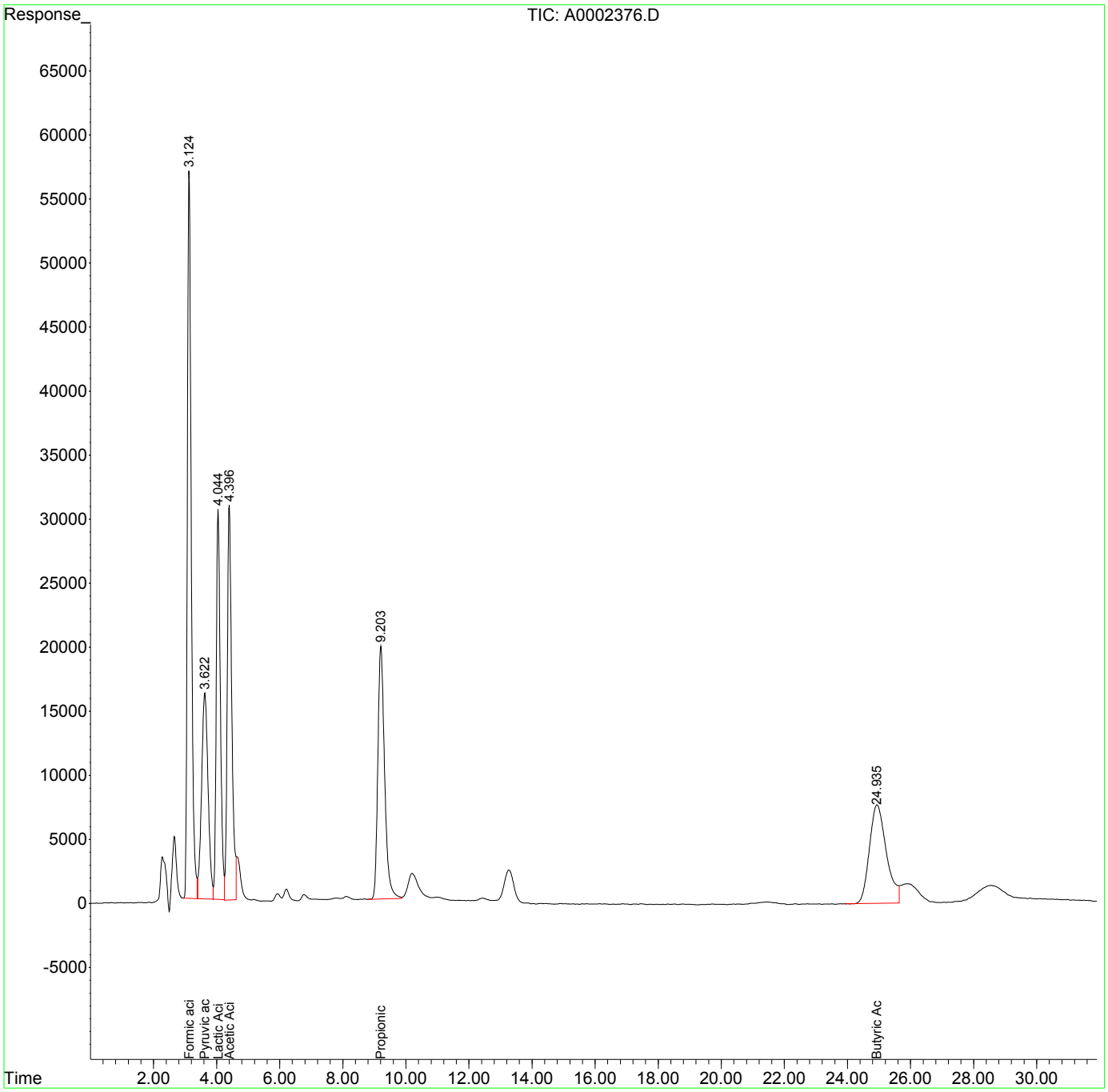
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



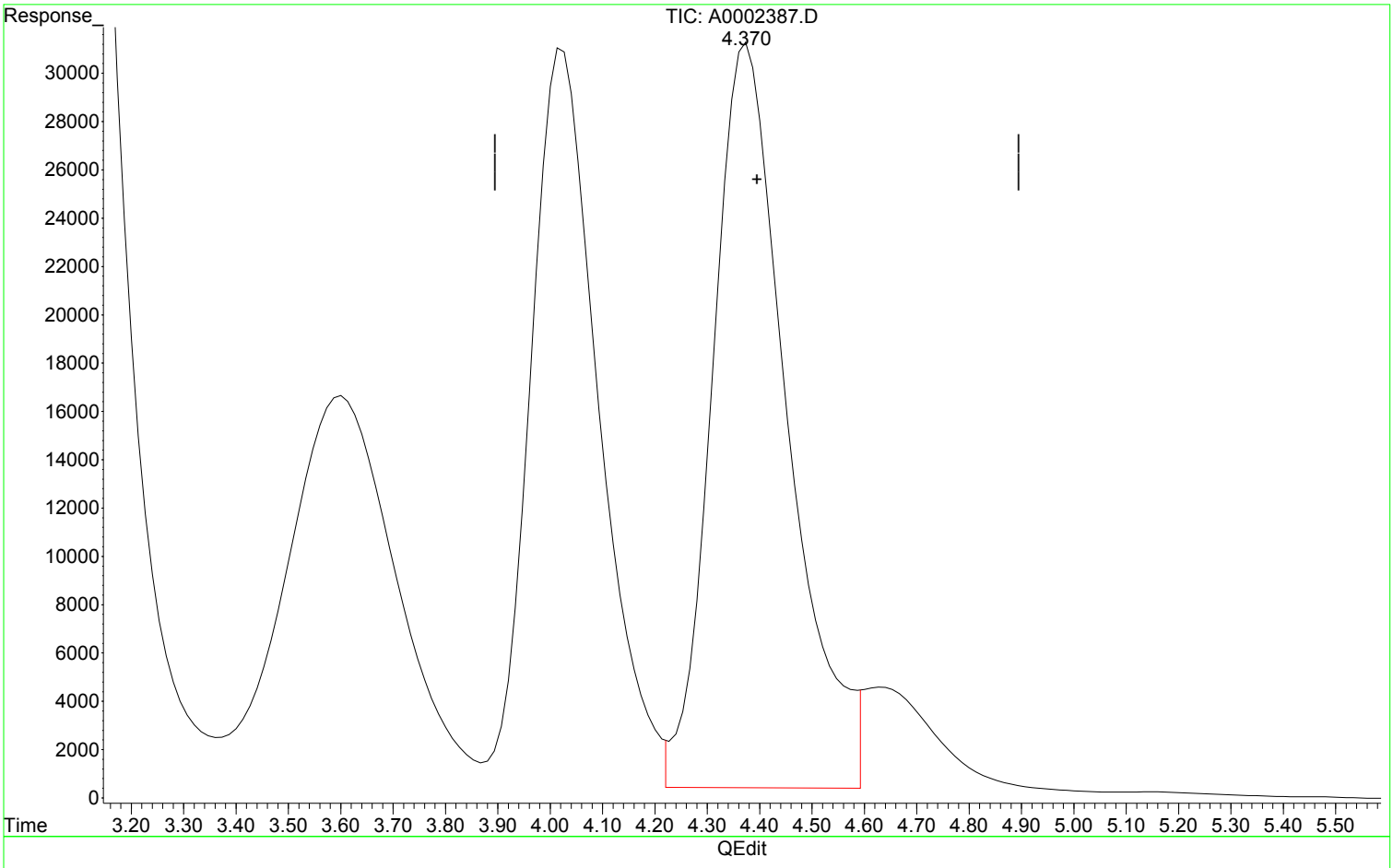
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.370min 52.246 ppm m

response 3091378

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

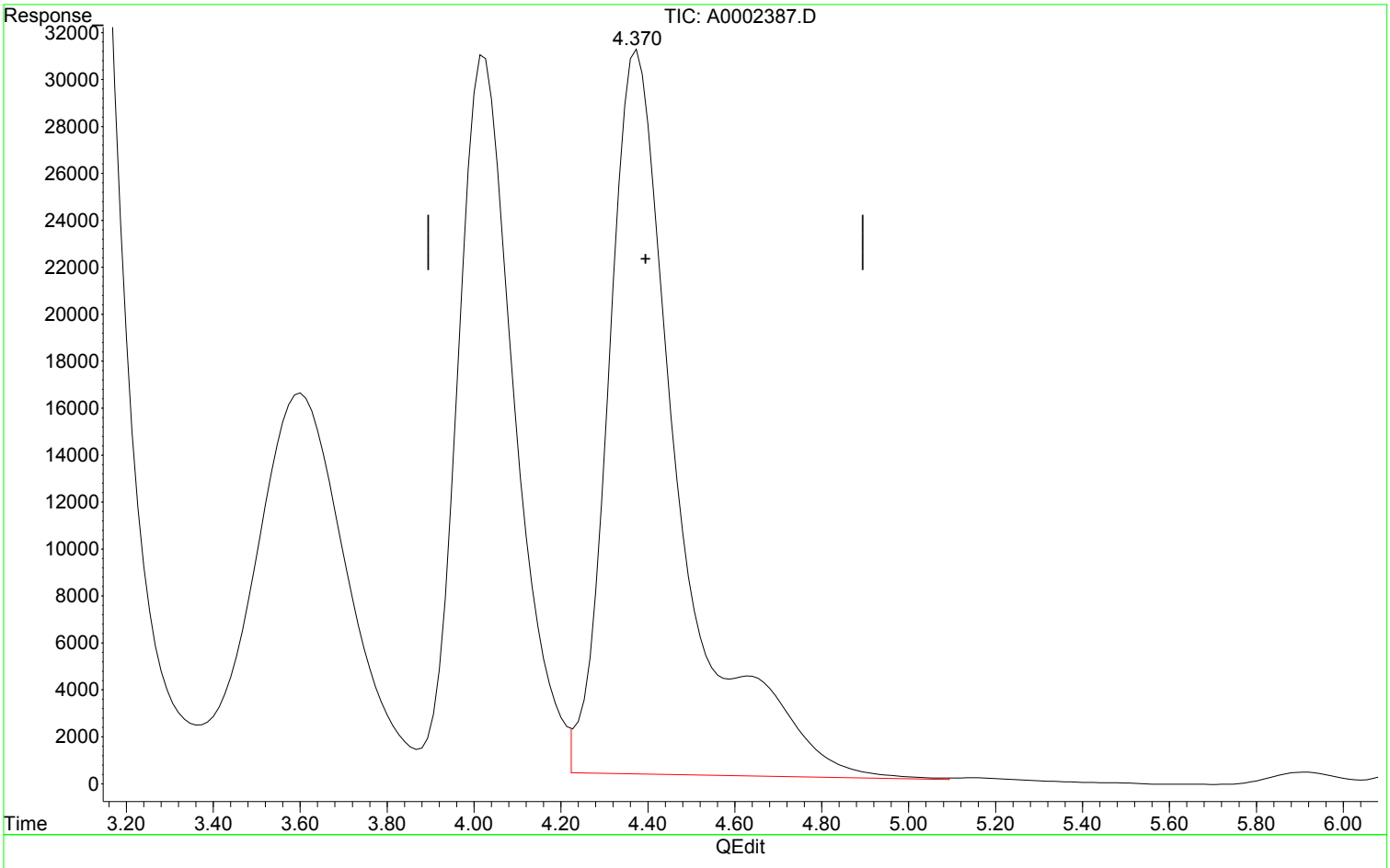
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.378min 59.424 ppm

response 3516056

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

Evaluate Continuing Calibration Report

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.897 E3	-0.6	101	-0.02
2 T	Pyruvic acid	452.935	460.392 E3	-1.6	100	-0.03
3 T	Lactic Acid	53.765	55.156 E3	-2.6	102	-0.02
4 T	Acetic Acid	59.169	61.828 E3	-4.5	102	-0.03
5 T	Propionic Acid	59.592	58.777 E3	1.4	100	-0.03
6 T	Butyric Acid	62.897	58.758 E3	6.6	100	-0.03

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Compound	R.T.	Response	Conc	Units	
Target Compounds					
1) t Formic acid	3.111	4844848	50.287	ppm	
2) T Pyruvic acid	3.603	2301960	5.082	ppm	
3) T Lactic Acid	4.026	2757824	51.294	ppm	
4) T Acetic Acid	4.370	3091378	52.246	ppm	m
5) T Propionic Acid	9.162	2938838	49.316	ppm	
6) T Butyric Acid	24.810	2937908	46.710	ppm	

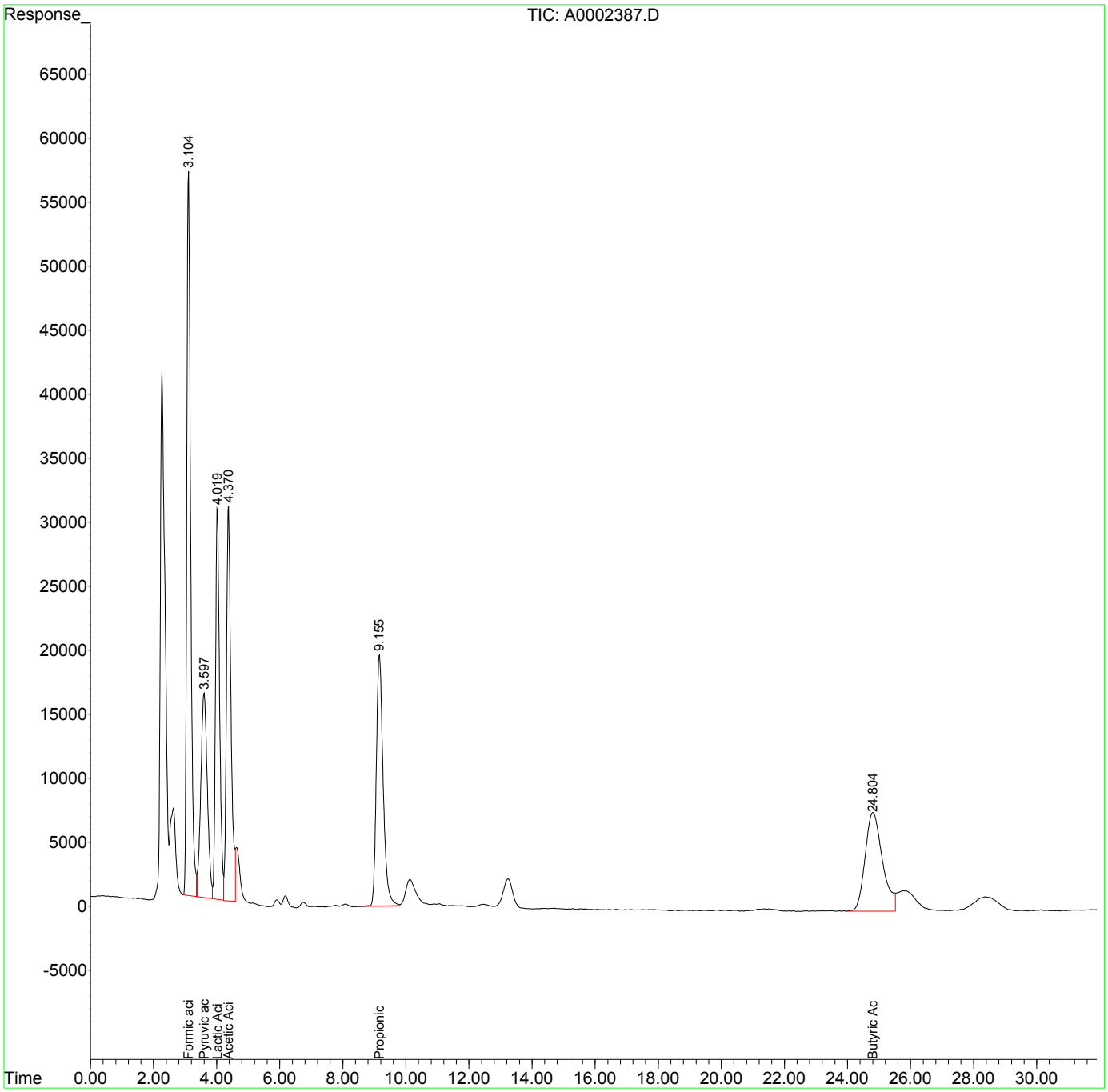
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



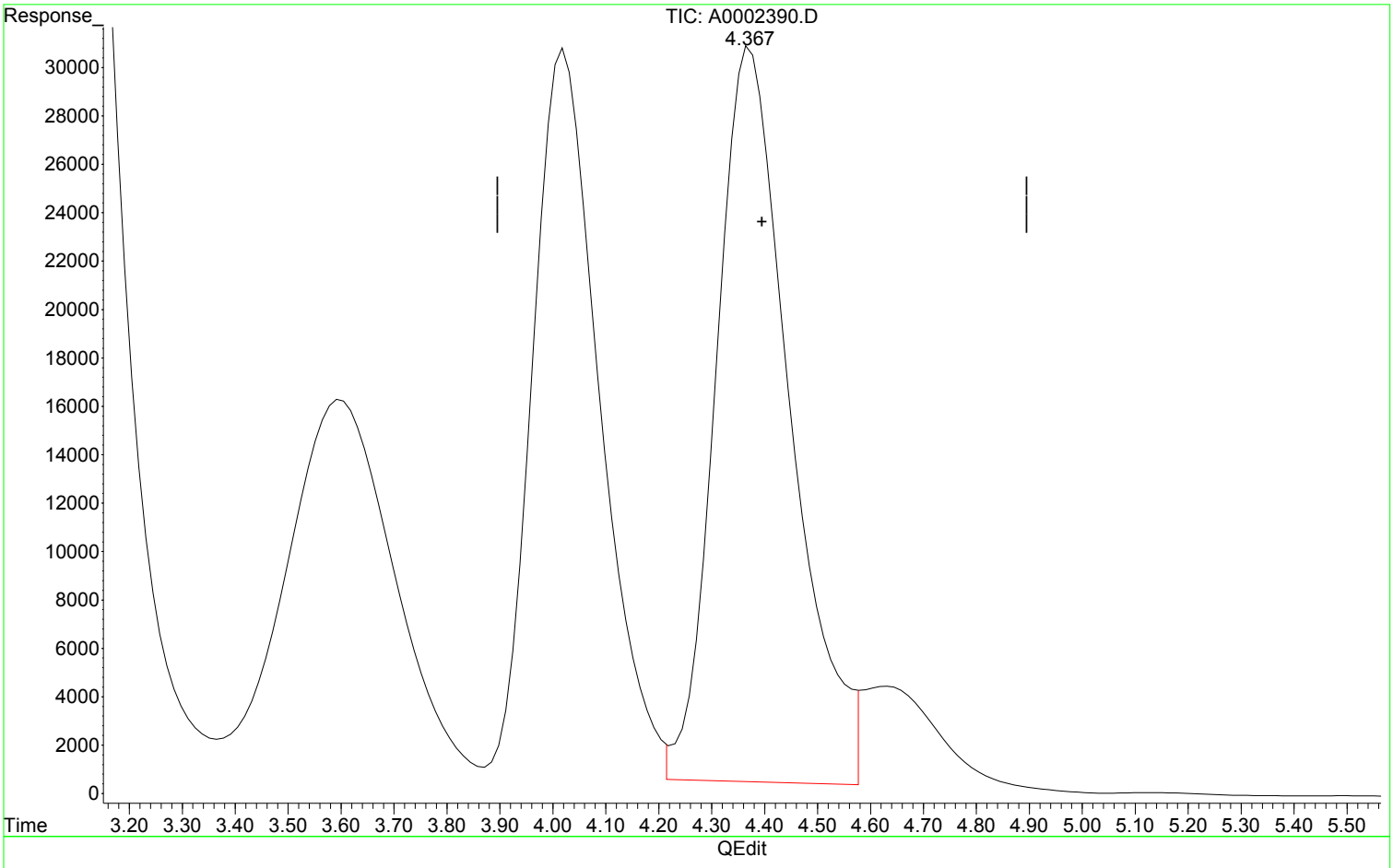
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.367min 49.784 ppm m

response 2945690

Manual Integration:

After

Poor integration.

10/05/18

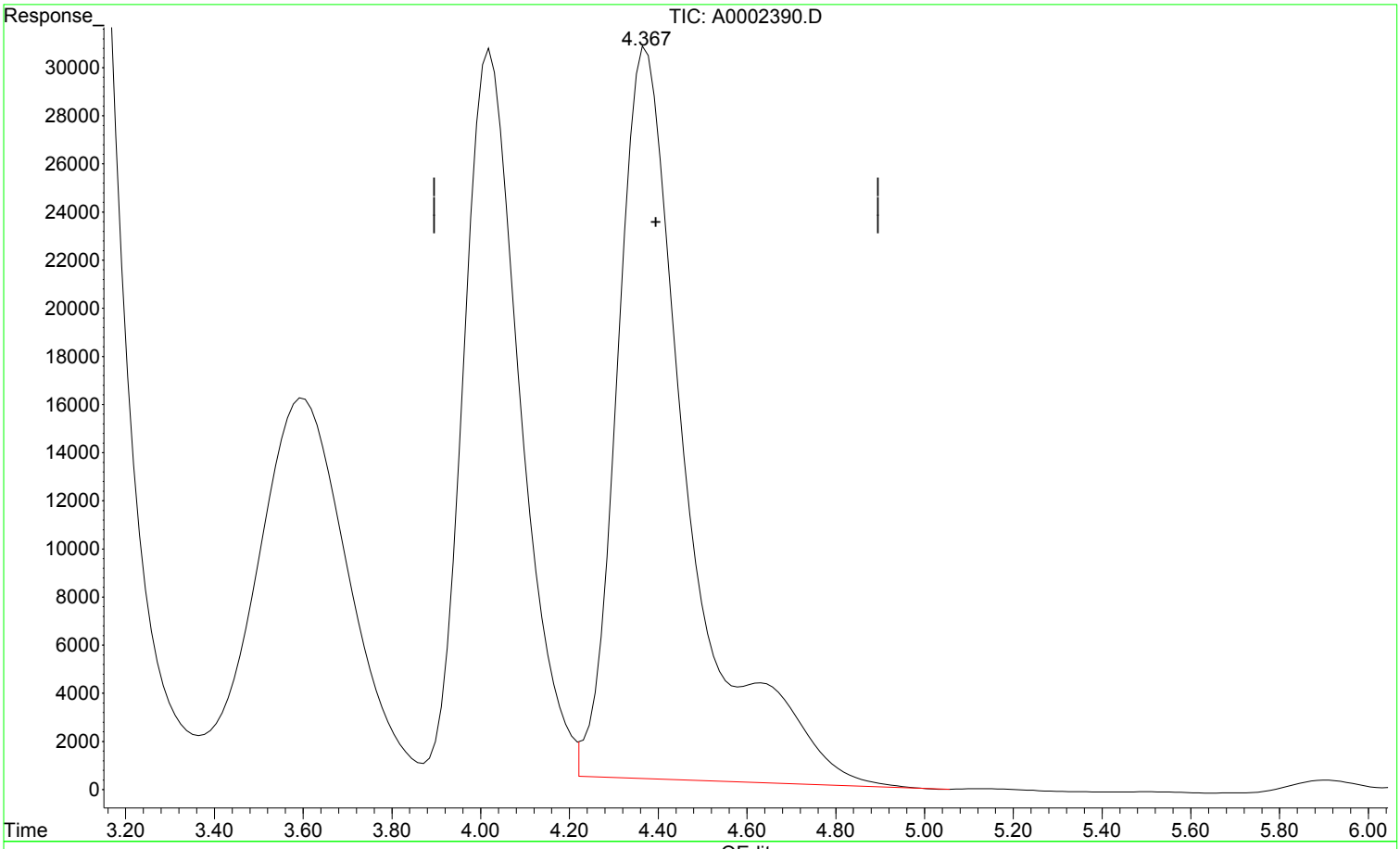
(+) = Expected Retention Time

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.375min 57.500 ppm

response 3402228

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

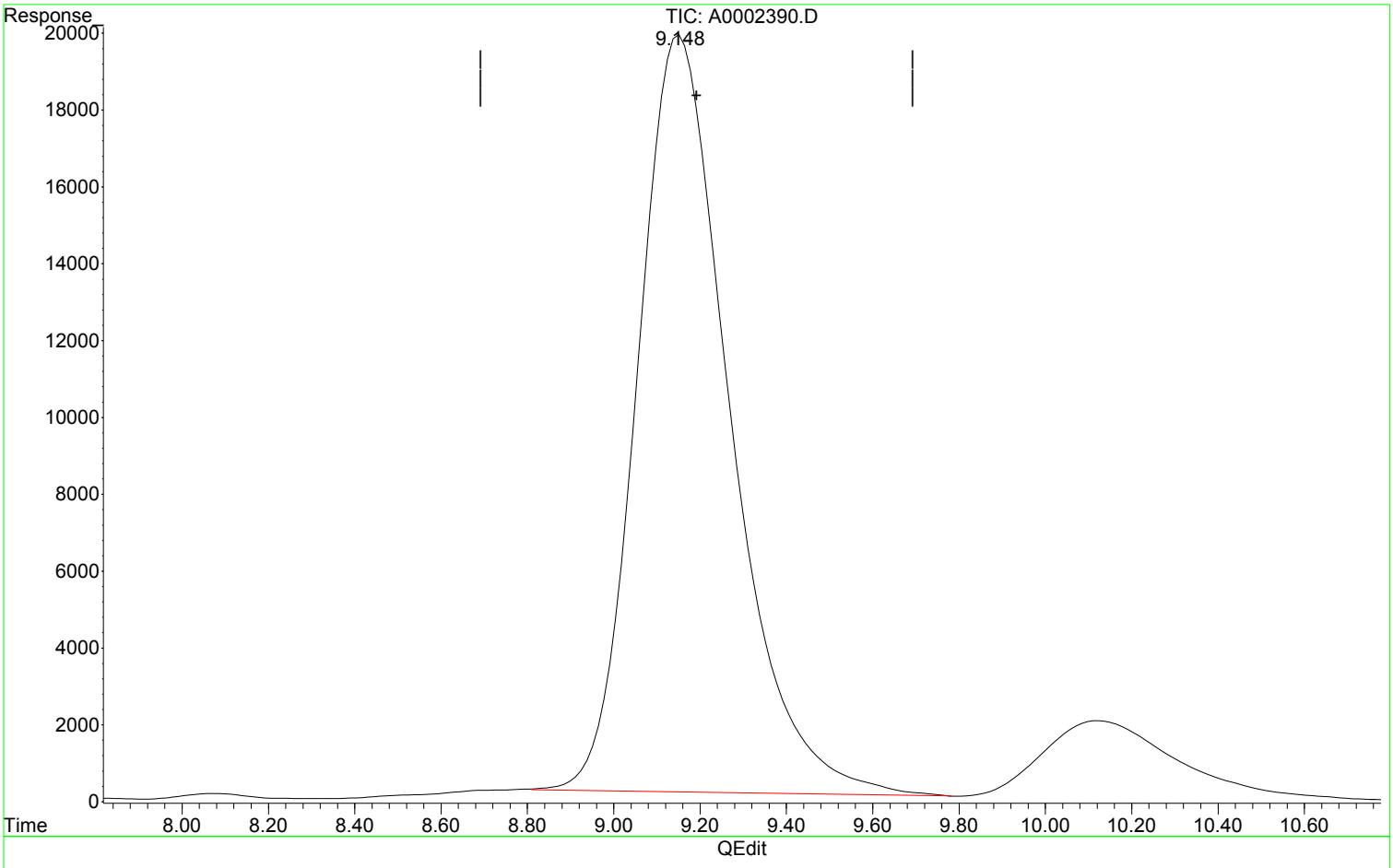
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.148min 49.189 ppm m

response 2931268

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

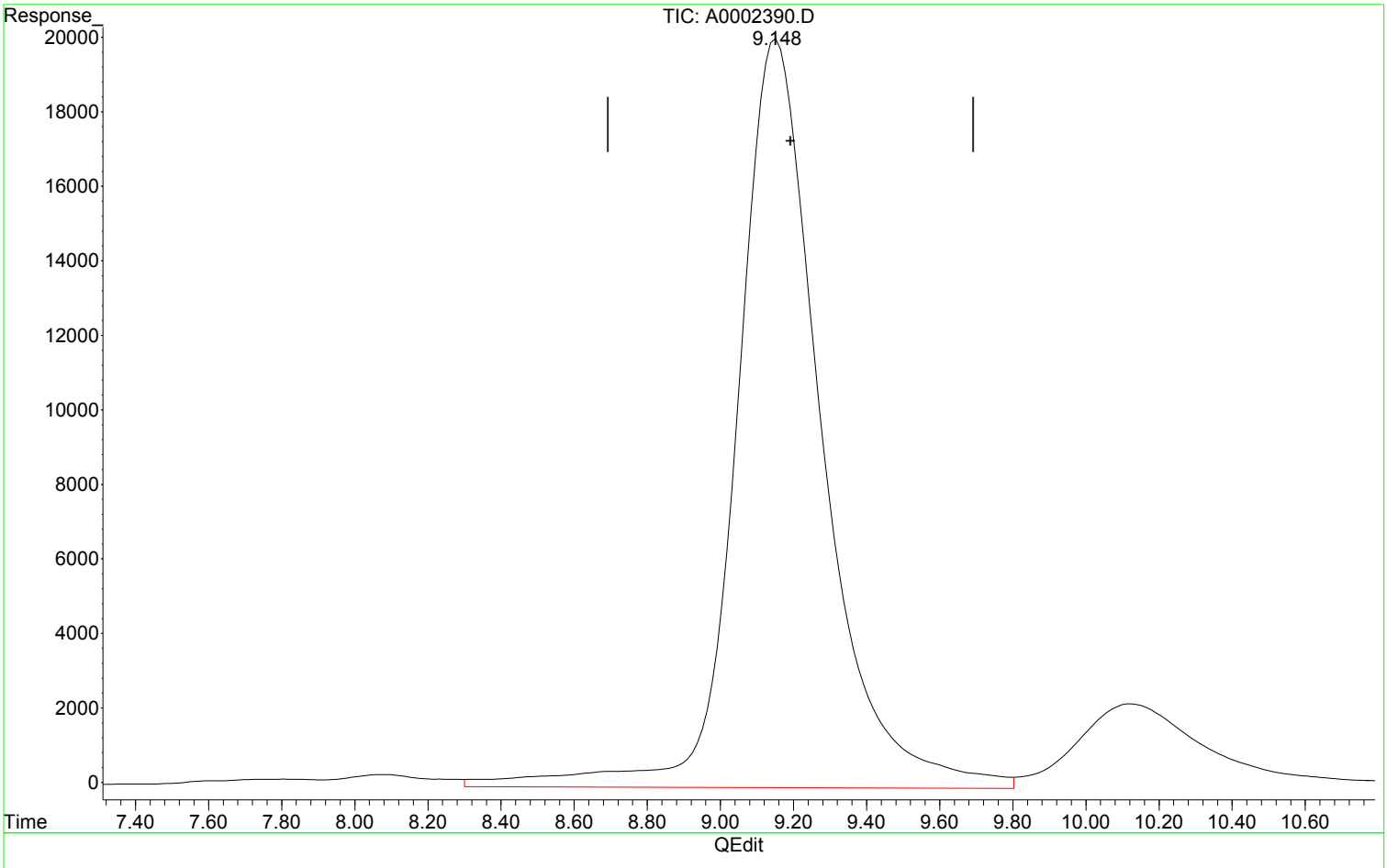
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.154min 54.569 ppm

response 3251832

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

Evaluate Continuing Calibration Report

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	95.630 E3	0.7	99	-0.02
2 T	Pyruvic acid	452.935	422.410 E3	6.7	92	-0.03
3 T	Lactic Acid	53.765	53.004 E3	1.4	98	-0.03
4 T	Acetic Acid	59.169	58.914 E3	0.4	97	-0.03
5 T	Propionic Acid	59.592	58.625 E3	1.6	99	-0.04
6 T	Butyric Acid	62.897	57.833 E3	8.1	99	-0.05

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.109	4781519	49.630	ppm	
2) T	Pyruvic acid	3.601	2112050	4.663	ppm	
3) T	Lactic Acid	4.024	2650211	49.293	ppm	
4) T	Acetic Acid	4.367	2945690	49.784	ppm	m
5) T	Propionic Acid	9.148	2931268	49.189	ppm	m
6) T	Butyric Acid	24.791	2891658	45.974	ppm	

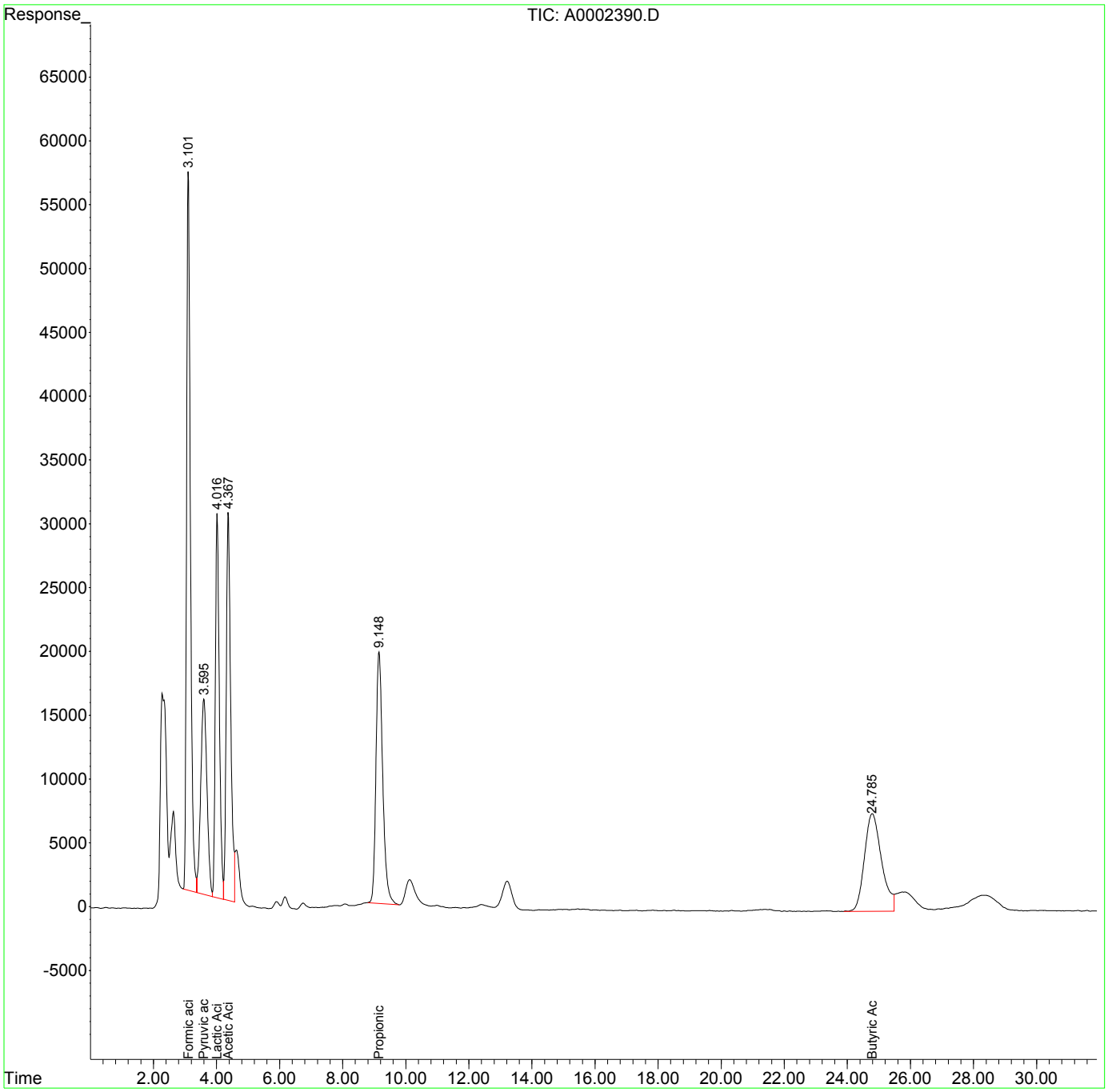
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



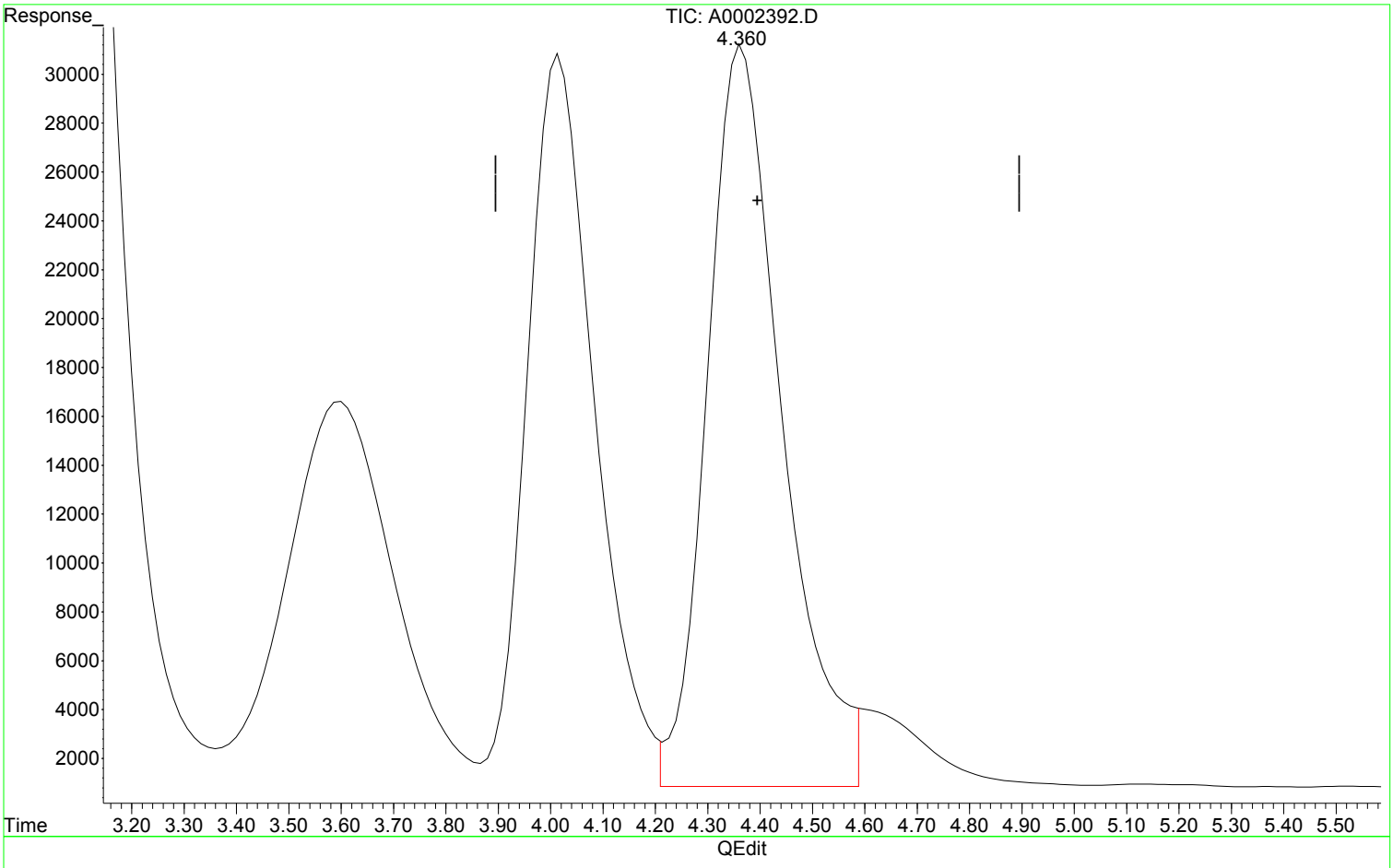
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.360min 51.179 ppm m

response 3028258

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

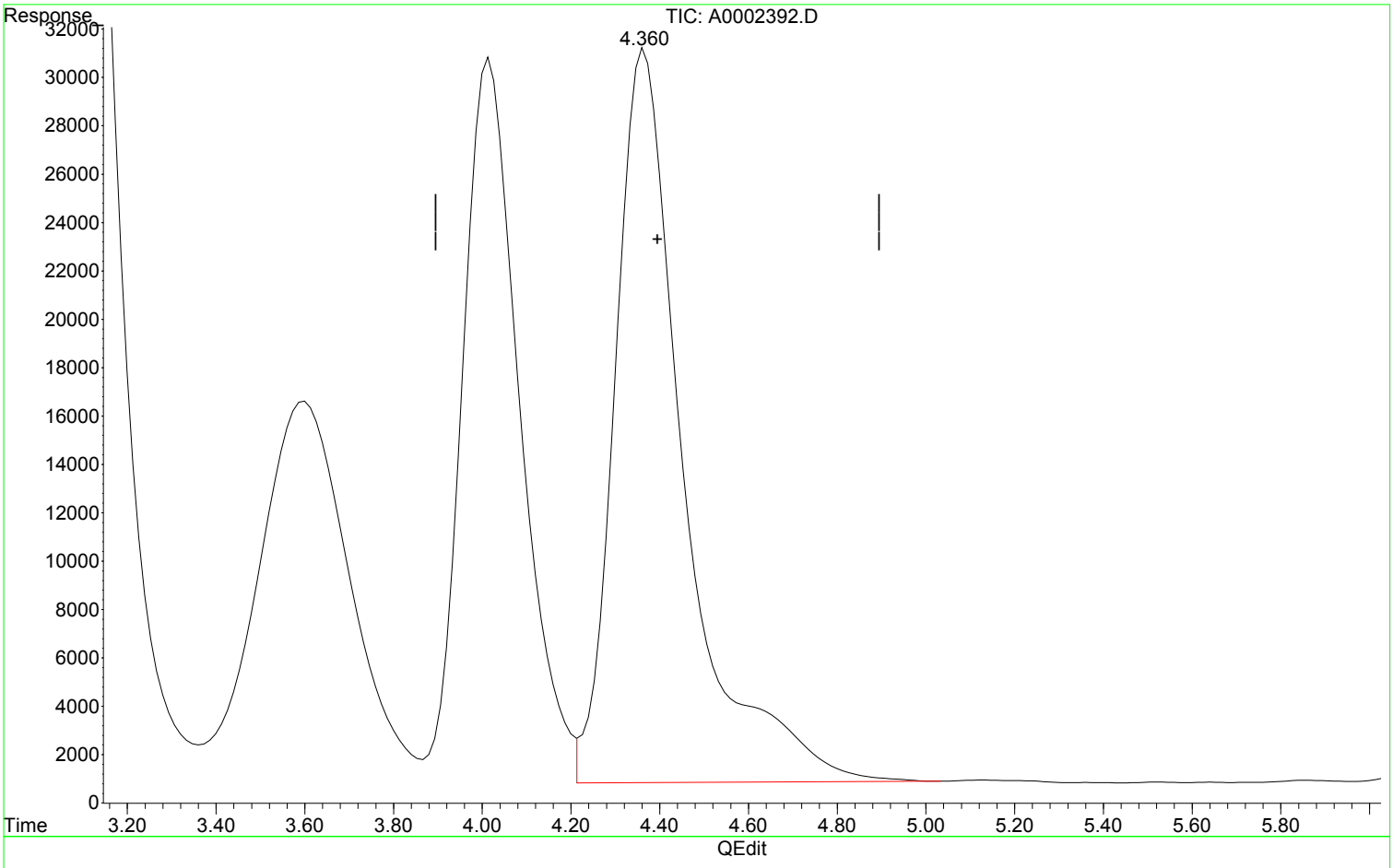
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.367min 55.649 ppm

response 3292693

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

Evaluate Continuing Calibration Report

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	95.645 E3	0.7	99	0.00
2 T	Pyruvic acid	452.935	453.885 E3	-0.2	99	0.00
3 T	Lactic Acid	53.765	54.021 E3	-0.5	100	0.00
4 T	Acetic Acid	59.169	60.565 E3	-2.4	100	0.00
5 T	Propionic Acid	59.592	58.178 E3	2.4	99	0.00
6 T	Butyric Acid	62.897	58.755 E3	6.6	100	0.00

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.108	4782273	49.638	ppm	
2) T	Pyruvic acid	3.600	2269427	5.010	ppm	
3) T	Lactic Acid	4.018	2701047	50.238	ppm	
4) T	Acetic Acid	4.360	3028258	51.179	ppm	m
5) T	Propionic Acid	9.121	2908885	48.814	ppm	
6) T	Butyric Acid	24.655	2937738	46.707	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

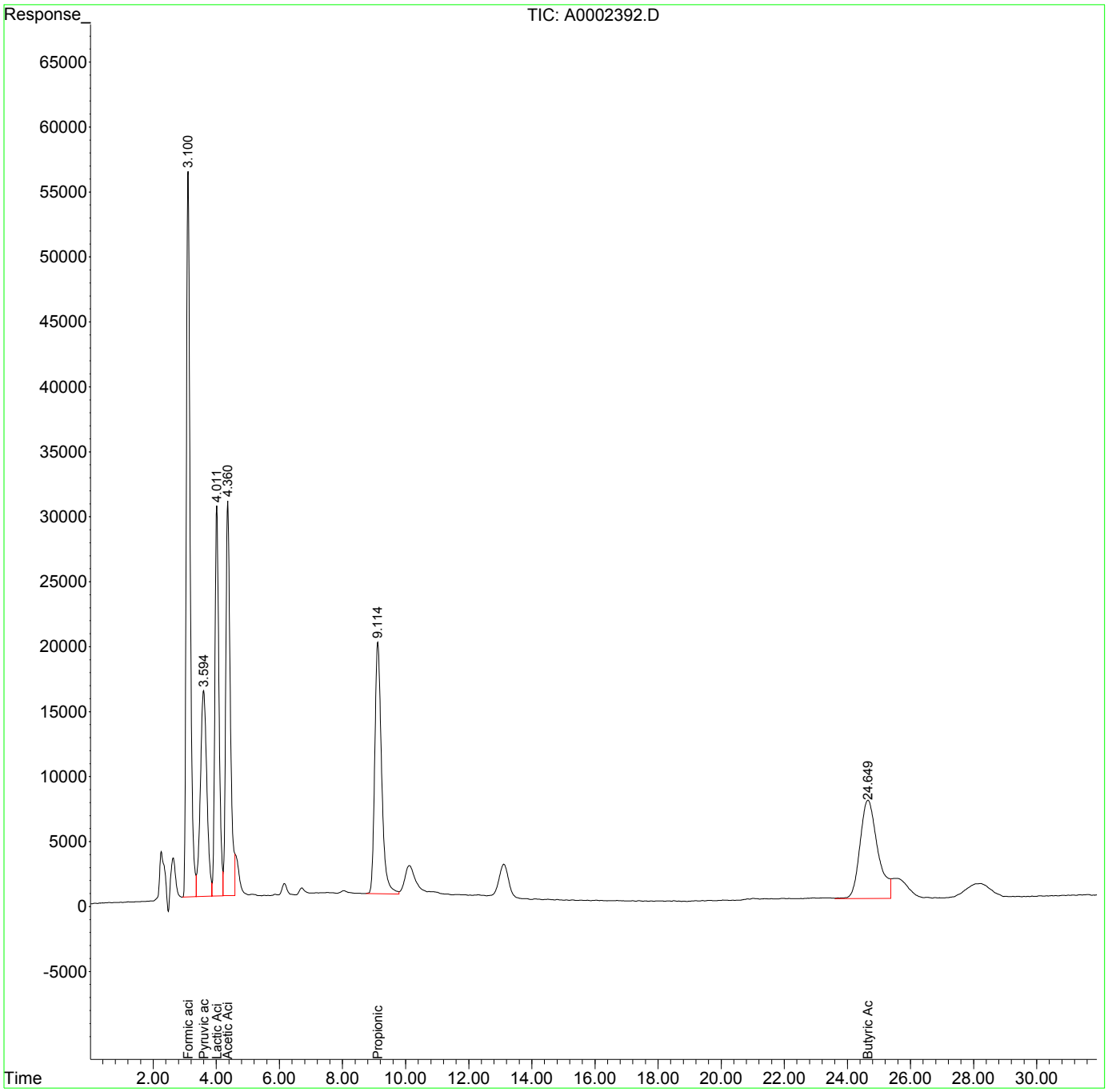
Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



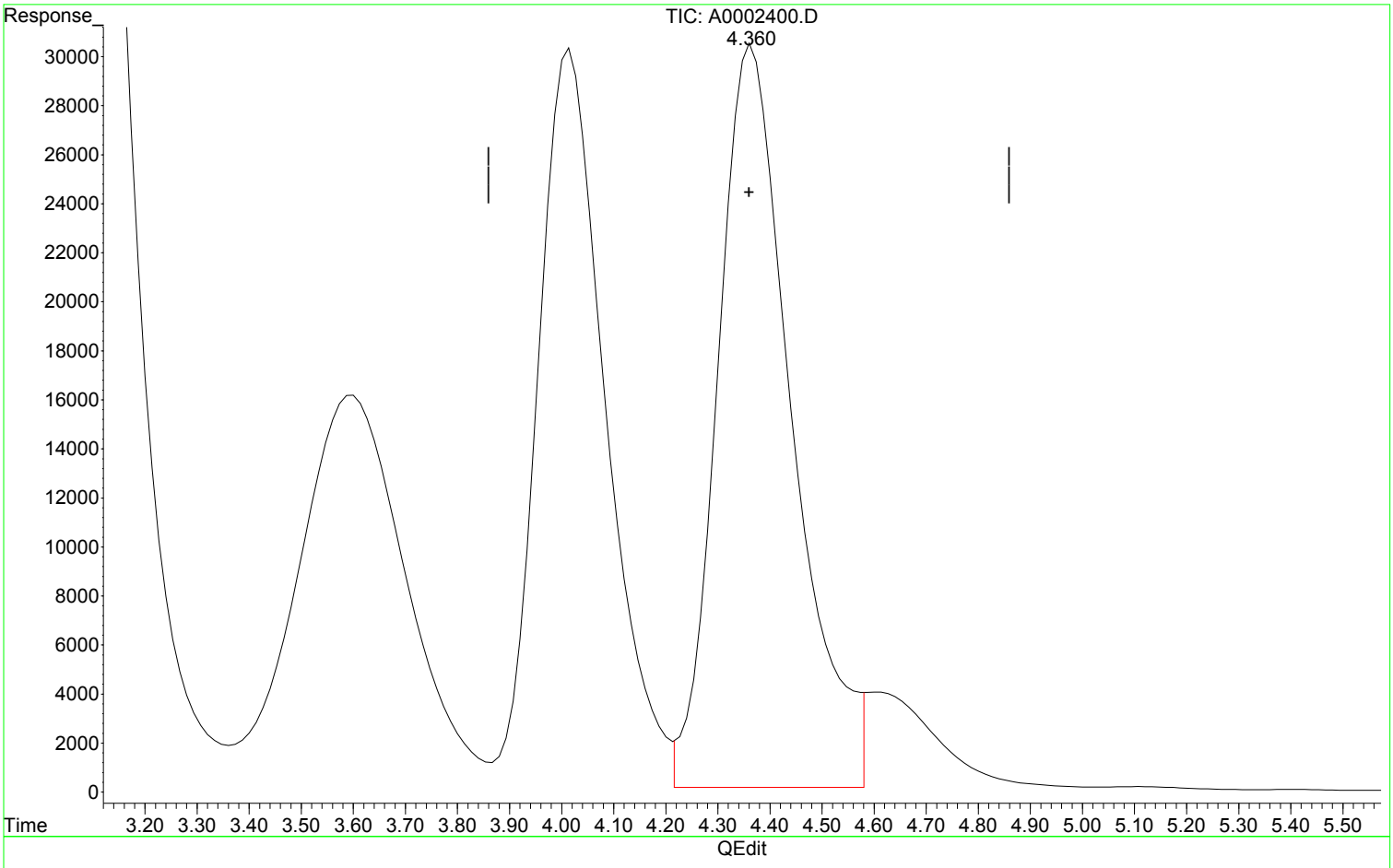
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.360min 50.833 ppm m

response 3007786

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

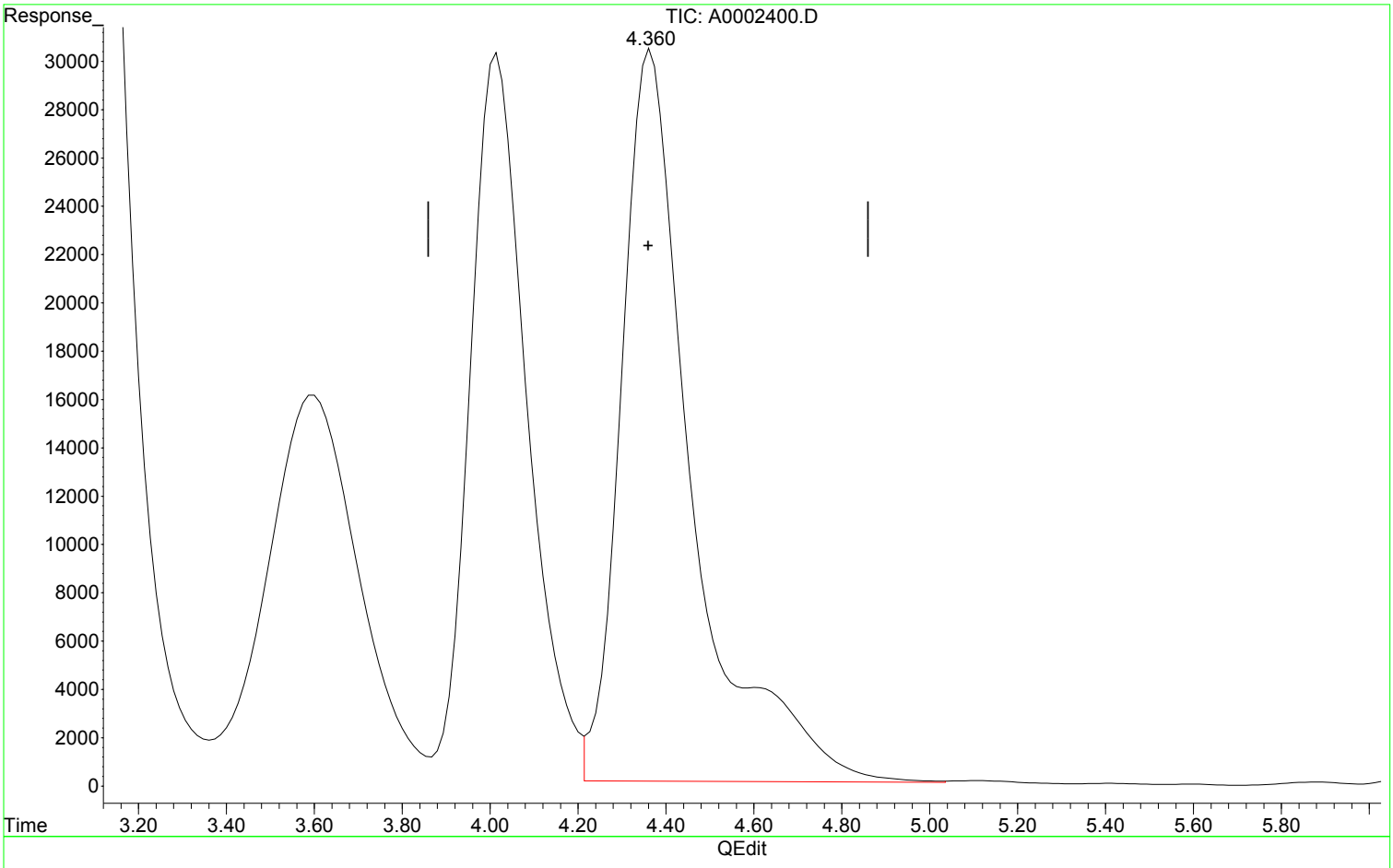
00944073

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.367min 57.265 ppm

response 3388325

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

Evaluate Continuing Calibration Report

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	95.077 E3	1.3	99	0.00
2 T	Pyruvic acid	452.935	456.790 E3	-0.9	100	0.00
3 T	Lactic Acid	53.765	54.332 E3	-1.1	100	0.00
4 T	Acetic Acid	59.169	60.156 E3	-1.7	99	0.00
5 T	Propionic Acid	59.592	57.295 E3	3.9	97	0.00
6 T	Butyric Acid	62.897	58.521 E3	7.0	100	0.03

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.107	4753865	49.343	ppm	
2) T	Pyruvic acid	3.599	2283950	5.043	ppm	
3) T	Lactic Acid	4.018	2716598	50.527	ppm	
4) T	Acetic Acid	4.360	3007786	50.833	ppm	m
5) T	Propionic Acid	9.123	2864749	48.073	ppm	
6) T	Butyric Acid	24.681	2926070	46.521	ppm	

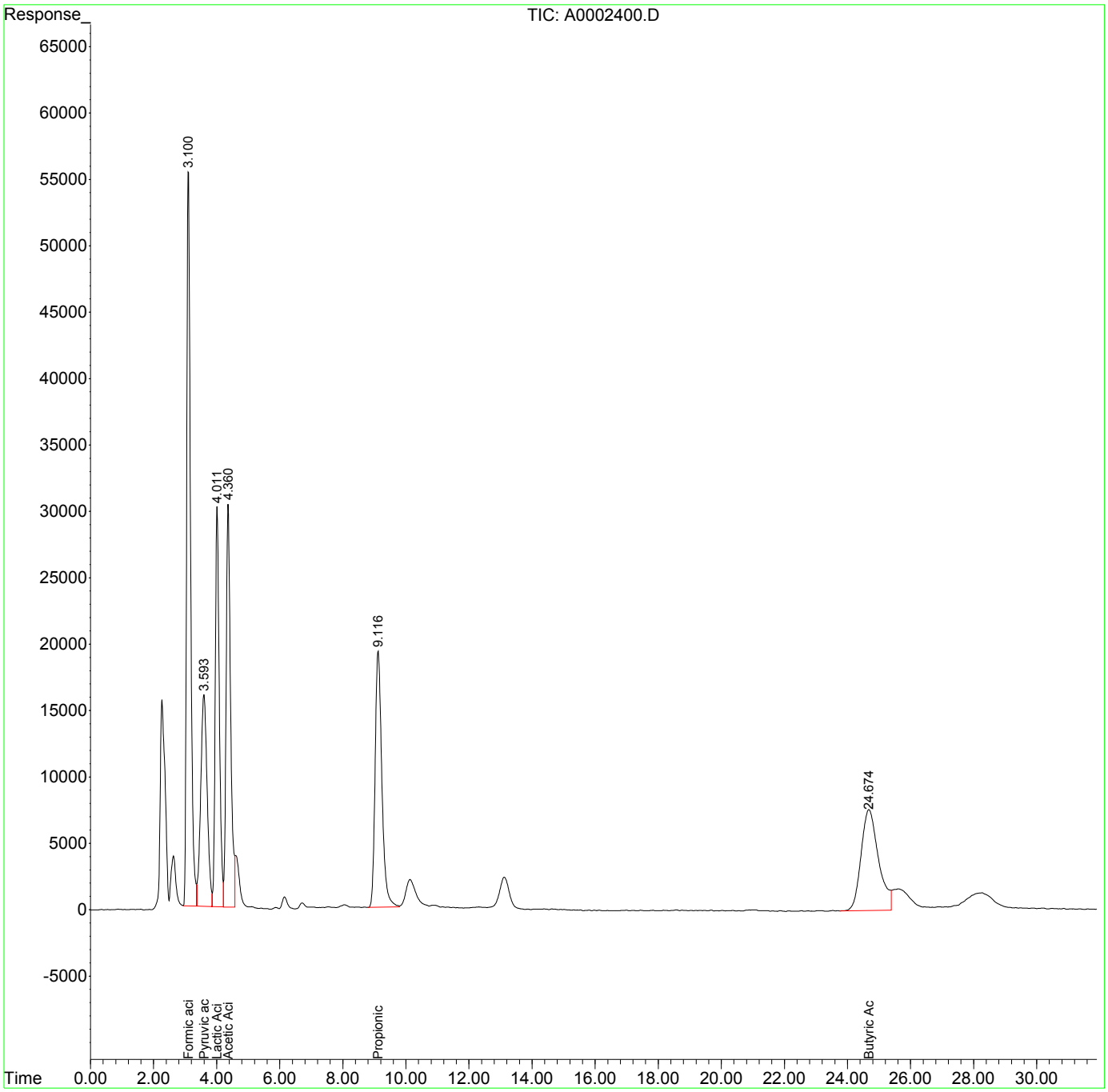
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

1st BA 10/08/18
2nd BA 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.131	1896636	19.686 ppm
2) T	Pyruvic acid	3.628	1357394	2.997 ppm
3) T	Lactic Acid	4.052	1086883	20.215 ppm
4) T	Acetic Acid	4.405	1218452	20.593 ppm
5) T	Propionic Acid	9.222	1146657	19.242 ppm
6) T	Butyric Acid	25.002	1138865	18.107 ppm

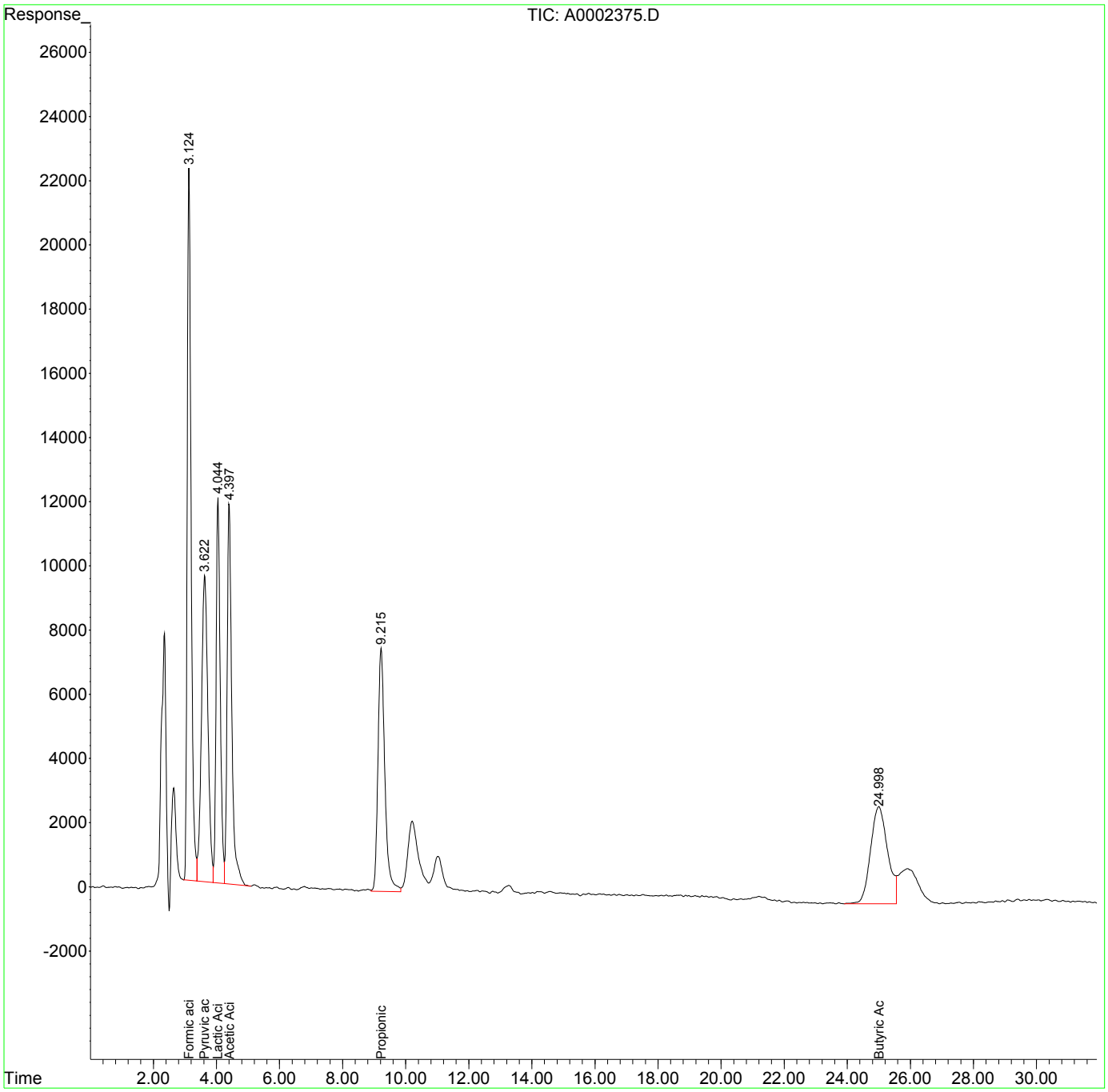
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	94.832 E3	1.6	100	0.00
2 T	Pyruvic acid	452.935	678.697 E3	-49.8#	160#	0.00
3 T	Lactic Acid	53.765	54.344 E3	-1.1	108	0.00
4 T	Acetic Acid	59.169	60.923 E3	-3.0	111	0.00
5 T	Propionic Acid	59.592	57.333 E3	3.8	101	0.03
6 T	Butyric Acid	62.897	56.943 E3	9.5	94	0.16

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.129	18870917	195.296	ppm	
2) T	Pyruvic acid	3.625	9170882	20.284	ppm	
3) T	Lactic Acid	4.045	10741636	199.759	ppm	
4) T	Acetic Acid	4.387	11865318	200.607	ppm	m
5) T	Propionic Acid	9.141	11451173	191.091	ppm	
6) T	Butyric Acid	24.580	12106071	191.444	ppm	m

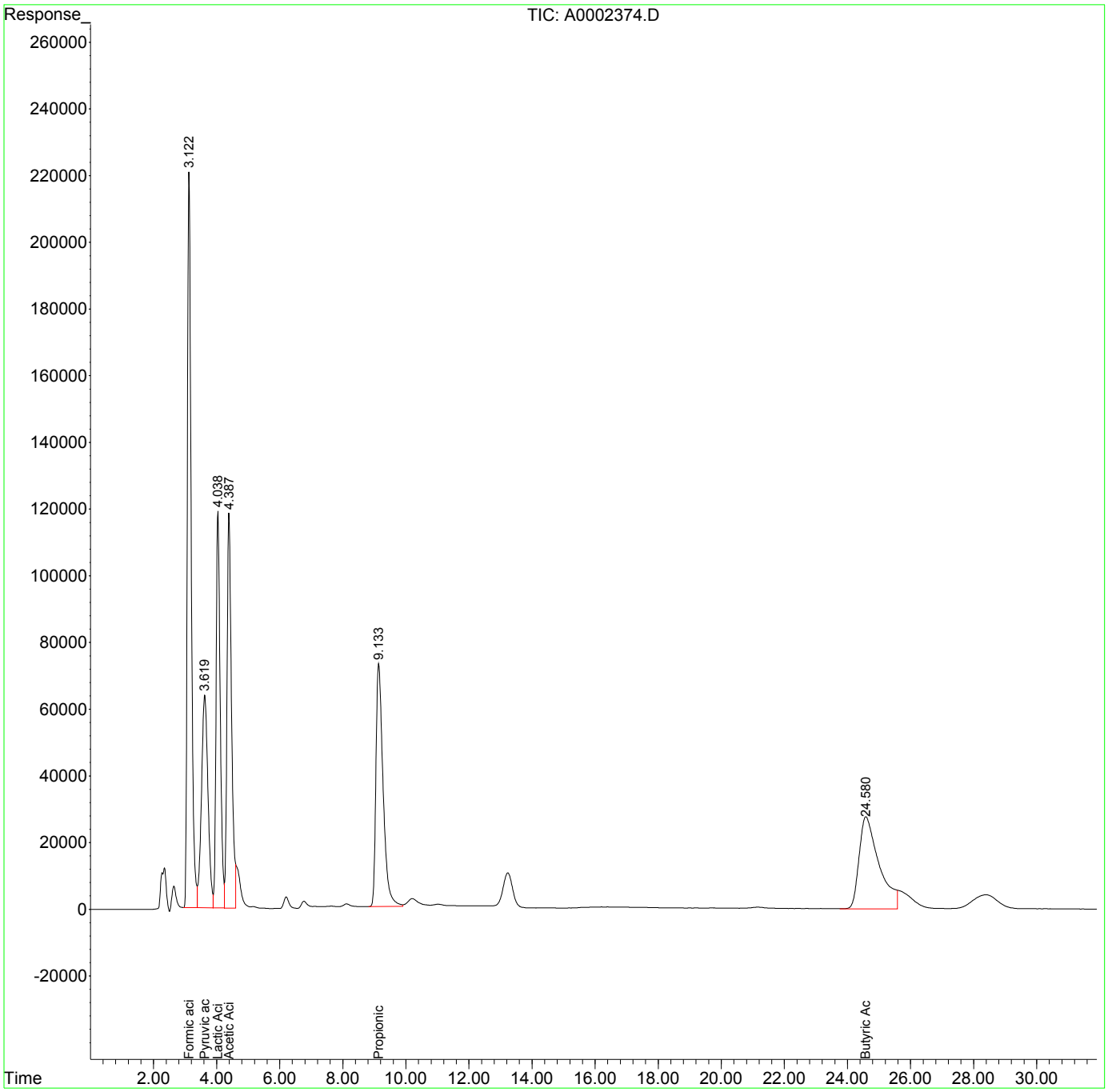
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



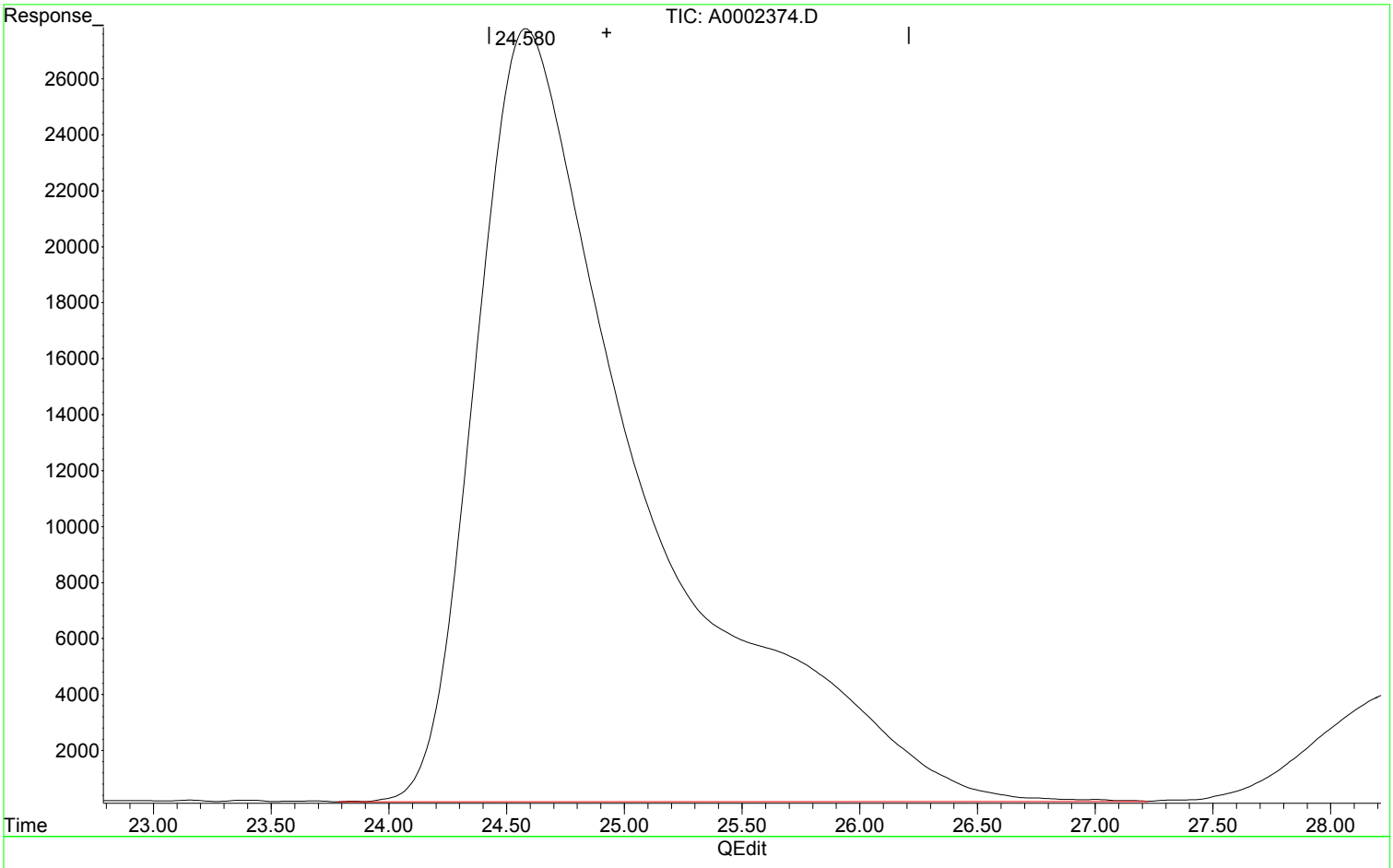
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.587min 217.586 ppm

response 13759140

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

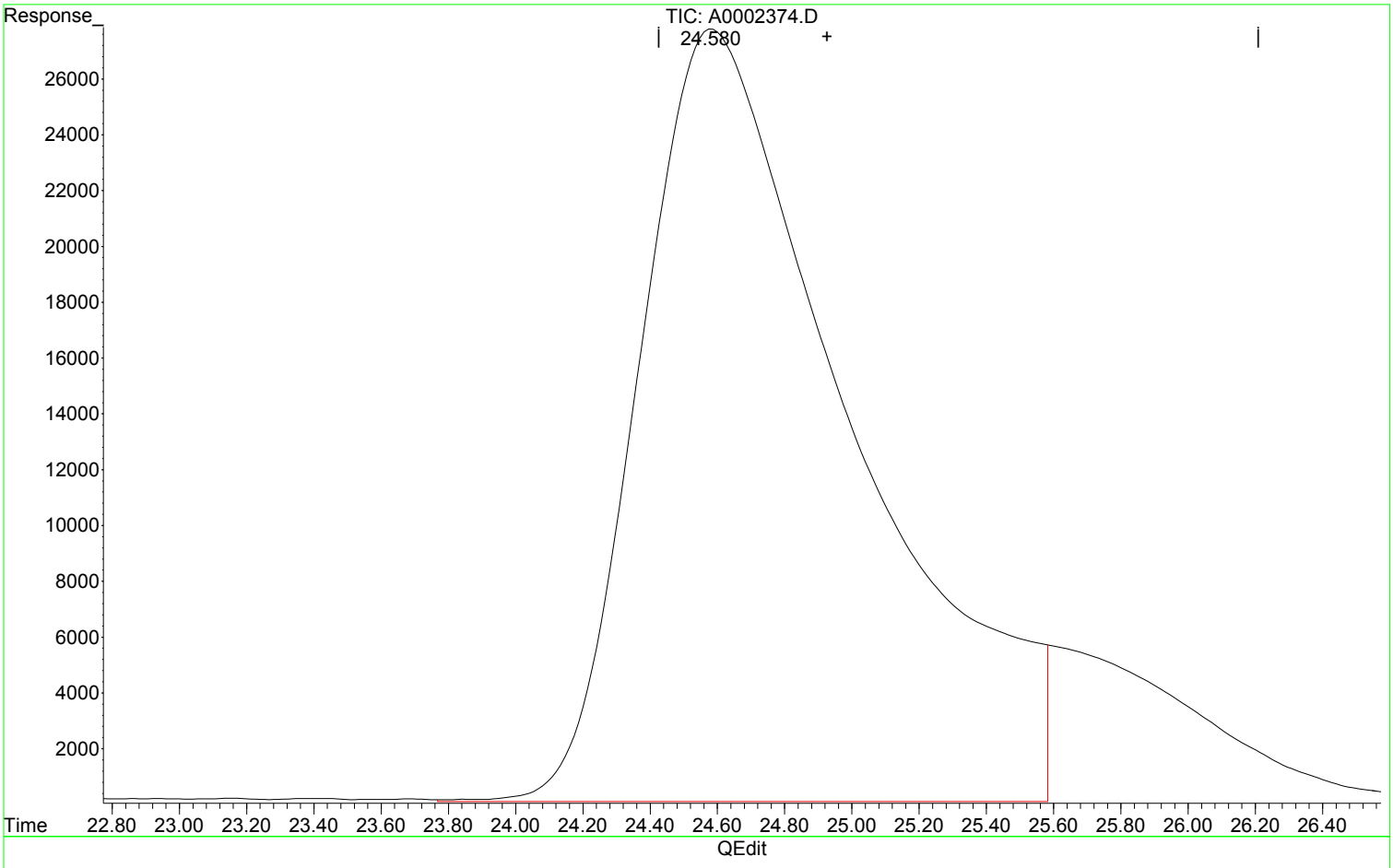
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.580min 191.444 ppm m

response 12106071

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

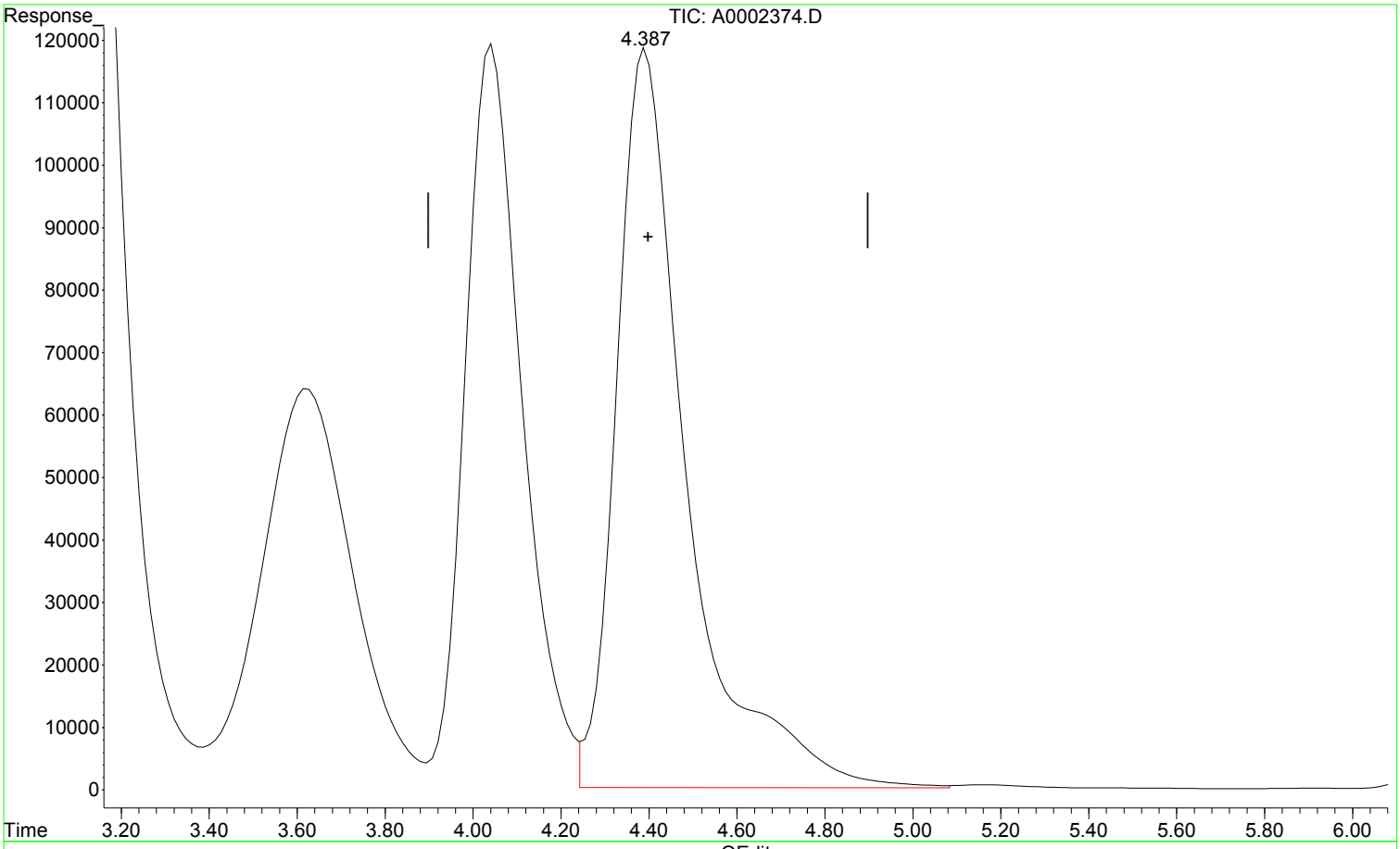
00944084

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.394min 222.004 ppm

response 13130885

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

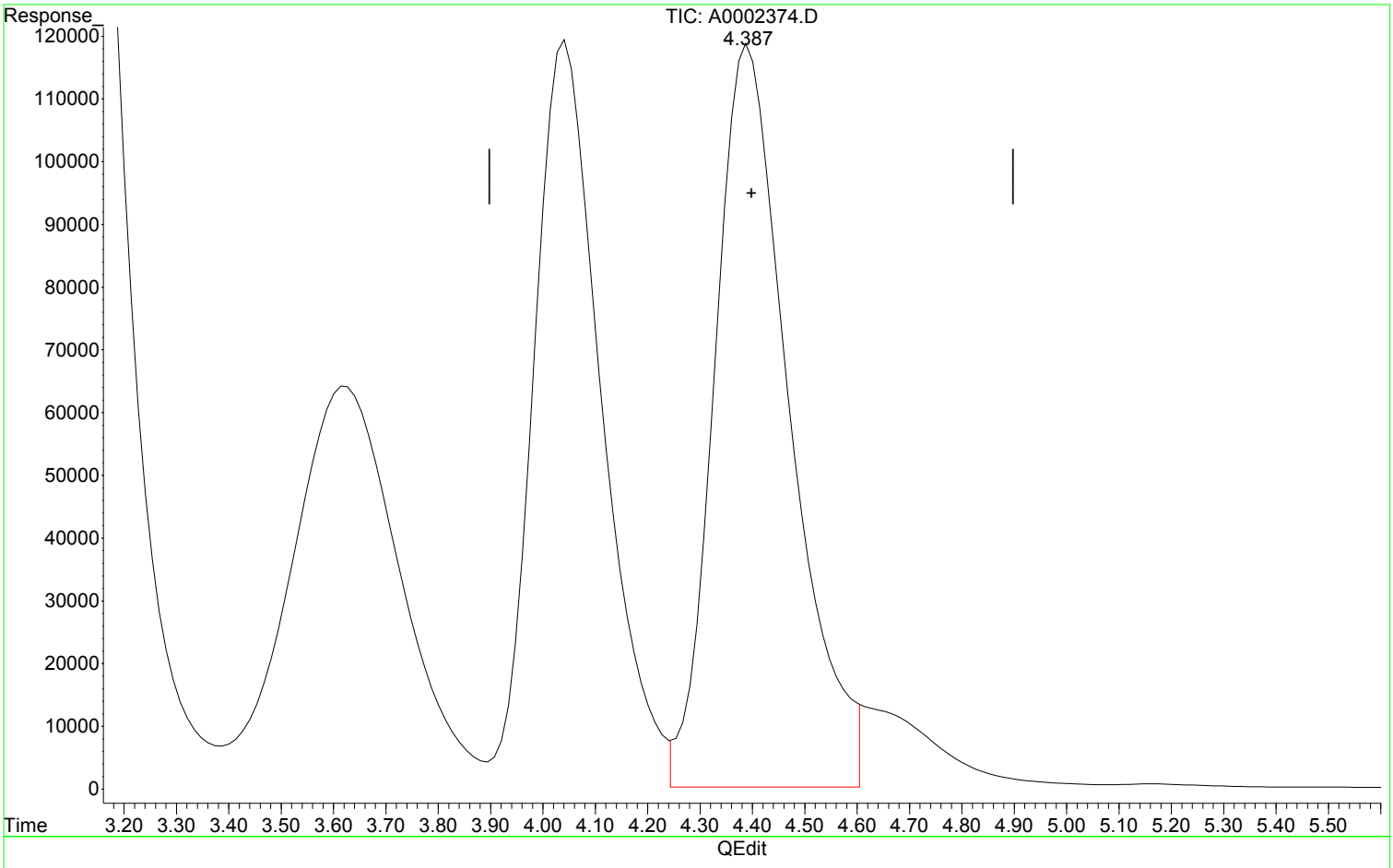
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.387min 200.607 ppm m

response 11865318

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.132	9131569	96.958	ppm	
2) T	Pyruvic acid	3.629	4430352	9.849	ppm	
3) T	Lactic Acid	4.052	5216101	98.587	ppm	
4) T	Acetic Acid	4.397	5725459	96.715	ppm	m
5) T	Propionic Acid	9.203	5508012	93.403	ppm	
6) T	Butyric Acid	24.847	5510917	91.221	ppm	m

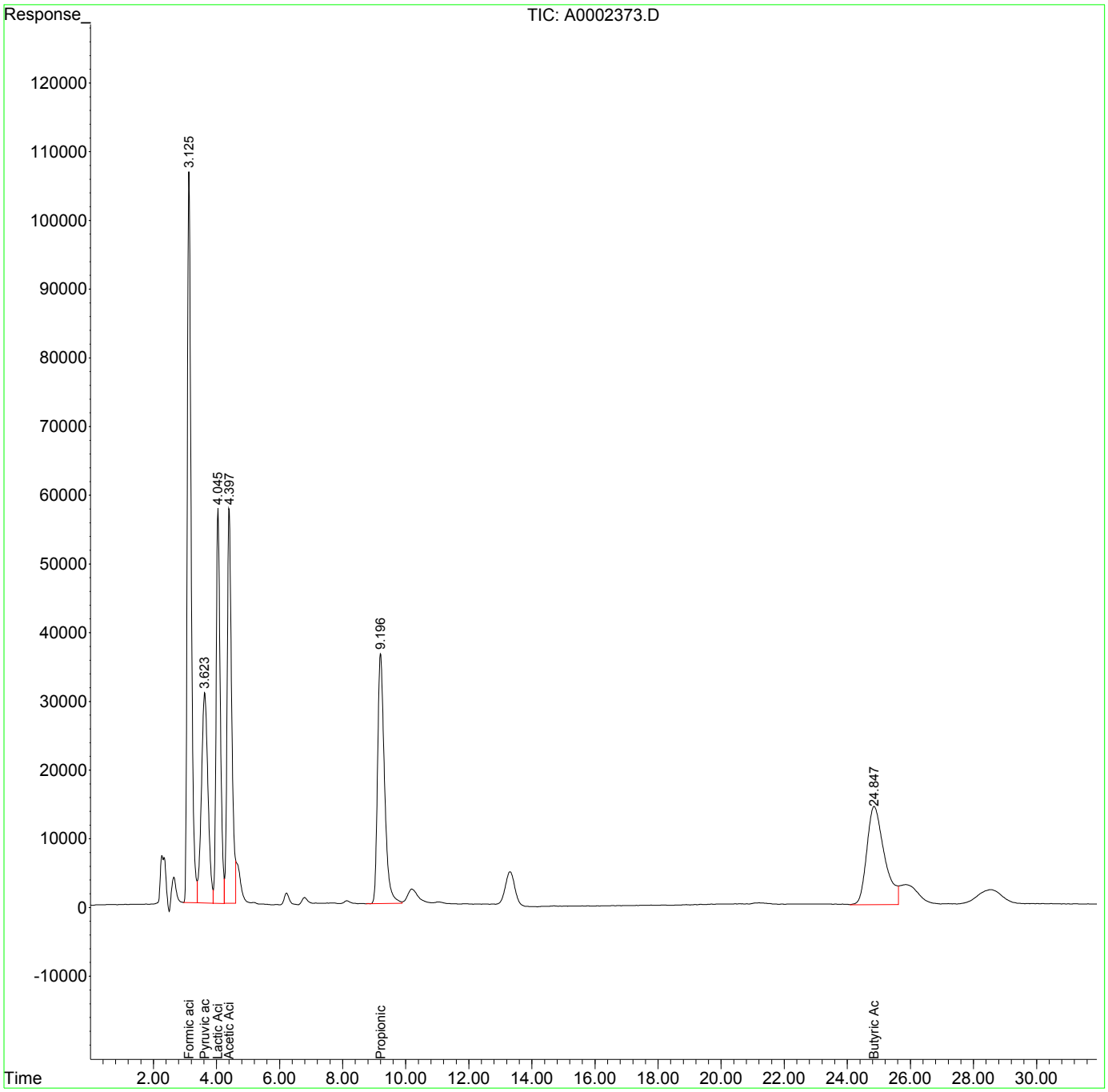
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



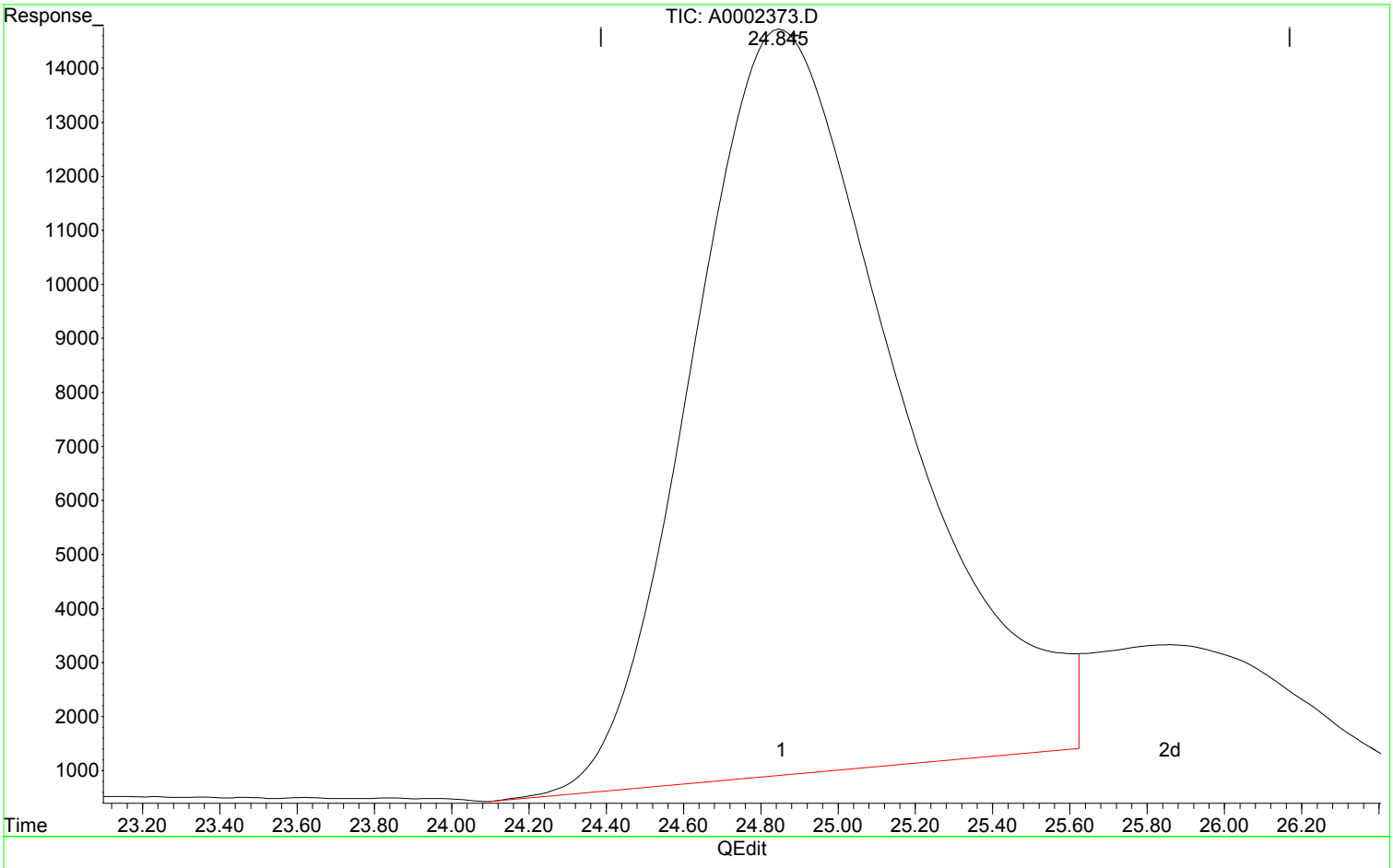
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.853min 84.188 ppm

response 5086048

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

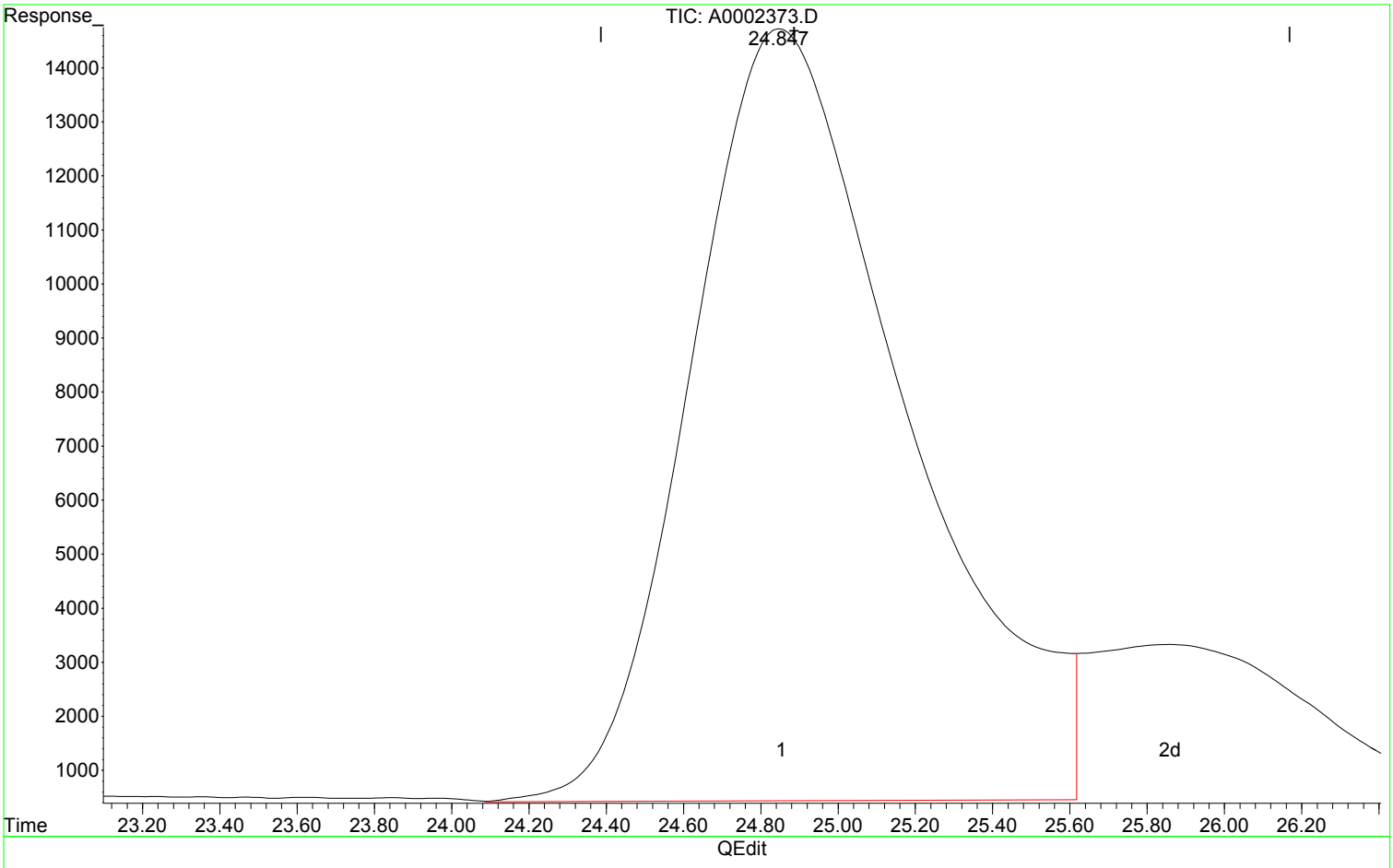
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.847min 91.221 ppm m

response 5510917

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

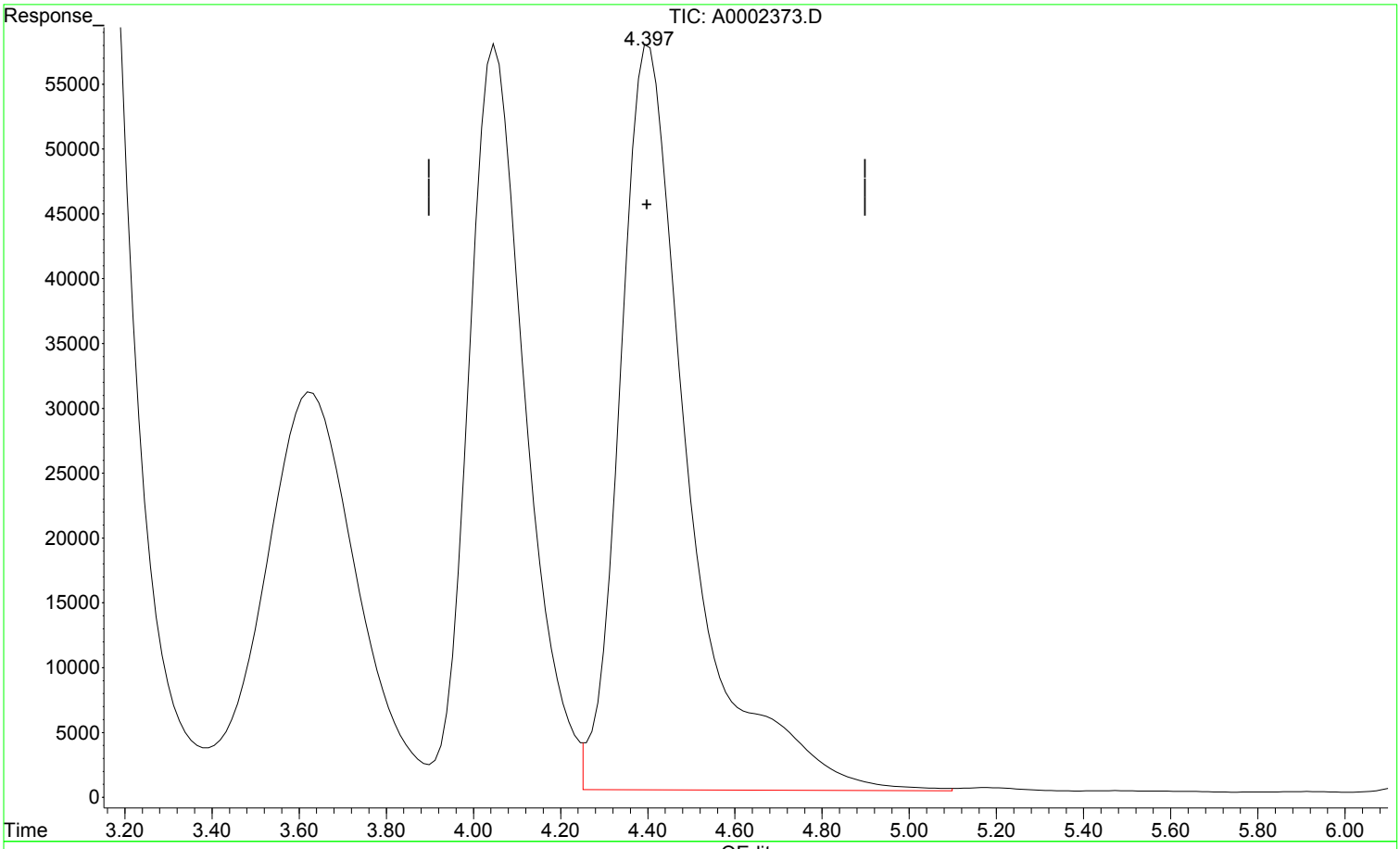
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.405min 107.446 ppm

response 6360712

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

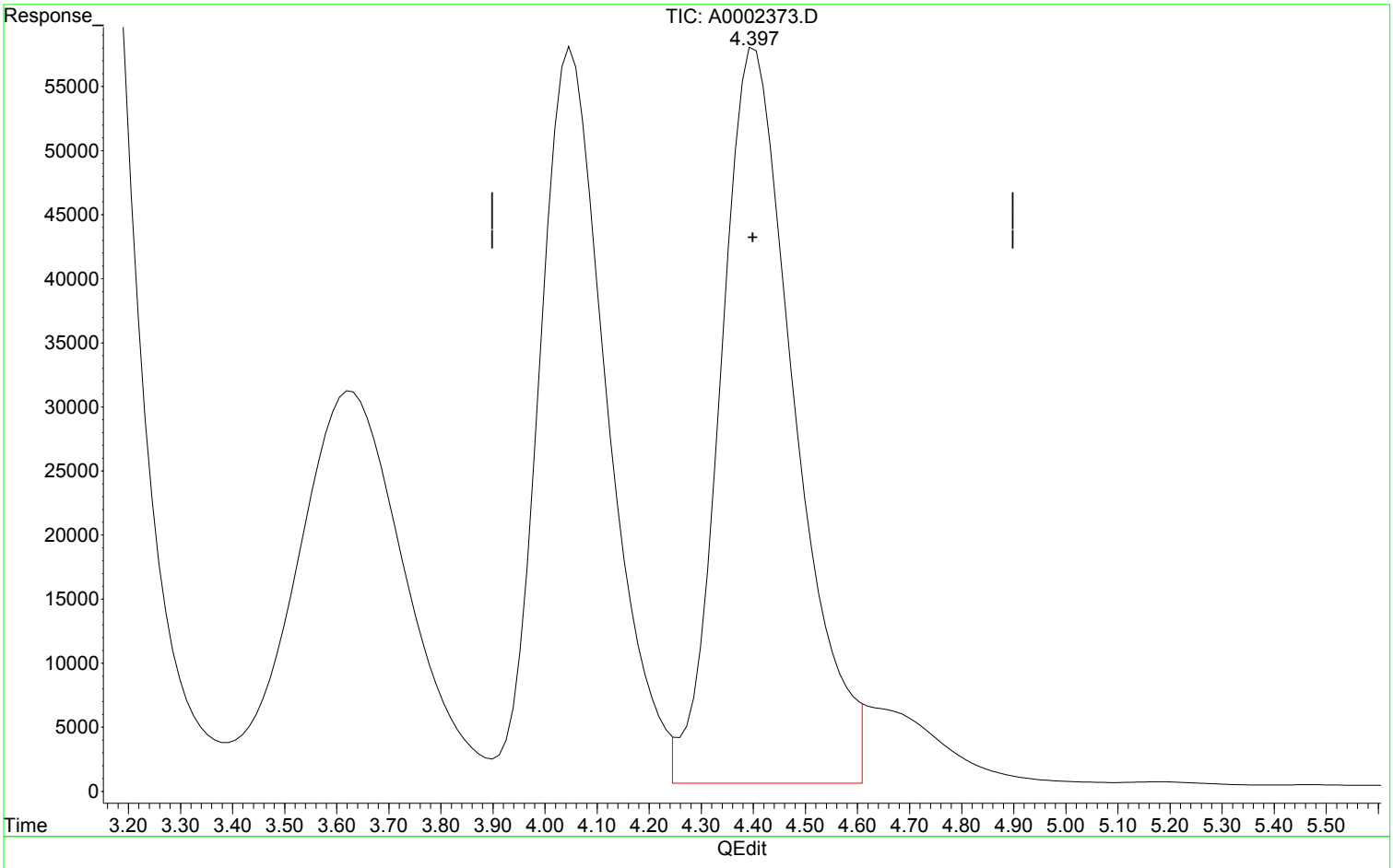
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 96.715 ppm m

response 5725459

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	4817586	51.153	ppm	
2) T	Pyruvic acid	3.630	2294161	5.100	ppm	
3) T	Lactic Acid	4.053	2711599	51.251	ppm	
4) T	Acetic Acid	4.398	3026497	51.124	ppm	m
5) T	Propionic Acid	9.212	2949938	50.024	ppm	
6) T	Butyric Acid	24.928	2932273	48.537	ppm	

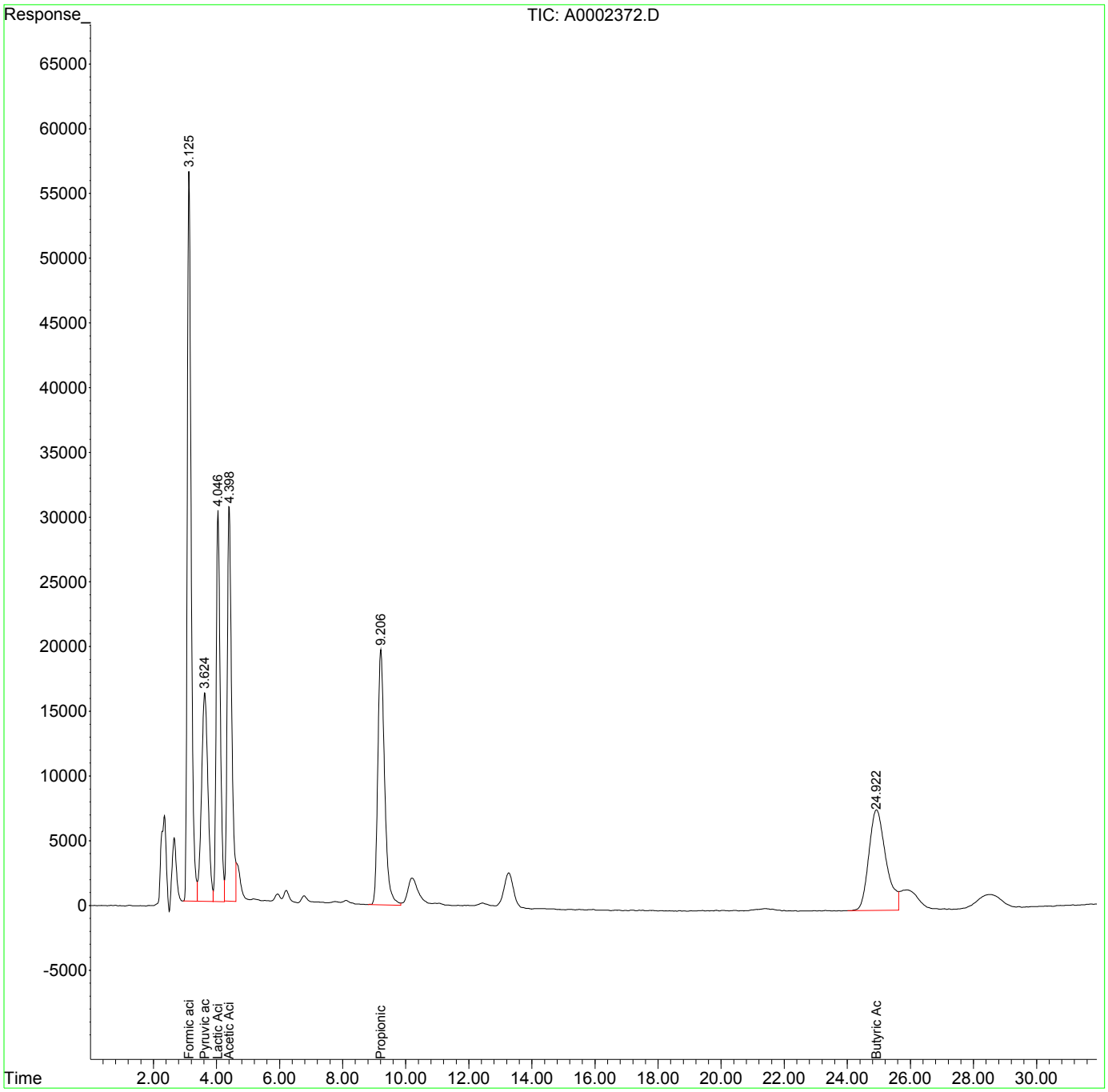
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



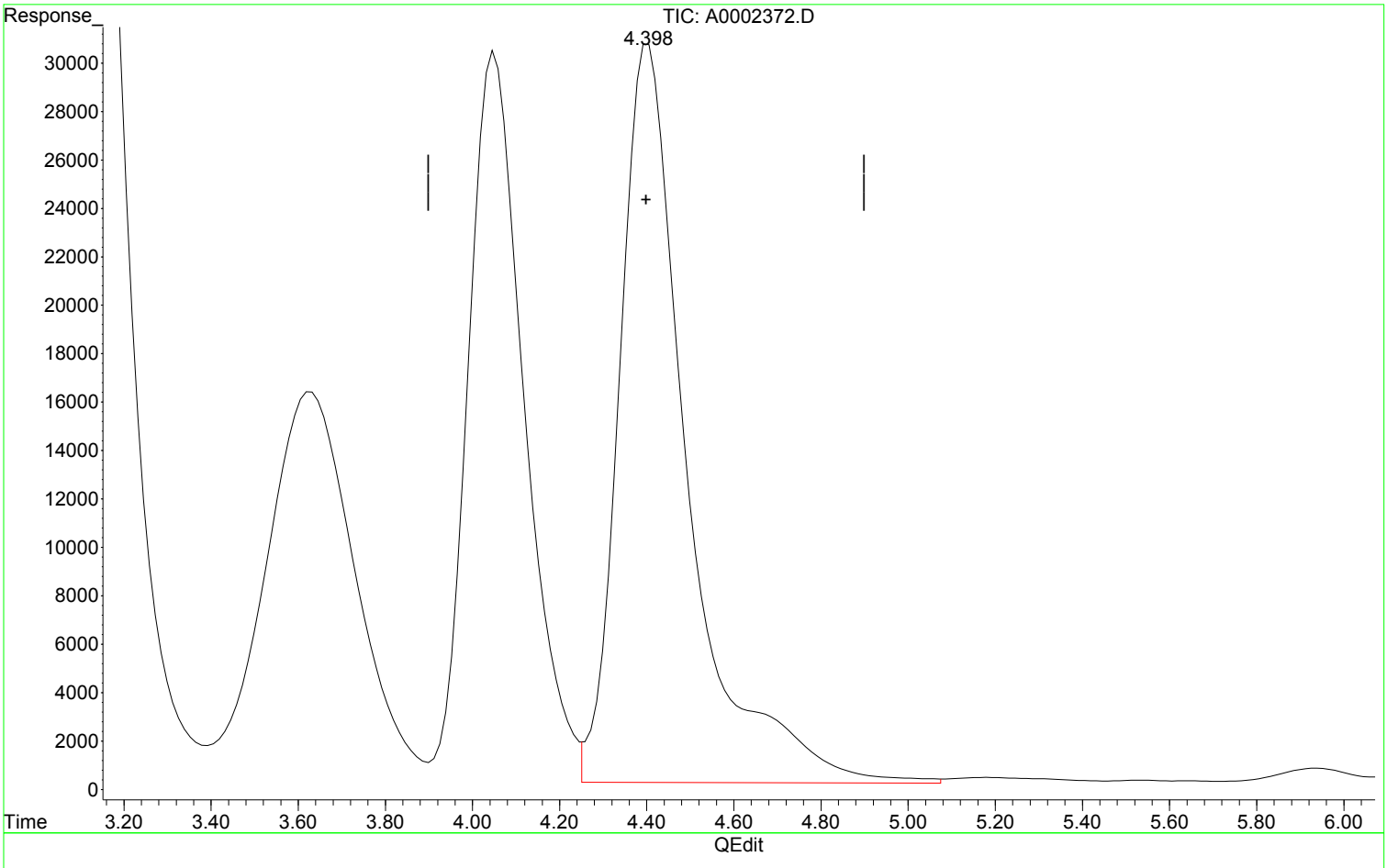
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 56.131 ppm

response 3322912

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

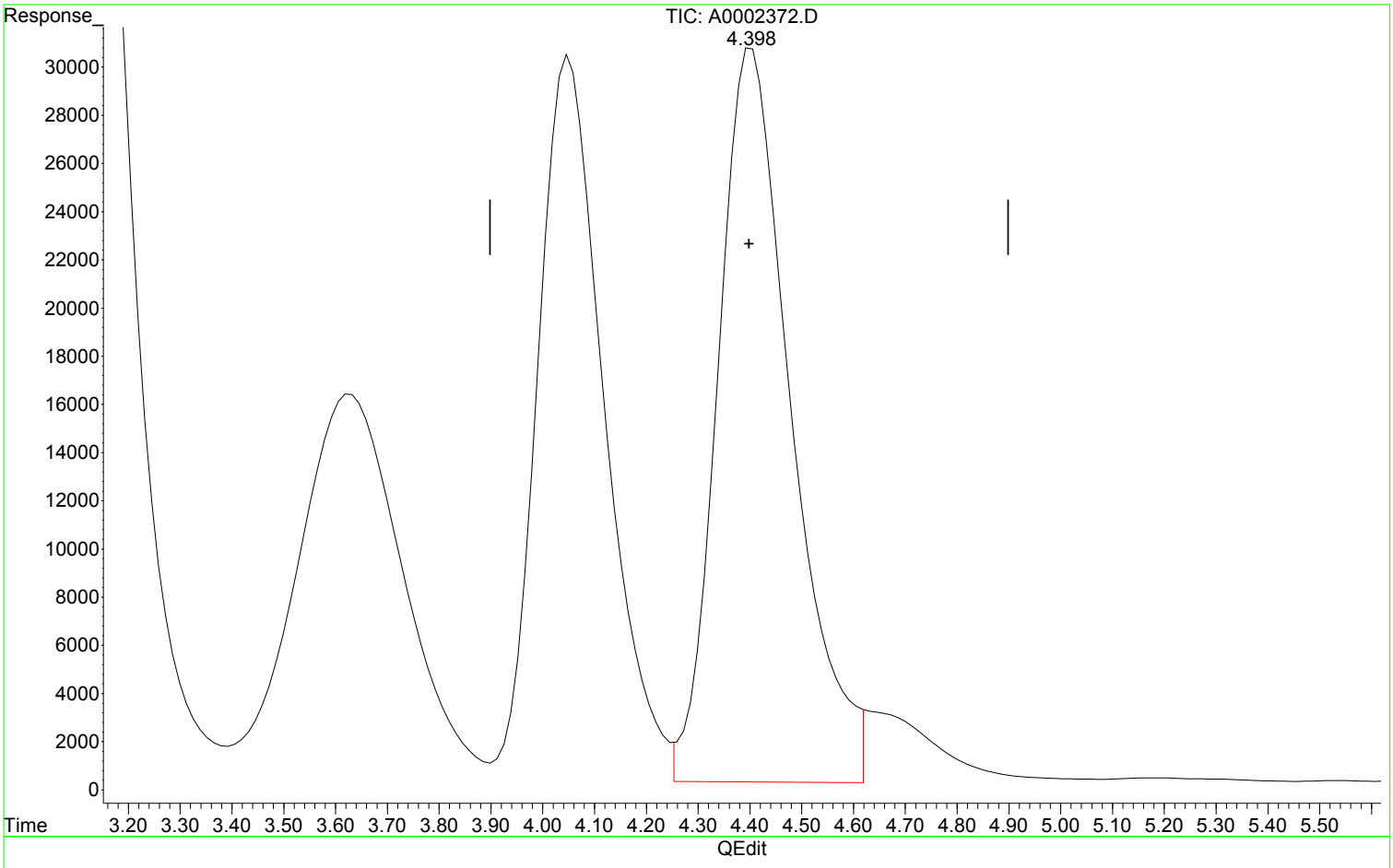
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.398min 51.124 ppm m

response 3026497

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.131	1890077	20.069	ppm	
2) T	Pyruvic acid	3.629	850051	1.890	ppm	
3) T	Lactic Acid	4.051	1003444	18.966	ppm	
4) T	Acetic Acid	4.397	1096677	18.525	ppm	m
5) T	Propionic Acid	9.206	1140510	19.340	ppm	m
6) T	Butyric Acid	24.960	1207082	19.981	ppm	

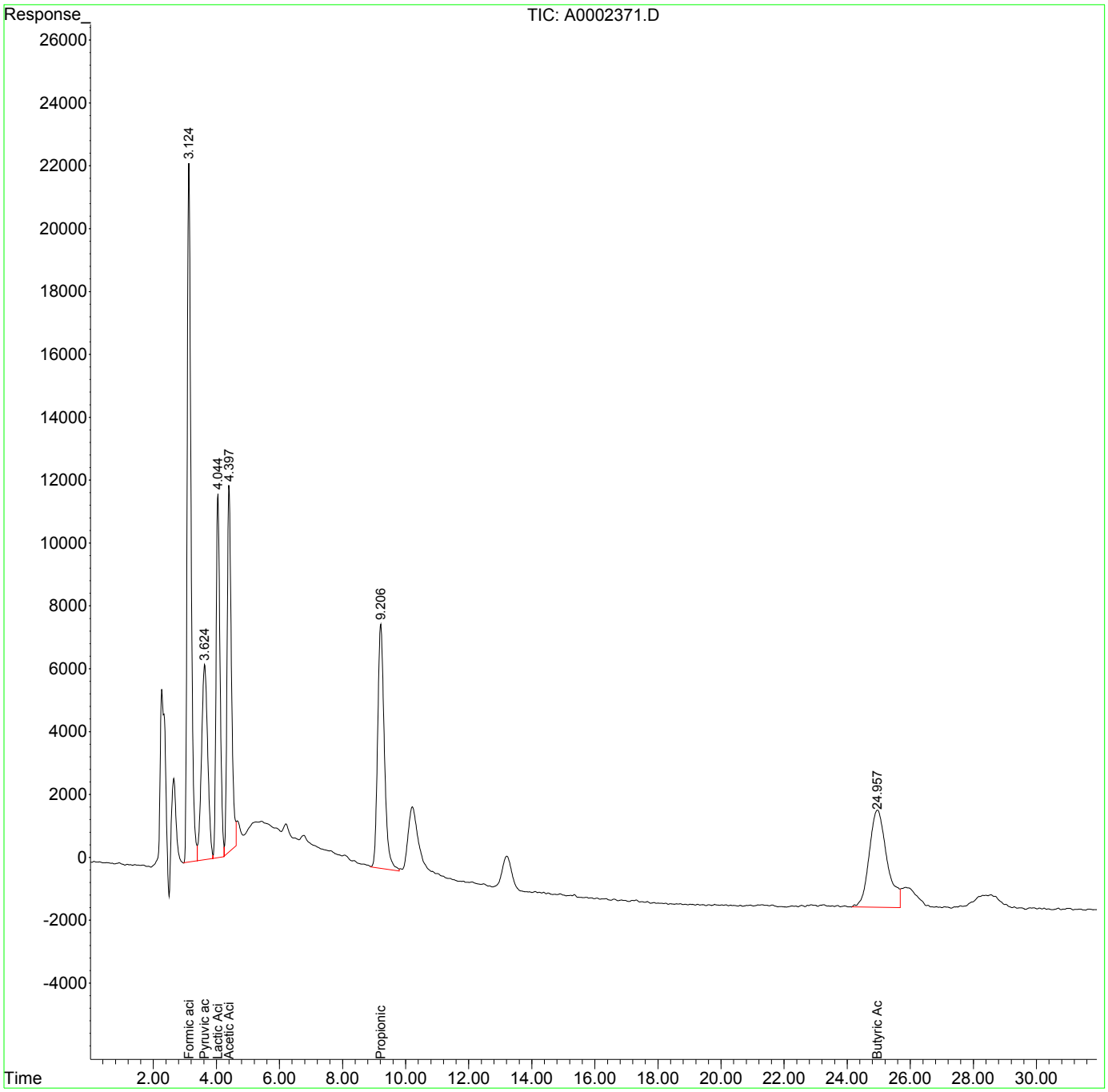
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



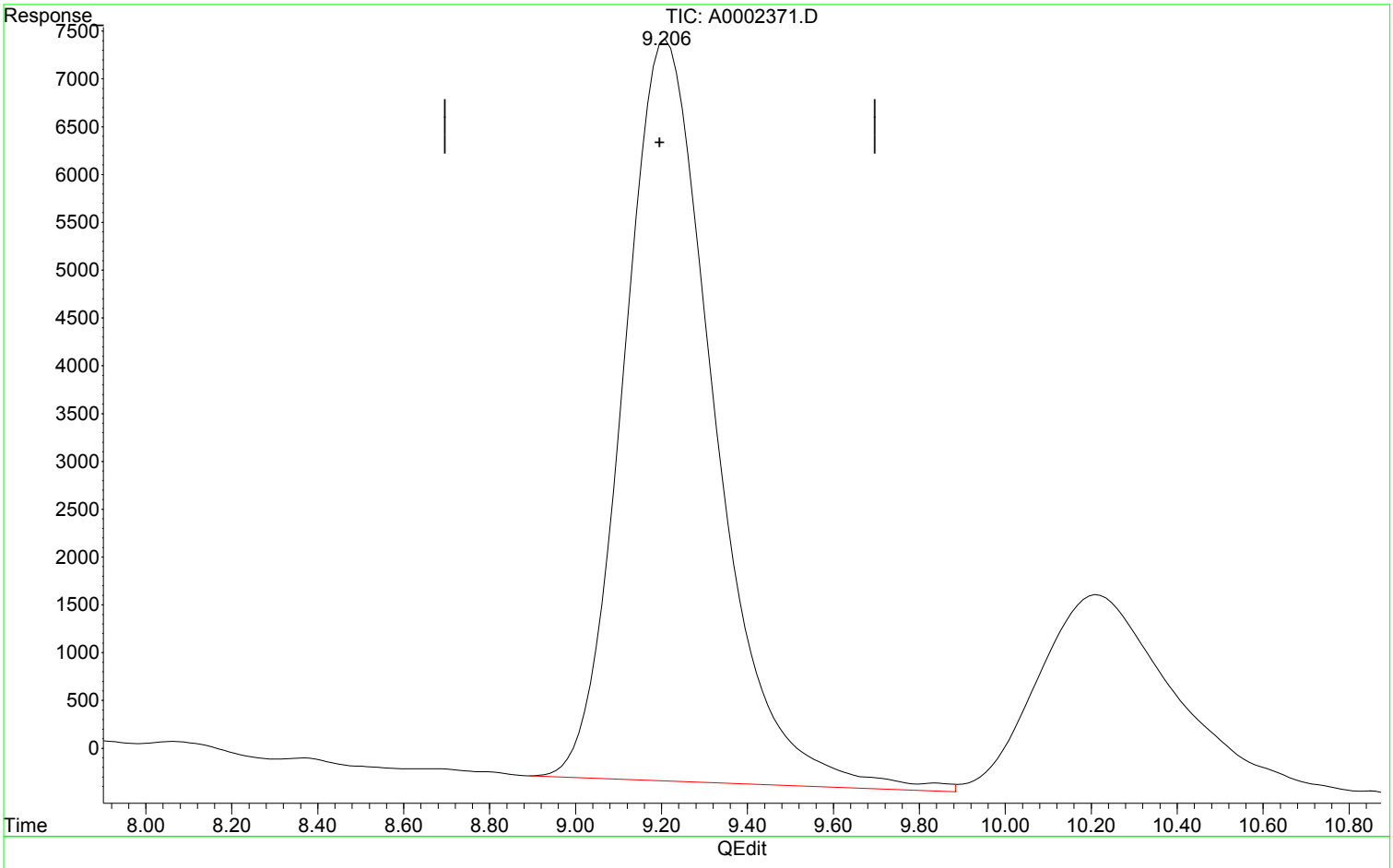
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.212min 19.380 ppm

response 1142822

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

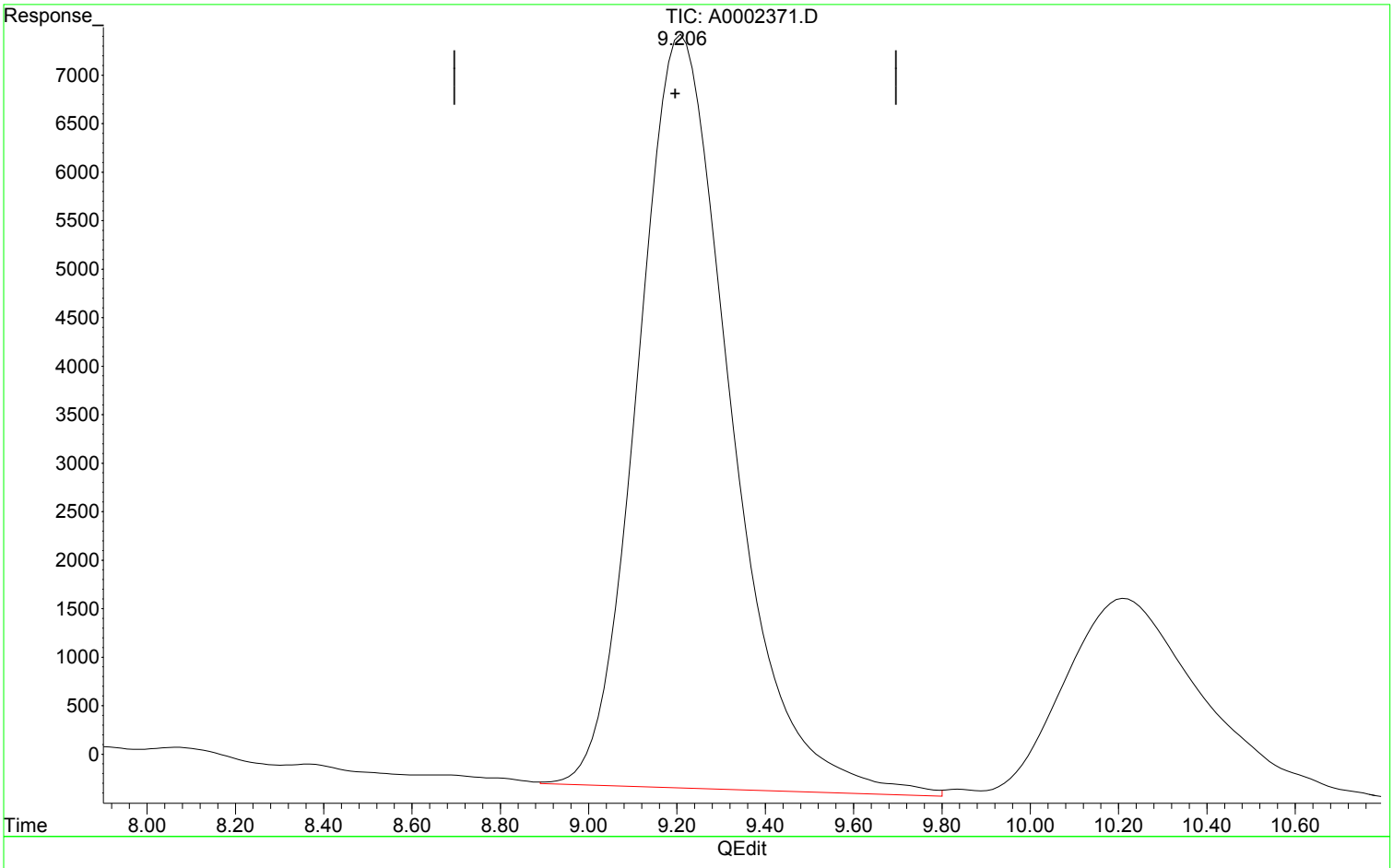
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.206min 19.340 ppm m

response 1140510

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

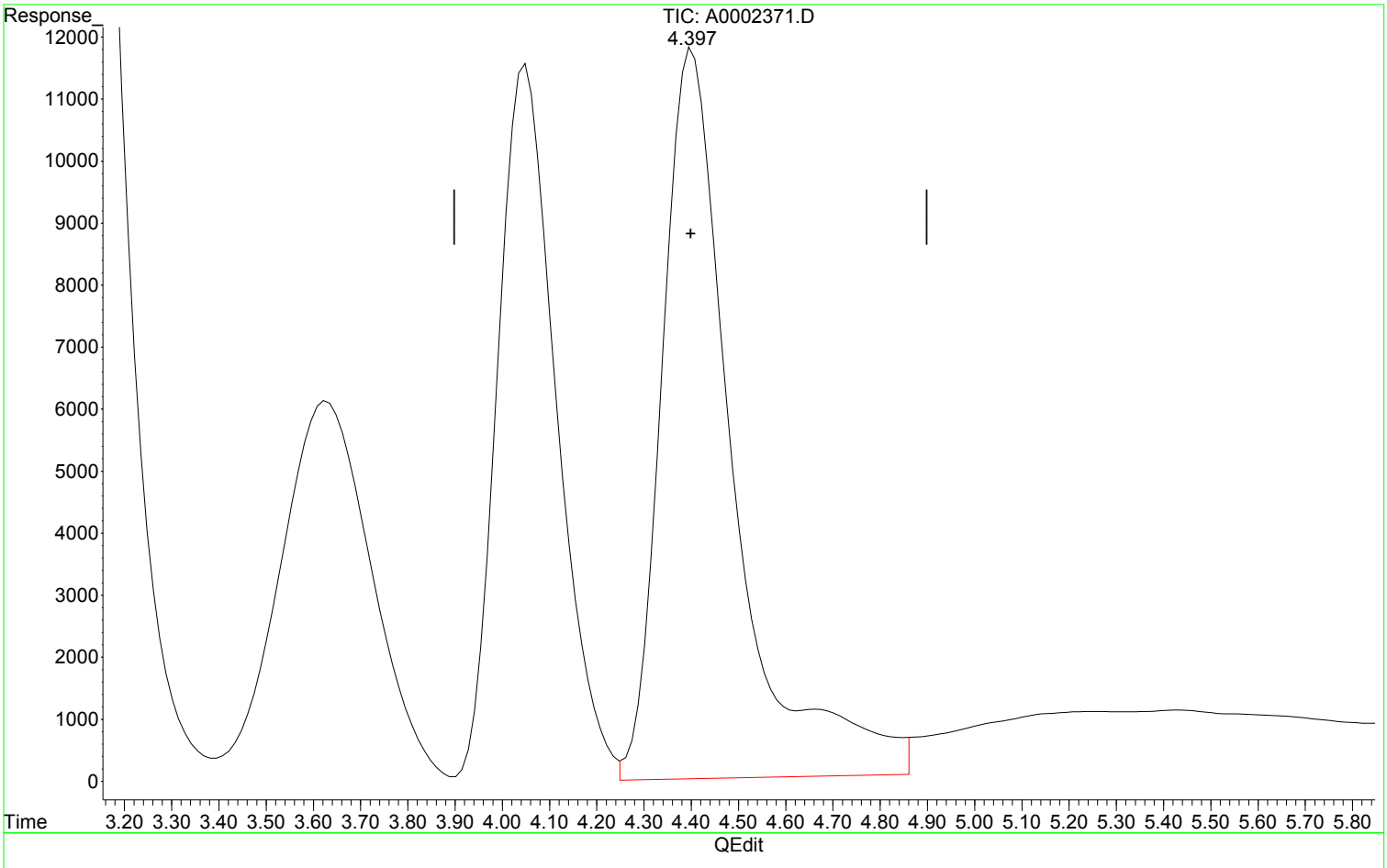
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.404min 21.093 ppm

response 1248683

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

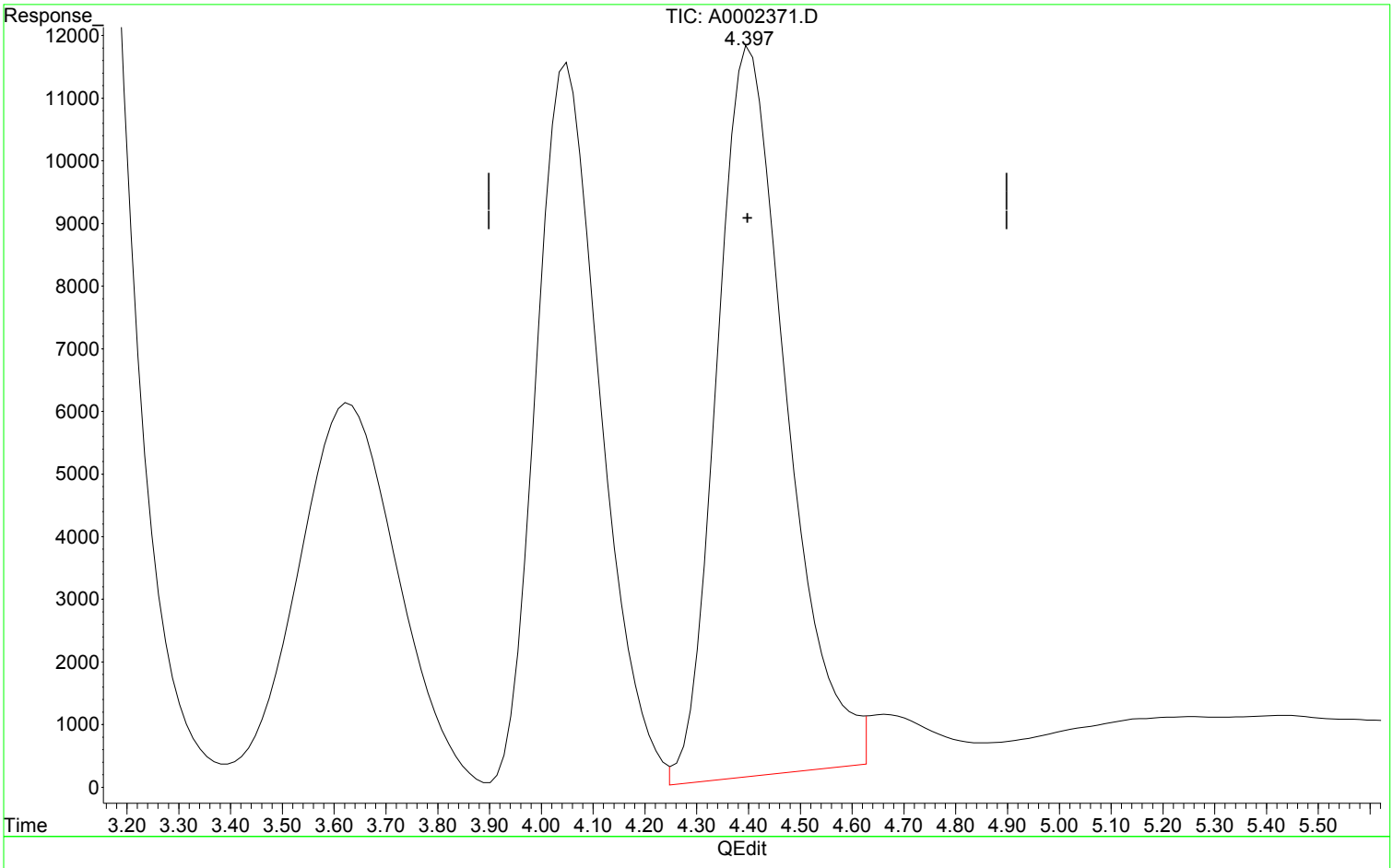
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 18.525 ppm m

response 1096677

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	942238	10.005	ppm	
2) T	Pyruvic acid	3.631	448113	0.996	ppm	
3) T	Lactic Acid	4.053	528635	9.991	ppm	
4) T	Acetic Acid	4.399	585881	9.897	ppm	m
5) T	Propionic Acid	9.226	585985	9.937	ppm	
6) T	Butyric Acid	25.010	602088	9.966	ppm	

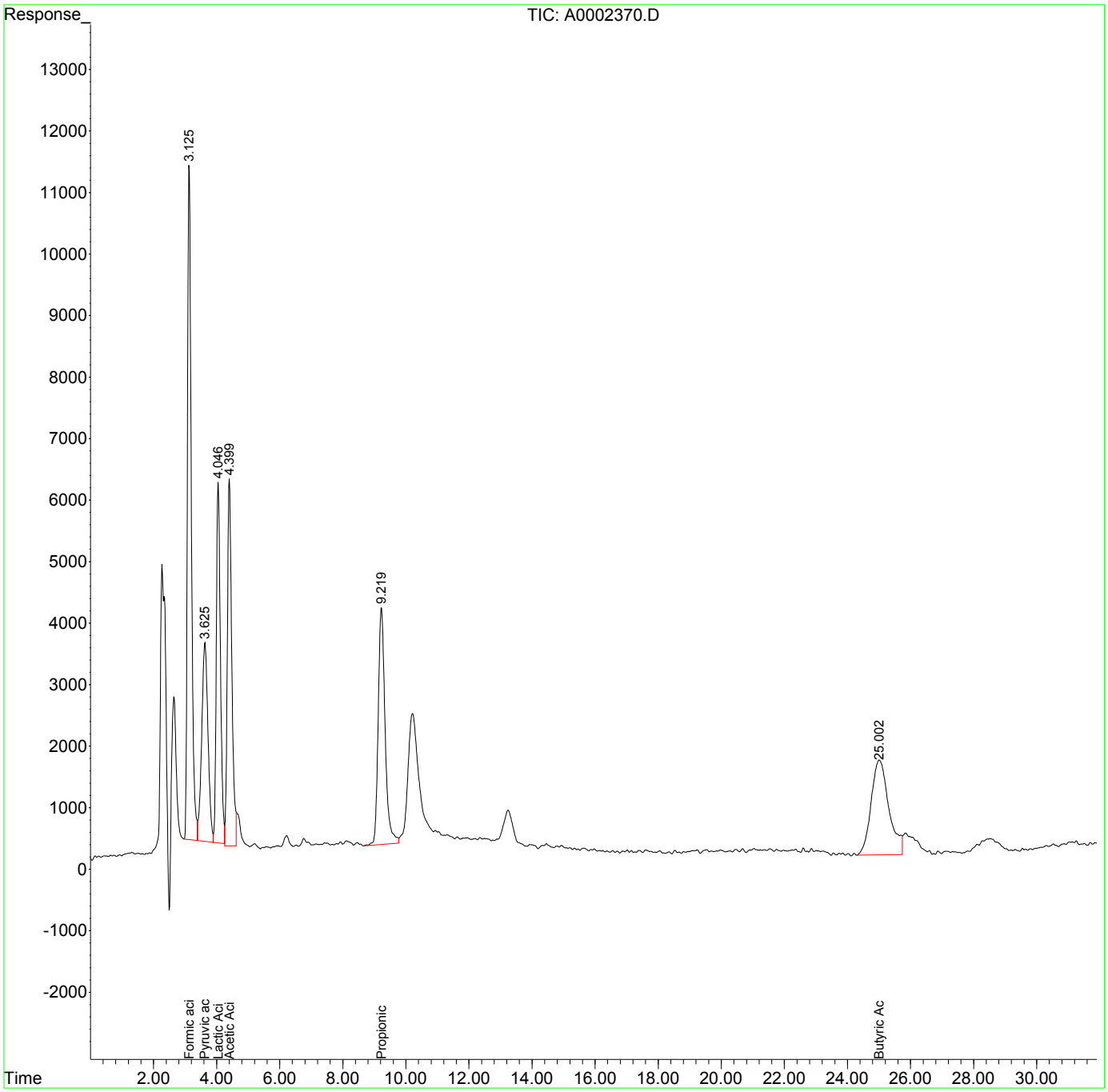
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



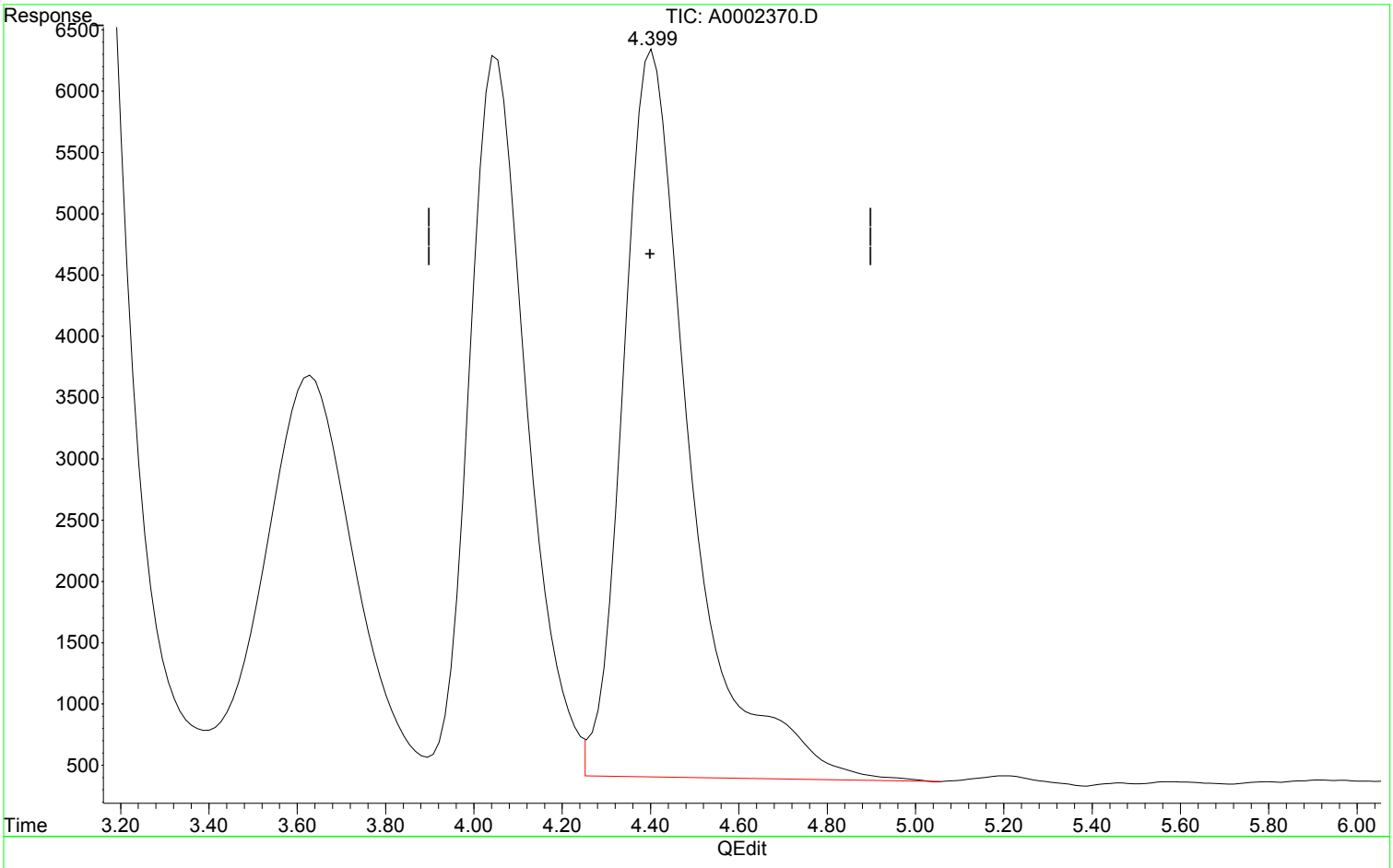
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 10.646 ppm

response 630261

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

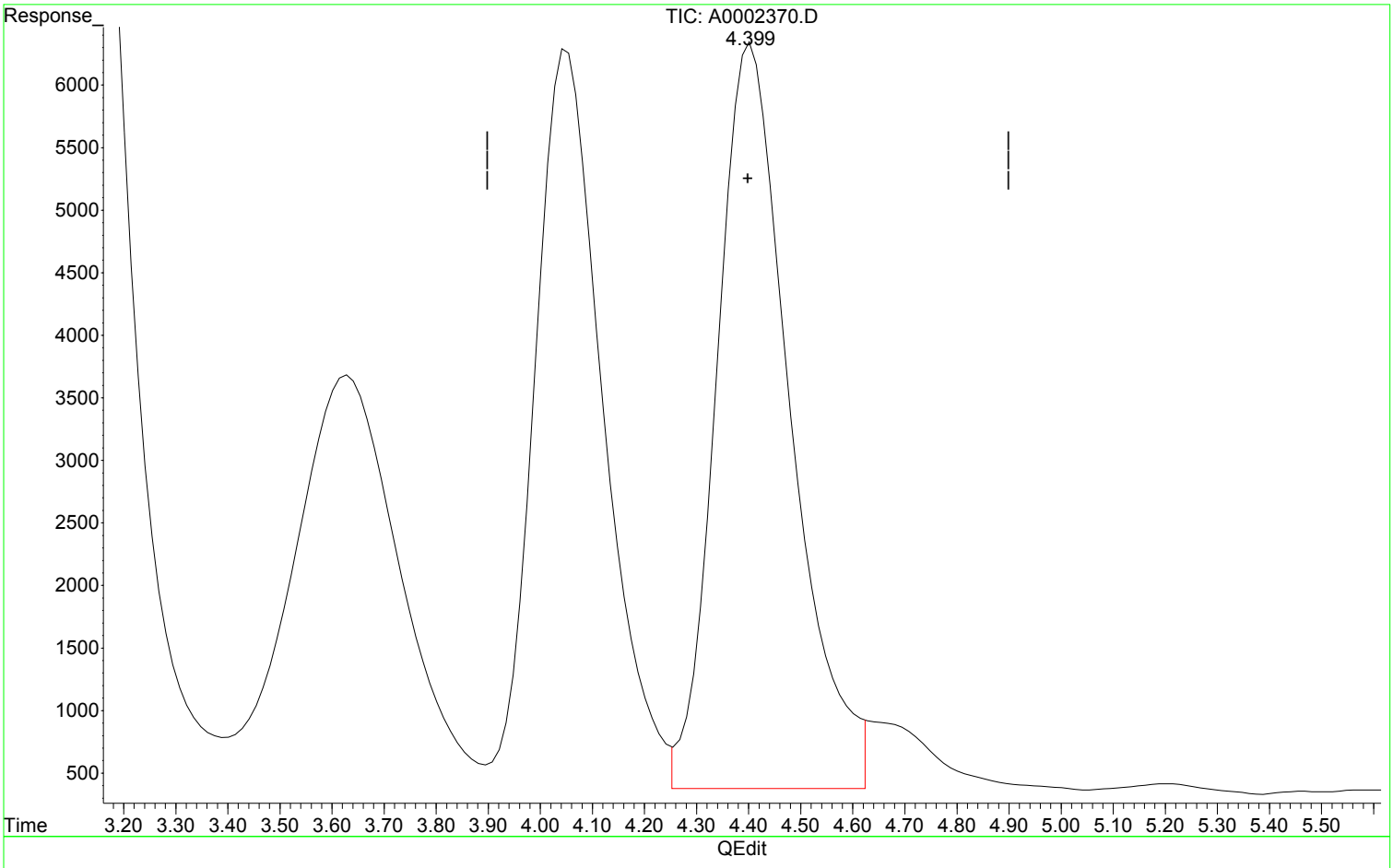
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 9.897 ppm m

response 585881

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	497049	5.278	ppm	
2) T	Pyruvic acid	3.631	227620	0.506	ppm	
3) T	Lactic Acid	4.053	269401	5.092	ppm	
4) T	Acetic Acid	4.399	309471	5.228	ppm	m
5) T	Propionic Acid	9.220	306395	5.196	ppm	m
6) T	Butyric Acid	25.001	310758	5.144	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

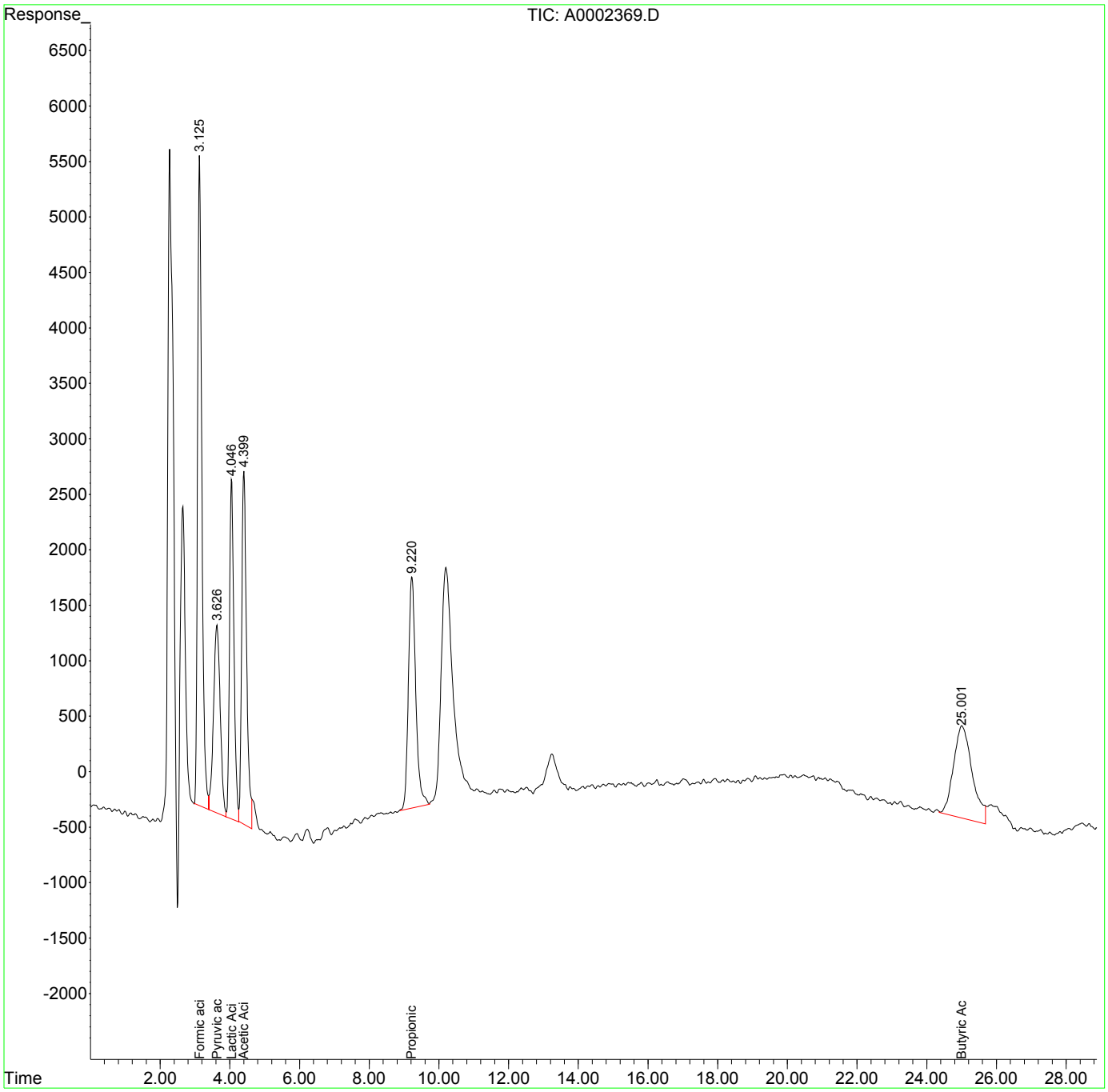
Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



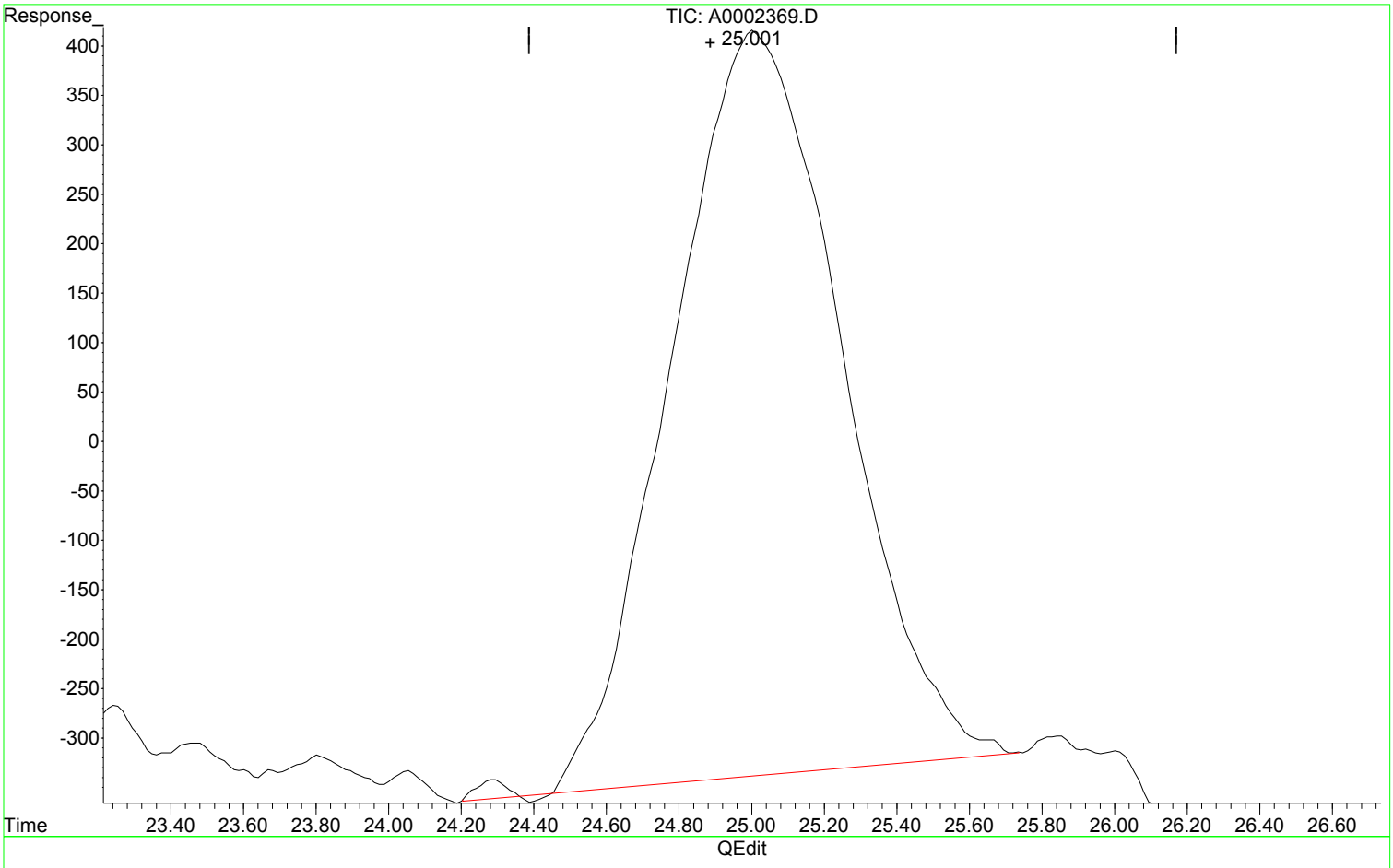
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.009min 4.071 ppm

response 245954

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

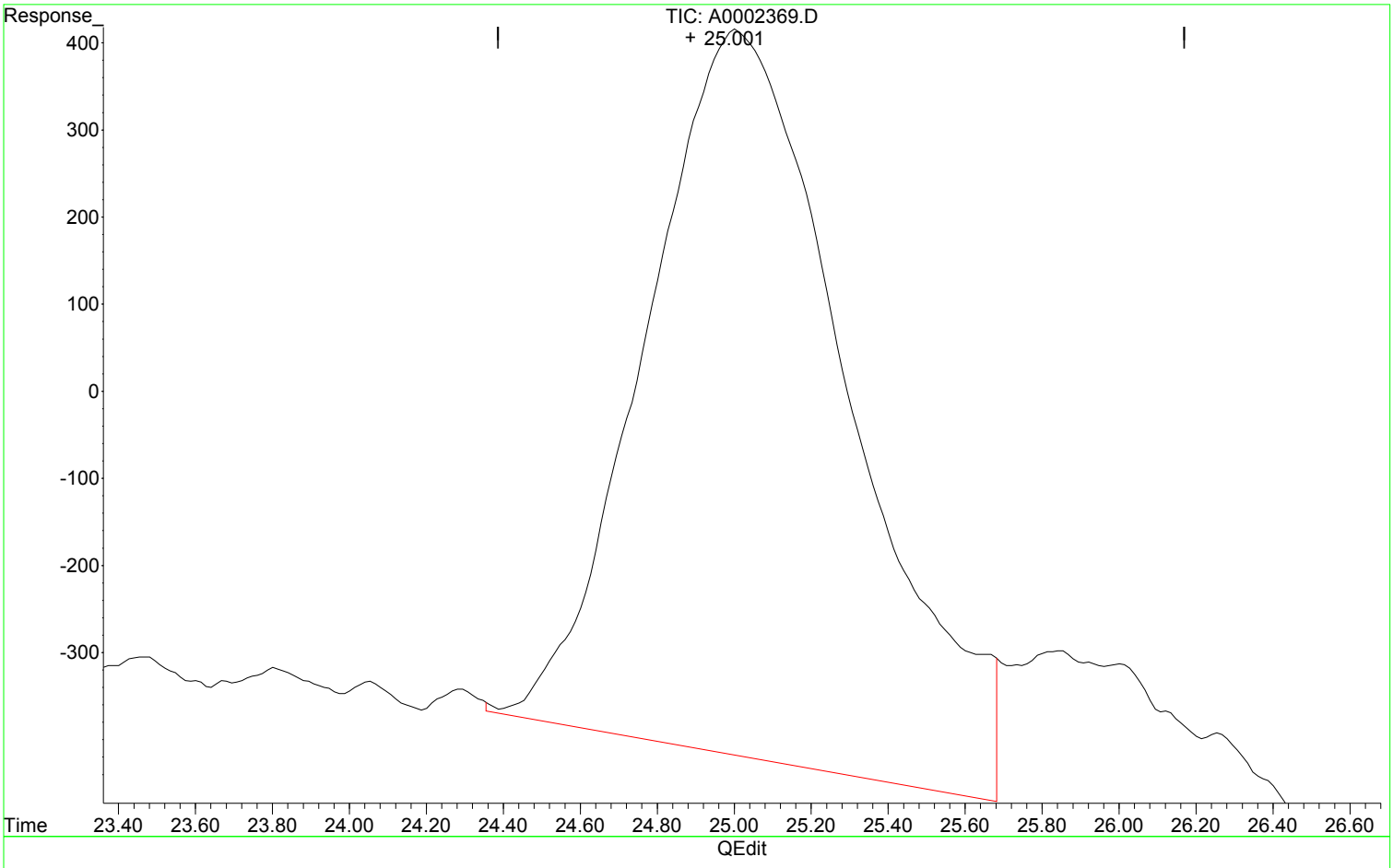
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.001min 5.144 ppm m

response 310758

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

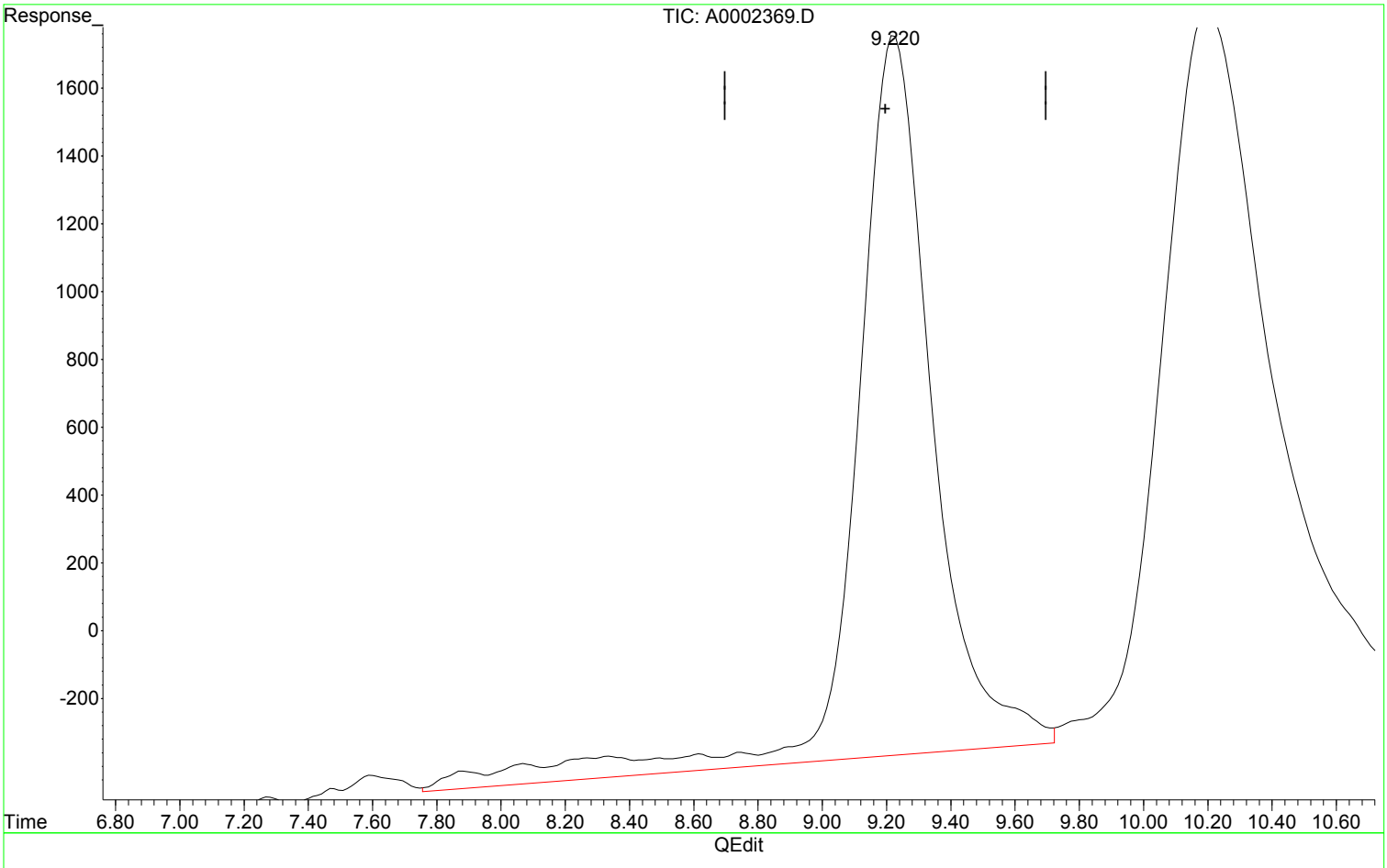
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 6.027 ppm

response 355419

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

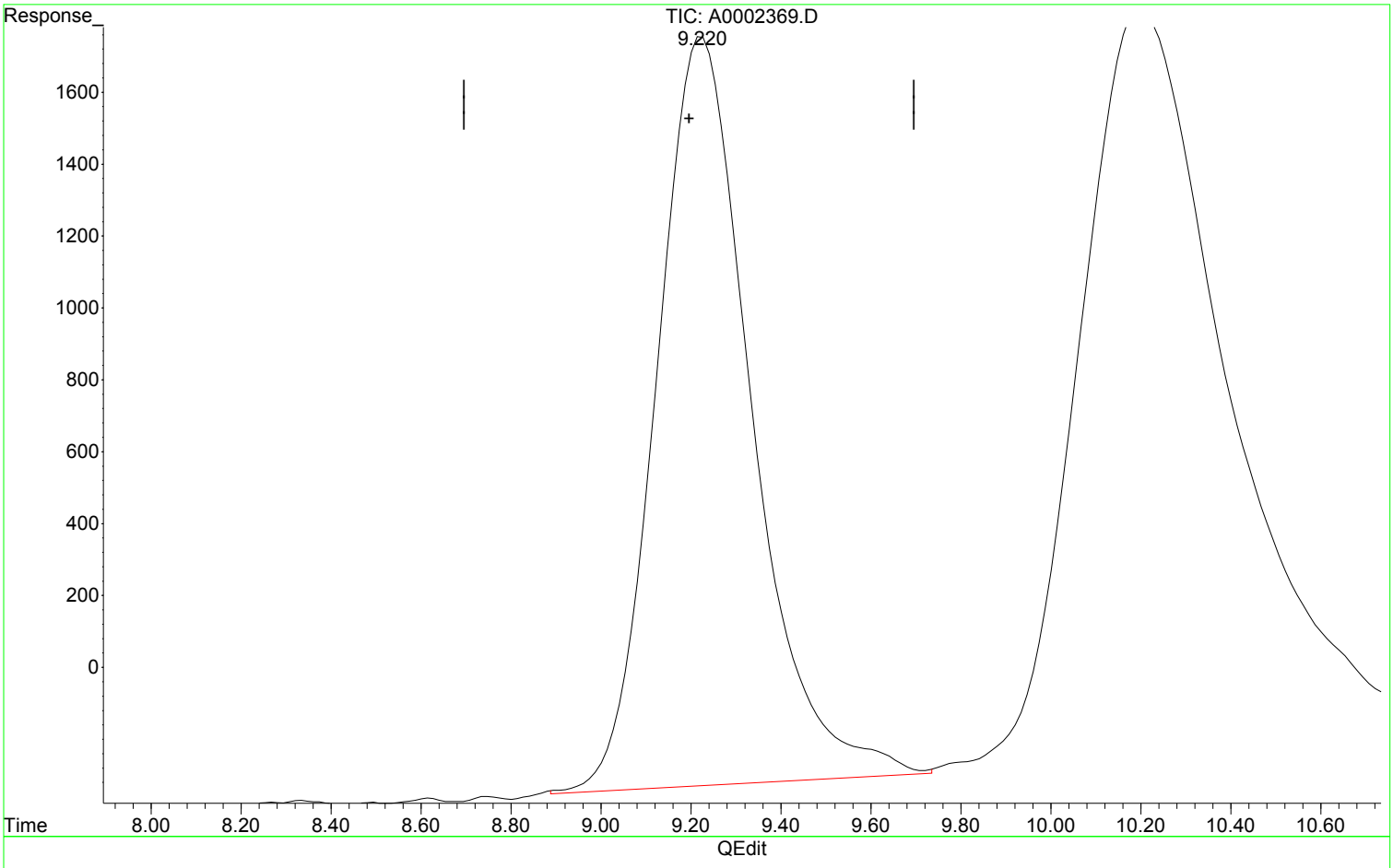
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.220min 5.196 ppm m

response 306395

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

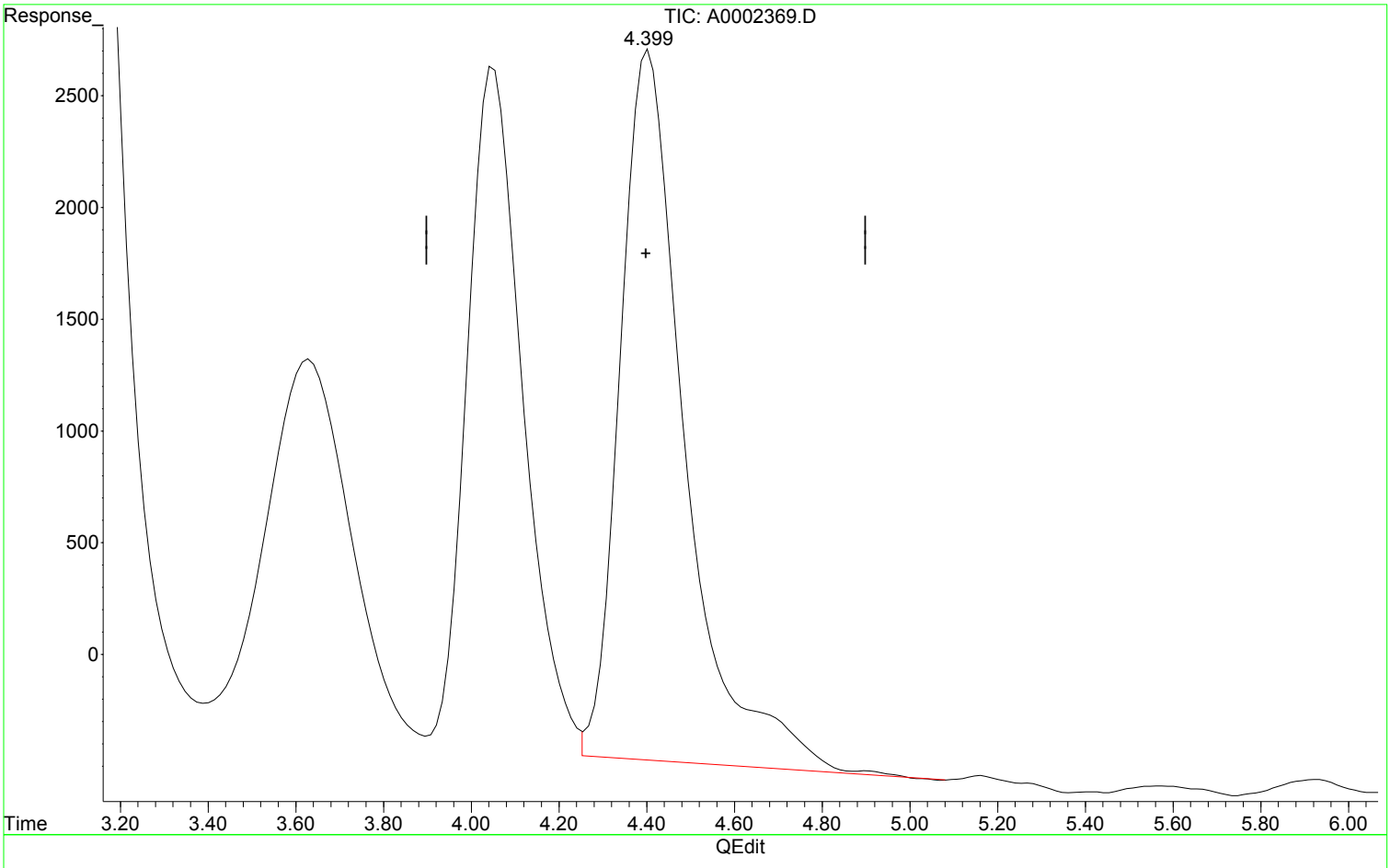
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd [illegible] 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 5.542 ppm

response 328094

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

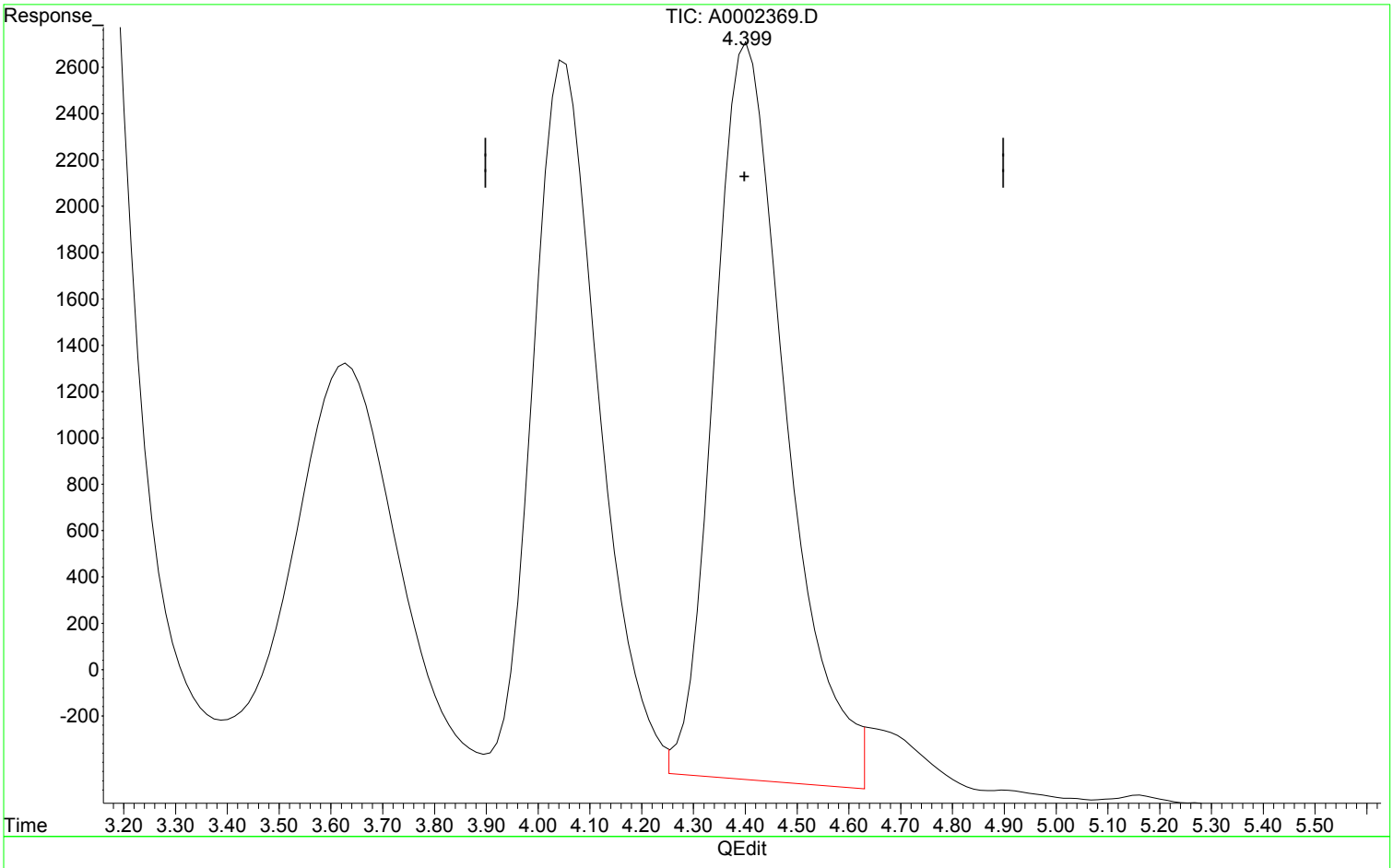
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 5.228 ppm m

response 309471

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

1st BA 10/05/18
2nd MLP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	197324	2.095	ppm	
2) T	Pyruvic acid	3.628	94203	0.209	ppm	
3) T	Lactic Acid	4.053	108314	2.047	ppm	
4) T	Acetic Acid	4.399	121343	2.050	ppm	m
5) T	Propionic Acid	9.219	118189	2.004	ppm	m
6) T	Butyric Acid	24.985	143852	2.381	ppm	m

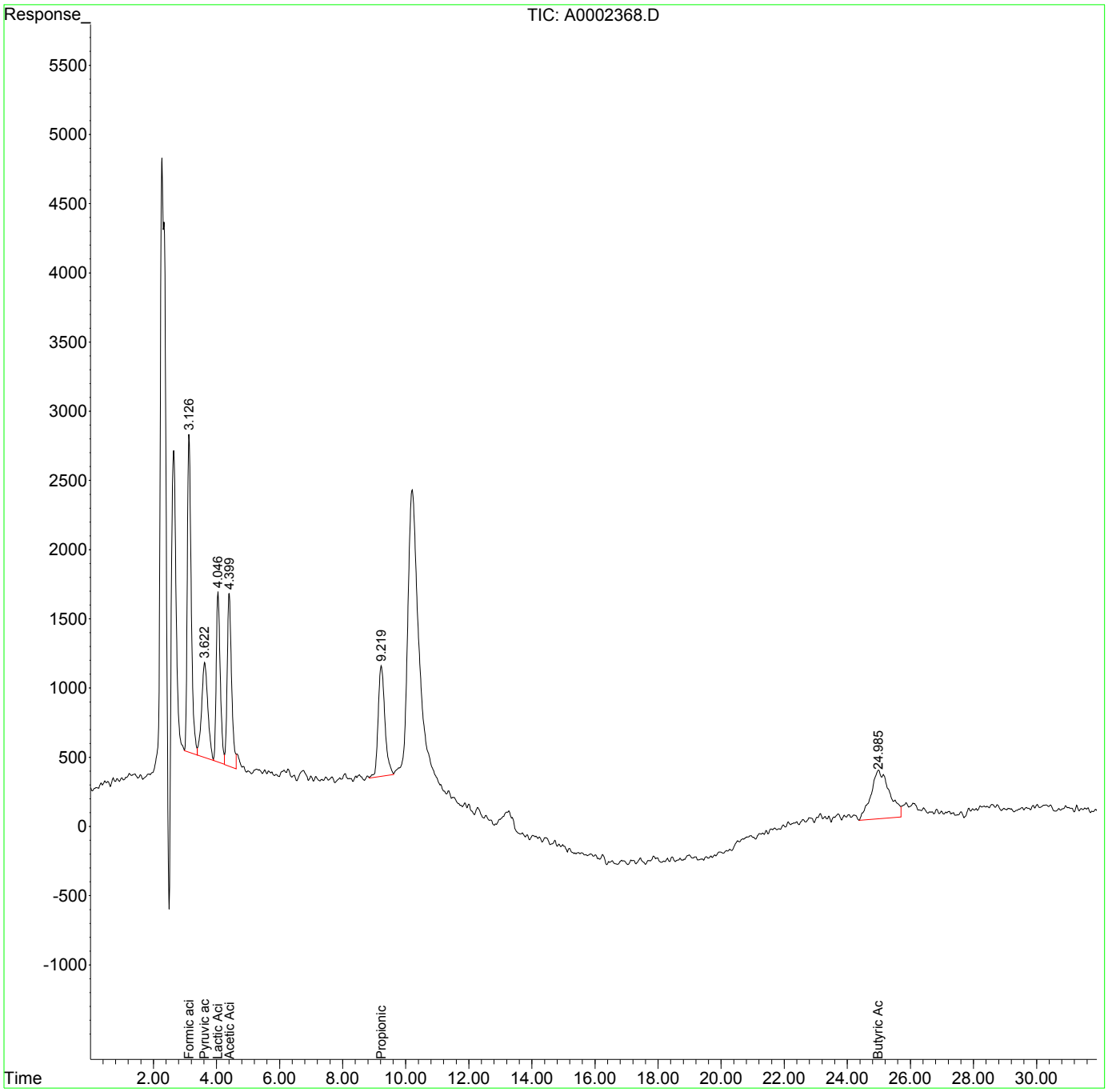
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



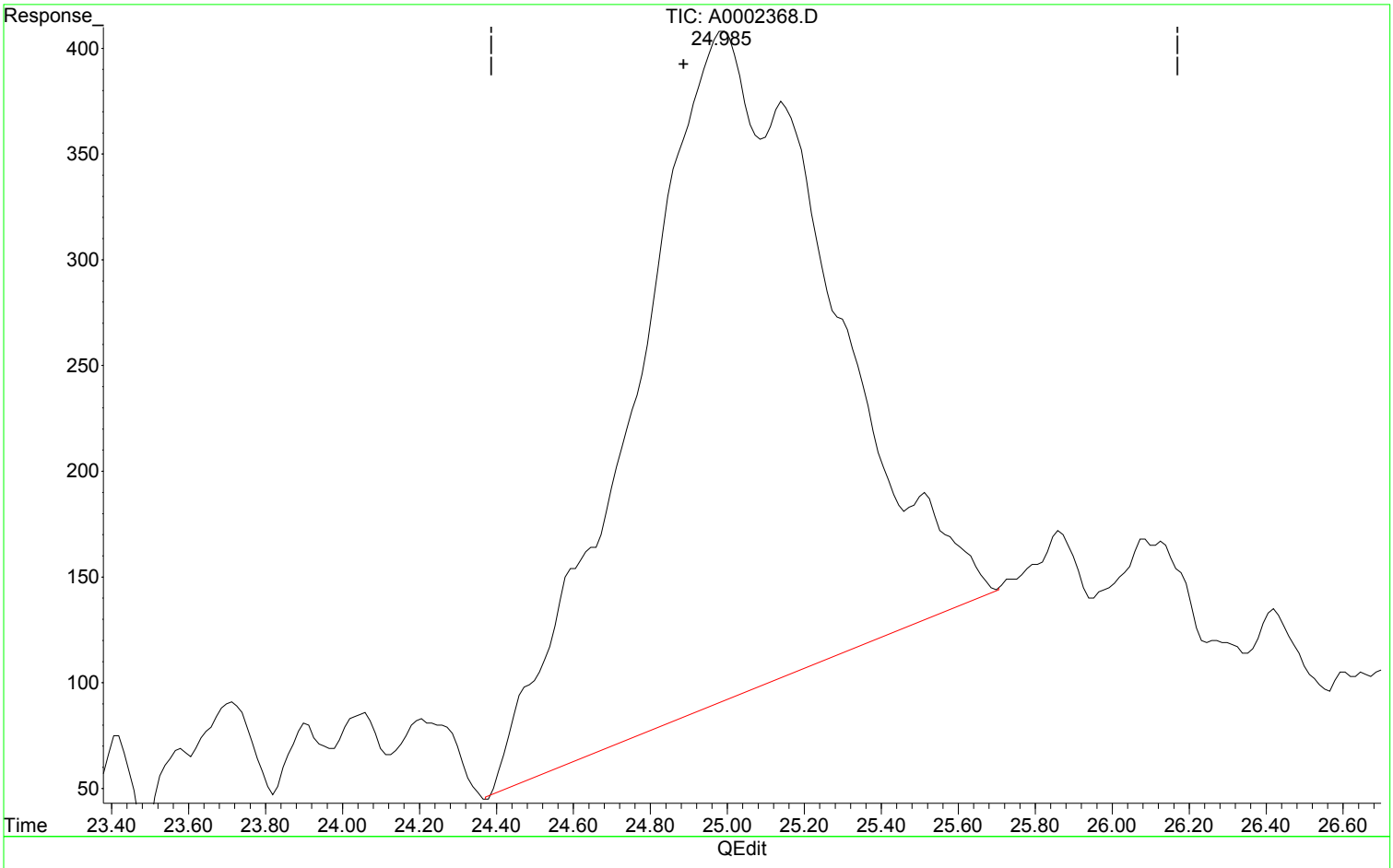
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.991min 1.857 ppm

response 112205

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

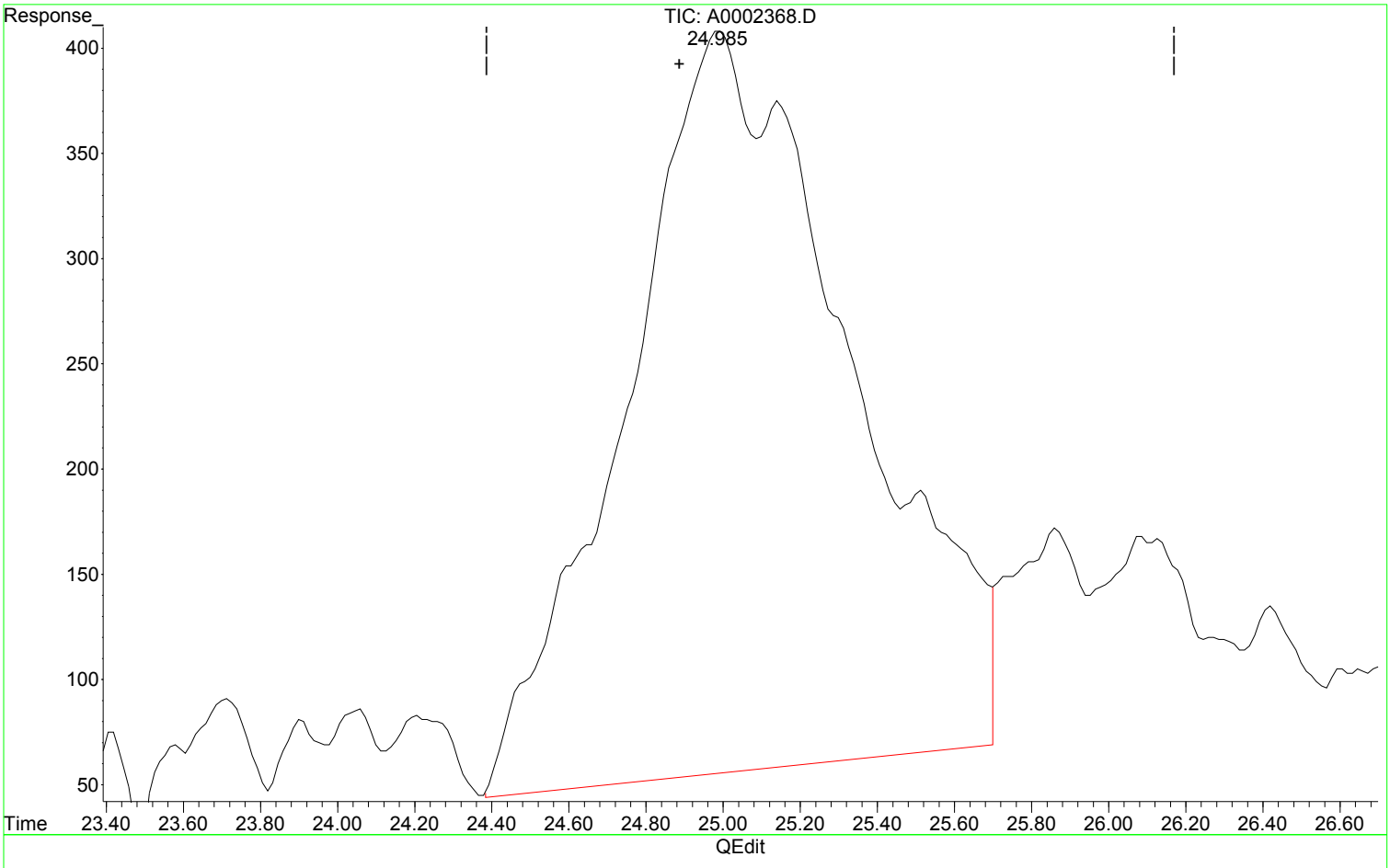
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.985min 2.381 ppm m

response 143852

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

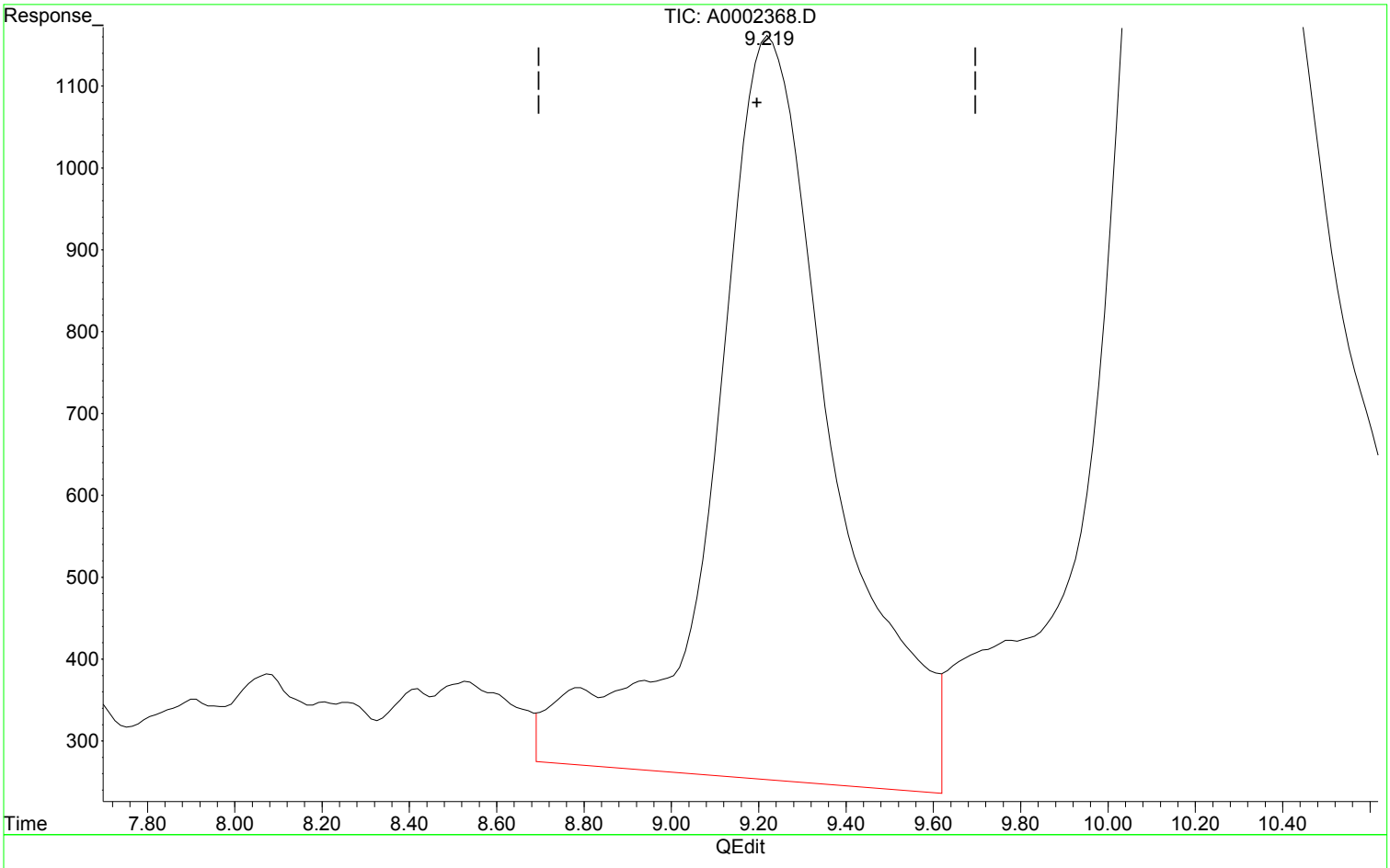
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 3.005 ppm

response 177221

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

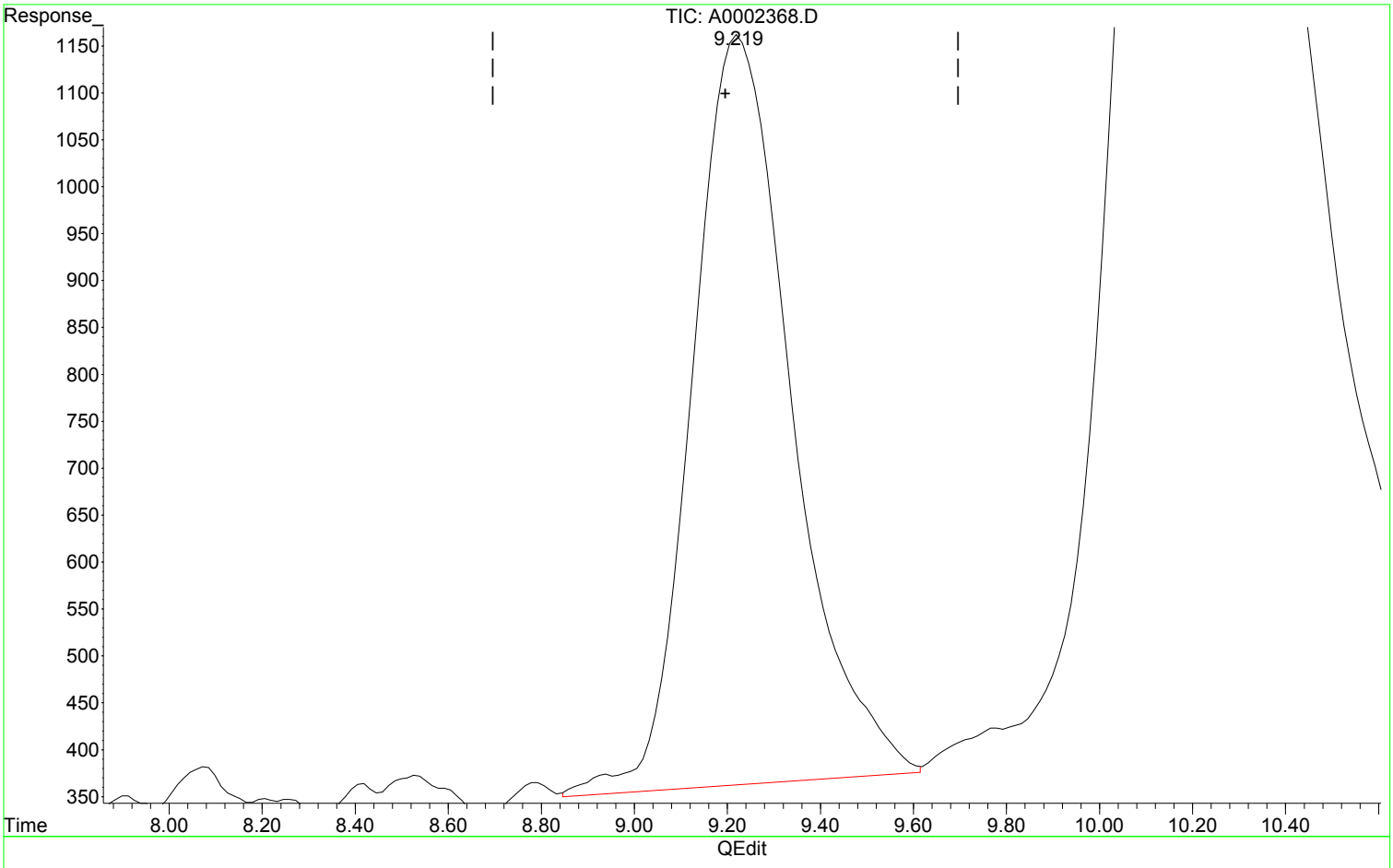
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.219min 2.004 ppm m

response 118189

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

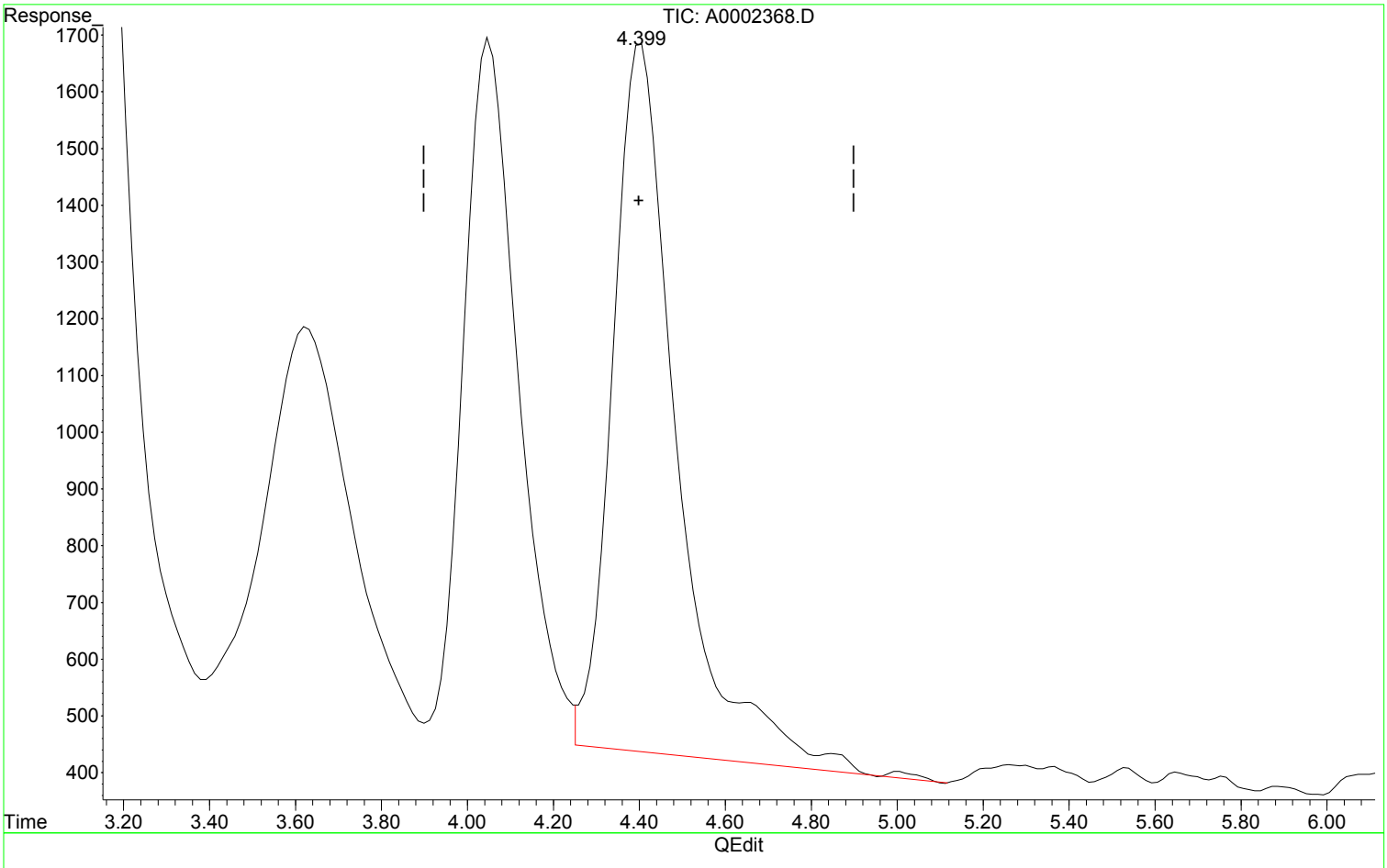
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 2.212 ppm

response 130945

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

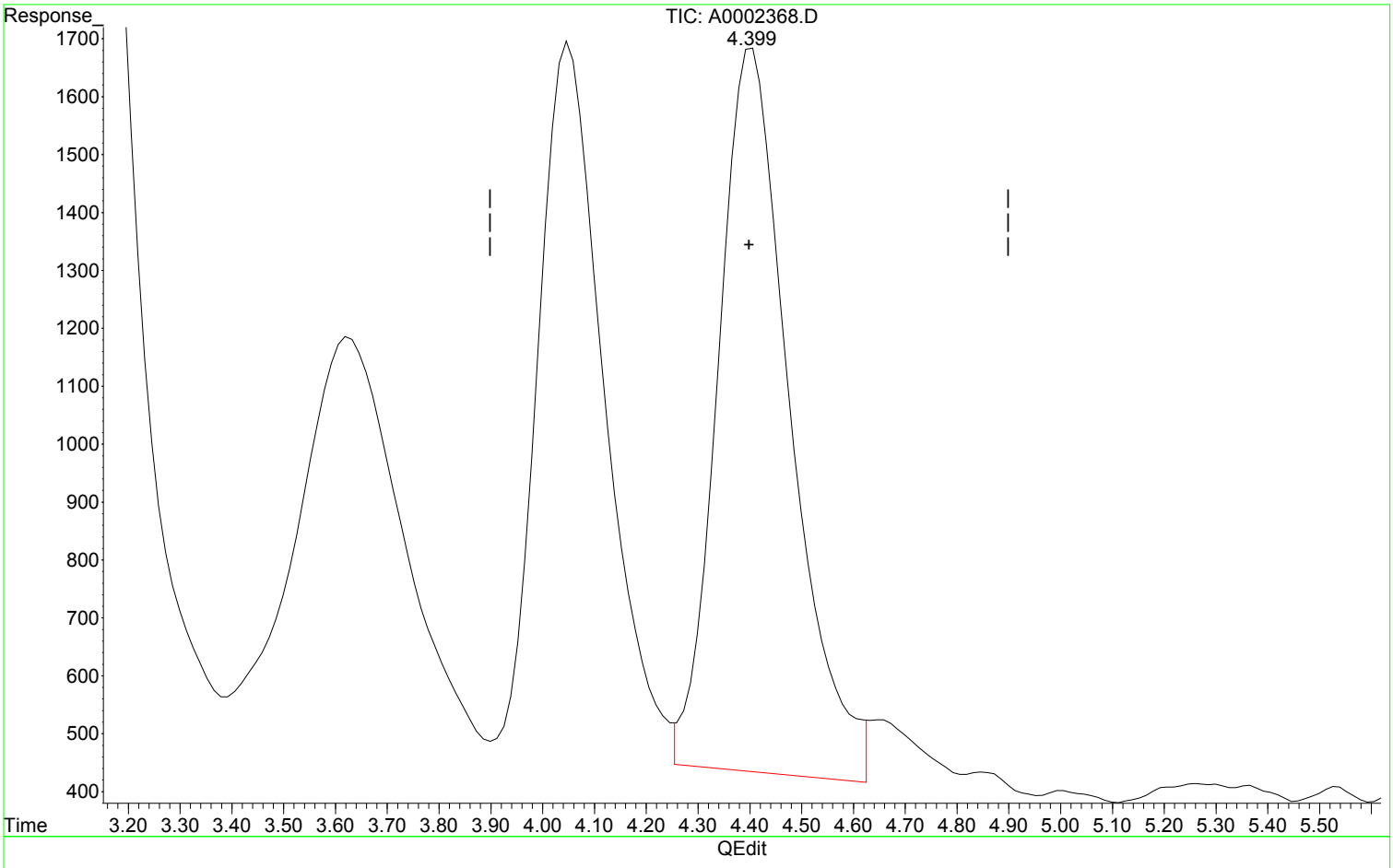
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 2.050 ppm m

response 121343

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	101923	1.082	ppm	
2) T	Pyruvic acid	3.631	46367	0.103	ppm	
3) T	Lactic Acid	4.052	58945	1.114	ppm	
4) T	Acetic Acid	4.404	60257	1.018	ppm	
5) T	Propionic Acid	9.215	69400	1.177	ppm	m
6) T	Butyric Acid	24.964	74253	1.229	ppm	m

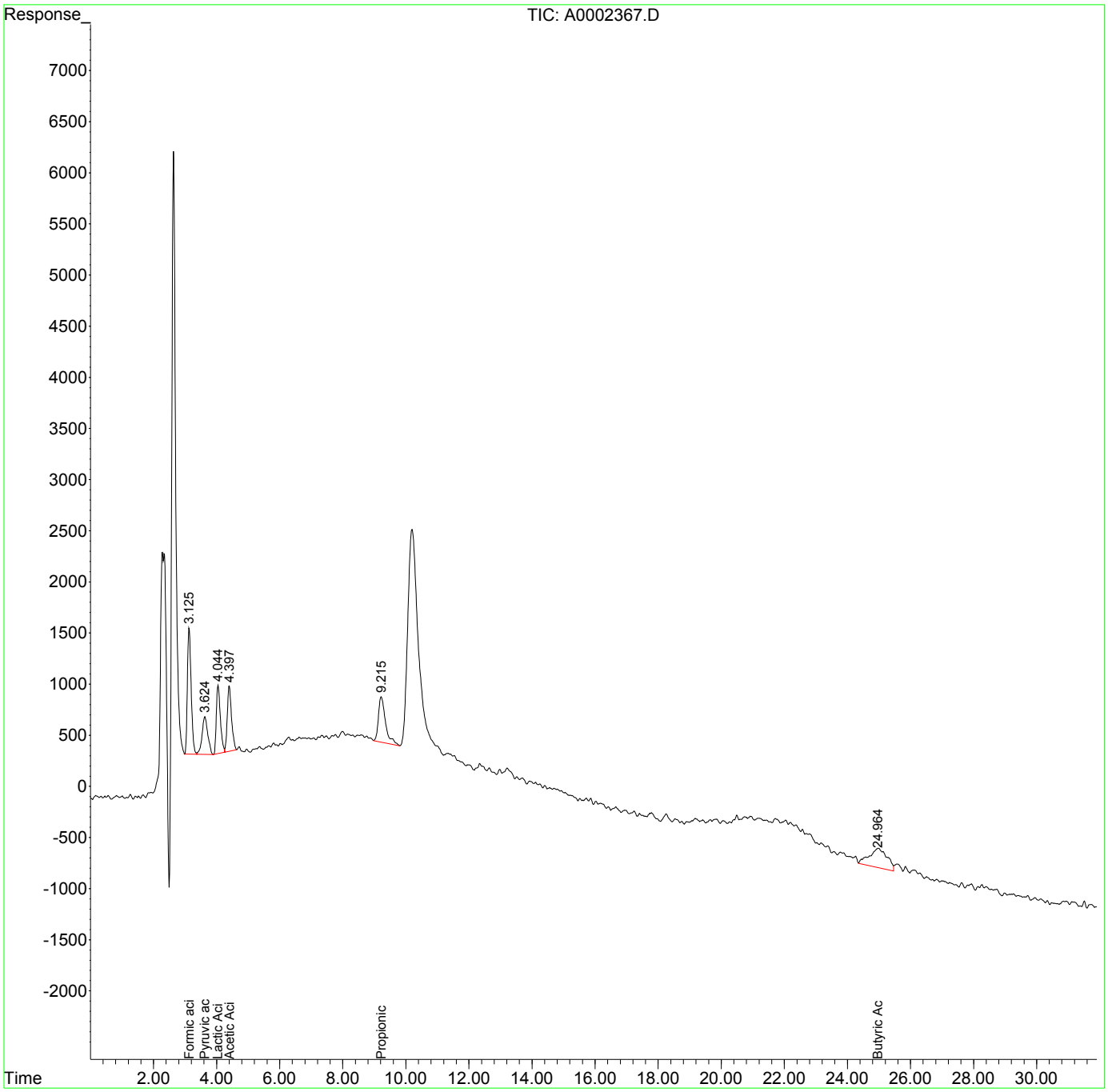
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

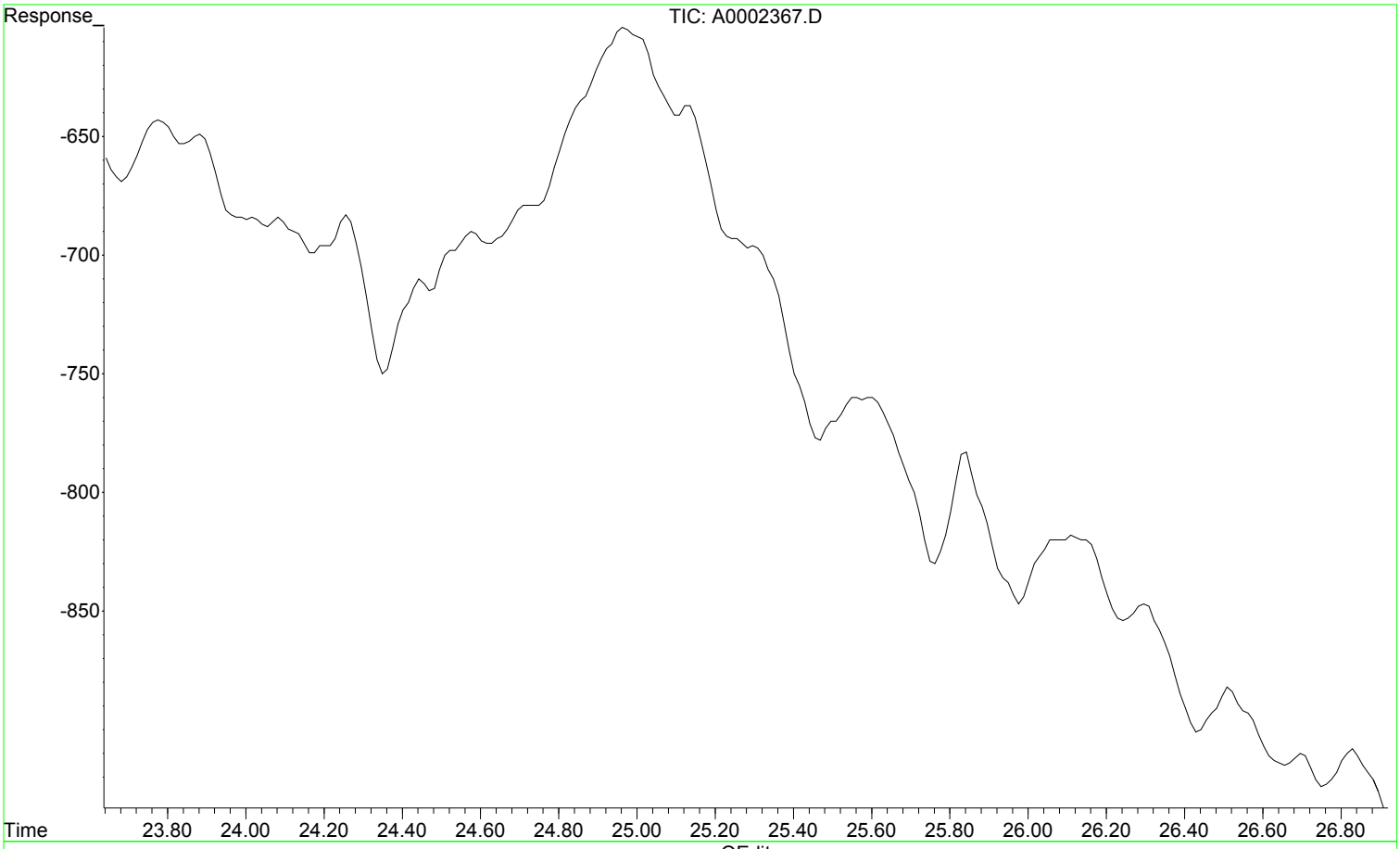


Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

1st BA 10/05/18
2nd MLP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.887min 0.000 ppm

response 0

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

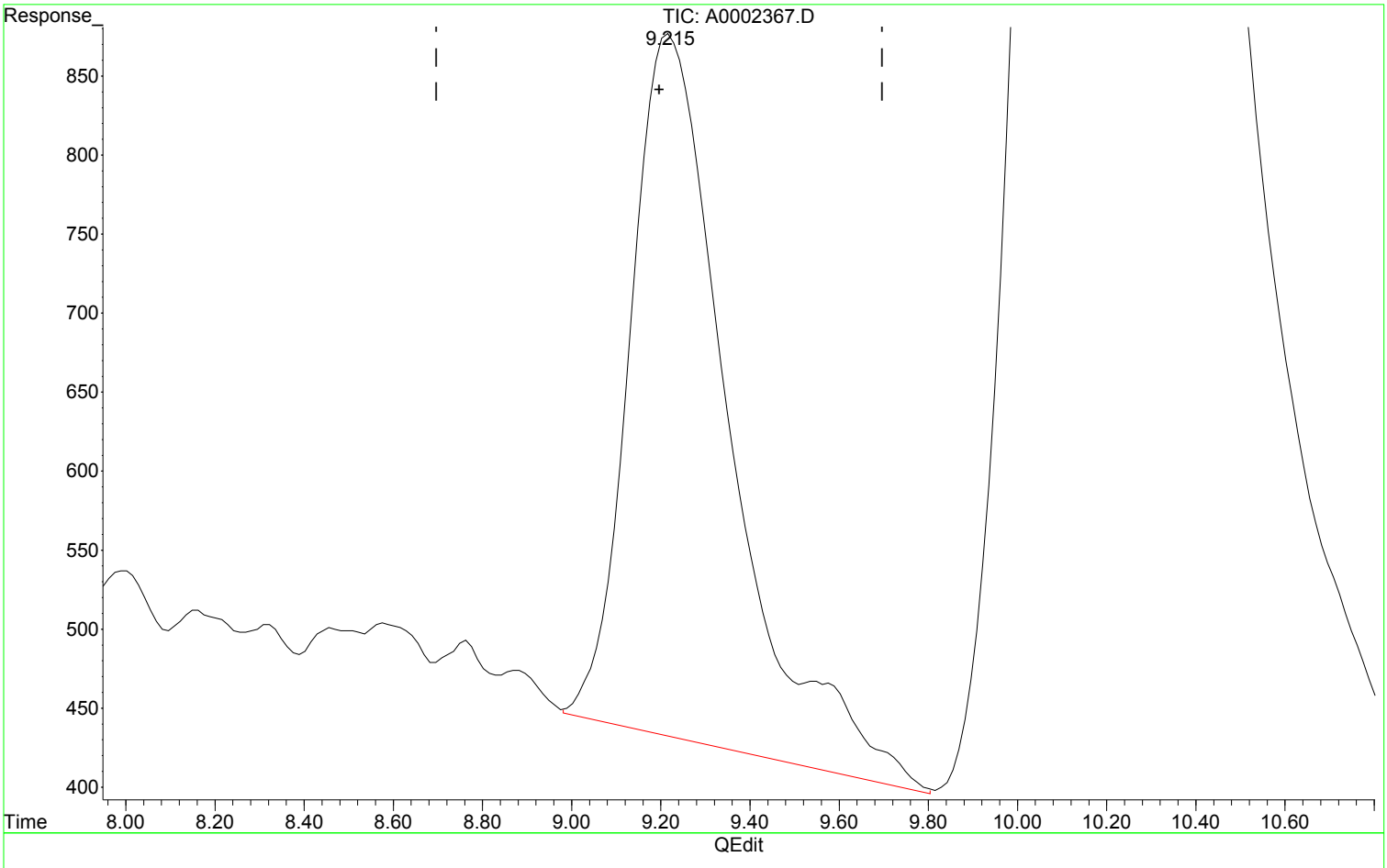
Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

1st BA 10/05/18
2nd MP 10/09/18

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.215min 1.177 ppm m

response 69400

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	3.655	25630	0.057	ppm	m
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	0.000	0	N.D.	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

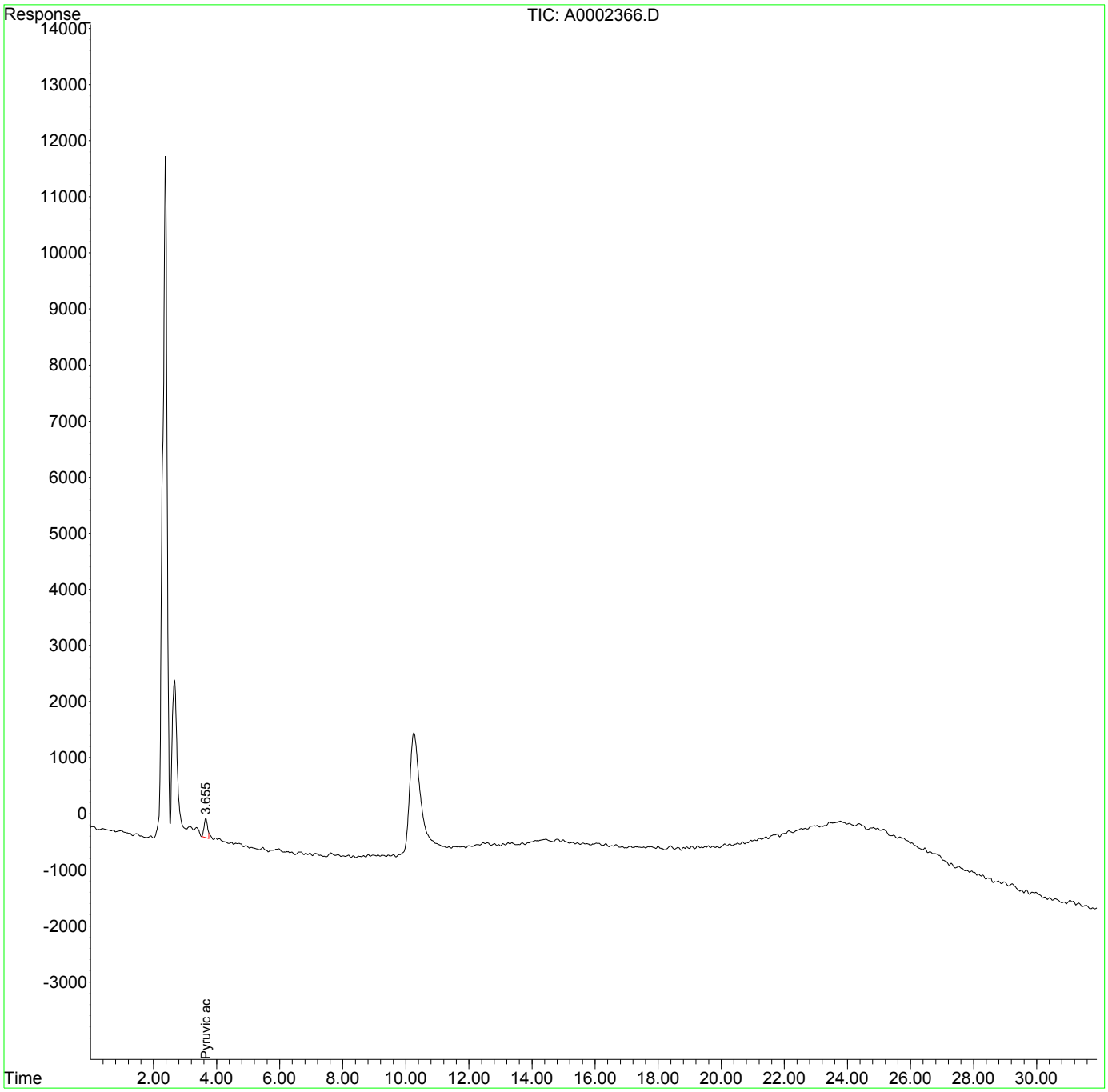
Quantitation Report (QT Reviewed)

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809340
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

#	Lab Code	Sample Name	File Location	Acquisition Date
01	RC1800114-01	0.1-1.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002367.D	10/04/2018 12:01
02	RC1800114-02	0.2-2.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002368.D	10/04/2018 12:32
03	RC1800114-03	0.5-5.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002369.D	10/04/2018 13:04
04	RC1800114-04	1.0-10.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002370.D	10/04/2018 13:36
05	RC1800114-05	2.0-20.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002371.D	10/04/2018 14:21
06	RC1800114-06	5.0-50.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002372.D	10/04/2018 14:56
07	RC1800114-07	10.0-100.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002373.D	10/04/2018 15:31
08	RC1800114-08	20.0-200.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002374.D	10/04/2018 16:03

Analyte

Acetic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.026E4	02	2.000	6.067E4	03	5.000	6.189E4	04	10.000	5.859E4
05	20.000	5.483E4	06	50.000	6.053E4	07	100.000	5.725E4	08	200.000	5.933E4

Butanoic Acid (Butyric Acid)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	7.425E4	02	2.000	7.193E4	03	5.000	6.215E4	04	10.000	6.021E4
05	20.000	6.035E4	06	50.000	5.865E4	07	100.000	5.511E4	08	200.000	6.053E4

Lactic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	5.895E4	02	2.000	5.416E4	03	5.000	5.388E4	04	10.000	5.286E4
05	20.000	5.017E4	06	50.000	5.423E4	07	100.000	5.216E4	08	200.000	5.371E4

Propionic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.94E4	02	2.000	5.909E4	03	5.000	6.128E4	04	10.000	5.86E4
05	20.000	5.703E4	06	50.000	5.9E4	07	100.000	5.508E4	08	200.000	5.726E4

Pyruvic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.100	4.637E5	02	0.200	4.71E5	03	0.500	4.552E5	04	1.000	4.481E5
05	2.000	4.25E5	06	5.000	4.588E5	07	10.000	4.43E5	08	20.000	4.585E5

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809340
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

		Calibration Evaluation				Calibration Evaluation	
Analyte Name	Compound Type	Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
Acetic Acid	TRG	Average RF	% RSD	3.8	≤	5.917E4	
Butanoic Acid (Butyric Acid)	TRG	Average RF	% RSD	10.6	≤	6.29E4	
Lactic Acid	TRG	Average RF	% RSD	4.6	≤	5.376E4	
Propionic Acid	TRG	Average RF	% RSD	7.3	≤	5.959E4	
Pyruvic Acid	TRG	Average RF	% RSD	3.1	≤	4.529E5	

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809340
Calibration Date: 10/4/2018

Initial Calibration Verification Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

#	Lab Code	Sample Name	File Location	Acquisition Date
09	RC1800114-09	icv	I:\ACQUDATA\hplc05\data\100418\A0002375.D	10/04/2018 16:35

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
Pyruvic Acid	2.00	3.00	4.529E5	6.787E5	150*	85-115	Average RF
Acetic Acid	20.0	20.6	5.917E4	6.092E4	103	85-115	Average RF
Butanoic Acid (Butyric Acid)	20.0	18.1	6.29E4	5.694E4	90.5	85-115	Average RF
Lactic Acid	20.0	20.2	5.376E4	5.434E4	101	85-115	Average RF
Propionic Acid	20.0	19.2	5.959E4	5.733E4	96.0	85-115	Average RF

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Analyzed:**	10/04/18 17:16

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method:	Organic Acids	**Calibration Date:**	10/4/2018
File ID:	I:\ACQUDATA\hplc05\data\100418\A0002376.D\	**Calibration ID:**	RC1800114
Signal ID:	synergi hydro rp	**Analysis Lot:**	609639
		Units:	mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.11	4.529E5	4.608E5	1.7	NA	±15	Average RF
Acetic Acid	50.1	51.7	5.917E4	6.1E4	3.1	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	45.9	6.29E4	5.677E4	-9.7	NA	±15	Average RF
Lactic Acid	49.8	51.2	5.376E4	5.528E4	2.8	NA	±15	Average RF
Propionic Acid	50.3	49.3	5.959E4	5.839E4	-2.0	NA	±15	Average RF

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Analyzed:**	10/04/18 23:40

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method:	Organic Acids	**Calibration Date:**	10/4/2018
File ID:	I:\ACQUDATA\hplc05\data\100418\A0002387.D\	**Calibration ID:**	RC1800114
Signal ID:	synergi hydro rp	**Analysis Lot:**	609639
		Units:	mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.08	4.529E5	4.579E5	1.1	NA	±15	Average RF
Acetic Acid	50.1	52.3	5.917E4	6.17E4	4.3	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.7	6.29E4	5.78E4	-8.1	NA	±15	Average RF
Lactic Acid	49.8	51.3	5.376E4	5.543E4	3.1	NA	±15	Average RF
Propionic Acid	50.3	49.3	5.959E4	5.838E4	-2.0	NA	±15	Average RF

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Analyzed:**	10/05/18 01:25

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method:	Organic Acids	**Calibration Date:**	10/4/2018
File ID:	I:\ACQUDATA\hplc05\data\100418\A0002390.D\	**Calibration ID:**	RC1800114
Signal ID:	synergi hydro rp	**Analysis Lot:**	609639
		Units:	mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.66	4.529E5	4.201E5	-7.2	NA	±15	Average RF
Acetic Acid	50.1	49.8	5.917E4	5.88E4	-0.6	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.0	6.29E4	5.689E4	-9.6	NA	±15	Average RF
Lactic Acid	49.8	49.3	5.376E4	5.327E4	-0.9	NA	±15	Average RF
Propionic Acid	50.3	49.2	5.959E4	5.823E4	-2.3	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1809340
Date Analyzed: 10/05/18 10:29

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\100518\A0002392.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 609806
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.01	4.529E5	4.514E5	-0.3	NA	±15	Average RF
Acetic Acid	50.1	51.2	5.917E4	6.044E4	2.2	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.7	6.29E4	5.78E4	-8.1	NA	±15	Average RF
Lactic Acid	49.8	50.2	5.376E4	5.429E4	1.0	NA	±15	Average RF
Propionic Acid	50.3	48.8	5.959E4	5.778E4	-3.0	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1809340
Date Analyzed: 10/05/18 15:09

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\100518\A0002400.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 609806
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.04	4.529E5	4.543E5	0.3	NA	±15	Average RF
Acetic Acid	50.1	50.8	5.917E4	6.004E4	1.5	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.5	6.29E4	5.757E4	-8.5	NA	±15	Average RF
Lactic Acid	49.8	50.5	5.376E4	5.46E4	1.6	NA	±15	Average RF
Propionic Acid	50.3	48.1	5.959E4	5.691E4	-4.5	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1809340
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids **Analysis Lot:**609639
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\100418 \A0002385.D\	LHSMW07_092618	R1809340-004	12/29/2000	23:10:21	
I:\ACQUDATA\hplc05\data\100418 \A0002379.D\	Duplicate Lab Control Sample	RQ1810603-06	12/29/2000	23:47:53	
I:\ACQUDATA\hplc05\data\100418 \A0002384.D\	35AWW20_092618_a	R1809340-003	12/30/2000	16:48:23	
I:\ACQUDATA\hplc05\data\100418 \A0002376.D\	Continuing Calibration Verification	RQ1810603-01	10/4/2018	17:16:44	
I:\ACQUDATA\hplc05\data\100418 \A0002377.D\	Method Blank	RQ1810603-04	10/4/2018	17:51:39	
I:\ACQUDATA\hplc05\data\100418 \A0002378.D\	Lab Control Sample	RQ1810603-05	10/4/2018	18:26:33	
I:\ACQUDATA\hplc05\data\100418 \A0002379.D\	Duplicate Lab Control Sample	RQ1810603-06	10/4/2018	19:00:00	
I:\ACQUDATA\hplc05\data\100418 \A0002383.D\	35AWW20_092618	R1809340-002	10/4/2018	21:21:05	
I:\ACQUDATA\hplc05\data\100418 \A0002384.D\	35AWW20_092618_a	R1809340-003	10/4/2018	21:53:00	
I:\ACQUDATA\hplc05\data\100418 \A0002385.D\	LHSMW07_092618	R1809340-004	10/4/2018	22:25:00	
I:\ACQUDATA\hplc05\data\100418 \A0002386.D\	ZZZZZZZ	ZZZZZZZ	10/4/2018	23:05:51	
I:\ACQUDATA\hplc05\data\100418 \A0002387.D\	Continuing Calibration Verification	RQ1810603-02	10/4/2018	23:40:52	
I:\ACQUDATA\hplc05\data\100418 \A0002388.D\	ZZZZZZZ	ZZZZZZZ	10/5/2018	00:15:52	
I:\ACQUDATA\hplc05\data\100418 \A0002390.D\	Continuing Calibration Verification	RQ1810603-03	10/5/2018	01:25:46	

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1809340
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids **Analysis Lot:**609806
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\100518 \A0002395.D\	Duplicate Lab Control Sample	RQ1810656-05	12/29/2000	23:18:07	
I:\ACQUDATA\hplc05\data\100518 \A0002399.D\	ZZZZZZZ	ZZZZZZZ	12/31/2000	02:47:48	
I:\ACQUDATA\hplc05\data\100518 \A0002392.D\	Continuing Calibration Verification	RQ1810656-01	10/5/2018	10:29:40	
I:\ACQUDATA\hplc05\data\100518 \A0002393.D\	Method Blank	RQ1810656-03	10/5/2018	11:04:39	
I:\ACQUDATA\hplc05\data\100518 \A0002394.D\	Lab Control Sample	RQ1810656-04	10/5/2018	11:39:38	
I:\ACQUDATA\hplc05\data\100518 \A0002395.D\	Duplicate Lab Control Sample	RQ1810656-05	10/5/2018	12:02:00	
I:\ACQUDATA\hplc05\data\100518 \A0002396.D\	35AWW06_092618	R1809340-001	10/5/2018	12:49:31	
I:\ACQUDATA\hplc05\data\100518 \A0002397.D\	35AWW06_092618 MS	RQ1810656-06	10/5/2018	13:24:22	
I:\ACQUDATA\hplc05\data\100518 \A0002398.D\	35AWW06_092618 DMS	RQ1810656-07	10/5/2018	13:59:20	
I:\ACQUDATA\hplc05\data\100518 \A0002399.D\	ZZZZZZZ	ZZZZZZZ	10/5/2018	14:30:00	
I:\ACQUDATA\hplc05\data\100518 \A0002400.D\	Continuing Calibration Verification	RQ1810656-02	10/5/2018	15:09:20	

Analysis: 10/5/18 Analyst: BA Run Method: NEWMETA

Date: Organic Acids Instr. HPLC-05 Quant Method: MA100918

LIMS Run#: 609806

Setup: Column: Synergi Hydro RP 150x4.6 Col.Temp: 35 Flow: 0.6 ml/min

Mobile Phase: 0.02KH2PO4 prep 0.1PO4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	BLK			A0002391	—	
	CCV	1000/1ml	193753	92	YC	
	MET BLK			93	Y	
	LCS	1000/1ml	193754	94	Y	PYRUVIC ↓
	DLCS	↓	↓	95	Y	↓
	R1809340-001	10.0		96	Y	
	-001	10.0mg	1000/1ml 193754	97	Y	
	-001	10.0mS0	↓ ↓	98	Y	
	R1809393-003			99	Y	
	CCV	1000/1ml	193753	2400	YC	

BD 10/5/18

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:

Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

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Analysis: 10/4/18 Analyst: BA Run Method: NEWMETA (BA)

Date: Organic Acids Instr. _HPLC-05_____ Quant Method: ~~MA0926.8~~ MA100418

LIMS Run#: 609639

Setup: Column: Synergi Hydro RP 150x46 Col.Temp: 35 Flow: 0.6 ml/min

Mobile Phase: 0.2 KH2 prep 0.1 PO4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	BLK			A0003365	—	
	INST BLK			66	Y	
	0.1-1.0 PPM	200/1ml	193753	67	Y	
	0.2-2.0	400/		68	Y	
	0.5-5.0	1000/		69	Y	
	1.0-10.0	2000/		70	Y	
	2.0-20.0	4000/		71	Y	
	5.0-50.0	10000/		72	Y	
	10.0-100.0	20000/		73	Y	
	20.0-200.0	40000/		74	Y	
	ICV	10000/	193754	75	Y	Pyruvic out
	CCV	10000/1ml	193753	76	YC	
	MET BLK			77	Y	
	LCS	10000/1ml	193754	78	Y	Pyruvic out
	LCSD			79	Y	
	R1809340-001			80	(N)	RPT 1/10
	-001	MS 10000/1ml	193754	81		
	-001	MSD		82		
	-002			83	Y	
	-003			84	Y	
	-004			85	Y	
	R1809393-001			86	Y	
	CCV	10000/1ml	193754	87	YC	
	-002			88	Y	
	-003			89	(N)	RPT 1/10
	CCV	10000/1ml	193754	90	YC	
			10/4/18			
	BA					

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:

Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

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General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 09:20
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW06_092618	**Basis:**	NA
Lab Code:	R1809340-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**27.8**	mg/L	1.0	0.8	0.3	10	09/27/18 20:00	*

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dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618	**Basis:**	NA
Lab Code:	R1809340-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**1.38**	mg/L	0.10	0.08	0.03	1	09/27/18 20:00	*

ALS Group USA, Corp.
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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 11:15
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	35AWW20_092618_a	**Basis:**	NA
Lab Code:	R1809340-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**1.41**	mg/L	0.10	0.08	0.03	1	09/27/18 20:00	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809340
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	09/26/18 12:30
Sample Matrix:	Water	**Date Received:**	09/27/18 09:15
Sample Name:	LHSMW07_092618	**Basis:**	NA
Lab Code:	R1809340-004		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.93**	mg/L	0.10	0.08	0.03	1	09/27/18 20:00	*

Analytical Results Summary

Instrument Name: R-UV-VIS-05 **Analyst:** MROGERSON **Analysis Lot:** 609189 **Method/Testcode:** SM 3500-Fe B.4.c/Ferrous DOD

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1810495-01	Iron, Divalent (Ferrous Iron)	CCV		Water	1.99 mg/L	5 mL	1.99 mg/L	1					9/27/18 20:00	N	IV
RQ1810495-02	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			9/27/18 20:00	N	IV
RQ1810495-03	Iron, Divalent (Ferrous Iron)	LCS		Water	0.39 mg/L	5 mL	0.389 mg/L	1	0.03	0.10	97		9/27/18 20:00	N	IV
RQ1810495-04	Iron, Divalent (Ferrous Iron)	MB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.08	0.10			9/27/18 20:00:00	N	IV
R1809340-001	Iron, Divalent (Ferrous Iron)	N/A		Water	27.76 mg/L	5 mL	27.8 mg/L	10	0.3	1.0			9/27/18 20:00	Y	IV
RQ1810495-07	Iron, Divalent (Ferrous Iron)	MS	R1809340-001	Water	30.68 mg/L	5 mL	30.7 mg/L	10	0.3	1.0	73		9/27/18 20:00	N	IV
RQ1810495-08	Iron, Divalent (Ferrous Iron)	DMS	R1809340-001	Water	29.90 mg/L	5 mL	29.9 mg/L	10	0.3	1.0	54*	3	9/27/18 20:00	N	IV
R1809340-002	Iron, Divalent (Ferrous Iron)	N/A		Water	1.38 mg/L	5 mL	1.38 mg/L	1	0.03	0.10			9/27/18 20:00	N	IV
R1809340-003	Iron, Divalent (Ferrous Iron)	N/A		Water	1.41 mg/L	5 mL	1.41 mg/L	1	0.03	0.10			9/27/18 20:00	N	IV
R1809340-004	Iron, Divalent (Ferrous Iron)	N/A		Water	0.93 mg/L	5 mL	0.93 mg/L	1	0.03	0.10			9/27/18 20:00	N	IV
RQ1810495-06	Iron, Divalent (Ferrous Iron)	CCV		Water	1.99 mg/L	5 mL	1.99 mg/L	1					9/27/18 20:00	N	IV
RQ1810495-05	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			9/27/18 20:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Sample Dilutions

Analyst: MAR
Instrument: UV-05

Date 9/27/18
Analysis Fe^{2+}

Sample ID	Matrix of Diluent	1st Dilution			2nd Dilution			3rd Dilution			4th Dilution			5th Dilution		
		mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor
RTB 09340-001	Fe^{2+} DI	1	9	1/10												

MAR 10/2/18

Pippetor Calibration

ALS Environmental

Frequency:

Pipettes: 3 trials for both bias and precision DOD Projects - Daily before use at each volume of use, or if more than 3 volumes of use, a high, medium, and low. Non-DOD: Monthly at high, medium, and low.	**Calculations:** %Recovery = Mean/Nominal Volume*100 %RSD = Stdev/Volume*100
Repeaters, Dispensers, and Repipettors: 3 trials for both bias and precision If used for dilutions - Daily before use and each time the volume is changed. If not used for dilutions - monthly	**Limits:** % Rec: 98-102 for Pipettes and others for dilutions % Recovery: 90-110 (Repeaters, Dispensers, Repipettors not for dilutions) %RSD: ≤1 (Pipets); ≤3 (Repeaters, Dispensers, and Repipettors)

Use a balance and DI for all except Dispensers and Repipettors which contain reagents. For these, dispense into a To Contain Class A grad cylinder and document the Max Volume of the cylinder instead of the Balance ID. Record to 1/10 the graduation of the cylinder.

Date	Init.	Equipment ID	Volume (mL)	Trial #1 (g/mL)	Trial #2 (g/mL)	Trial #3 (g/mL)	Bias %Recovery	Pass/ Fail	Precision %RSD	Pass/ Fail	Recal? Y/N	Balance ID or Class A (TC)	Comments/ Corrective Action
9/26/18	GN	DAISY	0.0060	0.0602	0.0601	0.0602	100.2718	P	0.09625	P	N	R-10 ~~DOD~~	DOD
		THOR	0.3600	0.3608	0.3605	0.3606	100.1759	P	0.0424	P	N	GN	
		↓	0.2400	0.2409	0.2405	0.2407	100.2917	P	0.0833	P	N	9/26/18	
		↓	0.7500	0.7503	0.7505	0.7504	100.0533	P	0.0133	P	N		
		Frank	1.5000	1.5003	1.5007	1.5006	100.0356	P	0.0133	P	N		
↓	↓	Nessy	6.0000	6.0015	6.0019	6.0011	100.0172	P	0.00096	P	N	↓	↓
9/28/18	mmr	Hank	5.000	5.0220	5.0131	5.0078	100.286	P	0.143	P	N	R-10	DOD
↓	↓	Thor	1.000	1.0053	1.0021	1.0020	100.31	P	0.188	P	N	↓	Monthly / DOD
↓	↓	↓	0.5000	0.5007	0.5004	0.5005	100.10	P	0.031	P	N	↓	↓
↓	↓	↓	0.2000	0.1978	0.1980	0.1980	98.97	P	0.058	P	N	↓	↓
							mmr 10/2/18						

ALS ENVIRONMENTAL

Analyte: Ferrous Iron By Standard Methods Analyst: MAR Date: 9/27/18

Method: 3500-Fe,D Pipette: THOR , HANK Time: 20:00

Instrument: UV-1600PC (R-UV-VIS-05)DOD Pipet Check: WC147 P. 47 Balance: NA

Calibration:

Std	Conc.	Absorb.	Result	% Rec
1	0.00	0.000	-0.001	
2	0.10	0.010	0.097	96.6%
3	0.20	0.021	0.204	101.9%
4	0.30	0.031	0.301	100.4%
5	0.40	0.041	0.399	99.7%
6	0.80	0.081	0.788	98.5%
7	1.00	0.103	1.003	100.3%
8	2.00	0.207	2.016	100.8%
9	3.00	0.308	3.000	100.0%
10	4.00	0.410	3.994	99.8%

Curve Date: 7/16/2018
C.C = 0.999986
y-int. = 0.000084
Slope: 0.102641
Wavelength: 510nm

	Misc.	Order #	Absorb.	Color Blk, if nec.	Abs. Difference Sample - Color	mg/L	Dilution	Final Result (mg/L)/(mg/Kg	Check if Soil
1	TV=2.0	ICV	0.202		0.202	1.9672	1.0	1.967	
2		ICB	0.000		0.000	-0.0008	1.0	-0.001	
3	TV=0.4	LCS	0.038		0.038	0.3694	1.0	0.369	
4		CCV	0.204		0.204	1.9867	1.0	1.987	
5		CCB	0.000		0.000	-0.0008	1.0	-0.001	
6		LCS	0.040		0.040	0.3889	1.0	0.389	
7		R1809340-001	0.285	0.005	0.285	2.7759	10.0	27.759	
8		R1809340-001 MS	0.315	0.005	0.315	3.0681	10.0	30.681	
9		R1809340-001 DMS	0.307	0.005	0.307	2.9902	10.0	29.902	
10		R1809340-002	0.154	0.012	0.142	1.3826	1.0	1.383	
11		R1809340-003	0.157	0.012	0.145	1.4119	1.0	1.412	
12		R1809340-004	0.126	0.030	0.096	0.9345	1.0	0.934	
13		CCV	0.204		0.204	1.9867	1.0	1.987	
14		CCB	0.000		0.000	-0.0008	1.0	-0.001	

ALS Environmental
1565 Jefferson Rd., Rochester, NY 14623

General Chemistry Analytical Run Cover Sheet

Analyst: MMR Date: 9/27/18

Analysis: Ferrous Iron by Method 3500-Fe, D. Instrument: R-UV-VIS-05

Quality Control:

	Same as Log#, Date,	Stocks Prep. Log#, Date,	Stock Sol (mLs)	Stock Sol (mg/L)	Final Vol (mLs)	True Value (mg/L)
a) Standards Prep.:	WC126121A,11/25/13	WC149110A, 10/13/15				
b) ICV Preparation:	WC126121B,11/25/13	191837, 7/16/18	2.5	4.0	5	2.00
b2) CCV Preparation:	WC126121B, 11/25/14	191837, 7/16/18				
c) LCS Preparation:	WC126121C, 11/25/14	191836, 7/16/18	0.5	4.0	5	0.40
d) Matrix Spike Prep.:	WC126121C, 11/25/13	191836, 7/16/18	0.5	4.0	5	0.40

Instrument log filled in? (Y) (N)

Packages: Copy and attach Standards Preparation

Comments:

All standards, QC (CCV's, LCS's, Matrix Spikes) and samples are based on the Standard Methods 3500-Fe D. Phenanthroline Method being scaled down by a factor of 10. Hence, 1.0 mL of Ammonium acetate buffer and 2.0 mL of Phenanthroline solution are added to 5.0 mL of sample, standards, or QC and brought to 10.0 mL with DI water. True values are based on sample volumes of 5.0 mLs.

Color blank absorbance is not measured where the sample itself is clear or the sample absorbance is less than the PQL. Samples above the PQL do not have their color blank absorbance subtracted if it is less than the absorbance of the low standard (PQL).

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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October 15, 2018

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS18091510**

Laboratory Results for: **LHAAP-58**

Dear Marcia,

ALS Environmental received 4 sample(s) on Sep 28, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18091510

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18091510-01	35AWW24_092718	Groundwater		27-Sep-2018 09:30	28-Sep-2018 08:55	☐
HS18091510-02	35AWW19_092718	Groundwater		27-Sep-2018 10:35	28-Sep-2018 08:55	☐
HS18091510-03	35AWW11_092718	Groundwater		27-Sep-2018 11:50	28-Sep-2018 08:55	☐
HS18091510-04	Trip Blank	Water	ALS 090718-90	27-Sep-2018 00:00	28-Sep-2018 08:55	☐

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP-58
Work Order: HS18091510

Work Order Comments

- The analyses for RSK-175 Dissolved Gases and CO2 were subcontracted to ALS Environmental in Simi Valley, CA. Final Report attached.

  The analyses for Ferrous Iron and Volatile Fatty Acids were subcontracted to ALS Environmental in Rochester, NY. Final Report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

  The analyses for DHC/DHB were subcontracted to Microbial Insights in Knoxville, TN. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R325112

Sample ID: 35AWW24_092718 (HS18091510-01MS)

- MS and/or MSD recovered outside control limits for multiple compounds

Metals by Method SW6020

Batch ID: 133110

Sample ID: 35AWW24_092718 (HS18091510-01MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference. Iron and Manganese.

Sample ID: 35AWW24_092718 (HS18091510-01MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference. Iron and Manganese.

Sample ID: 35AWW24_092718 (HS18091510-01PDS)

- The recovery of the Post Digestion Spike was outside of the control limit. Iron.

Batch ID: 133107

Sample ID: 35AWW24_092718 (HS18091510-01MS)

- Iron failed in the MS/MSD but passed in the PDS.

WetChemistry by Method E376.1

Batch ID: R324851

Sample ID: HS18091438-01MS

- MS is for an unrelated sample

WetChemistry by Method SM2320B

Batch ID: R324730

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R324594

Sample ID: 35AWW11_092718 (HS18091510-03)

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18091510

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R324594

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrogen, Nitrate (As N),Nitrogen, Nitrite (As N))

Sample ID: 35AWW24_092718 (HS18091510-01MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Chloride)

Sample ID: HS18091438-01MS

- MS and MSD are for an unrelated sample (Chloride)

WetChemistry by Method E365.3

Batch ID: 133178

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_092718
Collection Date: 27-Sep-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Oct-2018 14:34
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Oct-2018 14:34
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	10-Oct-2018 14:34
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Oct-2018 14:34
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Oct-2018 14:34
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_092718
Collection Date: 27-Sep-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Oct-2018 14:34
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	10-Oct-2018 14:34
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:34
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:34
Surr: 1,2-Dichloroethane-d4	*94.5*			**0**	*81-118*	*%REC*	*1*	*10-Oct-2018 14:34*
Surr: 4-Bromofluorobenzene	*92.4*			**0**	*85-114*	*%REC*	*1*	*10-Oct-2018 14:34*
Surr: Dibromofluoromethane	*87.6*			**0**	*80-119*	*%REC*	*1*	*10-Oct-2018 14:34*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*10-Oct-2018 14:34*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 03-Oct-2018		Analyst: JDE
Iron	**1.06**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	12-Oct-2018 15:45
Manganese	**0.108**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	12-Oct-2018 15:45
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 03-Oct-2018		Analyst: JDE
Iron	**6.55**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	12-Oct-2018 14:15
Manganese	**0.127**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	12-Oct-2018 14:15
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 04-Oct-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.0620**		**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	04-Oct-2018 14:35
SULFIDE BY E376.1		**Method:E376.1**						Analyst: KVL
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	03-Oct-2018 11:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_092718
Collection Date: 27-Sep-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**50.8**		**5.00**	**5.00**	**5.00**	**mg/L**	1	04-Oct-2018 14:39
ANIONS BY SW9056A		**Method:SW9056**						Analyst: AJH
Chloride	**110**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Sep-2018 16:28
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	28-Sep-2018 15:45
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	28-Sep-2018 15:45
Sulfate	**69.9**		**0.200**	**0.500**	**0.500**	**mg/L**	1	28-Sep-2018 15:45
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Oct-2018 15:10
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	09-Oct-2018 14:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 09:55
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_092718
Collection Date: 27-Sep-2018 10:35

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,1-Dichloroethane	**1.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Oct-2018 14:59
1,1-Dichloroethene	**8.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Oct-2018 14:59
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,2-Dichloroethane	**2.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Oct-2018 14:59
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Oct-2018 14:59
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Oct-2018 14:59
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	10-Oct-2018 14:59
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Oct-2018 14:59
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Oct-2018 14:59
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_092718
Collection Date: 27-Sep-2018 10:35

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Oct-2018 14:59
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	10-Oct-2018 14:59
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 14:59
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Trichloroethene	**0.59**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Oct-2018 14:59
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 14:59
Surr: 1,2-Dichloroethane-d4	*94.0*			**0**	*81-118*	*%REC*	*1*	*10-Oct-2018 14:59*
Surr: 4-Bromofluorobenzene	*92.6*			**0**	*85-114*	*%REC*	*1*	*10-Oct-2018 14:59*
Surr: Dibromofluoromethane	*88.3*			**0**	*80-119*	*%REC*	*1*	*10-Oct-2018 14:59*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*10-Oct-2018 14:59*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 03-Oct-2018		Analyst: JDE
Iron	**4.24**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	12-Oct-2018 15:55
Manganese	**6.39**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	12-Oct-2018 17:33
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 03-Oct-2018		Analyst: JDE
Iron	**4.22**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	12-Oct-2018 14:25
Manganese	**6.27**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	12-Oct-2018 16:17
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 04-Oct-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.0340**	J	**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	04-Oct-2018 14:35
SULFIDE BY E376.1		**Method:E376.1**						Analyst: KVL
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	03-Oct-2018 11:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_092718
Collection Date: 27-Sep-2018 10:35

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**213**		**5.00**	**5.00**	**5.00**	**mg/L**	1	04-Oct-2018 14:51
ANIONS BY SW9056A		**Method:SW9056**						Analyst: AJH
Chloride	**1,230**		**20.0**	**50.0**	**50.0**	**mg/L**	100	28-Sep-2018 17:56
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 17:12
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 17:12
Sulfate	**989**		**20.0**	**50.0**	**50.0**	**mg/L**	100	28-Sep-2018 17:56
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Oct-2018 15:10
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	09-Oct-2018 14:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 09:55
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_092718
Collection Date: 27-Sep-2018 11:50

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,1-Dichloroethane	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Oct-2018 15:49
1,1-Dichloroethene	**2.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	10-Oct-2018 15:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
2-Butanone	**330**		**0.50**	**1.0**	**2.0**	**ug/L**	1	10-Oct-2018 15:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Oct-2018 15:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	10-Oct-2018 15:49
Acetone	**590**		**2.0**	**10**	**10**	**ug/L**	5	10-Oct-2018 17:29
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Carbon disulfide	**5.0**		**0.60**	**1.0**	**2.0**	**ug/L**	1	10-Oct-2018 15:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_092718
Collection Date: 27-Sep-2018 11:50

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Oct-2018 15:49
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	10-Oct-2018 15:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 15:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 15:49
Surr: 1,2-Dichloroethane-d4	*92.8*			**0**	*81-118*	*%REC*	*1*	*10-Oct-2018 15:49*
Surr: 1,2-Dichloroethane-d4	*92.7*			**0**	*81-118*	*%REC*	*5*	*10-Oct-2018 17:29*
Surr: 4-Bromofluorobenzene	*94.0*			**0**	*85-114*	*%REC*	*1*	*10-Oct-2018 15:49*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*5*	*10-Oct-2018 17:29*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*10-Oct-2018 15:49*
Surr: Dibromofluoromethane	*90.9*			**0**	*80-119*	*%REC*	*5*	*10-Oct-2018 17:29*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*10-Oct-2018 15:49*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*10-Oct-2018 17:29*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 03-Oct-2018		Analyst: JDE
Iron	**31.7**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	12-Oct-2018 15:57
Manganese	**6.21**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	12-Oct-2018 17:35
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 03-Oct-2018		Analyst: JDE
Iron	**31.7**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	12-Oct-2018 14:27
Manganese	**6.53**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	12-Oct-2018 16:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_092718
Collection Date: 27-Sep-2018 11:50

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 04-Oct-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.341**		**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	04-Oct-2018 14:35
SULFIDE BY E376.1		**Method:E376.1**						Analyst: KVL
Sulfide	**22.4**		**1.00**	**1.00**	**1.00**	**mg/L**	1	03-Oct-2018 11:45
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,190**		**5.00**	**5.00**	**5.00**	**mg/L**	1	04-Oct-2018 15:02
ANIONS BY SW9056A		**Method:SW9056**						Analyst: AJH
Chloride	**2,110**		**20.0**	**50.0**	**50.0**	**mg/L**	100	28-Sep-2018 19:08
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 18:39
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	28-Sep-2018 18:39
Sulfate	**285**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Sep-2018 18:54
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Oct-2018 15:10
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	09-Oct-2018 14:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 09:55
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Oct-2018 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 27-Sep-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Oct-2018 13:44
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Oct-2018 13:44
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	10-Oct-2018 13:44
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	10-Oct-2018 13:44
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Oct-2018 13:44
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 27-Sep-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18091510
Lab ID:HS18091510-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Oct-2018 13:44
Methylene chloride	0.50	U	0.40	0.50	2.0	ug/L	1	10-Oct-2018 13:44
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Oct-2018 13:44
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Oct-2018 13:44
Surr: 1,2-Dichloroethane-d4	*93.3*			**0**	*81-118*	*%REC*	*1*	*10-Oct-2018 13:44*
Surr: 4-Bromofluorobenzene	*92.9*			**0**	*85-114*	*%REC*	*1*	*10-Oct-2018 13:44*
Surr: Dibromofluoromethane	*88.0*			**0**	*80-119*	*%REC*	*1*	*10-Oct-2018 13:44*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*10-Oct-2018 13:44*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 15-Oct-18

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

Batch ID: 133107 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18091510-01	1	10	10 (mL)	1
HS18091510-02	1	10	10 (mL)	1
HS18091510-03	1	10	10 (mL)	1

Batch ID: 133110 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18091510-01	1	10	10 (mL)	1
HS18091510-02	1	10	10 (mL)	1
HS18091510-03	1	10	10 (mL)	1

Batch ID: 133178 **Method:** PHOSPHORUS BY E365.3 **Prep:** P_TW_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18091510-01	1	50	50 (mL)	1
HS18091510-02	1	50	50 (mL)	1
HS18091510-03	1	50	50 (mL)	1

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 133107	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30		03 Oct 2018 10:00	12 Oct 2018 15:45	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35		03 Oct 2018 10:00	12 Oct 2018 17:33	10
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35		03 Oct 2018 10:00	12 Oct 2018 15:55	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50		03 Oct 2018 10:00	12 Oct 2018 17:35	10
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50		03 Oct 2018 10:00	12 Oct 2018 15:57	1
Batch ID 133110	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30		03 Oct 2018 11:00	12 Oct 2018 14:15	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35		03 Oct 2018 11:00	12 Oct 2018 16:17	10
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35		03 Oct 2018 11:00	12 Oct 2018 14:25	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50		03 Oct 2018 11:00	12 Oct 2018 16:19	10
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50		03 Oct 2018 11:00	12 Oct 2018 14:27	1
Batch ID 133178	**Test Name :** PHOSPHORUS BY E365.3			**Matrix:** Groundwater		
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30		04 Oct 2018 09:30	04 Oct 2018 14:35	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35		04 Oct 2018 09:30	04 Oct 2018 14:35	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50		04 Oct 2018 09:30	04 Oct 2018 14:35	1
Batch ID R324594	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			28 Sep 2018 16:28	10
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			28 Sep 2018 15:45	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			28 Sep 2018 17:56	100
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			28 Sep 2018 17:12	2
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			28 Sep 2018 19:08	100
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			28 Sep 2018 18:54	10
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			28 Sep 2018 18:39	2
Batch ID R324652	**Test Name :** SUBCONTRACT ANALYSIS - DHC/DHB			**Matrix:** Groundwater		
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			03 Oct 2018 15:10	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			03 Oct 2018 15:10	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			03 Oct 2018 15:10	1
Batch ID R324730	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			04 Oct 2018 14:39	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			04 Oct 2018 14:51	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			04 Oct 2018 15:02	1
Batch ID R324851	**Test Name :** SULFIDE BY E376.1			**Matrix:** Groundwater		
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			03 Oct 2018 11:45	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			03 Oct 2018 11:45	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			03 Oct 2018 11:45	1

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R325032	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			09 Oct 2018 14:23	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			09 Oct 2018 14:23	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			09 Oct 2018 14:23	1
Batch ID R325112	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS18091510-04	Trip Blank	27 Sep 2018 00:00			10 Oct 2018 13:44	1
Batch ID R325112	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			10 Oct 2018 14:34	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			10 Oct 2018 14:59	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			10 Oct 2018 17:29	5
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			10 Oct 2018 15:49	1
Batch ID R325174	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			11 Oct 2018 09:55	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			11 Oct 2018 09:55	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			11 Oct 2018 09:55	1
Batch ID R325206	**Test Name :** SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS				**Matrix:** Groundwater	
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			11 Oct 2018 12:51	1
HS18091510-01	35AWW24_092718	27 Sep 2018 09:30			11 Oct 2018 12:51	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			11 Oct 2018 12:51	1
HS18091510-02	35AWW19_092718	27 Sep 2018 10:35			11 Oct 2018 12:51	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			11 Oct 2018 12:51	1
HS18091510-03	35AWW11_092718	27 Sep 2018 11:50			11 Oct 2018 12:51	1

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: 133107 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-133107** Units: **mg/L** Analysis Date: **12-Oct-2018 14:11**
Client ID: Run ID: **ICPMS05_325303** SeqNo: **4770574** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.000827	0.00500								J

LCS Sample ID: **LCS-133107** Units: **mg/L** Analysis Date: **12-Oct-2018 14:13**
Client ID: Run ID: **ICPMS05_325303** SeqNo: **4770575** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.734	0.200	5	0	94.7	80 - 120				
Manganese	0.04672	0.00500	0.05	0	93.4	80 - 120				

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **12-Oct-2018 15:49**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770719** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	8.85	0.200	5	1.06	156	80 - 120				S
Manganese	0.1588	0.00500	0.05	0.1081	101	80 - 120				

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **12-Oct-2018 17:50**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4771036** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	9.125	0.200	5	1.06	161	80 - 120	8.85	3.07	20	S

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **12-Oct-2018 15:51**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770720** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	0.1622	0.00500	0.05	0.1081	108	80 - 120	0.1588	2.08	20	

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: 133107 **Instrument: ICPMS05** **Method: SW6020**

PDS Sample ID: **HS18091510-01PDS** Units: **mg/L** Analysis Date: **12-Oct-2018 15:53**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770721** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	12.38	0.200	10	1.06	113	75 - 125				
Manganese	0.1982	0.00500	0.1	0.1081	90.1	75 - 125				

SD Sample ID: **HS18091510-01SD** Units: **mg/L** Analysis Date: **12-Oct-2018 15:47**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770718** PrepDate: **03-Oct-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	1.076	1.00					1.06	1.54	10	
Manganese	0.1133	0.0250					0.1081	4.76	10	

The following samples were analyzed in this batch: HS18091510-01 HS18091510-02 HS18091510-03

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: 133110 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-133110** Units: **mg/L** Analysis Date: **12-Oct-2018 14:03**
Client ID: Run ID: **ICPMS05_325303** SeqNo: **4770570** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-133110** Units: **mg/L** Analysis Date: **12-Oct-2018 14:05**
Client ID: Run ID: **ICPMS05_325303** SeqNo: **4770571** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.834	0.200	5	0	96.7	80 - 120				
Manganese	0.04756	0.00500	0.05	0	95.1	80 - 120				

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **12-Oct-2018 14:19**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770585** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	8.65	0.200	5	6.551	42.0	75 - 125				S
Manganese	0.1569	0.00500	0.05	0.1266	60.6	75 - 125				S

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **12-Oct-2018 14:21**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770586** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	7.793	0.200	5	6.551	24.8	75 - 125	8.65	10.4	20	S
Manganese	0.1553	0.00500	0.05	0.1266	57.3	75 - 125	0.1569	1.06	20	S

PDS Sample ID: **HS18091510-01PDS** Units: **mg/L** Analysis Date: **12-Oct-2018 14:23**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770587** PrepDate: **03-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	14	0.200	10	6.551	74.4	75 - 125				S
Manganese	0.2076	0.00500	0.1	0.1266	80.9	75 - 125				

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: 133110 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18091510-01SD** Units: **mg/L** Analysis Date: **12-Oct-2018 14:17**
Client ID: **35AWW24_092718** Run ID: **ICPMS05_325303** SeqNo: **4770584** PrepDate: **03-Oct-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	6.921	1.00					6.551	5.65	10	
Manganese	0.1319	0.0250					0.1266	4.16	10	

The following samples were analyzed in this batch: HS18091510-01 HS18091510-02 HS18091510-03

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181010** Units: **ug/L** Analysis Date: **10-Oct-2018 13:18**
Client ID: Run ID: **VOA9_325112** SeqNo: **4767275** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181010** Units: **ug/L** Analysis Date: **10-Oct-2018 13:18**
Client ID: Run ID: **VOA9_325112** SeqNo: **4767275** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	0.50	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.61*	*1.0*	*50*	*0*	*93.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.1*	*1.0*	*50*	*0*	*92.2*	*85 - 114*				
Surr: Dibromofluoromethane	*44.09*	*1.0*	*50*	*0*	*88.2*	*80 - 119*				
Surr: Toluene-d8	*53.57*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-181010** Units: **ug/L** Analysis Date: **10-Oct-2018 12:28**
Client ID: Run ID: **VOA9_325112** SeqNo: **4767274** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.99	1.0	20	0	95.0	78 - 124				
1,1,1-Trichloroethane	17.03	1.0	20	0	85.1	74 - 131				
1,1,2,2-Tetrachloroethane	21.24	1.0	20	0	106	71 - 121				
1,1,2-Trichloroethane	20.27	1.0	20	0	101	80 - 119				
1,1-Dichloroethane	18.77	1.0	20	0	93.8	77 - 125				
1,1-Dichloroethene	18.27	1.0	20	0	91.4	71 - 131				
1,1-Dichloropropene	19.97	1.0	20	0	99.8	78 - 125				
1,2,3-Trichlorobenzene	21.23	1.0	20	0	106	69 - 129				
1,2,3-Trichloropropane	19.25	1.0	20	0	96.3	73 - 122				
1,2,4-Trichlorobenzene	21.48	1.0	20	0	107	69 - 130				
1,2,4-Trimethylbenzene	20.67	1.0	20	0	103	76 - 124				
1,2-Dibromo-3-chloropropane	16.67	1.0	20	0	83.4	62 - 128				
1,2-Dibromoethane	19.84	1.0	20	0	99.2	77 - 121				
1,2-Dichlorobenzene	21.14	1.0	20	0	106	80 - 119				
1,2-Dichloroethane	19.91	1.0	20	0	99.6	73 - 128				
1,2-Dichloropropane	20.83	1.0	20	0	104	78 - 122				
1,3,5-Trimethylbenzene	20.51	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	21.5	1.0	20	0	108	80 - 119				
1,3-Dichloropropane	20.44	1.0	20	0	102	80 - 119				
1,4-Dichlorobenzene	21.7	1.0	20	0	108	79 - 118				
2,2-Dichloropropane	18.32	1.0	20	0	91.6	60 - 139				
2-Butanone	37.7	2.0	40	0	94.2	56 - 143				
2-Chlorotoluene	20.57	1.0	20	0	103	79 - 122				
2-Hexanone	37.77	2.0	40	0	94.4	57 - 139				
4-Chlorotoluene	20.9	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	21.17	1.0	20	0	106	77 - 127				
4-Methyl-2-pentanone	37.79	2.0	40	0	94.5	67 - 130				
Acetone	49.81	2.0	40	0	125	39 - 160				
Benzene	21.02	1.0	20	0	105	79 - 120				
Bromobenzene	19.73	1.0	20	0	98.6	80 - 120				
Bromochloromethane	19.93	1.0	20	0	99.6	78 - 123				
Bromodichloromethane	17.74	1.0	20	0	88.7	79 - 125				
Bromoform	15.07	1.0	20	0	75.4	66 - 130				
Bromomethane	17.72	1.0	20	0	88.6	53 - 141				

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-181010** Units: **ug/L** Analysis Date: **10-Oct-2018 12:28**
Client ID: Run ID: **VOA9_325112** SeqNo: **4767274** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.93	2.0	40	0	99.8	64 - 133				
Carbon tetrachloride	17.63	1.0	20	0	88.1	72 - 136				
Chlorobenzene	20.05	1.0	20	0	100	82 - 118				
Chloroethane	20.68	1.0	20	0	103	60 - 138				
Chloroform	18.91	1.0	20	0	94.6	79 - 124				
Chloromethane	19.26	1.0	20	0	96.3	50 - 139				
cis-1,2-Dichloroethene	18.98	1.0	20	0	94.9	78 - 123				
cis-1,3-Dichloropropene	18.37	1.0	20	0	91.8	75 - 124				
Dibromochloromethane	17.9	1.0	20	0	89.5	74 - 126				
Dibromomethane	19.13	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	23.59	1.0	20	0	118	32 - 152				
Ethylbenzene	19.79	1.0	20	0	99.0	79 - 121				
Hexachlorobutadiene	25.19	1.0	20	0	126	66 - 134				
Isopropylbenzene	19.69	1.0	20	0	98.4	72 - 131				
m,p-Xylene	39.47	2.0	40	0	98.7	80 - 121				
Methylene chloride	20.79	2.0	20	0	104	74 - 124				
Naphthalene	20.37	1.0	20	0	102	61 - 128				
n-Butylbenzene	22.13	1.0	20	0	111	75 - 128				
n-Propylbenzene	21.06	1.0	20	0	105	76 - 126				
o-Xylene	19.91	1.0	20	0	99.5	78 - 122				
sec-Butylbenzene	21.15	1.0	20	0	106	77 - 126				
Styrene	20.13	1.0	20	0	101	78 - 123				
tert-Butylbenzene	21.36	1.0	20	0	107	78 - 124				
Tetrachloroethene	19.8	1.0	20	0	99.0	74 - 129				
Toluene	20.76	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	19.3	1.0	20	0	96.5	75 - 124				
trans-1,3-Dichloropropene	17.56	1.0	20	0	87.8	73 - 127				
Trichloroethene	19.21	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	17.89	1.0	20	0	89.5	65 - 141				
Vinyl chloride	21.14	1.0	20	0	106	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.8*	*1.0*	*50*	*0*	*91.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.86*	*1.0*	*50*	*0*	*99.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.29*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*53.41*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18091510-01MS** Units: **ug/L** Analysis Date: **10-Oct-2018 16:14**
Client ID: **35AWW24_092718** Run ID: **VOA9_325112** SeqNo: **4767282** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.63	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	19.9	1.0	20	0	99.5	74 - 131				
1,1,2,2-Tetrachloroethane	22.42	1.0	20	0	112	71 - 121				
1,1,2-Trichloroethane	21.87	1.0	20	0	109	80 - 119				
1,1-Dichloroethane	21.37	1.0	20	0	107	77 - 125				
1,1-Dichloroethene	21.44	1.0	20	0	107	71 - 131				
1,1-Dichloropropene	22.86	1.0	20	0	114	78 - 125				
1,2,3-Trichlorobenzene	21.53	1.0	20	0	108	69 - 129				
1,2,3-Trichloropropane	20.25	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	22.01	1.0	20	0	110	69 - 130				
1,2,4-Trimethylbenzene	22.61	1.0	20	0	113	76 - 124				
1,2-Dibromo-3-chloropropane	18.37	1.0	20	0	91.8	62 - 128				
1,2-Dibromoethane	21.41	1.0	20	0	107	77 - 121				
1,2-Dichlorobenzene	22.16	1.0	20	0	111	80 - 119				
1,2-Dichloroethane	21.44	1.0	20	0	107	73 - 128				
1,2-Dichloropropane	22.56	1.0	20	0	113	78 - 122				
1,3,5-Trimethylbenzene	22	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	22.7	1.0	20	0	113	80 - 119				
1,3-Dichloropropane	22.3	1.0	20	0	111	80 - 119				
1,4-Dichlorobenzene	22.77	1.0	20	0	114	79 - 118				
2,2-Dichloropropane	19.32	1.0	20	0	96.6	60 - 139				
2-Butanone	40.86	2.0	40	0	102	56 - 143				
2-Chlorotoluene	22.09	1.0	20	0	110	79 - 122				
2-Hexanone	40.55	2.0	40	0	101	57 - 139				
4-Chlorotoluene	22.11	1.0	20	0	111	78 - 122				
4-Isopropyltoluene	22.93	1.0	20	0	115	77 - 127				
4-Methyl-2-pentanone	40.55	2.0	40	0	101	67 - 130				
Acetone	52.15	2.0	40	0	130	39 - 160				
Benzene	23.12	1.0	20	0	116	79 - 120				
Bromobenzene	20.98	1.0	20	0	105	80 - 120				
Bromochloromethane	21.63	1.0	20	0	108	78 - 123				
Bromodichloromethane	19.68	1.0	20	0	98.4	79 - 125				
Bromoform	16.92	1.0	20	0	84.6	66 - 130				
Bromomethane	6.088	1.0	20	0	30.4	53 - 141				S

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18091510-01MS** Units: **ug/L** Analysis Date: **10-Oct-2018 16:14**
Client ID: **35AWW24_092718** Run ID: **VOA9_325112** SeqNo: **4767282** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	47.13	2.0	40	0	118	64 - 133				
Carbon tetrachloride	21.48	1.0	20	0	107	72 - 136				
Chlorobenzene	21.97	1.0	20	0	110	82 - 118				
Chloroethane	27.8	1.0	20	0	139	60 - 138				S
Chloroform	20.84	1.0	20	0	104	79 - 124				
Chloromethane	17	1.0	20	0	85.0	50 - 139				
cis-1,2-Dichloroethene	20.33	1.0	20	0	102	78 - 123				
cis-1,3-Dichloropropene	19.35	1.0	20	0	96.8	75 - 124				
Dibromochloromethane	19.81	1.0	20	0	99.1	74 - 126				
Dibromomethane	21.14	1.0	20	0	106	79 - 123				
Dichlorodifluoromethane	23.04	1.0	20	0	115	32 - 152				
Ethylbenzene	21.52	1.0	20	0	108	79 - 121				
Hexachlorobutadiene	24.31	1.0	20	0	122	66 - 134				
Isopropylbenzene	22	1.0	20	0	110	72 - 131				
m,p-Xylene	43.29	2.0	40	0	108	80 - 121				
Methylene chloride	22.42	2.0	20	0	112	74 - 124				
Naphthalene	21.39	1.0	20	0	107	61 - 128				
n-Butylbenzene	23.43	1.0	20	0	117	75 - 128				
n-Propylbenzene	22.97	1.0	20	0	115	76 - 126				
o-Xylene	21.45	1.0	20	0	107	78 - 122				
sec-Butylbenzene	23.02	1.0	20	0	115	77 - 126				
Styrene	21.65	1.0	20	0	108	78 - 123				
tert-Butylbenzene	23.33	1.0	20	0	117	78 - 124				
Tetrachloroethene	22.54	1.0	20	0	113	74 - 129				
Toluene	22.73	1.0	20	0	114	80 - 121				
trans-1,2-Dichloroethene	21.59	1.0	20	0	108	75 - 124				
trans-1,3-Dichloropropene	19.42	1.0	20	0	97.1	73 - 127				
Trichloroethene	21.35	1.0	20	0	107	79 - 123				
Trichlorofluoromethane	21.82	1.0	20	0	109	65 - 141				
Vinyl chloride	23.01	1.0	20	0	115	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.67*	*1.0*	*50*	*0*	*93.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.84*	*1.0*	*50*	*0*	*97.7*	*85 - 114*				
Surr: Dibromofluoromethane	*47.81*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*53.14*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18091510-01MSD** Units: **ug/L** Analysis Date: **10-Oct-2018 16:39**
Client ID: **35AWW24_092718** Run ID: **VOA9_325112** SeqNo: **4767283** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.27	1.0	20	0	101	78 - 124	20.63	1.74	20	
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131	19.9	3.53	20	
1,1,2,2-Tetrachloroethane	22.03	1.0	20	0	110	71 - 121	22.42	1.75	20	
1,1,2-Trichloroethane	22.1	1.0	20	0	111	80 - 119	21.87	1.06	20	
1,1-Dichloroethane	20.75	1.0	20	0	104	77 - 125	21.37	2.97	20	
1,1-Dichloroethene	20.63	1.0	20	0	103	71 - 131	21.44	3.85	20	
1,1-Dichloropropene	22.14	1.0	20	0	111	78 - 125	22.86	3.17	20	
1,2,3-Trichlorobenzene	21.71	1.0	20	0	109	69 - 129	21.53	0.818	20	
1,2,3-Trichloropropane	20.24	1.0	20	0	101	73 - 122	20.25	0.0532	20	
1,2,4-Trichlorobenzene	21.45	1.0	20	0	107	69 - 130	22.01	2.58	20	
1,2,4-Trimethylbenzene	21.86	1.0	20	0	109	76 - 124	22.61	3.37	20	
1,2-Dibromo-3-chloropropane	17.7	1.0	20	0	88.5	62 - 128	18.37	3.73	20	
1,2-Dibromoethane	21.27	1.0	20	0	106	77 - 121	21.41	0.632	20	
1,2-Dichlorobenzene	21.66	1.0	20	0	108	80 - 119	22.16	2.28	20	
1,2-Dichloroethane	21.27	1.0	20	0	106	73 - 128	21.44	0.82	20	
1,2-Dichloropropane	22.38	1.0	20	0	112	78 - 122	22.56	0.81	20	
1,3,5-Trimethylbenzene	21.34	1.0	20	0	107	75 - 124	22	3.06	20	
1,3-Dichlorobenzene	22.32	1.0	20	0	112	80 - 119	22.7	1.66	20	
1,3-Dichloropropane	22.09	1.0	20	0	110	80 - 119	22.3	0.947	20	
1,4-Dichlorobenzene	22.5	1.0	20	0	113	79 - 118	22.77	1.18	20	
2,2-Dichloropropane	18.31	1.0	20	0	91.6	60 - 139	19.32	5.35	20	
2-Butanone	41.96	2.0	40	0	105	56 - 143	40.86	2.66	20	
2-Chlorotoluene	21.66	1.0	20	0	108	79 - 122	22.09	1.98	20	
2-Hexanone	41.5	2.0	40	0	104	57 - 139	40.55	2.32	20	
4-Chlorotoluene	21.86	1.0	20	0	109	78 - 122	22.11	1.14	20	
4-Isopropyltoluene	22.52	1.0	20	0	113	77 - 127	22.93	1.78	20	
4-Methyl-2-pentanone	40.71	2.0	40	0	102	67 - 130	40.55	0.394	20	
Acetone	53.86	2.0	40	0	135	39 - 160	52.15	3.22	20	
Benzene	22.4	1.0	20	0	112	79 - 120	23.12	3.15	20	
Bromobenzene	20.47	1.0	20	0	102	80 - 120	20.98	2.44	20	
Bromochloromethane	20.69	1.0	20	0	103	78 - 123	21.63	4.44	20	
Bromodichloromethane	19.21	1.0	20	0	96.0	79 - 125	19.68	2.44	20	
Bromoform	16.77	1.0	20	0	83.9	66 - 130	16.92	0.867	20	
Bromomethane	7.45	1.0	20	0	37.3	53 - 141	6.088	20.1	20	SR

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18091510-01MSD** Units: **ug/L** Analysis Date: **10-Oct-2018 16:39**
Client ID: **35AWW24_092718** Run ID: **VOA9_325112** SeqNo: **4767283** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	54.62	2.0	40	0	137	64 - 133	47.13	14.7	20	S
Carbon tetrachloride	20.58	1.0	20	0	103	72 - 136	21.48	4.26	20	
Chlorobenzene	21.53	1.0	20	0	108	82 - 118	21.97	2.02	20	
Chloroethane	25.39	1.0	20	0	127	60 - 138	27.8	9.04	20	
Chloroform	20.32	1.0	20	0	102	79 - 124	20.84	2.53	20	
Chloromethane	15.29	1.0	20	0	76.5	50 - 139	17	10.6	20	
cis-1,2-Dichloroethene	19.77	1.0	20	0	98.9	78 - 123	20.33	2.76	20	
cis-1,3-Dichloropropene	18.78	1.0	20	0	93.9	75 - 124	19.35	2.99	20	
Dibromochloromethane	19.48	1.0	20	0	97.4	74 - 126	19.81	1.68	20	
Dibromomethane	20.76	1.0	20	0	104	79 - 123	21.14	1.82	20	
Dichlorodifluoromethane	22.35	1.0	20	0	112	32 - 152	23.04	3.03	20	
Ethylbenzene	21.28	1.0	20	0	106	79 - 121	21.52	1.1	20	
Hexachlorobutadiene	24.53	1.0	20	0	123	66 - 134	24.31	0.92	20	
Isopropylbenzene	21.65	1.0	20	0	108	72 - 131	22	1.62	20	
m,p-Xylene	42.86	2.0	40	0	107	80 - 121	43.29	0.98	20	
Methylene chloride	26.65	2.0	20	0	133	74 - 124	22.42	17.2	20	S
Naphthalene	21.33	1.0	20	0	107	61 - 128	21.39	0.277	20	
n-Butylbenzene	23.1	1.0	20	0	116	75 - 128	23.43	1.39	20	
n-Propylbenzene	22.54	1.0	20	0	113	76 - 126	22.97	1.88	20	
o-Xylene	20.96	1.0	20	0	105	78 - 122	21.45	2.32	20	
sec-Butylbenzene	22.58	1.0	20	0	113	77 - 126	23.02	1.92	20	
Styrene	20.82	1.0	20	0	104	78 - 123	21.65	3.89	20	
tert-Butylbenzene	22.88	1.0	20	0	114	78 - 124	23.33	1.92	20	
Tetrachloroethene	21.9	1.0	20	0	109	74 - 129	22.54	2.92	20	
Toluene	22.42	1.0	20	0	112	80 - 121	22.73	1.35	20	
trans-1,2-Dichloroethene	20.62	1.0	20	0	103	75 - 124	21.59	4.61	20	
trans-1,3-Dichloropropene	18.55	1.0	20	0	92.7	73 - 127	19.42	4.59	20	
Trichloroethene	20.96	1.0	20	0	105	79 - 123	21.35	1.82	20	
Trichlorofluoromethane	20.65	1.0	20	0	103	65 - 141	21.82	5.51	20	
Vinyl chloride	21.51	1.0	20	0	108	58 - 137	23.01	6.74	20	
Surr: 1,2-Dichloroethane-d4	*45.98*	*1.0*	*50*	*0*	*92.0*	*81 - 118*	*46.67*	*1.48*	*20*	
Surr: 4-Bromofluorobenzene	*49.52*	*1.0*	*50*	*0*	*99.0*	*85 - 114*	*48.84*	*1.38*	*20*	
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*	*47.81*	*2.27*	*20*	
Surr: Toluene-d8	*53.49*	*1.0*	*50*	*0*	*107*	*89 - 112*	*53.14*	*0.653*	*20*	

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R325112 **Instrument: VOA9** **Method: SW8260**

The following samples were analyzed in this batch:	HS18091510-01	HS18091510-02	HS18091510-03	HS18091510-04

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: 133178 **Instrument: UV-2450** **Method: E365.3**

MBLK Sample ID: **MBLK-133178** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754626** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.0250	0.0500								U

LCS Sample ID: **LCS-133178** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754625** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.252	0.0500	0.25	0	101	80 - 120				

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: **35AWW24_092718** Run ID: **UV-2450_324727** SeqNo: **4754623** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.302	0.0500	0.25	0.062	96.0	80 - 120				

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754621** PrepDate: **04-Oct-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	5.18	0.500	2.5	2.67	100	80 - 120				

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: **35AWW24_092718** Run ID: **UV-2450_324727** SeqNo: **4754624** PrepDate: **04-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.299	0.0500	0.25	0.062	94.8	80 - 120	0.302	0.998	20	

MSD Sample ID: **HS18091438-01MSD** Units: **mg/L** Analysis Date: **04-Oct-2018 14:35**
Client ID: Run ID: **UV-2450_324727** SeqNo: **4754622** PrepDate: **04-Oct-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	5.17	0.500	2.5	2.67	100	80 - 120	5.18	0.193	20	

The following samples were analyzed in this batch: HS18091510-01 HS18091510-02 HS18091510-03

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R324594 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW1-092718** Units: **mg/L** Analysis Date: **28-Sep-2018 03:26**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751753** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-092718** Units: **mg/L** Analysis Date: **28-Sep-2018 03:40**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751754** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.28	0.500	20	0	101	80 - 120				
Nitrogen, Nitrate (As N)	3.935	0.100	4	0	98.4	80 - 120				
Nitrogen, Nitrite (As N)	4.217	0.100	4	0	105	80 - 120				
Sulfate	20.06	0.500	20	0	100	80 - 120				

LCSD Sample ID: **WLCSDW1-092718** Units: **mg/L** Analysis Date: **28-Sep-2018 03:55**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751755** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.46	0.500	20	0	102	80 - 120	20.28	0.889	20	
Nitrogen, Nitrate (As N)	3.977	0.100	4	0	99.4	80 - 120	3.935	1.06	20	
Nitrogen, Nitrite (As N)	4.261	0.100	4	0	107	80 - 120	4.217	1.04	20	
Sulfate	20.25	0.500	20	0	101	80 - 120	20.06	0.962	20	

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **28-Sep-2018 15:59**
Client ID: **35AWW24_092718** Run ID: **ICS2100_324594** SeqNo: **4765748** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	121.6	0.500	10	113.6	79.8	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.028	0.100	2	0	101	80 - 120				
Nitrogen, Nitrite (As N)	2.096	0.100	2	0	105	80 - 120				
Sulfate	78.31	0.500	10	69.87	84.4	80 - 120				O

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R324594 **Instrument: ICS2100** **Method: SW9056**

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **28-Sep-2018 16:43**
Client ID: **35AWW24_092718** Run ID: **ICS2100_324594** SeqNo: **4765751** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	205.7	5.00	100	109.5	96.2	80 - 120				
Nitrogen, Nitrate (As N)	18.53	1.00	20	0	92.6	80 - 120				
Nitrogen, Nitrite (As N)	20.08	1.00	20	0	100	80 - 120				
Sulfate	161.2	5.00	100	65.28	95.9	80 - 120				

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **28-Sep-2018 04:39**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751758** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1025	5.00	100	909.6	115	80 - 120				EO
Nitrogen, Nitrate (As N)	19.46	1.00	20	0	97.3	80 - 120				
Nitrogen, Nitrite (As N)	22.99	1.00	20	0	115	80 - 120				
Sulfate	599.9	5.00	100	507.7	92.3	80 - 120				O

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **28-Sep-2018 16:58**
Client ID: **35AWW24_092718** Run ID: **ICS2100_324594** SeqNo: **4765752** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	205.3	5.00	100	109.5	95.8	80 - 120	205.7	0.187	20	
Nitrogen, Nitrate (As N)	18.36	1.00	20	0	91.8	80 - 120	18.53	0.905	20	
Nitrogen, Nitrite (As N)	20.1	1.00	20	0	101	80 - 120	20.08	0.11	20	
Sulfate	161.2	5.00	100	65.28	96.0	80 - 120	161.2	0.0192	20	

MSD Sample ID: **HS18091510-01MSD** Units: **mg/L** Analysis Date: **28-Sep-2018 16:14**
Client ID: **35AWW24_092718** Run ID: **ICS2100_324594** SeqNo: **4765749** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	124.1	0.500	10	113.6	104	80 - 120	121.6	2.01	20	EO
Nitrogen, Nitrate (As N)	2.057	0.100	2	0	103	80 - 120	2.028	1.42	20	
Nitrogen, Nitrite (As N)	2.131	0.100	2	0	107	80 - 120	2.096	1.66	20	
Sulfate	79.53	0.500	10	69.87	96.6	80 - 120	78.31	1.54	20	O

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R324594 **Instrument: ICS2100** **Method: SW9056**

MSD Sample ID: **HS18091438-01MSD** Units: **mg/L** Analysis Date: **28-Sep-2018 04:53**
Client ID: Run ID: **ICS2100_324594** SeqNo: **4751759** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1031	5.00	100	909.6	121	80 - 120	1025	0.584	20	SEO
Nitrogen, Nitrate (As N)	19.5	1.00	20	0	97.5	80 - 120	19.46	0.2	20	
Nitrogen, Nitrite (As N)	23.21	1.00	20	0	116	80 - 120	22.99	0.957	20	
Sulfate	607.2	5.00	100	507.7	99.5	80 - 120	599.9	1.2	20	O

The following samples were analyzed in this batch: HS18091510-01 HS18091510-02 HS18091510-03

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R324730 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181004** Units: **mg/L** Analysis Date: **04-Oct-2018 13:26**
Client ID: Run ID: **ManTech01_324730** SeqNo: **4754685** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS1-181004** Units: **mg/L** Analysis Date: **04-Oct-2018 13:34**
Client ID: Run ID: **ManTech01_324730** SeqNo: **4754686** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1073	5.00	1000	0	107	85 - 115				

LCSD Sample ID: **WLCSD1-181004** Units: **mg/L** Analysis Date: **04-Oct-2018 13:44**
Client ID: Run ID: **ManTech01_324730** SeqNo: **4754687** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1083	5.00	1000	0	108	85 - 115	1073	0.945	20	

DUP Sample ID: **HS18091510-01DUP** Units: **mg/L** Analysis Date: **04-Oct-2018 14:45**
Client ID: **35AWW24_092718** Run ID: **ManTech01_324730** SeqNo: **4754697** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	51.45	5.00					50.82	1.23	20	

The following samples were analyzed in this batch: HS18091510-01 HS18091510-02 HS18091510-03

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18091510

QC BATCH REPORT

Batch ID: R324851 **Instrument: WetChem_HS** **Method: E376.1**

MBLK Sample ID: **MBLK-R324851** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760404** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	1.00	1.00								U

LCS Sample ID: **LCS-R324851** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760403** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.36	1.00	25	0	85.4	80 - 120				

LCSD Sample ID: **LCSD-R324851** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760402** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.16	1.00	25	0	84.6	80 - 120	21.36	0.941	20	

MS Sample ID: **HS18091510-01MS** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: **35AWW24_092718** Run ID: **WetChem_HS_324851** SeqNo: **4760401** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.36	1.00	25	0.36	84.0	80 - 120				

MS Sample ID: **HS18091438-01MS** Units: **mg/L** Analysis Date: **03-Oct-2018 11:45**
Client ID: Run ID: **WetChem_HS_324851** SeqNo: **4760399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.56	1.00	25	1.96	78.4	80 - 120				S

The following samples were analyzed in this batch: HS18091510-01 HS18091510-02 HS18091510-03

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS18091510**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 15-Oct-18

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

ALS Houston, US Date: 15-Oct-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18091510

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	MET067
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	MET067
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	VOA197
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	Sub
HS18091510-01	35AWW24_092718	Login	9/28/2018 12:40:50 PM	JRM	Sub
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	MET067
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	MET067
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	VOA197
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	Sub
HS18091510-02	35AWW19_092718	Login	9/28/2018 12:40:50 PM	JRM	Sub
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	WET367
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	MET067
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	MET067
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	VOA197
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	Sub
HS18091510-03	35AWW11_092718	Login	9/28/2018 12:40:50 PM	JRM	Sub
HS18091510-04	Trip Blank	Login	9/28/2018 12:40:50 PM	JRM	VOA197

ALS Houston, US Date: 15-Oct-18

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS18091510
Date/Time Received: **28-Sep-2018 08:55**
Received by: **NDR**

Checklist completed by: *Jared R. Makan* eSignature 28-Sep-2018 Date
Reviewed by: *RJ Modashia* eSignature 1-Oct-2018 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.0c/0.6c UC/C	IR11	
Cooler(s)/Kit(s):	44326		
Date/Time sample(s) sent to storage:	09/28/2018 15:30		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Neat volume for 35AWW11_092718 appears a darker color to the rest of the sample, logged in for analysis to catch hold time on anions (NO3/NO2).

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00944191

bhate ENVIRONMENTAL ASSOCIATES, INC.

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code [2]	Sample Number [3]	Sample Matrix [4]	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Anions/Alkalinity	Total Phosphorous	Total Manganese & Iron	Dissolved Manganese & Iron	Sulfide	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW24_092718		27Sep2018	0930	-	N		WG	12	X	X	X	X	X	X	X	X	X				
35AWW19_092718		27Sep2018	1035	-	N		WG	12	X	X	X	X	X	X	X	X	X				
35AWW11_092718		27Sep2018	1150	-	N		WG	12	X	X	X	X	X	X	X	X	X				
TRIP BLANK		27Sep2018			TB		W	2	X												
				-																	
				-																	
				-																	
				-																	
				-																	
				-																	
				-																	

Sample Analysis Requested [5] | Quality Assurance Samples [6]

HS18091510

Bhate Environmental Associates, Inc.
LHAAP-58

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	9/27/18	1400	1. ND	9/28/18	0855
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stanciff Rd, Suite 210, Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SB = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

44326

Temp - 4.1 C 1.0

IR # 11 CF - 0.1

00944192

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44326

CUSTODY SEAL

Date: 9/27/18 Time: 1450
Name: Scott Beesinger
Company: Shate

Seal Broken By:
Date:

44326

SEP 28 2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

44326

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 07AUG18
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3111
DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-58-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4380 9531 5109

FRI - 28 SEP 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 162786 27SEP18 0GGA 553C1/770C/8CBA

LABORATORY REPORT

October 9, 2018

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS18091510

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on October 2, 2018. For your reference, these analyses have been assigned our service request number P1805214.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko

By Kate Kaneko at 12:08 pm, 10/09/18

Kate Kaneko
Laboratory Director

Client: ALS Laboratory Group Service Request No: P1805214
Project: HS18091510

CASE NARRATIVE

The samples were received intact under chain of custody on October 2, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1347317
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS18091510

Service Request: P1805214

Date Received: 10/2/2018
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
35AWW24_092718	P1805214-001	Water	9/27/2018	09:30	X	X
35AWW19_092718	P1805214-002	Water	9/27/2018	10:35	X	X
35AWW11_092718	P1805214-003	Water	9/27/2018	11:50	X	X

00944197

P1805214

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 9917

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18091510
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18091510-01**	**35AWW24_092718**	**Groundwater**	**27 Sep 2018 09:30**
	MEE plus CO2 Sub to ALS SimiValley			08 Oct 2018
2.	**HS18091510-02**	**35AWW19_092718**	**Groundwater**	**27 Sep 2018 10:35**
	MEE plus CO2 Sub to ALS SimiValley			08 Oct 2018
3.	**HS18091510-03**	**35AWW11_092718**	**Groundwater**	**27 Sep 2018 11:50**
	MEE plus CO2 Sub to ALS SimiValley			08 Oct 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

Neat vials for CO2 analysis

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/1/18 1800

Received By: _____ Date/Time: 10-2-18 0950

Cooler ID(s): _____ Temperature(s): _____ 5° not ice temp acceptable

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1805214

Project: HS18091510

Sample(s) received on: 10/2/18 Date opened: 10/2/18 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 3° C Blank Temperature: ° C Thermometer ID CO907034581 Wet Ic			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1805214-001.01	40mL VOA NP		7		A	MR 10/05/18
P1805214-001.02	40mL VOA NP				A	
P1805214-001.04	40ml VOA HCL		1		A	MR 10/04/18
P1805214-001.05	40ml VOA HCL				A	
P1805214-002.01	40mL VOA NP		7		A	MR 10/05/18
P1805214-002.02	40mL VOA NP				A	
P1805214-002.04	40ml VOA HCL		1		A	MR 10/04/18
P1805214-002.05	40ml VOA HCL				A	
P1805214-003.01	40mL VOA NP		6		A	MR 10/05/18
P1805214-003.02	40mL VOA NP				A	
P1805214-003.04	40ml VOA HCL		1		A	MR 10/04/18
P1805214-003.05	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS18091510** ALS Project ID: P1805214

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date(s) Collected: 9/27/18
Date Received: 10/2/18
Date Analyzed: 10/5/18

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	**Result µg/L**	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
35AWW24_092718	P1805214-001	0.10	**330,000**	1,000	860	370	**B**
35AWW19_092718	P1805214-002	0.10	**250,000**	1,000	860	370	**B**
35AWW11_092718	P1805214-003	0.050	**320,000**	2,000	1,700	740	**B**
Method Control Sample	P181005-MB	0.10	**640**	1,000	860	370	**J**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
B = Analyte was detected in both the sample and associated Method Control Sample.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P1805214
Client Project ID: **HS18091510** ALS Sample ID: P181005-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Wade Henton Date Analyzed: 10/05/18
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	18,900	19,200	**83**	**84**	80-122	1	15	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW24_092718**
Client Project ID: **HS18091510**

ALS Project ID: P1805214
ALS Sample ID: P1805214-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 9/27/18
Date Received: 10/2/18
Date Analyzed: 10/4/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**190**	1.3	1.0	0.51	**B**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
B = Analyte detected in both the sample and associated method blank.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW19_092718**
Client Project ID: **HS18091510**

ALS Project ID: P1805214
ALS Sample ID: P1805214-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 9/27/18
Date Received: 10/2/18
Date Analyzed: 10/4/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**27**	1.3	1.0	0.51	**B**
74-85-1	Ethene	**0.32**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
B = Analyte detected in both the sample and associated method blank.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW11_092718**
Client Project ID: **HS18091510**

ALS Project ID: P1805214
ALS Sample ID: P1805214-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: 9/27/18
Date Received: 10/2/18
Date Analyzed: 10/4/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1,300**	1.3	1.0	0.51	**B**
74-85-1	Ethene	**2.1**	1.0	0.55	0.24	
74-84-0	Ethane	**0.63**	0.60	0.47	0.16	

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
B = Analyte detected in both the sample and associated method blank.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS18091510**

ALS Project ID: P1805214
ALS Sample ID: P181004-MB

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 10/04/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.54**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18091510**

ALS Project ID: P1805214
ALS Sample ID: P181004-LCS
P181004-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 10/04/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.50	2.37	2.47	**95**	**99**	73-125	4	12	
74-85-1	Ethene	4.37	4.40	4.53	**101**	**104**	72-133	3	7	
74-84-0	Ethane	4.69	4.63	4.68	**99**	**100**	74-131	1	6	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

October 10, 2018 Service Request No:R1809393

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: LHAAP / Site 58

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 28, 2018
For your reference, these analyses have been assigned our service request number **R1809393.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger
Project Manager

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ALS Group USA, Corp.
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ALS Environmental—Rochester Laboratory
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1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Received: 09/28/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 09/28/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

Semivoa GC:

Method Organic Acids, 10/05/2018: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

General Chemistry:

Ferrous Iron was not performed in the field as recommended by the EPA to meet an "immediate" or 15 minute Holding Time. Samples analyzed in the laboratory have been flagged with an "H" to indicate the "immediate" holding time has been exceeded.

Approved by _____ Date 10/10/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: 35AWW24_092718			Lab ID: R1809393-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.31		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW19_092718			Lab ID: R1809393-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	3.99		0.11	0.50	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW11_092718			Lab ID: R1809393-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	36.5		1.1	5.0	mg/L	SM 3500-Fe B.4.c
Acetic Acid	1100		10	40	mg/L	Organic Acids
Propionic Acid	520		1.9	20	mg/L	Organic Acids

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: ALS Environmental - US **Service Request:**R1809393
Project: LHAAP / Site 58

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1809393-001	35AWW24_092718	9/27/2018	0930
R1809393-002	35AWW19_092718	9/27/2018	1035
R1809393-003	35AWW11_092718	9/27/2018	1150

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Sample Analysis Requested (5): Number of containers	VFA	Ferrous Iron									Quality Assurance Samples (6): Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW24-092718		27Sep2018	0930	-	N		WG	2	X	X												
35AWW19-092718		27Sep2018	1035	-	N		WG	2	X	X												
35AWW11-092718		27Sep2018	1150	-	N		WG	2	X	X												
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	9/27/18	1400	1. [signature]	9/28/18	@ 0900
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler Receipt and Preservation Check Form

Project/Client Bhate Folder Number .

Cooler received on 9/28/18 by: @ **COURIER:** ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y) (N)	5a	**Perchlorate** samples have required headspace?	Y N (NA)
2	**Custody papers** properly completed (ink, signed)?	(Y) N	5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y N (NA)
3	Did all bottles arrive in good **condition** (unbroken)?	(Y) N	6	Where did the bottles originate?	ALS/ROC (CLIENT)
4	Circle: (Wet Ice) **Dry Ice Gel packs** present?	(Y) N	7	Soil VOA received as: Bulk Encore 5035set	(NA)

8. Temperature Readings Date: 9/28/18 Time: 0935 ID: IR#7 (IR#10) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	2.0						
Correction Factor (°C)	–						
Corrected Temp (°C)	2.0						
Temp from:Type of bottle	–						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-002 by @ on 9/28/18 at 0940
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown/Preservation Check**: Date: 9/28/18 Time: 1442 by: @

9.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
10.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
11.	Were correct containers used for the tests indicated?	(YES)	NO
12.	Were 5035 vials acceptable (no extra labels, not leaking)?	YES	NO (N/A)
13.	Air Samples: Cassettes / Tubes Intact with MS? Canisters Pressurized	Tedlar® Bags Inflated	(N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2	209318	HNO_3	✓		1117092					
≤2	↓	H_2SO_4	✓		~~A9~~ B260052C	5/20				
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, (Phenol), 625, 608pest, 522	✓		If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-			**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).			
		HCl	**	**						

Bottle lot numbers: klbany

Explain all Discrepancies/ Other Comments:

CLRES	BULK
DO	FLDT
HPROD	HGFB
(HTR)	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: @

PC Secondary Review: MKJ 10/1/18

*significant air bubbles: VOA > 5-6 mm ; WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1809393
Project: LHAAP / Site 58

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1809393-001.01					
	SM 3500-Fe B.4.c				
		10/1/2018	0901	SMO / GLAFORCE	
		10/5/2018	1158	RT000205 / GLAFORCE	
		10/5/2018	1159	R-015 / GLAFORCE	
R1809393-001.02					
	Organic Acids				
		10/1/2018	0901	SMO / GLAFORCE	
		10/4/2018	1507	In Lab / BALLGEIER	
		10/4/2018	1508	R-002 / BALLGEIER	
R1809393-002.01					
	SM 3500-Fe B.4.c				
		10/1/2018	0901	SMO / GLAFORCE	
		10/5/2018	1158	RT000205 / GLAFORCE	
		10/5/2018	1159	R-015 / GLAFORCE	
R1809393-002.02					
	Organic Acids				
		10/1/2018	0901	SMO / GLAFORCE	
		10/4/2018	1507	In Lab / BALLGEIER	
		10/4/2018	1508	R-002 / BALLGEIER	
R1809393-003.01					
	SM 3500-Fe B.4.c				
		10/1/2018	0901	SMO / GLAFORCE	
		10/5/2018	1158	RT000205 / GLAFORCE	
		10/5/2018	1159	R-015 / GLAFORCE	
R1809393-003.02					
	Organic Acids				
		10/1/2018	0901	SMO / GLAFORCE	
		10/4/2018	1506	In Lab / BALLGEIER	
		10/4/2018	1508	R-002 / BALLGEIER	

Miscellaneous Forms

ALS Environmental—Rochester Laboratory
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ALS Environmental

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.

Spike was diluted out.

\+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratoryôs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

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Analyst Summary report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Service Request: R1809393

Sample Name: 35AWW24_092718
Lab Code: R1809393-001
Sample Matrix: Water
Date Collected: 09/27/18
Date Received: 09/28/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW19_092718
Lab Code: R1809393-002
Sample Matrix: Water
Date Collected: 09/27/18
Date Received: 09/28/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW11_092718
Lab Code: R1809393-003
Sample Matrix: Water
Date Collected: 09/27/18
Date Received: 09/28/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

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dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 09:30
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW24_092718	**Units:**	mg/L
Lab Code:	R1809393-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	10/04/18 23:05	
Acetic Acid	ND U	4.0	2.0	1.0	1	10/04/18 23:05	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	10/04/18 23:05	
Lactic Acid	ND U	2.0	1.0	0.14	1	10/04/18 23:05	
Propionic Acid	ND U	2.0	1.0	0.19	1	10/04/18 23:05	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 10:35
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW19_092718	**Units:**	mg/L
Lab Code:	R1809393-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/05/18 00:15	
Acetic Acid	ND	U	4.0	2.0	1.0	1	10/05/18 00:15	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/05/18 00:15	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/05/18 00:15	
Propionic Acid	ND	U	2.0	1.0	0.19	1	10/05/18 00:15	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 11:50
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW11_092718	**Units:**	mg/L
Lab Code:	R1809393-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	2.0	1.0	0.16	10	10/05/18 14:30	
Acetic Acid	**1100**		40	20	10	10	10/05/18 14:30	
Butanoic Acid (Butyric Acid)	ND	U	20	10	3.2	10	10/05/18 14:30	
Lactic Acid	ND	U	20	10	1.4	10	10/05/18 14:30	
Propionic Acid	**520**		20	10	1.9	10	10/05/18 14:30	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 09:30
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW24_092718	**Basis:**	NA
Lab Code:	R1809393-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.31**	mg/L	0.10	0.08	0.03	1	09/28/18 16:10	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 10:35
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW19_092718	**Basis:**	NA
Lab Code:	R1809393-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**3.99**	mg/L	0.50	0.40	0.11	5	09/28/18 16:10	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 11:50
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW11_092718	**Basis:**	NA
Lab Code:	R1809393-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**36.5**	mg/L	5.0	4.0	1.1	50	09/28/18 16:10	*

QC Summary Forms

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Analyzed: 10/04/18 17:51

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Method Blank
Lab Code: RQ1810603-04

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\100418\A0002377.D\

Analysis Method: Organic Acids

Analysis Lot:609639

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1810603-05	I:\ACQUDATA\hplc05\data\100418\A0002378.D\	10/04/18 18:26
Duplicate Lab Control Sample	RQ1810603-06	I:\ACQUDATA\hplc05\data\100418\A0002379.D\	10/04/18 19:00
35AWW24_092718	R1809393-001	I:\ACQUDATA\hplc05\data\100418\A0002386.D\	10/04/18 23:05
35AWW19_092718	R1809393-002	I:\ACQUDATA\hplc05\data\100418\A0002388.D\	10/05/18 00:15

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Analyzed: 10/05/18 11:04

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Method Blank
Lab Code: RQ1810656-03

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\100518\A0002393.D\

Analysis Method: Organic Acids

Analysis Lot:609806

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1810656-04	I:\ACQUDATA\hplc05\data\100518\A0002394.D\	10/05/18 11:39
Duplicate Lab Control Sample	RQ1810656-05	I:\ACQUDATA\hplc05\data\100518\A0002395.D\	10/05/18 12:02
35AWW11_092718	R1809393-003	I:\ACQUDATA\hplc05\data\100518\A0002399.D\	10/05/18 14:30

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1810603-04	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/04/18 17:51	
Acetic Acid	ND	U	4.0	2.0	1.0	1	10/04/18 17:51	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/04/18 17:51	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/04/18 17:51	
Propionic Acid	ND	U	2.0	1.0	0.19	1	10/04/18 17:51	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1810656-03	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	10/05/18 11:04	
Acetic Acid	ND	U	4.0	2.0	1.0	1	10/05/18 11:04	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	10/05/18 11:04	
Lactic Acid	ND	U	2.0	1.0	0.14	1	10/05/18 11:04	
Propionic Acid	ND	U	2.0	1.0	0.19	1	10/05/18 11:04	

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Analyzed: 10/04/18 18:26

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Lab Control Sample
Lab Code: RQ1810603-05

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\100418\A0002378.D\

Analysis Method: Organic Acids
Analysis Lot:609639

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1810603-04	I:\ACQUDATA\hplc05\data\100418\A0002377.D\	10/04/18 17:51
Duplicate Lab Control Sample	RQ1810603-06	I:\ACQUDATA\hplc05\data\100418\A0002379.D\	10/04/18 19:00
35AWW24_092718	R1809393-001	I:\ACQUDATA\hplc05\data\100418\A0002386.D\	10/04/18 23:05
35AWW19_092718	R1809393-002	I:\ACQUDATA\hplc05\data\100418\A0002388.D\	10/05/18 00:15

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Analyzed: 10/05/18 11:39

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Lab Control Sample
Lab Code: RQ1810656-04

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\100518\A0002394.D\

Analysis Method: Organic Acids

Analysis Lot:609806

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1810656-03	I:\ACQUDATA\hplc05\data\100518\A0002393.D\	10/05/18 11:04
Duplicate Lab Control Sample	RQ1810656-05	I:\ACQUDATA\hplc05\data\100518\A0002395.D\	10/05/18 12:02
35AWW11_092718	R1809393-003	I:\ACQUDATA\hplc05\data\100518\A0002399.D\	10/05/18 14:30

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Analyzed: 10/04/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample			Duplicate Lab Control Sample					
		RQ1810603-05			RQ1810603-06					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	2.97	2.02	147 *	3.00	2.02	148 *	73-122	1	30
Acetic Acid	Organic Acids	20.7	19.9	104	20.9	19.9	105	80-130	<1	30
Butanoic Acid (Butyric Acid)	Organic Acids	18.2	20.3	90	17.5	20.3	86	86-128	4	30
Lactic Acid	Organic Acids	20.3	20.6	98	20.5	20.6	99	81-114	1	30
Propionic Acid	Organic Acids	18.8	20.0	94	18.9	20.0	95	63-153	<1	30

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Analyzed: 10/05/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample RQ1810656-04			Duplicate Lab Control Sample RQ1810656-05					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	2.99	2.02	148 *	2.97	2.02	147 *	73-122	<1	30
Acetic Acid	Organic Acids	20.7	19.9	104	20.8	19.9	105	80-130	<1	30
Butanoic Acid (Butyric Acid)	Organic Acids	18.4	20.3	90	17.8	20.3	88	86-128	3	30
Lactic Acid	Organic Acids	20.3	20.6	98	20.2	20.6	98	81-114	<1	30
Propionic Acid	Organic Acids	19.1	20.0	95	18.6	20.0	93	63-153	2	30

General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1809393-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	ND U	mg/L	0.10	0.08	0.03	1	09/28/18 16:10	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18
Sample Matrix:	Water	**Date Received:**	09/28/18
		Date Analyzed:	09/28/18

Duplicate Matrix Spike Summary
Iron, Divalent (Ferrous Iron)

Sample Name:	35AWW24_092718	**Units:**	mg/L
Lab Code:	R1809393-001	**Basis:**	NA
Analysis Method:	SM 3500-Fe B.4.c		

		Matrix Spike R1809393-001MS			Duplicate Matrix Spike R1809393-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Iron, Divalent (Ferrous Iron)	0.31	0.81	0.40	124	0.81	0.40	124	67-129	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1809393
Date Analyzed: 09/28/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1809393-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	0.39	0.40	97	67-129

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1809393
Project: LHAAP / Site 58

Continuing Calibration Blank (CCB) Summary
Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	609190	RQ1810496-02	09/28/18 16:10	0.10	0.08	0.03	ND	U
CCB2	609190	RQ1810496-05	09/28/18 16:10	0.10	0.08	0.03	ND	U

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QA/QC Report

Client: ALS Environmental - US **Service Request:** R1809393
Project: LHAAP / Site 58

Continuing Calibration Verification (CCV) Summary

Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	609190	RQ1810496-01	09/28/18 16:10	2.00	2.00	100	90-110
CCV2	609190	RQ1810496-06	09/28/18 16:10	2.00	2.00	100	90-110

Raw Data

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 09:30
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW24_092718	**Units:**	mg/L
Lab Code:	R1809393-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	10/04/18 23:05	
Acetic Acid	ND U	4.0	2.0	1.0	1	10/04/18 23:05	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	10/04/18 23:05	
Lactic Acid	ND U	2.0	1.0	0.14	1	10/04/18 23:05	
Propionic Acid	ND U	2.0	1.0	0.19	1	10/04/18 23:05	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 10:35
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW19_092718	**Units:**	mg/L
Lab Code:	R1809393-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	10/05/18 00:15	
Acetic Acid	ND U	4.0	2.0	1.0	1	10/05/18 00:15	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	10/05/18 00:15	
Lactic Acid	ND U	2.0	1.0	0.14	1	10/05/18 00:15	
Propionic Acid	ND U	2.0	1.0	0.19	1	10/05/18 00:15	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 11:50
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW11_092718	**Units:**	mg/L
Lab Code:	R1809393-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	2.0	1.0	0.16	10	10/05/18 14:30	
Acetic Acid	**1100**		40	20	10	10	10/05/18 14:30	
Butanoic Acid (Butyric Acid)	ND	U	20	10	3.2	10	10/05/18 14:30	
Lactic Acid	ND	U	20	10	1.4	10	10/05/18 14:30	
Propionic Acid	**520**		20	10	1.9	10	10/05/18 14:30	

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002386.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:05:51
Operator : b.allgeier
Sample : r1809393-001
Misc :
ALS Vial : 20 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

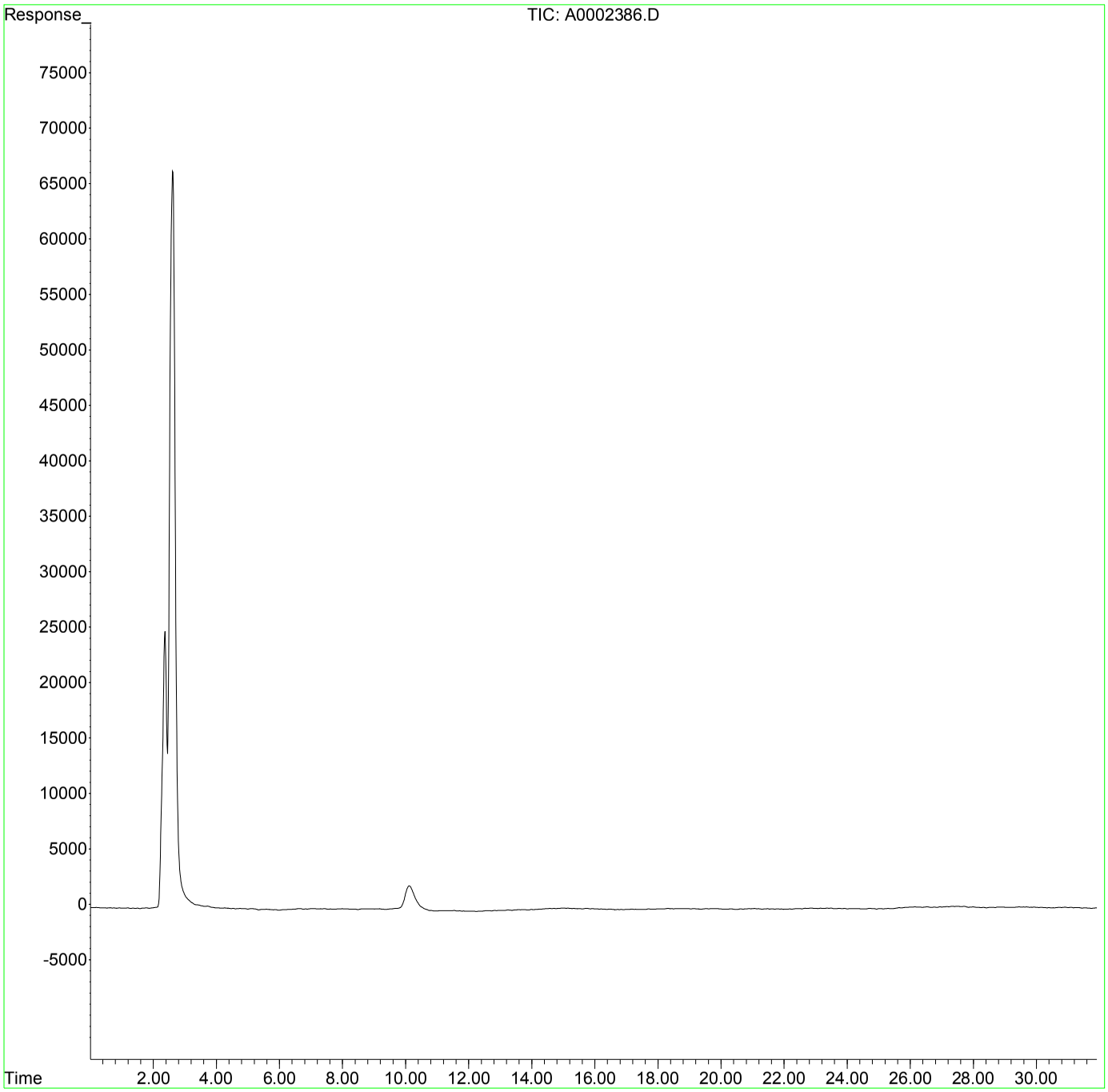
00944253

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002386.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:05:51
Operator : b.allgeier
Sample : r1809393-001
Misc :
ALS Vial : 20 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944254

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002388.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 00:15:52
Operator : b.allgeier
Sample : r1809393-002
Misc :
ALS Vial : 21 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:19 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

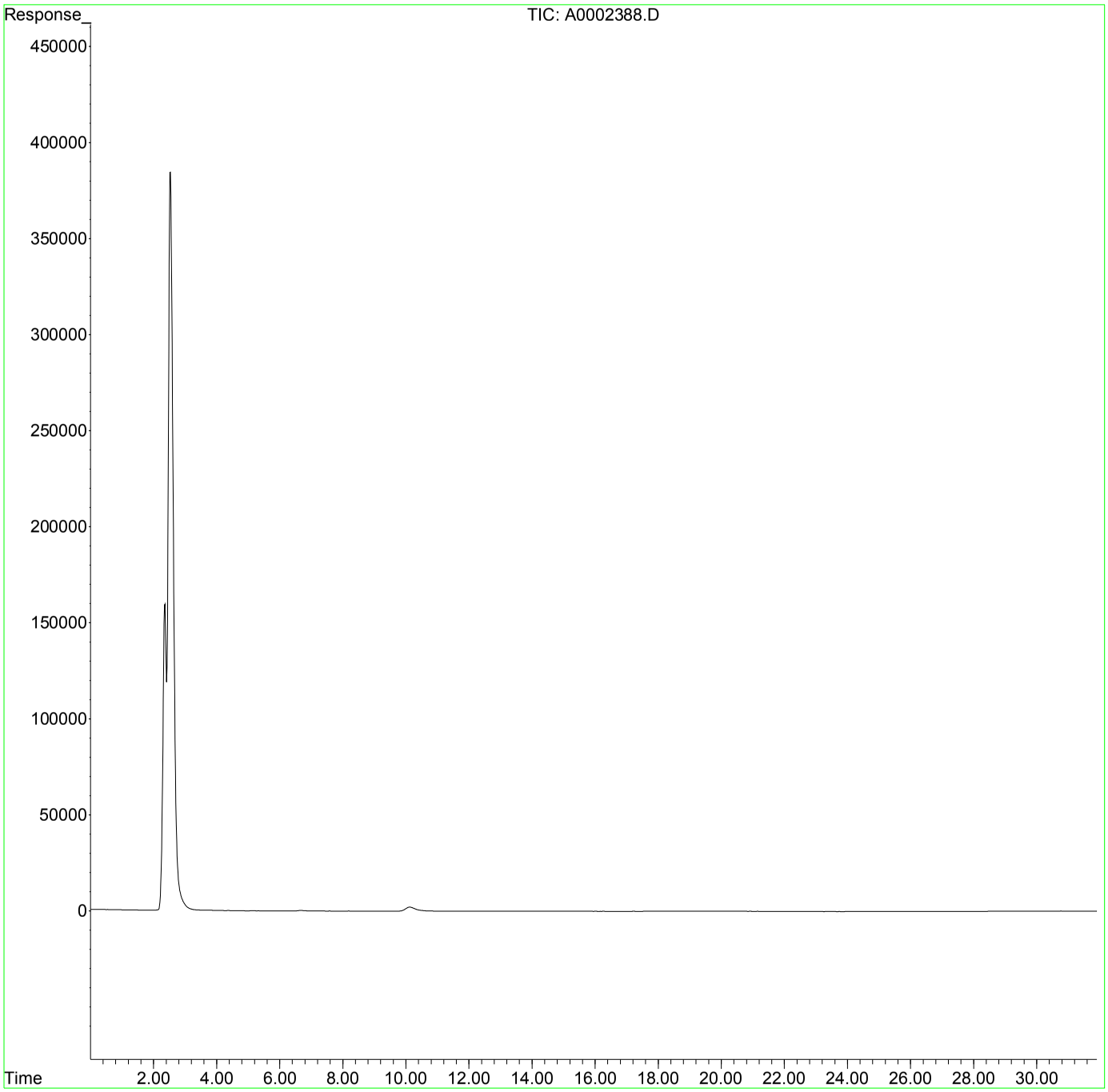
00944255

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002388.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 00:15:52
Operator : b.allgeier
Sample : r1809393-002
Misc :
ALS Vial : 21 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:19 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944256

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002399.D
Signal(s) : dad1A.ch
Acq On : ~~31-Dec-2000, 02:47:48~~ 05-Oct-2018, 14:30:00
Operator : b.allgeier
Sample : r1809393-003|10
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:25 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	d
3) T	Lactic Acid	0.000	0	N.D.	ppm	d
4) T	Acetic Acid	4.363	6525516	110.285	ppm	
5) T	Propionic Acid	9.115	3125438	52.448	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

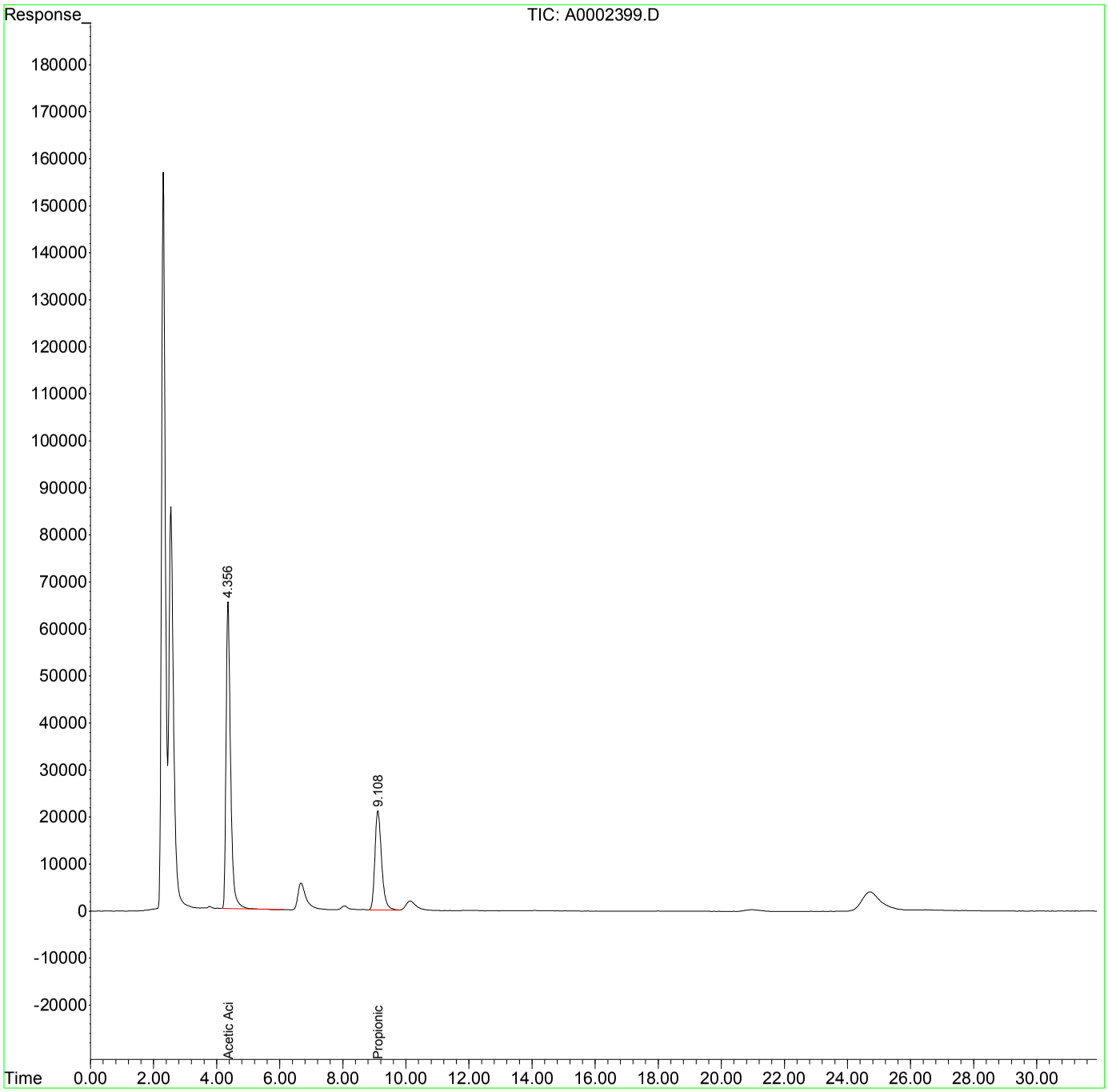
00944257

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002399.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:47:48
Operator : b.allgeier
Sample : r1809393-003|10
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:25 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944258

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002377.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:51:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

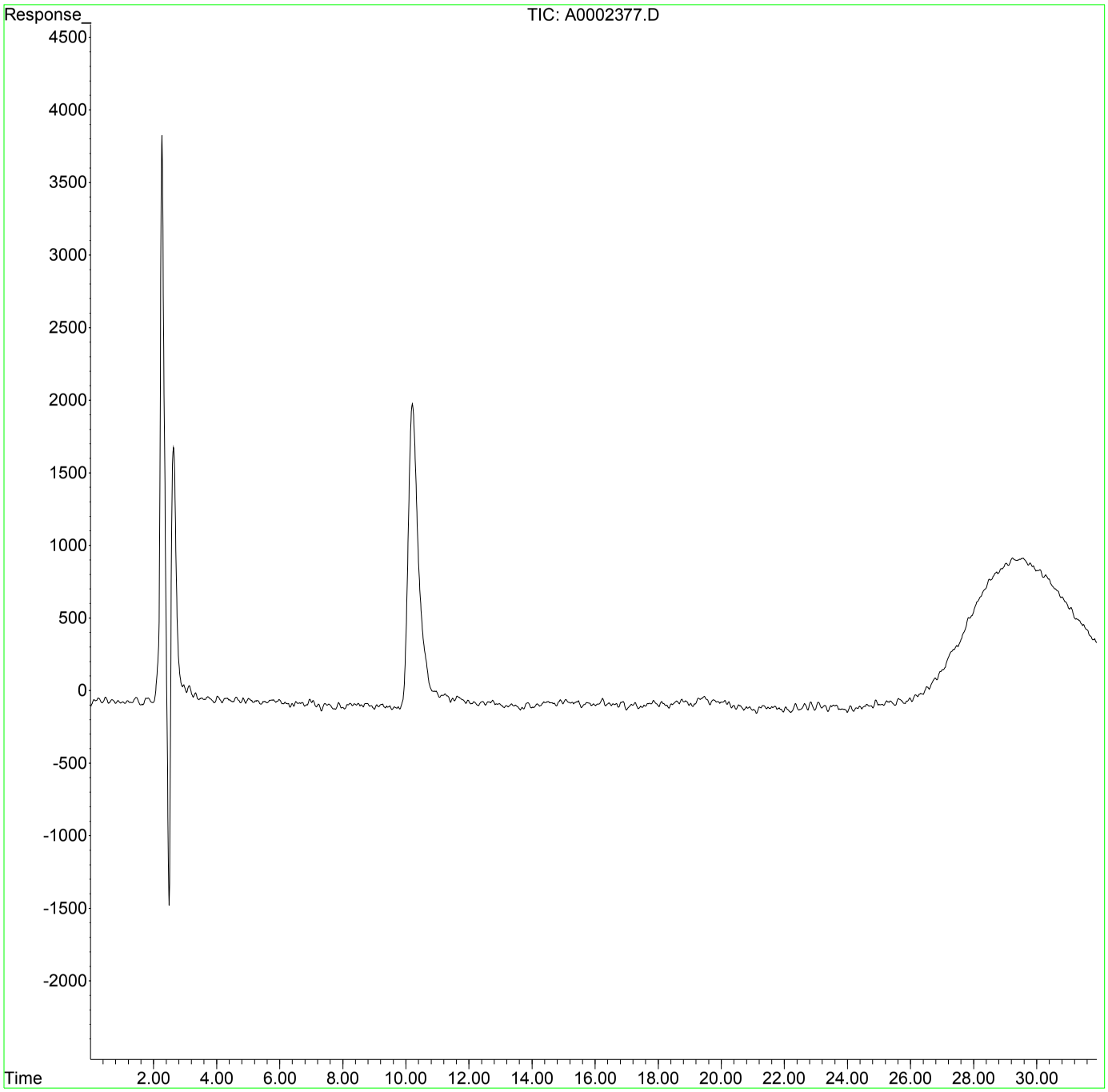
00944259

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002377.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:51:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944260

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002393.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:04:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:11 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

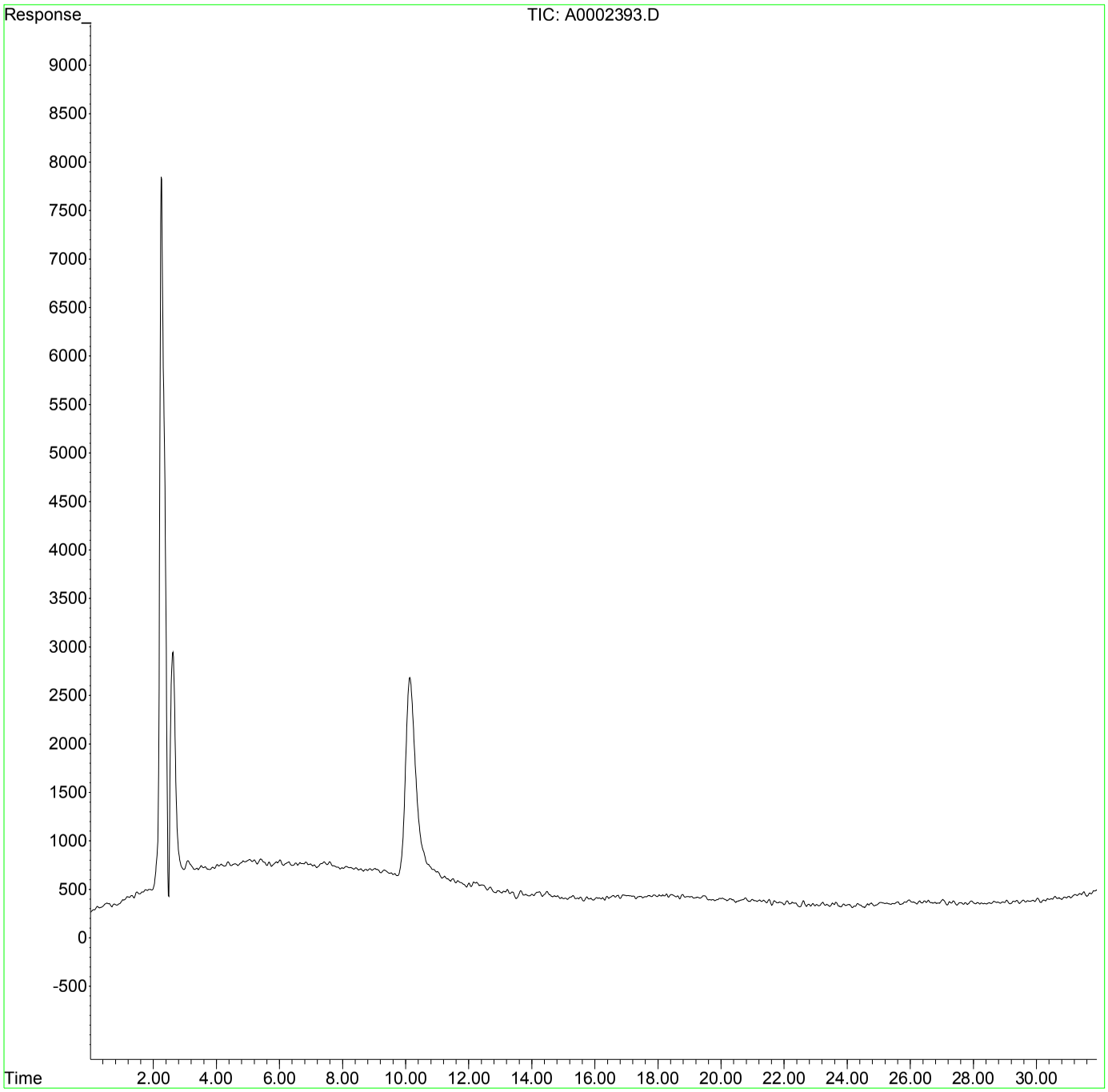
00944261

1st BA 10/08/18
2nd BA 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002393.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:04:39
Operator : b.allgeier
Sample : met blk
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:11 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944262

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002378.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 18:26:33
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.133	1888113	19.598 ppm
2) T	Pyruvic acid	3.630	1345992	2.972 ppm
3) T	Lactic Acid	4.055	1088740	20.250 ppm
4) T	Acetic Acid	4.409	1224265	20.691 ppm
5) T	Propionic Acid	9.241	1120055	18.796 ppm
6) T	Butyric Acid	25.078	1146501	18.228 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

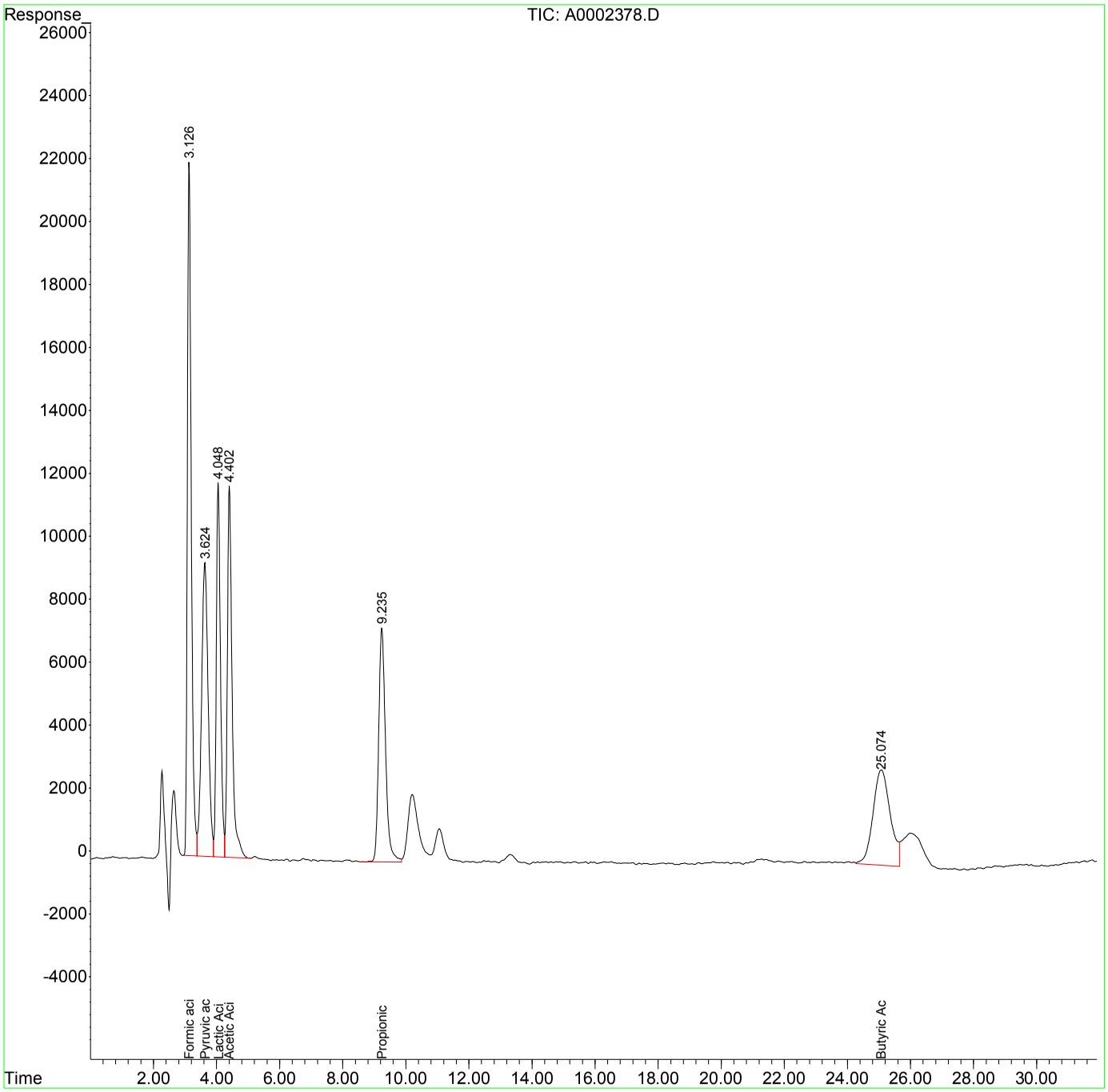
00944263

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002378.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 18:26:33
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:27:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944264

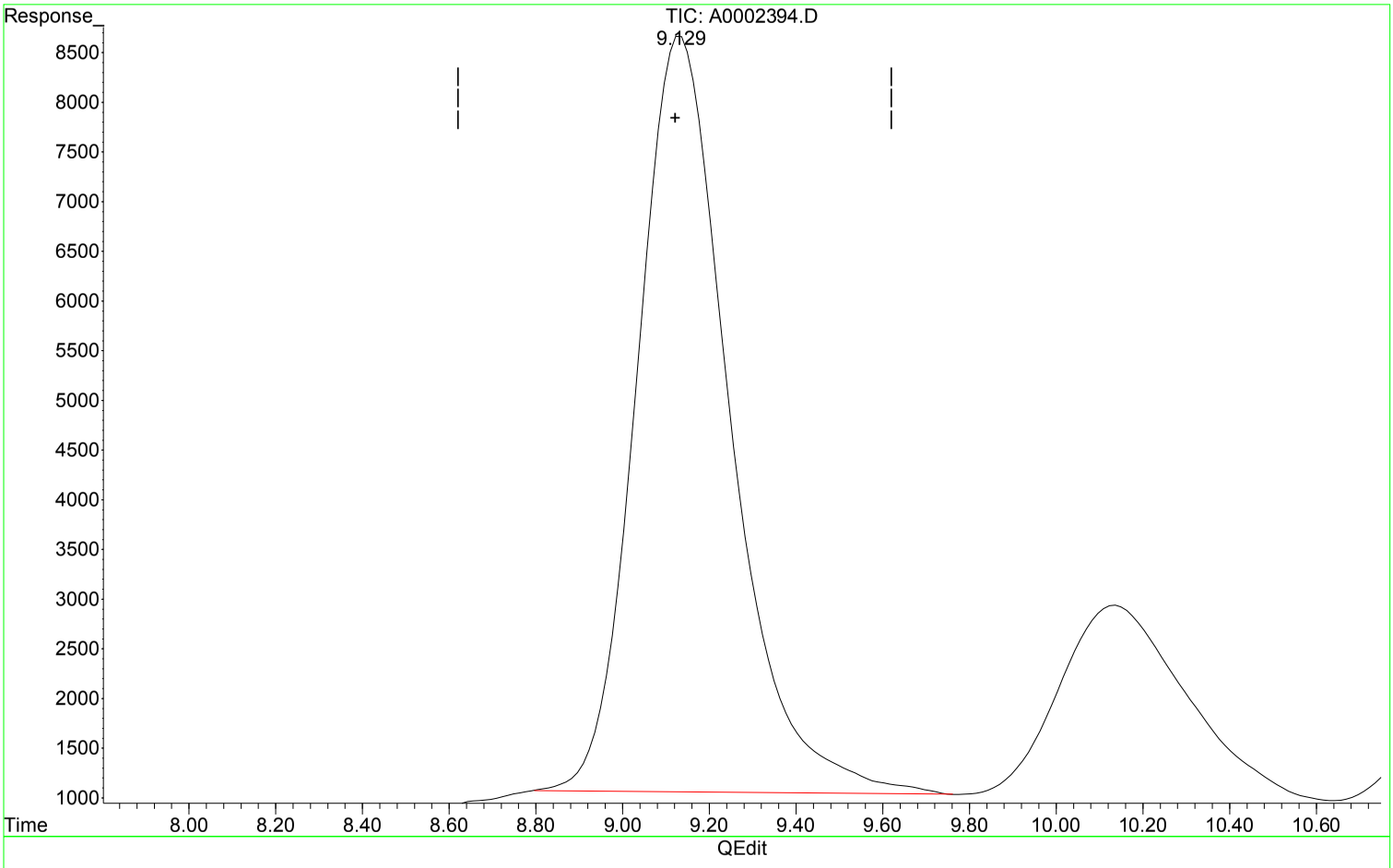
1st BA 10/08/18
2nd BA 10/09/18

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002394.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:39:38
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.129min 19.053 ppm m

response 1135408

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 15:31:10 2018 Page: 1

00944265

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002394.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:39:38
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.110	1910564	19.831	ppm	
2) T	Pyruvic acid	3.603	1352094	2.985	ppm	
3) T	Lactic Acid	4.020	1090336	20.280	ppm	
4) T	Acetic Acid	4.369	1227239	20.741	ppm	
5) T	Propionic Acid	9.129	1135408	19.053	ppm	m
6) T	Butyric Acid	24.710	1155592	18.373	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

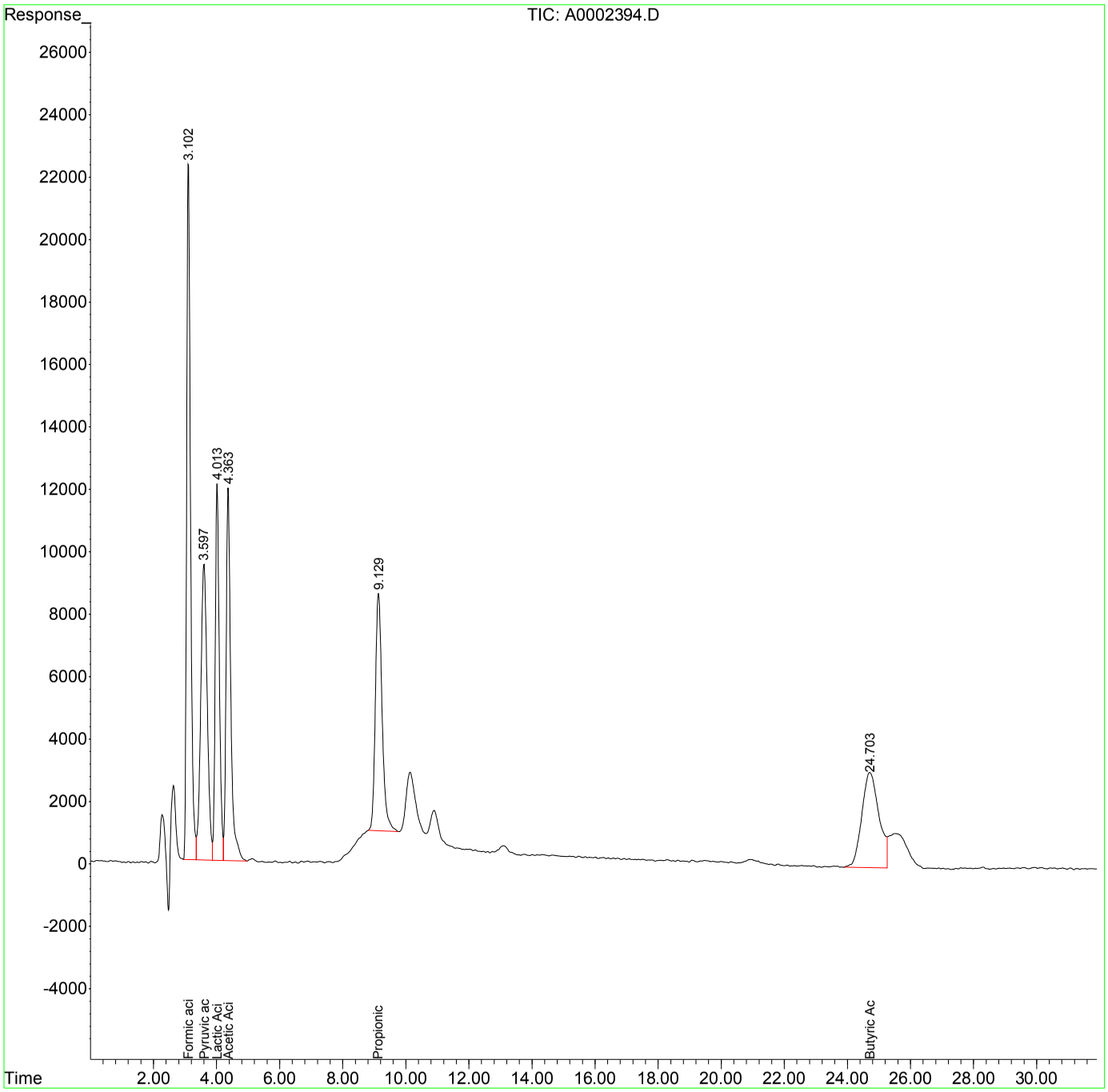
00944266

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002394.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 11:39:38
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



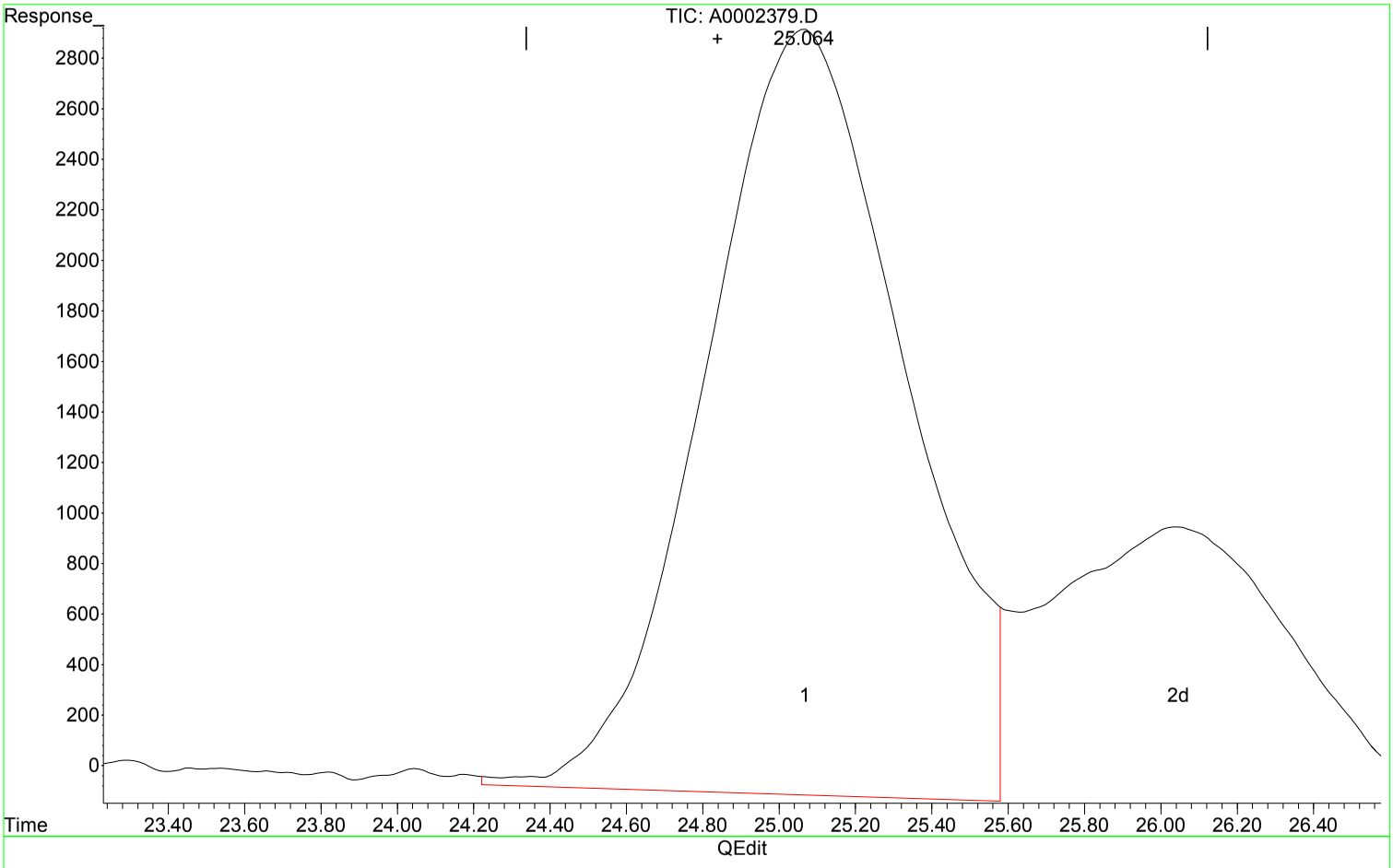
00944267

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002379.D
Signal(s) : dad1A.ch
Acq On : 29-Dec-2000, 23:47:53
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 13 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:01 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.064min 17.514 ppm m

response 1101604

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

00944268

1st BA 10/05/18
2nd MP 10/09/18

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002379.D
Signal(s) : dad1A.ch
Acq On : ~~29-Dec-2000, 23:47:53~~ 04-Oct-2018, 19:00:00
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 13 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:01 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	1909074	19.815	ppm	
2) T	Pyruvic acid	3.629	1357464	2.997	ppm	
3) T	Lactic Acid	4.056	1100466	20.468	ppm	
4) T	Acetic Acid	4.411	1236167	20.892	ppm	
5) T	Propionic Acid	9.244	1128333	18.934	ppm	
6) T	Butyric Acid	25.064	1101604	17.514	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

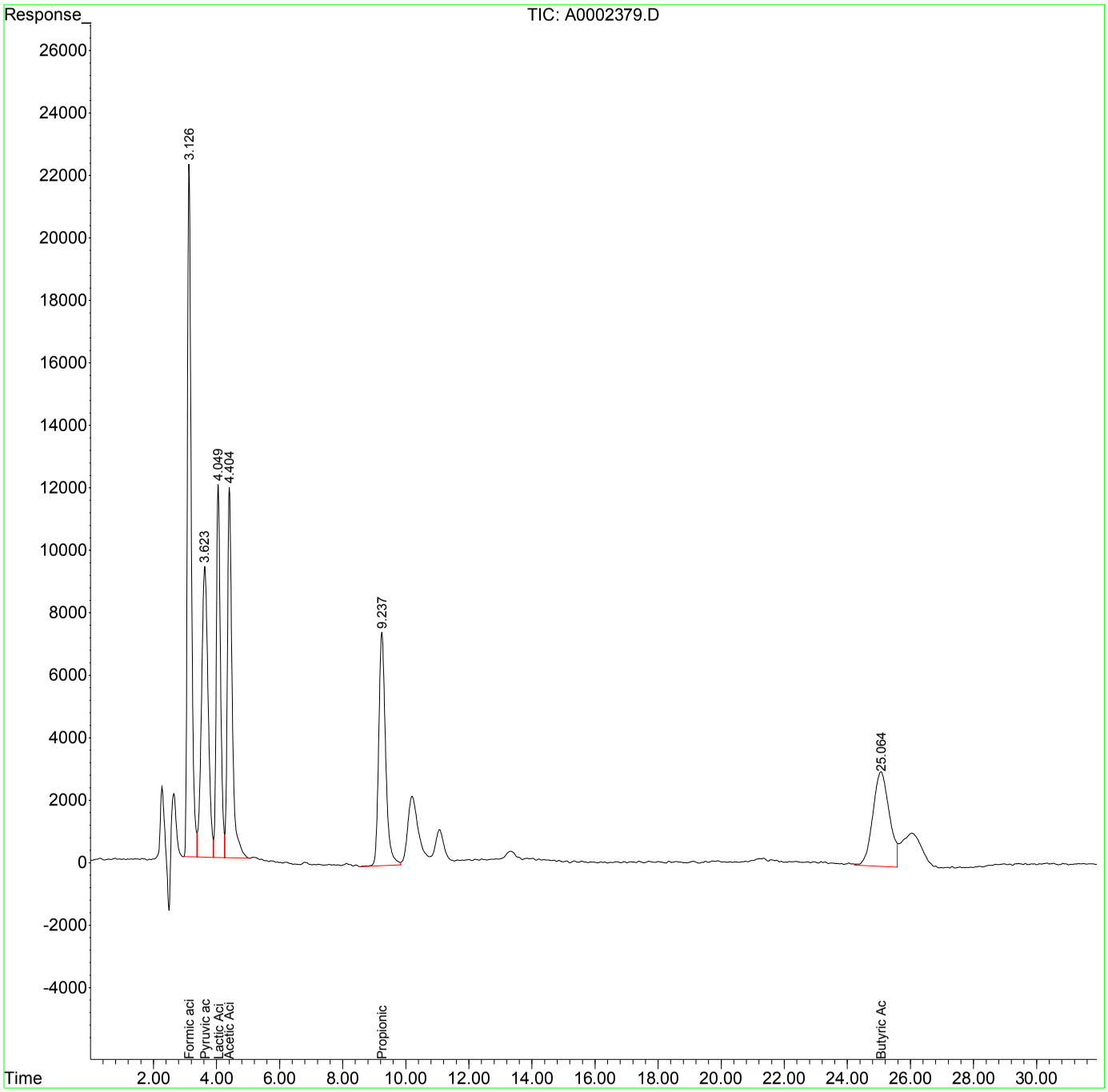
00944269

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002379.D
Signal(s) : dad1A.ch
Acq On : 29-Dec-2000, 23:47:53
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 13 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:01 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944270

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002395.D
Signal(s) : dad1A.ch
Acq On : ~~29-Dec-2000, 23:18:07~~ 05-Oct-2018, 12:02:00
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.109	1891515	19.633 ppm
2) T	Pyruvic acid	3.602	1344844	2.969 ppm
3) T	Lactic Acid	4.019	1087299	20.223 ppm
4) T	Acetic Acid	4.368	1231094	20.806 ppm
5) T	Propionic Acid	9.130	1108903	18.608 ppm
6) T	Butyric Acid	24.712	1120597	17.816 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

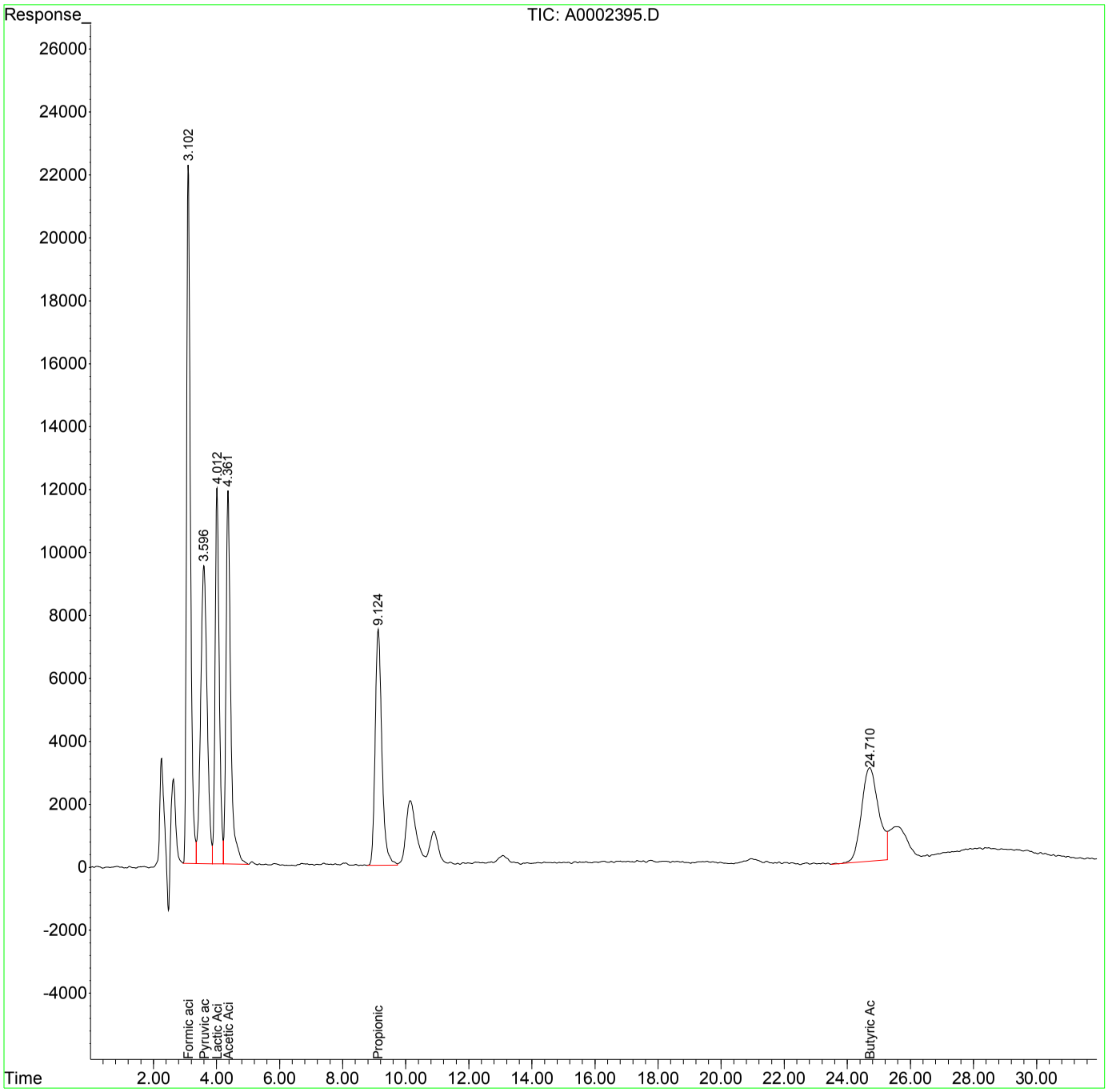
00944271

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002395.D
Signal(s) : dad1A.ch
Acq On : 29-Dec-2000, 23:18:07
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:30:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



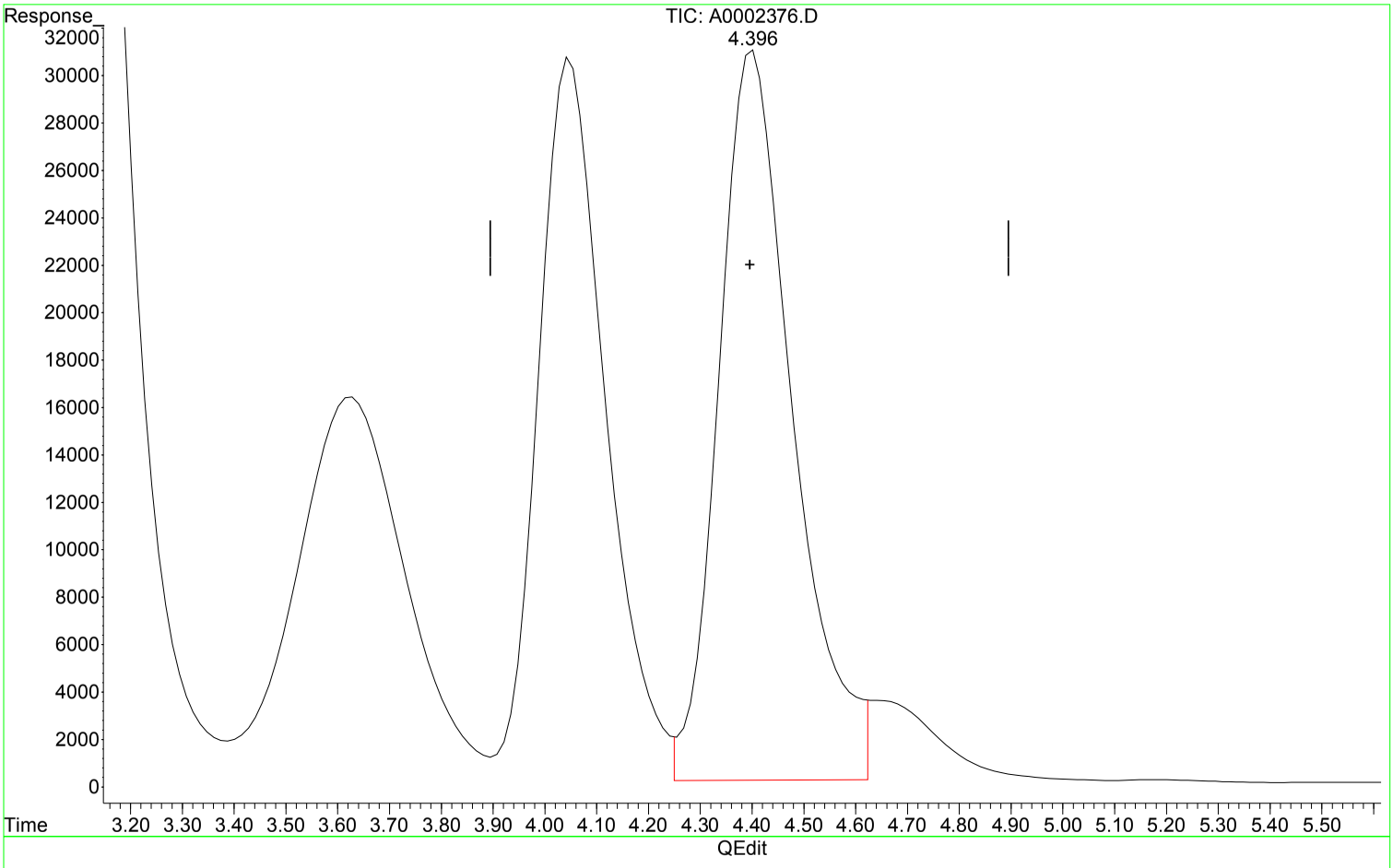
00944272

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.396min 51.650 ppm m

response 3056109

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

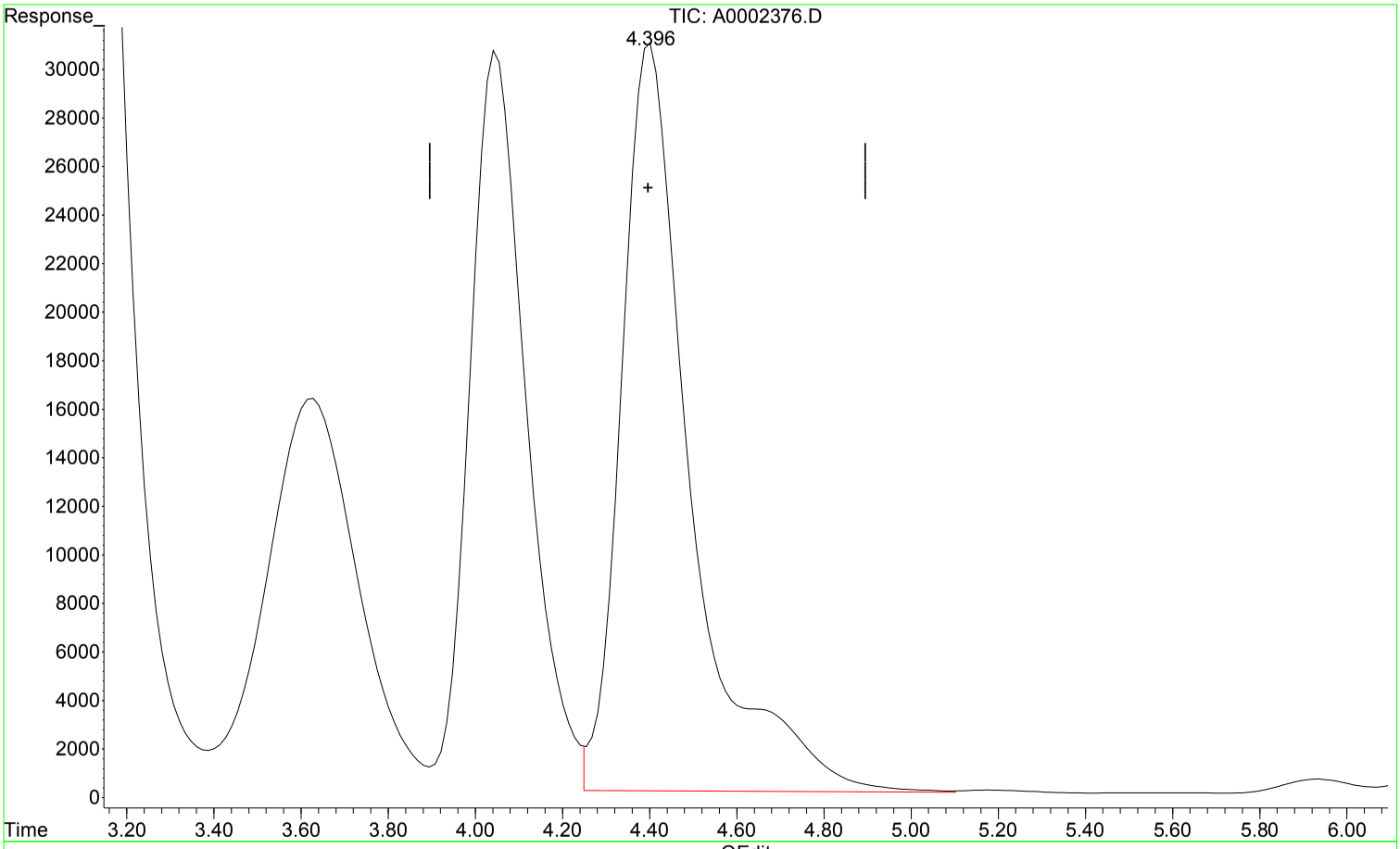
00944273

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.404min 57.452 ppm

response 3399396

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 08:26:33 2018 Page: 1

00944274

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.119 E3	-0.8	101	0.00
2 T	Pyruvic acid	452.935	463.290 E3	-2.3	101	0.00
3 T	Lactic Acid	53.765	55.006 E3	-2.3	101	0.00
4 T	Acetic Acid	59.169	61.122 E3	-3.3	101	0.00
5 T	Propionic Acid	59.592	58.787 E3	1.4	100	0.02
6 T	Butyric Acid	62.897	57.717 E3	8.2	98	0.10

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944275

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.131	4855945	50.403	ppm	
2) T	Pyruvic acid	3.628	2316452	5.114	ppm	
3) T	Lactic Acid	4.051	2750282	51.154	ppm	
4) T	Acetic Acid	4.396	3056109	51.650	ppm	m
5) T	Propionic Acid	9.209	2939344	49.325	ppm	
6) T	Butyric Acid	24.941	2885862	45.882	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

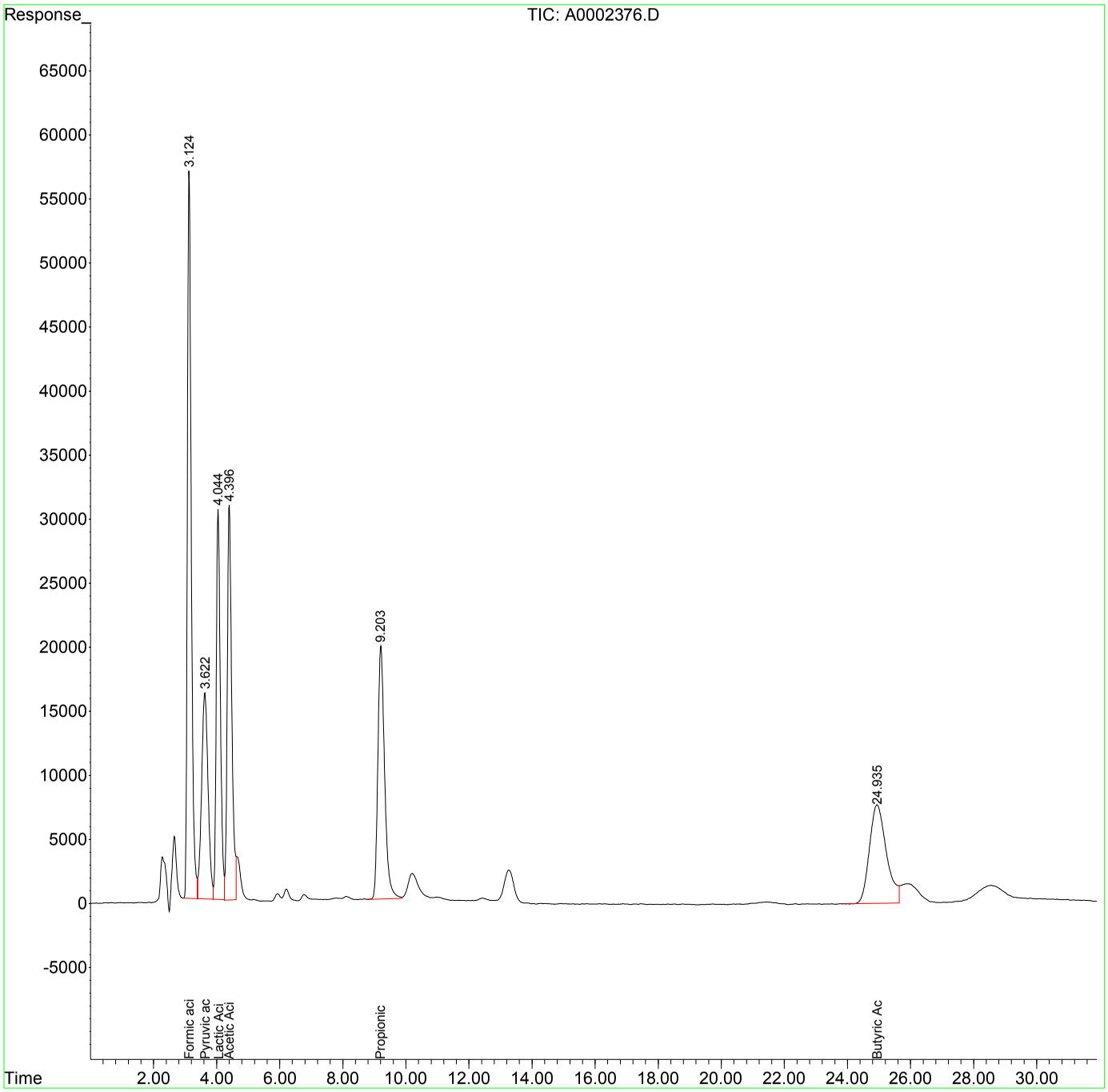
00944276

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002376.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 17:16:44
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:26:22 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



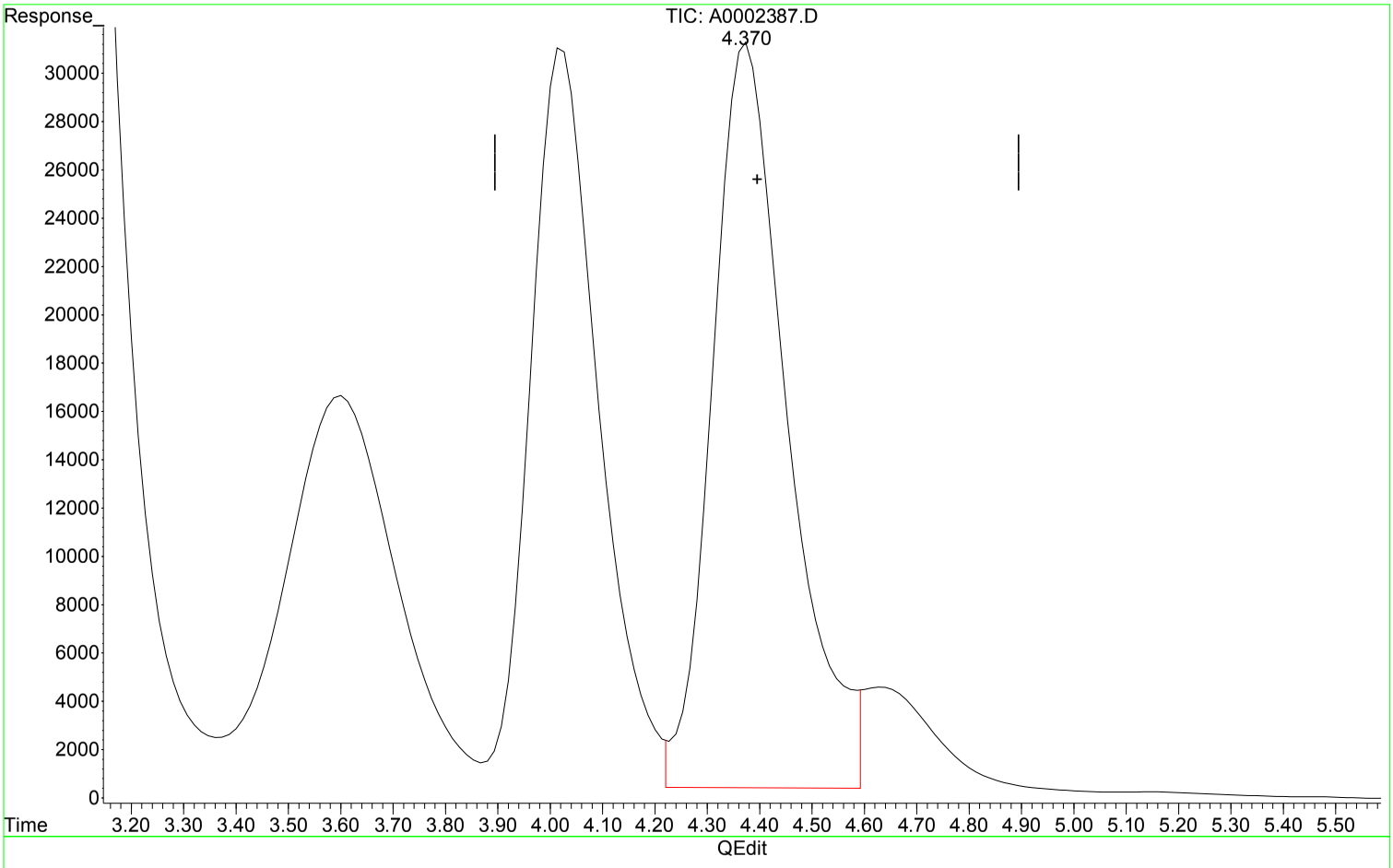
00944277

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.370min 52.246 ppm m

response 3091378

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 08:33:48 2018 Page: 1

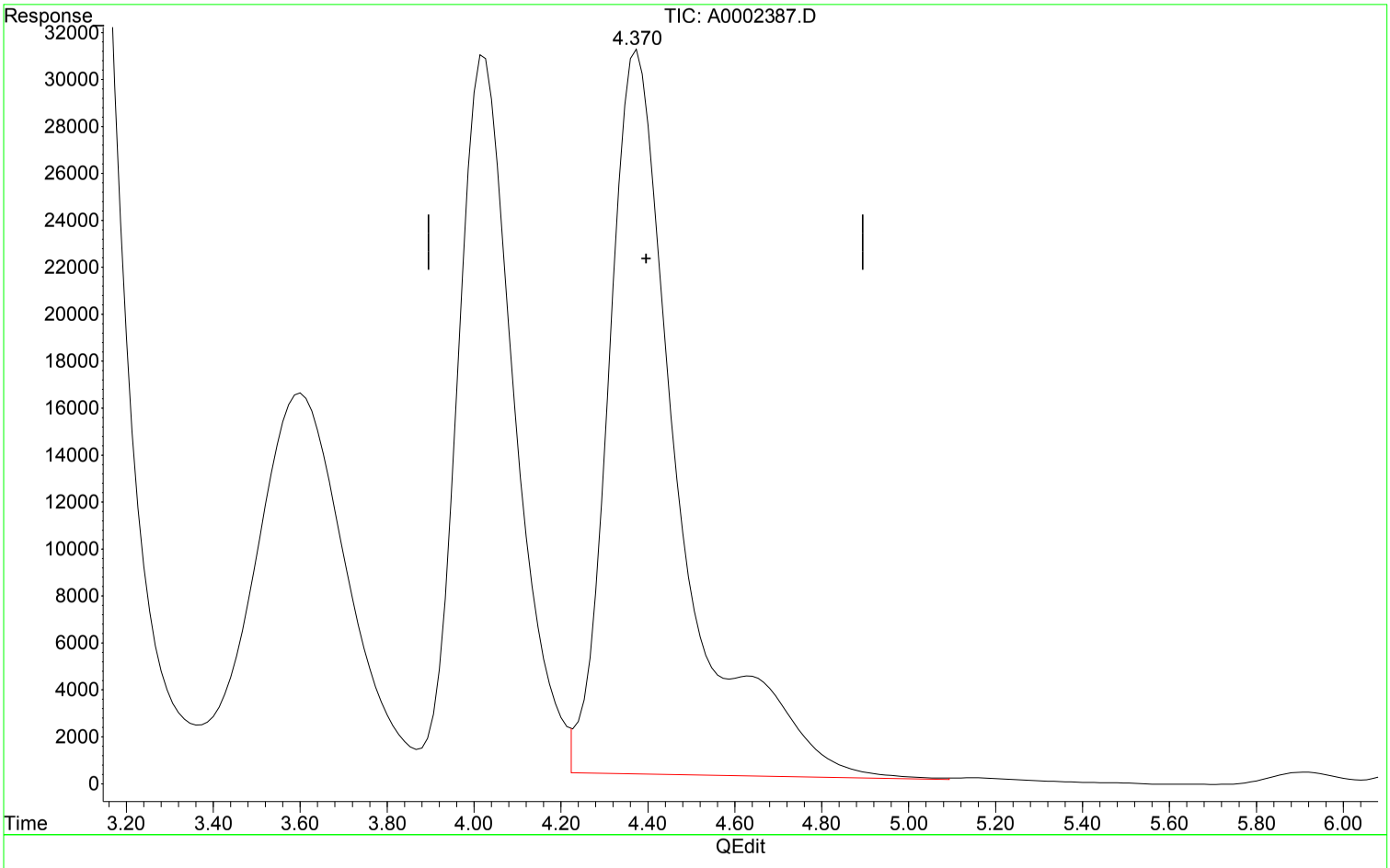
00944278

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.378min 59.424 ppm

response 3516056

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 08:33:41 2018 Page: 1

00944279

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.897 E3	-0.6	101	-0.02
2 T	Pyruvic acid	452.935	460.392 E3	-1.6	100	-0.03
3 T	Lactic Acid	53.765	55.156 E3	-2.6	102	-0.02
4 T	Acetic Acid	59.169	61.828 E3	-4.5	102	-0.03
5 T	Propionic Acid	59.592	58.777 E3	1.4	100	-0.03
6 T	Butyric Acid	62.897	58.758 E3	6.6	100	-0.03

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944280

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.111	4844848	50.287	ppm	
2) T	Pyruvic acid	3.603	2301960	5.082	ppm	
3) T	Lactic Acid	4.026	2757824	51.294	ppm	
4) T	Acetic Acid	4.370	3091378	52.246	ppm	m
5) T	Propionic Acid	9.162	2938838	49.316	ppm	
6) T	Butyric Acid	24.810	2937908	46.710	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

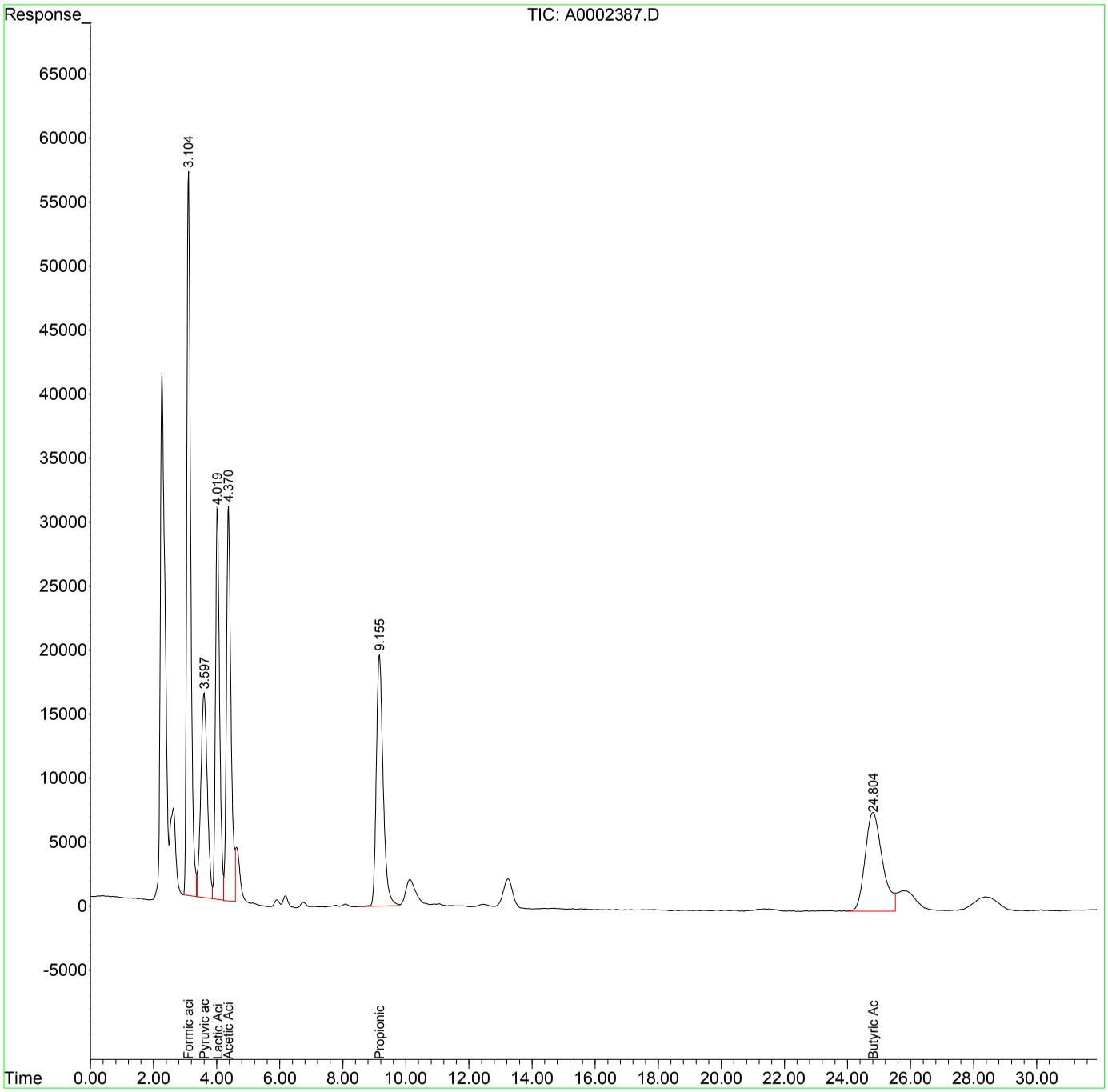
00944281

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002387.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 23:40:52
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:17 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



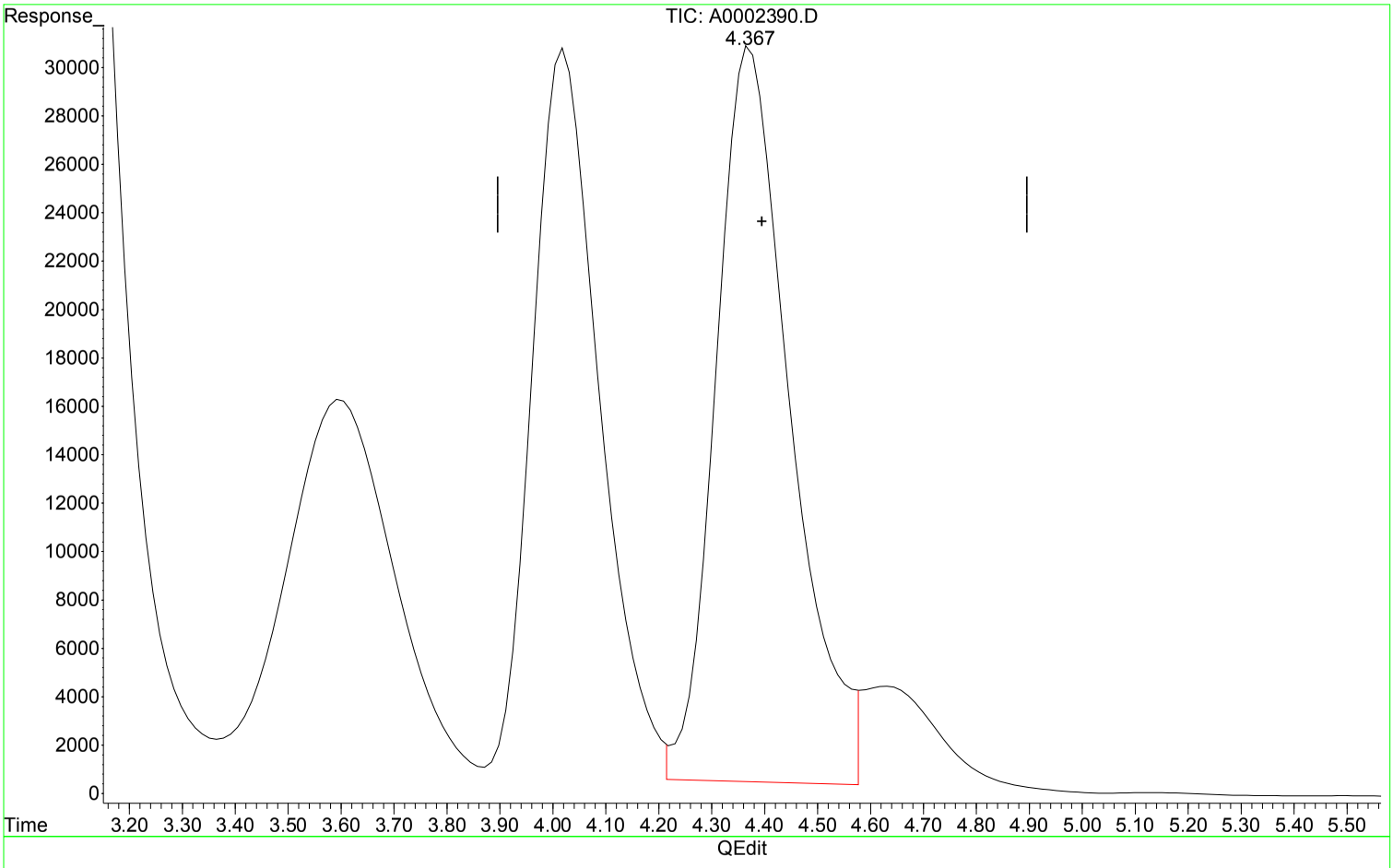
00944282

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.367min 49.784 ppm m

response 2945690

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

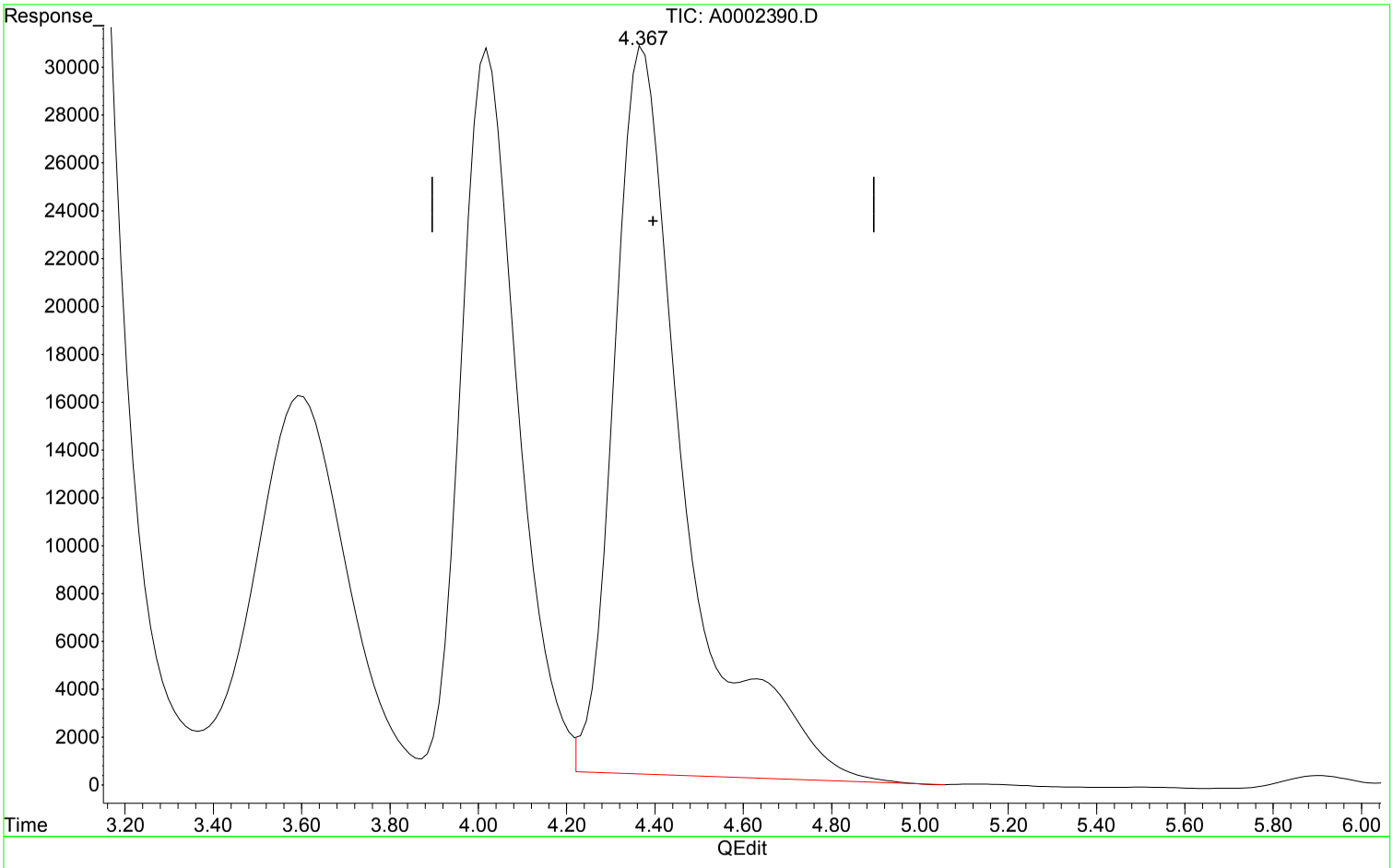
00944283

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.375min 57.500 ppm

response 3402228

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 08:35:33 2018 Page: 1

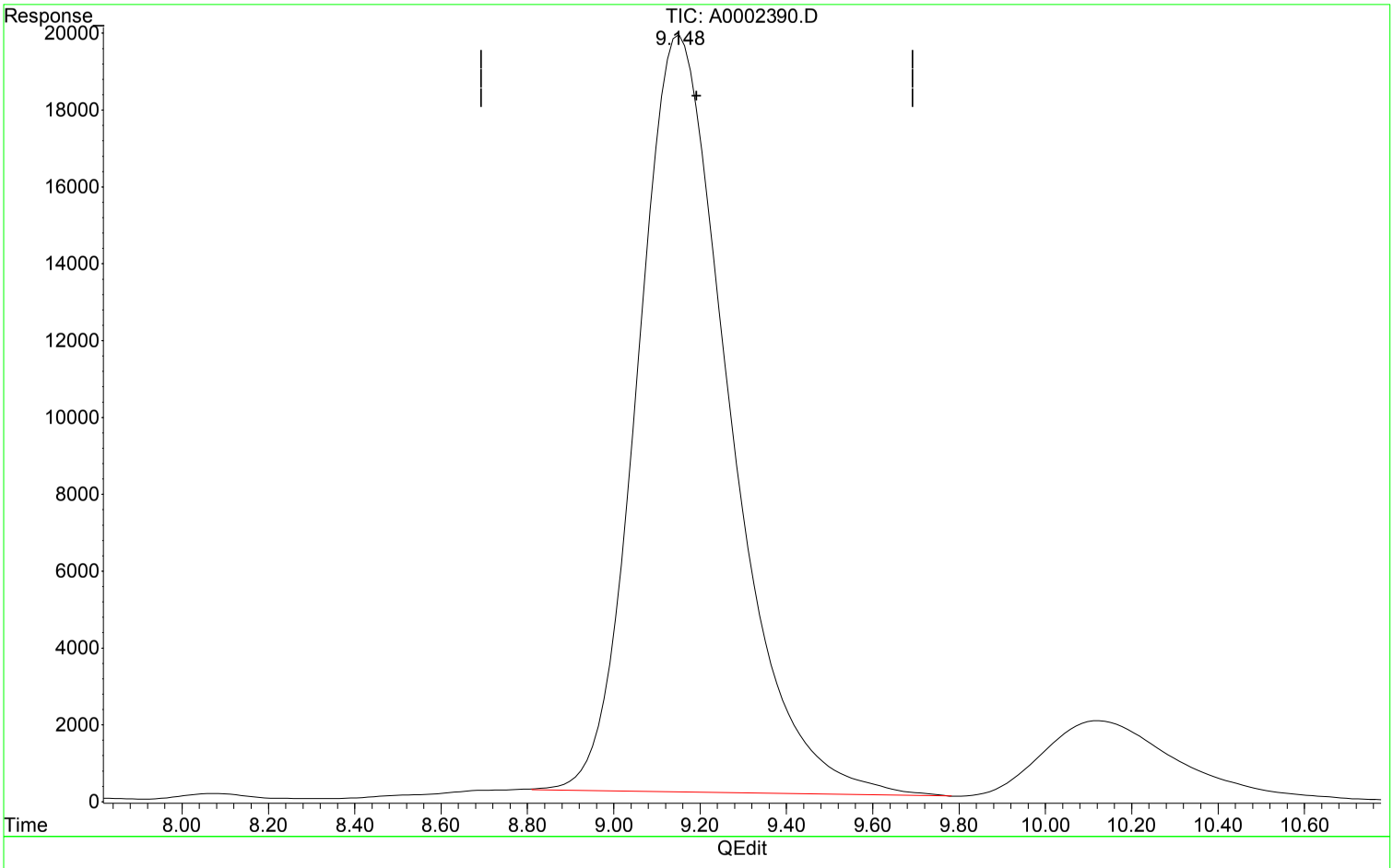
00944284

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.148min 49.189 ppm m

response 2931268

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

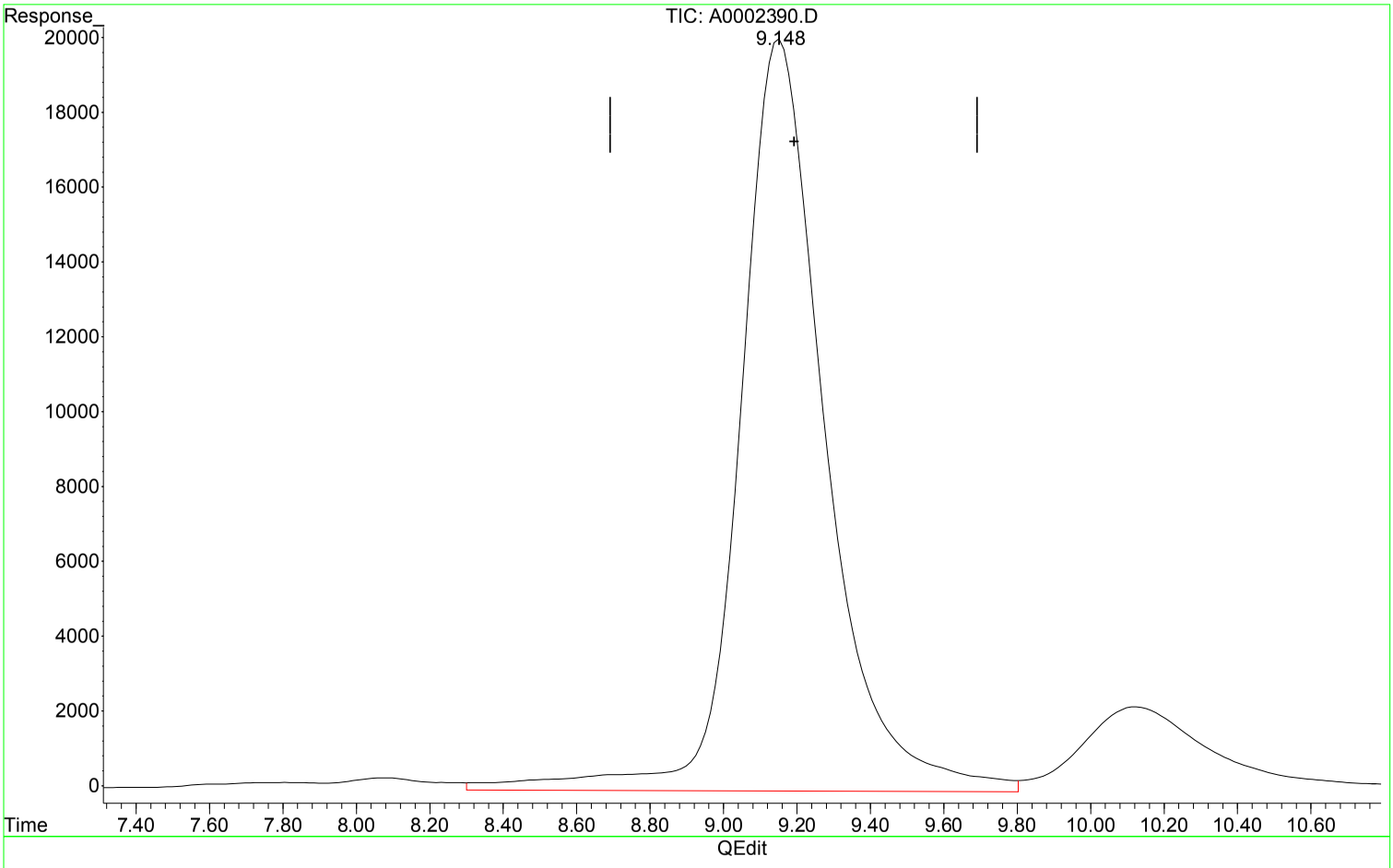
00944285

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.154min 54.569 ppm

response 3251832

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

00944286

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	95.630 E3	0.7	99	-0.02
2 T	Pyruvic acid	452.935	422.410 E3	6.7	92	-0.03
3 T	Lactic Acid	53.765	53.004 E3	1.4	98	-0.03
4 T	Acetic Acid	59.169	58.914 E3	0.4	97	-0.03
5 T	Propionic Acid	59.592	58.625 E3	1.6	99	-0.04
6 T	Butyric Acid	62.897	57.833 E3	8.1	99	-0.05

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944287

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.109	4781519	49.630	ppm	
2) T	Pyruvic acid	3.601	2112050	4.663	ppm	
3) T	Lactic Acid	4.024	2650211	49.293	ppm	
4) T	Acetic Acid	4.367	2945690	49.784	ppm	m
5) T	Propionic Acid	9.148	2931268	49.189	ppm	m
6) T	Butyric Acid	24.791	2891658	45.974	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

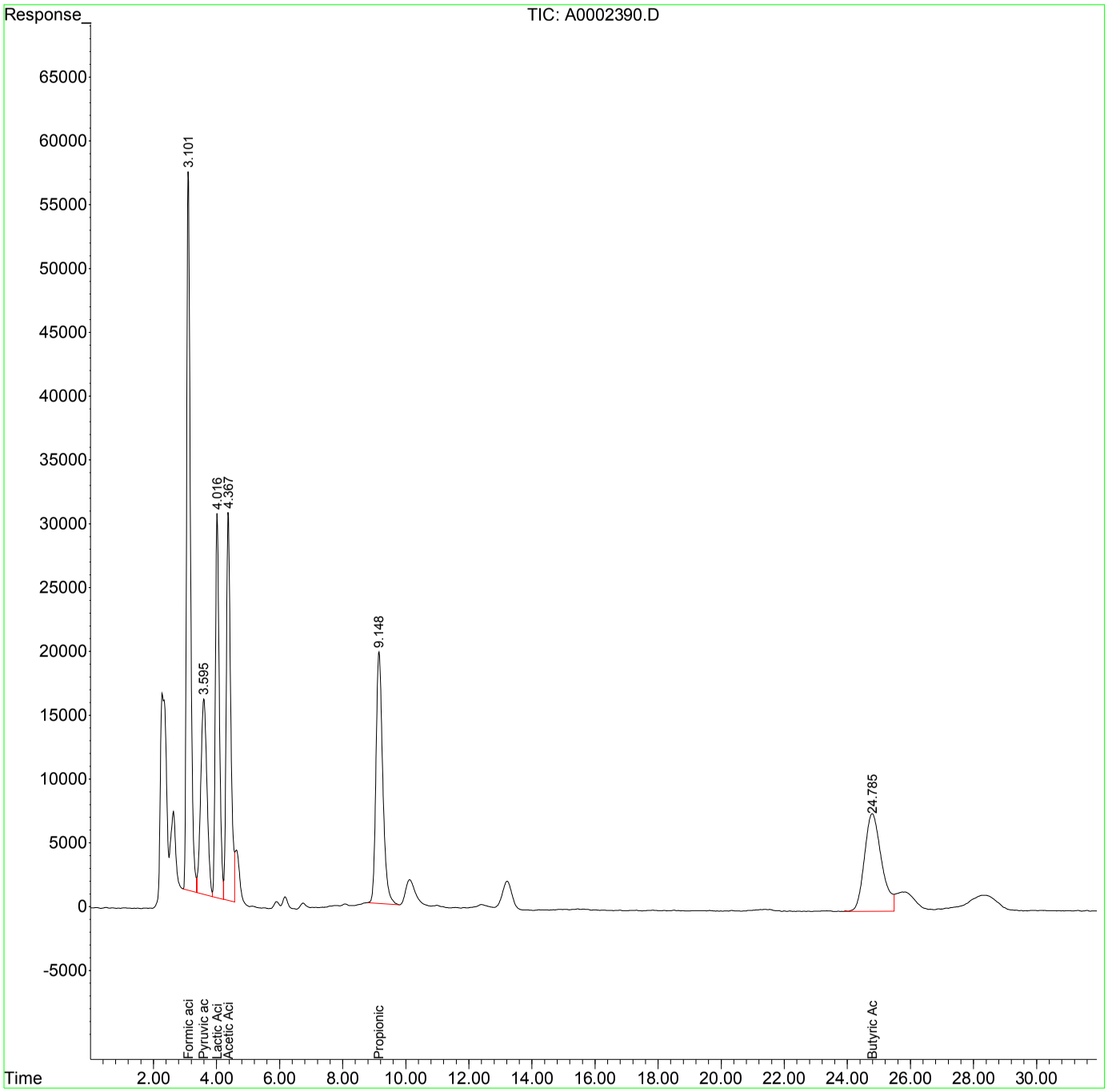
00944288

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002390.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 01:25:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:28:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



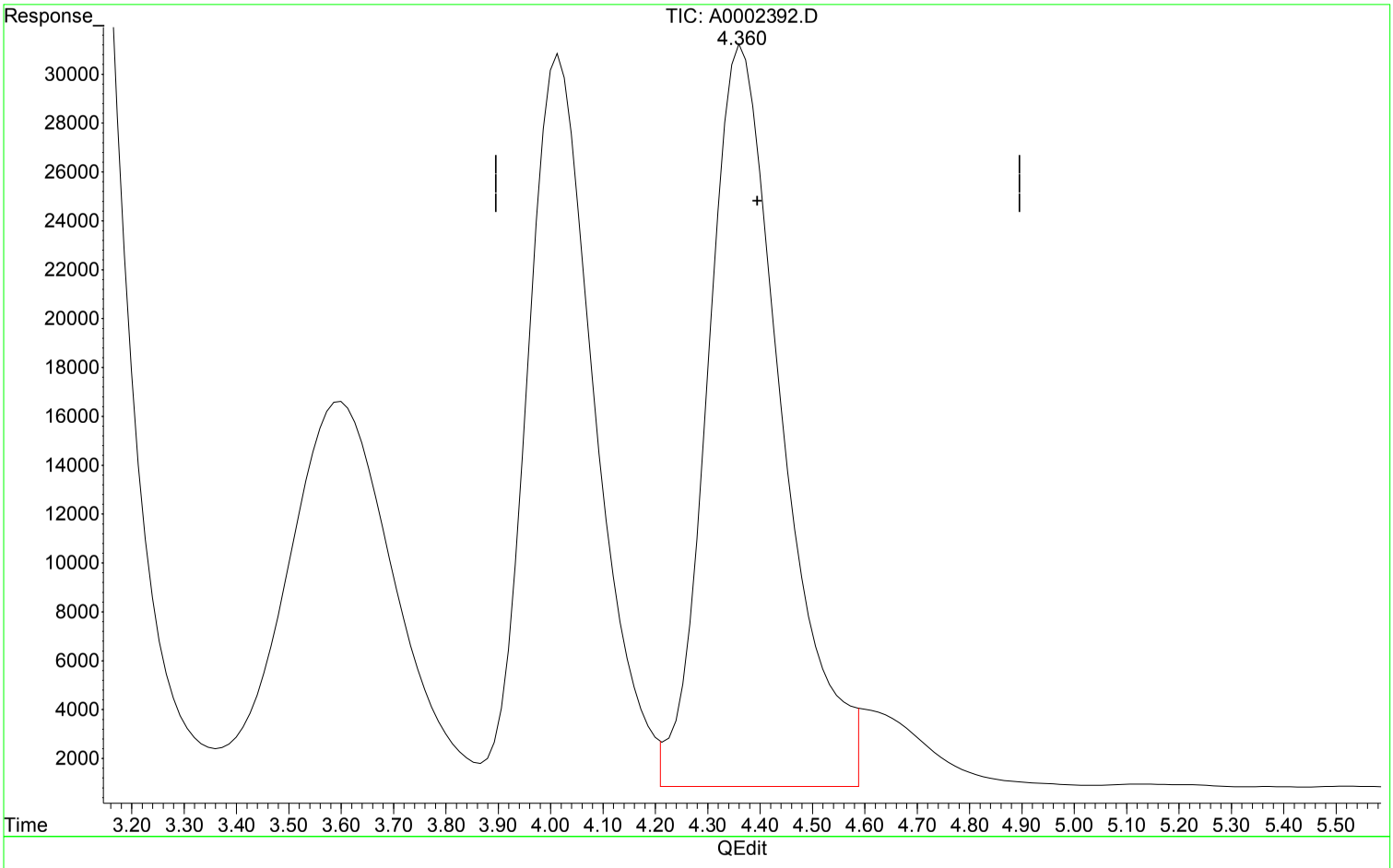
00944289

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.360min 51.179 ppm m

response 3028258

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 15:15:32 2018 Page: 1

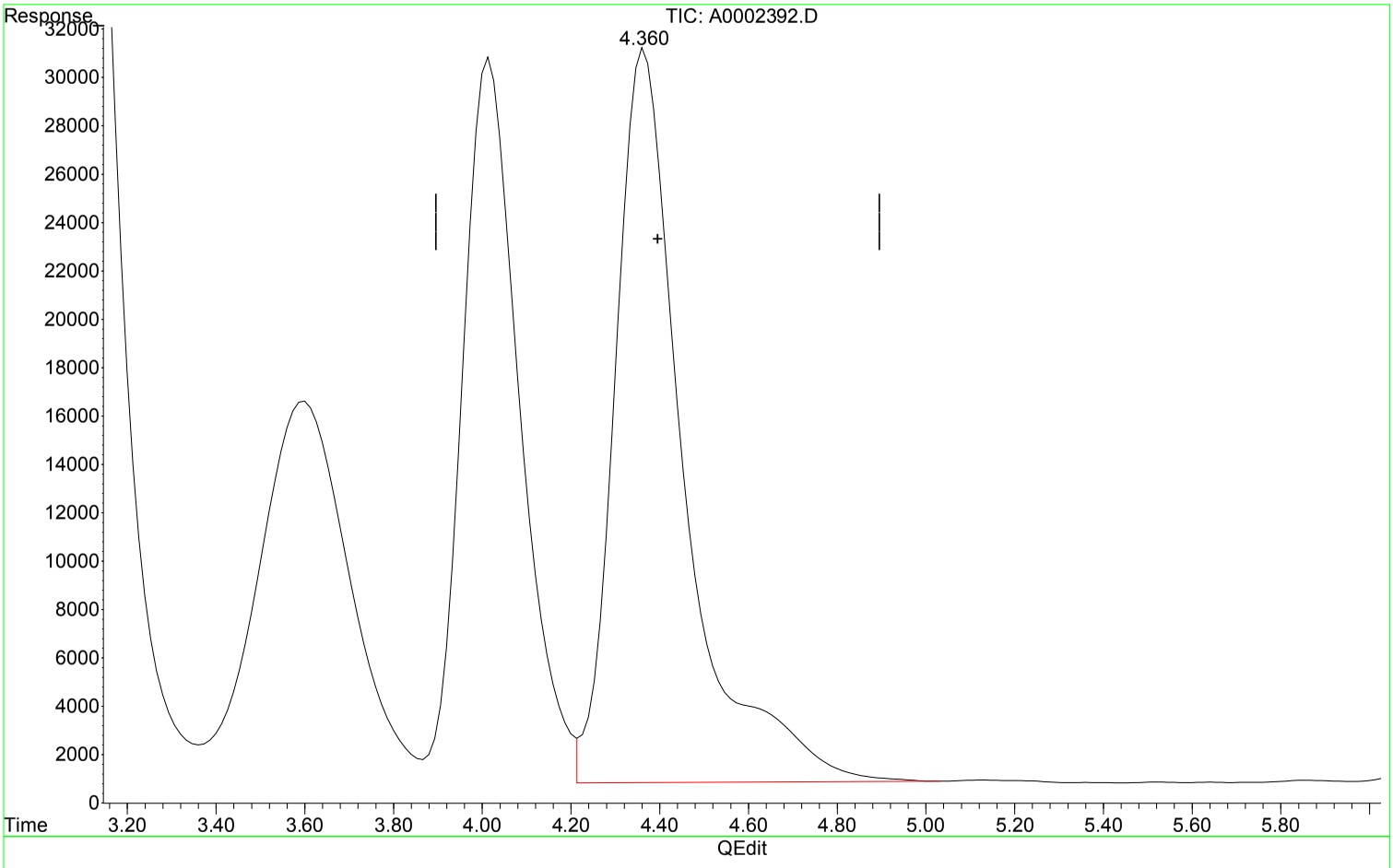
00944290

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.367min 55.649 ppm

response 3292693

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 15:15:25 2018 Page: 1

00944291

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	95.645 E3	0.7	99	0.00
2 T	Pyruvic acid	452.935	453.885 E3	-0.2	99	0.00
3 T	Lactic Acid	53.765	54.021 E3	-0.5	100	0.00
4 T	Acetic Acid	59.169	60.565 E3	-2.4	100	0.00
5 T	Propionic Acid	59.592	58.178 E3	2.4	99	0.00
6 T	Butyric Acid	62.897	58.755 E3	6.6	100	0.00

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944292

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.108	4782273	49.638	ppm	
2) T	Pyruvic acid	3.600	2269427	5.010	ppm	
3) T	Lactic Acid	4.018	2701047	50.238	ppm	
4) T	Acetic Acid	4.360	3028258	51.179	ppm	m
5) T	Propionic Acid	9.121	2908885	48.814	ppm	
6) T	Butyric Acid	24.655	2937738	46.707	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

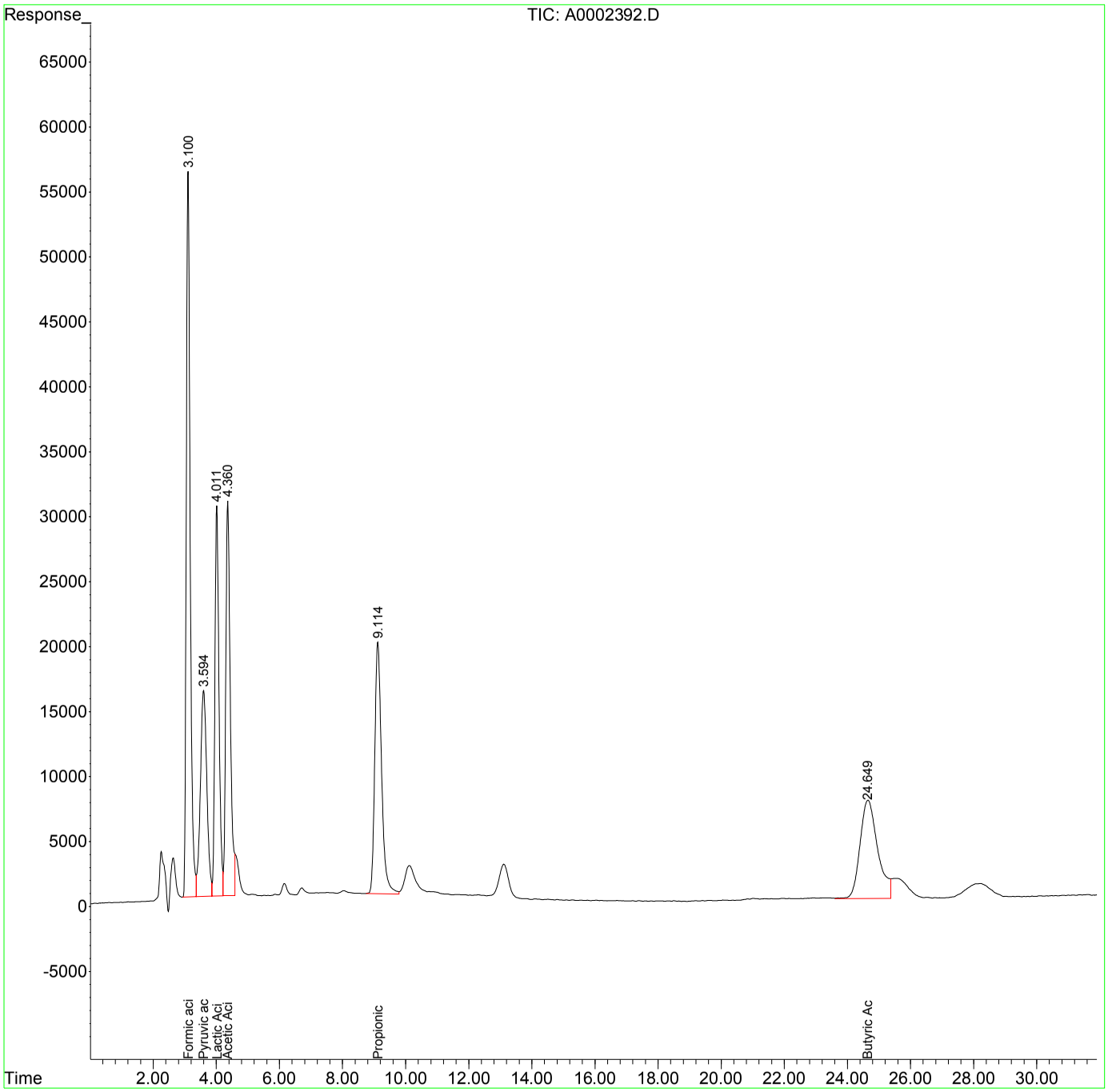
00944293

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002392.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 10:29:40
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 15:14:43 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



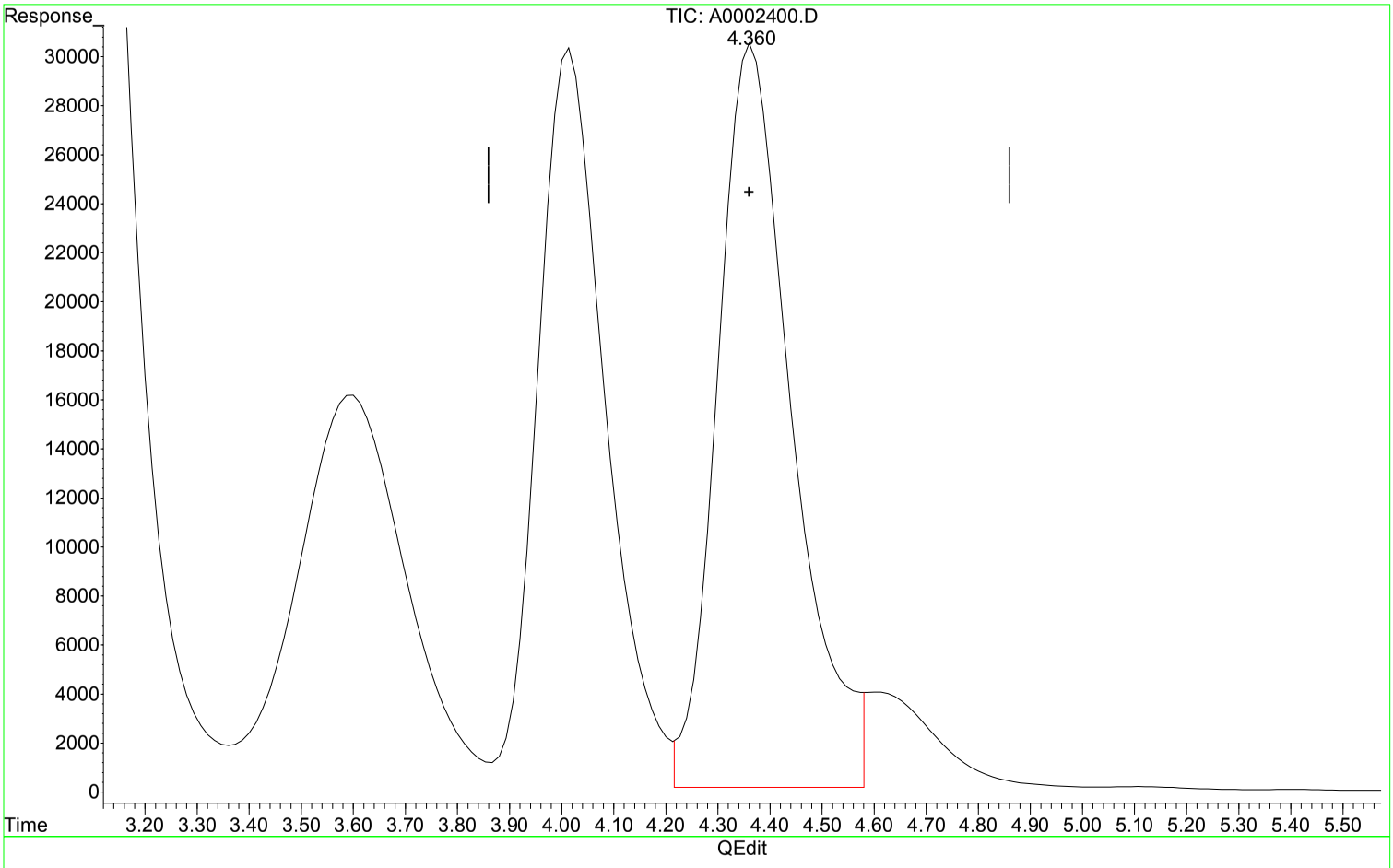
00944294

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.360min 50.833 ppm m

response 3007786

Manual Integration:

After

Poor integration.

10/05/18

(+) = Expected Retention Time

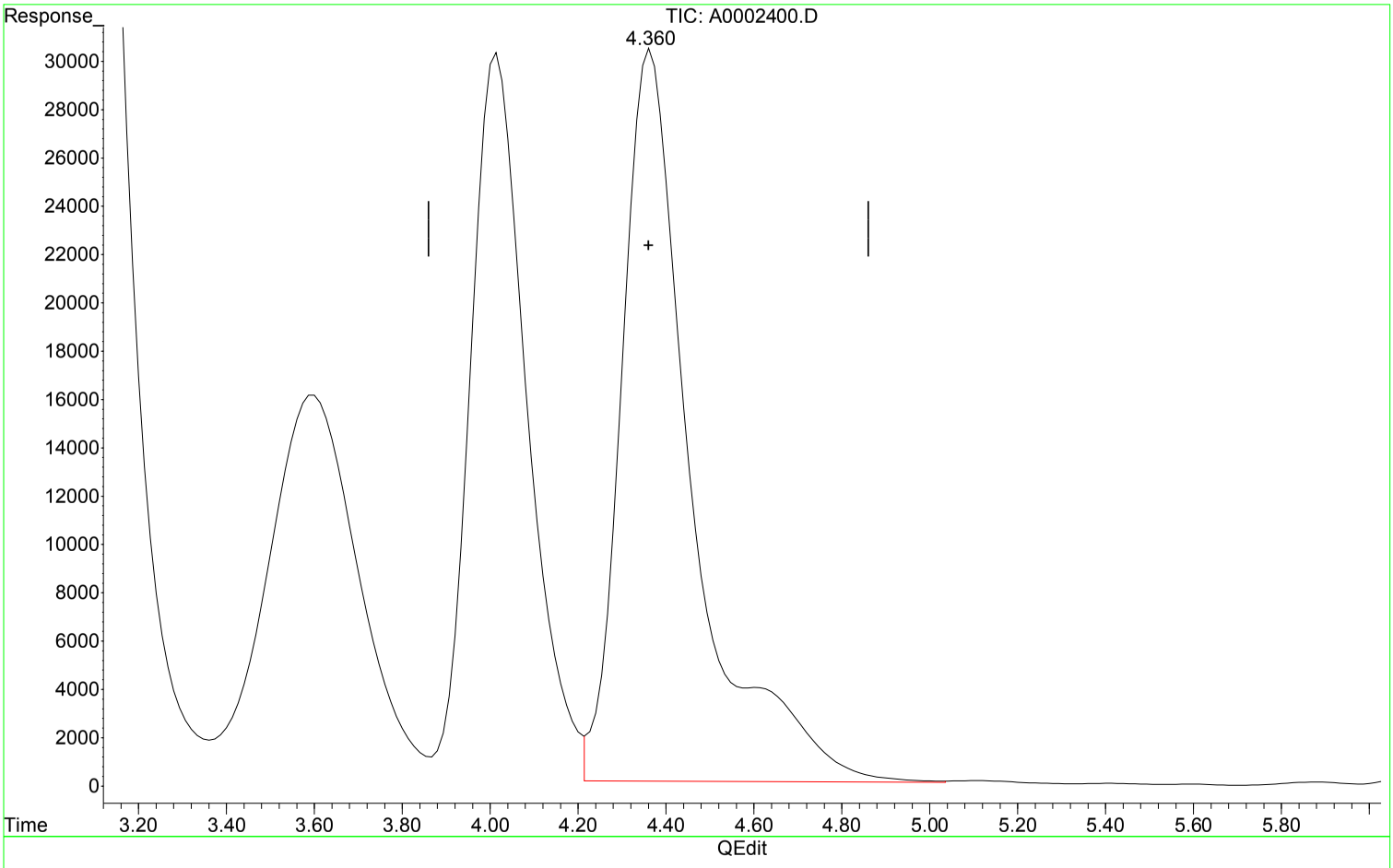
00944295

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.367min 57.265 ppm

response 3388325

Manual Integration:

Before

10/05/18

(+) = Expected Retention Time

MA100418.M Fri Oct 05 16:07:17 2018 Page: 1

00944296

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	95.077 E3	1.3	99	0.00
2 T	Pyruvic acid	452.935	456.790 E3	-0.9	100	0.00
3 T	Lactic Acid	53.765	54.332 E3	-1.1	100	0.00
4 T	Acetic Acid	59.169	60.156 E3	-1.7	99	0.00
5 T	Propionic Acid	59.592	57.295 E3	3.9	97	0.00
6 T	Butyric Acid	62.897	58.521 E3	7.0	100	0.03

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944297

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.107	4753865	49.343	ppm	
2) T	Pyruvic acid	3.599	2283950	5.043	ppm	
3) T	Lactic Acid	4.018	2716598	50.527	ppm	
4) T	Acetic Acid	4.360	3007786	50.833	ppm	m
5) T	Propionic Acid	9.123	2864749	48.073	ppm	
6) T	Butyric Acid	24.681	2926070	46.521	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

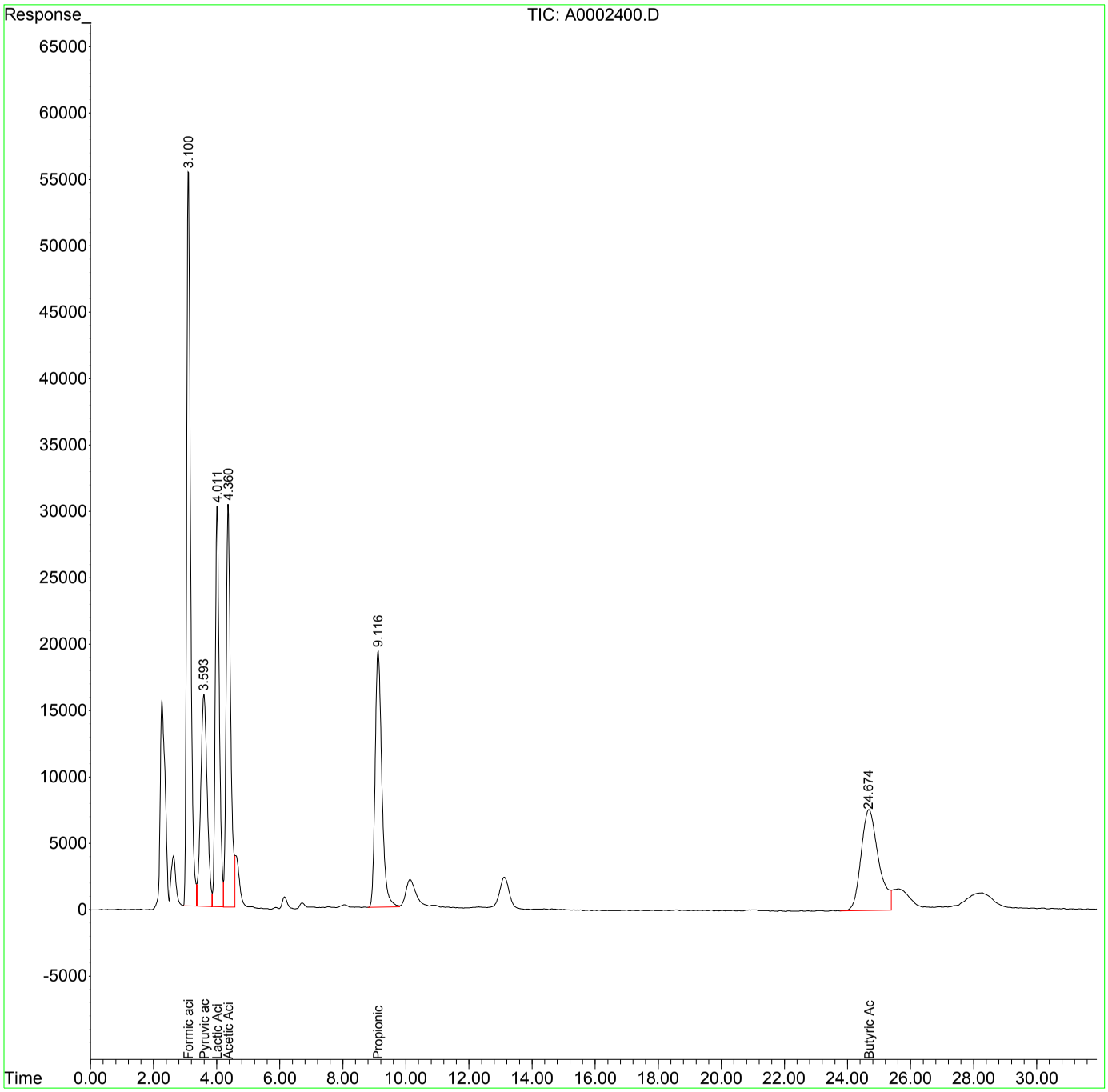
00944298

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100518\
Data File : A0002400.D
Signal(s) : dad1A.ch
Acq On : 05-Oct-2018, 15:09:20
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 16:07:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Oct 05 15:29:58 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944299

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.131	1896636	19.686 ppm
2) T	Pyruvic acid	3.628	1357394	2.997 ppm
3) T	Lactic Acid	4.052	1086883	20.215 ppm
4) T	Acetic Acid	4.405	1218452	20.593 ppm
5) T	Propionic Acid	9.222	1146657	19.242 ppm
6) T	Butyric Acid	25.002	1138865	18.107 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

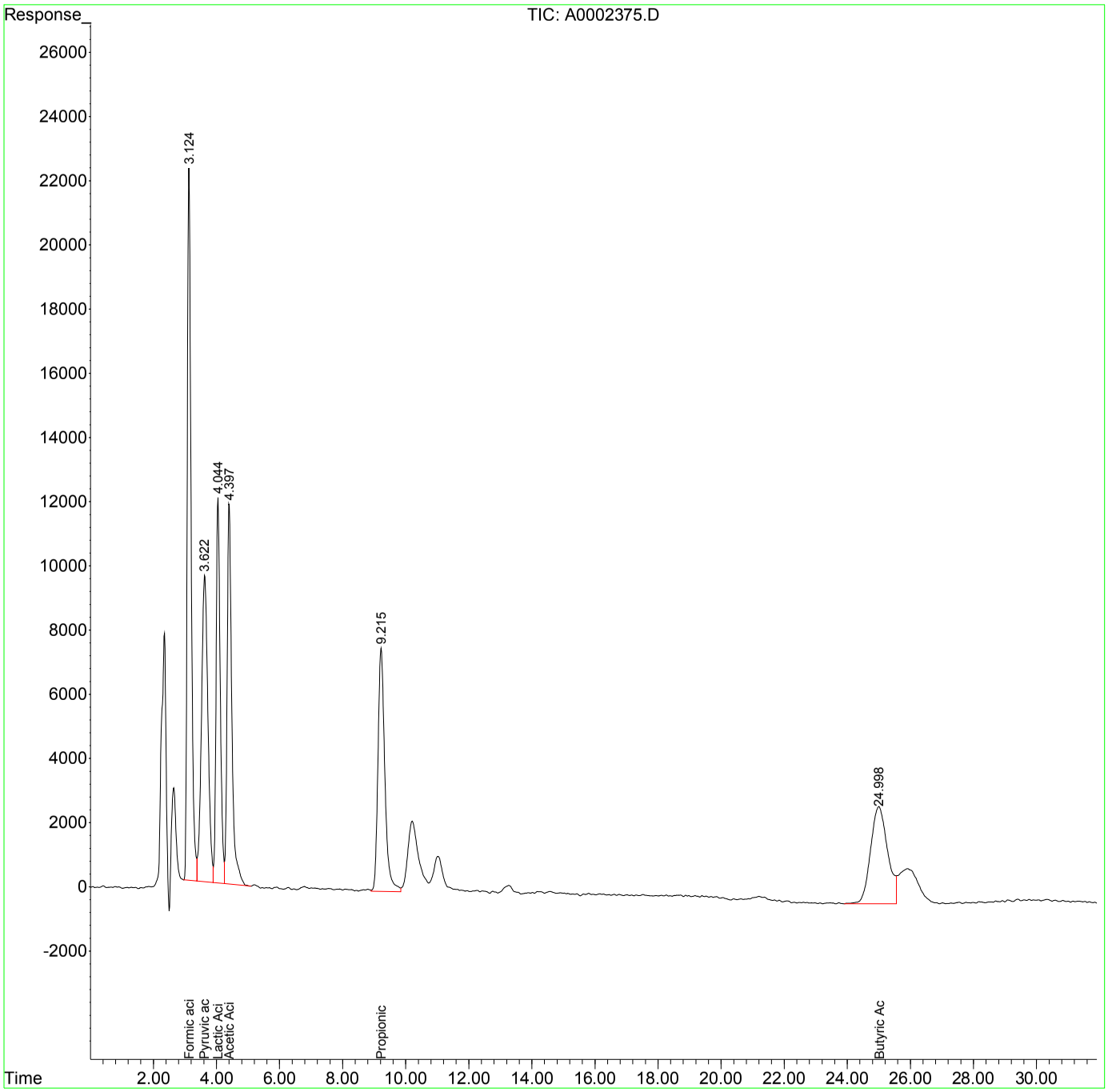
00944300

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944301

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	94.832 E3	1.6	100	0.00
2 T	Pyruvic acid	452.935	678.697 E3	-49.8#	160#	0.00
3 T	Lactic Acid	53.765	54.344 E3	-1.1	108	0.00
4 T	Acetic Acid	59.169	60.923 E3	-3.0	111	0.00
5 T	Propionic Acid	59.592	57.333 E3	3.8	101	0.03
6 T	Butyric Acid	62.897	56.943 E3	9.5	94	0.16

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944302

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.129	18870917	195.296	ppm	
2) T	Pyruvic acid	3.625	9170882	20.284	ppm	
3) T	Lactic Acid	4.045	10741636	199.759	ppm	
4) T	Acetic Acid	4.387	11865318	200.607	ppm	m
5) T	Propionic Acid	9.141	11451173	191.091	ppm	
6) T	Butyric Acid	24.580	12106071	191.444	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

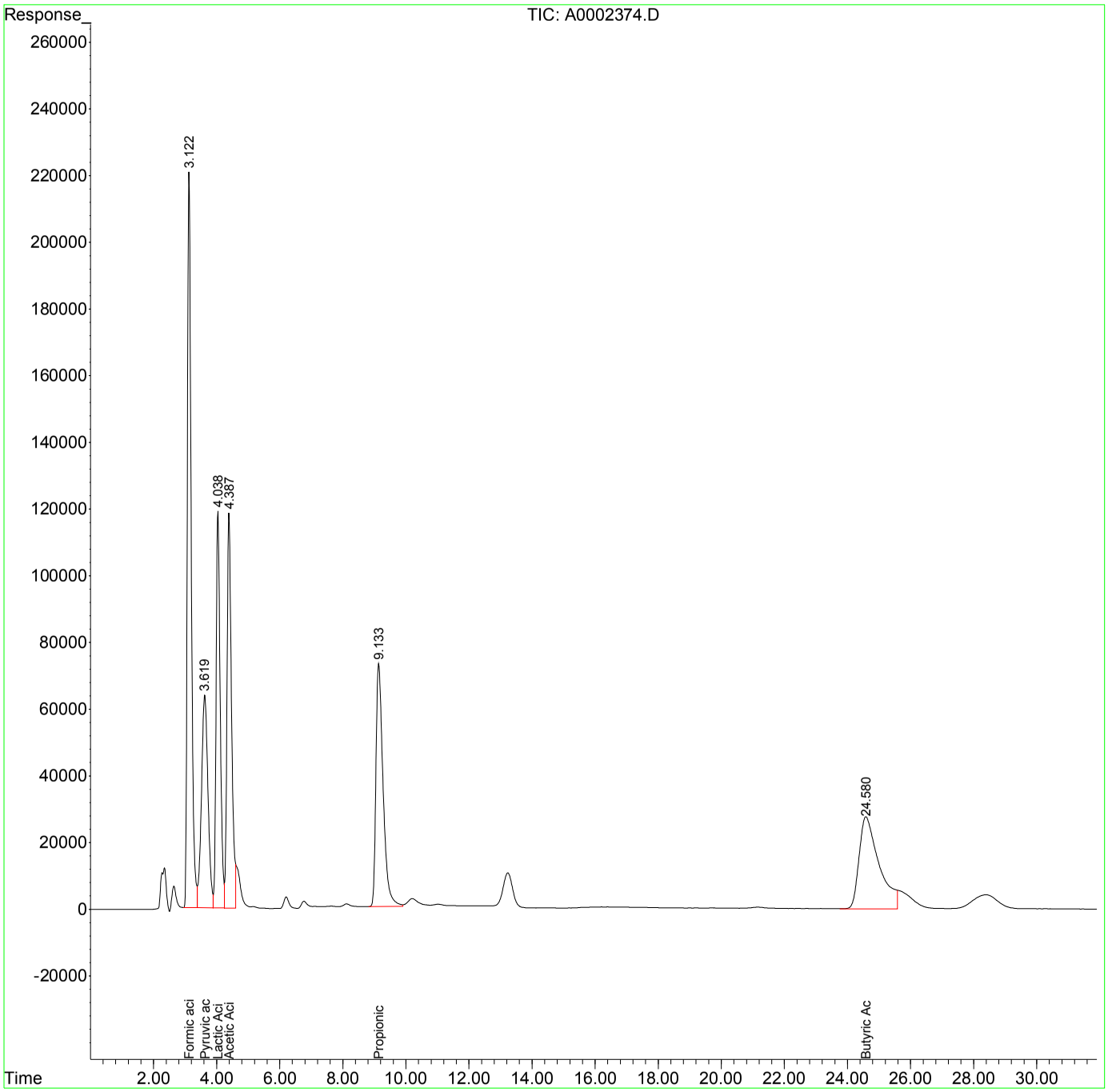
00944303

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



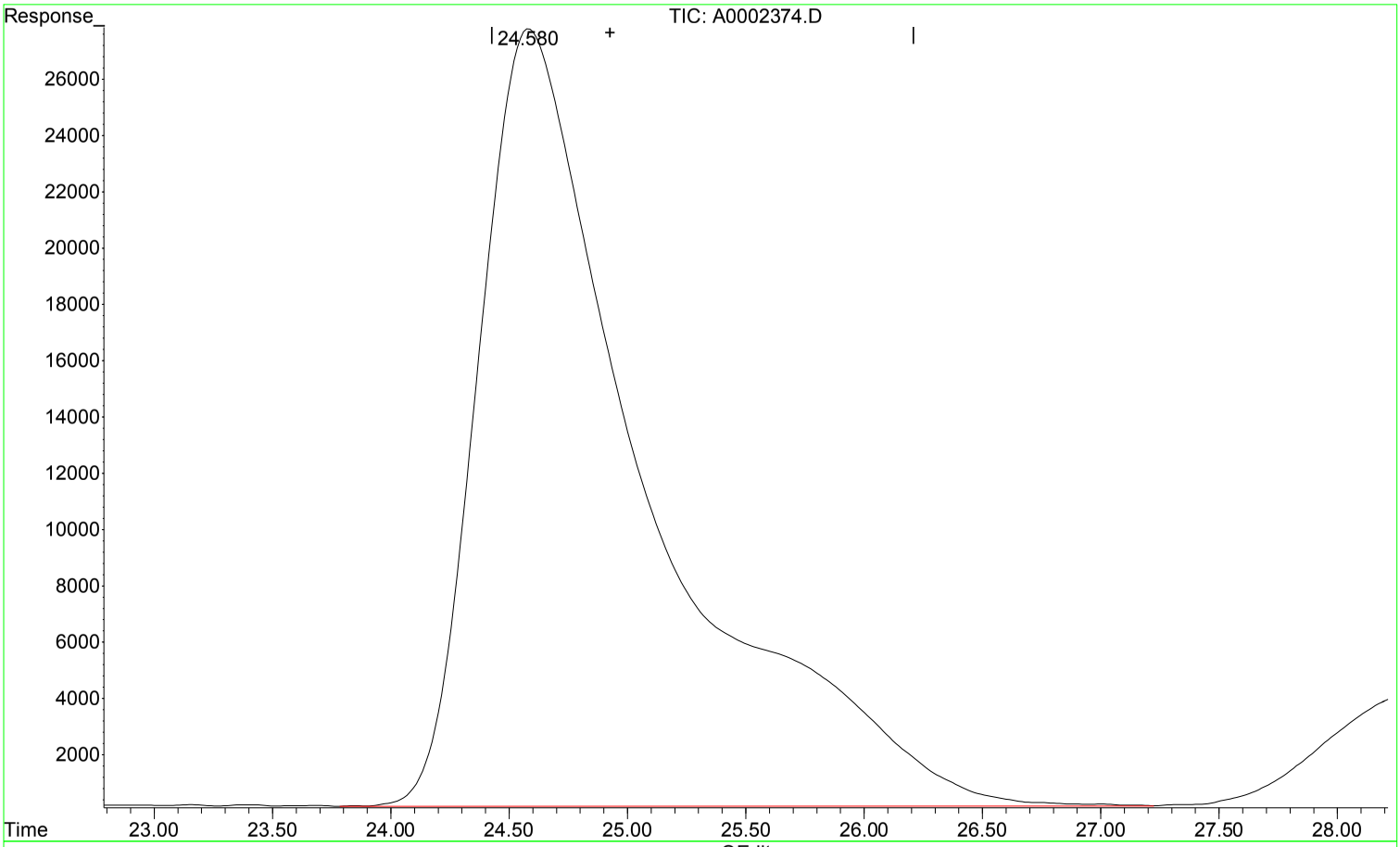
00944304

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.587min 217.586 ppm

response 13759140

Manual Integration:

Before

10/04/18

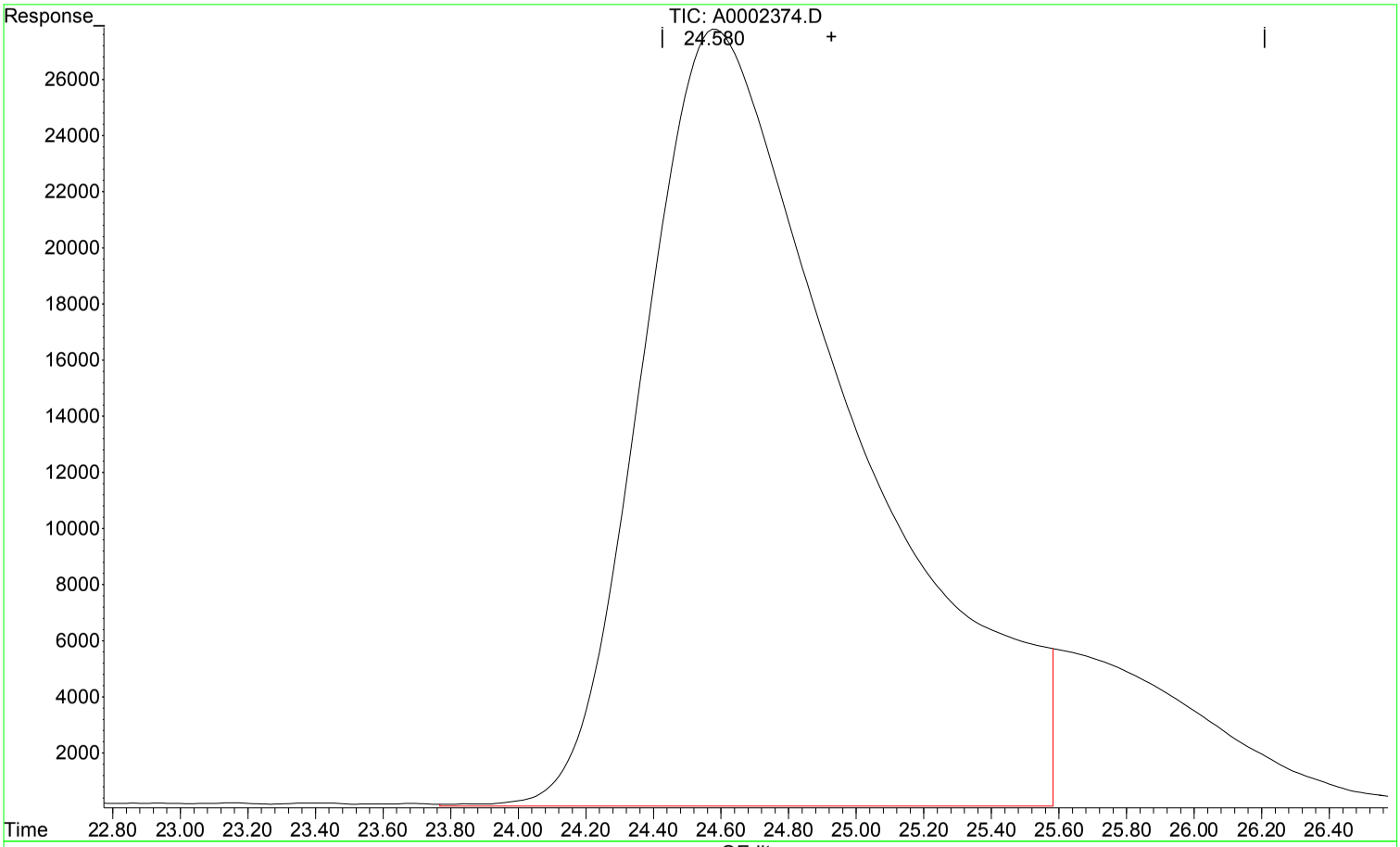
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.580min 191.444 ppm m

response 12106071

Manual Integration:

After

Poor integration.

10/04/18

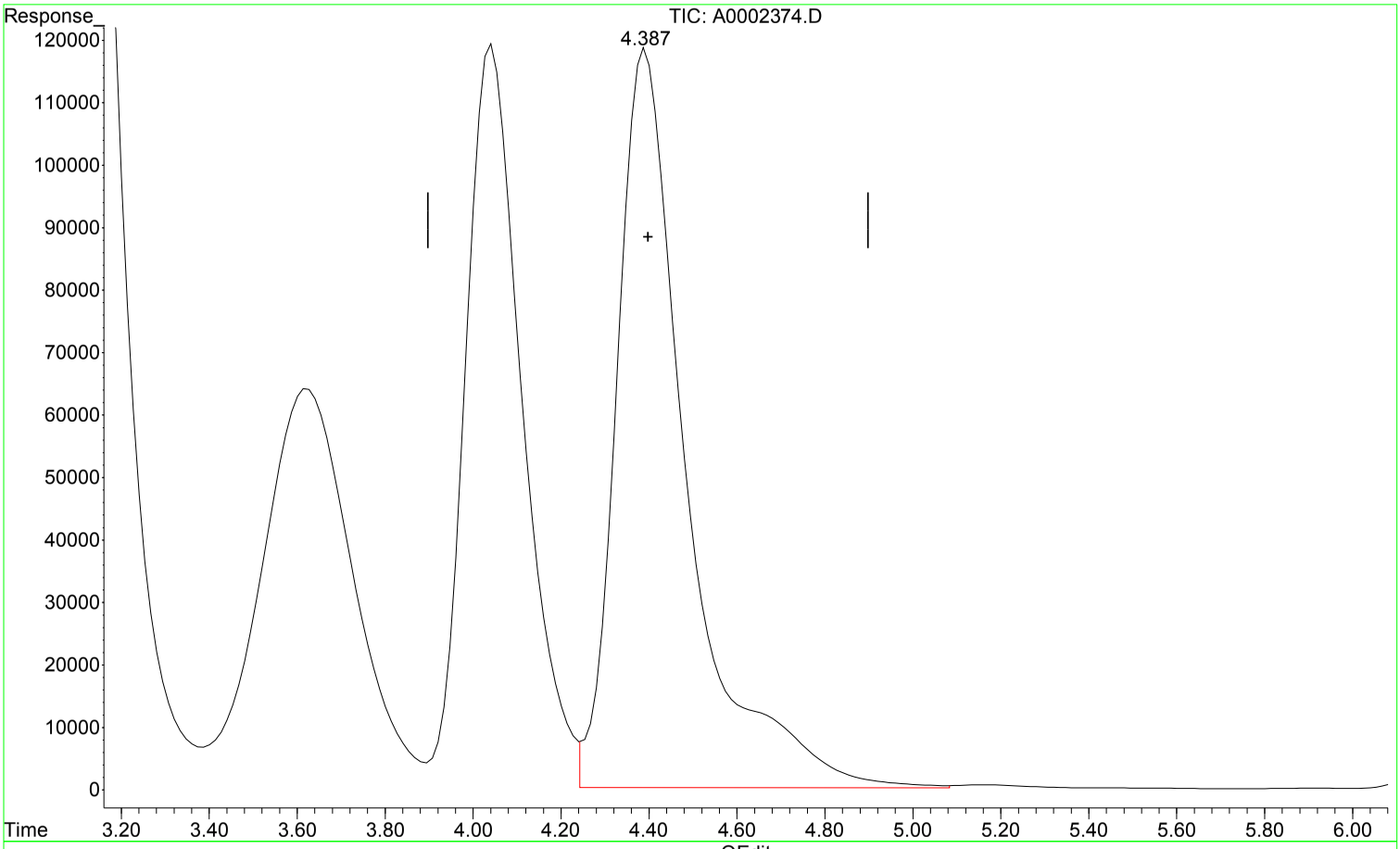
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.394min 222.004 ppm

response 13130885

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:42:06 2018 Page: 1

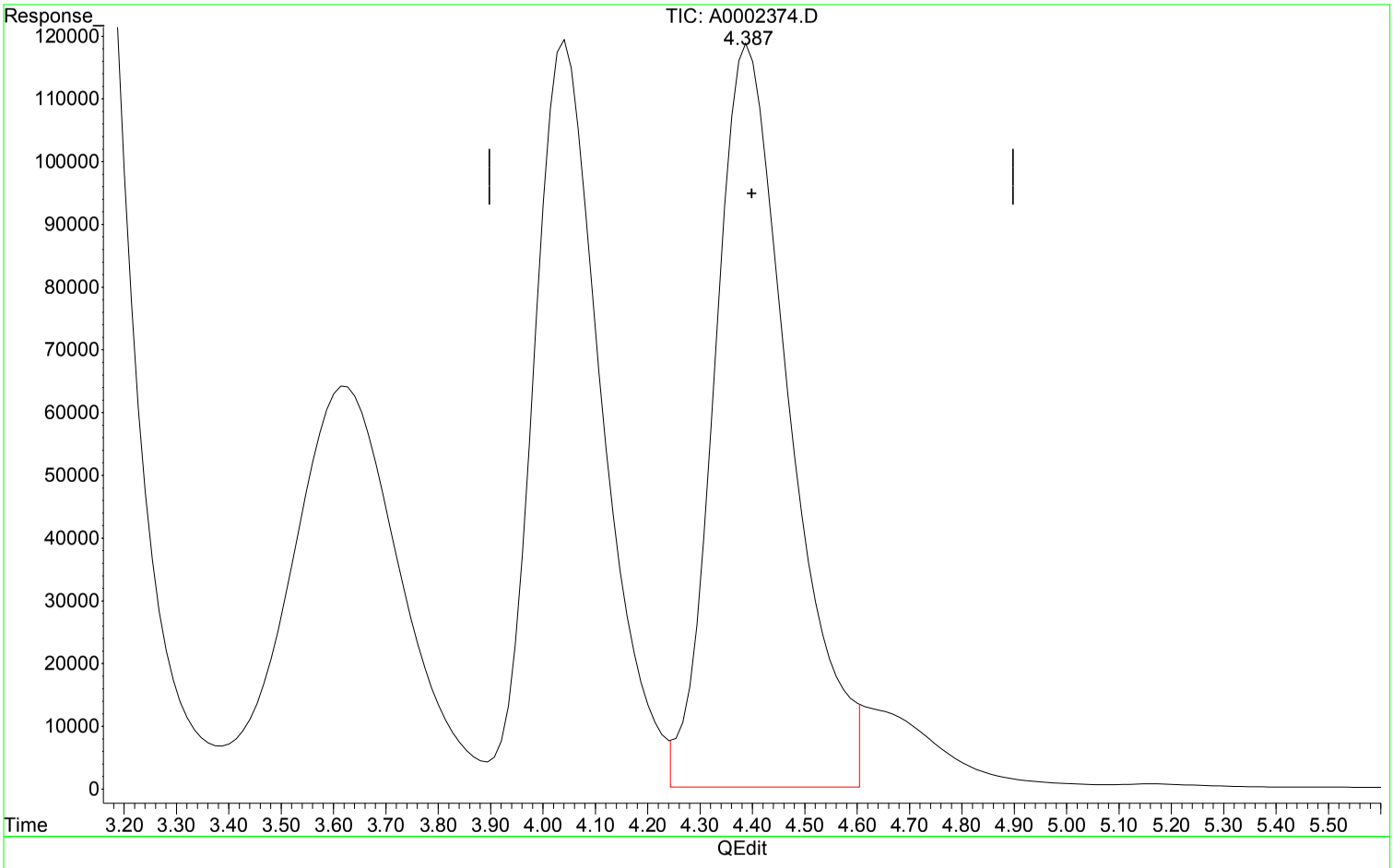
00944307

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.387min 200.607 ppm m

response 11865318

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944308

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.132	9131569	96.958	ppm	
2) T	Pyruvic acid	3.629	4430352	9.849	ppm	
3) T	Lactic Acid	4.052	5216101	98.587	ppm	
4) T	Acetic Acid	4.397	5725459	96.715	ppm	m
5) T	Propionic Acid	9.203	5508012	93.403	ppm	
6) T	Butyric Acid	24.847	5510917	91.221	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

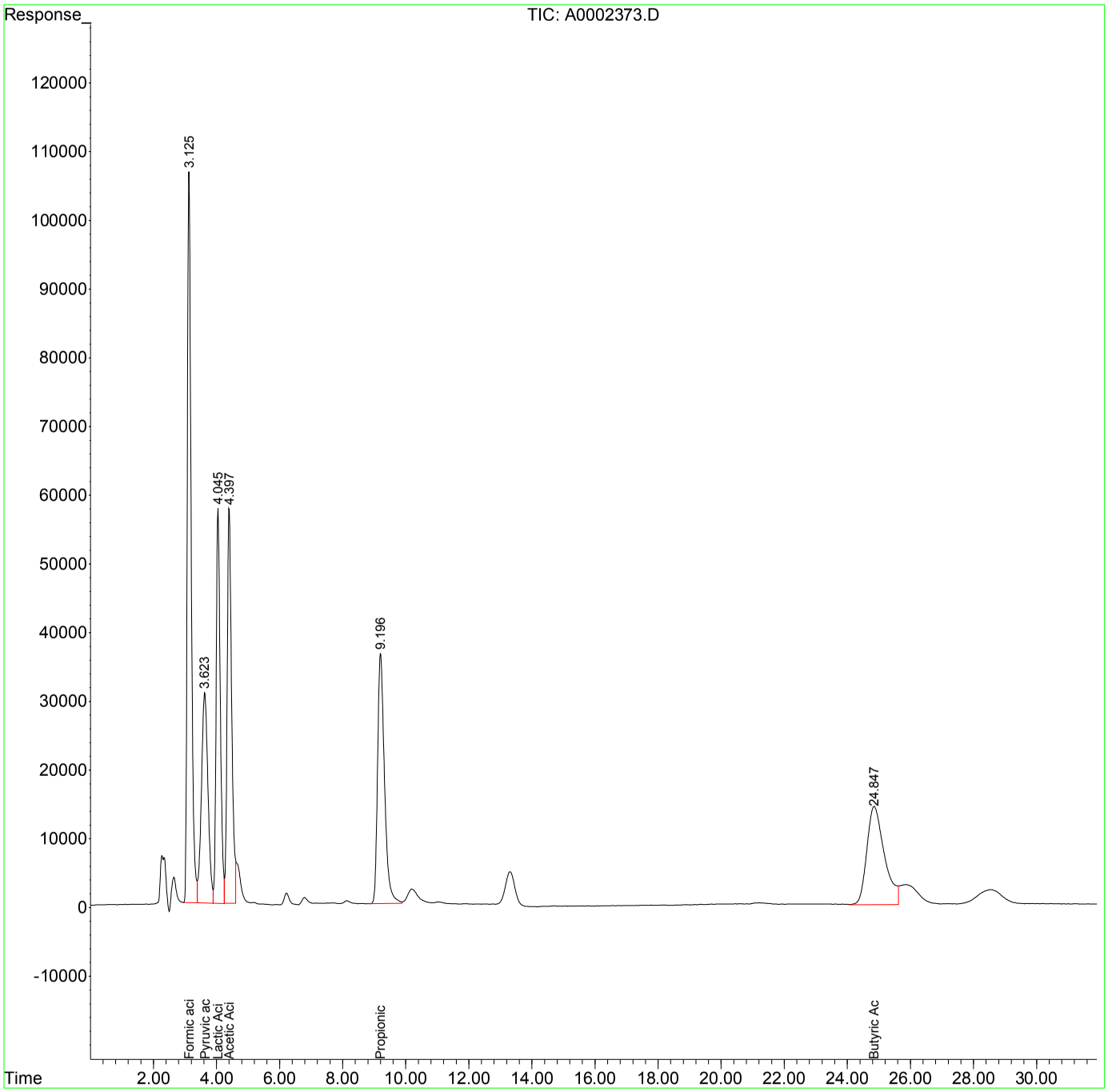
00944309

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



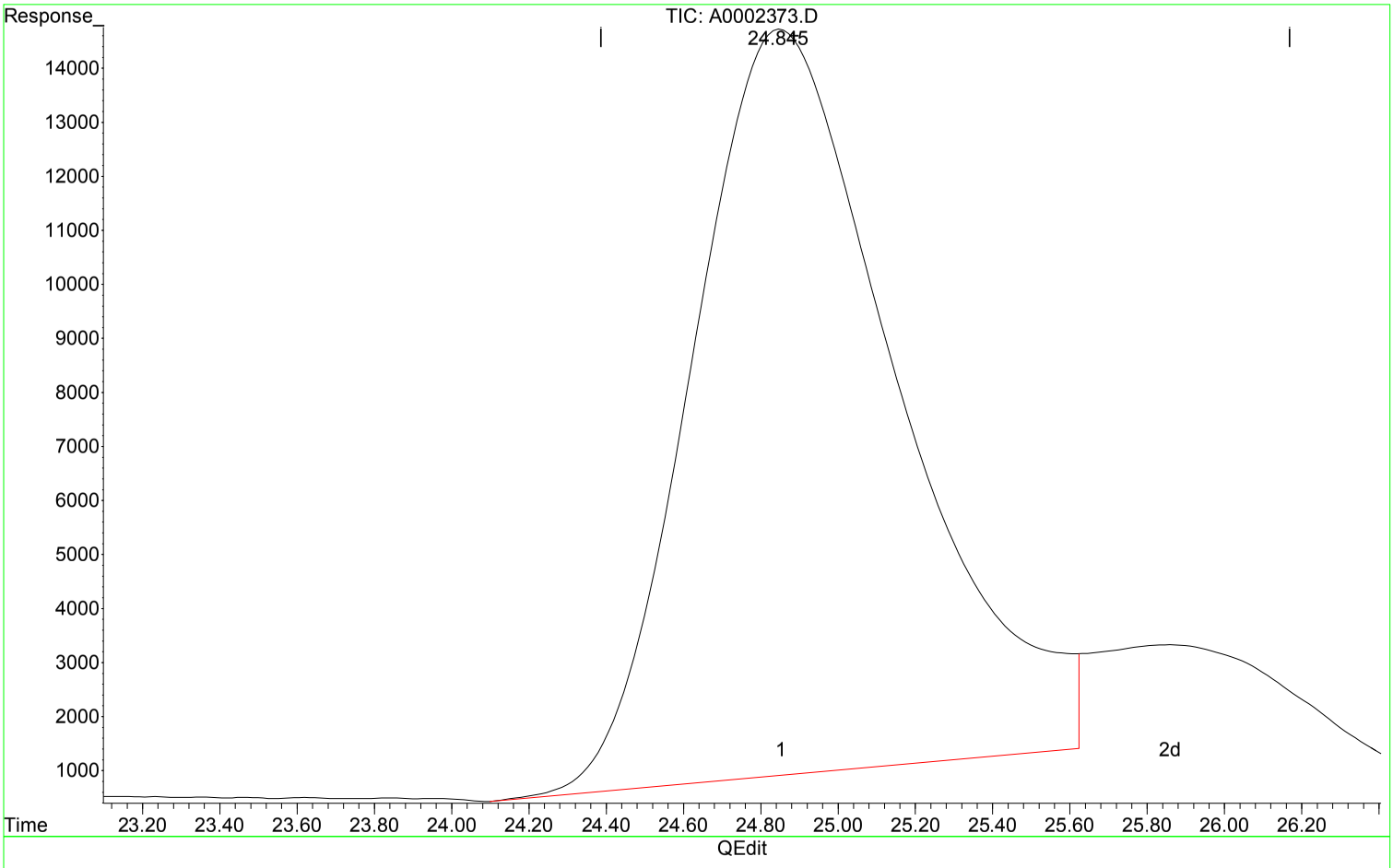
00944310

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.853min 84.188 ppm

response 5086048

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

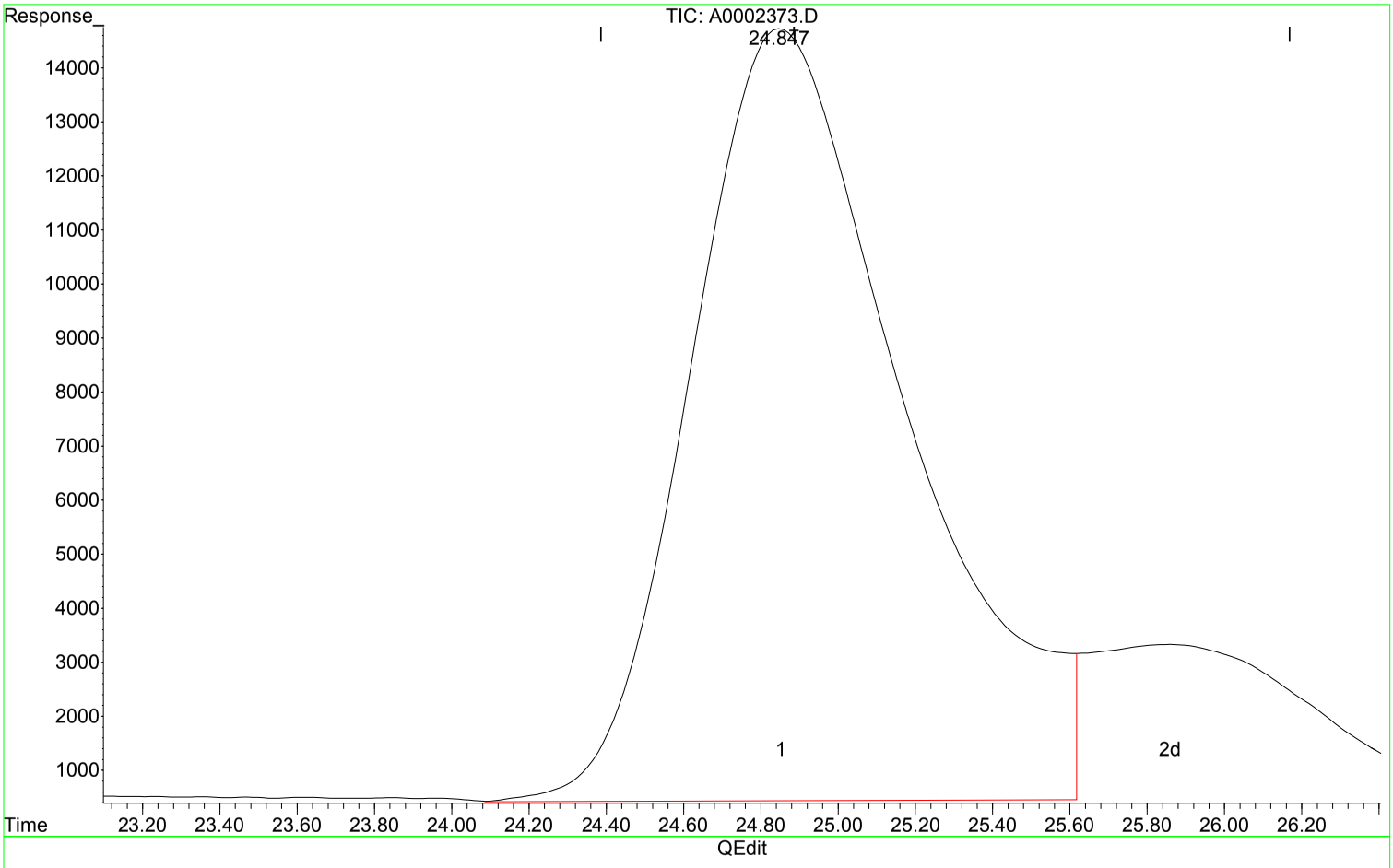
00944311

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.847min 91.221 ppm m

response 5510917

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

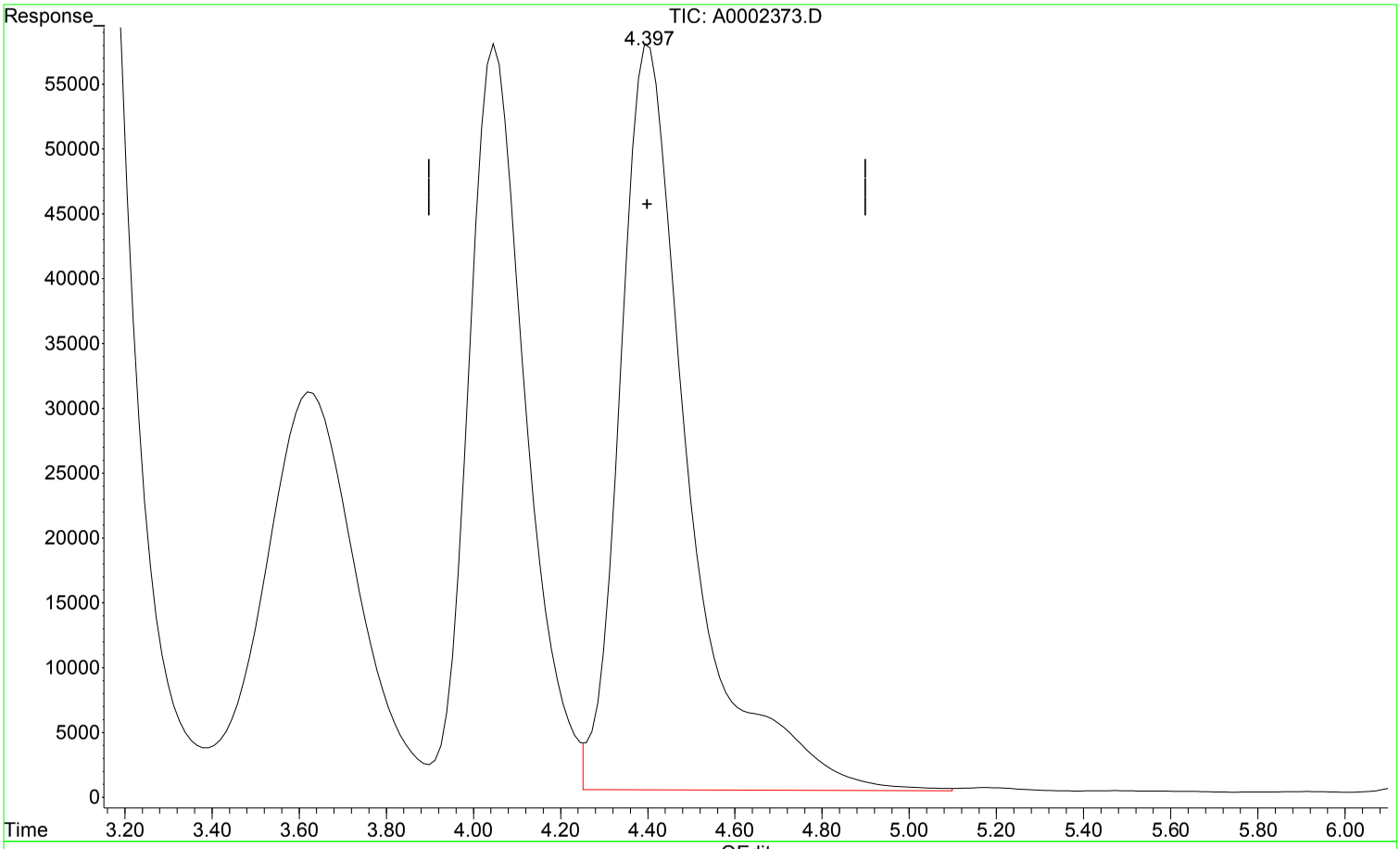
00944312

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.405min 107.446 ppm

response 6360712

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:10:56 2018 Page: 1

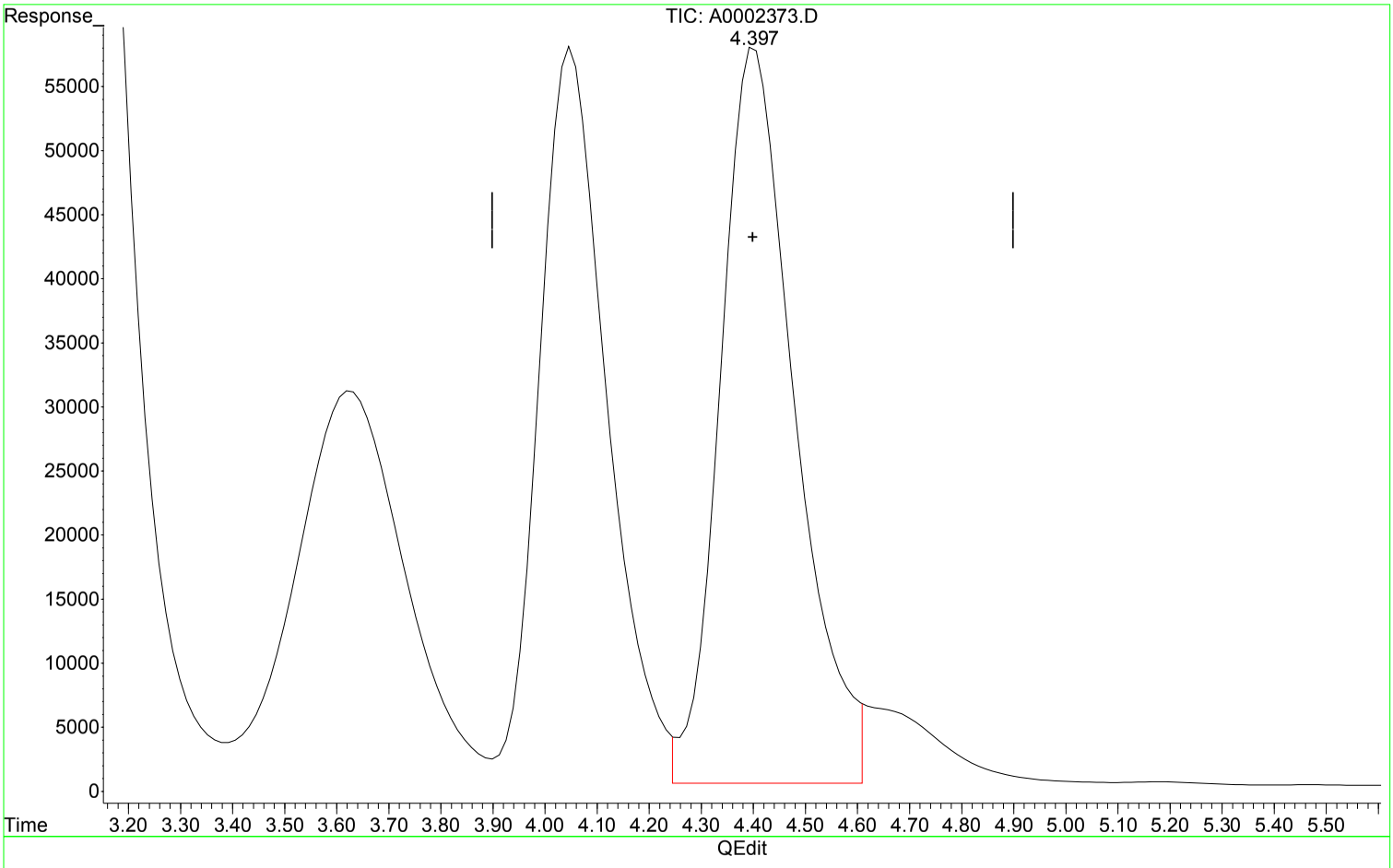
00944313

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 96.715 ppm m

response 5725459

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944314

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	4817586	51.153	ppm	
2) T	Pyruvic acid	3.630	2294161	5.100	ppm	
3) T	Lactic Acid	4.053	2711599	51.251	ppm	
4) T	Acetic Acid	4.398	3026497	51.124	ppm	m
5) T	Propionic Acid	9.212	2949938	50.024	ppm	
6) T	Butyric Acid	24.928	2932273	48.537	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

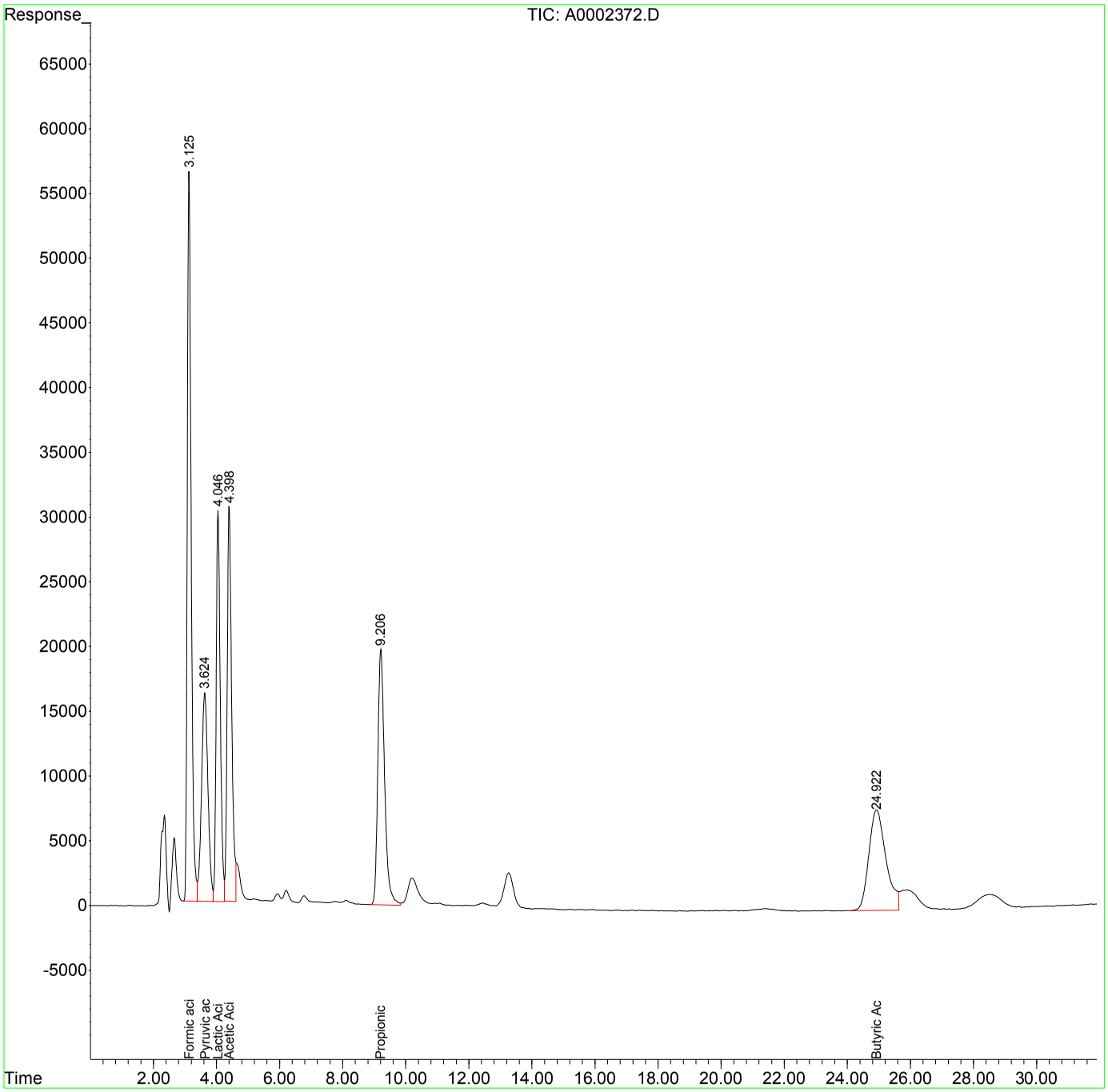
00944315

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



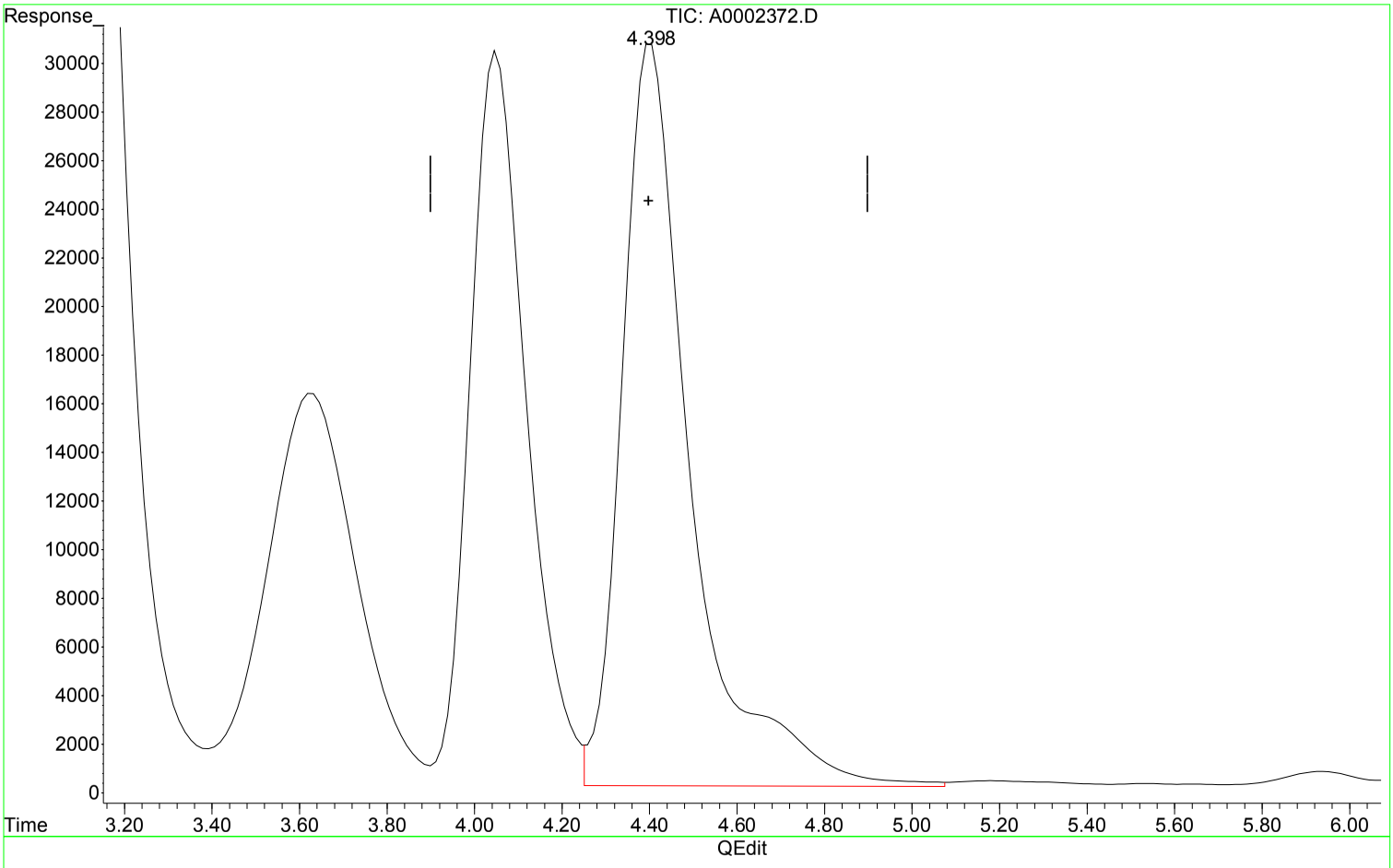
00944316

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 56.131 ppm

response 3322912

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:10:16 2018 Page: 1

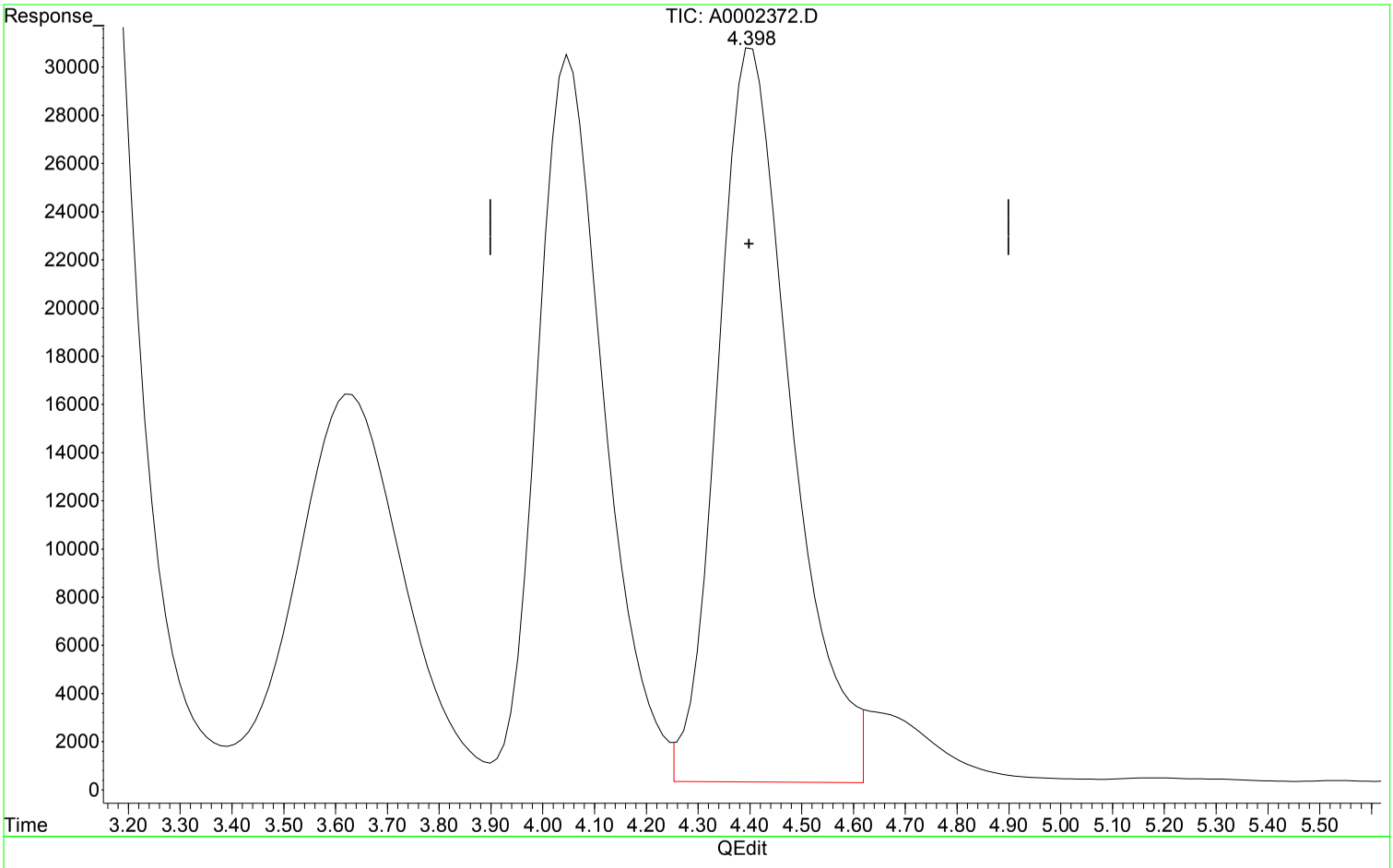
00944317

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.398min 51.124 ppm m

response 3026497

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.131	1890077	20.069	ppm	
2) T	Pyruvic acid	3.629	850051	1.890	ppm	
3) T	Lactic Acid	4.051	1003444	18.966	ppm	
4) T	Acetic Acid	4.397	1096677	18.525	ppm	m
5) T	Propionic Acid	9.206	1140510	19.340	ppm	m
6) T	Butyric Acid	24.960	1207082	19.981	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

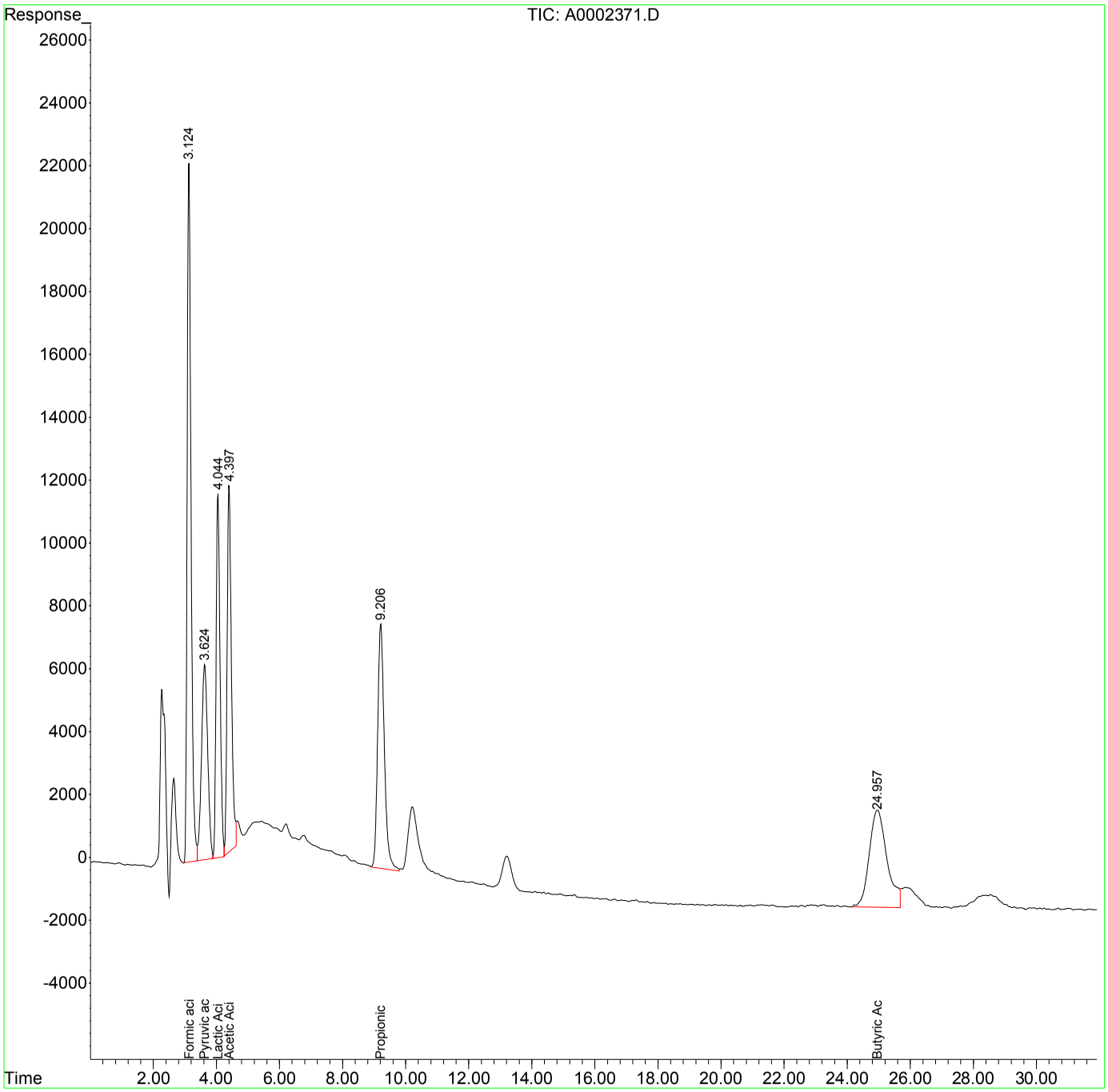
00944319

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



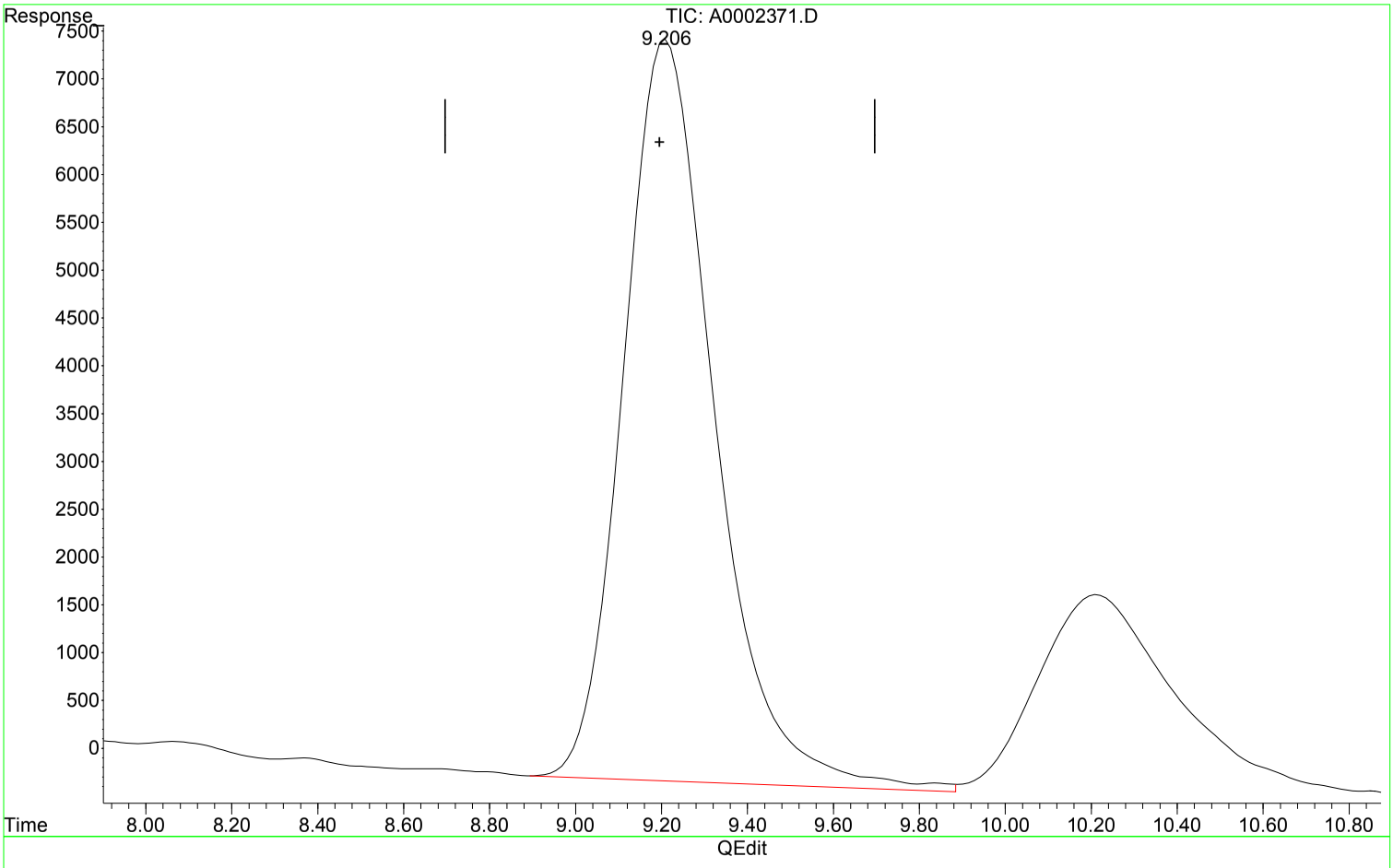
00944320

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.212min 19.380 ppm

response 1142822

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:09:40 2018 Page: 1

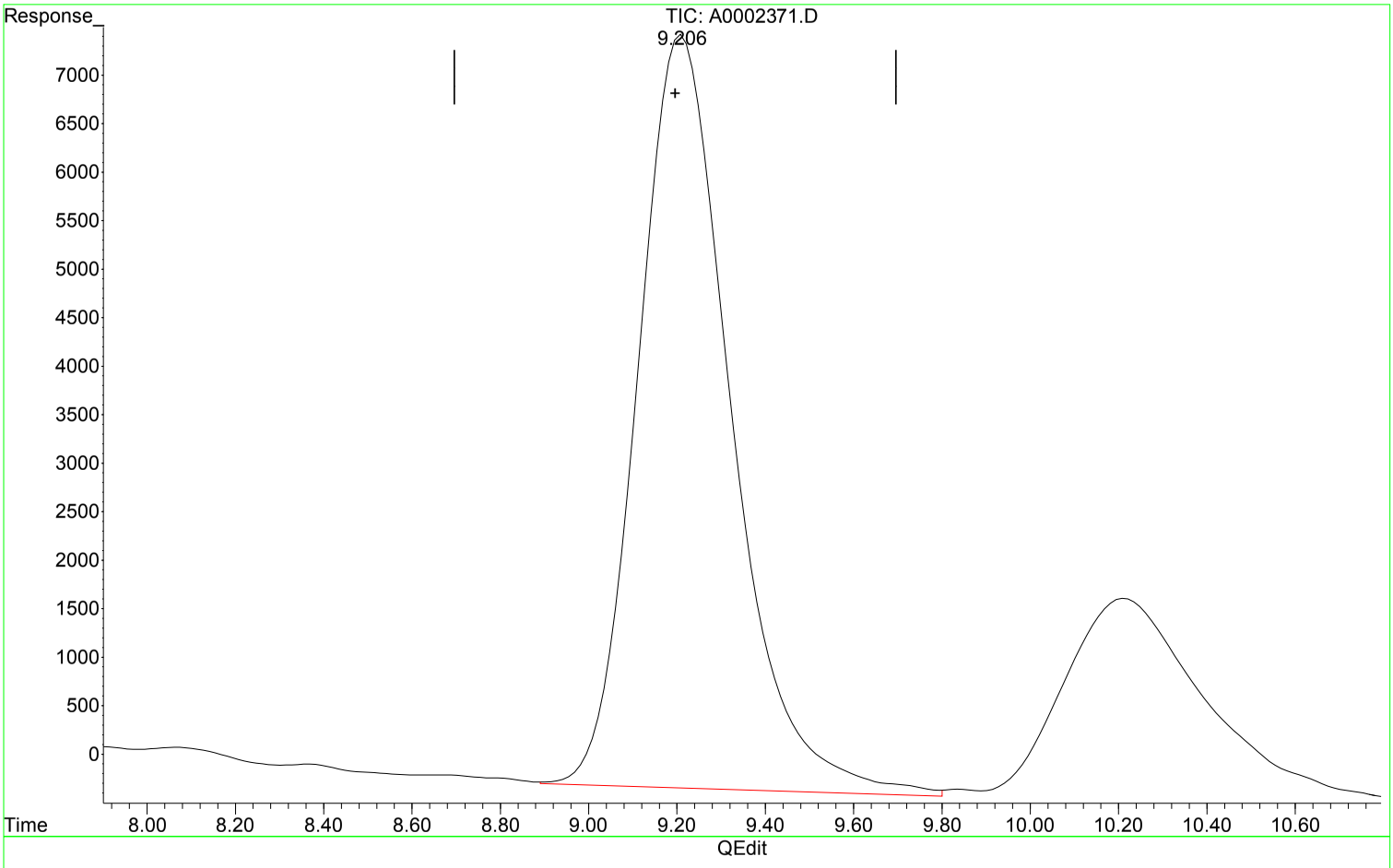
00944321

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.206min 19.340 ppm m

response 1140510

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

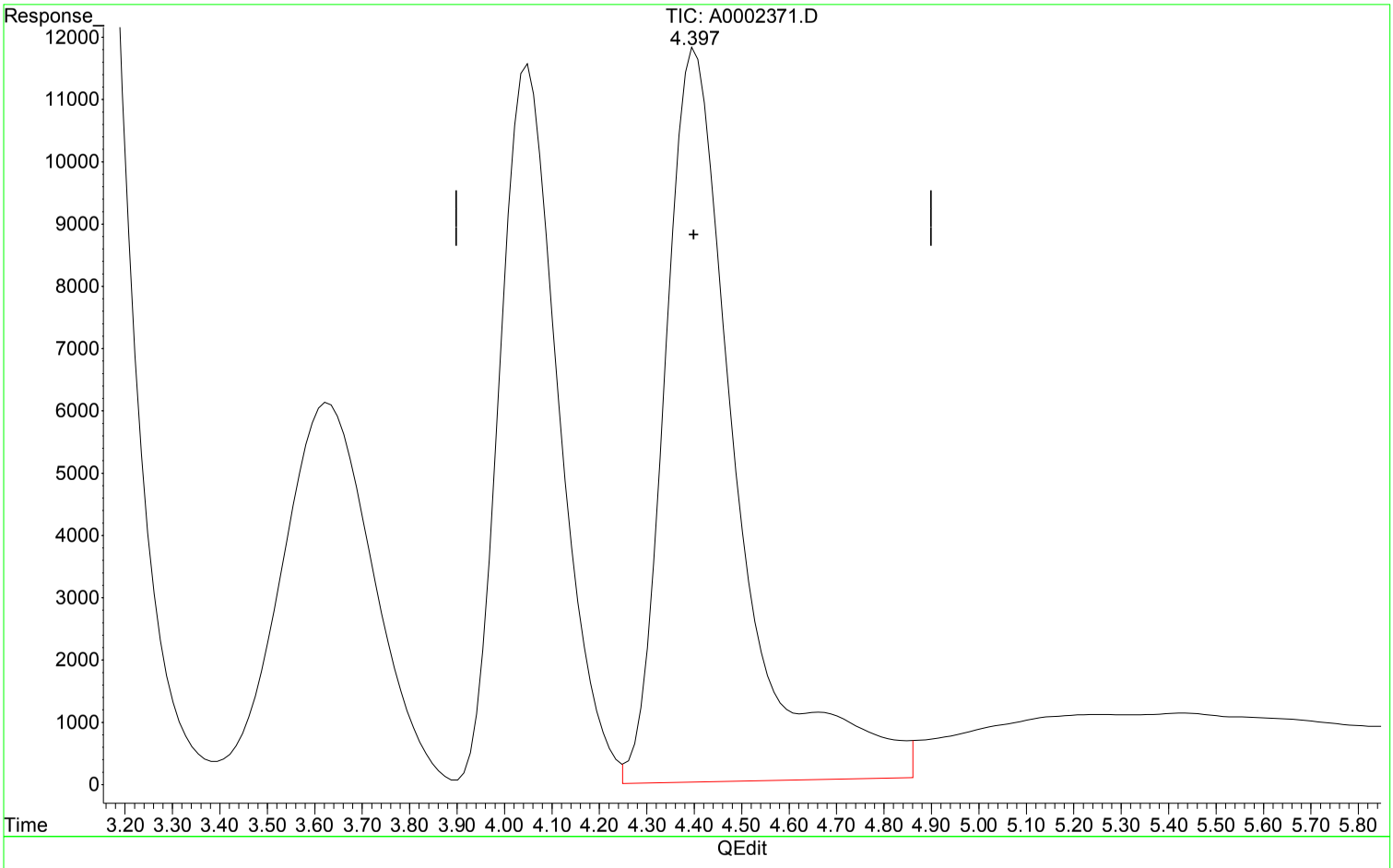
00944322

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.404min 21.093 ppm

response 1248683

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:09:26 2018 Page: 1

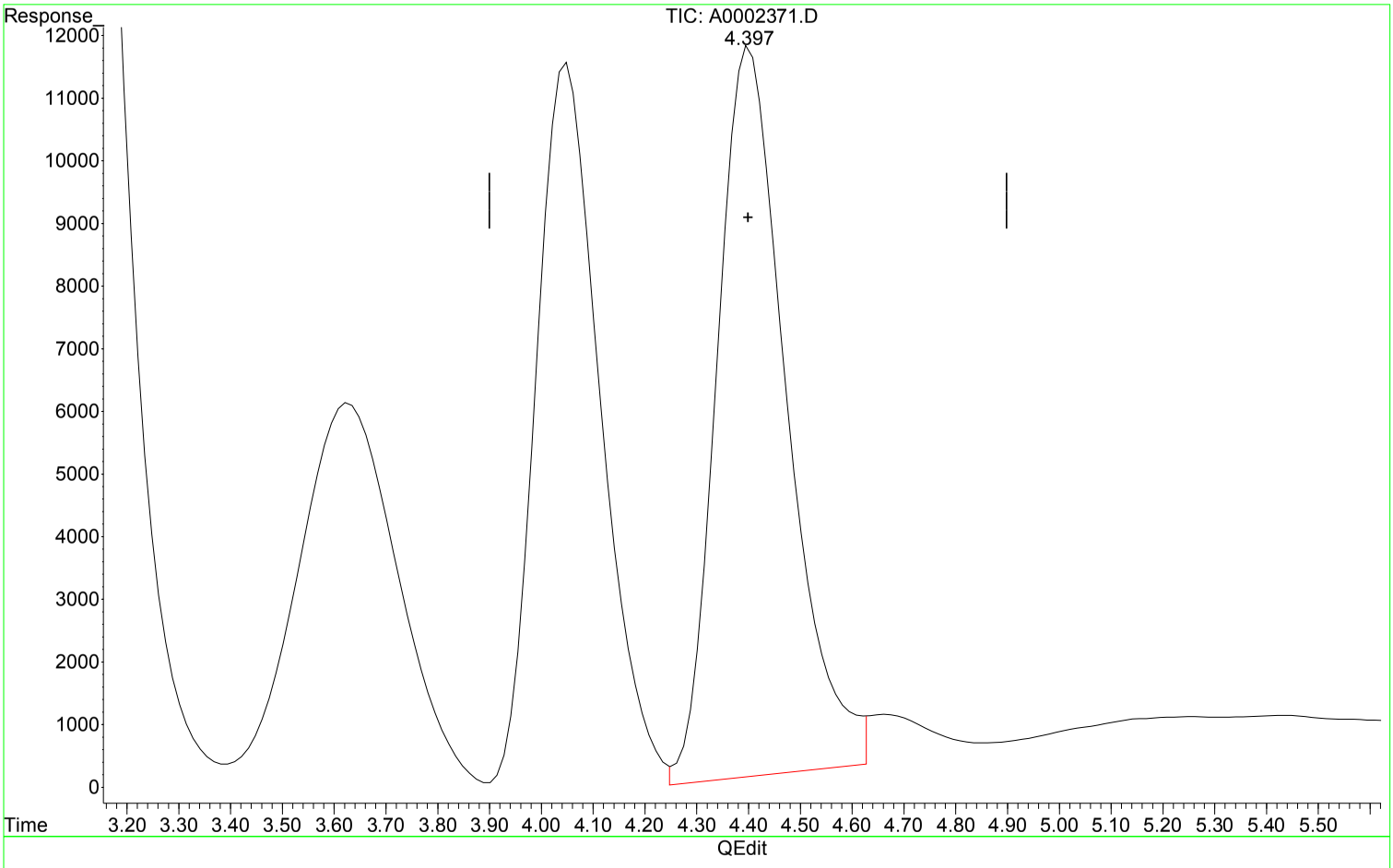
00944323

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 18.525 ppm m

response 1096677

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:09:33 2018 Page: 1

00944324

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	942238	10.005	ppm	
2) T	Pyruvic acid	3.631	448113	0.996	ppm	
3) T	Lactic Acid	4.053	528635	9.991	ppm	
4) T	Acetic Acid	4.399	585881	9.897	ppm	m
5) T	Propionic Acid	9.226	585985	9.937	ppm	
6) T	Butyric Acid	25.010	602088	9.966	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

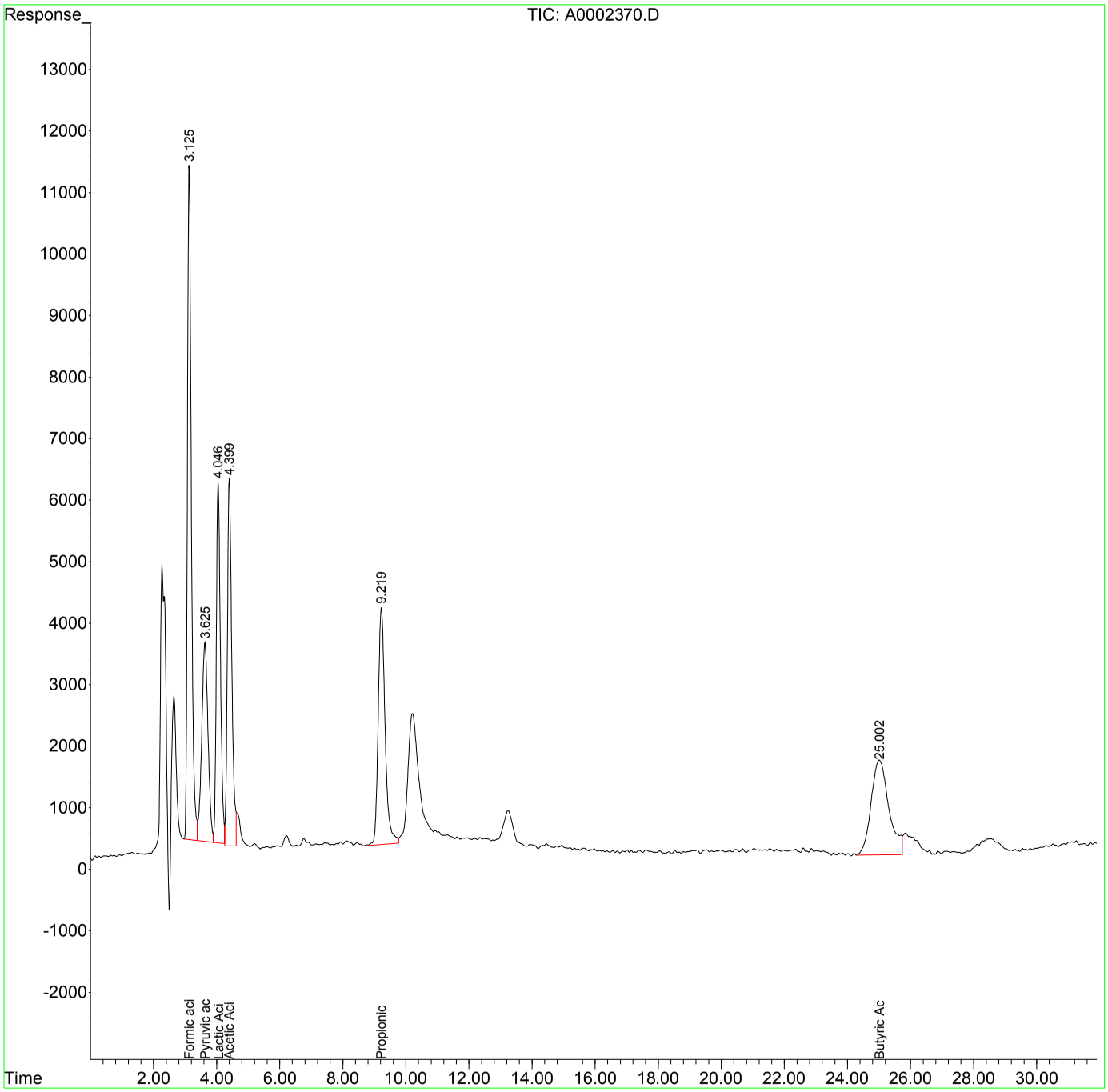
00944325

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



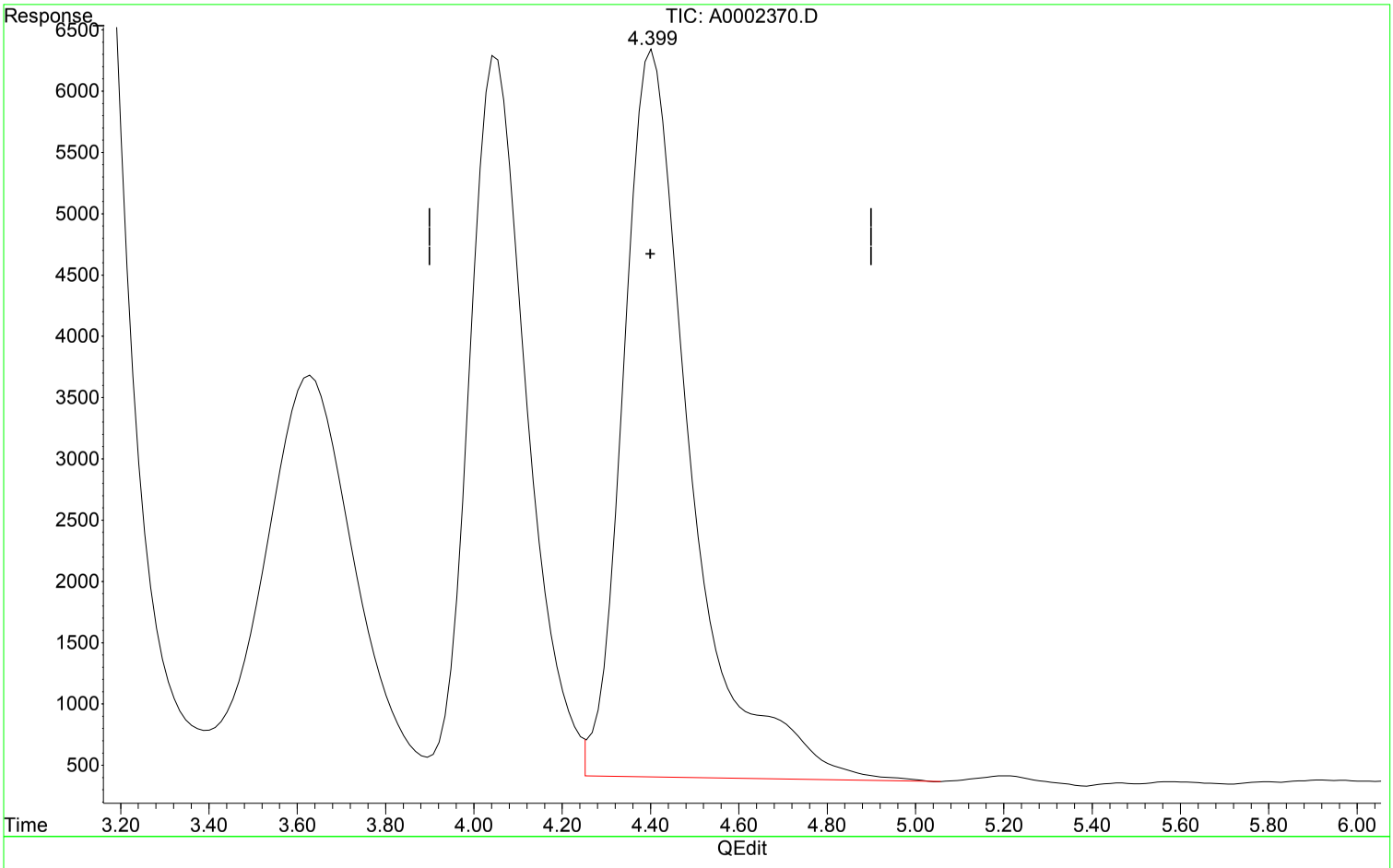
00944326

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 10.646 ppm

response 630261

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:08:50 2018 Page: 1

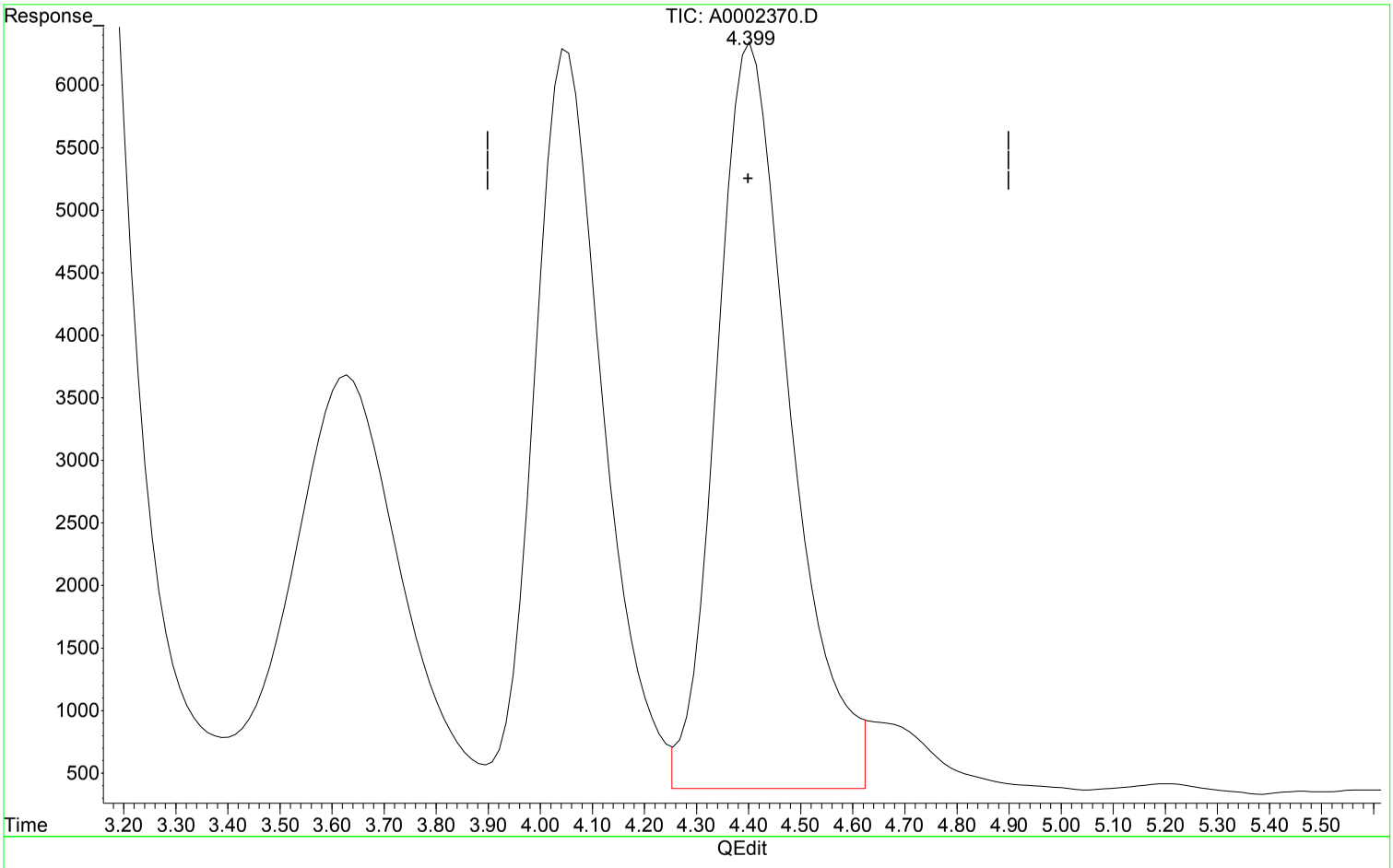
00944327

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 9.897 ppm m

response 585881

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:08:56 2018 Page: 1

00944328

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	497049	5.278	ppm	
2) T	Pyruvic acid	3.631	227620	0.506	ppm	
3) T	Lactic Acid	4.053	269401	5.092	ppm	
4) T	Acetic Acid	4.399	309471	5.228	ppm	m
5) T	Propionic Acid	9.220	306395	5.196	ppm	m
6) T	Butyric Acid	25.001	310758	5.144	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

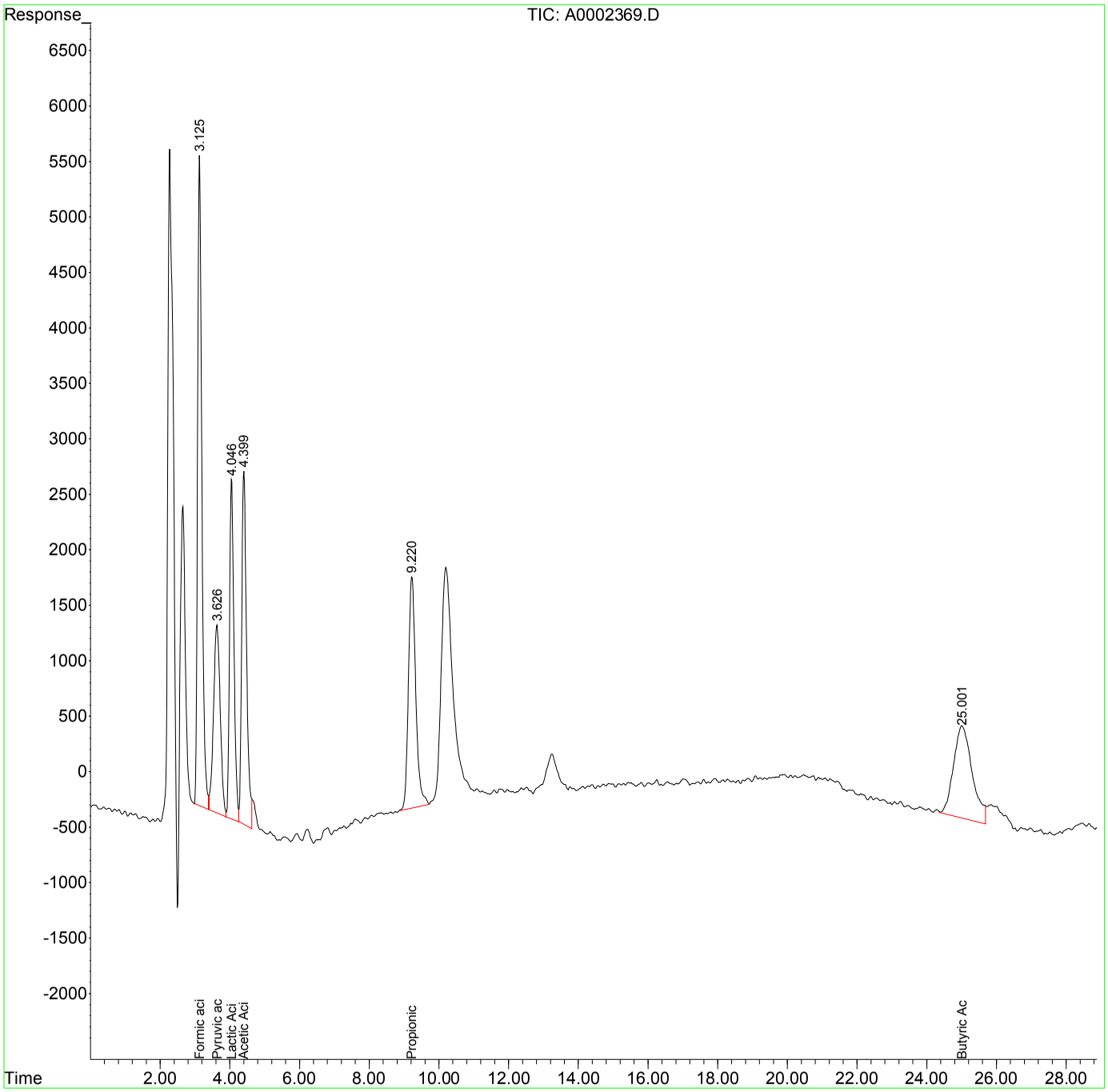
00944329

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



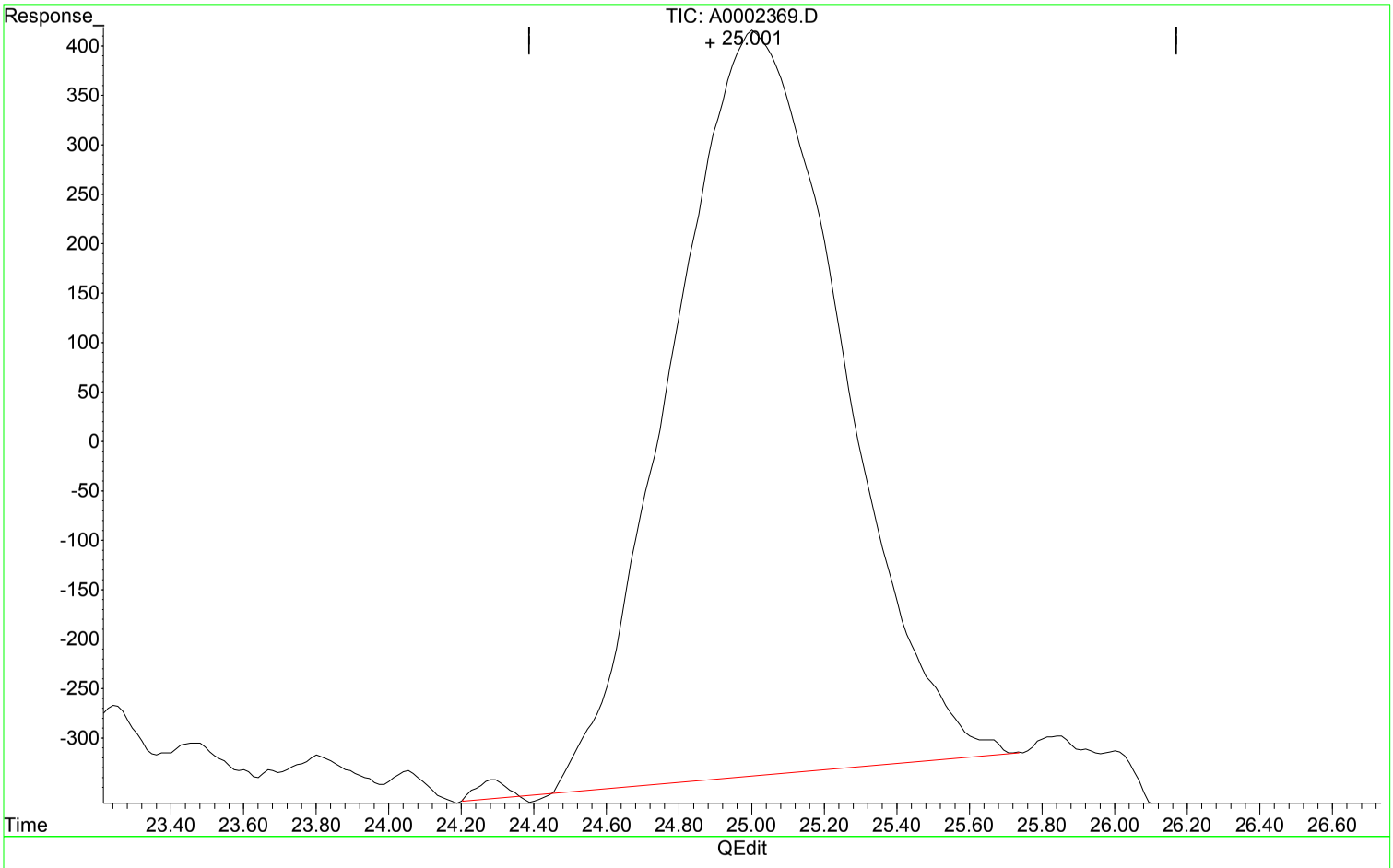
00944330

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.009min 4.071 ppm

response 245954

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

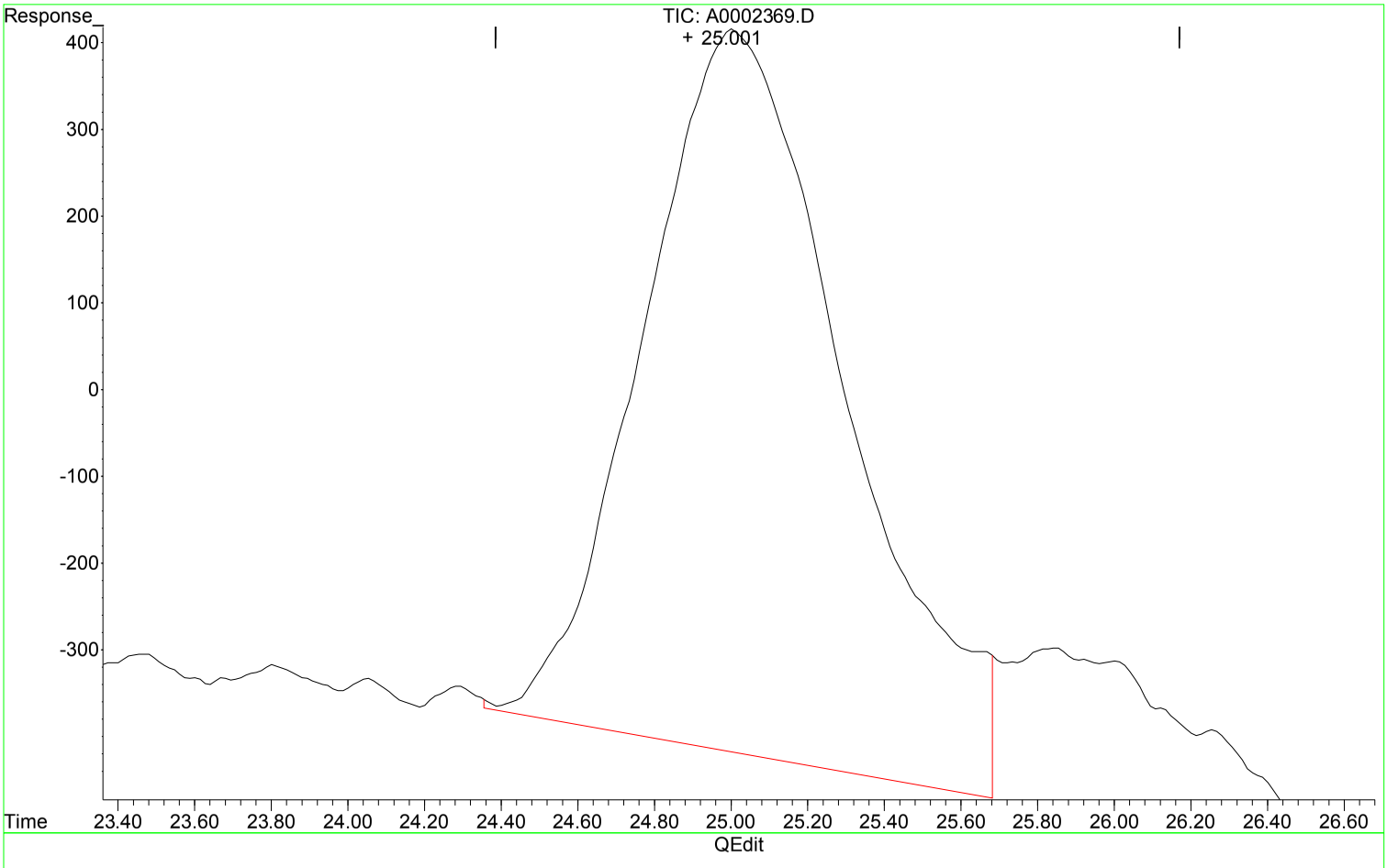
00944331

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.001min 5.144 ppm m

response 310758

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:45:19 2018 Page: 1

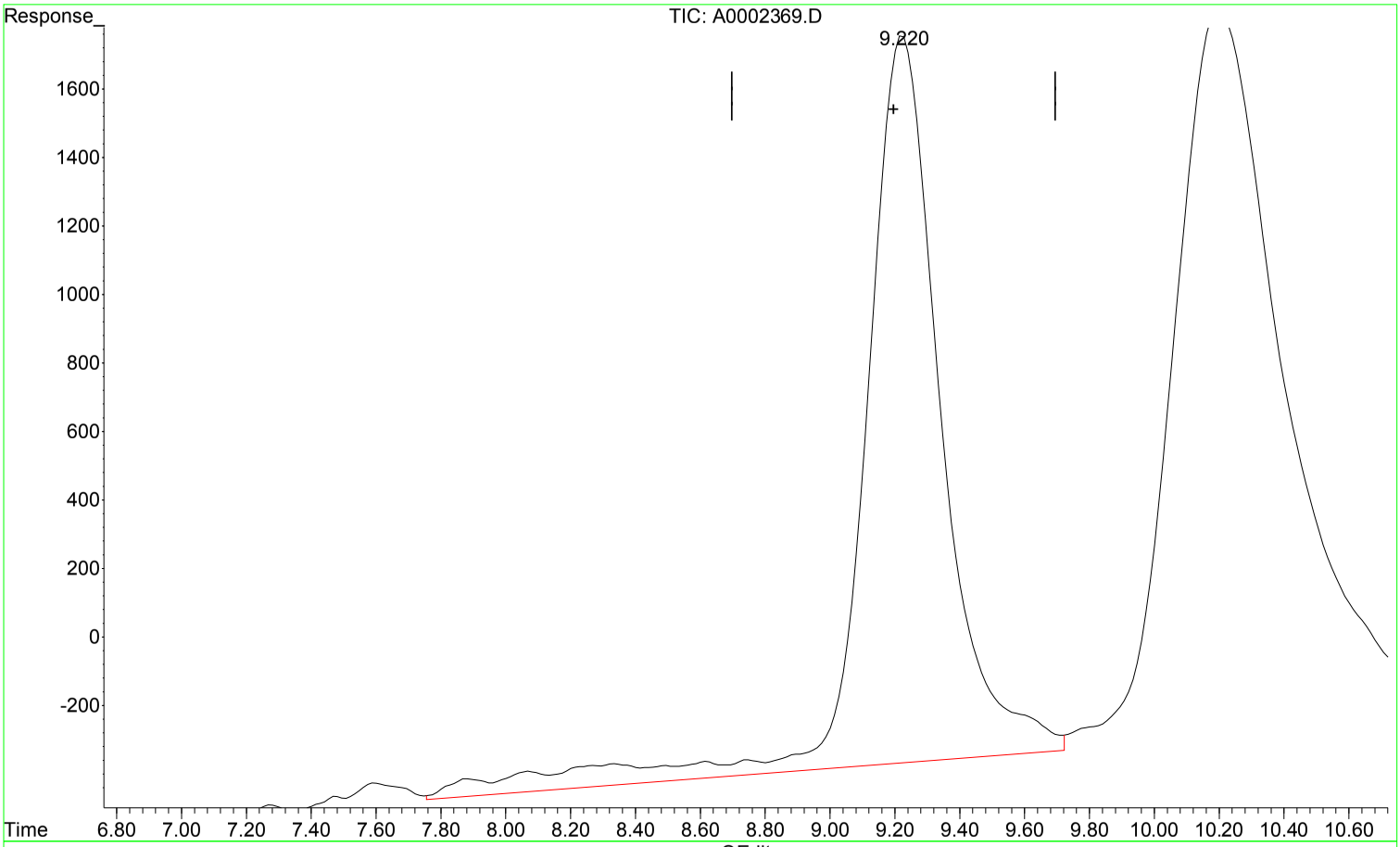
00944332

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 6.027 ppm

response 355419

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

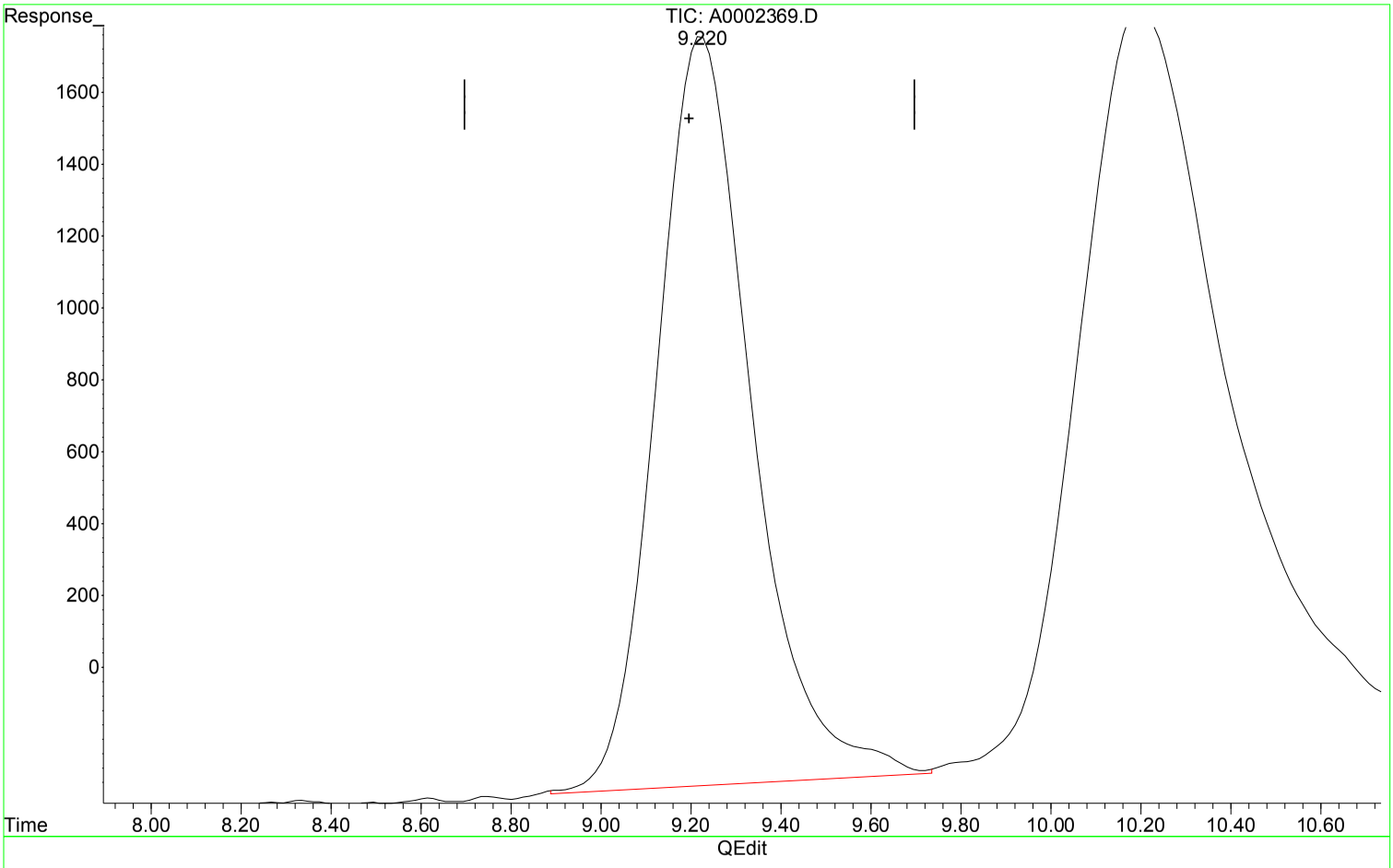
00944333

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.220min 5.196 ppm m

response 306395

Manual Integration:

After

Poor integration.

10/04/18

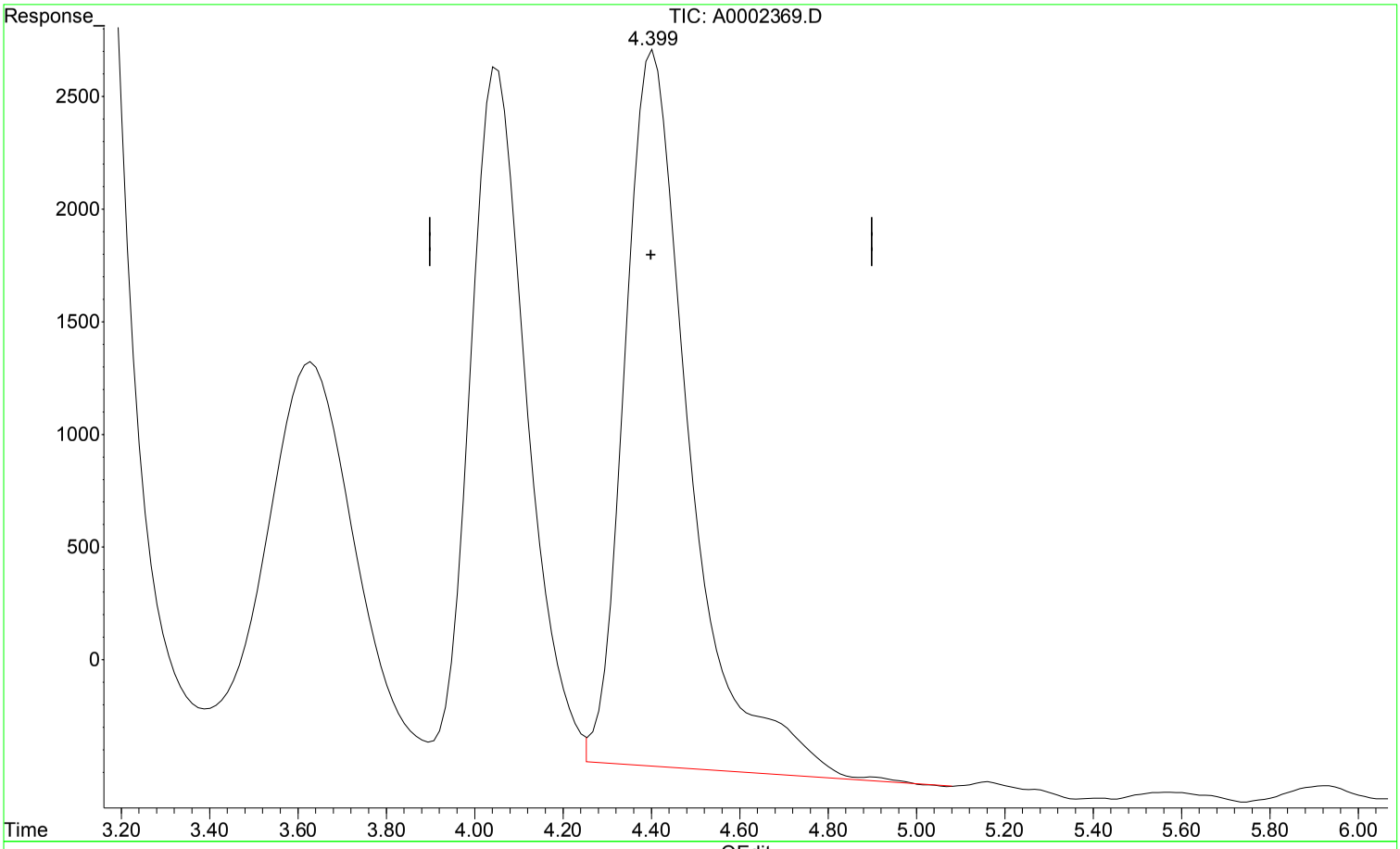
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 5.542 ppm

response 328094

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:46 2018 Page: 1

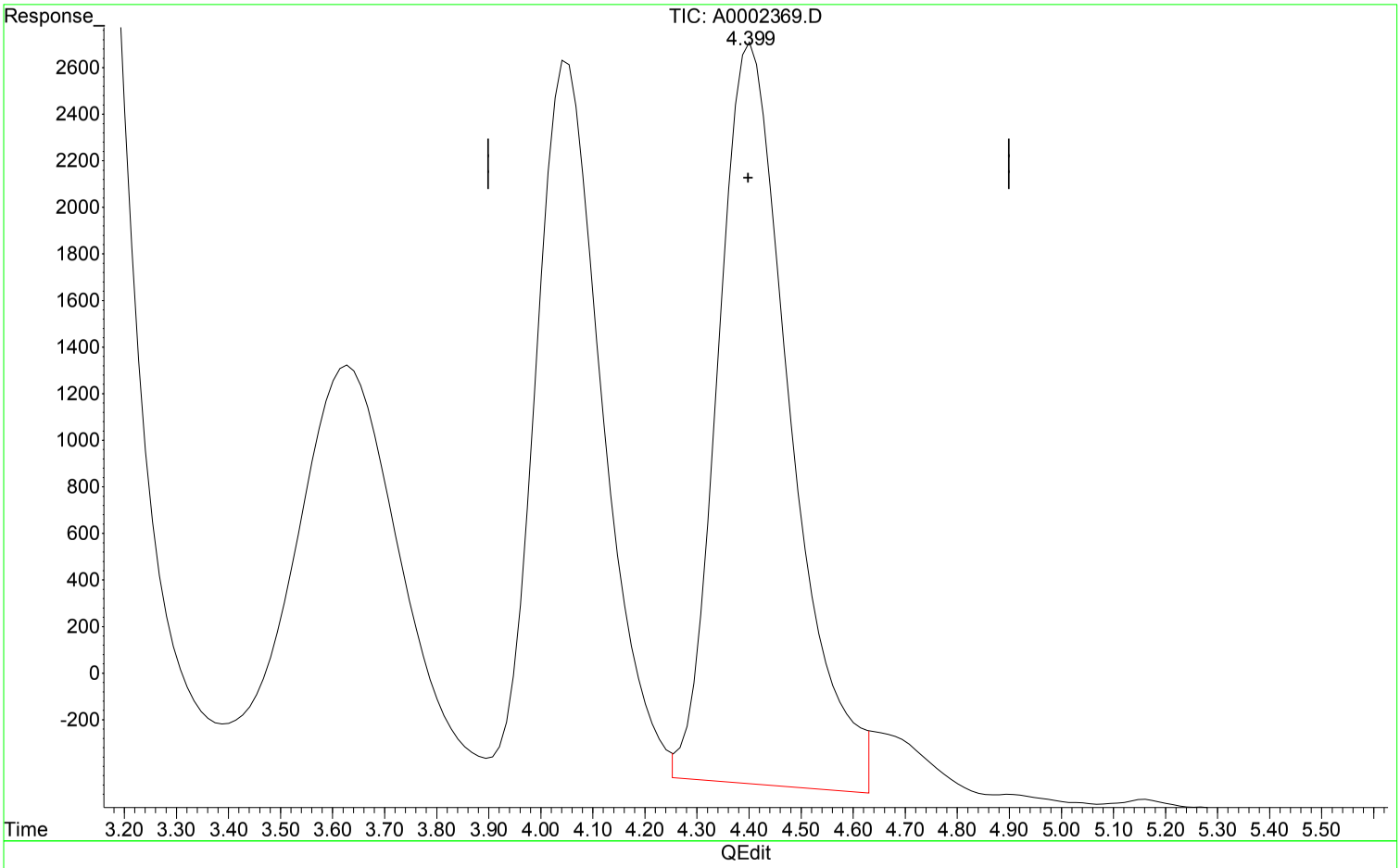
00944335

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 5.228 ppm m

response 309471

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944336

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	197324	2.095	ppm	
2) T	Pyruvic acid	3.628	94203	0.209	ppm	
3) T	Lactic Acid	4.053	108314	2.047	ppm	
4) T	Acetic Acid	4.399	121343	2.050	ppm	m
5) T	Propionic Acid	9.219	118189	2.004	ppm	m
6) T	Butyric Acid	24.985	143852	2.381	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

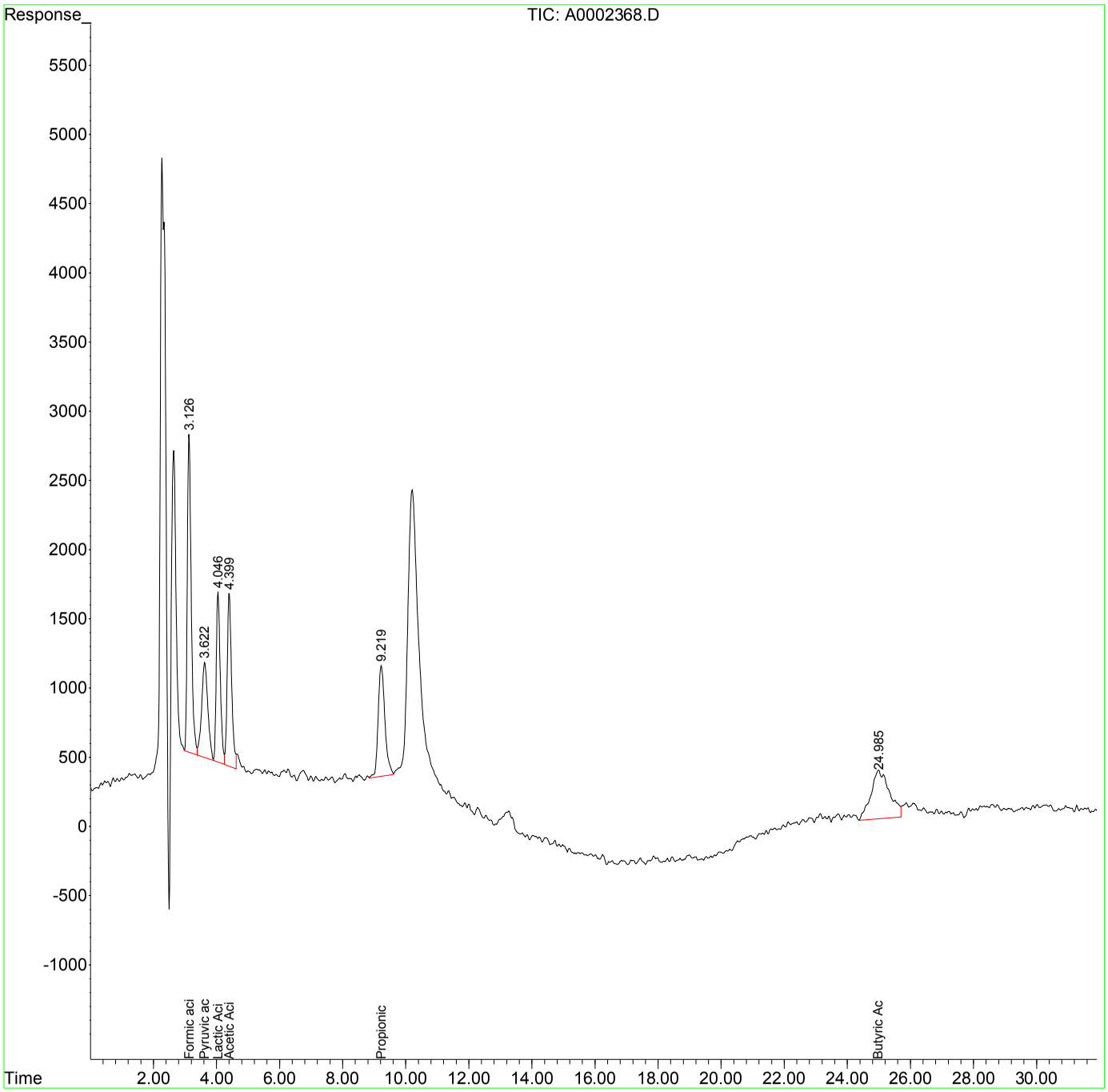
00944337

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944338

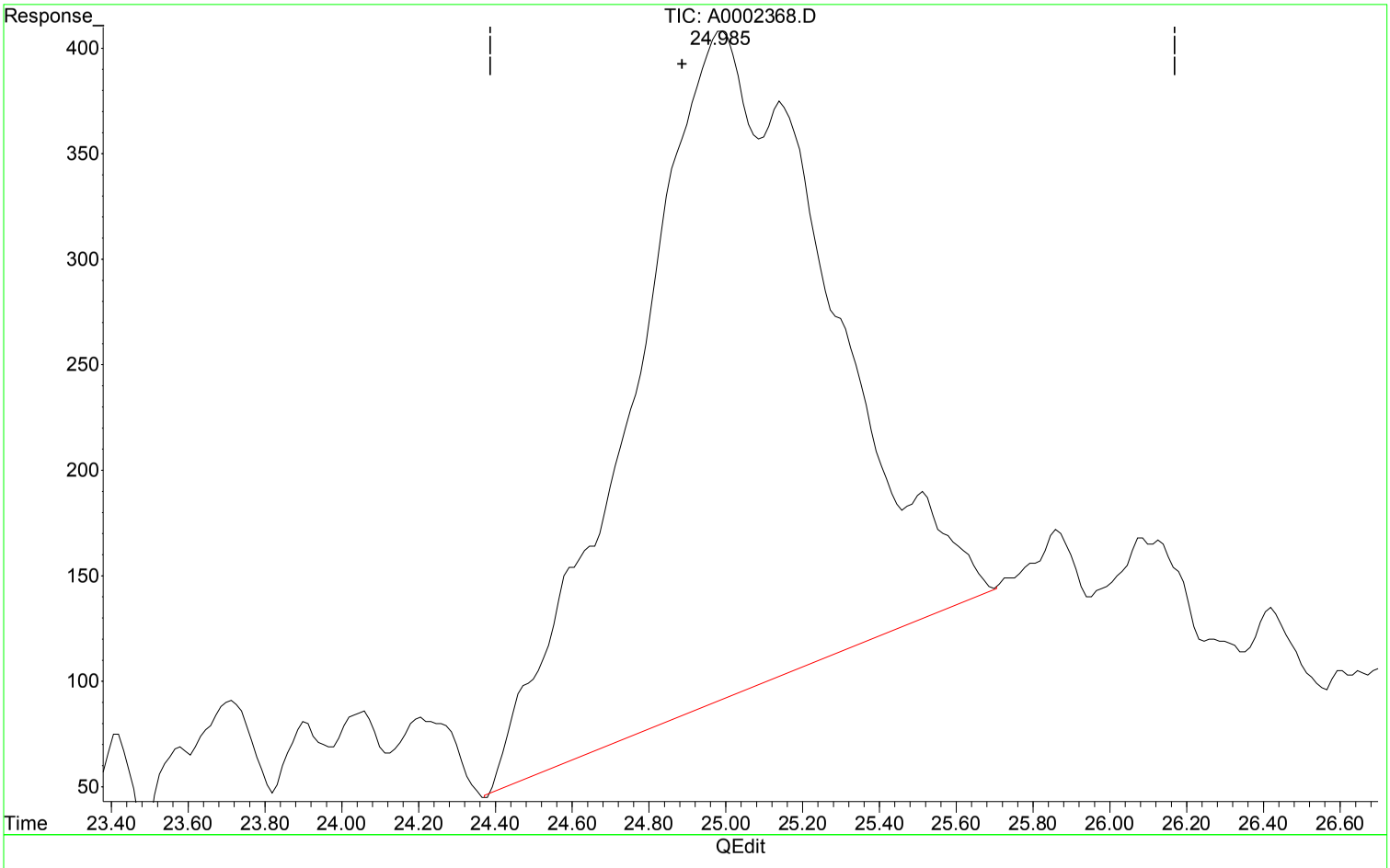
1st BA 10/05/18
2nd MP 10/09/18

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.991min 1.857 ppm

response 112205

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

00944339

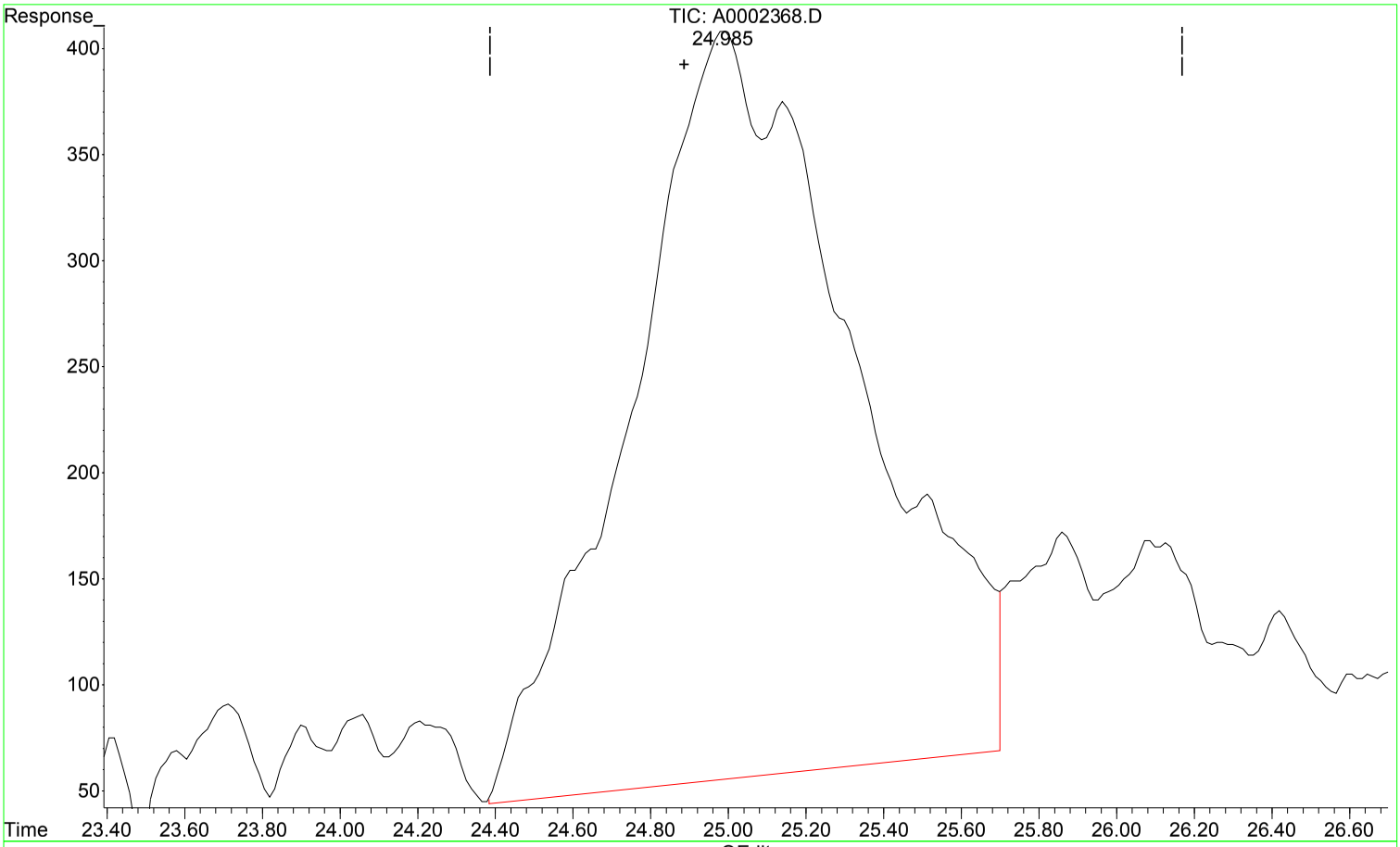
1st BA 10/05/18
2nd MP 10/09/18

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.985min 2.381 ppm m

response 143852

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

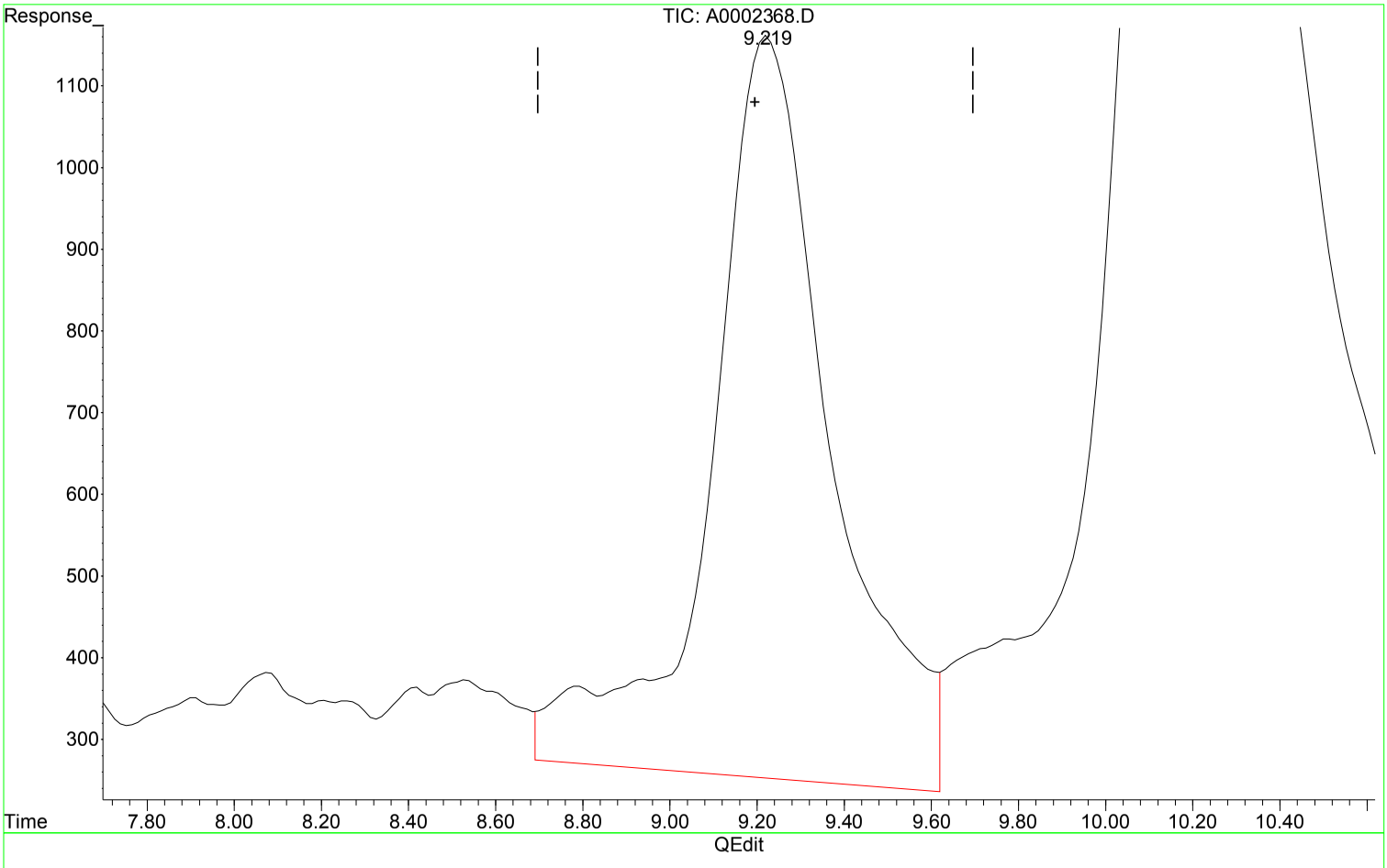
00944340

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 3.005 ppm

response 177221

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

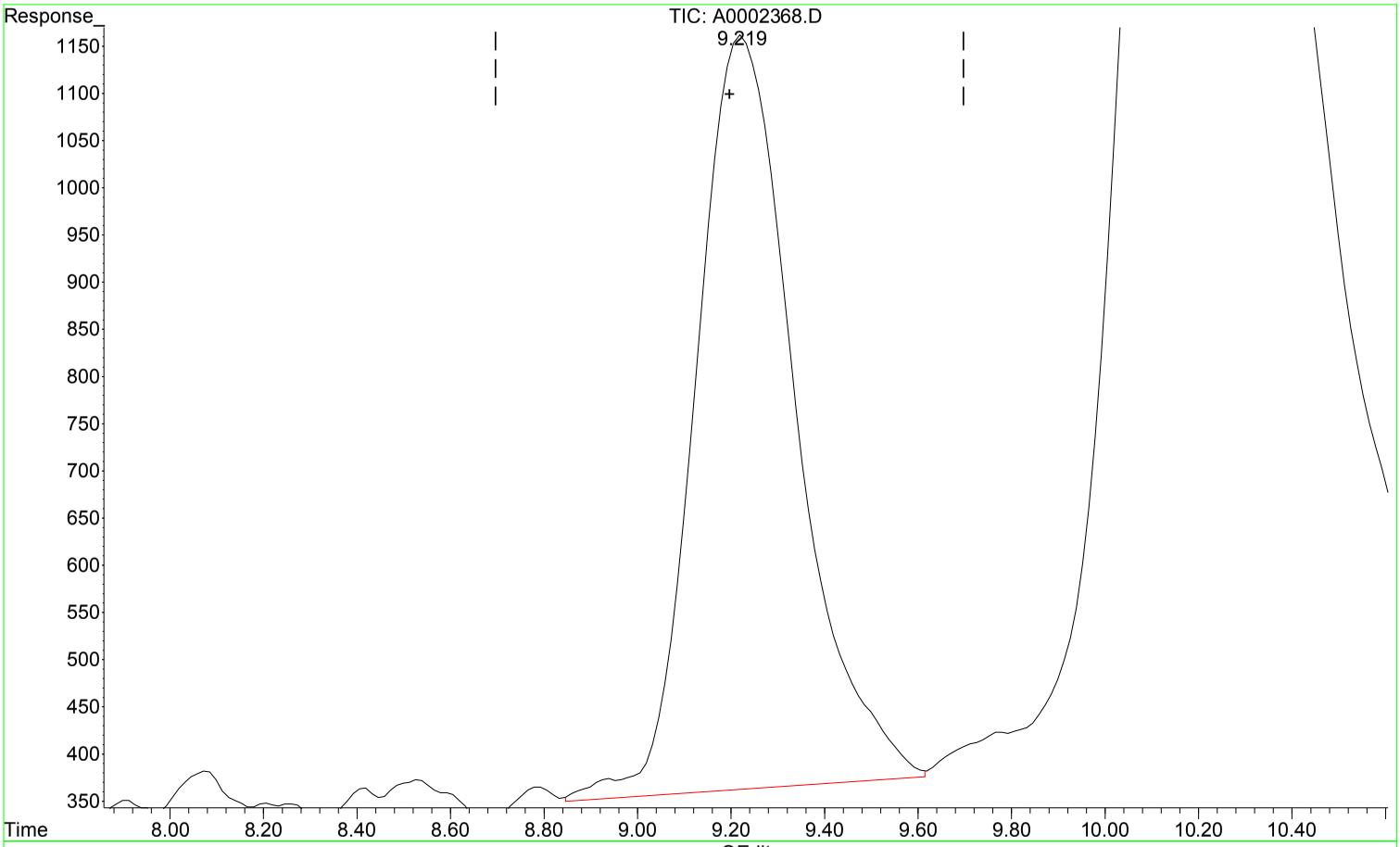
00944341

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.219min 2.004 ppm m

response 118189

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

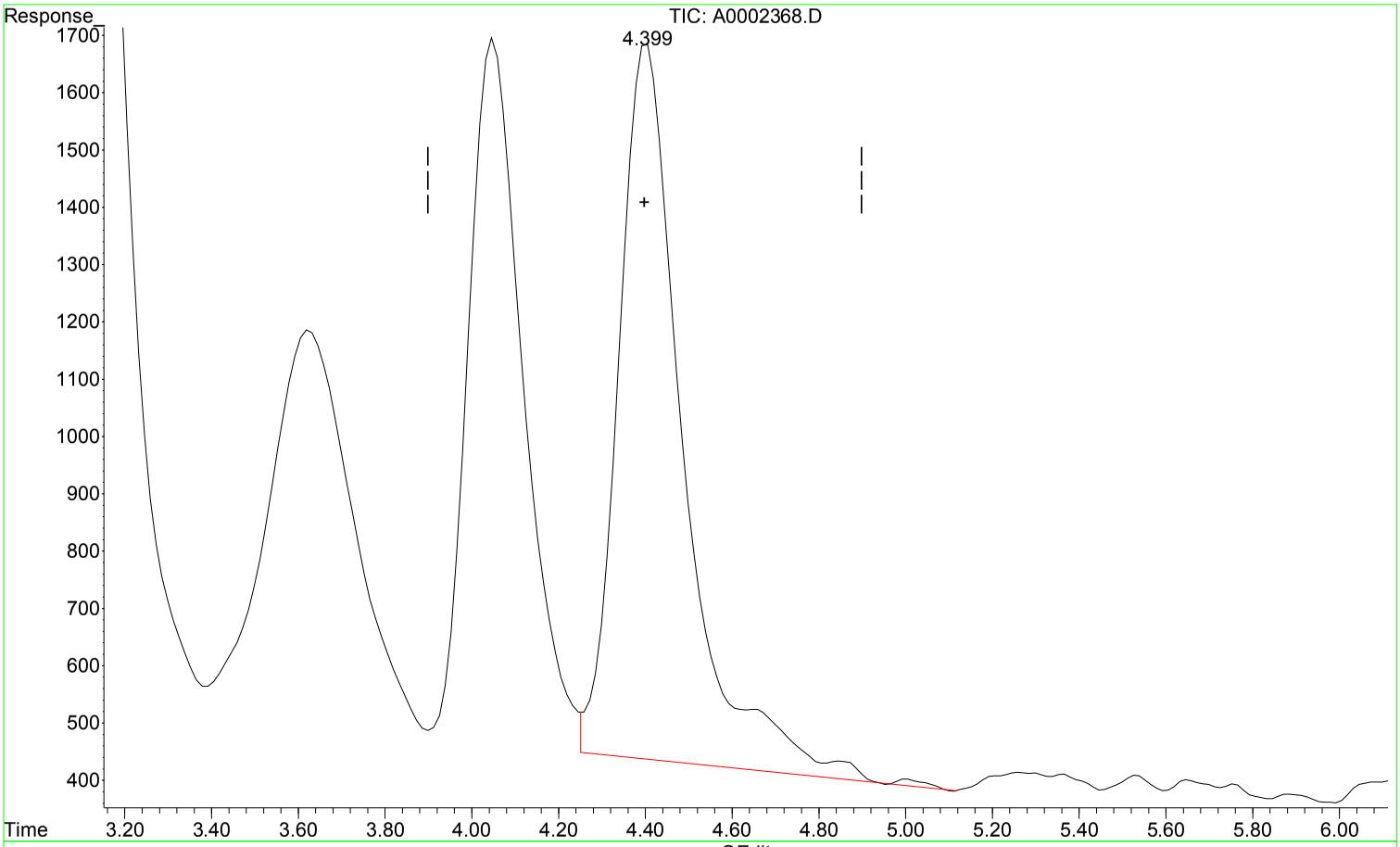
00944342

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 2.212 ppm

response 130945

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:43:56 2018 Page: 1

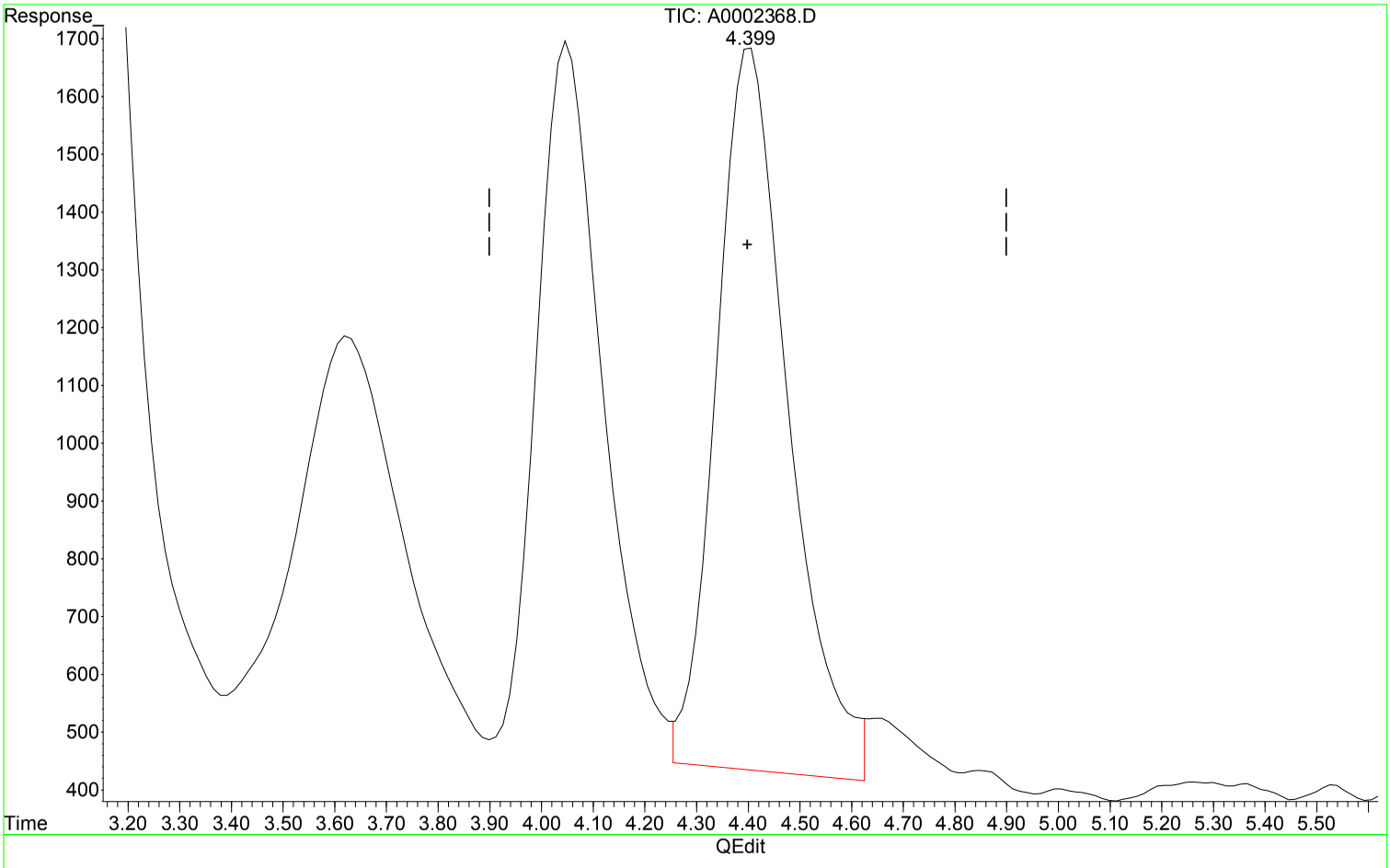
00944343

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 2.050 ppm m

response 121343

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944344

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	101923	1.082	ppm	
2) T	Pyruvic acid	3.631	46367	0.103	ppm	
3) T	Lactic Acid	4.052	58945	1.114	ppm	
4) T	Acetic Acid	4.404	60257	1.018	ppm	
5) T	Propionic Acid	9.215	69400	1.177	ppm	m
6) T	Butyric Acid	24.964	74253	1.229	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

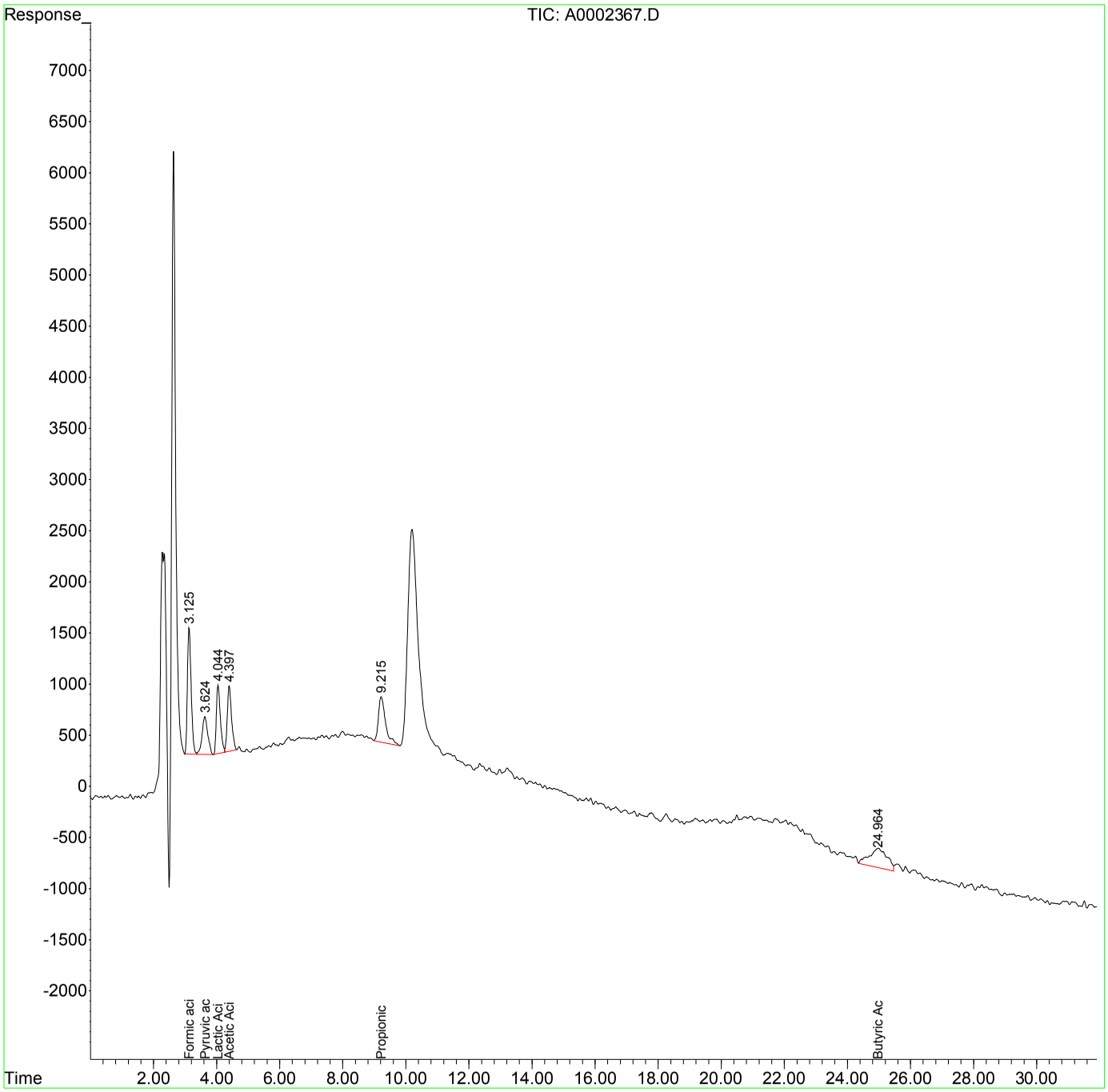
00944345

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



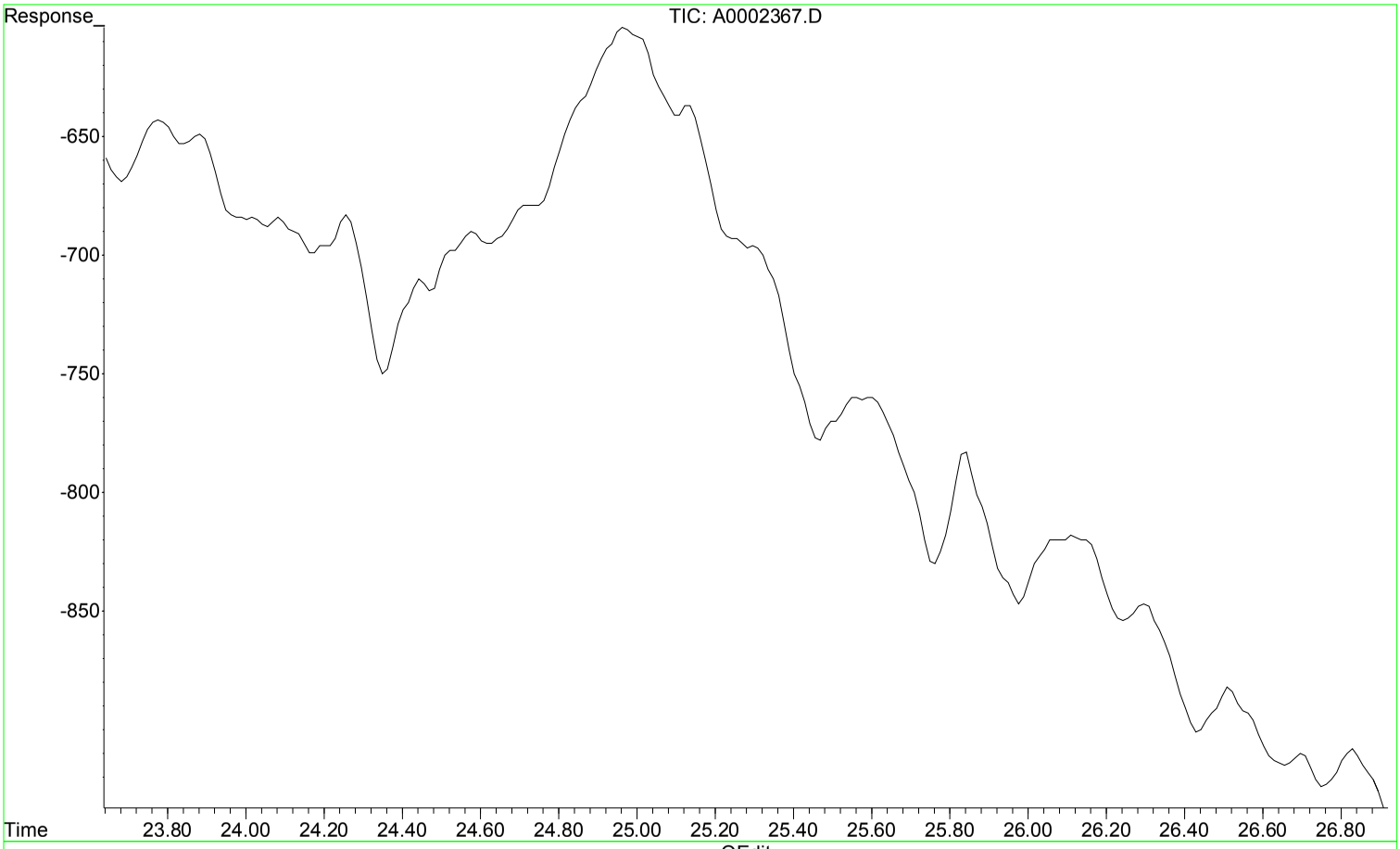
00944346

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.887min 0.000 ppm

response 0

Manual Integration:

Before

10/04/18

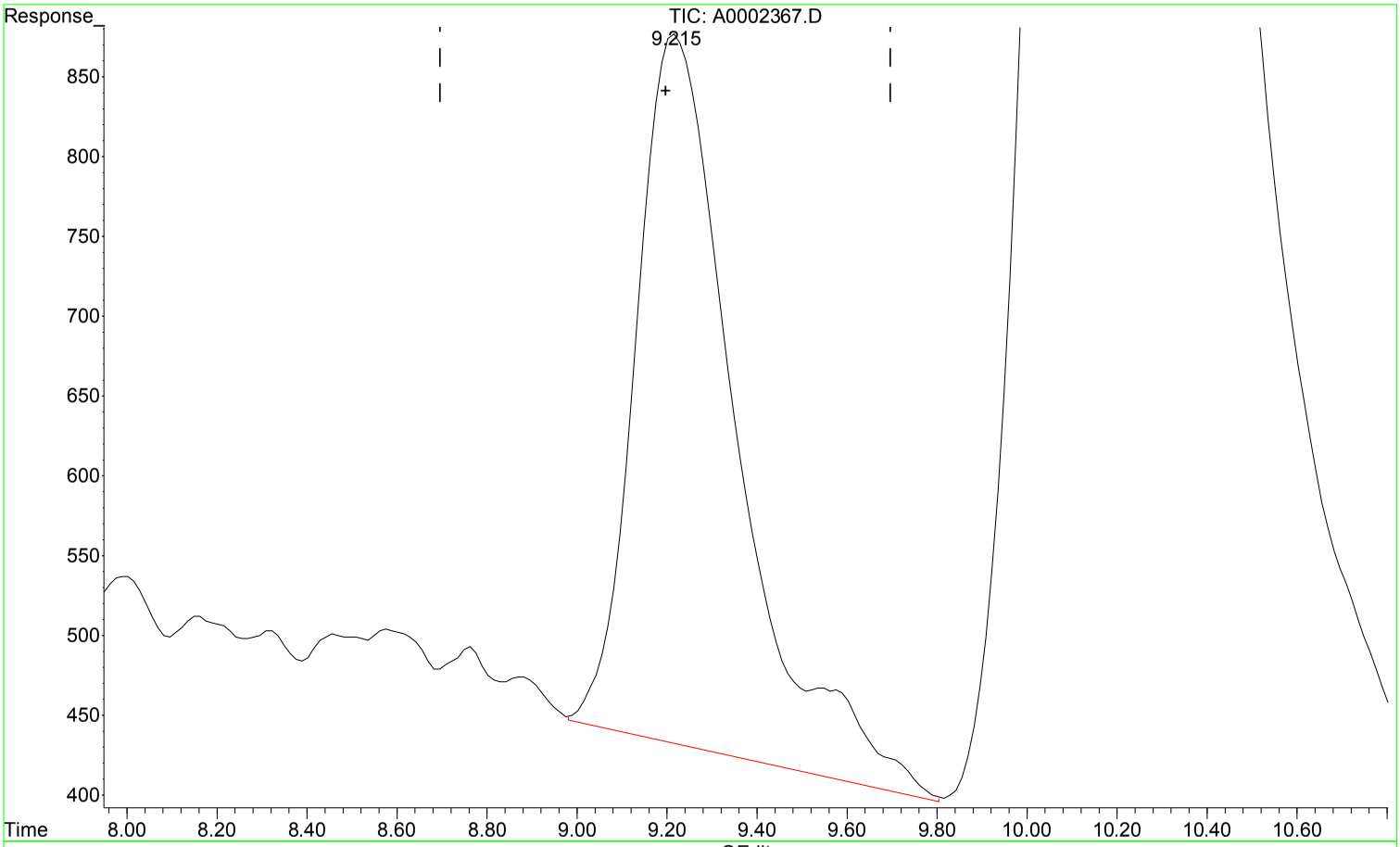
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.215min 1.177 ppm m

response 69400

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944348

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	3.655	25630	0.057	ppm	m
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	0.000	0	N.D.	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

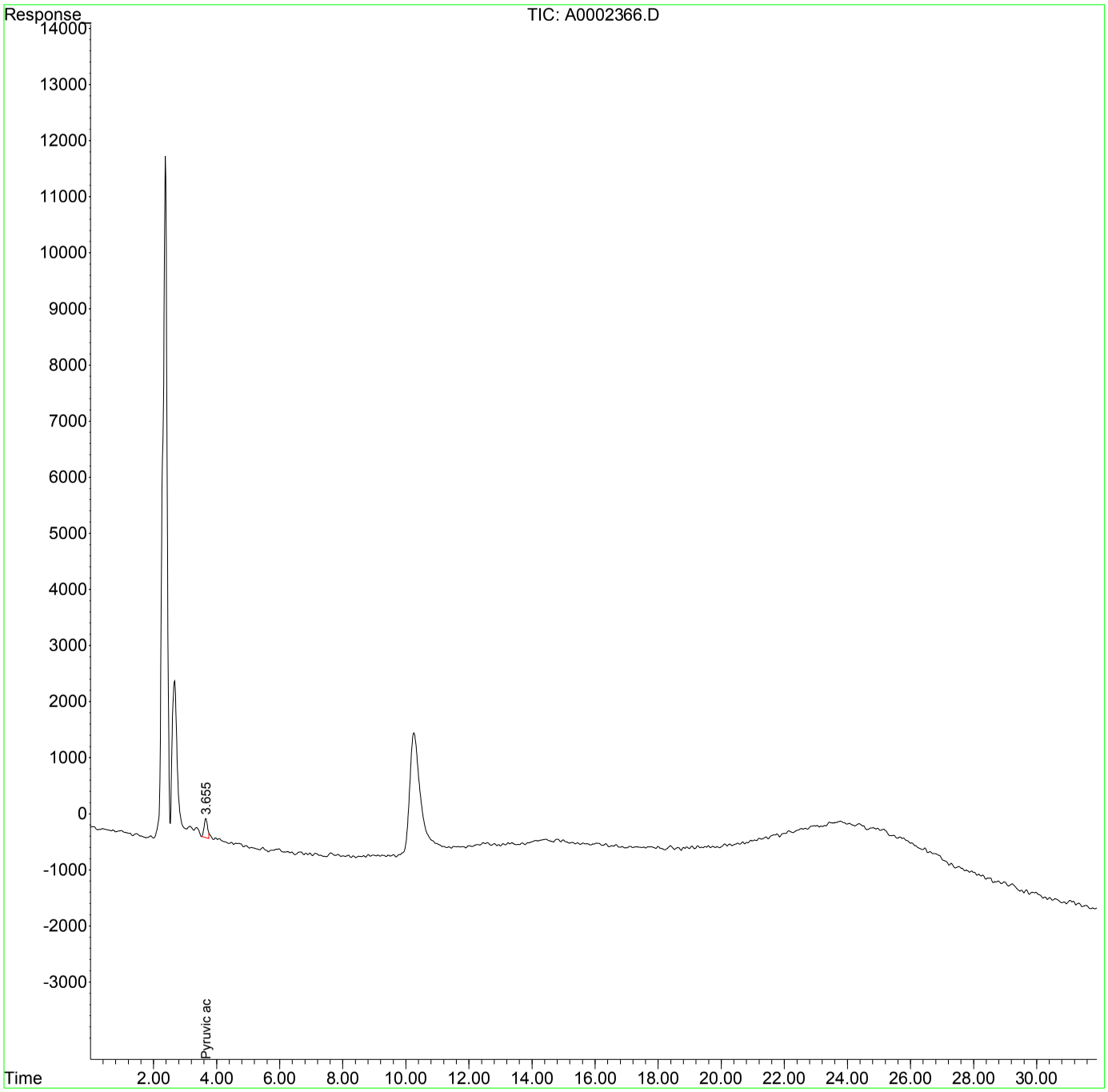
00944349

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944350

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809393
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

#	Lab Code	Sample Name	File Location	Acquisition Date
01	RC1800114-01	0.1-1.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002367.D	10/04/2018 12:01
02	RC1800114-02	0.2-2.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002368.D	10/04/2018 12:32
03	RC1800114-03	0.5-5.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002369.D	10/04/2018 13:04
04	RC1800114-04	1.0-10.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002370.D	10/04/2018 13:36
05	RC1800114-05	2.0-20.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002371.D	10/04/2018 14:21
06	RC1800114-06	5.0-50.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002372.D	10/04/2018 14:56
07	RC1800114-07	10.0-100.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002373.D	10/04/2018 15:31
08	RC1800114-08	20.0-200.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002374.D	10/04/2018 16:03

Analyte

Acetic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.026E4	02	2.000	6.067E4	03	5.000	6.189E4	04	10.000	5.859E4
05	20.000	5.483E4	06	50.000	6.053E4	07	100.000	5.725E4	08	200.000	5.933E4

Butanoic Acid (Butyric Acid)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	7.425E4	02	2.000	7.193E4	03	5.000	6.215E4	04	10.000	6.021E4
05	20.000	6.035E4	06	50.000	5.865E4	07	100.000	5.511E4	08	200.000	6.053E4

Lactic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	5.895E4	02	2.000	5.416E4	03	5.000	5.388E4	04	10.000	5.286E4
05	20.000	5.017E4	06	50.000	5.423E4	07	100.000	5.216E4	08	200.000	5.371E4

Propionic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.94E4	02	2.000	5.909E4	03	5.000	6.128E4	04	10.000	5.86E4
05	20.000	5.703E4	06	50.000	5.9E4	07	100.000	5.508E4	08	200.000	5.726E4

Pyruvic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.100	4.637E5	02	0.200	4.71E5	03	0.500	4.552E5	04	1.000	4.481E5
05	2.000	4.25E5	06	5.000	4.588E5	07	10.000	4.43E5	08	20.000	4.585E5

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809393
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

		Calibration Evaluation				Calibration Evaluation	
Analyte Name	Compound Type	Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
Acetic Acid	TRG	Average RF	% RSD	3.8	≤	5.917E4	
Butanoic Acid (Butyric Acid)	TRG	Average RF	% RSD	10.6	≤	6.29E4	
Lactic Acid	TRG	Average RF	% RSD	4.6	≤	5.376E4	
Propionic Acid	TRG	Average RF	% RSD	7.3	≤	5.959E4	
Pyruvic Acid	TRG	Average RF	% RSD	3.1	≤	4.529E5	

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QA/QC Report

Client: ALS Environmental - US **Service Request:** R1809393
Project: LHAAP / Site 58 **Calibration Date:** 10/4/2018

Initial Calibration Verification Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114 **Signal ID:** synergi hydro rp
Instrument ID: R-HPLC-05

#	Lab Code	Sample Name	File Location	Acquisition Date
09	RC1800114-09	icv	I:\ACQUDATA\hplc05\data\100418\A0002375.D	10/04/2018 16:35

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
Pyruvic Acid	2.00	3.00	4.529E5	6.787E5	150*	85-115	Average RF
Acetic Acid	20.0	20.6	5.917E4	6.092E4	103	85-115	Average RF
Butanoic Acid (Butyric Acid)	20.0	18.1	6.29E4	5.694E4	90.5	85-115	Average RF
Lactic Acid	20.0	20.2	5.376E4	5.434E4	101	85-115	Average RF
Propionic Acid	20.0	19.2	5.959E4	5.733E4	96.0	85-115	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809393
Date Analyzed: 10/04/18 17:16

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\100418\A0002376.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 609639
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.11	4.529E5	4.608E5	1.7	NA	±15	Average RF
Acetic Acid	50.1	51.7	5.917E4	6.1E4	3.1	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	45.9	6.29E4	5.677E4	-9.7	NA	±15	Average RF
Lactic Acid	49.8	51.2	5.376E4	5.528E4	2.8	NA	±15	Average RF
Propionic Acid	50.3	49.3	5.959E4	5.839E4	-2.0	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809393
Date Analyzed: 10/04/18 23:40

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\100418\A0002387.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 609639
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.08	4.529E5	4.579E5	1.1	NA	±15	Average RF
Acetic Acid	50.1	52.3	5.917E4	6.17E4	4.3	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.7	6.29E4	5.78E4	-8.1	NA	±15	Average RF
Lactic Acid	49.8	51.3	5.376E4	5.543E4	3.1	NA	±15	Average RF
Propionic Acid	50.3	49.3	5.959E4	5.838E4	-2.0	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809393
Date Analyzed: 10/05/18 01:25

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\100418\A0002390.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 609639
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.66	4.529E5	4.201E5	-7.2	NA	±15	Average RF
Acetic Acid	50.1	49.8	5.917E4	5.88E4	-0.6	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.0	6.29E4	5.689E4	-9.6	NA	±15	Average RF
Lactic Acid	49.8	49.3	5.376E4	5.327E4	-0.9	NA	±15	Average RF
Propionic Acid	50.3	49.2	5.959E4	5.823E4	-2.3	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809393
Date Analyzed: 10/05/18 10:29

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\100518\A0002392.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 609806
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.01	4.529E5	4.514E5	-0.3	NA	±15	Average RF
Acetic Acid	50.1	51.2	5.917E4	6.044E4	2.2	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.7	6.29E4	5.78E4	-8.1	NA	±15	Average RF
Lactic Acid	49.8	50.2	5.376E4	5.429E4	1.0	NA	±15	Average RF
Propionic Acid	50.3	48.8	5.959E4	5.778E4	-3.0	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1809393
Date Analyzed: 10/05/18 15:09

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\100518\A0002400.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 609806
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.04	4.529E5	4.543E5	0.3	NA	±15	Average RF
Acetic Acid	50.1	50.8	5.917E4	6.004E4	1.5	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	46.5	6.29E4	5.757E4	-8.5	NA	±15	Average RF
Lactic Acid	49.8	50.5	5.376E4	5.46E4	1.6	NA	±15	Average RF
Propionic Acid	50.3	48.1	5.959E4	5.691E4	-4.5	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1809393
Project: LHAAP / Site 58

Analysis Run Log
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: **Analysis Lot:**609639
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\100418\A0002385.D\	ZZZZZZZ	ZZZZZZZ	12/29/2000	23:10:21	
I:\ACQUDATA\hplc05\data\100418\A0002379.D\	Duplicate Lab Control Sample	RQ1810603-06	12/29/2000	23:47:53	
I:\ACQUDATA\hplc05\data\100418\A0002384.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	16:48:23	
I:\ACQUDATA\hplc05\data\100418\A0002376.D\	Continuing Calibration Verification	RQ1810603-01	10/4/2018	17:16:44	
I:\ACQUDATA\hplc05\data\100418\A0002377.D\	Method Blank	RQ1810603-04	10/4/2018	17:51:39	
I:\ACQUDATA\hplc05\data\100418\A0002378.D\	Lab Control Sample	RQ1810603-05	10/4/2018	18:26:33	
I:\ACQUDATA\hplc05\data\100418\A0002379.D\	Duplicate Lab Control Sample	RQ1810603-06	10/4/2018	19:00:00	
I:\ACQUDATA\hplc05\data\100418\A0002383.D\	ZZZZZZZ	ZZZZZZZ	10/4/2018	21:21:05	
I:\ACQUDATA\hplc05\data\100418\A0002384.D\	ZZZZZZZ	ZZZZZZZ	10/4/2018	21:53:00	
I:\ACQUDATA\hplc05\data\100418\A0002385.D\	ZZZZZZZ	ZZZZZZZ	10/4/2018	22:25:00	
I:\ACQUDATA\hplc05\data\100418\A0002386.D\	35AWW24_092718	R1809393-001	10/4/2018	23:05:51	
I:\ACQUDATA\hplc05\data\100418\A0002387.D\	Continuing Calibration Verification	RQ1810603-02	10/4/2018	23:40:52	
I:\ACQUDATA\hplc05\data\100418\A0002388.D\	35AWW19_092718	R1809393-002	10/5/2018	00:15:52	
I:\ACQUDATA\hplc05\data\100418\A0002390.D\	Continuing Calibration Verification	RQ1810603-03	10/5/2018	01:25:46	

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1809393
Project: LHAAP / Site 58

Analysis Run Log
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids **Analysis Lot:**609806
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\100518 \A0002395.D\	Duplicate Lab Control Sample	RQ1810656-05	12/29/2000	23:18:07	
I:\ACQUDATA\hplc05\data\100518 \A0002399.D\	35AWW11_092718	R1809393-003	12/31/2000	02:47:48	
I:\ACQUDATA\hplc05\data\100518 \A0002392.D\	Continuing Calibration Verification	RQ1810656-01	10/5/2018	10:29:40	
I:\ACQUDATA\hplc05\data\100518 \A0002393.D\	Method Blank	RQ1810656-03	10/5/2018	11:04:39	
I:\ACQUDATA\hplc05\data\100518 \A0002394.D\	Lab Control Sample	RQ1810656-04	10/5/2018	11:39:38	
I:\ACQUDATA\hplc05\data\100518 \A0002395.D\	Duplicate Lab Control Sample	RQ1810656-05	10/5/2018	12:02:00	
I:\ACQUDATA\hplc05\data\100518 \A0002396.D\	ZZZZZZZ	ZZZZZZZ	10/5/2018	12:49:31	
I:\ACQUDATA\hplc05\data\100518 \A0002397.D\	ZZZZZZZ	ZZZZZZZ	10/5/2018	13:24:22	
I:\ACQUDATA\hplc05\data\100518 \A0002398.D\	ZZZZZZZ	ZZZZZZZ	10/5/2018	13:59:20	
I:\ACQUDATA\hplc05\data\100518 \A0002399.D\	35AWW11_092718	R1809393-003	10/5/2018	14:30:00	
I:\ACQUDATA\hplc05\data\100518 \A0002400.D\	Continuing Calibration Verification	RQ1810656-02	10/5/2018	15:09:20	

Analysis: 10/4/18 Analyst: BA Run Method: NEWMETA (BA)

Date: Organic Acids Instr. _HPLC-05_____ Quant Method: ~~MA0926.18~~ MA100418

LIMS Run#: 609639

Setup: Column: Synergi Hydro RP 150x46 Col.Temp: 35 Flow: 0.6 ml/min

Mobile Phase: 0.2 KH2 prep 0.1 PO4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	BLK			A0009365	—	
	INST BLK			66	Y	
	0.1-1.0 PPM	200 / 1 ml	193753	67	Y	
	0.2-2.0	400 /		68	Y	
	0.5-5.0	1000 /		69	Y	
	1.0-10.0	2000 /		70	Y	
	2.0-20.0	4000 /		71	Y	
	5.0-50.0	10000 /		72	Y	
	10.0-100.0	20000 /		73	Y	
	20.0-200.0	40000 /		74	Y	
	ICV	10000 /	193754	75	Y	Pyruvic out
	CCV	10000 / 1 ml	193753	76	YC	
	MET BLK			77	Y	
	LCS	10000 / 1 ml	193754	78	Y	Pyruvic out
	LCSD	"	"	79	Y	"
	R1809340-001			80	(N)	RPT 1/10
	-001	MS 10000 / 1 ml	193754	81		
	-001	MSD "	"	82	"	"
	-002			83	Y	
	-003			84	Y	
	-004			85	Y	
	R1809343-001			86	Y	
	CCV	10000 / 1 ml	193754	87	YC	
	-002			88	Y	
	-003			89	(N)	RPT 1/10
	CCV	10000 / 1 ml	193754	90	YC	

BJA 10/4/18

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:

Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

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Analysis: 10/5/18 Analyst: BA Run Method: NEWMETA
Date: Organic Acids Instr. HPLC-05 Quant Method: MA100418
LIMS Run#: 609806
Setup: Column: Synergi Hydro RP 150x4.6 Col.Temp: 35 Flow: 0.6 ml/min
Mobile Phase: 0.02 KH2PO4 prep 0.1 PO4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	BLK			A0002391	—	
	CCV	1000 ppm	193753	92	YC	
	MET BLK			93	Y	
	LCS	1000 ppm	193754	94	Y	PYRUVIC ↓
	DLCS	↓	↓	95	Y	↓
	R1809340-001	10.0		96	Y	
	-001	10.0mg	1000 ppm 193754	97	Y	
	-001	10.0mL50	↓ ↓	98	Y	
	R1809393-003			99	Y	
	CCV	1000 ppm	193753	2400	YC	

BD 10/5/18

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:
Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

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General Chemistry

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www.alsglobal.com

ALS Group USA, Corp.
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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 09:30
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW24_092718	**Basis:**	NA
Lab Code:	R1809393-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.31**	mg/L	0.10	0.08	0.03	1	09/28/18 16:10	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 10:35
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW19_092718	**Basis:**	NA
Lab Code:	R1809393-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**3.99**	mg/L	0.50	0.40	0.11	5	09/28/18 16:10	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1809393
Project:	LHAAP / Site 58	**Date Collected:**	09/27/18 11:50
Sample Matrix:	Water	**Date Received:**	09/28/18 09:00
Sample Name:	35AWW11_092718	**Basis:**	NA
Lab Code:	R1809393-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**36.5**	mg/L	5.0	4.0	1.1	50	09/28/18 16:10	*

Analytical Results Summary

Instrument Name: R-UV-VIS-05 **Analyst:** MROGERSON **Analysis Lot:** 609190 **Method/Testcode:** SM 3500-Fe B.4.c/Ferrous DOD

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1810496-01	Iron, Divalent (Ferrous Iron)	CCV		Water	2.00 mg/L	5 mL	2.00 mg/L	1					9/28/18 16:10	N	IV
RQ1810496-02	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			9/28/18 16:10	N	IV
RQ1810496-03	Iron, Divalent (Ferrous Iron)	LCS		Water	0.39 mg/L	5 mL	0.389 mg/L	1	0.03	0.10	97		9/28/18 16:10	N	IV
RQ1810496-04	Iron, Divalent (Ferrous Iron)	MB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.08	0.10			9/28/18 16:10:00	N	IV
R1809393-001	Iron, Divalent (Ferrous Iron)	N/A		Water	0.31 mg/L	5 mL	0.31 mg/L	1	0.03	0.10			9/28/18 16:10	N	IV
RQ1810496-07	Iron, Divalent (Ferrous Iron)	MS	R1809393-001	Water	0.81 mg/L	5 mL	0.81 mg/L	1	0.03	0.10	124		9/28/18 16:10	N	IV
RQ1810496-08	Iron, Divalent (Ferrous Iron)	DMS	R1809393-001	Water	0.81 mg/L	5 mL	0.81 mg/L	1	0.03	0.10	124	<1	9/28/18 16:10	N	IV
R1809393-002	Iron, Divalent (Ferrous Iron)	N/A		Water	3.99 mg/L	5 mL	3.99 mg/L	5	0.11	0.50			9/28/18 16:10	N	IV
R1809393-003	Iron, Divalent (Ferrous Iron)	N/A		Water	36.49 mg/L	5 mL	36.5 mg/L	50	1.1	5.0			9/28/18 16:10	N	IV
R1809387-001	Iron, Divalent (Ferrous Iron)	N/A		Water	0.08 mg/L	5 mL	0.08 mg/L J	1	0.03	0.10			9/28/18 16:10	N	II
R1809387-004	Iron, Divalent (Ferrous Iron)	N/A		Water	23.47 mg/L	5 mL	23.5 mg/L	10	0.3	1.0			9/28/18 16:10	N	II
RQ1810496-06	Iron, Divalent (Ferrous Iron)	CCV		Water	2.00 mg/L	5 mL	2.00 mg/L	1					9/28/18 16:10	N	II
RQ1810496-05	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			9/28/18 16:10	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

00944368

Sample Dilutions

Analyst: MMR
Instrument: UV-05

Date 9/28/18
Analysis Fe^{2+}

Sample ID	Matrix of Diluent	1st Dilution			2nd Dilution			3rd Dilution			4th Dilution			5th Dilution		
		mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor
R1809393-002	DI	2	8	1/5												
R1809393003	↓	2	8	1/5	1	9	1/50									
R1809387-004	↓	1	9	1/10												

MMR 10/2/18

Pippetor Calibration

ALS Environmental

Frequency:

Pipettes: 3 trials for both bias and precision DOD Projects - Daily before use at each volume of use, or if more than 3 volumes of use, a high, medium, and low. Non-DOD: Monthly at high, medium, and low.	**Calculations:** %Recovery = Mean/Nominal Volume*100 %RSD = Stdev/Volume*100
Repeaters, Dispensers, and Repipettors: 3 trials for both bias and precision If used for dilutions - Daily before use and each time the volume is changed. If not used for dilutions - monthly	**Limits:** % Rec: 98-102 for Pipettes and others for dilutions % Recovery: 90-110 (Repeaters, Dispensers, Repipettors not for dilutions) %RSD: ≤1 (Pipets); ≤3 (Repeaters, Dispensers, and Repipettors)

Use a balance and DI for all except Dispensers and Repipettors which contain reagents. For these, dispense into a To Contain Class A grad cylinder and document the Max Volume of the cylinder instead of the Balance ID. Record to 1/10 the graduation of the cylinder.

Date	Init.	Equipment ID	Volume (mL)	Trial #1 (g/mL)	Trial #2 (g/mL)	Trial #3 (g/mL)	Bias %Recovery	Pass/ Fail	Precision %RSD	Pass/ Fail	Recal? Y/N	Balance ID or Class A (TC)	Comments/ Corrective Action
9/26/18	GN	DAISY	0.0060	0.0602	0.0601	0.0602	100.2778	P	0.09625	P	N	R-10 ~~DOP~~	DOD
		THOR	0.3600	0.3608	0.3605	0.3606	100.1759	P	0.0424	P	N	GN	
		↓	0.2400	0.2403	0.2405	0.2407	100.2917	P	0.0833	P	N	9/26/18	
		↓	0.7500	0.7503	0.7505	0.7504	100.0533	P	0.0133	P	N		
		Frauly	1.5000	1.5003	1.5007	1.5006	100.0356	P	0.0133	P	N		
↓	↓	Nessy	6.0000	6.0015	6.0010	6.0011	100.0172	P	0.0096	P	N	↓	↓
9/28/18	MAR	Hawk	5.000	5.0220	5.0131	5.0078	100.286	P	0.143	P	N	R-10	DOD
↓	↓	Thor	1.000	1.0053	1.0021	1.0020	100.31	P	0.188	P	N	↑	Monthly / DOD
		↓	0.5000	0.5007	0.5004	0.5005	100.60	P	0.031	P	N		↓
↓	↓	↓	0.2000	0.1978	0.1980	0.1980	98.97	P	0.058	P	N	↓	

MAR 10/2/18

ALS ENVIRONMENTAL

Analyte: Ferrous Iron By Standard Methods Analyst: MAR Date: 9/28/18

Method: 3500-Fe,D Pipette: THOR Time: 16:10

Instrument: UV-1600PC (R-UV-VIS-05) DOD Pipet Check: WC178 P. 47 Balance: NA

Calibration:

Std	Conc.	Absorb.	Result	% Rec
1	0.00	0.000	-0.001	
2	0.10	0.010	0.097	96.6%
3	0.20	0.021	0.204	101.9%
4	0.30	0.031	0.301	100.4%
5	0.40	0.041	0.399	99.7%
6	0.80	0.081	0.788	98.5%
7	1.00	0.103	1.003	100.3%
8	2.00	0.207	2.016	100.8%
9	3.00	0.308	3.000	100.0%
10	4.00	0.410	3.994	99.8%

Curve Date: 7/16/2018
C.C = 0.999986
y-int. = 0.000084
Slope: 0.102641
Wavelength: 510nm

	Misc.	Order #	Absorb.	Color Blk, if nec.	Abs. Difference Sample - Color	mg/L	Dilution	Final Result (mg/L)/(mg/Kg)	Check if Soil
1	TV=2.0	ICV	0.202		0.202	1.9672	1.0	1.967	
2		ICB	0.000		0.000	-0.0008	1.0	-0.001	
3	TV=0.4	LCS	0.038		0.038	0.3694	1.0	0.369	
4		CCV	0.205		0.205	1.9964	1.0	1.996	
5		CCB	0.000		0.000	-0.0008	1.0	-0.001	
6		LCS	0.040		0.040	0.3889	1.0	0.389	
7		R1809393-001	0.032	0.005	0.032	0.3110	1.0	0.311	
8		R1809393-001 MS	0.083	0.005	0.083	0.8078	1.0	0.808	
9		R1809393-001 DMS	0.083	0.005	0.083	0.8078	1.0	0.808	
10		R1809393-002	0.082	0.001	0.082	0.7981	5.0	3.990	
11		R1809393-003	0.075	0.000	0.075	0.7299	50.0	36.494	
12		R1809387-001	0.008		0.008	0.0771	1.0	0.077	
13		R1809387-004	0.253	0.012	0.241	2.3472	10.0	23.472	
14		CCV	0.205		0.205	1.9964	1.0	1.996	
15		CCB	0.000		0.000	-0.0008	1.0	-0.001	

ALS Environmental
1565 Jefferson Rd., Rochester, NY 14623

General Chemistry Analytical Run Cover Sheet

Analyst: MAC Date: 8/28/18

Analysis: Ferrous Iron by Method 3500-Fe, D. Instrument: R-UV-VIS-05

Quality Control:

	Same as Log#, Date,	Stocks Prep. Log#, Date,	Stock Sol (mLs)	Stock Sol (mg/L)	Final Vol (mLs)	True Value (mg/L)
a) Standards Prep.:	WC126121A,11/25/13	WC149110A, 10/13/15				
b) ICV Preparation:	WC126121B,11/25/13	191837, 7/16/18	2.5	4.0	5	2.00
b2) CCV Preparation:	WC126121B, 11/25/14	191837, 7/16/18				
c) LCS Preparation:	WC126121C, 11/25/14	191836, 7/16/18	0.5	4.0	5	0.40
d) Matrix Spike Prep.:	WC126121C, 11/25/13	191836, 7/16/18	0.5	4.0	5	0.40

Instrument log filled in? (Y) (N)

Packages: Copy and attach Standards Preparation

Comments:

All standards, QC (CCV's, LCS's, Matrix Spikes) and samples are based on the Standard Methods 3500-Fe D. Phenanthroline Method being scaled down by a factor of 10. Hence, 1.0 mL of Ammonium acetate buffer and 2.0 mL of Phenanthroline solution are added to 5.0 mL of sample, standards, or QC and brought to 10.0 mL with DI water. True values are based on sample volumes of 5.0 mLs.

Color blank absorbance is not measured where the sample itself is clear or the sample absorbance is less than the PQL. Samples above the PQL do not have their color blank absorbance subtracted if it is less than the absorbance of the low standard (PQL).

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October 10, 2018

Analytical Report for Service Request No: K1809491

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS18091510

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 02, 2018
For your reference, these analyses have been assigned our service request number **K1809491.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

00944377

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: HS18091510
Sample Matrix: Ground Water

Service Request: K1809491
Date Received: 10/02/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Three ground water samples were received for analysis at ALS Environmental on 10/02/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 10/10/2018

00944379

Chain of Custody

ALS Environmental—Kelso Laboratory
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K1809491

00944380

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Subcontract Chain of Custody

COC ID: 9918

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18091510
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18091510-01**	**35AWW24_092718**	**Groundwater**	**27 Sep 2018 09:30**
	TOC Analysis for DOD Level IV			08 Oct 2018
2.	**HS18091510-02**	**35AWW19_092718**	**Groundwater**	**27 Sep 2018 10:35**
	TOC Analysis for DOD Level IV			08 Oct 2018
3.	**HS18091510-03**	**35AWW11_092718**	**Groundwater**	**27 Sep 2018 11:50**
	TOC Analysis for DOD Level IV			08 Oct 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/1/18 1800

Received By: _____ Date/Time: 10/2/18 0930

Cooler ID(s): _____ Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER

00944381

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request *K18* 09491

Received: 10/2/18 Opened: 10/2/18 By: CG Unloaded: 10/2/18 By: CG

1. Samples were received via? *USPS* (*FedEx*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-1.1	-1.2	-0.3	-0.4	-0.1	352		4380 9533 0727	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: RUSH

00944382

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1809491
Project:	HS18091510	**Date Collected:**	09/27/18
Sample Matrix:	Ground Water	**Date Received:**	10/2/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	Dil.	Date Analyzed	Q
HS18091510-01	K1809491-001	**0.87**	0.50	0.20	1	10/04/18 17:10	
HS18091510-02	K1809491-002	**2.21**	0.50	0.20	1	10/06/18 05:28	
HS18091510-03	K1809491-003	**1120**	25	10	50	10/06/18 06:32	
Method Blank	K1809491-MB1	ND U	0.50	0.20	1	10/04/18 20:55	
Method Blank	K1809491-MB2	ND U	0.50	0.20	1	10/05/18 15:51	
Method Blank	K1809491-MB3	ND U	0.50	0.20	1	10/06/18 01:28	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809491
Project	HS18091510	**Date Collected:**	09/27/18
Sample Matrix:	Ground Water	**Date Received:**	10/02/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary

Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
HS18091510-01	K1809491-001DUP	0.50	0.20	0.87	0.85	0.861	2	10	10/04/18
HS18091510-02	K1809491-002DUP2	0.50	0.20	2.21	2.14	2.18	3	10	10/06/18
HS18091510-03	K1809491-003DUP2	25	10	1120	1090	1110	3	10	10/06/18

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809491
Project:	HS18091510	**Date Collected:**	09/27/18
Sample Matrix:	Ground Water	**Date Received:**	10/02/18
		Date Analyzed:	10/4/18
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	HS18091510-01	**Units:**	mg/L
Lab Code:	K1809491-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1809491-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	0.87	26.4	25.0	102	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809491
Project:	HS18091510	**Date Analyzed:**	10/04/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	609436

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1809491-LCS1	20.8	21.9	95	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1809491
Project:	HS18091510	**Date Analyzed:**	10/05/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	609741

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1809491-LCS2	20.7	21.9	95	83-117
Lab Control Sample	K1809491-LCS3	20.2	21.9	92	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1809491
Project: HS18091510

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	609436	KQ1814370-23	10/04/18 10:29	25.0	24.3	97	90-110
CCV2	609436	KQ1814370-24	10/04/18 15:17	25.0	24.7	99	90-110
CCV3	609436	KQ1814370-25	10/04/18 20:22	25.0	24.4	98	90-110
CCV4	609436	KQ1814370-26	10/05/18 00:38	25.0	24.6	98	90-110
CCV5	609436	KQ1814370-27	10/05/18 05:10	25.0	24.0	96	90-110
CCV6	609741	KQ1814385-27	10/05/18 15:18	25.0	24.6	98	90-110
CCV7	609741	KQ1814385-28	10/05/18 19:21	25.0	24.8	99	90-110
CCV8	609741	KQ1814385-29	10/06/18 00:55	25.0	24.5	98	90-110
CCV9	609741	KQ1814385-30	10/06/18 05:59	25.0	25.2	101	90-110
CCV10	609741	KQ1814385-31	10/06/18 11:04	25.0	24.7	99	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1809491
Project: HS18091510

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	Result	Q
CCB1	609436	KQ1814370-28	10/04/18 10:45	0.50	0.20	ND	U
CCB2	609436	KQ1814370-29	10/04/18 15:34	0.50	0.20	ND	U
CCB3	609436	KQ1814370-30	10/04/18 20:38	0.50	0.20	ND	U
CCB4	609436	KQ1814370-31	10/05/18 00:55	0.50	0.20	ND	U
CCB5	609436	KQ1814370-32	10/05/18 05:26	0.50	0.20	ND	U
CCB6	609741	KQ1814385-32	10/05/18 15:35	0.50	0.20	ND	U
CCB7	609741	KQ1814385-33	10/05/18 19:37	0.50	0.20	ND	U
CCB8	609741	KQ1814385-34	10/06/18 01:12	0.50	0.20	ND	U
CCB9	609741	KQ1814385-35	10/06/18 06:16	0.50	0.20	ND	U
CCB10	609741	KQ1814385-36	10/06/18 11:20	0.50	0.20	ND	U

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Identifier: 125PI **Date Rec:** 09/28/2018 **Report Date:** 10/03/2018

Client Project #: NW01312.0150 **Client Project Name:** LHAAP-58

Purchase Order #:

Analysis Requested: CENSUS

Reviewed By:

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CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP-58

MI Project Number: **125PI**
Date Received: 09/28/2018

Sample Information

Client Sample ID:		**35AWW24_092718**	**35AWW19_092718**	**35AWW11_092718**
Sample Date:		09/27/2018	09/27/2018	09/27/2018
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	<5.00E-01	**8.00E-01**	**2.10E+00**
tceA Reductase	TCE	<5.00E-01	**1.00E-01 (J)**	<7.00E-01
BAV1 Vinyl Chloride Reductase	BVC	<5.00E-01	<5.00E-01	<7.00E-01
Vinyl Chloride Reductase	VCR	<5.00E-01	<5.00E-01	**1.10E+00**
Dehalobacter spp.	*DHBt*	**4.60E+00 (J)**	**1.48E+05**	**3.94E+05**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

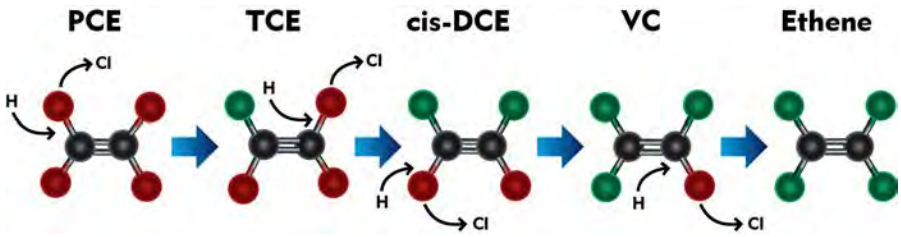
Samples Received **9/28/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	09/28/2018	10/03/2018	0 °C	101%	non-detect	non-detect
DHBt	09/28/2018	10/03/2018	0 °C	101%	non-detect	non-detect
BVC	09/28/2018	10/03/2018	0 °C	98%	non-detect	non-detect
TCE	09/28/2018	10/03/2018	0 °C	99%	non-detect	non-detect
VCR	09/28/2018	10/03/2018	0 °C	104%	non-detect	non-detect

DHC Interpretation

Dehalococcoides 16S rRNA gene (qDHC)

Under anaerobic conditions, tetrachloroethene (PCE) and trichloroethene (TCE) can undergo sequential reductive dechlorination through the daughter products *cis*-dichloroethene (*cis*-DCE) and vinyl chloride to nontoxic ethene (1,2).



While a number of bacterial cultures capable of utilizing PCE and TCE as growth supporting electron acceptors have been isolated (3-7), *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene (8). In fact, the presence of *Dehalococcoides* spp. has been associated with complete dechlorination to ethene at sites across North America and Europe (9).

Status	*Dehalococcoides spp.*	Observation
	≥ 10^4 (cells/mL)	Lu et al. proposed that a concentration of 1 x 10^4 DHC cells/mL could be used as a screening criterion to identify sites where reductive dechlorination will yield a generally useful biodegradation rate (10). Similarly, in an internal study conducted with nearly 1000 groundwater samples obtained from sites across the US, ethene production was observed in approximately 80% of samples in which CENSUS® qDHC results were greater than or equal to 10^4 DHC cells/mL.
	10^1 to < 10^4 (cells/mL)	When vinyl chloride reductase genes (See DHC functional genes discussion below) are also detected, complete reductive dechlorination of PCE and TCE to ethene may still occur even with moderate DHC concentrations. When the DHC population is below the 10^4 cells/mL criterion proposed by Lu et al. (10), project managers should carefully consider other site-specific data to determine whether subsurface conditions may be limiting reductive dechlorination. For example, the addition of an electron donor may be able to stimulate DHC growth and enhance anaerobic bioremediation.
	< 10^1 (cells/mL)	DHC concentrations are low suggesting that complete reductive dechlorination of PCE and TCE to ethene is unlikely to occur under existing conditions. Enhanced anaerobic bioremediation options (biostimulation or bioaugmentation) may need to be considered.

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DHC Interpretation

DHC Functional Genes (*tce*A, *bvc*A, *vcr*A)

A "stall" where daughter products *cis*-DCE and vinyl chloride accumulate can occur at PCE- and TCE-impacted sites especially under MNA conditions. The accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. Although elevated *Dehalococcoides* concentrations correspond to ethene production in numerous studies, the range of chlorinated ethenes metabolized and cometabolized varies among species and strains within the *Dehalococcoides* genus. For example, *Dehalococcoides ethenogenes* str. 195 metabolizes PCE, TCE, and *cis*-DCE and cometabolizes vinyl chloride (8) to produce ethene. Conversely, *Dehalococcoides* sp. CBDB1 utilizes PCE and TCE but does not cometabolize additional chloroethenes (11). Other *Dehalococcoides* strains, such as BAV1, GT and VS, are known to fully dechlorinate cis-DCE and VC to ethene (14,16,19). Quantification of reductive dehalogenase genes is used to more definitively confirm the potential for reductive dechlorination of TCE, cis-DCE, and vinyl chloride (12-15).

Functional Gene	Observation
TCE Reductase	
***tce*A gene**	The *tce*A gene encodes the enzyme responsible for reductive dechlorination of TCE to *cis*-DCE in some strains of *Dehalococcoides*. Absence of *tce*A does not preclude the potential for reductive dechlorination of TCE in the field since the *tce*A gene is not universally distributed among all DHC and is not present in other microorganisms capable of reductive dechlorination of TCE (e.g. *Dehalobacter*). Detection of the *tce*A gene provides an additional line of evidence indicating the potential for dechlorination of TCE.
Vinyl Chloride Reductase	
***bvc*A gene**	The *bvc*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of vinyl chloride to ethene by *Dehalococcoides* sp. str. BAV1 (16). Presence of *bvc*A gene indicates the potential for reductive dechlorination of VC to ethene. Absence of both *bvc*A and *vcr*A genes suggests VC may accumulate. An internal study with ~1,000 samples showed ethene production was observed in 80% of the samples that the DHC population was greater than or equal to 10^4 cells/mL. The *bvc*A gene was detected in over 50% of these samples. Van Der Zaan et al (17) noted that the bvcA gene was the only VC reductase gene detected at three of their sites. Alfred Spormann's laboratory at Stanford University (18) reported that the *bvc*A gene was the most abundant and active at the outflow of a PCE fed column study. This section of the column was in the DCE to VC stages of reductive dechlorination thus confirming the importance of the *bvc*A gene for complete reductive dechlorination.
***vcr*A gene**	The *vcr*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of *cis*-DCE and vinyl chloride by *Dehalococcoides* sp. strain VS (14). Presence of *vcr*A gene indicates the potential for reductive dechlorination of DCE and/or VC to ethene. Absence of both *bvc*A and *vcr*A genes suggest VC may accumulate. As with the *bvc*A gene, detection of the *vcr*A gene is associated with ethene production in internal studies (67%) and vinyl chloride reduction in independent studies (14, 17).

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DHC Interpretation

Reporting

Microbial Insights can provide a variety of data packages and reporting levels to suit the needs of any project. Data packages range from simple analytical reports with results only to more complex data packages that include a report narrative, analytical results, QC data, and supporting materials including all raw data and chain-of-custody documentation. The figure below shows our standard report and explains the way values are reported.

Microbial Insights, Inc.

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CENSUS

Client: Company Name
Project: Your Project Name

MI Project Number: Unique Laboratory Identifier
Date Received: Date Samples Arrived

Sample Information

Client Sample ID:		Sample A	Sample B	Sample C
Sample Date:		00/00/0000	00/00/0000	00/00/0000
Units:		cells/mL	cells/mL	cells/mL
Analyst:		Intials	Intials	Intials
Dechlorinating Bacteria				
Dehalococcoides spp.	DHC	**1.84E+05**	**2.76E+02**	**2.28E+01 (J)**
Functional Genes				
tceA Reductase	TCE	**6.00E+01**	**3.23E+01**	<4.00E-01
bvcA Reductase	BVC	**1.17E+04**	**1.81E+01**	<4.00E-01
vcrA Reducatase	VCR	**8.42E+04**	**1.74E+02**	<4.00E-01

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

"J" value
Result is an estimated value. This data qualifier (flag) is used when the target gene is detected but at a concentration or abundance below the practical quantification limit (PQL).

< value
The target gene was not detected at the limit of quantitation (LOQ) reported for that sample.

"I" value
QA Procedure indicated that the sample may have exhibited PCR inhibition. Although relatively rare, PCR inhibition can occur due to the presence of metals or humic acids at high concentrations in the sample.

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Quality Assurance

Microbial Insights' comprehensive Quality Assurance (QA) Program is the foundation of all laboratory analyses, ensuring that our clients receive high-quality analytical services that are timely, reliable, and meet their intended purpose in a cost effective manner. MI is committed to providing quality data that surpasses regulatory and industry standards, thus enabling the client to make well-informed decisions. MI maintains strict standard operating procedures and QA/QC measures throughout all of the analyses offered. The following Table details specific QA/QC procedures that are used for CENSUS.

QA/QC	Description
Date of Extraction	DNA and RNA extractions are performed the day the samples are received by MI to minimize the possibility of any changes to the microbial community prior to analysis.
Laboratory Method Blanks	An extraction blank (no sample added) is processed alongside each set of field samples from DNA extraction through CENSUS® analysis to ensure that cross contamination has not occurred. Although MI has never experienced this issue, the detection of the CENSUS® target (e.g. *Dehalococcoides*) in an extraction blank is direct evidence of cross contamination with a sample or contamination of a reagent and would invalidate the results. If this were to occur, MI would re-extract the sample. If not possible to re-extract, MI would contact the client immediately and notate it on the laboratory report.
Laboratory Control Samples (LCS)	A laboratory control sample (LCS) or positive control (target DNA) is included with each CENSUS® plate to confirm amplification and as a continuing calibration check.
Negative Controls	A negative control (no DNA) is included with each CENSUS plate to ensure that cross contamination has not occurred during amplification. As with the extraction blank, detection of CENSUS target (e.g. DHC) in a negative control is direct evidence of contamination and would invalidate the results. If this were to occur, MI would rerun the analysis.

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Project Manager: Kim Nemmers
Project Name: LHAAP-58
Project No.: NW01312.0150

Purchase Order No.
Subcontract No.
MI Quote No.

Please Check One:
☐ More samples to follow
☒ No Additional Samples

Report Type: ☐ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (30%)

EDD type: ☐ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information					Analyses					CENSUS: Please select the target organism/gene																							
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vc)	DHBt (Dehalobacter)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirK)	AOB (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
125PI1	35AWW24_092718	9/27/18	0430								X	X																					
2	35AWW19_092718	9/27/18	1035								X	X																					
3	35AWW11_092718	9/27/18	1150								X	X																					

Relinquished by: Scott Beesley 9/27/18 1400
Received by: [signature] Date 9/28/18 10:44

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

How to Retrieve and Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database

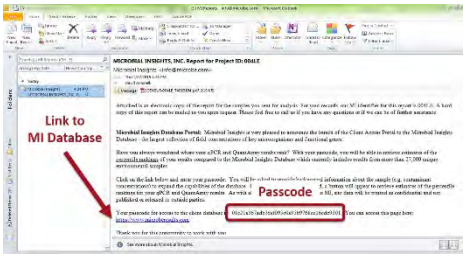
The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 40,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide.

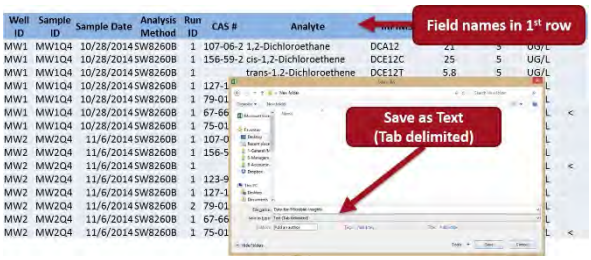
Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. The estimated percentile ranks retrieved from the MI Database answer the question "Is that low, medium or high?" by comparing your results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Retrieving Estimated Percentile Ranks

With your report, you were emailed a passcode and link enabling you to login to the Client Portal. Just enter basic information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations and you can retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge.





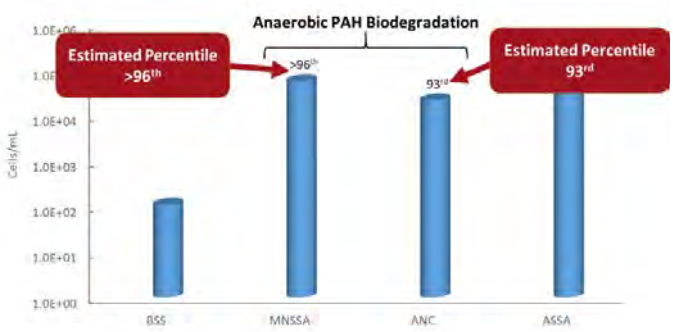
All site specific data will be treated as confidential and uploading is easy.

You can even upload chemical and geochemical data from EDDs. Just save as a Tab Delimited text file.

Example - Using Estimated Percentile for MNA Assessment at an MGP Site

CENSUS® qPCR was performed to quantify anaerobic naphthalene carboxylase (ANC) and naphthyl-2-methylsuccinate synthase (MNSSA) to assess anaerobic biodegradation of naphthalene and methyl-naphthalene under existing site conditions.

- Not only were ANC and MNSSA genes detected, but these functional genes responsible for anaerobic biodegradation of PAHs were present at concentrations "far better than average" based on the estimated percentile ranks.
- Demonstrating high concentrations of ANC and MNSSA gave an additional line of evidence indicating growth substantial populations of anaerobic PAH degraders and suggested a greater probability that monitored natural attenuation (MNA) will be successful.



How to Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database and Client Portal

The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 32,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide. Driven by field samples, the database reflects the impacts of common contaminants, geochemical conditions, and site management practices on critical microbial populations.

With your report, you received a passcode enabling you to retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge. When accessing the database, you will be asked to provide background information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations. As with all client information provided to MI, site specific data will be treated as confidential.

Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. Simply put, qPCR and QuantArray results demonstrating high concentrations of target microorganisms or functional genes suggest in situ selection, enrichment and growth of those specific contaminant degraders and therefore a greater probability that monitored natural attenuation (MNA) or bioremediation will be successful.

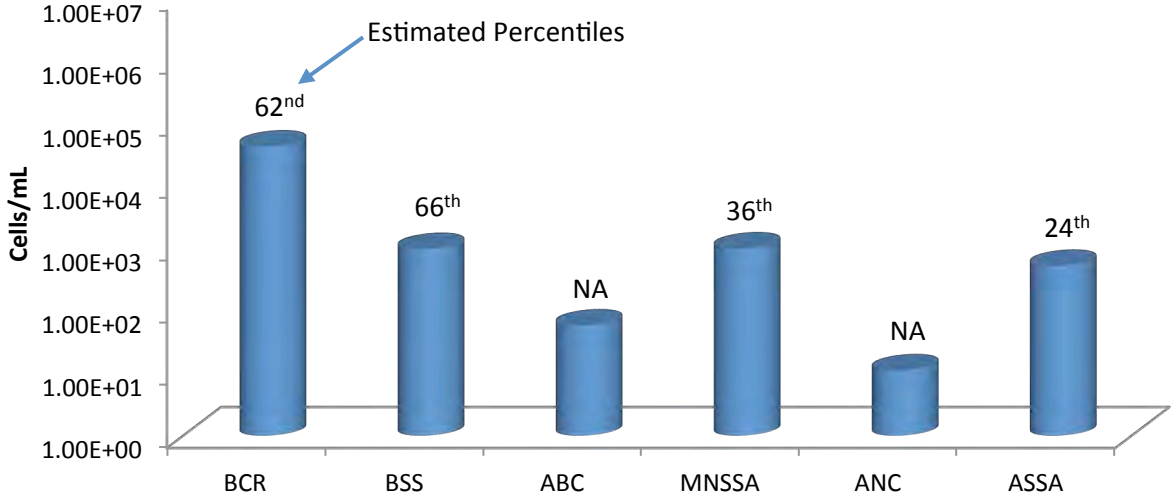
Is that a low, medium, or high concentration? The estimated percentile ranks retrieved from the MI Database answer that question by comparing your qPCR and QuantArray results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Using the Estimated Percentile - Interpretation Examples

MNA Assessment – Petroleum Hydrocarbon Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between samples obtained from background and impacted wells. The estimated percentile ranks however provide an additional avenue for comparison and evaluation of treatment options as shown below.

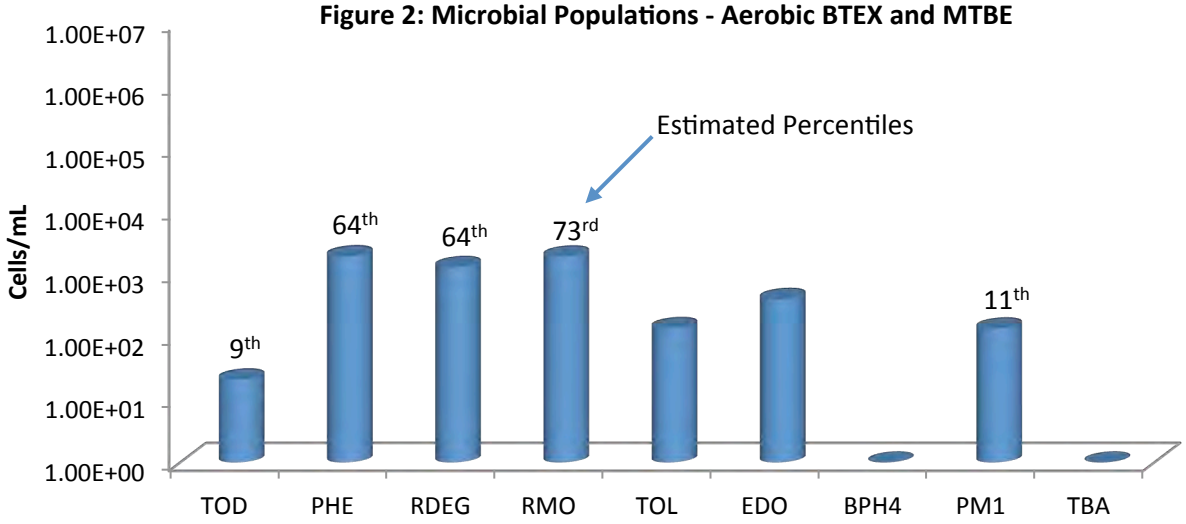
Figure 1: Microbial Populations - Anaerobic BTEX and PAHs



Anaerobic BTEX and PAH Biodegradation (Figure 1):

- With moderate concentrations of functional genes involved in anaerobic BTEX metabolism detected, the QuantArray-Petro® results were encouraging in terms of evaluating biodegradation potential under existing site conditions.
- More specifically, benzylsuccinate synthase (BSS) was detected on the order of nearly 10^3 cells/mL indicating the presence of a substantial population (66^{th} percentile) capable of anaerobic biodegradation of toluene and other alkyl substituted benzenes.
- Naphthyl-2-methylsuccinate synthase (MNSSA) and alkylsuccinate synthase (ASSA) genes were also detected indicating the potential for anaerobic biodegradation of 2-methylnaphthalene and normal alkanes.
- The concentration of MNSSA genes would be considered modest with an estimated percentile of 36^{th}.
- While the percentile rank for MNSSA would be "below average", a number of additional factors should be considered.
    - First, anaerobic hydrocarbon degraders are less prevalent than aerobic BTEX degraders and overall detection frequencies for many genes involved in anaerobic hydrocarbon biodegradation are less than 50%.
    - Therefore, the detection of genes like BSS, MNSSA, ASSA, anaerobic benzene carboxylase (ABC), and anaerobic naphthalene carboxylase (ANC) even at low concentrations is certainly noteworthy and inherently "better than average".
    - The estimated percentiles for all assays are based only on samples where the concentration of the target gene was greater than the practical quantitation limit (PQL).
    - For less commonly detected targets like many of the genes involved in anaerobic hydrocarbon biodegradation this is an especially important consideration.
    - Excluding samples where a gene target is below the PQL ensured that the median concentrations of less commonly detected targets would not be unduly biased low by the fact that the gene is not detected in most samples.
- Anaerobic benzene carboxylase (ABC) and naphthalene carboxylase (ANC) genes were also detected indicating the presence of bacterial populations capable of anaerobic biodegradation of benzene and naphthalene.
- For newly identified genes like ABC and ANC, estimated percentile ranks are not yet available due to the limited number of field samples that have been analyzed to date.
- However, like MNSSA and other genes involved in anaerobic hydrocarbon biodegradation, ABC and ANC detection frequencies are relatively low so the detection of these genes even at low concentrations should be considered when evaluating biodegradation potential under existing site conditions.

Figure 2: Microbial Populations - Aerobic BTEX and MTBE



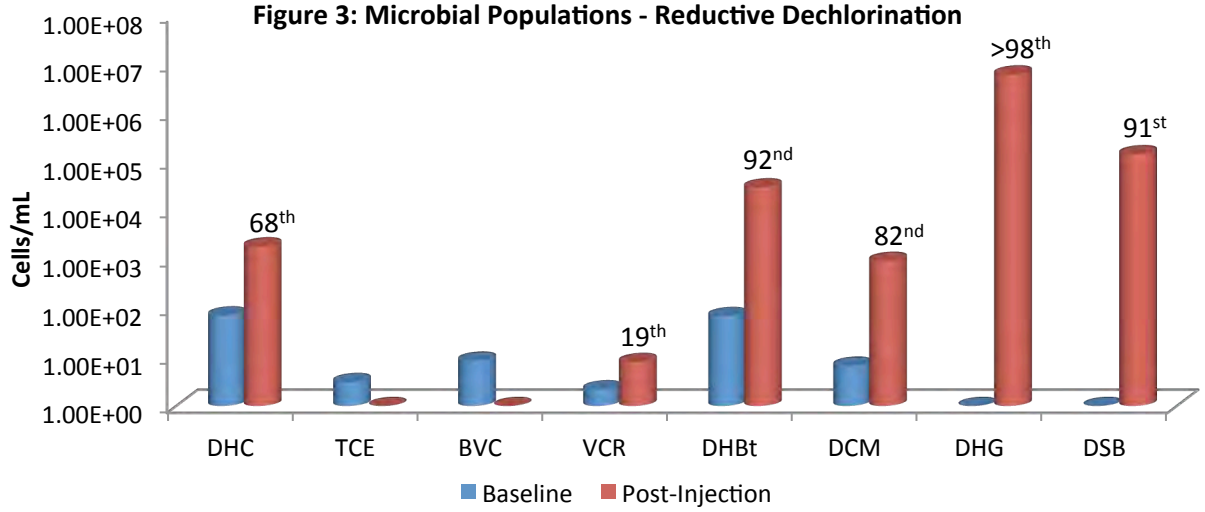
Aerobic BTEX and MTBE Biodegradation (Figure 2):

- With growing evidence that aromatic oxygenases function at low dissolved oxygen concentrations, aerobic BTEX biodegradation pathways should also be evaluated when considering MNA.
- Again, the QuantArray-Petro results were encouraging – genes encoding the first step in multiple pathways for aerobic BTEX biodegradation were detected indicating the presence of a diverse population of aerobic BTEX degraders.
- However, aerobic BTEX degraders are often considered ubiquitous. Therefore answering the question "Is that low, medium or high?" becomes especially important when evaluating aerobic BTEX biodegradation at petroleum hydrocarbon sites.
- In this case, the estimated percentile ranks of the concentrations of toluene/benzene monooxygenase (RMO and RDEG) and phenol hydroxylase (PHE) genes ranged from the 64th to 73rd percentile.
- In other words, the concentrations of RMO, RDEG, and PHE detected in this groundwater sample were greater than the concentrations detected in 64% to 73% of all other groundwater samples where these genes were analyzed and detected above the PQL.
- Aerobic BTEX degraders are common in the environment, but in this sample concentrations of toluene/benzene monooxygenase genes could be viewed as "better than average" when compared to the MI Database.

Biostimulation – Chlorinated Solvent Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between baseline and post-injection monitoring events as shown below (Figure 3). The estimated percentile ranks however provide an additional avenue for comparison and evaluation of remedy performance.

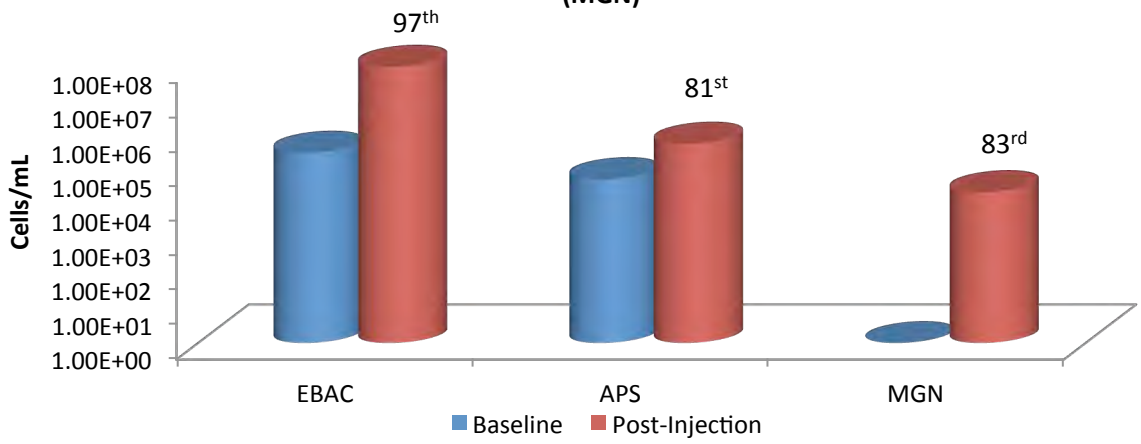
Figure 3: Microbial Populations - Reductive Dechlorination



- During the baseline groundwater sampling event, *Dehalococcoides* and vinyl chloride reductase genes were detected indicating the potential for complete reductive dechlorination of PCE and TCE to ethene.
- However, the *Dehalococcoides* concentration was well below the 10^4 cells/mL recommended by Lu et al. (2006) for generally effective rates of reductive dechlorination.
- Based on qPCR results as well as traditional groundwater monitoring, biostimulation with electron donor addition was selected as the site management plan.
- By the first monitoring event after injection, populations of halorespiring bacteria had increased substantially in response to electron donor addition.
    - *Dehalobacter* populations increased by more than two orders of magnitude to post-injection concentrations greater than 10^4 cells/mL (92^{nd} percentile).
    - *Dehalogenimonas* (10^6 cells/mL) and *Desulfitobacterium* (10^5 cells/mL) which had not been detected prior electron donor addition were present at concentrations greater than observed in over 90% of other groundwater samples where these halorespiring bacteria were detected.
- After injection, *Dehalococcoides* populations increased by more than an order of magnitude to a concentration of over 10^3 cells/mL (68^{th} percentile) demonstrating growth of this key group of halorespiring bacteria.
- Despite a substantial increase and a "better than average" concentration, the *Dehalococcoides* population was still below the 10^4 cells/mL threshold and vinyl chloride reductase gene copies were low (19^{th} percentile).
    - In terms of electron donors and acceptors, the metabolic capabilities of *Dehalococcoides* are rather specialized (hydrogen utilizing obligate halorespiring bacteria) so the median concentration is low. With a low median concentration across the database, a "better than average" *Dehalococcoides* concentration in a given sample may not exceed the 10^4 cells/mL threshold established for effective reductive dechlorination (Lu et al. 2006) and ethene production (Microbial Insights, unpublished data).

- In this case, the initial growth of *Dehalococcoides* was substantial but may have been somewhat hindered by competition with sulfate reducing bacteria (Figure 4 below).
    - The baseline population of sulfate reducing bacteria was moderate (10^4 cells/mL; 63rd percentile). Consistent with an observed decreased in dissolved sulfate concentrations, populations of sulfate reducing bacteria increased and were detected at a relatively high concentration (81st percentile) after electron donor addition.
    - After injection, methanogen populations also increased to a relatively high concentration (83rd percentile) suggesting generation of methanogenic conditions.
- With sulfate depletion and generation of highly anaerobic conditions more conducive to reductive dechlorination, *Dehalococcoides* populations may continue to increase and exceed the 10^4 *Dehalococcoides* cells/mL threshold in subsequent monitoring events.
- Overall, QuantArray analysis conclusively demonstrated that electron donor addition stimulated growth of halorespiring bacteria with the estimated percentiles retrieved from the MI Database providing the "low, medium or high" perspective to the observed changes in microbial populations.

Figure 4: Total Bacteria (EBAC), Sulfate Reducering Bacteria (APS) and Methanogens (MGN)



References

Lu, X., J.T. Wilson, and D.H. Kampbell. 2006. Relationship between *Dehalococcoides* DNA in ground water and rates of reductive dechlorination at field scale. *Water Research* 40 no. 16: 3131-3140.

QUARTERLY CONTROL SUMMARY REPORT
LHAAP-58 DECEMBER 2018
SEMI-ANNUAL SAMPLING EVENT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

February 2019

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

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1 INTRODUCTION

Bhate reviewed five data packages from ALS Environmental, Houston, Texas with the analyses for ferrous iron and volatile fatty acids subcontracted to ALS Rochester, NY; and the analyses of dissolved gases to ALS Simi Valley, CA. The dechlorinating bacteria analysis was subcontracted to Microbial Insights in Knoxville, TN. Groundwater samples were collected on December 10-17, 2018, from Site LHAAP-58 at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [United States Environmental Protection Agency] *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the *Final Basewide Uniform Federal Policy (UFP) – Quality Assurance Project Plan (QAPP) Longhorn Army Ammunition Plant* (Bhate, May 2018).

1.1 Intended Use of Data

The objective of sampling at LHAAP-58 in December 2018 was to complete a semi-annual groundwater sampling event.

Analyses performed include:

- SM2320B – Alkalinity
- E365.3 – Phosphorus
- RSK175 – Dissolved Gases
- E415.1/SM5310C – Total Organic Carbon
- SW8260C – Volatile Organic Compounds (VOCs)
- SM3500-Fe - Ferrous Iron
- SW6020A – Total and Dissolved Metals (Iron and Manganese) and Total Arsenic
- SW9056A – Anions (chloride, nitrate, nitrite, and sulfate)
- E376.1 – Sulfide
- High Performance Liquid Chromatography (HPLC)-METACIDS – Volatile Fatty Acids (VFAs)
- CENSUS – Dechlorinating Bacteria (dehalococcoides [DHC]/dehalobacter [DHB])

Table 1 lists the sample identification (ID) numbers and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample ID data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time with the following exception.

- The analysis for ferrous iron was outside the requisite 24-hour hold time and all results were qualified as estimated, "J".

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range.

1.3.1 Continuing Calibration Verifications

The calibrations must meet the following criteria otherwise the compound is qualified J or UJ: The continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and 50% for closing CCVs. Metals and general chemistry - 10%D; VFAs, dissolved gases, and TOC - 15%D.

The CCV for 4-methyl-2-pentanone; cis-1,3-dichloropropene; 2-hexanone; and bromomethane were outside control limits associated with samples 35AWW19_121018, 35AWW20_121018, 35AWW23_121018, 35AWW24_121018, and LHSMW07_121018. These compound were considered estimated and flagged as "J/UJ".

1.4 Blanks

If the analyte result for an associated sample was less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, that result was qualified "UB" and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5X the amount in the blank, no qualifier was applied.

The trip blank for samples in package HS18120913 reported a low level detection of acetone. Sample 35AWW12_121418 reported an acetone detection < 10X the blank concentration and was qualified as "UB".

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

No surrogates were reported outside control limits.

1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD recoveries were evaluated using limits defined in the project-specific QAPP Worksheet 15.

All sample recoveries were within control limits.

1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)

MS/MSD recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4X the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data.

No qualification was necessary based on MS/MSD recoveries.

1.8 Internal Standards

If the percent recovery (%R) for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

1.9 Field Precision

Precision is the measure of variability of individual sample measurements. Evaluation of field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater matrices.

1.9.1 SW6020

The RPD, between 35AWW10_121218 and its duplicate, was exceeded for dissolved and total iron. These compounds were qualified as estimated, “J”, in both sample and duplicate.

2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (see Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package/ID	SM2320B	E365.3	SM/5310C E415.1	SW6020A	SW8260C	HPLC-METACIDS	SW9056A	RSK-175	SM3500Fe	E376.1	CENSUS	Arsenic (As) 6020A
03WW01_121218	HS18120736	X	X	X	X	X	X	X	X	X	X	X	
35ASW03_121718	HS18121030					X							
35AWW01_121318	HS18120913					X							X
35AWW05_121218	HS18120736					X							
35AWW06_121118	HS18120642	X	X	X	X	X	X	X	X	X	X	X	
35AWW08_121218	HS18120736	X	X	X	X	X	X	X	X	X	X	X	X
35AWW09_121118	HS18120642 HS18120736 (As)	X	X	X	X	X	X	X	X	X	X	X	X
35AWW10_121218	HS18120736	X	X	X	X	X	X	X	X	X	X	X	
35AWW10_121218_a	HS18120736	X	X	X	X	X	X	X	X	X	X		
35AWW11_121118	HS18120642	X	X	X	X	X	X	X	X	X	X	X	
35AWW12_121418	HS18120913					X							
35AWW13_121118	HS18120642					X							
35AWW14_121318	HS18120913					X							
35AWW15_121218	HS18120736					X							
35AWW16_121218	HS18120736					X							
35AWW17_121718	HS18121030					X							
35AWW18_121718	HS18121030					X							
35AWW18_121718_a	HS18121030					X							
35AWW19_121018	HS18120569	X	X	X	X	X	X	X	X	X	X	X	
35AWW20_121018	HS18120569	X	X	X	X	X	X	X	X	X	X	X	
34AWW21_121318	HS18120913					X							
35AWW22_121418	HS18120913					X							
35AWW23_121018	HS18120569	X	X	X	X	X	X	X	X	X	X	X	
35AWW24_121018	HS18120569	X	X	X	X	X	X	X	X	X	X	X	
LHSMW06_121318	HS18120913					X							X
LHSMW06_121318_a	HS18120913					X							X
LHSMW07_121018	HS18120569	X	X	X	X	X	X	X	X	X	X	X	

Notes:
MW – Monitoring Well
SM – Standard Method
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.
E – USEPA Method
HS - Houston

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier*	Reason for Qualification
35AWW10_121218	HS18120736	Dissolved Iron Total Iron Ferrous Iron	0.332 J 0.340 J 0.09 J	Dup RPD Dup RPD HT
35AWW10_121218_a	HS18120736	Dissolved Iron Total Iron Ferrous Iron	0.227 J 0.166 J 0.07 J	Dup RPD Dup RPD HT
35AWW12_121418	HS18120913	Acetone	3.2 UB	TB
03WW01_121218	HS18120736	Ferrous Iron	27.5 J	HT
35AWW06_121118	HS18120642	Ferrous Iron	88.1 J	HT
35AWW08_121218	HS18120642	Ferrous Iron	21 J	HT
35AWW09_121118	HS18120642	Ferrous Iron	0.13 J	HT
35AWW11_121118	HS18120642	Ferrous Iron	20.6 J	HT

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier*	Reason for Qualification
35AWW19_121018	HS18120569	Ferrous Iron	4.19 J	HT
		2-Hexanone	< 1.0 UJ	CCV
		4-Methyl-2-pentanone	< 1.0 UJ	CCV
		Bromomethane	< 0.5 UJ	CCV
		cis-1,3-Dichloropropene	< 0.5 UJ	CCV
35AWW20_121018	HS18120569	Ferrous Iron	5.01 J	HT
		2-Hexanone	< 1.0 UJ	CCV
		4-Methyl-2-pentanone	< 1.0 UJ	CCV
		Bromomethane	< 0.5 UJ	CCV
		cis-1,3-Dichloropropene	< 0.5 UJ	CCV
35AWW23_121018	HS18120569	Ferrous Iron	50 J	HT
		2-Hexanone	6.0 J	CCV
		4-Methyl-2-pentanone	3.9 J	CCV
		Bromomethane	< 0.5 UJ	CCV
		cis-1,3-Dichloropropene	3.3 J	CCV
35AWW24_121018	HS18120569	Ferrous Iron	0.54 J	HT
		2-Hexanone	< 1.0 UJ	CCV
		4-Methyl-2-pentanone	< 1.0 UJ	CCV
		Bromomethane	< 0.5 UJ	CCV
		cis-1,3-Dichloropropene	< 0.5 UJ	CCV
LHSMW07_121018	HS18120569	Ferrous Iron	0.43 J	HT
		2-Hexanone	< 1.0 UJ	CCV
		4-Methyl-2-pentanone	< 1.0 UJ	CCV
		Bromomethane	< 0.5 UJ	CCV
		cis-1,3-Dichloropropene	< 0.5 UJ	CCV

Notes:
J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ – The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
UB – Considered an artifact of blank contamination
TB – Trip Blank
Dup RPD – the relative percent difference between sample and duplicate was outside control limits
HT – exceeded recommended hold time
CCV – continuing calibration verification outside control limits
*Iron in milligrams per liter (mg/L), Volatiles in micrograms per liter (µg/L)

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
SM2320B	0	100
E365.3	0	100
E415.1	0	100
SW6020A	0	100
SW8260C	0	100
HPLC-METACIDS	0	100
SW9056A	0	100
RSK-175	0	100
SM3500Fe	0	100
E376.1	0	100
CENSUS	0	100

HS18120569 Cover Page

ALS WO# HS18120569

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Form 4 - ICPMS05_329812 ICSA
Form 5A - ICPMS04_329719 MS
Form 5B - ICPMS04_329719 PDS
Form 7 - ICPMS04_329719 LCS
Form 8 - ICPMS04_329719 SD
HS18120569 Wet Chem Raw Data

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WorkOrder: HS18120569

LHAAP-58

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

28-Jan-2019

HS18120569 LHAAP58 Final

ALS WO# HS18120569

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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January 04, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS18120569**

Laboratory Results for: **LHAAP-58**

Dear Marcia,

ALS Environmental received 6 sample(s) on Dec 11, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18120569

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18120569-01	35AWW20_121018	Groundwater		10-Dec-2018 09:10	11-Dec-2018 10:12	☐
HS18120569-02	35AWW24_121018	Groundwater		10-Dec-2018 10:15	11-Dec-2018 10:12	☐
HS18120569-03	35AWW19_121018	Groundwater		10-Dec-2018 11:15	11-Dec-2018 10:12	☐
HS18120569-04	35AWW23_121018	Groundwater		10-Dec-2018 12:30	11-Dec-2018 10:12	☐
HS18120569-05	LHSMW07_121018	Groundwater		10-Dec-2018 13:30	11-Dec-2018 10:12	☐
HS18120569-06	Trip Blank	Water		10-Dec-2018 00:00	11-Dec-2018 10:12	☐

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18120569

CASE NARRATIVE

Work Order Comments

- The analyses for RSK-175 Dissolved Gases and CO2 were subcontracted to ALS Environmental in Simi Valley, CA. Final Report attached.

  The analyses for Ferrous Iron and Volatile Fatty Acids were subcontracted to ALS Environmental in Rochester, NY. Final Report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

  The analyses for DHC/DHB were subcontracted to Microbial Insights in Knoxville, TN. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R329600

Sample ID: CCV_END

- Bromomethane outside recovery limits on closing CCV due to foamy sample run before closing CCV.

Sample ID: HS18120734-01MS

- MS and MSD are for an unrelated sample.

Sample ID: VLCSW-1812019

- Hexachlorobutadiene exceeded QC limits for LCS. CCV passed and associated samples are non-detect for this compound.

Sample ID: VSTD050

- 4-Methyl-2-Pentanone, cis-1,3-Dichloropropene and 2-Hexanone exceeded %D limits for CCV, associated samples are non-detect.

Metals by Method SW6020

Batch ID: 135804

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: 135805

Sample ID: HS18120927-08MS

- MS and MSD are for an unrelated sample.

WetChemistry by Method SW9056

Batch ID: R329899

Sample ID: 35AWW19_121018 (HS18120569-03)

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrogen, Nitrate (As N),Nitrogen, Nitrite (As N))

Sample ID: HS18120545-04MS

- MS and MSD are for an unrelated sample (Sulfate).

Batch ID: R329896

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18120569

CASE NARRATIVE

WetChemistry by Method E376.1

Batch ID: R329956

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R329695

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: 135598

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_121018
Collection Date: 10-Dec-2018 09:10

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,1,2-Trichloroethane	**88**		**0.30**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
1,1-Dichloroethane	**690**		**5.0**	**12**	**25**	**UG/L**	25	19-Dec-2018 23:17
1,1-Dichloroethene	**2,700**		**5.0**	**12**	**25**	**UG/L**	25	19-Dec-2018 23:17
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,2-Dichlorobenzene	**20**		**0.50**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
1,2-Dichloroethane	**26**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,3-Dichlorobenzene	**0.99**	J	**0.40**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
1,4-Dichlorobenzene	**3.5**		**0.40**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 23:42
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2018 23:42
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 23:42
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2018 23:42
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	19-Dec-2018 23:42
Benzene	**9.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2018 23:42
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_121018
Collection Date: 10-Dec-2018 09:10

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
cis-1,2-Dichloroethene	**120**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	19-Dec-2018 23:42
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 23:42
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	19-Dec-2018 23:42
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 23:42
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Tetrachloroethene	**1.3**		**0.30**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
trans-1,2-Dichloroethene	**6.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Trichloroethene	**570**		**5.0**	**12**	**25**	**UG/L**	25	19-Dec-2018 23:17
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 23:42
Vinyl chloride	**110**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 23:42
Surr: 1,2-Dichloroethane-d4	*92.7*			**0**	*81-118*	*%REC*	*25*	*19-Dec-2018 23:17*
Surr: 1,2-Dichloroethane-d4	*91.7*			**0**	*81-118*	*%REC*	*1*	*19-Dec-2018 23:42*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*85-114*	*%REC*	*25*	*19-Dec-2018 23:17*
Surr: 4-Bromofluorobenzene	*99.2*			**0**	*85-114*	*%REC*	*1*	*19-Dec-2018 23:42*
Surr: Dibromofluoromethane	*91.5*			**0**	*80-119*	*%REC*	*25*	*19-Dec-2018 23:17*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*1*	*19-Dec-2018 23:42*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*25*	*19-Dec-2018 23:17*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*19-Dec-2018 23:42*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**5.32**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:12
Manganese	**6.19**		**0.0350**	**0.0500**	**0.250**	**mg/L**	50	24-Dec-2018 13:26
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**4.93**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:28
Manganese	**5.32**		**0.0350**	**0.0500**	**0.250**	**mg/L**	50	24-Dec-2018 13:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_121018
Collection Date: 10-Dec-2018 09:10

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.101**		**0.0200**	**0.0400**	**0.0500**	**mg/L**	1	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	**21.4**		**1.00**	**1.00**	**1.00**	**mg/L**	1	17-Dec-2018 16:30
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,190**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 21:13
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,010**		**10.0**	**25.0**	**25.0**	**mg/L**	50	24-Dec-2018 19:34
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 21:52
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 21:52
Sulfate	**1,010**		**10.0**	**25.0**	**25.0**	**mg/L**	50	24-Dec-2018 19:34
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	18-Dec-2018 14:50
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2019 09:43
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_121018
Collection Date: 10-Dec-2018 10:15

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 21:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2018 21:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2018 21:13
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	19-Dec-2018 21:13
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2018 21:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_121018
Collection Date: 10-Dec-2018 10:15

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	19-Dec-2018 21:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 21:13
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	19-Dec-2018 21:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:13
Surr: 1,2-Dichloroethane-d4	*93.1*			**0**	*81-118*	*%REC*	*1*	*19-Dec-2018 21:13*
Surr: 4-Bromofluorobenzene	*97.8*			**0**	*85-114*	*%REC*	*1*	*19-Dec-2018 21:13*
Surr: Dibromofluoromethane	*89.7*			**0**	*80-119*	*%REC*	*1*	*19-Dec-2018 21:13*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*19-Dec-2018 21:13*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**11.4**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:14
Manganese	**0.134**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	21-Dec-2018 21:14
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**11.1**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:30
Manganese	**0.142**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	21-Dec-2018 23:30
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.316**		**0.0200**	**0.0400**	**0.0500**	**mg/L**	1	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	17-Dec-2018 16:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_121018
Collection Date: 10-Dec-2018 10:15

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**45.9**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 21:18
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**109**		**2.00**	**5.00**	**5.00**	**mg/L**	10	24-Dec-2018 19:56
Nitrogen, Nitrate (As N)	**0.157**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	11-Dec-2018 22:07
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Dec-2018 22:07
Sulfate	**69.9**		**0.200**	**0.500**	**0.500**	**mg/L**	1	11-Dec-2018 22:07
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	18-Dec-2018 14:50
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2019 09:43
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18120569
Sample ID: 35AWW19_121018 Lab ID:HS18120569-03
Collection Date: 10-Dec-2018 11:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,1-Dichloroethane	**1.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 21:38
1,1-Dichloroethene	**7.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 21:38
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,2-Dichloroethane	**2.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 21:38
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 21:38
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2018 21:38
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2018 21:38
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	19-Dec-2018 21:38
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2018 21:38
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18120569
Sample ID: 35AWW19_121018 Lab ID:HS18120569-03
Collection Date: 10-Dec-2018 11:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	19-Dec-2018 21:38
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 21:38
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	19-Dec-2018 21:38
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 21:38
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Trichloroethene	**0.59**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 21:38
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 21:38
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*1*	*19-Dec-2018 21:38*
Surr: 4-Bromofluorobenzene	*98.6*			**0**	*85-114*	*%REC*	*1*	*19-Dec-2018 21:38*
Surr: Dibromofluoromethane	*90.0*			**0**	*80-119*	*%REC*	*1*	*19-Dec-2018 21:38*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*19-Dec-2018 21:38*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**4.63**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:16
Manganese	**6.65**		**0.0350**	**0.0500**	**0.250**	**mg/L**	50	24-Dec-2018 13:28
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**4.75**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:33
Manganese	**6.88**		**0.0350**	**0.0500**	**0.250**	**mg/L**	50	24-Dec-2018 13:52
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.101**		**0.0200**	**0.0400**	**0.0500**	**mg/L**	1	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	17-Dec-2018 16:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_121018
Collection Date: 10-Dec-2018 11:15

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**198**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 21:24
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,190**		**10.0**	**25.0**	**25.0**	**mg/L**	50	24-Dec-2018 20:17
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 22:21
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 22:21
Sulfate	**998**		**10.0**	**25.0**	**25.0**	**mg/L**	50	24-Dec-2018 20:17
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	18-Dec-2018 14:50
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2019 09:43
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_121018
Collection Date: 10-Dec-2018 12:30

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,1-Dichloroethane	**1.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
1,1-Dichloroethene	**2.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2,3-Trichloropropane	**22**		**0.50**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:28
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
2-Butanone	**300**		**0.50**	**1.0**	**2.0**	**UG/L**	1	19-Dec-2018 22:28
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
2-Hexanone	**6.0**		**1.0**	**1.0**	**2.0**	**UG/L**	1	19-Dec-2018 22:28
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:28
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
4-Methyl-2-pentanone	**3.9**		**0.70**	**1.0**	**2.0**	**UG/L**	1	19-Dec-2018 22:28
Acetone	**120**		**0.40**	**2.0**	**2.0**	**UG/L**	1	19-Dec-2018 22:28
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Bromoform	**1.8**		**0.40**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2018 22:28
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18120569
Sample ID: 35AWW23_121018 Lab ID:HS18120569-04
Collection Date: 10-Dec-2018 12:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
cis-1,2-Dichloroethene	**20**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
cis-1,3-Dichloropropene	**3.3**		**0.10**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	19-Dec-2018 22:28
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 22:28
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	19-Dec-2018 22:28
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:28
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
trans-1,3-Dichloropropene	**4.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
Trichloroethene	**5.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:28
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:28
Surr: 1,2-Dichloroethane-d4	*90.5*			**0**	*81-118*	*%REC*	*1*	*19-Dec-2018 22:28*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*19-Dec-2018 22:28*
Surr: Dibromofluoromethane	*88.8*			**0**	*80-119*	*%REC*	*1*	*19-Dec-2018 22:28*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*19-Dec-2018 22:28*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**50.8**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:19
Manganese	**8.04**		**0.0700**	**0.100**	**0.500**	**mg/L**	100	24-Dec-2018 13:30
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**46.4**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:35
Manganese	**7.73**		**0.0700**	**0.100**	**0.500**	**mg/L**	100	24-Dec-2018 13:54
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**1.08**		**0.200**	**0.400**	**0.500**	**mg/L**	10	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	17-Dec-2018 16:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_121018
Collection Date: 10-Dec-2018 12:30

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,110**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 21:34
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**578**		**4.00**	**10.0**	**10.0**	**mg/L**	20	24-Dec-2018 20:39
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 22:36
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 22:36
Sulfate	**4.19**		**0.400**	**1.00**	**1.00**	**mg/L**	2	11-Dec-2018 22:36
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	18-Dec-2018 14:50
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2019 09:43
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_121018
Collection Date: 10-Dec-2018 13:30

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,1-Dichloroethane	**42**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,2-Dichloroethane	**1.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Dec-2018 22:52
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 22:52
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2018 22:52
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2018 22:52
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	19-Dec-2018 22:52
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2018 22:52
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18120569
Sample ID: LHSMW07_121018 Lab ID:HS18120569-05
Collection Date: 10-Dec-2018 13:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	19-Dec-2018 22:52
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 22:52
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	19-Dec-2018 22:52
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 22:52
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 22:52
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*81-118*	*%REC*	*1*	*19-Dec-2018 22:52*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*1*	*19-Dec-2018 22:52*
Surr: Dibromofluoromethane	*90.0*			**0**	*80-119*	*%REC*	*1*	*19-Dec-2018 22:52*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*19-Dec-2018 22:52*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**0.773**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:21
Manganese	**9.40**		**0.0700**	**0.100**	**0.500**	**mg/L**	100	24-Dec-2018 13:32
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**0.785**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:37
Manganese	**9.06**		**0.0700**	**0.100**	**0.500**	**mg/L**	100	24-Dec-2018 13:56
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.125**		**0.0200**	**0.0400**	**0.0500**	**mg/L**	1	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	**14.8**		**1.00**	**1.00**	**1.00**	**mg/L**	1	17-Dec-2018 16:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_121018
Collection Date: 10-Dec-2018 13:30

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,640**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 21:45
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**2,030**		**20.0**	**50.0**	**50.0**	**mg/L**	100	24-Dec-2018 21:44
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 22:50
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Dec-2018 22:50
Sulfate	**1,530**		**20.0**	**50.0**	**50.0**	**mg/L**	100	24-Dec-2018 21:44
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	18-Dec-2018 14:50
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2019 09:43
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 10-Dec-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 20:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2018 20:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2018 20:49
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	19-Dec-2018 20:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2018 20:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 10-Dec-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18120569
Lab ID:HS18120569-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	19-Dec-2018 20:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2018 20:49
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	19-Dec-2018 20:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2018 20:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2018 20:49
Surr: 1,2-Dichloroethane-d4	*92.7*			**0**	*81-118*	*%REC*	*1*	*19-Dec-2018 20:49*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*85-114*	*%REC*	*1*	*19-Dec-2018 20:49*
Surr: Dibromofluoromethane	*89.8*			**0**	*80-119*	*%REC*	*1*	*19-Dec-2018 20:49*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*19-Dec-2018 20:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Batch ID: 135598 **Method:** PHOSPHORUS BY E365.3 **Prep:** P_TW_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120569-01	1	50	50 (mL)	1
HS18120569-02	1	50	50 (mL)	1
HS18120569-03	1	50	50 (mL)	1
HS18120569-04	1	50	50 (mL)	1
HS18120569-05	1	50	50 (mL)	1

Batch ID: 135804 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120569-01	1	10	10 (mL)	1
HS18120569-02	1	10	10 (mL)	1
HS18120569-03	1	10	10 (mL)	1
HS18120569-04	1	10	10 (mL)	1
HS18120569-05	1	10	10 (mL)	1

Batch ID: 135805 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120569-01	1	10	10 (mL)	1
HS18120569-02	1	10	10 (mL)	1
HS18120569-03	1	10	10 (mL)	1
HS18120569-04	1	10	10 (mL)	1
HS18120569-05	1	10	10 (mL)	1

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 135598	**Test Name :** PHOSPHORUS BY E365.3			**Matrix:** Groundwater		
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10		13 Dec 2018 11:00	13 Dec 2018 15:15	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15		13 Dec 2018 11:00	13 Dec 2018 15:15	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15		13 Dec 2018 11:00	13 Dec 2018 15:15	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30		13 Dec 2018 11:00	13 Dec 2018 15:15	10
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30		13 Dec 2018 11:00	13 Dec 2018 15:15	1
Batch ID 135804	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10		19 Dec 2018 13:00	24 Dec 2018 13:26	50
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10		19 Dec 2018 13:00	21 Dec 2018 21:12	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15		19 Dec 2018 13:00	21 Dec 2018 21:14	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15		19 Dec 2018 13:00	24 Dec 2018 13:28	50
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15		19 Dec 2018 13:00	21 Dec 2018 21:16	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30		19 Dec 2018 13:00	24 Dec 2018 13:30	100
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30		19 Dec 2018 13:00	21 Dec 2018 21:19	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30		19 Dec 2018 13:00	24 Dec 2018 13:32	100
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30		19 Dec 2018 13:00	21 Dec 2018 21:21	1
Batch ID 135805	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10		19 Dec 2018 13:00	24 Dec 2018 13:50	50
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10		19 Dec 2018 13:00	21 Dec 2018 23:28	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15		19 Dec 2018 13:00	21 Dec 2018 23:30	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15		19 Dec 2018 13:00	24 Dec 2018 13:52	50
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15		19 Dec 2018 13:00	21 Dec 2018 23:33	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30		19 Dec 2018 13:00	24 Dec 2018 13:54	100
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30		19 Dec 2018 13:00	21 Dec 2018 23:35	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30		19 Dec 2018 13:00	24 Dec 2018 13:56	100
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30		19 Dec 2018 13:00	21 Dec 2018 23:37	1
Batch ID R329478	**Test Name :** SUBCONTRACT ANALYSIS - DHC/DHB			**Matrix:** Groundwater		
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			18 Dec 2018 14:50	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			18 Dec 2018 14:50	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			18 Dec 2018 14:50	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			18 Dec 2018 14:50	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			18 Dec 2018 14:50	1
Batch ID R329600	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS18120569-06	Trip Blank	10 Dec 2018 00:00			19 Dec 2018 20:49	1

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R329600	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			19 Dec 2018 23:42	1
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			19 Dec 2018 23:17	25
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			19 Dec 2018 21:13	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			19 Dec 2018 21:38	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			19 Dec 2018 22:28	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			19 Dec 2018 22:52	1
Batch ID R329695	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			20 Dec 2018 21:13	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			20 Dec 2018 21:18	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			20 Dec 2018 21:24	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			20 Dec 2018 21:34	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			20 Dec 2018 21:45	1
Batch ID R329884	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			26 Dec 2018 09:04	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			26 Dec 2018 09:04	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			26 Dec 2018 09:04	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			26 Dec 2018 09:04	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			26 Dec 2018 09:04	1
Batch ID R329896	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			24 Dec 2018 19:34	50
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			24 Dec 2018 19:56	10
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			24 Dec 2018 20:17	50
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			24 Dec 2018 20:39	20
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			24 Dec 2018 21:44	100
Batch ID R329899	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			11 Dec 2018 21:52	2
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			11 Dec 2018 22:07	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			11 Dec 2018 22:21	2
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			11 Dec 2018 22:36	2
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			11 Dec 2018 22:50	2
Batch ID R329956	**Test Name :** SULFIDE BY E376.1				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			17 Dec 2018 16:30	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			17 Dec 2018 16:30	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			17 Dec 2018 16:30	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			17 Dec 2018 16:30	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			17 Dec 2018 16:30	1

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58 **DATES REPORT**
WorkOrder: HS18120569

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R330379	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			03 Jan 2019 09:43	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			03 Jan 2019 09:43	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			03 Jan 2019 09:43	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			03 Jan 2019 09:43	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			03 Jan 2019 09:43	1
Batch ID R330453	**Test Name :** SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS				**Matrix:** Groundwater	
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			04 Jan 2019 10:12	1
HS18120569-01	35AWW20_121018	10 Dec 2018 09:10			04 Jan 2019 10:12	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			04 Jan 2019 10:12	1
HS18120569-02	35AWW24_121018	10 Dec 2018 10:15			04 Jan 2019 10:12	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			04 Jan 2019 10:12	1
HS18120569-03	35AWW19_121018	10 Dec 2018 11:15			04 Jan 2019 10:12	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			04 Jan 2019 10:12	1
HS18120569-04	35AWW23_121018	10 Dec 2018 12:30			04 Jan 2019 10:12	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			04 Jan 2019 10:12	1
HS18120569-05	LHSMW07_121018	10 Dec 2018 13:30			04 Jan 2019 10:12	1

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: 135804 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-135804** Units: **mg/L** Analysis Date: **21-Dec-2018 21:07**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879116** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-135804** Units: **mg/L** Analysis Date: **21-Dec-2018 21:10**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879117** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.811	0.200	5	0	96.2	80 - 120				
Manganese	0.04729	0.00500	0.05	0	94.6	80 - 120				

MS Sample ID: **HS18120913-04MS** Units: **mg/L** Analysis Date: **21-Dec-2018 22:12**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879142** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	15.56	0.200	5	10.76	96.0	80 - 120				
Manganese	0.1135	0.00500	0.05	0.06587	95.3	80 - 120				

MSD Sample ID: **HS18120913-04MSD** Units: **mg/L** Analysis Date: **21-Dec-2018 22:14**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879143** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	15.34	0.200	5	10.76	91.6	80 - 120	15.56	1.43	20	
Manganese	0.1084	0.00500	0.05	0.06587	85.0	80 - 120	0.1135	4.65	20	

PDS Sample ID: **HS18120913-04PDS** Units: **mg/L** Analysis Date: **21-Dec-2018 22:17**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879144** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	22.17	0.200	10	10.76	114	75 - 125				
Manganese	0.1632	0.00500	0.1	0.06587	97.3	75 - 125				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: 135804 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS18120913-04SD** Units: **mg/L** Analysis Date: **21-Dec-2018 22:10**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879141** PrepDate: **19-Dec-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	11.5	1.00					10.76	6.85	10	
Manganese	0.06612	0.0250					0.06587	0.376	10	

The following samples were analyzed in this batch: HS18120569-01 HS18120569-02 HS18120569-03 HS18120569-04 HS18120569-05

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: 135805 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-135805** Units: **mg/L** Analysis Date: **21-Dec-2018 23:24**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879287** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-135805** Units: **mg/L** Analysis Date: **21-Dec-2018 23:26**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879288** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.612	0.200	5	0	92.2	80 - 120				
Manganese	0.04744	0.00500	0.05	0	94.9	80 - 120				

MS Sample ID: **HS18120927-08MS** Units: **mg/L** Analysis Date: **22-Dec-2018 00:45**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879323** PrepDate: **19-Dec-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.965	2.00	5	0.101	97.3	75 - 125				
Manganese	0.04104	0.0500	0.05	0.004999	72.1	75 - 125				JS

MSD Sample ID: **HS18120927-08MSD** Units: **mg/L** Analysis Date: **22-Dec-2018 00:47**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879324** PrepDate: **19-Dec-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.346	2.00	5	0.101	84.9	75 - 125	4.965	13.3	20	
Manganese	0.03526	0.0500	0.05	0.004999	60.5	75 - 125	0.04104	0	20	JS

PDS Sample ID: **HS18120927-08PDS** Units: **mg/L** Analysis Date: **22-Dec-2018 00:50**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879325** PrepDate: **19-Dec-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	99.19	2.00	100	0	99.2	75 - 125				
Manganese	1.104	0.0500	1	0	110	75 - 125				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: 135805 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18120927-08SD** Units: **mg/L** Analysis Date: **22-Dec-2018 00:43**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879322** PrepDate: **19-Dec-2018** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	0.6201	10.0					0.101	0	10	J
Manganese	0.0500	0.250					0.004999	0	10	U

The following samples were analyzed in this batch: HS18120569-01 HS18120569-02 HS18120569-03 HS18120569-04 HS18120569-05

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181219** Units: **UG/L** Analysis Date: **19-Dec-2018 14:12**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873544** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181219** Units: **UG/L** Analysis Date: **19-Dec-2018 14:12**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873544** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	0.50	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.52*	*1.0*	*50*	*0*	*91.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.78*	*1.0*	*50*	*0*	*97.6*	*85 - 114*				
Surr: Dibromofluoromethane	*43.82*	*1.0*	*50*	*0*	*87.6*	*80 - 119*				
Surr: Toluene-d8	*52.21*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-1812019** Units: **UG/L** Analysis Date: **19-Dec-2018 13:23**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873543** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.45	1.0	20	0	107	78 - 124				
1,1,1-Trichloroethane	19.64	1.0	20	0	98.2	74 - 131				
1,1,2,2-Tetrachloroethane	21.9	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	21.95	1.0	20	0	110	80 - 119				
1,1-Dichloroethane	20.76	1.0	20	0	104	77 - 125				
1,1-Dichloroethene	18.1	1.0	20	0	90.5	71 - 131				
1,1-Dichloropropene	22.21	1.0	20	0	111	78 - 125				
1,2,3-Trichlorobenzene	22.77	1.0	20	0	114	69 - 129				
1,2,3-Trichloropropane	21.86	1.0	20	0	109	73 - 122				
1,2,4-Trichlorobenzene	22.37	1.0	20	0	112	69 - 130				
1,2,4-Trimethylbenzene	23.07	1.0	20	0	115	76 - 124				
1,2-Dibromo-3-chloropropane	19.95	1.0	20	0	99.7	62 - 128				
1,2-Dibromoethane	22.07	1.0	20	0	110	77 - 121				
1,2-Dichlorobenzene	21.09	1.0	20	0	105	80 - 119				
1,2-Dichloroethane	20.53	1.0	20	0	103	73 - 128				
1,2-Dichloropropane	22.8	1.0	20	0	114	78 - 122				
1,3,5-Trimethylbenzene	22.87	1.0	20	0	114	75 - 124				
1,3-Dichlorobenzene	21.54	1.0	20	0	108	80 - 119				
1,3-Dichloropropane	21.79	1.0	20	0	109	80 - 119				
1,4-Dichlorobenzene	22.65	1.0	20	0	113	79 - 118				
2,2-Dichloropropane	20.46	1.0	20	0	102	60 - 139				
2-Butanone	43.93	2.0	40	0	110	56 - 143				
2-Chlorotoluene	22.31	1.0	20	0	112	79 - 122				
2-Hexanone	47.86	2.0	40	0	120	57 - 139				
4-Chlorotoluene	22.58	1.0	20	0	113	78 - 122				
4-Isopropyltoluene	23.84	1.0	20	0	119	77 - 127				
4-Methyl-2-pentanone	47.37	2.0	40	0	118	67 - 130				
Acetone	43.94	2.0	40	0	110	39 - 160				
Benzene	22.47	1.0	20	0	112	79 - 120				
Bromobenzene	21.43	1.0	20	0	107	80 - 120				
Bromochloromethane	21.73	1.0	20	0	109	78 - 123				
Bromodichloromethane	20.41	1.0	20	0	102	79 - 125				
Bromoform	19.22	1.0	20	0	96.1	66 - 130				
Bromomethane	17.47	1.0	20	0	87.3	53 - 141				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-1812019** Units: **UG/L** Analysis Date: **19-Dec-2018 13:23**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873543** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43	2.0	40	0	108	64 - 133				
Carbon tetrachloride	20.87	1.0	20	0	104	72 - 136				
Chlorobenzene	21.48	1.0	20	0	107	82 - 118				
Chloroethane	18.03	1.0	20	0	90.2	60 - 138				
Chloroform	19.61	1.0	20	0	98.0	79 - 124				
Chloromethane	18.29	1.0	20	0	91.4	50 - 139				
cis-1,2-Dichloroethene	20.47	1.0	20	0	102	78 - 123				
cis-1,3-Dichloropropene	22.46	1.0	20	0	112	75 - 124				
Dibromochloromethane	21.34	1.0	20	0	107	74 - 126				
Dibromomethane	20.94	1.0	20	0	105	79 - 123				
Dichlorodifluoromethane	19.71	1.0	20	0	98.5	32 - 152				
Ethylbenzene	22.22	1.0	20	0	111	79 - 121				
Hexachlorobutadiene	27.23	1.0	20	0	136	66 - 134				S
Isopropylbenzene	22.91	1.0	20	0	115	72 - 131				
m,p-Xylene	45.06	2.0	40	0	113	80 - 121				
Methylene chloride	21.6	2.0	20	0	108	74 - 124				
Naphthalene	23.36	1.0	20	0	117	61 - 128				
n-Butylbenzene	24.55	1.0	20	0	123	75 - 128				
n-Propylbenzene	23.46	1.0	20	0	117	76 - 126				
o-Xylene	22.37	1.0	20	0	112	78 - 122				
sec-Butylbenzene	23.63	1.0	20	0	118	77 - 126				
Styrene	23	1.0	20	0	115	78 - 123				
tert-Butylbenzene	23.12	1.0	20	0	116	78 - 124				
Tetrachloroethene	22.72	1.0	20	0	114	74 - 129				
Toluene	22.34	1.0	20	0	112	80 - 121				
trans-1,2-Dichloroethene	20.96	1.0	20	0	105	75 - 124				
trans-1,3-Dichloropropene	19.75	1.0	20	0	98.8	73 - 127				
Trichloroethene	21.24	1.0	20	0	106	79 - 123				
Trichlorofluoromethane	17.94	1.0	20	0	89.7	65 - 141				
Vinyl chloride	19.66	1.0	20	0	98.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.64*	*1.0*	*50*	*0*	*87.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.2*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*44.46*	*1.0*	*50*	*0*	*88.9*	*80 - 119*				
Surr: Toluene-d8	*52.77*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18120734-01MS** Units: **UG/L** Analysis Date: **19-Dec-2018 15:26**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873547** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	23.32	1.0	20	0	117	78 - 124				
1,1,1-Trichloroethane	21.6	1.0	20	0	108	74 - 131				
1,1,2,2-Tetrachloroethane	22.82	1.0	20	0	114	71 - 121				
1,1,2-Trichloroethane	23.2	1.0	20	0	116	80 - 119				
1,1-Dichloroethane	22.17	1.0	20	0	111	77 - 125				
1,1-Dichloroethene	18.5	1.0	20	0	92.5	71 - 131				
1,1-Dichloropropene	24.88	1.0	20	0	124	78 - 125				
1,2,3-Trichlorobenzene	22.86	1.0	20	0	114	69 - 129				
1,2,3-Trichloropropane	21.74	1.0	20	0	109	73 - 122				
1,2,4-Trichlorobenzene	22.74	1.0	20	0	114	69 - 130				
1,2,4-Trimethylbenzene	24.72	1.0	20	0	124	76 - 124				
1,2-Dibromo-3-chloropropane	20.38	1.0	20	0	102	62 - 128				
1,2-Dibromoethane	23.33	1.0	20	0	117	77 - 121				
1,2-Dichlorobenzene	22.08	1.0	20	0	110	80 - 119				
1,2-Dichloroethane	22.31	1.0	20	0	112	73 - 128				
1,2-Dichloropropane	24.66	1.0	20	0	123	78 - 122				S
1,3,5-Trimethylbenzene	24.62	1.0	20	0	123	75 - 124				
1,3-Dichlorobenzene	22.54	1.0	20	0	113	80 - 119				
1,3-Dichloropropane	23.31	1.0	20	0	117	80 - 119				
1,4-Dichlorobenzene	23.73	1.0	20	0	119	79 - 118				S
2,2-Dichloropropane	22.39	1.0	20	0	112	60 - 139				
2-Butanone	44.1	2.0	40	0	110	56 - 143				
2-Chlorotoluene	23.89	1.0	20	0	119	79 - 122				
2-Hexanone	48.46	2.0	40	0	121	57 - 139				
4-Chlorotoluene	24.02	1.0	20	0	120	78 - 122				
4-Isopropyltoluene	25.44	1.0	20	0	127	77 - 127				S
4-Methyl-2-pentanone	47.94	2.0	40	0	120	67 - 130				
Acetone	38.91	2.0	40	0	97.3	39 - 160				
Benzene	24.5	1.0	20	0	123	79 - 120				S
Bromobenzene	22.78	1.0	20	0	114	80 - 120				
Bromochloromethane	22.81	1.0	20	0	114	78 - 123				
Bromodichloromethane	22.36	1.0	20	0	112	79 - 125				
Bromoform	20.12	1.0	20	0	101	66 - 130				
Bromomethane	10.78	1.0	20	0	53.9	53 - 141				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18120734-01MS** Units: **UG/L** Analysis Date: **19-Dec-2018 15:26**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873547** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	45.07	2.0	40	0	113	64 - 133				
Carbon tetrachloride	24.07	1.0	20	0	120	72 - 136				
Chlorobenzene	23.31	1.0	20	0	117	82 - 118				
Chloroethane	18.58	1.0	20	0	92.9	60 - 138				
Chloroform	21.38	1.0	20	0	107	79 - 124				
Chloromethane	18.23	1.0	20	0	91.1	50 - 139				
cis-1,2-Dichloroethene	24.21	1.0	20	2.687	108	78 - 123				
cis-1,3-Dichloropropene	23.58	1.0	20	0	118	75 - 124				
Dibromochloromethane	23.08	1.0	20	0	115	74 - 126				
Dibromomethane	22.57	1.0	20	0	113	79 - 123				
Dichlorodifluoromethane	10.41	1.0	20	0	52.0	32 - 152				
Ethylbenzene	24.03	1.0	20	0	120	79 - 121				
Hexachlorobutadiene	26.9	1.0	20	0	135	66 - 134				S
Isopropylbenzene	25.07	1.0	20	0	125	72 - 131				
m,p-Xylene	48.89	2.0	40	0	122	80 - 121				S
Methylene chloride	23.42	2.0	20	0	117	74 - 124				
Naphthalene	23.64	1.0	20	0	118	61 - 128				
n-Butylbenzene	25.98	1.0	20	0	130	75 - 128				S
n-Propylbenzene	25.06	1.0	20	0	125	76 - 126				
o-Xylene	24.52	1.0	20	0	123	78 - 122				S
sec-Butylbenzene	25.5	1.0	20	0	127	77 - 126				S
Styrene	24.6	1.0	20	0	123	78 - 123				S
tert-Butylbenzene	24.94	1.0	20	0	125	78 - 124				S
Tetrachloroethene	24.23	1.0	20	0	121	74 - 129				
Toluene	24.29	1.0	20	0	121	80 - 121				S
trans-1,2-Dichloroethene	22.56	1.0	20	0	113	75 - 124				
trans-1,3-Dichloropropene	21.18	1.0	20	0	106	73 - 127				
Trichloroethene	24.47	1.0	20	0.8775	118	79 - 123				
Trichlorofluoromethane	17.99	1.0	20	0	90.0	65 - 141				
Vinyl chloride	16.71	1.0	20	0	83.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.67*	*1.0*	*50*	*0*	*87.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.51*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*44.82*	*1.0*	*50*	*0*	*89.6*	*80 - 119*				
Surr: Toluene-d8	*52.8*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18120734-01MSD** Units: **UG/L** Analysis Date: **19-Dec-2018 15:51**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873548** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	22.22	1.0	20	0	111	78 - 124	23.32	4.81	20	
1,1,1-Trichloroethane	20.38	1.0	20	0	102	74 - 131	21.6	5.84	20	
1,1,2,2-Tetrachloroethane	22.36	1.0	20	0	112	71 - 121	22.82	2.04	20	
1,1,2-Trichloroethane	22.38	1.0	20	0	112	80 - 119	23.2	3.64	20	
1,1-Dichloroethane	21.22	1.0	20	0	106	77 - 125	22.17	4.42	20	
1,1-Dichloroethene	18.27	1.0	20	0	91.4	71 - 131	18.5	1.22	20	
1,1-Dichloropropene	23.42	1.0	20	0	117	78 - 125	24.88	6.07	20	
1,2,3-Trichlorobenzene	22.48	1.0	20	0	112	69 - 129	22.86	1.65	20	
1,2,3-Trichloropropane	21.67	1.0	20	0	108	73 - 122	21.74	0.315	20	
1,2,4-Trichlorobenzene	22.05	1.0	20	0	110	69 - 130	22.74	3.07	20	
1,2,4-Trimethylbenzene	23.62	1.0	20	0	118	76 - 124	24.72	4.54	20	
1,2-Dibromo-3-chloropropane	19.66	1.0	20	0	98.3	62 - 128	20.38	3.59	20	
1,2-Dibromoethane	22.49	1.0	20	0	112	77 - 121	23.33	3.68	20	
1,2-Dichlorobenzene	21.13	1.0	20	0	106	80 - 119	22.08	4.4	20	
1,2-Dichloroethane	21.39	1.0	20	0	107	73 - 128	22.31	4.18	20	
1,2-Dichloropropane	23.86	1.0	20	0	119	78 - 122	24.66	3.3	20	
1,3,5-Trimethylbenzene	23.29	1.0	20	0	116	75 - 124	24.62	5.55	20	
1,3-Dichlorobenzene	21.54	1.0	20	0	108	80 - 119	22.54	4.53	20	
1,3-Dichloropropane	22.62	1.0	20	0	113	80 - 119	23.31	3	20	
1,4-Dichlorobenzene	22.88	1.0	20	0	114	79 - 118	23.73	3.64	20	
2,2-Dichloropropane	20.98	1.0	20	0	105	60 - 139	22.39	6.5	20	
2-Butanone	43.88	2.0	40	0	110	56 - 143	44.1	0.488	20	
2-Chlorotoluene	22.65	1.0	20	0	113	79 - 122	23.89	5.34	20	
2-Hexanone	48.28	2.0	40	0	121	57 - 139	48.46	0.379	20	
4-Chlorotoluene	23.02	1.0	20	0	115	78 - 122	24.02	4.27	20	
4-Isopropyltoluene	24.51	1.0	20	0	123	77 - 127	25.44	3.7	20	
4-Methyl-2-pentanone	47.49	2.0	40	0	119	67 - 130	47.94	0.944	20	
Acetone	43.99	2.0	40	0	110	39 - 160	38.91	12.3	20	
Benzene	23.02	1.0	20	0	115	79 - 120	24.5	6.22	20	
Bromobenzene	21.66	1.0	20	0	108	80 - 120	22.78	5.05	20	
Bromochloromethane	22.48	1.0	20	0	112	78 - 123	22.81	1.46	20	
Bromodichloromethane	21.71	1.0	20	0	109	79 - 125	22.36	2.97	20	
Bromoform	19.3	1.0	20	0	96.5	66 - 130	20.12	4.19	20	
Bromomethane	9.701	1.0	20	0	48.5	53 - 141	10.78	10.5	20	S

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18120734-01MSD** Units: **UG/L** Analysis Date: **19-Dec-2018 15:51**
Client ID: Run ID: **VOA9_329600** SeqNo: **4873548** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	43.1	2.0	40	0	108	64 - 133	45.07	4.46	20	
Carbon tetrachloride	22.67	1.0	20	0	113	72 - 136	24.07	5.99	20	
Chlorobenzene	22.05	1.0	20	0	110	82 - 118	23.31	5.52	20	
Chloroethane	16.63	1.0	20	0	83.1	60 - 138	18.58	11.1	20	
Chloroform	20.2	1.0	20	0	101	79 - 124	21.38	5.67	20	
Chloromethane	18.04	1.0	20	0	90.2	50 - 139	18.23	1.03	20	
cis-1,2-Dichloroethene	23.17	1.0	20	2.687	102	78 - 123	24.21	4.4	20	
cis-1,3-Dichloropropene	22.96	1.0	20	0	115	75 - 124	23.58	2.65	20	
Dibromochloromethane	22.14	1.0	20	0	111	74 - 126	23.08	4.18	20	
Dibromomethane	22.09	1.0	20	0	110	79 - 123	22.57	2.17	20	
Dichlorodifluoromethane	9.713	1.0	20	0	48.6	32 - 152	10.41	6.91	20	
Ethylbenzene	22.94	1.0	20	0	115	79 - 121	24.03	4.62	20	
Hexachlorobutadiene	25.6	1.0	20	0	128	66 - 134	26.9	4.97	20	
Isopropylbenzene	23.75	1.0	20	0	119	72 - 131	25.07	5.41	20	
m,p-Xylene	46.6	2.0	40	0	116	80 - 121	48.89	4.8	20	
Methylene chloride	22.17	2.0	20	0	111	74 - 124	23.42	5.49	20	
Naphthalene	23.33	1.0	20	0	117	61 - 128	23.64	1.32	20	
n-Butylbenzene	24.91	1.0	20	0	125	75 - 128	25.98	4.2	20	
n-Propylbenzene	23.78	1.0	20	0	119	76 - 126	25.06	5.24	20	
o-Xylene	23.15	1.0	20	0	116	78 - 122	24.52	5.76	20	
sec-Butylbenzene	24.17	1.0	20	0	121	77 - 126	25.5	5.32	20	
Styrene	23.59	1.0	20	0	118	78 - 123	24.6	4.18	20	
tert-Butylbenzene	23.79	1.0	20	0	119	78 - 124	24.94	4.7	20	
Tetrachloroethene	23.5	1.0	20	0	118	74 - 129	24.23	3.05	20	
Toluene	23.06	1.0	20	0	115	80 - 121	24.29	5.16	20	
trans-1,2-Dichloroethene	20.91	1.0	20	0	105	75 - 124	22.56	7.59	20	
trans-1,3-Dichloropropene	20.37	1.0	20	0	102	73 - 127	21.18	3.89	20	
Trichloroethene	23.12	1.0	20	0.8775	111	79 - 123	24.47	5.68	20	
Trichlorofluoromethane	17.26	1.0	20	0	86.3	65 - 141	17.99	4.19	20	
Vinyl chloride	16.07	1.0	20	0	80.3	58 - 137	16.71	3.91	20	
Surr: 1,2-Dichloroethane-d4	*43.51*	*1.0*	*50*	*0*	*87.0*	*81 - 118*	*43.67*	*0.368*	*20*	
Surr: 4-Bromofluorobenzene	*51.46*	*1.0*	*50*	*0*	*103*	*85 - 114*	*51.51*	*0.0905*	*20*	
Surr: Dibromofluoromethane	*44.68*	*1.0*	*50*	*0*	*89.4*	*80 - 119*	*44.82*	*0.318*	*20*	
Surr: Toluene-d8	*52.72*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.8*	*0.158*	*20*	

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329600 **Instrument: VOA9** **Method: SW8260**

The following samples were analyzed in this batch:				
	HS18120569-01	HS18120569-02	HS18120569-03	HS18120569-04
	HS18120569-05	HS18120569-06		

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: 135598 **Instrument: UV-2450** **Method: E365.3**

MBLK Sample ID: **MBLK-135598** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863283** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.0400	0.0500								U

LCS Sample ID: **LCS-135598** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863282** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.241	0.0500	0.25	0	96.4	80 - 120				

MS Sample ID: **HS18120487-01MS** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863280** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.339	0.0500	0.25	0.113	90.4	80 - 120				

MSD Sample ID: **HS18120487-01MSD** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863281** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.338	0.0500	0.25	0.113	90.0	80 - 120	0.339	0.295	20	

The following samples were analyzed in this batch: HS18120569-01 HS18120569-02 HS18120569-03 HS18120569-04 HS18120569-05

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329695 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 20:45**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876171** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 20:54**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876172** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1061	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **LCSD1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 21:04**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876173** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1057	5.00	1000	0	106	85 - 115	1061	0.378	20	

DUP Sample ID: **HS18120927-05DUP** Units: **mg/L** Analysis Date: **20-Dec-2018 23:05**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876188** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	650.2	5.00					647.6	0.402	20	

The following samples were analyzed in this batch: HS18120569-01 HS18120569-02 HS18120569-03 HS18120569-04 HS18120569-05

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329896 **Instrument: ICS3K2** **Method: SW9056**

MBLK Sample ID: **WBLKW1-122418** Units: **mg/L** Analysis Date: **24-Dec-2018 18:30**
Client ID: Run ID: **ICS3K2_329896** SeqNo: **4881426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-122418** Units: **mg/L** Analysis Date: **24-Dec-2018 18:51**
Client ID: Run ID: **ICS3K2_329896** SeqNo: **4881427** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.65	0.500	20	0	98.2	80 - 120				
Sulfate	19.18	0.500	20	0	95.9	80 - 120				

LCSD Sample ID: **WLCSDW1-122418** Units: **mg/L** Analysis Date: **24-Dec-2018 19:13**
Client ID: Run ID: **ICS3K2_329896** SeqNo: **4881428** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.53	0.500	20	0	97.7	80 - 120	19.65	0.592	20	
Sulfate	18.97	0.500	20	0	94.9	80 - 120	19.18	1.08	20	

MS Sample ID: **HS18120569-04MS** Units: **mg/L** Analysis Date: **24-Dec-2018 21:01**
Client ID: **35AWW23_121018** Run ID: **ICS3K2_329896** SeqNo: **4881433** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	760.9	10.0	200	578.1	91.4	80 - 120				
Sulfate	173	10.0	200	11.05	81.0	80 - 120				

MSD Sample ID: **HS18120569-04MSD** Units: **mg/L** Analysis Date: **24-Dec-2018 21:22**
Client ID: **35AWW23_121018** Run ID: **ICS3K2_329896** SeqNo: **4881434** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	764.8	10.0	200	578.1	93.4	80 - 120	760.9	0.509	20	
Sulfate	176.9	10.0	200	11.05	82.9	80 - 120	173	2.27	20	

The following samples were analyzed in this batch: HS18120569-01 HS18120569-02 HS18120569-03 HS18120569-04 HS18120569-05

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329899 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW1-121118** Units: **mg/L** Analysis Date: **11-Dec-2018 12:27**
Client ID: Run ID: **ICS2100_329899** SeqNo: **4881514** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-121118** Units: **mg/L** Analysis Date: **11-Dec-2018 12:42**
Client ID: Run ID: **ICS2100_329899** SeqNo: **4881515** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	3.958	0.100	4	0	99.0	80 - 120				
Nitrogen, Nitrite (As N)	4.395	0.100	4	0	110	80 - 120				
Sulfate	20.21	0.500	20	0	101	80 - 120				

LCSD Sample ID: **WLCSDW1-121118** Units: **mg/L** Analysis Date: **11-Dec-2018 12:56**
Client ID: Run ID: **ICS2100_329899** SeqNo: **4881516** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	3.852	0.100	4	0	96.3	80 - 120	3.958	2.71	20	
Nitrogen, Nitrite (As N)	4.275	0.100	4	0	107	80 - 120	4.395	2.77	20	
Sulfate	19.6	0.500	20	0	98.0	80 - 120	20.21	3.05	20	

MS Sample ID: **HS18120545-04MS** Units: **mg/L** Analysis Date: **11-Dec-2018 13:37**
Client ID: Run ID: **ICS2100_329899** SeqNo: **4881517** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	2.143	0.100	2	0	107	80 - 120				
Nitrogen, Nitrite (As N)	2.155	0.100	2	0	108	80 - 120				
Sulfate	233.4	0.500	10	228	54.5	80 - 120				SEO

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329899 **Instrument: ICS2100** **Method: SW9056**

MS Sample ID: **HS18120487-01MS** Units: **mg/L** Analysis Date: **11-Dec-2018 17:16**
Client ID: Run ID: **ICS2100_329899** SeqNo: **4881522** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	1.967	0.100	2	0.15	90.8	80 - 120				
Nitrogen, Nitrite (As N)	2.095	0.100	2	0	105	80 - 120				
Sulfate	51.45	0.500	10	43.21	82.4	80 - 120				O

MSD Sample ID: **HS18120545-04MSD** Units: **mg/L** Analysis Date: **11-Dec-2018 13:52**
Client ID: Run ID: **ICS2100_329899** SeqNo: **4881518** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	2.065	0.100	2	0	103	80 - 120	2.143	3.71	20	
Nitrogen, Nitrite (As N)	2.122	0.100	2	0	106	80 - 120	2.155	1.54	20	
Sulfate	227.1	0.500	10	228	-8.64	80 - 120	233.4	2.74	20	SEO

MSD Sample ID: **HS18120487-01MSD** Units: **mg/L** Analysis Date: **11-Dec-2018 17:30**
Client ID: Run ID: **ICS2100_329899** SeqNo: **4881523** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	1.975	0.100	2	0.15	91.2	80 - 120	1.967	0.406	20	
Nitrogen, Nitrite (As N)	2.094	0.100	2	0	105	80 - 120	2.095	0.0477	20	
Sulfate	51.31	0.500	10	43.21	81.0	80 - 120	51.45	0.282	20	O

The following samples were analyzed in this batch: HS18120569-01 HS18120569-02 HS18120569-03 HS18120569-04 HS18120569-05

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

QC BATCH REPORT

Batch ID: R329956 **Instrument: WetChem_HS** **Method: E376.1**

MBLK Sample ID: **MBLK-R329956** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: Run ID: **WetChem_HS_329956** SeqNo: **4882426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	1.00	1.00								U

LCS Sample ID: **LCS-R329956** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: Run ID: **WetChem_HS_329956** SeqNo: **4882425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.24	1.00	25	0	89.0	80 - 120				

LCSD Sample ID: **LCSD-R329956** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: Run ID: **WetChem_HS_329956** SeqNo: **4882424** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.44	1.00	25	0	89.8	80 - 120	22.24	0.895	20	

MS Sample ID: **HS18120569-04MS** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: **35AWW23_121018** Run ID: **WetChem_HS_329956** SeqNo: **4882427** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	24.64	1.00	25	0.04	98.4	80 - 120				

The following samples were analyzed in this batch: HS18120569-01 HS18120569-02 HS18120569-03 HS18120569-04 HS18120569-05

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS18120569**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

ALS Houston, US Date: 04-Jan-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS18120569
Date/Time Received: **11-Dec-2018 10:12**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 11-Dec-2018 Date
Reviewed by: *RJ Modashia* eSignature 11-Dec-2018 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.4c/2.7c UC/C	IR25	
Cooler(s)/Kit(s):	44492		
Date/Time sample(s) sent to storage:	12/11/2018 13:10		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate
ENVIRONMENTAL CONSTRUCTION

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Total Phosphorous	Total Manganese & Iron	Dissolved Manganese & Iron	Sulfide	Arsenic	ANIONS	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AMW20_121018		10 DEC 2018	0910	-	N		WG	14	X	X	X	X	X	X	X	X		7				
35AMW24_121018		10 DEC 2018	1015	-	N		WG	14	X	X	X	X	X	X	X	X		X				
35AMW19_121018		10 DEC 2018	1115	-	N		WG	14	X	X	X	X	X	X	X	X		X				
35AMW23_121018		10 DEC 2018	1230		N		WG	14	X	X	X	X	X	X	X	X		X				
LHSMW07_121018		10 DEC 2018	1330		N		WG	14	X	X	X	X	X	X	X	X		X				
TRIP BLANK		10 DEC 2018		-	TB		W	2	X									X				
				-																		
				-																		
				-																		
				-																		
				-																		

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS18120569

Bhate Environmental Associates, Inc.
LHAAP-58

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	12/10/18	1500	1. Jmmmm	12/11/18	10:12
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stanolift Rd, Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler 44492
Temp 2-4
1125
of 0-3

ALS

009444464

ALS
10450 Stanciff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44492

CUSTODY SEAL

Date: 12/10/18 Time: 1500
Name: Brett Dressinger
Company: ALS

Seal Broken By:
Date: 12/11/18

44492

DEC 11 2018

UPS Next Day Air®
UPS Worldwide Express®
Shipping Document

WEIGHT	LTR	PAK	WEIGHT	DIMENSIONAL WEIGHT If Applicable	LARGE PACKAGE	SHIPPER RELEASE
	☐	☐			☐	☐

1
1

44492

☐ EXPRESS (INT'L)
☐ DOCUMENTS ONLY
SATURDAY DELIVERY ☐

J461 688 017 8
J461 688 017 8

EXPORT

SHIPMENT FROM
UPS ACCOUNT NO.
REFERENCE NUMBER
TELEPHONE

UPS Next Day Air® 1

DELIVERY TO
TELEPHONE

J461 688 017 8
J461 688 017 8

DELIVERY

TRACKING NUMBER
DATE OF SHIPMENT

010191120 6/14 BRD United Parcel Service, Louisville, KY

December 27, 2018 Service Request No:R1811942

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: LHAAP / Site 58

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory December 11, 2018
For your reference, these analyses have been assigned our service request number **R1811942.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger
Project Manager

ADDRESS 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
PHONE +1 585 288 5380 | FAX +1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental

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ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1811942
Date Received: 12/11/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt:

Five water samples were received for analysis at ALS Environmental on 12/11/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 0 to 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature. If any samples were received for the analysis of pH, chlorine residual, sulfite, dissolved oxygen, or ferrous iron, the samples were analyzed past their holding time expiration since these analyses are required to be analyzed within 15 minutes of sampling.

Semivoa GC:

Method Organic Acids, 12/19/2018: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

Method Organic Acids, 12/19/2018: The retention time limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question. Since the exceedance equates to no hits, the data quality was not significantly affected and no further corrective action was taken.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 12/27/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: 35AWW20_121018			Lab ID: R1811942-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	5.01		0.11	0.50	mg/L	SM 3500-Fe B.4.c
Acetic Acid	8.3		1.0	4.0	mg/L	Organic Acids
Lactic Acid	1.3	J	0.14	2.0	mg/L	Organic Acids

CLIENT ID: 35AWW24_121018			Lab ID: R1811942-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.54		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW19_121018			Lab ID: R1811942-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	4.19		0.11	0.50	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW23_121018			Lab ID: R1811942-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	50		3	10	mg/L	SM 3500-Fe B.4.c
Acetic Acid	570		10	40	mg/L	Organic Acids
Butanoic Acid (Butyric Acid)	140		3.2	20	mg/L	Organic Acids
Propionic Acid	850		1.9	20	mg/L	Organic Acids

CLIENT ID: LHSMW07_121018			Lab ID: R1811942-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.43		0.03	0.10	mg/L	SM 3500-Fe B.4.c
Lactic Acid	1.3	J	0.14	2.0	mg/L	Organic Acids

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: ALS Environmental - US **Service Request:**R1811942
Project: LHAAP / Site 58/NWO1312.0150

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1811942-001	35AWW20_121018	12/10/2018	0910
R1811942-002	35AWW24_121018	12/10/2018	1015
R1811942-003	35AWW19_121018	12/10/2018	1115
R1811942-004	35AWW23_121018	12/10/2018	1230
R1811942-005	LHSMW07_121018	12/10/2018	1330

bhate ENVIRONMENTAL CONSTRUCTION MILITARY

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VFA	Ferrous Iron								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
								Sample Analysis Requested (5)										Quality Assurance Samples (6)			
35AWW19_121018		10 DEC 2018	0910	-	N		WG	2	X	X											
35AWW24_121018		10 DEC 2018	1015	-	N		WG	2	X	X											
35AWW24_121018		10 DEC 2018	1115	-	N		WG	2	X	X											
35AWW23_121018		10 DEC 2018	1230		N		WG	2	X	X											
LHSMW07_121018		10 DEC 2018	1330		N		WG	2	X	X											
				-																	
				-																	
				-																	
				-																	
				-																	
				-																	

COMMENTS: Sample bottles for sample collected 11:15 had sample ID of 35AWW19_121018 AMW 12/12/18

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received By (Signed)	Date	Time
1.	Scott Beesinger	12/10/18	1500			
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment

R1811942 5
ALS Group USA, Corp.
LHAAP / Site 58

R1811942 5
ALS Group USA, Corp.
LHAAP / Site 66

Cooler Receipt and Preservation Check Form

Project/Client Bhate Folder Number R1811942

Cooler received on 12-11-18 by: ME

COURIER: ALS (UPS) FEDEX VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y)	N
2	**Custody papers** properly completed (ink, signed)?	(Y)	N
3	Did all bottles arrive in good **condition** (unbroken)?	(Y)	N
4	Circle: (Wet Ice) **Dry Ice, Gel packs** present?	(Y)	N

5a	**Perchlorate** samples have required headspace?	Y	N	(NA)
5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y	N	(NA)
6	Where did the bottles originate? ALS/ROC	(CLIENT)		
7	Soil VOA received as: Bulk Encore 5035set	(NA)		

8. Temperature Readings Date: 12-11-18 Time: 10:27 ID: IR#7 (IR#10) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	0.9						
Correction Factor (°C)	0						
Corrected Temp (°C)	0.9						
Temp from:Type of bottle	—						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-002 by ME on 12-11-18 at 10:30
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown/Preservation Check**: Date: 12-11-18 Time: 13:00 by: ME

9.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
10.	Did all bottle labels and tags agree with custody papers?	YES	(NO)
11.	Were correct containers used for the tests indicated?	(YES)	NO
12.	Were 5035 vials acceptable (no extra labels, not leaking)?	YES	NO (N/A)
13.	Air Samples: Cassettes / Tubes Intact with MS? Canisters Pressurized Tedlar® Bags Inflated		(N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-			**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).			
		HCl	**	**	Client bottles					

Bottle lot numbers: 092418-IBMC client bottles

Explain all Discrepancies/ Other Comments:

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: ME

PC Secondary Review: _____ 12/12/18 *significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1811942
Project: LHAAP / Site 58/NWO1312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1811942-001.01					
	SM 3500-Fe B.4.c				
		12/11/2018	1301	SMO / GESMERIAN	
		12/12/2018	1216	RT000104 / GESMERIAN	
		12/12/2018	1217	R-015 / GESMERIAN	
R1811942-001.02					
	Organic Acids				
		12/11/2018	1301	SMO / GESMERIAN	
		12/11/2018	1303	R-002 / GESMERIAN	
		12/17/2018	0811	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	
R1811942-002.01					
	SM 3500-Fe B.4.c				
		12/11/2018	1301	SMO / GESMERIAN	
		12/12/2018	1216	RT000104 / GESMERIAN	
		12/12/2018	1217	R-015 / GESMERIAN	
R1811942-002.02					
	Organic Acids				
		12/11/2018	1301	SMO / GESMERIAN	
		12/11/2018	1303	R-002 / GESMERIAN	
		12/17/2018	0811	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	
R1811942-003.01					
	SM 3500-Fe B.4.c				
		12/11/2018	1301	SMO / GESMERIAN	
		12/12/2018	1216	RT000104 / GESMERIAN	
		12/12/2018	1217	R-015 / GESMERIAN	
R1811942-003.02					
	Organic Acids				
		12/11/2018	1301	SMO / GESMERIAN	
		12/11/2018	1303	R-002 / GESMERIAN	
		12/17/2018	0812	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	
R1811942-004.01					
	SM 3500-Fe B.4.c				
		12/11/2018	1301	SMO / GESMERIAN	
		12/12/2018	1216	RT000104 / GESMERIAN	
		12/12/2018	1217	R-015 / GESMERIAN	
R1811942-004.02					
	Organic Acids				
		12/11/2018	1301	SMO / GESMERIAN	

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1811942
Project: LHAAP / Site 58/NWO1312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	Organic Acids				
		12/11/2018	1303	R-002 / GESMERIAN	
		12/17/2018	0811	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	
R1811942-005.01					
	SM 3500-Fe B.4.c				
		12/11/2018	1301	SMO / GESMERIAN	
		12/12/2018	1216	RT000104 / GESMERIAN	
		12/12/2018	1217	R-015 / GESMERIAN	
R1811942-005.02					
	Organic Acids				
		12/11/2018	1301	SMO / GESMERIAN	
		12/11/2018	1303	R-002 / GESMERIAN	
		12/17/2018	0811	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	

Miscellaneous Forms

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REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.

Spike was diluted out.

\+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratoryôs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

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Analyst Summary report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Service Request: R1811942

Sample Name: 35AWW20_121018
Lab Code: R1811942-001
Sample Matrix: Water
Date Collected: 12/10/18
Date Received: 12/11/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW24_121018
Lab Code: R1811942-002
Sample Matrix: Water
Date Collected: 12/10/18
Date Received: 12/11/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW19_121018
Lab Code: R1811942-003
Sample Matrix: Water
Date Collected: 12/10/18
Date Received: 12/11/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW23_121018
Lab Code: R1811942-004
Sample Matrix: Water
Date Collected: 12/10/18
Date Received: 12/11/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150		

Sample Name:	LHSMW07_121018	**Date Collected:**	12/10/18
Lab Code:	R1811942-005	**Date Received:**	12/11/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

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Semivolatile Organic Compounds by GC

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 09:10
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW20_121018	**Units:**	mg/L
Lab Code:	R1811942-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	12/18/18 21:15	
Acetic Acid	**8.3**		4.0	2.0	1.0	1	12/18/18 21:15	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	12/18/18 21:15	
Lactic Acid	**1.3**	**J**	2.0	1.0	0.14	1	12/18/18 21:15	
Propionic Acid	ND	U	2.0	1.0	0.19	1	12/18/18 21:15	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 10:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW24_121018	**Units:**	mg/L
Lab Code:	R1811942-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	12/18/18 22:08	
Acetic Acid	ND	U	4.0	2.0	1.0	1	12/18/18 22:08	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	12/18/18 22:08	
Lactic Acid	ND	U	2.0	1.0	0.14	1	12/18/18 22:08	
Propionic Acid	ND	U	2.0	1.0	0.19	1	12/18/18 22:08	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 11:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW19_121018	**Units:**	mg/L
Lab Code:	R1811942-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	12/18/18 23:05	
Acetic Acid	ND U	4.0	2.0	1.0	1	12/18/18 23:05	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	12/18/18 23:05	
Lactic Acid	ND U	2.0	1.0	0.14	1	12/18/18 23:05	
Propionic Acid	ND U	2.0	1.0	0.19	1	12/18/18 23:05	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 12:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW23_121018	**Units:**	mg/L
Lab Code:	R1811942-004	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	2.0	1.0	0.16	10	12/20/18 03:28	
Acetic Acid	**570**		40	20	10	10	12/20/18 03:28	
Butanoic Acid (Butyric Acid)	**140**		20	10	3.2	10	12/20/18 03:28	
Lactic Acid	ND	U	20	10	1.4	10	12/20/18 03:28	
Propionic Acid	**850**		20	10	1.9	10	12/20/18 03:28	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 13:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	LHSMW07_121018	**Units:**	mg/L
Lab Code:	R1811942-005	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	12/19/18 00:53	
Acetic Acid	ND	U	4.0	2.0	1.0	1	12/19/18 00:53	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	12/19/18 00:53	
Lactic Acid	**1.3**	**J**	2.0	1.0	0.14	1	12/19/18 00:53	
Propionic Acid	ND	U	2.0	1.0	0.19	1	12/19/18 00:53	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 09:10
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW20_121018	**Basis:**	NA
Lab Code:	R1811942-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**5.01**	mg/L	0.50	0.40	0.11	5	12/11/18 22:31	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 10:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW24_121018	**Basis:**	NA
Lab Code:	R1811942-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.54**	mg/L	0.10	0.08	0.03	1	12/11/18 22:31	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 11:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW19_121018	**Basis:**	NA
Lab Code:	R1811942-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**4.19**	mg/L	0.50	0.40	0.11	5	12/11/18 22:31	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 12:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW23_121018	**Basis:**	NA
Lab Code:	R1811942-004		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**50**	mg/L	10	8	3	100	12/11/18 22:31	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 13:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	LHSMW07_121018	**Basis:**	NA
Lab Code:	R1811942-005		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.43**	mg/L	0.10	0.08	0.03	1	12/11/18 22:31	*

QC Summary Forms

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811942
Date Analyzed: 12/18/18 16:38

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Method Blank
Lab Code: RQ1814001-01

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\121718\A0002588.D\

Analysis Method: Organic Acids

Analysis Lot:619495

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1814001-02	I:\ACQUDATA\hplc05\data\121718\A0002589.D\	12/18/18 17:35
Duplicate Lab Control Sample	RQ1814001-03	I:\ACQUDATA\hplc05\data\121718\A0002590.D\	12/18/18 18:28
35AWW20_121018	R1811942-001	I:\ACQUDATA\hplc05\data\121718\A0002593.D\	12/18/18 21:15
35AWW24_121018	R1811942-002	I:\ACQUDATA\hplc05\data\121718\A0002594.D\	12/18/18 22:08
35AWW19_121018	R1811942-003	I:\ACQUDATA\hplc05\data\121718\A0002595.D\	12/18/18 23:05
LHSMW07_121018	R1811942-005	I:\ACQUDATA\hplc05\data\121718\A0002597.D\	12/19/18 00:53
35AWW23_121018	R1811942-004	I:\ACQUDATA\hplc05\data\121918\A0002622.D\	12/20/18 03:28

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1814001-01	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	12/18/18 16:38	
Acetic Acid	ND U	4.0	2.0	1.0	1	12/18/18 16:38	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	12/18/18 16:38	
Lactic Acid	ND U	2.0	1.0	0.14	1	12/18/18 16:38	
Propionic Acid	ND U	2.0	1.0	0.19	1	12/18/18 16:38	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811942
Date Analyzed: 12/18/18 17:35

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Lab Control Sample
Lab Code: RQ1814001-02

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\121718\A0002589.D\

Analysis Method: Organic Acids

Analysis Lot:619495

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1814001-01	I:\ACQUDATA\hplc05\data\121718\A0002588.D\	12/18/18 16:38
Duplicate Lab Control Sample	RQ1814001-03	I:\ACQUDATA\hplc05\data\121718\A0002590.D\	12/18/18 18:28
35AWW20_121018	R1811942-001	I:\ACQUDATA\hplc05\data\121718\A0002593.D\	12/18/18 21:15
35AWW24_121018	R1811942-002	I:\ACQUDATA\hplc05\data\121718\A0002594.D\	12/18/18 22:08
35AWW19_121018	R1811942-003	I:\ACQUDATA\hplc05\data\121718\A0002595.D\	12/18/18 23:05
LHSMW07_121018	R1811942-005	I:\ACQUDATA\hplc05\data\121718\A0002597.D\	12/19/18 00:53
35AWW23_121018	R1811942-004	I:\ACQUDATA\hplc05\data\121918\A0002622.D\	12/20/18 03:28

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811942
Date Analyzed: 12/18/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample RQ1814001-02			Duplicate Lab Control Sample RQ1814001-03					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	2.97	2.02	147 *	2.97	2.02	147 *	73-122	<1	30
Acetic Acid	Organic Acids	19.8	19.9	99	20.1	19.9	101	80-130	1	30
Butanoic Acid (Butyric Acid)	Organic Acids	18.0	20.3	89	18.0	20.3	88	86-128	<1	30
Lactic Acid	Organic Acids	21.3	20.6	103	21.4	20.6	104	81-114	<1	30
Propionic Acid	Organic Acids	19.2	20.0	96	18.6	20.0	93	63-153	3	30

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1811942-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	ND U	mg/L	0.10	0.08	0.03	1	12/11/18 22:31	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18
Sample Matrix:	Water	**Date Received:**	12/11/18
		Date Analyzed:	12/11/18

Duplicate Matrix Spike Summary
Iron, Divalent (Ferrous Iron)

Sample Name:	LHSMW07_121018	**Units:**	mg/L
Lab Code:	R1811942-005	**Basis:**	NA
Analysis Method:	SM 3500-Fe B.4.c		

		Matrix Spike R1811942-005MS			Duplicate Matrix Spike R1811942-005DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Iron, Divalent (Ferrous Iron)	0.43	0.76	0.40	83	0.77	0.40	85	67-129	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811942
Date Analyzed: 12/11/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1811942-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	0.38	0.40	95	67-129

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811942
Project: LHAAP / Site 58/NWO1312.0150

Continuing Calibration Blank (CCB) Summary
Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	619160	RQ1813871-02	12/11/18 22:31	0.10	0.08	0.03	ND	U
CCB2	619160	RQ1813871-05	12/11/18 22:31	0.10	0.08	0.03	ND	U

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** R1811942
Project: LHAAP / Site 58/NWO1312.0150

Continuing Calibration Verification (CCV) Summary

Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	619160	RQ1813871-01	12/11/18 22:31	2.00	2.04	102	90-110
CCV2	619160	RQ1813871-06	12/11/18 22:31	2.00	2.03	101	90-110

Raw Data

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 09:10
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW20_121018	**Units:**	mg/L
Lab Code:	R1811942-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	12/18/18 21:15	
Acetic Acid	**8.3**		4.0	2.0	1.0	1	12/18/18 21:15	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	12/18/18 21:15	
Lactic Acid	**1.3**	**J**	2.0	1.0	0.14	1	12/18/18 21:15	
Propionic Acid	ND	U	2.0	1.0	0.19	1	12/18/18 21:15	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 10:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW24_121018	**Units:**	mg/L
Lab Code:	R1811942-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	12/18/18 22:08	
Acetic Acid	ND U	4.0	2.0	1.0	1	12/18/18 22:08	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	12/18/18 22:08	
Lactic Acid	ND U	2.0	1.0	0.14	1	12/18/18 22:08	
Propionic Acid	ND U	2.0	1.0	0.19	1	12/18/18 22:08	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 11:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW19_121018	**Units:**	mg/L
Lab Code:	R1811942-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	12/18/18 23:05	
Acetic Acid	ND U	4.0	2.0	1.0	1	12/18/18 23:05	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	12/18/18 23:05	
Lactic Acid	ND U	2.0	1.0	0.14	1	12/18/18 23:05	
Propionic Acid	ND U	2.0	1.0	0.19	1	12/18/18 23:05	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 12:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW23_121018	**Units:**	mg/L
Lab Code:	R1811942-004	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	2.0	1.0	0.16	10	12/20/18 03:28	
Acetic Acid	**570**		40	20	10	10	12/20/18 03:28	
Butanoic Acid (Butyric Acid)	**140**		20	10	3.2	10	12/20/18 03:28	
Lactic Acid	ND	U	20	10	1.4	10	12/20/18 03:28	
Propionic Acid	**850**		20	10	1.9	10	12/20/18 03:28	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 13:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	LHSMW07_121018	**Units:**	mg/L
Lab Code:	R1811942-005	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

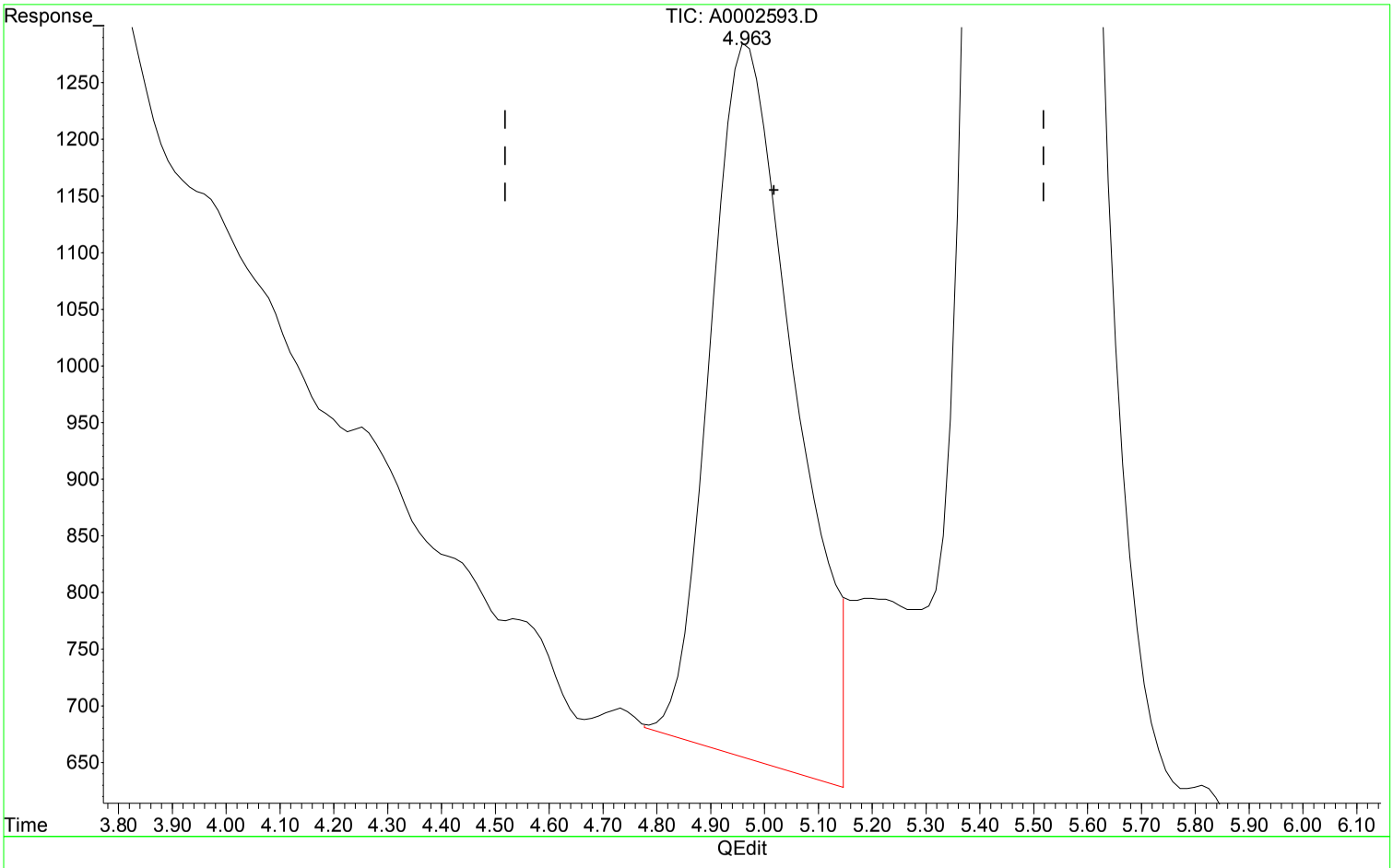
Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	12/19/18 00:53	
Acetic Acid	ND	U	4.0	2.0	1.0	1	12/19/18 00:53	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	12/19/18 00:53	
Lactic Acid	**1.3**	**J**	2.0	1.0	0.14	1	12/19/18 00:53	
Propionic Acid	ND	U	2.0	1.0	0.19	1	12/19/18 00:53	

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002593.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:48:30
Operator : b.allgeier
Sample : r1811942-001
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.963min 1.303 ppm m

response 70050

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:17:28 2018

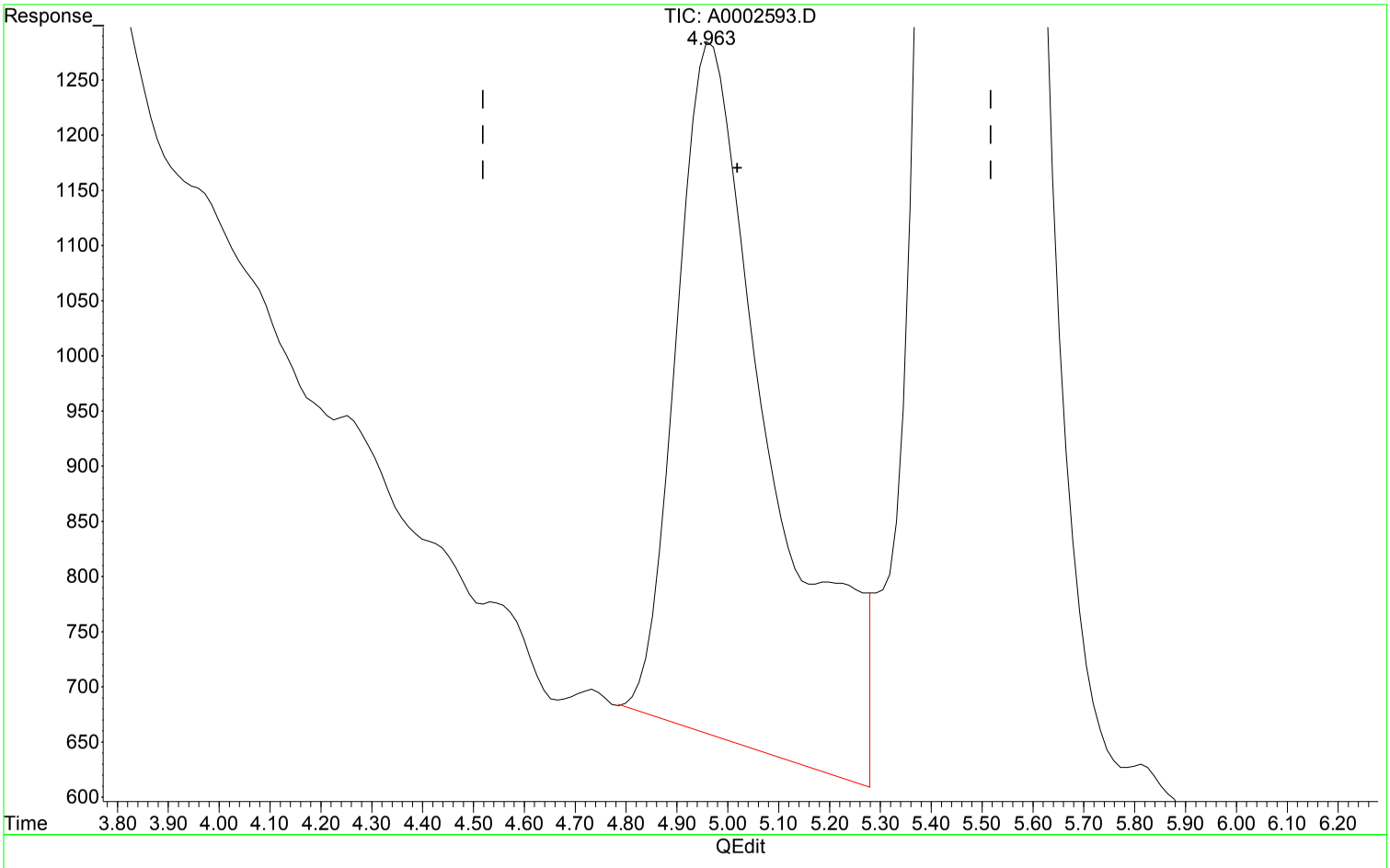
00944517

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002593.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:48:30
Operator : b.allgeier
Sample : r1811942-001
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.971min 1.521 ppm

response 81782

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:17:21 2018

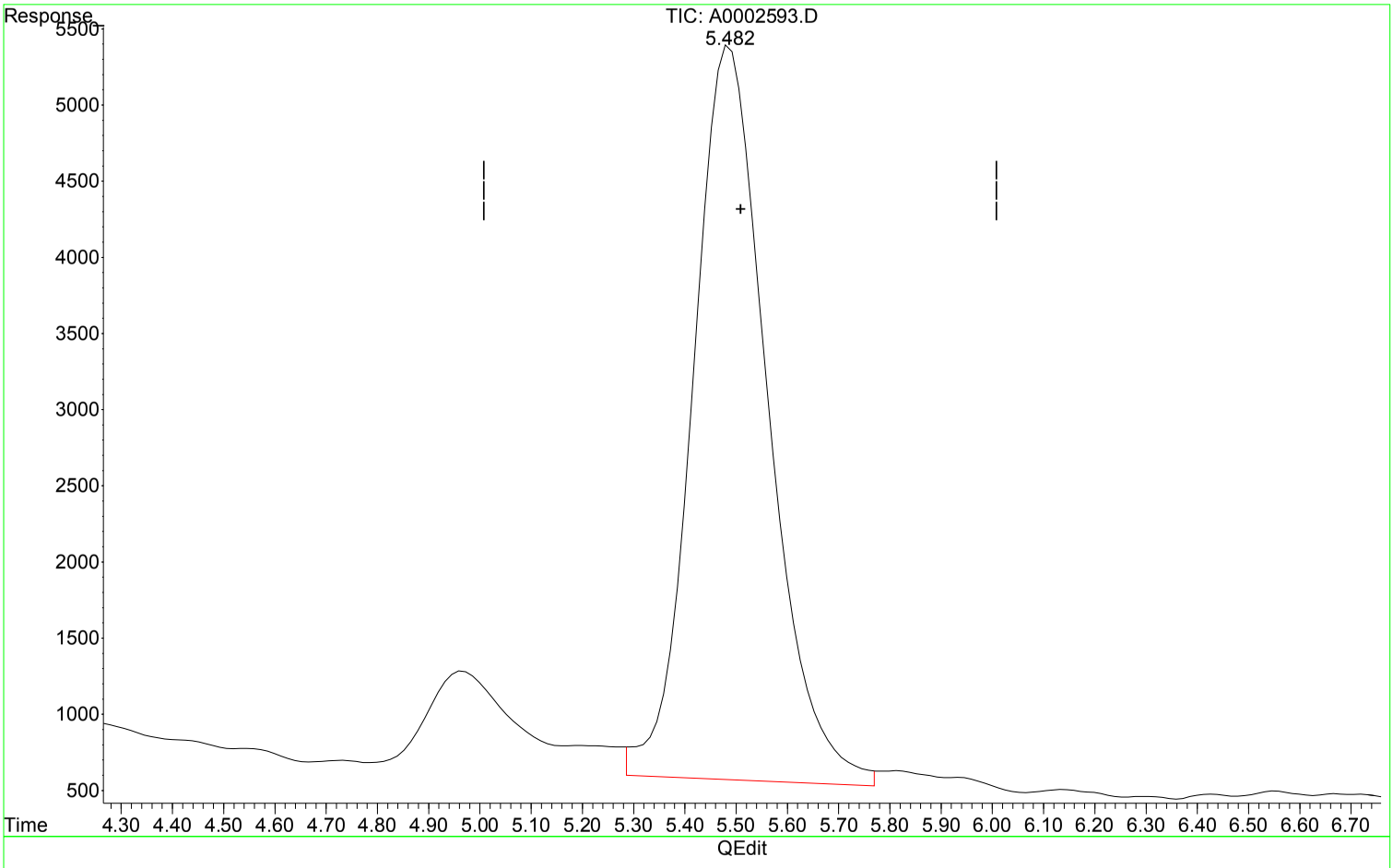
00944518

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002593.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:48:30
Operator : b.allgeier
Sample : r1811942-001
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.482min 8.275 ppm m

response 489639

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

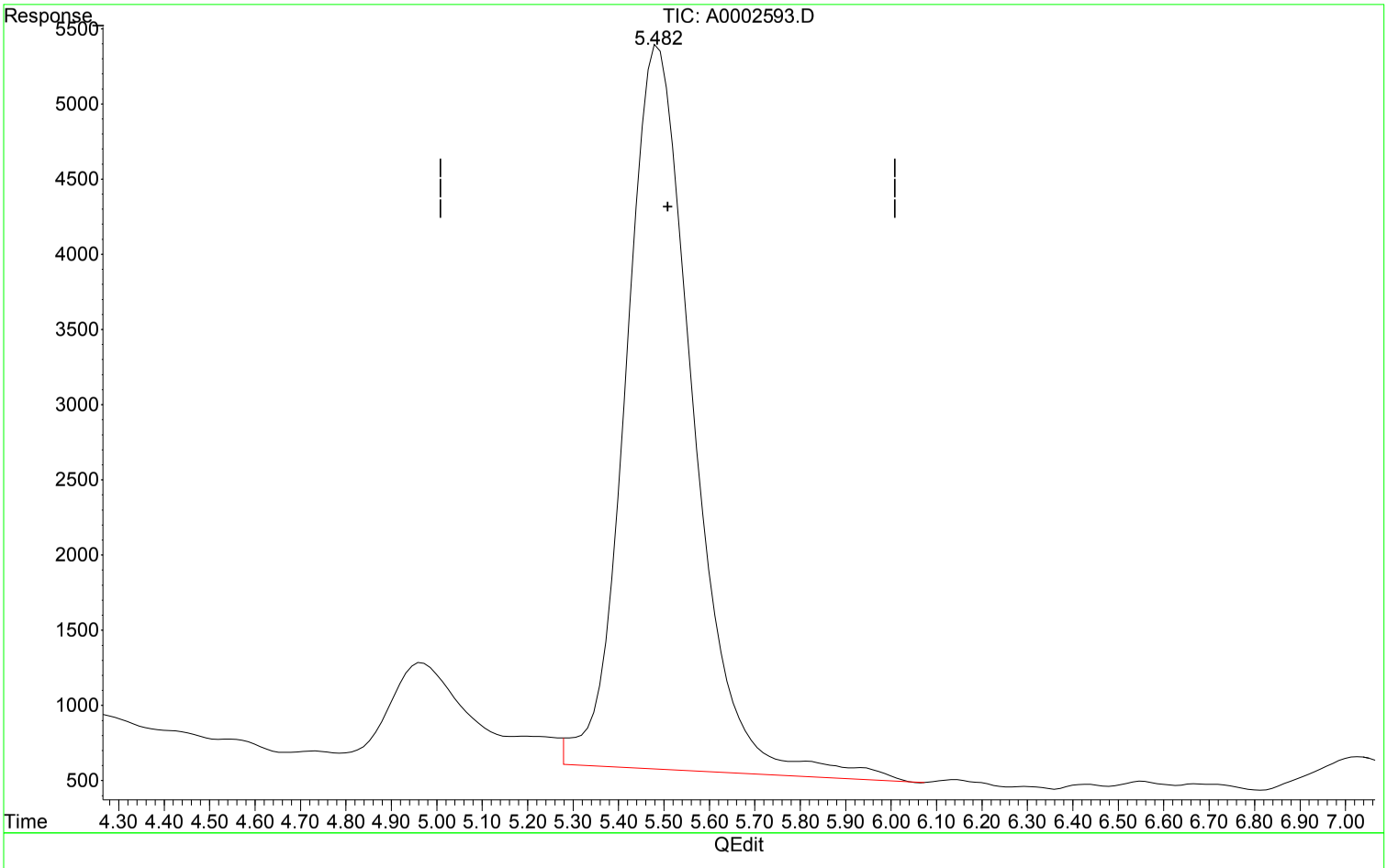
00944519

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002593.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:48:30
Operator : b.allgeier
Sample : r1811942-001
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.489min 8.478 ppm

response 501653

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:17:32 2018

00944520

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002593.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 02:48:30~~ 18-Dec-2018, 21:15:00
Operator : b.allgeier
Sample : r1811942-001
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	
3) T	Lactic Acid	4.963	70050	1.303	ppm	m
4) T	Acetic Acid	5.482	489639	8.275	ppm	m
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

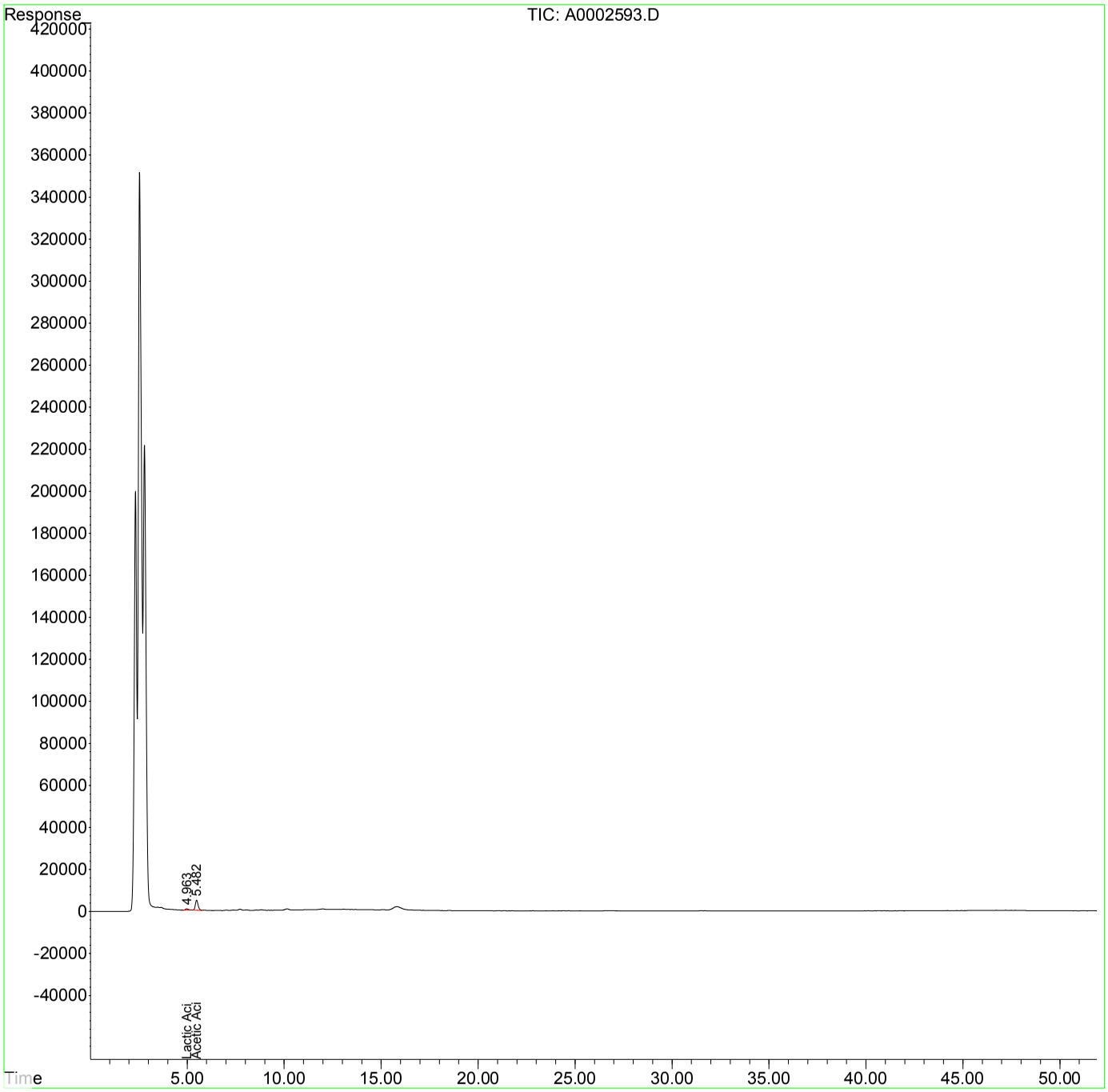
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002593.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:48:30
Operator : b.allgeier
Sample : r1811942-001
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:05 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002594.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 22:08:14
Operator : b.allgeier
Sample : r1811942-002
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:07 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

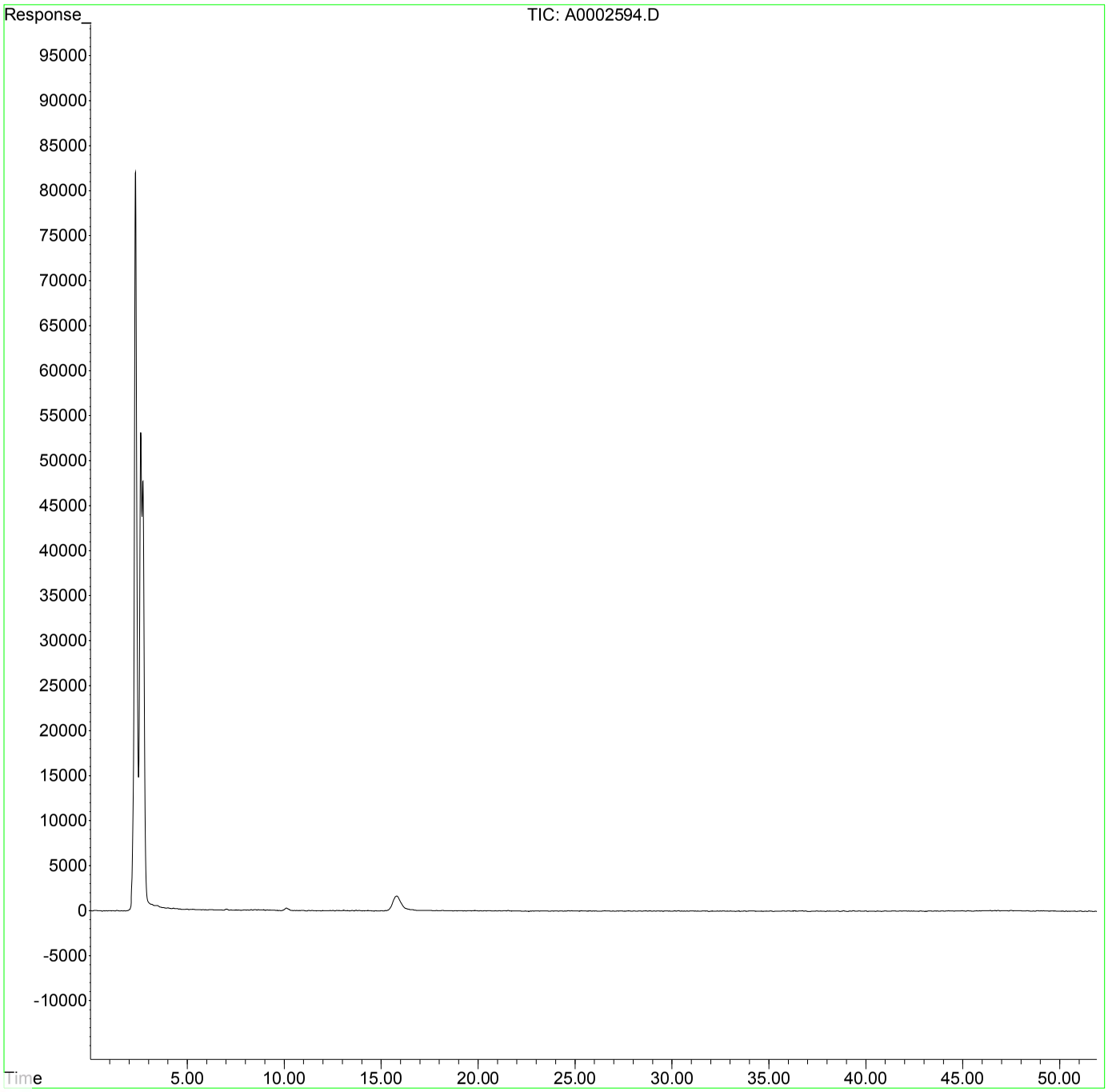
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002594.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 22:08:14
Operator : b.allgeier
Sample : r1811942-002
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:07 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944524

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002595.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 01:28:29~~ 18-Dec-2018, 23:05:00
Operator : b.allgeier
Sample : r1811942-003
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:09 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

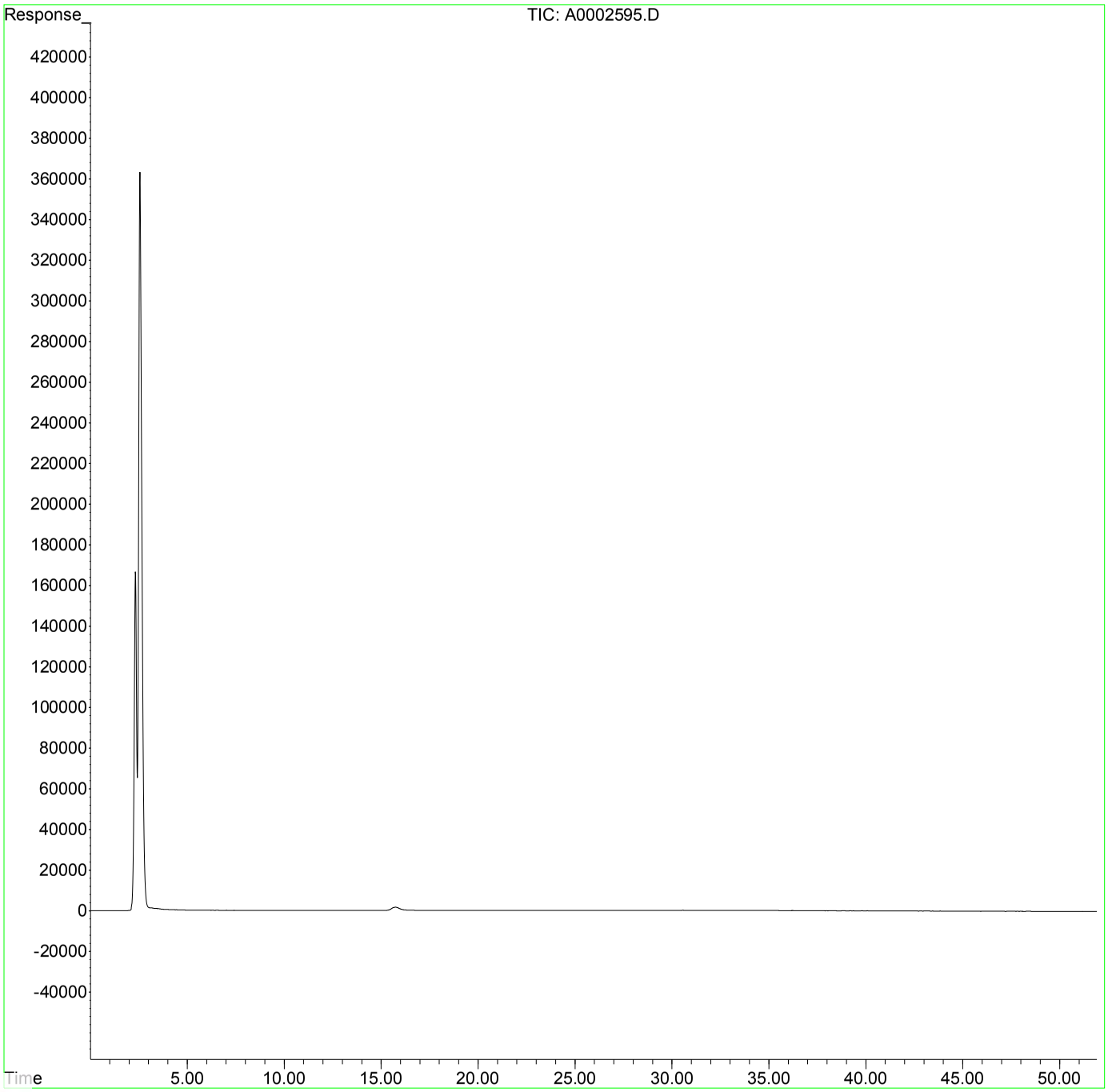
00944525

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002595.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:28:29
Operator : b.allgeier
Sample : r1811942-003
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:09 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002622.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 03:28:04
Operator : b.allgeier
Sample : r1811942-004|10
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:44 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	d
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	5.539	3359593	56.779	ppm	
5) T	Propionic Acid	14.279	5086660	85.359	ppm	
6) T	Butyric Acid	45.850	890049	14.151	ppm	

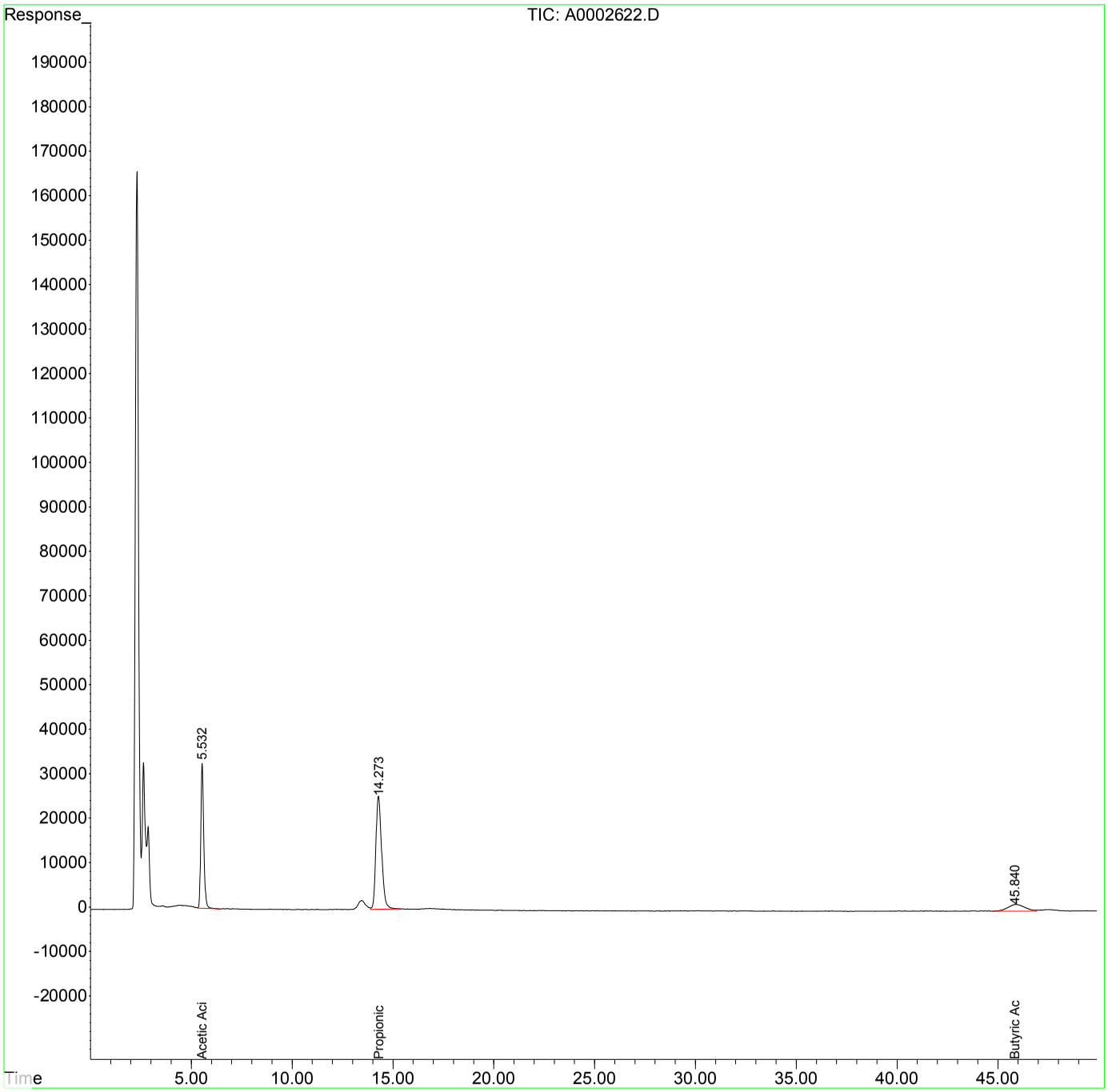
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002622.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 03:28:04
Operator : b.allgeier
Sample : r1811942-004|10
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:44 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

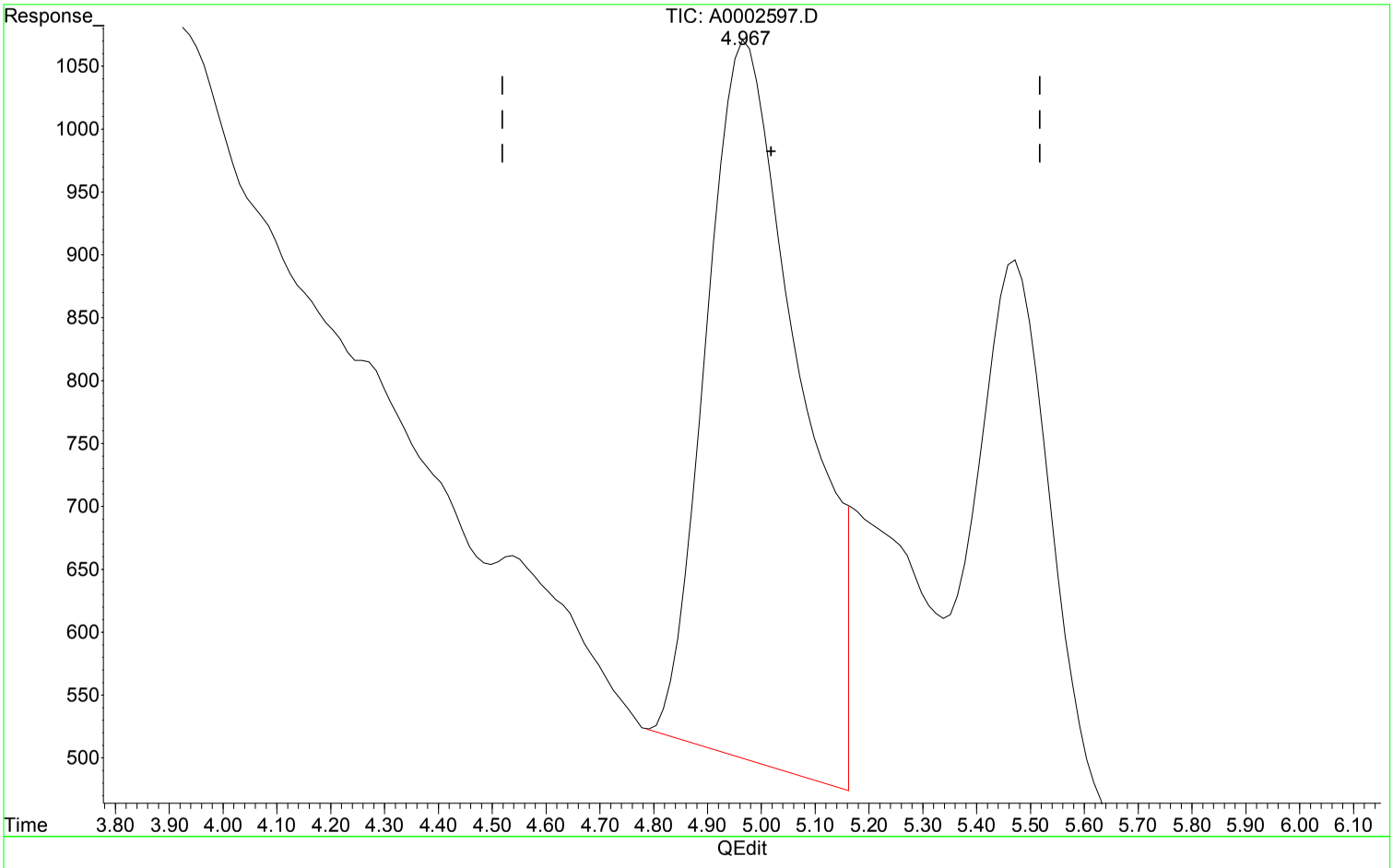


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002597.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 00:53:09
Operator : b.allgeier
Sample : r1811942-005
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.967min 1.276 ppm m

response 68620

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

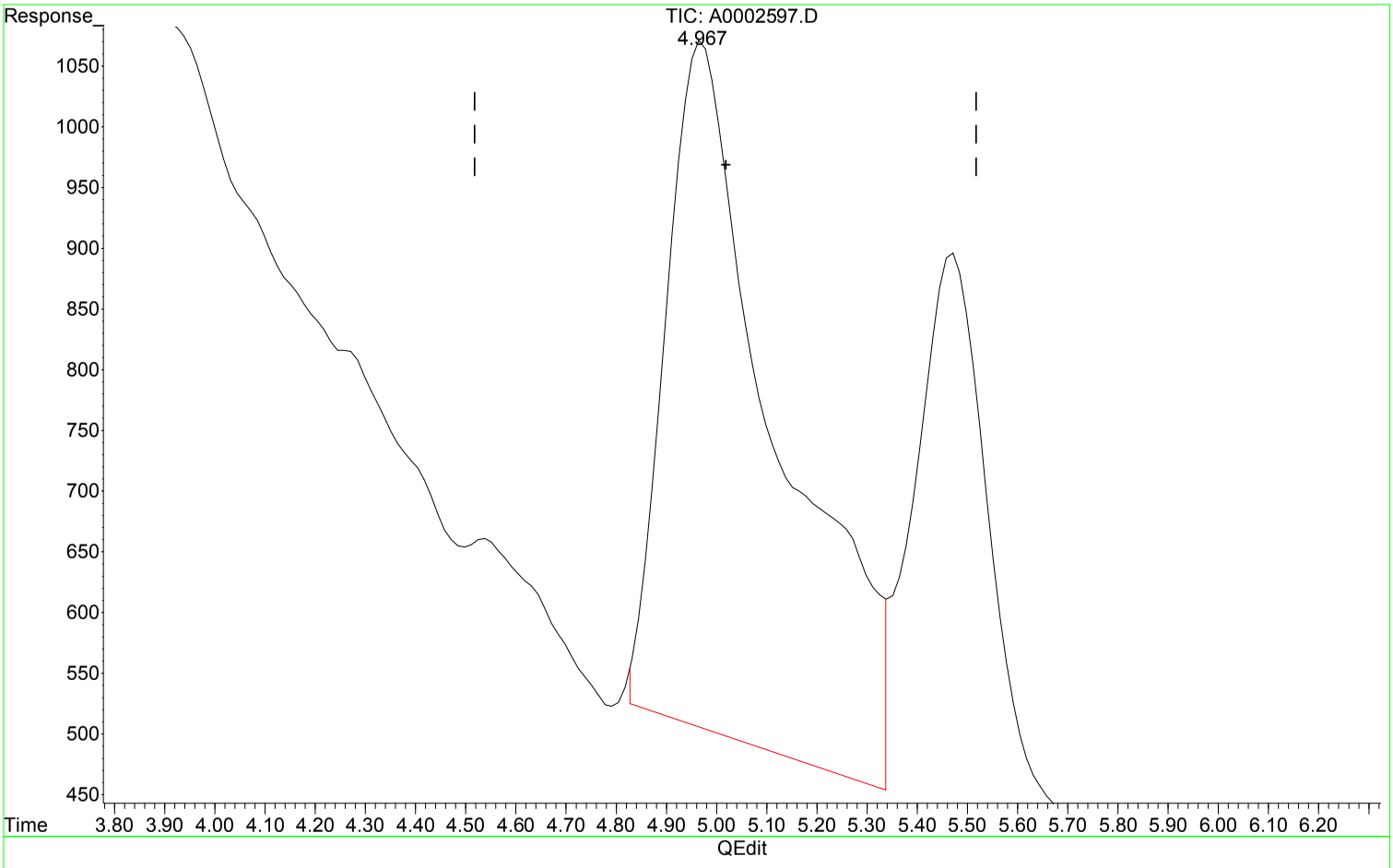
00944529

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002597.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 00:53:09
Operator : b.allgeier
Sample : r1811942-005
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.974min 1.645 ppm

response 88454

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:19:32 2018

00944530

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002597.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 00:53:09
Operator : b.allgeier
Sample : r1811942-005
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	
3) T	Lactic Acid	4.967	68620	1.276	ppm	m
4) T	Acetic Acid	5.473	50455	0.853	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

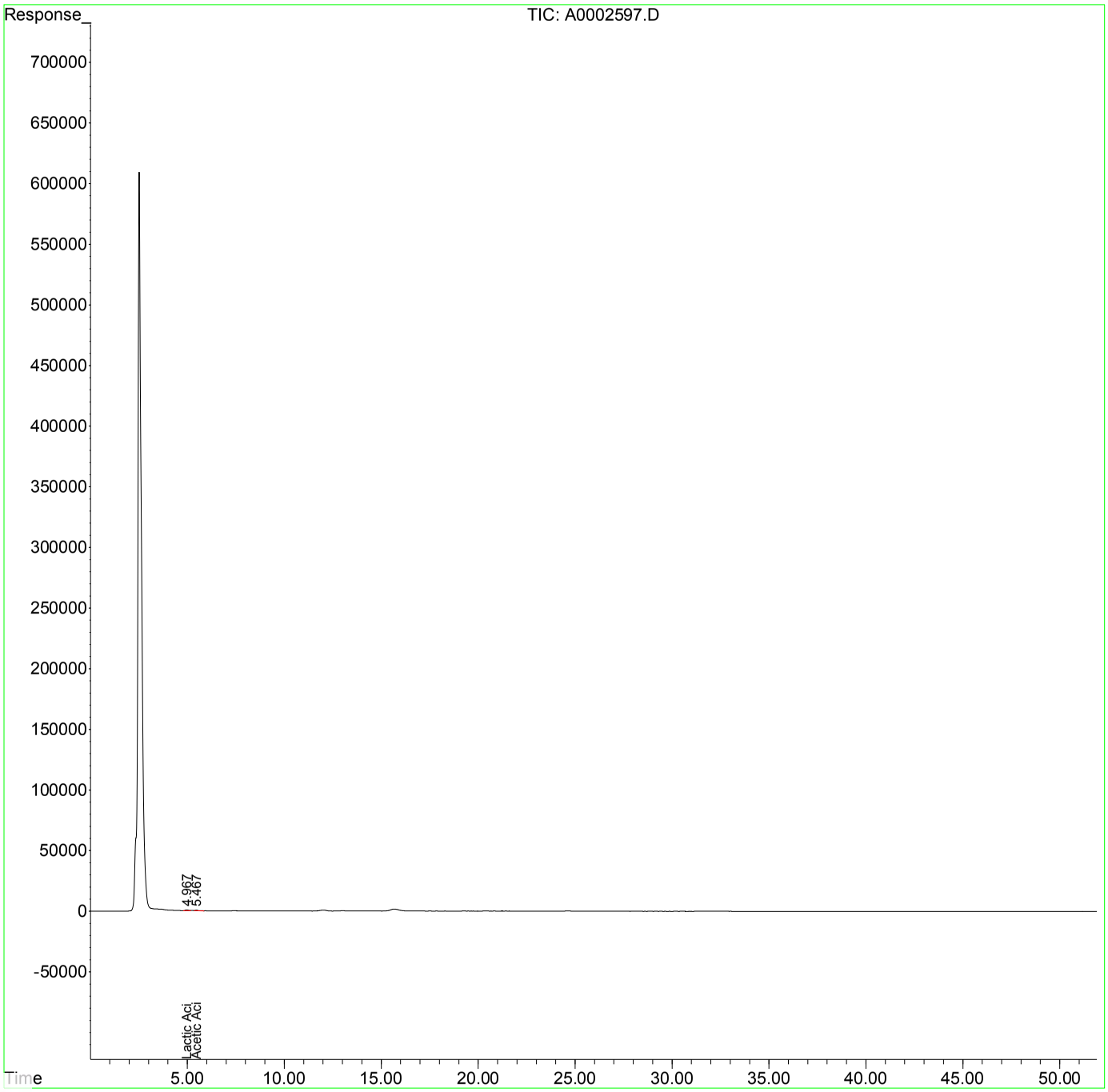
00944531

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002597.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 00:53:09
Operator : b.allgeier
Sample : r1811942-005
Misc :
ALS Vial : 11 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:13 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002588.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 16:38:32
Operator : b.allgeier
Sample : MB
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:55 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	d
2) T	Pyruvic acid	0.000	0	N.D.	ppm	
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	0.000	0	N.D.	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

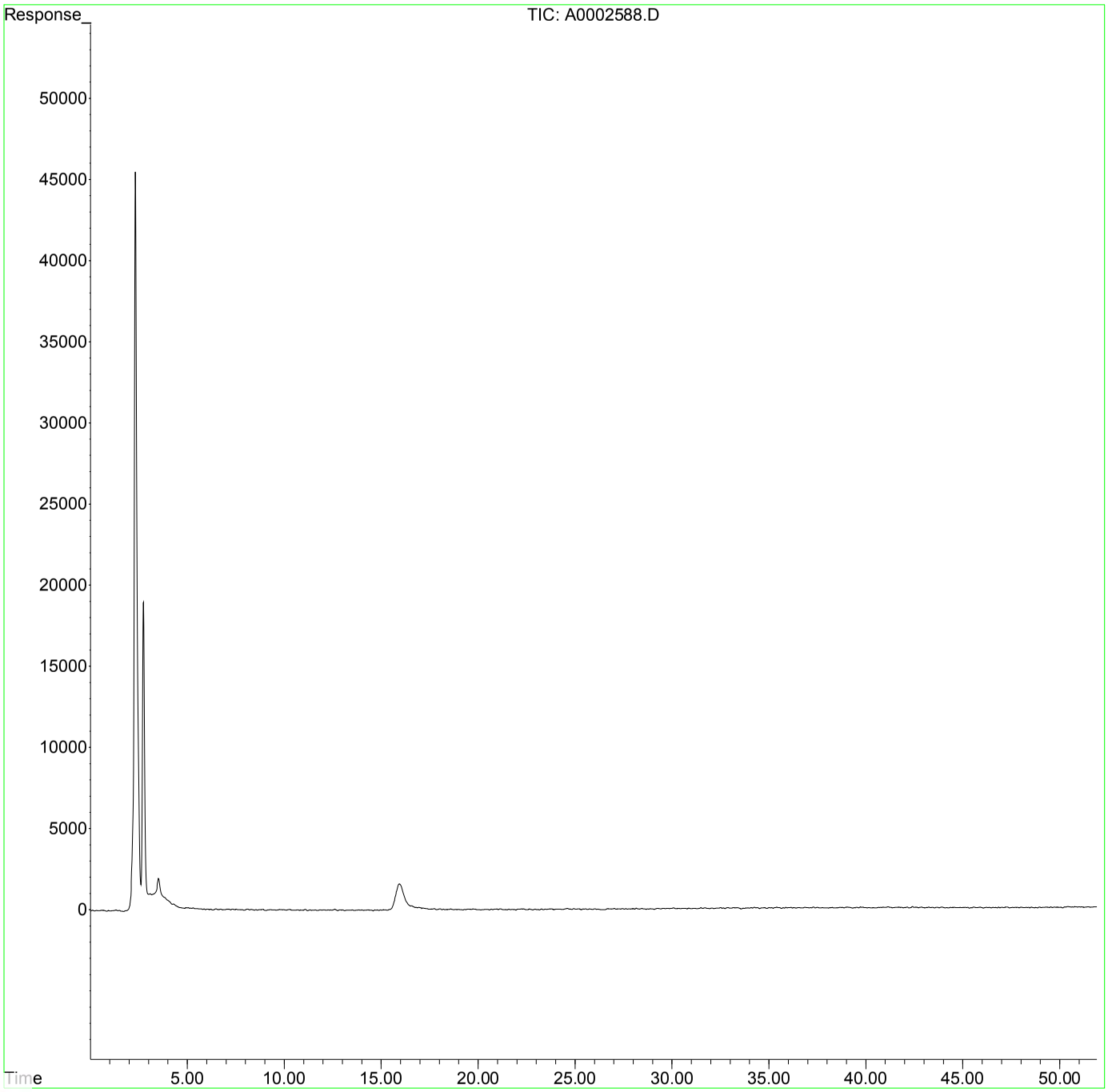
00944533

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002588.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 16:38:32
Operator : b.allgeier
Sample : MB
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:55 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

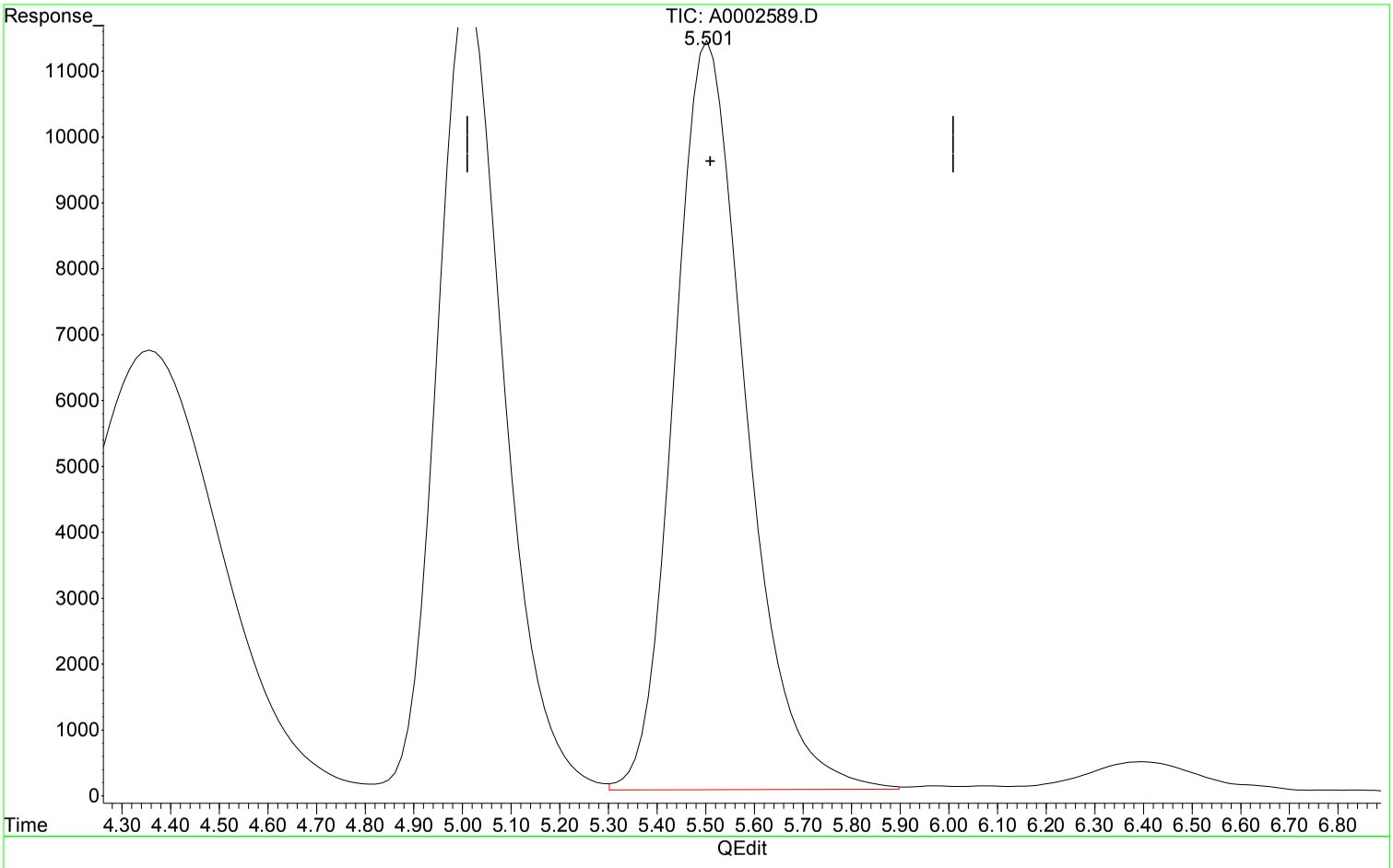


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.501min 19.770 ppm m

response 1169791

Manual Integration:

After

Poor integration.

12/19/18

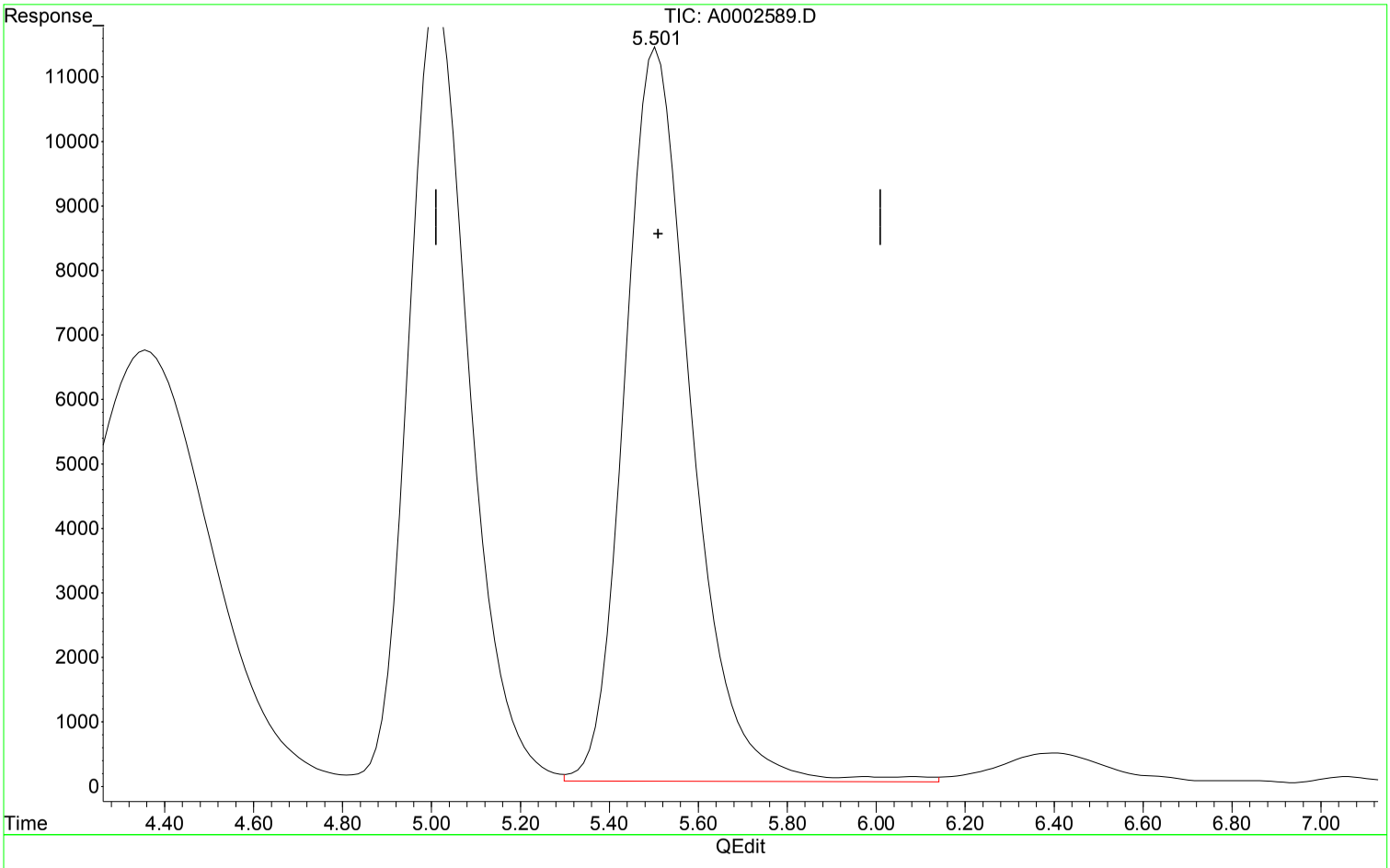
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.507min 20.052 ppm

response 1186474

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

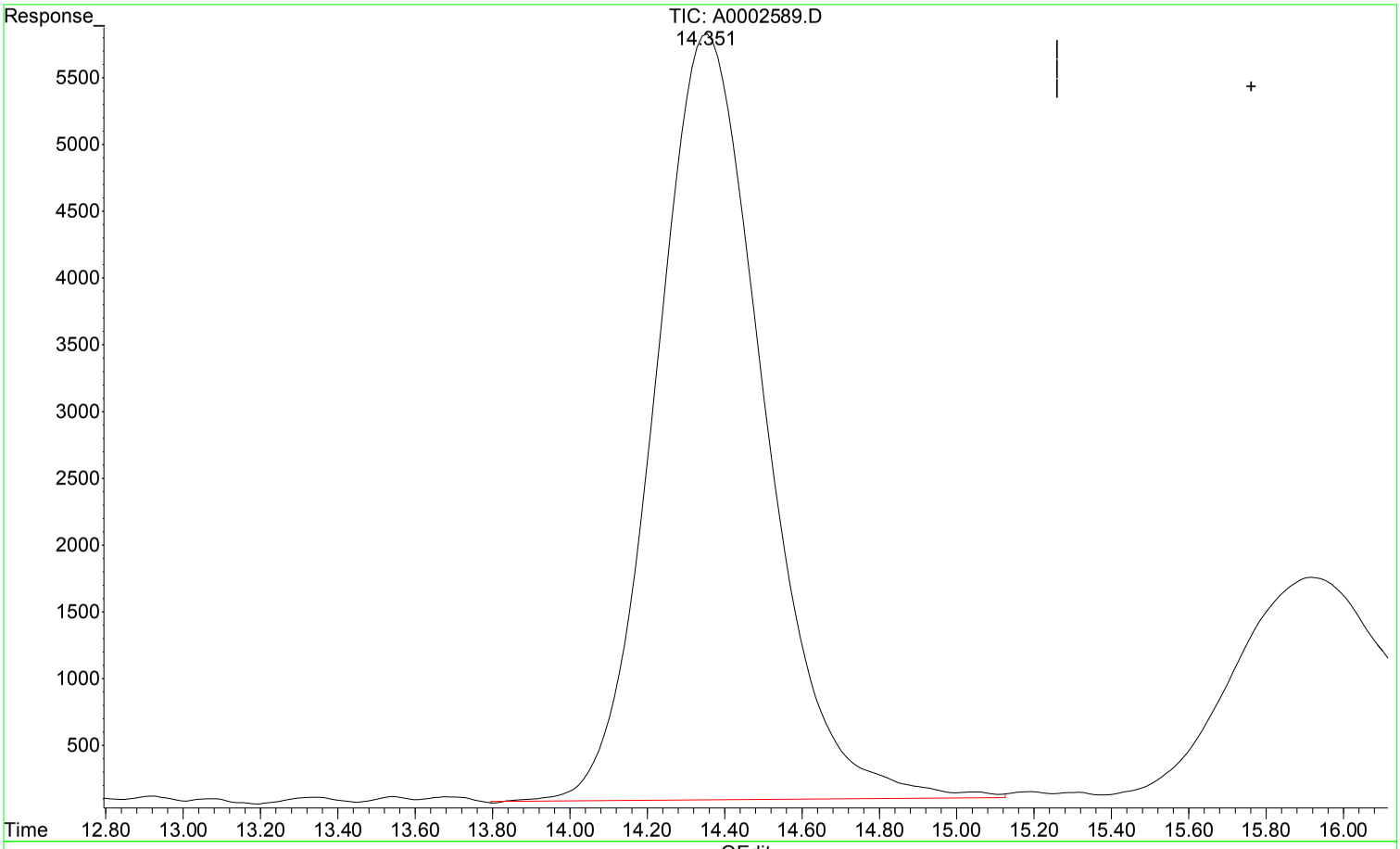
00944536

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:01:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:01:05 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.351min 18.786 ppm m

response 1119471

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:12:31 2018

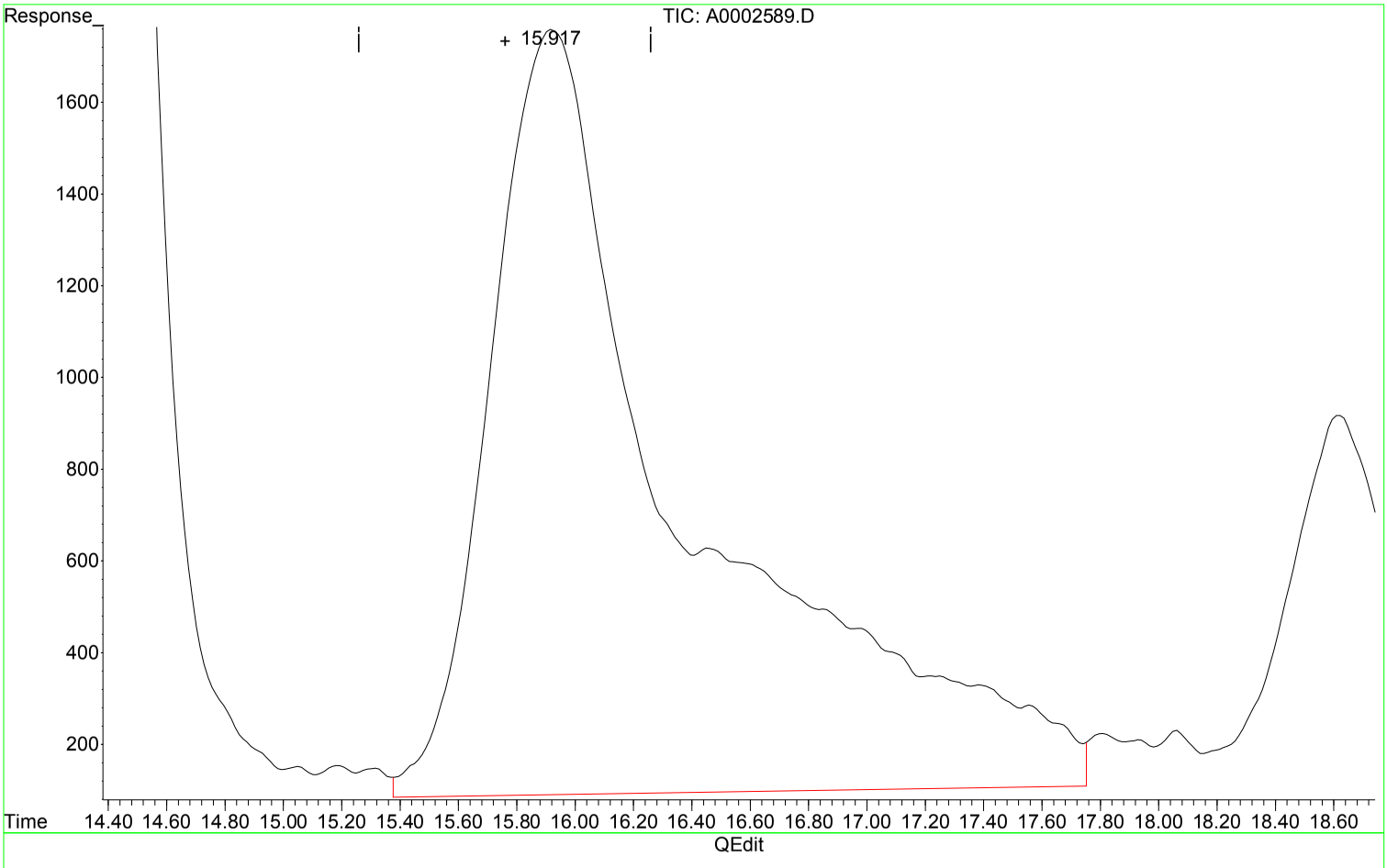
00944537

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:01:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:01:05 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

15.925min 13.163 ppm

response 784404

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:12:25 2018

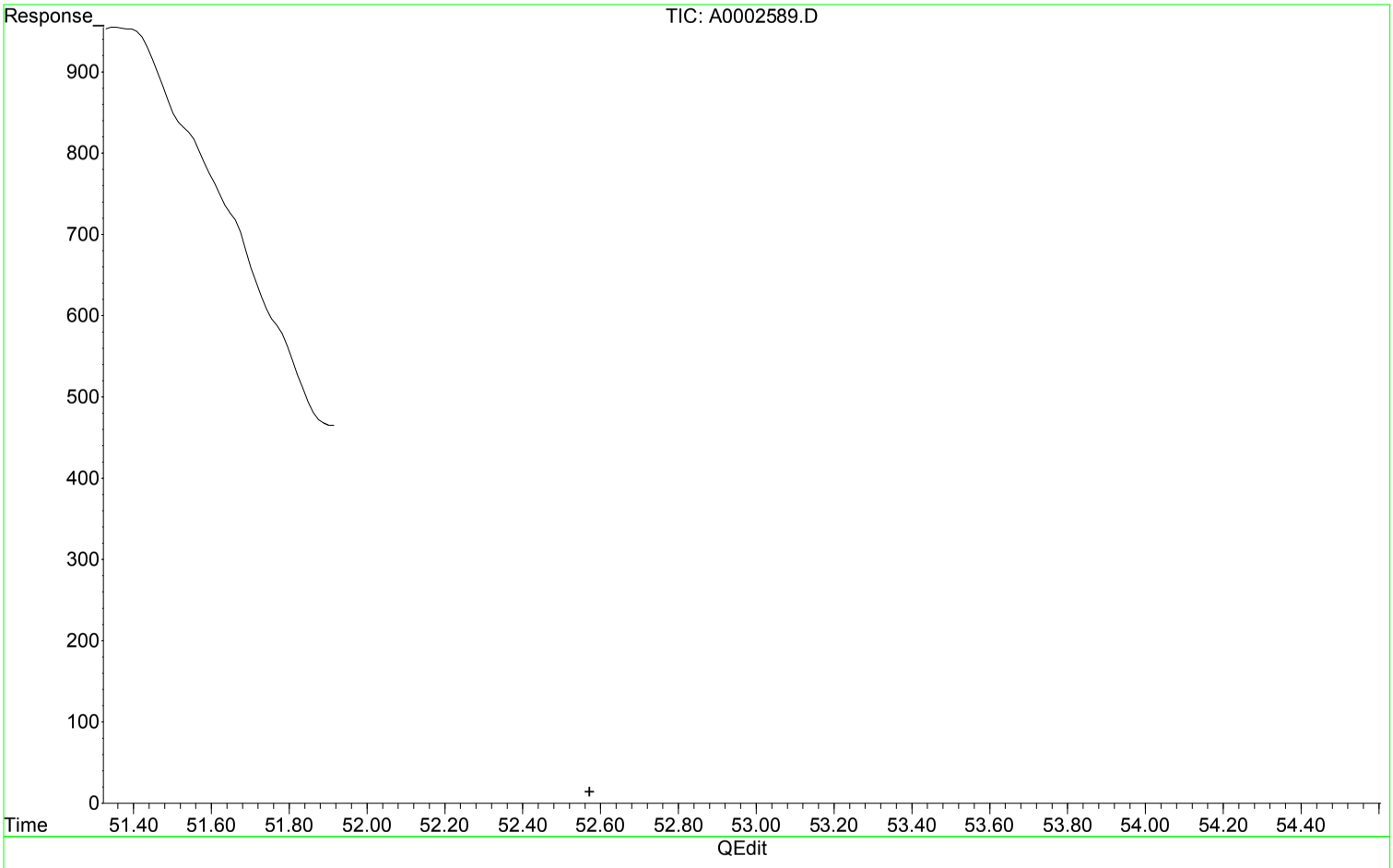
00944538

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:01:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:01:05 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

52.572min 0.000 ppm

response 0

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:12:42 2018

00944539

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 02:47:47~~ 18-Dec-2018, 17:35:00
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.398	1948872	20.228	ppm	
2) T	Pyruvic acid	4.361	1343905	2.967	ppm	
3) T	Lactic Acid	5.016	1147308	21.339	ppm	
4) T	Acetic Acid	5.501	1169791	19.770	ppm	m
5) T	Propionic Acid	14.358	1142782	19.177	ppm	
6) T	Butyric Acid	46.164	1132410	18.004	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

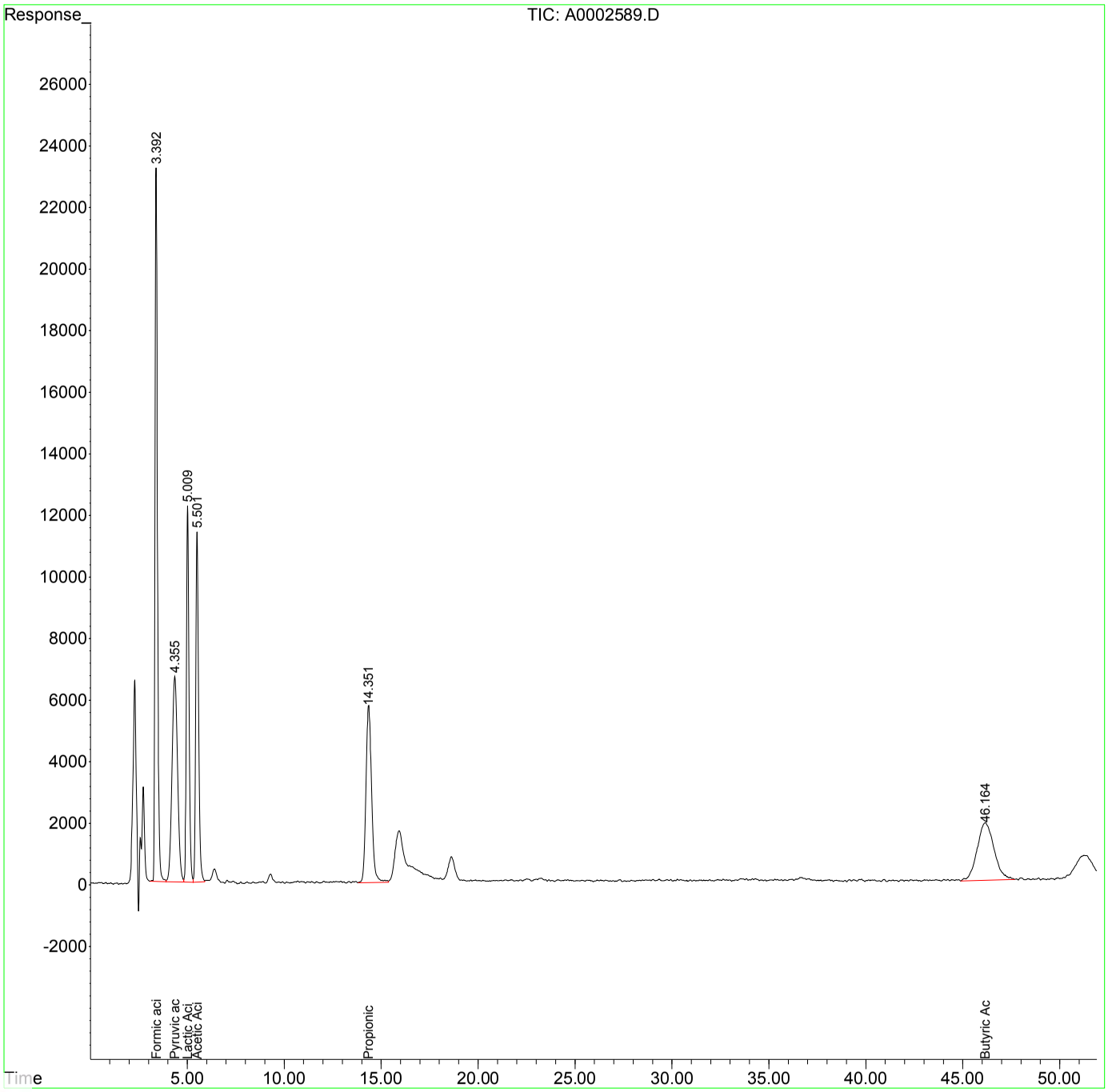
00944540

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

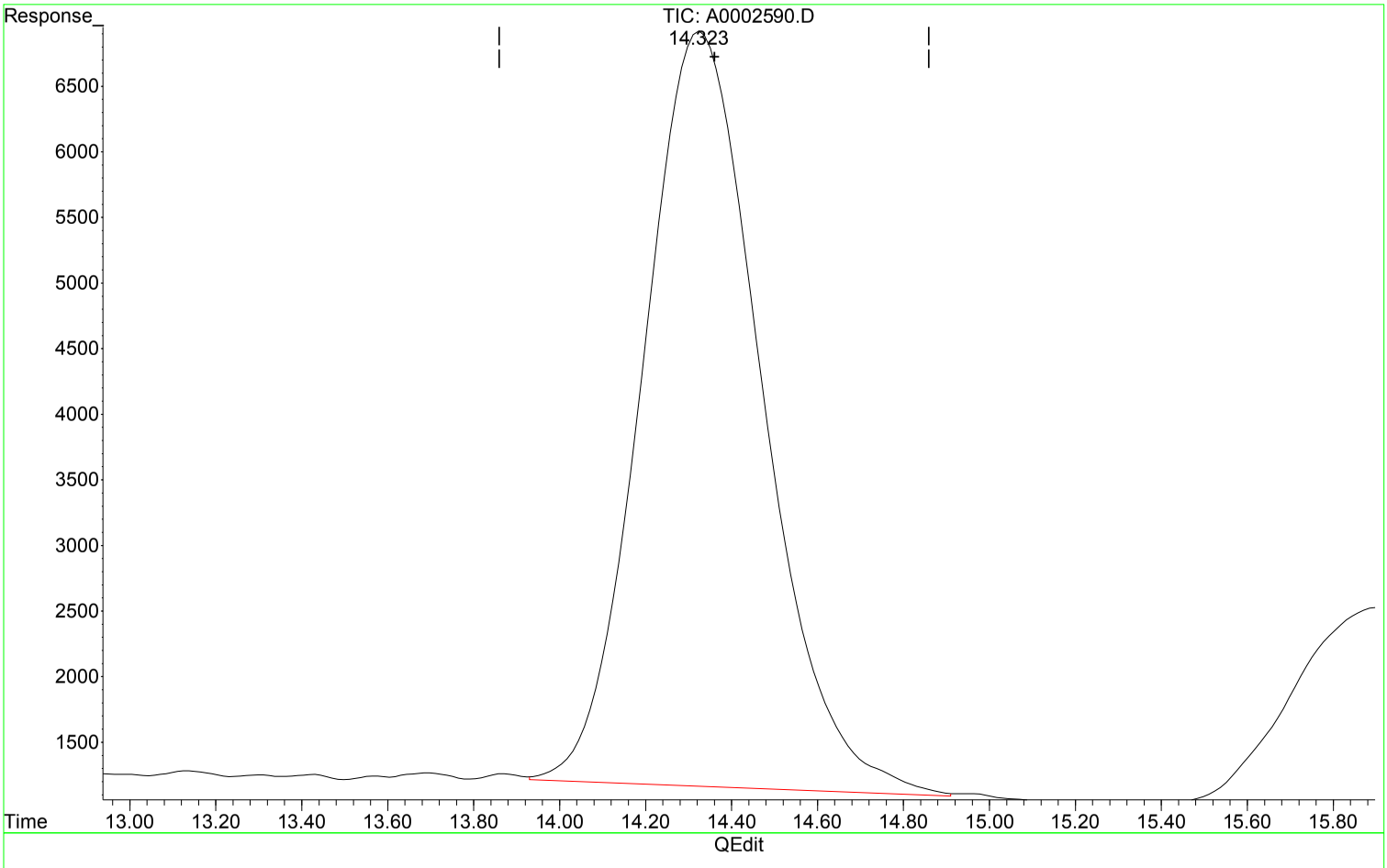


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.323min 18.639 ppm m

response 1110701

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

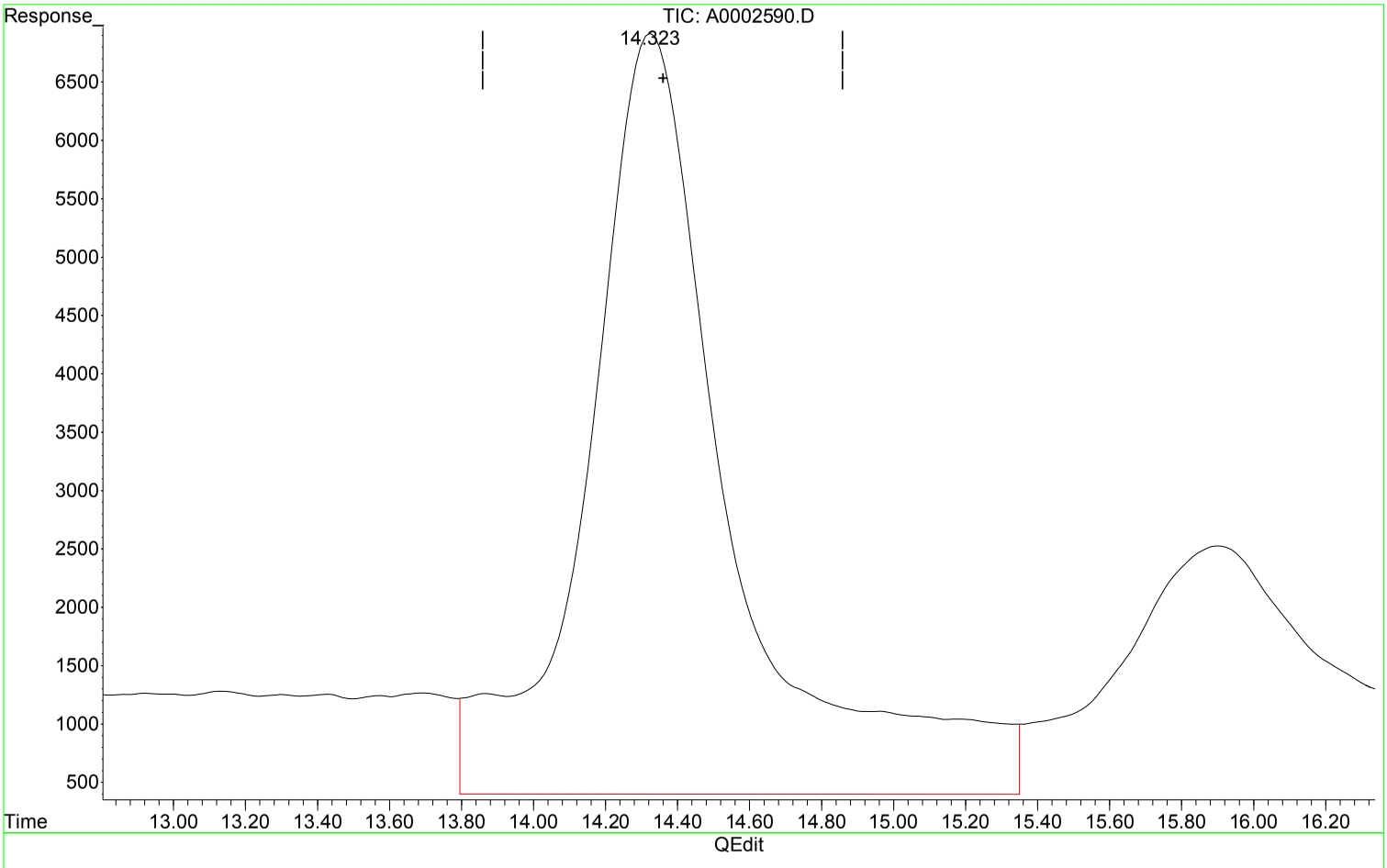
00944542

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.329min 30.117 ppm

response 1794742

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:15:55 2018

00944543

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.398	1956662	20.309	ppm	
2) T	Pyruvic acid	4.359	1346166	2.972	ppm	
3) T	Lactic Acid	5.014	1149193	21.374	ppm	
4) T	Acetic Acid	5.505	1186924	20.060	ppm	
5) T	Propionic Acid	14.323	1110701	18.639	ppm	m
6) T	Butyric Acid	46.044	1131013	17.982	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

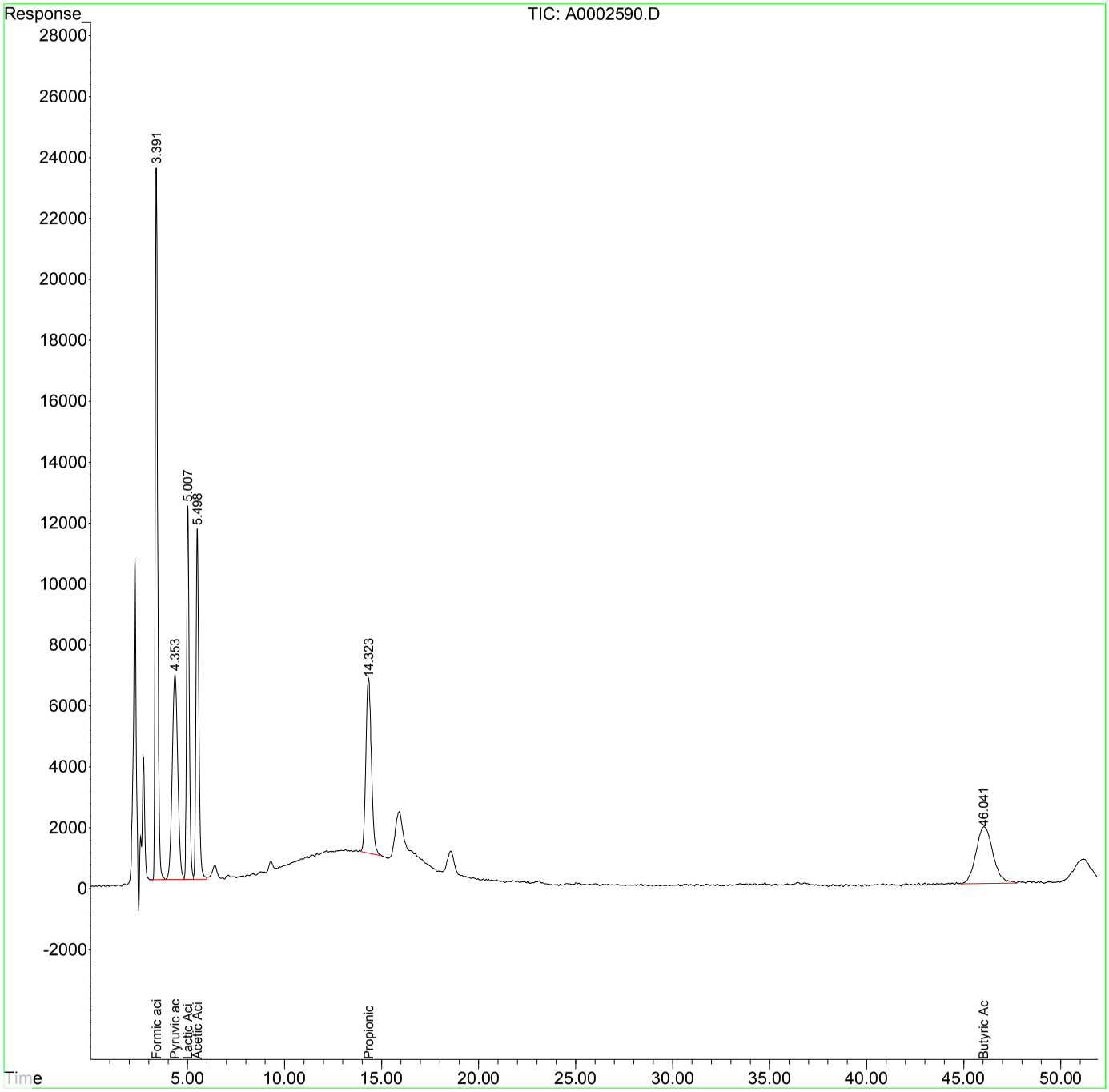
00944544

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002587.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 02:47:53~~ 18-Dec-2018, 15:45:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.545 E3	-1.2	101	0.00
2 T	Pyruvic acid	452.935	451.371 E3	0.3	98	0.00
3 T	Lactic Acid	53.765	58.152 E3	-8.2	107	0.00
4 T	Acetic Acid	59.169	60.054 E3	-1.5	99	0.00
5 T	Propionic Acid	59.592	58.025 E3	2.6	98	0.00
6 T	Butyric Acid	62.897	55.870 E3	11.2	95	0.00

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002587.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 02:47:53~~ 18-Dec-2018, 15:45:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.398	4877269	50.624 ppm
2) T	Pyruvic acid	4.365	2256853	4.983 ppm
3) T	Lactic Acid	5.018	2907596	54.080 ppm
4) T	Acetic Acid	5.509	3002708	50.748 ppm
5) T	Propionic Acid	14.360	2901256	48.686 ppm
6) T	Butyric Acid	46.228	2793510	44.414 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

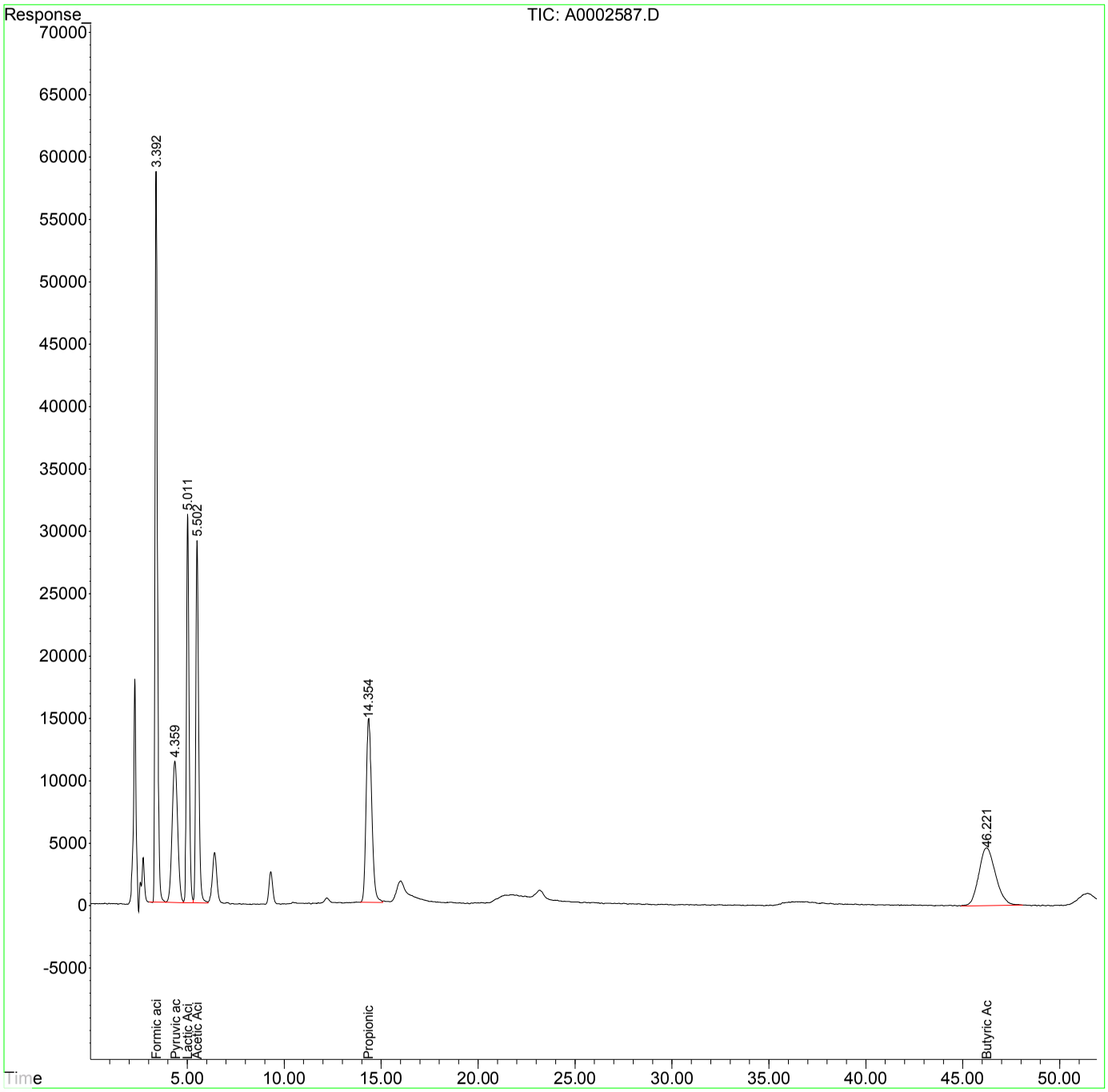
00944547

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002587.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:53
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

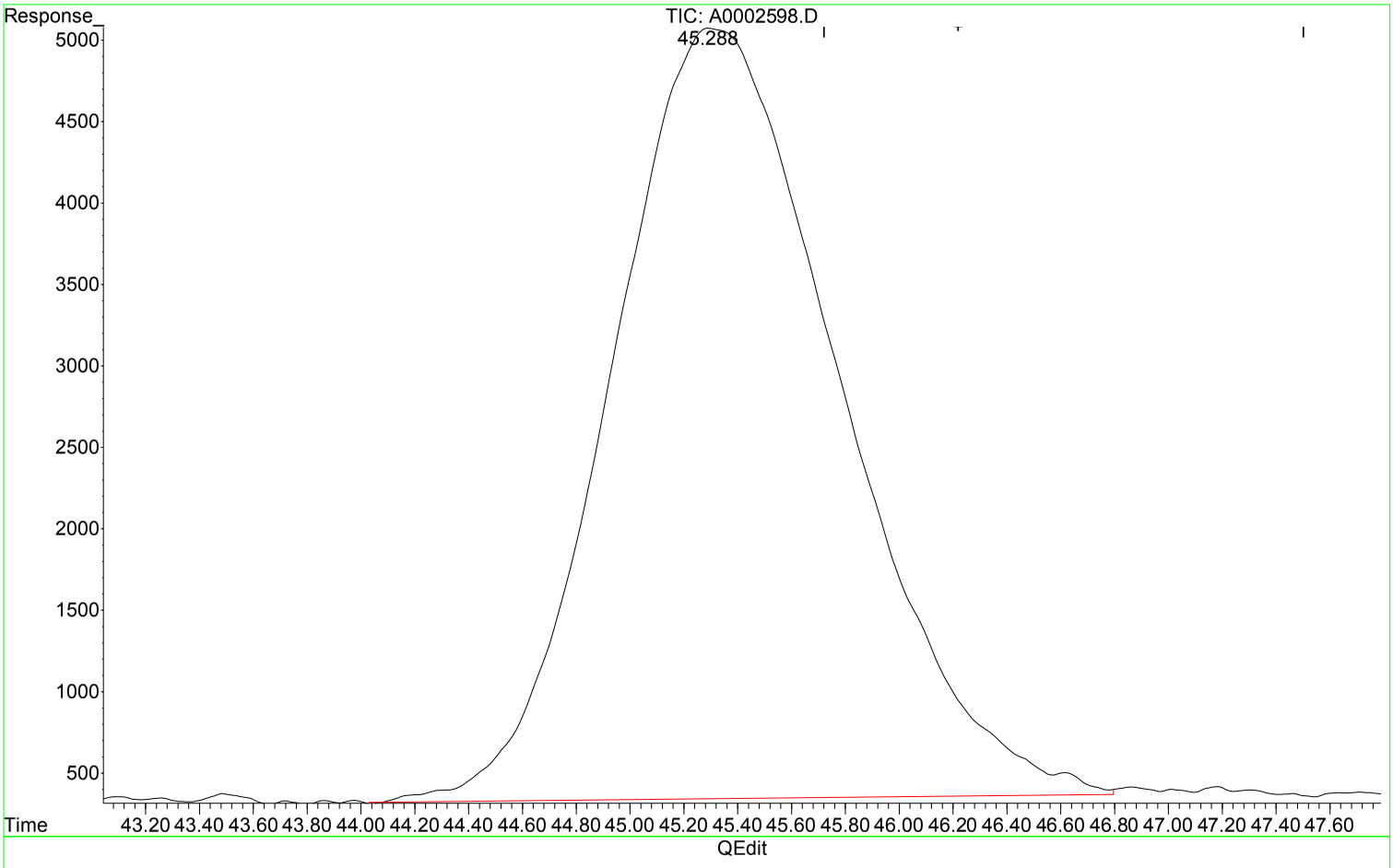


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

45.288min 44.291 ppm m

response 2785759

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

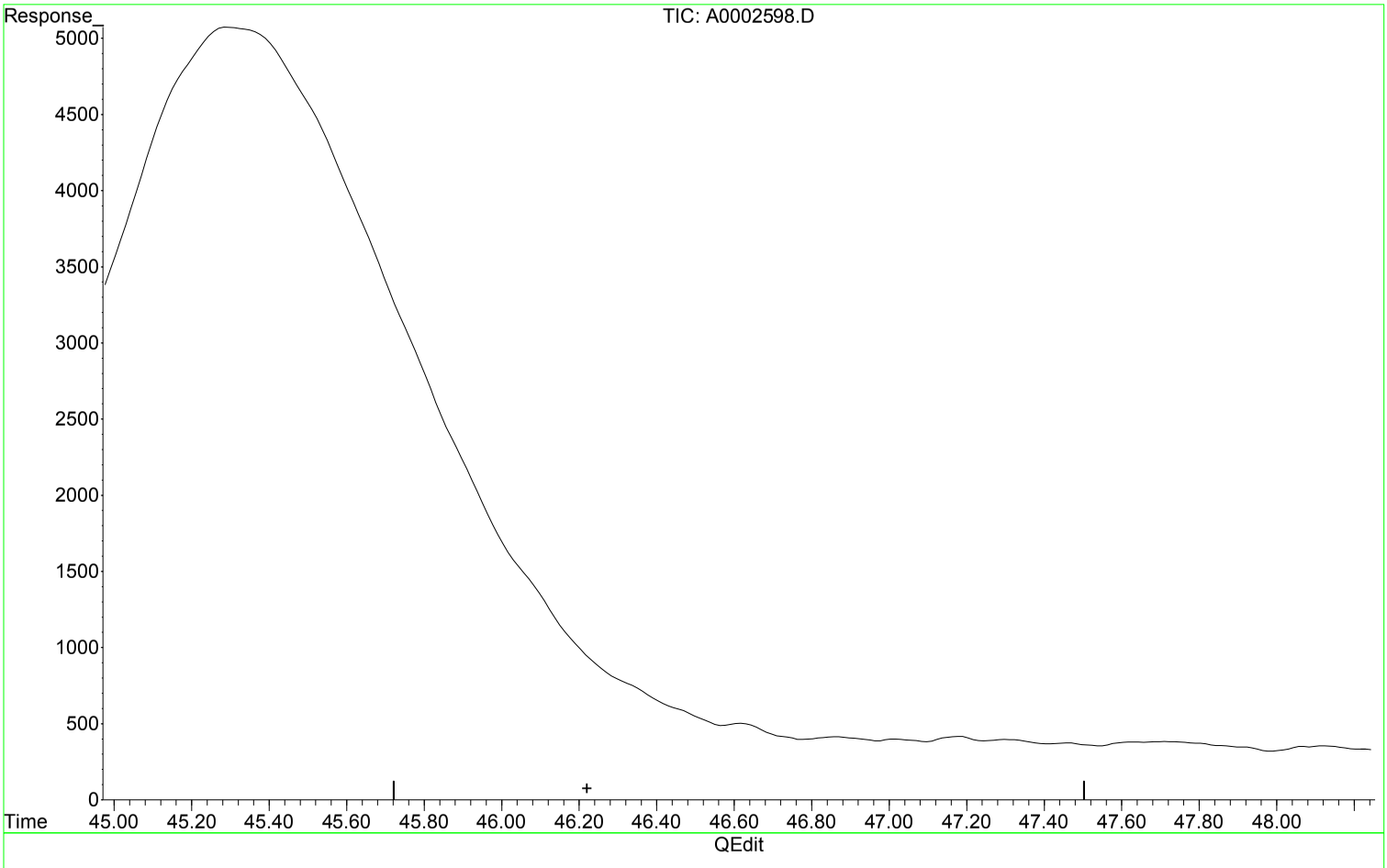
00944549

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

46.221min 0.000 ppm

response 0

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:20:23 2018

00944550

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.724 E3	-0.4	100	0.00
2 T	Pyruvic acid	452.935	445.920 E3	1.5	97	-0.03
3 T	Lactic Acid	53.765	58.468 E3	-8.7	108	-0.03
4 T	Acetic Acid	59.169	59.478 E3	-0.5	98	-0.03
5 T	Propionic Acid	59.592	58.220 E3	2.3	99	-0.17
6 T	Butyric Acid	62.897	55.715 E3	11.4	95	-0.94#

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944551

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.392	4836188	50.198	ppm	
2) T	Pyruvic acid	4.334	2229601	4.923	ppm	
3) T	Lactic Acid	4.992	2923402	54.374	ppm	
4) T	Acetic Acid	5.480	2973916	50.261	ppm	
5) T	Propionic Acid	14.188	2911015	48.849	ppm	
6) T	Butyric Acid	45.288f	2785759	44.291	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

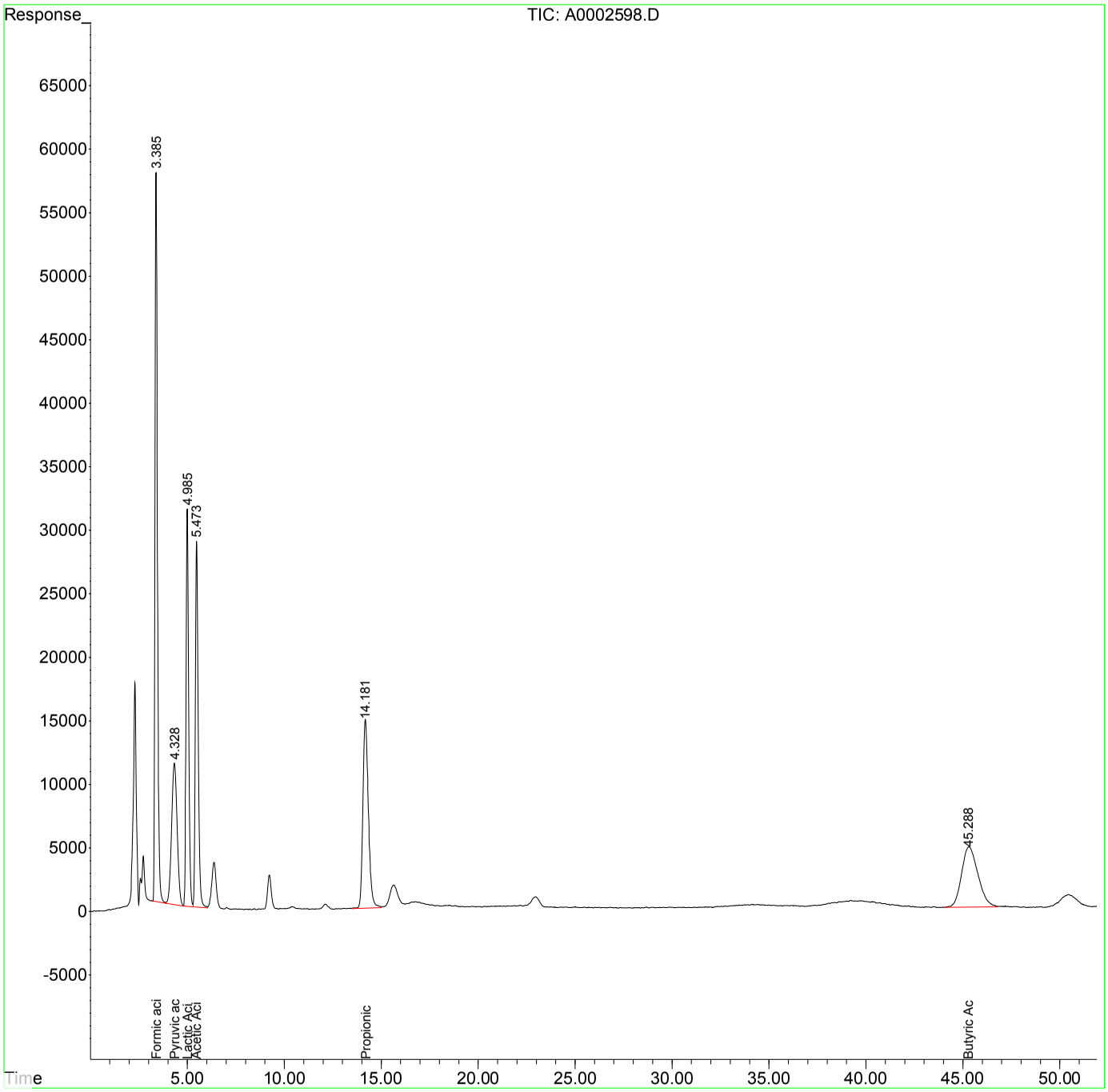
00944552

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



1st BA 12/21/18
2nd DM 12/26/18

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002621.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 01:28:24~~ 20-Dec-2018, 02:35:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:29:50 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:29:23 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.744 E3	-0.4	100	0.00
2 T	Pyruvic acid	452.935	453.830 E3	-0.2	99	0.00
3 T	Lactic Acid	53.765	58.697 E3	-9.2	108	0.00
4 T	Acetic Acid	59.169	59.940 E3	-1.3	99	0.00
5 T	Propionic Acid	59.592	58.984 E3	1.0	100	0.03
6 T	Butyric Acid	62.897	56.296 E3	10.5	96	0.16

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944554

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002621.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 01:28:24~~ 20-Dec-2018, 02:35:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:29:50 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:29:23 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.436	4837191	50.208 ppm
2) T	Pyruvic acid	4.398	2269150	5.010 ppm
3) T	Lactic Acid	5.065	2934854	54.587 ppm
4) T	Acetic Acid	5.547	2997009	50.651 ppm
5) T	Propionic Acid	14.326	2949206	49.490 ppm
6) T	Butyric Acid	45.642	2814809	44.752 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

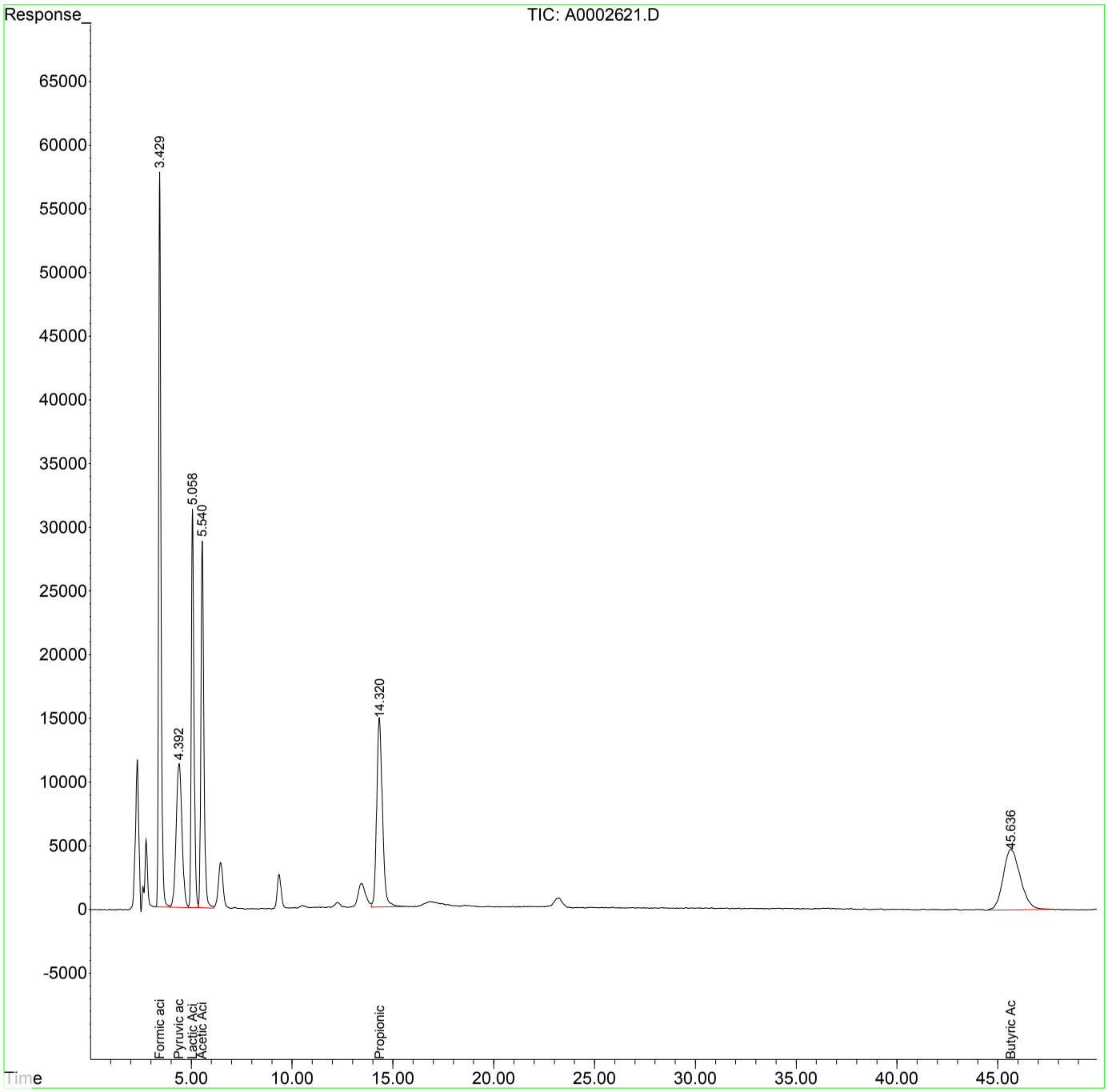
00944555

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002621.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:28:24
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:29:50 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:29:23 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002623.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 04:21:02
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:51 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.194 E3	0.2	100	0.00
2 T	Pyruvic acid	452.935	443.729 E3	2.0	97	0.00
3 T	Lactic Acid	53.765	58.140 E3	-8.1	107	0.00
4 T	Acetic Acid	59.169	59.231 E3	-0.1	98	0.00
5 T	Propionic Acid	59.592	58.485 E3	1.9	99	0.00
6 T	Butyric Acid	62.897	55.287 E3	12.1	94	0.00

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944557

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002623.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 04:21:02
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:51 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.435	4809684	49.922 ppm
2) T	Pyruvic acid	4.393	2218644	4.898 ppm
3) T	Lactic Acid	5.060	2906976	54.068 ppm
4) T	Acetic Acid	5.541	2961574	50.052 ppm
5) T	Propionic Acid	14.292	2924251	49.072 ppm
6) T	Butyric Acid	45.483	2764365	43.950 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

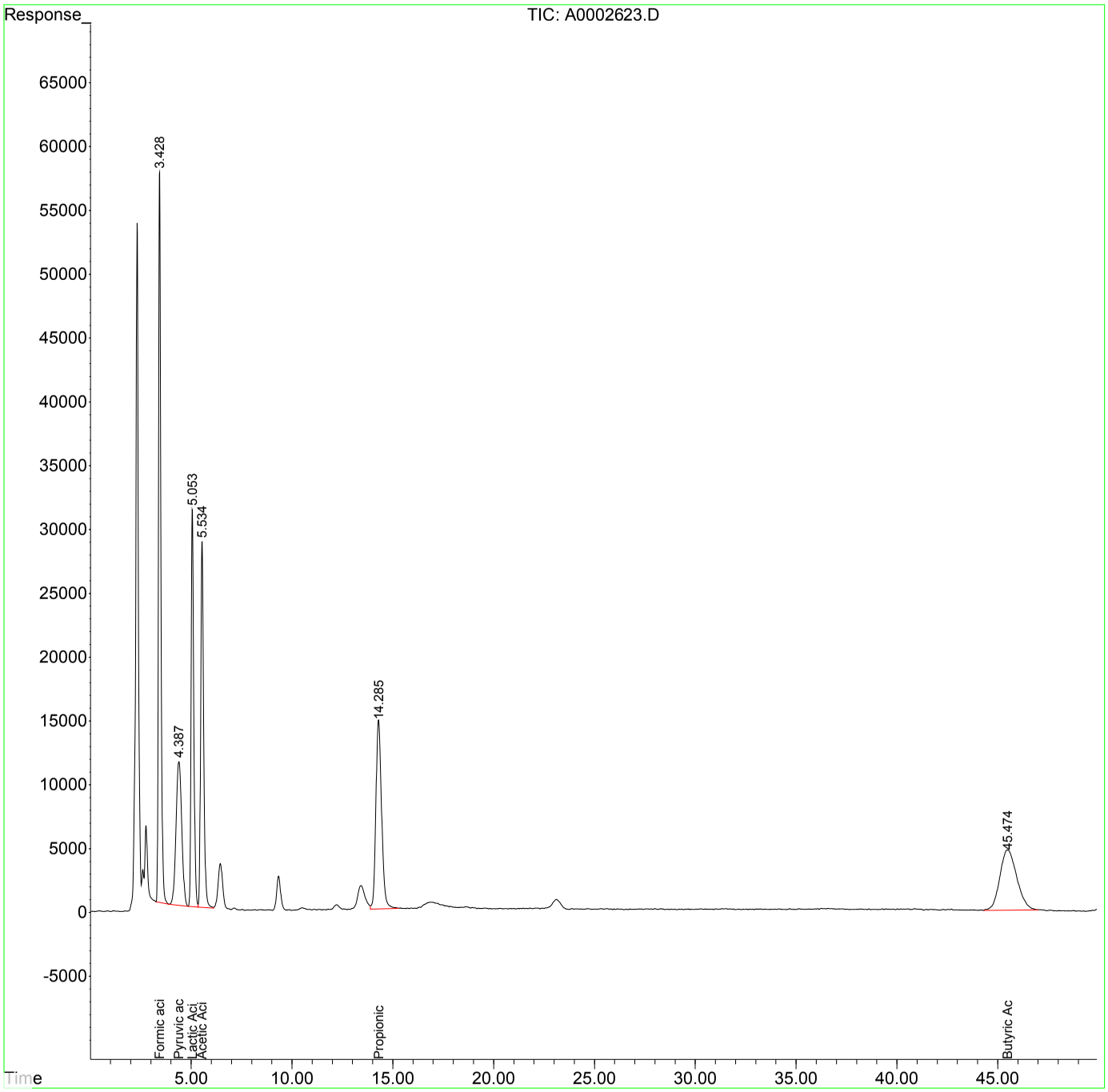
00944558

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002623.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 04:21:02
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:51 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002651.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 05:03:39
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 09:51:28 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 09:51:11 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.212 E3	0.1	100	0.00
2 T	Pyruvic acid	452.935	451.409 E3	0.3	98	0.00
3 T	Lactic Acid	53.765	60.234 E3	-12.0	111	-0.01
4 T	Acetic Acid	59.169	59.299 E3	-0.2	98	0.00
5 T	Propionic Acid	59.592	60.176 E3	-1.0	102	-0.07
6 T	Butyric Acid	62.897	55.921 E3	11.1	95	-0.32

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944560

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002651.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 05:03:39
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 09:51:28 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 09:51:11 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.413	4810618	49.932 ppm
2) T	Pyruvic acid	4.334	2257047	4.983 ppm
3) T	Lactic Acid	4.979	3011701	56.016 ppm
4) T	Acetic Acid	5.447	2964931	50.109 ppm
5) T	Propionic Acid	13.850	3008788	50.490 ppm
6) T	Butyric Acid	43.641	2796063	44.454 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

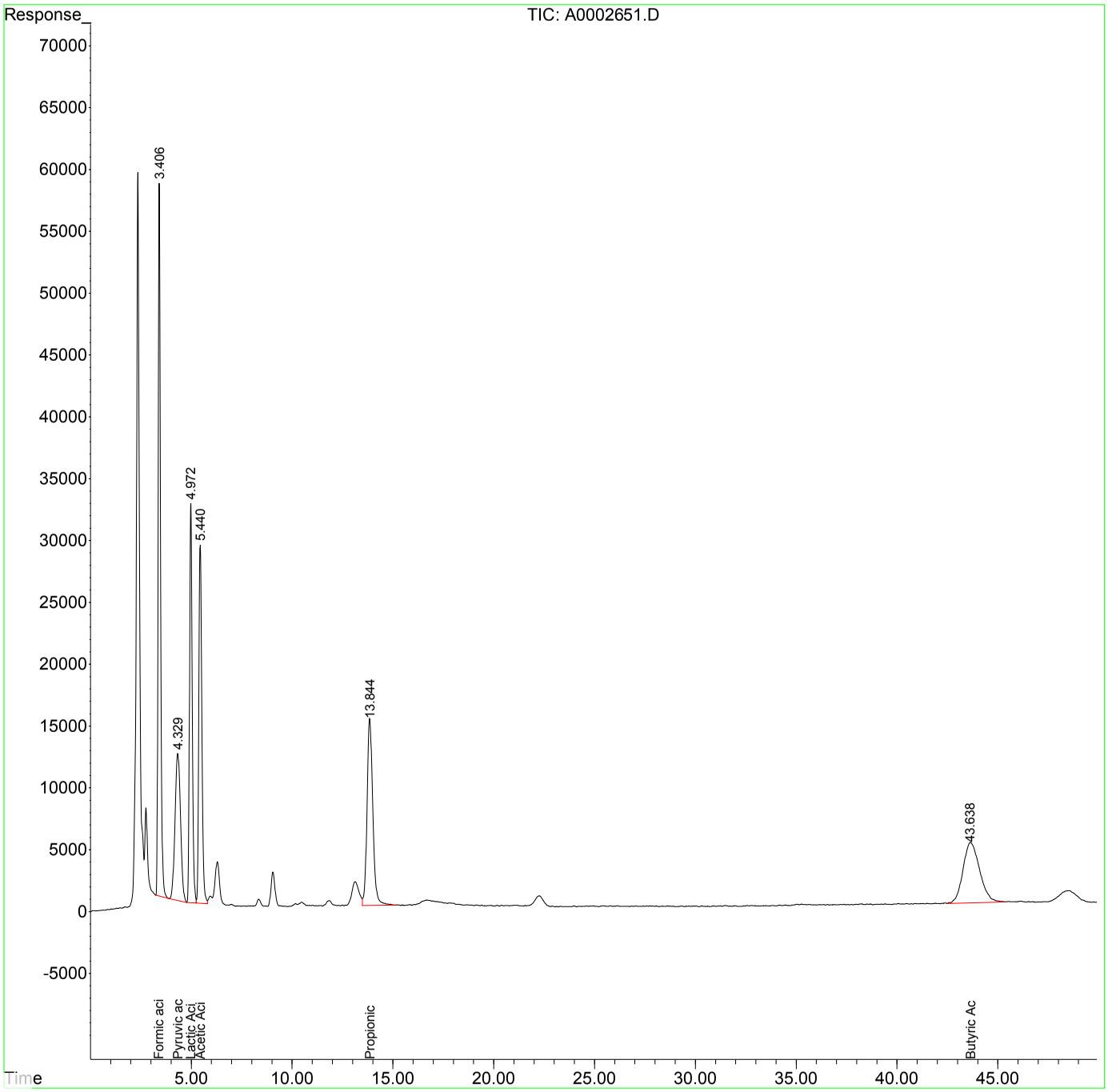
00944561

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002651.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 05:03:39
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 09:51:28 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 09:51:11 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

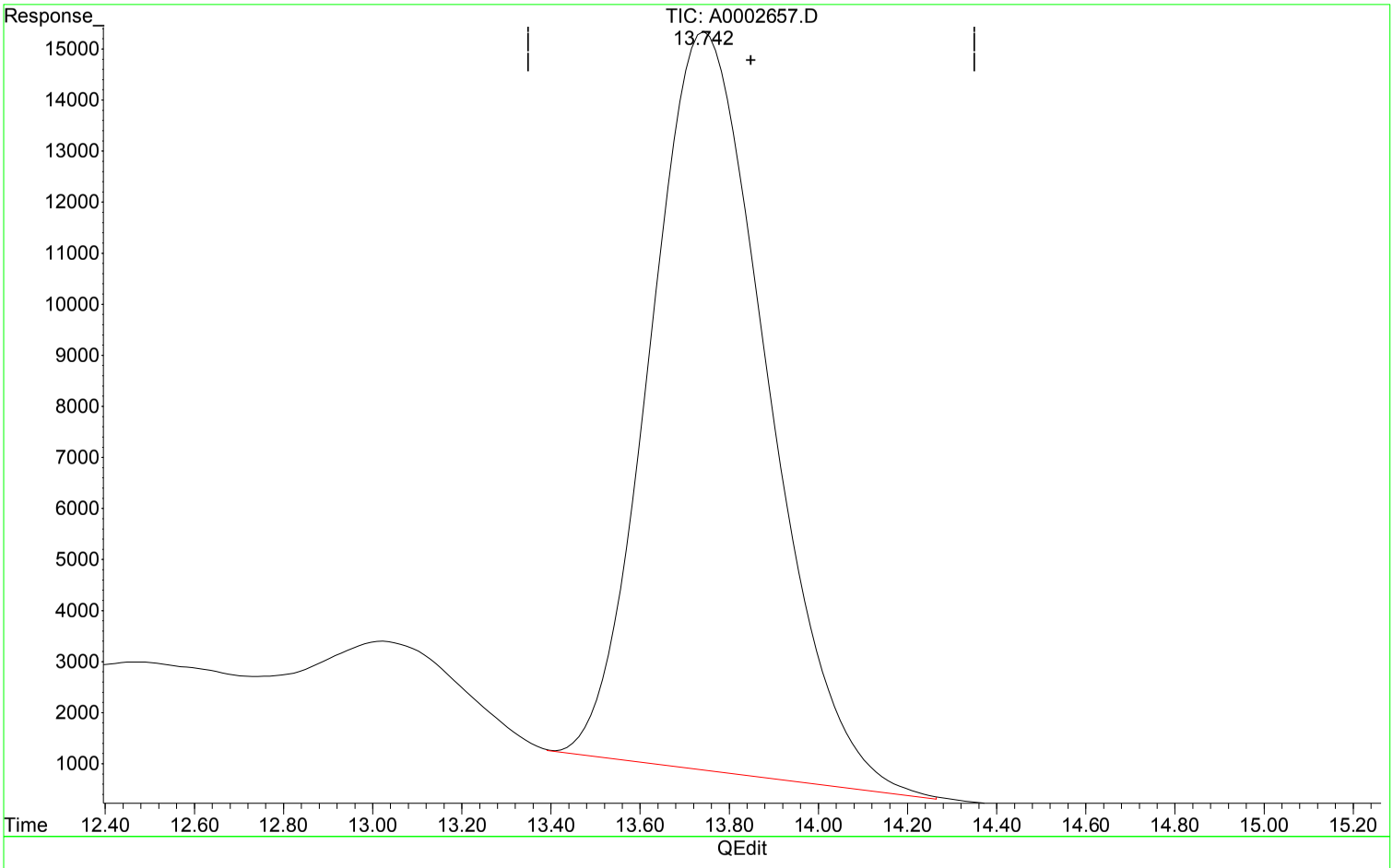


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 00:10:32
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:25:44 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 10:14:14 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.742min 44.551 ppm m

response 2654877

Manual Integration:

After

Poor integration.

12/21/18

(+) = Expected Retention Time

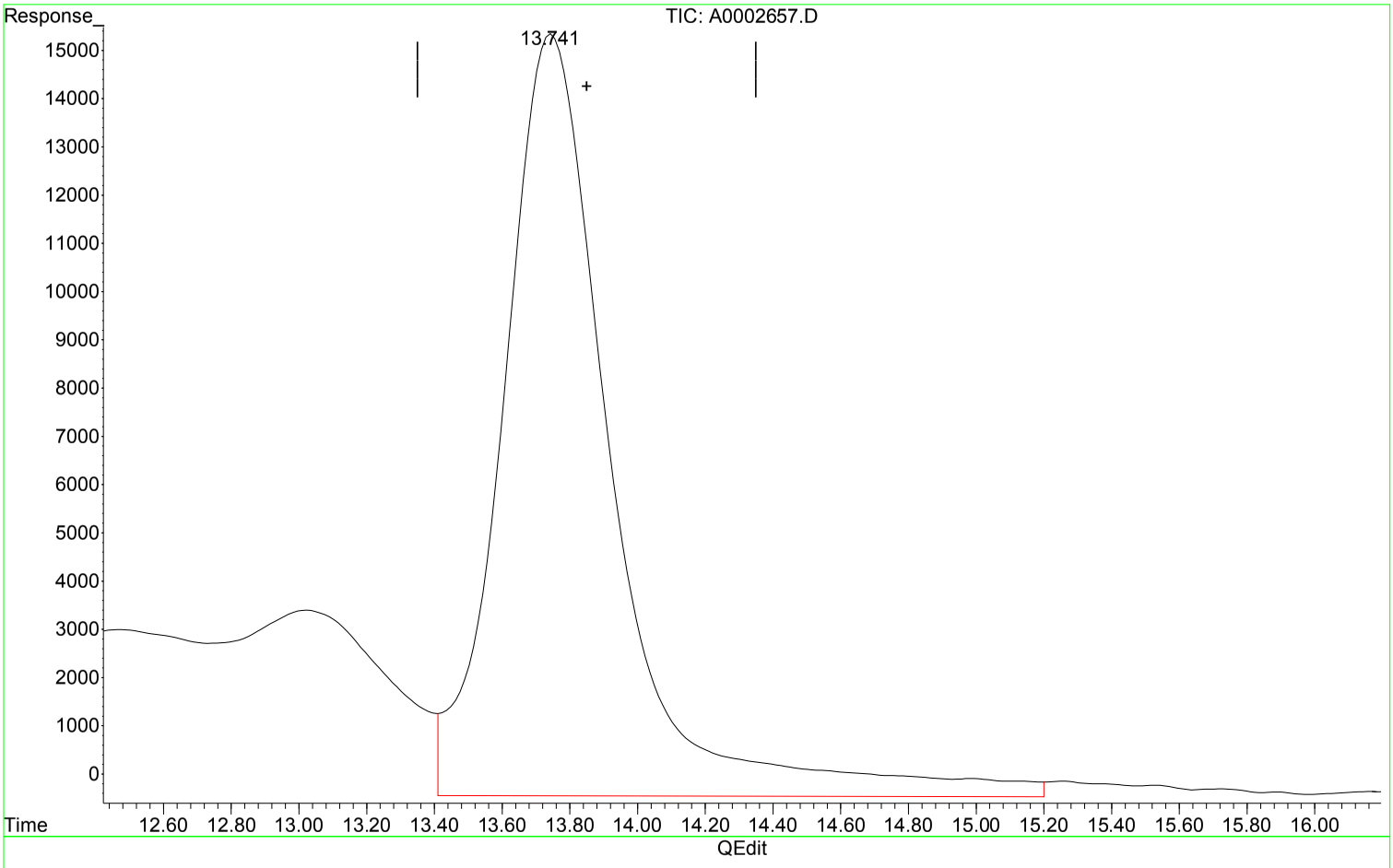
00944563

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 00:10:32
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:25:44 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 10:14:14 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.747min 59.660 ppm

response 3555234

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 00:10:32~~ 21-Dec-2018, 09:00:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:26:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 11:26:29 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.608 E3	-1.3	101	0.00
2 T	Pyruvic acid	452.935	458.020 E3	-1.1	100	0.00
3 T	Lactic Acid	53.765	60.544 E3	-12.6	112	-0.01
4 T	Acetic Acid	59.169	59.707 E3	-0.9	99	-0.02
5 T	Propionic Acid	59.592	53.194 E3	10.7	90	-0.11
6 T	Butyric Acid	62.897	55.389 E3	11.9	94	-0.46

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 00:10:32~~ 21-Dec-2018, 09:00:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:26:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 11:26:29 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.411	4880415	50.657	ppm	
2) T	Pyruvic acid	4.326	2290098	5.056	ppm	
3) T	Lactic Acid	4.965	3027179	56.304	ppm	
4) T	Acetic Acid	5.430	2985327	50.454	ppm	
5) T	Propionic Acid	13.742	2659702	44.632	ppm	m
6) T	Butyric Acid	43.180f	2769435	44.031	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

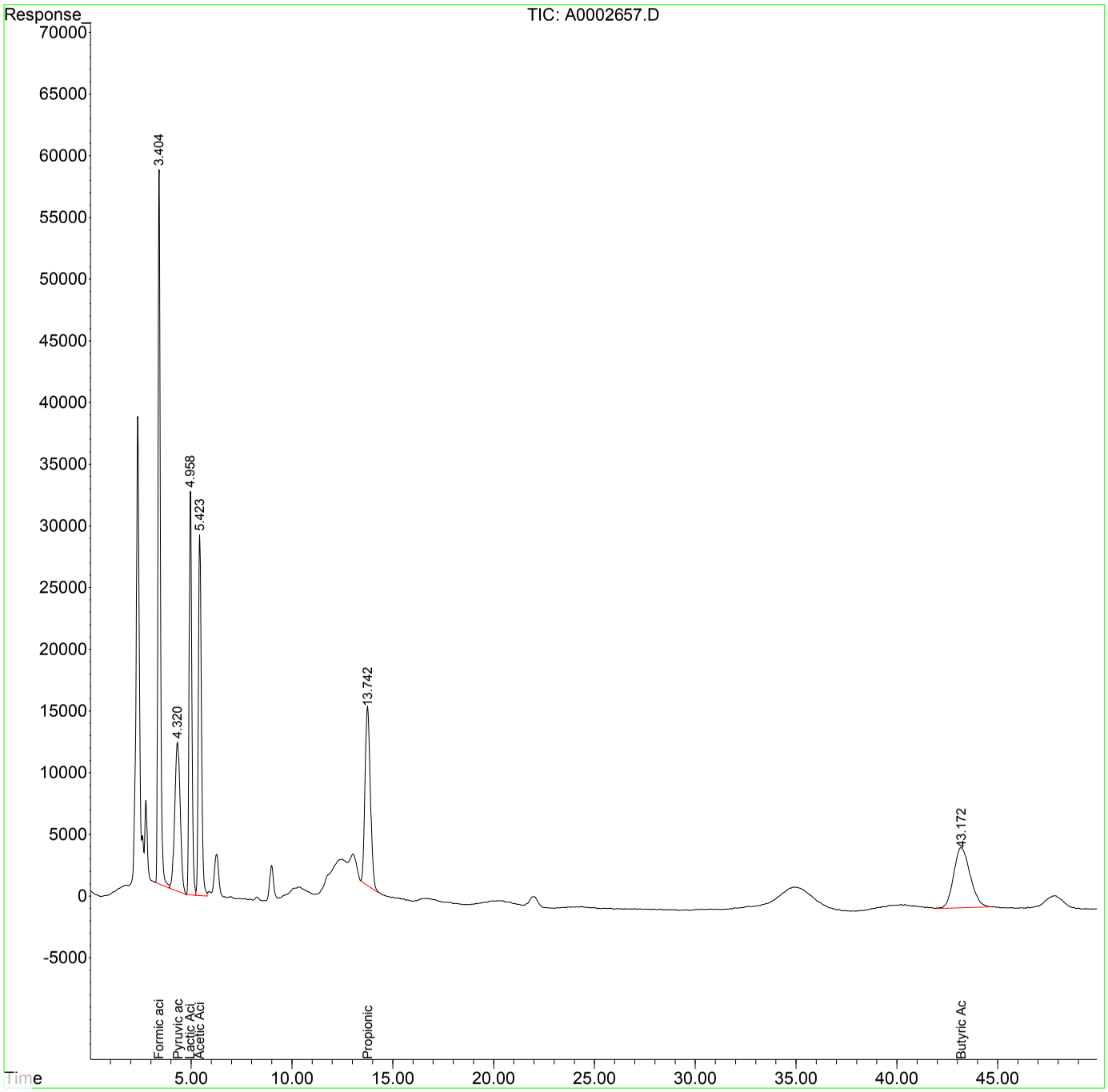
00944566

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 00:10:32
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:26:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 11:26:29 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



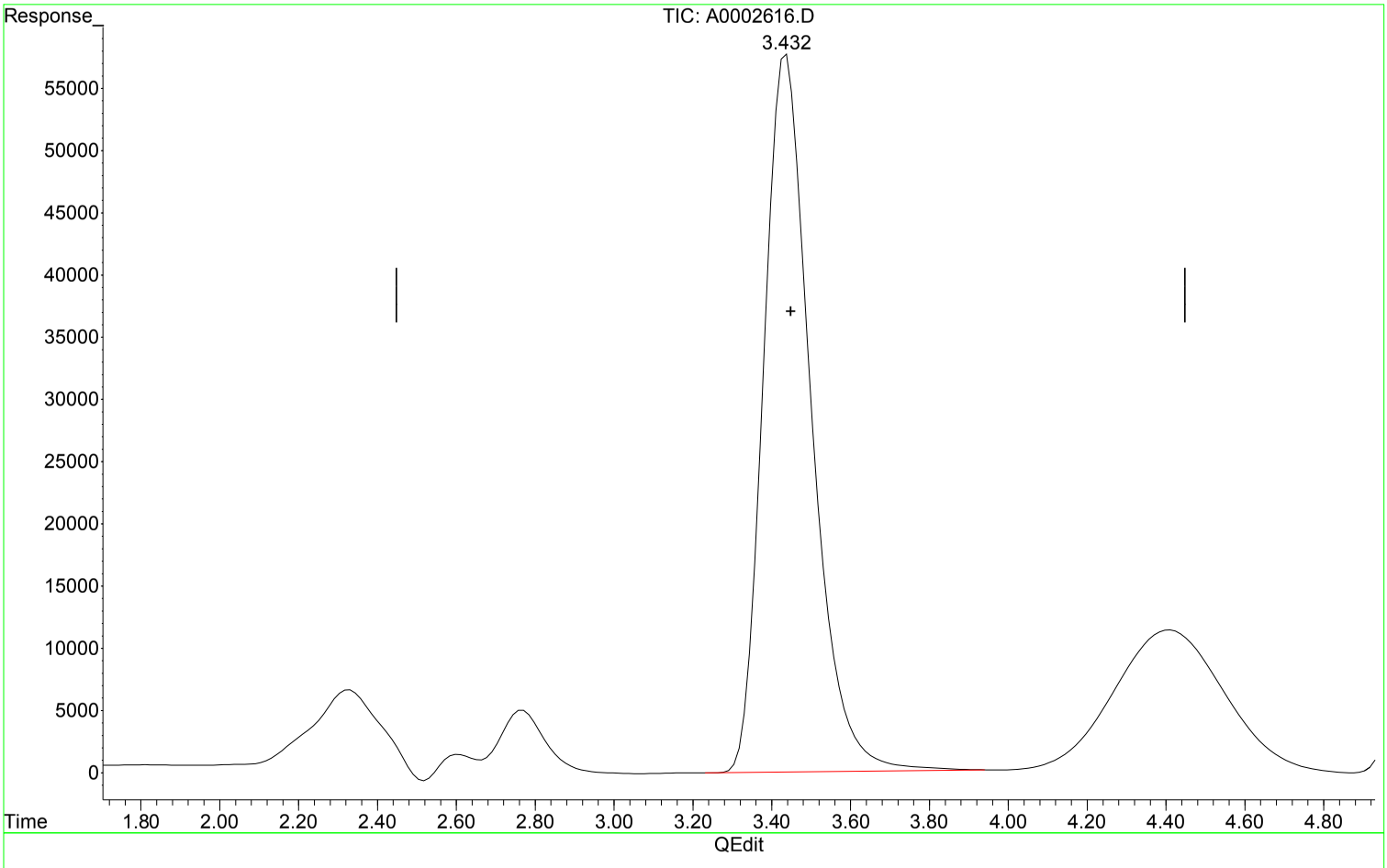
00944567

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(1) Formic acid (t)

3.432min 50.416 ppm m

response 4857207

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

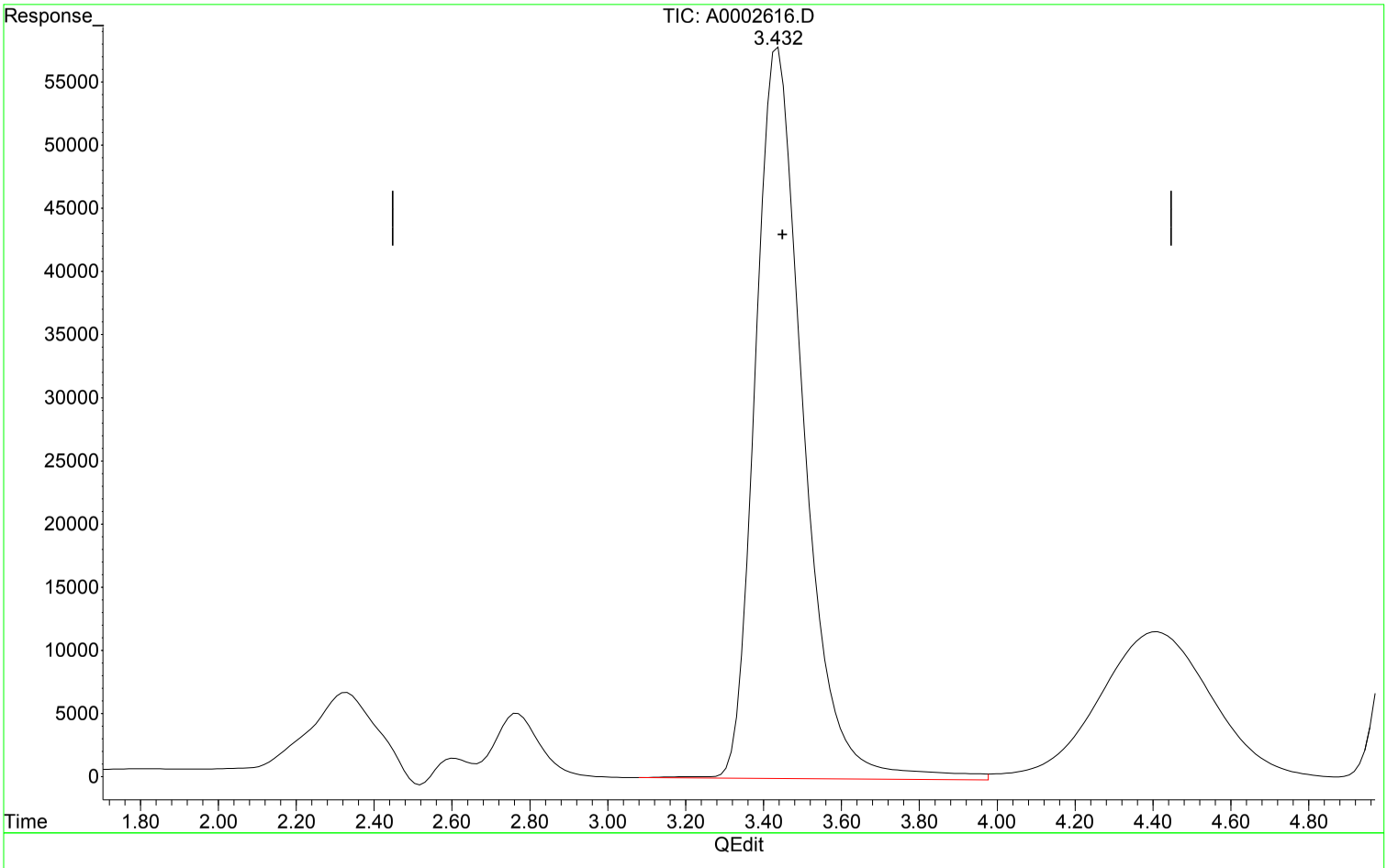
00944568

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(1) Formic acid (t)

3.439min 51.810 ppm

response 4991581

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

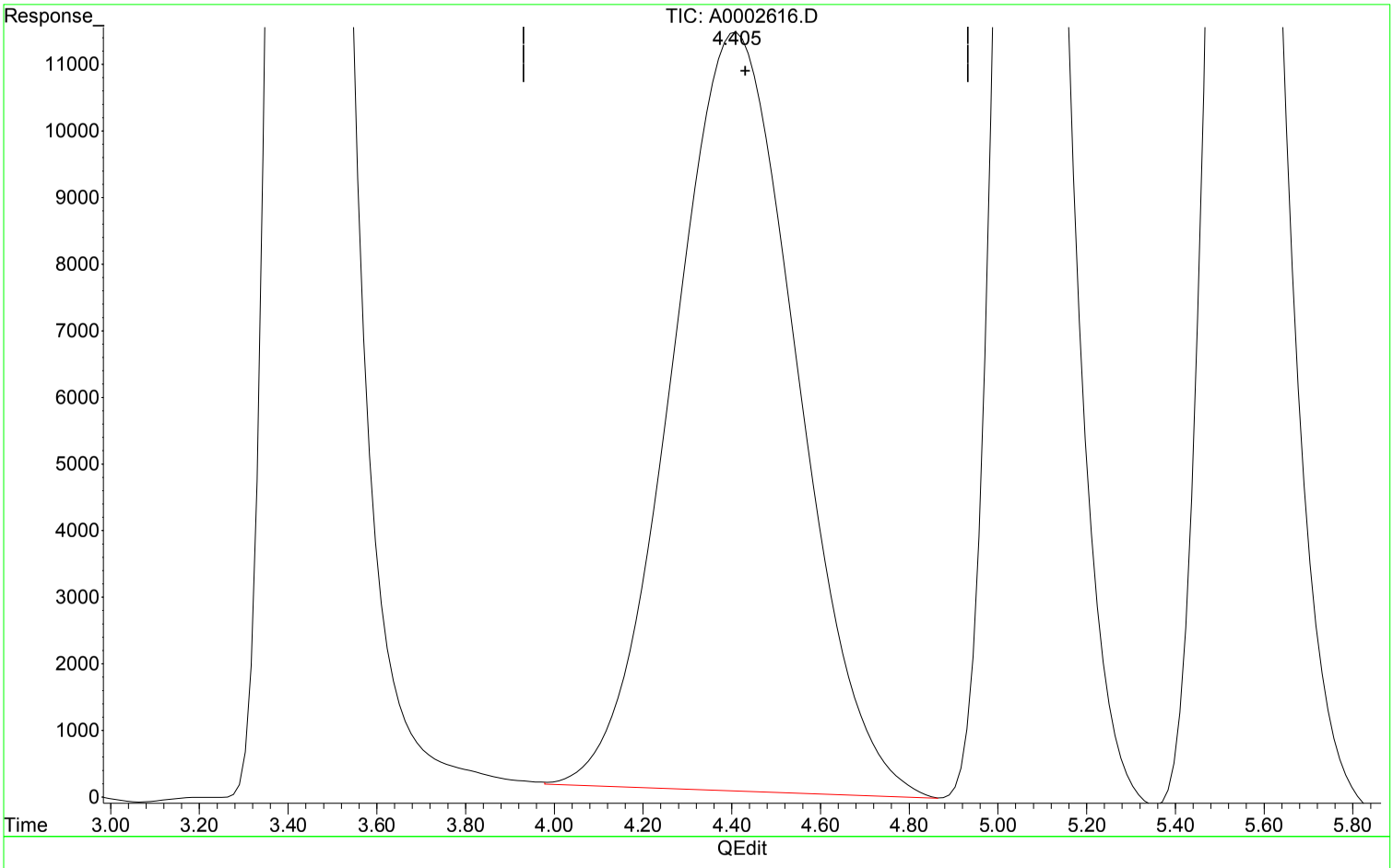
00944569

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(2) Pyruvic acid (T)

4.405min 4.933 ppm m

response 2234360

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:22 2018

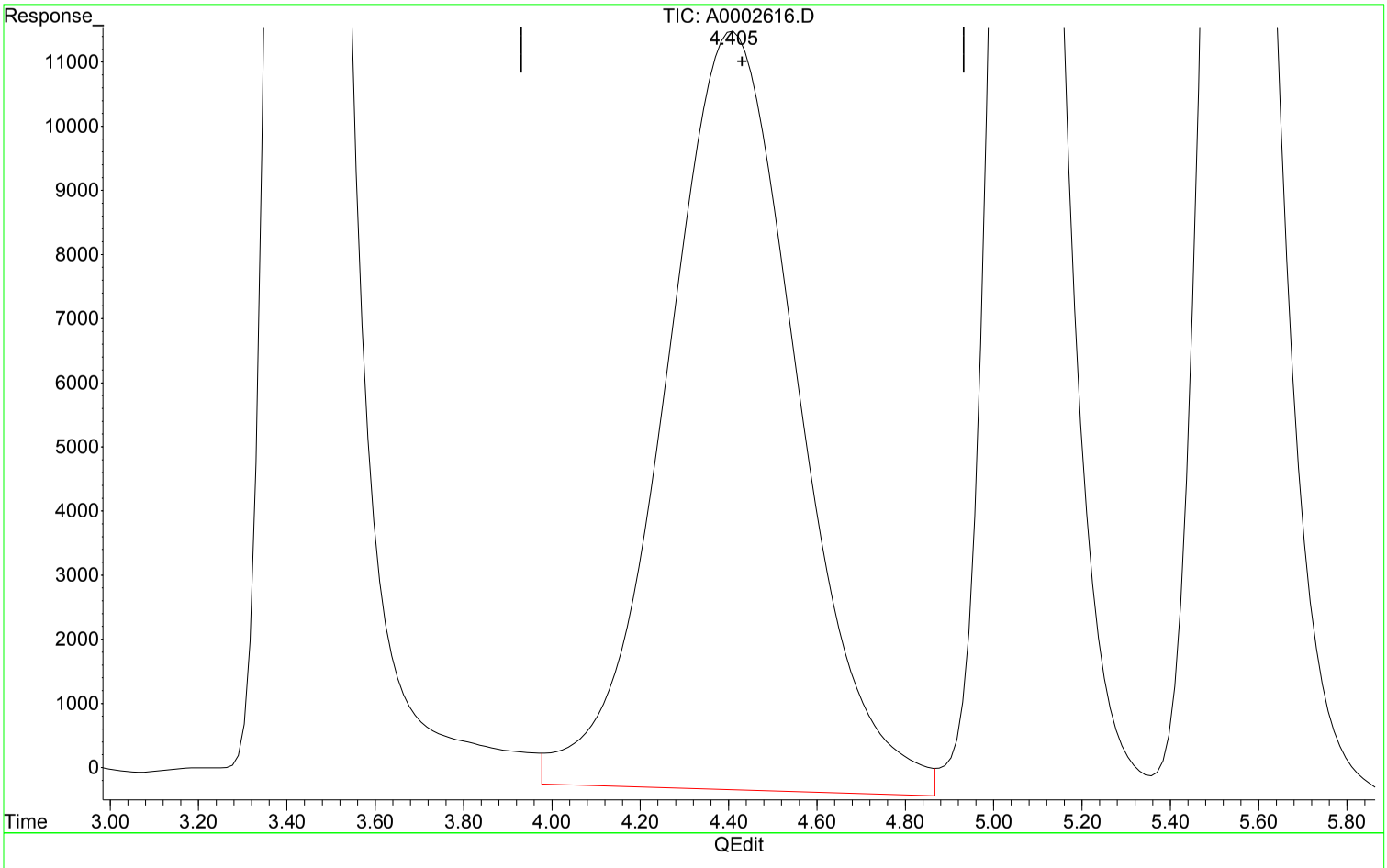
00944570

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(2) Pyruvic acid (T)

4.411min 5.448 ppm

response 2467745

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

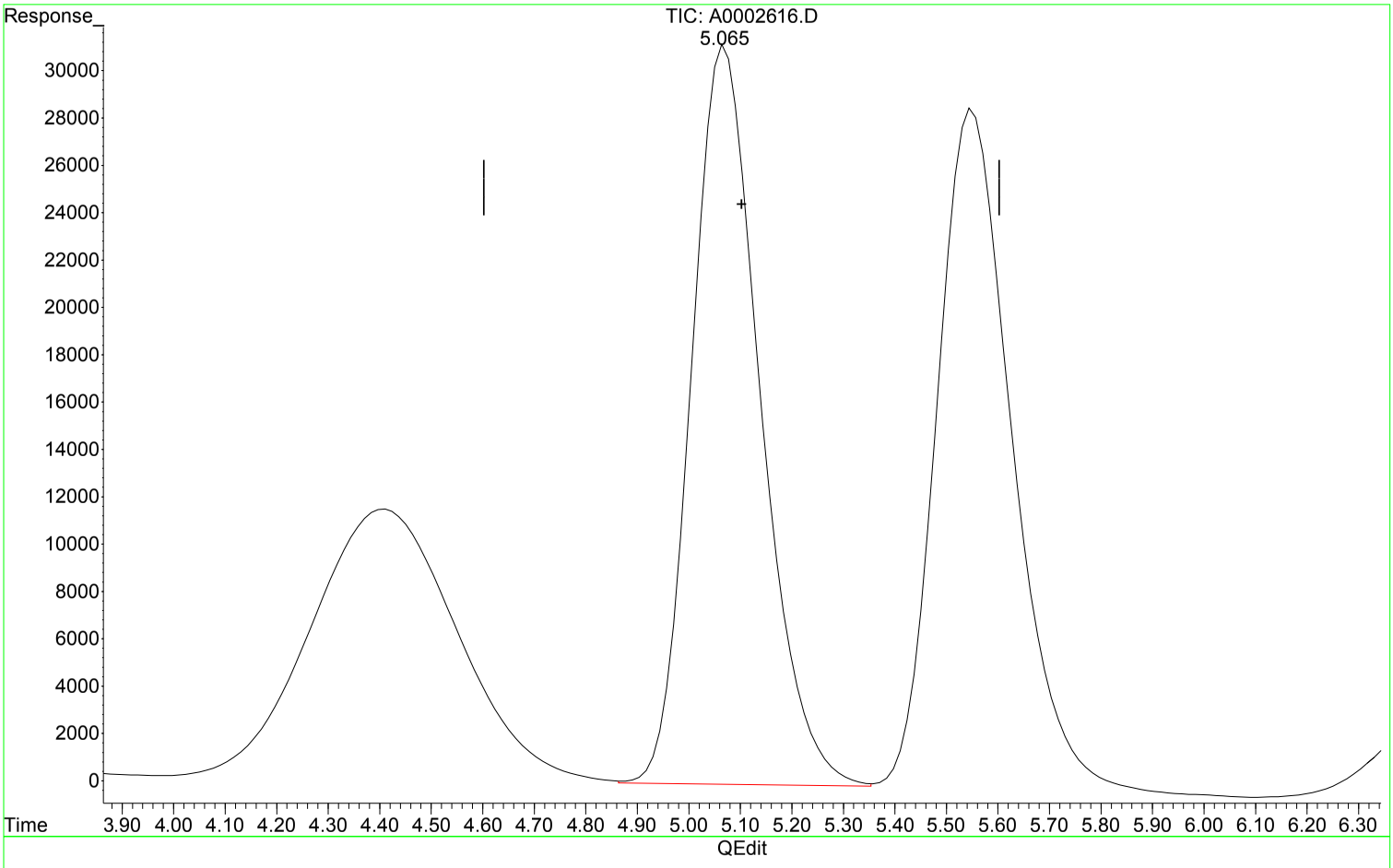
00944571

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

5.065min 54.023 ppm m

response 2904540

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

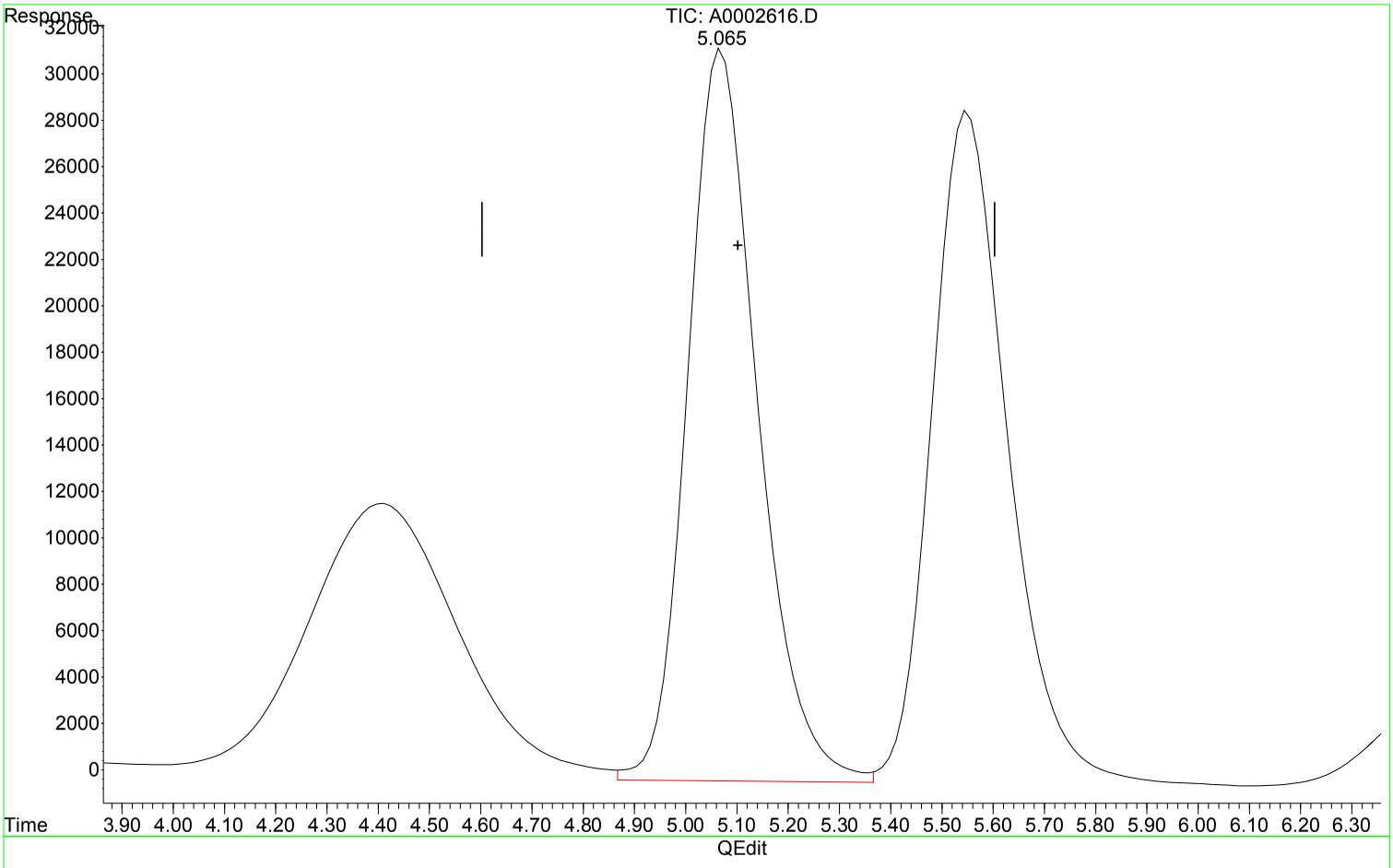
00944572

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

5.072min 55.891 ppm

response 3004993

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:27 2018

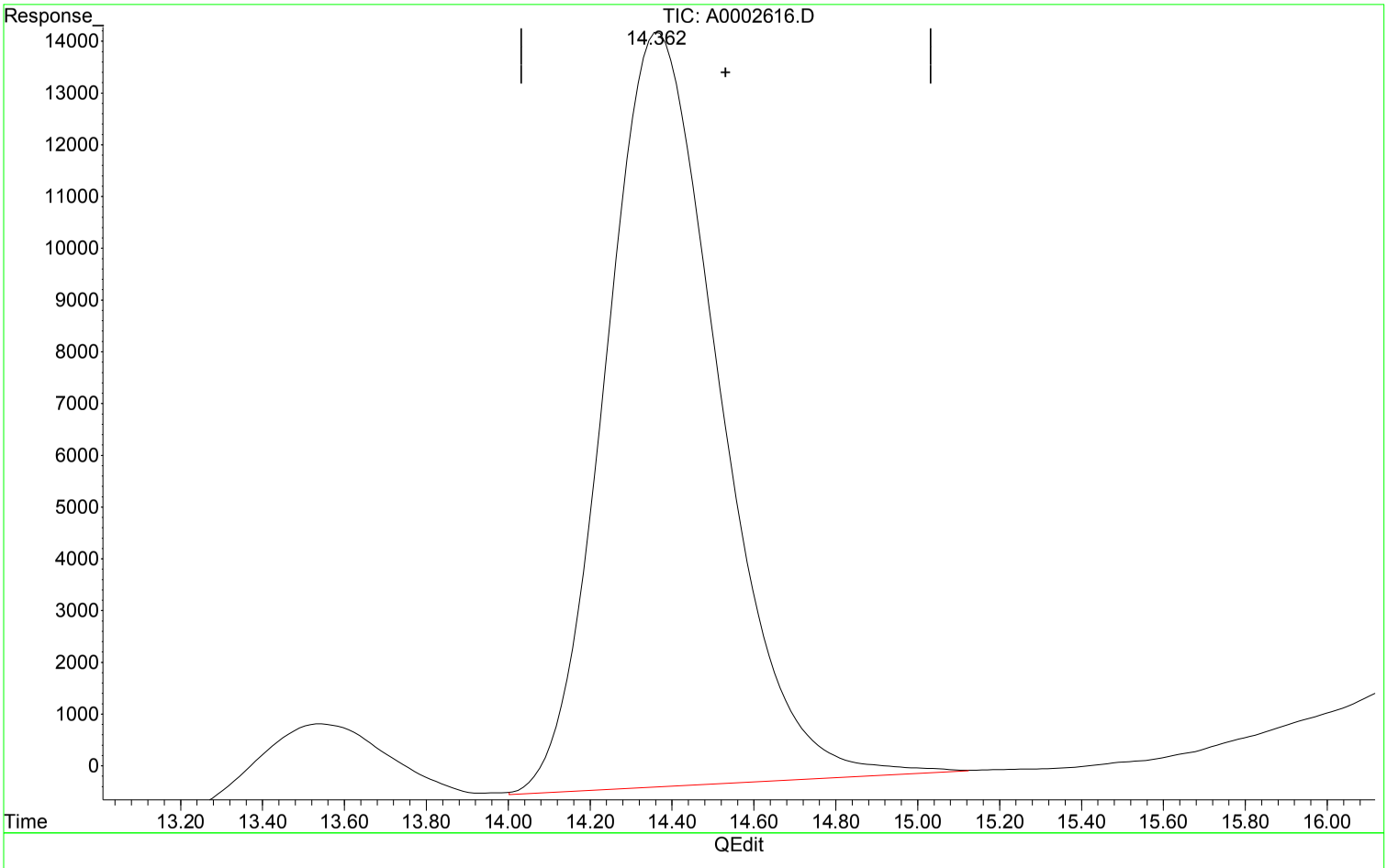
00944573

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.362min 47.411 ppm m

response 2825301

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

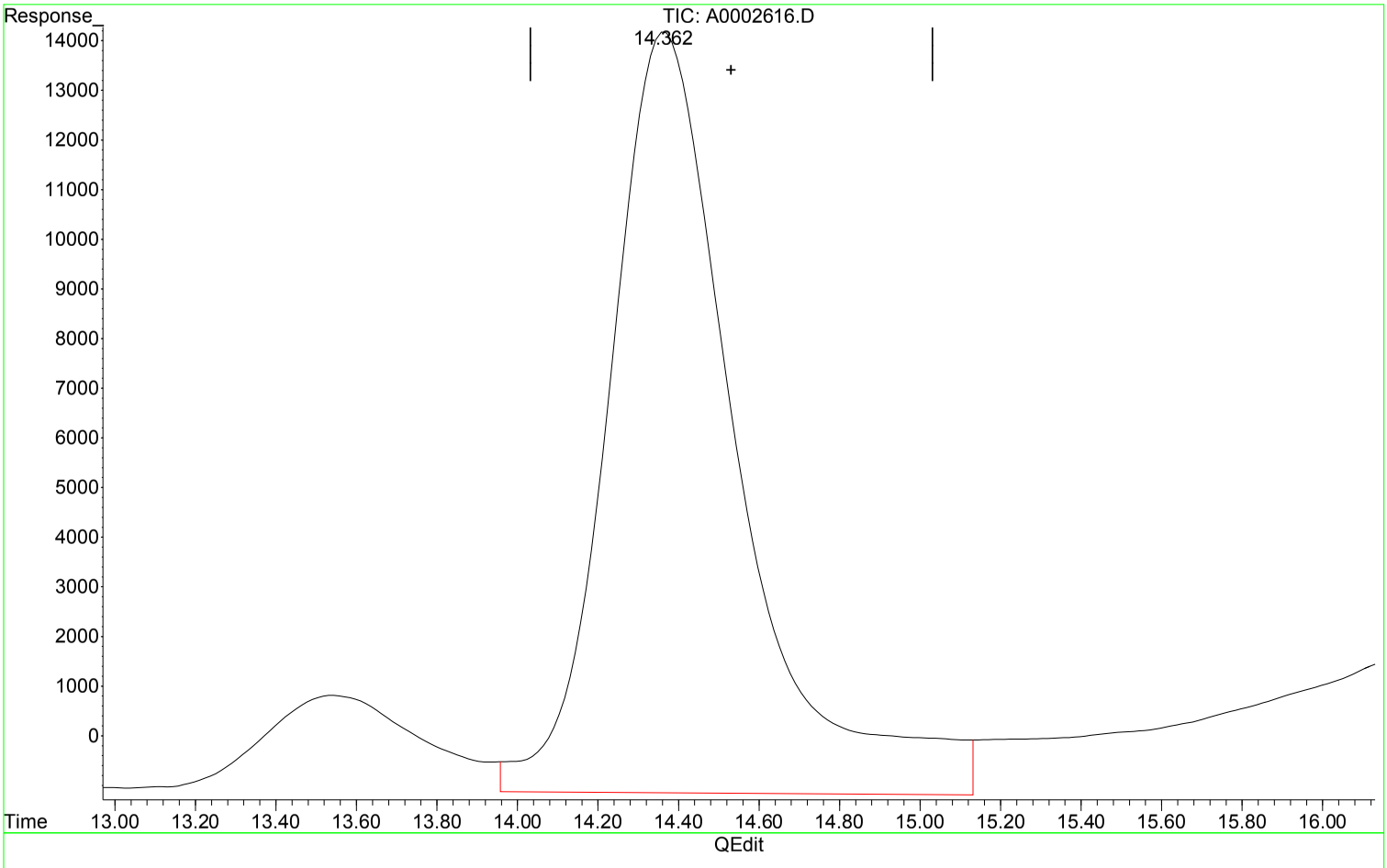
00944574

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.368min 57.152 ppm

response 3405796

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:40 2018

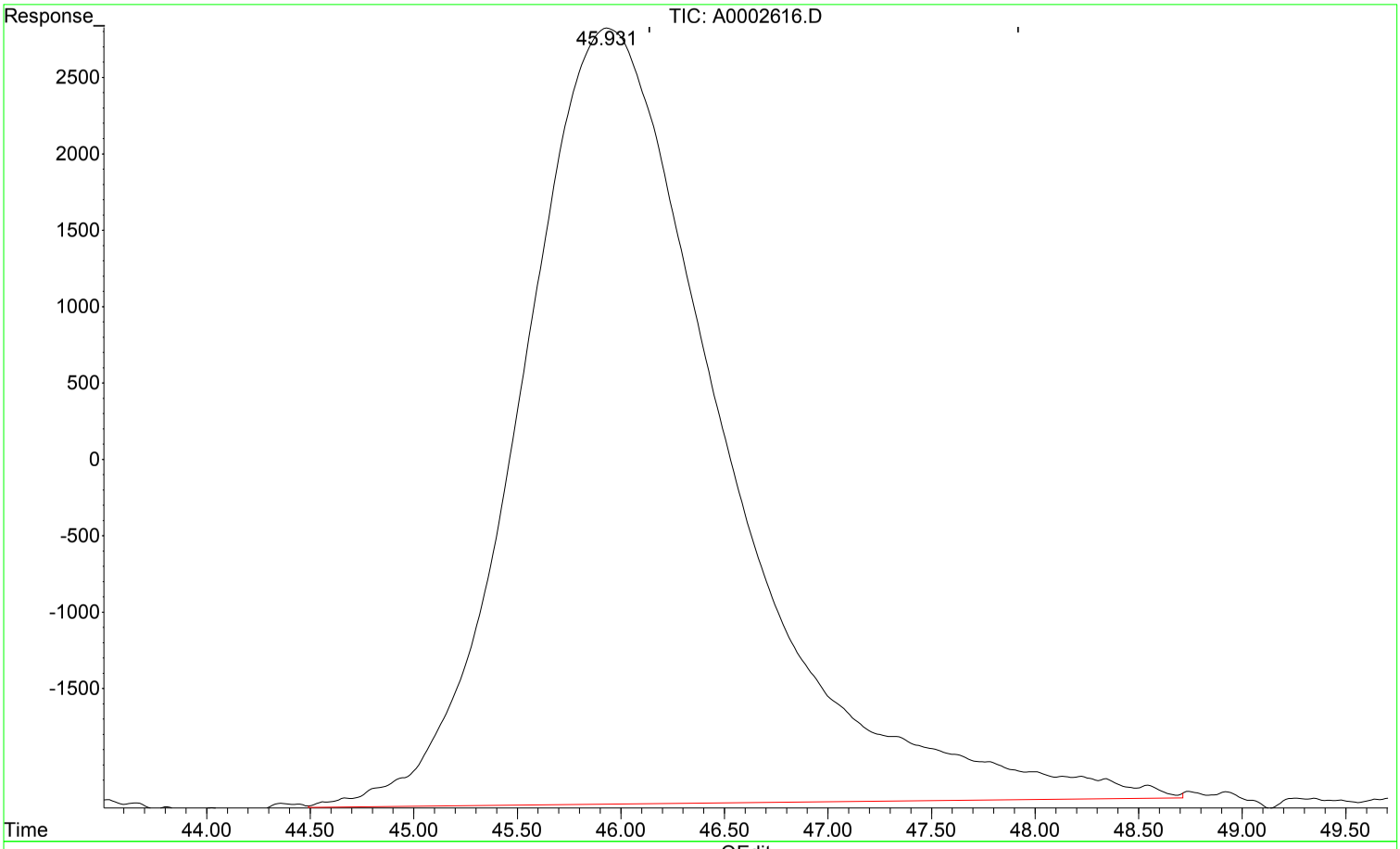
00944575

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

45.931min 55.051 ppm m

response 3462535

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:29:03 2018

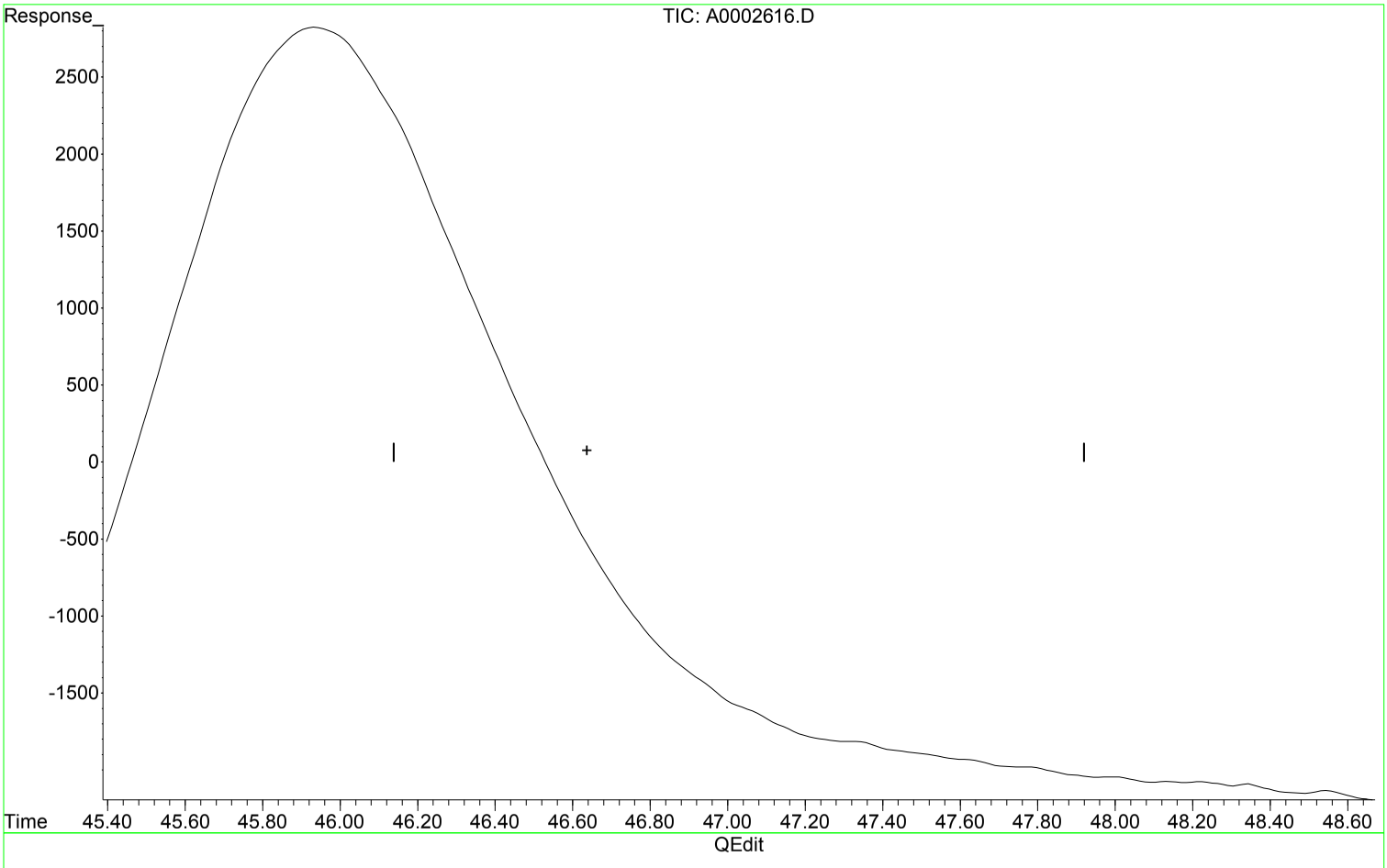
00944576

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

46.638min 0.000 ppm

response 0

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:53 2018

00945577

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.144 E3	-0.8	101	-0.02
2 T	Pyruvic acid	452.935	446.872 E3	1.3	97	-0.03
3 T	Lactic Acid	53.765	58.091 E3	-8.0	107	-0.04
4 T	Acetic Acid	59.169	59.782 E3	-1.0	99	-0.04
5 T	Propionic Acid	59.592	56.506 E3	5.2	96	-0.17
6 T	Butyric Acid	62.897	69.251 E3	-10.1	118	-0.71#

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.432	4857207	50.416	ppm	m
2) T	Pyruvic acid	4.405	2234360	4.933	ppm	m
3) T	Lactic Acid	5.065	2904540	54.023	ppm	m
4) T	Acetic Acid	5.552	2989104	50.518	ppm	
5) T	Propionic Acid	14.362	2825301	47.411	ppm	m
6) T	Butyric Acid	45.931f	3462535	55.051	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

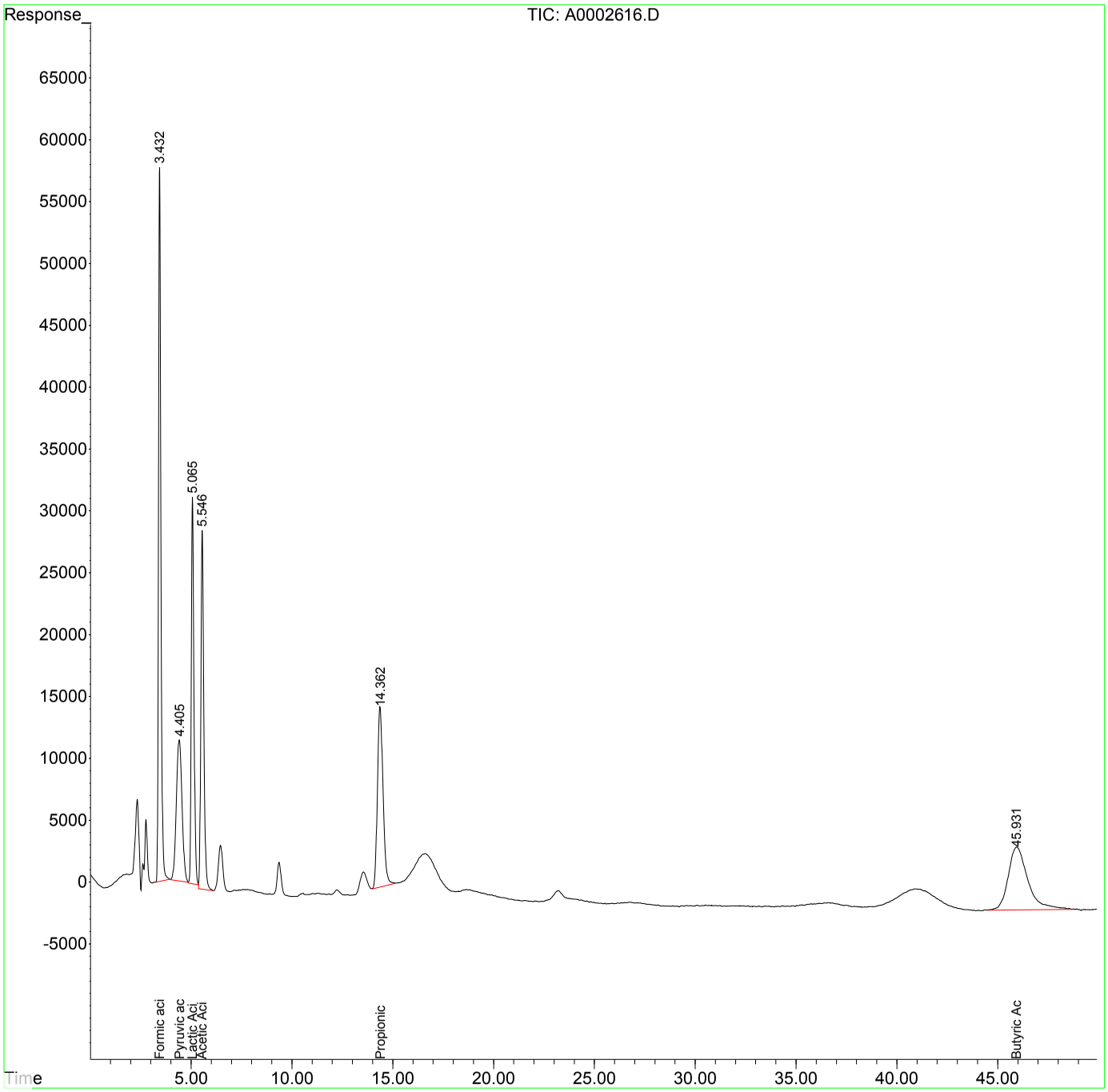
00944579

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

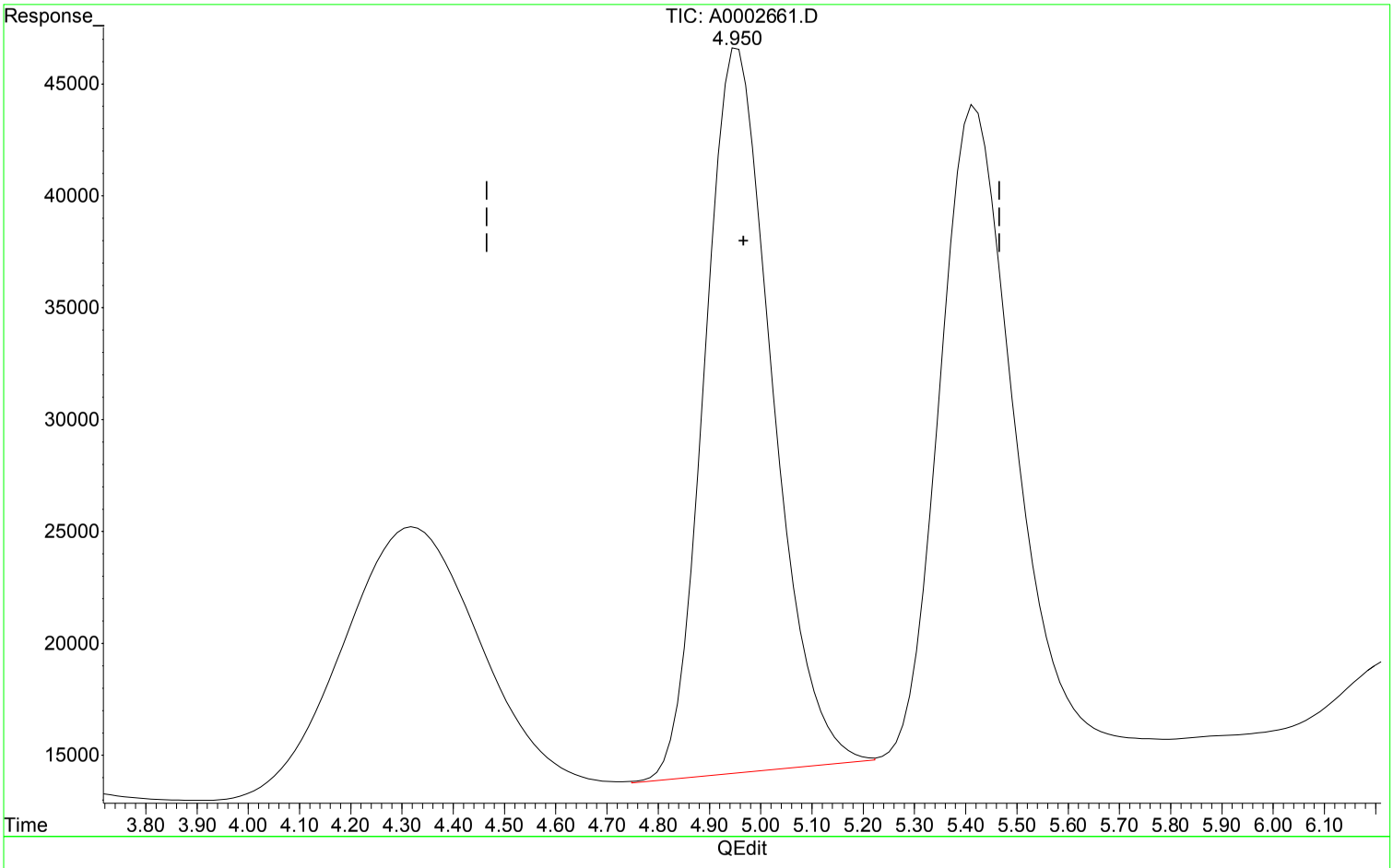


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.950min 55.665 ppm m

response 2992819

Manual Integration:

After

Poor integration.

12/21/18

(+) = Expected Retention Time

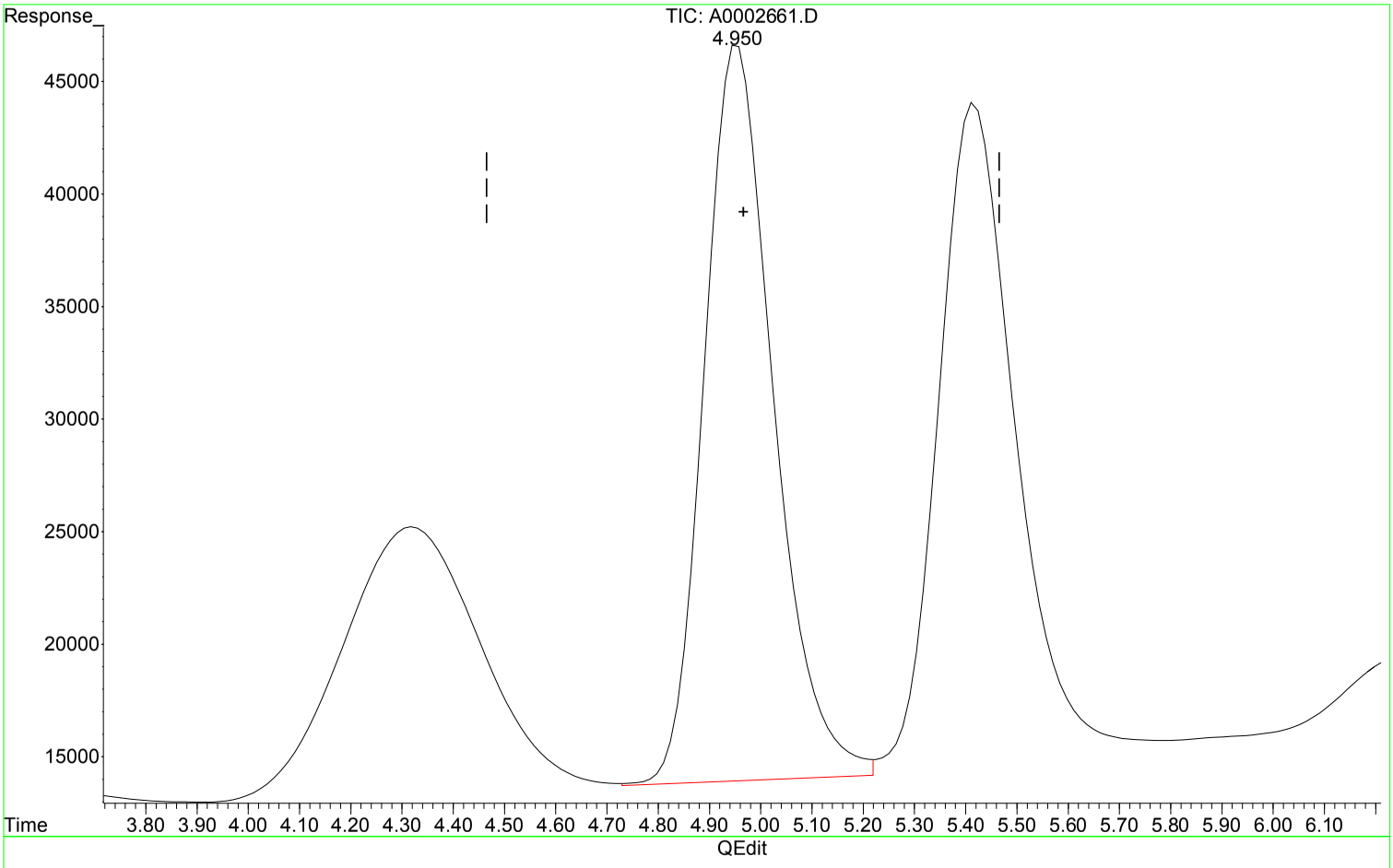
00944581

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.957min 57.280 ppm

response 3079640

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

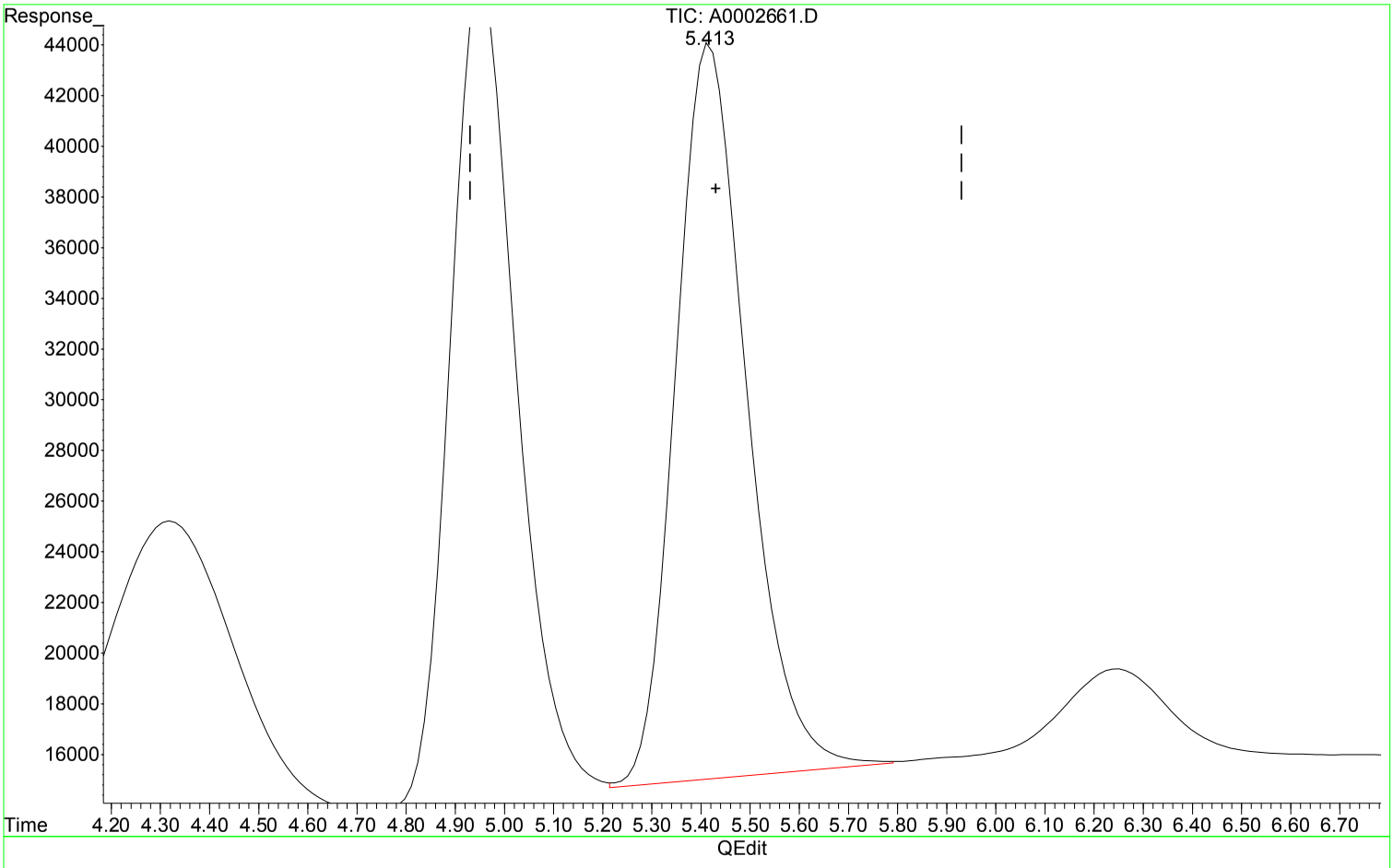
00944582

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.413min 49.499 ppm m

response 2928823

Manual Integration:

After

Poor integration.

12/21/18

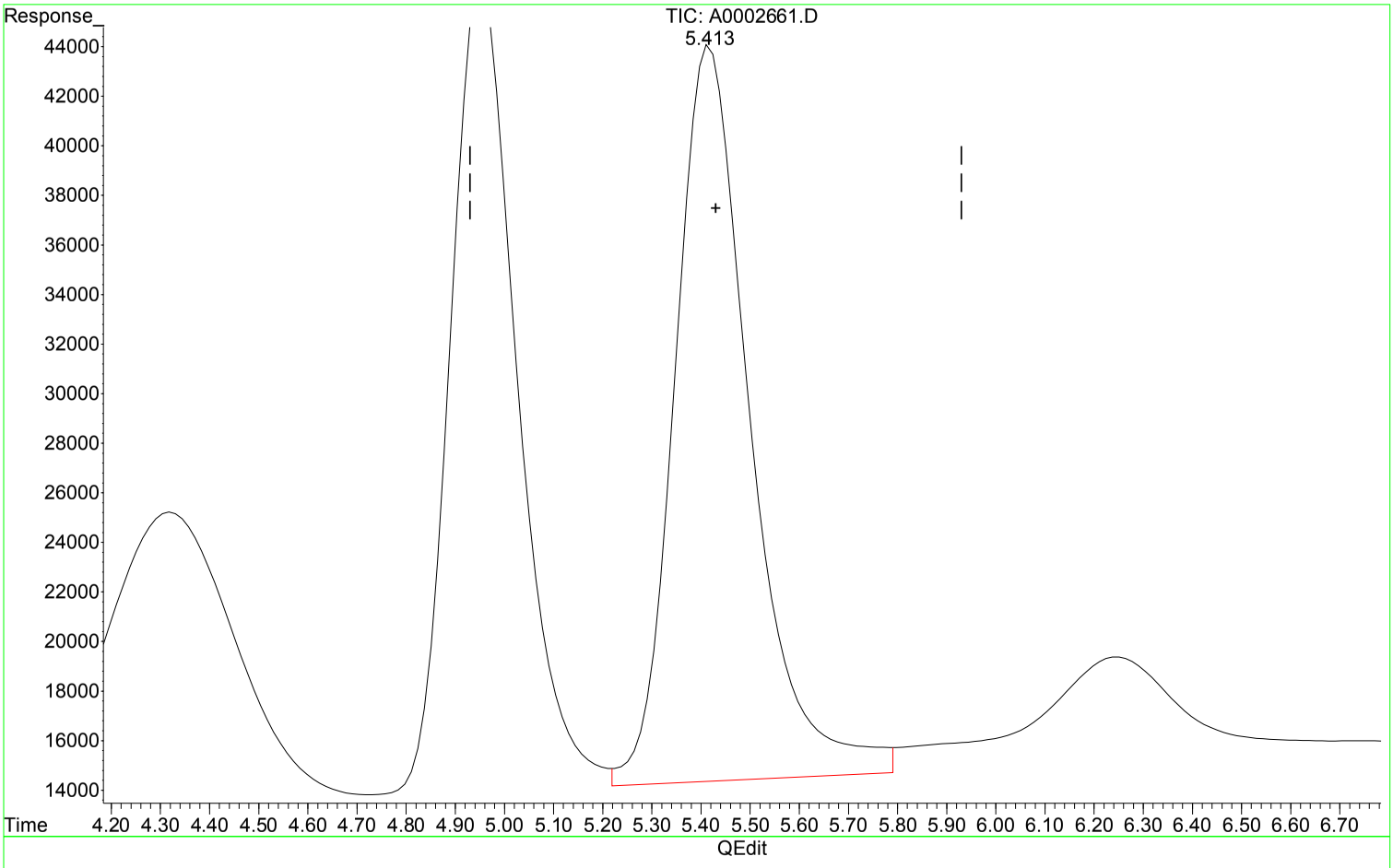
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.420min 53.746 ppm

response 3180137

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

MA100418.M Fri Dec 21 14:46:53 2018

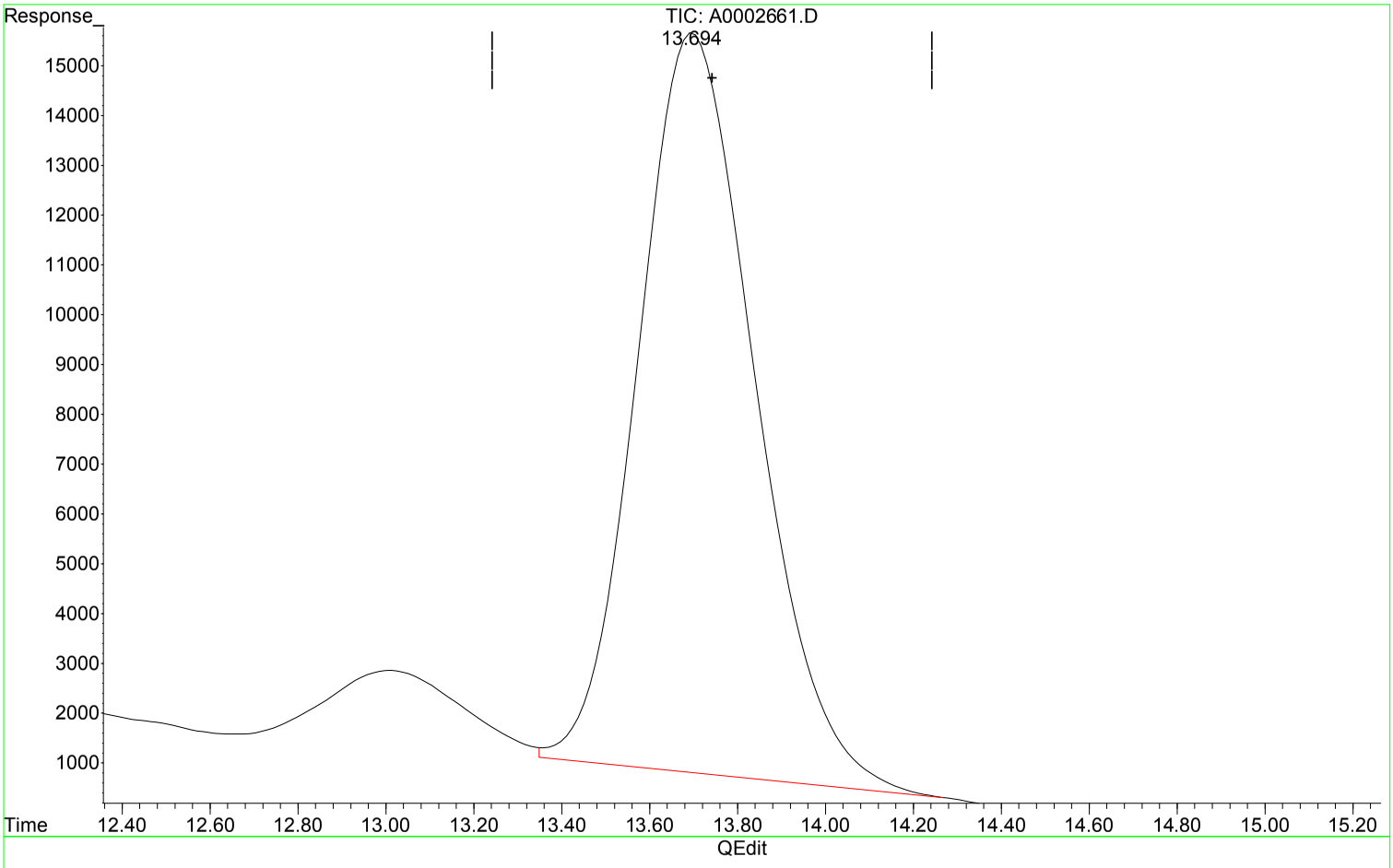
00944584

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.694min 46.178 ppm m

response 2751846

Manual Integration:

After

Poor integration.

12/21/18

(+) = Expected Retention Time

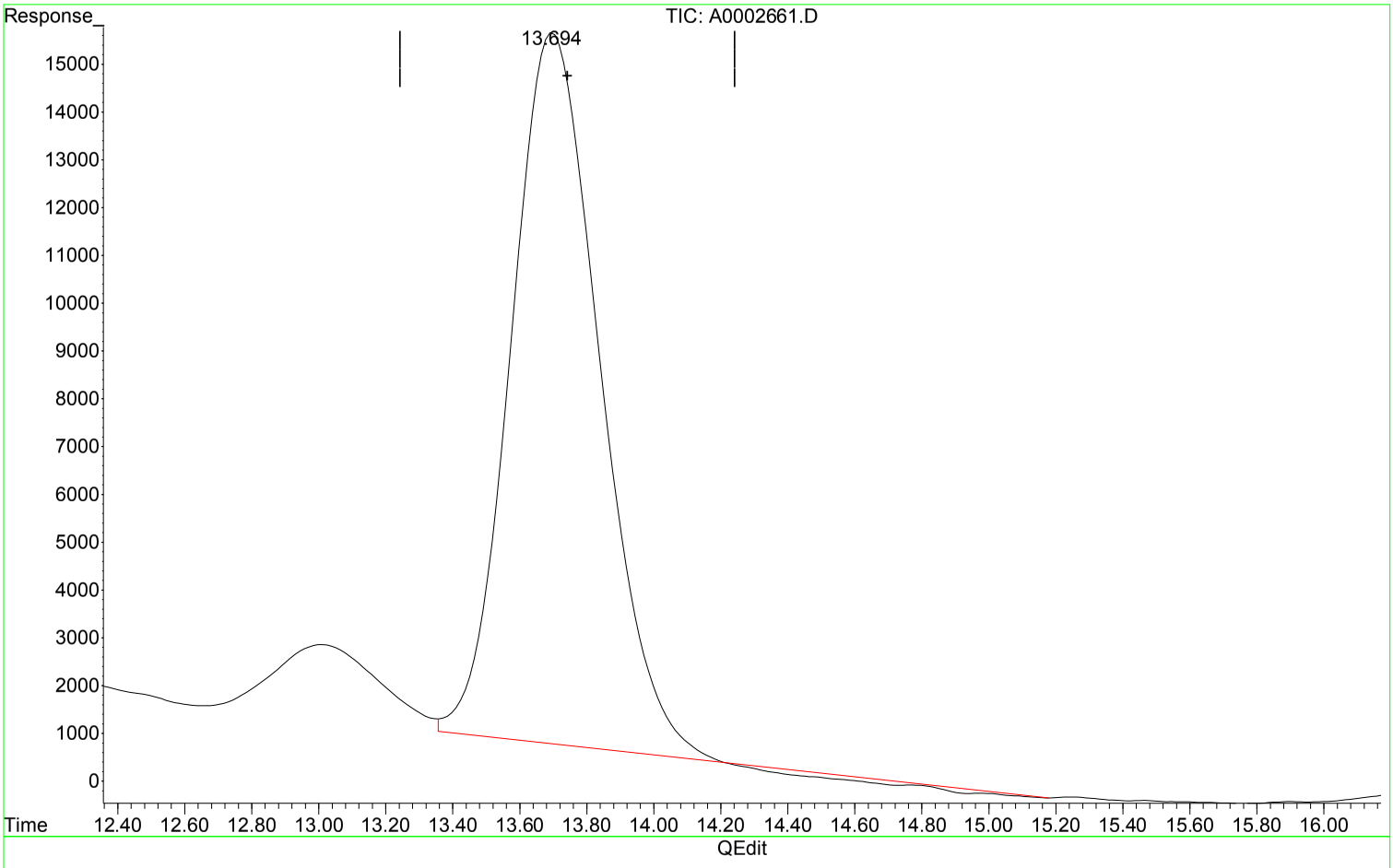
00944585

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.701min 45.674 ppm

response 2721779

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

00944586

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 17:48:15~~ 21-Dec-2018, 13:50:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	94.769 E3	1.6	98	0.00
2 T	Pyruvic acid	452.935	439.778 E3	2.9	96	0.00
3 T	Lactic Acid	53.765	59.856 E3	-11.3	110	-0.02
4 T	Acetic Acid	59.169	58.576 E3	1.0	97	-0.02
5 T	Propionic Acid	59.592	55.037 E3	7.6	93	-0.05
6 T	Butyric Acid	62.897	54.523 E3	13.3	93	-0.22

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 17:48:15~~ 21-Dec-2018, 13:50:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.409	4738427	49.183	ppm	
2) T	Pyruvic acid	4.323	2198889	4.855	ppm	
3) T	Lactic Acid	4.950	2992819	55.665	ppm	m
4) T	Acetic Acid	5.413	2928823	49.499	ppm	m
5) T	Propionic Acid	13.694	2751846	46.178	ppm	m
6) T	Butyric Acid	42.960	2726132	43.343	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

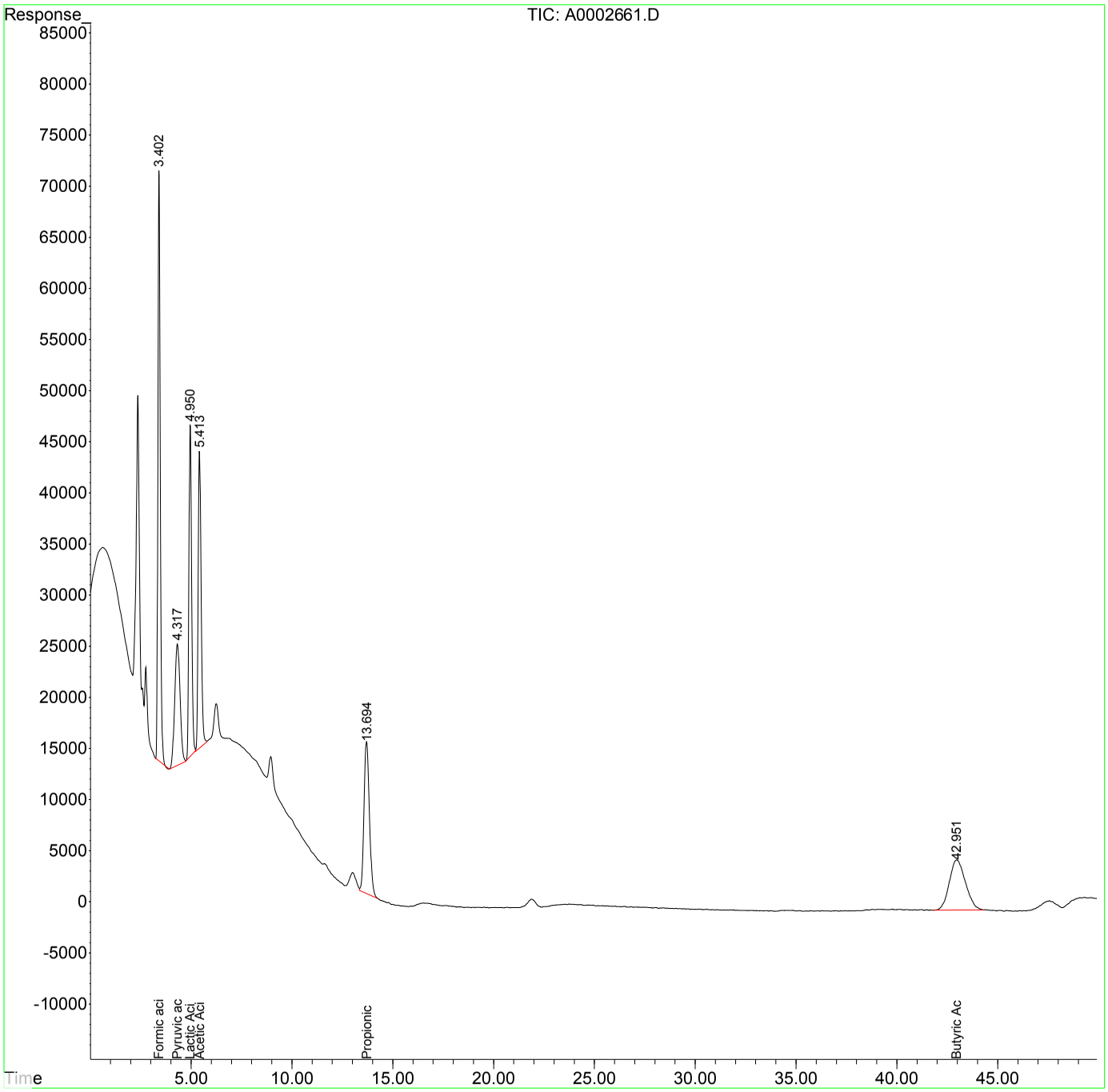
00944588

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002664.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 16:31:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:50:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.917 E3	-0.6	101	0.00
2 T	Pyruvic acid	452.935	455.683 E3	-0.6	99	0.00
3 T	Lactic Acid	53.765	60.657 E3	-12.8	112	0.00
4 T	Acetic Acid	59.169	59.543 E3	-0.6	98	0.00
5 T	Propionic Acid	59.592	59.498 E3	0.2	101	0.00
6 T	Butyric Acid	62.897	56.871 E3	9.6	97	-0.02

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944590

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002664.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 16:31:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:50:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.410	4845835	50.298 ppm
2) T	Pyruvic acid	4.318	2278413	5.030 ppm
3) T	Lactic Acid	4.957	3032840	56.409 ppm
4) T	Acetic Acid	5.420	2977131	50.315 ppm
5) T	Propionic Acid	13.692	2974878	49.921 ppm
6) T	Butyric Acid	42.935	2843527	45.209 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

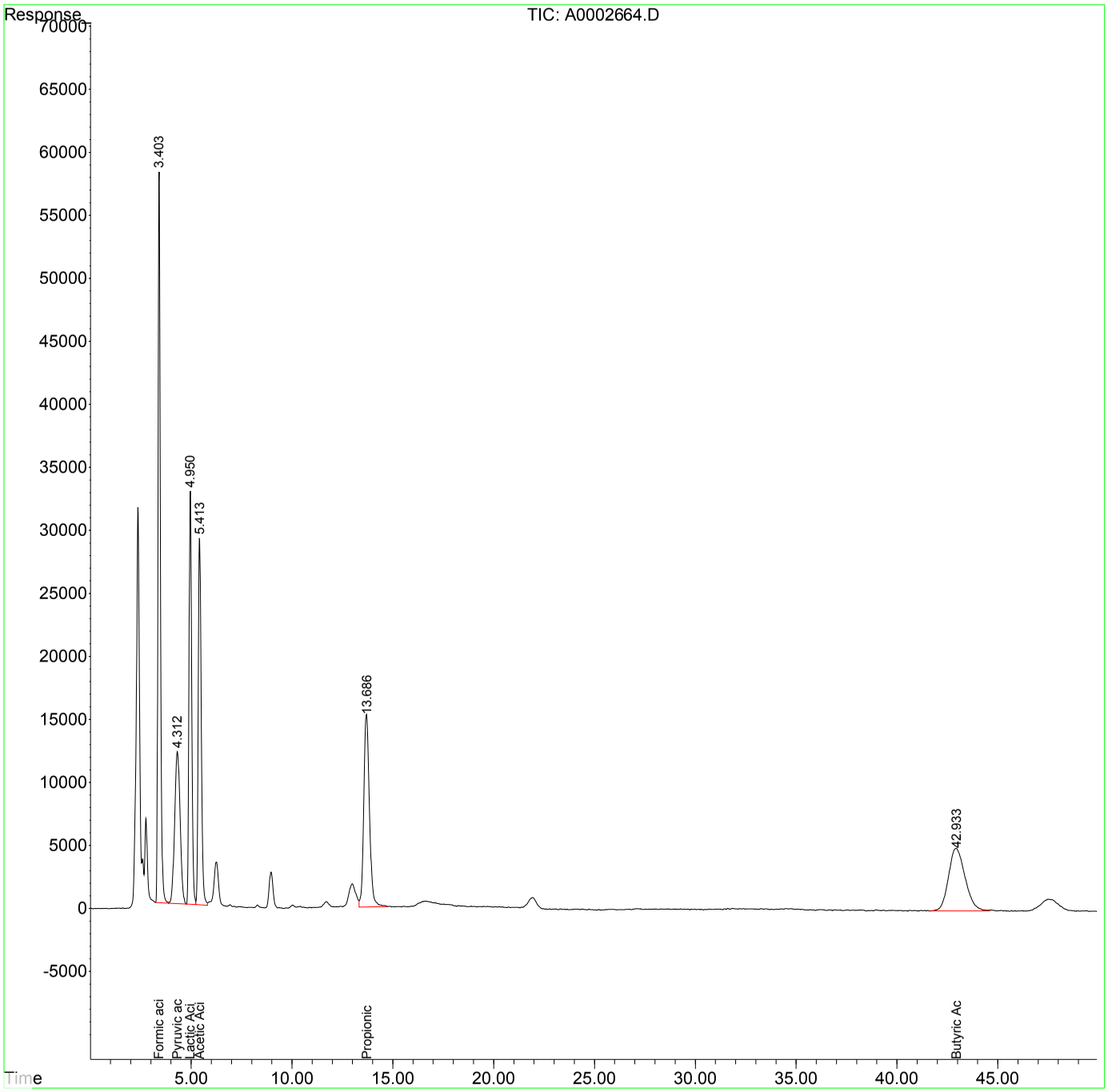
00944591

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002664.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 16:31:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:50:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.131	1896636	19.686 ppm
2) T	Pyruvic acid	3.628	1357394	2.997 ppm
3) T	Lactic Acid	4.052	1086883	20.215 ppm
4) T	Acetic Acid	4.405	1218452	20.593 ppm
5) T	Propionic Acid	9.222	1146657	19.242 ppm
6) T	Butyric Acid	25.002	1138865	18.107 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

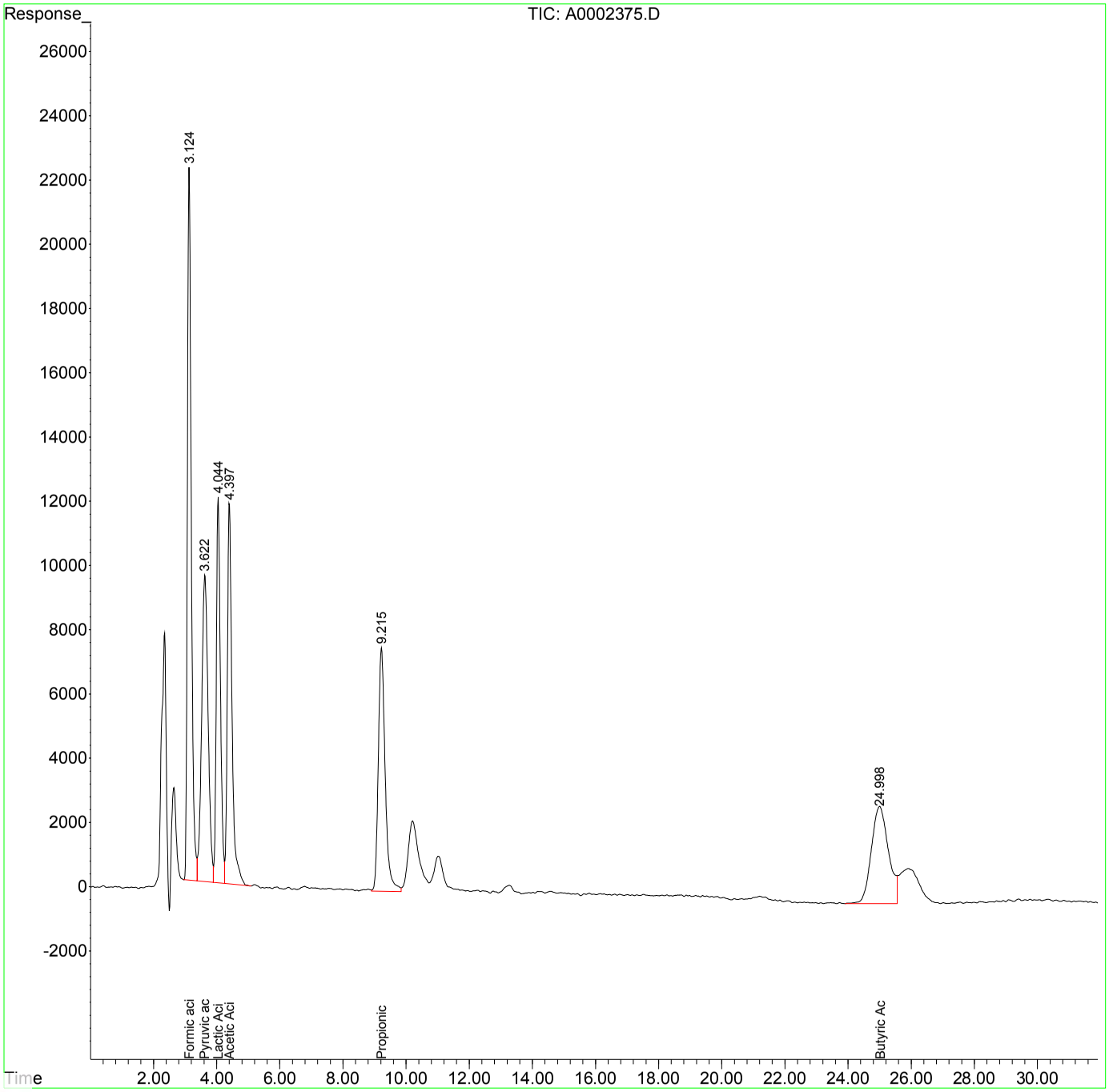
00944593

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944594

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	94.832 E3	1.6	100	0.00
2 T	Pyruvic acid	452.935	678.697 E3	-49.8#	160#	0.00
3 T	Lactic Acid	53.765	54.344 E3	-1.1	108	0.00
4 T	Acetic Acid	59.169	60.923 E3	-3.0	111	0.00
5 T	Propionic Acid	59.592	57.333 E3	3.8	101	0.03
6 T	Butyric Acid	62.897	56.943 E3	9.5	94	0.16

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00944595

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.129	18870917	195.296	ppm	
2) T	Pyruvic acid	3.625	9170882	20.284	ppm	
3) T	Lactic Acid	4.045	10741636	199.759	ppm	
4) T	Acetic Acid	4.387	11865318	200.607	ppm	m
5) T	Propionic Acid	9.141	11451173	191.091	ppm	
6) T	Butyric Acid	24.580	12106071	191.444	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

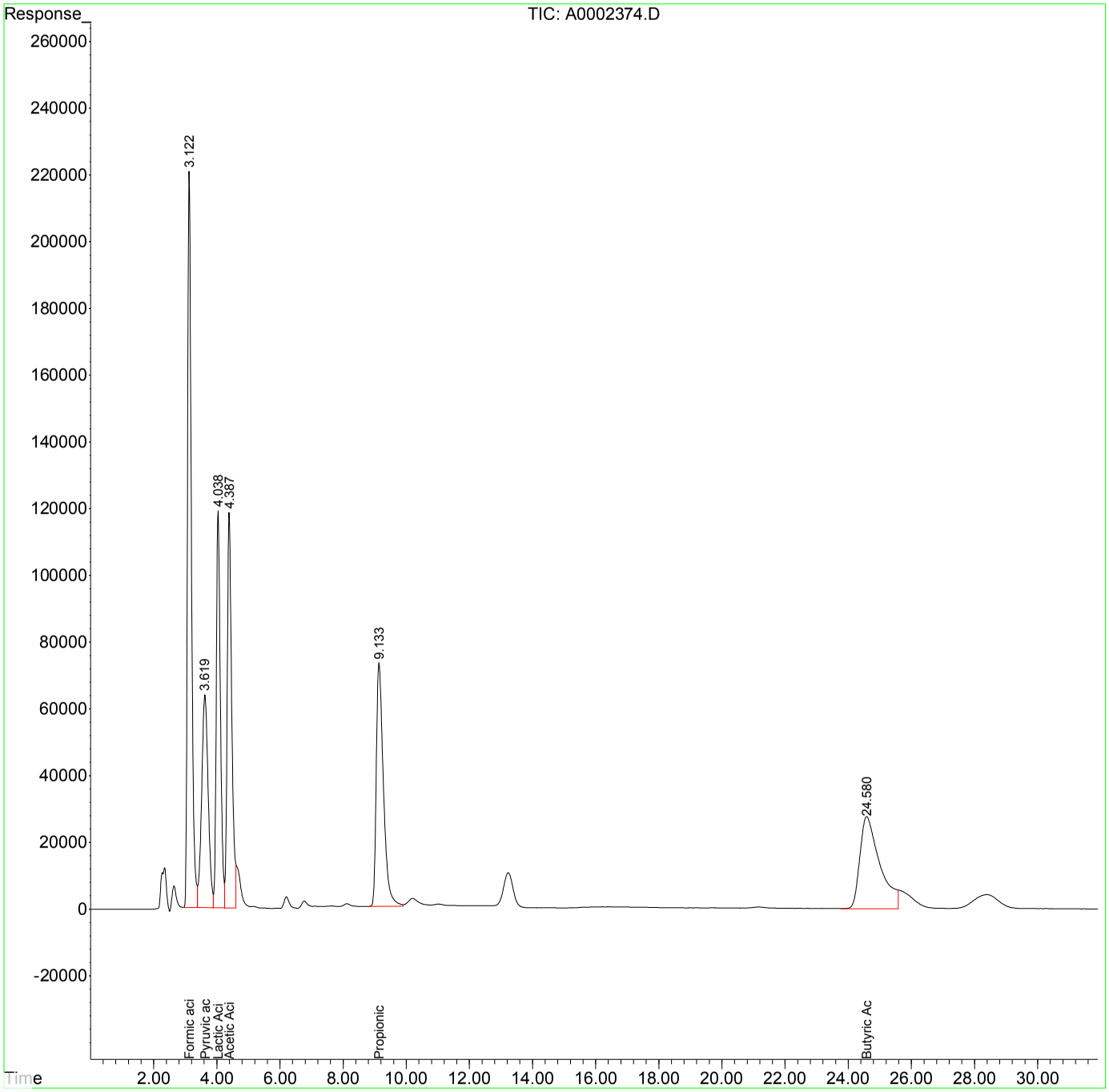
00944596

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



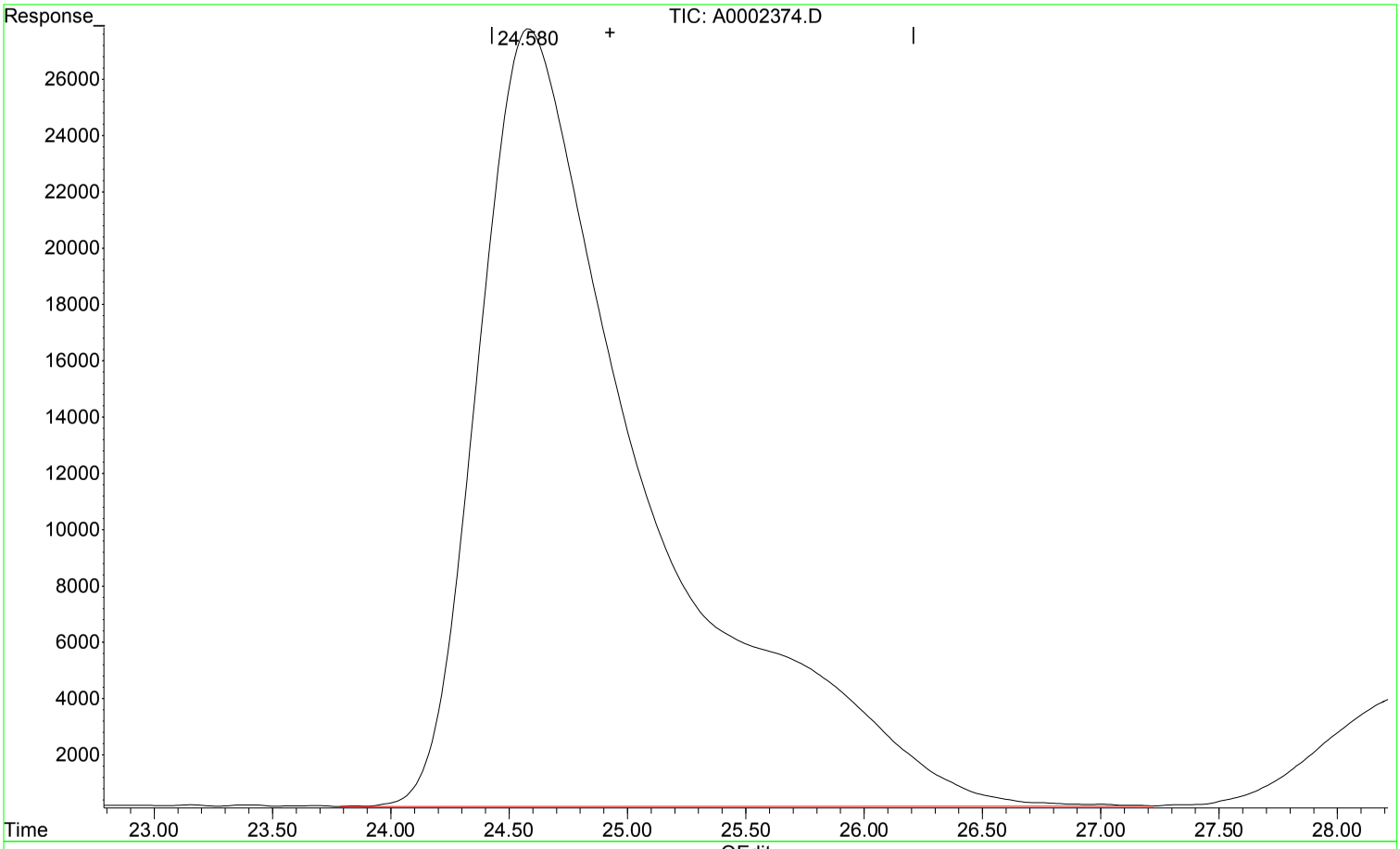
00944597

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.587min 217.586 ppm

response 13759140

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

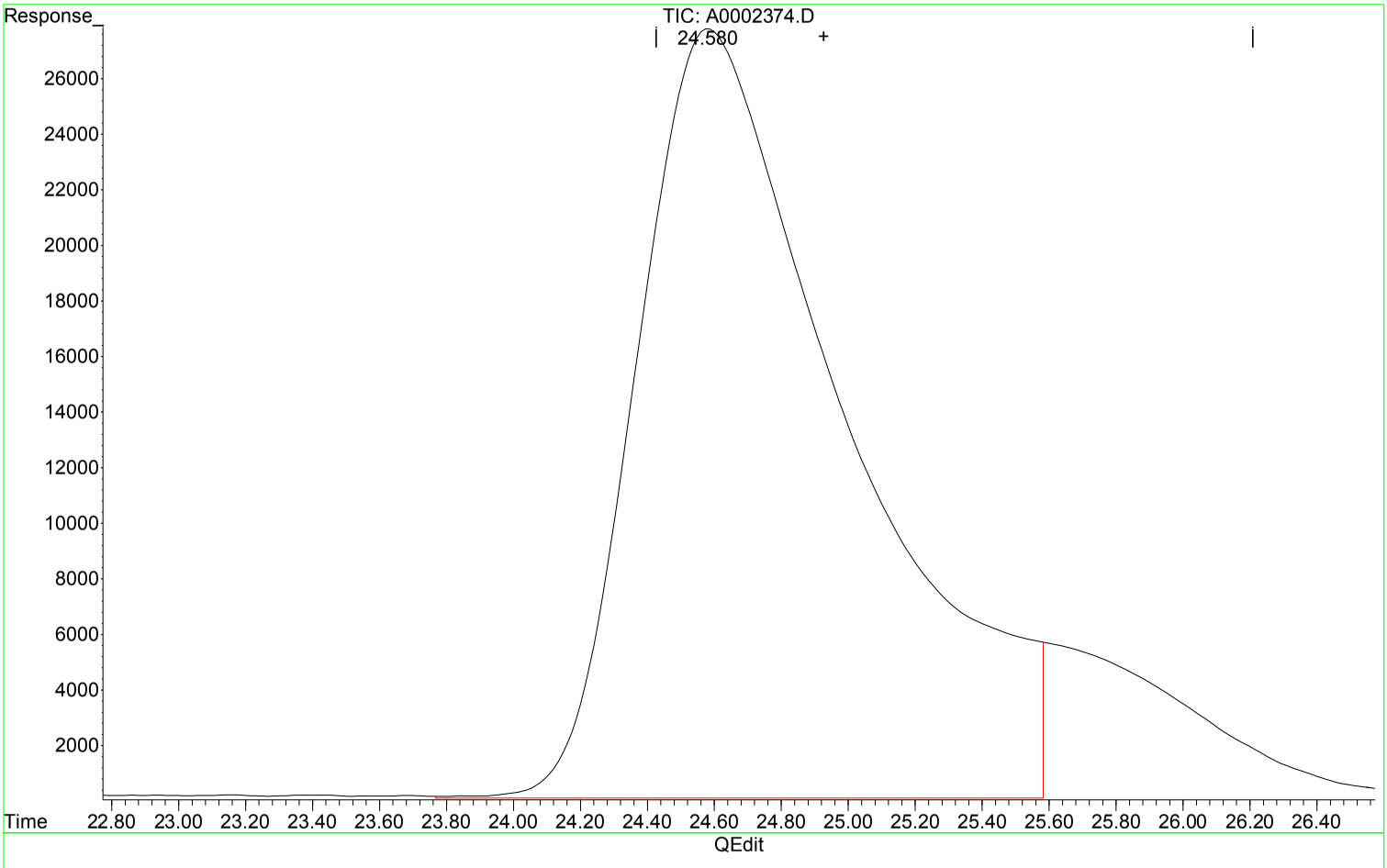
00944598

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.580min 191.444 ppm m

response 12106071

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:42:27 2018

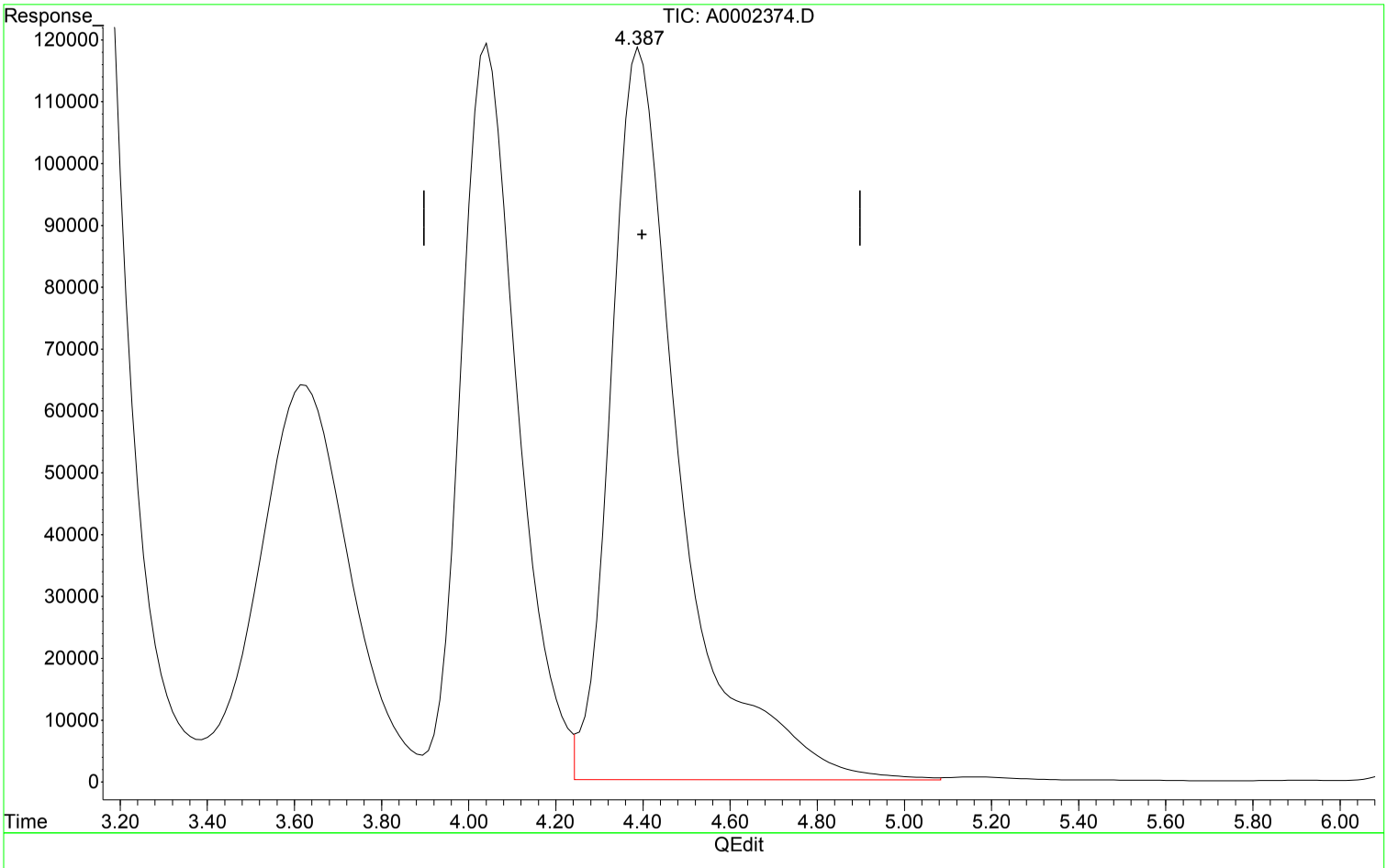
00944599

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.394min 222.004 ppm

response 13130885

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:42:06 2018

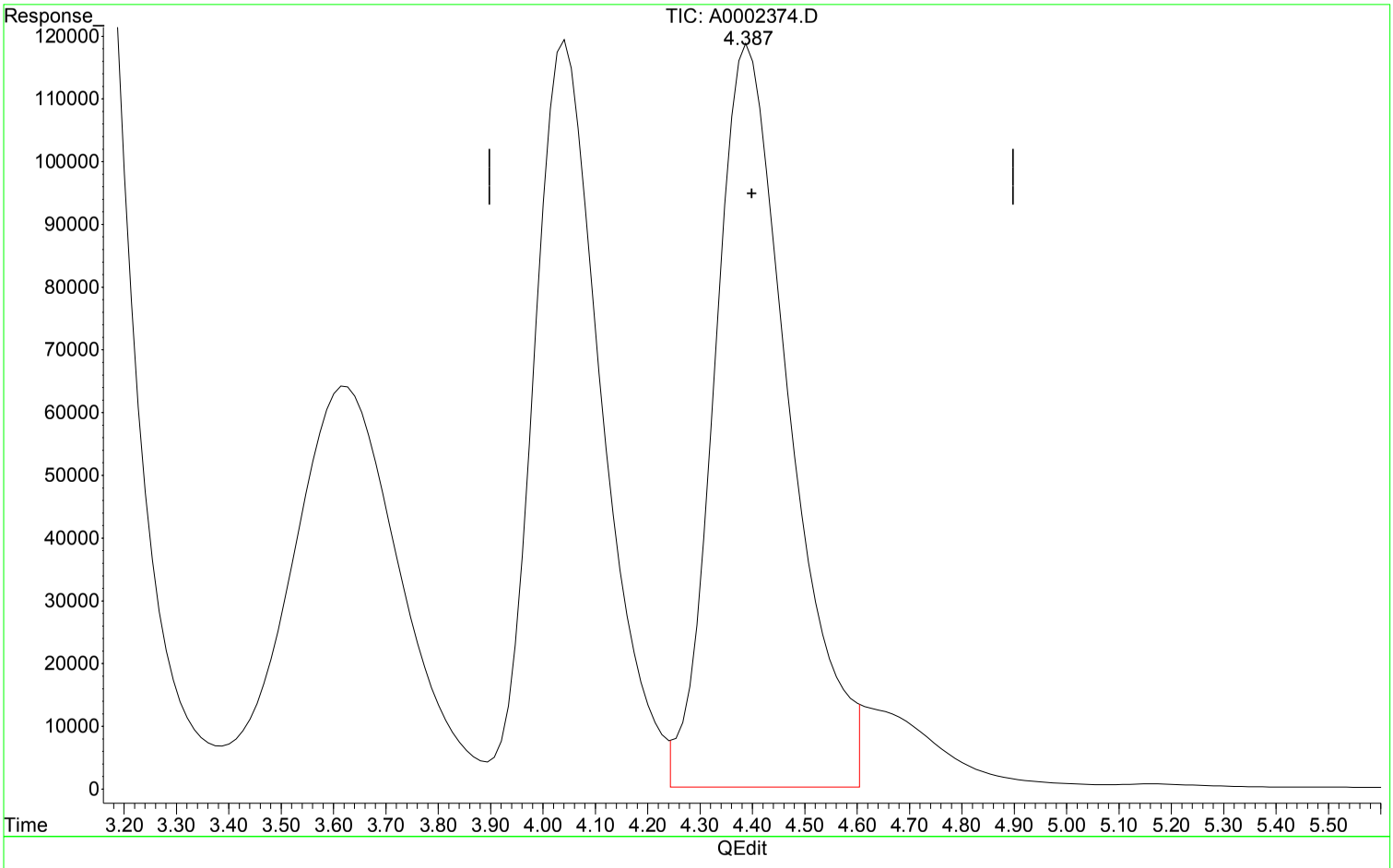
00944600

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.387min 200.607 ppm m

response 11865318

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944601

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.132	9131569	96.958	ppm	
2) T	Pyruvic acid	3.629	4430352	9.849	ppm	
3) T	Lactic Acid	4.052	5216101	98.587	ppm	
4) T	Acetic Acid	4.397	5725459	96.715	ppm	m
5) T	Propionic Acid	9.203	5508012	93.403	ppm	
6) T	Butyric Acid	24.847	5510917	91.221	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

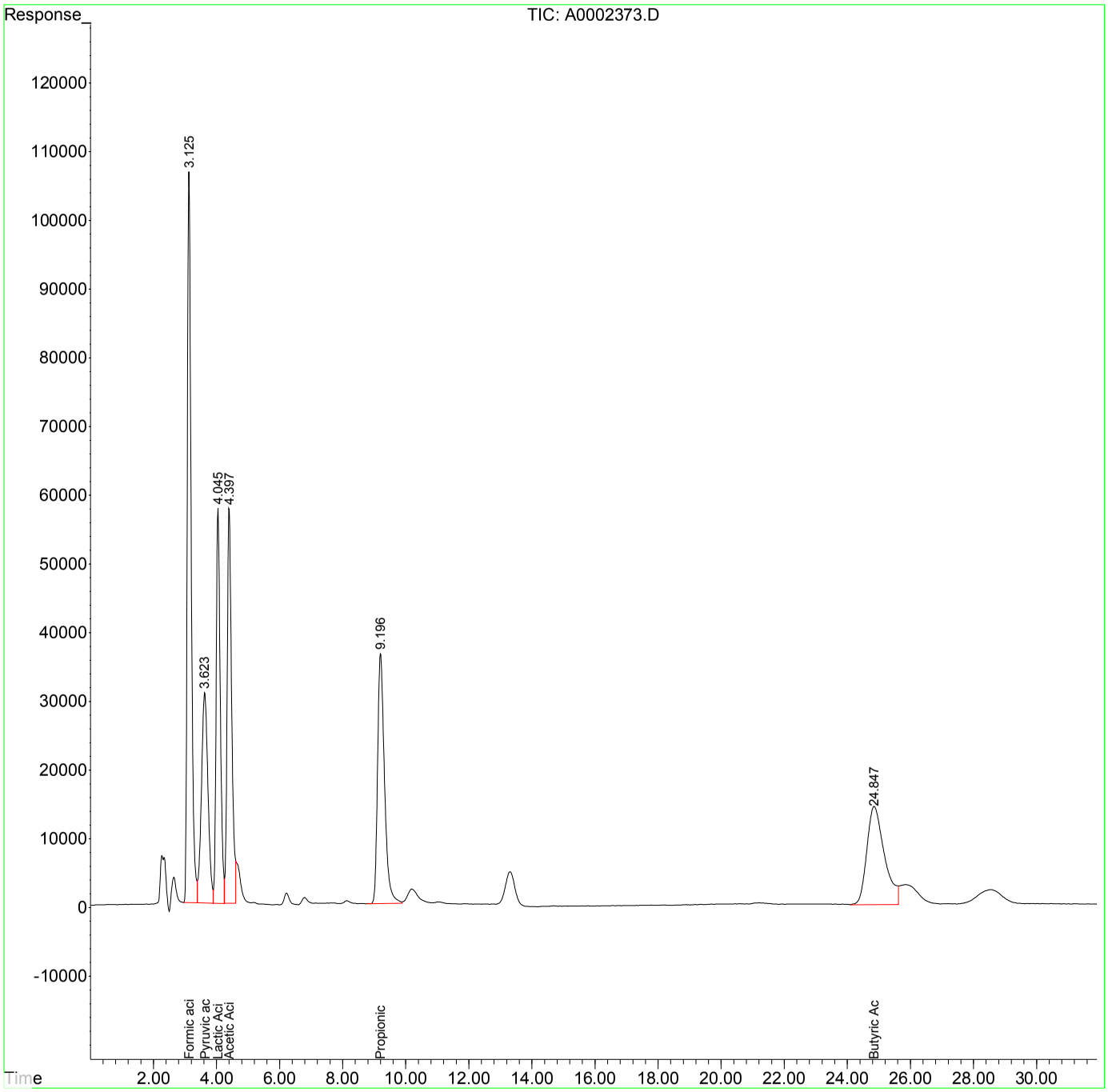
00944602

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

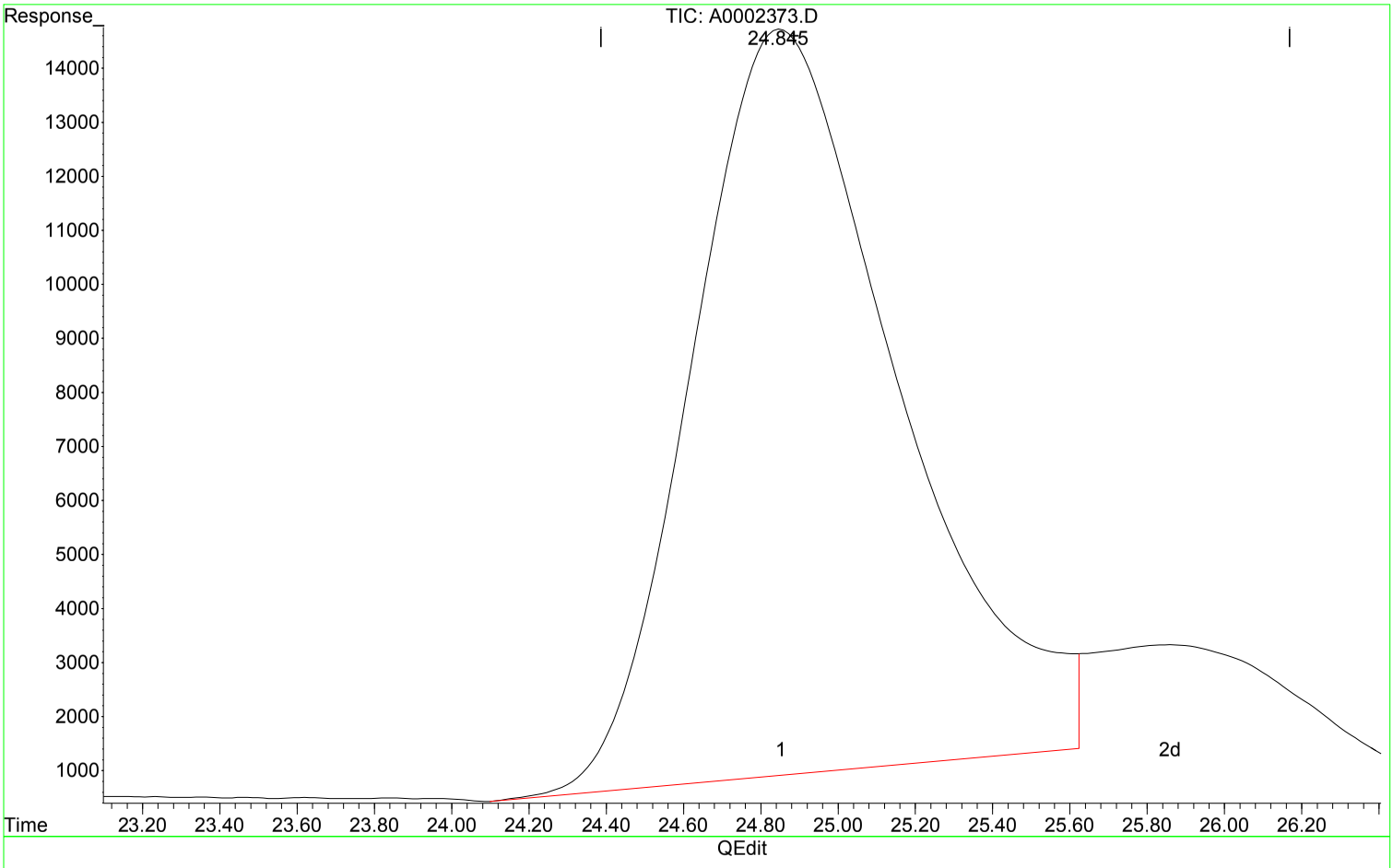


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.853min 84.188 ppm

response 5086048

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

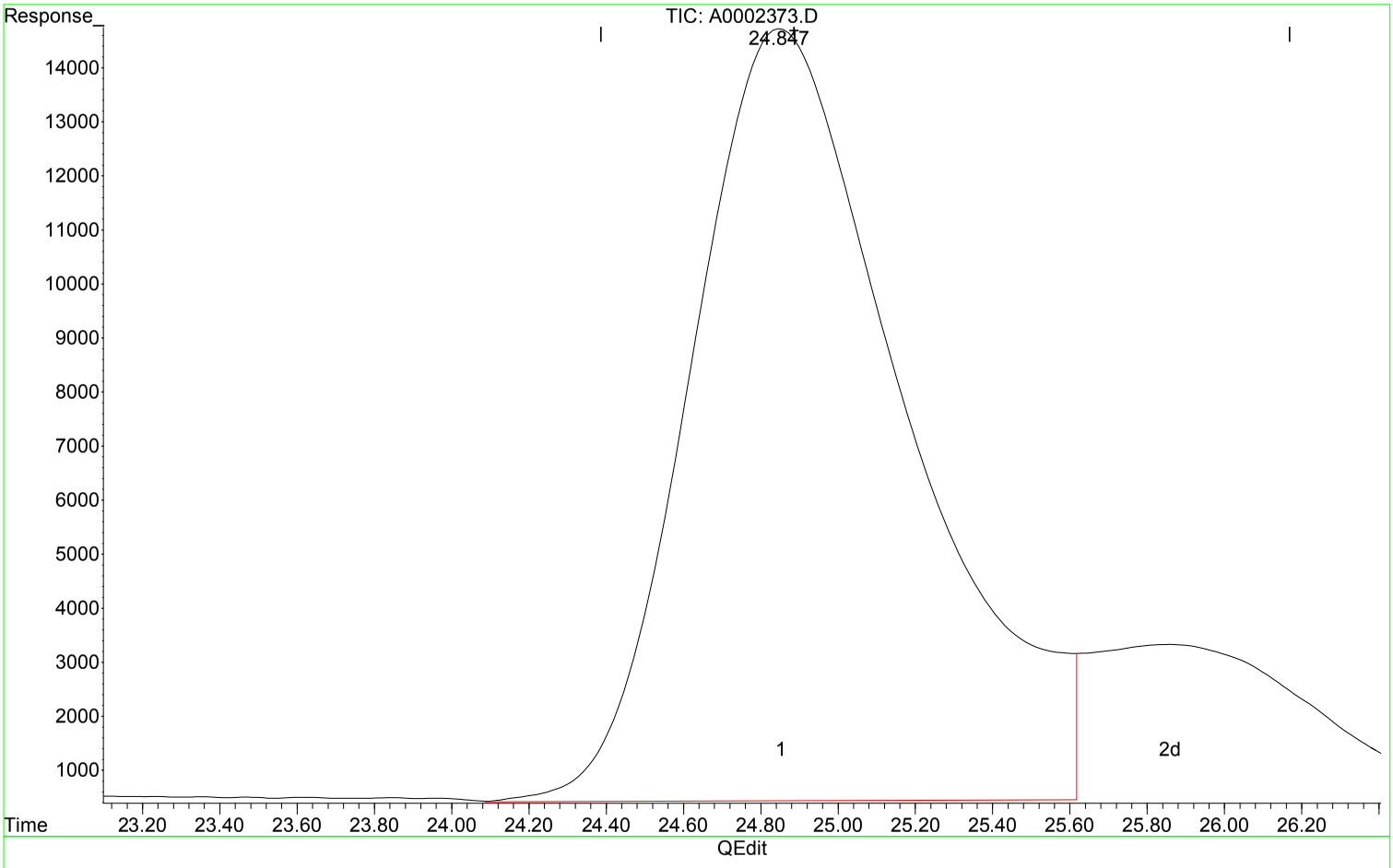
00944604

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.847min 91.221 ppm m

response 5510917

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:11:21 2018

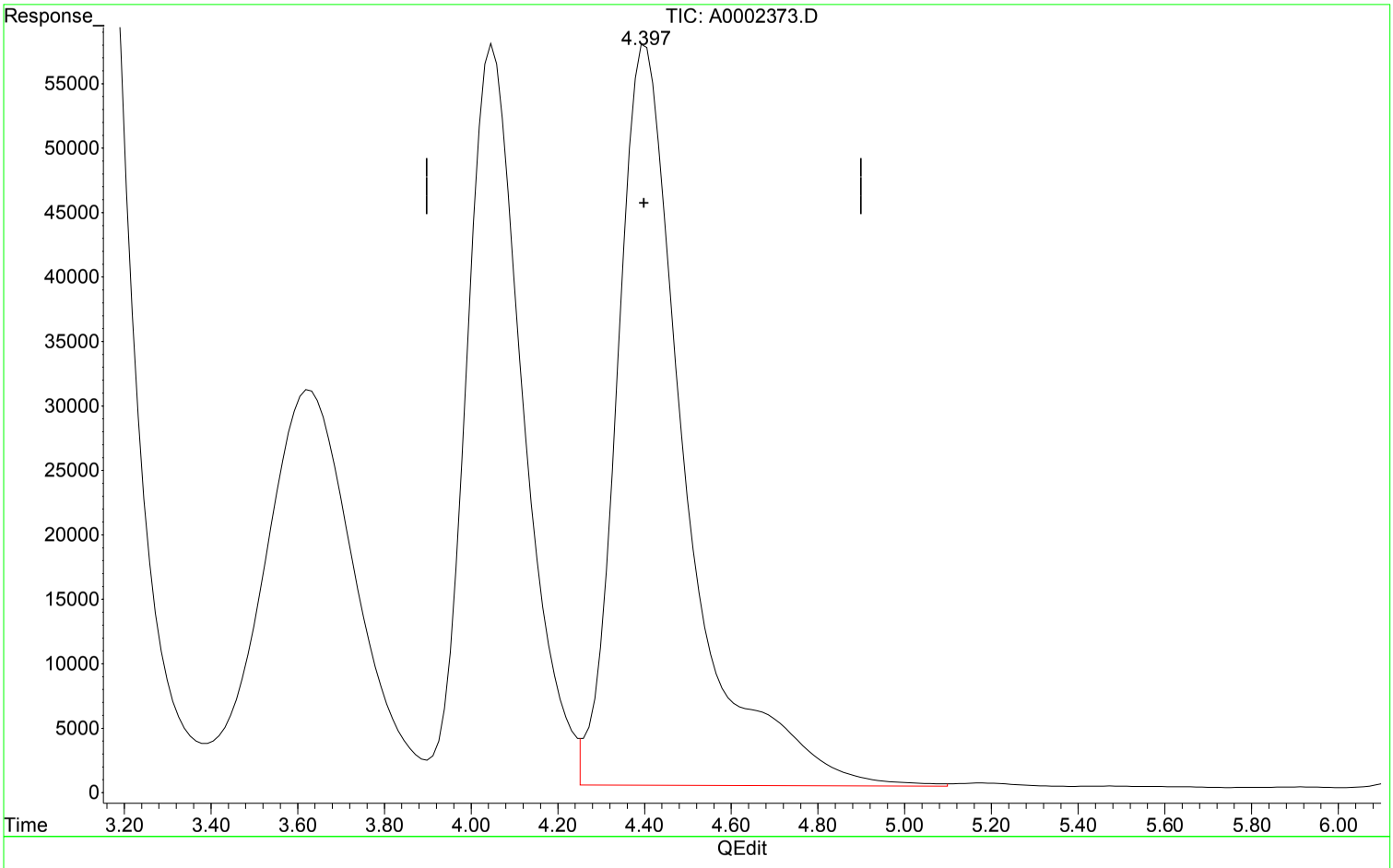
00944605

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.405min 107.446 ppm

response 6360712

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:10:56 2018

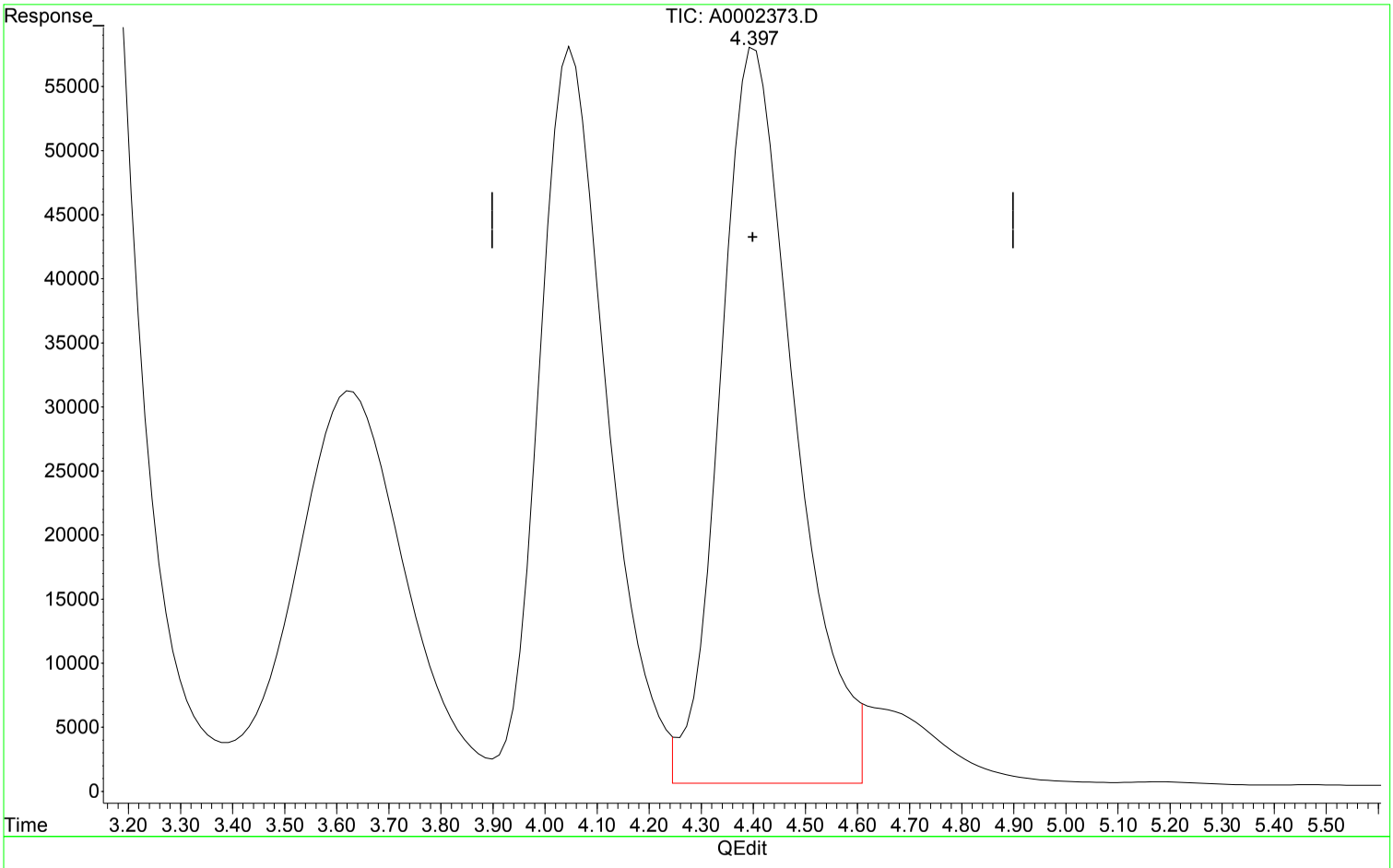
00944606

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 96.715 ppm m

response 5725459

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944607

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	4817586	51.153	ppm	
2) T	Pyruvic acid	3.630	2294161	5.100	ppm	
3) T	Lactic Acid	4.053	2711599	51.251	ppm	
4) T	Acetic Acid	4.398	3026497	51.124	ppm	m
5) T	Propionic Acid	9.212	2949938	50.024	ppm	
6) T	Butyric Acid	24.928	2932273	48.537	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

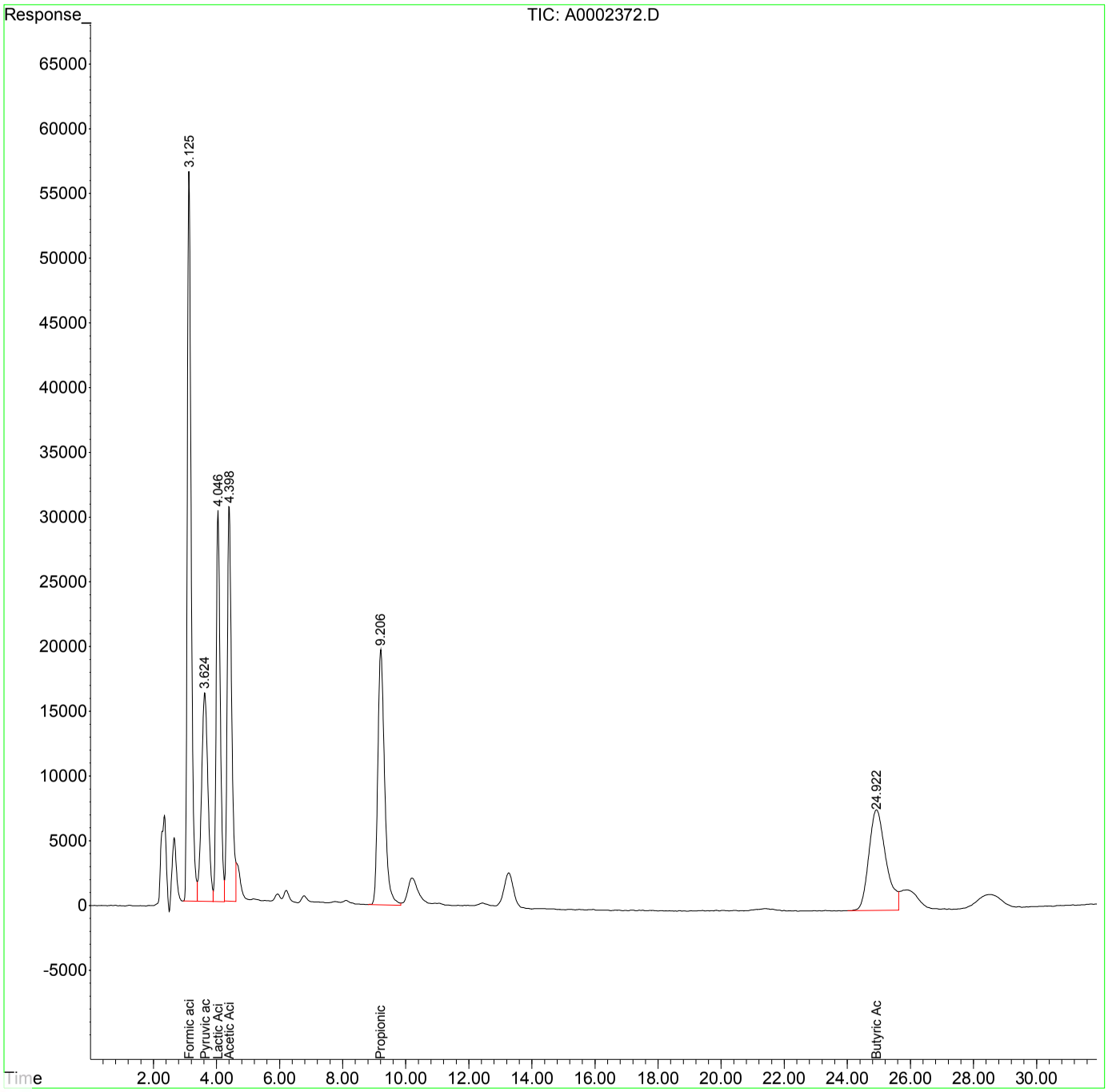
00944608

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

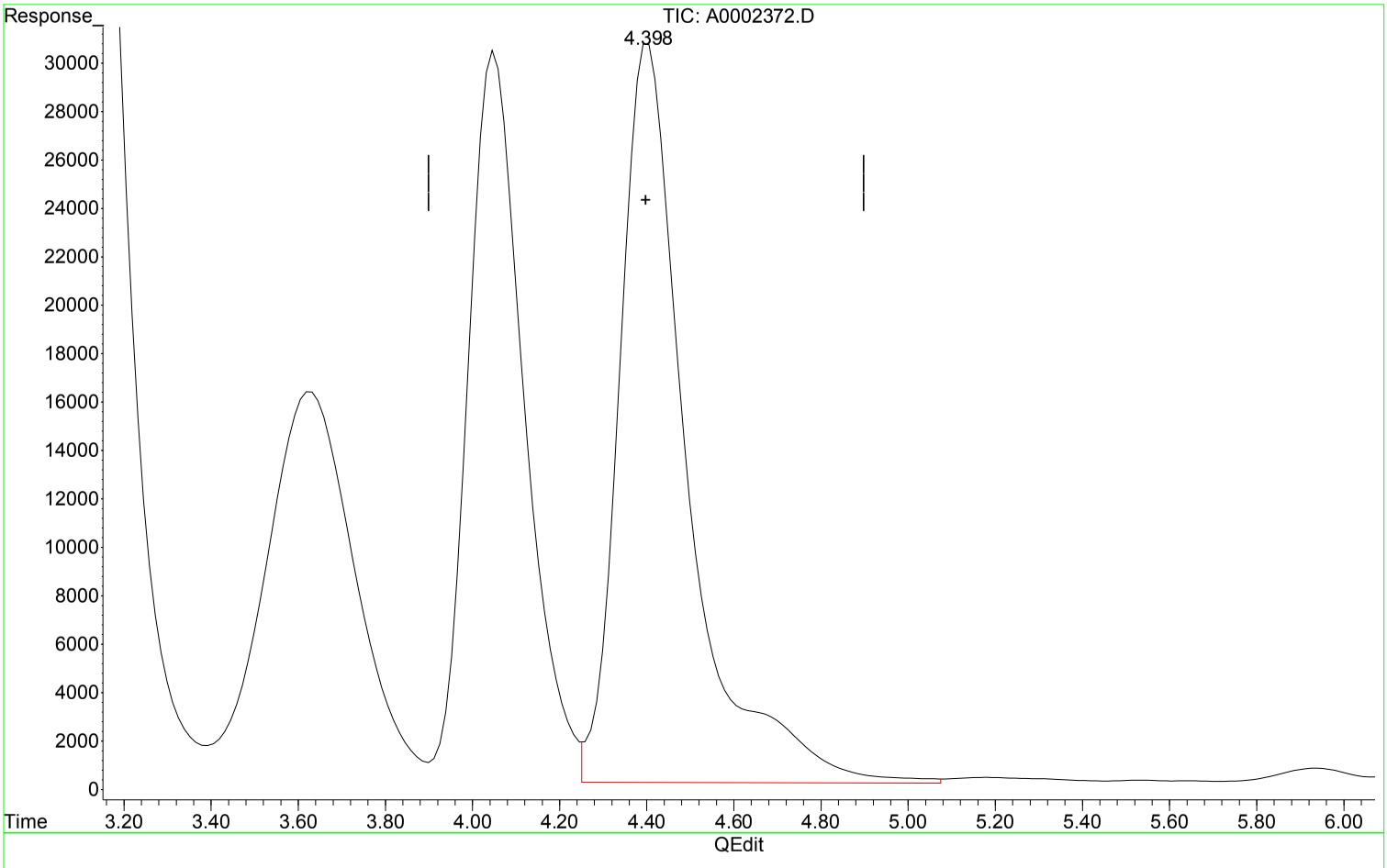


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 56.131 ppm

response 3322912

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:10:16 2018

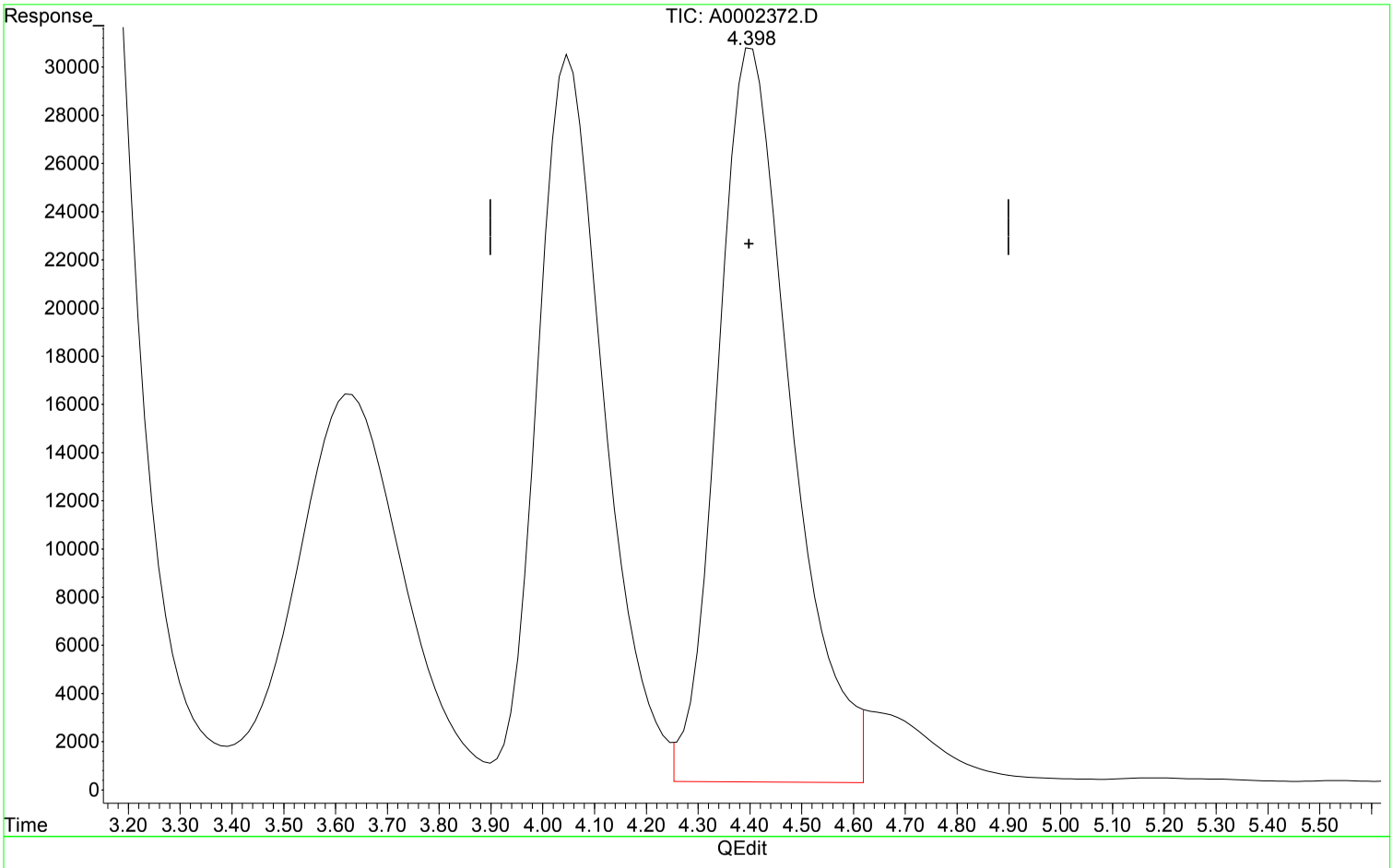
00944610

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.398min 51.124 ppm m

response 3026497

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:10:25 2018

00944611

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.131	1890077	20.069	ppm	
2) T	Pyruvic acid	3.629	850051	1.890	ppm	
3) T	Lactic Acid	4.051	1003444	18.966	ppm	
4) T	Acetic Acid	4.397	1096677	18.525	ppm	m
5) T	Propionic Acid	9.206	1140510	19.340	ppm	m
6) T	Butyric Acid	24.960	1207082	19.981	ppm	

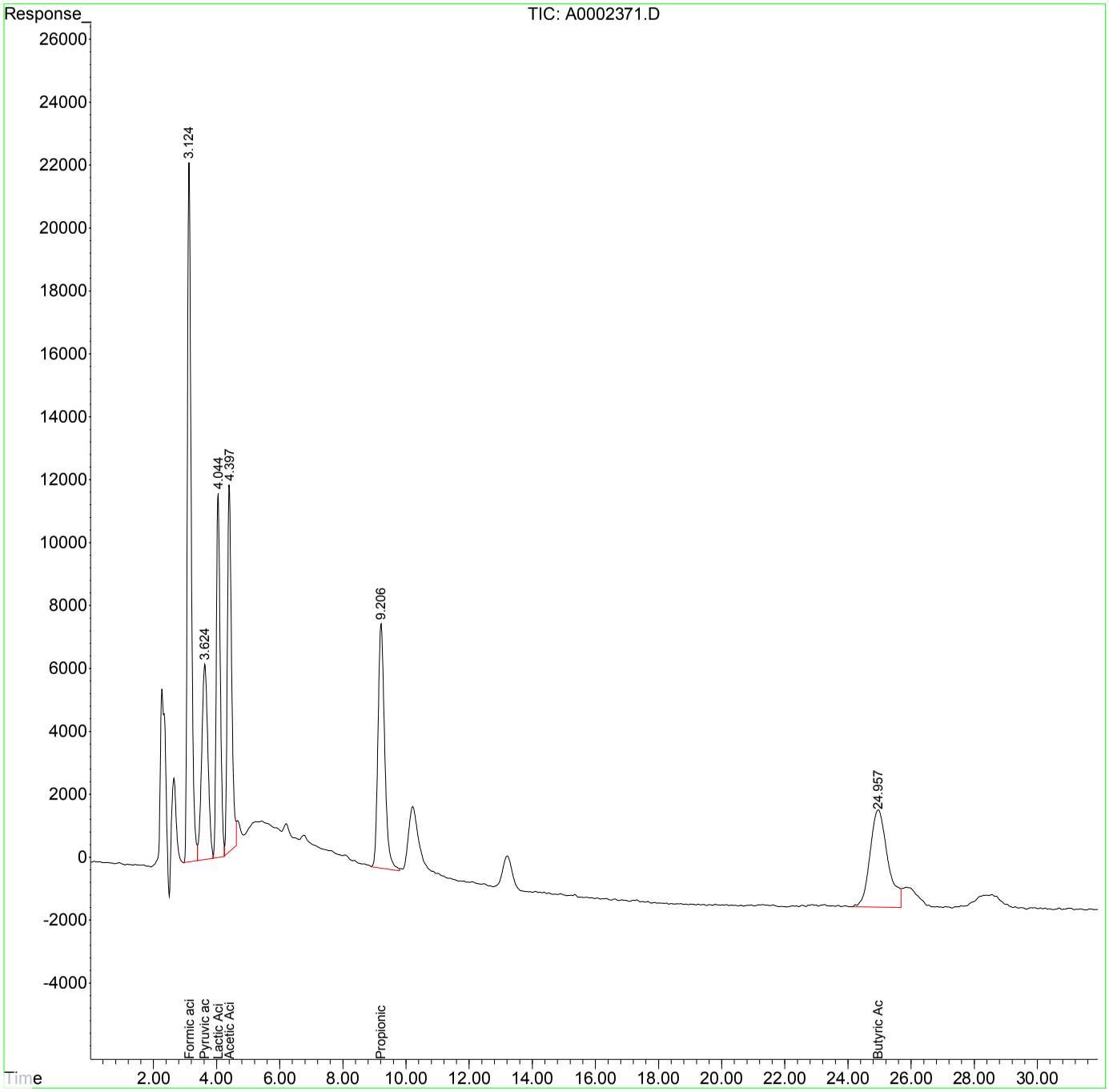
(f)=RT Delta > 1/2 Window (m)=manual int.

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



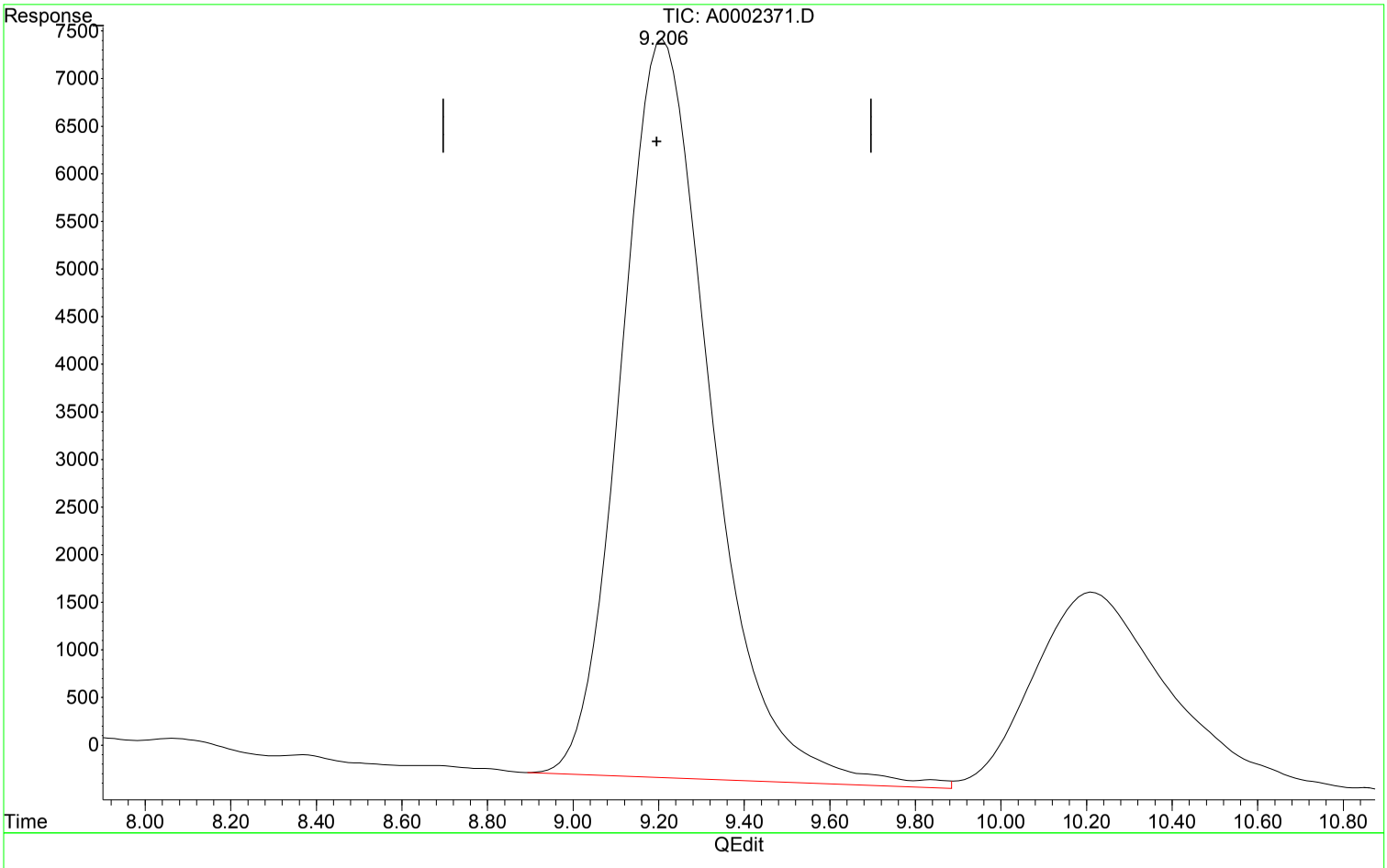
00944613

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.212min 19.380 ppm

response 1142822

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

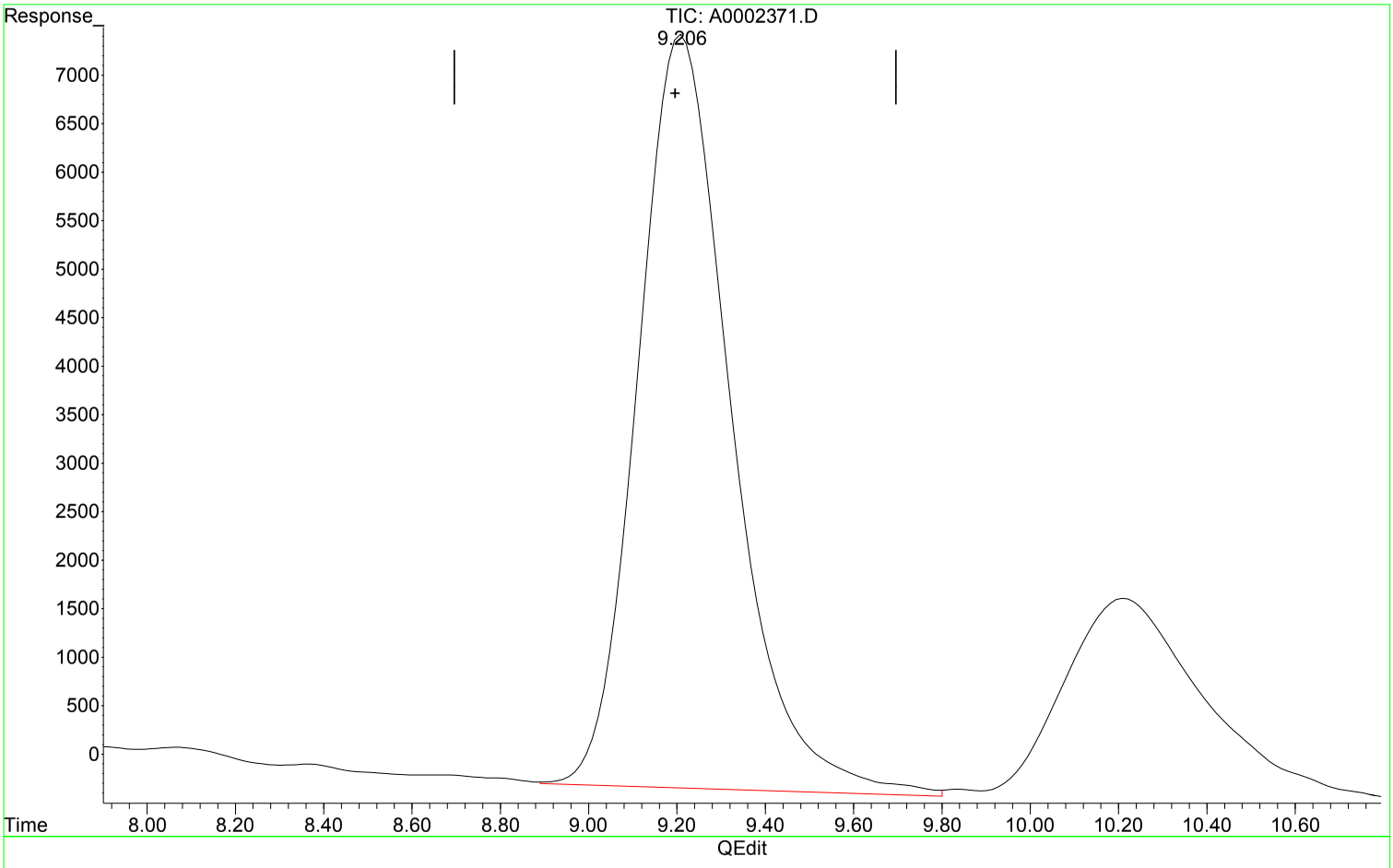
00944614

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.206min 19.340 ppm m

response 1140510

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

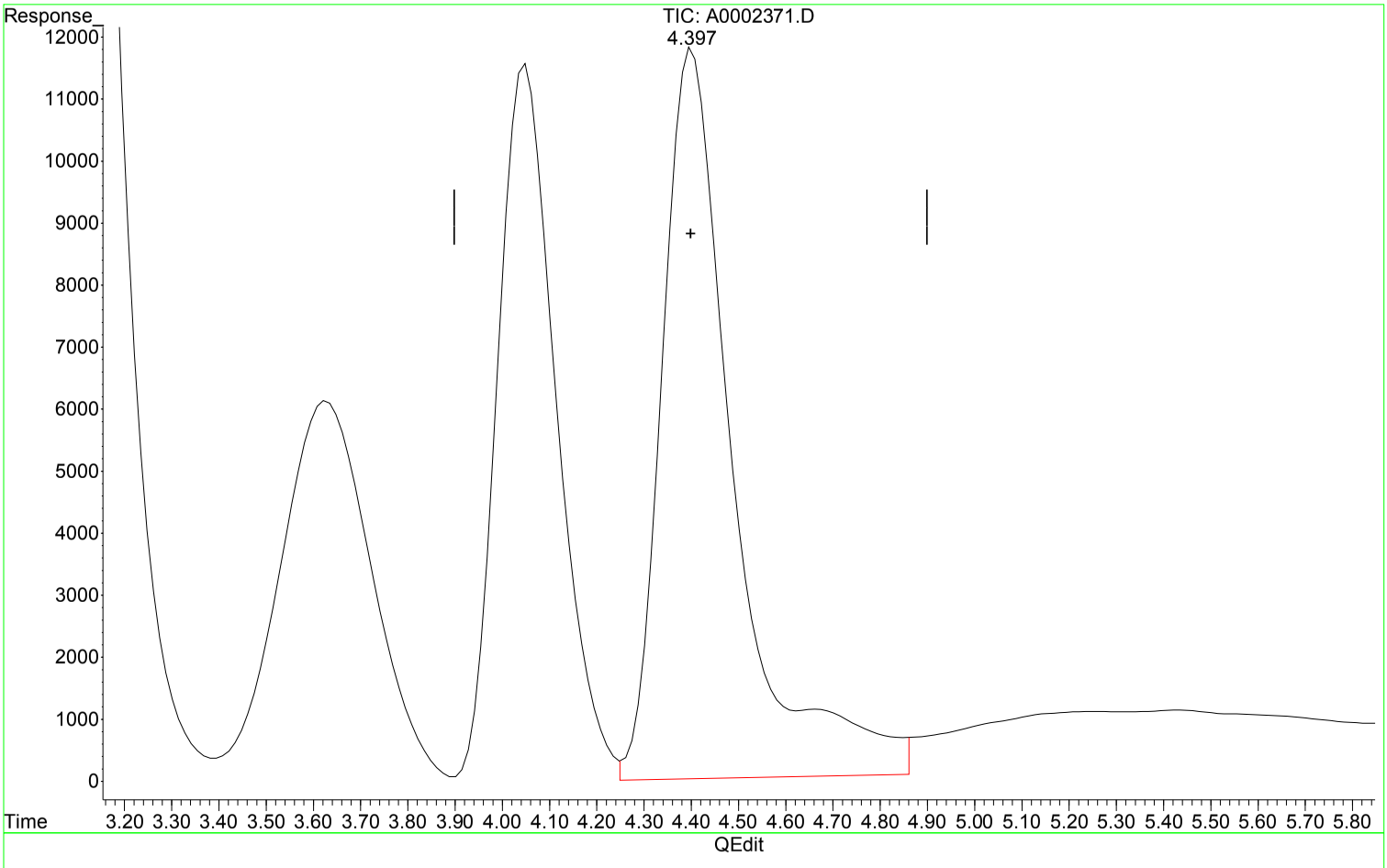
00944615

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.404min 21.093 ppm

response 1248683

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

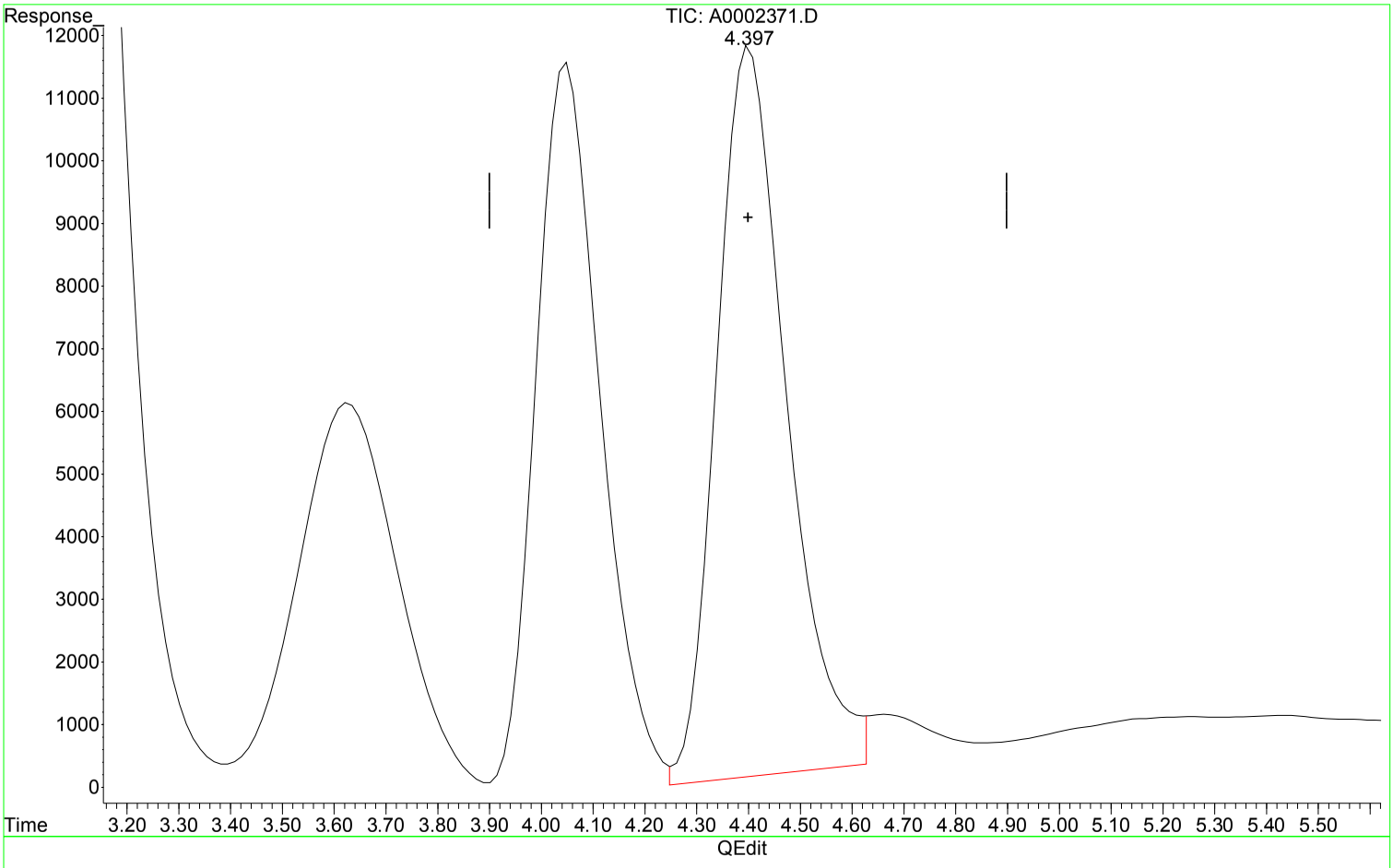
00944616

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 18.525 ppm m

response 1096677

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944617

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	942238	10.005	ppm	
2) T	Pyruvic acid	3.631	448113	0.996	ppm	
3) T	Lactic Acid	4.053	528635	9.991	ppm	
4) T	Acetic Acid	4.399	585881	9.897	ppm	m
5) T	Propionic Acid	9.226	585985	9.937	ppm	
6) T	Butyric Acid	25.010	602088	9.966	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

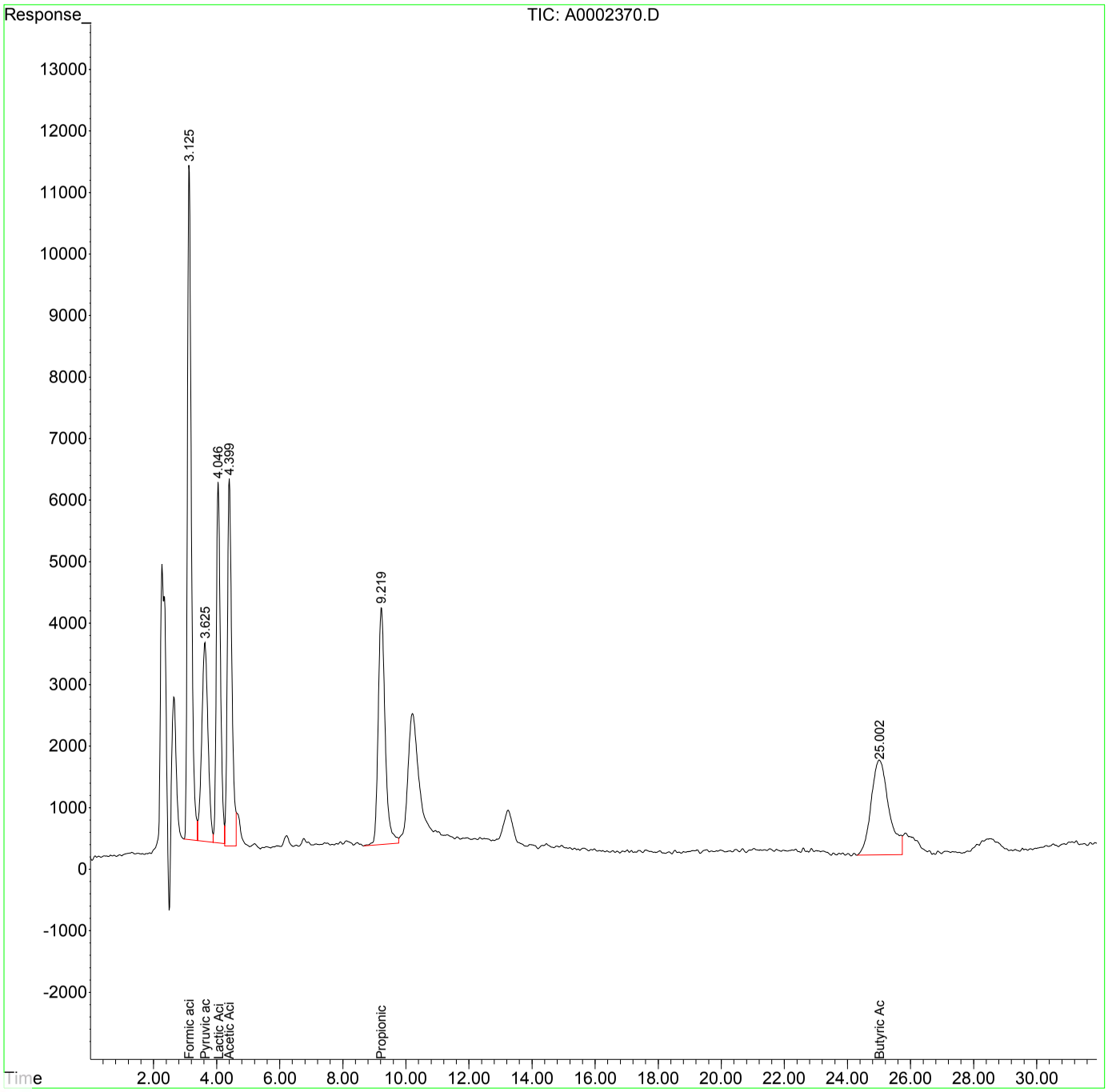
00944618

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

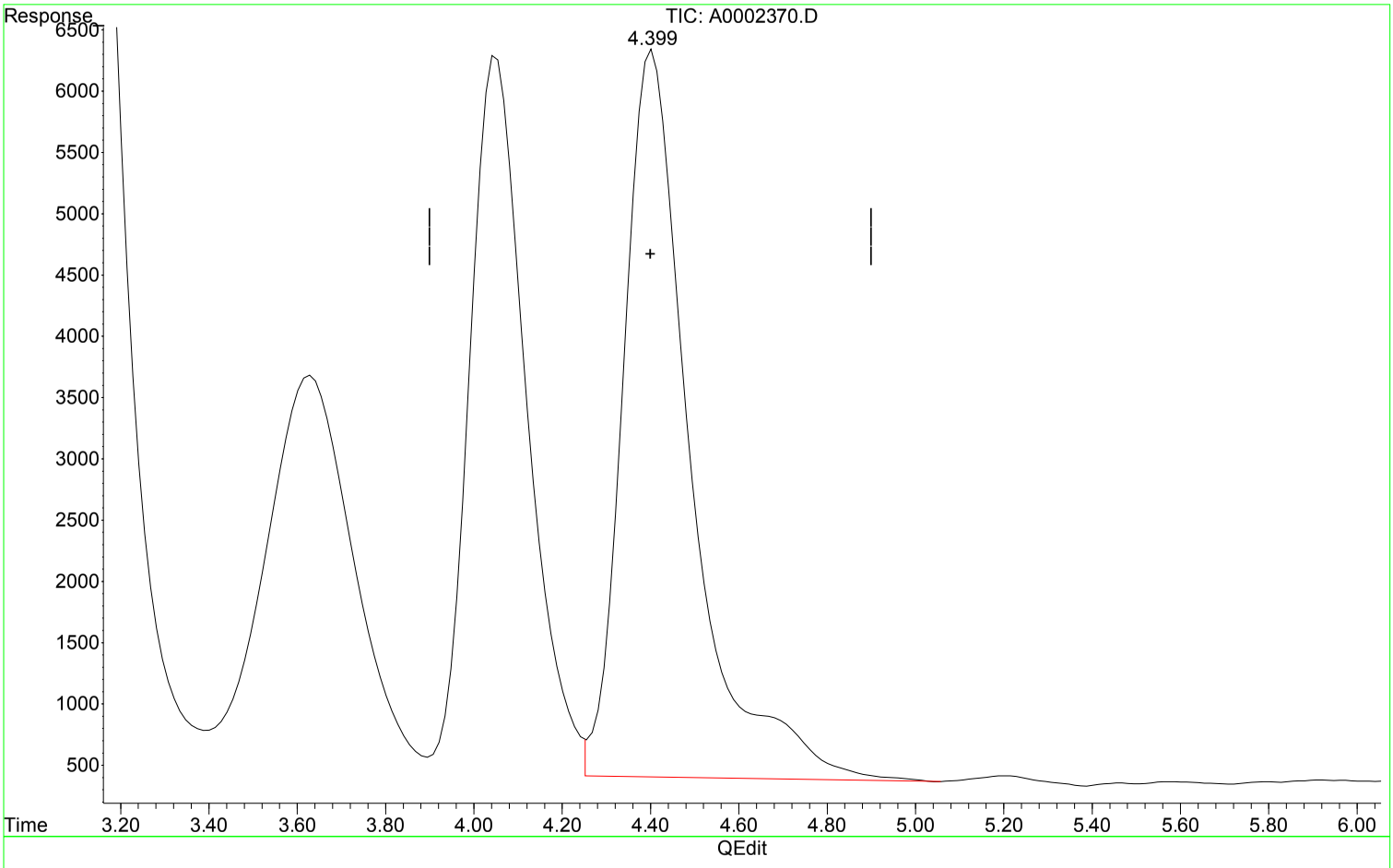


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 10.646 ppm

response 630261

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:08:50 2018

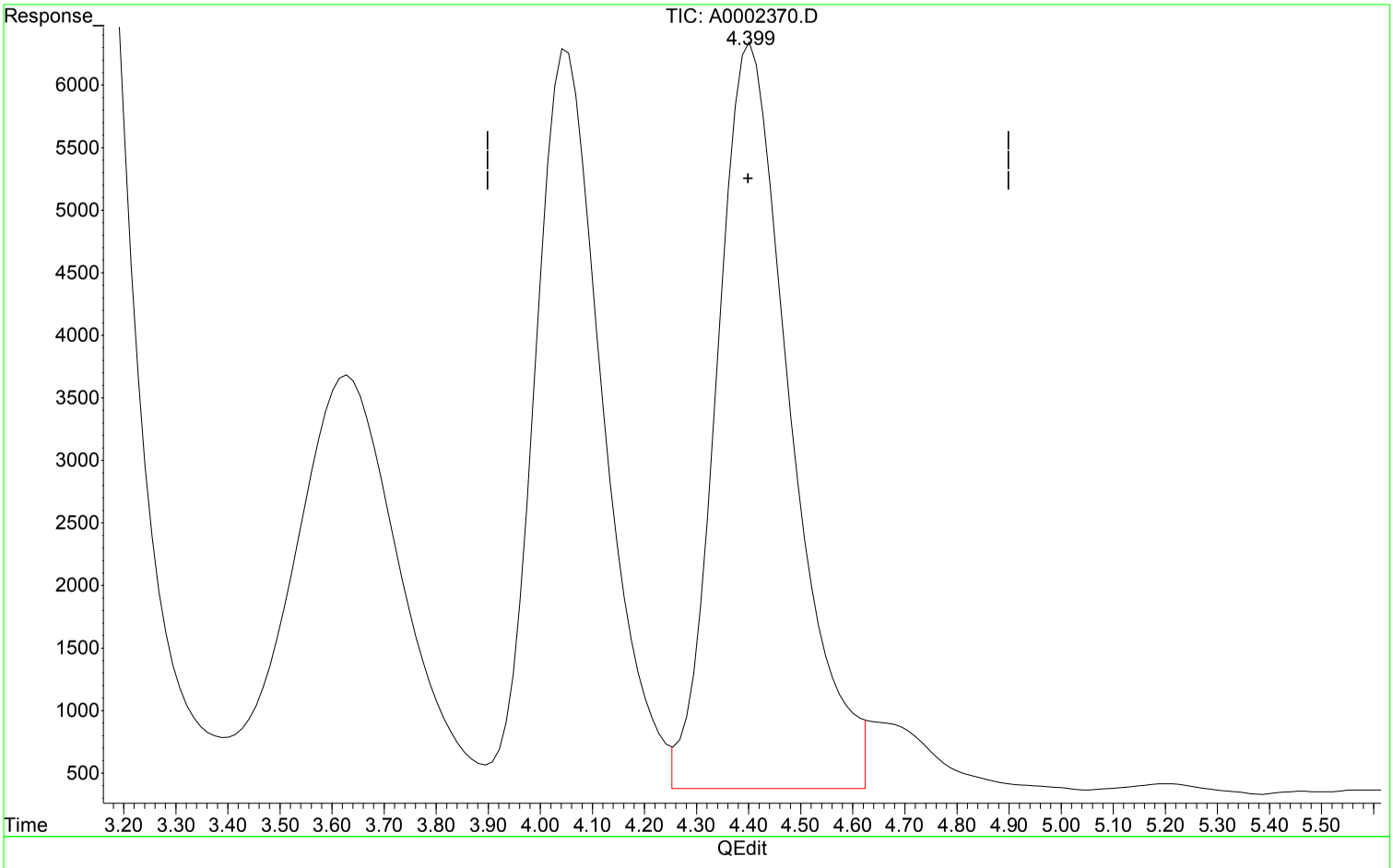
00944620

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 9.897 ppm m

response 585881

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944621

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	497049	5.278	ppm	
2) T	Pyruvic acid	3.631	227620	0.506	ppm	
3) T	Lactic Acid	4.053	269401	5.092	ppm	
4) T	Acetic Acid	4.399	309471	5.228	ppm	m
5) T	Propionic Acid	9.220	306395	5.196	ppm	m
6) T	Butyric Acid	25.001	310758	5.144	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

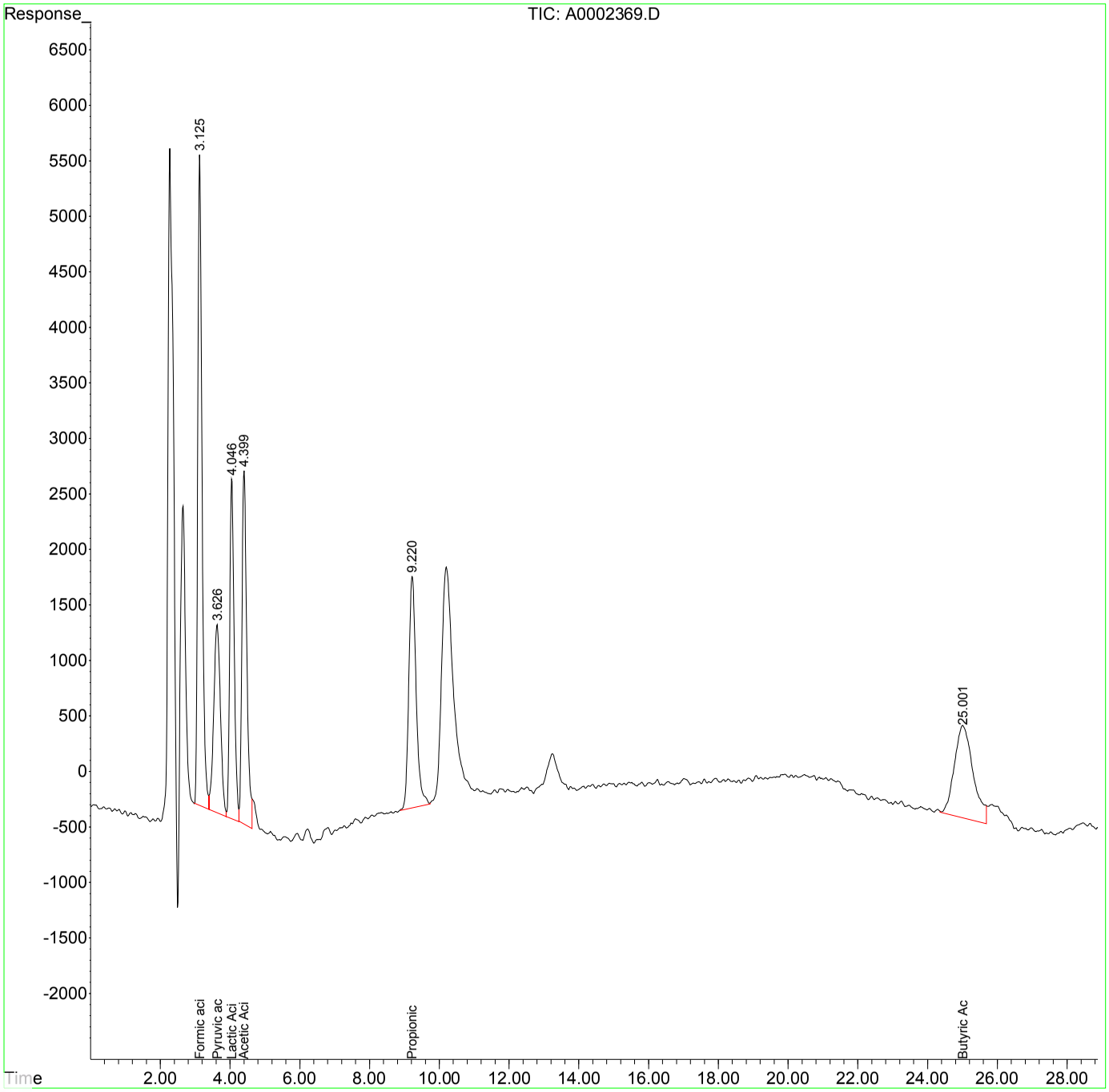
00944622

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



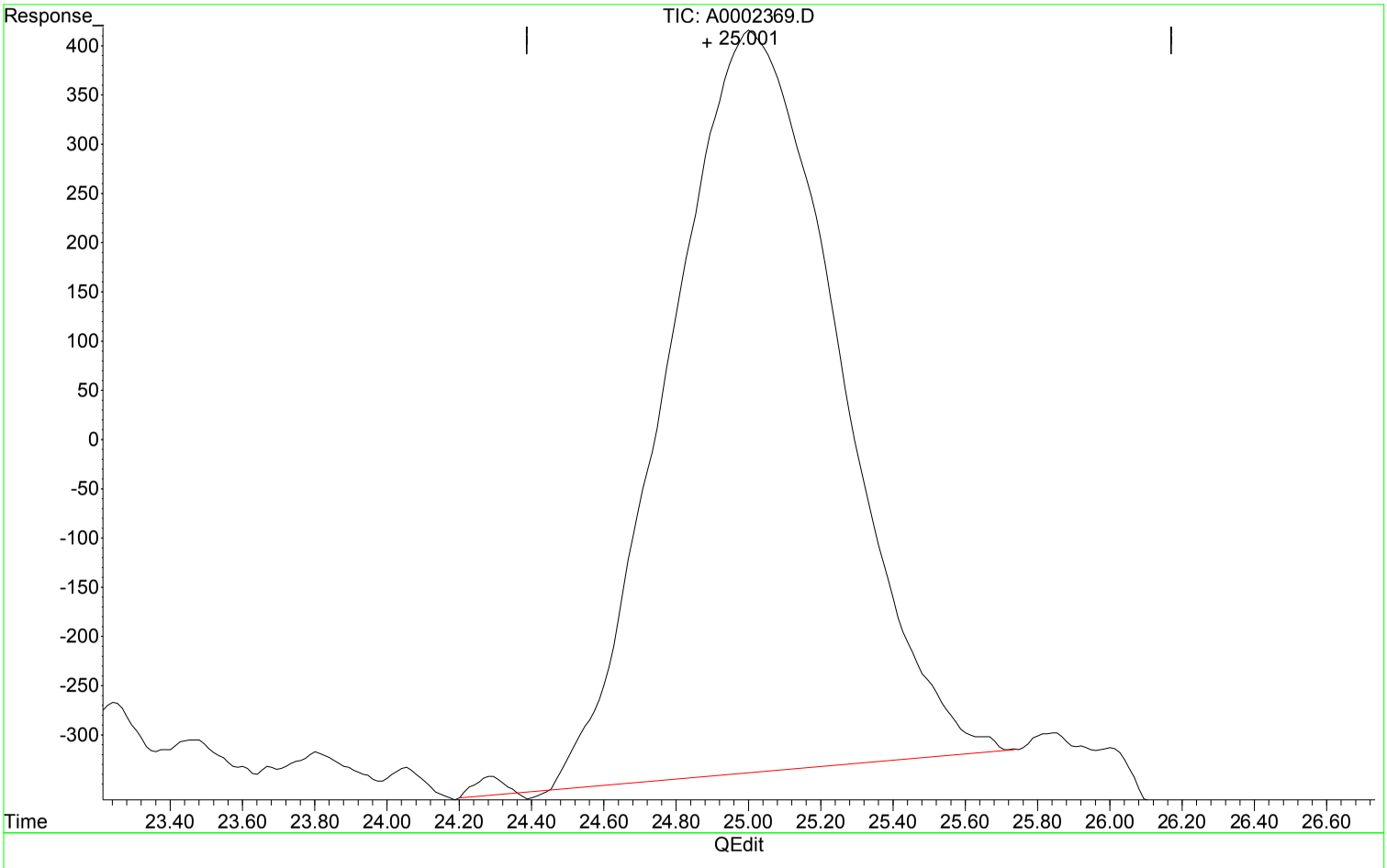
00944623

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.009min 4.071 ppm

response 245954

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

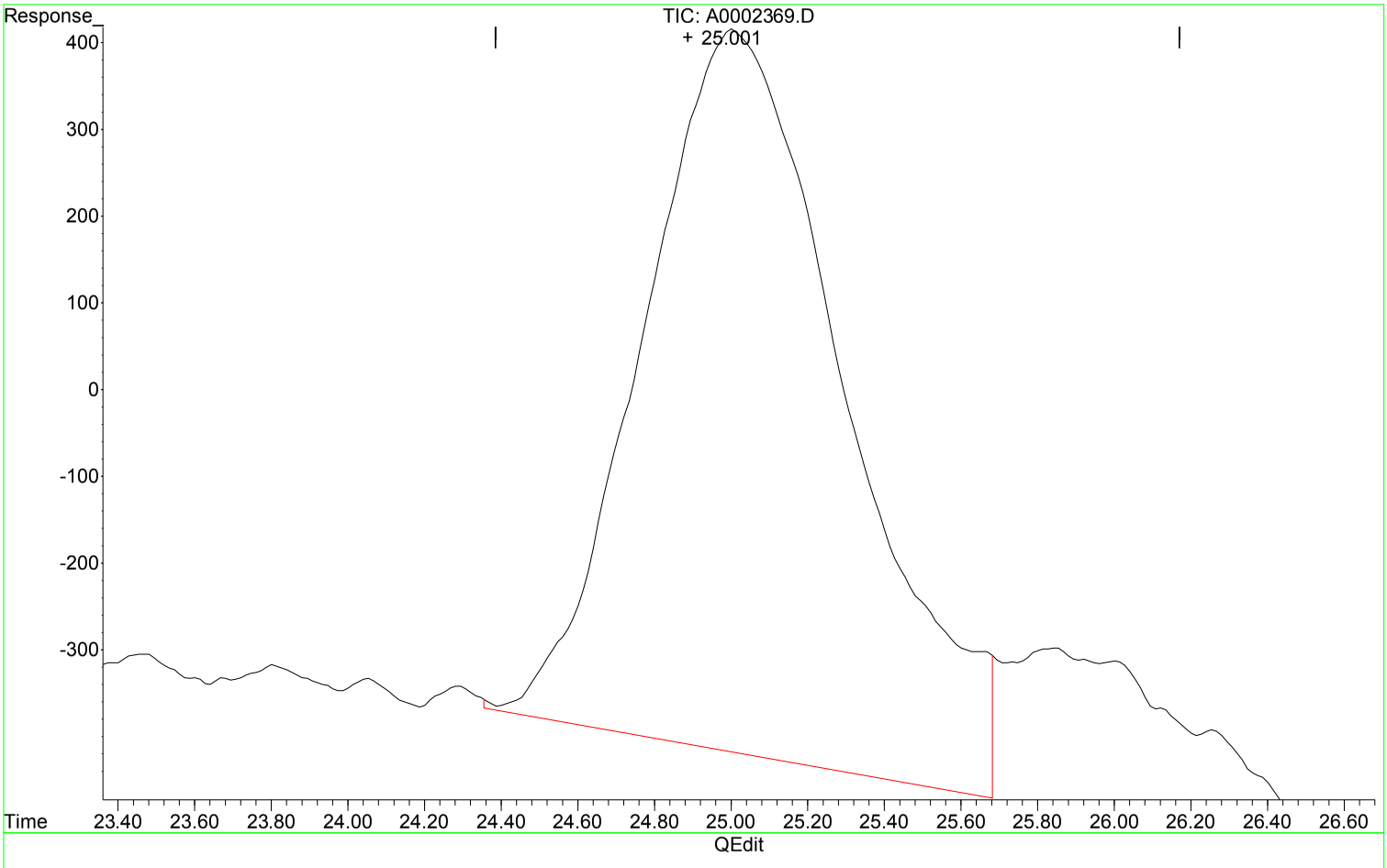
00944624

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.001min 5.144 ppm m

response 310758

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:45:19 2018

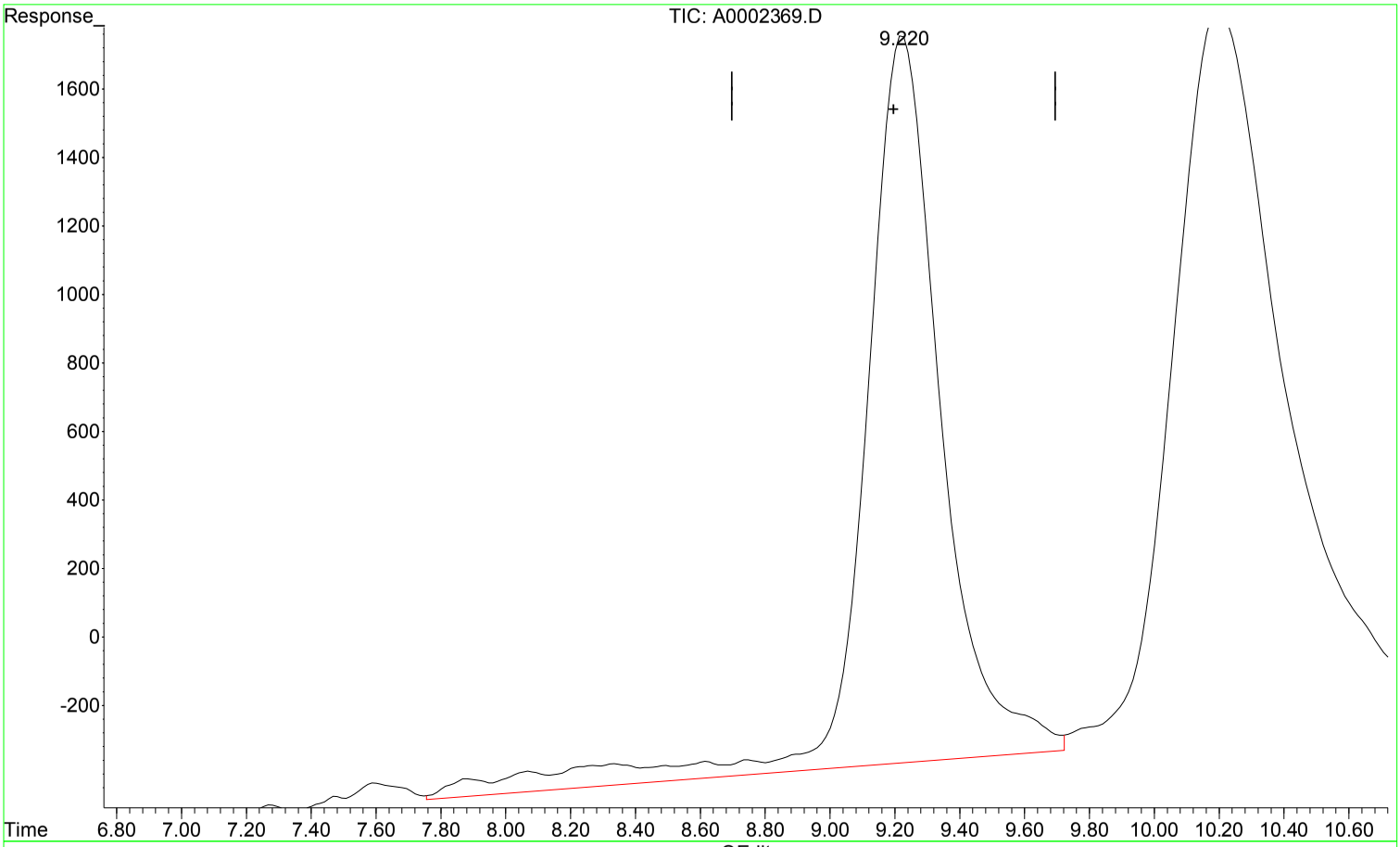
00944625

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 6.027 ppm

response 355419

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:57 2018

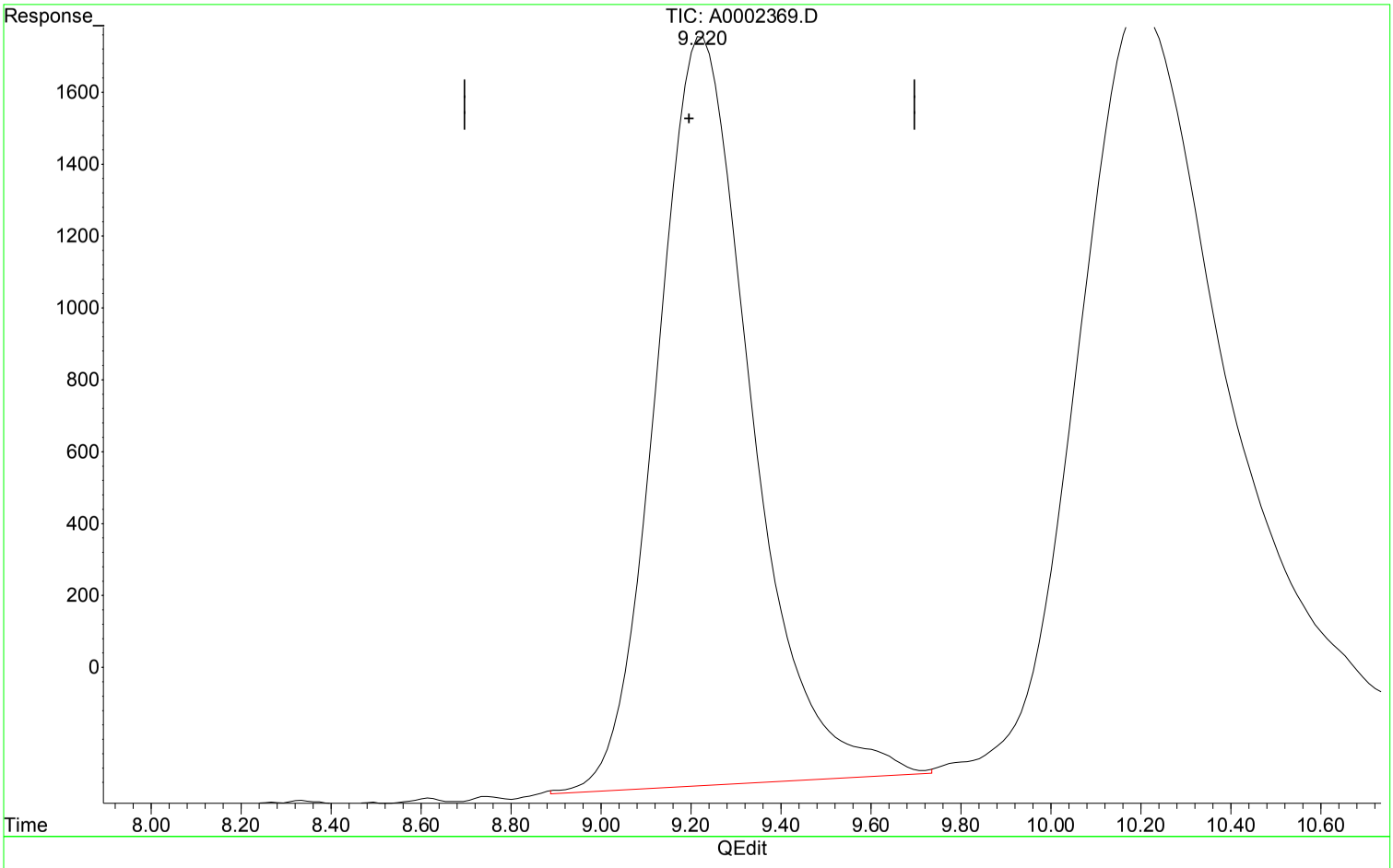
00944626

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.220min 5.196 ppm m

response 306395

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:45:02 2018

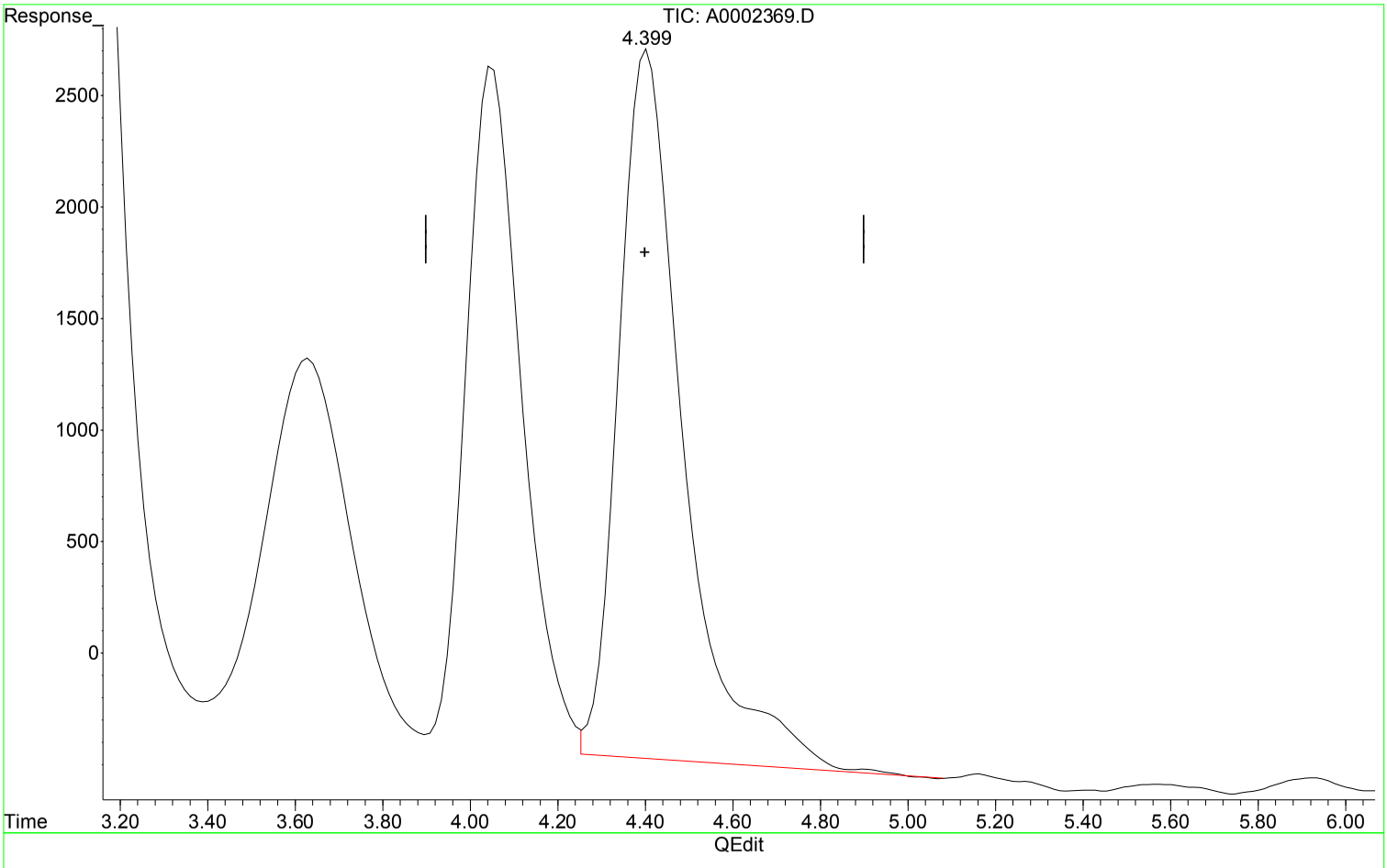
00944627

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 5.542 ppm

response 328094

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:46 2018

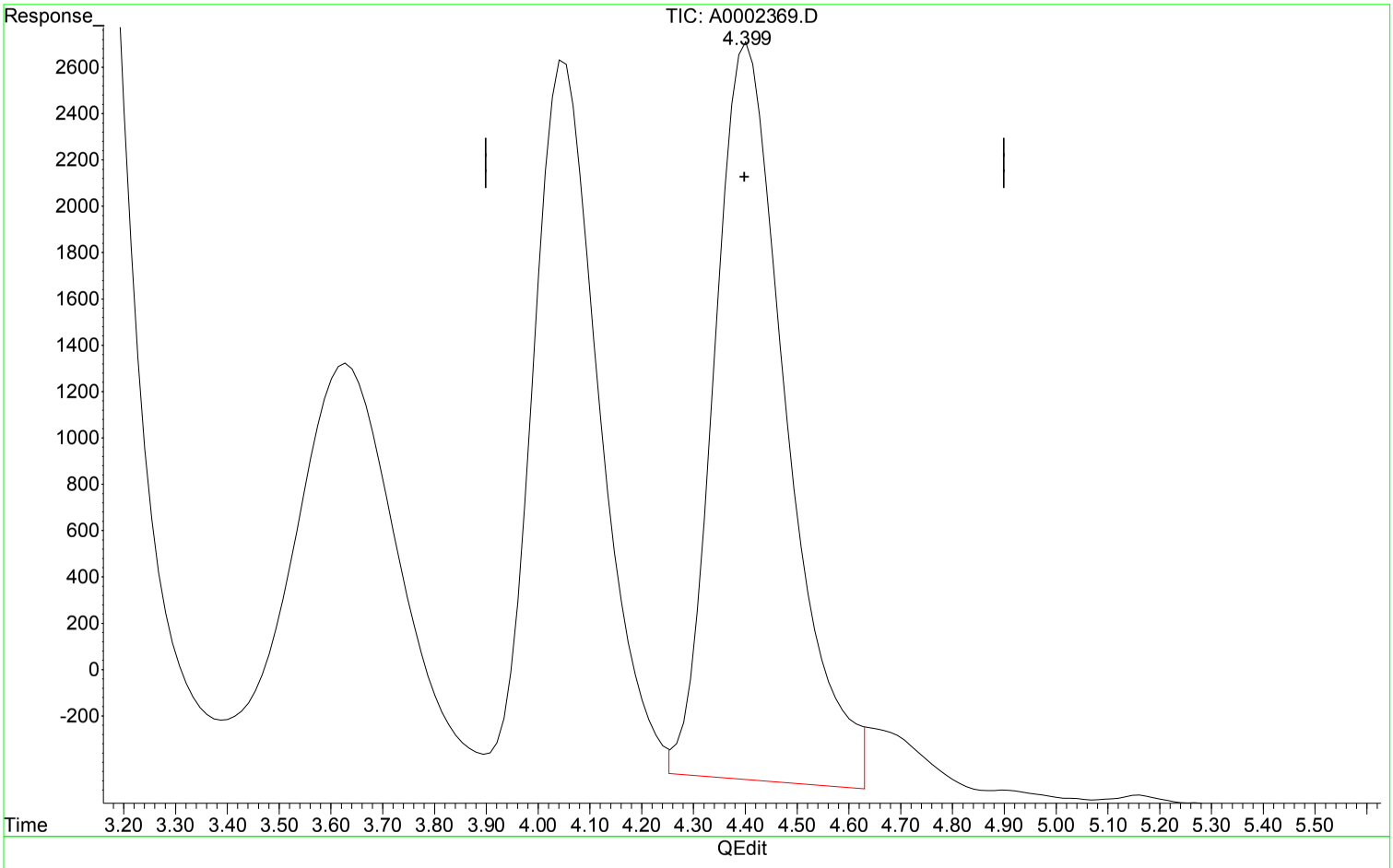
00944628

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 5.228 ppm m

response 309471

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944629

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	197324	2.095	ppm	
2) T	Pyruvic acid	3.628	94203	0.209	ppm	
3) T	Lactic Acid	4.053	108314	2.047	ppm	
4) T	Acetic Acid	4.399	121343	2.050	ppm	m
5) T	Propionic Acid	9.219	118189	2.004	ppm	m
6) T	Butyric Acid	24.985	143852	2.381	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

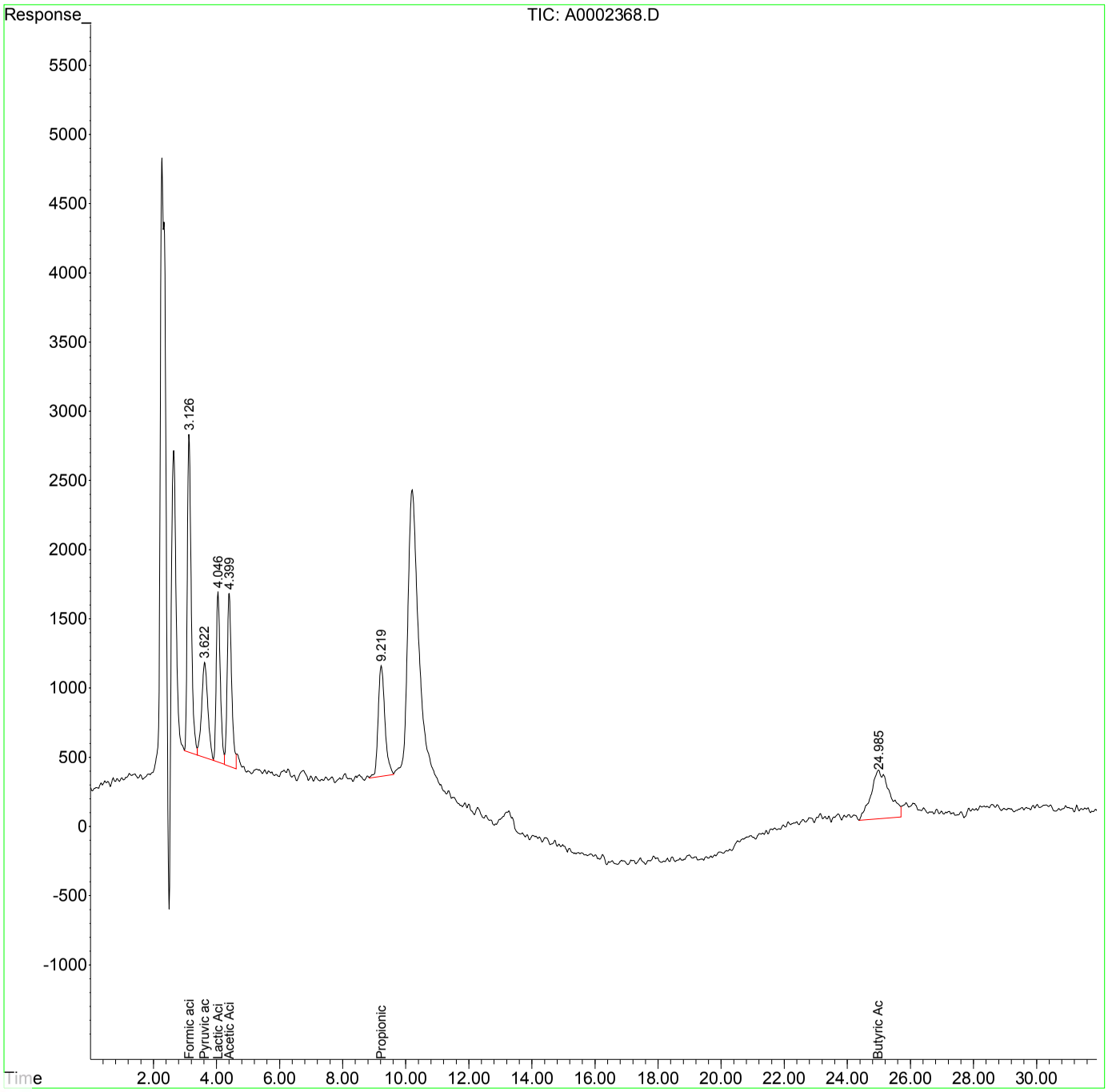
00944630

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

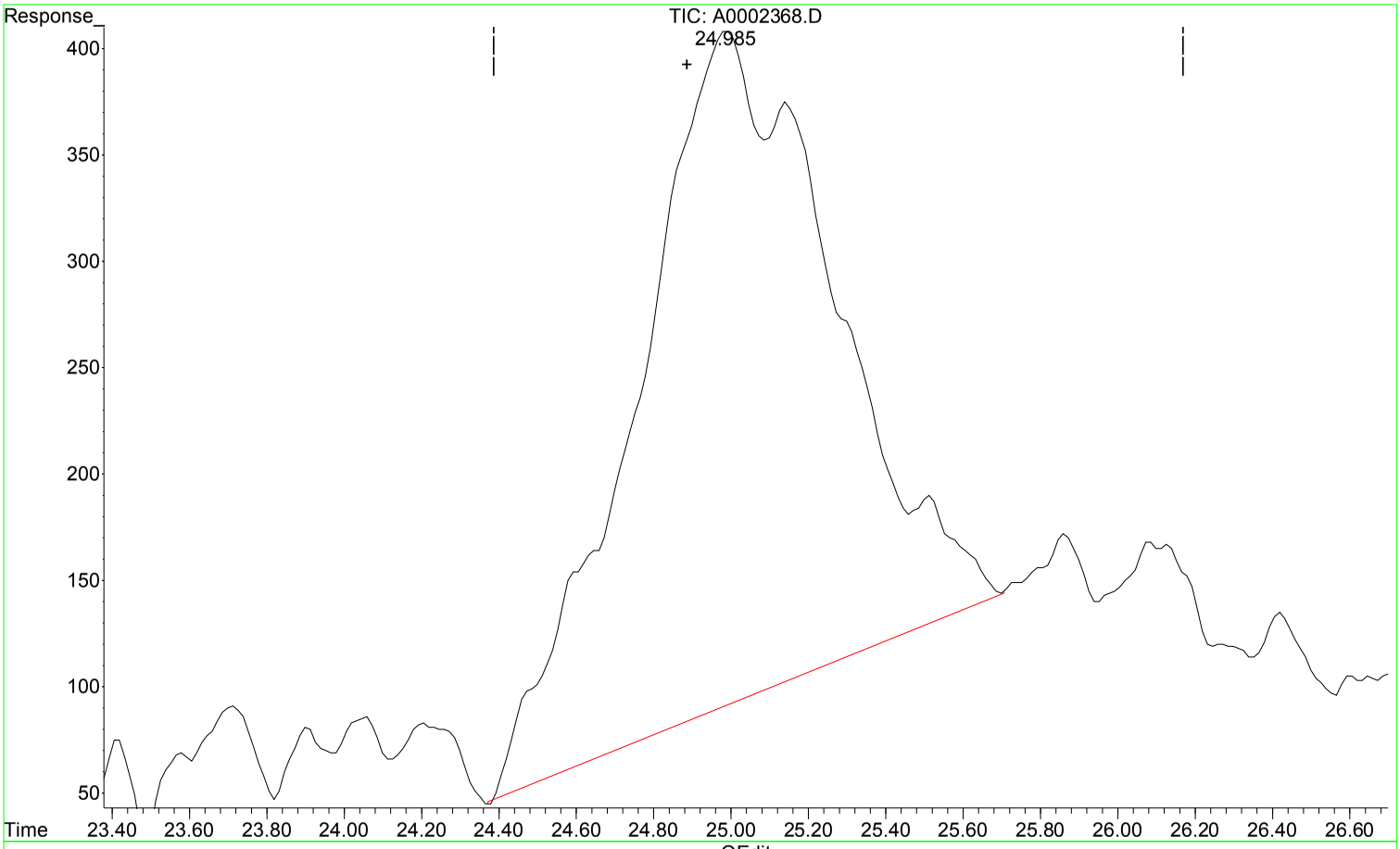


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.991min 1.857 ppm

response 112205

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

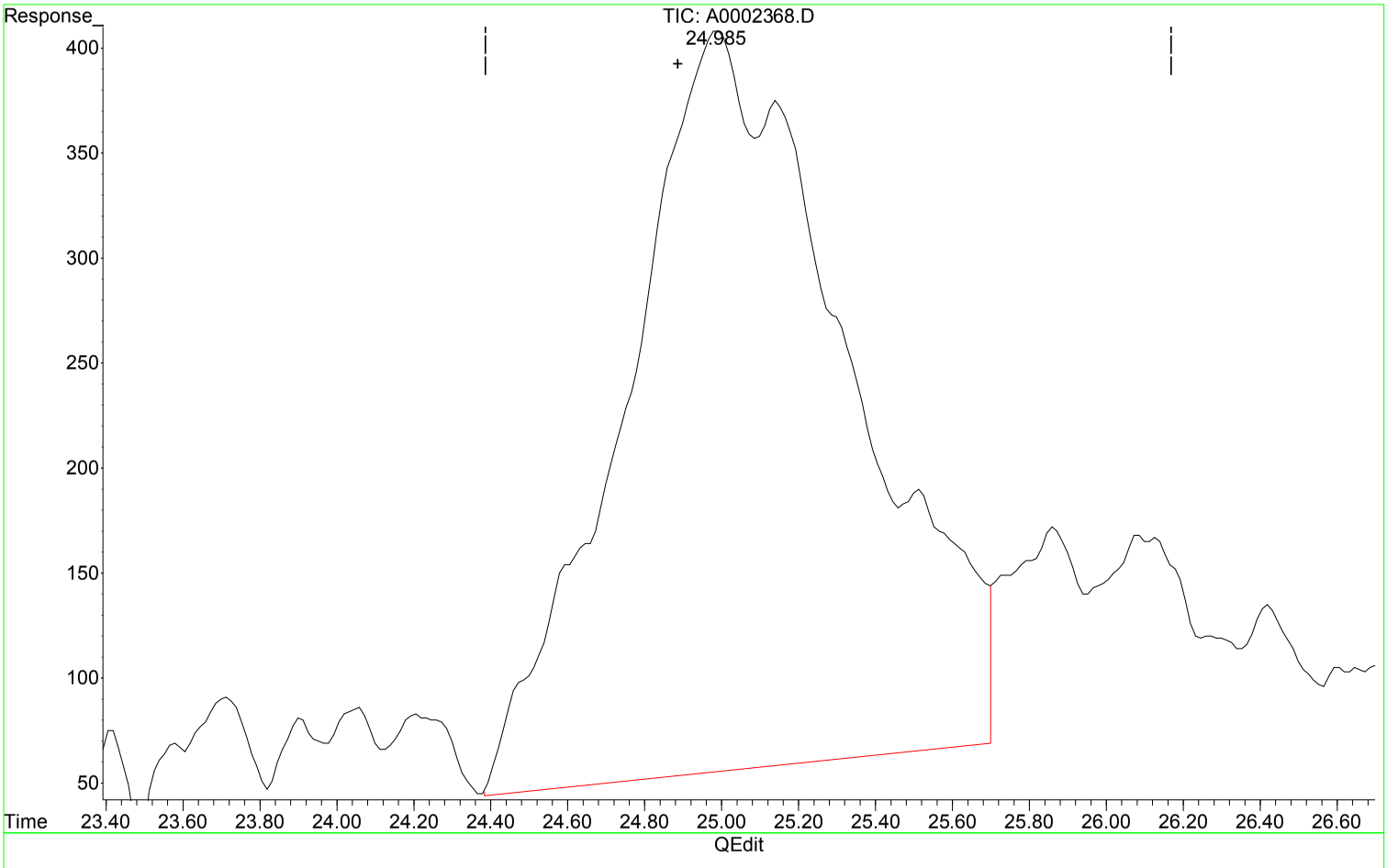
00944632

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.985min 2.381 ppm m

response 143852

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:27 2018

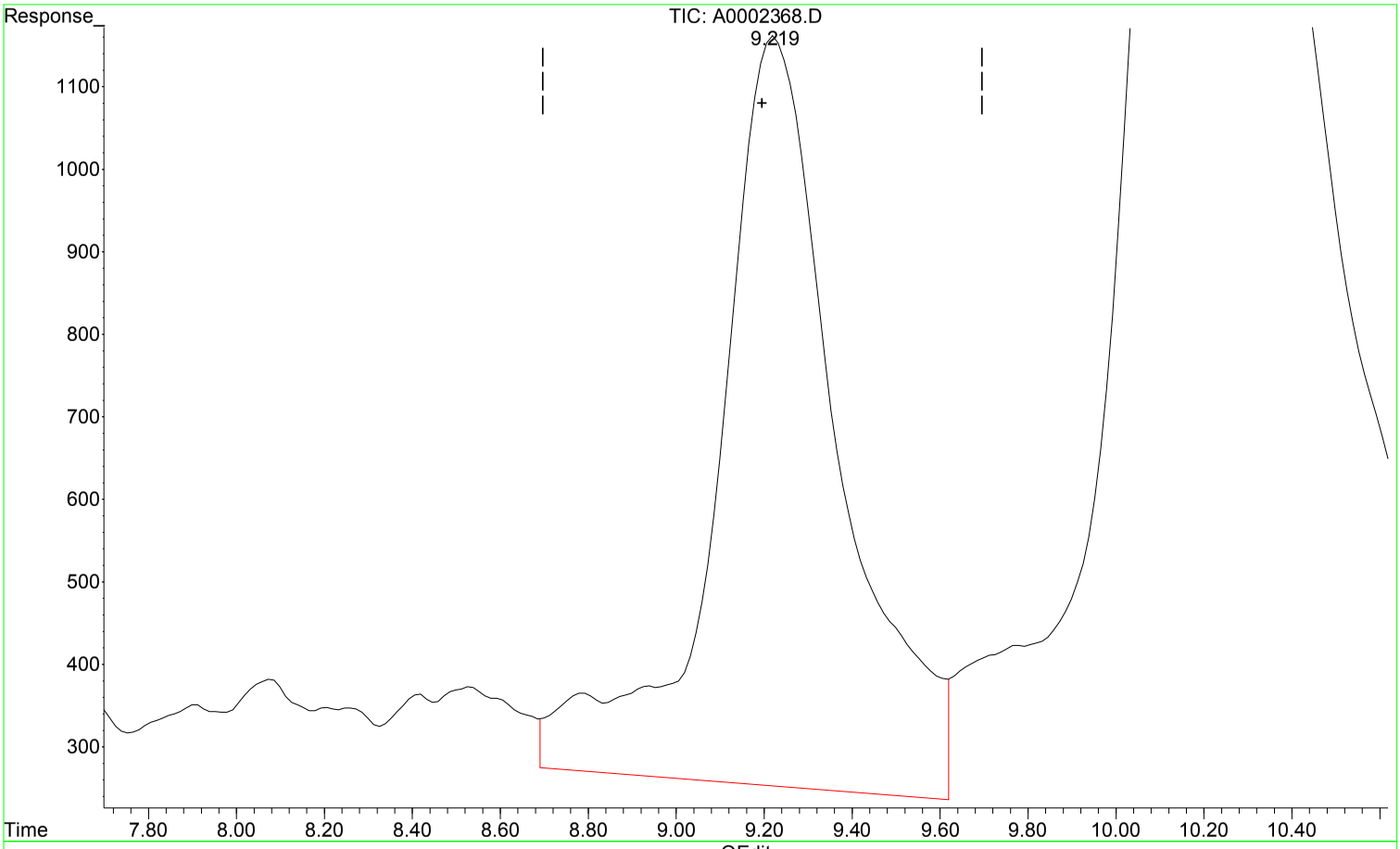
00944633

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 3.005 ppm

response 177221

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

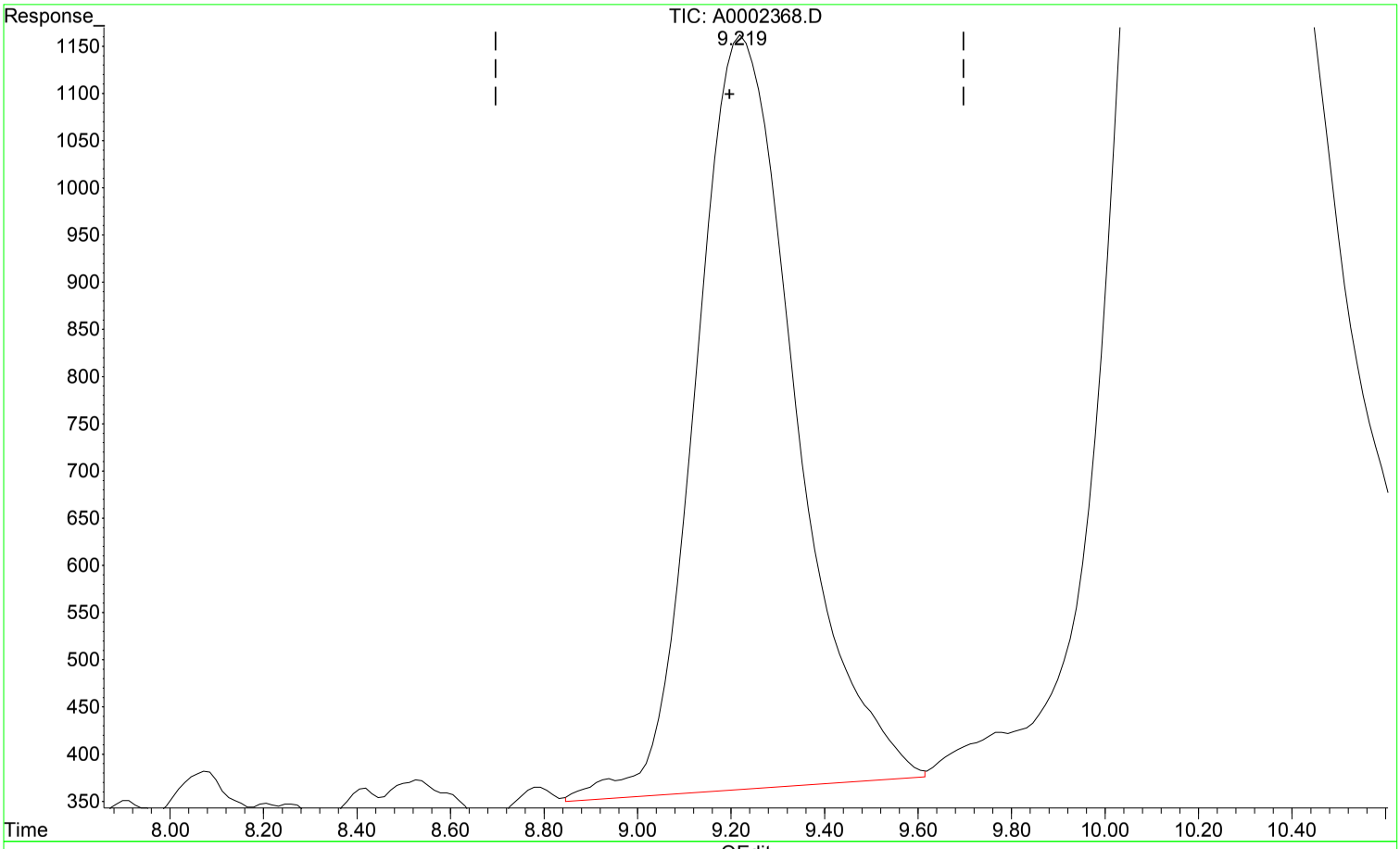
00944634

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.219min 2.004 ppm m

response 118189

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

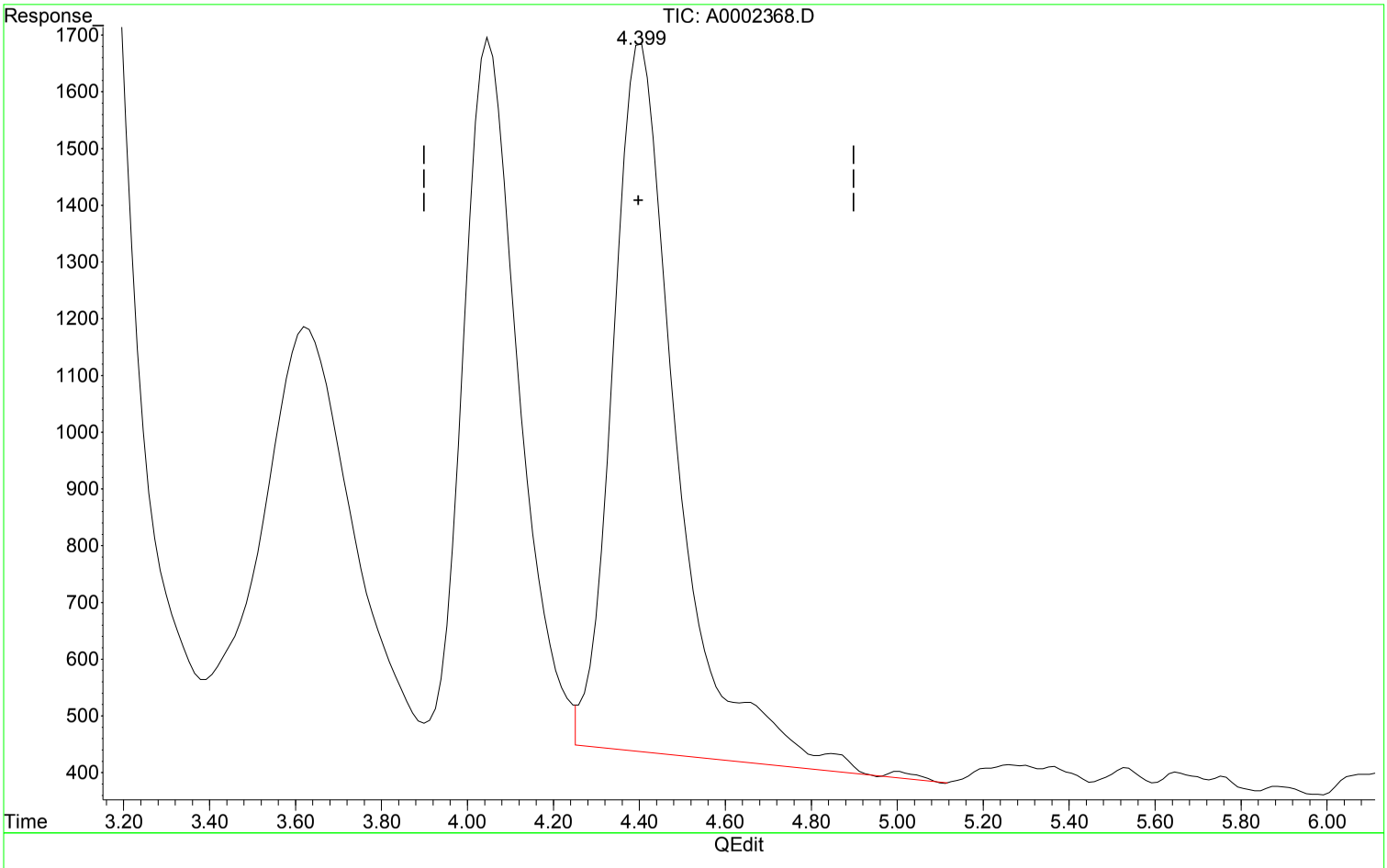
00944635

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 2.212 ppm

response 130945

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

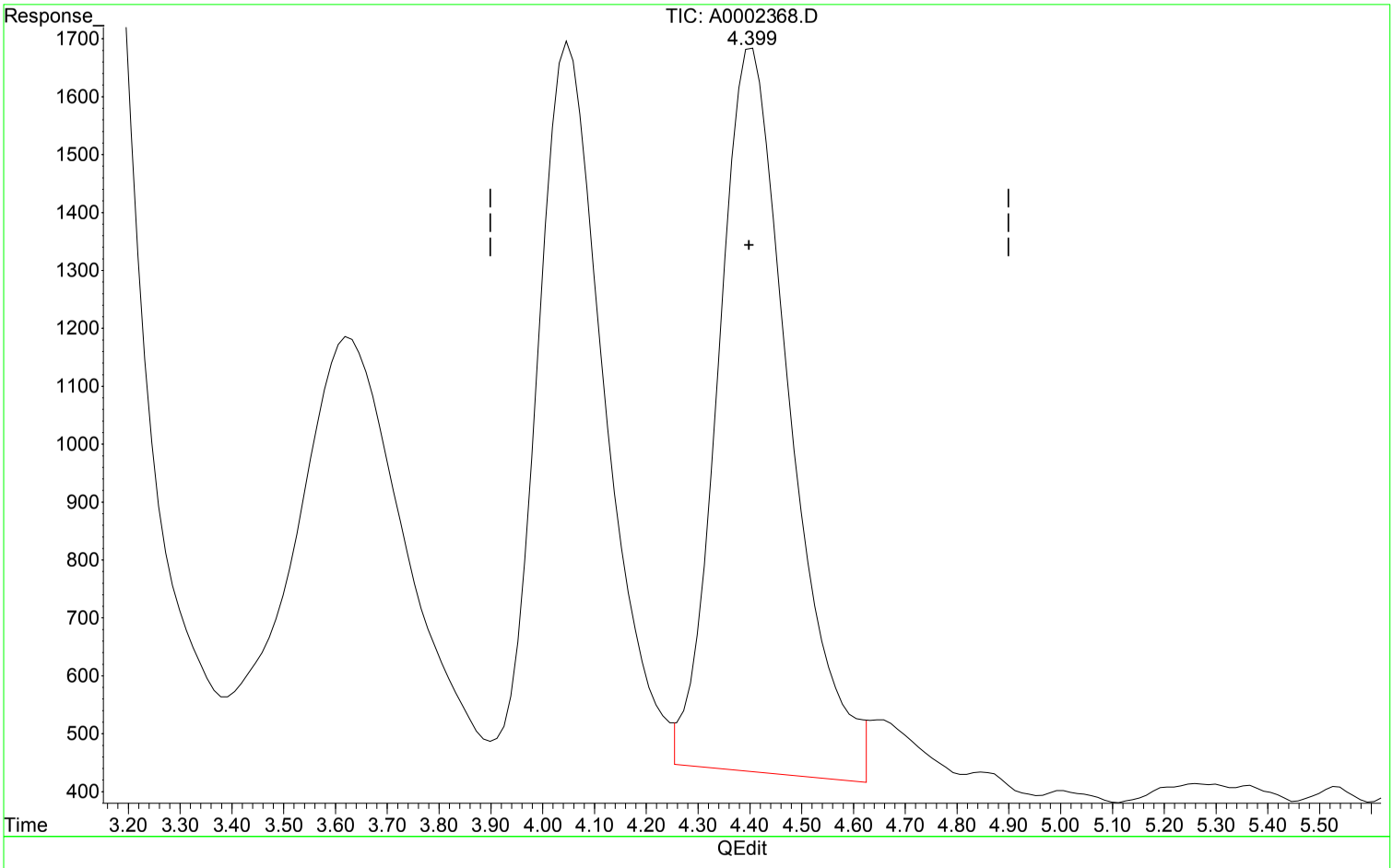
00944636

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 2.050 ppm m

response 121343

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944637

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	101923	1.082	ppm	
2) T	Pyruvic acid	3.631	46367	0.103	ppm	
3) T	Lactic Acid	4.052	58945	1.114	ppm	
4) T	Acetic Acid	4.404	60257	1.018	ppm	
5) T	Propionic Acid	9.215	69400	1.177	ppm	m
6) T	Butyric Acid	24.964	74253	1.229	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

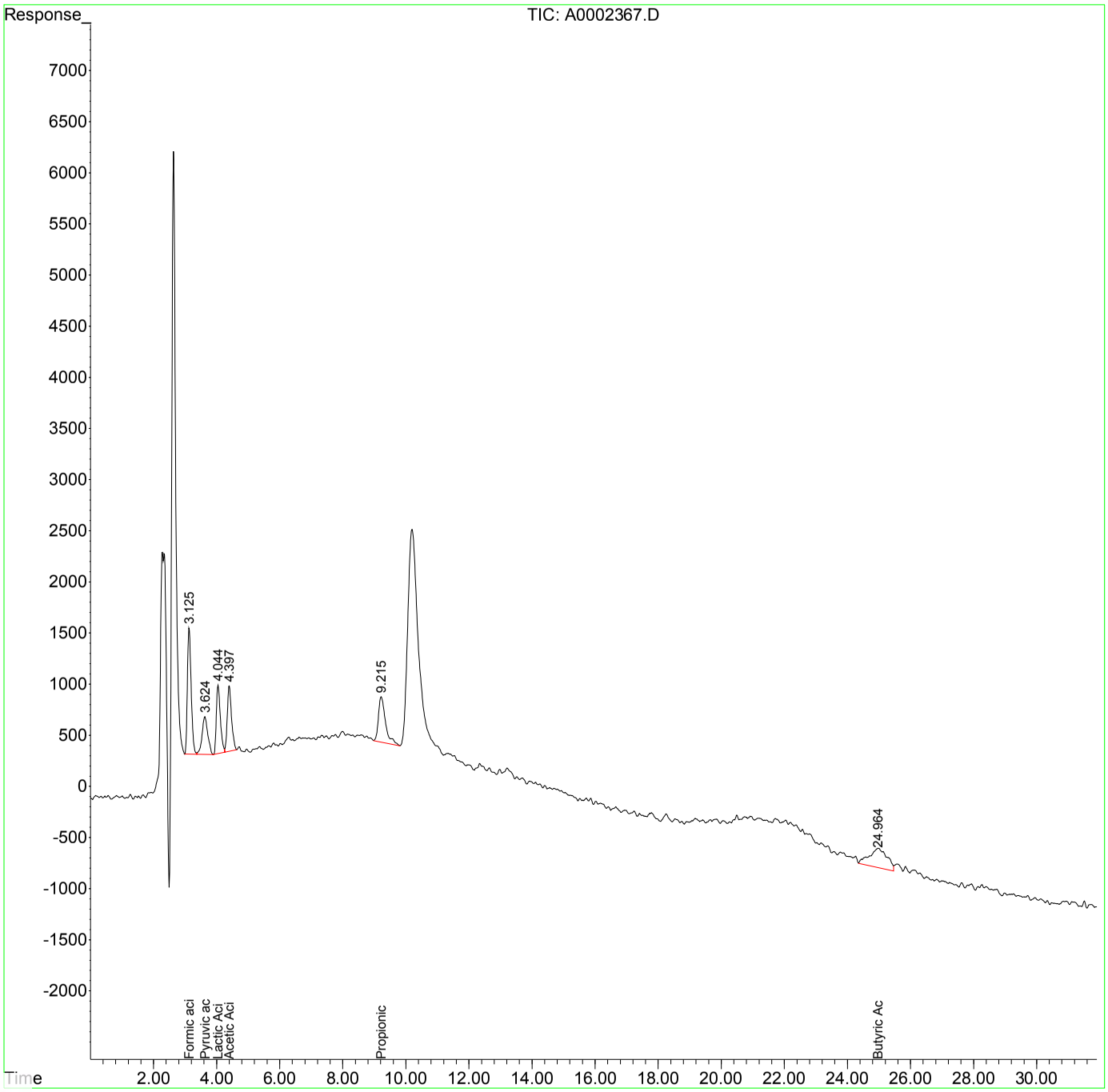
00944638

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

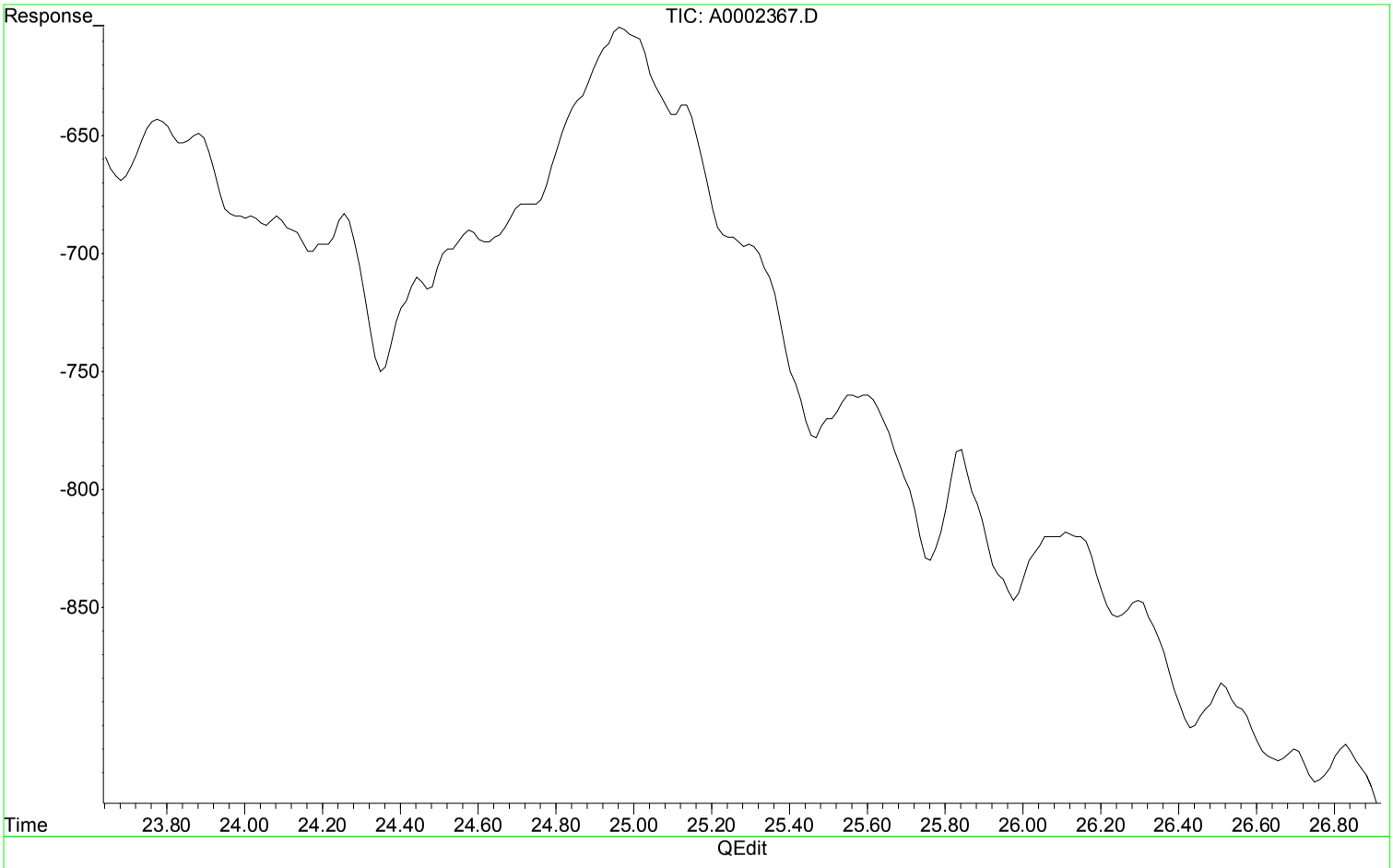


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.887min 0.000 ppm

response 0

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:43:19 2018

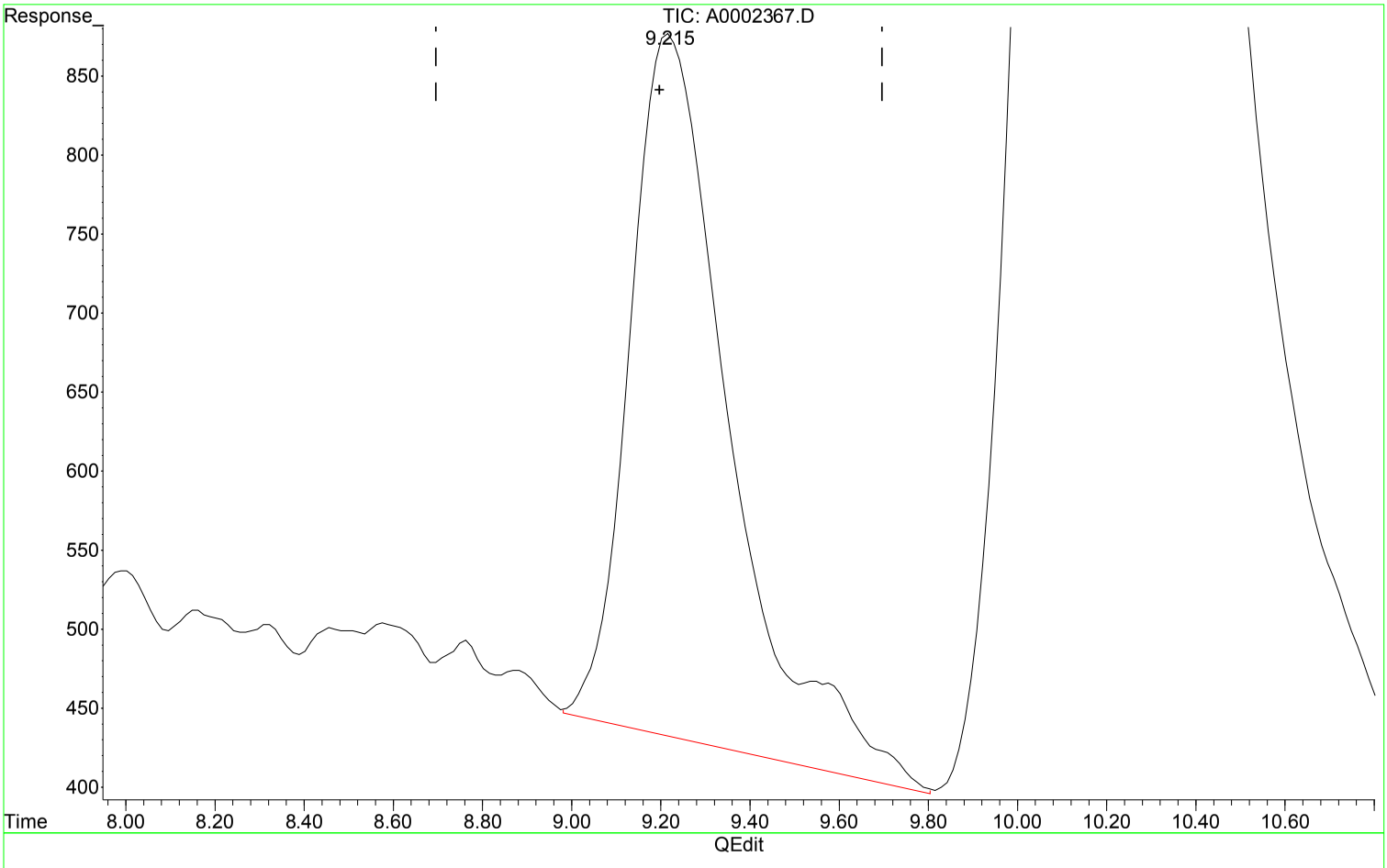
00944640

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.215min 1.177 ppm m

response 69400

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00944641

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	3.655	25630	0.057	ppm	m
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	0.000	0	N.D.	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

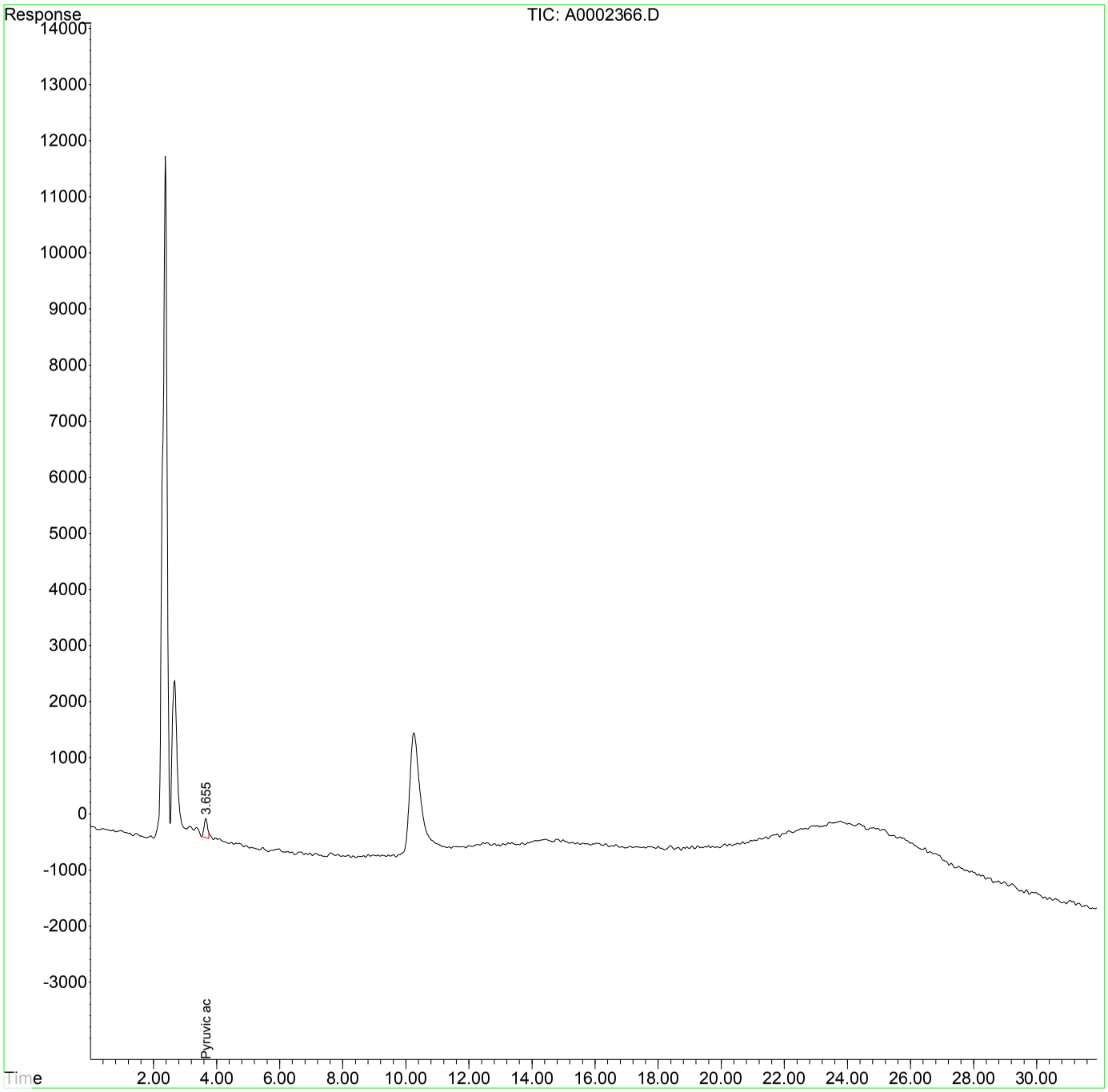
00944642

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00944643

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1811942
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

#	Lab Code	Sample Name	File Location	Acquisition Date
01	RC1800114-01	0.1-1.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002367.D	10/04/2018 12:01
02	RC1800114-02	0.2-2.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002368.D	10/04/2018 12:32
03	RC1800114-03	0.5-5.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002369.D	10/04/2018 13:04
04	RC1800114-04	1.0-10.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002370.D	10/04/2018 13:36
05	RC1800114-05	2.0-20.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002371.D	10/04/2018 14:21
06	RC1800114-06	5.0-50.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002372.D	10/04/2018 14:56
07	RC1800114-07	10.0-100.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002373.D	10/04/2018 15:31
08	RC1800114-08	20.0-200.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002374.D	10/04/2018 16:03

Analyte

Acetic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.026E4	02	2.000	6.067E4	03	5.000	6.189E4	04	10.000	5.859E4
05	20.000	5.483E4	06	50.000	6.053E4	07	100.000	5.725E4	08	200.000	5.933E4

Butanoic Acid (Butyric Acid)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	7.425E4	02	2.000	7.193E4	03	5.000	6.215E4	04	10.000	6.021E4
05	20.000	6.035E4	06	50.000	5.865E4	07	100.000	5.511E4	08	200.000	6.053E4

Lactic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	5.895E4	02	2.000	5.416E4	03	5.000	5.388E4	04	10.000	5.286E4
05	20.000	5.017E4	06	50.000	5.423E4	07	100.000	5.216E4	08	200.000	5.371E4

Propionic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.94E4	02	2.000	5.909E4	03	5.000	6.128E4	04	10.000	5.86E4
05	20.000	5.703E4	06	50.000	5.9E4	07	100.000	5.508E4	08	200.000	5.726E4

Pyruvic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.100	4.637E5	02	0.200	4.71E5	03	0.500	4.552E5	04	1.000	4.481E5
05	2.000	4.25E5	06	5.000	4.588E5	07	10.000	4.43E5	08	20.000	4.585E5

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1811942
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
Acetic Acid	TRG	Average RF	% RSD	3.8	≤	5.917E4	
Butanoic Acid (Butyric Acid)	TRG	Average RF	% RSD	10.6	≤	6.29E4	
Lactic Acid	TRG	Average RF	% RSD	4.6	≤	5.376E4	
Propionic Acid	TRG	Average RF	% RSD	7.3	≤	5.959E4	
Pyruvic Acid	TRG	Average RF	% RSD	3.1	≤	4.529E5	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1811942
Calibration Date: 10/4/2018

Initial Calibration Verification Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

#	Lab Code	Sample Name	File Location	Acquisition Date
09	RC1800114-09	icv	I:\ACQUDATA\hplc05\data\100418\A0002375.D	10/04/2018 16:35

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
Pyruvic Acid	2.00	3.00	4.529E5	6.787E5	150*	85-115	Average RF
Acetic Acid	20.0	20.6	5.917E4	6.092E4	103	85-115	Average RF
Butanoic Acid (Butyric Acid)	20.0	18.1	6.29E4	5.694E4	90.5	85-115	Average RF
Lactic Acid	20.0	20.2	5.376E4	5.434E4	101	85-115	Average RF
Propionic Acid	20.0	19.2	5.959E4	5.733E4	96.0	85-115	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/18/18 15:45

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121718\A0002587.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.98	4.529E5	4.489E5	-0.9	NA	±15	Average RF
Acetic Acid	50.1	50.8	5.917E4	5.993E4	1.3	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.4	6.29E4	5.496E4	-12.6	NA	±15	Average RF
Lactic Acid	49.8	54.1	5.376E4	5.844E4	8.7	NA	±15	Average RF
Propionic Acid	50.3	48.7	5.959E4	5.763E4	-3.3	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/19/18 01:48

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121718\A0002598.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.92	4.529E5	4.435E5	-2.1	NA	±15	Average RF
Acetic Acid	50.1	50.3	5.917E4	5.936E4	0.3	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.3	6.29E4	5.481E4	-12.9	NA	±15	Average RF
Lactic Acid	49.8	54.4	5.376E4	5.876E4	9.3	NA	±15	Average RF
Propionic Acid	50.3	48.9	5.959E4	5.783E4	-3.0	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/20/18 02:35

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002621.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.01	4.529E5	4.514E5	-0.3	NA	±15	Average RF
Acetic Acid	50.1	50.7	5.917E4	5.982E4	1.1	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.8	6.29E4	5.538E4	-12.0	NA	±15	Average RF
Lactic Acid	49.8	54.6	5.376E4	5.899E4	9.7	NA	±15	Average RF
Propionic Acid	50.3	49.5	5.959E4	5.859E4	-1.7	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/20/18 04:21

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002623.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.90	4.529E5	4.413E5	-2.6	NA	±15	Average RF
Acetic Acid	50.1	50.1	5.917E4	5.911E4	-0.1	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.0	6.29E4	5.438E4	-13.5	NA	±15	Average RF
Lactic Acid	49.8	54.1	5.376E4	5.843E4	8.7	NA	±15	Average RF
Propionic Acid	50.3	49.1	5.959E4	5.809E4	-2.5	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/21/18 05:03

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002651.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.98	4.529E5	4.49E5	-0.9	NA	±15	Average RF
Acetic Acid	50.1	50.1	5.917E4	5.918E4	0.0	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.5	6.29E4	5.501E4	-12.5	NA	±15	Average RF
Lactic Acid	49.8	56.0	5.376E4	6.053E4	12.6	NA	±15	Average RF
Propionic Acid	50.3	50.5	5.959E4	5.977E4	0.3	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/21/18 09:00

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002657.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.06	4.529E5	4.556E5	0.6	NA	±15	Average RF
Acetic Acid	50.1	50.5	5.917E4	5.959E4	0.7	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.0	6.29E4	5.448E4	-13.4	NA	±15	Average RF
Lactic Acid	49.8	56.3	5.376E4	6.084E4	13.2	NA	±15	Average RF
Propionic Acid	50.3	44.6	5.959E4	5.283E4	-11.3	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/19/18 22:10

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002616.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.93	4.529E5	4.445E5	-1.9	NA	±15	Average RF
Acetic Acid	50.1	50.5	5.917E4	5.966E4	0.8	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	55.1	6.29E4	6.812E4	8.3	NA	±15	Average RF
Lactic Acid	49.8	54.0	5.376E4	5.838E4	8.6	NA	±15	Average RF
Propionic Acid	50.3	47.4	5.959E4	5.612E4	-5.8	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/21/18 13:50

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002661.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.85	4.529E5	4.374E5	-3.4	NA	±15	Average RF
Acetic Acid	50.1	49.5	5.917E4	5.846E4	-1.2	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	43.3	6.29E4	5.363E4	-14.7	NA	±15	Average RF
Lactic Acid	49.8	55.7	5.376E4	6.015E4	11.9	NA	±15	Average RF
Propionic Acid	50.3	46.2	5.959E4	5.467E4	-8.3	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811942
Date Analyzed: 12/21/18 16:31

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002664.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.03	4.529E5	4.532E5	0.1	NA	±15	Average RF
Acetic Acid	50.1	50.3	5.917E4	5.942E4	0.4	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	45.2	6.29E4	5.594E4	-11.1	NA	±15	Average RF
Lactic Acid	49.8	56.4	5.376E4	6.096E4	13.4	NA	±15	Average RF
Propionic Acid	50.3	49.9	5.959E4	5.91E4	-0.8	NA	±15	Average RF

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811942
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: **Analysis Lot:**619495
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\121918 \A0002627.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	00:06:10	
I:\ACQUDATA\hplc05\data\121918 \A0002663.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	00:10:08	
I:\ACQUDATA\hplc05\data\121918 \A0002638.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	00:10:31	
I:\ACQUDATA\hplc05\data\121918 \A0002657.D\	Continuing Calibration Verification	RQ1814001-18	12/30/2000	00:10:32	
I:\ACQUDATA\hplc05\data\121918 \A0002619.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	00:18:26	
I:\ACQUDATA\hplc05\data\121918 \A0002621.D\	Continuing Calibration Verification	RQ1814001-10	12/30/2000	01:28:24	
I:\ACQUDATA\hplc05\data\121718 \A0002595.D\	35AWW19_121018	R1811942-003	12/30/2000	01:28:29	
I:\ACQUDATA\hplc05\data\121718 \A0002589.D\	Lab Control Sample	RQ1814001-02	12/30/2000	02:47:47	
I:\ACQUDATA\hplc05\data\121718 \A0002587.D\	Continuing Calibration Verification	RQ1814001-06	12/30/2000	02:47:53	
I:\ACQUDATA\hplc05\data\121918 \A0002660.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	02:48:16	
I:\ACQUDATA\hplc05\data\121718 \A0002593.D\	35AWW20_121018	R1811942-001	12/30/2000	02:48:30	
I:\ACQUDATA\hplc05\data\121918 \A0002655.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	02:48:38	
I:\ACQUDATA\hplc05\data\121918 \A0002636.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	02:48:42	
I:\ACQUDATA\hplc05\data\121918 \A0002625.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	03:48:16	
I:\ACQUDATA\hplc05\data\121918 \A0002624.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	05:48:22	
I:\ACQUDATA\hplc05\data\121918 \A0002628.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	17:48:05	
I:\ACQUDATA\hplc05\data\121918 \A0002661.D\	Continuing Calibration Verification	RQ1814001-23	12/30/2000	17:48:15	
I:\ACQUDATA\hplc05\data\121718 \A0002591.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	17:48:42	
I:\ACQUDATA\hplc05\data\121918 \A0002634.D\	ZZZZZZZ	ZZZZZZZ	12/31/2000	03:47:56	
I:\ACQUDATA\hplc05\data\121718 \A0002587.D\	Continuing Calibration Verification	RQ1814001-06	12/18/2018	15:45:00	
I:\ACQUDATA\hplc05\data\121718 \A0002588.D\	Method Blank	RQ1814001-01	12/18/2018	16:38:32	
I:\ACQUDATA\hplc05\data\121718 \A0002589.D\	Lab Control Sample	RQ1814001-02	12/18/2018	17:35:00	
I:\ACQUDATA\hplc05\data\121718 \A0002590.D\	Duplicate Lab Control Sample	RQ1814001-03	12/18/2018	18:28:31	

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811942
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: **Analysis Lot:**619495
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\121718\A0002591.D\	ZZZZZZZ	ZZZZZZZ	12/18/2018	19:25:00	
I:\ACQUDATA\hplc05\data\121718\A0002592.D\	ZZZZZZZ	ZZZZZZZ	12/18/2018	20:18:17	
I:\ACQUDATA\hplc05\data\121718\A0002593.D\	35AWW20_121018	R1811942-001	12/18/2018	21:15:00	
I:\ACQUDATA\hplc05\data\121718\A0002594.D\	35AWW24_121018	R1811942-002	12/18/2018	22:08:14	
I:\ACQUDATA\hplc05\data\121718\A0002595.D\	35AWW19_121018	R1811942-003	12/18/2018	23:05:00	
I:\ACQUDATA\hplc05\data\121718\A0002597.D\	LHSMW07_121018	R1811942-005	12/19/2018	00:53:09	
I:\ACQUDATA\hplc05\data\121718\A0002598.D\	Continuing Calibration Verification	RQ1814001-07	12/19/2018	01:48:07	
I:\ACQUDATA\hplc05\data\121918\A0002616.D\	Continuing Calibration Verification	RQ1814001-22	12/19/2018	22:10:28	
I:\ACQUDATA\hplc05\data\121918\A0002617.D\	ZZZZZZZ	ZZZZZZZ	12/19/2018	23:03:21	
I:\ACQUDATA\hplc05\data\121918\A0002618.D\	ZZZZZZZ	ZZZZZZZ	12/19/2018	23:56:12	
I:\ACQUDATA\hplc05\data\121918\A0002619.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	00:50:00	
I:\ACQUDATA\hplc05\data\121918\A0002620.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	01:42:07	
I:\ACQUDATA\hplc05\data\121918\A0002621.D\	Continuing Calibration Verification	RQ1814001-10	12/20/2018	02:35:00	
I:\ACQUDATA\hplc05\data\121918\A0002622.D\	35AWW23_121018	R1811942-004	12/20/2018	03:28:04	
I:\ACQUDATA\hplc05\data\121918\A0002623.D\	Continuing Calibration Verification	RQ1814001-11	12/20/2018	04:21:02	
I:\ACQUDATA\hplc05\data\121918\A0002624.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	05:15:00	
I:\ACQUDATA\hplc05\data\121918\A0002625.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	06:10:00	
I:\ACQUDATA\hplc05\data\121918\A0002626.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	06:59:53	
I:\ACQUDATA\hplc05\data\121918\A0002627.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	07:52:00	
I:\ACQUDATA\hplc05\data\121918\A0002628.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	08:49:00	
I:\ACQUDATA\hplc05\data\121918\A0002634.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	13:00:00	
I:\ACQUDATA\hplc05\data\121918\A0002635.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	14:56:30	
I:\ACQUDATA\hplc05\data\121918\A0002636.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	15:50:00	

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811942
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: **Analysis Lot:**619495
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\121918\A0002637.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	16:42:18	
I:\ACQUDATA\hplc05\data\121918\A0002638.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	17:20:00	
I:\ACQUDATA\hplc05\data\121918\A0002639.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	18:28:13	
I:\ACQUDATA\hplc05\data\121918\A0002640.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	19:21:16	
I:\ACQUDATA\hplc05\data\121918\A0002641.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	20:14:08	
I:\ACQUDATA\hplc05\data\121918\A0002645.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	23:45:50	
I:\ACQUDATA\hplc05\data\121918\A0002646.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	00:38:42	
I:\ACQUDATA\hplc05\data\121918\A0002647.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	01:31:38	
I:\ACQUDATA\hplc05\data\121918\A0002648.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	02:24:42	
I:\ACQUDATA\hplc05\data\121918\A0002649.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	03:17:35	
I:\ACQUDATA\hplc05\data\121918\A0002650.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	04:10:42	
I:\ACQUDATA\hplc05\data\121918\A0002651.D\	Continuing Calibration Verification	RQ1814001-17	12/21/2018	05:03:39	
I:\ACQUDATA\hplc05\data\121918\A0002654.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	07:42:15	
I:\ACQUDATA\hplc05\data\121918\A0002655.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	08:20:00	
I:\ACQUDATA\hplc05\data\121918\A0002657.D\	Continuing Calibration Verification	RQ1814001-18	12/21/2018	09:00:00	
I:\ACQUDATA\hplc05\data\121918\A0002658.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	11:14:02	
I:\ACQUDATA\hplc05\data\121918\A0002659.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	12:06:57	
I:\ACQUDATA\hplc05\data\121918\A0002660.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	13:00:00	
I:\ACQUDATA\hplc05\data\121918\A0002661.D\	Continuing Calibration Verification	RQ1814001-23	12/21/2018	13:50:00	
I:\ACQUDATA\hplc05\data\121918\A0002662.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	14:45:51	
I:\ACQUDATA\hplc05\data\121918\A0002663.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	15:40:00	
I:\ACQUDATA\hplc05\data\121918\A0002664.D\	Continuing Calibration Verification	RQ1814001-24	12/21/2018	16:31:46	

Analysis: Organic Acids Analyst: BA Run Method: ~~OXIO~~ NEW METH
Date: 12/17/18 Instr. _HPLC-05_ Quant Method: MA100418
LIMS Run#: 619495
Setup: Column: Synergi Hydro RP 150x4.6 Col.Temp: 35 Flow: 0.60 ml/min
Mobile Phase: 0.02 KH2 prep 0.1PO4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	CCV	1000/1ml	193753	A0[illegible]87	YC	
	MEOT BLK			8887	Y	
	LCS	100/1ml	193754	8988	Y	> PYRUVIC OUT
	DLCS	↓	↓	9089	Y	
	R1812142-001			9190	Y	
	↓ -002			9291	Y	
	R1811942-001			9392	Y	
	-002			9493	Y	
	-003			9594	Y	
	-004			9695	N	RPT 1/10
	↓ -005			9796	Y	
	CCV			9897	YC	RT SHIFT prep and BOTTLE
	R1811991-001			9998	N	RPT 1/10
	-002			6099		1/5
	-003			0100		
	R1812085-004			0201		
	-002			0302		
	-003			0403		
	-004			0504		
	-004MS	1000/1ml	193754	0605		
	-004MSD	↓	↓	0706	↓	RUST SHUTDOWN NO CLOC
	~~CCV~~	~~1000/1ml~~	~~193753~~	~~0807~~		WHY MISSED 12 HR CLOCK
	R1811991-001			0908		RESTART
	-002		12/20	1009		
	-003			1110		
	R1812085-001	BA		1211		
	-002			1312		
	-003			1413		
	-004			1514		
	-004MS	1000/1ml	193754	1615		
	-004MSD	↓	↓	1716		
	~~CCV~~	↓	193753	1817		

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:
Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

Analysis: Organic Acids Analyst: BA Run Method: NEWMETA
Date: 12/19/18 Instr. _HPLC-05_ Quant Method: MA100418
LIMS Run#: _____
Setup: Column: Synergi Hydro RP150x4.6 Col.Temp: 35 Flow: 0.6 mL/min N
Mobile Phase: 0.02 KH2 prep 0.1P04 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	CCV	1000ul/1mL	193753	A0002608	—	
	R1811991-001	10.0		09	—	
	CCV			10	YC	
	R1811991-001	10.0		11	N	RPT RT SHEET
	-002	5.0		12		
	-003			13		
	R181 2085-001			14		
	-002			15	↓	
	CCV	1000ul/1mL	193753	16	YC	
	R1812085-003			17	Y	
	-004			18	Y	
	-004MS	1000ul/1mL	193754	19	Y	
	-004MSD	↓	↓	20	Y	
	CCV			21	YC	
	R1811942-004	10.0		22	Y	
	CCV	1000ul/1mL	193753	23	YC	
	MET BLK			24	Y	
	LCS	1000ul/1mL	193754	25	Y	
	LCSD	↓	↓	26	Y	
	R1812089-006			27	Y	
	-007			28	Y	
	-008			29	N	
	-009			30		
	-015			31		
	-016			32		
	-017			33	↓	
	-018			34	Y	
	-019			35	Y	
	R181 2120-005			36	Y	
	CCV	1000ul/1mL	193753	37	YC	RT PROP + BUTYRIC WRG HRT
	R1812120-006			38	Y	
	-007			39	Y	
	-009			40	Y	
	-010			41	Y	

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:
Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

Analysis: Organic Acids Analyst: BA Run Method: NEW META
Date: 12/20/18 Instr. _HPLC-05 Quant Method: MA100418
LIMS Run#:
Setup: Column: Synergi Hydro RP 150x4.6 Col.Temp: 35 Flow: 0.6 ml/min
Mobile Phase: 0.02 KH_2 prep 0.1 H_3PO_4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	R182120-011			4000242	N	RPT 1/2.5
	-011MS			43		
	-011MSD			44		
	CCV	1000/1mL	193753	45	YC	
	R1812089-008			46	Y	
	-009			47	Y	
	-015			48	Y	
	-016			49	Y	
	-017			50	Y	
	CCV	1000/1mL	193753	51	YC	
	R1811991-001	10.0		52	N	
	-002	5.0		53	N	
	-003			54	N Y	
	R1812085 -001			55	Y Y	
	-002			56	Y N	
	CCV	1000/1mL	193753	57	YC	RT SHIFT PROP + Butyr.
	R1812120-011			58	Y	
	-011MS			59	Y	
	-011MSD			60	Y	
	CCV	1000/1mL	193753	61	YC	
	R181199-001	10.0		62	Y	
	-002	5.0		63	Y	
	CCV	1000/1mL	193753	64	YC	

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:
Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 09:10
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW20_121018	**Basis:**	NA
Lab Code:	R1811942-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**5.01**	mg/L	0.50	0.40	0.11	5	12/11/18 22:31	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 10:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW24_121018	**Basis:**	NA
Lab Code:	R1811942-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.54**	mg/L	0.10	0.08	0.03	1	12/11/18 22:31	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 11:15
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW19_121018	**Basis:**	NA
Lab Code:	R1811942-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**4.19**	mg/L	0.50	0.40	0.11	5	12/11/18 22:31	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 12:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	35AWW23_121018	**Basis:**	NA
Lab Code:	R1811942-004		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**50**	mg/L	10	8	3	100	12/11/18 22:31	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811942
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/10/18 13:30
Sample Matrix:	Water	**Date Received:**	12/11/18 10:10
Sample Name:	LHSMW07_121018	**Basis:**	NA
Lab Code:	R1811942-005		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.43**	mg/L	0.10	0.08	0.03	1	12/11/18 22:31	*

Analytical Results Summary

Instrument Name: R-UV-VIS-05 **Analyst:** MROGERSON **Analysis Lot:** 619160 **Method/Testcode:** SM 3500-Fe B.4.c/Ferrous DOD

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1813871-01	Iron, Divalent (Ferrous Iron)	CCV		Water	2.04 mg/L	5 mL	2.04 mg/L	1					12/11/18 22:31	N	IV
RQ1813871-02	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			12/11/18 22:31	N	IV
RQ1813871-03	Iron, Divalent (Ferrous Iron)	LCS		Water	0.38 mg/L	5 mL	0.379 mg/L	1	0.03	0.10	95		12/11/18 22:31	N	IV
RQ1813871-04	Iron, Divalent (Ferrous Iron)	MB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.08	0.10			12/11/18 22:31:00	N	IV
R1811942-001	Iron, Divalent (Ferrous Iron)	N/A		Water	5.01 mg/L	5 mL	5.01 mg/L	5	0.11	0.50			12/11/18 22:31	N	IV
R1811942-002	Iron, Divalent (Ferrous Iron)	N/A		Water	0.54 mg/L	5 mL	0.54 mg/L	1	0.03	0.10			12/11/18 22:31	N	IV
R1811942-003	Iron, Divalent (Ferrous Iron)	N/A		Water	4.19 mg/L	5 mL	4.19 mg/L	5	0.11	0.50			12/11/18 22:31	N	IV
R1811942-004	Iron, Divalent (Ferrous Iron)	N/A		Water	49.61 mg/L	5 mL	50 mg/L	100	3	10			12/11/18 22:31	N	IV
R1811942-005	Iron, Divalent (Ferrous Iron)	N/A		Water	0.43 mg/L	5 mL	0.43 mg/L	1	0.03	0.10			12/11/18 22:31	N	IV
RQ1813871-07	Iron, Divalent (Ferrous Iron)	MS	R1811942-005	Water	0.76 mg/L	5 mL	0.76 mg/L	1	0.03	0.10	83		12/11/18 22:31	N	IV
RQ1813871-08	Iron, Divalent (Ferrous Iron)	DMS	R1811942-005	Water	0.77 mg/L	5 mL	0.77 mg/L	1	0.03	0.10	85	1	12/11/18 22:31	N	IV
RQ1813871-06	Iron, Divalent (Ferrous Iron)	CCV		Water	2.03 mg/L	5 mL	2.03 mg/L	1					12/11/18 22:31	N	IV
RQ1813871-05	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			12/11/18 22:31	N	IV

#indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Pippetor Calibration

ALS Environmental

Frequency:

Pipettes: 3 trials for both bias and precision DOD Projects - Daily before use at each volume of use, or if more than 3 volumes of use, a high, medium, and low. Non-DOD: Monthly at high, medium, and low.	**Calculations:** %Recovery = Mean/Nominal Volume*100 %RSD = Stdev/Volume*100
Repeaters, Dispensers, and Repipettors: 3 trials for both bias and precision If used for dilutions - Daily before use and each time the volume is changed. If not used for dilutions - monthly	**Limits:** % Rec: 98-102 for Pipettes and others for dilutions % Recovery: 90-110 (Repeaters, Dispensers, Repipettors not for dilutions) %RSD: ≤1 (Pipets); ≤3 (Repeaters, Dispensers, and Repipettors)

Use a balance and DI for all except Dispensers and Repipettors which contain reagents. For these, dispense into a To Contain Class A grad cylinder and document the Max Volume of the cylinder instead of the Balance ID. Record to 1/10 the graduation of the cylinder.

Date	Init.	Equipment ID	Volume (mL)	Trial #1 (g/mL)	Trial #2 (g/mL)	Trial #3 (g/mL)	Bias %Recovery	Pass/ Fail	Precision %RSD	Pass/ Fail	Recal? Y/N	Balance ID or Class A (TC)	Comments/ Corrective Action
12/6/18	GN	HTULIC	2.00	1.9688	1.9640	1.9680	98.3467	P	0.12858	P	N	R-10	
↓	↓	↓	5.00	4.9225	4.9516	4.9338	98.7193	P	0.29341	P	N	↓	
		Donald	0.5000	0.5052	0.5054	0.5051	101.0467	P	0.03955	P	N		
		↓	1.0000	1.0021	1.0010	1.0002	100.1100	P	0.095314	P	N		
↓	↓	↓	0.2000	0.2021	0.2024	02025	101.1667	P	0.104083	P	N	↓	
12/12/18	MAR	Hank	1.00	0.9998	0.9983	0.9993	99.91	P	0.07	P	N	R-10	DOD/Monthly
		↓	3.00	2.9999	3.0003	3.0009	100.03	P	0.05	P			
		↓	5.00	5.0134	5.0016	5.0055	100.19	P	0.12	P			
		Thor	0.200	0.1994	0.2000	0.2011	100.08	P	0.43	P			
		↓	0.500	0.4967	0.4958	0.4957	99.20	P	0.12	P			
		↓	1.000	0.9974	0.9970	0.9964	99.76	P	0.16	P			
		Daisy	0.200	0.1991	0.1988	0.1990	99.49	P	0.09	P			
		↓	0.100	0.0999	0.0998	0.0999	99.87	P	0.06	P			
↓	↓	↓	0.0200	0.0101	0.0101	0.0101	101	P	0	P	↓	↓	↓
12/13/18	MAR	Thor	0.5000	0.4954	0.4952	0.4960	99.11	P	0.05	P	N	R-10	DOD
↓	↓	Hank	2.500	2.4983	2.5027	2.4903	99.88	P	0.85	P	↓	↓	↓
							MAR 12/17/18						

Sample Dilutions

Analyst: MAR
Instrument: UV-05

Date 12/11/18
Analysis Fe^{2+}

Sample ID	Matrix of Diluent	1st Dilution			2nd Dilution			3rd Dilution			4th Dilution			5th Dilution		
		mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor
R1811942-001	DI	1	4	1/5												
R1811942-003	DI	1	4	1/5												
R1811942-004	DI	1	9	1/10	1	9	1/100									

MAR 12/17/18

C:\Users\chris.woods\Downloads\Sample Dilution Sheets R2Original

9/18/15

Analyte: Ferrous Iron By Standard Methods Analyst: MAR Date: 12/11/18
Method: 3500-Fe,D Pipette: HANK, THOR Time: 22:31
Instrument: UV-1600PC (R-UVVIS-05) DOD Pipet Check: WC194 P. 3 Balance: NA

Calibration:

Phenanthroline (0.1%w/v): 190443
Ammonium Acetate: 194232

Std	Conc.	Absorb.	Result	% Rec
1	0.00	0.000	-0.001	
2	0.10	0.010	0.097	96.6%
3	0.20	0.021	0.204	101.9%
4	0.30	0.031	0.301	100.4%
5	0.40	0.041	0.399	99.7%
6	0.80	0.081	0.788	98.5%
7	1.00	0.103	1.003	100.3%
8	2.00	0.207	2.016	100.8%
9	3.00	0.308	3.000	100.0%
10	4.00	0.410	3.994	99.8%

Curve Date: 7/16/2018
C.C = 0.999986
y-int. = 0.000084
Slope: 0.102641
Wavelength: 510nm

	Misc.	Order #	Absorb.	Color Blk, if nec.	Abs. Difference Sample - Color	mg/L	Dilution	Final Result (mg/L)/(mg/Kg	Check if Soil
1	TV=2.0	ICV	0.202		0.202	1.9672	1.0	1.967	
2		ICB	0.000		0.000	-0.0008	1.0	-0.001	
3	TV=0.4	LCS	0.038		0.038	0.3694	1.0	0.369	
4		CCV	0.209		0.209	2.0354	1.0	2.035	
5		CCB	0.000		0.000	-0.0008	1.0	-0.001	
6		LCS	0.039		0.039	0.3792	1.0	0.379	
7		R1811942-001	0.103	0.004	0.103	1.0027	5.0	5.013	
8		R1811942-002	0.055	0.006	0.055	0.5350	1.0	0.535	
9		R1811942-003	0.086	0.001	0.086	0.8371	5.0	4.185	
10		R1811942-004	0.051	0.002	0.051	0.4961	100.0	49.606	
11		R1811942-005	0.085	0.041	0.044	0.4279	1.0	0.428	
12		R1811942-005 MS	0.119	0.041	0.078	0.7591	1.0	0.759	
13		R1811942-005 DMS	0.120	0.041	0.079	0.7689	1.0	0.769	
14		CCV	0.208		0.208	2.0257	1.0	2.026	
15		CCB	0.000		0.000	-0.0008	1.0	-0.001	

Soil Samples: 1g --> 100mL final volume. Decanted and filtered before analysis.

ALS Environmental
1565 Jefferson Rd., Rochester, NY 14623

General Chemistry Analytical Run Cover Sheet

Analyst: MAR Date: 12/11/19

Analysis: Ferrous Iron by Method 3500-Fe, D. Instrument: R-UV-VIS-05

Quality Control:

	Same as Log#, Date,	Stocks Prep. Log#, Date,	Stock Sol (mLs)	Stock Sol (mg/L)	Final Vol (mLs)	True Value (mg/L)
a) Standards Prep.:	WC126121A,11/25/13	WC149110A, 10/13/15				
b) ICV Preparation:	WC126121B,11/25/13	191837, 7/16/18	2.5	4.0	5	2.00
b2) CCV Preparation:	WC126121B, 11/25/14	191837, 7/16/18				
c) LCS Preparation:	WC126121C, 11/25/14	191836, 7/16/18	0.5	4.0	5	0.40
d) Matrix Spike Prep.:	WC126121C, 11/25/13	191836, 7/16/18	0.5	4.0	5	0.40

Instrument log filled in? (Y) (N)

Packages: Copy and attach Standards Preparation

Comments:

All standards, QC (CCV's, LCS's, Matrix Spikes) and samples are based on the Standard Methods 3500-Fe D. Phenanthroline Method being scaled down by a factor of 10. Hence, 1.0 mL of Ammonium acetate buffer and 2.0 mL of Phenanthroline solution are added to 5.0 mL of sample, standards, or QC and brought to 10.0 mL with DI water. True values are based on sample volumes of 5.0 mLs.

Color blank absorbance is not measured where the sample itself is clear or the sample absorbance is less than the PQL. Samples above the PQL do not have their color blank absorbance subtracted if it is less than the absorbance of the low standard (PQL).

LABORATORY REPORT

December 24, 2018

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS18120736

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on December 14, 2018. For your reference, these analyses have been assigned our service request number P1806865.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko
By Kate Kaneko at 4:07 pm, 12/24/18

Kate Kaneko
Laboratory Director

Client: ALS Laboratory Group Service Request No: P1806865
Project: HS18120736

CASE NARRATIVE

The samples were received intact under chain of custody on December 12, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P1806800-003, 005	Carbon Dioxide

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Service Request: P1806800
Project ID: HS18120569

Date Received: 12/12/2018
Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
35AWW20_121018	P1806800-001	Water	12/10/2018	09:10	X	X
35AWW24_121018	P1806800-002	Water	12/10/2018	10:15	X	X
35AWW19_121018	P1806800-003	Water	12/10/2018	11:15	X	X
35AWW23_121018	P1806800-004	Water	12/10/2018	12:30	X	X
LHSMW07_121018	P1806800-005	Water	12/10/2018	13:30	X	X

P1806800

00944677

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 10415

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18120569
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18120569-01**	**35AWW20_121018**	**Groundwater**	**10 Dec 2018 09:10**
	MEE plus CO2 Sub to ALS SimiValley			26 Dec 2018
2.	**HS18120569-02**	**35AWW24_121018**	**Groundwater**	**10 Dec 2018 10:15**
	MEE plus CO2 Sub to ALS SimiValley			26 Dec 2018
3.	**HS18120569-03**	**35AWW19_121018**	**Groundwater**	**10 Dec 2018 11:15**
	MEE plus CO2 Sub to ALS SimiValley			26 Dec 2018
4.	**HS18120569-04**	**35AWW23_121018**	**Groundwater**	**10 Dec 2018 12:30**
	MEE plus CO2 Sub to ALS SimiValley			26 Dec 2018
5.	**HS18120569-05**	**LHSMW07_121018**	**Groundwater**	**10 Dec 2018 13:30**
	MEE plus CO2 Sub to ALS SimiValley			26 Dec 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

₱1806800

Subcontract Chain of Custody

COC ID: 10415

Relinquished By: R Ciga

Date/Time: 12/11/18 1800

Received By:

Date/Time: 12-12-18 1000 2° avg 1 cooler

Cooler ID(s):

Temperature(s):

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1806800

Project: HS18120569

Sample(s) received on: 12/12/18 Date opened: 12/12/18 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 2° C Thermometer ID CO907034581 Wet Ice			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1806800-001.01	40mL VOA NP		7		A	MR 12/17/18
P1806800-001.02	40mL VOA NP				A	
P1806800-001.04	40ml VOA HCL		1		A	MR 12/18/18
P1806800-001.05	40ml VOA HCL				A	
P1806800-002.01	40mL VOA NP		6		A	MR 12/17/18
P1806800-002.02	40mL VOA NP				A	
P1806800-002.03	40mL VOA NP				A	
P1806800-002.04	40ml VOA HCL		1		A	MR 12/18/18
P1806800-003.01	40mL VOA NP		6		A	MR 12/17/18
P1806800-003.02	40mL VOA NP				A	
P1806800-003.04	40ml VOA HCL		1		A	MR 12/18/18
P1806800-003.05	40ml VOA HCL				A	
P1806800-004.01	40mL VOA NP		6		A	MR 12/17/18
P1806800-004.02	40mL VOA NP				A	
P1806800-004.04	40ml VOA HCL		1		A	MR 12/18/18

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1806800

Project: HS18120569

Sample(s) received on: 12/12/18 Date opened: 12/12/18 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1806800-004.05	40ml VOA HCL				A	
P1806800-005.01	40mL VOA NP		7		A	MR 12/17/18
P1806800-005.02	40mL VOA NP				A	
P1806800-005.04	40ml VOA HCL		1		A	MR 12/18/18
P1806800-005.05	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS18120569** ALS Project ID: P1806800

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date(s) Collected: 12/10/18
Date Received: 12/12/18
Date Analyzed: 12/17/18

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
35AWW20_121018	P1806800-001	0.050	**720,000**	2,000	1,700	740	
35AWW24_121018	P1806800-002	0.050	**660,000**	2,000	1,700	740	
35AWW19_121018	P1806800-003	0.050	**330,000**	2,000	1,700	740	
35AWW23_121018	P1806800-004	0.050	**810,000**	2,000	1,700	740	
LHSMW07_121018	P1806800-005	0.050	**460,000**	2,000	1,700	740	
Method Control Sample	P181217-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P181217-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 12/17/18
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	18,600	18,300	**81**	**80**	80-122	1	12	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW20_121018**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P1806800-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/10/18
Date Received: 12/12/18
Date Analyzed: 12/18/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**440**	1.3	1.0	0.51	
74-85-1	Ethene	**1.3**	1.0	0.55	0.24	
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW24_121018**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P1806800-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/10/18
Date Received: 12/12/18
Date Analyzed: 12/18/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**68**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW19_121018**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P1806800-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/10/18
Date Received: 12/12/18
Date Analyzed: 12/18/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**5.7**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW23_121018**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P1806800-004

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/10/18
Date Received: 12/12/18
Date Analyzed: 12/18/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**2,200**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **LHSMW07_121018**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P1806800-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/10/18
Date Received: 12/12/18
Date Analyzed: 12/18/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**170**	1.3	1.0	0.51	
74-85-1	Ethene	**28**	1.0	0.55	0.24	
74-84-0	Ethane	**0.46**	0.60	0.47	0.16	**J**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P181218-MB

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 12/18/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18120569**

ALS Project ID: P1806800
ALS Sample ID: P181218-LCS
P181218-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 12/18/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.50	2.37	2.41	**95**	**96**	73-125	1	26	
74-85-1	Ethene	4.37	4.41	4.41	**101**	**101**	72-133	0	11	
74-84-0	Ethane	4.69	4.61	4.66	**98**	**99**	74-131	1	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171809.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 14:36:49
Operator : MR
Sample : P1806800-001 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 14:50:05 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

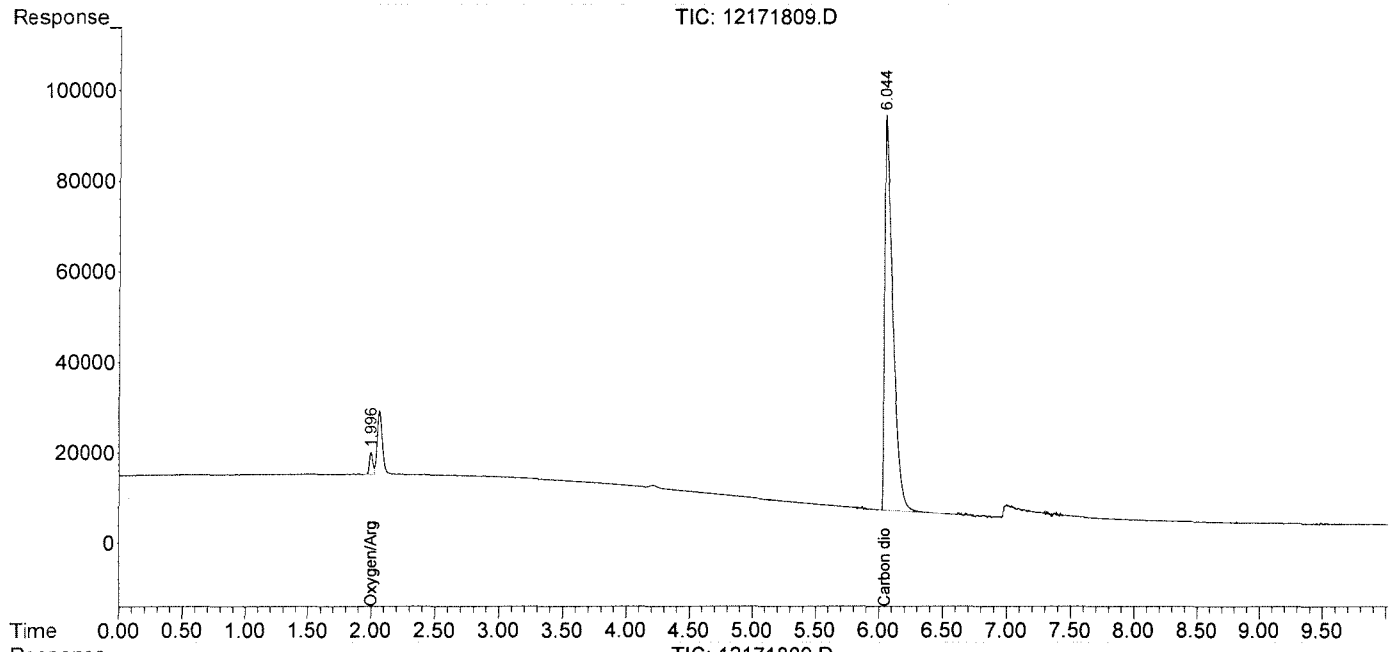
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.996f	89867	0.019	ppm
2)	Carbon monoxide	1.996f	89867	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	6.047	3883396	16544.154	ppm
6)	Methane (FID)	1.120	1383297	146.414	ppm
7)	Ethylene	1.685	2975	0.177	ppm
8)	Ethane	1.685f	2975	0.173	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.660	14019	NoCal	ppm
13)	n-Butane	6.660	14019	NoCal	ppm

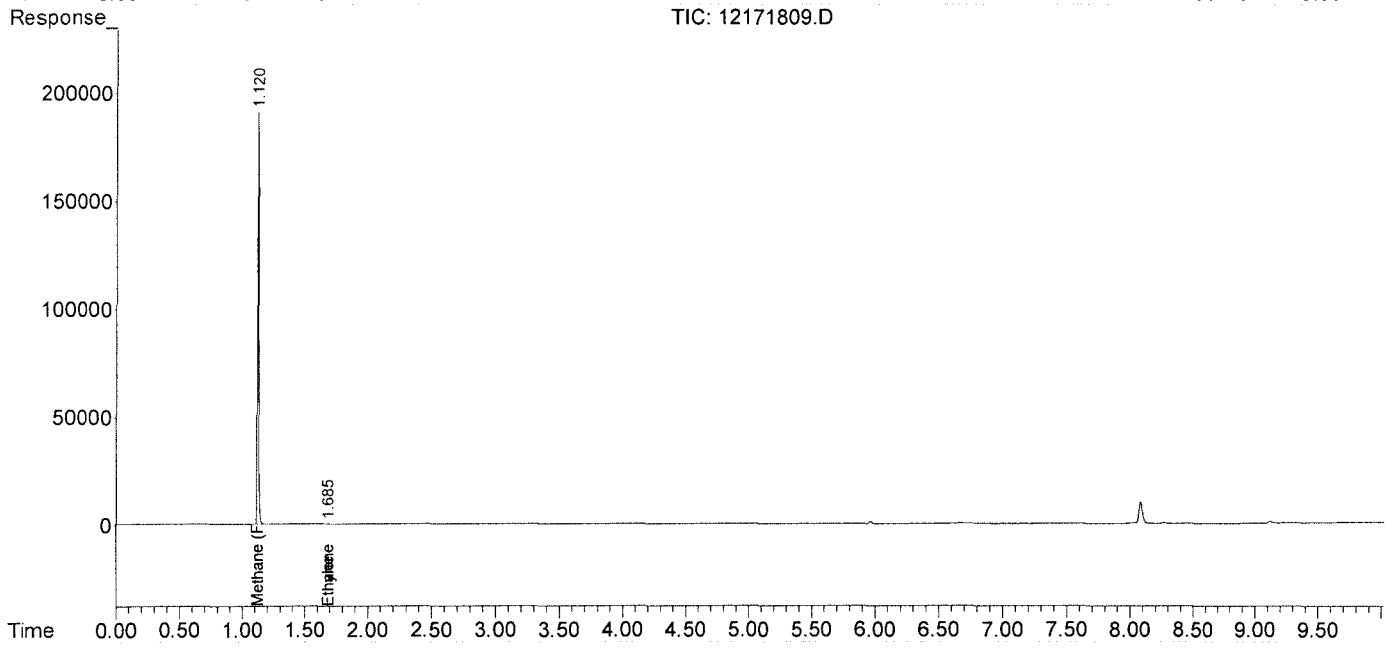
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171809.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 14:36:49
Operator : MR
Sample : P1806800-001 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 14:50:05 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171810.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 14:50:03
Operator : MR
Sample : P1806800-002 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 15:24:21 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

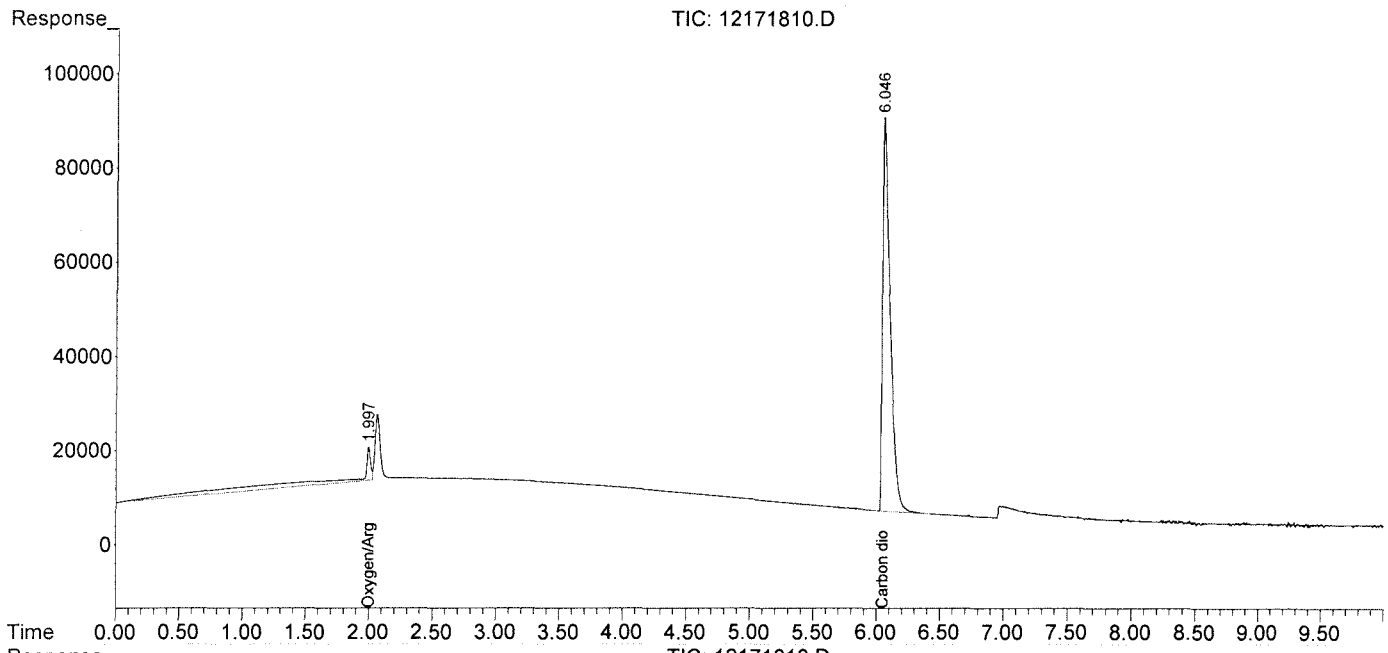
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.998f	854854	0.180	ppm
2)	Carbon monoxide	1.998f	854854	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	6.047	3536653	15066.951	ppm
6)	Methane (FID)	1.121	117742	12.462	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

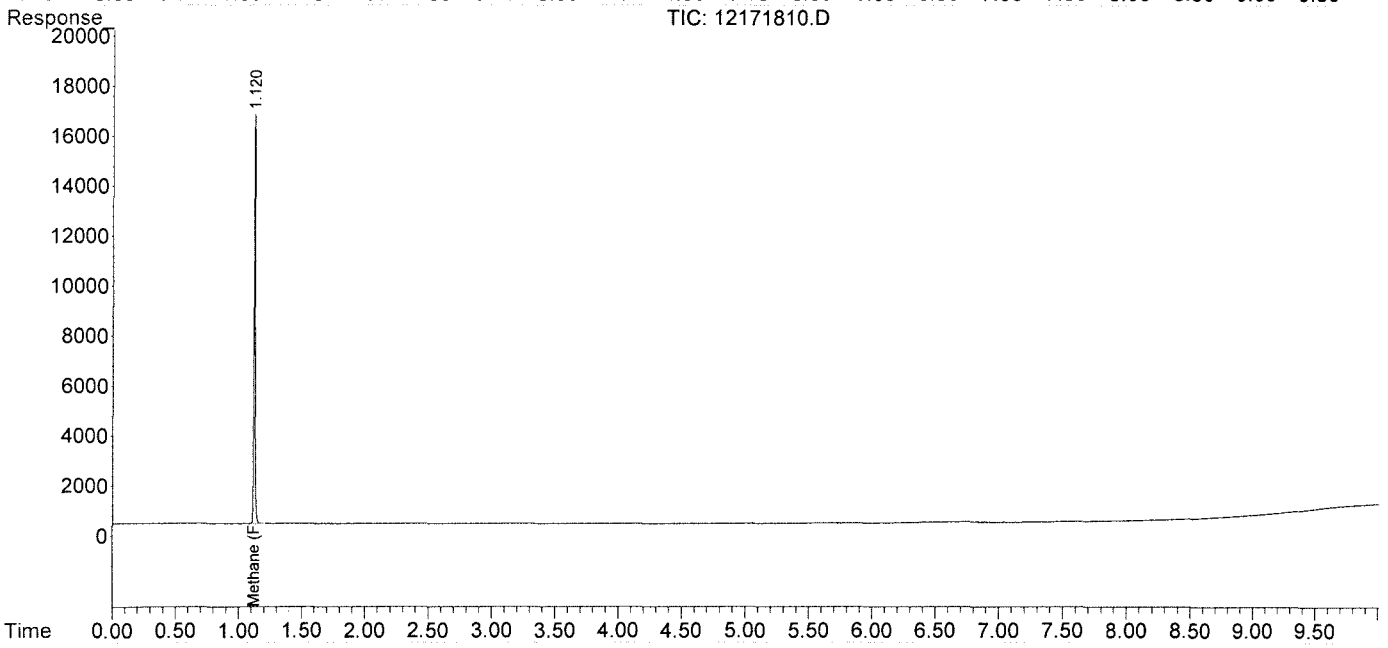
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171810.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 14:50:03
Operator : MR
Sample : P1806800-002 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 15:24:21 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171811.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:08:33
Operator : MR
Sample : P1806800-003 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:28:57 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

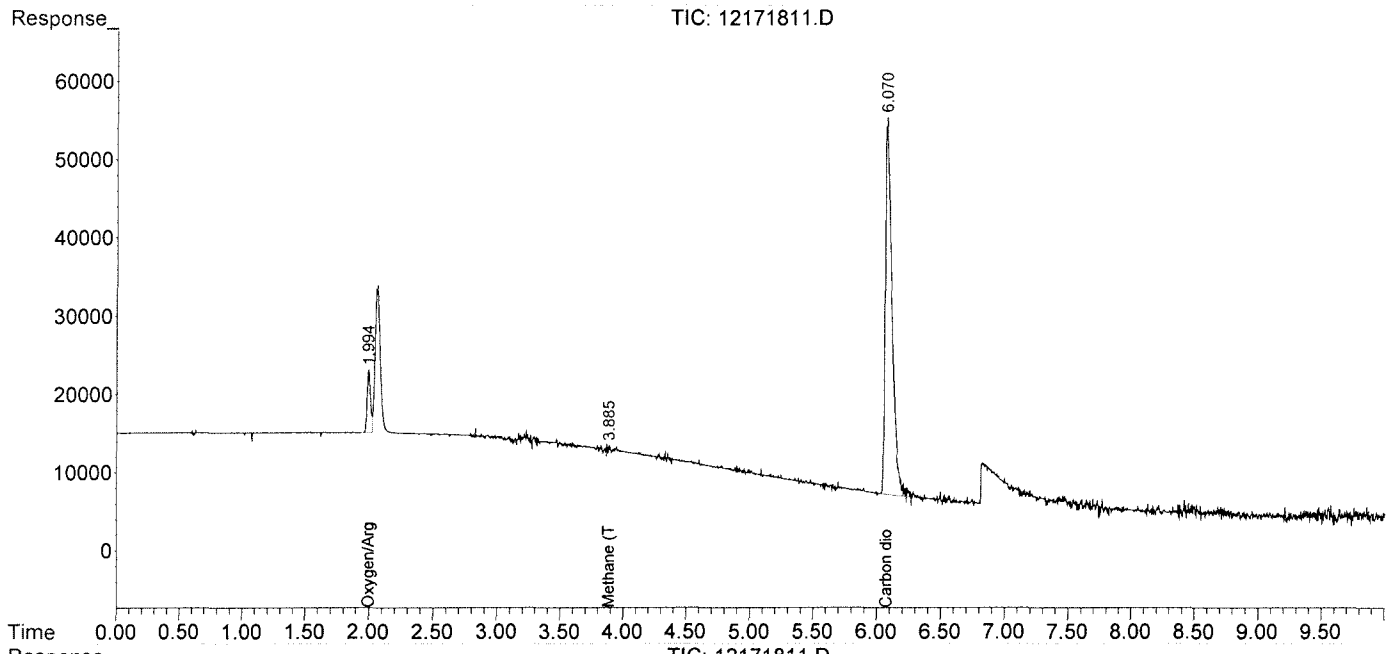
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.995f	145584	0.031	ppm	
2)	Carbon monoxide	1.995f	145584	N.D.	ppm	
3)	Methane (TCD)	3.886	7241	765.679	ppm	
4)	Carbon dioxide	6.070	1760005	7498.023	ppm	m
6)	Methane (FID)	1.122	11406	1.207	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

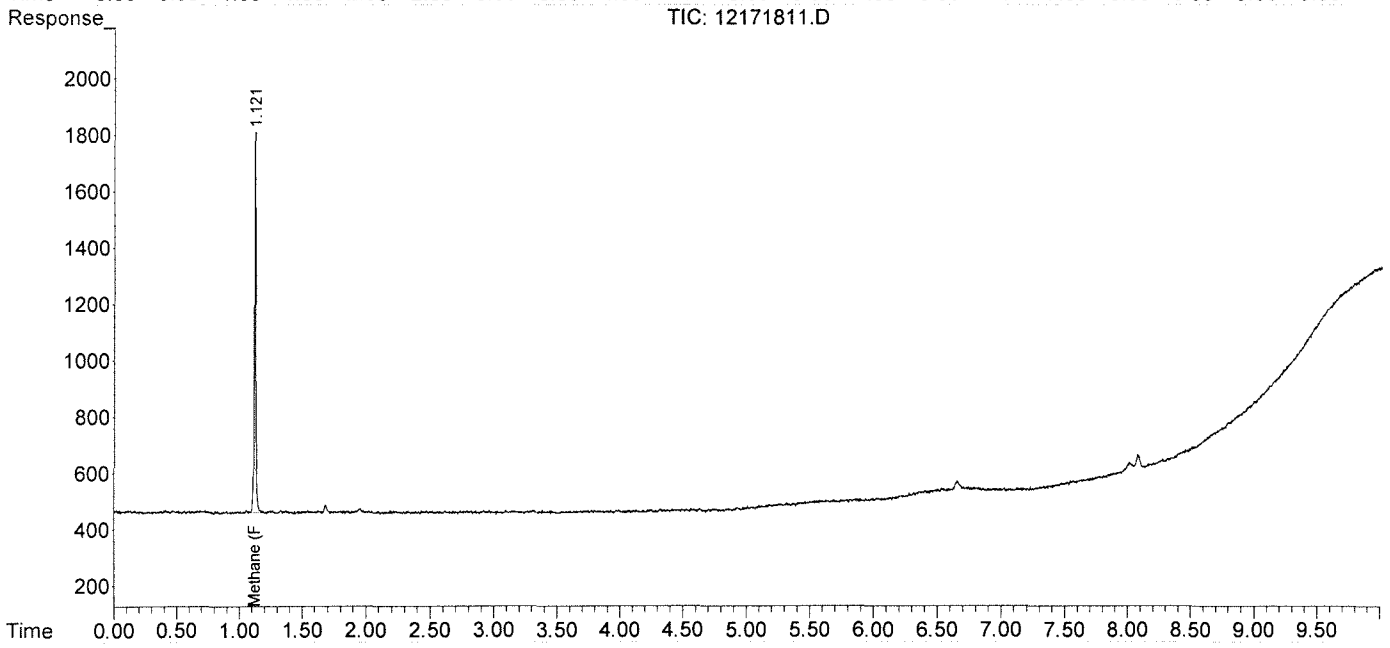
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171811.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:08:33
Operator : MR
Sample : P1806800-003 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:28:57 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

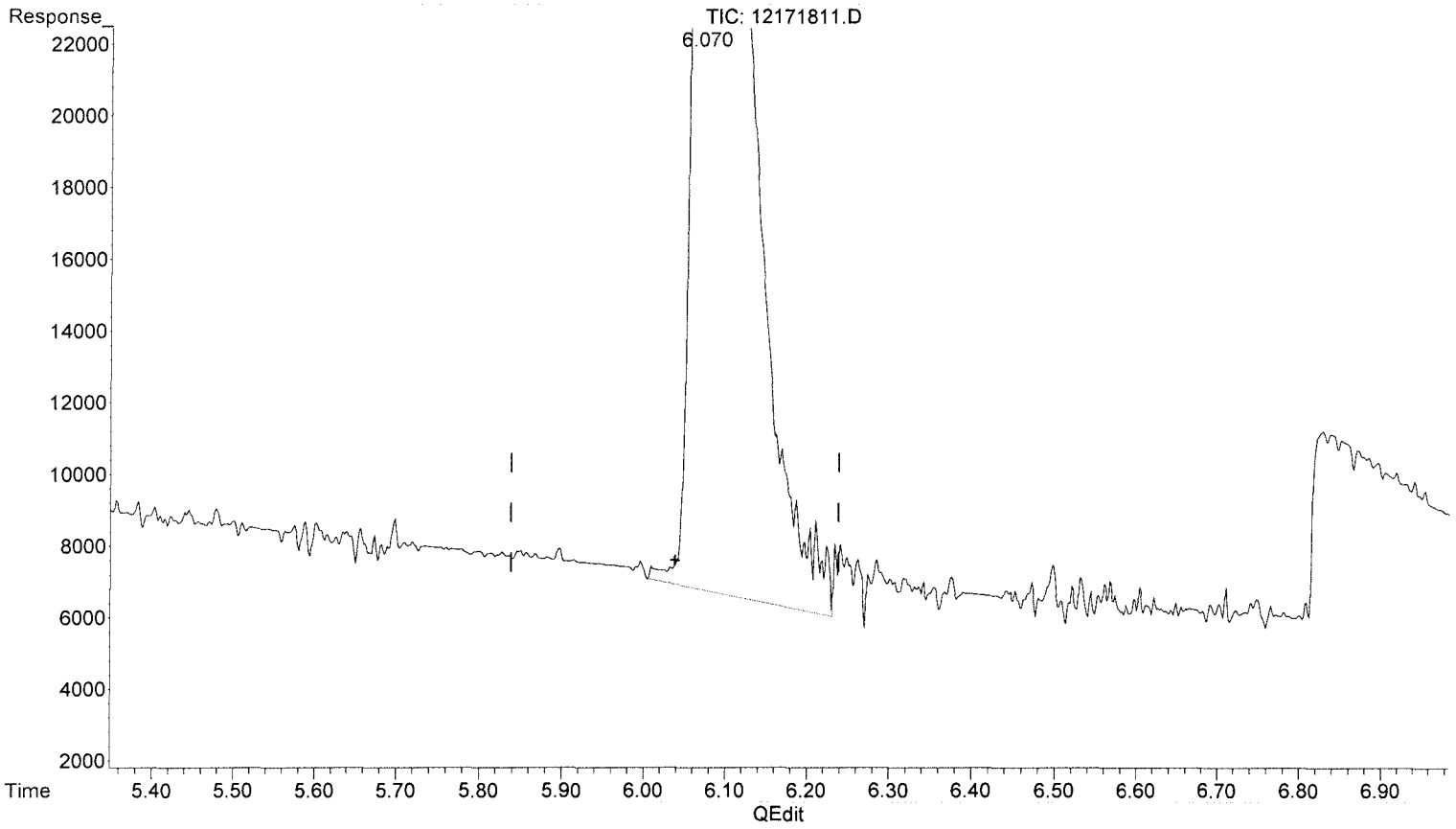




Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171811.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:08:33
Operator : MR
Sample : P1806800-003 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:28:57 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.072min 7748.542 ppm

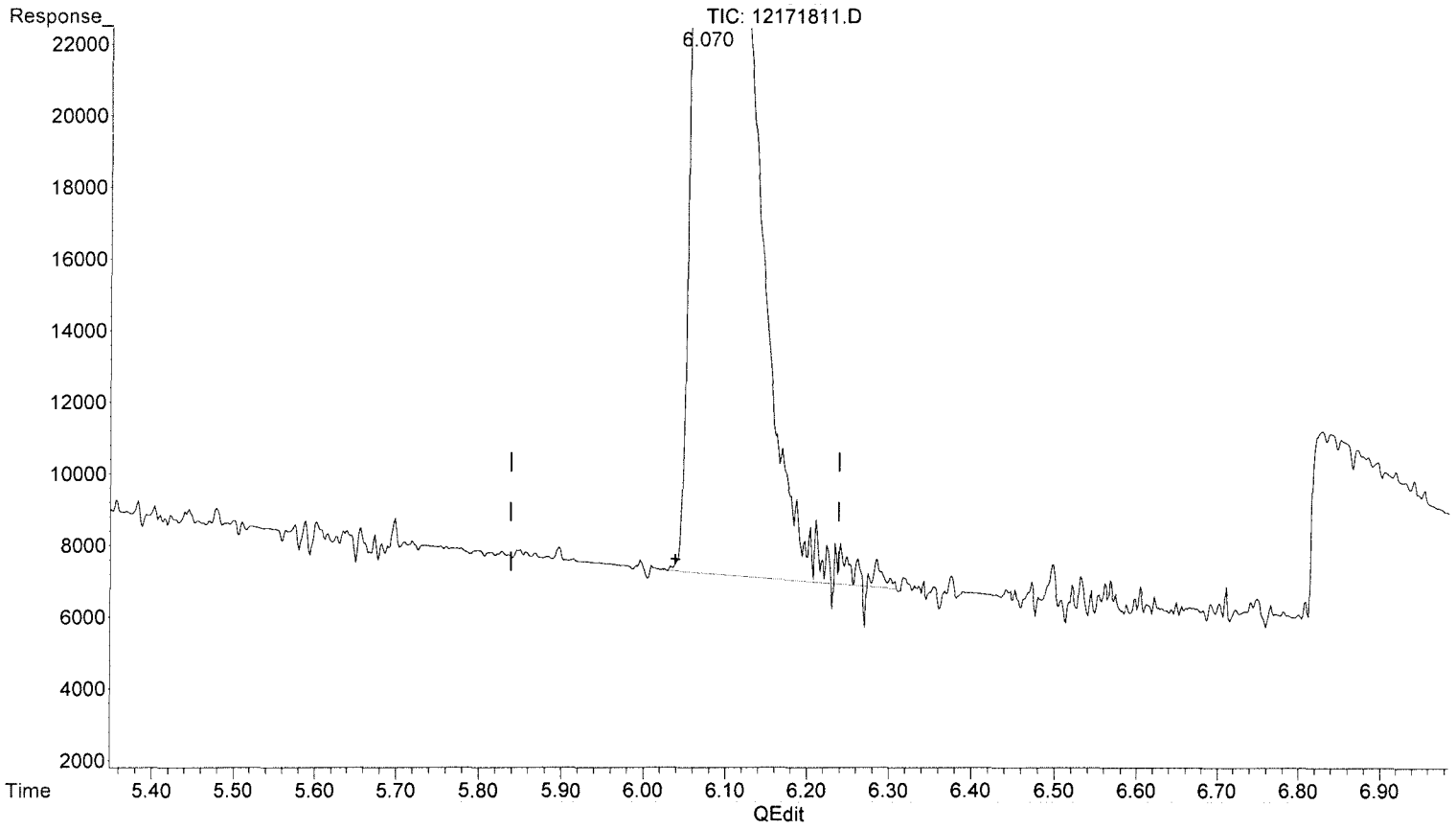
response 1818809

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171811.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:08:33
Operator : MR
Sample : P1806800-003 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:28:57 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.070min 7498.023 ppm m

response 1760005

MR 12/18/18
BLC

(+) = Expected Retention Time

RS082817_CO2.M Tue Dec 18 12:29:29 2018 Page: 1

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171812.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:21:55
Operator : MR
Sample : P1806800-004 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 15:41:41 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

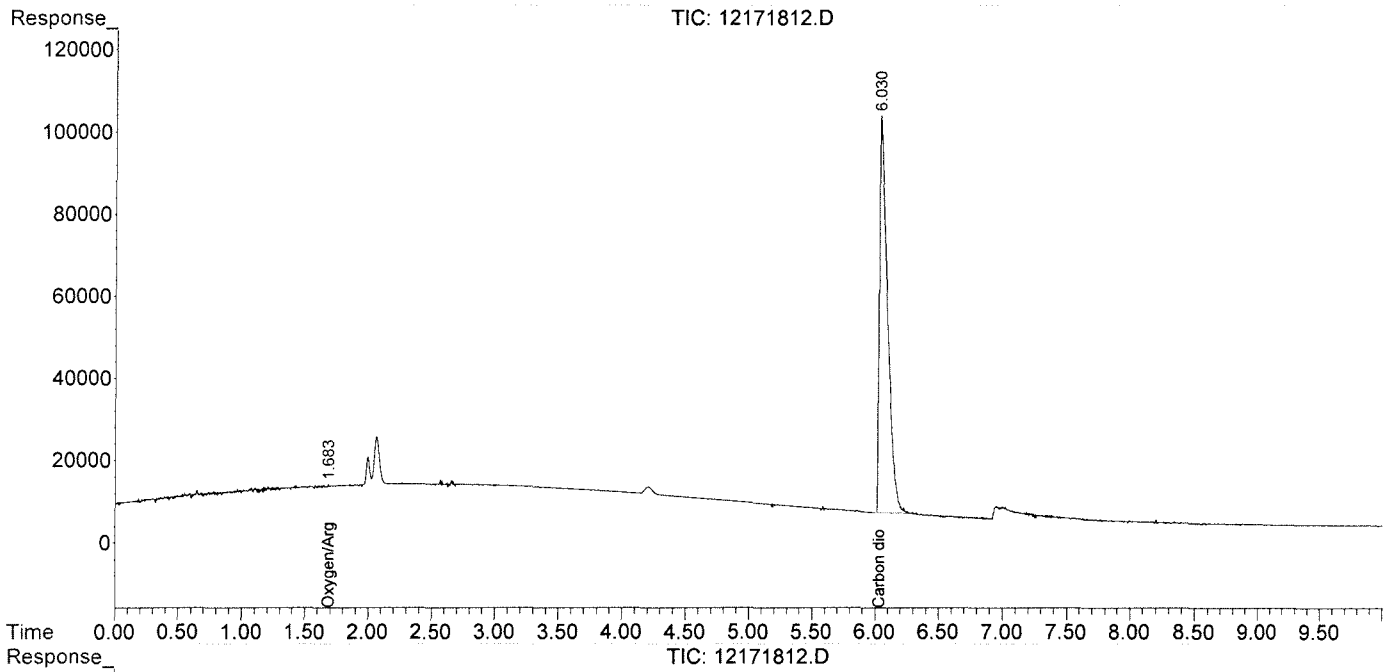
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.684f	3058	0.001	ppm
2)	Carbon monoxide	1.684f	3058	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	6.032	4337710	18479.636	ppm
6)	Methane (FID)	1.120	4339018	459.261	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

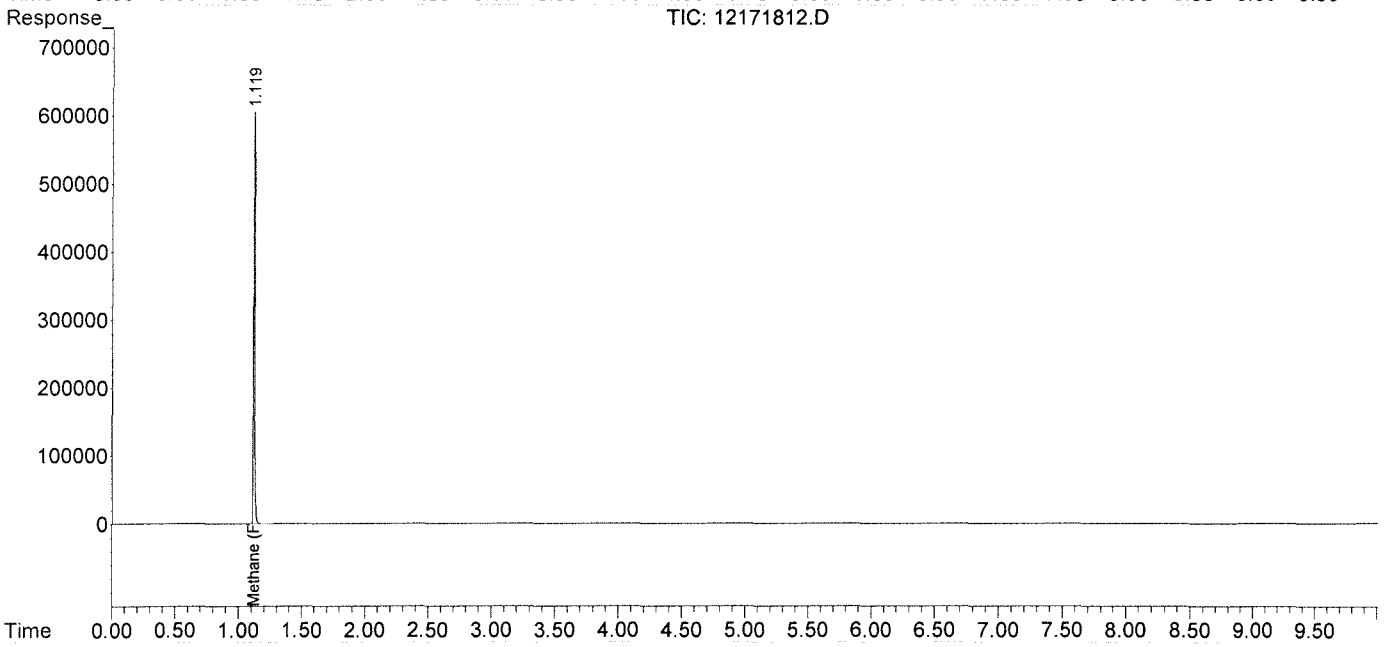
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171812.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:21:55
Operator : MR
Sample : P1806800-004 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 15:41:41 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:40:17
Operator : MR
Sample : P1806800-005 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:35:08 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

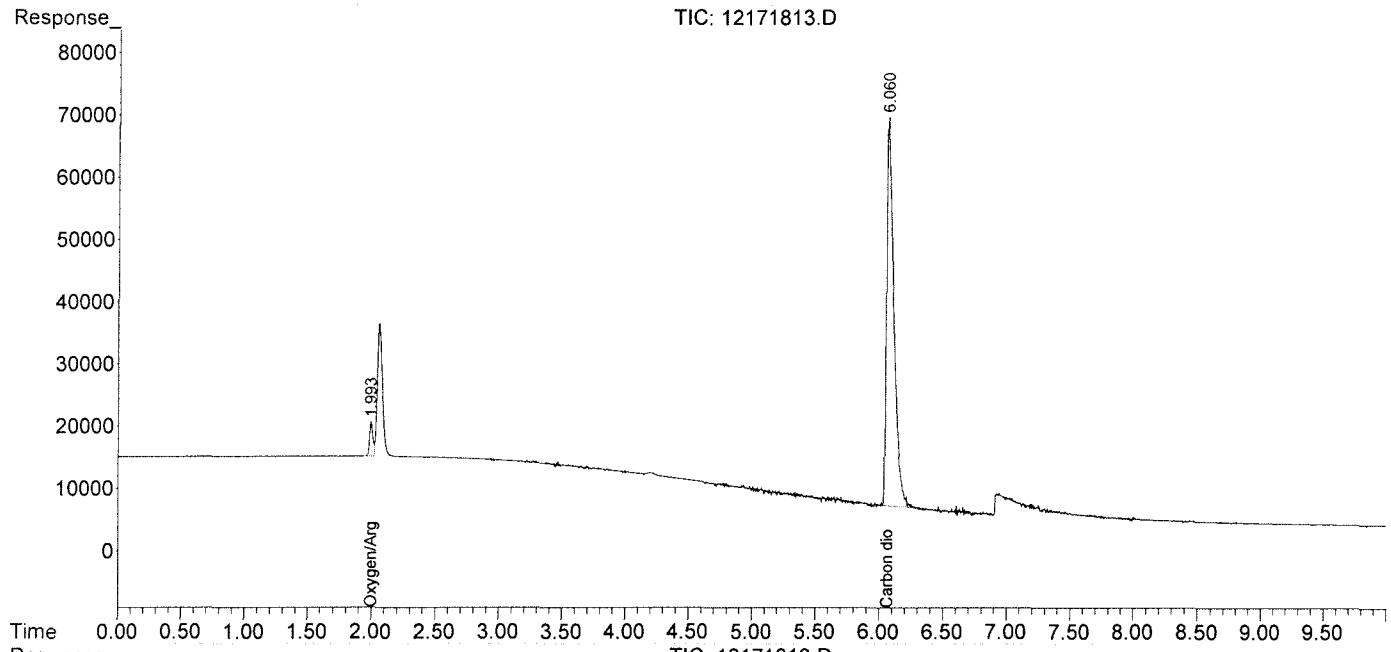
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.993f	98609	0.021	ppm	
2)	Carbon monoxide	1.993f	98609	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.060	2450402	10439.271	ppm	m
6)	Methane (FID)	1.119	808534	85.579	ppm	
7)	Ethylene	1.681	88835	5.274	ppm	
8)	Ethane	1.946	2027	0.118	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	6.218	5198	NoCal	ppm	
12)	Isobutane	6.655	47830	NoCal	ppm	
13)	n-Butane	6.655	47830	NoCal	ppm	

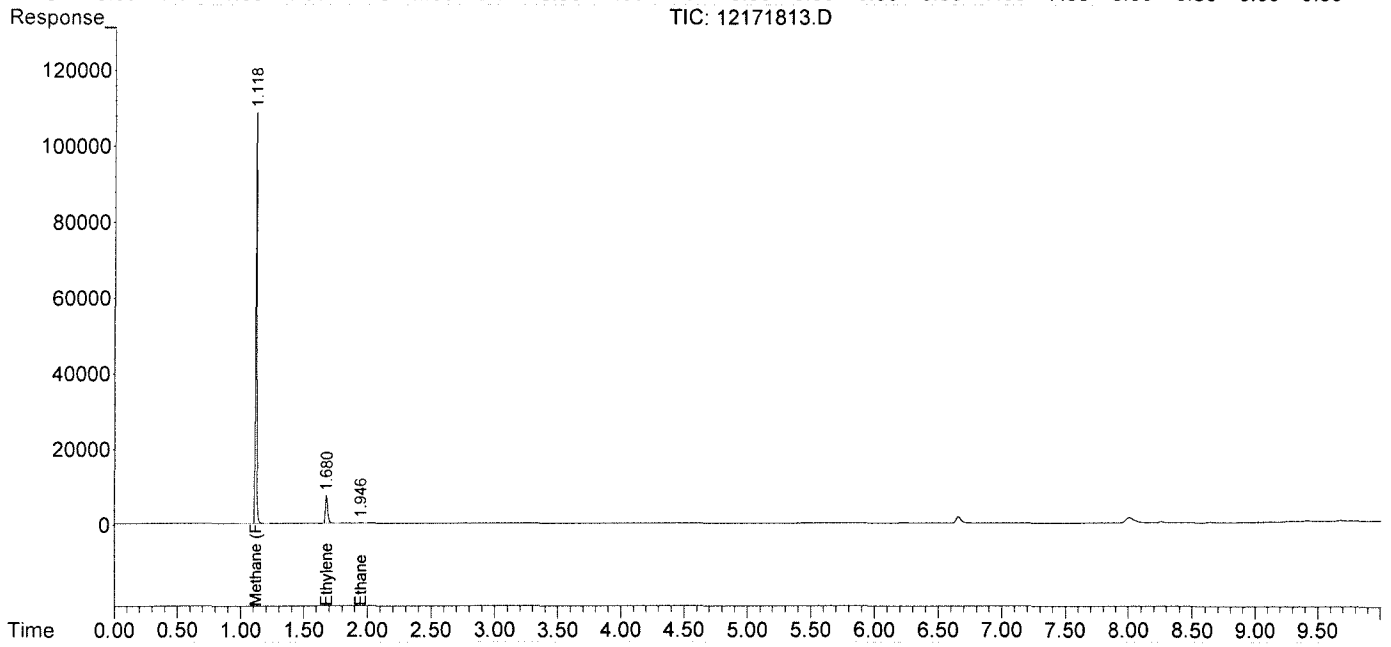
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:40:17
Operator : MR
Sample : P1806800-005 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:35:08 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

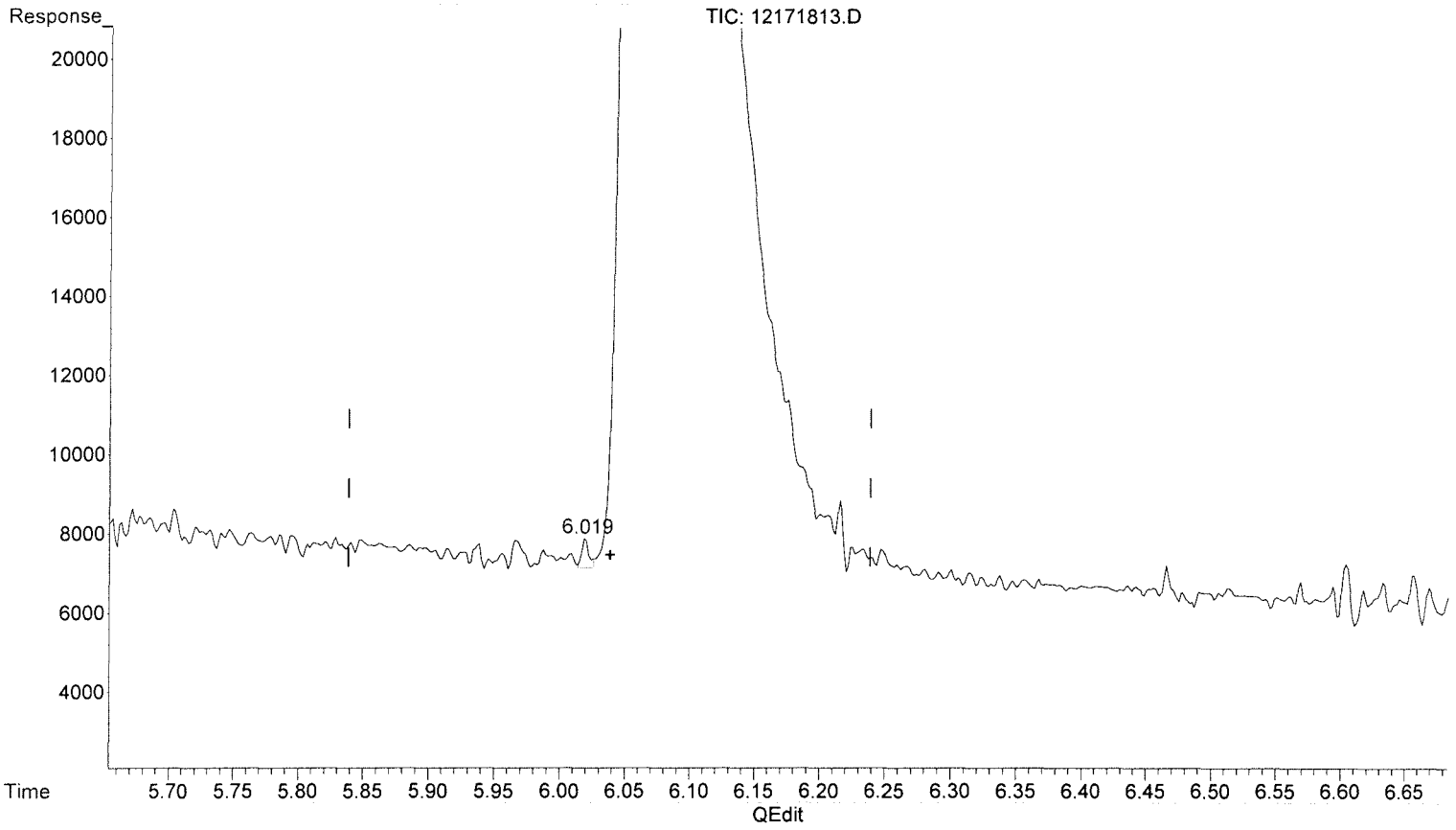




Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:40:17
Operator : MR
Sample : P1806800-005 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:35:08 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.020min 11.708 ppm

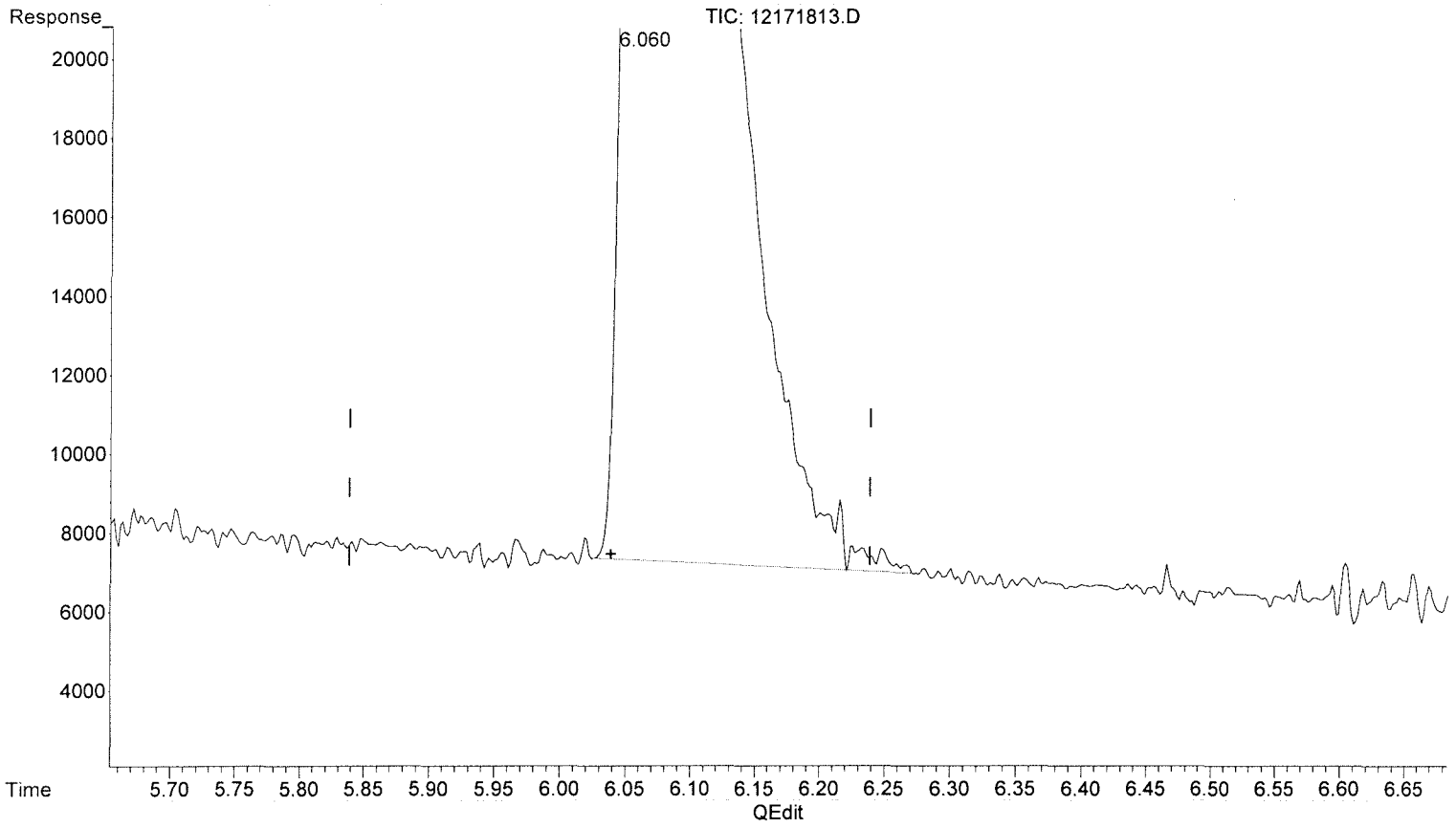
response 2748

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 15:40:17
Operator : MR
Sample : P1806800-005 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:35:08 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.060min 10439.271 ppm m

response 2450402

MR 12/18/18

MP

Compliant

(+) = Expected Retention Time

RS082817_CO2.M Tue Dec 18 12:35:45 2018 Page: 1

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 12:47:59
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 13:21:48 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

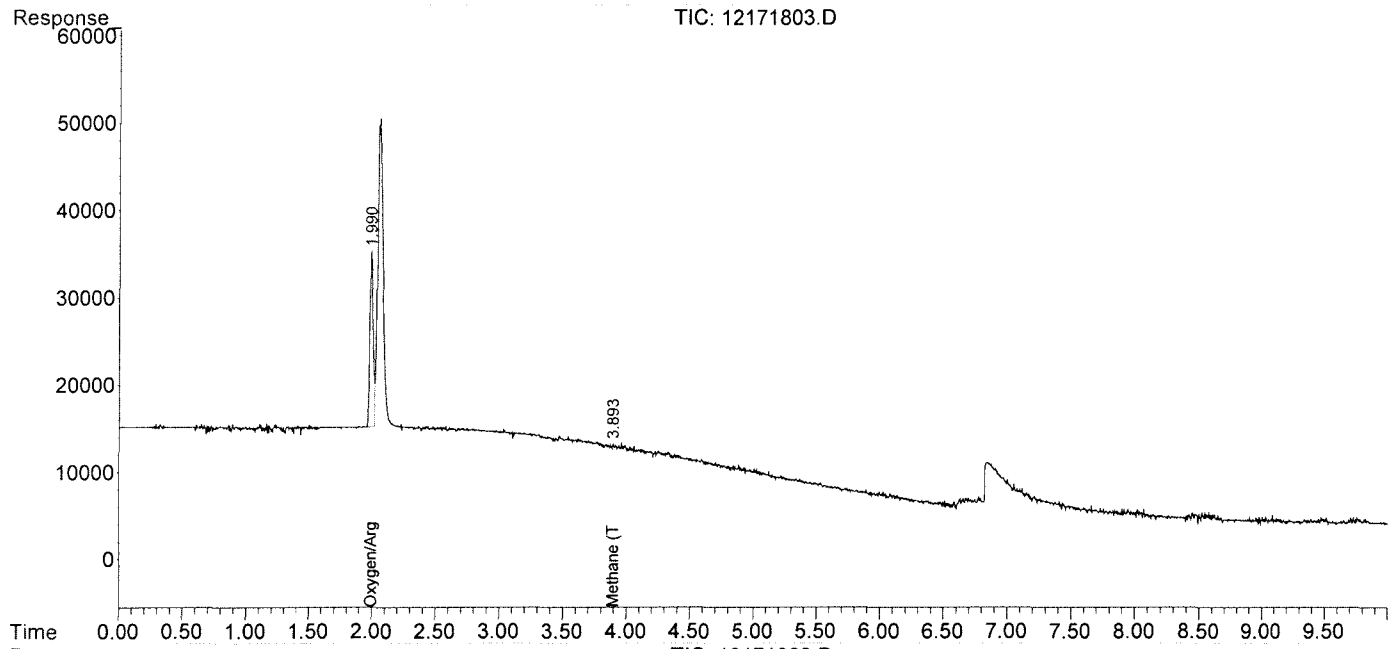
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.991f	367908	0.077	ppm	
2)	Carbon monoxide	1.991f	367908	N.D.	ppm	
3)	Methane (TCD)	3.894	3873	409.557	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.121	2895	0.306	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

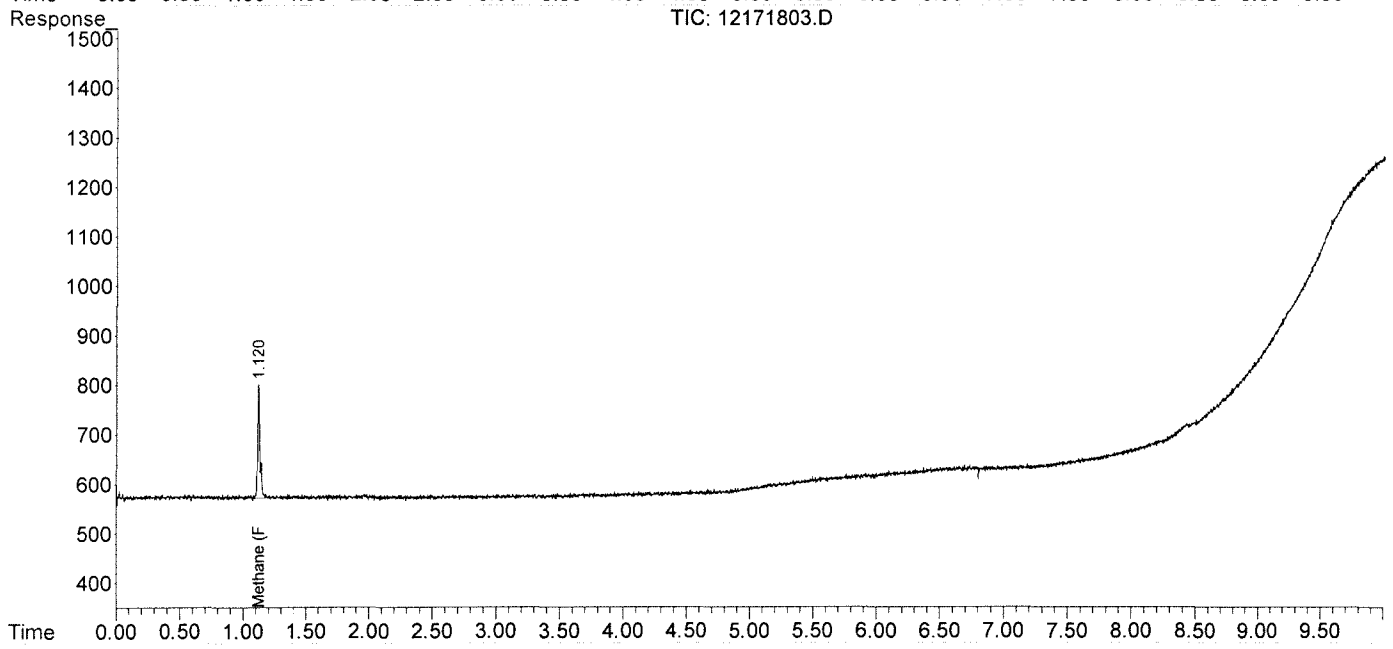
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 12:47:59
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 13:21:48 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171816.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 16:35:26
Operator : MR
Sample : tcd lcs s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:36:37 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

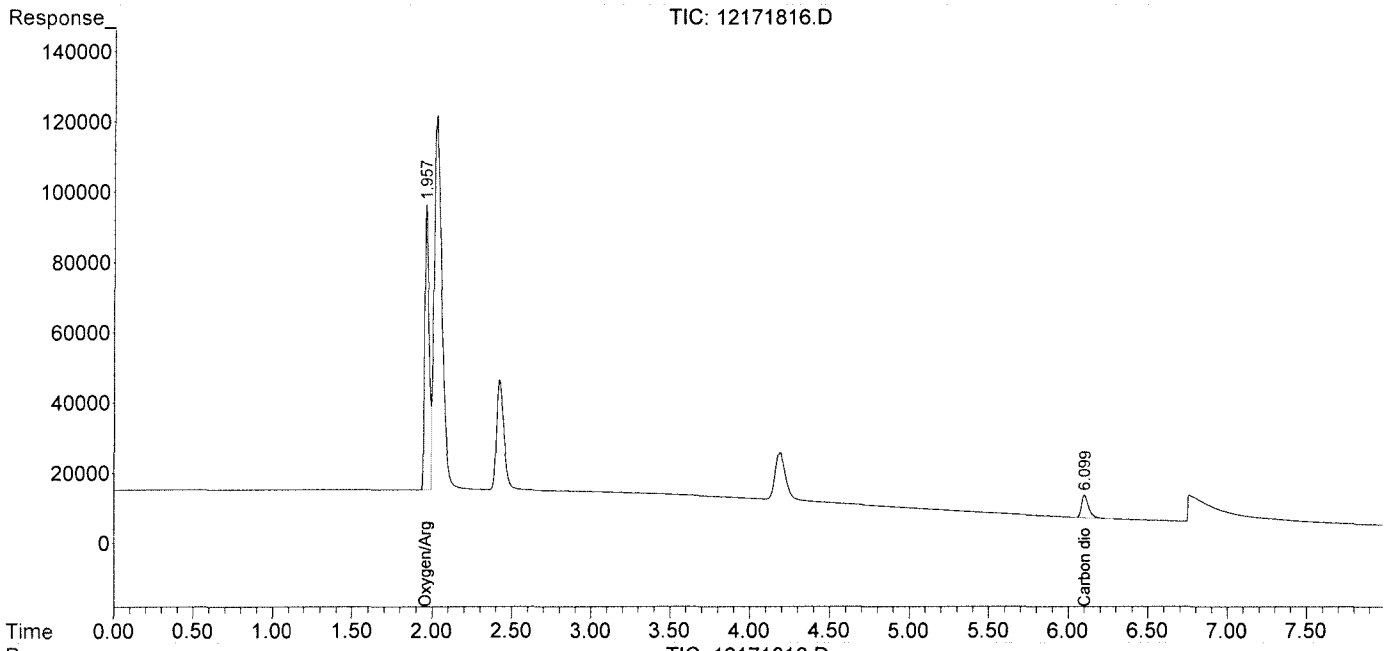
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.958f	1479705	0.311	ppm	
2)	Carbon monoxide	1.958f	1479705	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.099	199754	850.998	ppm	m
6)	Methane (FID)	1.110	32571086	3447.473	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

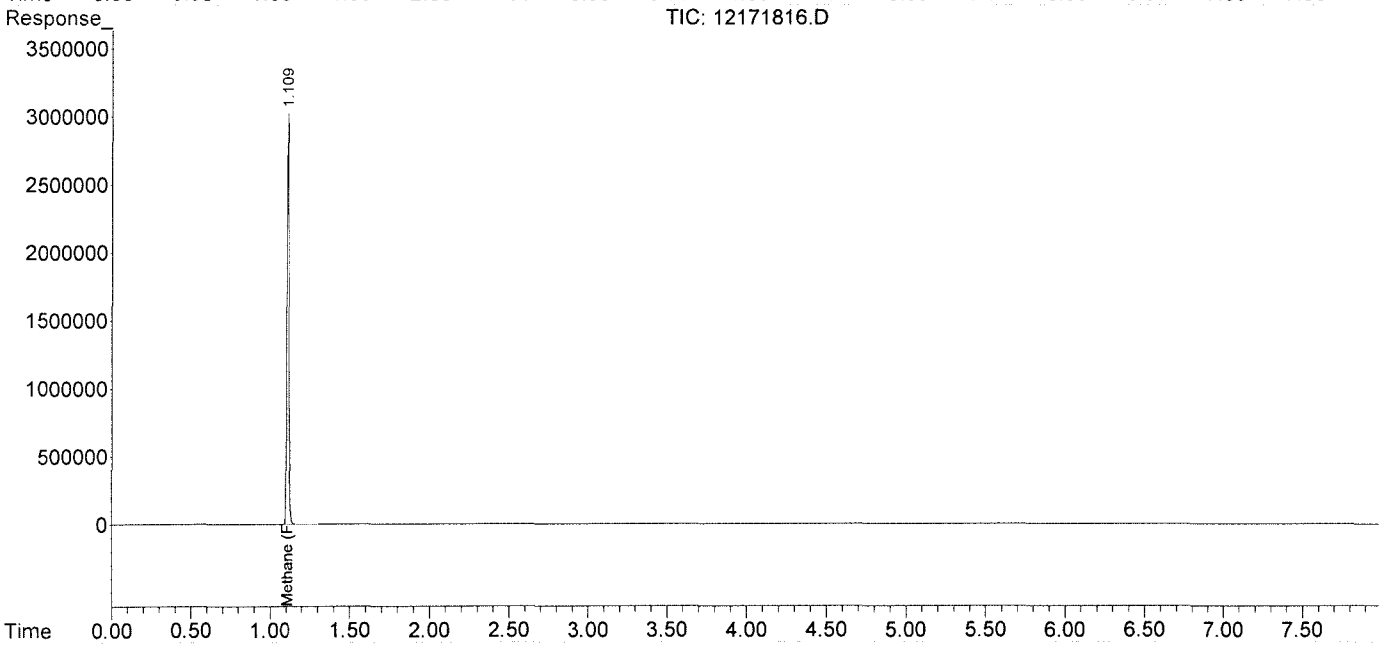
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171816.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 16:35:26
Operator : MR
Sample : tcd lcs s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:36:37 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

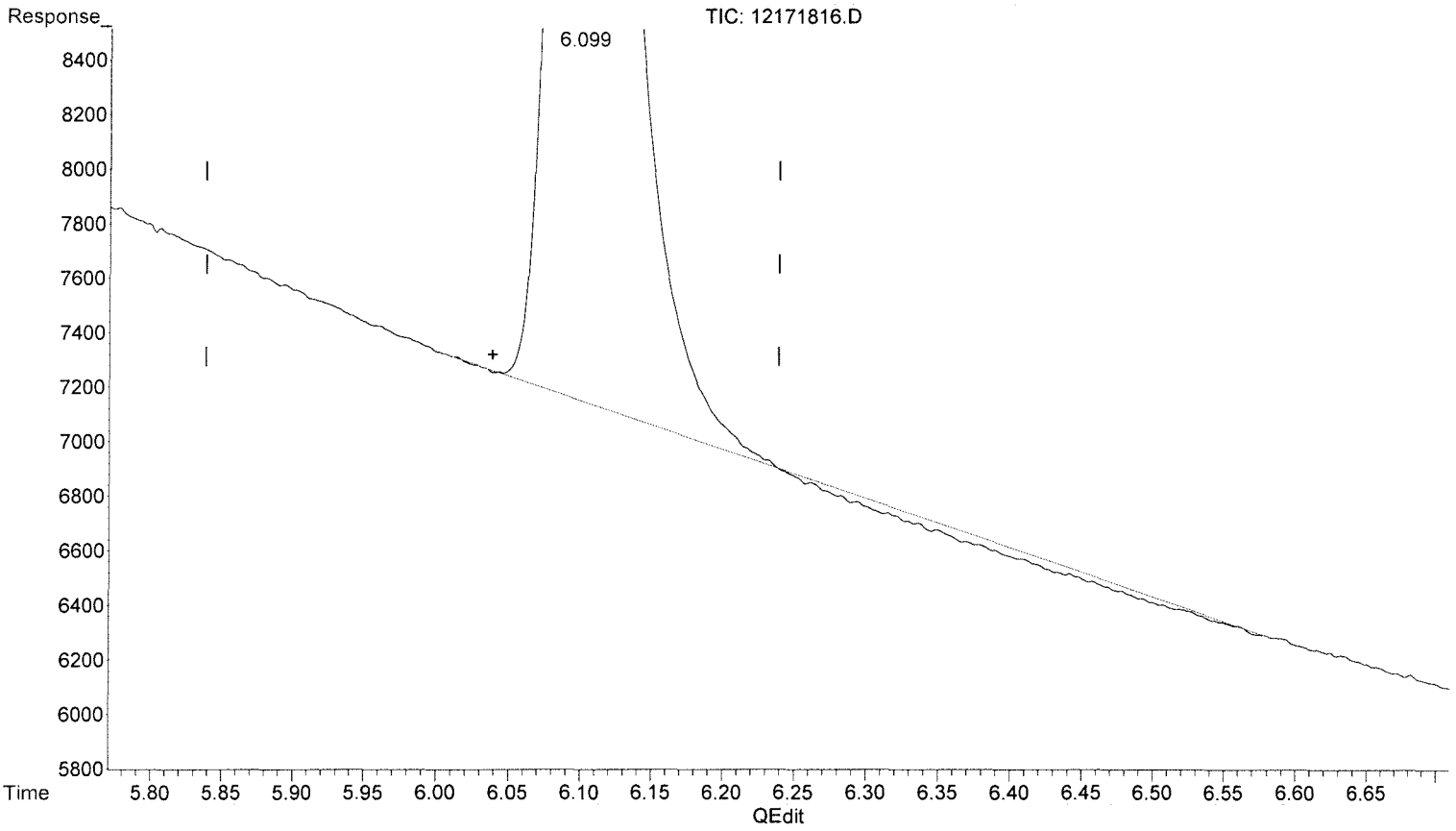




Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171816.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 16:35:26
Operator : MR
Sample : tcd lcs s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:36:37 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.100min 822.075 ppm

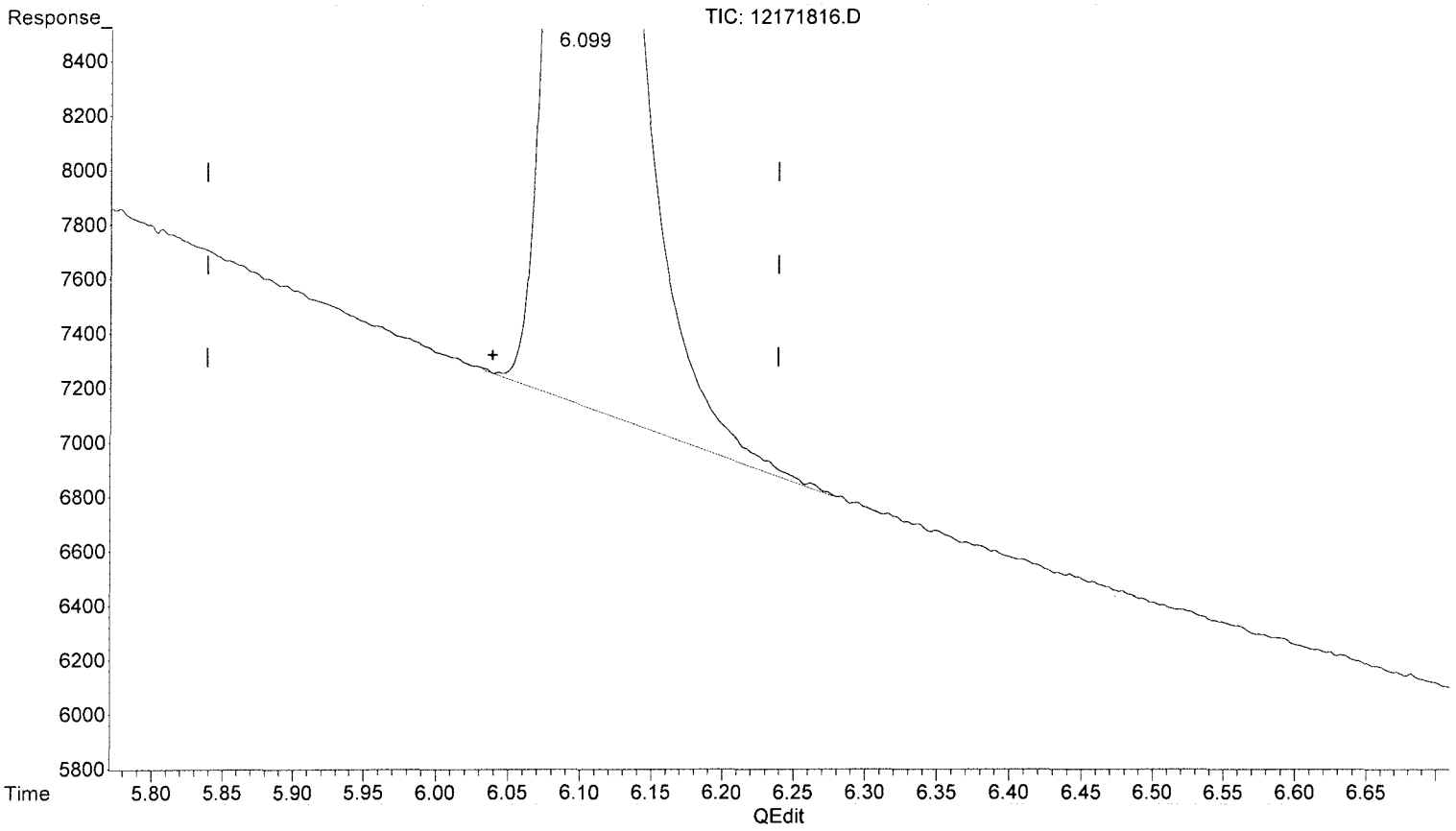
response 192965

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171816.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 16:35:26
Operator : MR
Sample : tcd lcs s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:36:37 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.099min 850.998 ppm m

response 199754

MK 12/18/18
BLC

12/18/18

(+) = Expected Retention Time

RS082817_CO2.M Tue Dec 18 12:37:07 2018 Page: 1

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171817.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 16:46:42
Operator : MR
Sample : tcd lcsd s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:37:39 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

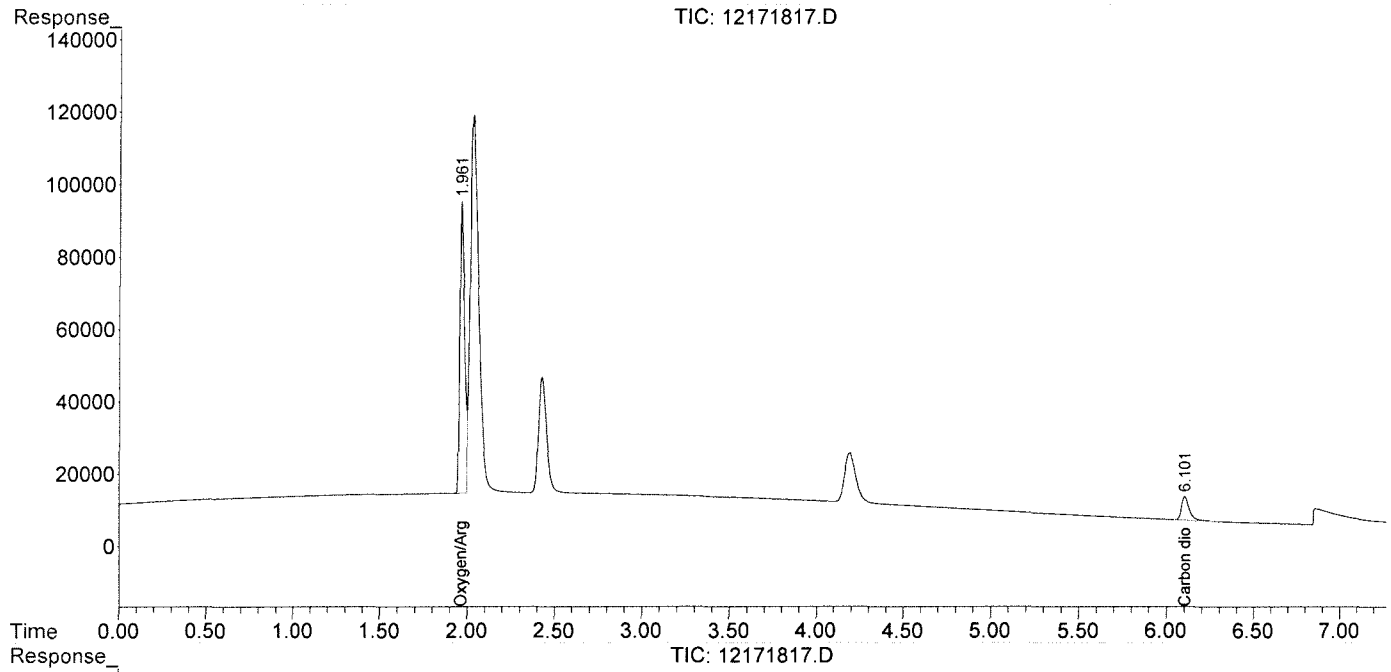
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.962f	1474209	0.310	ppm	
2)	Carbon monoxide	1.962f	1474209	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.101	197188	840.064	ppm	m
6)	Methane (FID)	1.114	32961735	3488.821	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

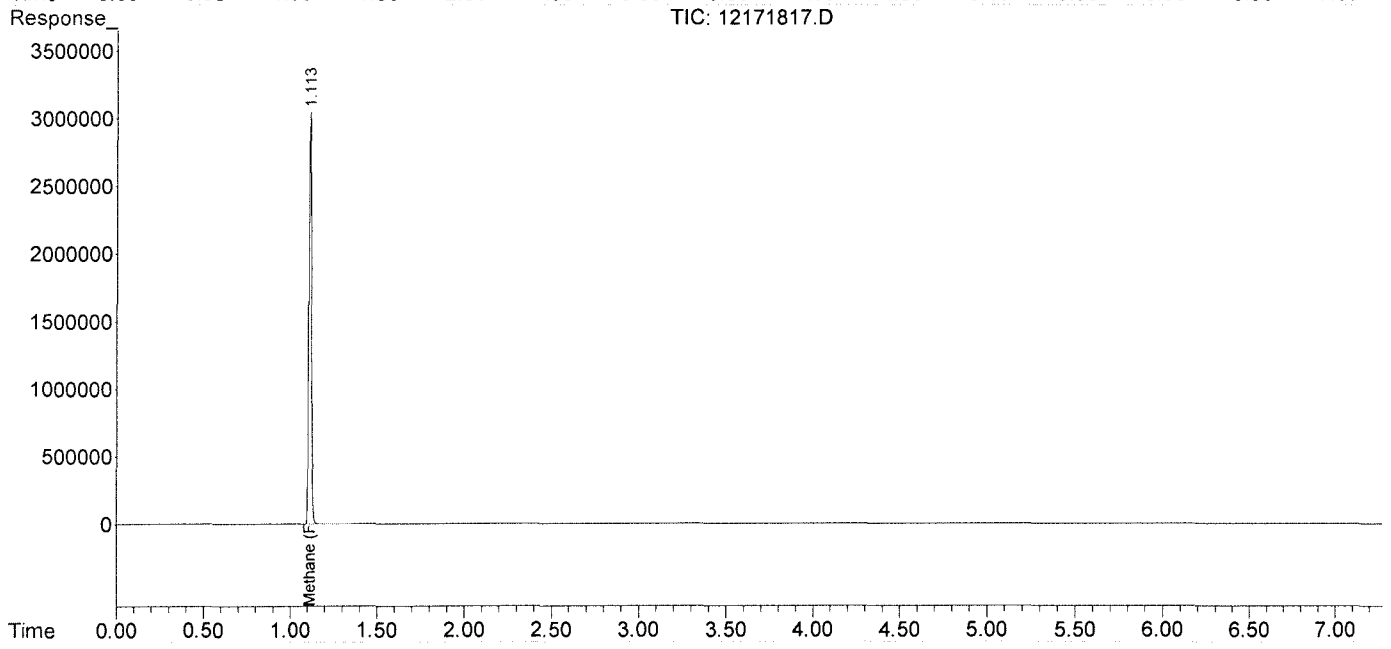
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171817.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 16:46:42
Operator : MR
Sample : tcd lcsd s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:37:39 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

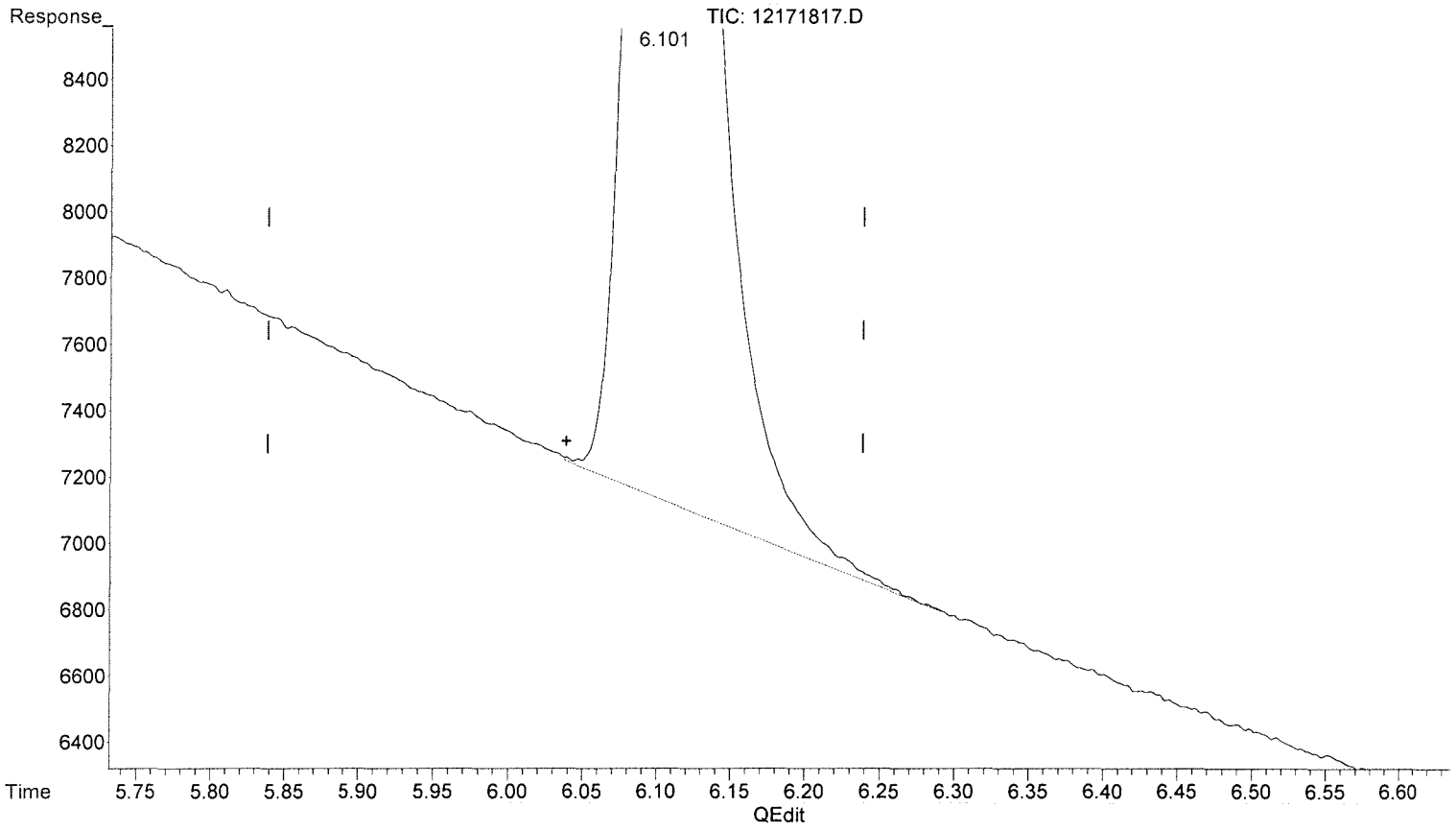




Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171817.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 16:46:42
Operator : MR
Sample : tcd lcsd s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:37:39 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.101min 840.064 ppm m

response 197188

MR 12/18/18
BLC
no previous

(+) = Expected Retention Time

Response Factor Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	4.760						4.760	E6	0.00
2)	Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657	E6	170.12
3)	Methane (TCD)							9.457		0.00
4)	Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347	E2	7.99

Signal #2 Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945	E4	15.85
7)	Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684	E4	7.30
8)	Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723	E4	5.40
9)	Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449	E4	7.32
10)	Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655	E4	7.75
11)	Isobutylene							0.000		-1.00
12)	Isobutane							0.000		-1.00
13)	n-Butane							0.000		-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

Compounds -- Compound #4 -- Carbon dioxide

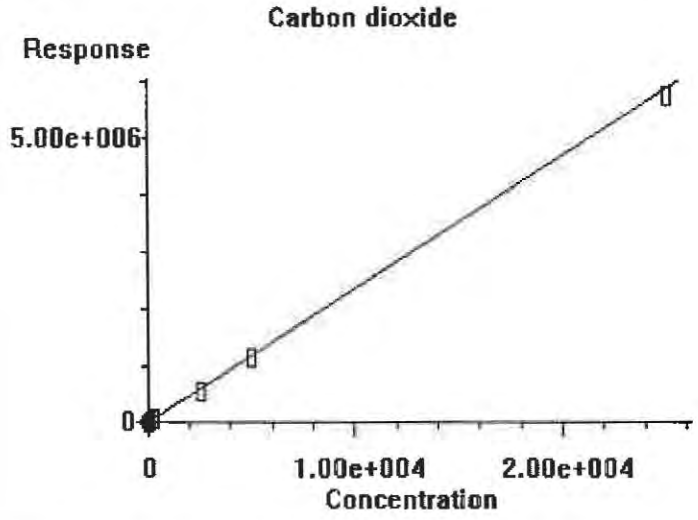
Search by: Ret Time | Name | Index — Find Compound

Compound Database
External Standard Compoun
- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	25.000000	6793.665186
2	100.000000	21932.418000
3	250.000000	58460.642510
4	2500.000000	568043.388750
5	5000.000000	1132363.215937
6	25000.000000	5744294.891563
7	25000.000000	
8	25000.000000	
9	2000.000000	
10	30000.000000	

Lvl ID	Concentration	Response



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.776	277465	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	6794	27.870	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

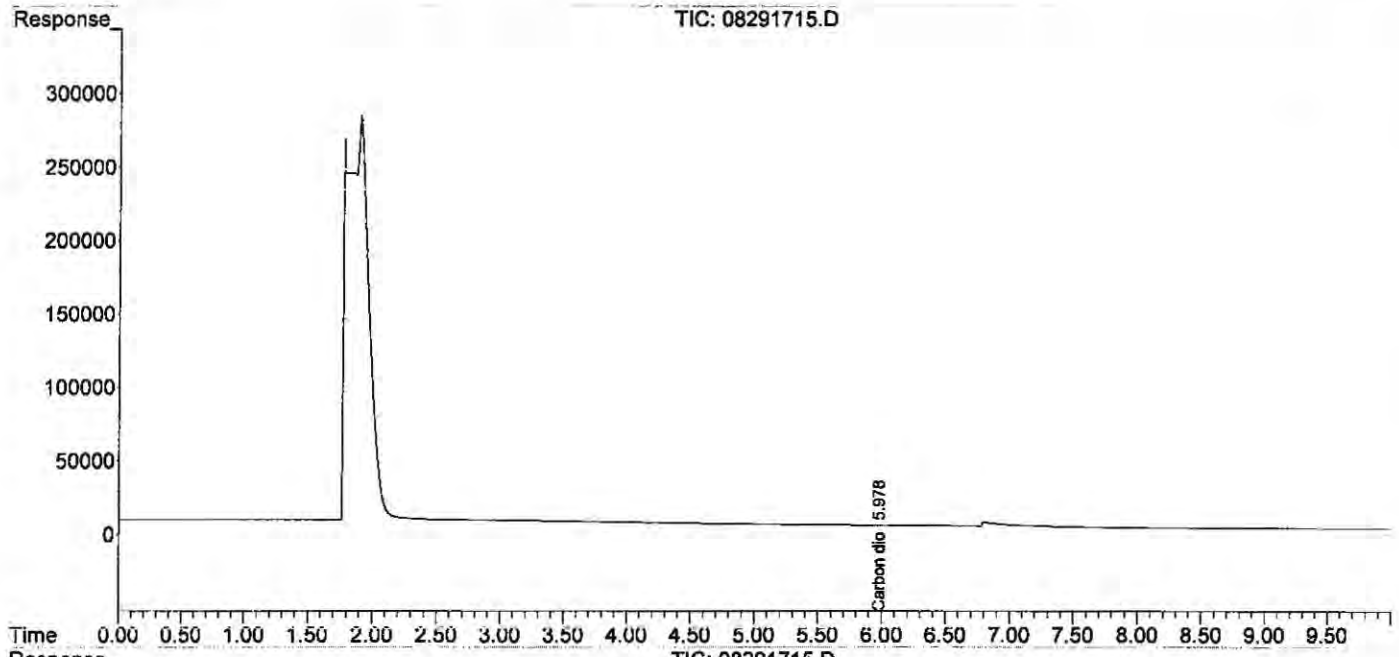
(f)=RT Delta > 1/2 Window (m)=manual int.

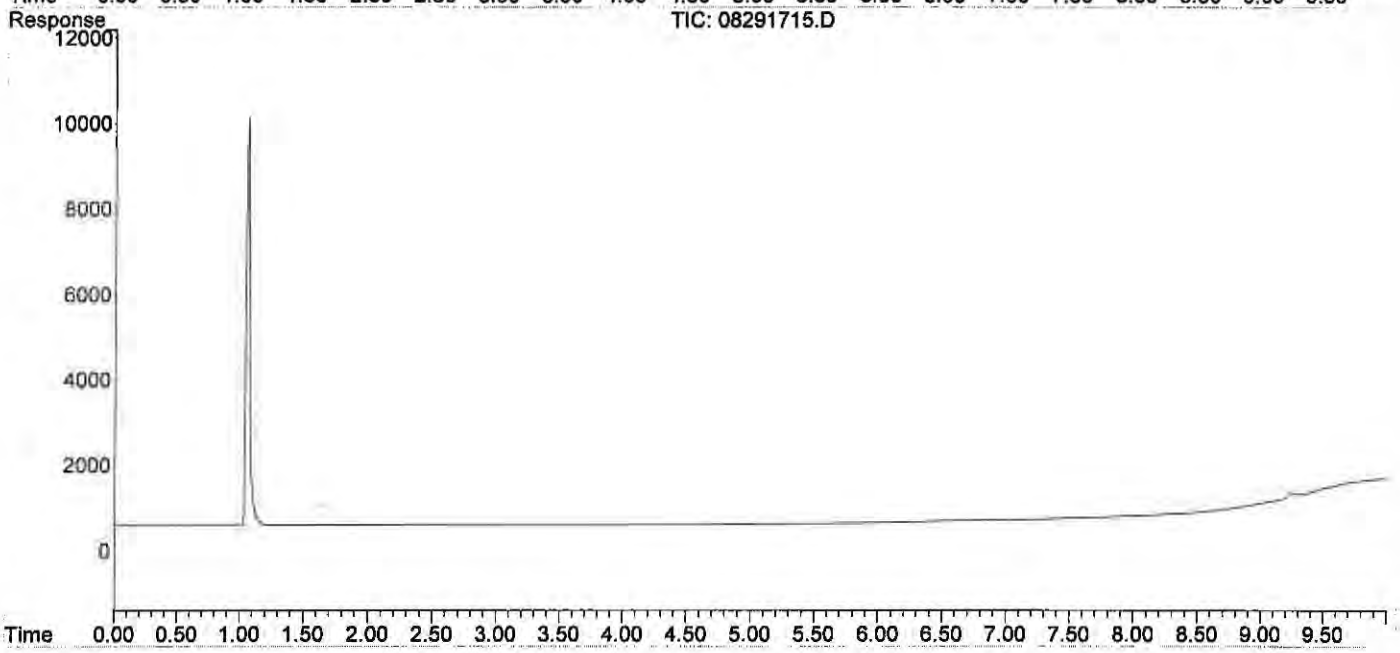
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



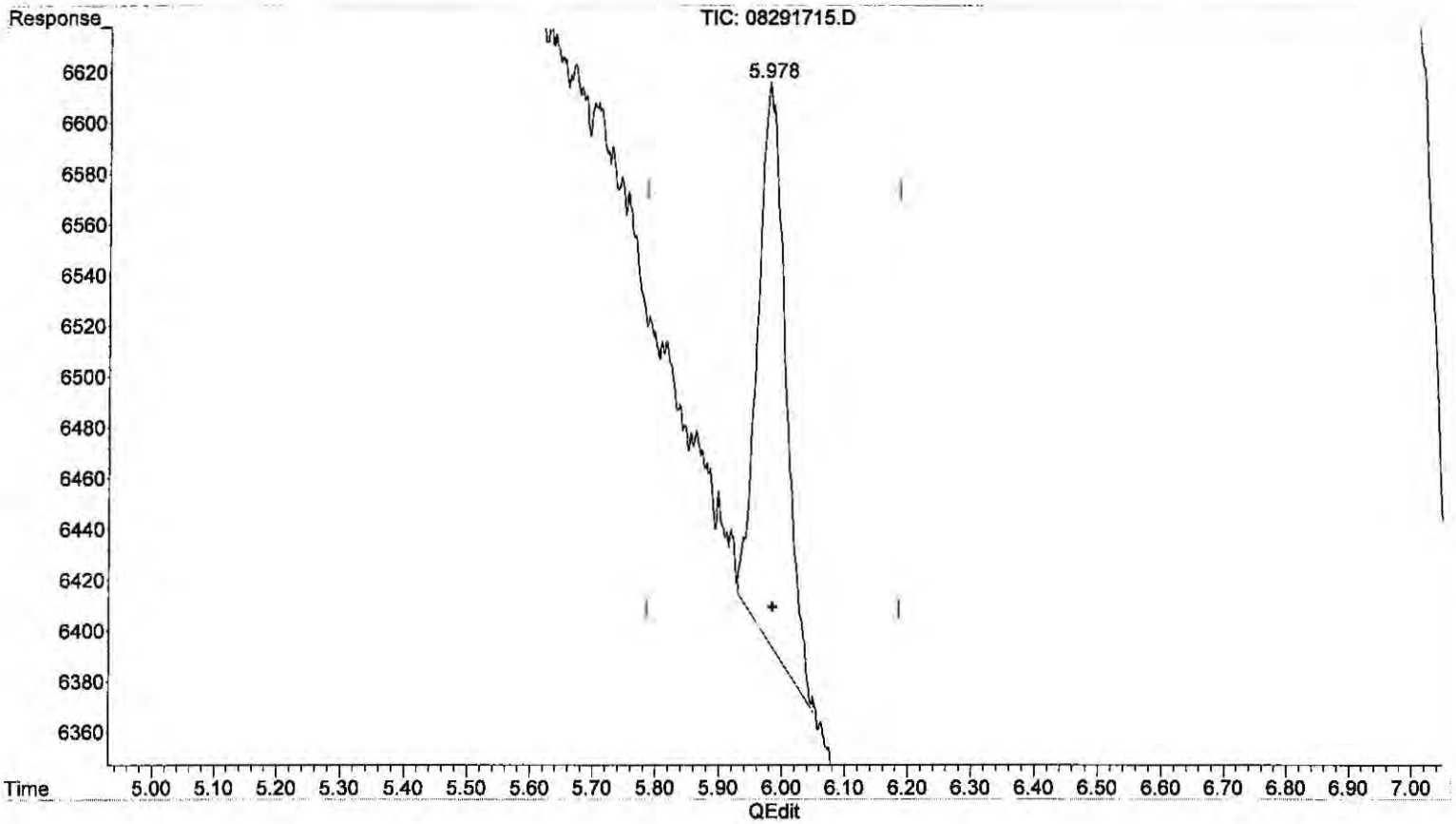


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.978min 27.870 ppm m

response 6794

(+) = Expected Retention Time

RS082817_CO2.M Wed Aug 30 13:17:47 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.790	-598962	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	21932	87.858	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

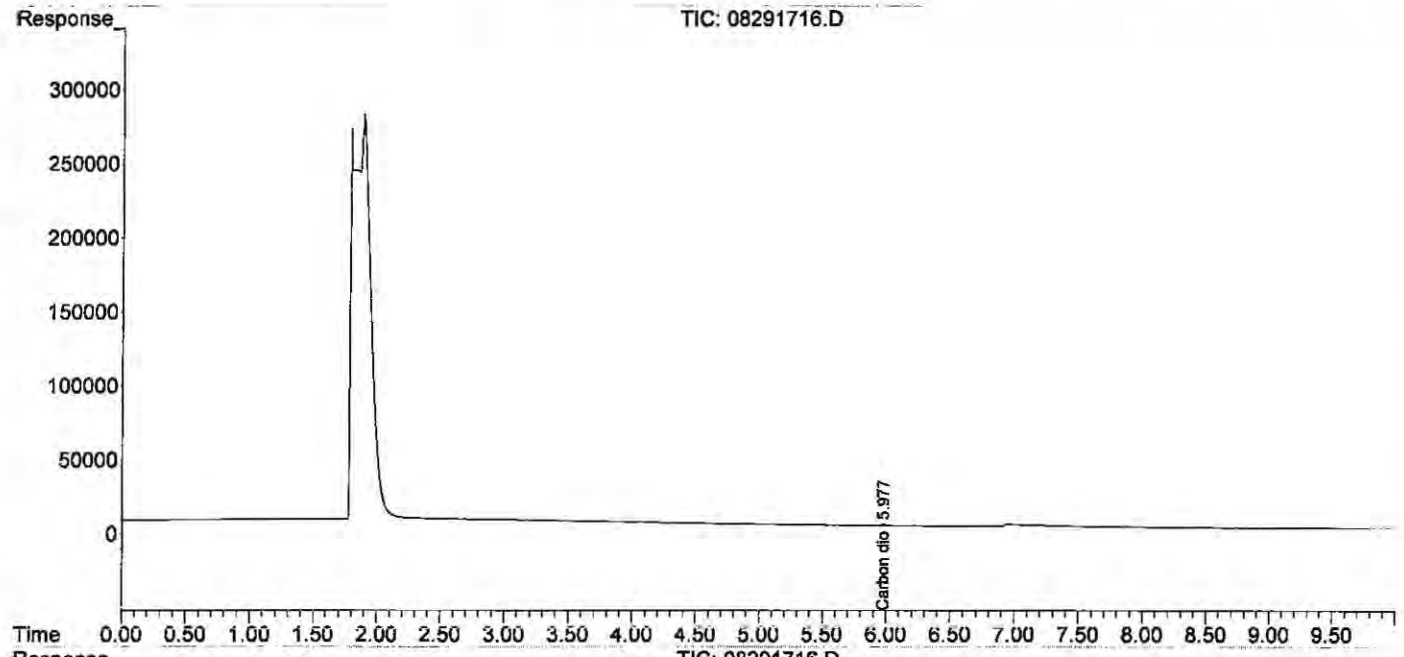
(f)=RT Delta > 1/2 Window (m)=manual int.

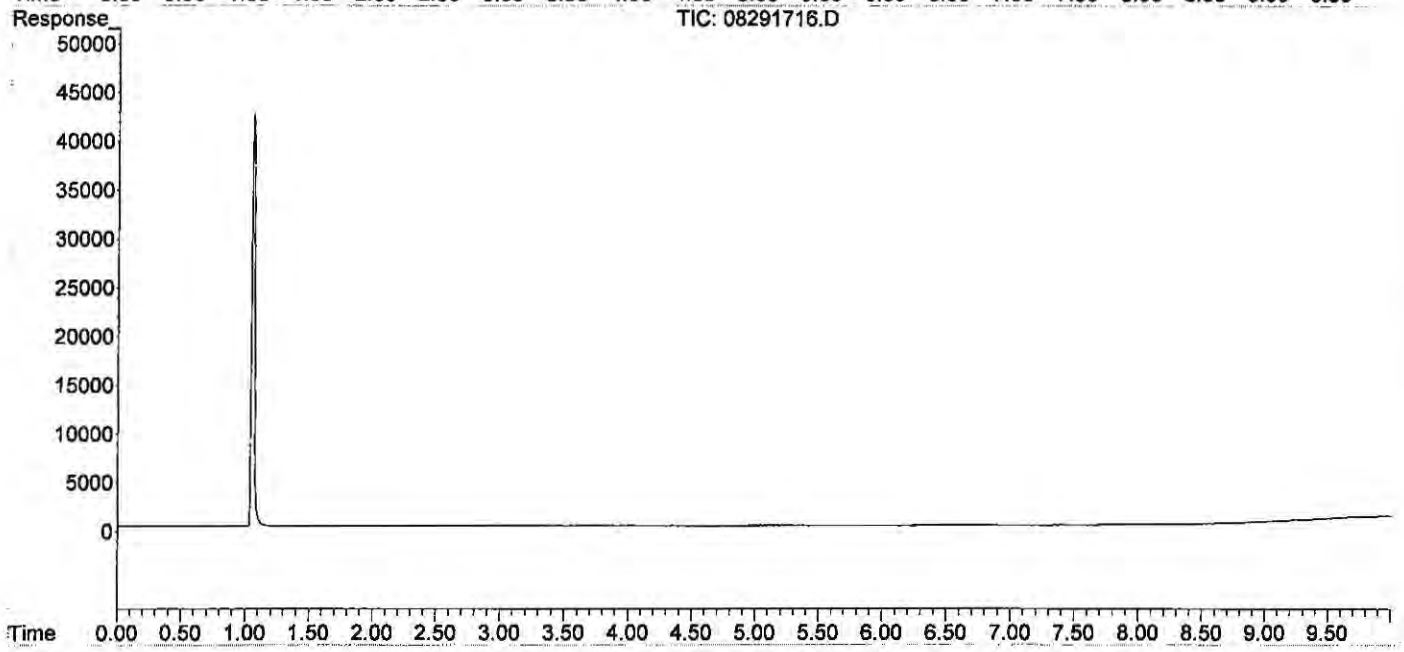
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

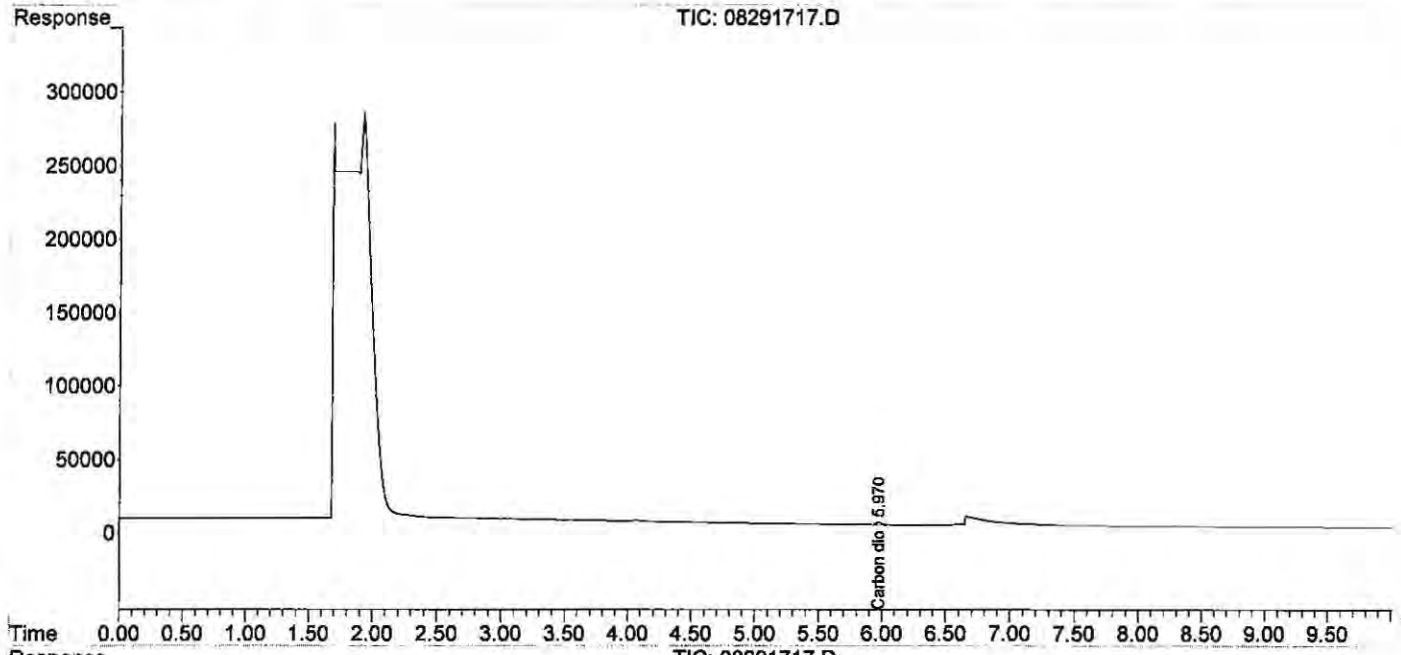
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.920f	-30716454	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.970	58461	240.204	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

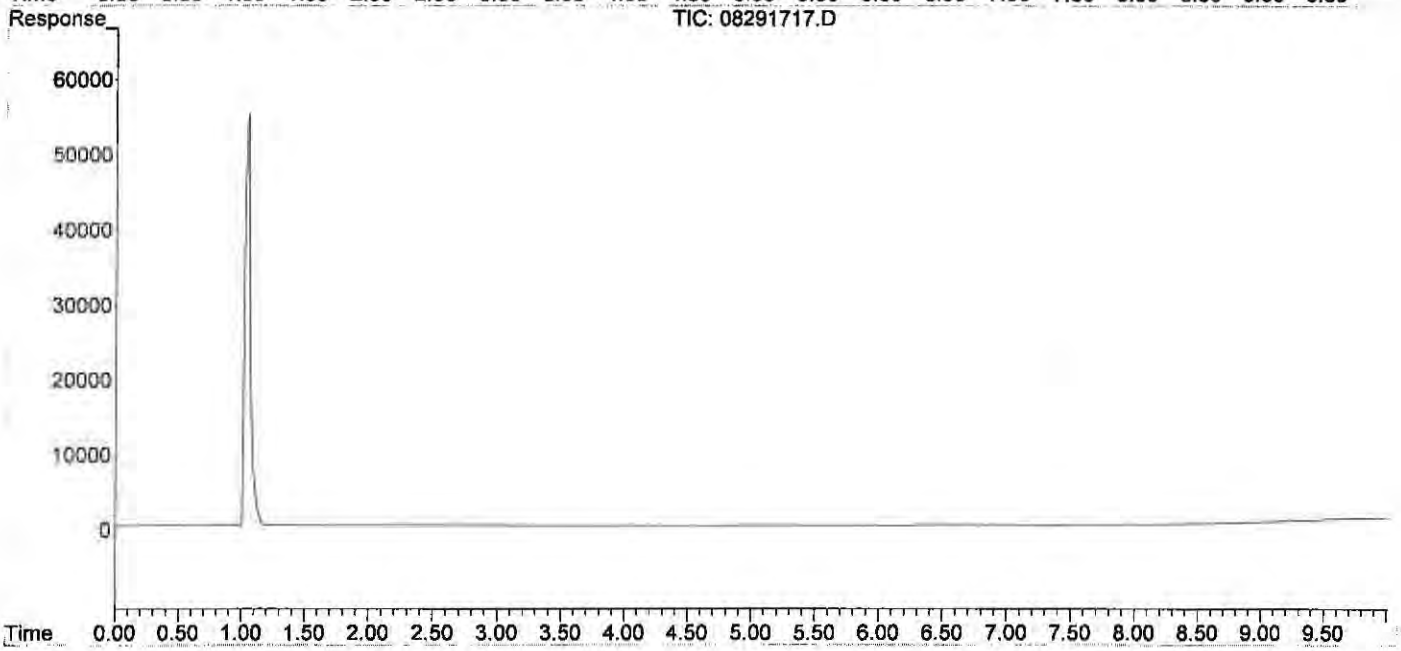
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



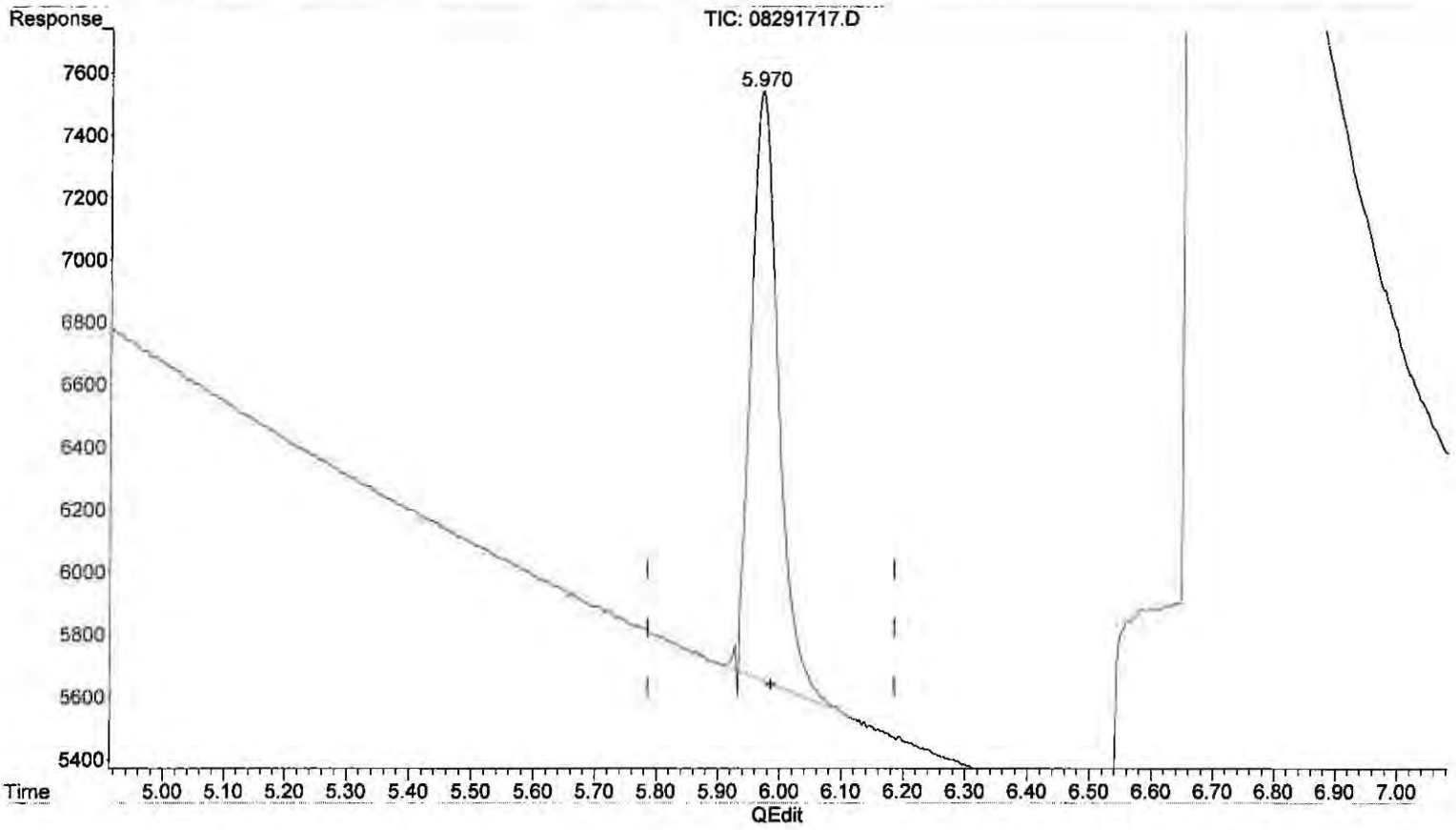


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
5.970min 240.204 ppm m
response 58461

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

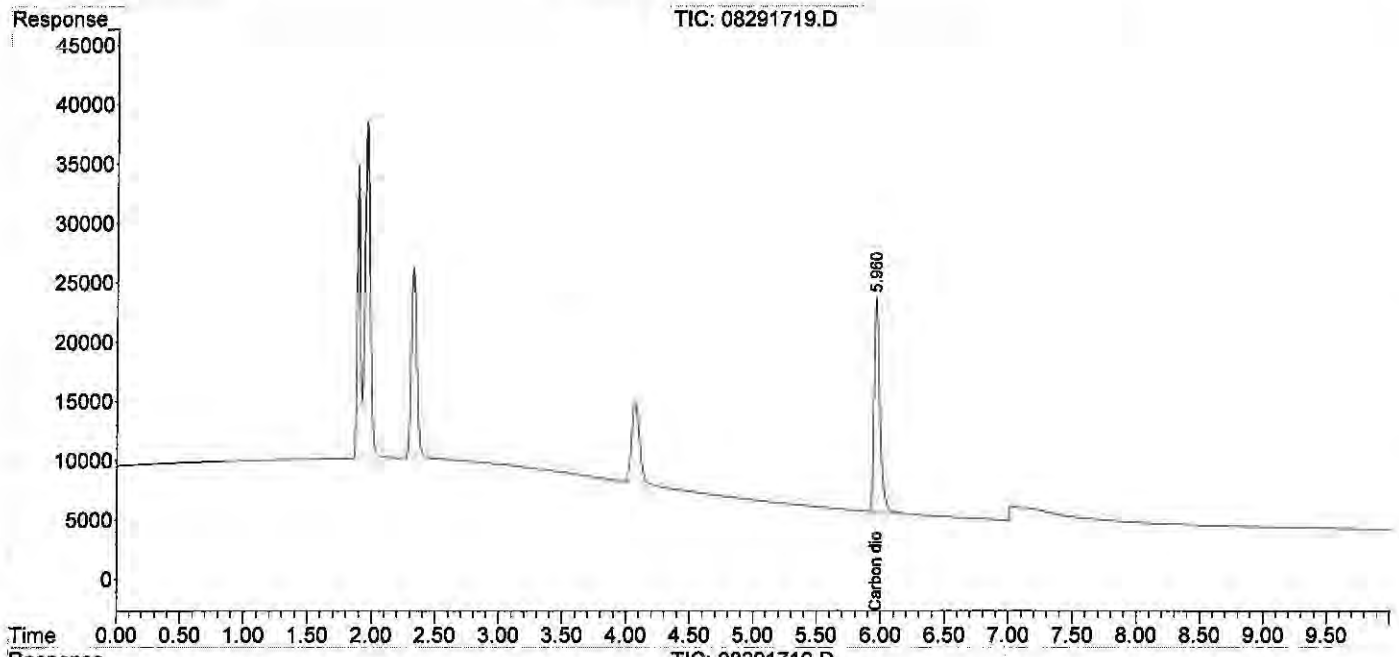
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.891	425113	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.962	568043	2369.673	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

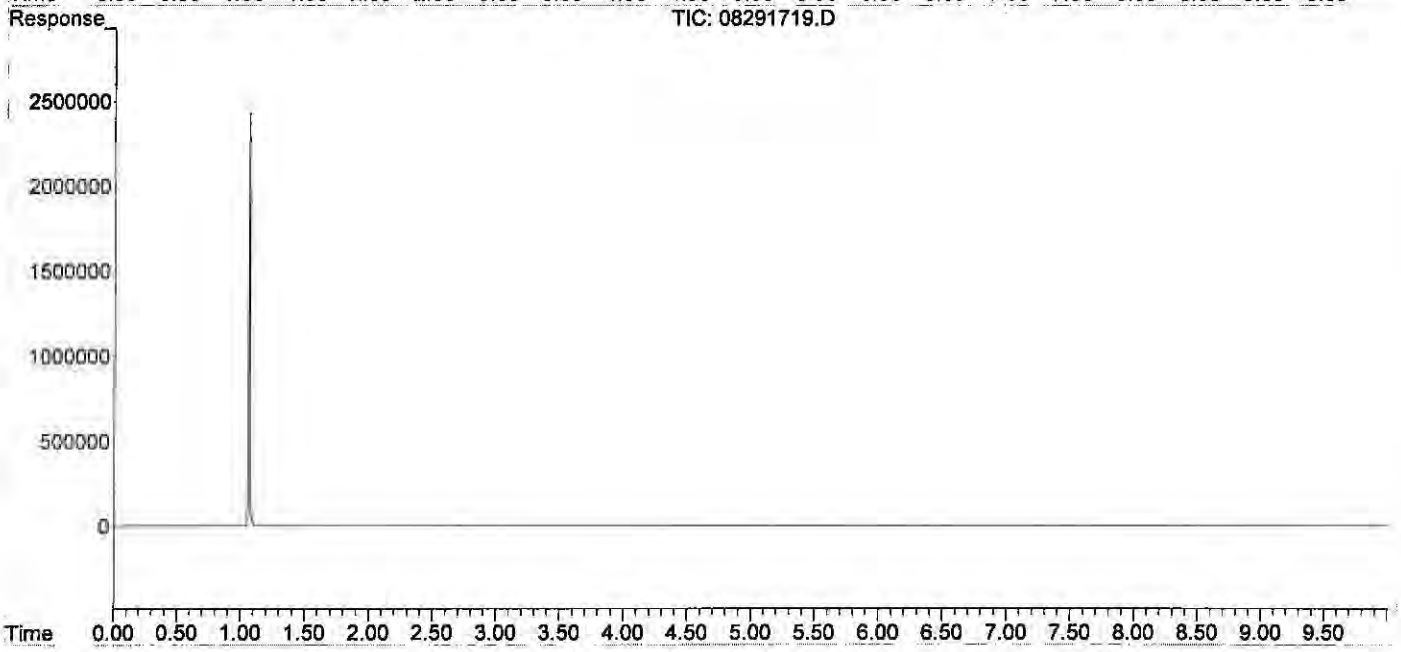
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

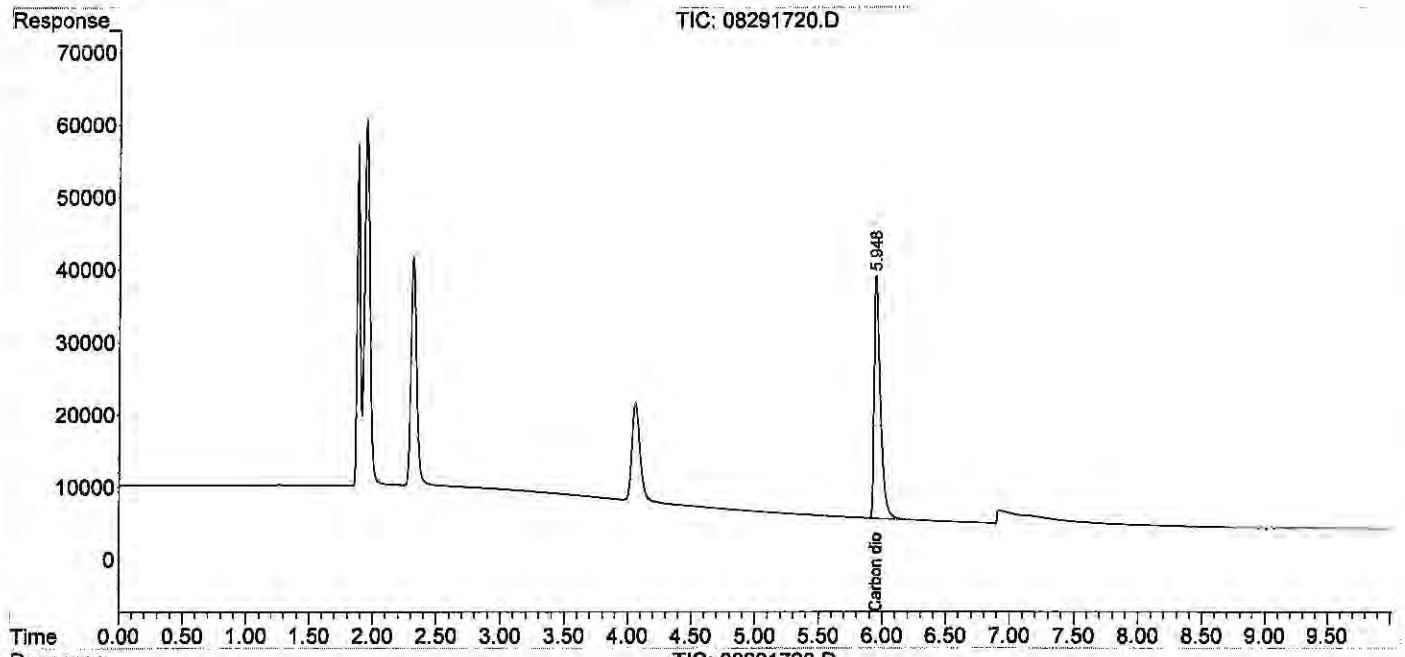
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.880	819221	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.948	1132363	4753.126	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

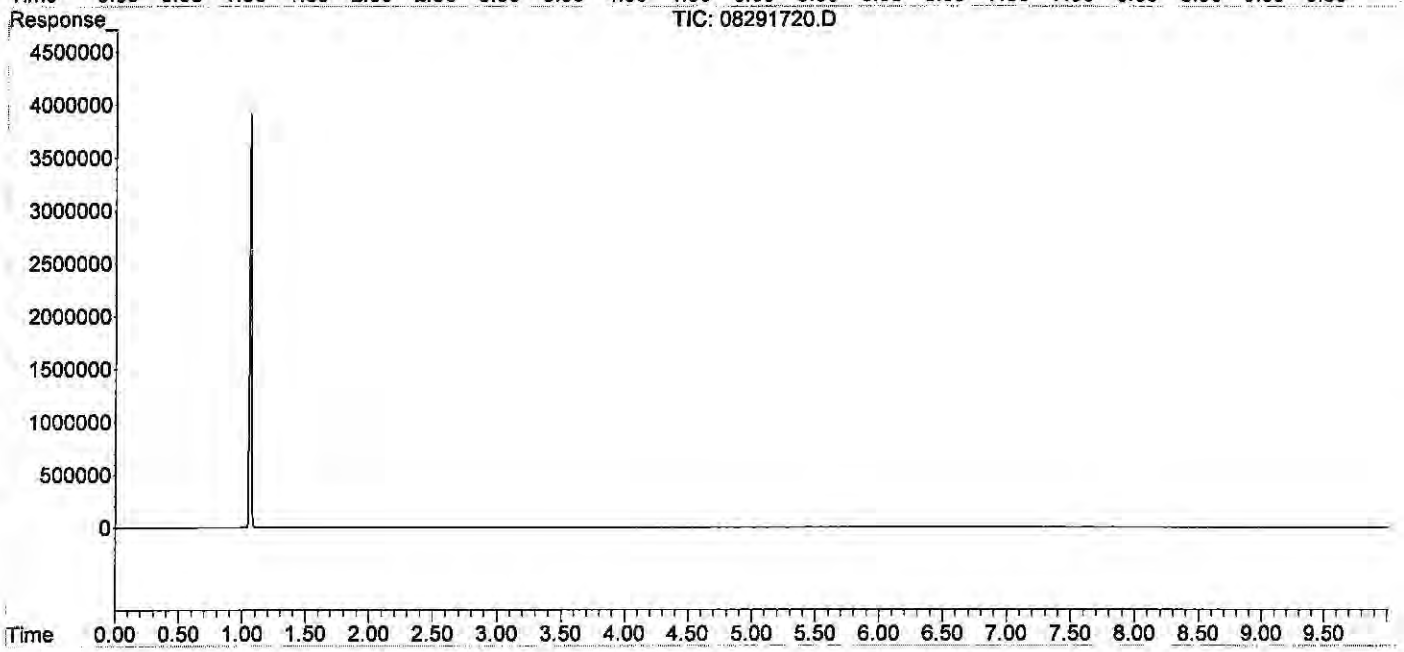
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

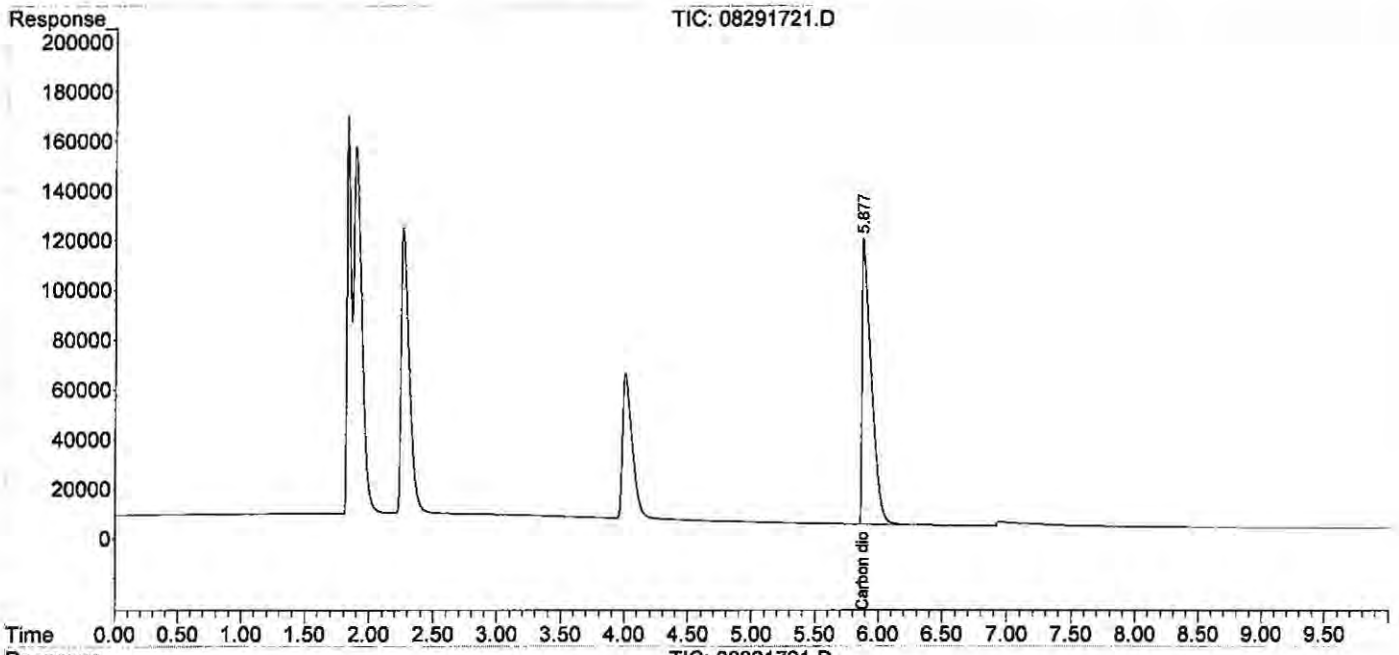
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.827	3325463	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.879f	5744295	24443.288	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

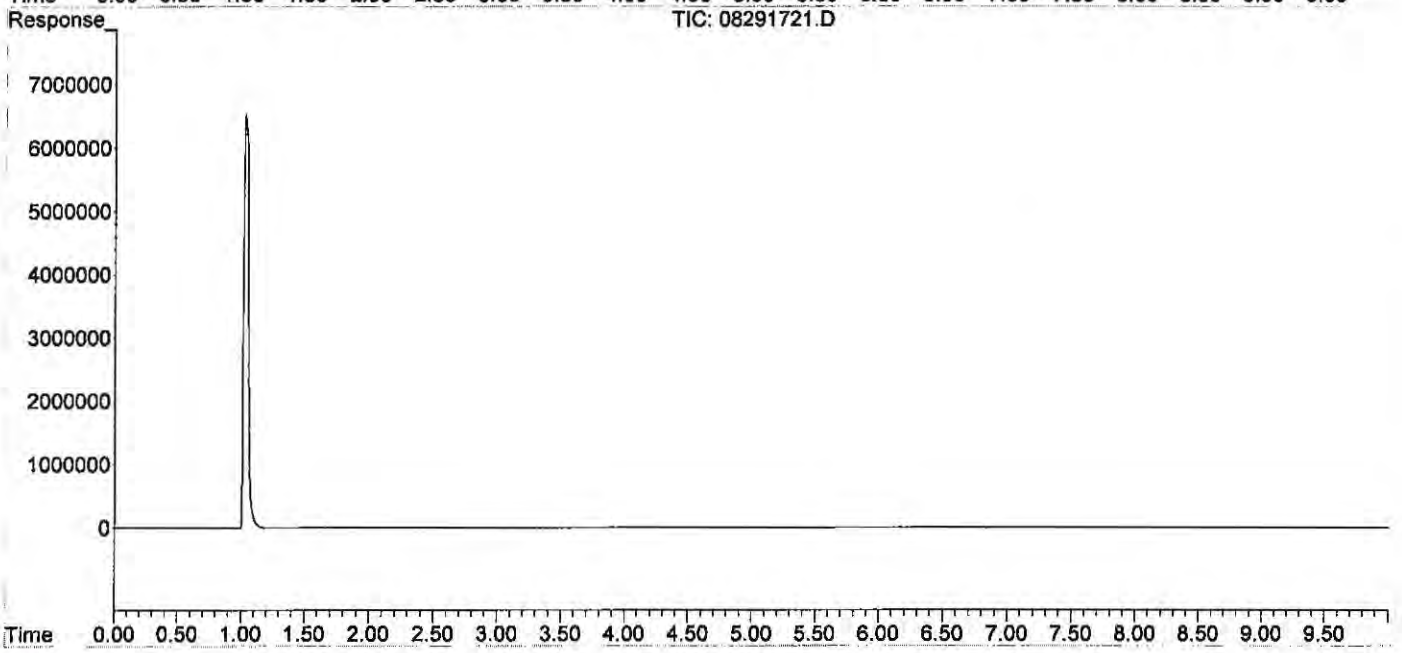
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.886	536422	0.113	ppm	Actual %D
2)	Carbon monoxide	1.886	536422	N.D.	ppm	
3)	Methane (TCD)	4.059f	626500	66244.710	ppm	
4)	Carbon dioxide	5.947	1163775	4957.948	ppm	5000 99.16
6)	Methane (FID)	1.062	37290742	3947.023	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

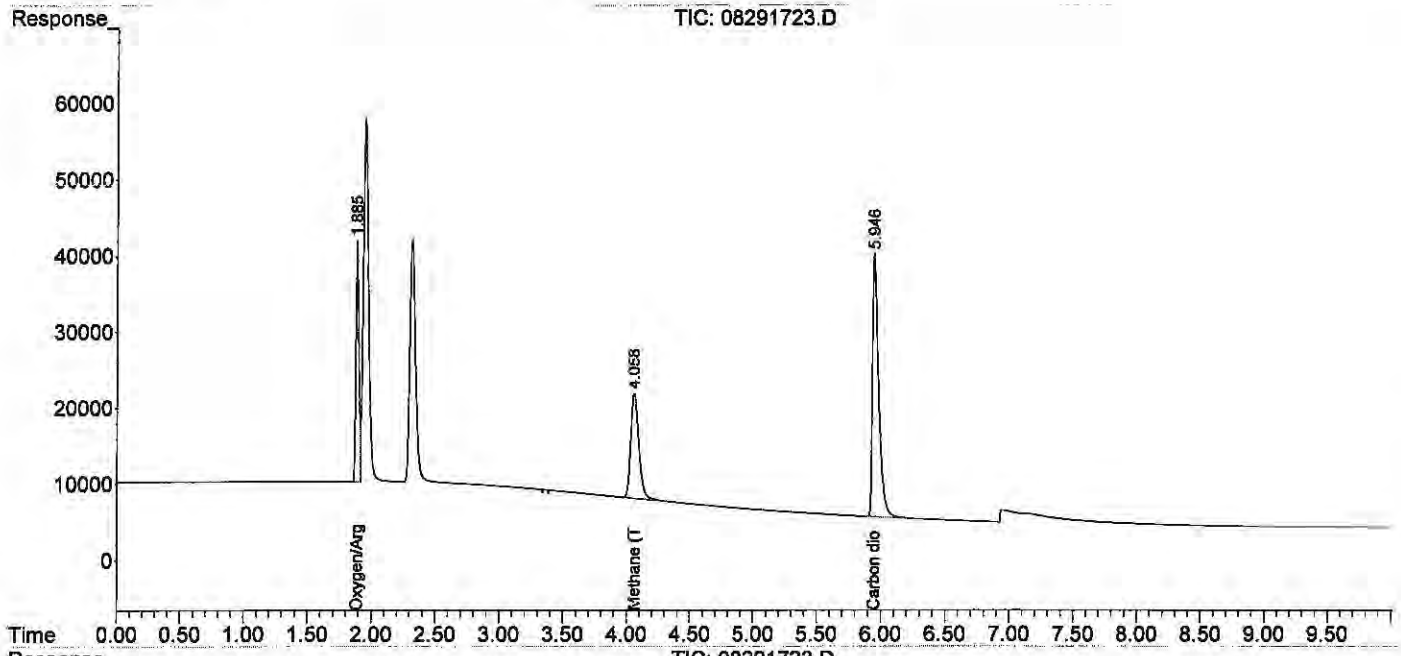
(f)=RT Delta > 1/2 Window (m)=manual int.

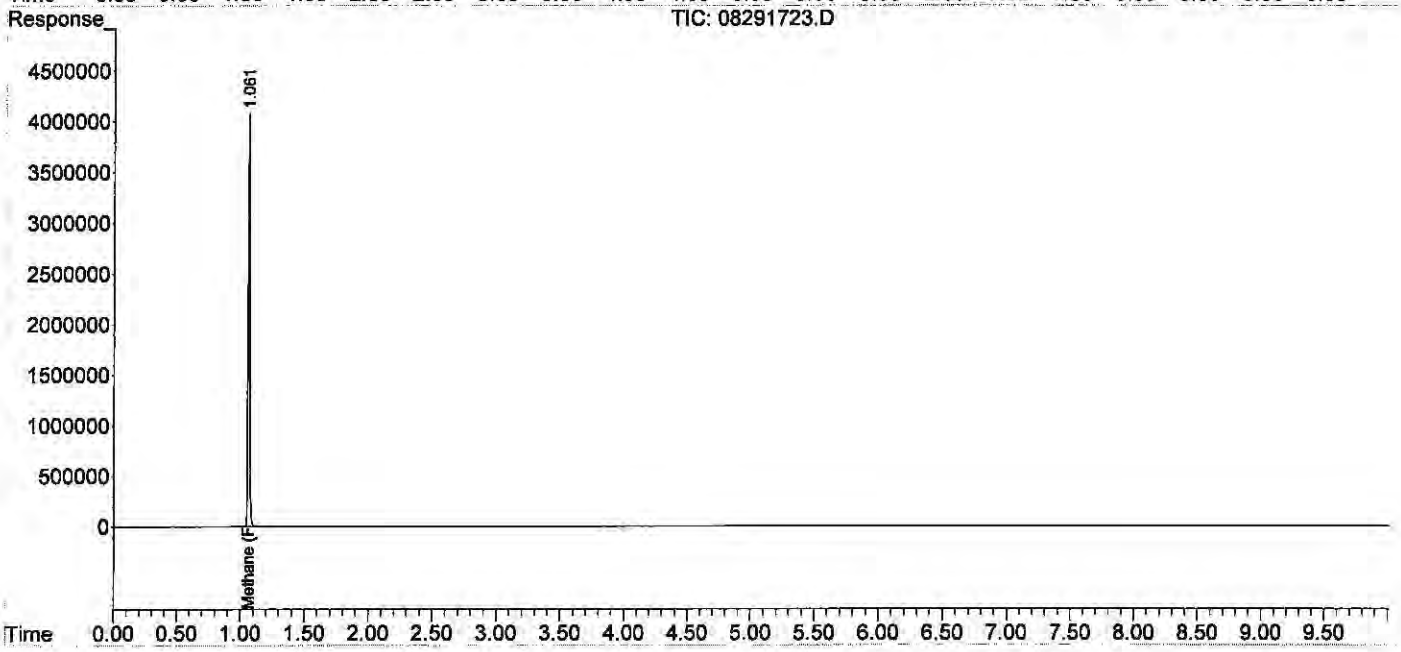
W 9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group | Analyst : MR | Instrument : GC#10
Service Request: P1806800 | Date Analysis : 12/17/18 | Detector : FID#10, TCD#10
Sample Vol. (ml) : 32.00 ml | Head Space Vol.(ml) : 8.00 ml | Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Carbon Dioxide
std s32-11091801	0.100	5082.662
ACTUAL		5000.00
%Difference		1.7%
mcs 0.1ml	0.100	0.000
rb 0.1ml	0.100	0.000
tcd lcs s32-10081801	0.100	850.998
tcd lcsd s32-10081801	0.100	840.064
P1806800-001 50ul	0.050	16544.15
P1806800-002 50ul	0.050	15066.95
P1806800-003 50ul	0.050	7498.023
P1806800-004 50ul	0.050	18479.64
P1806800-005 50ul	0.050	10439.27

FINAL HEAD SPACE RESULT (ppm)

	Carbon Dioxide
WWt.	44.10
HENRY'S CONSTANT	1.42E+03
RL	100.00
mcs 0.1ml	0.000
tcd lcs s32-10081801	8509.980
tcd lcsd s32-10081801	8400.640
P1806800-001 50ul	330883.08
P1806800-002 50ul	301339.02
P1806800-003 50ul	149960.46
P1806800-004 50ul	369592.72
P1806800-005 50ul	208785.42

std s32-11091801	4986.008
ACTUAL	5000.00
%Difference	0.3%

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 11:51:06
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:25:49 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.980f	573139	0.120	ppm	
2)	Carbon monoxide	1.980f	573139	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.078	1193049	5082.662	ppm	m
6)	Methane (FID)	1.113	33953511	3593.795	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

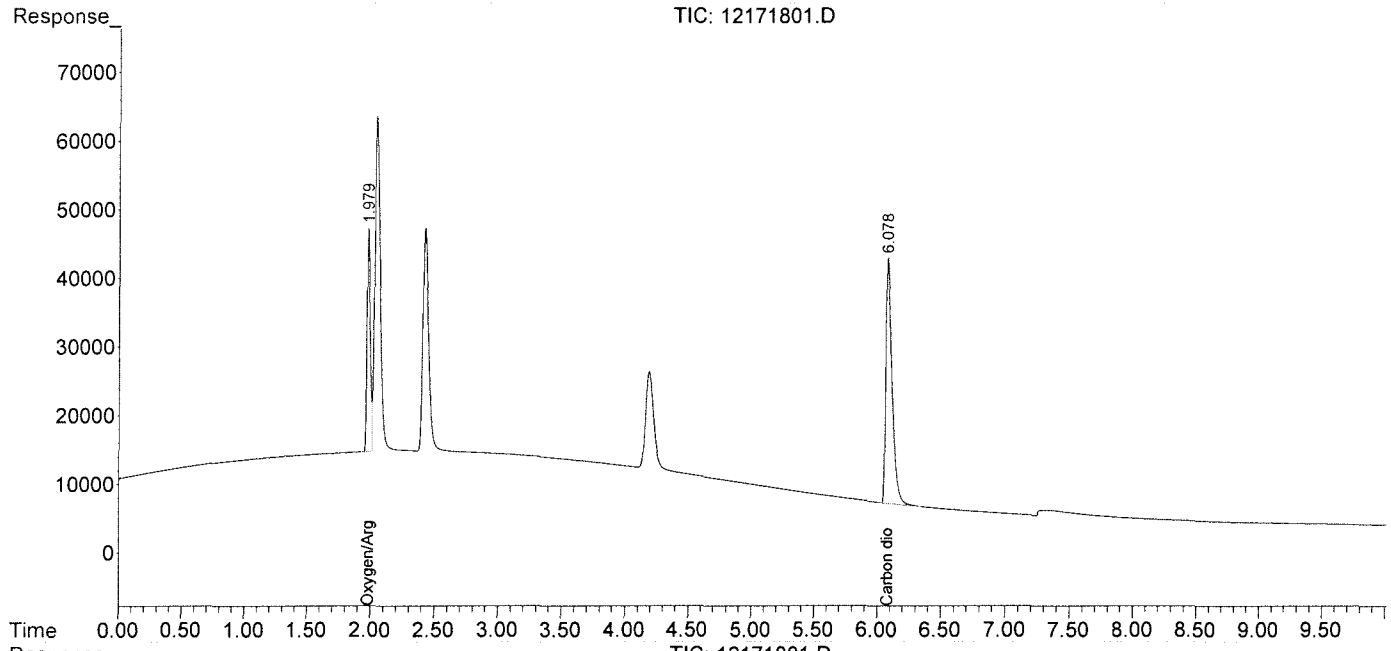
(f)=RT Delta > 1/2 Window (m)=manual int.

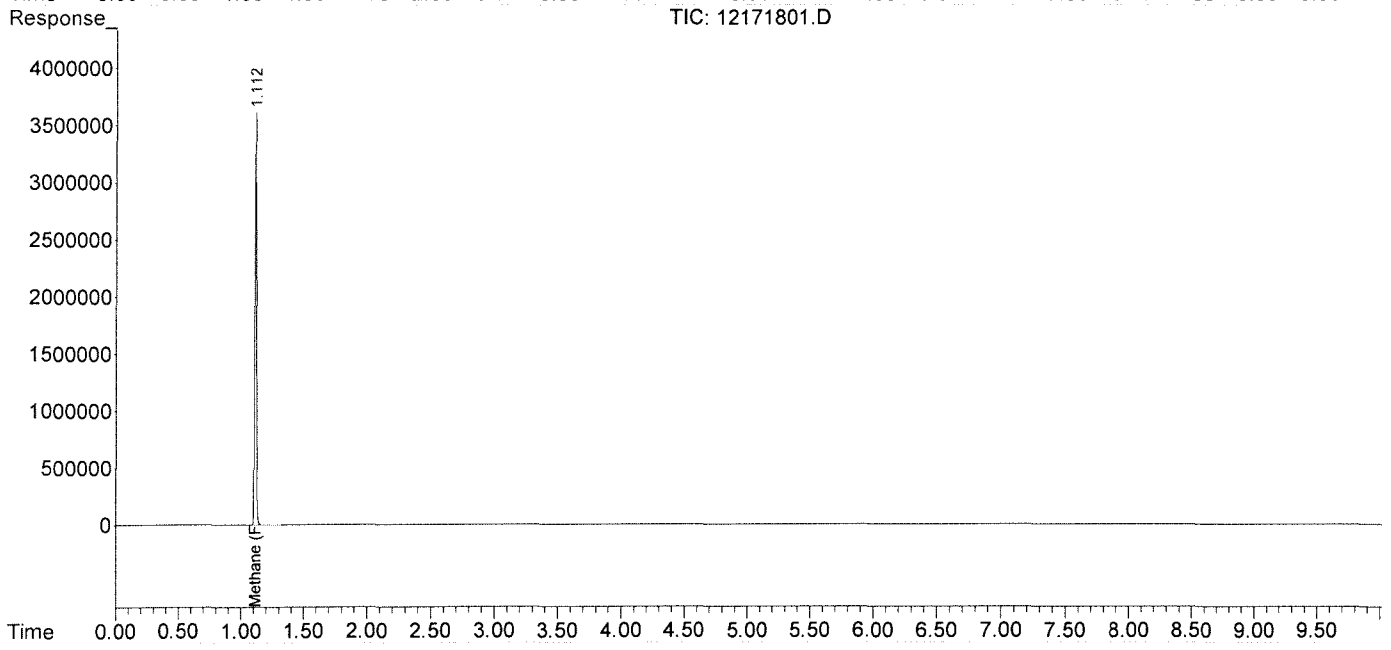
MR 12/18/18

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 11:51:06
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:25:49 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

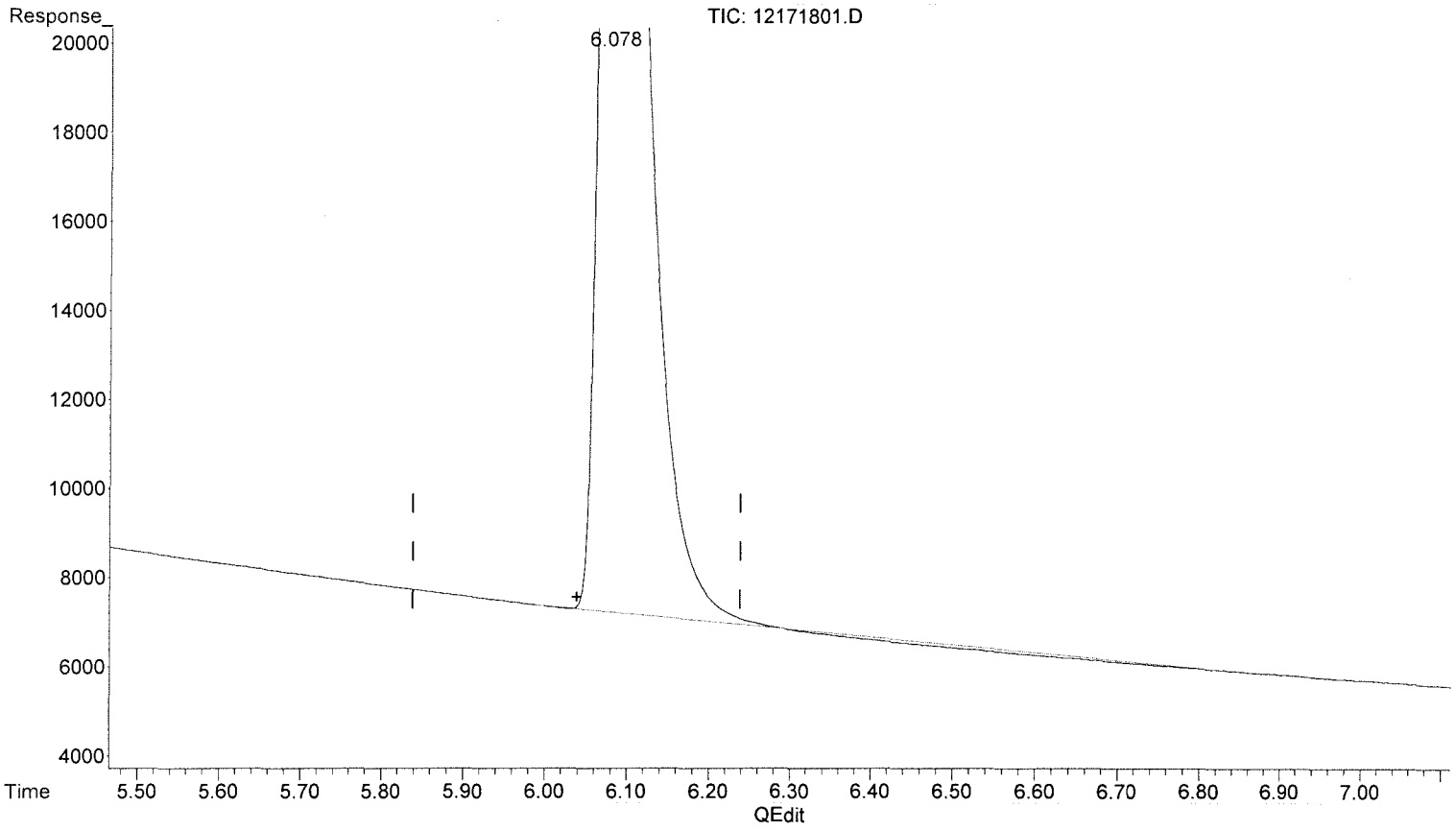




Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 11:51:06
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:25:49 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.079min 4992.840 ppm

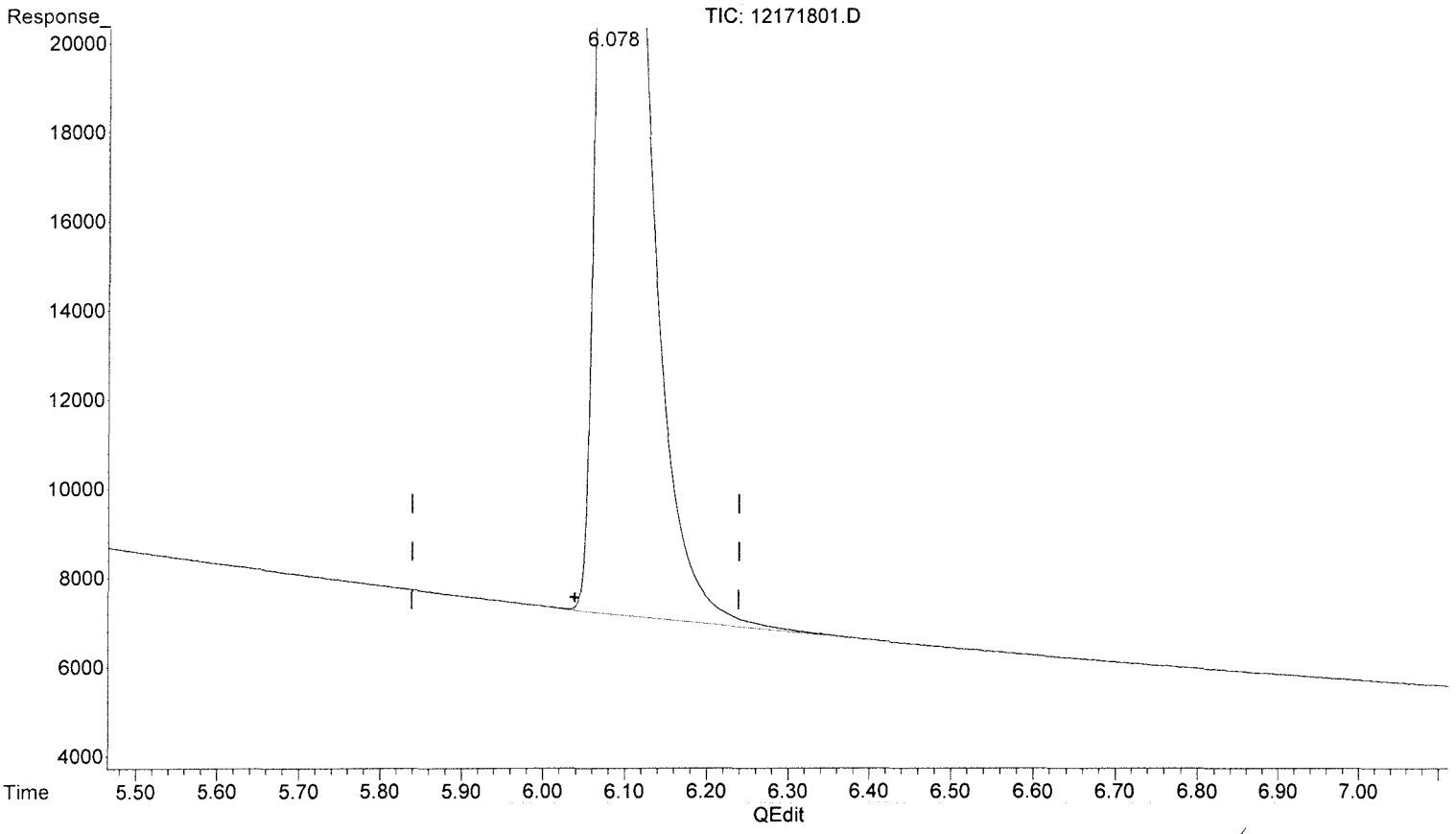
response 1171965

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 11:51:06
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:25:49 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.078min 5082.662 ppm m

response 1193049

ME 12/18/18
DLC

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171818.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 17:01:06
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 17:09:29 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

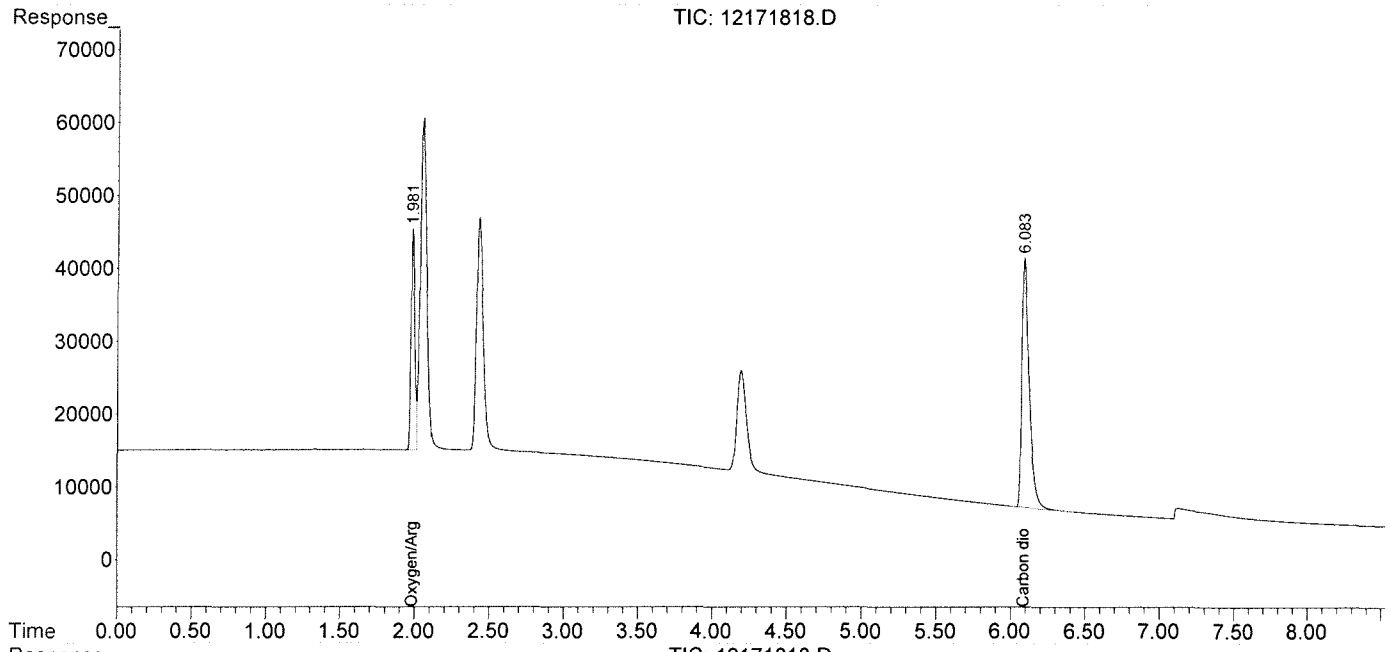
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.982f	539329	0.113	ppm
2)	Carbon monoxide	1.982f	539329	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	6.084	1170362	4986.008	ppm
6)	Methane (FID)	1.114	33579214	3554.178	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

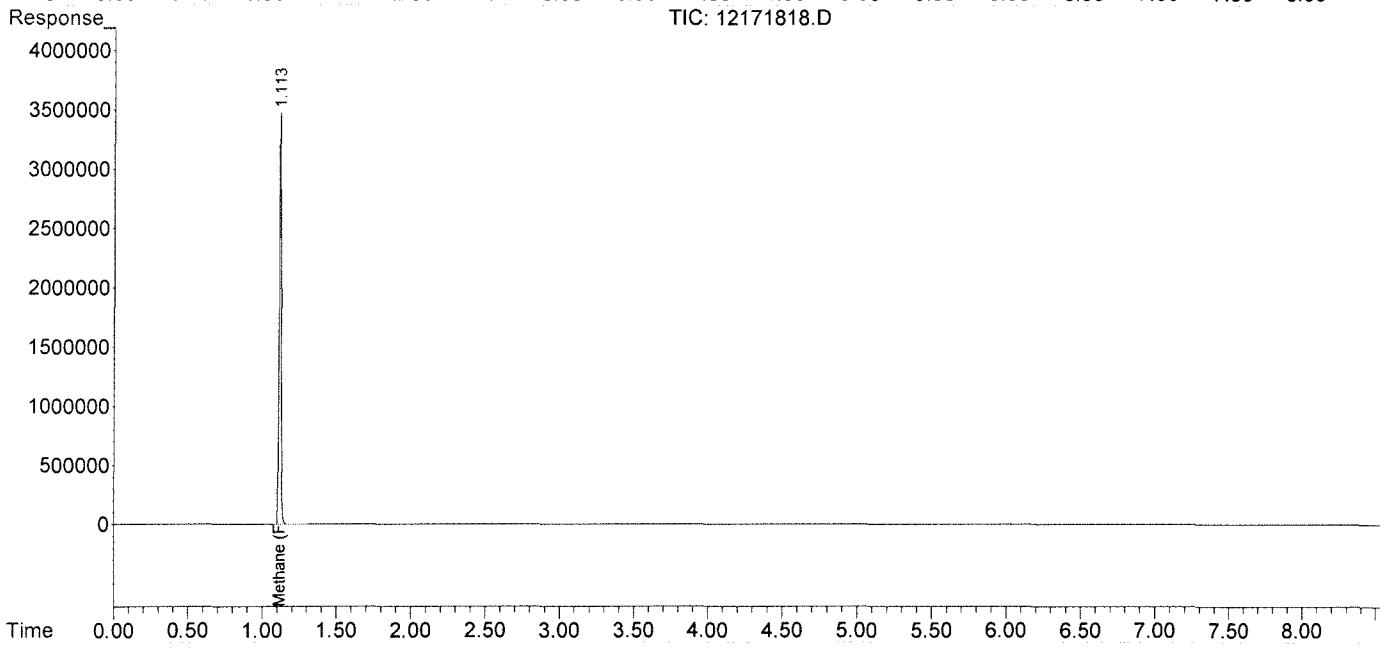
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\17TCD\
Data File : 12171818.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 17-Dec-2018, 17:01:06
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 17 17:09:29 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mls inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	lcv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2018_12\17\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	17-Dec-18, 11:51:06	12171801.D	std s32-11091801		MR	RSKBOTH.M	pass
2	17-Dec-18, 12:08:01	12171802.D	rb 0.1ml		MR	RSKBOTH.M	pass
3	17-Dec-18, 12:47:59	12171803.D	mcs 0.1ml		MR	RSKBOTH.M	pass
4	17-Dec-18, 13:10:41	12171804.D	XXtcd lcs		MR	RSKBOTH.M	
5	17-Dec-18, 13:34:51	12171805.D	XXtcd lcs		MR	RSKBOTH.M	
6	17-Dec-18, 13:50:20	12171806.D	XXtcd lcsd		MR	RSKBOTH.M	
7	17-Dec-18, 14:00:32	12171807.D	XXP1806800-001 0.1		MR	RSKBOTH.M	
8	17-Dec-18, 14:20:13	12171808.D	XXP1806800-002 0.1		MR	RSKBOTH.M	
9	17-Dec-18, 14:36:49	12171809.D	P1806800-001 50ul		MR	RSKBOTH.M	
10	17-Dec-18, 14:50:03	12171810.D	P1806800-002 50ul		MR	RSKBOTH.M	
11	17-Dec-18, 15:08:33	12171811.D	P1806800-003 50ul		MR	RSKBOTH.M	
12	17-Dec-18, 15:21:55	12171812.D	P1806800-004 50ul		MR	RSKBOTH.M	
13	17-Dec-18, 15:40:17	12171813.D	P1806800-005 50ul		MR	RSKBOTH.M	
14	17-Dec-18, 15:53:35	12171814.D	P1806638-001 50ul		MR	RSKBOTH.M	
15	17-Dec-18, 16:06:48	12171815.D	P1806638-002 50ul		MR	RSKBOTH.M	
16	17-Dec-18, 16:35:26	12171816.D	tcd lcs s32-10081801		MR	RSKBOTH.M	pass
17	17-Dec-18, 16:46:42	12171817.D	tcd lcsd s32-10081801		MR	RSKBOTH.M	pass
18	17-Dec-18, 17:01:06	12171818.D	std s32-11091801		MR	RSKBOTH.M	pass

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181815.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 14:35:03
Operator : MR
Sample : P1806800-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 14:46:52 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

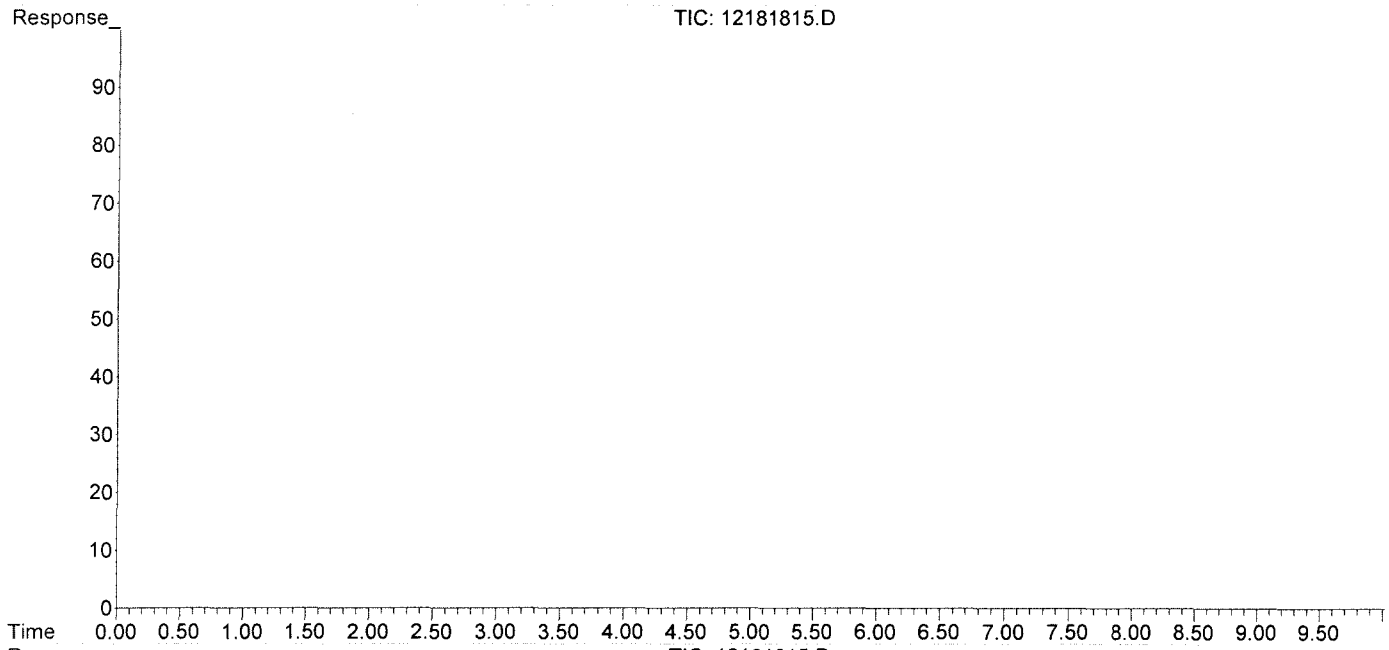
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.114	2098656	231.368	ppm
7)	Ethylene	1.672	4803	0.287	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.642f	14814	0.557	ppm
13)	n-Butane	6.642f	14814	0.557	ppm

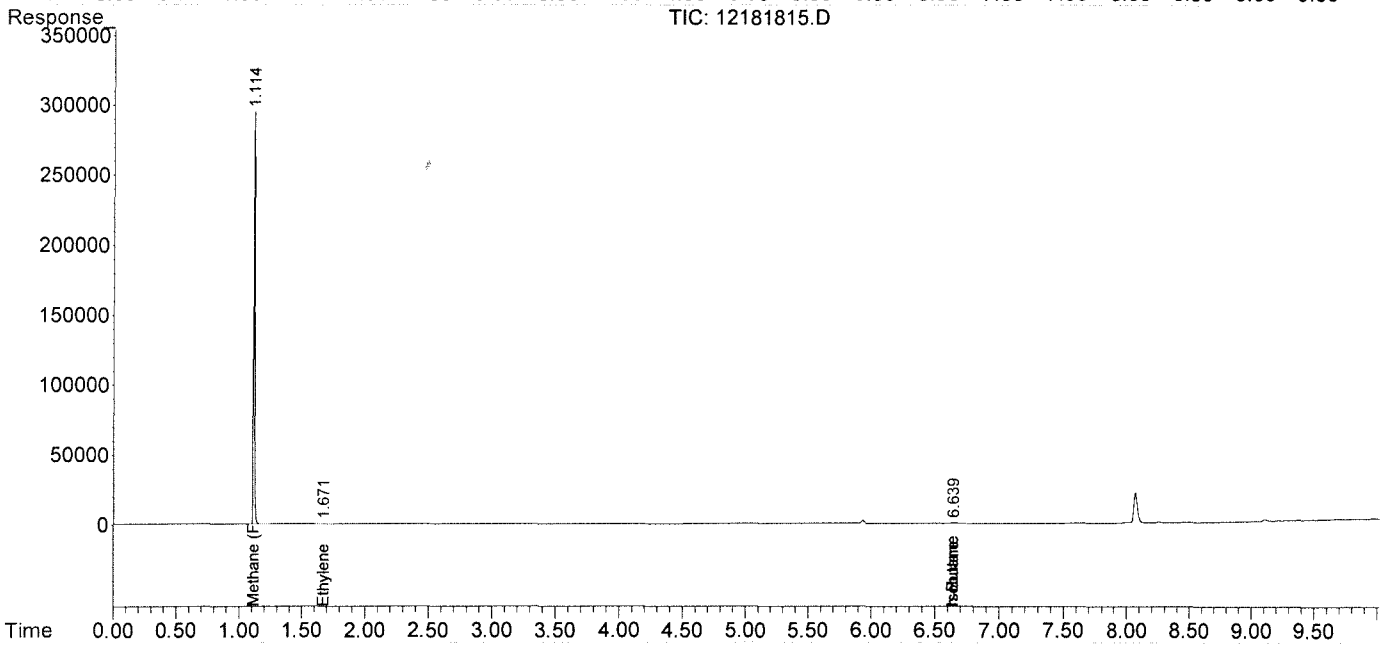
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181815.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 14:35:03
Operator : MR
Sample : P1806800-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 14:46:52 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181816.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 14:48:12
Operator : MR
Sample : P1806800-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:13:14 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

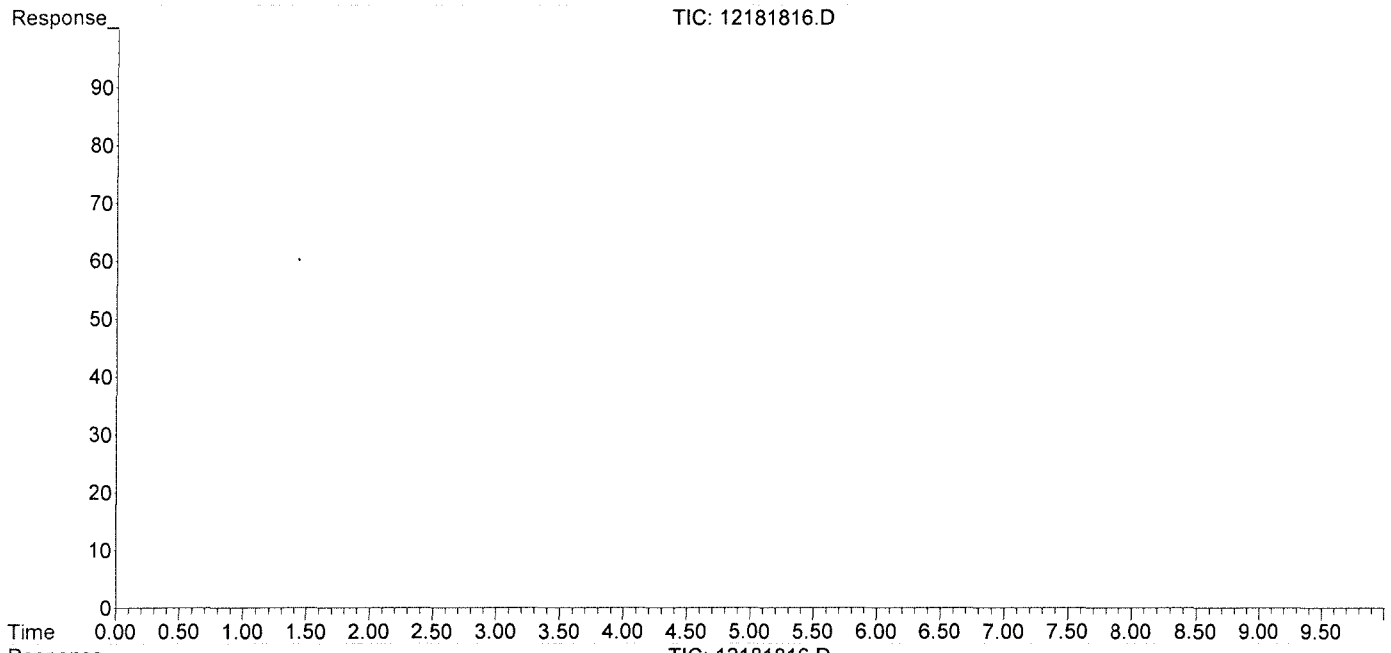
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.093	325683	35.905	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.704	14574	0.548	ppm
13)	n-Butane	6.704	14574	0.548	ppm

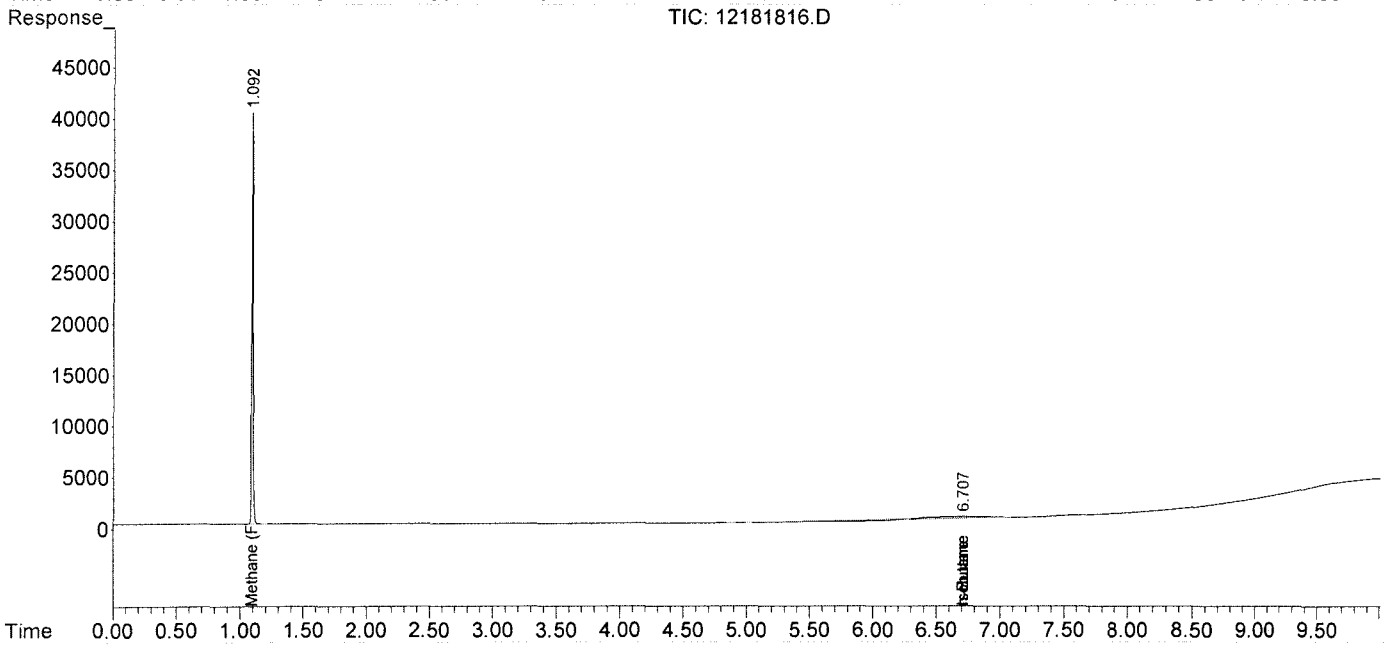
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181816.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 14:48:12
Operator : MR
Sample : P1806800-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:13:14 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181817.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:03:29
Operator : MR
Sample : P1806800-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:13:37 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

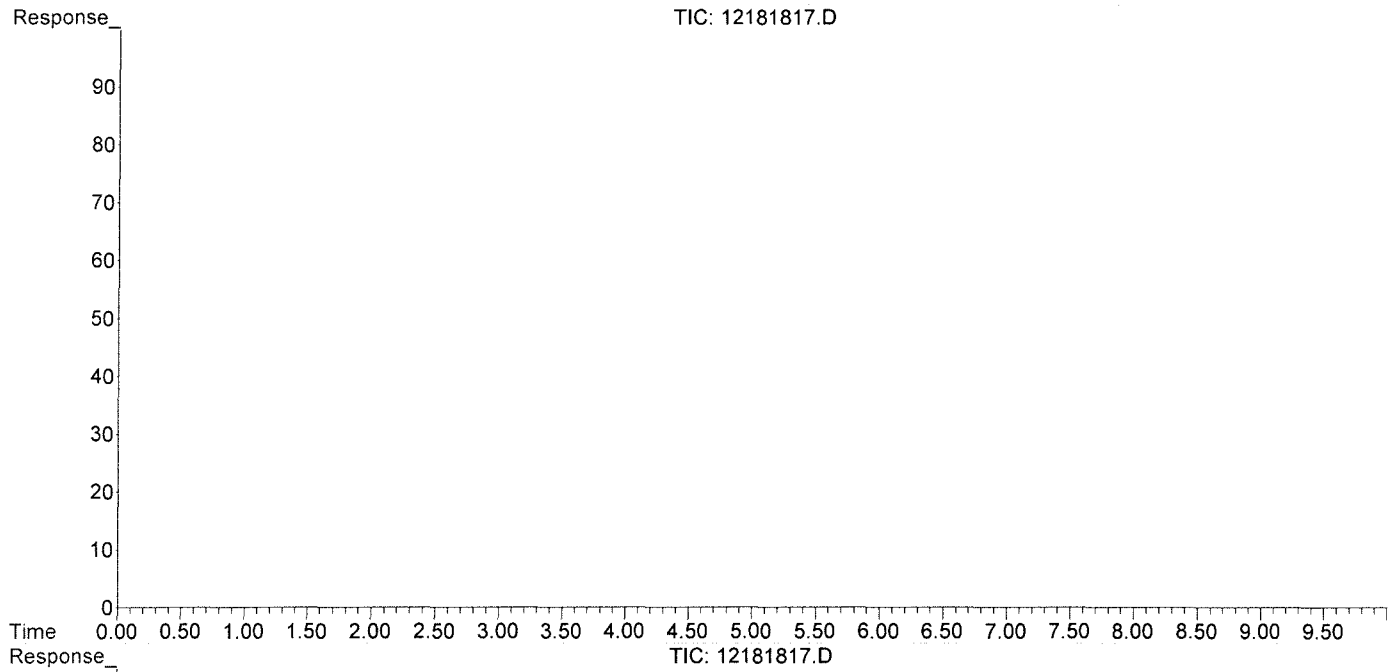
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.116	27317	3.012	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.690	1063	0.040	ppm
13)	n-Butane	6.690	1063	0.040	ppm

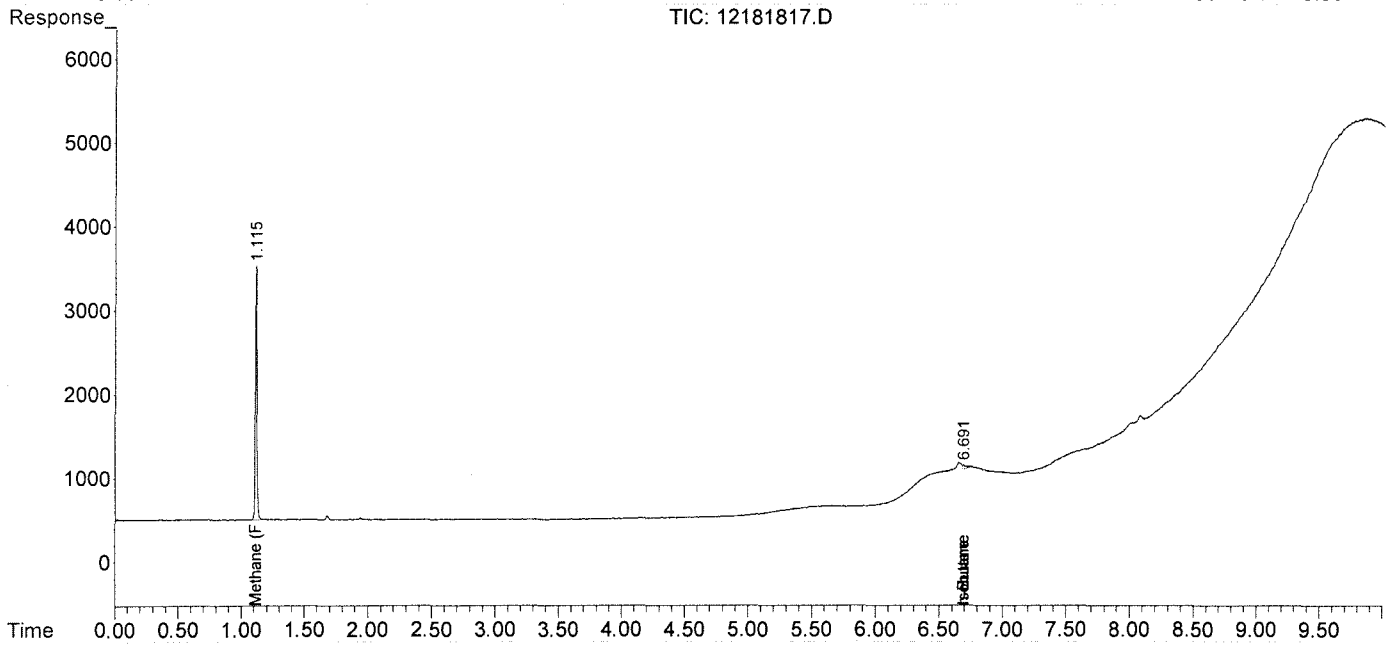
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181817.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:03:29
Operator : MR
Sample : P1806800-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:13:37 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181818.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:18:17
Operator : MR
Sample : P1806800-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:14:01 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

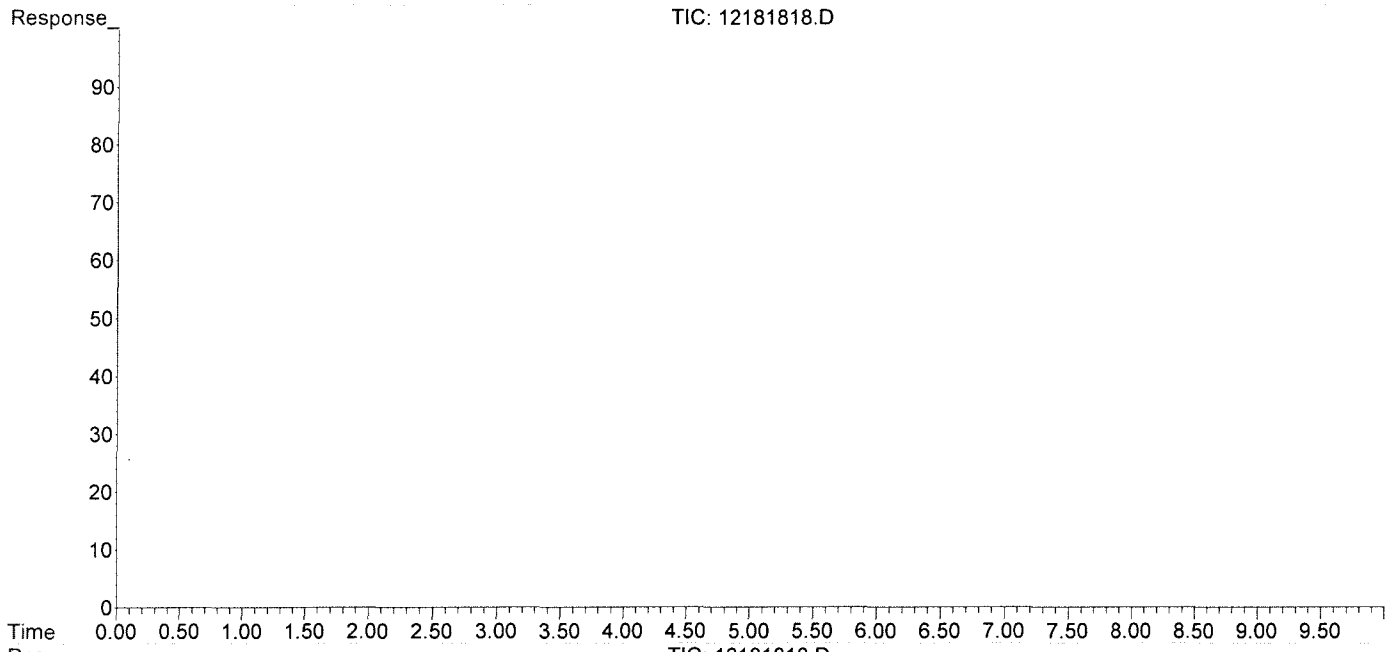
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.115	10482883	1155.694	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.741	75684	2.843	ppm
13)	n-Butane	6.741	75684	2.843	ppm

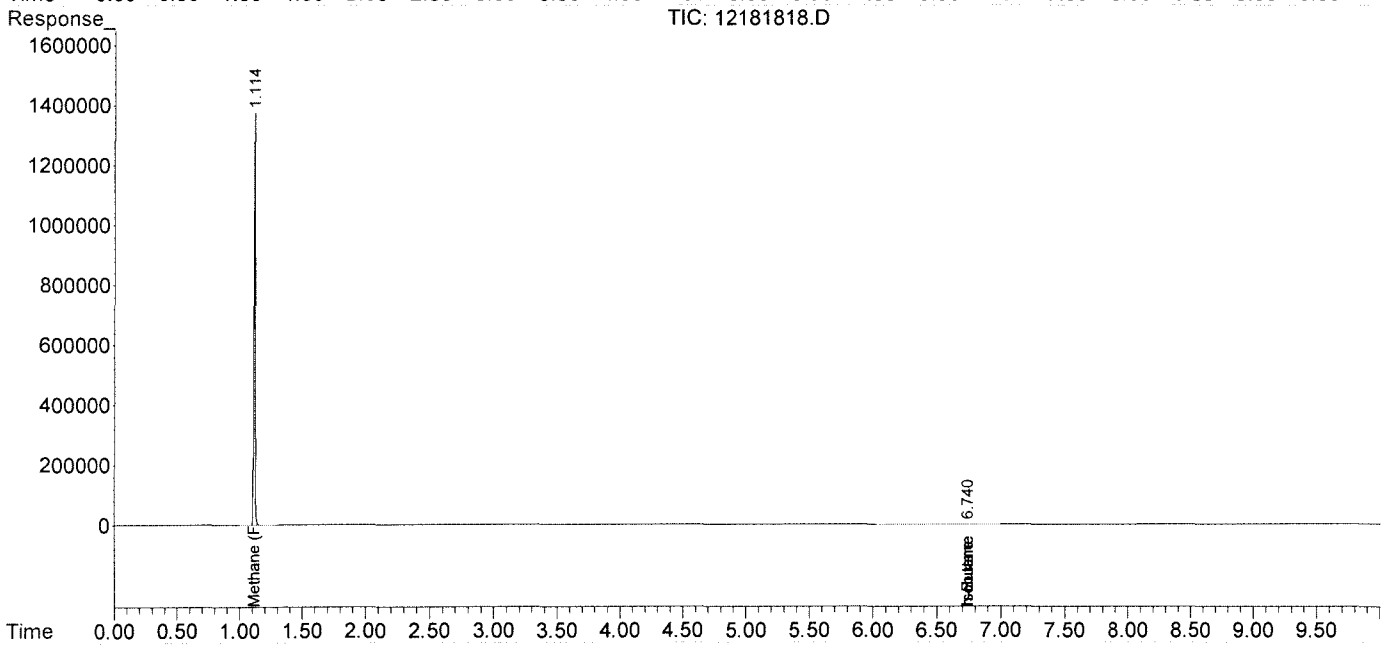
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181818.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:18:17
Operator : MR
Sample : P1806800-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:14:01 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181819.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:32:17
Operator : MR
Sample : P1806800-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:14:26 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

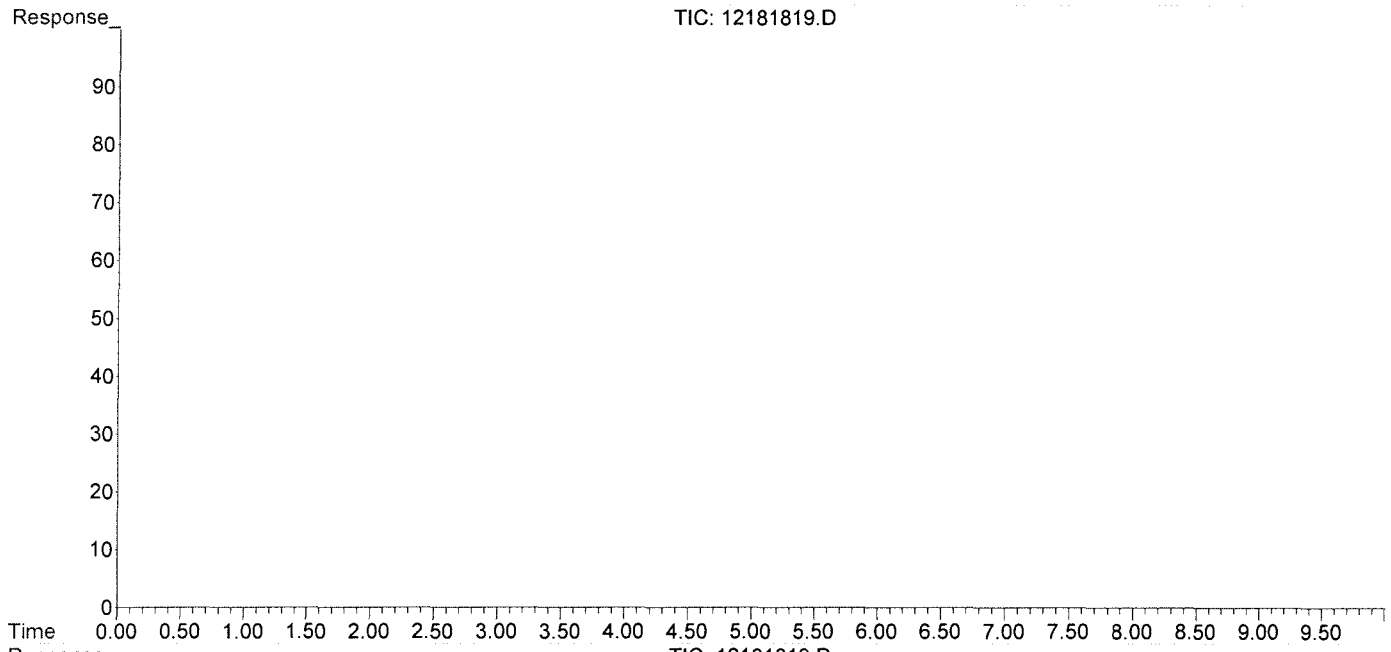
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.116	831835	91.706	ppm
7)	Ethylene	1.675	106685	6.375	ppm
8)	Ethane	1.940	2079	0.123	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	6.227	4378	671.583	ppm
12)	Isobutane	6.655	56227	2.112	ppm
13)	n-Butane	6.655	56227	2.112	ppm

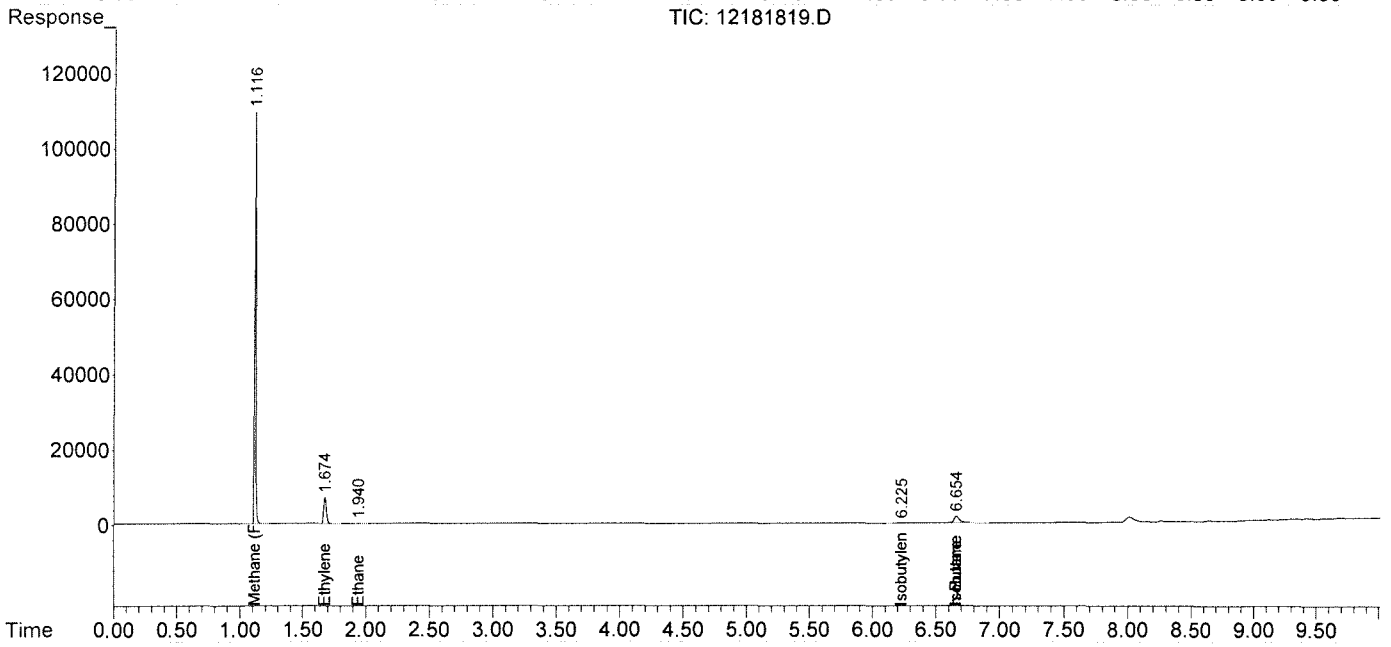
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181819.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:32:17
Operator : MR
Sample : P1806800-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 10:14:26 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:22:34
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:35:25 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

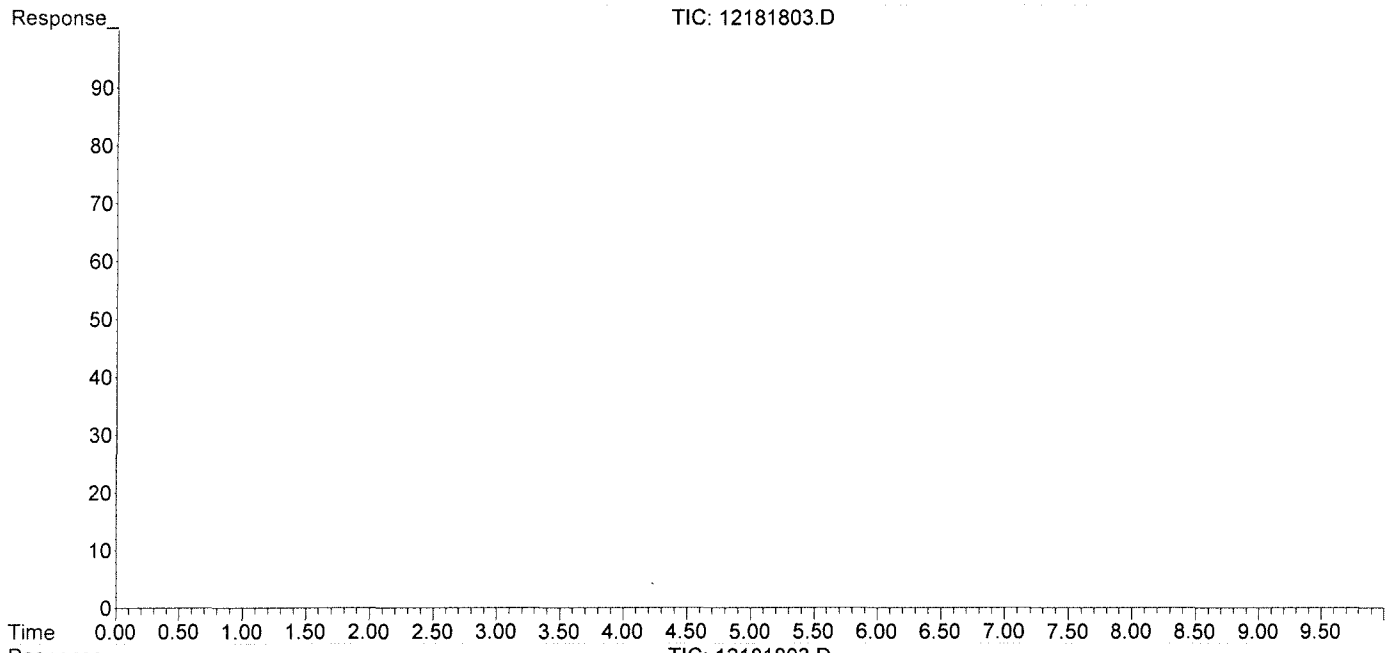
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.117	1905	0.210	ppm	m
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

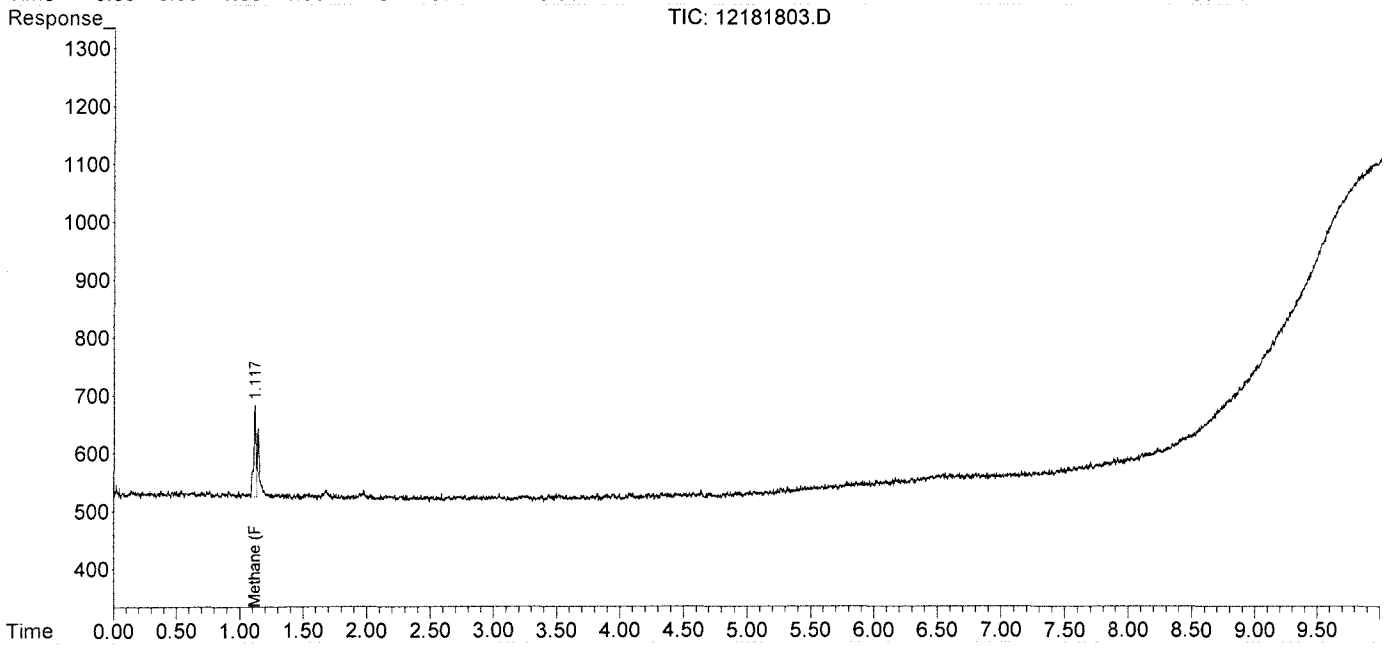
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:22:34
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:35:25 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

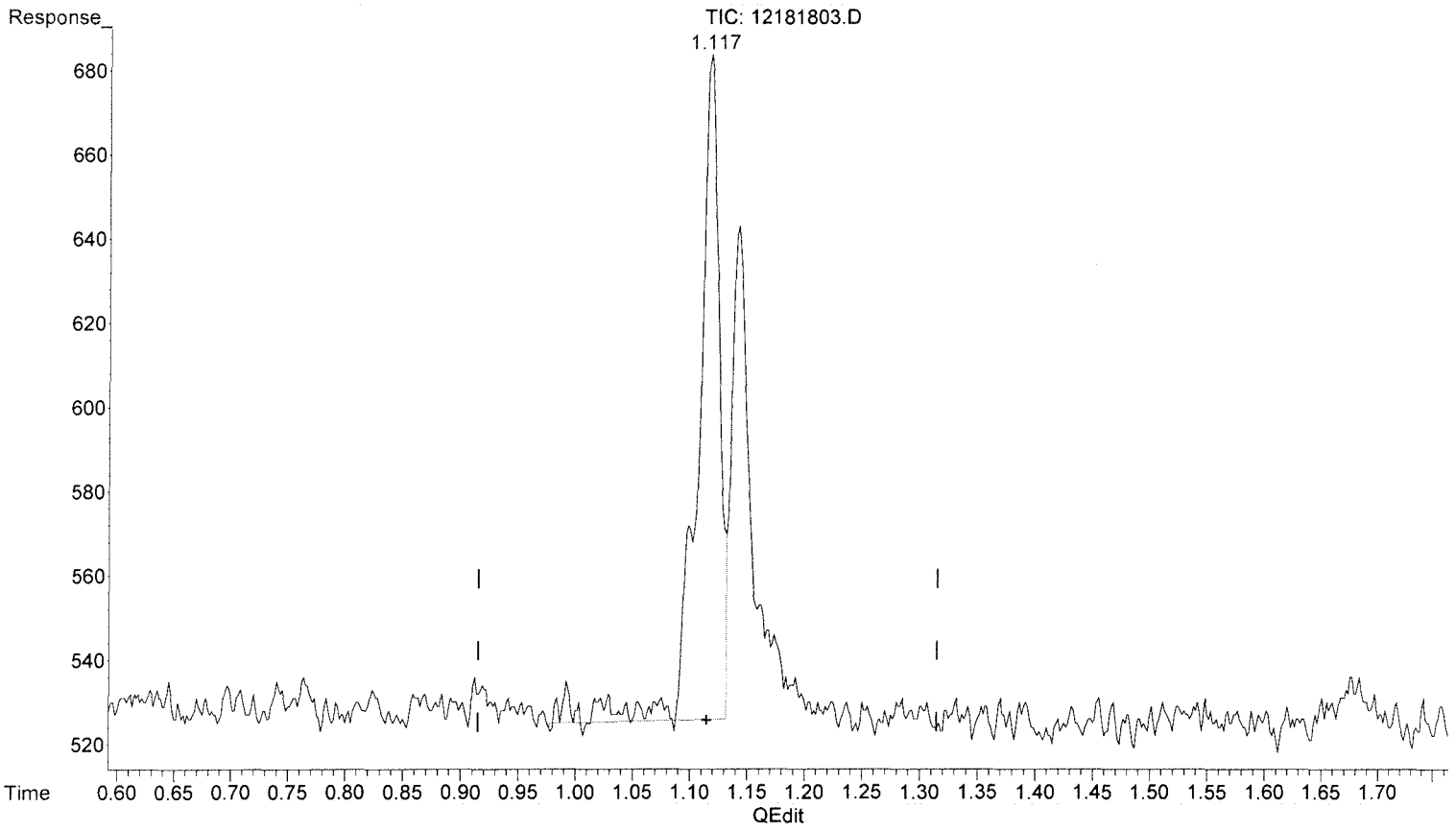




Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:22:34
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:35:25 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.117min 0.229 ppm

response 2073

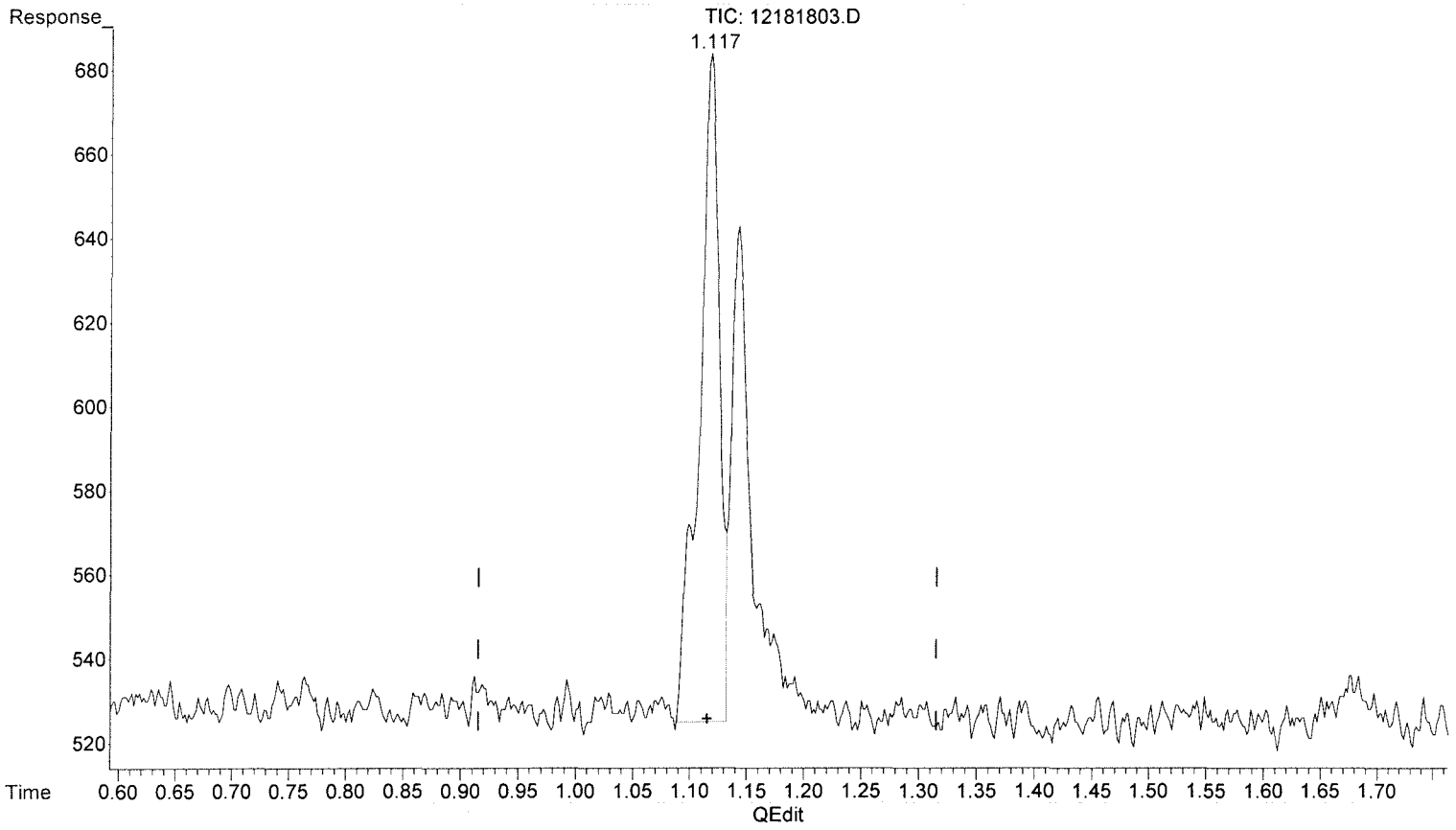
(+) = Expected Retention Time

RS091217_R.M Wed Dec 19 10:11:22 2018 Page: 1

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:22:34
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:35:25 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.117min 0.210 ppm m

response 1905

MR 12/19/18
BLC

(+) = Expected Retention Time

RS091217_R.M Wed Dec 19 10:11:35 2018 Page: 1

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181804.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:36:38
Operator : MR
Sample : fid lcs s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:44:31 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

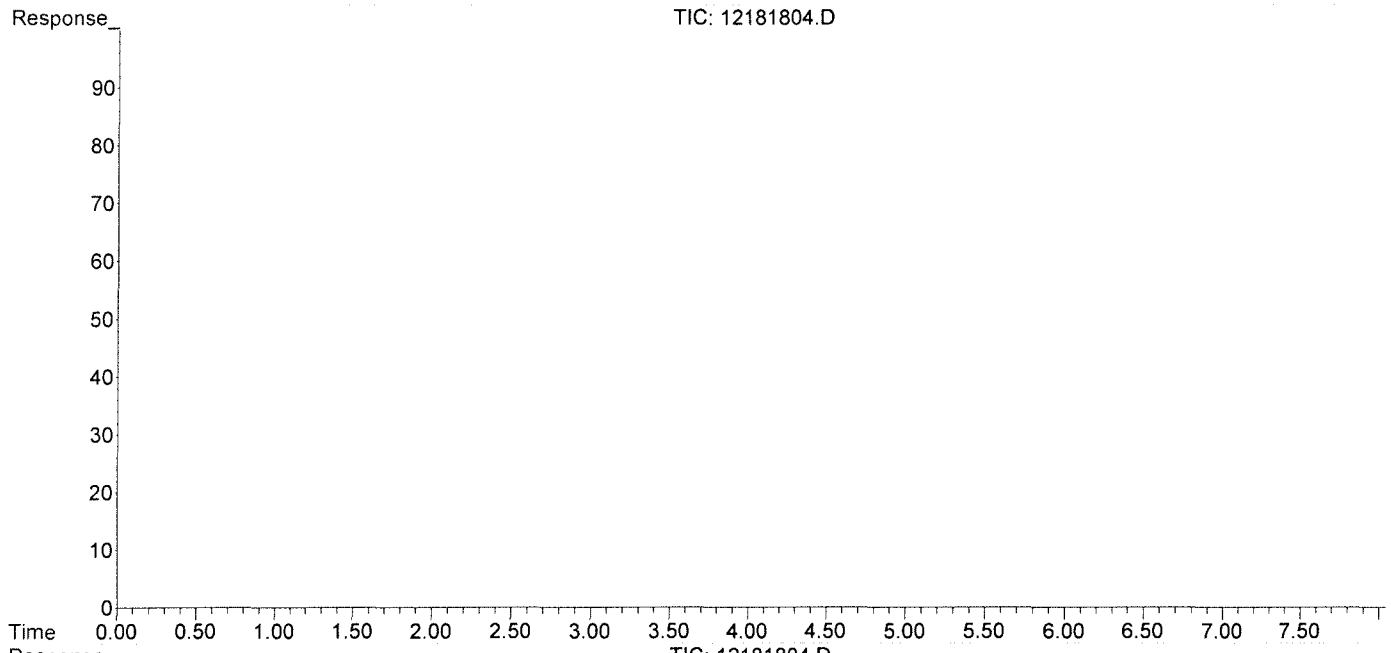
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	13195	1.455	ppm
7)	Ethylene	1.681	16622	0.993	ppm
8)	Ethane	1.945	20793	1.227	ppm
9)	Propylene	4.324	22819	0.974	ppm
10)	Propane	4.446	32061	1.289	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.659	43533	1.635	ppm
13)	n-Butane	6.659	43533	1.635	ppm

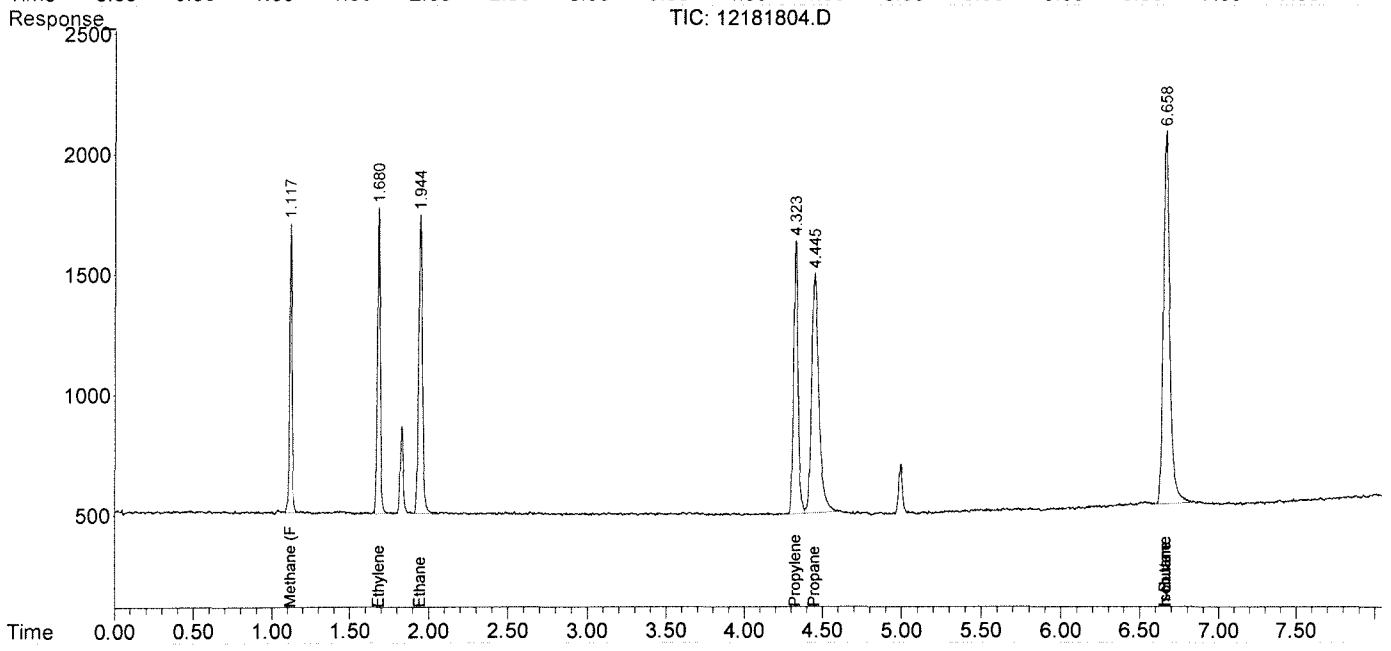
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181804.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:36:38
Operator : MR
Sample : fid lcs s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:44:31 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181805.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:47:34
Operator : MR
Sample : fid lcsd s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:01:52 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

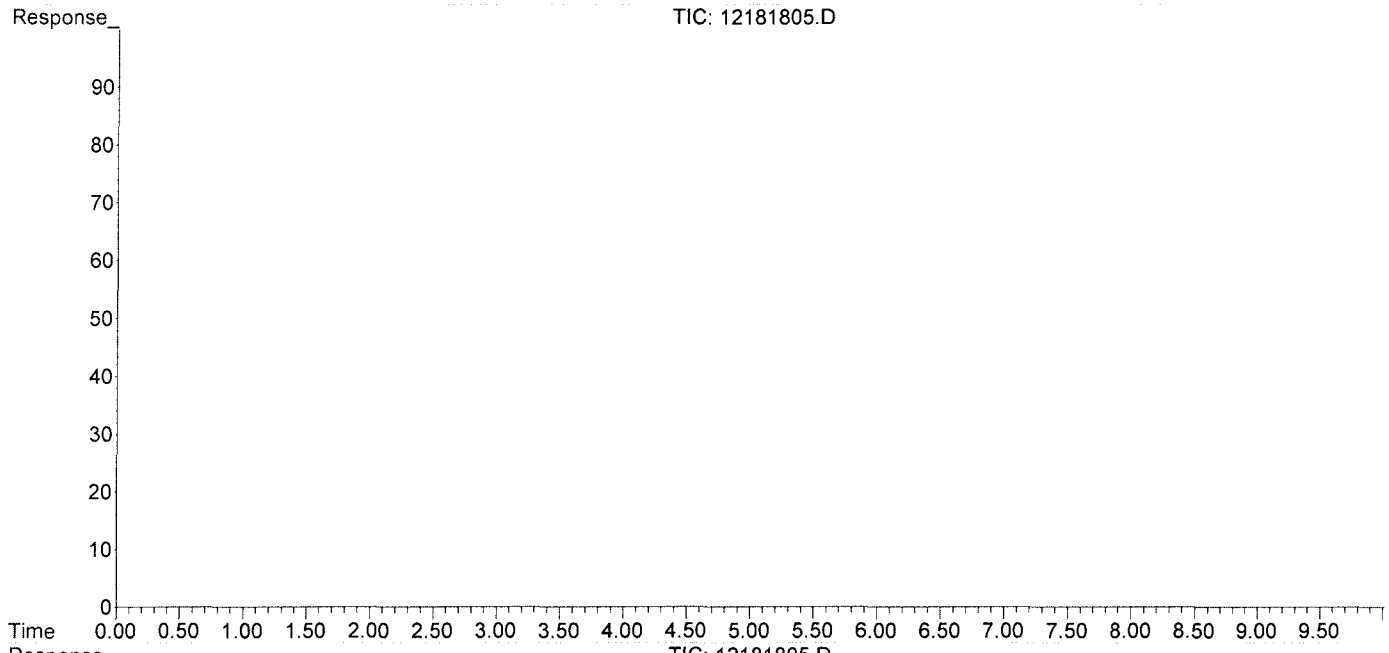
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.115	13368	1.474	ppm	m
7)	Ethylene	1.675	16639	0.994	ppm	
8)	Ethane	1.938	21021	1.240	ppm	
9)	Propylene	4.320	23020	0.982	ppm	
10)	Propane	4.443	33329	1.340	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.660	43745	1.643	ppm	
13)	n-Butane	6.660	43745	1.643	ppm	

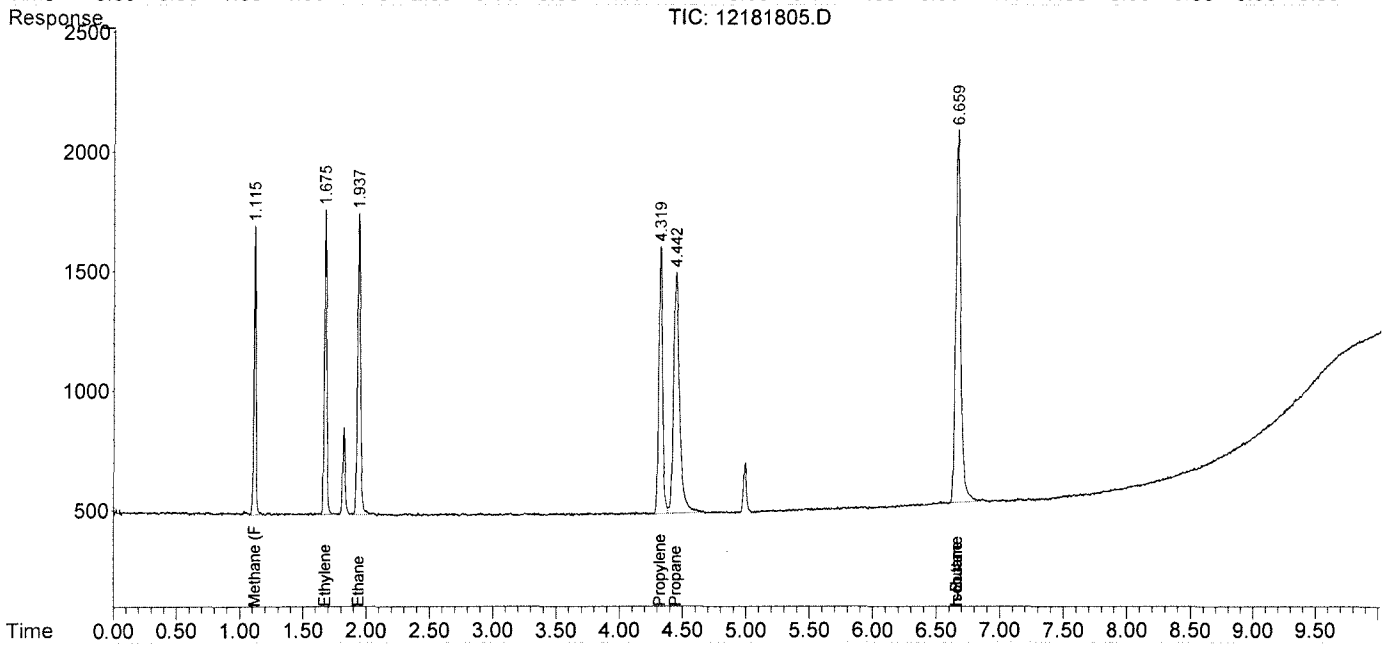
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181805.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:47:34
Operator : MR
Sample : fid lcsd s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:01:52 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

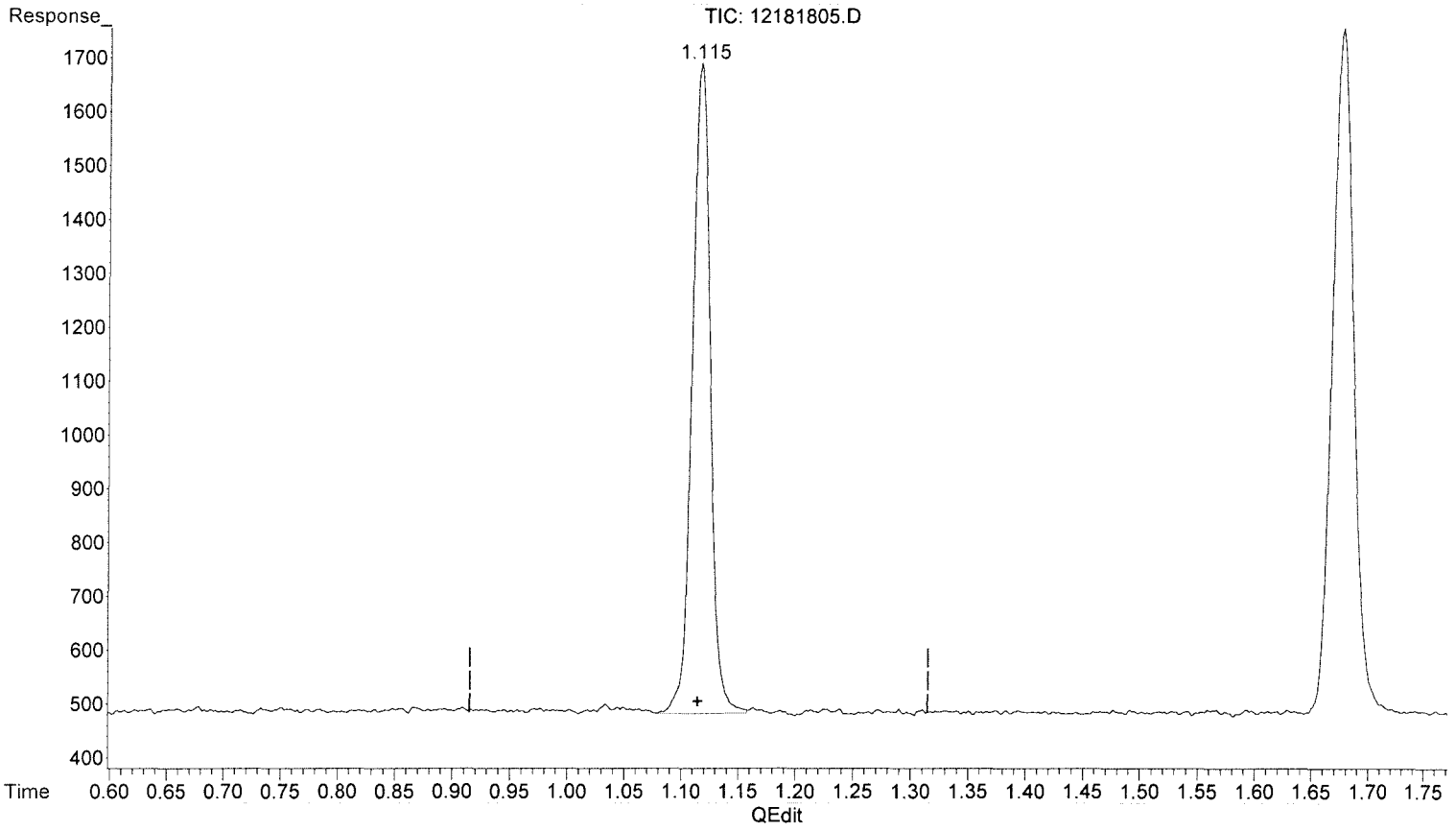




Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181805.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 11:47:34
Operator : MR
Sample : fid lcsd s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 12:01:52 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.115min 1.474 ppm m

response 13368

mm 12/19/18
BLC
no previous

(+) = Expected Retention Time

Response Factor Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	3.739		1.014			0.001	0.793	E6	189.17
2)	Carbon monoxide	3.739		1.014			0.001	0.594	E6	221.92
3)	Methane (TCD)						2.161	0.951	E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438	E2	4.44

Signal #2 Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907	E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673	E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695	E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343	E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488	E4	4.20
11)	Isobutylene							0.652	E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017

Edit Compounds -- Compound #6 -- Methane (FID)

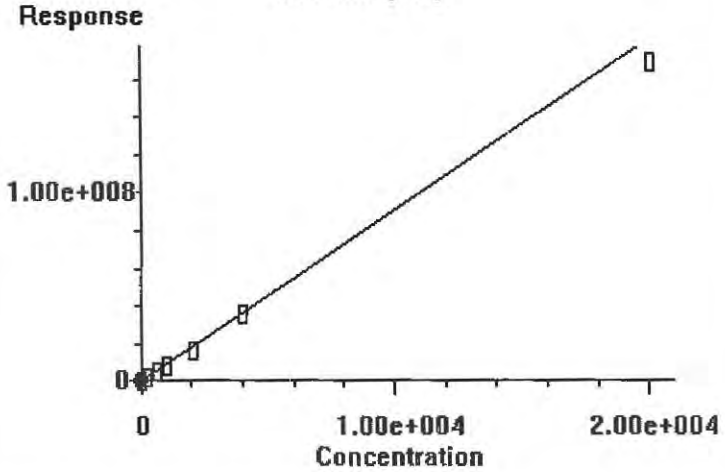
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	
2	0.302000	3564.400000
3	1.510000	14725.268625
4	4.530000	41128.575000
5	10.570000	91966.784531
6	200.000000	1735997.497500
7	600.000000	5189848.900000
8	1000.000000	8598533.570000
9	2000.000000	16098209.390000
10	4000.000000	35776839.311362
11	20000.000000	169009160.49199

Methane (FID)



0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #7 -- Ethylene

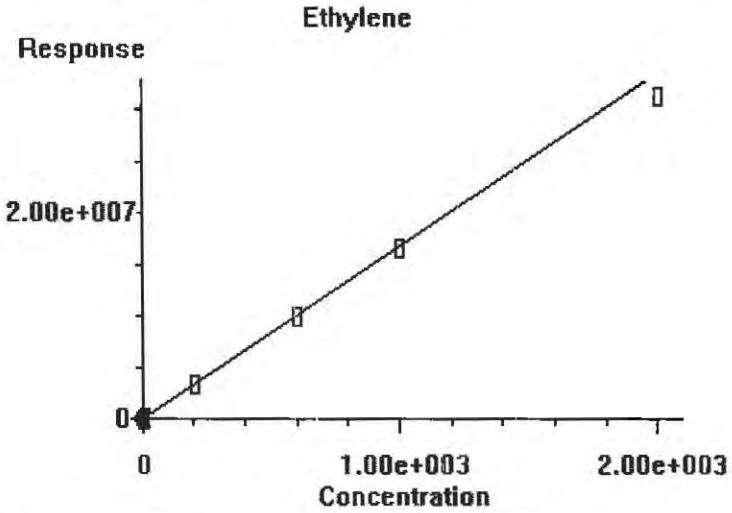
Search by: Ret Time | Name | Index | Find Compound

Compound Database
External Standard Compoun
- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16608503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.673e+004	Linear term
0.000e+000	Constant term
3.897%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #8 -- Ethane

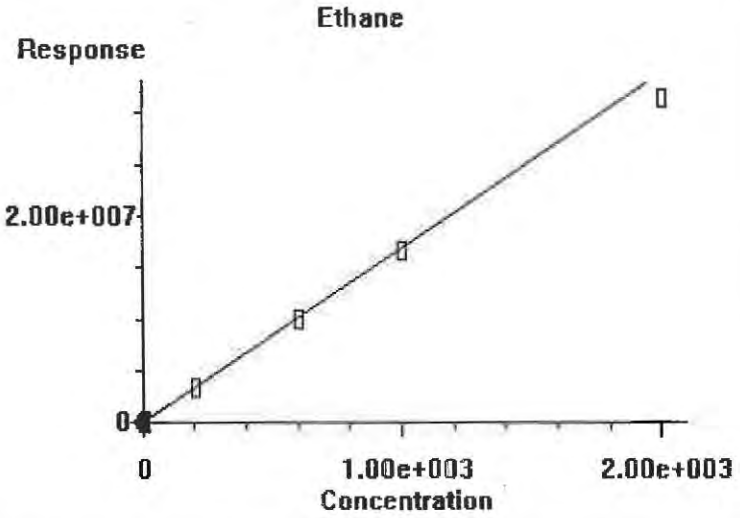
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2689.928008
2	0.302000	5060.331943
3	1.510000	26943.667500
4	4.530000	78353.525045
5	10.570000	178840.731148
6	200.000000	3350442.319129
7	600.000000	10048964.218029
8	1000.000000	16703164.879012
9	2000.000000	31424217.938900
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #9 -- Propylene

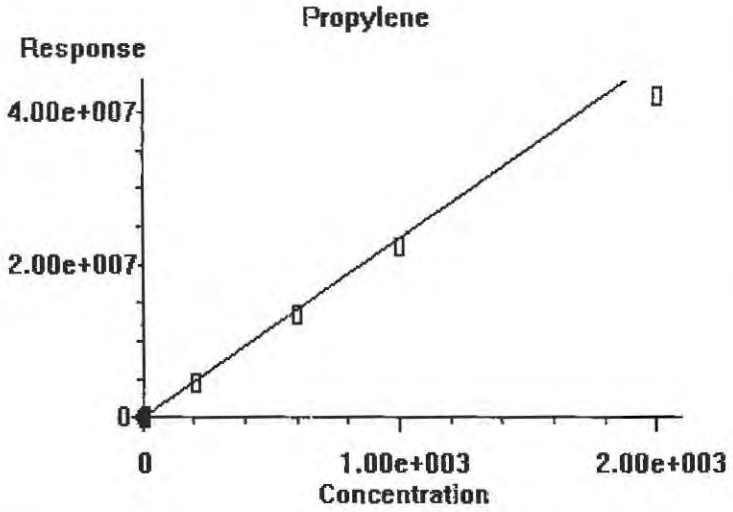
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3782.537646
2	0.302000	6933.285530
3	1.510000	39139.518208
4	4.530000	112341.896872
5	10.570000	248003.903623
6	200.000000	4504060.086084
7	600.000000	13569342.761419
8	1000.000000	22494887.720990
9	2000.000000	42124689.656800
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #10 -- Propane

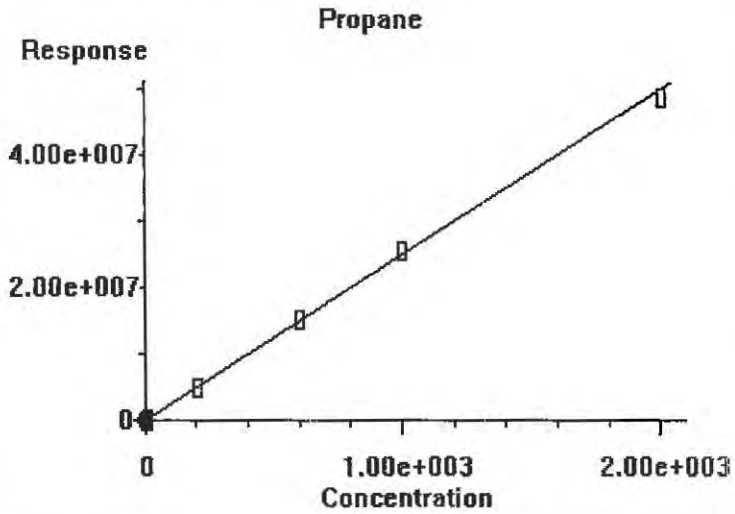
Search by: Ret Time | Name | Index — Find Compound

Compound Database
External Standard Compoun
- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3682.897354
2	0.302000	6894.237803
3	1.510000	39934.166792
4	4.530000	115723.428128
5	10.570000	257124.432806
6	200.000000	5043035.663316
7	600.000000	15251325.797404
8	1000.000000	25459410.657938
9	2000.000000	48583085.287451
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

00944765

Calibration Status Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.767	373920	0.128	ppm	
2)	Carbon monoxide	1.767	373920	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	1.595	2622	0.156	ppm	
8)	Ethane	1.848	2690	0.156	ppm	
9)	Propylene	4.222	3783	0.154	ppm	
10)	Propane	4.348	3683	0.139	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.582f	6058	NoCal	ppm	
13)	n-Butane	6.582f	6058	NoCal	ppm	

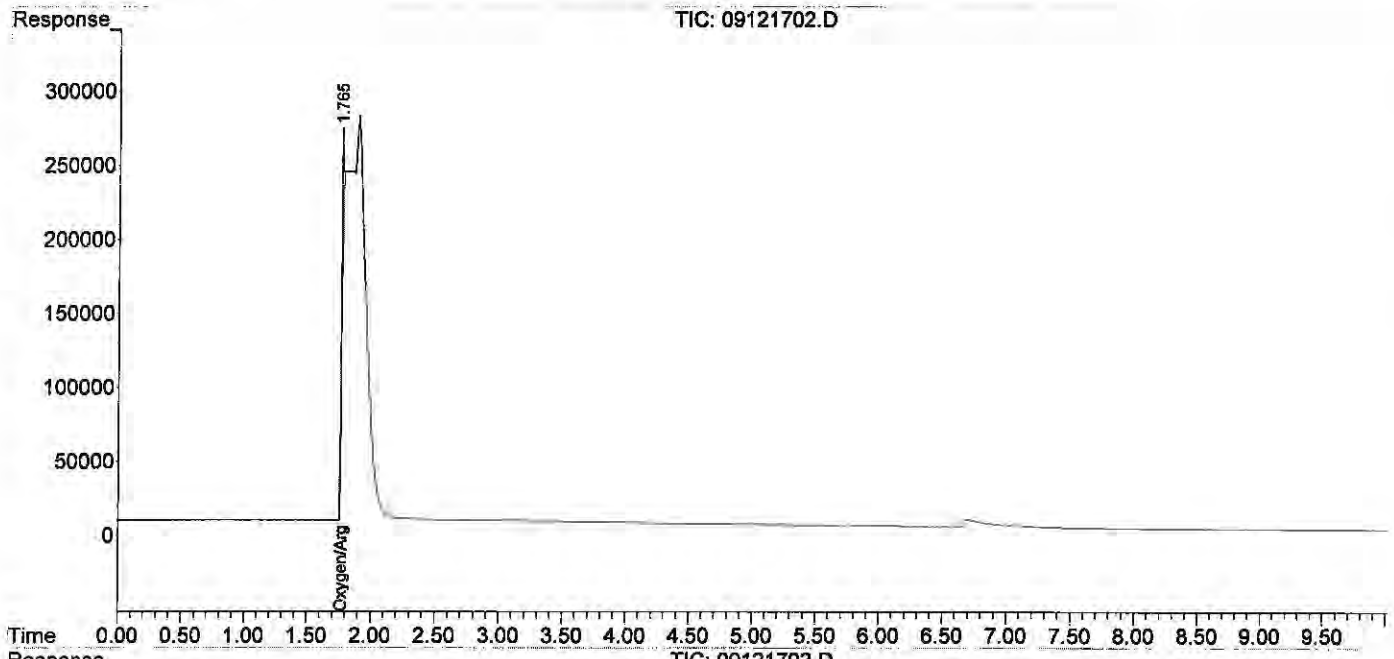
(f)=RT Delta > 1/2 Window (m)=manual int.

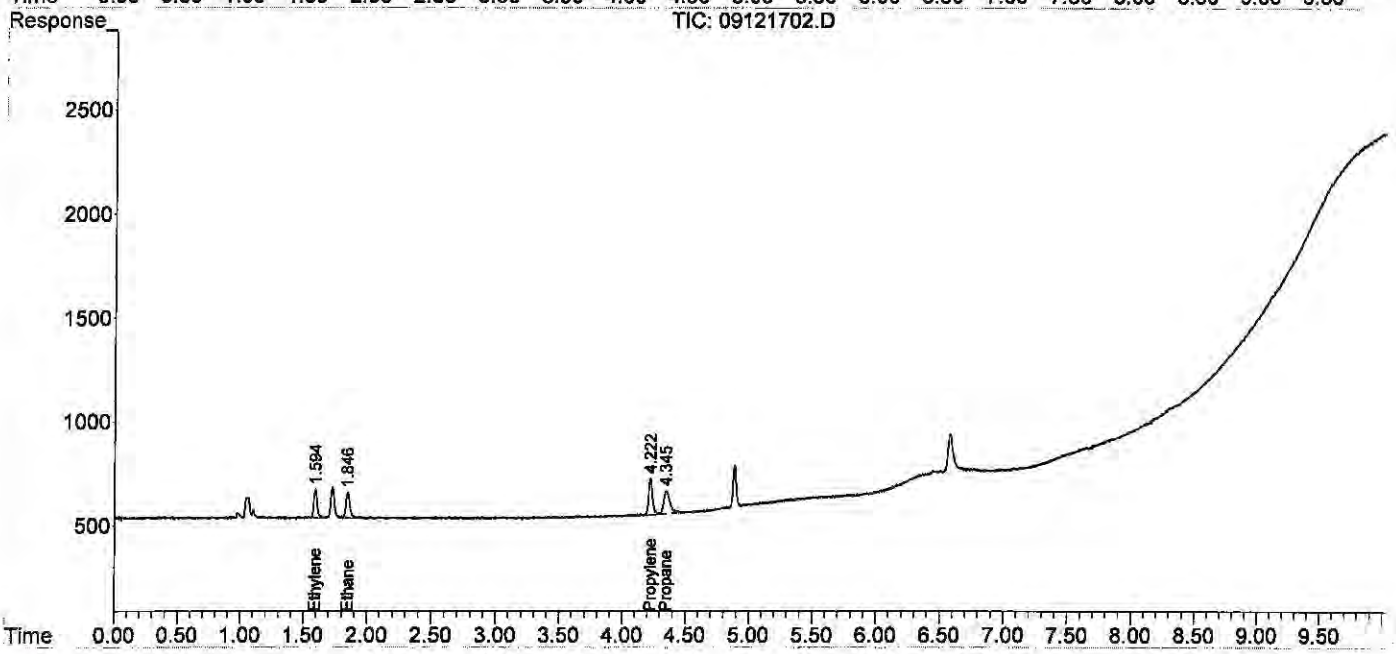
9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





RS091217_R.M Wed Sep 13 14:58:18 2017 Page: 2

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.913f	-25181981	N.D.	ppm	
2)	Carbon monoxide	1.913f	-25181981	1.089	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.049	3564	0.391	ppm	m
7)	Ethylene	1.577	4947	0.292	ppm	
8)	Ethane	1.828	5060	0.293	ppm	
9)	Propylene	4.207	6933	0.281	ppm	
10)	Propane	4.337	6894	0.268	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	9587	0.158	ppm	
13)	n-Butane	6.579f	9587	0.158	ppm	

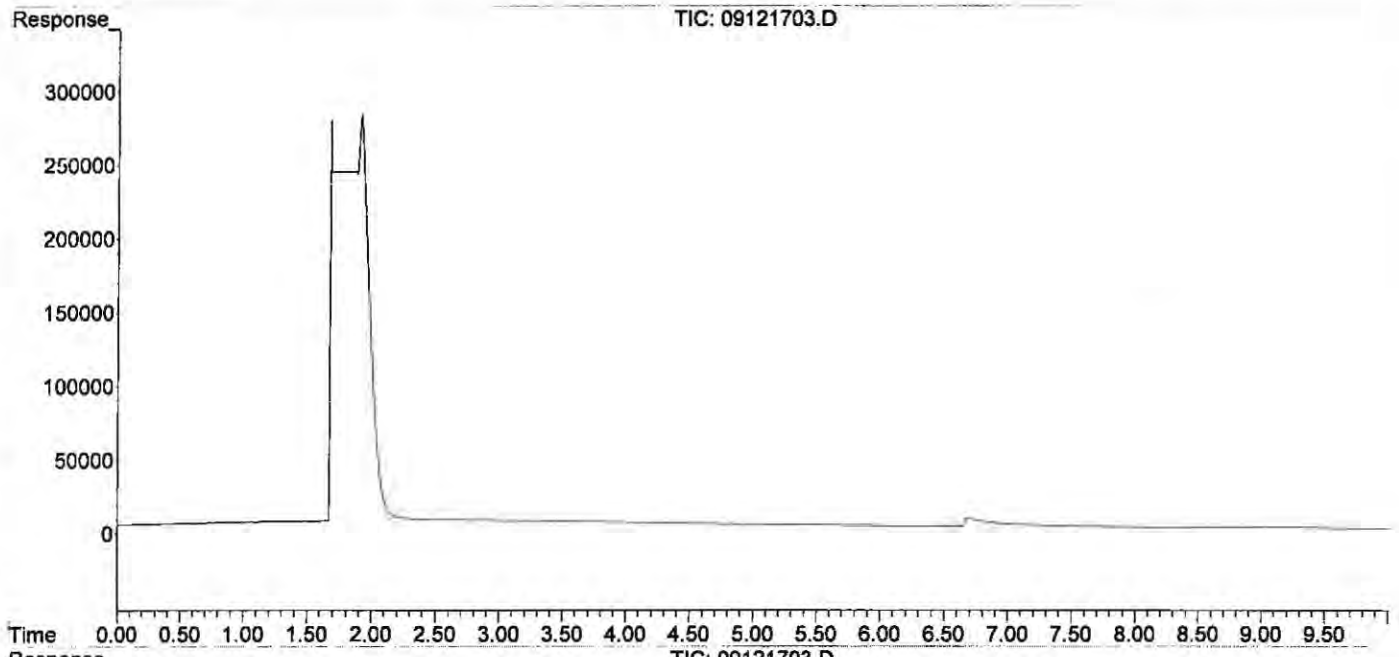
(f)=RT Delta > 1/2 Window (m)=manual int.

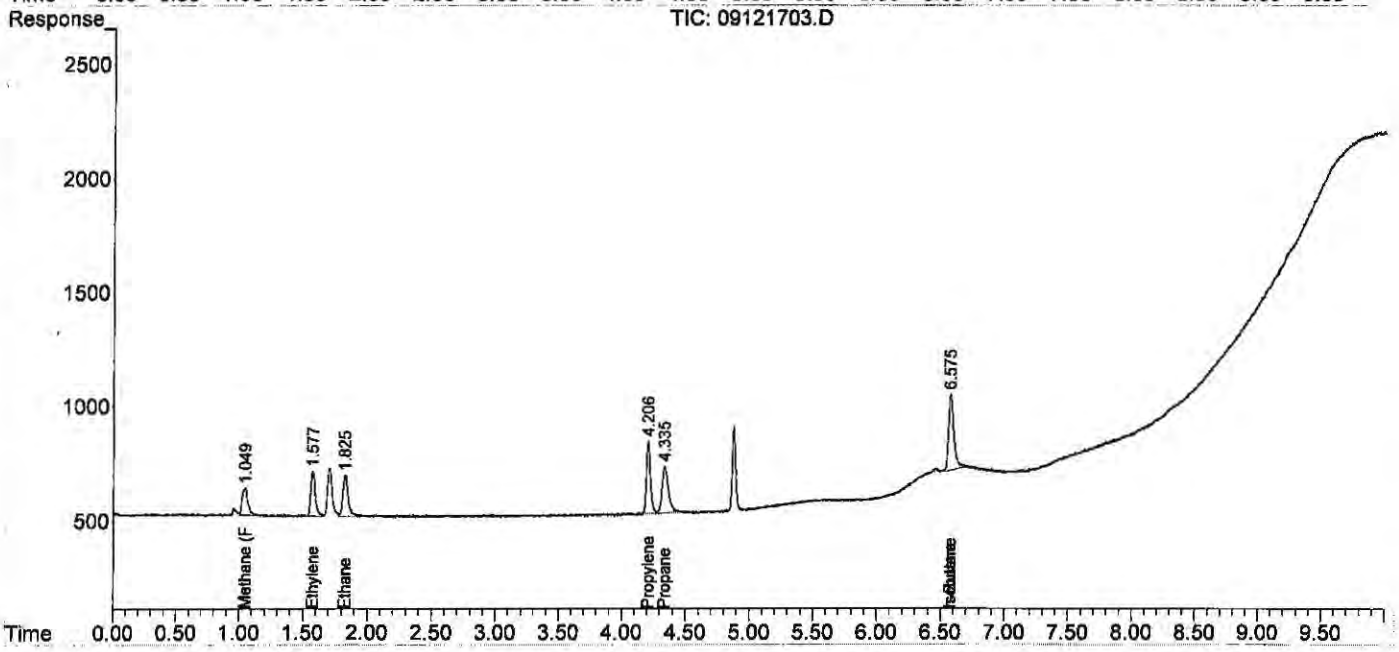
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



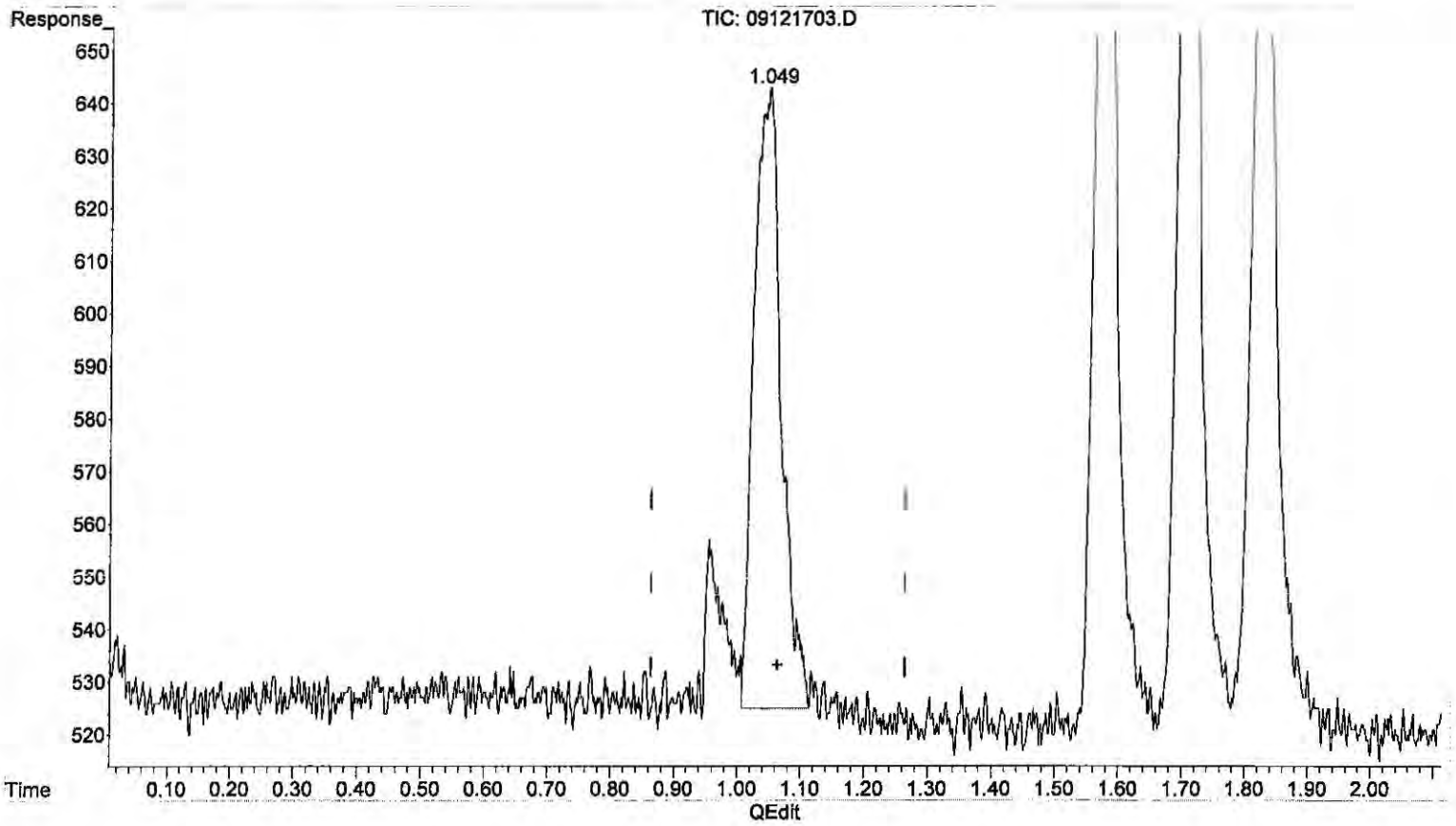


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.049min 0.391 ppm m

response 3564

(+) = Expected Retention Time

RS091217_R.M Wed Sep 13 15:00:03 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

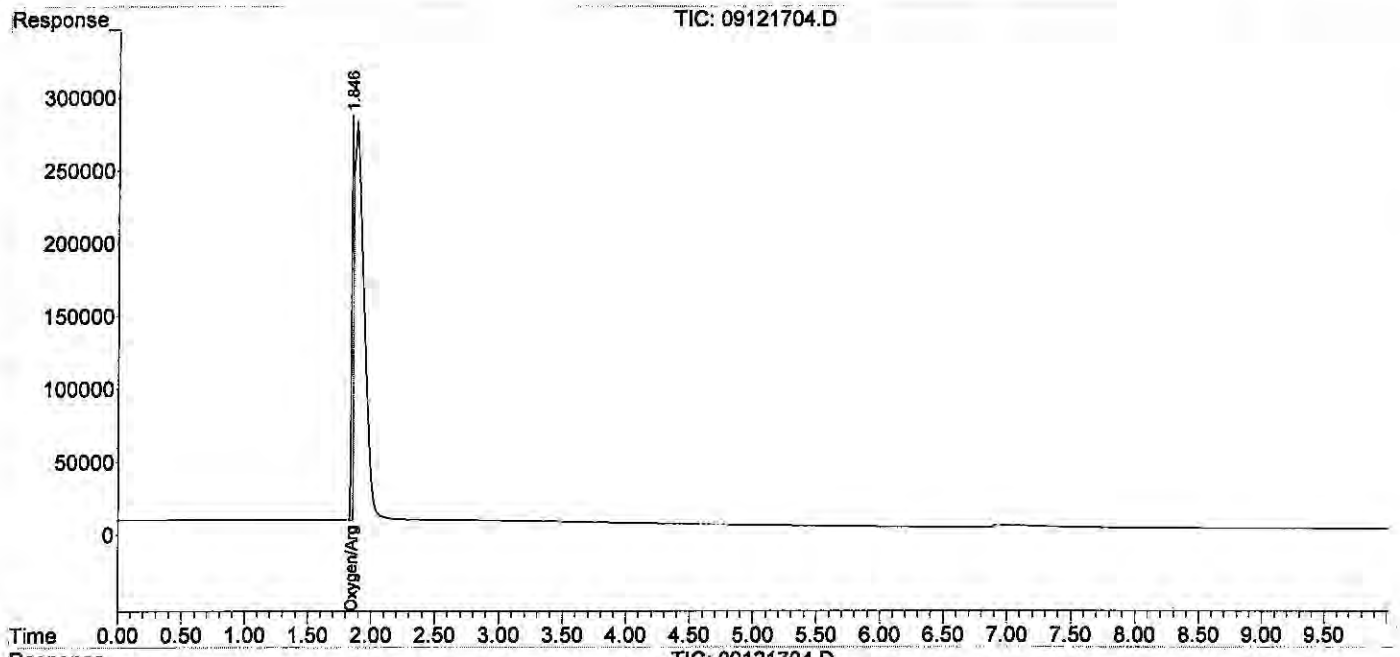
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.847	2536230	1.056	ppm
2)	Carbon monoxide	1.847	2536230	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.064	14725	1.613	ppm
7)	Ethylene	1.598	26885	1.582	ppm
8)	Ethane	1.851	26944	1.555	ppm
9)	Propylene	4.220	39140	1.589	ppm
10)	Propane	4.349	39934	1.596	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	55348	1.020	ppm
13)	n-Butane	6.578f	55348	1.020	ppm

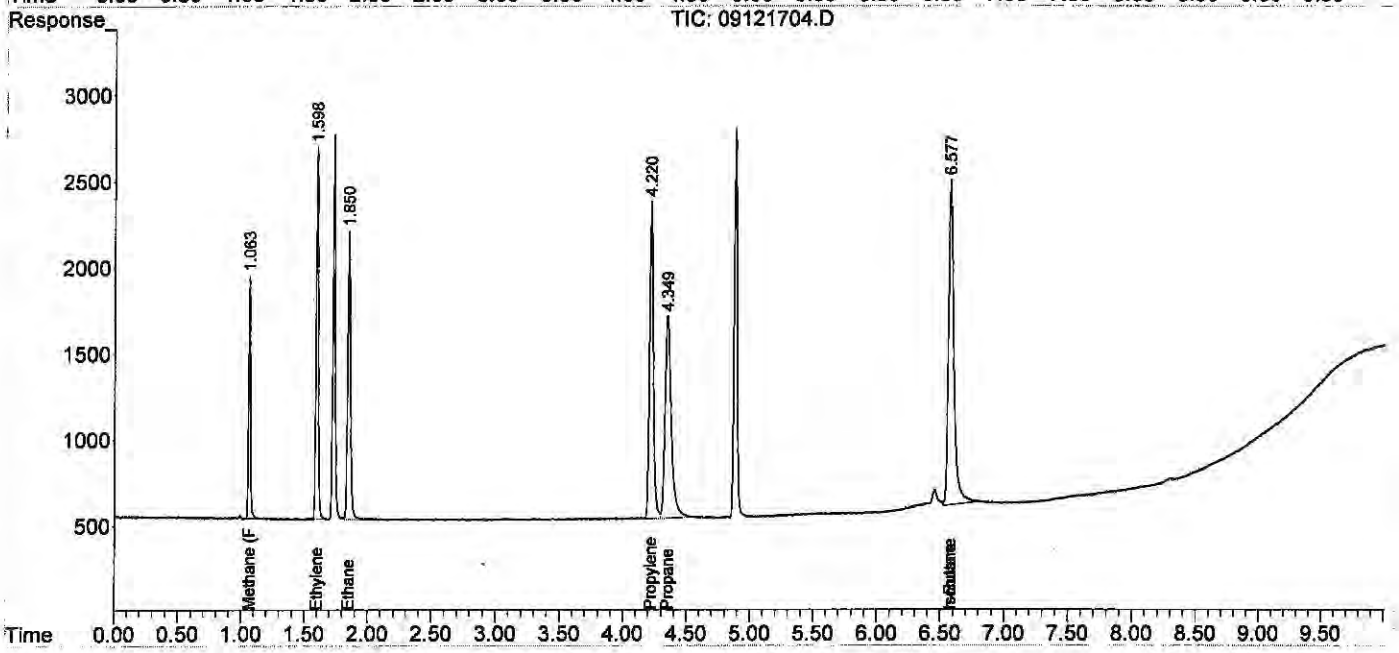
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.738	-331216	N.D.	ppm
2)	Carbon monoxide	1.738	-331216	0.019	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.052	41129	4.522	ppm
7)	Ethylene	1.586	77903	4.637	ppm
8)	Ethane	1.838	78354	4.558	ppm
9)	Propylene	4.218	112342	4.614	ppm
10)	Propane	4.347	115723	4.680	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.580f	155256	3.565	ppm
13)	n-Butane	6.580f	155256	3.565	ppm

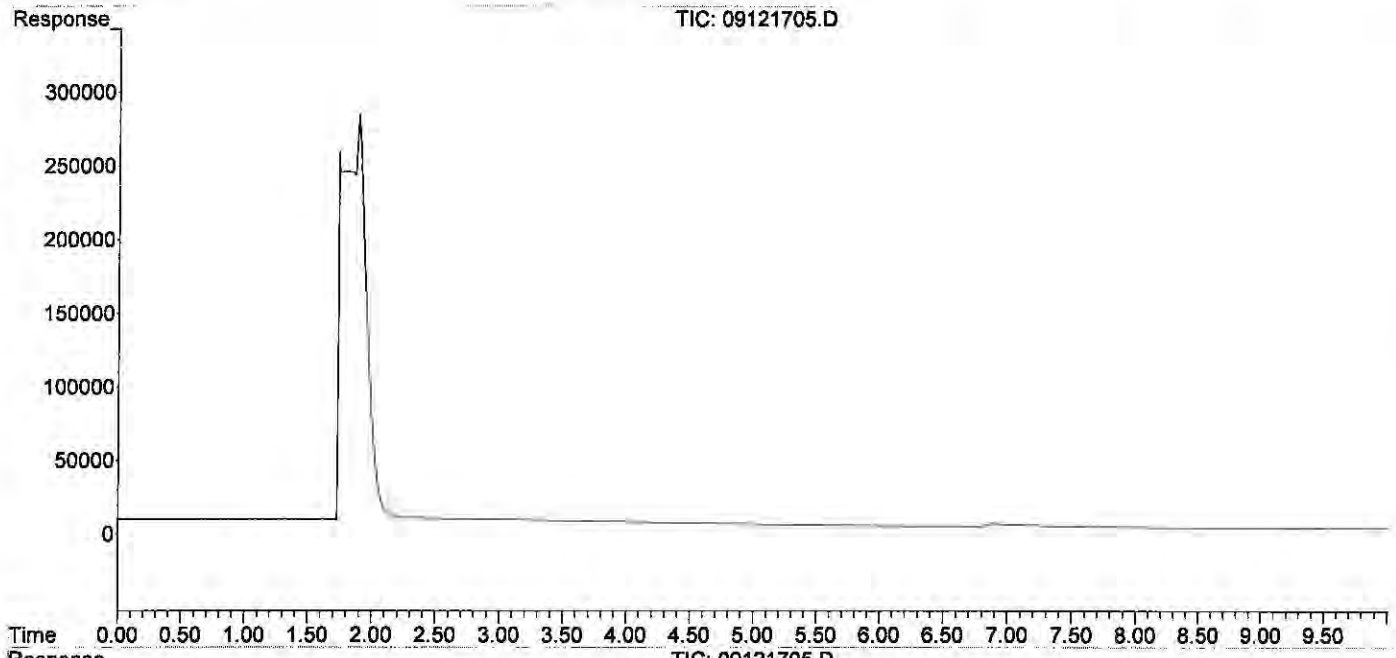
(f)=RT Delta > 1/2 Window (m)=manual int.

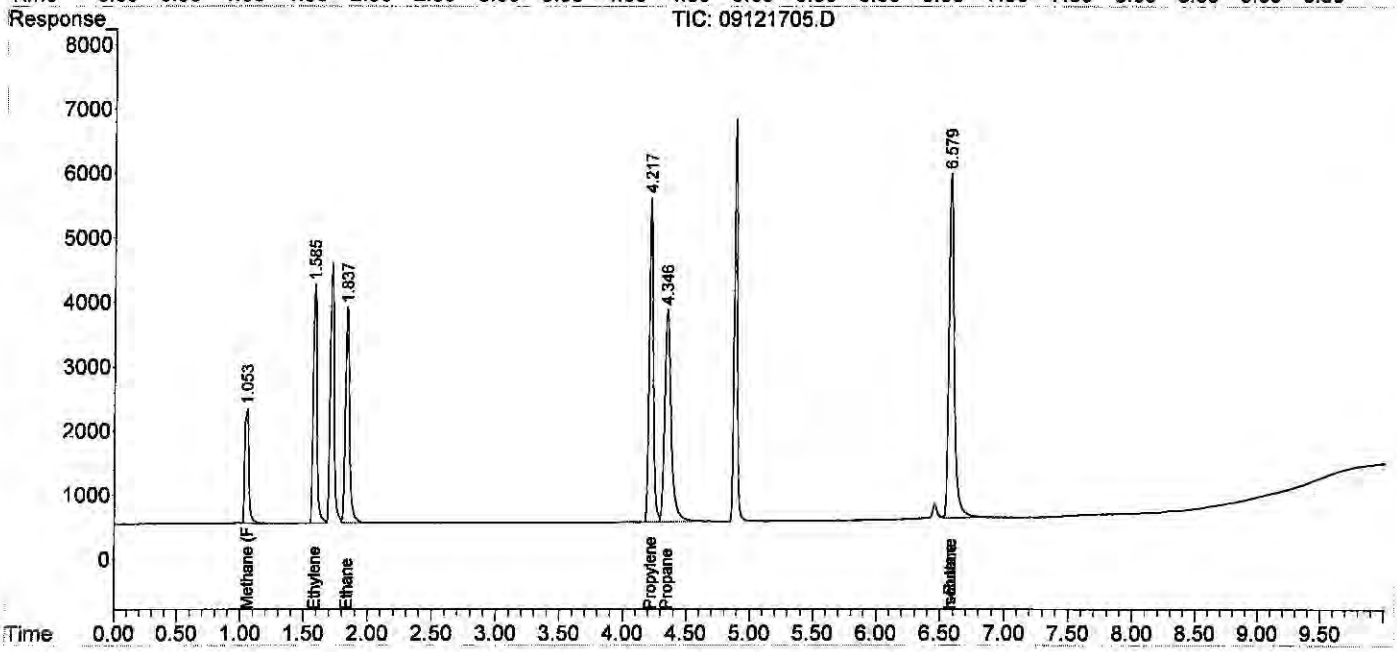
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2)	Carbon monoxide	1.929f	-31871242	1.818	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.025	91967	10.135	ppm
7)	Ethylene	1.568	172086	10.273	ppm
8)	Ethane	1.822	178841	10.441	ppm
9)	Propylene	4.214	248004	10.236	ppm
10)	Propane	4.344	257124	10.458	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	338181	9.254	ppm
13)	n-Butane	6.578f	338181	9.254	ppm

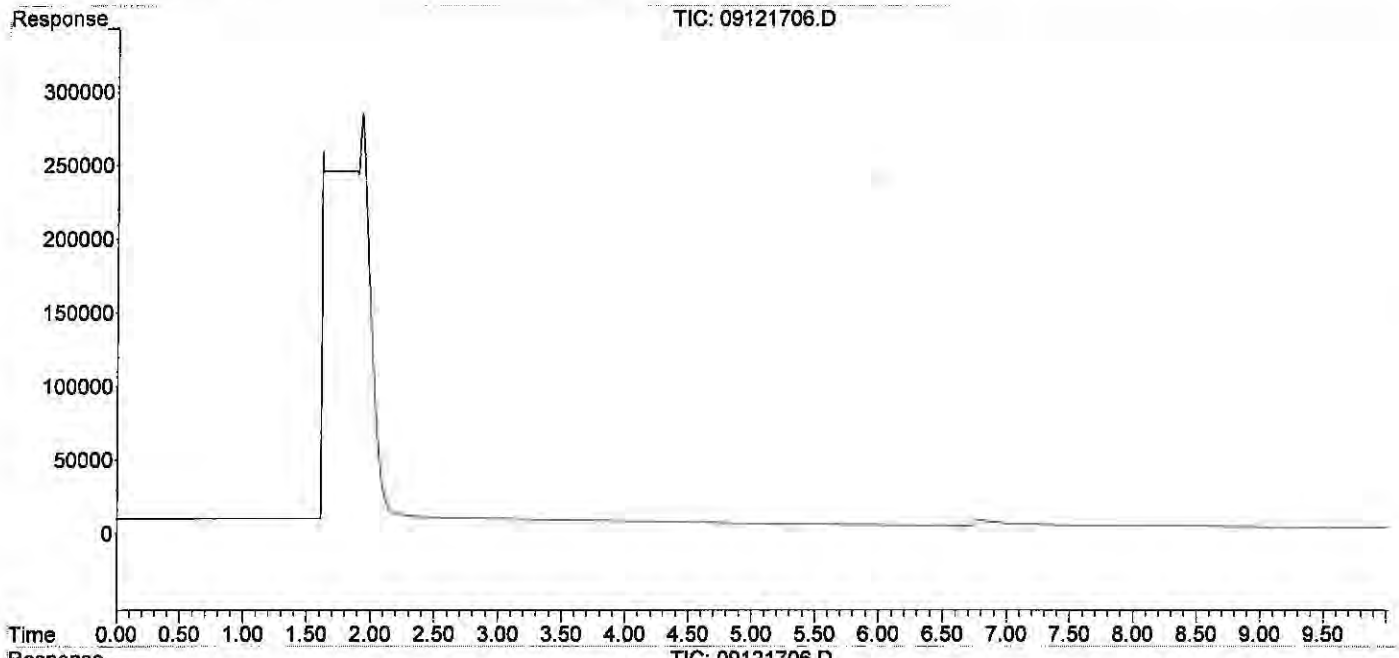
(f)=RT Delta > 1/2 Window (m)=manual int.

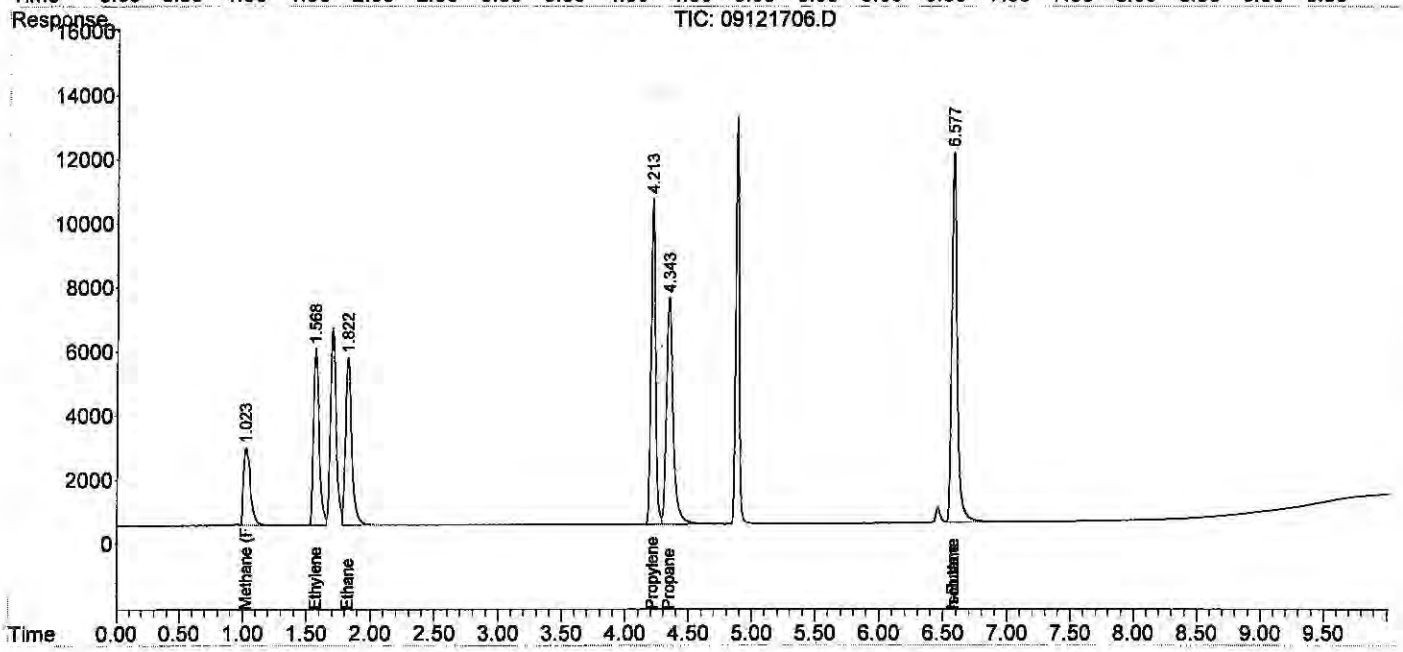
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.897	155286	0.065	ppm
2)	Carbon monoxide	1.897	155286	N.D.	ppm
3)	Methane (TCD)	4.079f	27015	2856.472	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.063	1735997	190.792	ppm
7)	Ethylene	1.597	3339702	198.758	ppm
8)	Ethane	1.849	3350442	194.597	ppm
9)	Propylene	4.201	4504060	185.706	ppm
10)	Propane	4.333	5043036	204.809	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

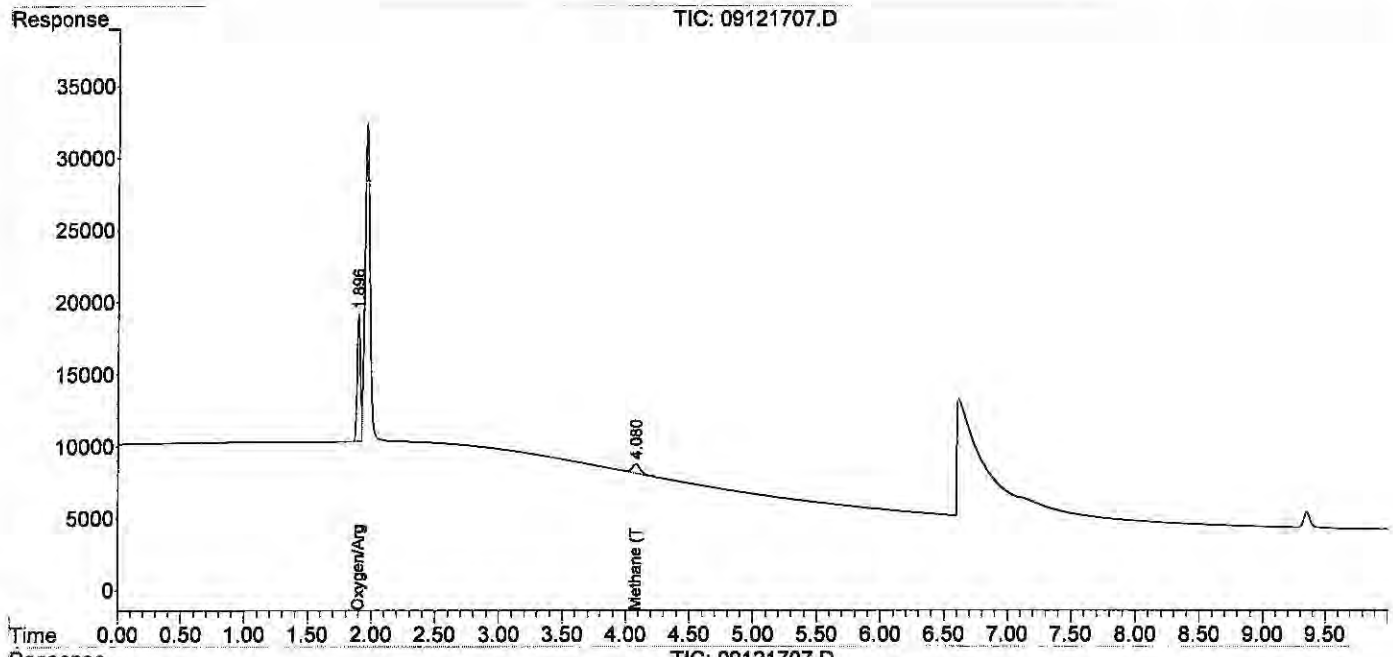
(f)=RT Delta > 1/2 Window (m)=manual int.

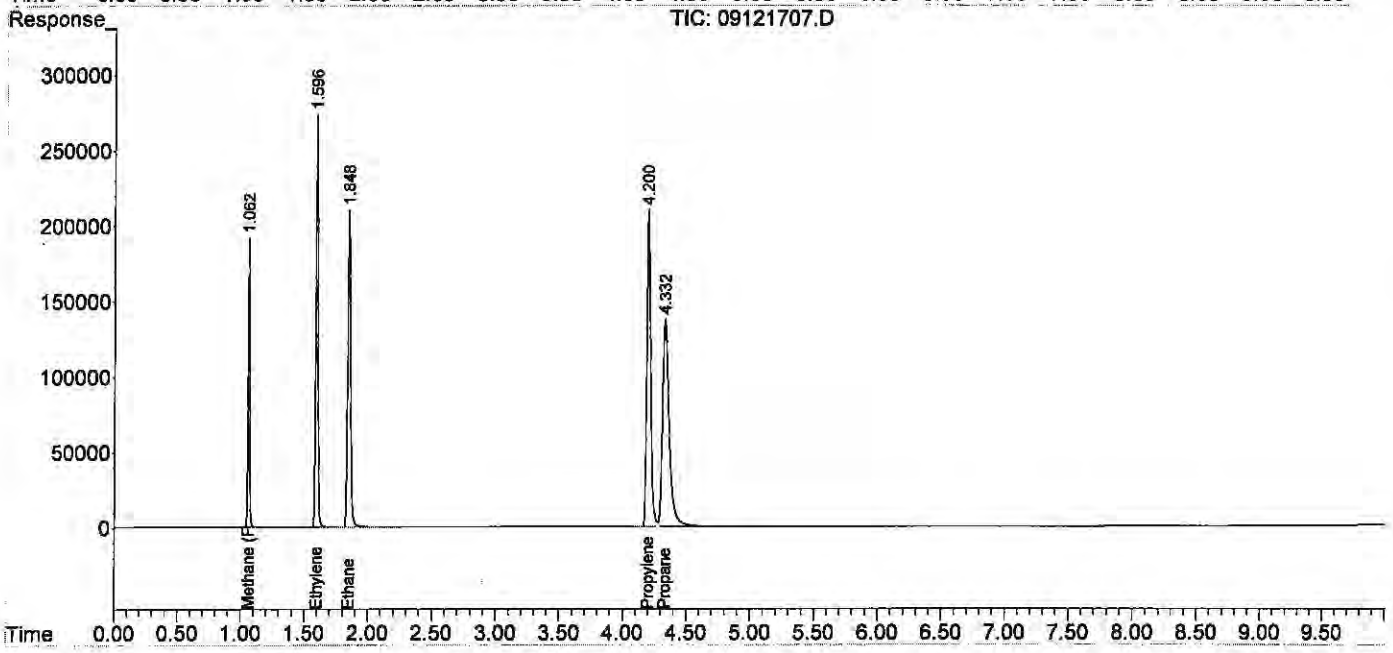
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	196022	0.124	ppm
2)	Carbon monoxide	1.884	196022	N.D.	ppm
3)	Methane (TCD)	4.070f	88282	782.730	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.044	5189849	539.759	ppm
7)	Ethylene	1.573	10007759	590.286	ppm
8)	Ethane	1.822	10048964	583.213	ppm
9)	Propylene	4.160	13569343	562.612	ppm
10)	Propane	4.300	15251326	615.171	ppm
11)	Isobutylene	6.143	9815	NoCal	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

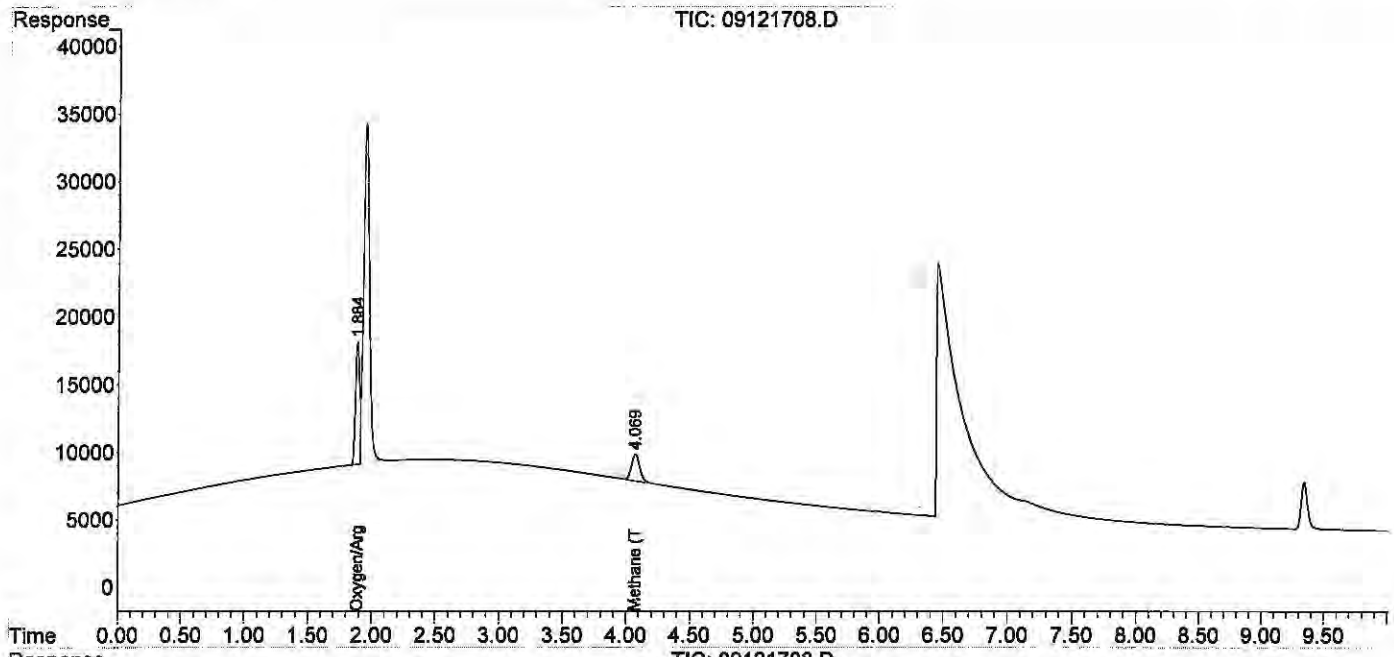
(f)=RT Delta > 1/2 Window (m)=manual int.

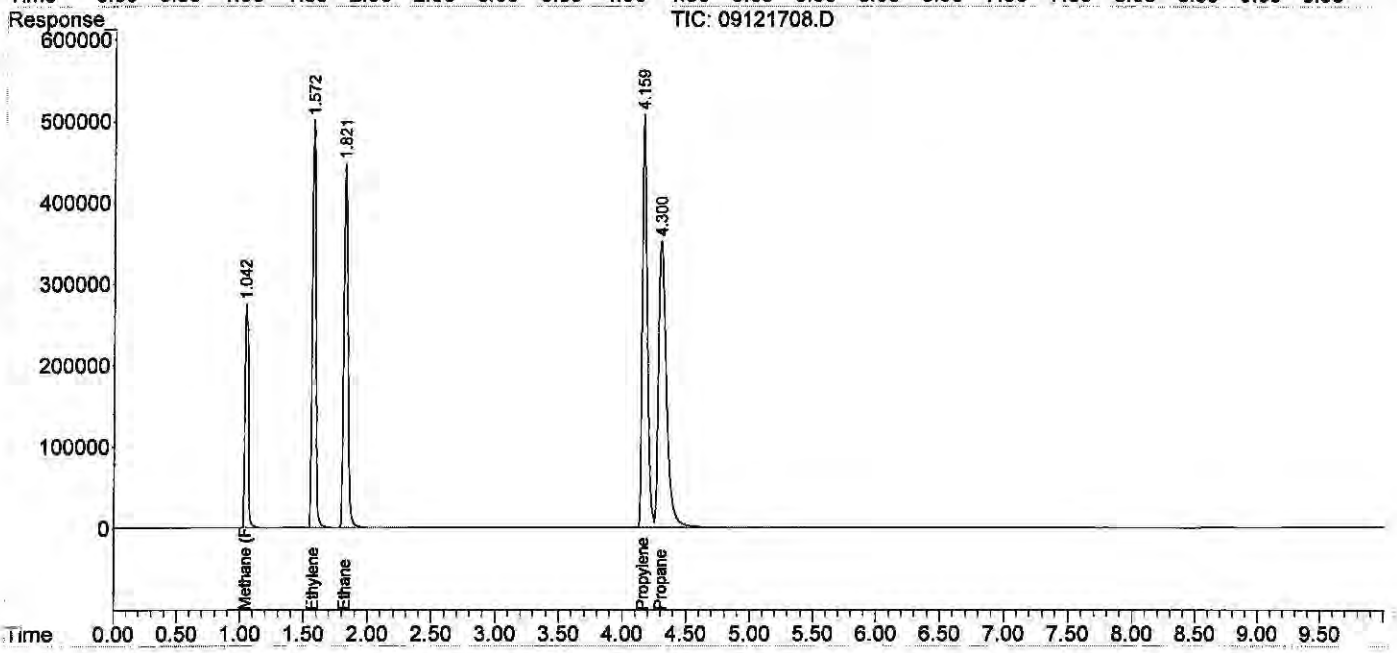
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

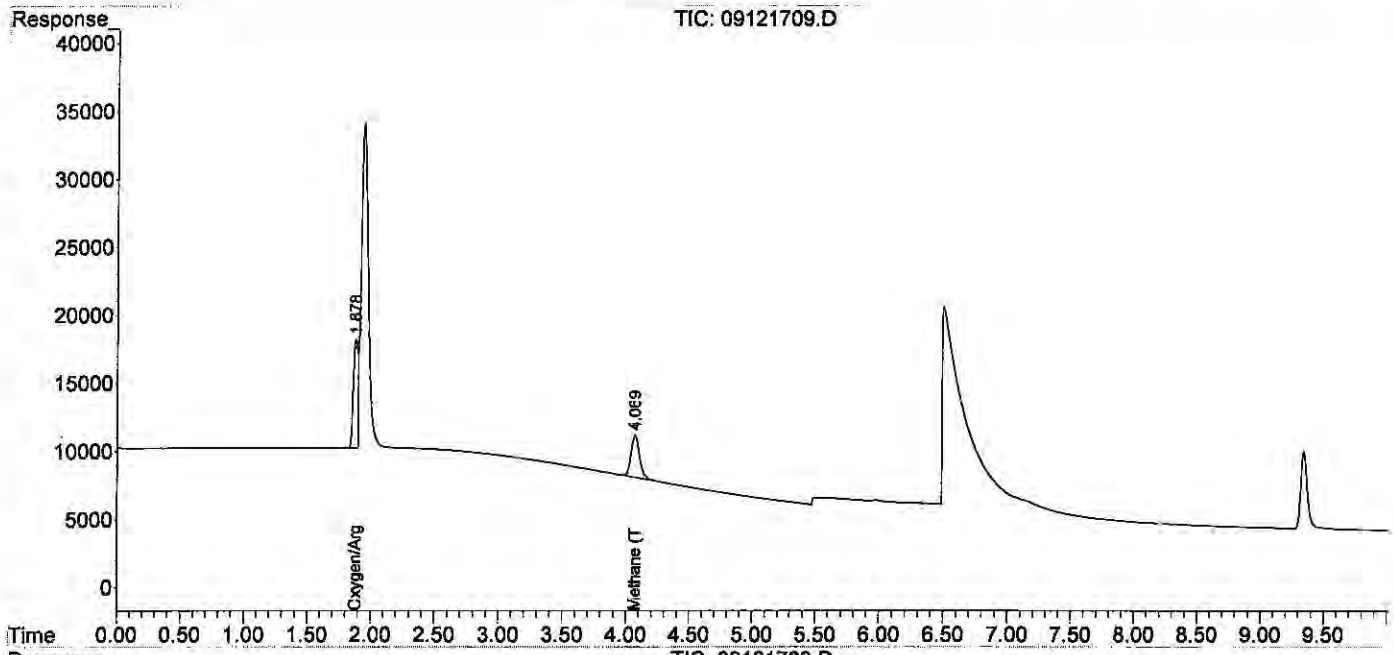
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.879	192611	0.162	ppm
2)	Carbon monoxide	1.879	192611	N.D.	ppm
3)	Methane (TCD)	4.070f	145492	1244.729	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.039	8598534	945.644	ppm
7)	Ethylene	1.576	16608504	981.887	ppm
8)	Ethane	1.827	16709165	973.644	ppm
9)	Propylene	4.161	22494888	941.060	ppm
10)	Propane	4.298	25459411	1023.223	ppm
11)	Isobutylene	6.138	16970	8645.243	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

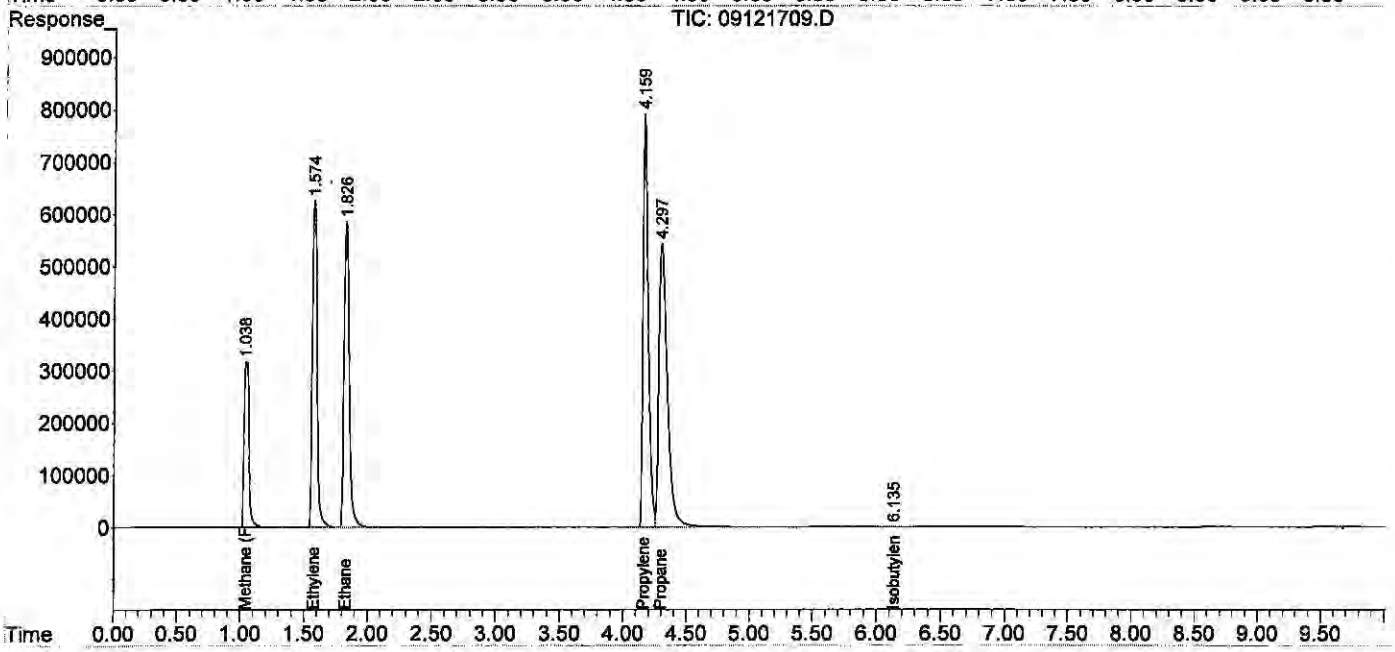
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

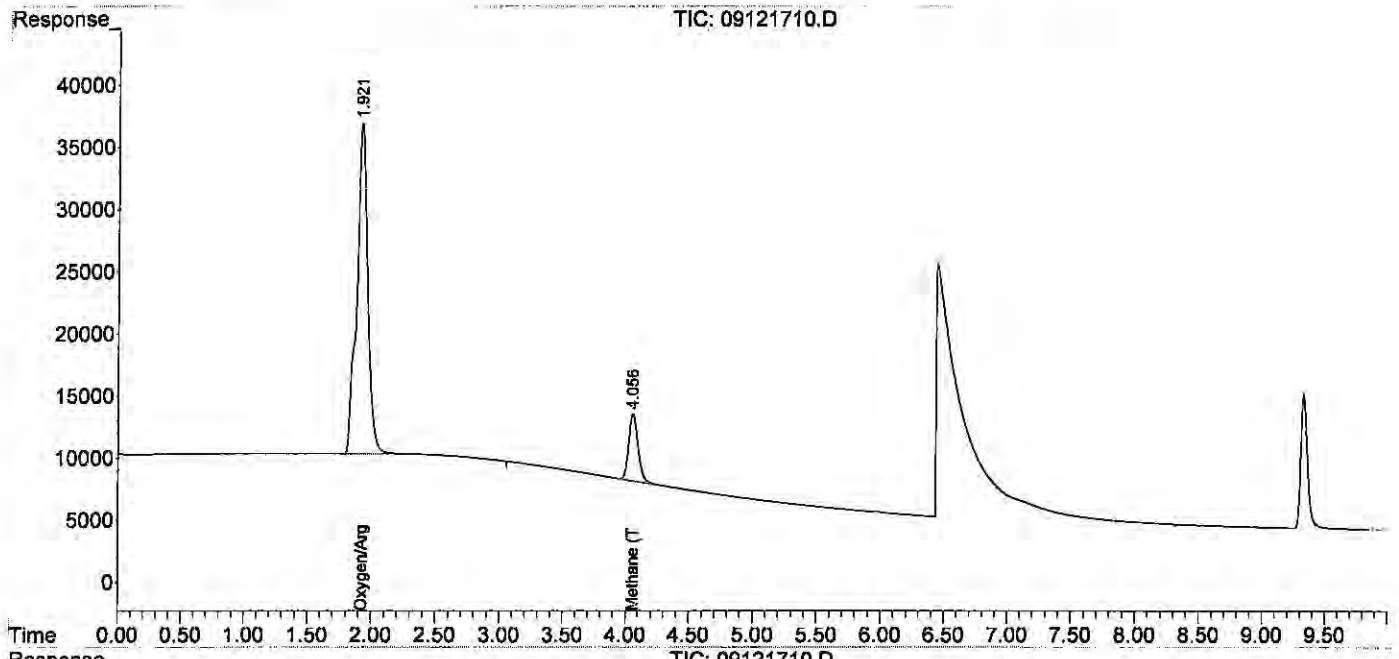
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.922f	1578147	1.659	ppm	
2)	Carbon monoxide	1.922f	1578147	N.D.	ppm	
3)	Methane (TCD)	4.057f	281651	3526.607	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.016	16098209	1763.622	ppm	
7)	Ethylene	1.552	31192444	1848.268	ppm	
8)	Ethane	1.801	31424218	1837.143	ppm	
9)	Propylene	4.129	42124690	1775.341	ppm	m
10)	Propane	4.269	48583085	1946.921	ppm	
11)	Isobutylene	6.136	33832	25613.603	ppm	
12)	Isobutane	6.576f	3845	0.120	ppm	
13)	n-Butane	6.576f	3845	0.120	ppm	

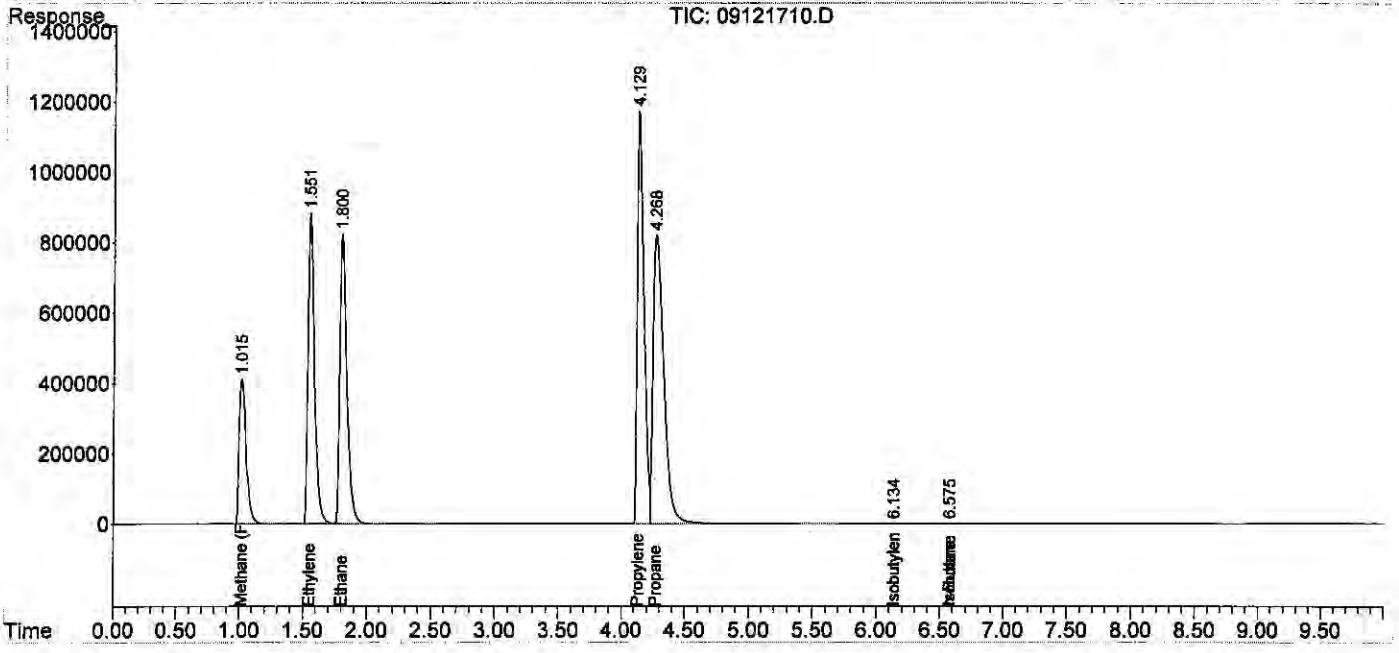
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



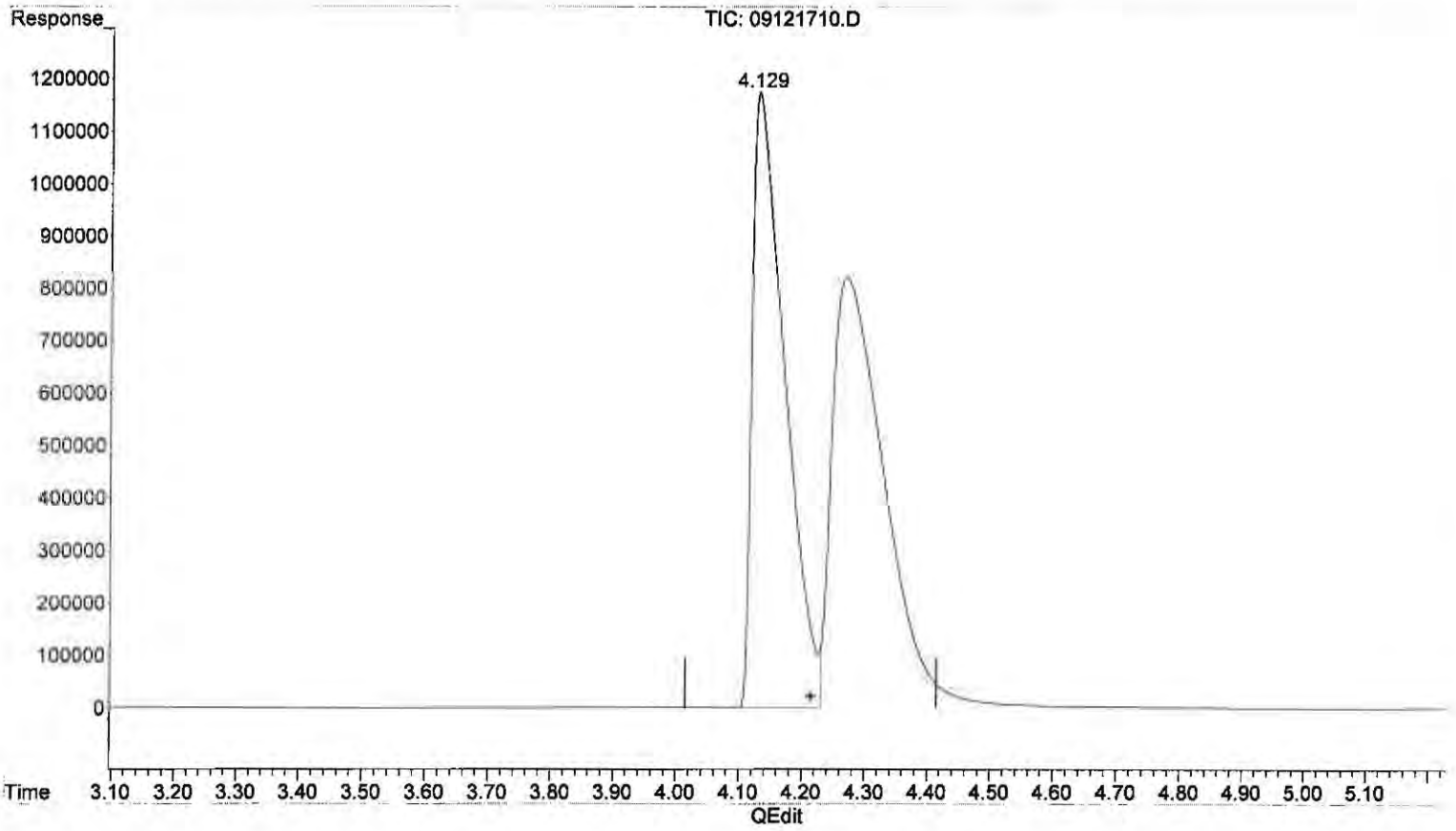


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(9) Propylene
4.129min 1775.341 ppm m
response 42124690

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

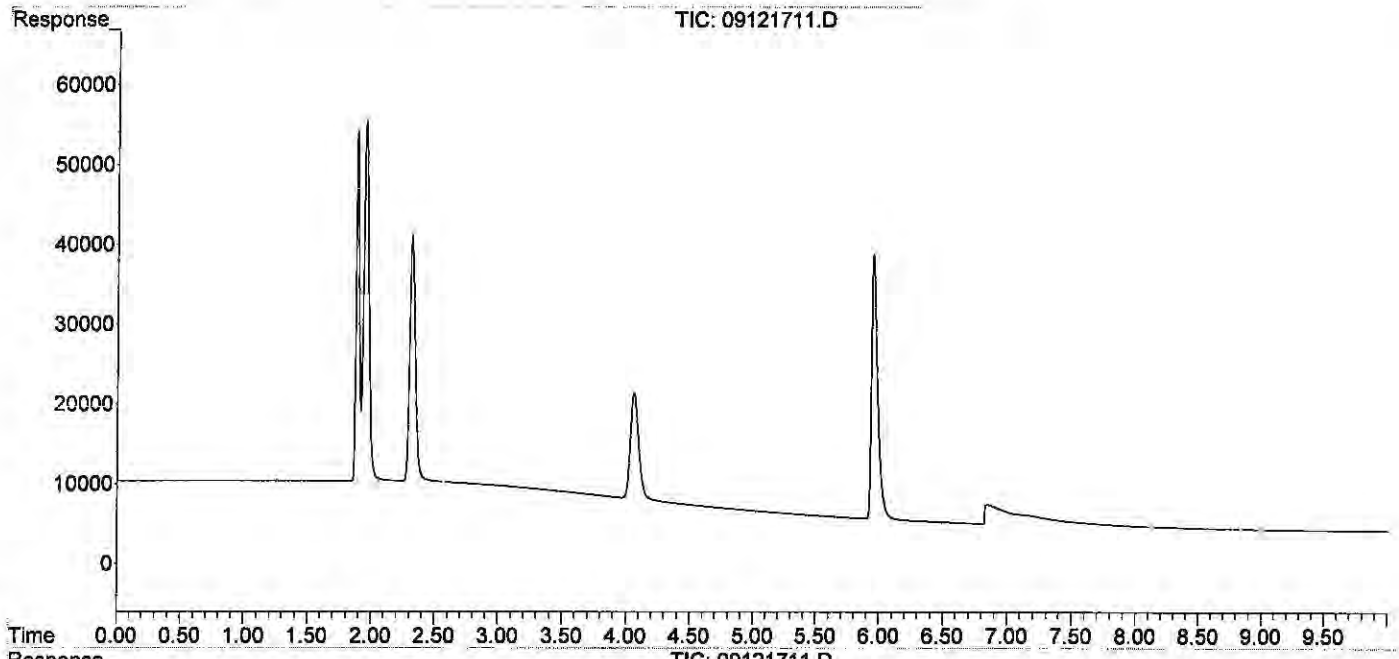
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.059	35776839	3925.122	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

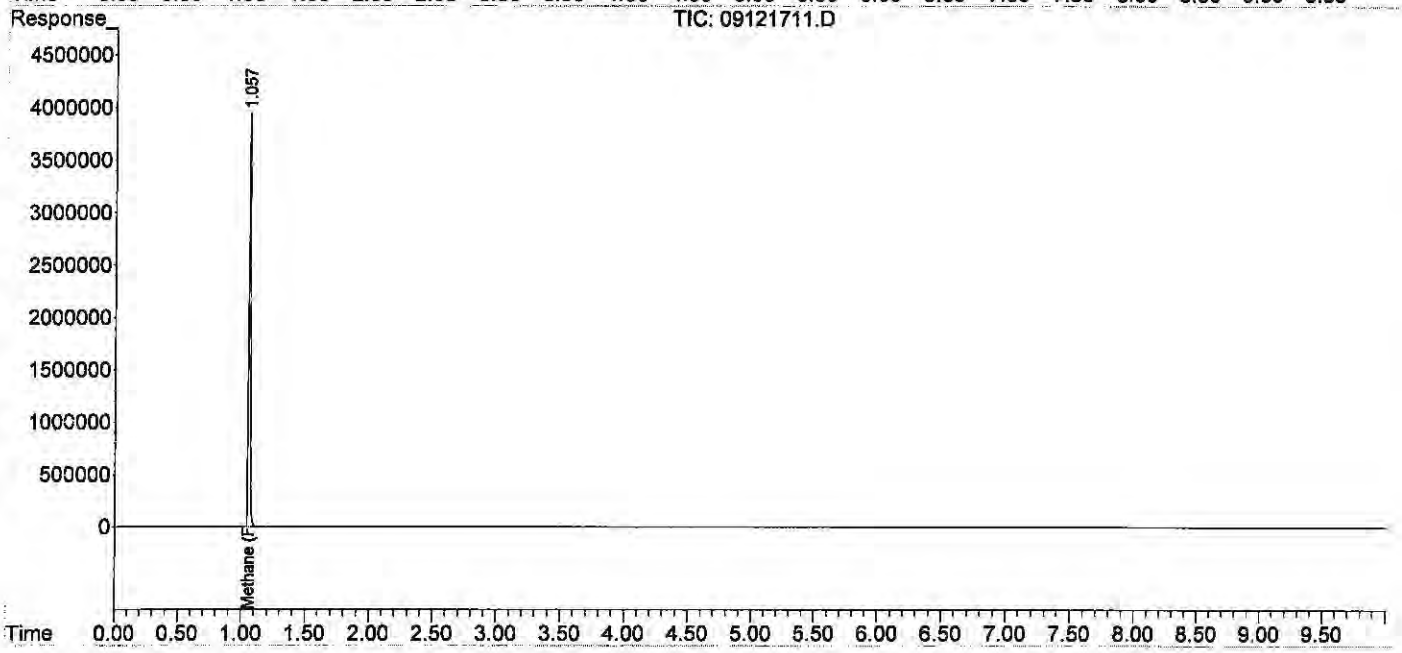
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

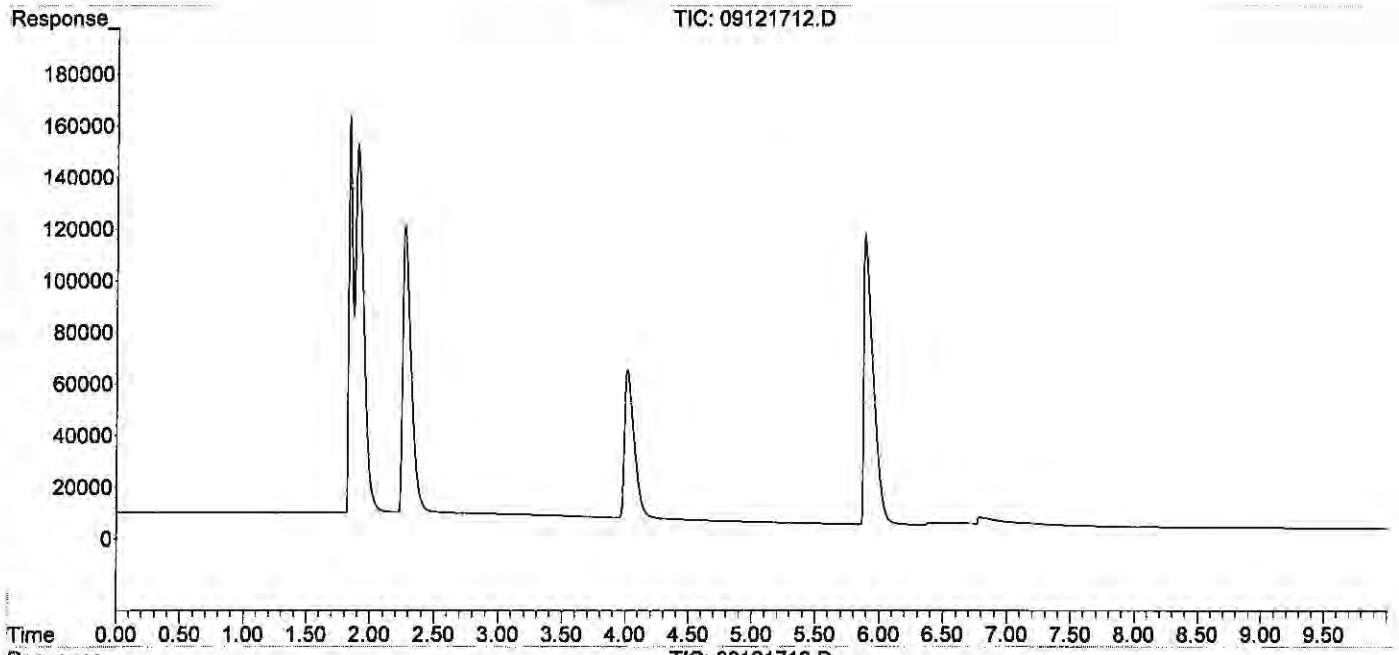
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.836	3190788	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.034	169009160	18492.064	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

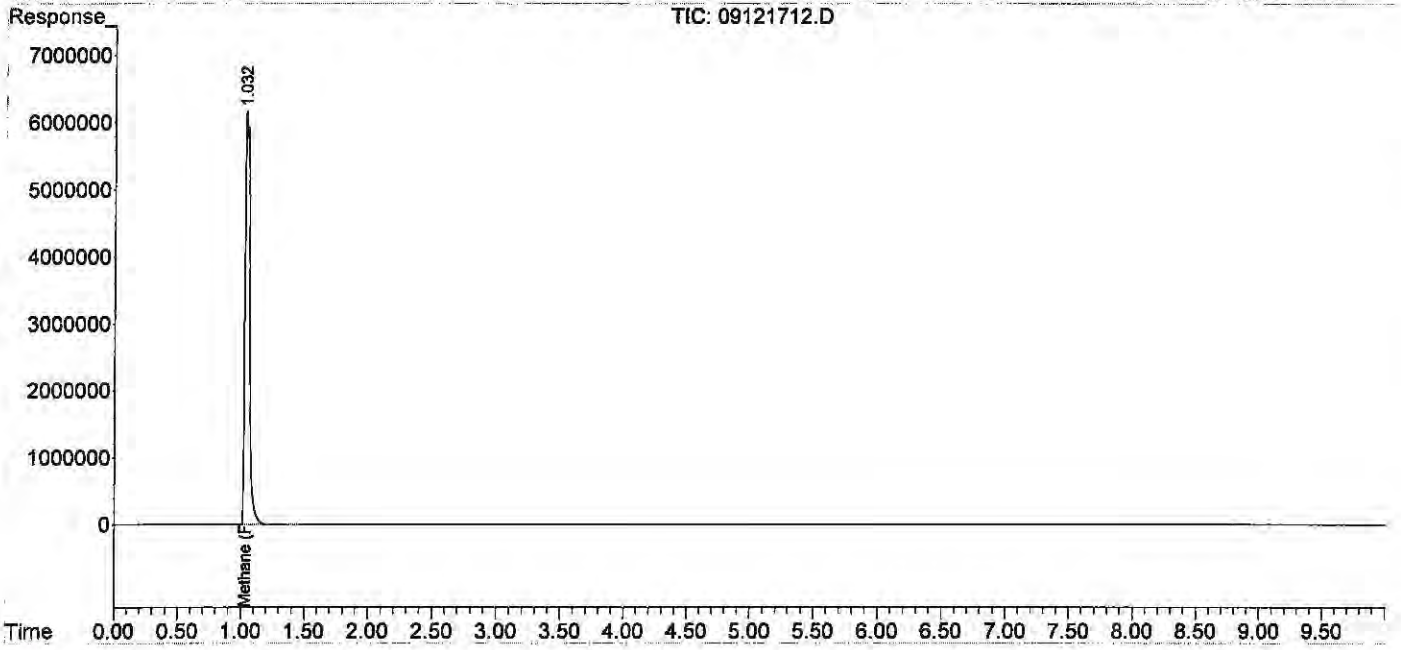
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.843	2922459	3.687	ppm	
2)	Carbon monoxide	1.843	2922459	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	actual %D
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.063	13748	1.516	ppm	1.50 101.1
7)	Ethylene	1.598	24153	1.443	ppm	1.50 96.2
8)	Ethane	1.850	24488	1.445	ppm	1.50 96.3
9)	Propylene	4.221	36004	1.537	ppm	1.50 102.5
10)	Propane	4.350	37738	1.517	ppm	1.51 100.5
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	48019	1.804	ppm	9/14/2
13)	n-Butane	6.579f	48019	1.804	ppm	

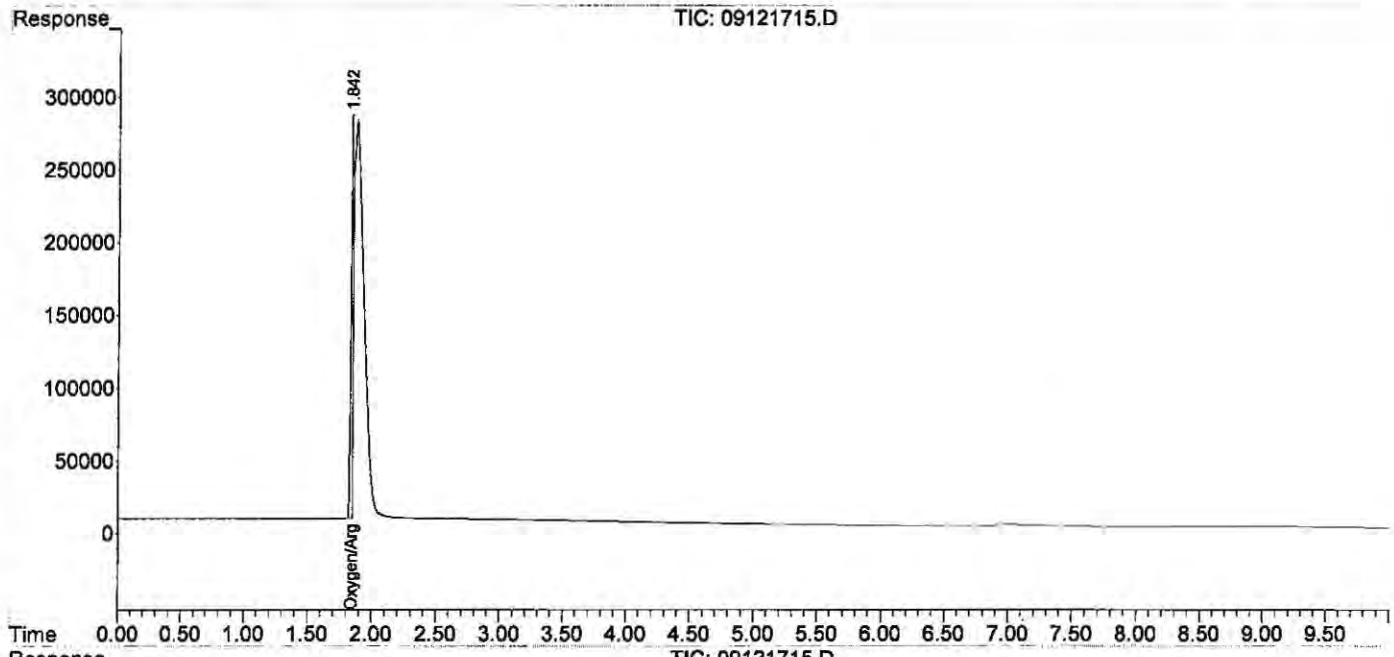
(f)=RT Delta > 1/2 Window (m)=manual int.

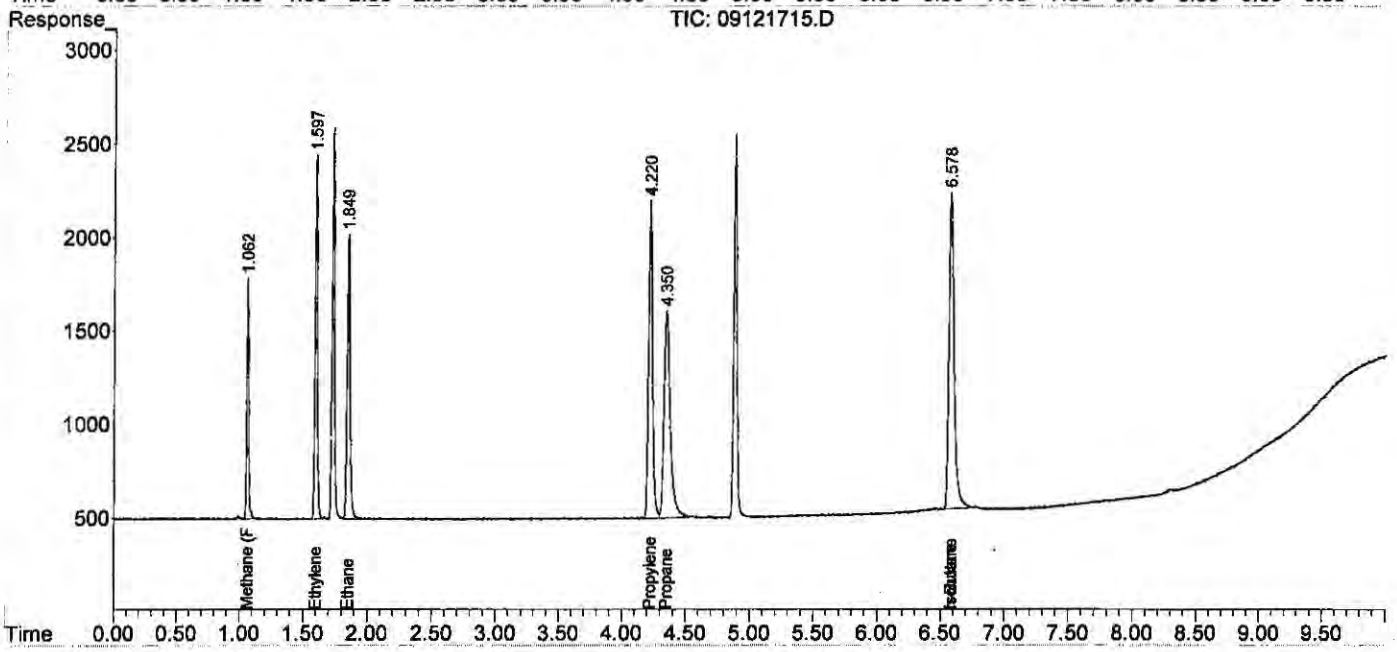
9/14/2017

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P1806800
Sample Vol. (ml) : 32.00 ml
Analyst : MR
Date Analysis : 12/18/18
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Methane	Ethylene	Ethane
std s32-07231801	0.100	1.493	1.446	1.411
ACTUAL		1.51	1.51	1.51
%Difference		1.1%	4.2%	6.6%
mcs 0.1ml	0.100	0.210	0.000	0.000
rb 0.1ml	0.100	0.000	0.000	0.000
fid lcs s30-05241604	0.100	1.455	0.993	1.227
fid lcsd s30-05241604	0.100	1.474	0.994	1.240
P1806800-001 0.1ml	0.100	231.368	0.287	0.000
P1806800-002 0.1ml	0.100	35.905	0.000	0.000
P1806800-003 0.1ml	0.100	3.012	0.000	0.000
P1806800-004 0.1ml	0.100	1155.69	0.000	0.000
P1806800-005 0.1ml	0.100	91.706	6.375	0.123

FINAL HEAD SPACE RESULT (ppm)

	Methane	Ethylene	Ethane
WWt.	16.04	28.05	30.07
HENRY'S CONSTANT	3.76E+04	1.02E+04	2.63E+04
RL	1.30	1.00	0.60
mcs 0.1ml	2.100	0.000	0.000
fid lcs s30-05241604	14.550	9.930	12.270
fid lcsd s30-05241604	14.740	9.940	12.400
P1806800-001 0.1ml	2313.680	2.870	0.000
P1806800-002 0.1ml	359.050	0.000	0.000
P1806800-003 0.1ml	30.120	0.000	0.000
P1806800-004 0.1ml	11556.94	0.000	0.000
P1806800-005 0.1ml	917.060	63.750	1.230

std s32-07231801	1.649	1.531	1.533
ACTUAL	1.51	1.51	1.51
%Difference	9.2%	1.4%	1.5%

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 10:54:59
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:04:59 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.103	13538	1.493	ppm
7)	Ethylene	1.663	24191	1.446	ppm
8)	Ethane	1.926	23920	1.411	ppm
9)	Propylene	4.316	32381	1.382	ppm
10)	Propane	4.439	33922	1.363	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.654	40657	1.527	ppm
13)	n-Butane	6.654	40657	1.527	ppm

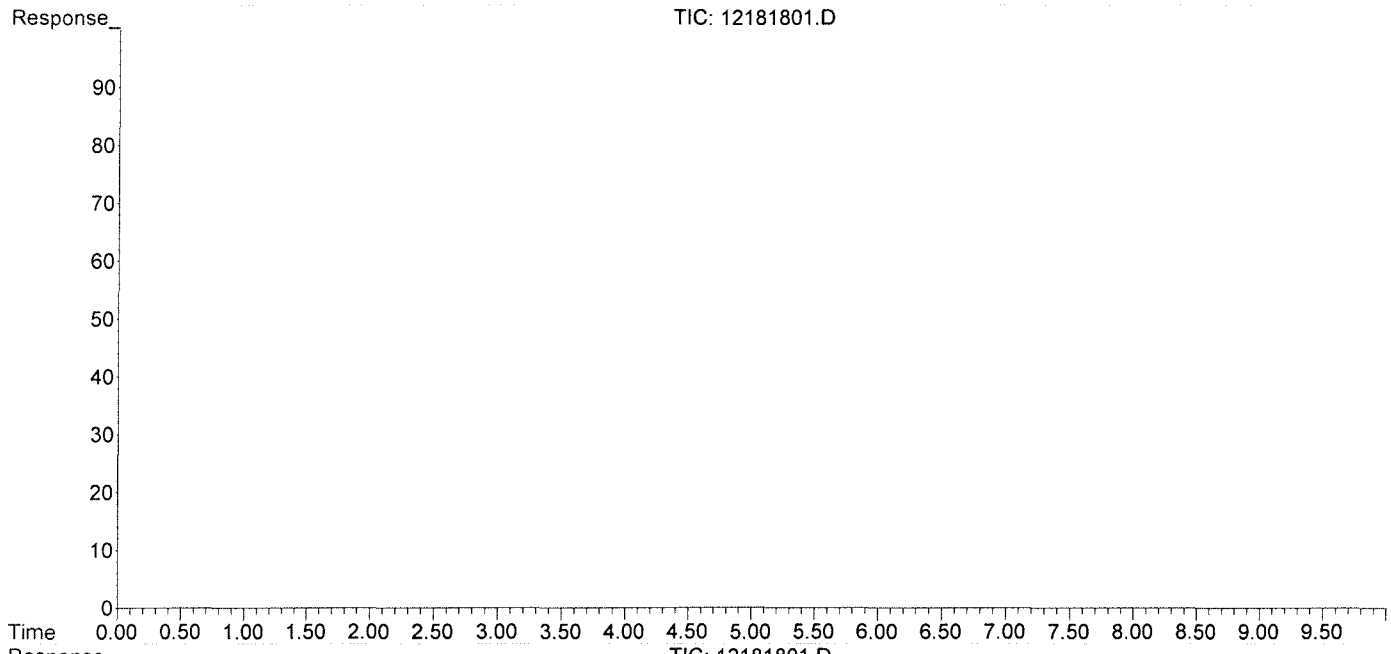
(f)=RT Delta > 1/2 Window (m)=manual int.

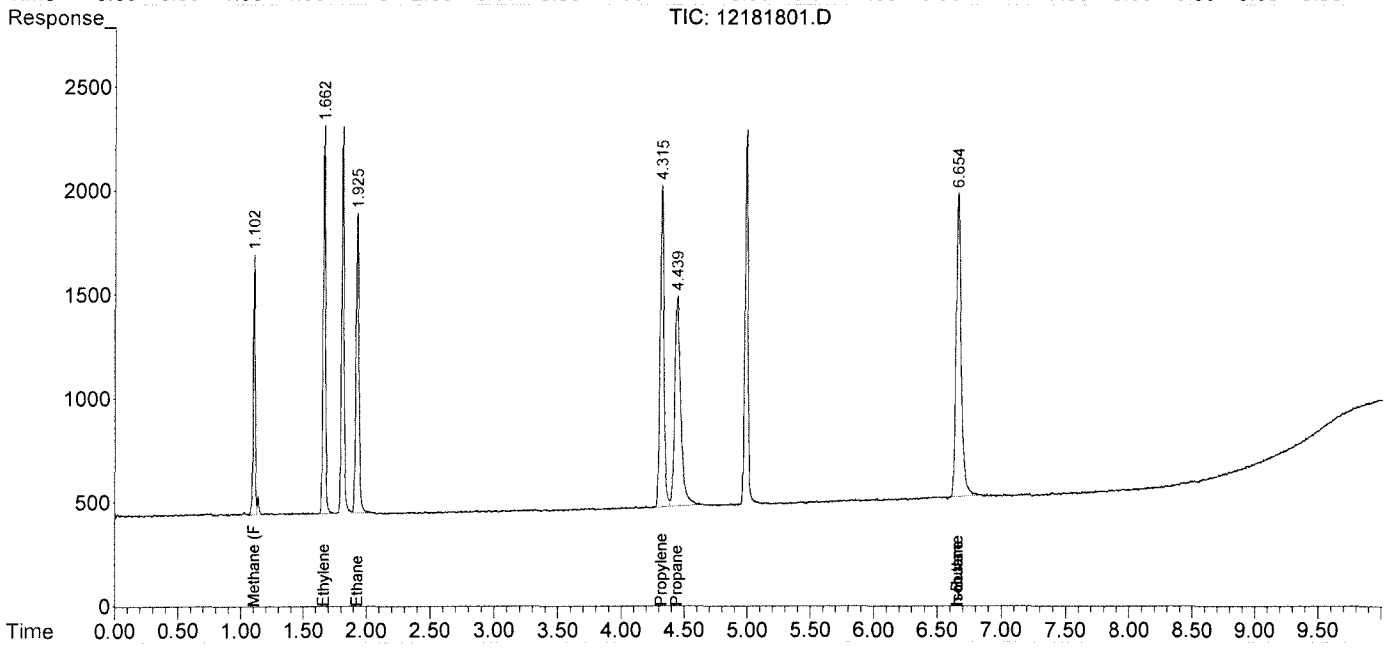
MR 12/19/18

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 10:54:59
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 11:04:59 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181814.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 14:21:37
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 14:33:28 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

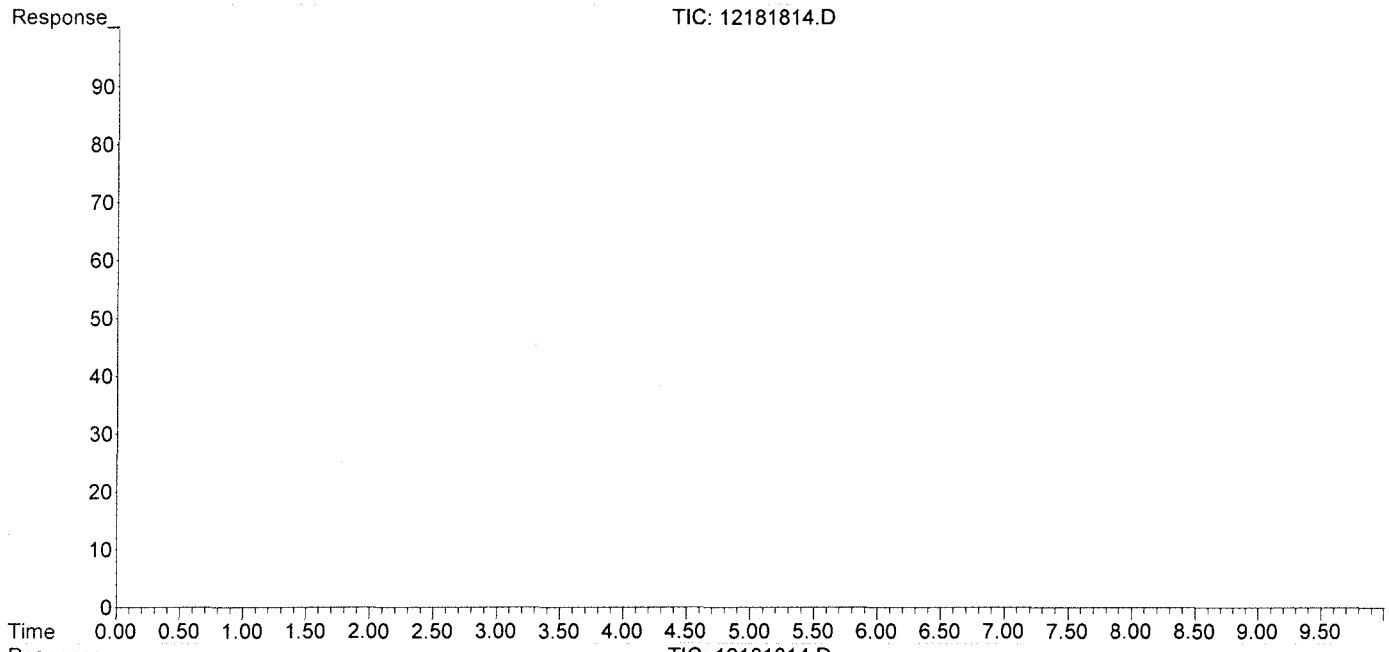
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.117	14090	1.553	ppm
7)	Ethylene	1.676	25325	1.513	ppm
8)	Ethane	1.938	25219	1.488	ppm
9)	Propylene	4.317	36164	1.543	ppm
10)	Propane	4.441	36725	1.476	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.655	51344	1.929	ppm
13)	n-Butane	6.655	51344	1.929	ppm

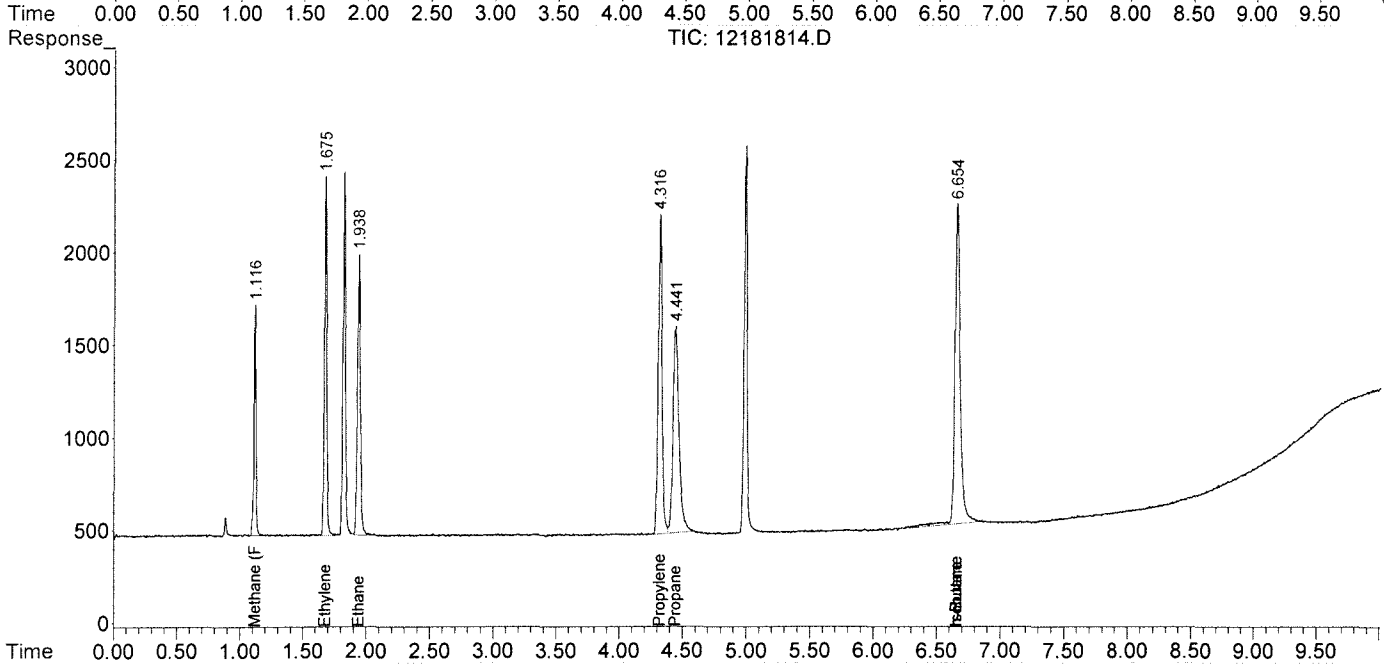
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181814.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 14:21:37
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 14:33:28 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181820.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:47:30
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 15:59:07 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

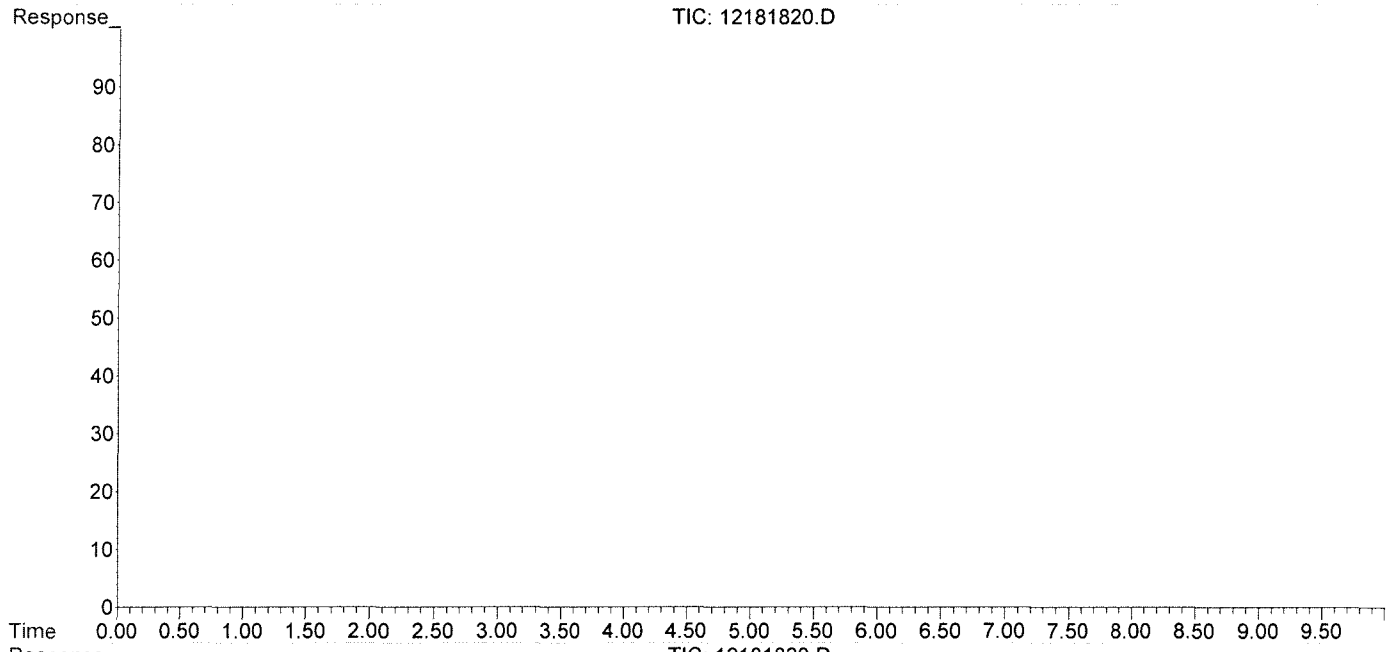
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.116	14955	1.649	ppm
7)	Ethylene	1.679	25619	1.531	ppm
8)	Ethane	1.942	25986	1.533	ppm
9)	Propylene	4.320	36383	1.553	ppm
10)	Propane	4.444	37896	1.523	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.655	59888	2.250	ppm
13)	n-Butane	6.655	59888	2.250	ppm

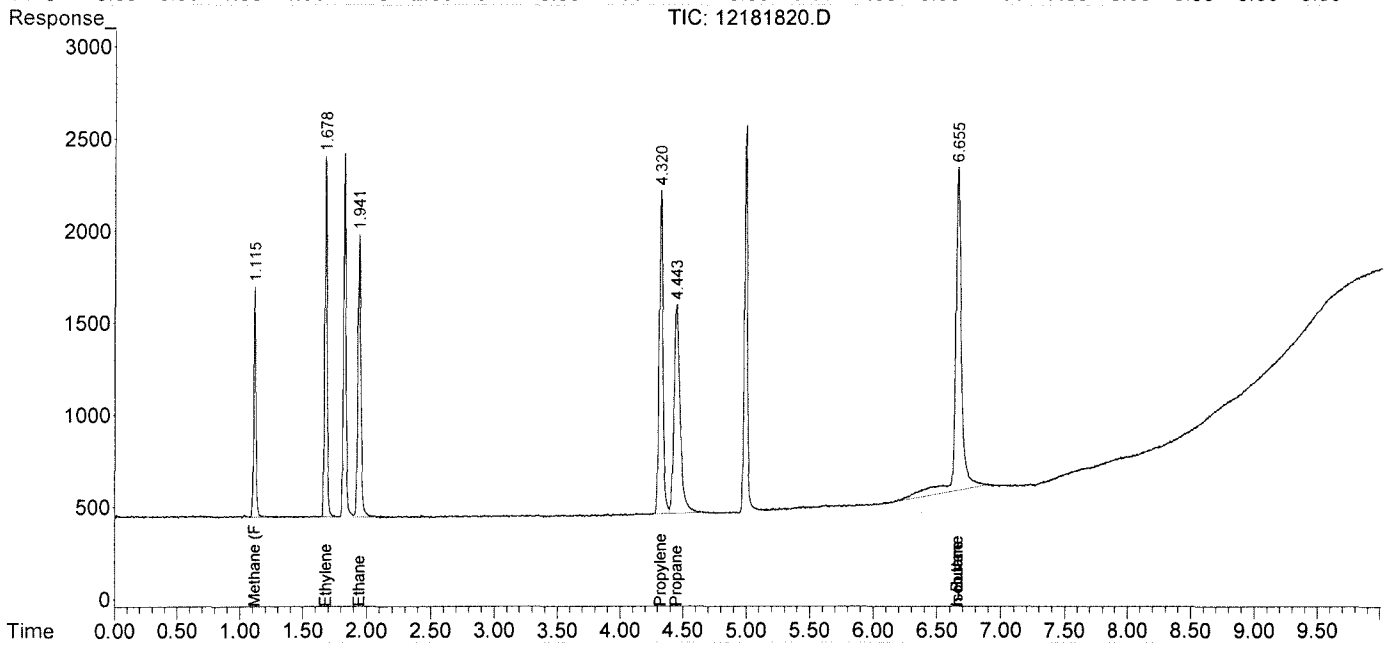
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\18\
Data File : 12181820.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Dec-2018, 15:47:30
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 18 15:59:07 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2018_12\18\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	18-Dec-18, 10:54:59	12181801.D	std s32-07231801		MR	RSKBOTH.M	pass
2	18-Dec-18, 11:08:29	12181802.D	rb 0.1ml		MR	RSKBOTH.M	pass
3	18-Dec-18, 11:22:34	12181803.D	mcs 0.1ml		MR	RSKBOTH.M	pass
4	18-Dec-18, 11:36:38	12181804.D	fid lcs s30-05241604		MR	RSKBOTH.M	pass
5	18-Dec-18, 11:47:34	12181805.D	fid lcsd s30-05241604		MR	RSKBOTH.M	pass
6	18-Dec-18, 12:03:02	12181806.D	K1811919-001 0.1		MR	RSKBOTH.M	
7	18-Dec-18, 12:16:57	12181807.D	K1811919-002 0.1		MR	RSKBOTH.M	
8	18-Dec-18, 12:30:38	12181808.D	K1811919-002 ms		MR	RSKBOTH.M	
9	18-Dec-18, 12:43:49	12181809.D	K1811919-002 msd		MR	RSKBOTH.M	
10	18-Dec-18, 13:23:55	12181810.D	K1811919-003 0.1		MR	RSKBOTH.M	
11	18-Dec-18, 13:38:01	12181811.D	K1811919-004 0.1		MR	RSKBOTH.M	
12	18-Dec-18, 13:53:34	12181812.D	K1811919-004 ms		MR	RSKBOTH.M	
13	18-Dec-18, 14:08:07	12181813.D	K1811919-004 msd		MR	RSKBOTH.M	
14	18-Dec-18, 14:21:37	12181814.D	std s32-07231801		MR	RSKBOTH.M	pass
15	18-Dec-18, 14:35:03	12181815.D	P1806800-001 0.1ml		MR	RSKBOTH.M	
16	18-Dec-18, 14:48:12	12181816.D	P1806800-002 0.1ml		MR	RSKBOTH.M	
17	18-Dec-18, 15:03:29	12181817.D	P1806800-003 0.1ml		MR	RSKBOTH.M	
18	18-Dec-18, 15:18:17	12181818.D	P1806800-004 0.1ml		MR	RSKBOTH.M	
19	18-Dec-18, 15:32:17	12181819.D	P1806800-005 0.1ml		MR	RSKBOTH.M	
20	18-Dec-18, 15:47:30	12181820.D	std s32-07231801		MR	RSKBOTH.M	pass
21	18-Dec-18, 16:01:07	12181821.D	4 4 0.1ml		MR	RSKBOTH.M	
22	18-Dec-18, 16:16:20	12181822.D	4 4 0.8ml		MR	RSKBOTH.M	
23	18-Dec-18, 16:29:42	12181823.D	2 6 0.1ml		MR	RSKBOTH.M	
24	18-Dec-18, 16:42:46	12181824.D	2 6 0.1ml		MR	RSKBOTH.M	
25	18-Dec-18, 16:56:23	12181825.D	1 7 0.1ml		MR	RSKBOTH.M	
26	18-Dec-18, 17:08:51	12181826.D	1 7 0.8ml		MR	RSKBOTH.M	

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January 02, 2019 **Analytical Report for Service Request No:** K1812154

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: ALS Houston DOD TOC / HS18120569

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory December 12, 2018
For your reference, these analyses have been assigned our service request number **K1812154.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K1812154
Date Received: 12/12/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 12/12/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 01/02/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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R1812154

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Subcontract Chain of Custody

COC ID: 10414

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18120569
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18120569-01**	**35AWW20_121018**	**Groundwater**	**10 Dec 2018 09:10**
	TOC Analysis for DOD Level IV			26 Dec 2018
2.	**HS18120569-02**	**35AWW24_121018**	**Groundwater**	**10 Dec 2018 10:15**
	TOC Analysis for DOD Level IV			26 Dec 2018
3.	**HS18120569-03**	**35AWW19_121018**	**Groundwater**	**10 Dec 2018 11:15**
	TOC Analysis for DOD Level IV			26 Dec 2018
4.	**HS18120569-04**	**35AWW23_121018**	**Groundwater**	**10 Dec 2018 12:30**
	TOC Analysis for DOD Level IV			26 Dec 2018
5.	**HS18120569-05**	**LHSMW07_121018**	**Groundwater**	**10 Dec 2018 13:30**
	TOC Analysis for DOD Level IV			26 Dec 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

K1812154

Subcontract Chain of Custody

COC ID: 10414

Relinquished By:	J. Monaghan	Date/Time:	12/11/18 18:00
Received By:		Date/Time:	12/12/18 0950
Cooler ID(s):		Temperature(s):	

00944812

PC KL

Cooler Receipt and Preservation Form

Client ALS / Houston Service Request K1812154

Received: 12/12/18 Opened: 12/12/18 By: [signature] Unloaded: 12/12/18 By: [signature]

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2, front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected. Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.4	0.5	0.2	0.2	+0.1	397	10414	4380 9532 5320	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1812154
Project:	ALS Houston DOD TOC/HS18120569	**Date Collected:**	12/10/18
Sample Matrix:	Ground Water	**Date Received:**	12/12/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
35AWW20_121018	K1812154-001	**19.0**	0.50	0.20	0.07	1	12/29/18 09:17	
35AWW24_121018	K1812154-002	**1.67**	0.50	0.20	0.07	1	12/21/18 12:59	
35AWW19_121018	K1812154-003	**2.17**	0.50	0.20	0.07	1	12/21/18 14:02	
35AWW23_121018	K1812154-004	**879**	25	10	4	50	12/21/18 14:34	
LHSMW07_121018	K1812154-005	**7.53**	0.50	0.20	0.07	1	12/29/18 10:37	
Method Blank	K1812154-MB1	ND U	0.50	0.20	0.07	1	12/21/18 11:06	
Method Blank	K1812154-MB2	ND U	0.50	0.20	0.07	1	12/28/18 20:29	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1812154
Project:	ALS Houston DOD TOC/HS18120569	**Date Analyzed:**	12/21/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	619810

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1812154-LCS1	20.3	21.9	93	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1812154
Project:	ALS Houston DOD TOC/HS18120569	**Date Analyzed:**	12/28/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	620497

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1812154-LCS2	20.7	21.9	94	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1812154
Project: ALS Houston DOD TOC/HS18120569

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	619810	KQ1818709-28	12/21/18 05:13	25.0	24.3	97	90-110
CCV2	619810	KQ1818709-29	12/21/18 10:33	25.0	24.0	96	90-110
CCV3	619810	KQ1818709-30	12/21/18 15:37	25.0	23.7	95	90-110
CCV4	619810	KQ1818709-31	12/21/18 21:13	25.0	23.6	94	90-110
CCV5	619810	KQ1818709-32	12/22/18 02:33	25.0	23.6	95	90-110
CCV6	619810	KQ1818709-33	12/22/18 07:36	25.0	23.9	95	90-110
CCV7	620497	KQ1818870-16	12/29/18 02:19	25.0	24.1	96	90-110
CCV8	620497	KQ1818870-17	12/29/18 07:39	25.0	24.2	97	90-110
CCV9	620497	KQ1818870-18	12/29/18 12:29	25.0	23.8	95	90-110
CCV10	620497	KQ1818870-19	12/29/18 17:17	25.0	23.7	95	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1812154
Project: ALS Houston DOD TOC/HS18120569

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	619810	KQ1818709-34	12/21/18 05:30	0.50	0.20	0.07	ND	U
CCB2	619810	KQ1818709-35	12/21/18 10:49	0.50	0.20	0.07	ND	U
CCB3	619810	KQ1818709-36	12/21/18 15:54	0.50	0.20	0.07	ND	U
CCB4	619810	KQ1818709-37	12/21/18 21:29	0.50	0.20	0.07	ND	U
CCB5	619810	KQ1818709-38	12/22/18 02:49	0.50	0.20	0.07	ND	U
CCB6	619810	KQ1818709-39	12/22/18 07:53	0.50	0.20	0.07	ND	U
CCB7	620497	KQ1818870-12	12/29/18 02:36	0.50	0.20	0.07	ND	U
CCB8	620497	KQ1818870-13	12/29/18 07:56	0.50	0.20	0.07	ND	U
CCB9	620497	KQ1818870-14	12/29/18 12:45	0.50	0.20	0.07	ND	U
CCB10	620497	KQ1818870-15	12/29/18 17:34	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
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General Chemistry

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Work Request # (Original) K18/1658, 1888, 2001, 1625, 1728, 1789, 1849, 1831, 2101, 2154,
1928, 2278, 2279, 2272, 1745, 1747, 2416

Tier: II IV IV I I IV II II IV IV
II IV IV IV IV IV II

Date Analyzed: 12/20/18

Analyst: CLS

Run # TOC 619808, 619810
DOC 620105

Analysis: TOC/DOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	(yes)/no/NA
2.	Holding times met for all analyses and for all samples?	(yes)/no/NA
3.	Are calculations correct?	(yes)/no/NA
4.	Is the reporting basis correct? (Dry Weight)	(yes)/no/NA
5.	All quality control criteria met?	yes/(no)
6.	Is the calibration curve correlation coefficient ≥ 0.995?	(yes)/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	(yes)/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	(yes)/no/NA
9.	Are results for methods blanks all ND?	(yes)/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/(no)/NA
11.	Are all exceptions explained?	(yes)/no/NA
12.	Have all applicable service requests been reviewed?	(yes)/no/NA
13.	Are all samples labeled correctly?	(yes)/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	(yes)/no/NA
15.	Are detection limits and units reported correctly?	(yes)/no/NA
16.	Is the unused space on the benchsheet crossed out?	(yes)/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/(no)/NA

COMMENTS:

1789-2, 3, 4, 5, 8, 1849-4, 2416-35 RPD not within acceptance limits. The sample results are less than 5x the MRL.
RA 2154-1, 2154-5 - over diluted.
1831-2, 1745-1 RPD not within acceptance limits - samples contain sediment - non homogeneous.

Final Approved by: _____ Date: 12/26/18

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619808 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811625-001	Carbon, Total Organic	N/A		Ground Water	4.25 mg/L	10 ml	8.5 mg/L	2	0.2	1.0			12/20/18 16:31	N	I
K1811625-003	Carbon, Total Organic	N/A		Ground Water	4.47 mg/L	10 ml	4.47 mg/L	1	0.07	0.50			12/20/18 17:51	N	I
K1811658-004	Carbon, Total Organic	N/A		Water	3.83 mg/L	10 ml	3.83 mg/L	1	0.07	0.50			12/20/18 13:18	N	II
K1811728-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 18:54	N	I
K1811728-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 19:26	N	I
K1811789-002	Carbon, Total Organic	N/A		Ground Water	0.51 mg/L	10 ml	0.51 mg/L	1	0.07	0.50			12/20/18 19:58	N	IV
K1811789-003	Carbon, Total Organic	N/A		Ground Water	0.74 mg/L	10 ml	0.74 mg/L	1	0.07	0.50			12/20/18 22:39	N	IV
K1811789-004	Carbon, Total Organic	N/A		Ground Water	0.16 mg/L	10 ml	0.16 mg/L J	1	0.07	0.50			12/20/18 23:42	N	IV
K1811789-005	Carbon, Total Organic	N/A		Ground Water	0.77 mg/L	10 ml	0.77 mg/L	1	0.07	0.50			12/21/18 00:45	N	IV
K1811789-006	Carbon, Total Organic	N/A		Ground Water	0.55 mg/L	10 ml	0.55 mg/L	1	0.07	0.50			12/21/18 01:48	N	IV
K1811789-008	Carbon, Total Organic	N/A		Ground Water	0.39 mg/L	10 ml	0.39 mg/L J	1	0.07	0.50			12/21/18 02:51	N	IV
K1811831-002	Carbon, Total Organic	N/A		Water	6.74 mg/L	10 ml	6.74 mg/L	1	0.07	0.50			12/21/18 08:25	N	II
K1811849-001	Carbon, Total Organic	N/A		Water	1.24 mg/L	10 ml	1.24 mg/L	1	0.07	0.50			12/21/18 04:25	N	II
K1811849-002	Carbon, Total Organic	N/A		Water	8.22 mg/L	10 ml	32.9 mg/L	4	0.3	2.0			12/21/18 05:46	N	II
K1811849-003	Carbon, Total Organic	N/A		Water	7.74 mg/L	10 ml	31.0 mg/L	4	0.3	2.0			12/21/18 06:18	N	II
K1811849-004	Carbon, Total Organic	N/A		Water	1.09 mg/L	10 ml	1.09 mg/L	1	0.07	0.50			12/21/18 06:50	N	II
K1811849-005	Carbon, Total Organic	N/A		Water	5.34 mg/L	10 ml	5.34 mg/L	1	0.07	0.50			12/21/18 07:22	N	II
K1811888-002	Carbon, Total Organic	N/A		Water	2.74 mg/L	10 ml	2.74 mg/L	1	0.07	0.50			12/20/18 14:22	N	IV
K1812001-001	Carbon, Total Organic	N/A		Water	6.94 mg/L	10 ml	69.4 mg/L	10	0.7	5.0			12/20/18 14:54	N	IV
KQ1818705-01	Carbon, Total Organic	DUP	K1811658-004	Water	3.91 mg/L	10 ml	3.91 mg/L	1	0.07	0.50		2	12/20/18 13:18	N	II
KQ1818705-02	Carbon, Total Organic	DUP	K1811888-002	Water	2.73 mg/L	10 ml	2.73 mg/L	1	0.07	0.50		<1	12/20/18 14:22	N	IV
KQ1818705-03	Carbon, Total Organic	MS	K1812001-001	Water	31.62 mg/L	10 ml	316 mg/L	10	0.7	5.0	99		12/20/18 15:25	N	IV
KQ1818705-04	Carbon, Total Organic	DUP	K1812001-001	Water	6.88 mg/L	10 ml	68.8 mg/L	10	0.7	5.0		<1	12/20/18 14:54	N	IV
KQ1818705-05	Carbon, Total Organic	MS	K1811625-001	Ground Water	29.15 mg/L	10 ml	58.3 mg/L	2	0.2	1.0	100		12/20/18 17:03	N	I
KQ1818705-06	Carbon, Total Organic	DUP	K1811625-001	Ground Water	3.84 mg/L	10 ml	7.7 mg/L	2	0.2	1.0		10	12/20/18 16:31	N	I
KQ1818705-07	Carbon, Total Organic	DUP	K1811625-003	Ground Water	4.23 mg/L	10 ml	4.23 mg/L	1	0.07	0.50		6	12/20/18 17:51	N	I
KQ1818705-08	Carbon, Total Organic	DUP	K1811728-001	Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/20/18 18:54	N	I
KQ1818705-09	Carbon, Total Organic	DUP	K1811728-002	Reagent Water	0.80 mg/L	10 ml	0.80 mg/L	1	0.07	0.50		NC	12/20/18 19:26	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619808 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818705-10	Carbon, Total Organic	MS	K1811789-002	Ground Water	25.21 mg/L	10 ml	25.2 mg/L	1	0.07	0.50	99		12/20/18 21:01	N	IV
KQ1818705-11	Carbon, Total Organic	DUP	K1811789-002	Ground Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		66*	12/20/18 19:58	N	IV
KQ1818705-12	Carbon, Total Organic	TRP	K1811789-002	Ground Water	0.22 mg/L	10 ml	0.22 mg/L J	1	0.07	0.50		48*	12/20/18 19:58	N	IV
KQ1818705-13	Carbon, Total Organic	QUAD	K1811789-002	Ground Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50		45*	12/20/18 19:58	N	IV
KQ1818705-14	Carbon, Total Organic	DUP	K1811789-003	Ground Water	0.60 mg/L	10 ml	0.60 mg/L	1	0.07	0.50		21*	12/20/18 22:39	N	IV
KQ1818705-15	Carbon, Total Organic	TRP	K1811789-003	Ground Water	0.58 mg/L	10 ml	0.58 mg/L	1	0.07	0.50		14	12/20/18 22:39	N	IV
KQ1818705-16	Carbon, Total Organic	QUAD	K1811789-003	Ground Water	0.52 mg/L	10 ml	0.52 mg/L	1	0.07	0.50		16	12/20/18 22:39	N	IV
KQ1818705-17	Carbon, Total Organic	DUP	K1811789-004	Ground Water	1.01 mg/L	10 ml	1.01 mg/L	1	0.07	0.50		146*	12/20/18 23:42	N	IV
KQ1818705-18	Carbon, Total Organic	TRP	K1811789-004	Ground Water	0.19 mg/L	10 ml	0.19 mg/L J	1	0.07	0.50		106*	12/20/18 23:42	N	IV
KQ1818705-19	Carbon, Total Organic	QUAD	K1811789-004	Ground Water	0.07 mg/L	10 ml	0.07 mg/L J	1	0.07	0.50		122*	12/20/18 23:42	N	IV
KQ1818705-20	Carbon, Total Organic	DUP	K1811789-005	Ground Water	0.58 mg/L	10 ml	0.58 mg/L	1	0.07	0.50		27*	12/21/18 00:45	N	IV
KQ1818705-21	Carbon, Total Organic	TRP	K1811789-005	Ground Water	0.57 mg/L	10 ml	0.57 mg/L	1	0.07	0.50		17	12/21/18 00:45	N	IV
KQ1818705-22	Carbon, Total Organic	QUAD	K1811789-005	Ground Water	0.61 mg/L	10 ml	0.61 mg/L	1	0.07	0.50		14	12/21/18 00:45	N	IV
KQ1818705-23	Carbon, Total Organic	DUP	K1811789-006	Ground Water	0.53 mg/L	10 ml	0.53 mg/L	1	0.07	0.50		3	12/21/18 01:48	N	IV
KQ1818705-24	Carbon, Total Organic	TRP	K1811789-006	Ground Water	0.50 mg/L	10 ml	0.50 mg/L	1	0.07	0.50		5	12/21/18 01:48	N	IV
KQ1818705-25	Carbon, Total Organic	QUAD	K1811789-006	Ground Water	0.54 mg/L	10 ml	0.54 mg/L	1	0.07	0.50		4	12/21/18 01:48	N	IV
KQ1818705-26	Carbon, Total Organic	DUP	K1811789-008	Ground Water	0.34 mg/L	10 ml	0.34 mg/L J	1	0.07	0.50		16	12/21/18 02:51	N	IV
KQ1818705-27	Carbon, Total Organic	TRP	K1811789-008	Ground Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50		31*	12/21/18 02:51	N	IV
KQ1818705-28	Carbon, Total Organic	QUAD	K1811789-008	Ground Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		28*	12/21/18 02:51	N	IV
KQ1818705-29	Carbon, Total Organic	MS	K1811849-001	Water	25.43 mg/L	10 ml	25.4 mg/L	1	0.07	0.50	97		12/21/18 04:57	N	II
KQ1818705-30	Carbon, Total Organic	DUP	K1811849-001	Water	1.25 mg/L	10 ml	1.25 mg/L	1	0.07	0.50		1	12/21/18 04:25	N	II
KQ1818705-31	Carbon, Total Organic	DUP	K1811849-002	Water	8.05 mg/L	10 ml	32.2 mg/L	4	0.3	2.0		2	12/21/18 05:46	N	II
KQ1818705-32	Carbon, Total Organic	DUP	K1811849-003	Water	7.59 mg/L	10 ml	30.3 mg/L	4	0.3	2.0		2	12/21/18 06:18	N	II
KQ1818705-33	Carbon, Total Organic	DUP	K1811849-004	Water	0.86 mg/L	10 ml	0.86 mg/L	1	0.07	0.50		24*	12/21/18 06:50	N	II
KQ1818705-34	Carbon, Total Organic	DUP	K1811849-005	Water	5.16 mg/L	10 ml	5.16 mg/L	1	0.07	0.50		3	12/21/18 07:22	N	II
KQ1818705-35	Carbon, Total Organic	MS	K1811831-002	Water	31.00 mg/L	10 ml	31.0 mg/L	1	0.07	0.50	97		12/21/18 08:57	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619808 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818705-36	Carbon, Total Organic	DUP	K1811831-002	Water	6.02 mg/L	10 ml	6.02 mg/L	1	0.07	0.50		11*	12/21/18 08:25	N	II
KQ1818705-37	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:29	N	II
KQ1818705-37	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:29	N	II
KQ1818705-38	Carbon, Total Organic	LCS		Water	20.64 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 12:46	N	II
KQ1818705-38	Carbon, Total Organic	LCS		Water	20.64 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 12:46	N	II
KQ1818705-39	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 22:06	N	II
KQ1818705-39	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 22:06	N	II
KQ1818705-40	Carbon, Total Organic	LCS		Water	20.62 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 22:23	N	II
KQ1818705-40	Carbon, Total Organic	LCS		Water	20.62 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 22:23	N	II
KQ1818705-41	Carbon, Total Organic	CCV		Water	24.08 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 11:56	N	II
KQ1818705-41	Carbon, Total Organic	CCV		Water	24.08 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 11:56	N	II
KQ1818705-42	Carbon, Total Organic	CCV		Water	24.01 mg/L	10 ml	24.0 mg/L	1			96		12/20/18 15:58	N	II
KQ1818705-42	Carbon, Total Organic	CCV		Water	24.01 mg/L	10 ml	24.0 mg/L	1			96		12/20/18 15:58	N	II
KQ1818705-43	Carbon, Total Organic	CCV		Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 21:33	N	II
KQ1818705-43	Carbon, Total Organic	CCV		Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 21:33	N	II
KQ1818705-44	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	II
KQ1818705-44	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	II
KQ1818705-45	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	II
KQ1818705-45	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	II
KQ1818705-46	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:13	N	II
KQ1818705-46	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:13	N	II
KQ1818705-47	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 16:14	N	II
KQ1818705-47	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 16:14	N	II
KQ1818705-48	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 21:50	N	II
KQ1818705-48	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 21:50	N	II
KQ1818705-49	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	II
KQ1818705-49	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	II
KQ1818705-50	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	II
KQ1818705-50	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

00944825

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619810 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811745-001	Carbon, Total Organic	N/A		Water	1.55 mg/L	10 ml	1.55 mg/L	1	0.07	0.50			12/22/18 05:13	N	IV
K1811747-001	Carbon, Total Organic	N/A		Water	4.71 mg/L	10 ml	4.71 mg/L	1	0.07	0.50			12/22/18 06:48	N	IV
K1811928-001	Carbon, Total Organic	N/A		Drinking Water	0.10 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 17:14	N	II
K1812101-001	Carbon, Total Organic	N/A		Water	16.05 mg/L	10 ml	16.0 mg/L	1	0.07	0.50			12/21/18 09:45	N	IV
K1812154-001	Carbon, Total Organic	N/A		Ground Water	0.19 mg/L	10 ml	10 mg/L J	50	4	25			12/21/18 11:39	N	IV
K1812154-002	Carbon, Total Organic	N/A		Ground Water	1.67 mg/L	10 ml	1.67 mg/L	1	0.07	0.50			12/21/18 12:59	N	IV
K1812154-003	Carbon, Total Organic	N/A		Ground Water	2.17 mg/L	10 ml	2.17 mg/L	1	0.07	0.50			12/21/18 14:02	N	IV
K1812154-004	Carbon, Total Organic	N/A		Ground Water	17.57 mg/L	10 ml	879 mg/L	50	4	25			12/21/18 14:34	N	IV
K1812154-005	Carbon, Total Organic	N/A		Ground Water	0.16 mg/L	10 ml	3 mg/L J	20	2	10			12/21/18 16:10	N	IV
K1812272-001	Carbon, Total Organic	N/A		Ground Water	10.54 mg/L	10 ml	42.2 mg/L	4	0.3	2.0			12/22/18 00:42	N	IV
K1812272-002	Carbon, Total Organic	N/A		Ground Water	3.92 mg/L	10 ml	392 mg/L	100	7	50			12/22/18 03:06	N	IV
K1812272-003	Carbon, Total Organic	N/A		Ground Water	3.97 mg/L	10 ml	3.97 mg/L	1	0.07	0.50			12/22/18 03:38	N	IV
K1812272-004	Carbon, Total Organic	N/A		Ground Water	4.03 mg/L	10 ml	4.03 mg/L	1	0.07	0.50			12/22/18 04:09	N	IV
K1812278-001	Carbon, Total Organic	N/A		Ground Water	13.71 mg/L	10 ml	685 mg/L	50	4	25			12/21/18 18:19	N	IV
K1812278-002	Carbon, Total Organic	N/A		Ground Water	14.02 mg/L	10 ml	701 mg/L	50	4	25			12/21/18 22:19	N	IV
K1812278-003	Carbon, Total Organic	N/A		Ground Water	1.13 mg/L	10 ml	4.5 mg/L	4	0.3	2.0			12/21/18 20:41	N	IV
K1812279-001	Carbon, Total Organic	N/A		Water	24.72 mg/L	10 ml	24.7 mg/L	1	0.07	0.50			12/21/18 23:22	N	IV
KQ1818709-01	Carbon, Total Organic	MS	K1812101-001	Water	40.70 mg/L	10 ml	40.7 mg/L	1	0.07	0.50	99		12/21/18 10:16	N	IV
KQ1818709-02	Carbon, Total Organic	DUP	K1812101-001	Water	16.03 mg/L	10 ml	16.0 mg/L	1	0.07	0.50		<1	12/21/18 09:45	N	IV
KQ1818709-03	Carbon, Total Organic	MS	K1812154-001	Ground Water	24.33 mg/L	10 ml	1220 mg/L	50	4	25	97		12/21/18 12:11	N	IV
KQ1818709-04	Carbon, Total Organic	DUP	K1812154-001	Ground Water	0.00 mg/L	10 ml	25 mg/L U	50	4	25		NC	12/21/18 11:39	N	IV
KQ1818709-05	Carbon, Total Organic	DUP	K1812154-002	Ground Water	1.52 mg/L	10 ml	1.52 mg/L	1	0.07	0.50		9	12/21/18 12:59	N	IV
KQ1818709-06	Carbon, Total Organic	DUP	K1812154-003	Ground Water	2.18 mg/L	10 ml	2.18 mg/L	1	0.07	0.50		<1	12/21/18 14:02	N	IV
KQ1818709-07	Carbon, Total Organic	DUP	K1812154-004	Ground Water	17.56 mg/L	10 ml	878 mg/L	50	4	25		<1	12/21/18 14:34	N	IV
KQ1818709-08	Carbon, Total Organic	DUP	K1812154-005	Ground Water	0.00 mg/L	10 ml	10 mg/L U	20	2	10		NC	12/21/18 16:10	N	IV
KQ1818709-09	Carbon, Total Organic	MS	K1811928-001	Drinking Water	24.48 mg/L	10 ml	24.5 mg/L	1	0.07	0.50	98		12/21/18 17:46	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619810 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818709-10	Carbon, Total Organic	DUP	K1811928-001	Drinking Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/21/18 17:14	N	II
KQ1818709-11	Carbon, Total Organic	MS	K1812278-001	Ground Water	38.12 mg/L	10 ml	1910 mg/L	50	4	25	98		12/21/18 19:22	N	IV
KQ1818709-12	Carbon, Total Organic	DUP	K1812278-001	Ground Water	13.53 mg/L	10 ml	677 mg/L	50	4	25		1	12/21/18 18:19	N	IV
KQ1818709-13	Carbon, Total Organic	DUP	K1812278-002	Ground Water	13.66 mg/L	10 ml	683 mg/L	50	4	25		3	12/21/18 22:19	N	IV
KQ1818709-14	Carbon, Total Organic	DUP	K1812278-003	Ground Water	1.15 mg/L	10 ml	4.6 mg/L	4	0.3	2.0		1	12/21/18 20:41	N	IV
KQ1818709-15	Carbon, Total Organic	MS	K1812279-001	Water	48.60 mg/L	10 ml	48.6 mg/L	1	0.07	0.50	96		12/21/18 23:54	N	IV
KQ1818709-16	Carbon, Total Organic	DUP	K1812279-001	Water	24.96 mg/L	10 ml	25.0 mg/L	1	0.07	0.50		<1	12/21/18 23:22	N	IV
KQ1818709-17	Carbon, Total Organic	MS	K1812272-001	Ground Water	36.01 mg/L	10 ml	144 mg/L	4	0.3	2.0	102		12/22/18 01:14	N	IV
KQ1818709-18	Carbon, Total Organic	DUP	K1812272-001	Ground Water	10.47 mg/L	10 ml	41.9 mg/L	4	0.3	2.0		<1	12/22/18 00:42	N	IV
KQ1818709-19	Carbon, Total Organic	DUP	K1812272-002	Ground Water	3.78 mg/L	10 ml	378 mg/L	100	7	50		4	12/22/18 03:06	N	IV
KQ1818709-20	Carbon, Total Organic	DUP	K1812272-003	Ground Water	3.95 mg/L	10 ml	3.95 mg/L	1	0.07	0.50		<1	12/22/18 03:38	N	IV
KQ1818709-21	Carbon, Total Organic	DUP	K1812272-004	Ground Water	3.99 mg/L	10 ml	3.99 mg/L	1	0.07	0.50		1	12/22/18 04:09	N	IV
KQ1818709-23	Carbon, Total Organic	DUP	K1811745-001	Water	2.34 mg/L	10 ml	2.34 mg/L	1	0.07	0.50		41*	12/22/18 05:13	N	IV
KQ1818709-24	Carbon, Total Organic	MS	K1811747-001	Water	29.30 mg/L	10 ml	29.3 mg/L	1	0.07	0.50	98		12/22/18 07:20	N	IV
KQ1818709-25	Carbon, Total Organic	DUP	K1811747-001	Water	4.71 mg/L	10 ml	4.71 mg/L	1	0.07	0.50		<1	12/22/18 06:48	N	IV
KQ1818709-26	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 11:06	N	IV
KQ1818709-26	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 11:06	N	IV
KQ1818709-27	Carbon, Total Organic	LCS		Water	20.26 mg/L	10 ml	20.3 mg/L	1	0.07	0.50	93		12/21/18 11:22	N	IV
KQ1818709-27	Carbon, Total Organic	LCS		Water	20.26 mg/L	10 ml	20.3 mg/L	1	0.07	0.50	93		12/21/18 11:22	N	IV
KQ1818709-28	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	IV
KQ1818709-28	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	IV
KQ1818709-29	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	IV
KQ1818709-29	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	IV
KQ1818709-30	Carbon, Total Organic	CCV		Water	23.72 mg/L	10 ml	23.7 mg/L	1			95		12/21/18 15:37	N	IV
KQ1818709-30	Carbon, Total Organic	CCV		Water	23.72 mg/L	10 ml	23.7 mg/L	1			95		12/21/18 15:37	N	IV
KQ1818709-31	Carbon, Total Organic	CCV		Water	23.55 mg/L	10 ml	23.6 mg/L	1			94		12/21/18 21:13	N	IV
KQ1818709-31	Carbon, Total Organic	CCV		Water	23.55 mg/L	10 ml	23.6 mg/L	1			94		12/21/18 21:13	N	IV
KQ1818709-32	Carbon, Total Organic	CCV		Water	23.63 mg/L	10 ml	23.6 mg/L	1			94		12/22/18 02:33	N	IV
KQ1818709-32	Carbon, Total Organic	CCV		Water	23.63 mg/L	10 ml	23.6 mg/L	1			94		12/22/18 02:33	N	IV
KQ1818709-33	Carbon, Total Organic	CCV		Water	23.86 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 07:36	N	IV
KQ1818709-33	Carbon, Total Organic	CCV		Water	23.86 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 07:36	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619810 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818709-34	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	IV
KQ1818709-34	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	IV
KQ1818709-35	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	IV
KQ1818709-35	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	IV
KQ1818709-36	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 15:54	N	IV
KQ1818709-36	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 15:54	N	IV
KQ1818709-37	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:29	N	IV
KQ1818709-37	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:29	N	IV
KQ1818709-38	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 02:49	N	IV
KQ1818709-38	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 02:49	N	IV
KQ1818709-39	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 07:53	N	IV
KQ1818709-39	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 07:53	N	IV
KQ1818709-40	Carbon, Total Organic	MS	K1811745-001	Water	26.18 mg/L	10 ml	26.2 mg/L	1	0.07	0.50	99		12/22/18 05:45	N	IV
KQ1818709-41	Carbon, Total Organic	DMS	K1811745-001	Water	25.64 mg/L	10 ml	25.6 mg/L	1	0.07	0.50	96		12/22/18 05:45	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620105 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1812416-035	Carbon, Dissolved Organic (DOC)	N/A		Water	1.24 mg/L	10 ml	1.24 mg/L	1	0.07	0.50			12/22/18 08:10	N	II
KQ1818712-01	Carbon, Dissolved Organic (DOC)	MS	K1812416-035	Water	24.33 mg/L	10 ml	24.3 mg/L	1	0.07	0.50	92		12/22/18 08:41	N	II
KQ1818712-02	Carbon, Dissolved Organic (DOC)	DUP	K1812416-035	Water	1.48 mg/L	10 ml	1.48 mg/L	1	0.07	0.50		18*	12/22/18 08:10	N	II
KQ1818712-03	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:46	N	II
KQ1818712-04	Carbon, Dissolved Organic (DOC)	LCS		Water	19.23 mg/L	10 ml	19.2 mg/L	1	0.07	0.50	88		12/21/18 22:02	N	II
KQ1818712-05	Carbon, Dissolved Organic (DOC)	CCV		Water	23.55 mg/L	10 ml	23.6 mg/L	1			94		12/21/18 21:13	N	II
KQ1818712-06	Carbon, Dissolved Organic (DOC)	CCV		Water	23.63 mg/L	10 ml	23.6 mg/L	1			94		12/22/18 02:33	N	II
KQ1818712-07	Carbon, Dissolved Organic (DOC)	CCV		Water	23.86 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 07:36	N	II
KQ1818712-08	Carbon, Dissolved Organic (DOC)	CCV		Water	23.93 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 08:58	N	II
KQ1818712-09	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:29	N	II
KQ1818712-10	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 02:49	N	II
KQ1818712-11	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 07:53	N	II
KQ1818712-12	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 09:14	N	II

CES 12/26/18

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ALS Environmental

StarLIMS Run: 619808, 619810, 620105

Analysis: TOC

Method: SM 5310 C, 9060, 415.1

CCV: 11-GEN-05-73F 50 ppm LCS: 11-GEN-05-73C 21.9 ppm

ICAL Date: 11/26/18

ICAL ID: 11-GEN-05-72J

ICS ID: 11-GEN-05-73B

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-70O 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-73J

21 % H3PO4: 11-GEN-05-73I

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, Marge, 129001F, N11314F

FILTER ID: NA

Analyzed By: CES	Date Analyzed: 12/20/18
Reviewed By:	Date Reviewed: 12/26/18

TOC: 619808, 619810
DOC: 620105

Schedule: 12202018

Version: 9
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2018/12/21 10:33 - Friday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	K1811658-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1811888-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	K1812001-001.01 10x	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K1812001-001.01 ms 10x	Extended Reaction 021711 (Extended Reaction 021711)	1
9	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1811625-001.03 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1811625-001.03 ms 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
12	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1811625-003.03	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1811728-001	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1811728-002	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1811789-002.08	Extended Reaction 021711 (Extended Reaction 021711)	4
18	Sample	K1811789-002.08 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
19	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1811789-003.08	Extended Reaction 021711 (Extended Reaction 021711)	4
22	Sample	K1811789-004.08	Extended Reaction 021711 (Extended Reaction 021711)	4
23	Sample	K1811789-005.08	Extended Reaction 021711 (Extended Reaction 021711)	4
24	Sample	K1811789-006.08	Extended Reaction 021711 (Extended Reaction 021711)	4
25	Sample	K1811789-008.08	Extended Reaction 021711 (Extended Reaction 021711)	4
26	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1811849-001.04	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1811849-001.04 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1811849-002.04 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1811849-003.04 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1811849-004.04	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1811849-005.04	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1811831-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	K1811831-002.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
36	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	K1812101-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2

Schedule: 12202018

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Page
38	Sample	K1812101-001.02 rns	Extended Reaction 021711 (Extended Reaction 021711)	11
39	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
40	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
41	Sample	K1812154-001.01 rns 50x	Extended Reaction 021711 (Extended Reaction 021711)	11
42	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
43	Sample	K1812154-002.01	Extended Reaction 021711 (Extended Reaction 021711)	12
44	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
45	Sample	K1812154-003.01	Extended Reaction 021711 (Extended Reaction 021711)	12
46	Sample	K1812154-004.01 dup	Extended Reaction 021711 (Extended Reaction 021711)	12
47	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
48	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
49	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
50	Sample	K1812154-005.01 dup	Extended Reaction 021711 (Extended Reaction 021711)	12
51	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
52	Sample	K1811825-001.01 rns	Extended Reaction 021711 (Extended Reaction 021711)	11
53	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
54	Sample	K1812276-001.01 50x	Extended Reaction 021711 (Extended Reaction 021711)	12
55	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
56	Sample	K1812275-001.01 rns 50x	Extended Reaction 021711 (Extended Reaction 021711)	11
57	Sample	K1812276-002.02 dup	Extended Reaction 021711 (Extended Reaction 021711)	12
58	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
59	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
60	Sample	K1812276-003.02 dup	Extended Reaction 021711 (Extended Reaction 021711)	12
61	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
62	Sample	K1812276-001.02	Extended Reaction 021711 (Extended Reaction 021711)	12
63	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
64	Sample	K1812272-001.01 4x	Extended Reaction 021711 (Extended Reaction 021711)	12
65	Sample	K1812272-001.01 rns 4x	Extended Reaction 021711 (Extended Reaction 021711)	11
66	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	14
67	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
68	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
69	Sample	K1812272-002.01 10x	Extended Reaction 021711 (Extended Reaction 021711)	12
70	Sample	K1812272-003.01	Extended Reaction 021711 (Extended Reaction 021711)	12
71	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
72	Sample	K1811745-001.02	Extended Reaction 021711 (Extended Reaction 021711)	12
73	Sample	K1811745-001.02 rns	Extended Reaction 021711 (Extended Reaction 021711)	12
74	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
75	Sample	K1811747-001.02	Extended Reaction 021711 (Extended Reaction 021711)	12
76	Sample	K1811747-001.02 rns	Extended Reaction 021711 (Extended Reaction 021711)	11
77	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
78	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
79	Sample	K1812415-001.01 4x	Extended Reaction 021711 (Extended Reaction 021711)	12
80	Sample	K1812415-001.01 rns 4x	Extended Reaction 021711 (Extended Reaction 021711)	11
81	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
82	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11

00944832

Fusion Report - 12202018
Thursday, December 20, 2018 08:21 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2018/12/26 11:38 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	12202018	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v9)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/12/20 08:21

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.04	16.47	4.43	49.47	05:34
2	TC Clean	8.60	11.29	2.69	49.71	07:15
3	TC Clean	2.48	5.22	2.74	49.77	07:01
4	TC Clean	1.83	4.57	2.75	49.73	07:03

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 08:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.50	16.00	2.50	49.87	12:34

Dilution **Blank Contribution** **Method** **Calibration**

1:10	(TC) 17.0445 (IC) (v1201)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/12/20 09:09

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.06	13.45	3.39	49.37	07:59
2	TC Clean	5.19	7.86	2.67	49.71	07:17
3	TC Clean	3.04	5.66	2.63	49.76	07:01
4	TC Clean	1.91	4.53	2.62	49.76	07:03

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 09:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.36	15.83	2.47	49.86	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0445 (IC) (v1201)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/12/20 10:00

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.15	13.24	3.09	49.44	08:00
2	TC Clean	4.75	7.44	2.69	49.80	07:17
3	TC Clean	1.82	4.43	2.62	49.83	07:02
4	TC Clean	1.43	4.08	2.65	49.84	07:02

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 10:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.13	15.68	2.54	49.91	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0445 (IC) (v1201)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Blank (Creating v1202) From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2018/12/20 10:50

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.18	13.18	3.00	49.42	07:58
2	TC Clean	4.60	7.15	2.55	49.76	07:16
3	TC Clean	1.96	4.47	2.51	49.84	07:03
4	TC Clean	1.49	4.08	2.59	49.85	07:01
5	Reagent Blank	5.37	8.01	2.63	49.80	08:12
6	Acid Blank	1.31	3.85	2.54	49.49	05:40

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.7100 ppm	0.0000 ppm	0.0000%	2018/12/20 11:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7100	7.1003	22.39	25.22	2.83	49.95	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0779 ppm (PASS)	0.0000 ppm	0%	2018/12/20 11:56

	Base

Pos	Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0779	240.7790	202.52	205.21	2.70	49.94	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/20 12:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	17.20	19.92	2.72	49.96	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 12:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.53	19.20	2.67	49.98	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.6415 ppm (PASS)	0.0000 ppm	0%	2018/12/20 12:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.6415	206.4151	176.24	178.89	2.65	49.99	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	ICS	0.2428 ppm	0.0000 ppm	0.0000%	2018/12/20 13:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2428	2.4278	18.82	21.60	2.78	50.00	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1811658-004.01	3.8703 ppm	0.0531 ppm	1.3700%	2018/12/20 13:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8327	38.3274	46.26	49.03	2.77	49.98	12:27
2	TOC	3.9078	39.0782	46.84	49.59	2.76	50.00	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0004 ppm	0.0006 ppm	141.4200%	2018/12/20 13:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0008	0.0078	16.97	19.66	2.69	50.05	12:27
2	TOC	0.0000	0.0000	15.66	18.25	2.59	50.03	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1811888-002.01	2.7312 ppm	0.0057 ppm	0.2100%	2018/12/20 14:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7352	27.3524	37.87	40.73	2.86	50.02	12:28
2	TOC	2.7271	27.2713	37.81	40.62	2.81	50.08	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1812001-001.01 10x	6.9117 ppm	0.0401 ppm	0.5800%	2018/12/20 14:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	6.9401	69.4013	70.02	72.80	2.79	50.07	12:25
2	TOC	6.8834	68.8336	69.58	72.19	2.61	50.09	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1812001-001.01 ms 10x	31.6218 ppm	0.0000 ppm	0.0000%	2018/12/20 15:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.6218	316.2181	258.70	261.23	2.53	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	RB	0.1048 ppm	0.0000 ppm	0.0000%	2018/12/20 15:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1048	1.0477	17.76	20.50	2.74	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0103 ppm (PASS)	0.0000 ppm	0%	2018/12/20 15:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0103	240.1027	202.00	204.73	2.73	50.11	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

~~**Sample Type**: Check Standard --> CCB 021711 From Schedule Version~~

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/20 16:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	17.00	19.74	2.75	50.14	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1811625-001.03 2x	4.0447 ppm	0.2857 ppm	7.0600%	2018/12/20 16:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2468	42.4675	49.43	52.16	2.73	50.15	12:28
2	TOC	3.8427	38.4268	46.34	48.97	2.63	50.14	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1811625-001.03 ms 2x	29.1500 ppm	0.0000 ppm	0.0000%	2018/12/20 17:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.1500	291.5002	239.80	242.66	2.86	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 17:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.64	17.28	2.63	50.16	12:29
2	TOC	0.0000	0.0000	14.52	17.37	2.85	50.16	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K1811625-003.03	4.3494 ppm	0.1702 ppm	3.9100%	2018/12/20 17:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4698	44.6978	51.13	53.85	2.72	50.20	12:30
2	TOC	4.2291	42.2909	49.29	51.80	2.51	50.15	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 18:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.47	16.22	2.75	50.18	12:22
2	TOC	0.0000	0.0000	14.66	17.23	2.57	50.14	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1811728-001	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 18:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.67	17.32	2.65	50.14	12:26
2	TOC	0.0000	0.0000	14.89	17.48	2.58	50.12	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1811728-002	0.3981 ppm	0.5629 ppm	141.4200%	2018/12/20 19:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.71	17.40	2.68	50.14	12:27
2	TOC	0.7961	7.9611	23.05	25.78	2.73	50.12	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1811789-002.08	0.3032 ppm	0.1364 ppm	44.9900%	2018/12/20 19:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5064	5.0636	20.83	23.42	2.59	50.08	12:28
2	TOC	0.2565	2.5651	18.92	21.63	2.71	50.14	12:25
3	TOC	0.2160	2.1596	18.61	21.36	2.75	50.13	12:2
4	TOC	0.2341	2.3415	18.75	21.38	2.63	50.14	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	18	TOC	K1811789-002.08 ms	25.2126 ppm	0.0000 ppm	0.0000%	2018/12/20 21:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.2126	252.1263	209.70	212.25	2.55	50.12	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 21:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.94	19.63	2.68	50.10	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0674 ppm (PASS)	0.0000 ppm	0%	2018/12/20 21:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0674	240.6743	202.44	205.01	2.58	50.10	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/20 21:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.32	19.03	2.72	50.15	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 22:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.21	17.97	2.76	50.11	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.6186 ppm (PASS)	0.0000 ppm	0%	2018/12/20 22:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.6186	206.1862	176.07	178.69	2.62	50.07	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1811789-003.08	0.6115 ppm	0.0957 ppm	15.6500%	2018/12/20 22:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7447	7.4470	22.65	25.41	2.75	50.03	12:29
2	TOC	0.6046	6.0460	21.58	24.25	2.67	49.99	12:26
3	TOC	0.5775	5.7752	21.38	23.89	2.51	49.91	12:24
4	TOC	0.5192	5.1918	20.93	23.51	2.58	49.93	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1811789-004.08	0.3582 ppm	0.4373 ppm	122.0700%	2018/12/20 23:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1593	1.5932	18.18	20.90	2.72	49.89	12:24

2	TOC	1.0099	10.0985	24.68	27.32	2.64	49.87	12:26
3	TOC	0.1908	1.9085	18.42	21.15	2.73	49.87	12:26
4	TOC	0.0729	0.7286	17.52	20.19	2.67	49.84	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1811789-005.08	0.6339 ppm	0.0893 ppm	14.0800%	2018/12/21 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7650	7.6497	22.81	25.45	2.65	49.83	12:24
2	TOC	0.5847	5.8472	21.43	24.13	2.70	49.81	12:25
3	TOC	0.5711	5.7111	21.33	24.07	2.74	49.79	12:24
4	TOC	0.6149	6.1493	21.66	24.35	2.68	49.78	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1811789-006.08	0.5329 ppm	0.0218 ppm	4.1000%	2018/12/21 01:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5515	5.5149	21.18	23.88	2.70	49.78	12:27
2	TOC	0.5332	5.3318	21.04	23.57	2.54	49.78	12:26
3	TOC	0.5022	5.0218	20.80	23.44	2.64	49.72	12:25
4	TOC	0.5447	5.4469	21.12	23.86	2.73	49.78	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1811789-008.08	0.2970 ppm	0.0830 ppm	27.9500%	2018/12/21 02:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3918	3.9177	19.96	22.52	2.56	49.74	12:28
2	TOC	0.3350	3.3500	19.52	22.21	2.69	49.74	12:24
3	TOC	0.2038	2.0380	18.52	21.29	2.77	49.72	12:27
4	TOC	0.2574	2.5743	18.93	21.62	2.69	49.72	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 03:54

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	15.47	17.90	2.42	49.72	12:24
2	TOC	0.0000	0.0000	14.64	17.20	2.56	49.73	12:23

Dilution 1:10
Blank Contribution (TC) 16.9610 (IC) (v1202)
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1811849-001.04	1.2435 ppm	0.0105 ppm	0.8400%	2018/12/21 04:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2362	12.3615	26.41	29.06	2.65	49.71	12:22
2	TOC	1.2509	12.5093	26.52	29.16	2.63	49.71	12:26

Dilution 1:10
Blank Contribution (TC) 16.9610 (IC) (v1202)
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1811849-001.04 ms	25.4293 ppm	0.0000 ppm	0.0000%	2018/12/21 04:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.4293	254.2925	211.36	213.95	2.59	49.70	12:30

Dilution 1:10
Blank Contribution (TC) 16.9610 (IC) (v1202)
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2565 ppm (PASS)	0.0000 ppm	0%	2018/12/21 05:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2565	242.5645	203.88	206.62	2.74	49.66	12:31

Completion State Success - Criteria met.
Success Action Do Nothing
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)
STD Conc - Pos B 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 05:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.31	19.10	2.80	49.66	12:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1811849-002.04 4x	8.1359 ppm	0.1209 ppm	1.4900%	2018/12/21 05:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.2214	82.2142	79.81	82.70	2.89	49.69	12:23
2	TOC	8.0505	80.5045	78.50	81.19	2.69	49.68	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1811849-003.04 4x	7.6636 ppm	0.1108 ppm	1.4500%	2018/12/21 06:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.7420	77.4200	76.15	78.89	2.75	49.68	12:26
2	TOC	7.5853	75.8529	74.95	77.63	2.68	49.71	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1811849-004.04	0.9762 ppm	0.1639 ppm	16.7900%	2018/12/21 06:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0921	10.9213	25.31	27.99	2.68	49.67	12:28
2	TOC	0.8603	8.6033	23.54	26.17	2.64	49.67	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1811849-005.04	5.2512 ppm	0.1272 ppm	2.4200%	2018/12/21 07:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3411	53.4111	57.79	60.40	2.61	49.69	12:24
2	TOC	5.1612	51.6125	56.42	59.23	2.82	49.71	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	RB	0.3241 ppm	0.4583 ppm	141.4200%	2018/12/21 07:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.09	18.66	2.57	49.67	12:29
2	TOC	0.6482	6.4816	21.92	24.59	2.67	49.61	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1811831-002.01	6.3814 ppm	0.5082 ppm	7.9600%	2018/12/21 08:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7408	67.4078	68.49	71.00	2.51	49.71	12:27
2	TOC	6.0221	60.2211	63.00	65.39	2.40	49.90	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1811831-002.01 ms	31.0037 ppm	0.0000 ppm	0.0000%	2018/12/21 08:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.0037	310.0373	253.97	256.56	2.59	49.92	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 09:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.45	16.02	2.57	49.95	12:24
2	TOC	0.0000	0.0000	13.80	16.48	2.67	49.92	12:23

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1812101-001.02	16.0372 ppm	0.0155 ppm	0.1000%	2018/12/21 09:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.0482	160.4819	139.64	142.30	2.66	49.93	12:27
2	TOC	16.0262	160.2622	139.48	142.17	2.69	49.89	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1812101-001.02 ms	40.7000 ppm	0.0000 ppm	0.0000%	2018/12/21 10:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	40.7000	407.0004	328.10	330.64	2.54	49.86	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0495 ppm (PASS)	0.0000 ppm	0%	2018/12/21 10:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0495	240.4951	202.30	204.97	2.67	49.86	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 — From Schedule Version

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 10:49

00944847

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	15.93	18.55	2.62	49.84	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 11:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.88	17.48	2.60	50.04	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.2644 ppm (PASS)	0.0000 ppm	0%	2018/12/21 11:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.2644	202.6439	173.36	175.92	2.56	49.99	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1812154-001.01 50x	0.0965 ppm	0.1365 ppm	141.4200%	2018/12/21 11:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1931	1.9307	18.44	21.05	2.61	49.95	12:28
2	TOC	0.0000	0.0000	16.89	19.63	2.74	49.95	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K1812154-001.01 ms 50x	24.3267 ppm	0.0000 ppm	0.0000%	2018/12/21 12:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.3267	243.2665	202.93	205.49	2.56	49.93	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 12:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.90	17.47	2.57	49.92	12:27
2	TOC	0.0000	0.0000	13.95	16.42	2.47	49.95	12:21

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	K1812154-002.01	1.5973 ppm	0.1048 ppm	6.5600%	2018/12/21 12:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6714	16.7136	29.74	32.52	2.78	49.93	12:27
2	TOC	1.5232	15.2315	28.60	31.41	2.81	49.97	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 13:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.83	17.44	2.61	49.98	12:26
2	TOC	0.0000	0.0000	13.52	16.27	2.75	49.99	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K1812154-003.01	2.1735 ppm	0.0087 ppm	0.4000%	2018/12/21 14:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1674	21.6739	33.53	36.21	2.68	49.99	12:27

2	TOC	2.1797	21.7969	33.62	36.23	2.60	49.96	12:25

Dilution 1:10 | **Blank Contribution** (TC) 16.9610 (IC) (v1202) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1812154-004.01 50x	17.5683 ppm	0.0074 ppm	0.0400%	2018/12/21 14:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.5736	175.7357	151.30	154.08	2.77	50.00	12:27
2	TOC	17.5631	175.6311	151.22	153.86	2.64	49.96	12:28

Dilution 1:10 | **Blank Contribution** (TC) 16.9610 (IC) (v1202) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 15:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.33	17.92	2.59	49.96	12:28
2	TOC	0.0000	0.0000	13.94	16.74	2.80	49.99	12:26

Dilution 1:10 | **Blank Contribution** (TC) 16.9610 (IC) (v1202) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7161 ppm (PASS)	0.0000 ppm	0%	2018/12/21 15:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7161	237.1608	199.75	202.36	2.62	50.01	12:29

Completion State Success - Criteria met. | **Success Action** Do Nothing | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24) | **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711 — From Schedule Version

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 15:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	15.45	17.92	2.47	50.01	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1812154-005.01 20x	0.0816 ppm	0.1112 ppm	136.2200%	2018/12/21 16:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1602	1.6024	18.19	20.63	2.44	50.06	12:26
2	TOC	0.0030	0.0300	16.98	19.62	2.63	50.02	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 16:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.08	16.76	2.68	50.06	12:24
2	TOC	0.0000	0.0000	13.43	15.97	2.54	50.07	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1811928-001.01	0.0564 ppm	0.0642 ppm	113.8700%	2018/12/21 17:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1018	1.0177	17.74	20.38	2.64	50.07	12:24
2	TOC	0.0110	0.1098	17.05	19.66	2.62	50.06	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1811928-001.01 ms	24.4826 ppm	0.0000 ppm	0.0000%	2018/12/21 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.4826	244.8258	204.12	206.67	2.55	50.07	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 18:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.50	18.26	2.75	50.01	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1812278-001.01 50x	13.6190 ppm	0.1234 ppm	0.9100%	2018/12/21 18:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.7063	137.0630	121.74	124.53	2.79	49.97	12:26
2	TOC	13.5318	135.3180	120.41	123.06	2.65	49.99	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 18:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.98	17.57	2.59	50.00	12:29
2	TOC	0.0000	0.0000	14.14	16.73	2.59	49.98	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1812278-001.01 ms 50x	38.1173 ppm	0.0000 ppm	0.0000%	2018/12/21 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	38.1173	381.1732	308.36	311.11	2.76	50.03	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reactio 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 19:38

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	15.38	18.03	2.65	50.12	12:21
2	TOC	0.0000	0.0000	13.18	15.90	2.72	50.12	12:29
3	TOC	0.0000	0.0000	13.10	15.85	2.75	50.11	12:25
4	TOC	0.0000	0.0000	13.37	15.90	2.53	50.14	12:23

Dilution: 1:10
Blank Contribution: (TC) 16.9610 (IC) (v1202)
Method: Extended Reaction 021711 (v3)
Calibration: Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	57	TOC	K1812278-003.02 4x	1.1389 ppm	0.0119 ppm	1.0500%	2018/12/21 20:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1305	11.3046	25.60	28.30	2.69	50.14	12:28
2	TOC	1.1473	11.4733	25.73	28.49	2.76	50.17	12:27

Dilution: 1:10
Blank Contribution: (TC) 16.9610 (IC) (v1202)
Method: Extended Reaction 021711 (v3)
Calibration: Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.5524 ppm (PASS)	0.0000 ppm	0%	2018/12/21 21:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5524	235.5243	198.50	201.17	2.67	50.15	12:31

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v3)
Calibration: Extended Reaction 021711 (v24)
STD Conc - Pos B: 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 21:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.23	18.82	2.59	50.15	12:30

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v3)
Calibration: Extended Reaction 021711 (v24)
STD Conc - Pos D: 0 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 21:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.51	17.24	2.74	50.15	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	19.2260 ppm (PASS)	0.0000 ppm	0%	2018/12/21 22:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	19.2260	192.2601	165.42	168.09	2.66	50.13	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	K1812278-002.01 50x	13.8400 ppm	0.2571 ppm	1.8600%	2018/12/21 22:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.0218	140.2181	124.15	126.95	2.79	50.10	12:23
2	TOC	13.6582	136.5816	121.37	124.17	2.79	50.13	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 22:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.44	17.22	2.77	50.12	12:27
2	TOC	0.0000	0.0000	13.12	15.76	2.64	50.12	12:27

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	K1812279-001.02	24.8410 ppm	0.1722 ppm	0.6900%	2018/12/21 23:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.7192	247.1921	205.93	208.61	2.68	50.12	12:24
2	TOC	24.9628	249.6278	207.79	210.56	2.77	50.10	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K1812279-001.02 ms	48.6019 ppm	0.0000 ppm	0.0000%	2018/12/21 23:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	48.6019	486.0190	388.51	391.29	2.78	50.13	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	RB	0.3638 ppm	0.5145 ppm	141.4200%	2018/12/22 00:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7276	7.2756	22.52	25.36	2.84	50.13	12:25
2	TOC	0.0000	0.0000	16.69	19.45	2.76	50.14	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1812272-001.01 4x	10.5041 ppm	0.0528 ppm	0.5000%	2018/12/22 00:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.5415	105.4147	97.55	100.17	2.62	50.14	12:27
2	TOC	10.4668	104.6678	96.98	99.78	2.81	50.13	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1812272-001.01 ms 4x	36.0064 ppm	0.0000 ppm	0.0000%	2018/12/22 01:14

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	36.0064	360.0644	292.22	294.86	2.64	50.13	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	RB	0.0221 ppm	0.0441 ppm	200.0000%	2018/12/22 01:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0883	0.8829	17.64	20.45	2.81	50.10	12:26
2	TOC	0.0000	0.0000	15.76	18.39	2.63	50.11	12:26
3	TOC	0.0000	0.0000	14.56	17.38	2.82	50.12	12:26
4	TOC	0.0000	0.0000	14.00	16.68	2.68	50.13	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6288 ppm (PASS)	0.0000 ppm	0%	2018/12/22 02:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6288	236.2883	199.08	201.57	2.49	50.12	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/22 02:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	15.09	17.75	2.66	50.13	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1812272-002.01 100x	3.8476 ppm	0.0975 ppm	2.5300%	2018/12/22 03:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9166	39.1659	46.90	49.50	2.60	50.12	12:28
2	TOC	3.7787	37.7871	45.85	48.70	2.85	50.12	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1812272-003.01	3.9636 ppm	0.0156 ppm	0.3900%	2018/12/22 03:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9747	39.7467	47.35	50.10	2.76	50.12	12:26
2	TOC	3.9526	39.5256	47.18	49.88	2.70	50.11	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K1812272-004.01	4.0087 ppm	0.0333 ppm	0.8300%	2018/12/22 04:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0322	40.3222	47.79	50.48	2.69	50.10	12:29
2	TOC	3.9851	39.8513	47.43	50.17	2.74	50.12	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/22 04:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.38	18.09	2.72	50.15	12:28
2	TOC	0.0000	0.0000	14.56	17.22	2.66	50.14	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1811745-001.09	1.9426 ppm	0.5604 ppm	28.8500%	2018/12/22 05:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	1.5463	15.4630	28.78	31.48	2.70	50.17	12:27
2	TOC	2.3389	23.3888	34.84	37.63	2.79	50.13	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1811745-001.09 ms	25.9104 ppm	0.3760 ppm	1.4500%	2018/12/22 05:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1763	261.7631	217.07	219.81	2.74	50.12	12:24
2	TOC	25.6446	256.4457	213.00	215.81	2.81	50.13	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/22 06:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.93	18.61	2.68	50.12	12:23
2	TOC	0.0000	0.0000	14.21	17.02	2.81	50.10	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1811747-001.09	4.7084 ppm	0.0027 ppm	0.0600%	2018/12/22 06:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7103	47.1034	52.97	55.91	2.94	50.11	12:24
2	TOC	4.7065	47.0655	52.94	55.63	2.69	50.12	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	75	TOC	K1811747-001.09 ms	29.2991 ppm	0.0000 ppm	0.0000%	2018/12/22 07:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.2991	292.9914	240.94	243.69	2.75	50.09	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8618 ppm (PASS)	0.0000 ppm	0%	2018/12/22 07:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8618	238.6180	200.86	203.53	2.67	50.09	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/22 07:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	14.88	17.69	2.81	50.09	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	K1812416-035.01 doc	1.3602 ppm	0.1716 ppm	12.6100%	2018/12/22 08:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2389	12.3890	26.43	29.31	2.88	50.08	12:27
2	TOC	1.4816	14.8155	28.29	31.38	3.09	50.10	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1812416-035.01 ms doc	24.3251 ppm	0.0000 ppm	0.0000%	2018/12/22 08:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.3251	243.2508	202.92	205.83	2.92	50.10	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9324 ppm (PASS)	0.0000 ppm	0%	2018/12/22 08:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9324	239.3244	201.40	204.23	2.82	50.11	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/22 09:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.24	18.97	2.73	50.12	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1201	2.2080	1.6200	0.0000	0.0000	0.0000	2018/12/17 20:18	Fusion1 (Fusion1)
v1202	1.7907	1.3090	0.0000	0.0000	0.0000	2018/12/20 11:40	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v24	Calibration curve formula:	TOC: y = 7.645x + 18.448
Ver Creation:	2018/11/26 18:53	r^2 value:	TOC: r^2 = 0.99984
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	19.1720	0.0000		2018/11/26 17:15
0.50 ppm	23.8410	0.5000		2018/11/26 17:31
1.00 ppm	25.1300	1.0000		2018/11/26 17:47
5.00 ppm	53.5500	5.0000		2018/11/26 18:03
10.0 ppm	95.3860	10.0000		2018/11/26 18:20
25.0 ppm	211.7220	25.0000		2018/11/26 18:36
50.0 ppm	399.8190	50.0000		2018/11/26 18:52

Methods

Name: Extended Reaction 021711 (TOC)

Version:	v3	Operator:	Gen Chem Lab (Fusion1)
Ver Creation:	2013/02/04 11:44		
Comment:			

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	7
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	7
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1

00944861

SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2018/12/22 09:34

Work Request # KR1178, 1779, 2054, 1953, 1854, 1919, 1924, 1962, 2234, 2154, 1749, 2079, 2084, 2087, 1962

Tier: II I I IV IV IV II II II IV IV IV IV IV II

Date Analyzed: 12/27/19

Analyst: BCD for CES

Analysis: ~~DOC~~ TOC

Run # Doc: 620495, 620498 TOC: 620496, 620497

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	(yes)/no/NA
2.	Holding times met for all analyses and for all samples?	yes/(no)/NA
3.	Are calculations correct?	(yes)/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/(NA)
5.	All quality control criteria met?	(yes)/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	(yes)/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	(yes)/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	(yes)/no/NA
9.	Are results for methods blanks all ND?	(yes)/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/(no)/NA
11.	Are all exceptions explained?	(yes)/no/NA
12.	Have all applicable service requests been reviewed?	(yes)/no/NA
13.	Are all samples labeled correctly?	(yes)/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	(yes)/no/NA
15.	Are detection limits and units reported correctly?	(yes)/no/NA
16.	Is the unused space on the benchsheet crossed out?	(yes)/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	(yes)/no/NA

COMMENTS: KR1924 was received past hold time.
Reported KR1962 ~~KR1962~~-3 reports a high %RSD due to suspected non-homogenous sample.
KR1853-3/3dup/3Trip/3Quad, KR1853-4/4d, KR1854-2/2dup/2trip/2quad, KR1854-3/3dup, KR1919-1/1d, KR1919-2/2dup/2trip/2quad and KR2234-2/2d report a high %RSD; However all of these samples report less than 5x the MRL.

Final Approved by: _____ Date: 12/31/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620495 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811779-001	Carbon, Dissolved Organic (DOC)	N/A		Water	4.61 mg/L	10 ml	4.61 mg/L	1	0.07	0.50			12/27/18 23:04	N	I
K1811779-002	Carbon, Dissolved Organic (DOC)	N/A		Water	19.25 mg/L	10 ml	19.2 mg/L	1	0.07	0.50			12/28/18 00:08	N	I
K1811788-001	Carbon, Dissolved Organic (DOC)	N/A		Water	6.10 mg/L	10 ml	6.10 mg/L	1	0.07	0.50			12/27/18 20:55	N	II
K1811788-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.25 mg/L	10 ml	2.25 mg/L	1	0.07	0.50			12/27/18 22:32	N	II
K1812054-001	Carbon, Dissolved Organic (DOC)	N/A		Water	4.28 mg/L	10 ml	17.1 mg/L	4	0.3	2.0			12/28/18 01:43	N	I
K1812054-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.98 mg/L	10 ml	3.98 mg/L	1	0.07	0.50			12/28/18 04:09	N	I
KQ1818868-01	Carbon, Dissolved Organic (DOC)	CCB		Water	0.07 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/27/18 17:27	N	II
KQ1818868-02	Carbon, Dissolved Organic (DOC)	CCB		Water	0.11 mg/L	10 ml	0.11 mg/L J	1	0.07	0.50			12/27/18 22:16	N	II
KQ1818868-03	Carbon, Dissolved Organic (DOC)	CCB		Water	0.10 mg/L	10 ml	0.1 mg/L J	1	0.07	0.50			12/28/18 03:19	N	II
KQ1818868-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 10:44	N	II
KQ1818868-05	Carbon, Dissolved Organic (DOC)	CCV		Water	24.23 mg/L	10 ml	24.2 mg/L	1			97		12/27/18 17:11	N	II
KQ1818868-06	Carbon, Dissolved Organic (DOC)	CCV		Water	24.65 mg/L	10 ml	24.7 mg/L	1			99		12/27/18 21:59	N	II
KQ1818868-07	Carbon, Dissolved Organic (DOC)	CCV		Water	24.50 mg/L	10 ml	24.5 mg/L	1			98		12/28/18 03:03	N	II
KQ1818868-08	Carbon, Dissolved Organic (DOC)	CCV		Water	23.82 mg/L	10 ml	23.8 mg/L	1			95		12/28/18 10:28	N	II
KQ1818868-09	Carbon, Dissolved Organic (DOC)	MB		Water	0.10 mg/L	10 ml	0.1 mg/L J	1	0.07	0.50			12/27/18 17:44	N	II
KQ1818868-10	Carbon, Dissolved Organic (DOC)	LCS		Water	20.55 mg/L	10 ml	20.5 mg/L	1	0.07	0.50	94		12/27/18 18:00	N	II
KQ1818868-11	Carbon, Dissolved Organic (DOC)	MS	K1811788-001	Water	31.05 mg/L	10 ml	31.1 mg/L	1	0.07	0.50	100		12/27/18 21:26	N	II
KQ1818868-12	Carbon, Dissolved Organic (DOC)	DUP	K1811788-001	Water	5.98 mg/L	10 ml	5.98 mg/L	1	0.07	0.50		2	12/27/18 20:55	N	II
KQ1818868-13	Carbon, Dissolved Organic (DOC)	DUP	K1811788-002	Water	2.07 mg/L	10 ml	2.07 mg/L	1	0.07	0.50		8	12/27/18 22:32	N	II
KQ1818868-14	Carbon, Dissolved Organic (DOC)	MS	K1811779-001	Water	29.64 mg/L	10 ml	29.6 mg/L	1	0.07	0.50	100		12/27/18 23:36	N	I
KQ1818868-15	Carbon, Dissolved Organic (DOC)	DUP	K1811779-001	Water	4.54 mg/L	10 ml	4.54 mg/L	1	0.07	0.50		2	12/27/18 23:04	N	I
KQ1818868-16	Carbon, Dissolved Organic (DOC)	DUP	K1811779-002	Water	20.15 mg/L	10 ml	20.1 mg/L	1	0.07	0.50		5	12/28/18 00:08	N	I
KQ1818868-17	Carbon, Dissolved Organic (DOC)	MS	K1812054-001	Water	29.92 mg/L	10 ml	120 mg/L	4	0.3	2.0	103		12/28/18 02:15	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

BCD 12/29/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620495 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818868-18	Carbon, Dissolved Organic (DOC)	DUP	K1812054-001	Water	4.08 mg/L	10 ml	16.3 mg/L	4	0.3	2.0		5	12/28/18 01:43	N	I
KQ1818868-19	Carbon, Dissolved Organic (DOC)	DUP	K1812054-002	Water	3.81 mg/L	10 ml	3.81 mg/L	1	0.07	0.50		4	12/28/18 04:09	N	I

BCD 12/29/18

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620496 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811853-001	Carbon, Total Organic	N/A		Ground Water	0.86 mg/L	10 ml	0.86 mg/L	1	0.07	0.50			12/28/18 04:41	N	IV
K1811853-002	Carbon, Total Organic	N/A		Ground Water	1.72 mg/L	10 ml	1.72 mg/L	1	0.07	0.50			12/28/18 06:16	N	IV
K1811853-003	Carbon, Total Organic	N/A		Ground Water	0.51 mg/L	10 ml	0.51 mg/L	1	0.07	0.50			12/28/18 07:19	N	IV
K1811853-004	Carbon, Total Organic	N/A		Ground Water	0.45 mg/L	10 ml	0.45 mg/L J	1	0.07	0.50			12/28/18 08:22	N	IV
K1811853-005	Carbon, Total Organic	N/A		Ground Water	2.17 mg/L	10 ml	8.7 mg/L	4	0.3	2.0			12/28/18 09:25	N	IV
K1811854-001	Carbon, Total Organic	N/A		Ground Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 11:01	N	IV
K1811854-002	Carbon, Total Organic	N/A		Ground Water	0.17 mg/L	10 ml	0.17 mg/L J	1	0.07	0.50			12/28/18 12:37	N	IV
K1811854-003	Carbon, Total Organic	N/A		Ground Water	0.16 mg/L	10 ml	0.16 mg/L J	1	0.07	0.50			12/28/18 13:39	N	IV
K1811854-004	Carbon, Total Organic	N/A		Ground Water	0.12 mg/L	10 ml	0.12 mg/L J	1	0.07	0.50			12/28/18 14:42	N	IV
K1811854-005	Carbon, Total Organic	N/A		Ground Water	3.64 mg/L	10 ml	3.64 mg/L	1	0.07	0.50			12/28/18 15:45	N	IV
K1811854-006	Carbon, Total Organic	N/A		Ground Water	3.34 mg/L	10 ml	3.34 mg/L	1	0.07	0.50			12/28/18 16:48	N	IV
K1811854-008	Carbon, Total Organic	N/A		Ground Water	0.07 mg/L	10 ml	0.07 mg/L J	1	0.07	0.50			12/28/18 17:51	N	IV
K1811919-001	Carbon, Total Organic	N/A		Ground Water	0.56 mg/L	10 ml	0.56 mg/L	1	0.07	0.50			12/28/18 18:54	N	IV
K1811919-002	Carbon, Total Organic	N/A		Ground Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			12/28/18 21:02	Y	IV
K1811919-003	Carbon, Total Organic	N/A		Ground Water	0.16 mg/L	10 ml	0.16 mg/L J	1	0.07	0.50			12/28/18 22:38	N	IV
K1811919-004	Carbon, Total Organic	N/A		Ground Water	0.11 mg/L	10 ml	0.11 mg/L J	1	0.07	0.50			12/28/18 23:41	Y	IV
K1811924-001	Carbon, Total Organic	N/A		Water	2.47 mg/L	10 ml	9.9 mg/L	4	0.3	2.0			12/29/18 01:16	N	II
K1811924-002	Carbon, Total Organic	N/A		Water	8.89 mg/L	10 ml	35.6 mg/L	4	0.3	2.0			12/29/18 03:41	N	II
K1811962-001	Carbon, Total Organic	N/A		Water	2.85 mg/L	10 ml	2.85 mg/L	1	0.07	0.50			12/29/18 05:15	N	II
K1811962-003	Carbon, Total Organic	N/A		Water	2.24 mg/L	10 ml	2.24 mg/L	1	0.07	0.50			12/29/18 06:20	N	II
KQ1818869-01	Carbon, Total Organic	MS	K1811853-001	Ground Water	25.70 mg/L	10 ml	25.7 mg/L	1	0.07	0.50	99		12/28/18 05:44	N	IV
KQ1818869-02	Carbon, Total Organic	DUP	K1811853-001	Ground Water	0.81 mg/L	10 ml	0.81 mg/L	1	0.07	0.50		6	12/28/18 04:41	N	IV
KQ1818869-03	Carbon, Total Organic	TRP	K1811853-001	Ground Water	0.80 mg/L	10 ml	0.80 mg/L	1	0.07	0.50		4	12/28/18 04:41	N	IV
KQ1818869-04	Carbon, Total Organic	QUAD	K1811853-001	Ground Water	0.71 mg/L	10 ml	0.71 mg/L	1	0.07	0.50		8	12/28/18 04:41	N	IV
KQ1818869-05	Carbon, Total Organic	DUP	K1811853-002	Ground Water	1.66 mg/L	10 ml	1.66 mg/L	1	0.07	0.50		3	12/28/18 06:16	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

FKP 12/29/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620496 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818869-06	Carbon, Total Organic	TRP	K1811853-002	Ground Water	1.66 mg/L	10 ml	1.66 mg/L	1	0.07	0.50		2	12/28/18 06:16	N	IV
KQ1818869-07	Carbon, Total Organic	QUAD	K1811853-002	Ground Water	1.68 mg/L	10 ml	1.68 mg/L	1	0.07	0.50		2	12/28/18 06:16	N	IV
KQ1818869-08	Carbon, Total Organic	DUP	K1811853-003	Ground Water	0.42 mg/L	10 ml	0.42 mg/L J	1	0.07	0.50		21*	12/28/18 07:19	N	IV
KQ1818869-09	Carbon, Total Organic	TRP	K1811853-003	Ground Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		32*	12/28/18 07:19	N	IV
KQ1818869-10	Carbon, Total Organic	QUAD	K1811853-003	Ground Water	0.28 mg/L	10 ml	0.28 mg/L J	1	0.07	0.50		33*	12/28/18 07:19	N	IV
KQ1818869-11	Carbon, Total Organic	DUP	K1811853-004	Ground Water	0.33 mg/L	10 ml	0.33 mg/L J	1	0.07	0.50		32*	12/28/18 08:22	N	IV
KQ1818869-12	Carbon, Total Organic	TRP	K1811853-004	Ground Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50		17	12/28/18 08:22	N	IV
KQ1818869-13	Carbon, Total Organic	QUAD	K1811853-004	Ground Water	0.29 mg/L	10 ml	0.29 mg/L J	1	0.07	0.50		20	12/28/18 08:22	N	IV
KQ1818869-14	Carbon, Total Organic	DUP	K1811853-005	Ground Water	2.11 mg/L	10 ml	8.4 mg/L	4	0.3	2.0		3	12/28/18 09:25	N	IV
KQ1818869-15	Carbon, Total Organic	TRP	K1811853-005	Ground Water	2.05 mg/L	10 ml	8.2 mg/L	4	0.3	2.0		3	12/28/18 09:25	N	IV
KQ1818869-16	Carbon, Total Organic	QUAD	K1811853-005	Ground Water	1.97 mg/L	10 ml	7.9 mg/L	4	0.3	2.0		4	12/28/18 09:25	N	IV
KQ1818869-17	Carbon, Total Organic	MS	K1811854-001	Ground Water	24.64 mg/L	10 ml	24.6 mg/L	1	0.07	0.50	99		12/28/18 12:04	N	IV
KQ1818869-18	Carbon, Total Organic	DUP	K1811854-001	Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 11:01	N	IV
KQ1818869-19	Carbon, Total Organic	TRP	K1811854-001	Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 11:01	N	IV
KQ1818869-20	Carbon, Total Organic	QUAD	K1811854-001	Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 11:01	N	IV
KQ1818869-21	Carbon, Total Organic	DUP	K1811854-002	Ground Water	0.25 mg/L	10 ml	0.25 mg/L J	1	0.07	0.50		36*	12/28/18 12:37	N	IV
KQ1818869-22	Carbon, Total Organic	TRP	K1811854-002	Ground Water	0.08 mg/L	10 ml	0.08 mg/L J	1	0.07	0.50		49*	12/28/18 12:37	N	IV
KQ1818869-23	Carbon, Total Organic	QUAD	K1811854-002	Ground Water	0.13 mg/L	10 ml	0.13 mg/L J	1	0.07	0.50		44*	12/28/18 12:37	N	IV
KQ1818869-24	Carbon, Total Organic	DUP	K1811854-003	Ground Water	0.22 mg/L	10 ml	0.22 mg/L J	1	0.07	0.50		35*	12/28/18 13:39	N	IV
KQ1818869-25	Carbon, Total Organic	TRP	K1811854-003	Ground Water	0.16 mg/L	10 ml	0.16 mg/L J	1	0.07	0.50		20	12/28/18 13:39	N	IV
KQ1818869-26	Carbon, Total Organic	QUAD	K1811854-003	Ground Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50		20	12/28/18 13:39	N	IV
KQ1818869-27	Carbon, Total Organic	DUP	K1811854-004	Ground Water	0.06 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 14:42	N	IV
KQ1818869-28	Carbon, Total Organic	TRP	K1811854-004	Ground Water	0.18 mg/L	10 ml	0.18 mg/L J	1	0.07	0.50		NC	12/28/18 14:42	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620496 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818869-29	Carbon, Total Organic	QUAD	K1811854-004	Ground Water	0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 14:42	N	IV
KQ1818869-30	Carbon, Total Organic	DUP	K1811854-005	Ground Water	3.23 mg/L	10 ml	3.23 mg/L	1	0.07	0.50		12	12/28/18 15:45	N	IV
KQ1818869-31	Carbon, Total Organic	TRP	K1811854-005	Ground Water	3.20 mg/L	10 ml	3.20 mg/L	1	0.07	0.50		7	12/28/18 15:45	N	IV
KQ1818869-32	Carbon, Total Organic	QUAD	K1811854-005	Ground Water	3.28 mg/L	10 ml	3.28 mg/L	1	0.07	0.50		6	12/28/18 15:45	N	IV
KQ1818869-33	Carbon, Total Organic	DUP	K1811854-006	Ground Water	3.24 mg/L	10 ml	3.24 mg/L	1	0.07	0.50		3	12/28/18 16:48	N	IV
KQ1818869-34	Carbon, Total Organic	TRP	K1811854-006	Ground Water	3.30 mg/L	10 ml	3.30 mg/L	1	0.07	0.50		2	12/28/18 16:48	N	IV
KQ1818869-35	Carbon, Total Organic	QUAD	K1811854-006	Ground Water	3.31 mg/L	10 ml	3.31 mg/L	1	0.07	0.50		1	12/28/18 16:48	N	IV
KQ1818869-36	Carbon, Total Organic	DUP	K1811854-008	Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 17:51	N	IV
KQ1818869-37	Carbon, Total Organic	TRP	K1811854-008	Ground Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 17:51	N	IV
KQ1818869-38	Carbon, Total Organic	QUAD	K1811854-008	Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 17:51	N	IV
KQ1818869-39	Carbon, Total Organic	DUP	K1811919-001	Ground Water	0.46 mg/L	10 ml	0.46 mg/L J	1	0.07	0.50		21*	12/28/18 18:54	N	IV
KQ1818869-40	Carbon, Total Organic	TRP	K1811919-001	Ground Water	0.43 mg/L	10 ml	0.43 mg/L J	1	0.07	0.50		15	12/28/18 18:54	N	IV
KQ1818869-41	Carbon, Total Organic	QUAD	K1811919-001	Ground Water	0.39 mg/L	10 ml	0.39 mg/L J	1	0.07	0.50		16	12/28/18 18:54	N	IV
KQ1818869-42	Carbon, Total Organic	MS	K1811919-002	Ground Water	24.92 mg/L	10 ml	24.9 mg/L	1	0.07	0.50	98		12/28/18 22:05	N	IV
KQ1818869-43	Carbon, Total Organic	DUP	K1811919-002	Ground Water	0.24 mg/L	10 ml	0.24 mg/L J	1	0.07	0.50		22*	12/28/18 21:02	N	IV
KQ1818869-44	Carbon, Total Organic	TRP	K1811919-002	Ground Water	0.81 mg/L	10 ml	0.81 mg/L	1	0.07	0.50		69*	12/28/18 21:02	N	IV
KQ1818869-45	Carbon, Total Organic	QUAD	K1811919-002	Ground Water	0.24 mg/L	10 ml	0.24 mg/L J	1	0.07	0.50		69*	12/28/18 21:02	N	IV
KQ1818869-46	Carbon, Total Organic	DUP	K1811919-003	Ground Water	0.15 mg/L	10 ml	0.15 mg/L J	1	0.07	0.50		8	12/28/18 22:38	N	IV
KQ1818869-47	Carbon, Total Organic	TRP	K1811919-003	Ground Water	0.06 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 22:38	N	IV
KQ1818869-48	Carbon, Total Organic	QUAD	K1811919-003	Ground Water	0.06 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 22:38	N	IV
KQ1818869-50	Carbon, Total Organic	DUP	K1811919-004	Ground Water	0.09 mg/L	10 ml	0.09 mg/L J	1	0.07	0.50		16	12/28/18 23:41	N	IV
KQ1818869-51	Carbon, Total Organic	TRP	K1811919-004	Ground Water	0.11 mg/L	10 ml	0.11 mg/L J	1	0.07	0.50		8	12/28/18 23:41	N	IV
KQ1818869-52	Carbon, Total Organic	QUAD	K1811919-004	Ground Water	0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/28/18 23:41	N	IV
KQ1818869-53	Carbon, Total Organic	DUP	K1811924-001	Water	2.51 mg/L	10 ml	10.0 mg/L	4	0.3	2.0		1	12/29/18 01:16	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620496 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818869-54	Carbon, Total Organic	TRP	K1811924-001	Water	2.45 mg/L	10 ml	9.8 mg/L	4	0.3	2.0		1	12/29/18 01:16	N	II
KQ1818869-55	Carbon, Total Organic	QUAD	K1811924-001	Water	2.45 mg/L	10 ml	9.8 mg/L	4	0.3	2.0		1	12/29/18 01:16	N	II
KQ1818869-56	Carbon, Total Organic	MS	K1811924-001	Water	27.60 mg/L	10 ml	110 mg/L	4	0.3	2.0	101		12/29/18 02:53	N	II
KQ1818869-57	Carbon, Total Organic	DUP	K1811924-002	Water	8.89 mg/L	10 ml	35.6 mg/L	4	0.3	2.0		<1	12/29/18 03:41	N	II
KQ1818869-58	Carbon, Total Organic	TRP	K1811924-002	Water	8.88 mg/L	10 ml	35.5 mg/L	4	0.3	2.0		<1	12/29/18 03:41	N	II
KQ1818869-59	Carbon, Total Organic	QUAD	K1811924-002	Water	8.77 mg/L	10 ml	35.1 mg/L	4	0.3	2.0		<1	12/29/18 03:41	N	II
KQ1818869-60	Carbon, Total Organic	MS	K1811962-001	Water	27.43 mg/L	10 ml	27.4 mg/L	1	0.07	0.50	98		12/29/18 05:47	N	II
KQ1818869-61	Carbon, Total Organic	DUP	K1811962-001	Water	2.69 mg/L	10 ml	2.69 mg/L	1	0.07	0.50		6	12/29/18 05:15	N	II
KQ1818869-62	Carbon, Total Organic	DUP	K1811962-003	Water	2.86 mg/L	10 ml	2.86 mg/L	1	0.07	0.50		24*	12/29/18 06:20	N	II
KQ1818869-63	Carbon, Total Organic	CCB		Ground Water	0.10 mg/L	10 ml	0.1 mg/L J	1	0.07	0.50			12/28/18 03:19	N	IV
KQ1818869-63	Carbon, Total Organic	CCB		Ground Water	0.10 mg/L	10 ml	0.1 mg/L J	1	0.07	0.50			12/28/18 03:19	N	IV
KQ1818869-64	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 10:44	N	IV
KQ1818869-64	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 10:44	N	IV
KQ1818869-65	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 20:13	N	IV
KQ1818869-65	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 20:13	N	IV
KQ1818869-66	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 02:36	N	IV
KQ1818869-66	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 02:36	N	IV
KQ1818869-67	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 07:56	N	IV
KQ1818869-67	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 07:56	N	IV
KQ1818869-68	Carbon, Total Organic	CCV		Ground Water	24.50 mg/L	10 ml	24.5 mg/L	1			98		12/28/18 03:03	N	IV
KQ1818869-68	Carbon, Total Organic	CCV		Ground Water	24.50 mg/L	10 ml	24.5 mg/L	1			98		12/28/18 03:03	N	IV
KQ1818869-69	Carbon, Total Organic	CCV		Ground Water	23.82 mg/L	10 ml	23.8 mg/L	1			95		12/28/18 10:28	N	IV
KQ1818869-69	Carbon, Total Organic	CCV		Ground Water	23.82 mg/L	10 ml	23.8 mg/L	1			95		12/28/18 10:28	N	IV
KQ1818869-70	Carbon, Total Organic	CCV		Ground Water	24.42 mg/L	10 ml	24.4 mg/L	1			98		12/28/18 19:56	N	IV
KQ1818869-70	Carbon, Total Organic	CCV		Ground Water	24.42 mg/L	10 ml	24.4 mg/L	1			98		12/28/18 19:56	N	IV
KQ1818869-71	Carbon, Total Organic	CCV		Ground Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/29/18 02:19	N	IV
KQ1818869-71	Carbon, Total Organic	CCV		Ground Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/29/18 02:19	N	IV

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620496 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818869-72	Carbon, Total Organic	CCV		Ground Water	24.19 mg/L	10 ml	24.2 mg/L	1			97		12/29/18 07:39	N	IV
KQ1818869-72	Carbon, Total Organic	CCV		Ground Water	24.19 mg/L	10 ml	24.2 mg/L	1			97		12/29/18 07:39	N	IV
KQ1818869-73	Carbon, Total Organic	MB		Ground Water	0.13 mg/L	10 ml	0.13 mg/L J	1	0.07	0.50			12/28/18 03:36	N	IV
KQ1818869-73	Carbon, Total Organic	MB		Ground Water	0.13 mg/L	10 ml	0.13 mg/L J	1	0.07	0.50			12/28/18 03:36	N	IV
KQ1818869-74	Carbon, Total Organic	LCS		Ground Water	20.09 mg/L	10 ml	20.1 mg/L	1	0.07	0.50	92		12/28/18 03:53	N	IV
KQ1818869-74	Carbon, Total Organic	LCS		Ground Water	20.09 mg/L	10 ml	20.1 mg/L	1	0.07	0.50	92		12/28/18 03:53	N	IV
KQ1818869-75	Carbon, Total Organic	MS	K1811919-004	Ground Water	24.82 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		12/29/18 00:44:00	N	IV

BCD 12/29/18

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620497 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811749-001	Carbon, Total Organic	N/A		Water	2.48 mg/L	10 ml	2.48 mg/L	1	0.07	0.50			12/29/18 11:40	N	IV
K1812078-001	Carbon, Total Organic	N/A		Water	5.52 mg/L	10 ml	5.52 mg/L	1	0.07	0.50			12/29/18 13:02	N	IV
K1812084-001	Carbon, Total Organic	N/A		Water	5.27 mg/L	10 ml	5.27 mg/L	1	0.07	0.50			12/29/18 13:34	N	IV
K1812087-001	Carbon, Total Organic	N/A		Water	5.49 mg/L	10 ml	5.49 mg/L	1	0.07	0.50			12/29/18 14:37	N	IV
K1812154-001	Carbon, Total Organic	N/A		Ground Water	19.05 mg/L	10 ml	19.0 mg/L	1	0.07	0.50			12/29/18 09:17	N	IV
K1812154-005	Carbon, Total Organic	N/A		Ground Water	7.53 mg/L	10 ml	7.53 mg/L	1	0.07	0.50			12/29/18 10:37	N	IV
K1812234-001	Carbon, Total Organic	N/A		Water	4.80 mg/L	10 ml	19.2 mg/L	4	0.3	2.0			12/29/18 06:51	N	II
K1812234-002	Carbon, Total Organic	N/A		Water	0.80 mg/L	10 ml	0.80 mg/L	1	0.07	0.50			12/29/18 08:45	N	II
KQ1818870-01	Carbon, Total Organic	MS	K1812234-001	Water	30.00 mg/L	10 ml	120 mg/L	4	0.3	2.0	101		12/29/18 07:23	N	II
KQ1818870-02	Carbon, Total Organic	DUP	K1812234-001	Water	4.48 mg/L	10 ml	17.9 mg/L	4	0.3	2.0		7	12/29/18 06:51	N	II
KQ1818870-03	Carbon, Total Organic	DUP	K1812234-002	Water	0.69 mg/L	10 ml	0.69 mg/L	1	0.07	0.50		15*	12/29/18 08:45	N	II
KQ1818870-04	Carbon, Total Organic	MS	K1812154-001	Ground Water	42.83 mg/L	10 ml	42.8 mg/L	1	0.07	0.50	95		12/29/18 09:49	N	IV
KQ1818870-05	Carbon, Total Organic	DUP	K1812154-001	Ground Water	19.24 mg/L	10 ml	19.2 mg/L	1	0.07	0.50		1	12/29/18 09:17	N	IV
KQ1818870-06	Carbon, Total Organic	DUP	K1812154-005	Ground Water	7.76 mg/L	10 ml	7.76 mg/L	1	0.07	0.50		3	12/29/18 10:37	N	IV
KQ1818870-07	Carbon, Total Organic	MS	K1811749-001	Water	26.81 mg/L	10 ml	26.8 mg/L	1	0.07	0.50	97		12/29/18 12:12	N	IV
KQ1818870-08	Carbon, Total Organic	DUP	K1811749-001	Water	2.22 mg/L	10 ml	2.22 mg/L	1	0.07	0.50		11	12/29/18 11:40	N	IV
KQ1818870-09	Carbon, Total Organic	DUP	K1812078-001	Water	5.40 mg/L	10 ml	5.40 mg/L	1	0.07	0.50		2	12/29/18 13:02	N	IV
KQ1818870-10	Carbon, Total Organic	DUP	K1812084-001	Water	5.19 mg/L	10 ml	5.19 mg/L	1	0.07	0.50		1	12/29/18 13:34	N	IV
KQ1818870-11	Carbon, Total Organic	DUP	K1812087-001	Water	5.51 mg/L	10 ml	5.51 mg/L	1	0.07	0.50		<1	12/29/18 14:37	N	IV
KQ1818870-12	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 02:36	N	II
KQ1818870-12	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 02:36	N	II
KQ1818870-13	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 07:56	N	II
KQ1818870-13	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 07:56	N	II
KQ1818870-14	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 12:45	N	II
KQ1818870-14	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 12:45	N	II
KQ1818870-15	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 17:34	N	II
KQ1818870-15	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 17:34	N	II
KQ1818870-16	Carbon, Total Organic	CCV		Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/29/18 02:19	N	II
KQ1818870-16	Carbon, Total Organic	CCV		Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/29/18 02:19	N	II
KQ1818870-17	Carbon, Total Organic	CCV		Water	24.19 mg/L	10 ml	24.2 mg/L	1			97		12/29/18 07:39	N	II
KQ1818870-17	Carbon, Total Organic	CCV		Water	24.19 mg/L	10 ml	24.2 mg/L	1			97		12/29/18 07:39	N	II
KQ1818870-18	Carbon, Total Organic	CCV		Water	23.78 mg/L	10 ml	23.8 mg/L	1			95		12/29/18 12:29	N	II
KQ1818870-18	Carbon, Total Organic	CCV		Water	23.78 mg/L	10 ml	23.8 mg/L	1			95		12/29/18 12:29	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620497 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818870-19	Carbon, Total Organic	CCV		Water	23.66 mg/L	10 ml	23.7 mg/L	1			95		12/29/18 17:17	N	II
KQ1818870-19	Carbon, Total Organic	CCV		Water	23.66 mg/L	10 ml	23.7 mg/L	1			95		12/29/18 17:17	N	II
KQ1818870-20	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 20:29	N	II
KQ1818870-20	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/18 20:29	N	II
KQ1818870-21	Carbon, Total Organic	LCS		Water	20.65 mg/L	10 ml	20.7 mg/L	1	0.07	0.50	94		12/28/18 20:46	N	II
KQ1818870-21	Carbon, Total Organic	LCS		Water	20.65 mg/L	10 ml	20.7 mg/L	1	0.07	0.50	94		12/28/18 20:46	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

BCP 12/29/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620498 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811962-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.70 mg/L	10 ml	2.70 mg/L	1	0.07	0.50			12/29/18 15:41	N	II
K1811962-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.01 mg/L	10 ml	2.01 mg/L	1	0.07	0.50			12/29/18 16:45	N	II
KQ1818871-01	Carbon, Dissolved Organic (DOC)	MS	K1811962-002	Water	27.30 mg/L	10 ml	27.3 mg/L	1	0.07	0.50	98		12/29/18 16:12	N	II
KQ1818871-02	Carbon, Dissolved Organic (DOC)	DUP	K1811962-002	Water	2.67 mg/L	10 ml	2.67 mg/L	1	0.07	0.50		<1	12/29/18 15:41	N	II
KQ1818871-03	Carbon, Dissolved Organic (DOC)	DUP	K1811962-004	Water	1.91 mg/L	10 ml	1.91 mg/L	1	0.07	0.50		5	12/29/18 16:45	N	II
KQ1818871-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 12:45	N	II
KQ1818871-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 17:34	N	II
KQ1818871-06	Carbon, Dissolved Organic (DOC)	CCV		Water	23.78 mg/L	10 ml	23.8 mg/L	1			95		12/29/18 12:29	N	II
KQ1818871-07	Carbon, Dissolved Organic (DOC)	CCV		Water	23.66 mg/L	10 ml	23.7 mg/L	1			95		12/29/18 17:17	N	II
KQ1818871-08	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/18 08:12	N	II
KQ1818871-09	Carbon, Dissolved Organic (DOC)	LCS		Water	20.60 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/29/18 08:29	N	II

BKD 12/29/18

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

StarLIMS Run: 620495, 620496, 620497, 620498

Analysis: TOC, DOC

Method: SM 5310 C, 9060, 415.1

CCV: 11-GEN-05-73F 50 ppm LCS: 11-GEN-05-73C 21.9 ppm

ICAL Date: 11/26/18

ICAL ID: 11-GEN-05-72J

ICS ID: 11-GEN-05-73B

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-70O 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-73K

21 % H3PO4: 11-GEN-05-73L

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, Marge, 129001F, N11314F

FILTER ID: NA

Analyzed By:	BCD for CES	Date Analyzed:	12/27/18
Reviewed By:		Date Reviewed:	12/31/18

DOC: 620495
TOC: 620496
620497
DOC: 620498

Schedule: 12272018

Version: 11
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2018/12/28 14:27 - Friday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
5	Sample	LOD	Extended Reaction 021711 (Extended Reaction 021711)	4
6	Sample	LOQ	Extended Reaction 021711 (Extended Reaction 021711)	4
7	Sample	K1811788-001.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K1811788-001.02 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
9	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1811788-002.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1811779-001.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1811779-001.04 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
13	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
14	Sample	K1811779-002.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	FB 12/12/18	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1812054-001 doc 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1812054-001 ms doc 4x	Extended Reaction 021711 (Extended Reaction 021711)	1
19	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1812054-002 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1811853-001.12	Extended Reaction 021711 (Extended Reaction 021711)	4
23	Sample	K1811853-001.12 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
24	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
25	Sample	K1811853-002.12	Extended Reaction 021711 (Extended Reaction 021711)	4
26	Sample	K1811853-003.12	Extended Reaction 021711 (Extended Reaction 021711)	4
27	Sample	K1811853-004.12	Extended Reaction 021711 (Extended Reaction 021711)	4
28	Sample	K1811853-005.12 4x	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1811854-001.12	Extended Reaction 021711 (Extended Reaction 021711)	4
30	Sample	K1811854-001.12 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
31	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
32	Sample	K1811854-002.12	Extended Reaction 021711 (Extended Reaction 021711)	4
33	Sample	K1811854-003.12	Extended Reaction 021711 (Extended Reaction 021711)	4
34	Sample	K1811854-004.12	Extended Reaction 021711 (Extended Reaction 021711)	4
35	Sample	K1811854-005.12	Extended Reaction 021711 (Extended Reaction 021711)	4
36	Sample	K1811854-006.12	Extended Reaction 021711 (Extended Reaction 021711)	4
37	Sample	K1811854-008.12	Extended Reaction 021711 (Extended Reaction 021711)	4

Schedule: 12272018

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
38	Sample	K1811919-001.12	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
40	Sample	K1811919-002.31	Extended Reaction 021711 (Extended Reaction 021711)	4
41	Sample	K1811919-002.31 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
42	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
43	Sample	K1811919-003.12	Extended Reaction 021711 (Extended Reaction 021711)	4
44	Sample	K1811919-004.31	Extended Reaction 021711 (Extended Reaction 021711)	4
45	Sample	K1811919-004.31 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
46	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
47	Sample	K1811924-001.10 4x	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K1811924-001.10 ms 4x	Extended Reaction 021711 (Extended Reaction 021711)	1
49	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	K1811924-002.10 4x	Extended Reaction 021711 (Extended Reaction 021711)	4
51	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	K1811962-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
53	Sample	K1811962-001.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
54	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
55	Sample	K1811962-003.01	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	K1812234-001.01 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	K1812234-001.01 ms 4x	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	K1812234-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	K1812154-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	K1812154-001.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
62	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	K1812154-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	K1811749-001.09	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K1811749-001.09 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1812078-001.23	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1812084-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1812087-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1811962-002.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1811962-002.02 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
74	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
75	Sample	K1811962-004.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Fusion Report - 12272018
Thursday, December 27, 2018 02:25 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2018/12/29 17:54 - Saturday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	12272018	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v11)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/12/27 14:25

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	14.78	17.57	2.79	49.28	05:24
2	TC Clean	59.71	62.46	2.75	50.10	04:05
3	TC Clean	3.94	6.83	2.88	50.05	03:47
4	TC Clean	2.20	5.13	2.93	50.07	03:48

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/27 14:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.37	16.17	2.79	50.11	12:33

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/12/27 15:04

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.07	15.58	3.51	49.43	05:25
2	TC Clean	4.98	7.97	3.00	50.00	03:59
3	TC Clean	2.45	5.32	2.87	50.14	03:55
4	TC Clean	1.60	4.46	2.86	50.03	03:54

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/27 15:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.95	15.69	2.74	50.19	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/12/27 15:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.61	15.17	3.56	49.26	05:23
2	TC Clean	4.97	7.72	2.75	50.06	04:04
3	TC Clean	2.22	4.88	2.66	50.11	03:46
4	TC Clean	1.46	4.26	2.80	50.17	03:46

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time

		Type			(ppmC)		
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/27 16:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.87	16.56	2.69	50.26	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Blank (Creating v1203) From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2018/12/27 16:21

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.86	15.24	3.39	49.33	05:24
2	TC Clean	4.92	7.80	2.88	50.00	04:01
3	TC Clean	2.19	4.88	2.69	50.13	03:46
4	TC Clean	1.64	4.36	2.72	50.18	03:45
5	Reagent Blank	6.96	9.71	2.74	50.18	05:04
6	Acid Blank	1.54	4.21	2.67	49.23	05:30

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	1.2394 ppm	0.0000 ppm	0.0000%	2018/12/27 16:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2394	12.3941	26.54	29.53	2.99	50.32	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2324 ppm (PASS)	0.0000 ppm	0%	2018/12/27 17:11

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Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2324	242.3239	203.70	206.50	2.81	50.32	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0664 ppm (PASS)	0.0000 ppm	0%	2018/12/27 17:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0664	0.6636	18.95	21.88	2.92	50.29	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0960 ppm	0.0000 ppm	0.0000%	2018/12/27 17:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0960	0.9600	17.80	20.65	2.85	50.38	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.5454 ppm (PASS)	0.0000 ppm	0%	2018/12/27 18:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.5454	205.4537	175.51	178.26	2.75	50.35	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	ICS	0.6448 ppm	0.0000 ppm	0.0000%	2018/12/27 18:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6448	6.4475	22.00	24.71	2.71	50.33	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	RB	0.2596 ppm	0.0000 ppm	0.0000%	2018/12/27 18:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2596	2.5965	19.05	21.74	2.69	50.32	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	LOD	0.2905 ppm	0.0834 ppm	28.7200%	2018/12/27 18:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2430	2.4303	18.92	21.49	2.57	50.31	12:29
2	TOC	0.2237	2.2367	18.78	21.44	2.66	50.26	12:25
3	TOC	0.4094	4.0942	20.20	22.80	2.60	50.27	12:25
4	TOC	0.2858	2.8581	19.25	21.94	2.69	50.26	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	LOQ	0.6377 ppm	0.0477 ppm	7.4900%	2018/12/27 19:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6022	6.0224	21.67	24.34	2.67	50.25	12:23
2	TOC	0.7026	7.0257	22.44	25.07	2.63	50.25	12:24
3	TOC	0.6445	6.4449	21.99	24.52	2.53	50.25	12:27
4	TOC	0.6013	6.0132	21.66	24.45	2.79	50.25	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC)	Extended Reaction	Extended Reaction

(v1203) 021711 (v3) 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1811788-001.02 doc	6.0415 ppm	0.0830 ppm	1.3700%	2018/12/27 20:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.1002	61.0019	63.70	66.32	2.62	50.20	12:28
2	TOC	5.9829	59.8286	62.80	65.54	2.74	50.20	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1811788-001.02 ms doc	31.0542 ppm	0.0000 ppm	0.0000%	2018/12/27 21:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.0542	310.5422	254.47	257.18	2.72	50.19	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	RB	0.3023 ppm	0.0000 ppm	0.0000%	2018/12/27 21:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3023	3.0229	19.38	22.18	2.80	50.20	12:36

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.6515 ppm (PASS)	0.0000 ppm	0%	2018/12/27 21:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6515	246.5150	206.90	209.56	2.66	50.15	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.1103 ppm (PASS)	0.0000 ppm	0%	2018/12/27 22:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.1103	1.1032	19.29	21.87	2.58	50.09	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1811788-002.02 doc	2.1572 ppm	0.1261 ppm	5.8400%	2018/12/27 22:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2464	22.4639	34.24	36.65	2.41	49.95	12:26
2	TOC	2.0681	20.6810	32.88	35.50	2.62	49.94	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1811779-001.04 doc	4.5778 ppm	0.0523 ppm	1.1400%	2018/12/27 23:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6147	46.1471	52.34	54.94	2.59	49.97	12:29
2	TOC	4.5408	45.4080	51.78	54.30	2.52	49.95	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K1811779-001.04 ms doc	29.6434 ppm	0.0000 ppm	0.0000%	2018/12/27 23:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.6434	296.4343	243.68	246.32	2.64	49.89	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time

		Type			(ppmC)		
◈	13	TOC	RB	0.3131 ppm	0.0000 ppm	0.0000%	2018/12/27 23:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3131	3.1315	19.46	22.10	2.64	49.87	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1811779-002.04 doc	19.6977 ppm	0.6358 ppm	3.2300%	2018/12/28 00:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	19.2481	192.4806	164.21	167.12	2.91	49.85	12:23
2	TOC	20.1473	201.4725	171.09	173.86	2.77	49.82	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	RB	0.6097 ppm	0.3221 ppm	52.8300%	2018/12/28 00:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8374	8.3743	23.47	26.21	2.74	49.79	12:28
2	TOC	0.3820	3.8195	19.99	22.56	2.57	49.74	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	FB 12/12/18	0.2041 ppm	0.0475 ppm	23.2500%	2018/12/28 01:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2377	2.3767	18.88	21.35	2.47	49.75	12:24
2	TOC	0.1706	1.7056	18.37	20.99	2.62	49.72	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1812054-001 doc 4x	4.1822 ppm	0.1390 ppm	3.3200%	2018/12/28 01:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2805	42.8049	49.79	52.38	2.59	49.74	12:25
2	TOC	4.0839	40.8388	48.29	50.89	2.60	49.71	12:26

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K1812054-001 ms doc 4x	29.9213 ppm	0.0000 ppm	0.0000%	2018/12/28 02:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.9213	299.2127	245.80	248.35	2.55	49.71	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	RB	0.2005 ppm	0.1565 ppm	78.0500%	2018/12/28 02:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3112	3.1118	19.45	22.06	2.62	49.69	12:25
2	TOC	0.0899	0.8985	17.75	20.45	2.69	49.69	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5045 ppm (PASS)	0.0000 ppm	0%	2018/12/28 03:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5045	245.0447	205.78	208.33	2.55	49.65	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0958 ppm (PASS)	0.0000 ppm	0%	2018/12/28 03:19

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

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	Type									
D	TOC	0.0 ppm	1	0.0958	0.9580	19.18	21.85	2.67	49.68	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.1278 ppm	0.0000 ppm	0.0000%	2018/12/28 03:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1278	1.2779	18.04	20.51	2.46	49.65	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.0852 ppm (PASS)	0.0000 ppm	0%	2018/12/28 03:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.0852	200.8518	171.99	174.72	2.72	49.65	12:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1812054-002 doc	3.8918 ppm	0.1227 ppm	3.1500%	2018/12/28 04:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9786	39.7858	47.48	50.13	2.65	49.65	12:25
2	TOC	3.8050	38.0500	46.16	48.82	2.66	49.63	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	22	TOC	K1811853-001.12	0.7955 ppm	0.0653 ppm	8.2100%	2018/12/28 04:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8608	8.6085	23.65	26.23	2.58	49.64	12:24
2	TOC	0.8130	8.1297	23.28	26.00	2.71	49.63	12:27
3	TOC	0.8032	8.0316	23.21	25.74	2.53	49.58	12:27
4	TOC	0.7052	7.0519	22.46	25.03	2.57	49.62	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1811853-001.12 ms	25.7034 ppm	0.0000 ppm	0.0000%	2018/12/28 05:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.7034	257.0342	213.56	216.17	2.61	49.61	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	RB	0.1799 ppm	0.0000 ppm	0.0000%	2018/12/28 06:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1799	1.7985	18.44	21.14	2.69	49.56	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1811853-002.12	1.6776 ppm	0.0280 ppm	1.6700%	2018/12/28 06:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7166	17.1661	30.19	32.94	2.75	49.60	12:29
2	TOC	1.6580	16.5801	29.74	32.44	2.70	49.60	12:26
3	TOC	1.6566	16.5657	29.73	32.46	2.73	49.60	12:26
4	TOC	1.6791	16.7907	29.90	32.61	2.70	49.58	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1811853-003.12	0.3677 ppm	0.1199 ppm	32.6000%	2018/12/28 07:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5149	5.1486	21.00	23.72	2.71	49.58	12:27

2	TOC	0.4154	4.1544	20.24	23.00	2.76	49.59	12:26
3	TOC	0.2600	2.6004	19.06	21.68	2.62	49.59	12:27
4	TOC	0.2806	2.8058	19.21	21.89	2.68	49.59	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1811853-004.12	0.3582 ppm	0.0701 ppm	19.5700%	2018/12/28 08:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4536	4.5364	20.54	23.08	2.54	49.58	12:28
2	TOC	0.3288	3.2884	19.58	22.12	2.54	49.56	12:26
3	TOC	0.3612	3.6115	19.83	22.39	2.56	49.55	12:26
4	TOC	0.2892	2.8921	19.28	21.91	2.63	49.59	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1811853-005.12 4x	2.0761 ppm	0.0845 ppm	4.0700%	2018/12/28 09:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1688	21.6882	33.65	36.28	2.63	49.60	12:24
2	TOC	2.1123	21.1231	33.21	35.67	2.45	49.67	12:26
3	TOC	2.0519	20.5188	32.75	35.30	2.54	49.76	12:26
4	TOC	1.9716	19.7156	32.14	34.89	2.75	49.87	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8182 ppm (PASS)	0.0000 ppm	0%	2018/12/28 10:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8182	238.1824	200.53	202.91	2.38	49.95	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/28 10:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	15.61	18.19	2.58	50.01	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1811854-001.12	0.0018 ppm	0.0037 ppm	200.0000%	2018/12/28 11:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0073	0.0731	17.12	19.82	2.69	50.03	12:30
2	TOC	0.0000	0.0000	16.90	19.40	2.50	50.04	12:28
3	TOC	0.0000	0.0000	16.88	19.37	2.48	50.03	12:25
4	TOC	0.0000	0.0000	16.90	19.48	2.58	50.05	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1811854-001.12 ms	24.6385 ppm	0.0000 ppm	0.0000%	2018/12/28 12:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.6385	246.3849	205.42	208.02	2.60	50.06	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/28 12:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.97	18.50	2.53	49.99	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	32	TOC	K1811854-002.12	0.1589 ppm	0.0707 ppm	44.4800%	2018/12/28 12:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1733	1.7331	18.39	20.97	2.58	50.04	12:28
2	TOC	0.2494	2.4944	18.97	21.49	2.52	50.06	12:25
3	TOC	0.0832	0.8318	17.70	20.35	2.65	50.09	12:25
4	TOC	0.1298	1.2975	18.06	20.70	2.64	50.05	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1811854-003.12	0.1706 ppm	0.0346 ppm	20.2800%	2018/12/28 13:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1550	1.5500	18.25	21.01	2.75	50.08	12:26
2	TOC	0.2209	2.2093	18.76	21.44	2.68	50.06	12:27
3	TOC	0.1635	1.6350	18.32	20.89	2.57	50.04	12:23
4	TOC	0.1430	1.4296	18.16	20.92	2.76	50.05	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1811854-004.12	0.1028 ppm	0.0648 ppm	63.0600%	2018/12/28 14:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1248	1.2478	18.02	20.68	2.66	50.04	12:26
2	TOC	0.0640	0.6395	17.56	20.20	2.64	50.04	12:21
3	TOC	0.1835	1.8351	18.47	21.23	2.76	50.06	12:29
4	TOC	0.0388	0.3884	17.36	20.13	2.77	50.07	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1811854-005.12	3.3360 ppm	0.2030 ppm	6.0800%	2018/12/28 15:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	3.6355	36.3547	44.86	47.63	2.77	50.07	12:30
2	TOC	3.2277	32.2773	41.74	44.43	2.68	50.01	12:30
3	TOC	3.1962	31.9621	41.50	44.27	2.77	50.07	12:27
4	TOC	3.2846	32.8463	42.18	44.89	2.71	50.06	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1811854-006.12	3.2966 ppm	0.0420 ppm	1.2700%	2018/12/28 16:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3360	33.3604	42.57	45.32	2.75	50.06	12:24
2	TOC	3.2374	32.3741	41.82	44.62	2.81	50.07	12:27
3	TOC	3.3022	33.0216	42.31	45.09	2.77	50.08	12:24
4	TOC	3.3109	33.1093	42.38	45.00	2.62	50.09	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1811854-008.12	0.0271 ppm	0.0339 ppm	125.2200%	2018/12/28 17:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0735	0.7350	17.63	20.24	2.61	50.03	12:25
2	TOC	0.0036	0.0365	17.10	19.65	2.55	49.99	12:25
3	TOC	0.0313	0.3125	17.31	20.03	2.73	49.99	12:24
4	TOC	0.0000	0.0000	16.84	19.45	2.61	49.92	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1811919-001.12	0.4612 ppm	0.0735 ppm	15.9400%	2018/12/28 18:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5643	5.6430	21.38	24.10	2.72	49.87	12:23
2	TOC	0.4556	4.5560	20.55	23.23	2.68	49.88	12:24
3	TOC	0.4326	4.3258	20.37	23.07	2.69	49.87	12:25
4	TOC	0.3924	3.9242	20.07	22.76	2.69	49.83	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.4242 ppm (PASS)	0.0000 ppm	0%	2018/12/28 19:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4242	244.2415	205.16	207.64	2.48	49.81	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/28 20:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	17.35	20.14	2.79	49.73	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/28 20:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.44	19.02	2.58	49.76	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.6517 ppm (PASS)	0.0000 ppm	0%	2018/12/28 20:46

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
2	TOC	21.9 ppm	1	20.6517	206.5172	176.32	178.84	2.52	49.74	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample — From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1811919-002.31	0.3993 ppm	0.2770 ppm	69.3800%	2018/12/28 21:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3036	3.0360	19.39	22.14	2.75	49.75	12:28
2	TOC	0.2441	2.4408	18.93	21.64	2.71	49.73	12:28
3	TOC	0.8124	8.1245	23.28	25.97	2.69	49.72	12:26
4	TOC	0.2371	2.3715	18.88	21.55	2.67	49.70	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1811919-002.31 ms	24.9224 ppm	0.0000 ppm	0.0000%	2018/12/28 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.9224	249.2235	207.59	210.24	2.65	49.67	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/28 22:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.58	19.26	2.68	49.73	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1811919-003.12	0.1066 ppm	0.0552 ppm	51.7500%	2018/12/28 22:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1602	1.6023	18.29	21.10	2.81	49.72	12:27
2	TOC	0.1481	1.4806	18.20	20.76	2.56	49.70	12:26
3	TOC	0.0566	0.5663	17.50	20.09	2.59	49.70	12:26

4	TOC	0.0615	0.6147	17.54	20.19	2.66	49.71	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1811919-004.31	0.0882 ppm	0.0319 ppm	36.1600%	2018/12/28 23:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1105	1.1052	17.91	20.68	2.77	49.71	12:27
2	TOC	0.0938	0.9378	17.78	20.41	2.63	49.65	12:24
3	TOC	0.1069	1.0686	17.88	20.52	2.63	49.67	12:25
4	TOC	0.0416	0.4158	17.39	20.11	2.73	49.70	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1811919-004.31 ms	24.8231 ppm	0.0000 ppm	0.0000%	2018/12/29 00:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.8231	248.2307	206.83	209.66	2.83	49.69	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 01:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.84	19.55	2.72	49.70	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1811924-001.10 4x	2.4684 ppm	0.0272 ppm	1.1000%	2018/12/29 01:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4716	24.7165	35.96	38.74	2.77	49.70	12:25
2	TOC	2.5057	25.0566	36.22	38.96	2.74	49.71	12:24
3	TOC	2.4481	24.4810	35.78	38.58	2.80	49.70	12:26
4	TOC	2.4481	24.4810	35.78	38.58	2.80	49.70	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0653 ppm (PASS)	0.0000 ppm	0%	2018/12/29 02:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0653	240.6534	202.42	205.12	2.70	49.67	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/29 02:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.43	19.34	2.91	49.69	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1811924-001.10 ms 4x	27.6033 ppm	0.0000 ppm	0.0000%	2018/12/29 02:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.6033	276.0331	228.08	230.74	2.66	49.67	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 03:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.22	19.04	2.82	49.67	12:28

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2	TOC	0.0000	0.0000	15.30	17.93	2.63	49.66	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1811924-002.10 4x	8.8559 ppm	0.0588 ppm	0.6600%	2018/12/29 03:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.8888	88.8881	85.02	87.76	2.74	49.65	12:29
2	TOC	8.8884	88.8841	85.02	87.67	2.65	49.67	12:28
3	TOC	8.8785	88.7847	84.94	87.67	2.73	49.64	12:23
4	TOC	8.7681	87.6807	84.10	86.95	2.85	49.63	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 04:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.48	18.12	2.64	49.67	12:25
2	TOC	0.0000	0.0000	14.60	17.28	2.68	49.66	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1811962-001.01	2.7660 ppm	0.1146 ppm	4.1400%	2018/12/29 05:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8471	28.4707	38.83	41.57	2.74	49.68	12:28
2	TOC	2.6850	26.8500	37.59	40.30	2.71	49.63	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1811962-001.01 ms	27.4331 ppm	0.0000 ppm	0.0000%	2018/12/29 05:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.4331	274.3313	226.78	229.54	2.76	49.66	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 06:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.30	19.01	2.71	49.65	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1811962-003.01	2.5518 ppm	0.4385 ppm	17.1900%	2018/12/29 06:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2417	22.4168	34.20	36.97	2.77	49.69	12:22
2	TOC	2.8619	28.6185	38.94	41.76	2.81	49.68	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1812234-001.01 4x	4.6404 ppm	0.2324 ppm	5.0100%	2018/12/29 06:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8046	48.0465	53.80	56.41	2.61	49.67	12:22
2	TOC	4.4761	44.7605	51.28	54.03	2.74	49.64	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1812234-001.01 ms 4x	29.9971 ppm	0.0000 ppm	0.0000%	2018/12/29 07:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.9971	299.9714	246.38	249.13	2.75	49.66	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.1887 ppm (PASS)	0.0000 ppm	0%	2018/12/29 07:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1887	241.8869	203.36	206.12	2.76	49.66	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/29 07:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.72	19.25	2.53	49.68	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 08:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.93	18.71	2.78	49.64	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.5977 ppm (PASS)	0.0000 ppm	0%	2018/12/29 08:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.5977	205.9769	175.91	178.61	2.70	49.66	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1812234-002.01	0.7458 ppm	0.0776 ppm	10.4100%	2018/12/29 08:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8007	8.0068	23.19	25.89	2.70	49.64	12:25
2	TOC	0.6909	6.9093	22.35	25.04	2.70	49.64	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	K1812154-001.01	19.1409 ppm	0.1354 ppm	0.7100%	2018/12/29 09:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	19.0452	190.4518	162.66	165.25	2.59	49.64	12:28
2	TOC	19.2367	192.3668	164.12	166.91	2.79	49.63	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	K1812154-001.01 ms	42.8325 ppm	0.0000 ppm	0.0000%	2018/12/29 09:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	42.8325	428.3250	344.51	347.26	2.76	49.65	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 10:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	17.06	19.89	2.83	49.62	12:26
2	TOC	0.0000	0.0000	15.36	18.14	2.78	49.64	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1812154-005.01	7.6459 ppm	0.1586 ppm	2.0700%	2018/12/29 10:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	7.5337	75.3374	74.66	77.36	2.70	49.64	12:28
2	TOC	7.7581	77.5808	76.38	79.16	2.79	49.64	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	RB	0.0755 ppm	0.1068 ppm	141.4200%	2018/12/29 11:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1511	1.5107	18.22	21.11	2.89	49.67	12:28
2	TOC	0.0000	0.0000	15.97	18.74	2.77	49.68	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	K1811749-001.09	2.3499 ppm	0.1818 ppm	7.7300%	2018/12/29 11:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4784	24.7845	36.01	38.77	2.75	49.73	12:30
2	TOC	2.2214	22.2141	34.05	36.88	2.83	49.82	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K1811749-001.09 ms	26.8084 ppm	0.0000 ppm	0.0000%	2018/12/29 12:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8084	268.0838	222.01	224.67	2.66	49.90	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7764 ppm (PASS)	0.0000 ppm	0%	2018/12/29 12:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7764	237.7638	200.21	202.90	2.69	49.93	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/29 12:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	14.96	17.63	2.66	49.98	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1812078-001.23	5.4620 ppm	0.0852 ppm	1.5600%	2018/12/29 13:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.5223	55.2227	59.28	61.93	2.65	49.98	12:26
2	TOC	5.4018	54.0180	58.36	61.04	2.68	50.02	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1812084-001.08	5.2310 ppm	0.0541 ppm	1.0300%	2018/12/29 13:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2693	52.6929	57.35	59.90	2.55	50.02	12:29
2	TOC	5.1928	51.9276	56.76	59.47	2.71	50.00	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 14:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.91	17.61	2.70	50.06	12:29

2	TOC	0.0000	0.0000	14.32	17.12	2.80	50.03	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1812087-001.08	5.5041 ppm	0.0135 ppm	0.2500%	2018/12/29 14:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.4945	54.9454	59.07	61.86	2.79	50.01	12:24
2	TOC	5.5136	55.1364	59.22	61.94	2.72	49.97	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 15:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.35	17.08	2.72	50.05	12:26
2	TOC	0.0000	0.0000	13.48	16.25	2.77	50.02	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1811962-002.02 doc	2.6843 ppm	0.0154 ppm	0.5800%	2018/12/29 15:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6952	26.9520	37.67	40.33	2.66	49.96	12:26
2	TOC	2.6734	26.7336	37.50	40.14	2.64	50.00	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1811962-002.02 ms doc	27.3004 ppm	0.0000 ppm	0.0000%	2018/12/29 16:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.3004	273.0035	225.77	228.55	2.78	50.01	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	74	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/29 16:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.36	18.11	2.75	50.01	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	75	TOC	K1811962-004.02 doc	1.9597 ppm	0.0697 ppm	3.5600%	2018/12/29 16:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0090	20.0897	32.42	35.01	2.58	50.01	12:27
2	TOC	1.9103	19.1034	31.67	34.29	2.62	50.01	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0671 (IC) (v1203)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6597 ppm (PASS)	0.0000 ppm	0%	2018/12/29 17:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6597	236.5970	199.32	202.05	2.73	50.02	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/29 17:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	14.98	17.56	2.58	50.02	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

00944903

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1202	1.7907	1.3090	0.0000	0.0000	0.0000	2018/12/20 11:40	Fusion1 (Fusion1)
v1203	2.3210	1.5420	0.0000	0.0000	0.0000	2018/12/27 16:54	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version: v24
Ver Creation: 2018/11/26 18:53
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 7.645x + 18.448
r^2 value: TOC: r^2 = 0.99984

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	19.1720	0.0000		2018/11/26 17:15
0.50 ppm	23.8410	0.5000		2018/11/26 17:31
1.00 ppm	25.1300	1.0000		2018/11/26 17:47
5.00 ppm	53.5500	5.0000		2018/11/26 18:03
10.0 ppm	95.3860	10.0000		2018/11/26 18:20
25.0 ppm	211.7220	25.0000		2018/11/26 18:36
50.0 ppm	399.8190	50.0000		2018/11/26 18:52

Methods

Name: Extended Reaction 021711 (TOC)

Version: v3
Ver Creation: 2013/02/04 11:44
Comment:
Operator: Gen Chem Lab (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min

00944904

NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpargeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpargeTime	4.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	7
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	7
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2018/12/29 17:54

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Client: RJ Modashia
ALS Laboratory Group
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Phone: 281-575-2279

Fax:

Identifier: 032PL **Date Rec:** 12/11/2018 **Report Date:** 12/18/2018

Client Project #: NW01312.0150 **Client Project Name:** LHAAP-58

Purchase Order #: HS18120569

Analysis Requested: CENSUS

Reviewed By:

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CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP-58

MI Project Number: **032PL**
Date Received: 12/11/2018

Sample Information

Client Sample ID:		**35AWW20_121018**	**35AWW24_121018**	**35AWW19_121018**	**35AWW23_121018**	**LHSMW07_121018**
Sample Date:		12/10/2018	12/10/2018	12/10/2018	12/10/2018	12/10/2018
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS	JS	JS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	<1.90E+00	<1.20E+00	**5.00E-01 (J)**	**1.49E+02**	**6.08E+03**
tceA Reductase	TCE	<1.90E+00	<1.20E+00	<5.00E-01	<2.50E+00	<2.10E+00
BAV1 Vinyl Chloride Reductase	BVC	<1.90E+00	<1.20E+00	<5.00E-01	**5.40E+00**	<2.10E+00
Vinyl Chloride Reductase	VCR	<1.90E+00	<1.20E+00	<5.00E-01	**6.07E+01**	**8.04E+03**
Dehalobacter spp.	*DHBt*	**2.83E+05**	**1.50E+00 (J)**	**9.90E+04**	<2.50E+01	**1.66E+05**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **12/11/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	12/11/2018	12/18/2018	0 °C	104%	non-detect	non-detect
DHBt	12/11/2018	12/18/2018	0 °C	100%	non-detect	non-detect
BVC	12/11/2018	12/18/2018	0 °C	101%	non-detect	non-detect
TCE	12/11/2018	12/18/2018	0 °C	101%	non-detect	non-detect
VCR	12/11/2018	12/18/2018	0 °C	98%	non-detect	non-detect

How to Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database and Client Portal

The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 32,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide. Driven by field samples, the database reflects the impacts of common contaminants, geochemical conditions, and site management practices on critical microbial populations.

With your report, you received a passcode enabling you to retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge. When accessing the database, you will be asked to provide background information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations. As with all client information provided to MI, site specific data will be treated as confidential.

Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. Simply put, qPCR and QuantArray results demonstrating high concentrations of target microorganisms or functional genes suggest in situ selection, enrichment and growth of those specific contaminant degraders and therefore a greater probability that monitored natural attenuation (MNA) or bioremediation will be successful.

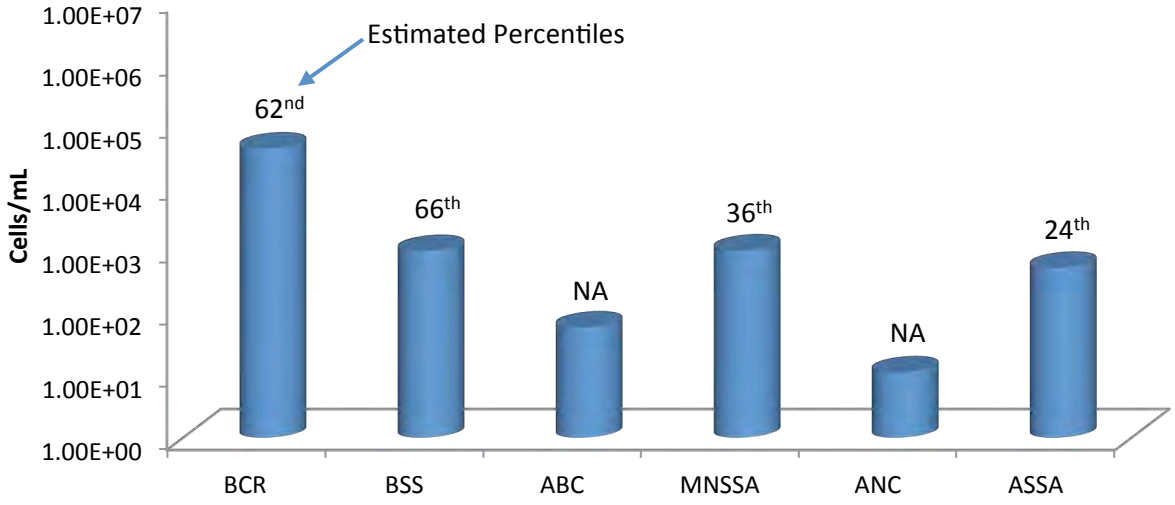
Is that a low, medium, or high concentration? The estimated percentile ranks retrieved from the MI Database answer that question by comparing your qPCR and QuantArray results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Using the Estimated Percentile - Interpretation Examples

MNA Assessment – Petroleum Hydrocarbon Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between samples obtained from background and impacted wells. The estimated percentile ranks however provide an additional avenue for comparison and evaluation of treatment options as shown below.

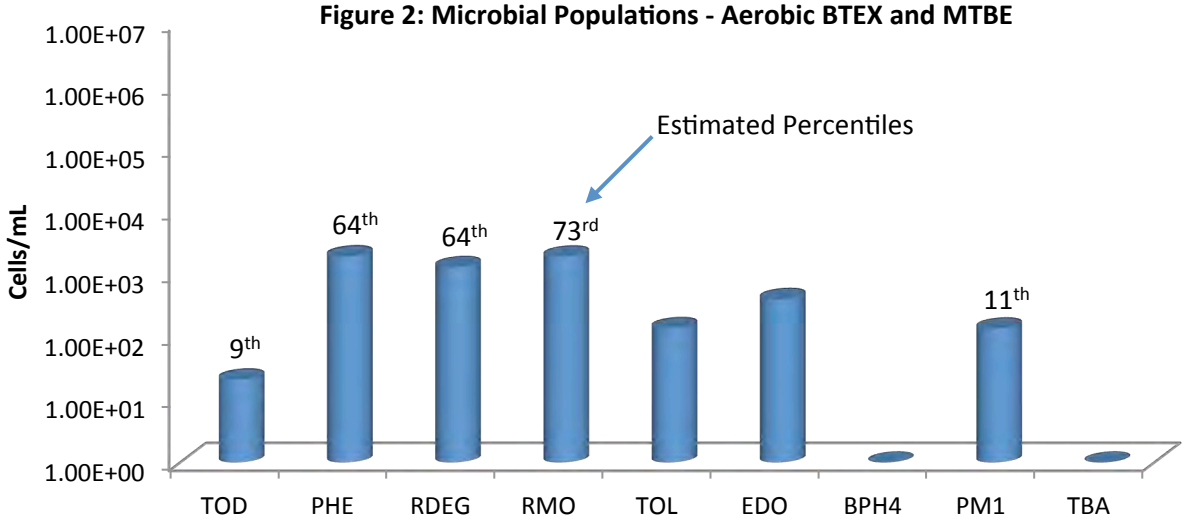
Figure 1: Microbial Populations - Anaerobic BTEX and PAHs



Anaerobic BTEX and PAH Biodegradation (Figure 1):

- With moderate concentrations of functional genes involved in anaerobic BTEX metabolism detected, the QuantArray-Petro® results were encouraging in terms of evaluating biodegradation potential under existing site conditions.
- More specifically, benzylsuccinate synthase (BSS) was detected on the order of nearly 10^3 cells/mL indicating the presence of a substantial population (66^{th} percentile) capable of anaerobic biodegradation of toluene and other alkyl substituted benzenes.
- Naphthyl-2-methylsuccinate synthase (MNSSA) and alkylsuccinate synthase (ASSA) genes were also detected indicating the potential for anaerobic biodegradation of 2-methylnaphthalene and normal alkanes.
- The concentration of MNSSA genes would be considered modest with an estimated percentile of 36^{th}.
- While the percentile rank for MNSSA would be "below average", a number of additional factors should be considered.
    - First, anaerobic hydrocarbon degraders are less prevalent than aerobic BTEX degraders and overall detection frequencies for many genes involved in anaerobic hydrocarbon biodegradation are less than 50%.
    - Therefore, the detection of genes like BSS, MNSSA, ASSA, anaerobic benzene carboxylase (ABC), and anaerobic naphthalene carboxylase (ANC) even at low concentrations is certainly noteworthy and inherently "better than average".
    - The estimated percentiles for all assays are based only on samples where the concentration of the target gene was greater than the practical quantitation limit (PQL).
    - For less commonly detected targets like many of the genes involved in anaerobic hydrocarbon biodegradation this is an especially important consideration.
    - Excluding samples where a gene target is below the PQL ensured that the median concentrations of less commonly detected targets would not be unduly biased low by the fact that the gene is not detected in most samples.
- Anaerobic benzene carboxylase (ABC) and naphthalene carboxylase (ANC) genes were also detected indicating the presence of bacterial populations capable of anaerobic biodegradation of benzene and naphthalene.
- For newly identified genes like ABC and ANC, estimated percentile ranks are not yet available due to the limited number of field samples that have been analyzed to date.
- However, like MNSSA and other genes involved in anaerobic hydrocarbon biodegradation, ABC and ANC detection frequencies are relatively low so the detection of these genes even at low concentrations should be considered when evaluating biodegradation potential under existing site conditions.

Figure 2: Microbial Populations - Aerobic BTEX and MTBE



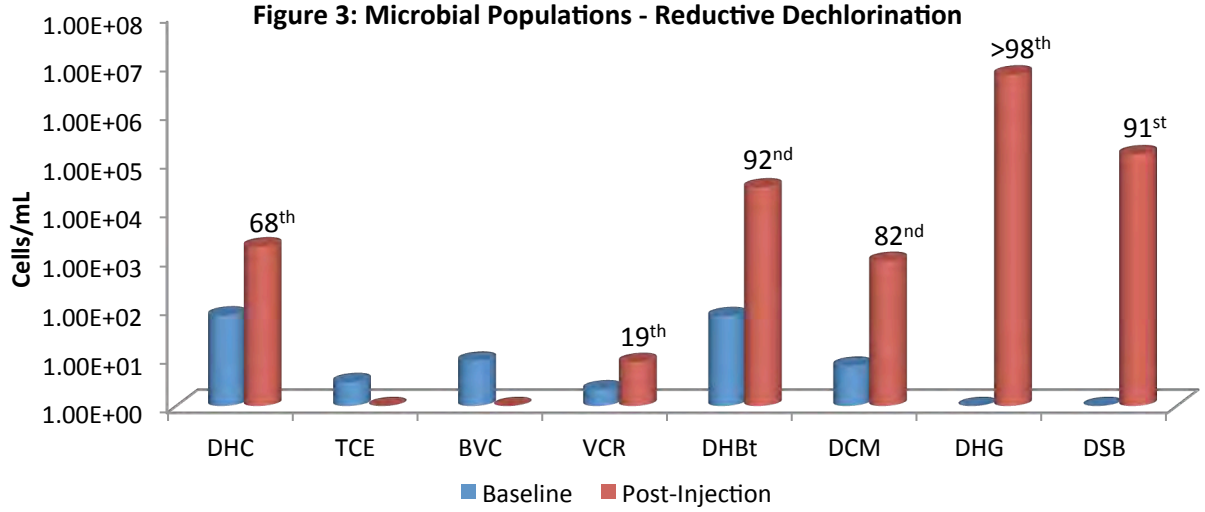
Aerobic BTEX and MTBE Biodegradation (Figure 2):

- With growing evidence that aromatic oxygenases function at low dissolved oxygen concentrations, aerobic BTEX biodegradation pathways should also be evaluated when considering MNA.
- Again, the QuantArray-Petro results were encouraging – genes encoding the first step in multiple pathways for aerobic BTEX biodegradation were detected indicating the presence of a diverse population of aerobic BTEX degraders.
- However, aerobic BTEX degraders are often considered ubiquitous. Therefore answering the question "Is that low, medium or high?" becomes especially important when evaluating aerobic BTEX biodegradation at petroleum hydrocarbon sites.
- In this case, the estimated percentile ranks of the concentrations of toluene/benzene monooxygenase (RMO and RDEG) and phenol hydroxylase (PHE) genes ranged from the 64th to 73rd percentile.
- In other words, the concentrations of RMO, RDEG, and PHE detected in this groundwater sample were greater than the concentrations detected in 64% to 73% of all other groundwater samples where these genes were analyzed and detected above the PQL.
- Aerobic BTEX degraders are common in the environment, but in this sample concentrations of toluene/benzene monooxygenase genes could be viewed as "better than average" when compared to the MI Database.

Biostimulation – Chlorinated Solvent Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between baseline and post-injection monitoring events as shown below (Figure 3). The estimated percentile ranks however provide an additional avenue for comparison and evaluation of remedy performance.

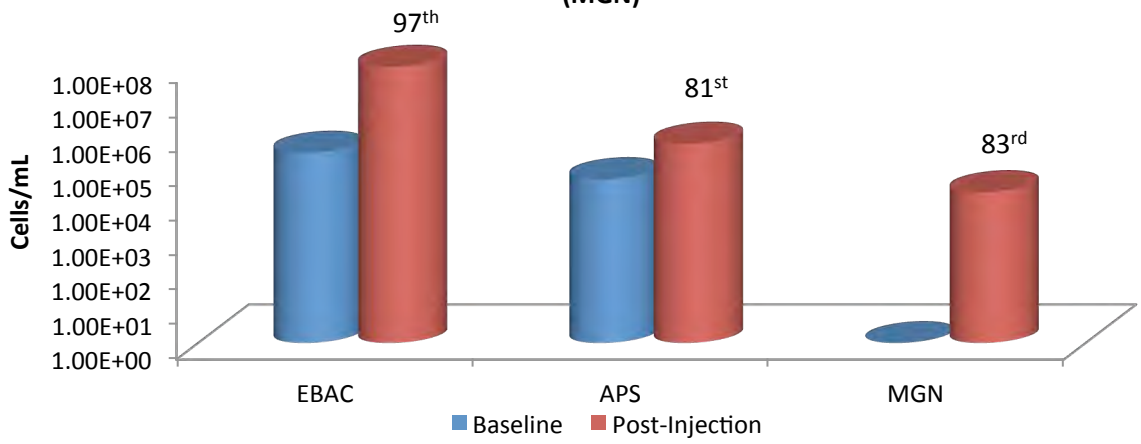
Figure 3: Microbial Populations - Reductive Dechlorination



- During the baseline groundwater sampling event, *Dehalococcoides* and vinyl chloride reductase genes were detected indicating the potential for complete reductive dechlorination of PCE and TCE to ethene.
- However, the *Dehalococcoides* concentration was well below the 10^4 cells/mL recommended by Lu et al. (2006) for generally effective rates of reductive dechlorination.
- Based on qPCR results as well as traditional groundwater monitoring, biostimulation with electron donor addition was selected as the site management plan.
- By the first monitoring event after injection, populations of halorespiring bacteria had increased substantially in response to electron donor addition.
    - *Dehalobacter* populations increased by more than two orders of magnitude to post-injection concentrations greater than 10^4 cells/mL (92^{nd} percentile).
    - *Dehalogenimonas* (10^6 cells/mL) and *Desulfitobacterium* (10^5 cells/mL) which had not been detected prior electron donor addition were present at concentrations greater than observed in over 90% of other groundwater samples where these halorespiring bacteria were detected.
- After injection, *Dehalococcoides* populations increased by more than an order of magnitude to a concentration of over 10^3 cells/mL (68^{th} percentile) demonstrating growth of this key group of halorespiring bacteria.
- Despite a substantial increase and a "better than average" concentration, the *Dehalococcoides* population was still below the 10^4 cells/mL threshold and vinyl chloride reductase gene copies were low (19^{th} percentile).
    - In terms of electron donors and acceptors, the metabolic capabilities of *Dehalococcoides* are rather specialized (hydrogen utilizing obligate halorespiring bacteria) so the median concentration is low. With a low median concentration across the database, a "better than average" *Dehalococcoides* concentration in a given sample may not exceed the 10^4 cells/mL threshold established for effective reductive dechlorination (Lu et al. 2006) and ethene production (Microbial Insights, unpublished data).

- In this case, the initial growth of *Dehalococcoides* was substantial but may have been somewhat hindered by competition with sulfate reducing bacteria (Figure 4 below).
    - The baseline population of sulfate reducing bacteria was moderate (10^4 cells/mL; 63rd percentile). Consistent with an observed decreased in dissolved sulfate concentrations, populations of sulfate reducing bacteria increased and were detected at a relatively high concentration (81st percentile) after electron donor addition.
    - After injection, methanogen populations also increased to a relatively high concentration (83rd percentile) suggesting generation of methanogenic conditions.
- With sulfate depletion and generation of highly anaerobic conditions more conducive to reductive dechlorination, *Dehalococcoides* populations may continue to increase and exceed the 10^4 *Dehalococcoides* cells/mL threshold in subsequent monitoring events.
- Overall, QuantArray analysis conclusively demonstrated that electron donor addition stimulated growth of halorespiring bacteria with the estimated percentiles retrieved from the MI Database providing the "low, medium or high" perspective to the observed changes in microbial populations.

Figure 4: Total Bacteria (EBAC), Sulfate Reducering Bacteria (APS) and Methanogens (MGN)



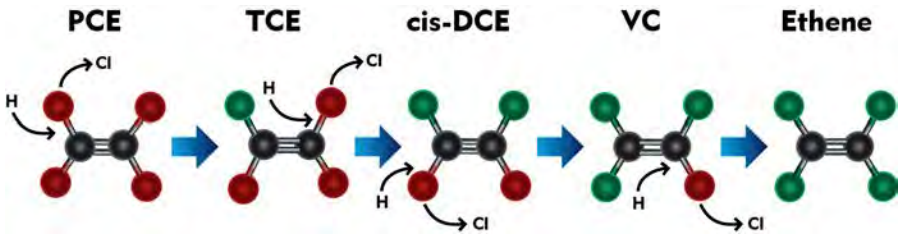
References

Lu, X., J.T. Wilson, and D.H. Kampbell. 2006. Relationship between *Dehalococcoides* DNA in ground water and rates of reductive dechlorination at field scale. *Water Research* 40 no. 16: 3131-3140.

DHC Interpretation

Dehalococcoides 16S rRNA gene (qDHC)

Under anaerobic conditions, tetrachloroethene (PCE) and trichloroethene (TCE) can undergo sequential reductive dechlorination through the daughter products *cis*-dichloroethene (*cis*-DCE) and vinyl chloride to nontoxic ethene (1,2).



While a number of bacterial cultures capable of utilizing PCE and TCE as growth supporting electron acceptors have been isolated (3-7), *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene (8). In fact, the presence of *Dehalococcoides* spp. has been associated with complete dechlorination to ethene at sites across North America and Europe (9).

Status	*Dehalococcoides spp.*	Observation
	≥ 10^4 (cells/mL)	Lu et al. proposed that a concentration of 1 x 10^4 DHC cells/mL could be used as a screening criterion to identify sites where reductive dechlorination will yield a generally useful biodegradation rate (10). Similarly, in an internal study conducted with nearly 1000 groundwater samples obtained from sites across the US, ethene production was observed in approximately 80% of samples in which CENSUS® qDHC results were greater than or equal to 10^4 DHC cells/mL.
	10^1 to < 10^4 (cells/mL)	When vinyl chloride reductase genes (See DHC functional genes discussion below) are also detected, complete reductive dechlorination of PCE and TCE to ethene may still occur even with moderate DHC concentrations. When the DHC population is below the 10^4 cells/mL criterion proposed by Lu et al. (10), project managers should carefully consider other site-specific data to determine whether subsurface conditions may be limiting reductive dechlorination. For example, the addition of an electron donor may be able to stimulate DHC growth and enhance anaerobic bioremediation.
	< 10^1 (cells/mL)	DHC concentrations are low suggesting that complete reductive dechlorination of PCE and TCE to ethene is unlikely to occur under existing conditions. Enhanced anaerobic bioremediation options (biostimulation or bioaugmentation) may need to be considered.

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DHC Interpretation

DHC Functional Genes (*tce*A, *bvc*A, *vcr*A)

A "stall" where daughter products *cis*-DCE and vinyl chloride accumulate can occur at PCE- and TCE-impacted sites especially under MNA conditions. The accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. Although elevated *Dehalococcoides* concentrations correspond to ethene production in numerous studies, the range of chlorinated ethenes metabolized and cometabolized varies among species and strains within the *Dehalococcoides* genus. For example, *Dehalococcoides ethenogenes* str. 195 metabolizes PCE, TCE, and *cis*-DCE and cometabolizes vinyl chloride (8) to produce ethene. Conversely, *Dehalococcoides* sp. CBDB1 utilizes PCE and TCE but does not cometabolize additional chloroethenes (11). Other *Dehalococcoides* strains, such as BAV1, GT and VS, are known to fully dechlorinate cis-DCE and VC to ethene (14,16,19). Quantification of reductive dehalogenase genes is used to more definitively confirm the potential for reductive dechlorination of TCE, cis-DCE, and vinyl chloride (12-15).

Functional Gene	Observation
TCE Reductase	
***tce*A gene**	The *tce*A gene encodes the enzyme responsible for reductive dechlorination of TCE to *cis*-DCE in some strains of *Dehalococcoides*. Absence of *tce*A does not preclude the potential for reductive dechlorination of TCE in the field since the *tce*A gene is not universally distributed among all DHC and is not present in other microorganisms capable of reductive dechlorination of TCE (e.g. *Dehalobacter*). Detection of the *tce*A gene provides an additional line of evidence indicating the potential for dechlorination of TCE.
Vinyl Chloride Reductase	
***bvc*A gene**	The *bvc*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of vinyl chloride to ethene by *Dehalococcoides* sp. str. BAV1 (16). Presence of *bvc*A gene indicates the potential for reductive dechlorination of VC to ethene. Absence of both *bvc*A and *vcr*A genes suggests VC may accumulate. An internal study with ~1,000 samples showed ethene production was observed in 80% of the samples that the DHC population was greater than or equal to 10^4 cells/mL. The *bvc*A gene was detected in over 50% of these samples. Van Der Zaan et al (17) noted that the bvcA gene was the only VC reductase gene detected at three of their sites. Alfred Spormann's laboratory at Stanford University (18) reported that the *bvc*A gene was the most abundant and active at the outflow of a PCE fed column study. This section of the column was in the DCE to VC stages of reductive dechlorination thus confirming the importance of the *bvc*A gene for complete reductive dechlorination.
***vcr*A gene**	The *vcr*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of *cis*-DCE and vinyl chloride by *Dehalococcoides* sp. strain VS (14). Presence of *vcr*A gene indicates the potential for reductive dechlorination of DCE and/or VC to ethene. Absence of both *bvc*A and *vcr*A genes suggest VC may accumulate. As with the *bvc*A gene, detection of the *vcr*A gene is associated with ethene production in internal studies (67%) and vinyl chloride reduction in independent studies (14, 17).

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DHC Interpretation

Reporting

Microbial Insights can provide a variety of data packages and reporting levels to suit the needs of any project. Data packages range from simple analytical reports with results only to more complex data packages that include a report narrative, analytical results, QC data, and supporting materials including all raw data and chain-of-custody documentation. The figure below shows our standard report and explains the way values are reported.

Microbial Insights, Inc.

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CENSUS

Client: Company Name
Project: Your Project Name

MI Project Number: Unique Laboratory Identifier
Date Received: Date Samples Arrived

Sample Information

Client Sample ID:		Sample A	Sample B	Sample C
Sample Date:		00/00/0000	00/00/0000	00/00/0000
Units:		cells/mL	cells/mL	cells/mL
Analyst:		Intials	Intials	Intials
Dechlorinating Bacteria				
Dehalococcoides spp.	DHC	**1.84E+05**	**2.76E+02**	**2.28E+01 (J)**
Functional Genes				
tceA Reductase	TCE	**6.00E+01**	**3.23E+01**	<4.00E-01
bvcA Reductase	BVC	**1.17E+04**	**1.81E+01**	<4.00E-01
vcrA Reducatase	VCR	**8.42E+04**	**1.74E+02**	<4.00E-01

"J" value
Result is an estimated value. This data qualifier (flag) is used when the target gene is detected but at a concentration or abundance below the practical quantification limit (PQL).

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

< value
The target gene was not detected at the limit of quantitation (LOQ) reported for that sample.

"I" value
QA Procedure indicated that the sample may have exhibited PCR inhibition. Although relatively rare, PCR inhibition can occur due to the presence of metals or humic acids at high concentrations in the sample.

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Quality Assurance

Microbial Insights' comprehensive Quality Assurance (QA) Program is the foundation of all laboratory analyses, ensuring that our clients receive high-quality analytical services that are timely, reliable, and meet their intended purpose in a cost effective manner. MI is committed to providing quality data that surpasses regulatory and industry standards, thus enabling the client to make well-informed decisions. MI maintains strict standard operating procedures and QA/QC measures throughout all of the analyses offered. The following Table details specific QA/QC procedures that are used for CENSUS.

QA/QC	Description
Date of Extraction	DNA and RNA extractions are performed the day the samples are received by MI to minimize the possibility of any changes to the microbial community prior to analysis.
Laboratory Method Blanks	An extraction blank (no sample added) is processed alongside each set of field samples from DNA extraction through CENSUS® analysis to ensure that cross contamination has not occurred. Although MI has never experienced this issue, the detection of the CENSUS® target (e.g. *Dehalococcoides*) in an extraction blank is direct evidence of cross contamination with a sample or contamination of a reagent and would invalidate the results. If this were to occur, MI would re-extract the sample. If not possible to re-extract, MI would contact the client immediately and notate it on the laboratory report.
Laboratory Control Samples (LCS)	A laboratory control sample (LCS) or positive control (target DNA) is included with each CENSUS® plate to confirm amplification and as a continuing calibration check.
Negative Controls	A negative control (no DNA) is included with each CENSUS plate to ensure that cross contamination has not occurred during amplification. As with the extraction blank, detection of CENSUS target (e.g. DHC) in a negative control is direct evidence of contamination and would invalidate the results. If this were to occur, MI would rerun the analysis.

References

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3. Gerritse, J., V. Renard, T. M. Pedro Gomes, P. A. Lawson, M. D. Collins, and J. C. Gottschal. 1996. *Desulfitobacterium* sp. Strain PCE1, an anaerobic bacterium that can grow by reductive dechlorination of tetrachloroethene or ortho-chlorinated phenols. Archives of Microbiology 165(2): 132-140.

4. Gerritse, J., O. Drzyzga, G. Kloetstra, M. Keijmel, L. P. Wiersum, R. Hutson, M. D. Collins, and J. C. Gottschal. 1999. Influence of different electron donors and acceptors on dehalorespiration of tetrachloroethene by *Desulfitobacterium frappieri* TCE1. Applied and Environmental Microbiology 65(12): 5212-5221.

5. Holliger, C., G. Schraa, A.J.M. Stams, and A.J.B. Zehnder. 1993. A highly purified enrichment culture couples the reductive dechlorination of tetrachloroethene to growth. Applied and Environmental Microbiology 59 (9): 2991-2997.

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10515 Research Drive
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How to Retrieve and Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database

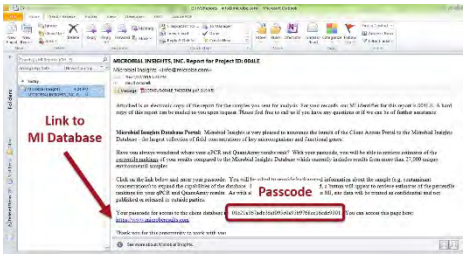
The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 40,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide.

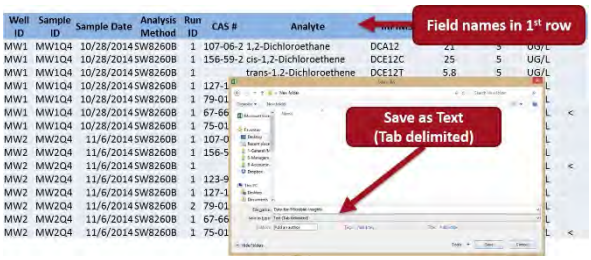
Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. The estimated percentile ranks retrieved from the MI Database answer the question "Is that low, medium or high?" by comparing your results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Retrieving Estimated Percentile Ranks

With your report, you were emailed a passcode and link enabling you to login to the Client Portal. Just enter basic information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations and you can retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge.





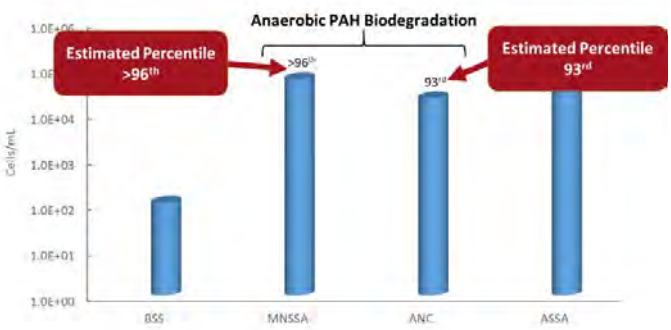
All site specific data will be treated as confidential and uploading is easy.

You can even upload chemical and geochemical data from EDDs. Just save as a Tab Delimited text file.

Example - Using Estimated Percentile for MNA Assessment at an MGP Site

CENSUS® qPCR was performed to quantify anaerobic naphthalene carboxylase (ANC) and naphthyl-2-methylsuccinate synthase (MNSSA) to assess anaerobic biodegradation of naphthalene and methyl-naphthalene under existing site conditions.

- Not only were ANC and MNSSA genes detected, but these functional genes responsible for anaerobic biodegradation of PAHs were present at concentrations "far better than average" based on the estimated percentile ranks.
- Demonstrating high concentrations of ANC and MNSSA gave an additional line of evidence indicating growth substantial populations of anaerobic PAH degraders and suggested a greater probability that monitored natural attenuation (MNA) will be successful.



REPORT TO:

Name: MARCIA OLIVE
Company: BHATE ENVIRONMENTAL
Address: 445 UNION BLVD. SUITE 129
LAKEWOOD, CO. 80228
email: molive@bhate.com
Phone: (303) 725-7631
Fax:

Project Manager: Kim NEMMERS
Project Name: LHAAP-58
Project No.: NW01312.0150

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)

Name:
Company:
Address:
email:
Phone:
Fax:

Purchase Order No.
Subcontract No.
MI Quote No.

microbialinsights
10515 Research Dr
Knoxville, TN 37932
865-573-8188
www.microbe.com

Please Check One:
☑ More samples to follow
☐ No Additional Samples

Report Type: ☐ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (30%)

EDD type: ☐ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information					Analyses					CENSUS: Please select the target organism/gene																						
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Denitrifiers-nirS and nirK)	AOB (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
032PL 1	35AWW20_121018	12/10/18	0910	WG						X		X																				
2	35AWW24_121018	12/10/18	1015	WG						X		X																				
3	35AWW19_121018	12/10/18	1115	WG						X		X																				
4	35AWW23_121018	12/10/18	1230	WG						X		X																				
5	~~LHS~~MW07_121018	12/10/18	1330	WG						X		X																				
6																																

Relinquished by: Scott Boesiger 12/10/18 1500

Received by: Date 12/11/18 1000

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

HS18120569 8260 Raw Data

ALS WO# HS18120569

MSVOA09 -Logbook

Batch: 33625
Date: 11-13-2018
Method: 8260
Comments:

Analyst: Presenta Cabascango
Reviewer: Anjana Poluri
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	11-13-2018 10:58 am	1.00	50 mL	50 mL	U111301.D	Liquid	Y	NA
2	*Auto find/purged* VSTD000.25	ICAL1	11-13-2018 11:23 am	1.00	50 mL	50 mL	U111302.D	Liquid	Y	NA
3	*0.25 uL cal std/250 mL DI* VSTD000.5	ICAL2	11-13-2018 11:47 am	1.00	50 mL	50 mL	U111303.D	Liquid	Y	NA
4	*0.5 uL cal std/250 mL DI* VSTD001	ICAL3	11-13-2018 12:36 pm	1.00	50 mL	50 mL	U111304.D	Liquid	Y	NA
5	*1 uL cal std/250 mL DI* VSTD002	ICAL4	11-13-2018 01:01 pm	1.00	50 mL	50 mL	U111305.D	Liquid	Y	NA
6	*2 uL cal std/250 mL DI* VSTD005	ICAL5	11-13-2018 01:25 pm	1.00	50 mL	50 mL	U111306.D	Liquid	Y	NA
7	*5 uL cal std/250 mL DI* VSTD020	ICAL6	11-13-2018 01:50 pm	1.00	50 mL	50 mL	U111307.D	Liquid	Y	NA
8	*4 uL cal std/50 mL DI* VSTD050	ICAL7	11-13-2018 02:15 pm	1.00	50 mL	50 mL	U111308.D	Liquid	Y	NA
9	*10 uL cal std/50 mL DI* VSTD100	ICAL8	11-13-2018 02:39 pm	1.00	50 mL	50 mL	U111309.D	Liquid	Y	NA
10	*20 uL cal std/50 mL DI* VSTD150	ICAL9	11-13-2018 03:04 pm	1.00	50 mL	50 mL	U111310.D	Liquid	Y	NA
11	*30 uL cal std/50 mL DI* VSTD200	ICAL	11-13-2018 03:28 pm	1.00	50 mL	50 mL	U111311.D	Liquid	Y	NA
12	*40 uL cal std/50 mL DI* BLANK	SAMP	11-13-2018 03:53 pm	1.00	50 mL	50 mL	U111312.D	Liquid	Y	NA
13	*Cleanup blk* VSTD050	ICV	11-13-2018 04:18 pm	1.00	50 mL	50 mL	U111313.D	Liquid	Y	NA
14	*10 uL ICV std/50 mL DI* BFB	TUNE	11-13-2018 05:07 pm	1.00	50 mL	50 mL	V111301.D	Liquid	Y	NA
15	*Auto find/purged* VSTD050	CCV	11-13-2018 05:32 pm	1.00	50 mL	50 mL	V111302.D	Liquid	Y	NA
16	*10 uL cal std/50 mL DI* VSTD050	CCV	11-13-2018 05:56 pm	1.00	50 mL	50 mL	V111303.D	Liquid	Y	NA
17	*10 uL cal std/50 mL DI* VLCSW-181113	LCS	11-13-2018 06:21 pm	1.00	50 mL	50 mL	V111304.D	Liquid	Y	NA
18	*4 uL cal std/50 mL DI* BLANK	SAMP	11-13-2018 06:46 pm	1.00	50 mL	50 mL	V111305.D	Liquid	Y	NA
19	VBLKW-181113	MBLK	11-13-2018 07:10 pm	1.00	50 mL	50 mL	V111306.D	Liquid	Y	NA
20	HS18110428-01	SAMP	11-13-2018 07:35 pm	1.00	50 mL	50 mL	V111307.D	Liquid	Y	<2
21	HS18110496-01	SAMP	11-13-2018 08:00 pm	1.00	50 mL	50 mL	V111308.D	Liquid	Y	<2
22	HS18110428-02	SAMP	11-13-2018 08:25 pm	1.00	50 mL	50 mL	V111309.D	Liquid	Y	<2
23	HS18110428-03	SAMP	11-13-2018 08:49 pm	1.00	50 mL	50 mL	V111310.D	Liquid	Y	<2
24	HS18110428-04	SAMP	11-13-2018 09:14 pm	1.00	50 mL	50 mL	V111311.D	Liquid	Y	<2
25	HS18110496-04	SAMP	11-13-2018 09:39 pm	1.00	50 mL	50 mL	V111312.D	Liquid	Y	<2
26	HS18110496-05	SAMP	11-13-2018 10:04 pm	1.00	50 mL	50 mL	V111313.D	Liquid	Y	<2
27	HS18110496-06	SAMP	11-13-2018 10:28 pm	1.00	50 mL	50 mL	V111314.D	Liquid	Y	<2
28	HS18110428-08	SAMP	11-13-2018 10:53 pm	1.00	50 mL	50 mL	V111315.D	Liquid	Y	<2
29	HS18110428-09	SAMP	11-13-2018 11:18 pm	1.00	50 mL	50 mL	V111316.D	Liquid	Y	<2
30	HS18110496-04MS	MS	11-13-2018 11:43 pm	1.00	50 mL	50 mL	V111317.D	Liquid	Y	<2
31	*8 uL cal std/40 mL Sample* HS18110496-04MSD	MSD	11-14-2018 12:07 am	1.00	50 mL	50 mL	V111318.D	Liquid	Y	<2

8 uL cal std/40 mL Sample

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
32	HS18110650-09	SAMP	11-14-2018 12:32 am	1.00	50 mL	50 mL	V111319.D	Liquid	Y	<2
33	HS18110428-05	SAMP	11-14-2018 12:57 am	5.00	10 mL	50 mL	V111320.D	Liquid	Y	<2
34	HS18110428-05	SAMP	11-14-2018 01:22 am	25.00	2 mL	50 mL	V111321.D	Liquid	Y	<2
35	HS18110428-06	SAMP	11-14-2018 01:46 am	5.00	10 mL	50 mL	V111322.D	Liquid	Y	<2
36	HS18110428-06	SAMP	11-14-2018 02:11 am	25.00	2 mL	50 mL	V111323.D	Liquid	Y	<2
37	HS18110428-07	SAMP	11-14-2018 02:36 am	100.0(	500 µL	50 mL	V111324.D	Liquid	Y	<2
38	HS18110428-07	SAMP	11-14-2018 03:01 am	10.00	5 mL	50 mL	V111325.D	Liquid	Y	<2
39	HS18110650-05	SAMP	11-14-2018 03:25 am	1.00	50 mL	50 mL	V111326.D	Liquid	Y	<2
40	HS18110650-06	SAMP	11-14-2018 03:50 am	1.00	50 mL	50 mL	V111327.D	Liquid	Y	<2
41	VSTD050-END	CCV	11-14-2018 04:15 am	1.00	50 mL	50 mL	V111328.D	Liquid	Y	NA

10 uL cal std/50 mL DI

Chemical	Value
SURR SPK ID	30502-51-03
IS ID	30502-51-03
ICV STD ID	30603-41-01
LCS/MS ID	30502-51-01/02
CAL STD ID	30502-51-01/02
BFB ID	30502-51-03

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Matrix Spike - Sample No.: VICV050

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	50.00	53.22	106	80-120
trans-1,3-Dichloroprope	50.00	47.39	95	80-120
1,3-Dichlorobenzene	50.00	45.55	91	80-120
2,2-Dichloropropane	50.00	51.21	102	80-120
1,1-Dichloropropene	50.00	46.61	93	80-120
Dibromomethane	50.00	47.16	94	80-120
1,2-Dibromoethane	50.00	48.42	97	80-120
trans-1,2-Dichloroethen	50.00	46.36	93	80-120
1,1,1,2-Tetrachloroetha	50.00	49.98	100	80-120
1,1,1-Trichloroethane	50.00	48.15	96	80-120
1,1,2,2-Tetrachloroetha	50.00	45.96	92	80-120
Freon TF	50.00	46.03	92	80-120
1,1,2-Trichloroethane	50.00	45.83	92	80-120
1,1-Dichloroethane	50.00	45.57	91	80-120
1,1-Dichloroethene	50.00	45.66	91	80-120
Trichlorofluoromethane	50.00	46.76	94	80-120
1,2,3-Trichlorobenzene	50.00	48.30	97	80-120
Toluene	50.00	46.16	92	80-120
1,2,4-Trichlorobenzene	50.00	47.47	95	80-120
1,2,4-Trimethylbenzene	50.00	47.71	95	80-120
Tetrachloroethene	50.00	45.53	91	80-120
Trichloroethene	50.00	46.38	93	80-120
1,2-Dichlorobenzene	50.00	44.93	90	80-120
1,2-Dichloroethane	50.00	45.18	90	80-120
1,2-Dichloropropane	50.00	47.27	94	80-120
1,3,5-Trimethylbenzene	50.00	47.70	95	80-120
1,3-Dichloropropane	50.00	46.16	92	80-120
1,4-Dichlorobenzene	50.00	48.32	97	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Matrix Spike - Sample No.: VICV050

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
2-Butanone	100.00	92.32	92	80-120
2-Chlorotoluene	50.00	45.71	91	80-120
2-Hexanone	100.00	99.26	99	80-120
4-Chlorotoluene	50.00	46.84	94	80-120
tert-Butylbenzene	50.00	47.82	96	80-120
4-Methyl-2-Pentanone	100.00	96.36	96	80-120
Acetone	100.00	95.46	95	80-120
Benzene	50.00	46.32	93	80-120
Bromobenzene	50.00	46.19	92	80-120
Bromochloromethane	50.00	50.90	102	80-120
Bromodichloromethane	50.00	48.53	97	80-120
Bromoform	50.00	47.71	95	80-120
Bromomethane	50.00	50.93	102	80-120
Carbon Disulfide	100.00	98.32	98	80-120
Carbon Tetrachloride	50.00	49.39	99	80-120
Chlorobenzene	50.00	45.35	91	80-120
Chloroethane	50.00	44.97	90	80-120
Chloroform	50.00	45.67	91	80-120
Chloromethane	50.00	46.70	93	80-120
cis-1,2-Dichloroethene	50.00	45.95	92	80-120
Dibromochloromethane	50.00	52.11	104	80-120
Dichlorodifluoromethane	50.00	47.87	96	80-120
Ethylbenzene	50.00	46.81	94	80-120
Hexachlorobutadiene	50.00	55.07	110	80-120
Isopropylbenzene	50.00	47.92	96	80-120
m,p-Xylenes	100.00	94.65	95	80-120
Methylene Chloride	50.00	48.07	96	80-120
n-Butylbenzene	50.00	49.50	99	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Matrix Spike - Sample No.: VICV050

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
n-Propylbenzene	50.00	47.57	95	80-120
Naphthalene	50.00	51.20	102	80-120
o-Xylene	50.00	47.39	95	80-120
sec-Butylbenzene	50.00	48.40	97	80-120
Styrene	50.00	49.81	100	80-120
Vinyl Chloride	50.00	47.66	95	80-120
1,2,3-Trichloropropane	50.00	49.28	98	80-120
p-Isopropyltoluene	50.00	49.15	98	80-120
1,2-Dibromo-3-Chloropro	50.00	47.82	96	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Lab File ID: U111301 BFB Injection Date: 11/13/18

Instrument ID: VOA9 BFB Injection Time: 1058

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.9
75	30.0 - 60.0% of mass 95	53.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.6 (1.0)1
174	Greater than 50.0% of mass 95	67.7
175	5.0 - 9.0% of mass 174	5.2 (7.7)1
176	95.0 - 101.0% of mass 174	64.6 (95.4)1
177	5.0 - 9.0% of mass 176	4.8 (7.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD000.25	VSTD000.25	U111302	11/13/18	1123
02	VSTD000.5	VSTD000.5	U111303	11/13/18	1147
03	VSTD001	VSTD001	U111304	11/13/18	1236
04	VSTD002	VSTD002	U111305	11/13/18	1301
05	VSTD005	VSTD005	U111306	11/13/18	1325
06	VSTD020	VSTD020	U111307	11/13/18	1350
07	VSTD050	VSTD050	U111308	11/13/18	1415
08	VSTD100	VSTD100	U111309	11/13/18	1439
09	VSTD150	VSTD150	U111310	11/13/18	1504
10	VSTD200	VSTD200	U111311	11/13/18	1528
11	VICV050	VICV050	U111313	11/13/18	1618
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Instrument ID: VOA9 Calibration Date(s): 11/13/18 11/13/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1123 1528

LAB FILE ID: RF0.25: U111302 RF0.5: U111303 RF1: U111304
RF2: U111305 RF5: U111306 RF20: U111307

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
cis-1,3-Dichloropropene		0.514	0.452	0.424	0.458	0.523
trans-1,3-Dichloropropene		3218	5482	10881	30108	147063
1,3-Dichlorobenzene		2.016	1.635	1.560	1.502	1.485
2,2-Dichloropropane		0.895	0.675	0.644	0.597	0.645
1,1-Dichloropropene		0.589	0.484	0.455	0.407	0.432
Dibromomethane		0.272	0.224	0.217	0.212	0.216
1,2-Dibromoethane		0.438	0.364	0.337	0.365	0.365
trans-1,2-Dichloroethene		0.776	0.676	0.607	0.562	0.575
1,1,1,2-Tetrachloroethane		0.357	0.286	0.272	0.294	0.309
1,1,1-Trichloroethane		1.047	0.838	0.848	0.741	0.818
1,1,2,2-Tetrachloroethane		1.478	1.172	1.145	1.215	1.150
Freon TF		0.612	0.528	0.532	0.409	0.460
1,1,2-Trichloroethane		0.411	0.336	0.304	0.314	0.307
1,1-Dichloroethane		1.465	1.215	1.128	1.077	1.065
1,1-Dichloroethene		0.736	0.626	0.565	0.474	0.526
Trichlorofluoromethane		1.241	1.099	1.043	0.817	0.913
1,2,3-Trichlorobenzene		1.196	0.776	0.891	0.911	0.922
Toluene		2.078	1.628	1.576	1.529	1.532
1,2,4-Trichlorobenzene		1.260	0.914	0.912	0.902	0.924
1,2,4-Trimethylbenzene		3.320	2.638	2.610	2.690	2.770
Tetrachloroethene		0.336	0.285	0.263	0.234	0.246
Trichloroethene		0.440	0.361	0.330	0.306	0.325
1,2-Dichlorobenzene		2.072	1.662	1.534	1.584	1.503
1,2-Dichloroethane		0.688	0.543	0.533	0.514	0.502
1,2-Dichloropropane		0.420	0.368	0.338	0.340	0.346
1,3,5-Trimethylbenzene		3.173	2.583	2.523	2.530	2.676
1,3-Dichloropropane		0.875	0.710	0.656	0.685	0.660
1,4-Dichlorobenzene		7995	11659	22453	55298	228900
2-Butanone		0.438	0.357	0.328	0.355	0.335
2-Chlorotoluene		3.108	2.512	2.344	2.371	2.366
2-Hexanone		0.309	0.250	0.264	0.296	0.296
4-Chlorotoluene		3.515	2.726	2.736	2.786	2.768
tert-Butylbenzene		2.788	2.149	2.208	2.094	2.254
4-Methyl-2-Pentanone		0.448	0.409	0.382	0.418	0.418
Acetone		5795	7657	12023	24249	87797
Benzene		1.791	1.472	1.332	1.296	1.322
Bromobenzene		1.057	0.812	0.769	0.798	0.781
Bromochloromethane		0.288	0.289	0.307	0.306	0.304
Bromodichloromethane		0.499	0.390	0.373	0.378	0.400
Bromoform		1478	2470	4530	13391	60993
Bromomethane		2224	4167	7606	17760	65394
Carbon Disulfide		2.186	1.775	1.666	1.469	1.640
Carbon Tetrachloride		0.413	0.348	0.330	0.290	0.344
Chlorobenzene		1.390	1.114	0.980	0.979	0.984

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812056

Instrument ID: VOA9 Calibration Date(s): 11/13/18 11/13/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1123 1528

LAB FILE ID: RF0.25: U111302 RF0.5: U111303 RF1: U111304
RF2: U111305 RF5: U111306 RF20: U111307

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Chloroethane		0.691	0.561	0.547	0.455	0.484
Chloroform		1.493	1.230	1.118	1.087	1.079
Chloromethane		4145	6506	12000	26431	114171
cis-1,2-Dichloroethene		0.890	0.758	0.706	0.655	0.674
Dibromochloromethane		0.340	0.262	0.256	0.287	0.314
Dichlorodifluoromethane		4116	6358	12615	24157	119108
Ethylbenzene		0.660	0.543	0.490	0.475	0.502
Hexachlorobutadiene		2273	2210	4667	8782	45235
Isopropylbenzene		1.845	1.478	1.459	1.431	1.486
m,p-Xylenes		0.830	0.625	0.602	0.602	0.634
Methylene Chloride		5188	7766	13586	29126	113894
n-Butylbenzene		11934	17894	36189	79206	381141
n-Propylbenzene		4.808	3.945	3.820	3.699	3.871
Naphthalene		2.957	2.577	2.535	2.887	3.092
o-Xylene		0.725	0.632	0.608	0.619	0.643
sec-Butylbenzene		4.052	3.193	3.096	2.852	3.218
Styrene		1.201	0.990	1.012	1.047	1.097
Vinyl Chloride		4801	7374	13465	29718	136290
1,2,3-Trichloropropane		1.381	1.095	1.101	1.220	1.204
p-Isopropyltoluene		3.227	2.386	2.598	2.465	2.727
1,2-Dibromo-3-Chloropropane		479	955	1762	5351	24969
1,2-Dichloroethane-d4		8937	11059	18531	38984	138453
Dibromofluoromethane		5664	7705	12925	27004	102630
Toluene-d8		23871	30489	51591	112942	412445
4-Bromofluorobenzene		8554	10512	18827	41214	154498

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812056

Instrument ID: VOA9 Calibration Date(s): 11/13/18 11/13/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1123 1528

LAB FILE ID: RF50: U111308 RF100: U111309 RF150: U111310
RF200: U111311

COMPOUND	RF50	RF100	RF150	RF200
cis-1,3-Dichloropropene	0.547	0.595	0.608	0.588
trans-1,3-Dichloropropene	407060	912116	1439550	1983766
1,3-Dichlorobenzene	1.441	1.512	1.522	1.494
2,2-Dichloropropane	0.668	0.740	0.784	0.738
1,1-Dichloropropene	0.414	0.457	0.468	0.451
Dibromomethane	0.214	0.221	0.220	0.212
1,2-Dibromoethane	0.363	0.366	0.360	0.353
trans-1,2-Dichloroethene	0.578	0.598	0.615	0.580
1,1,1,2-Tetrachloroethane	0.320	0.333	0.335	0.332
1,1,1-Trichloroethane	0.837	0.918	0.956	0.902
1,1,2,2-Tetrachloroethane	1.122	1.135	1.138	1.104
Freon TF	0.433	0.506	0.529	0.498
1,1,2-Trichloroethane	0.296	0.302	0.299	0.291
1,1-Dichloroethane	1.077	1.100	1.127	1.057
1,1-Dichloroethene	0.507	0.543	0.568	0.534
Trichlorofluoromethane	0.888	0.996	1.035	0.964
1,2,3-Trichlorobenzene	0.895	0.964	0.981	0.959
Toluene	1.480	1.511	1.507	1.445
1,2,4-Trichlorobenzene	0.918	0.997	1.018	1.004
1,2,4-Trimethylbenzene	2.646	2.808	2.798	2.714
Tetrachloroethene	0.231	0.253	0.257	0.253
Trichloroethene	0.310	0.331	0.336	0.327
1,2-Dichlorobenzene	1.470	1.530	1.529	1.486
1,2-Dichloroethane	0.482	0.494	0.487	0.468
1,2-Dichloropropane	0.339	0.355	0.356	0.342
1,3,5-Trimethylbenzene	2.552	2.731	2.750	2.658
1,3-Dichloropropane	0.642	0.647	0.644	0.623
1,4-Dichlorobenzene	576011	1240019	1907496	2606334
2-Butanone	0.340	0.348	0.343	0.318
2-Chlorotoluene	2.278	2.377	2.372	2.306
2-Hexanone	0.297	0.307	0.305	0.292
4-Chlorotoluene	2.640	2.769	2.781	2.705
tert-Butylbenzene	2.136	2.334	2.363	2.278
4-Methyl-2-Pentanone	0.416	0.431	0.421	0.410
Acetone	201617	430350	636098	869596
Benzene	1.290	1.330	1.333	1.271
Bromobenzene	0.757	0.802	0.810	0.796
Bromochloromethane	0.308	0.299	0.285	0.266
Bromodichloromethane	0.406	0.432	0.438	0.424
Bromoform	170886	383125	610635	844522
Bromomethane	154362	367005	609177	
Carbon Disulfide	1.661	1.759	1.826	1.705
Carbon Tetrachloride	0.337	0.388	0.405	0.392
Chlorobenzene	0.950	0.978	0.966	0.946

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812056

Instrument ID: VOA9 Calibration Date(s): 11/13/18 11/13/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1123 1528

LAB FILE ID: RF50: U111308 RF100: U111309 RF150: U111310
RF200: U111311

COMPOUND	RF50	RF100	RF150	RF200
Chloroethane	0.482	0.493	0.509	0.472
Chloroform	1.082	1.104	1.121	1.047
Chloromethane	285521	595590	963160	1334230
cis-1,2-Dichloroethene	0.664	0.681	0.694	0.654
Dibromochloromethane	0.333	0.351	0.354	0.351
Dichlorodifluoromethane	293949	680233	1086406	1483355
Ethylbenzene	0.492	0.514	0.517	0.504
Hexachlorobutadiene	110558	270039	426795	
Isopropylbenzene	1.427	1.543	1.535	1.471
m,p-Xylenes	0.609	0.638	0.632	0.615
Methylene Chloride	276248	577262	911224	1246871
n-Butylbenzene	954951	2203969	3347969	
n-Propylbenzene	3.668	3.966	3.962	3.771
Naphthalene	3.062	3.229	3.212	3.095
o-Xylene	0.629	0.652	0.649	0.635
sec-Butylbenzene	3.062	3.389	3.420	3.284
Styrene	1.100	1.130	1.117	1.082
Vinyl Chloride	335638	744825	1189386	1622522
1,2,3-Trichloropropane	1.240	1.296	1.309	1.275
p-Isopropyltoluene	2.627	2.886	2.907	2.820
1,2-Dibromo-3-Chloropropane	66581	149236	234820	321770
1,2-Dichloroethane-d4	335901	696595	1062364	1441844
Dibromofluoromethane	255826	526814	809097	1112100
Toluene-d8	1045096	2142731	3238162	4386438
4-Bromofluorobenzene	396604	823996	1261578	1723103

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812056

Instrument ID: VOA9 Calibration Date(s): 11/13/18 11/13/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1123 1528

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
cis-1,3-Dichloropropene	AVRG		0.52317106		12.886	20.000
trans-1,3-Dichloropropene	LINR	2.955e-002	1.87475164		0.9992282	0.9900000
1,3-Dichlorobenzene	AVRG		1.57423339		11.066	20.000
2,2-Dichloropropane	AVRG		0.70955952		12.773	20.000
1,1-Dichloropropene	AVRG		0.46178698		11.618	20.000
Dibromomethane	AVRG		0.22310340		8.428	20.000
1,2-Dibromoethane	AVRG		0.36809182		7.515	20.000
trans-1,2-Dichloroethene	AVRG		0.61854084		10.984	20.000
1,1,1,2-Tetrachloroethane	AVRG		0.31538401		8.665	20.000
1,1,1-Trichloroethane	AVRG		0.87828248		10.125	20.000
1,1,2,2-Tetrachloroethane	AVRG		1.18433615		9.680	20.000
Freon TF	AVRG		0.50088227		12.161	20.000
1,1,2-Trichloroethane	AVRG		0.31787570		11.701	20.000
1,1-Dichloroethane	AVRG		1.14578561		11.273	20.000
1,1-Dichloroethene	AVRG		0.56438078		13.689	20.000
Trichlorofluoromethane	AVRG		0.99961564		12.536	20.000
1,2,3-Trichlorobenzene	AVRG		0.94398267		11.868	20.000
Toluene	AVRG		1.58742783		12.041	20.000
1,2,4-Trichlorobenzene	AVRG		0.98325969		11.514	20.000
1,2,4-Trimethylbenzene	AVRG		2.77717297		7.772	20.000
Tetrachloroethene	AVRG		0.26191977		12.290	20.000
Trichloroethene	AVRG		0.34069901		11.908	20.000
1,2-Dichlorobenzene	AVRG		1.59672308		11.731	20.000
1,2-Dichloroethane	AVRG		0.52321079		12.632	20.000
1,2-Dichloropropane	AVRG		0.35598971		7.249	20.000
1,3,5-Trimethylbenzene	AVRG		2.68643867		7.489	20.000
1,3-Dichloropropane	AVRG		0.68254990		11.227	20.000
1,4-Dichlorobenzene	LINR	-8.51e-004	0.64997268		0.9997856	0.9900000
2-Butanone	AVRG		0.35147036		9.867	20.000
2-Chlorotoluene	AVRG		2.44838115		10.438	20.000
2-Hexanone	AVRG		0.29065206		6.972	20.000
4-Chlorotoluene	AVRG		2.82514687		9.297	20.000
tert-Butylbenzene	AVRG		2.28952823		9.083	20.000
4-Methyl-2-Pentanone	AVRG		0.41710960		4.264	20.000
Acetone	LINR	-8.86e-002	4.54997798		0.9976530	0.9900000
Benzene	AVRG		1.38203708		11.842	20.000
Bromobenzene	AVRG		0.82019754		11.060	20.000
Bromochloromethane	AVRG		0.29476503		4.761	20.000
Bromodichloromethane	AVRG		0.41544996		9.300	20.000
Bromoform	2ORDR	2.367e-002	4.32863402	-0.1428982	0.9996117	0.9900000
Bromomethane	LINR	3.806e-002	2.31863844		0.9951529	0.9900000
Carbon Disulfide	AVRG		1.74293069		11.174	20.000
Carbon Tetrachloride	AVRG		0.36075188		11.334	20.000
Chlorobenzene	AVRG		1.03196120		13.892	20.000

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812056

Instrument ID: VOA9 Calibration Date(s): 11/13/18 11/13/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1123 1528

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Chloroethane	AVRG		0.52169853		13.844	20.000
Chloroform	AVRG		1.15119170		11.977	20.000
Chloromethane	LINR	4.59e-003	1.49116761		0.9990790	0.9900000
cis-1,2-Dichloroethene	AVRG		0.70849189		10.610	20.000
Dibromochloromethane	AVRG		0.31638584		12.330	20.000
Dichlorodifluoromethane	LINR	2.002e-002	1.32602499		0.9979384	0.9900000
Ethylbenzene	AVRG		0.52179627		10.571	20.000
Hexachlorobutadiene	2ORDR	5.037e-003	3.37955533	-0.5103543	0.9988978	0.9900000
Isopropylbenzene	AVRG		1.51953048		8.449	20.000
m,p-Xylenes	AVRG		0.64297054		11.093	20.000
Methylene Chloride	LINR	-1.4e-002	1.58950727		0.9987446	0.9900000
n-Butylbenzene	2ORDR	7.523e-003	0.38680994	-2.96e-003	0.9992256	0.9900000
n-Propylbenzene	AVRG		3.94550864		8.657	20.000
Naphthalene	AVRG		2.96078148		8.567	20.000
o-Xylene	AVRG		0.64354428		5.210	20.000
sec-Butylbenzene	AVRG		3.28524136		10.228	20.000
Styrene	AVRG		1.08640200		5.880	20.000
Vinyl Chloride	LINR	1.016e-002	1.21438330		0.9982930	0.9900000
1,2,3-Trichloropropane	AVRG		1.23587941		7.613	20.000
p-Isopropyltoluene	AVRG		2.73812048		9.374	20.000
1,2-Dibromo-3-Chloropropane	2ORDR	2.08e-002	5.38876079	-0.2033476	0.9995316	0.9900000
1,2-Dichloroethane-d4	LINR	-3.55e-002	1.36996396		0.9980055	0.9900000
Dibromofluoromethane	LINR	-2.51e-002	1.78351549		0.9987270	0.9900000
Toluene-d8	LINR	-3.42e-002	0.80924260		0.9991601	0.9900000
4-Bromofluorobenzene	LINR	-2.13e-002	2.06564990		0.9996344	0.9900000

FORM VI VOA

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111301.D

Date : 13-NOV-2018 10:58

Client ID: BFB

Instrument: VOA9.i

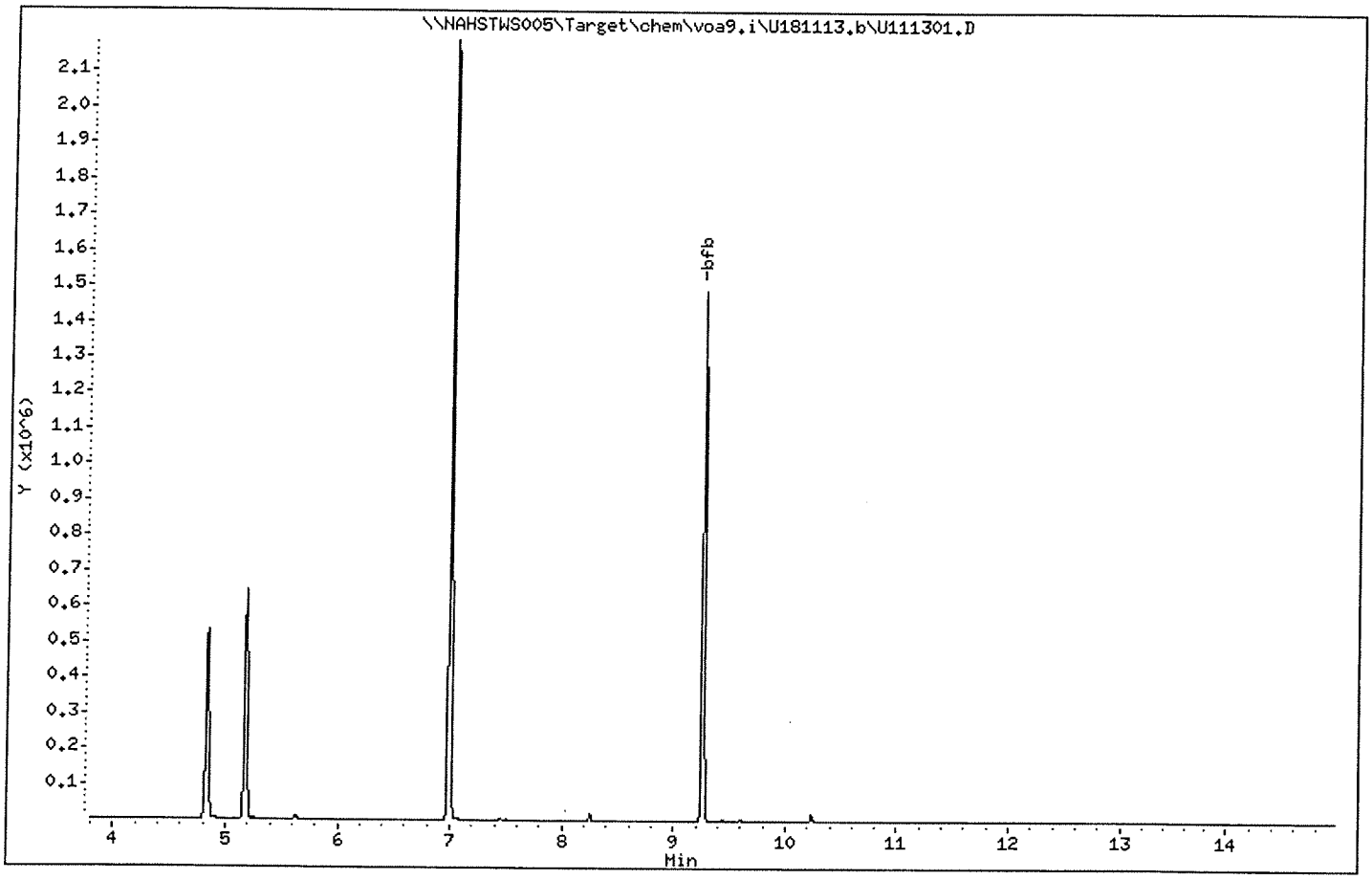
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111301.D

Date : 13-NOV-2018 10:58

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

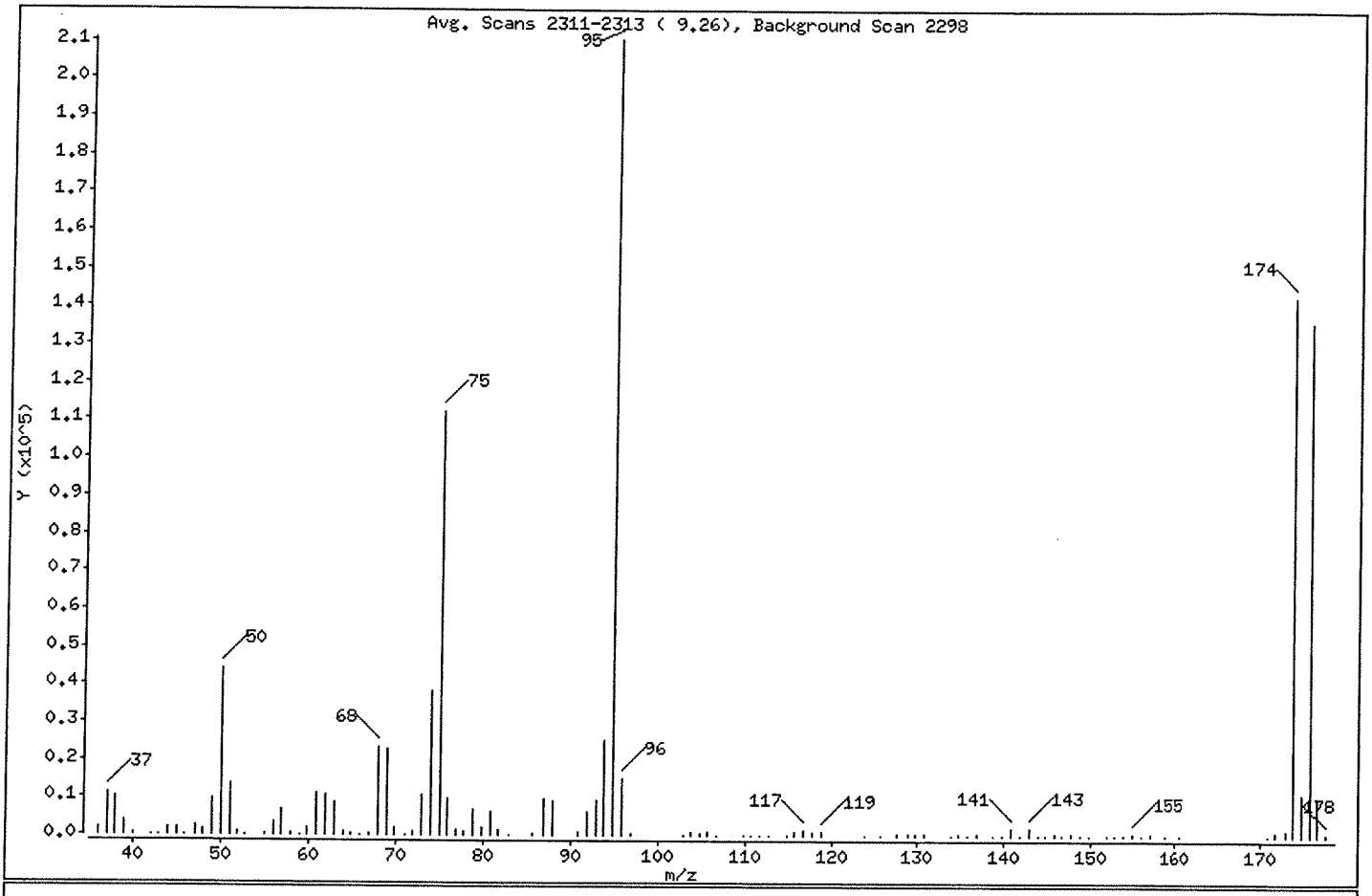
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	20.93
75	30.00 - 60.00% of mass 95	53.26
96	5.00 - 9.00% of mass 95	7.05
173	Less than 2.00% of mass 174	0.64 (0.95)
174	Greater than 50.00% of mass 95	67.71
175	5.00 - 9.00% of mass 174	5.22 (7.70)
176	95.00 - 101.00% of mass 174	64.61 (95.42)
177	5.00 - 9.00% of mass 176	4.79 (7.41)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111301.D

Date : 13-NOV-2018 10:58

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: U111301.D

Spectrum: Avg. Scans 2311-2313 (9,26), Background Scan 2298

Location of Maximum: 94.95

Number of points: 108

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	2069	65.90	90	102.90	106	142.80	1933
37.00	11082	66.90	610	103.80	947	143.90	71
38.00	10274	67.90	23360	104.80	338	144.70	179
39.00	3978	69.00	22944	105.80	973	145.70	325
40.00	381	69.90	1893	106.80	216	146.60	113
42.00	60	71.00	66	109.80	116	147.70	442
42.90	178	71.90	1065	110.70	166	148.60	101
43.90	1871	72.90	10562	111.80	126	149.70	180
45.00	2116	73.90	38432	112.70	189	151.80	82
45.90	123	75.00	112016	114.80	219	152.70	121
47.00	2495	75.90	9870	115.70	740	153.70	104
48.00	1426	76.90	1360	116.70	1240	154.70	552
49.00	9563	77.80	949	117.80	730	155.80	58
50.00	44016	78.80	6592	118.80	907	156.70	431
51.00	13714	79.80	1796	123.80	120	158.70	192
51.90	746	80.80	6503	125.70	57	160.60	164
52.70	59	81.80	1400	127.70	639	170.70	72
55.00	590	82.90	197	128.90	349	171.70	746
56.00	3508	85.70	252	129.70	626	172.80	1355
57.00	6688	86.90	9661	130.80	249	173.70	142400
57.90	351	87.90	8961	133.90	56	174.70	10971
58.90	116	90.80	826	134.70	394	175.70	135872
59.90	2009	91.90	6125	135.70	82	176.70	10067
60.90	11206	92.90	9048	136.70	337	177.70	296
62.00	10418	93.90	25168	138.70	60		
63.00	8677	94.90	210304	139.60	79		
63.90	848	95.90	14829	140.70	1870		
64.90	610	96.90	545	141.80	179		

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111302.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111302.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 13-NOV-2018 11:23
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.25;VSTD000.25;1;1;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 11:23 Cal File: U111302.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

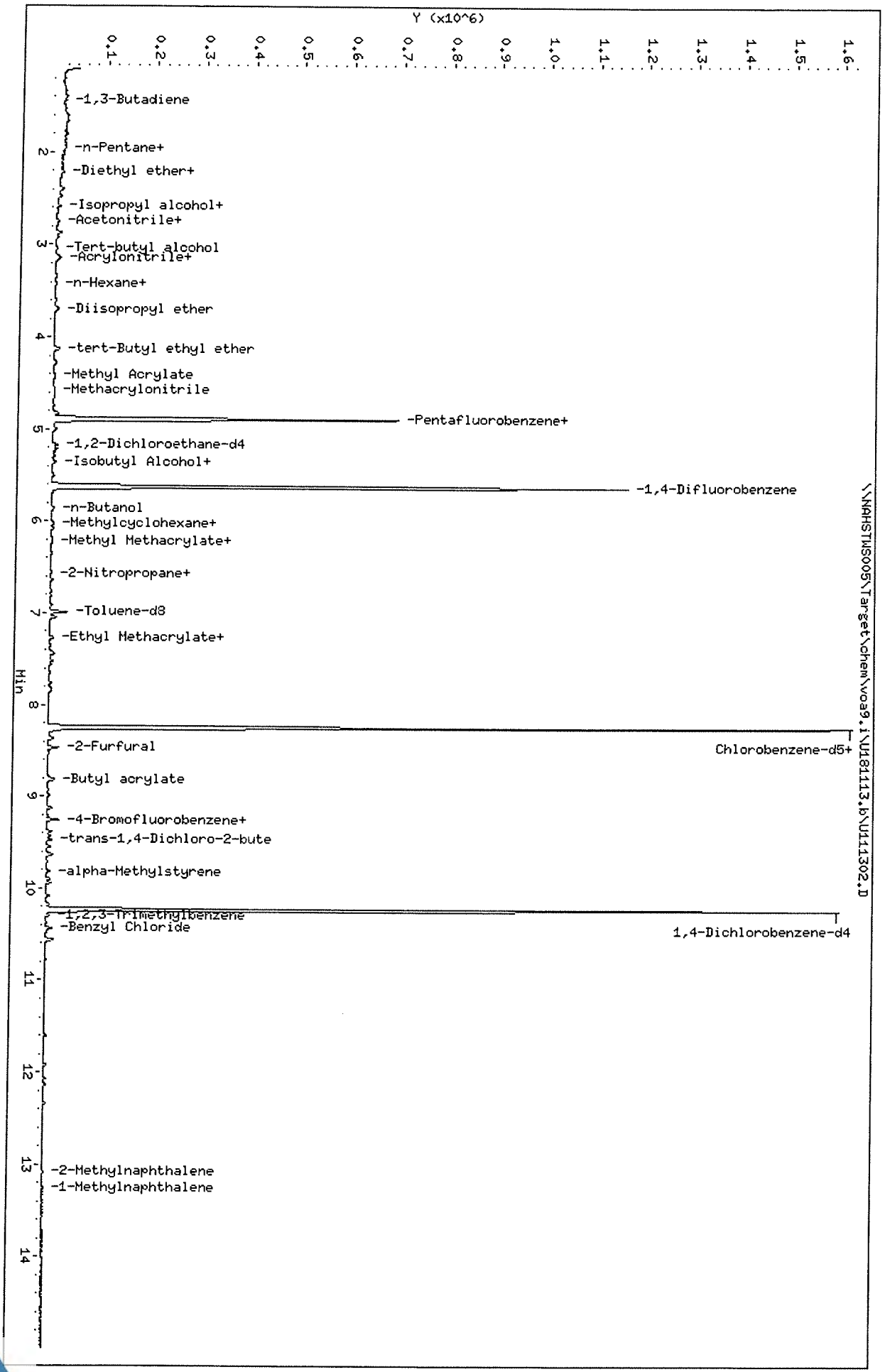
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)	
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	421654	50.0000		
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	823585	50.0000		
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	757808	50.0000		
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	346489	50.0000		
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.987)	4873	0.25000		(a)
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	7659	0.25000		(a)
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	19596	0.25000		(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	7125	0.25000		(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



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Date : 13-NOV-2018 11:23
Client ID: VSTD000.25
Sample Info: VSTD000.25;VSTD000.25;1;1;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111303.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111303.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 13-NOV-2018 11:47
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.5;VSTD000.5;1;2;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 11:23 Cal File: U111302.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

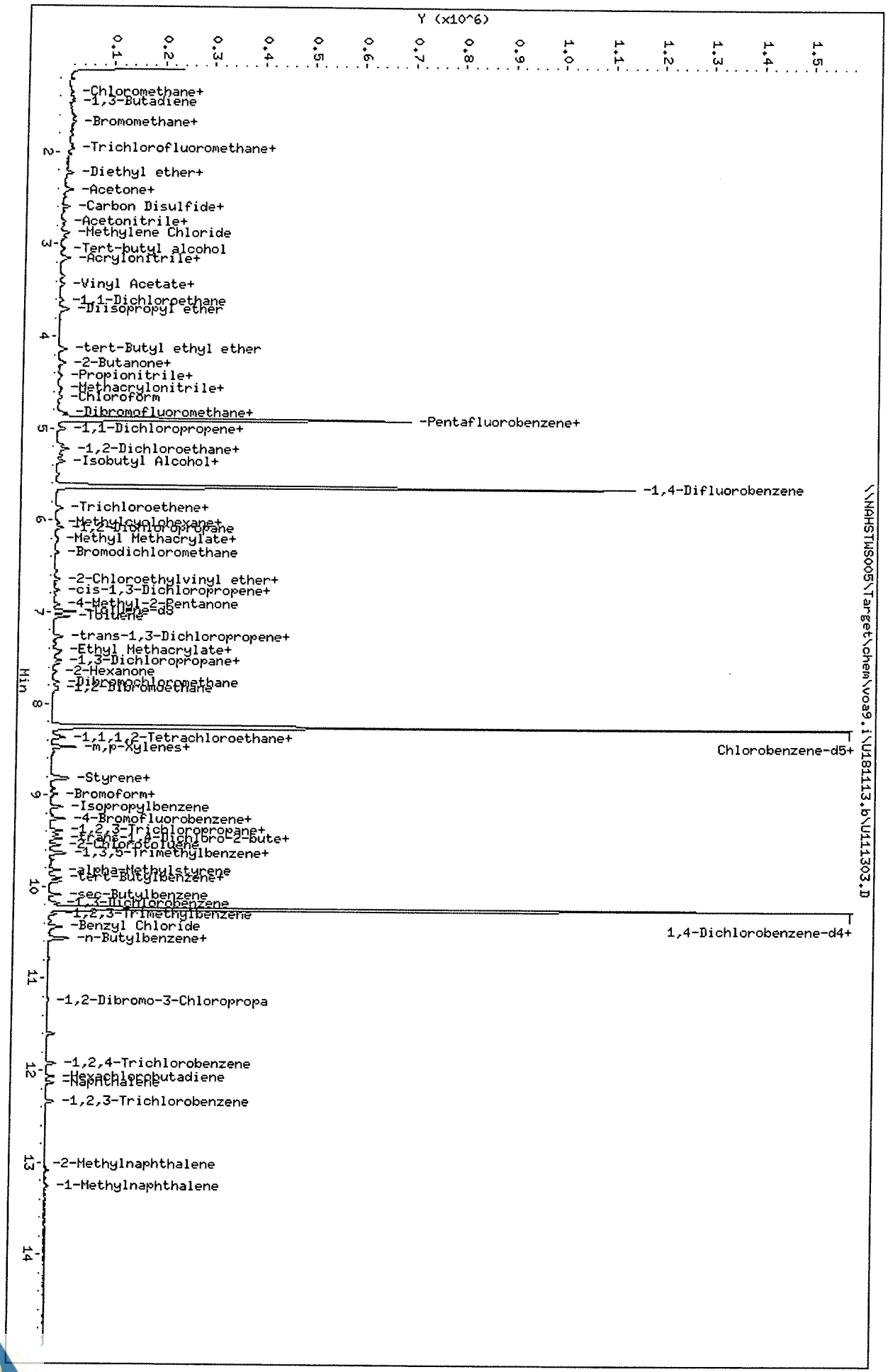
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.898	(1.000)	421285	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.629	(1.000)	817288	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	753573	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	345123	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	5664	0.50000	(a)
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	8937	0.50000	(a)
$ 48 Toluene-d8	98	6.990	6.990	(0.847)	23871	0.50000	(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	8554	0.50000	0.10(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	2690	0.50000	0.56(a)
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	4410	0.50000	0.59(a)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	5102	0.50000	0.62(aM)
138 Freon TF	101	2.409	2.409	(0.492)	2580	0.50000	0.61(a)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	3095	0.50000	0.64(a)
22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	6173	0.50000	0.63(a)
11 1,1-Dichloroethene	96	2.409	2.409	(0.492)	3102	0.50000	0.65(a)
32 1,1-Dichloropropene	75	5.006	5.006	(0.889)	4812	0.50000	0.63(a)
93 1,2,3-Trichlorobenzene	180	12.339	12.339	(1.205)	4127	0.50000	0.63(a)
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	4767	0.50000	0.55(a)
90 1,2,4-Trichlorobenzene	180	11.927	11.927	(1.165)	4348	0.50000	0.64(a)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	11460	0.50000	0.59(a)
89 1,2-Dibromo-3-Chloropropane	155	11.237	11.237	(1.098)	479	0.50000	1.41(aM)
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	3298	0.50000	0.59(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111303.D Page 2
Report Date: 24-Jan-2019 18:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	7152	0.50000	0.64(a)
33	1,2-Dichloroethane	62	5.258	5.258	(0.934)	5619	0.50000	0.65(aM)
42	1,2-Dichloropropane	63	6.082	6.082	(1.081)	3429	0.50000	0.58(a)
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	10952	0.50000	0.59(a)
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	6957	0.50000	0.64(a)
54	1,3-Dichloropropane	76	7.567	7.567	(0.917)	6595	0.50000	0.64(a)
84	1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	7995	0.50000	0.71(a)
26	2,2-Dichloropropane	77	4.279	4.279	(0.874)	3772	0.50000	0.63(a)
24	2-Butanone	43	4.354	4.354	(0.889)	3689	1.00000	1.24(a)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	10726	0.50000	0.63(a)
52	2-Hexanone	43	7.649	7.649	(0.927)	4658	1.00000	1.06(a)
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	12130	0.50000	0.62(a)
82	p-Isopropyltoluene	119	10.213	10.213	(0.998)	11138	0.50000	0.58(a)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.838)	6749	1.00000	1.07(a)
10	Acetone	43	2.487	2.487	(0.508)	5795	1.00000	(a)
37	Benzene	78	5.220	5.220	(0.927)	14635	0.50000	0.64(a)
74	Bromobenzene	156	9.381	9.381	(0.917)	3648	0.50000	0.64(a)
29	Bromochloromethane	128	4.560	4.560	(0.931)	1212	0.50000	0.48(a)
39	Bromodichloromethane	83	6.348	6.348	(1.128)	4075	0.50000	0.60(aM)
66	Bromoform	173	8.988	8.988	(1.090)	1478	0.50000	1.60(Ta)
6	Bromomethane	94	1.678	1.678	(0.343)	2224	0.50000	2.51(a)
19	Carbon Disulfide	76	2.596	2.596	(0.530)	18415	1.00000	1.25(a)
34	Carbon Tetrachloride	117	4.995	4.995	(0.887)	3377	0.50000	0.57(a)
59	Chlorobenzene	112	8.275	8.275	(1.003)	10477	0.50000	0.67(a)
7	Chloroethane	64	1.760	1.760	(0.359)	2912	0.50000	0.66(aM)
28	Chloroform	83	4.662	4.662	(0.952)	6289	0.50000	0.64(a)
3	Chloromethane	50	1.348	1.348	(0.275)	4145	0.50000	0.96(a)
27	cis-1,2-Dichloroethene	96	4.294	4.294	(0.877)	3748	0.50000	0.62(a)
46	cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	4205	0.50000	0.49(a)
55	Dibromochloromethane	129	7.758	7.758	(0.940)	2561	0.50000	0.53(a)
44	Dibromomethane	93	6.191	6.191	(1.100)	2223	0.50000	0.60(aM)
2	Dichlorodifluoromethane	85	1.213	1.213	(0.248)	4116	0.50000	1.64(a)
61	Ethylbenzene	106	8.373	8.373	(1.015)	4972	0.50000	0.63(a)
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	2273	0.50000	1.36(a)
67	Isopropylbenzene	105	9.126	9.126	(1.106)	13902	0.50000	0.60(a)
62	m,p-Xylenes	106	8.474	8.474	(1.027)	12504	1.00000	1.29(a)
17	Methylene Chloride	84	2.877	2.877	(0.587)	5188	0.50000	0.27(a)
87	n-Butylbenzene	91	10.558	10.558	(1.031)	11934	0.50000	1.04(a)
73	n-Propylbenzene	91	9.475	9.475	(0.926)	16592	0.50000	0.60(a)
92	Naphthalene	128	12.133	12.133	(1.185)	10205	0.50000	0.49(a)
63	o-Xylene	106	8.811	8.811	(1.068)	5464	0.50000	0.56(aH)
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	13984	0.50000	0.61(a)
64	Styrene	104	8.826	8.826	(1.070)	9048	0.50000	0.55(a)
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	9624	0.50000	0.60(a)
56	Tetrachloroethene	164	7.526	7.526	(0.912)	2536	0.50000	0.64(a)
50	Toluene	91	7.049	7.049	(0.855)	15656	0.50000	0.65(a)
20	trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	3270	0.50000	0.62(a)
51	trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	3218	0.50000	1.84(a)
38	Trichloroethene	130	5.865	5.865	(1.042)	3600	0.50000	0.64(a)
8	Trichlorofluoromethane	101	1.963	1.963	(0.401)	5229	0.50000	0.62(a)
5	Vinyl Chloride	62	1.426	1.426	(0.291)	4801	0.50000	1.20(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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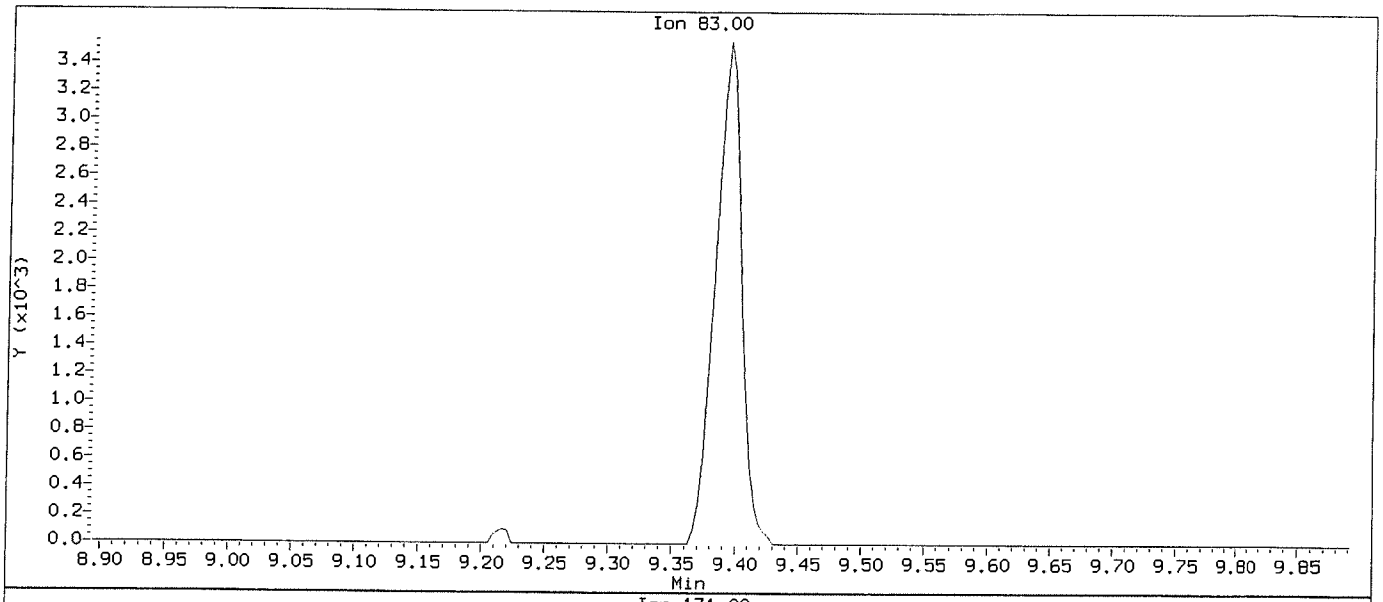
Date : 13-NOV-2018 11:47
Client ID: VSTD000.5
Sample Info: VSTD000.5;VSTD000.5;1;2;
Purge Volume: 5.0
Column phase: DB624

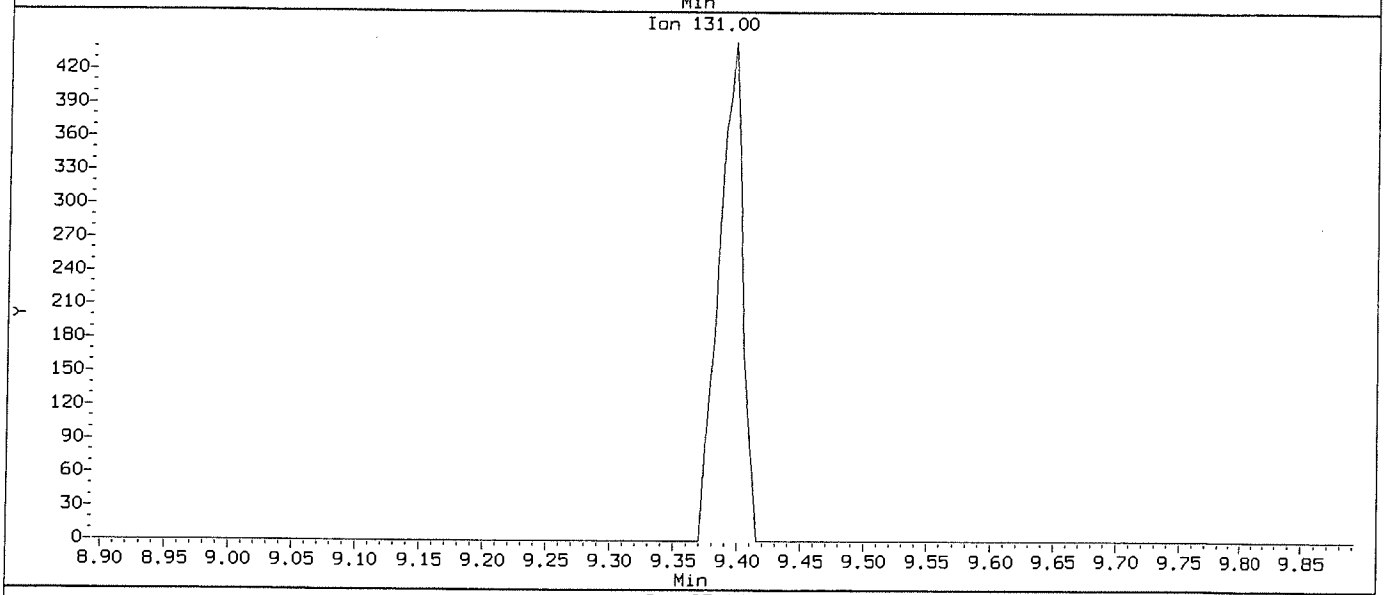
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

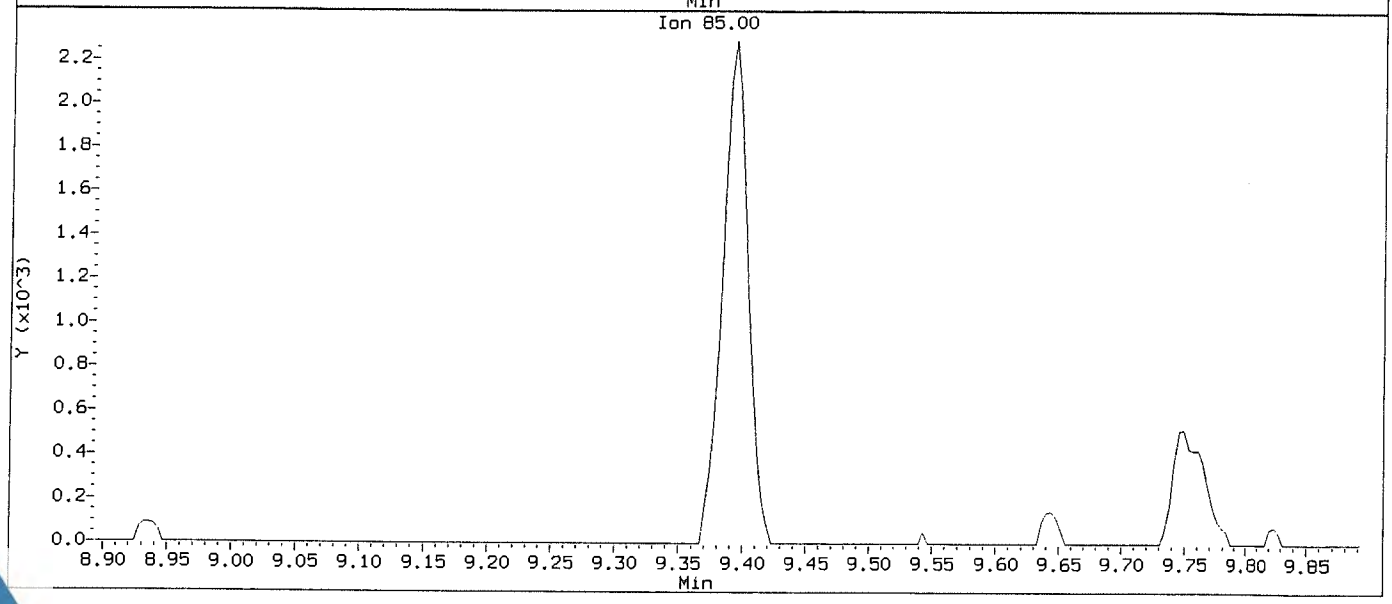
\\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111303.D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111303.D
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5







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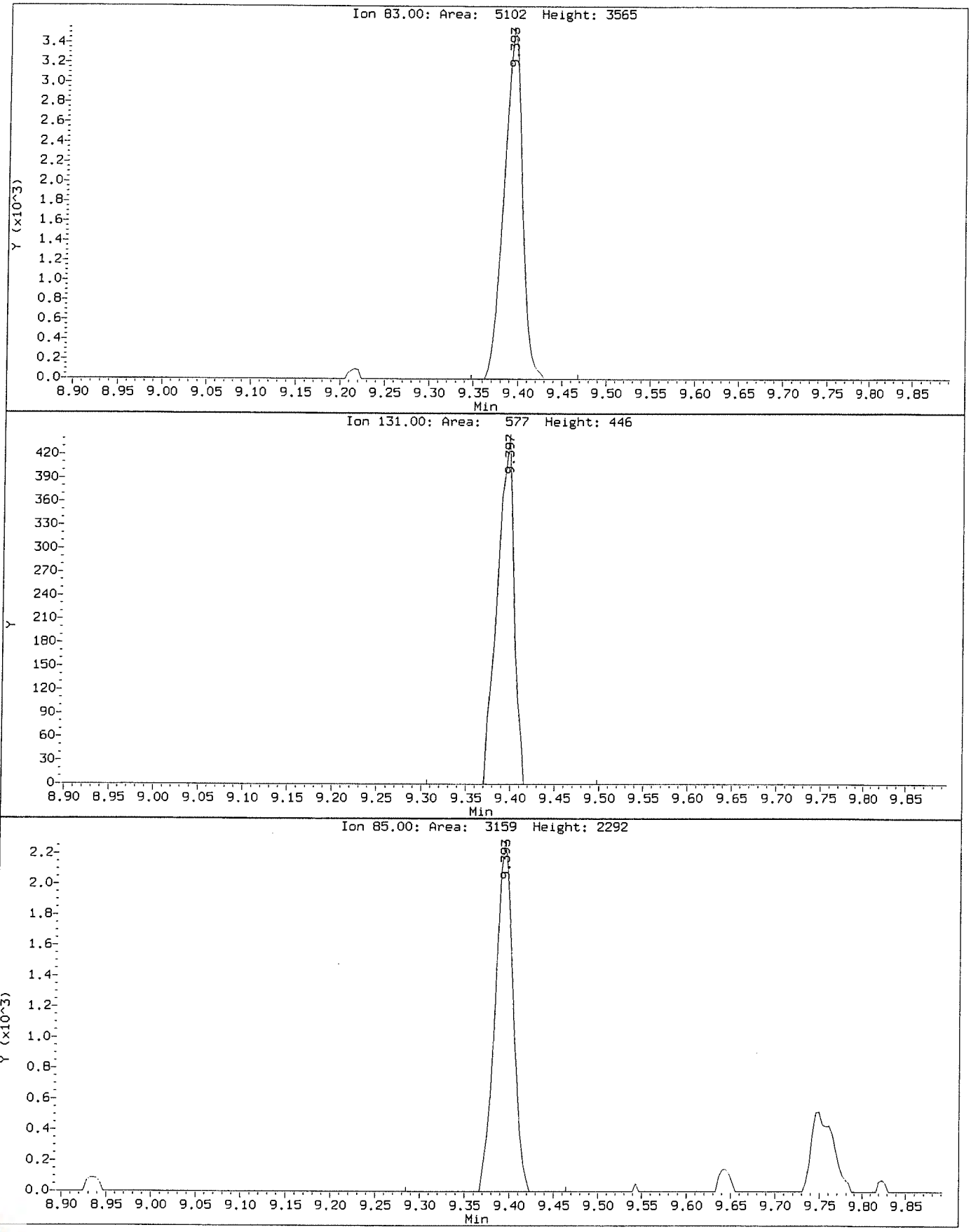
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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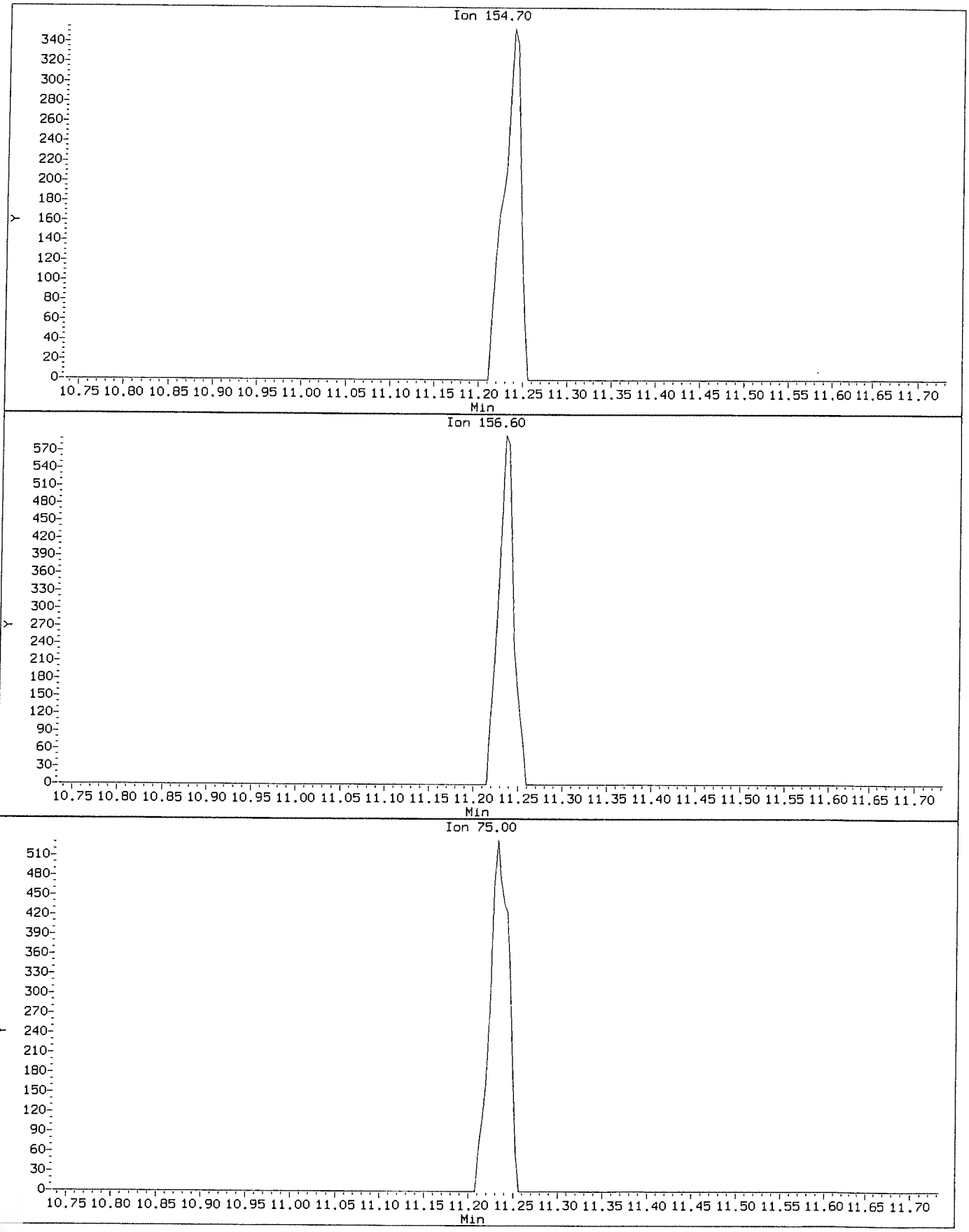
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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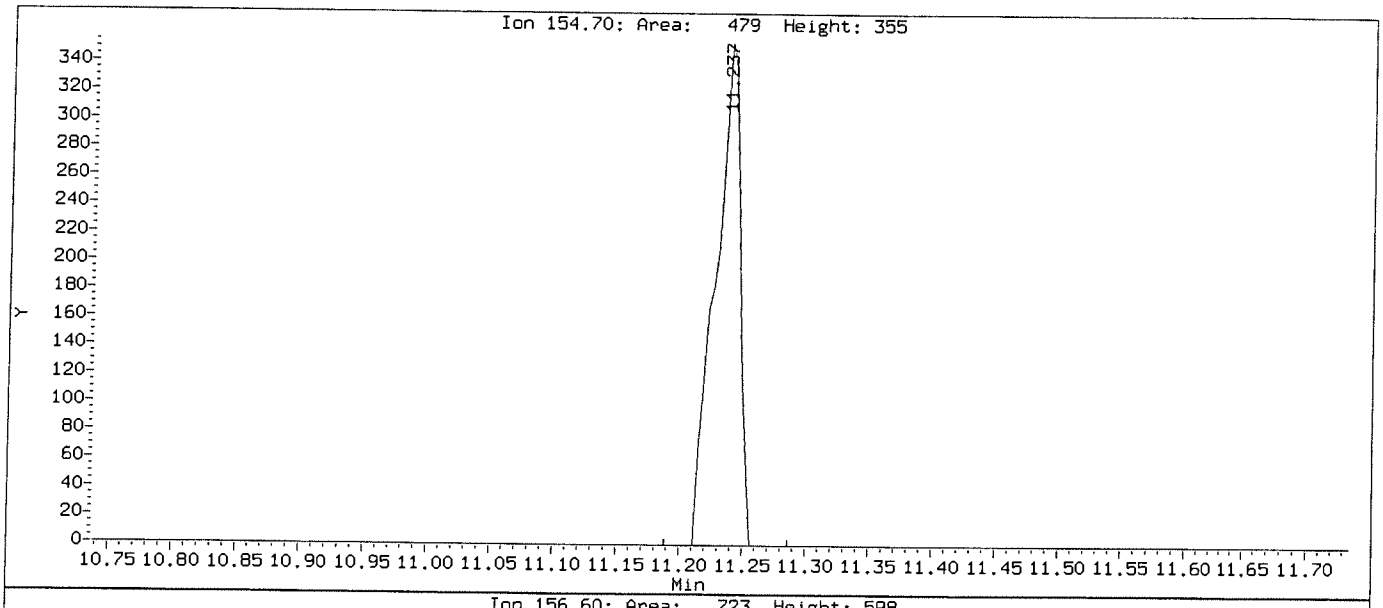
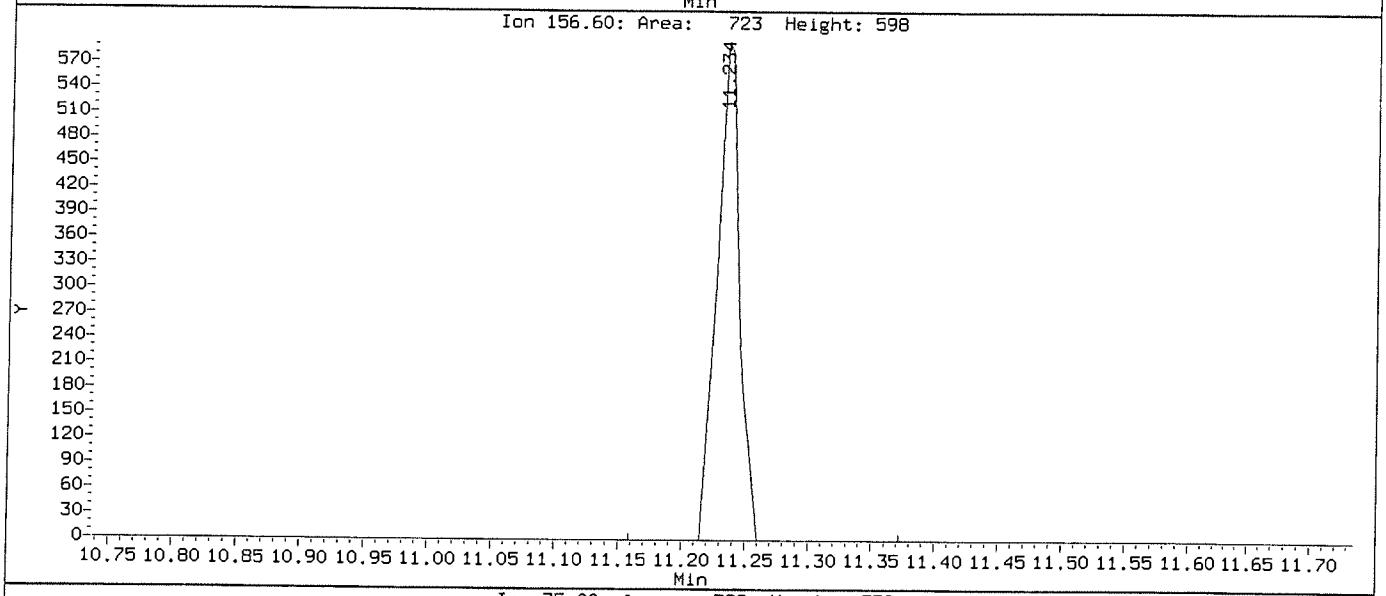
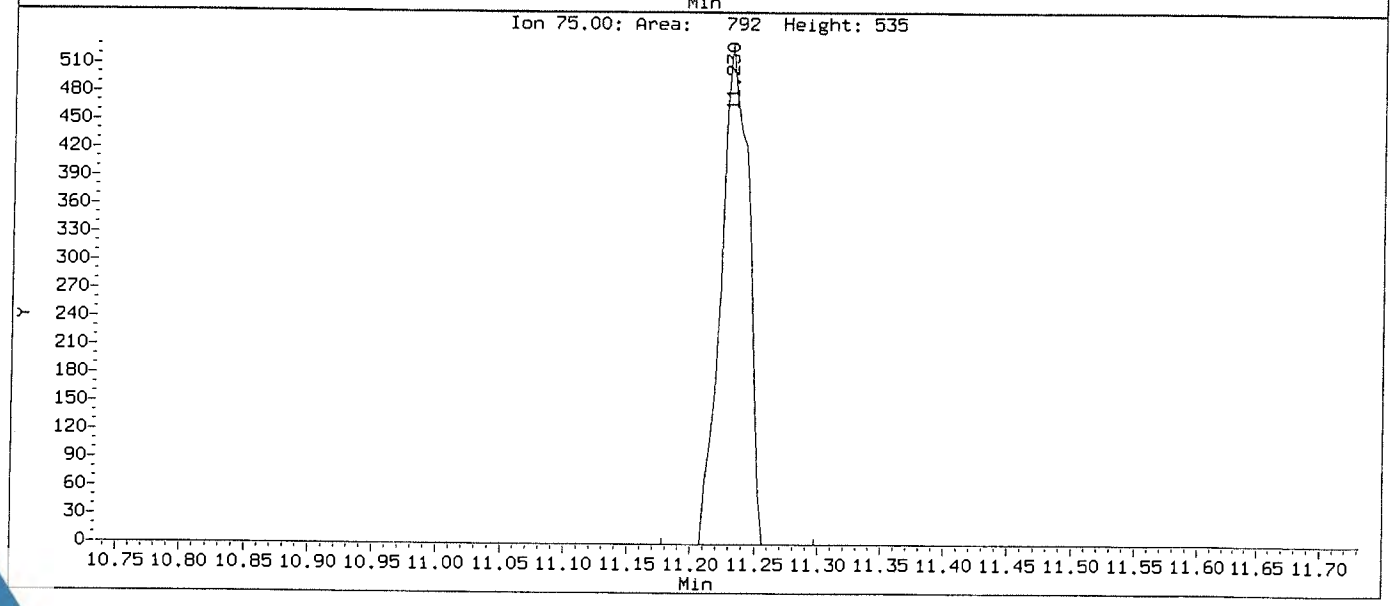
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8







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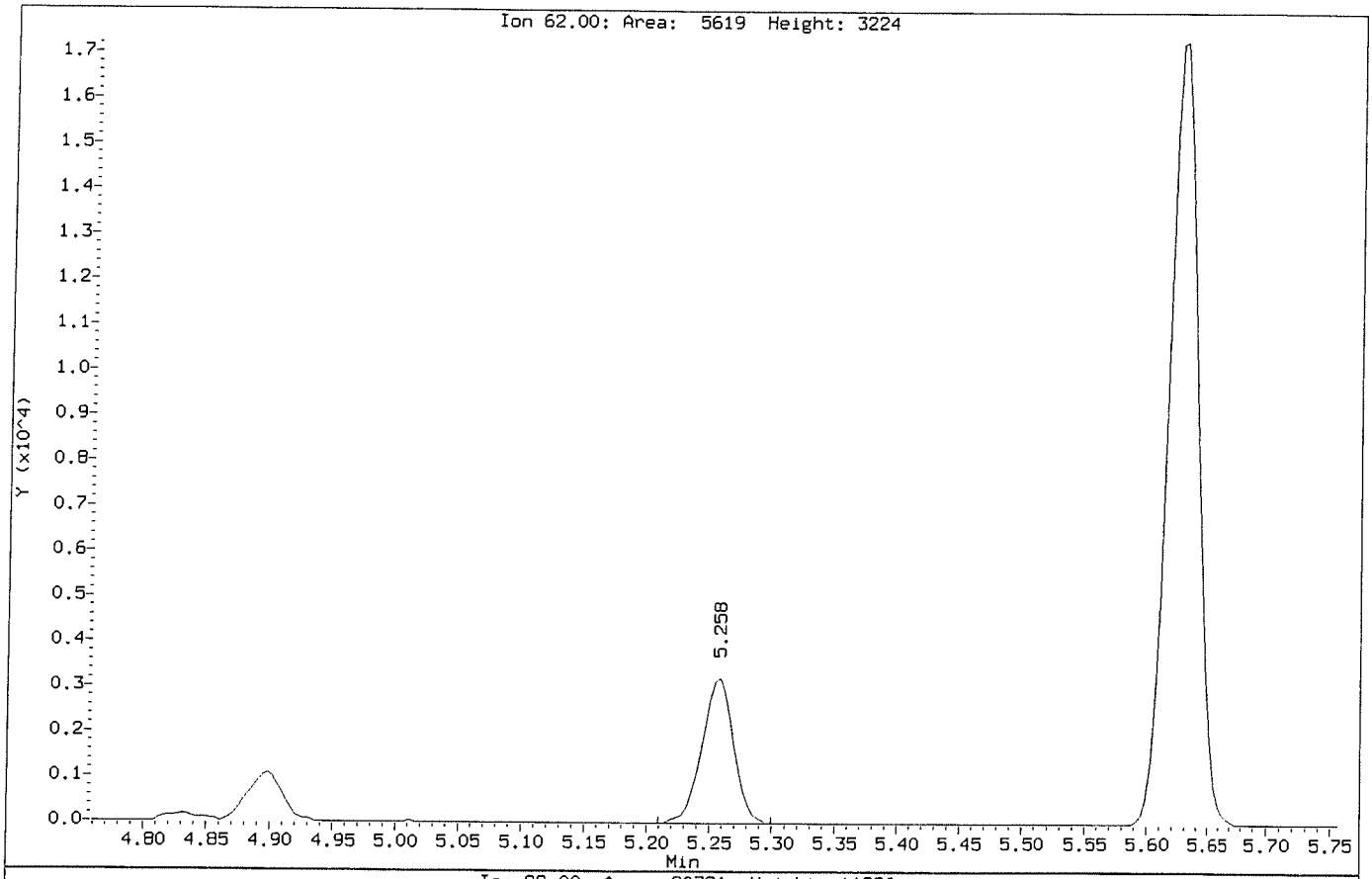
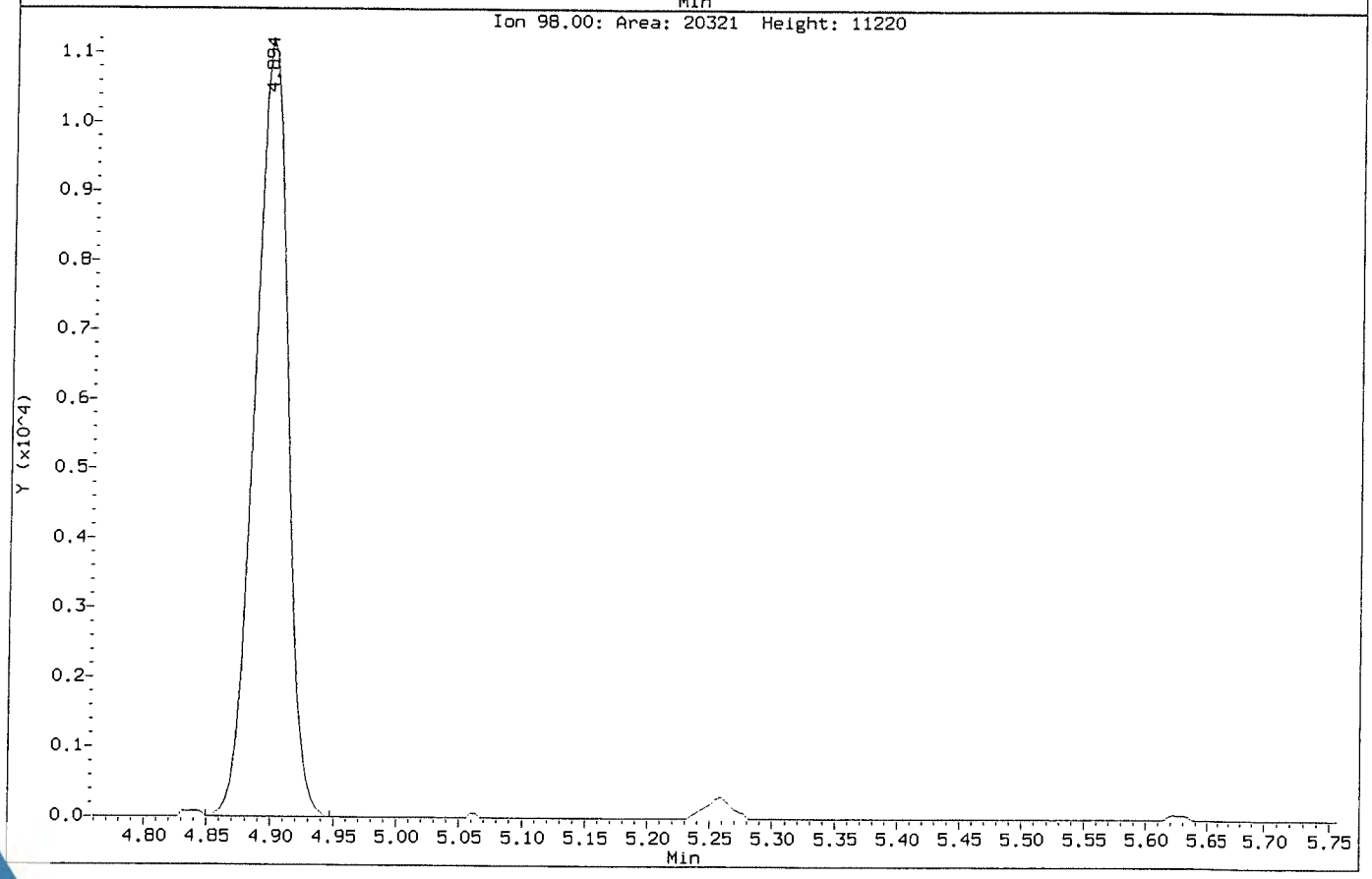
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1.2-Dichloroethane
CAS Number: 107-06-2





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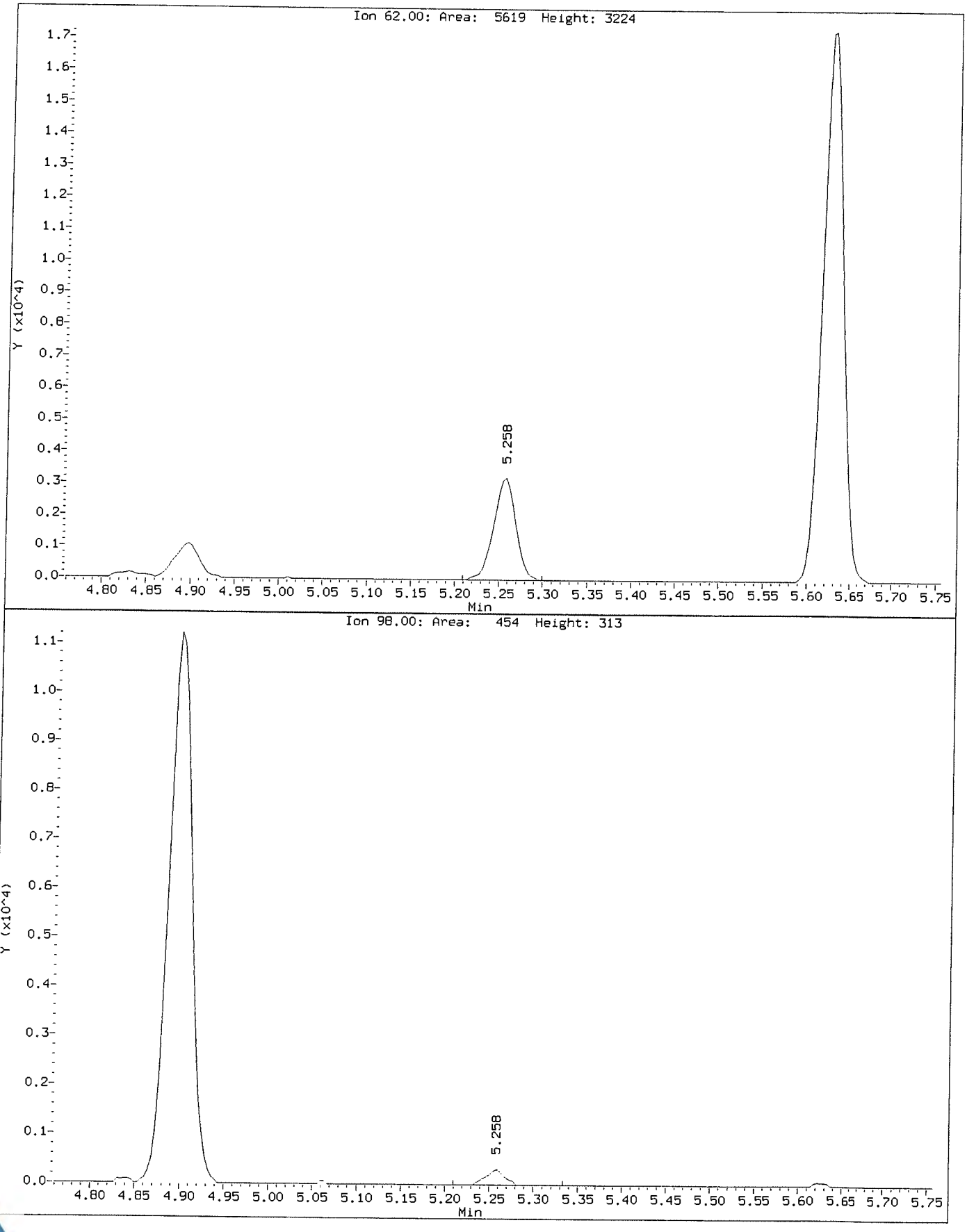
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dichloroethane
CAS Number: 107-06-2



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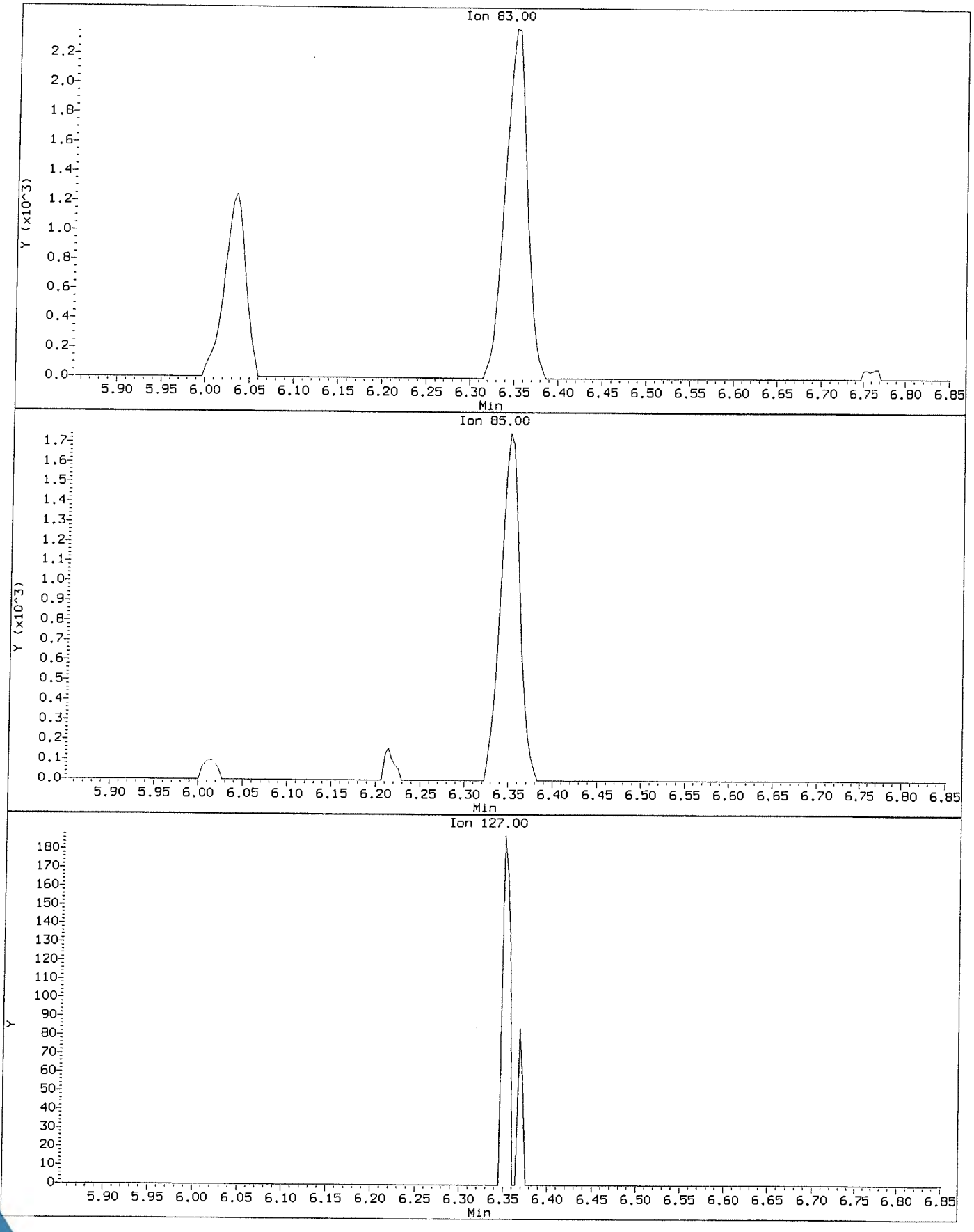
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



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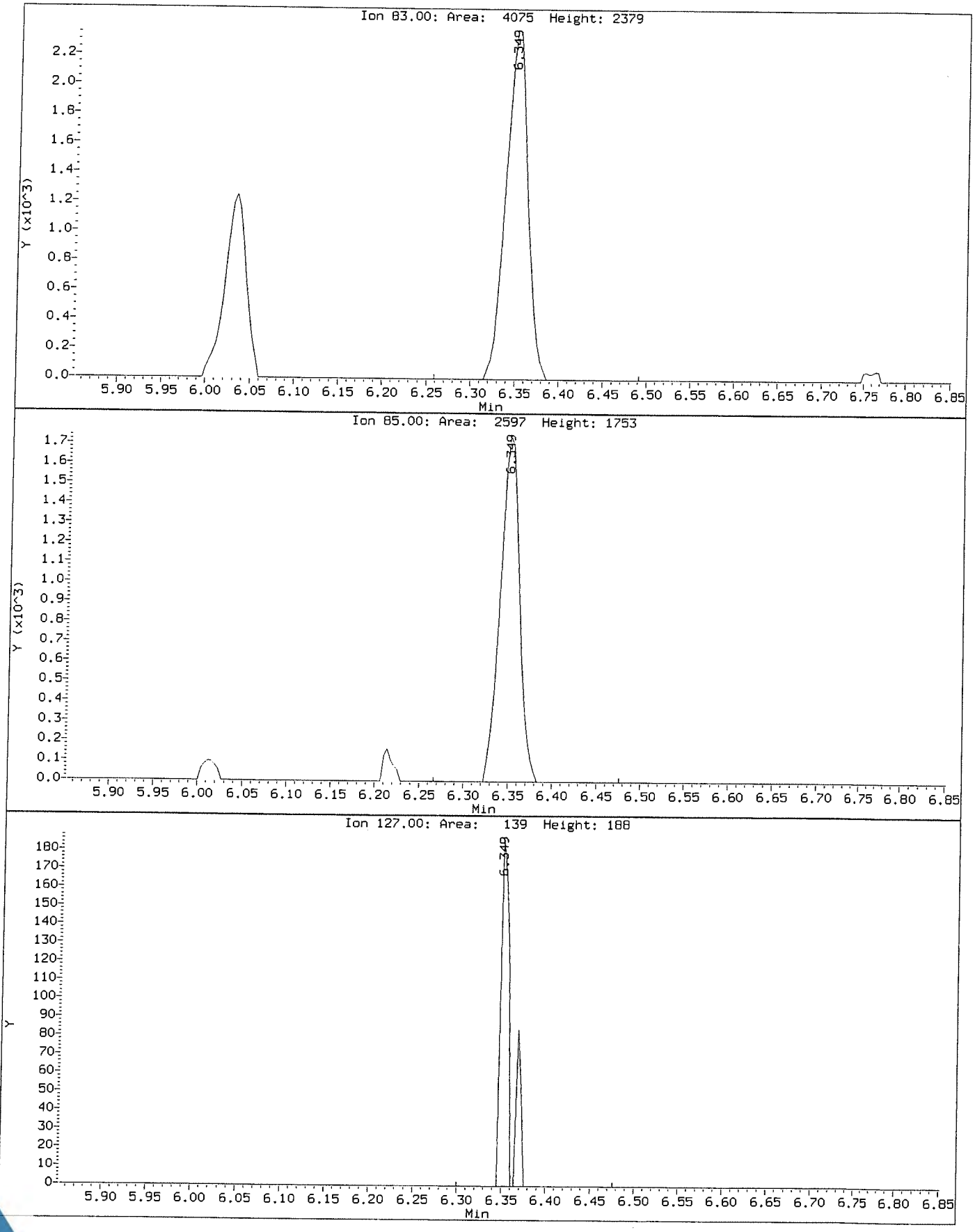
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



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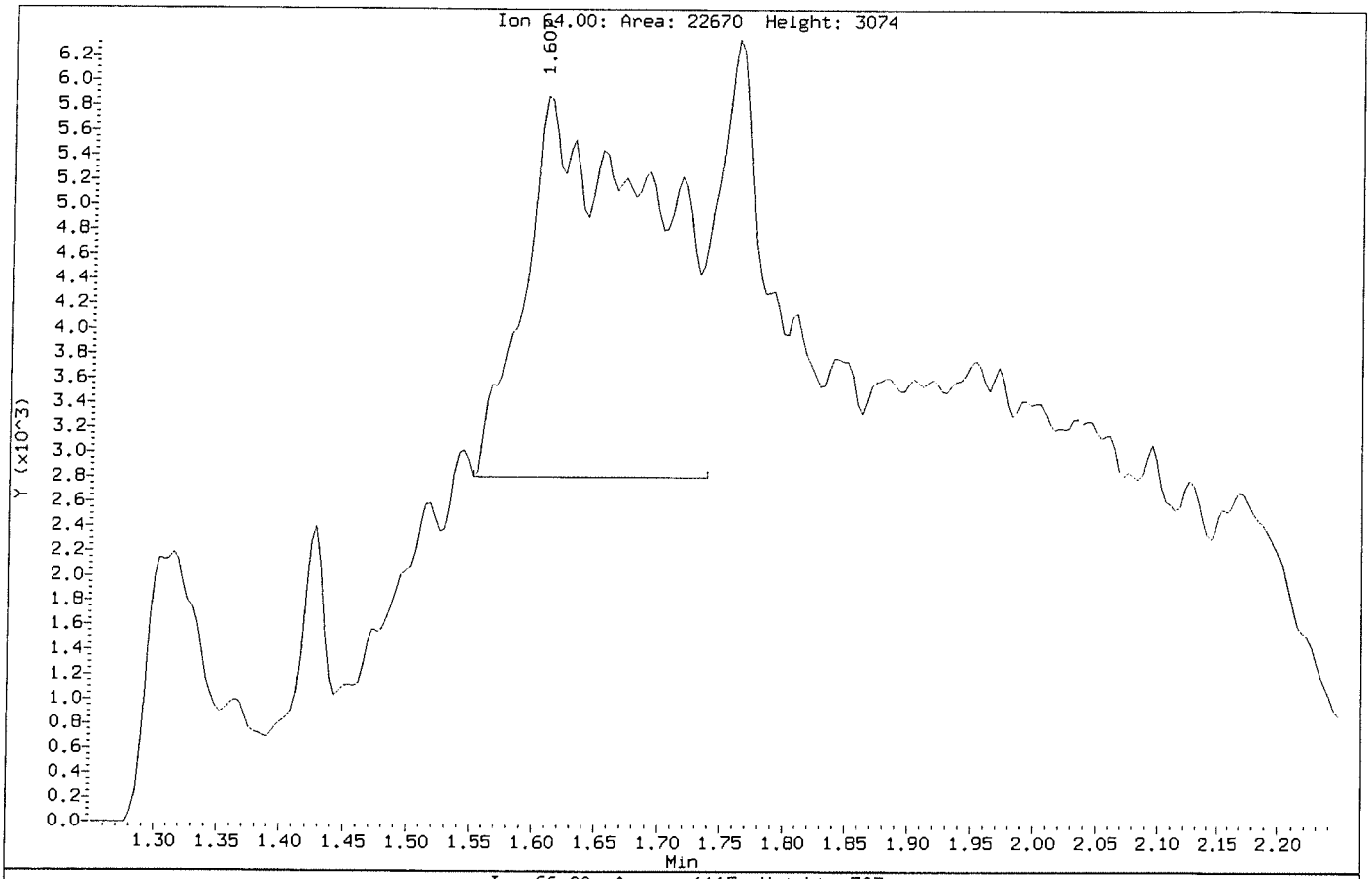
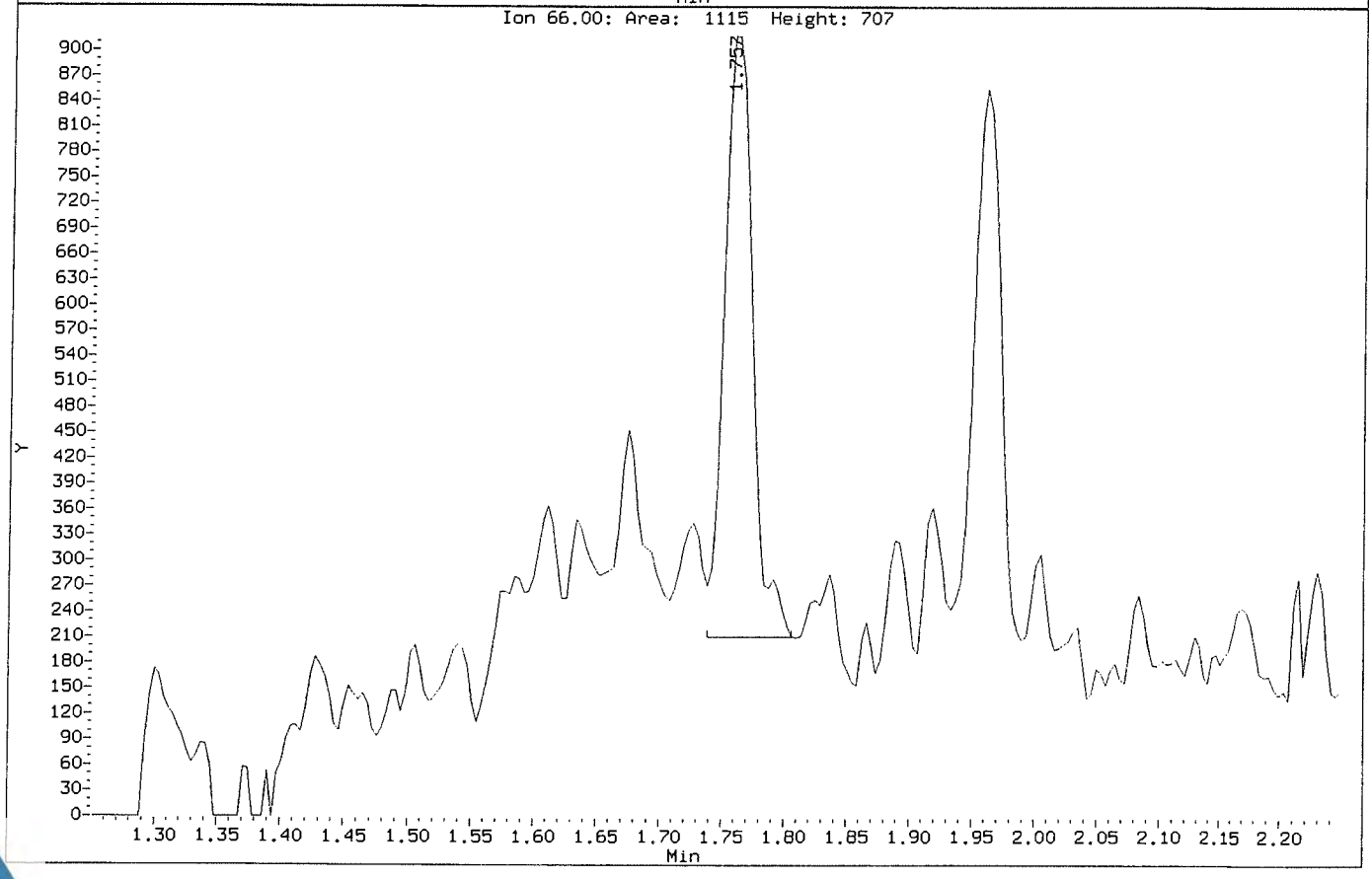
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

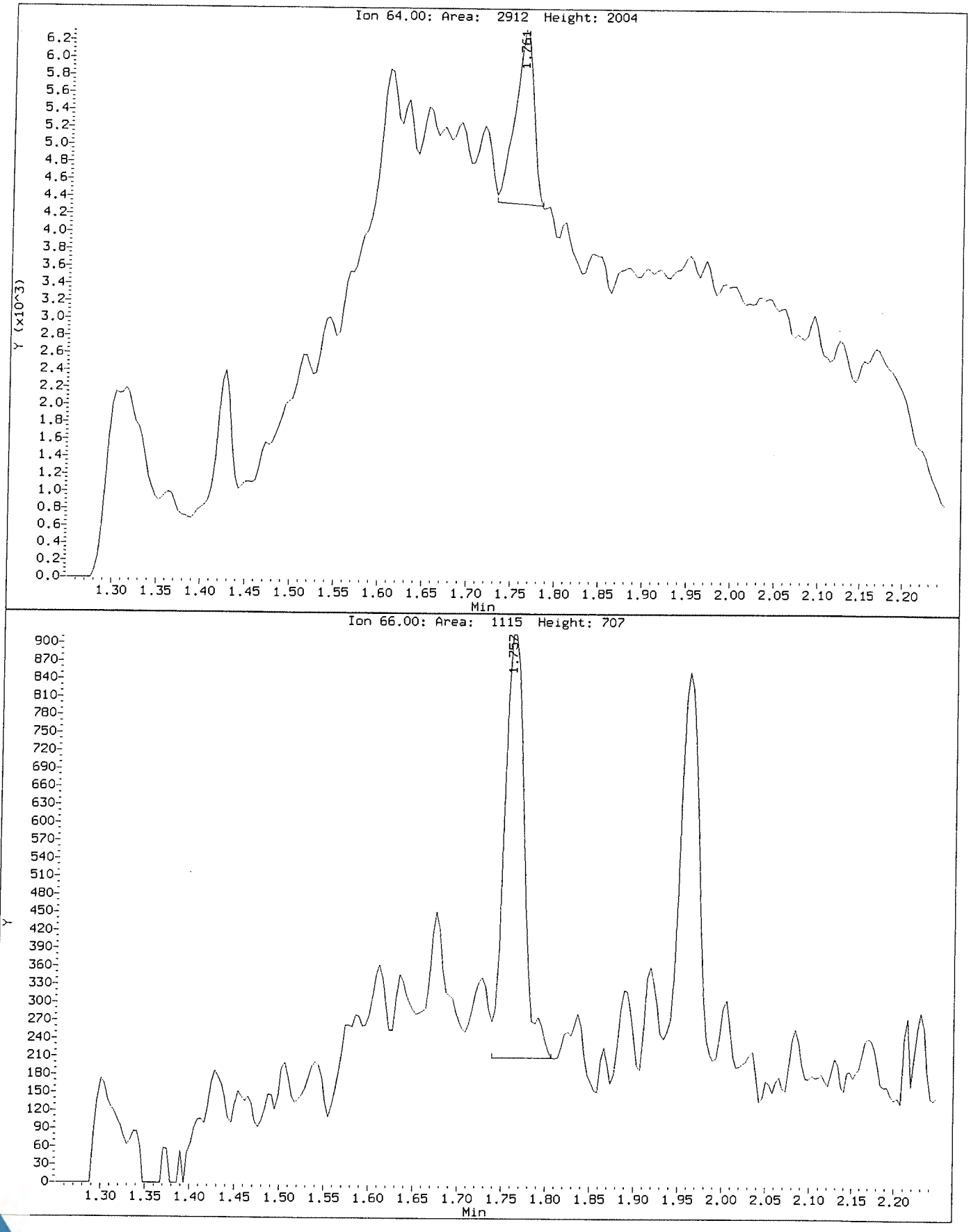
Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111303.D
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Chloroethane
CAS Number: 75-00-3



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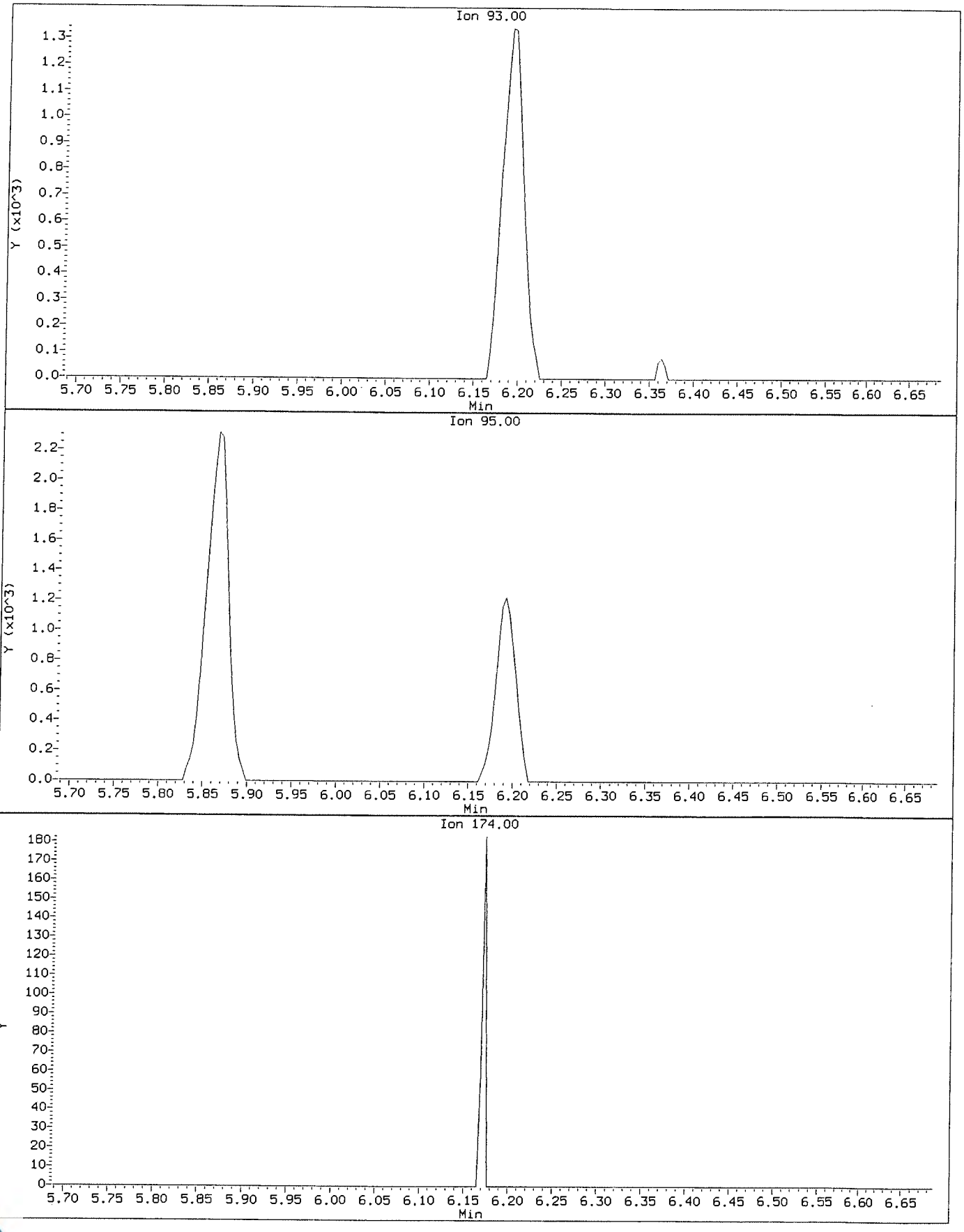
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Dibromomethane
CAS Number: 74-95-3



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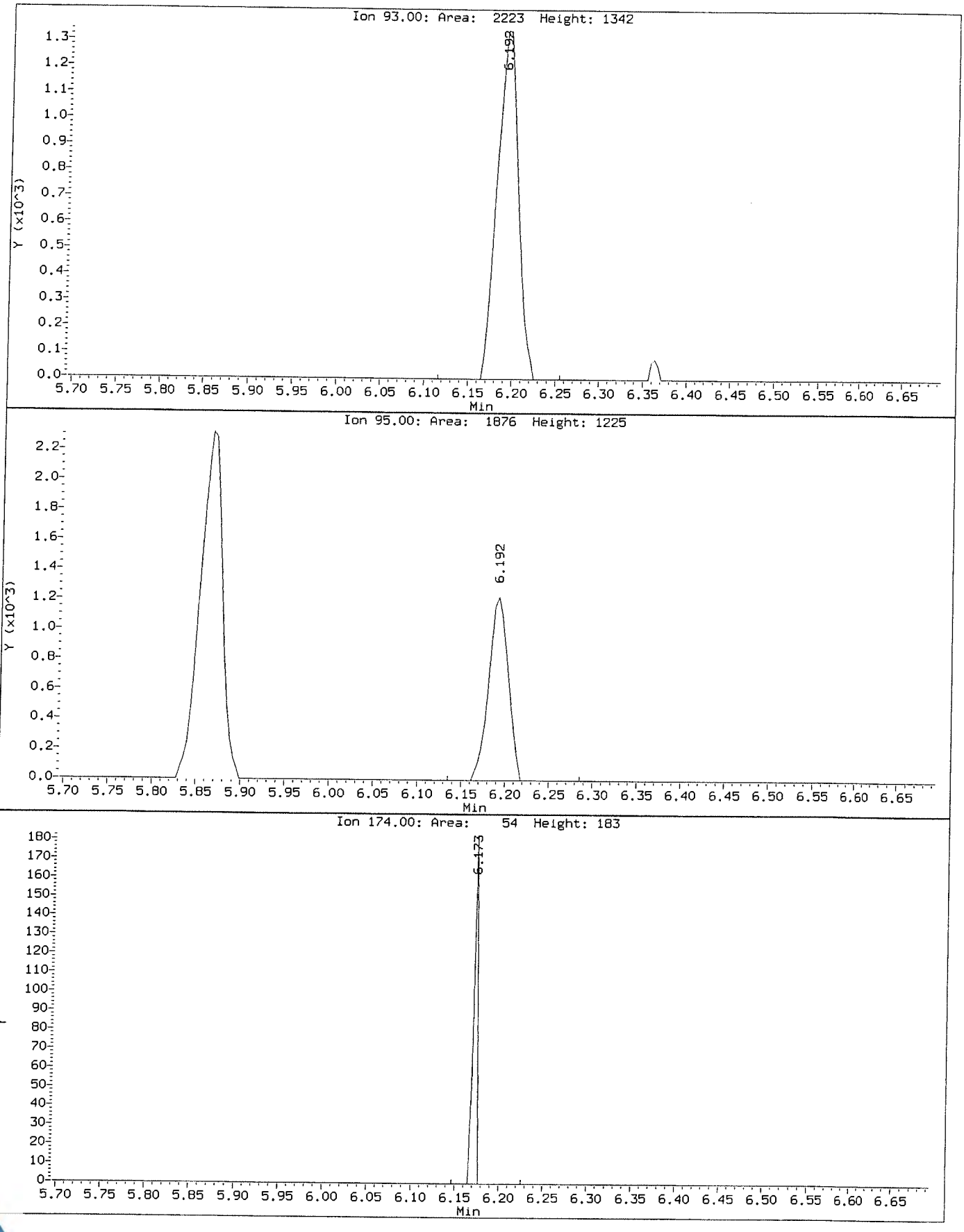
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Dibromomethane
CAS Number: 74-95-3



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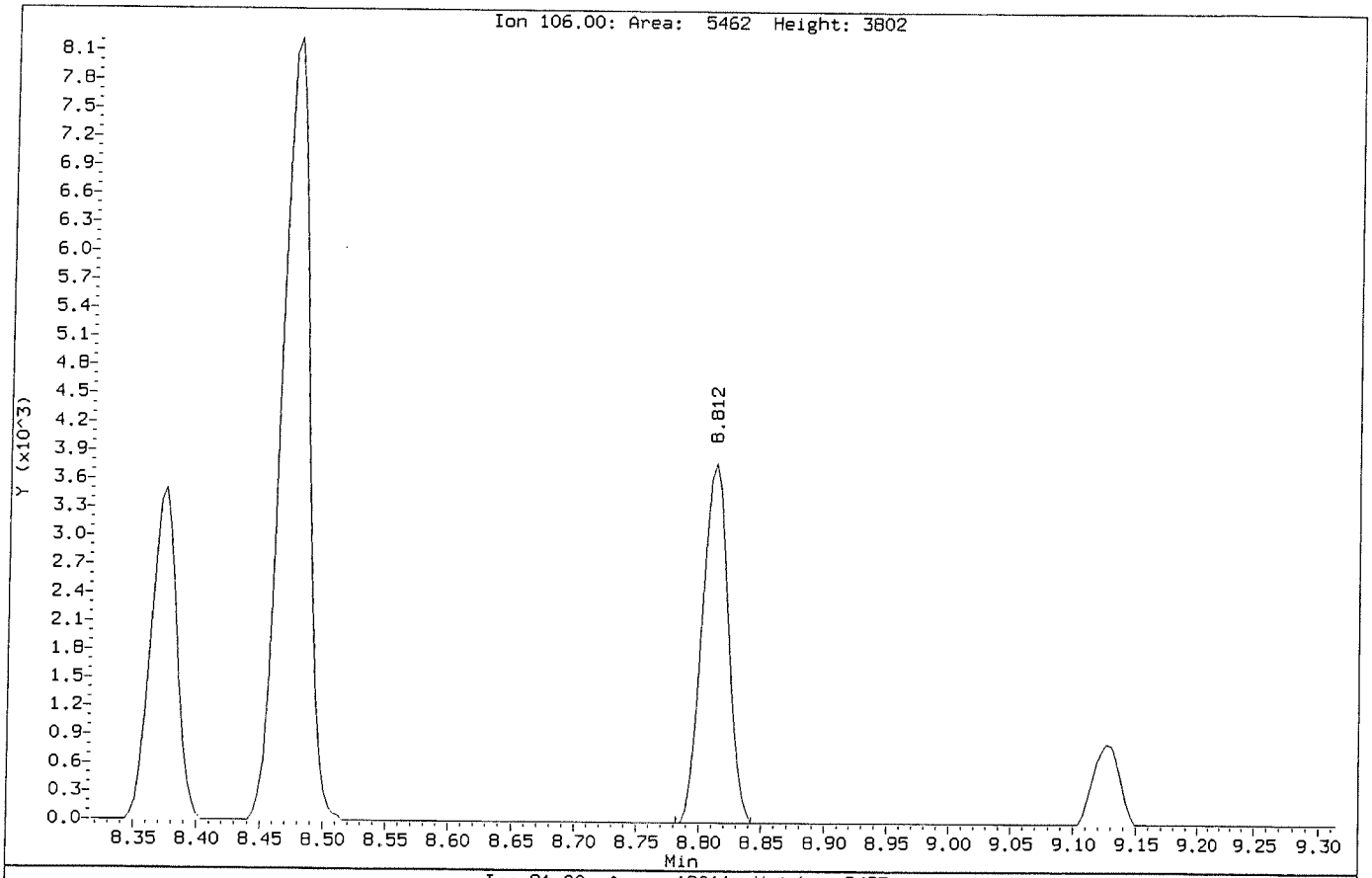
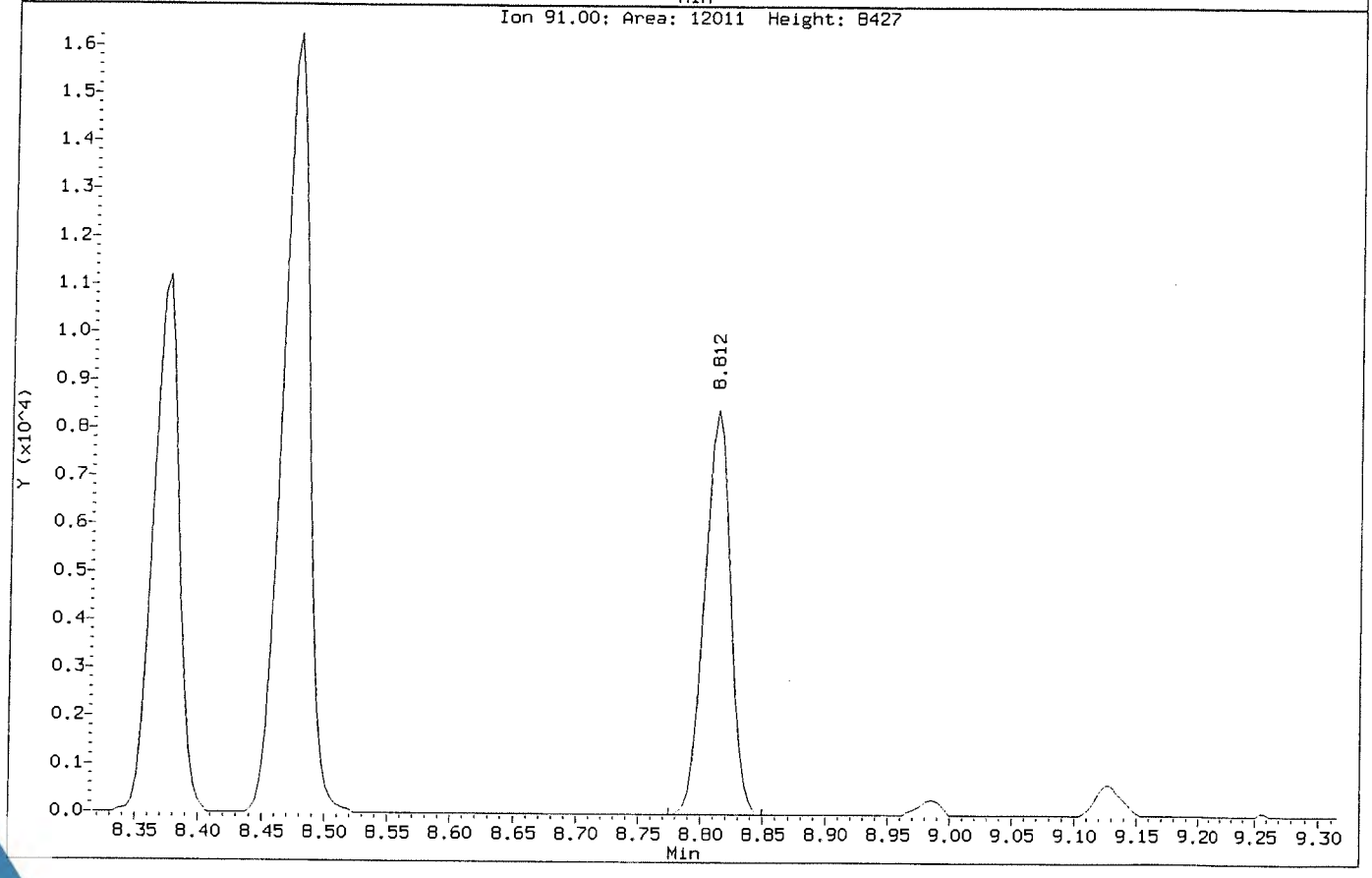
Injection Date: 13-NOV-2018 11:47
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: o-Xylene
CAS Number: 95-47-6





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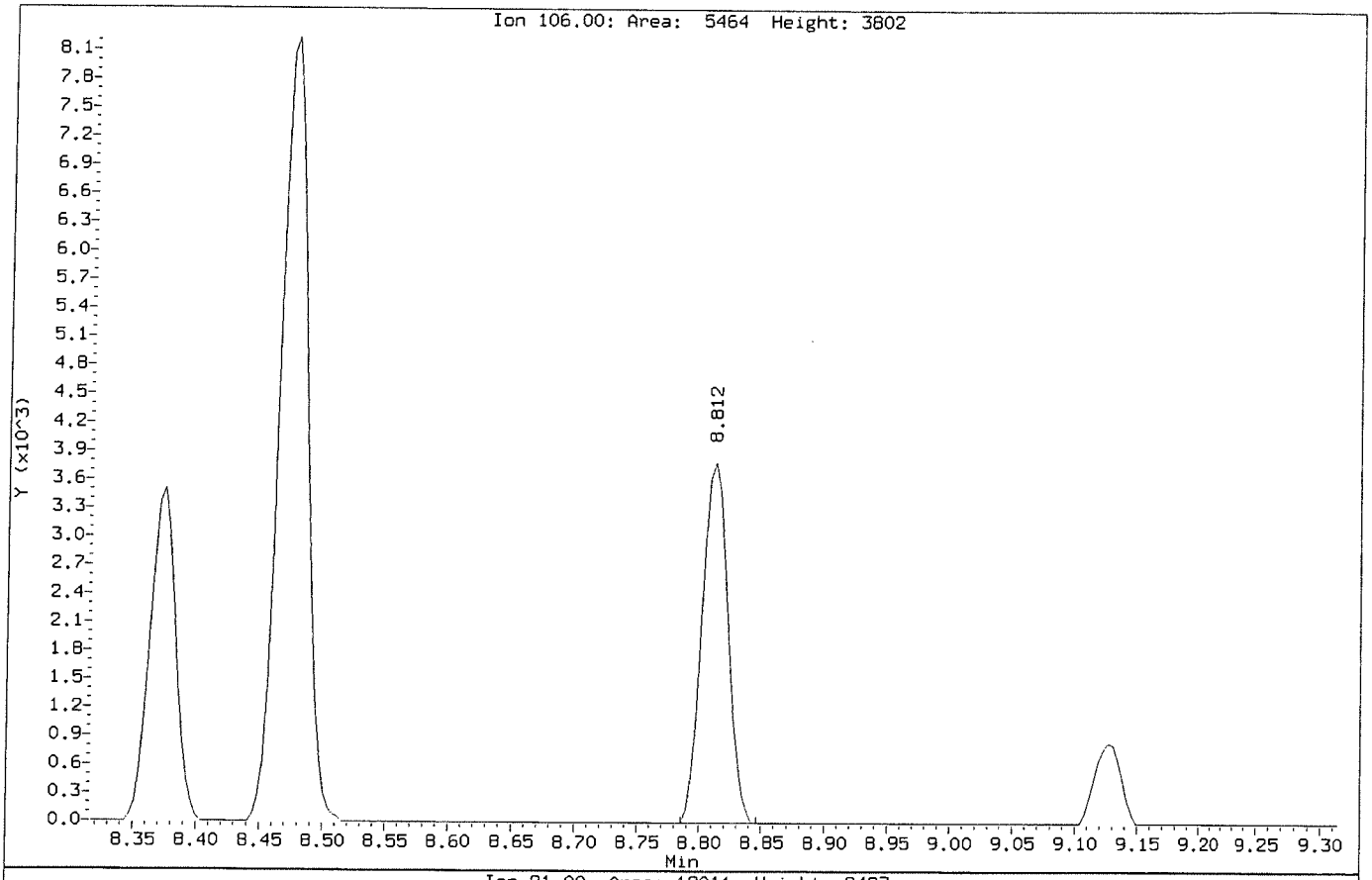
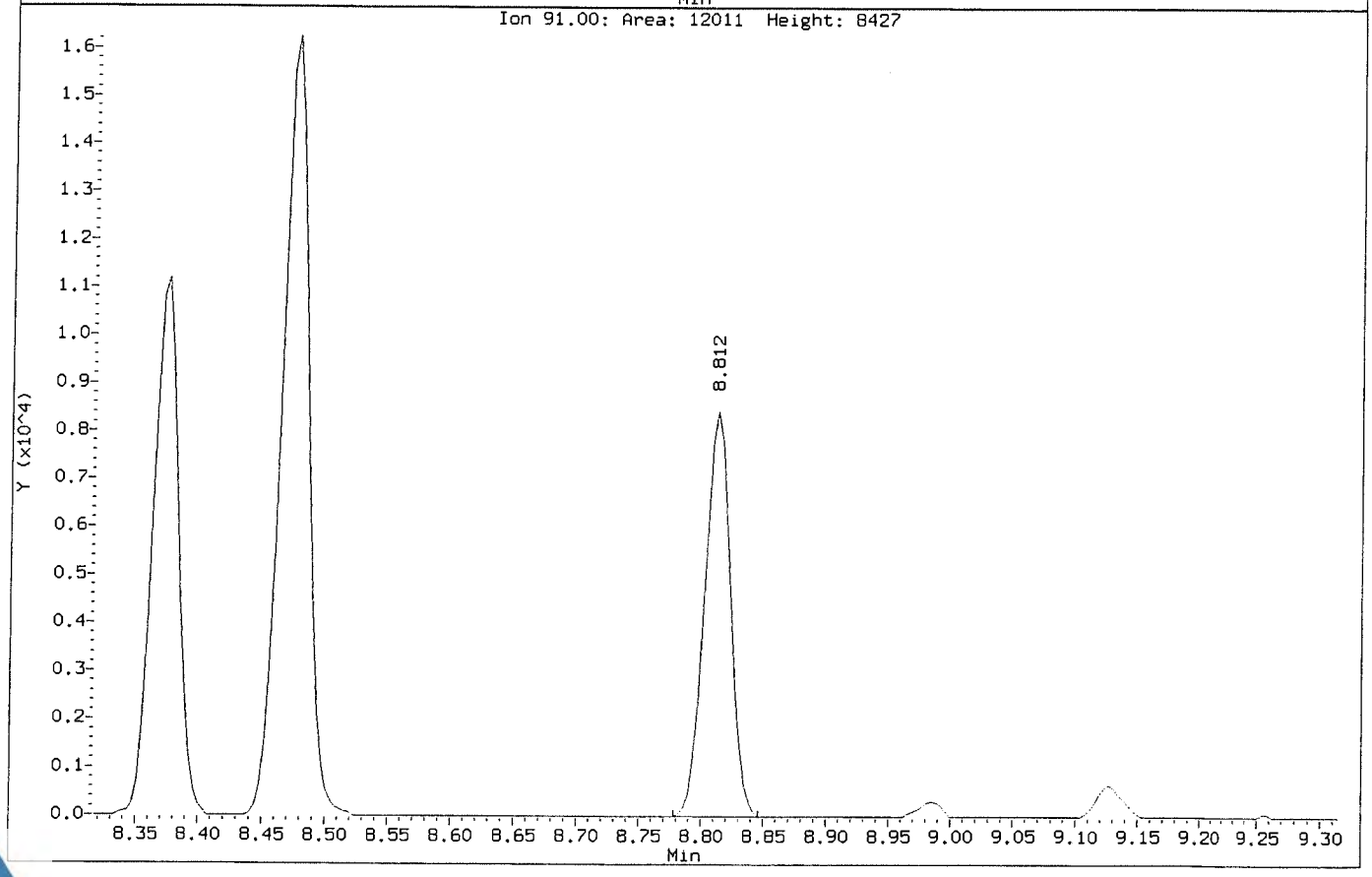
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: o-Xylene
CAS Number: 95-47-6





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111304.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111304.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 13-NOV-2018 12:36
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 11:47 Cal File: U111303.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

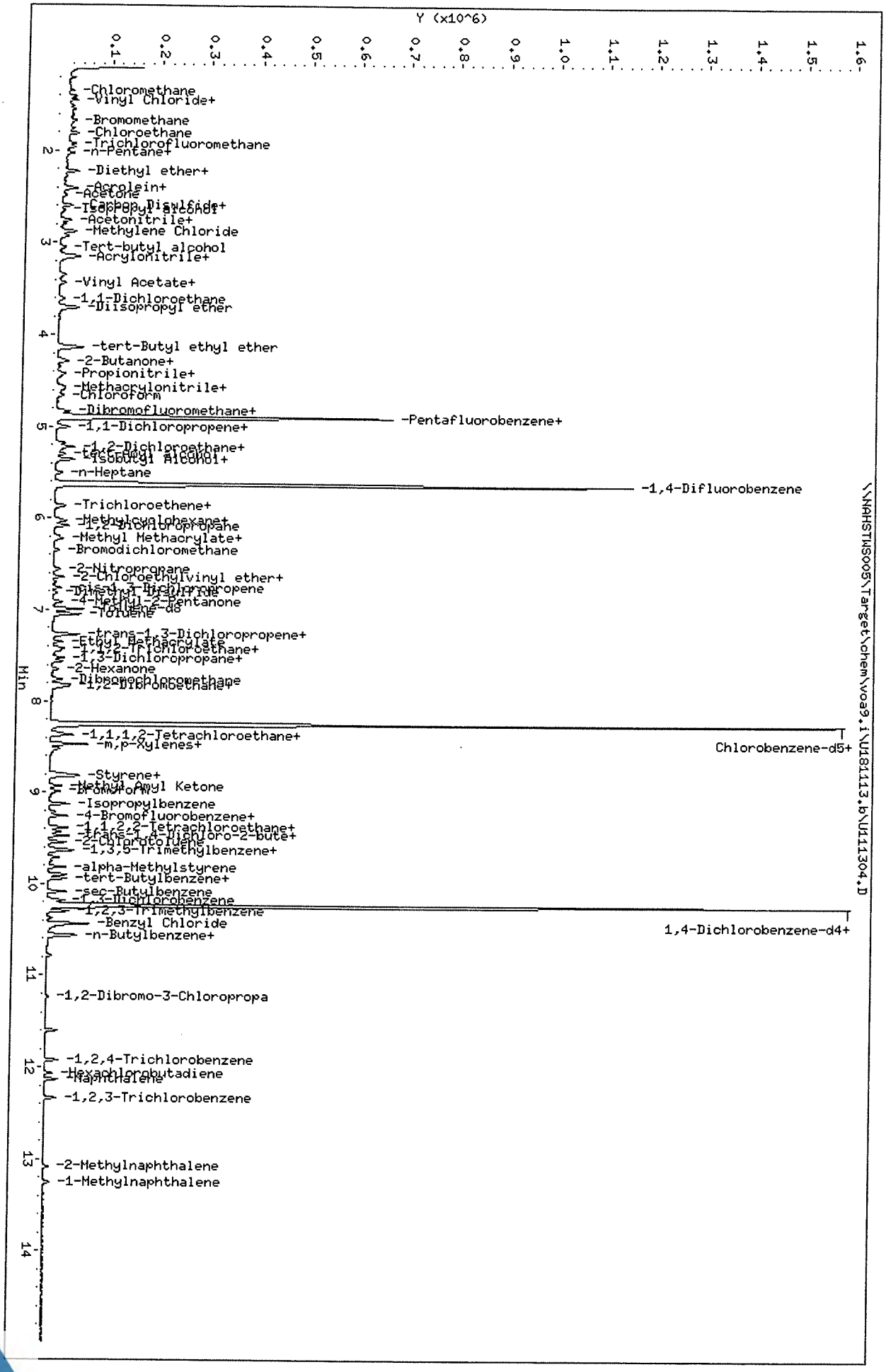
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.898	(1.000)	405565	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	804218	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	748347	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	345100	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	7705	1.00000	0.43(a)
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	11059	1.00000	0.09(a)
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	30489	1.00000	(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	10512	1.00000	0.38(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	4277	1.00000	0.90(a)
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.985)	6795	1.00000	0.95(a)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	8088	1.00000	0.98(a)
138 Freon TF	101	2.405	2.405	(0.491)	4282	1.00000	1.05(a)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	5034	1.00000	1.05(a)
22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	9857	1.00000	1.06(a)
11 1,1-Dichloroethene	96	2.405	2.405	(0.491)	5079	1.00000	1.10(a)
32 1,1-Dichloropropene	75	5.006	5.006	(0.890)	7778	1.00000	1.04(a)
93 1,2,3-Trichlorobenzene	180	12.339	12.339	(1.205)	5356	1.00000	0.82(a)
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	7560	1.00000	0.88(a)
90 1,2,4-Trichlorobenzene	180	11.926	11.926	(1.165)	6307	1.00000	0.92(a)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	18207	1.00000	0.94(a)
89 1,2-Dibromo-3-Chloropropane	155	11.237	11.237	(1.098)	955	1.00000	1.78(a)
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	5452	1.00000	0.98(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111304.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	11469	1.00000	1.04(a)
33 1,2-Dichloroethane	62	5.254	5.254	(0.934)	8729	1.00000	1.03(a)
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	5924	1.00000	1.03(a)
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	17829	1.00000	0.96(a)
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	11288	1.00000	1.03(a)
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	10633	1.00000	1.04(a)
84 1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	11659	1.00000	1.05(a)
26 2,2-Dichloropropane	77	4.275	4.275	(0.873)	5473	1.00000	0.95(a)
24 2-Butanone	43	4.343	4.343	(0.887)	5794	2.00000	2.03(a)
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	17337	1.00000	1.02(a)
52 2-Hexanone	43	7.653	7.653	(0.928)	7477	2.00000	1.71(a)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	18812	1.00000	0.96(a)
82 p-Isopropyltoluene	119	10.210	10.210	(0.997)	16467	1.00000	0.87(a)
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	12236	2.00000	1.96(a)
10 Acetone	43	2.484	2.484	(0.507)	7657	2.00000	(a)
37 Benzene	78	5.220	5.220	(0.928)	23677	1.00000	1.06(a)
74 Bromobenzene	156	9.385	9.385	(0.917)	5602	1.00000	0.98(a)
29 Bromochloromethane	128	4.557	4.557	(0.930)	2347	1.00000	0.98(aM)
39 Bromodichloromethane	83	6.348	6.348	(1.129)	6268	1.00000	0.93(aM)
66 Bromoform	173	8.984	8.984	(1.089)	2470	1.00000	1.89(Ta)
6 Bromomethane	94	1.674	1.674	(0.342)	4167	1.00000	3.09(a)
19 Carbon Disulfide	76	2.592	2.592	(0.529)	28789	2.00000	2.03(a)
34 Carbon Tetrachloride	117	4.999	4.999	(0.889)	5592	1.00000	0.96(a)
59 Chlorobenzene	112	8.275	8.275	(1.003)	16679	1.00000	1.07(a)
7 Chloroethane	64	1.756	1.756	(0.359)	4550	1.00000	1.07(aM)
28 Chloroform	83	4.658	4.658	(0.951)	9975	1.00000	1.06(a)
3 Chloromethane	50	1.344	1.344	(0.274)	6506	1.00000	1.42(a)
27 cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	6147	1.00000	1.06(a)
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	7263	1.00000	0.86(a)
55 Dibromochloromethane	129	7.758	7.758	(0.940)	3914	1.00000	0.82(a)
44 Dibromomethane	93	6.191	6.191	(1.101)	3612	1.00000	1.00(aM)
2 Dichlorodifluoromethane	85	1.209	1.209	(0.247)	6358	1.00000	2.04(a)
61 Ethylbenzene	106	8.373	8.373	(1.015)	8122	1.00000	1.03(a)
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	2210	1.00000	1.33(a)
67 Isopropylbenzene	105	9.126	9.126	(1.106)	22125	1.00000	0.97(a)
62 m,p-Xylenes	106	8.474	8.474	(1.027)	18714	2.00000	1.94(a)
17 Methylene Chloride	84	2.877	2.877	(0.587)	7766	1.00000	0.81(a)
87 n-Butylbenzene	91	10.558	10.558	(1.031)	17894	1.00000	1.37(a)
73 n-Propylbenzene	91	9.475	9.475	(0.926)	27227	1.00000	0.99(a)
92 Naphthalene	128	12.133	12.133	(1.185)	17787	1.00000	0.87(a)
63 o-Xylene	106	8.811	8.811	(1.068)	9461	1.00000	0.98(aH)
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	22039	1.00000	0.97(a)
64 Styrene	104	8.826	8.826	(1.070)	14819	1.00000	0.91(a)
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	14832	1.00000	0.93(a)
56 Tetrachloroethene	164	7.525	7.525	(0.912)	4264	1.00000	1.08(a)
50 Toluene	91	7.049	7.049	(0.855)	24363	1.00000	1.02(a)
20 trans-1,2-Dichloroethene	96	3.147	3.147	(0.643)	5480	1.00000	1.09(a)
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.291)	5482	1.00000	2.11(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	5801	1.00000	1.05(a)
8 Trichlorofluoromethane	101	1.959	1.959	(0.400)	8913	1.00000	1.09(a)
5 Vinyl Chloride	62	1.423	1.423	(0.291)	7374	1.00000	1.61(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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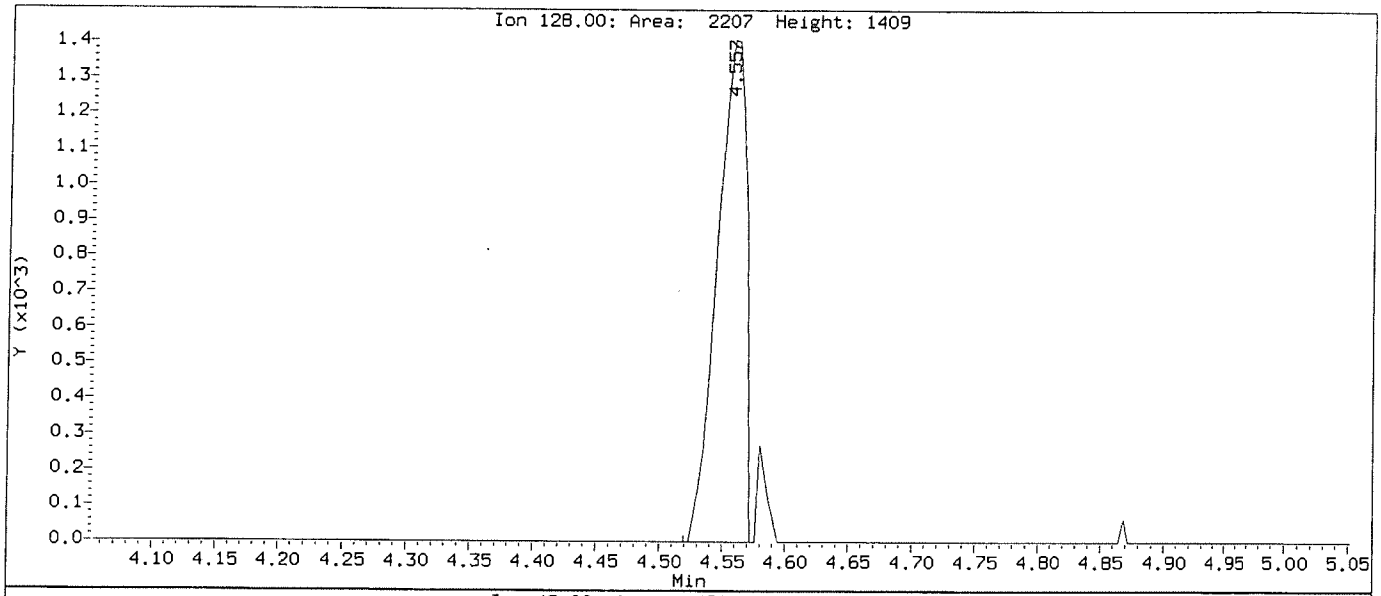
Date : 13-NOV-2018 12:36
Client ID: VSTD001
Sample Info: VSTD001,VSTD001,1,3,
Purge Volume: 5.0
Column phase: DB624

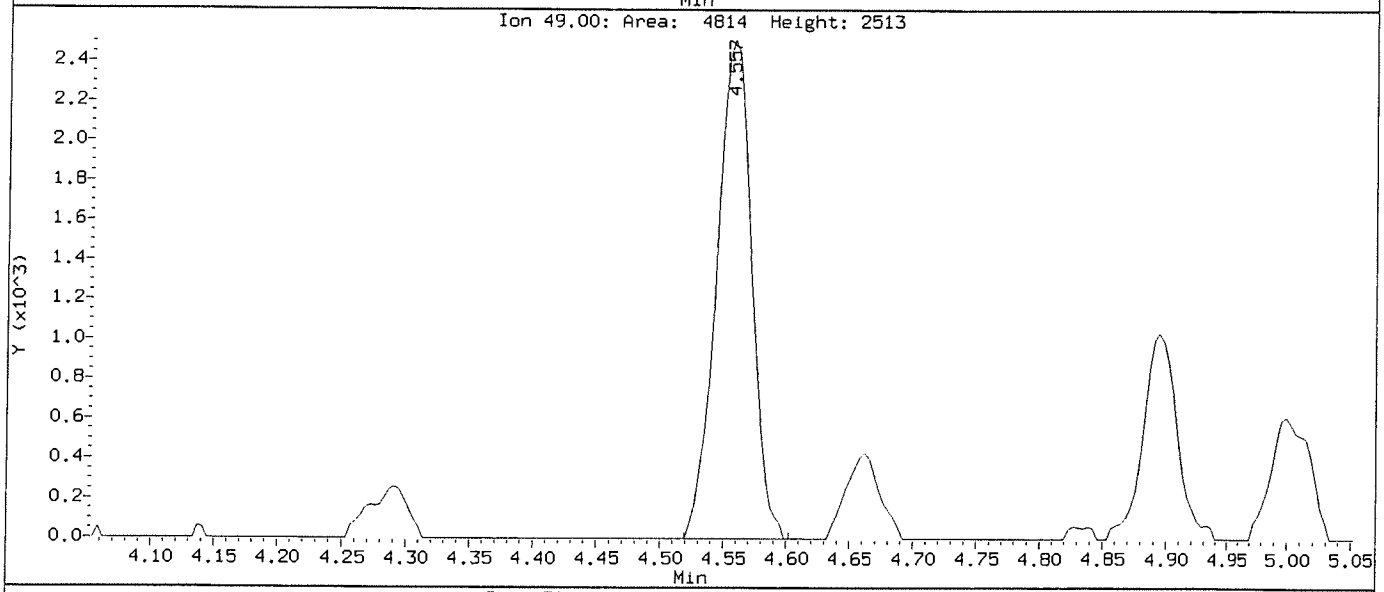
\\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111304.D

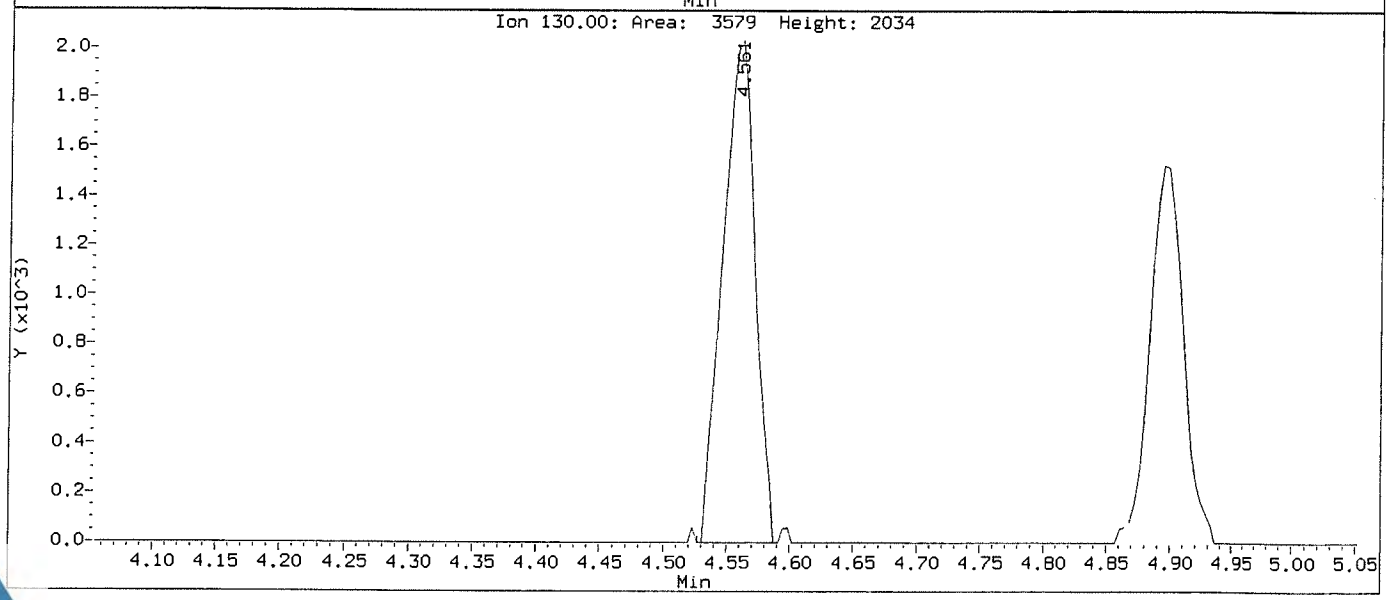
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111304.D
Injection Date: 13-NOV-2018 12:36
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromochloromethane
CAS Number: 74-97-5







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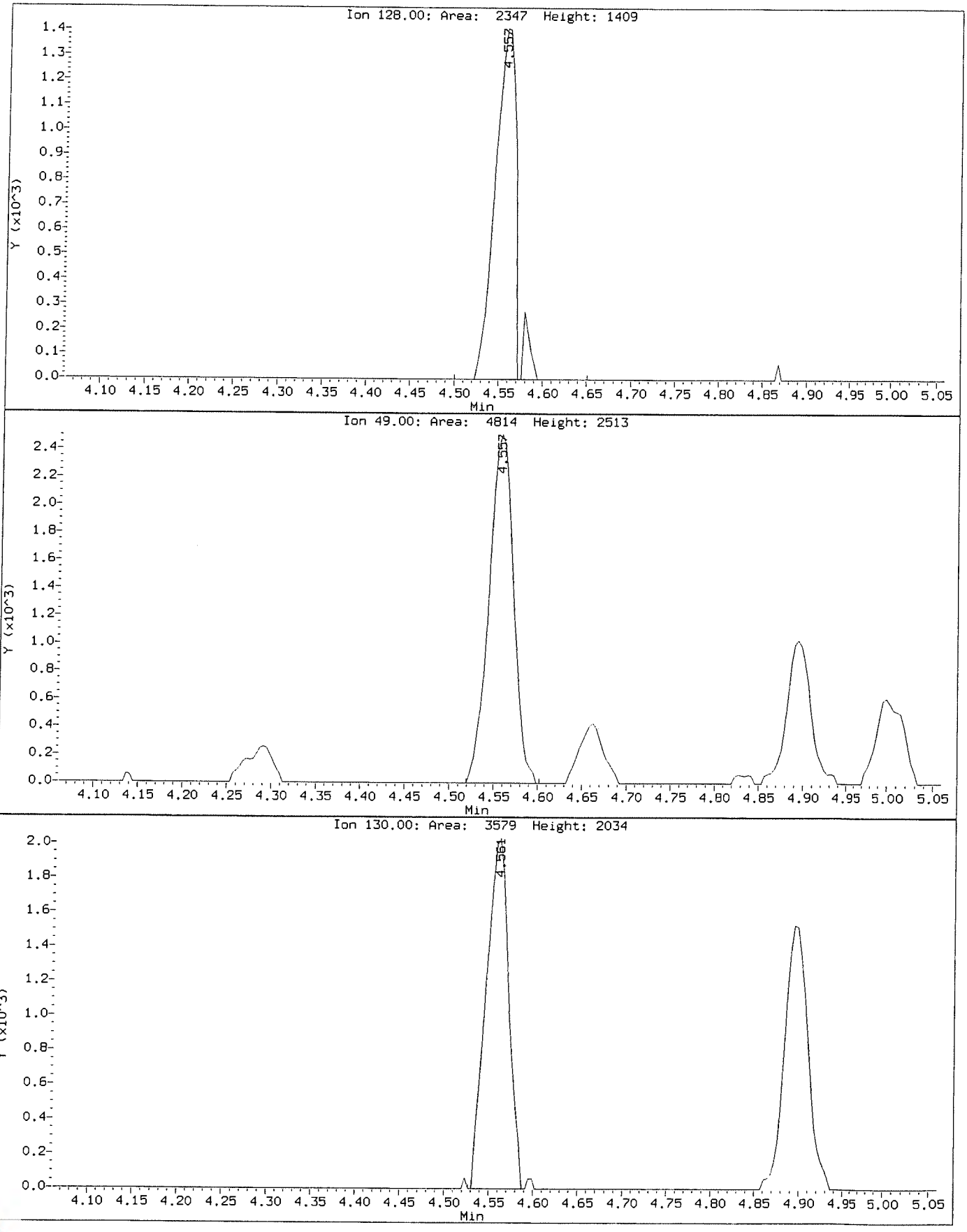
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromochloromethane
CAS Number: 74-97-5



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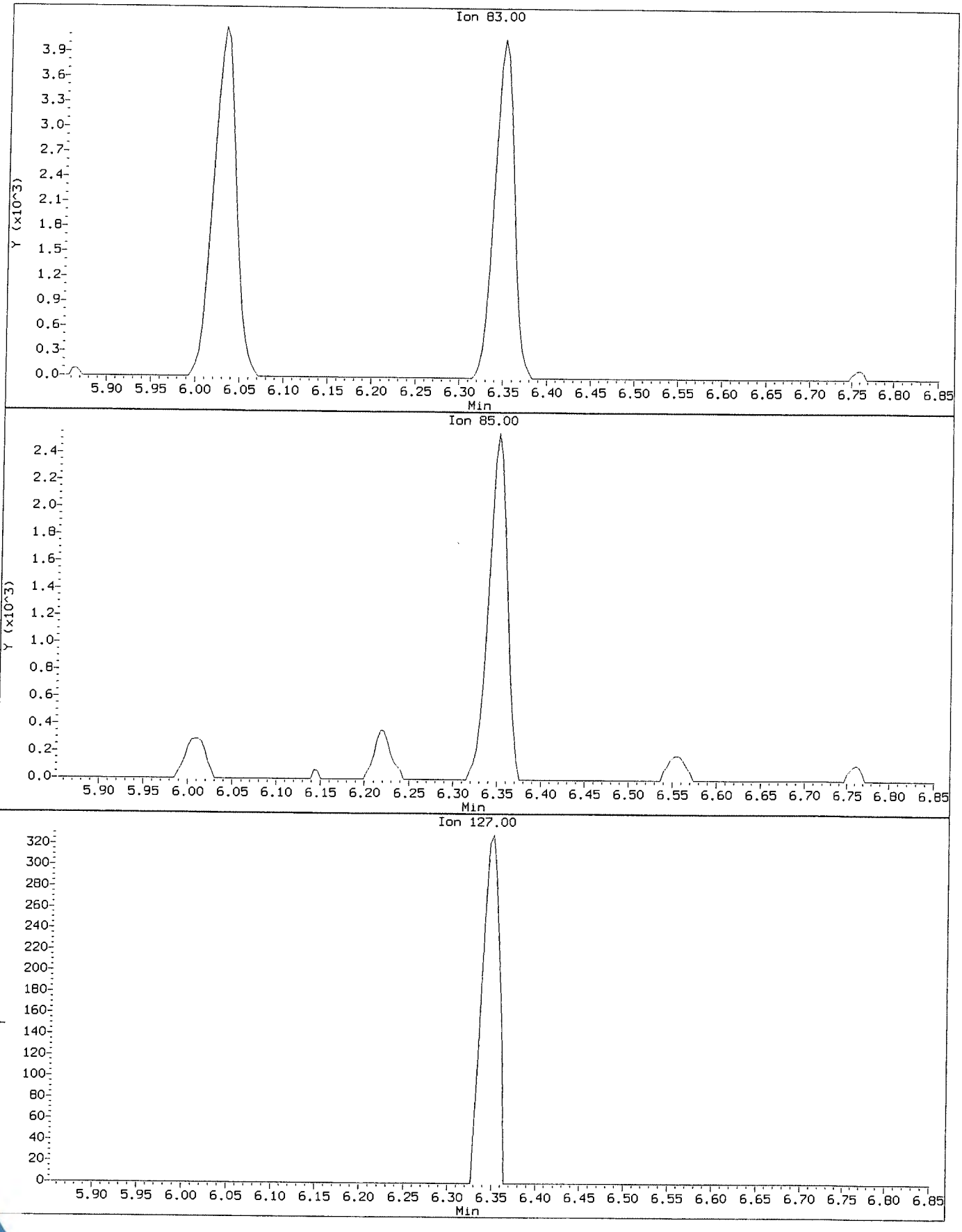
Injection Date: 13-NOV-2018 12:36
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4



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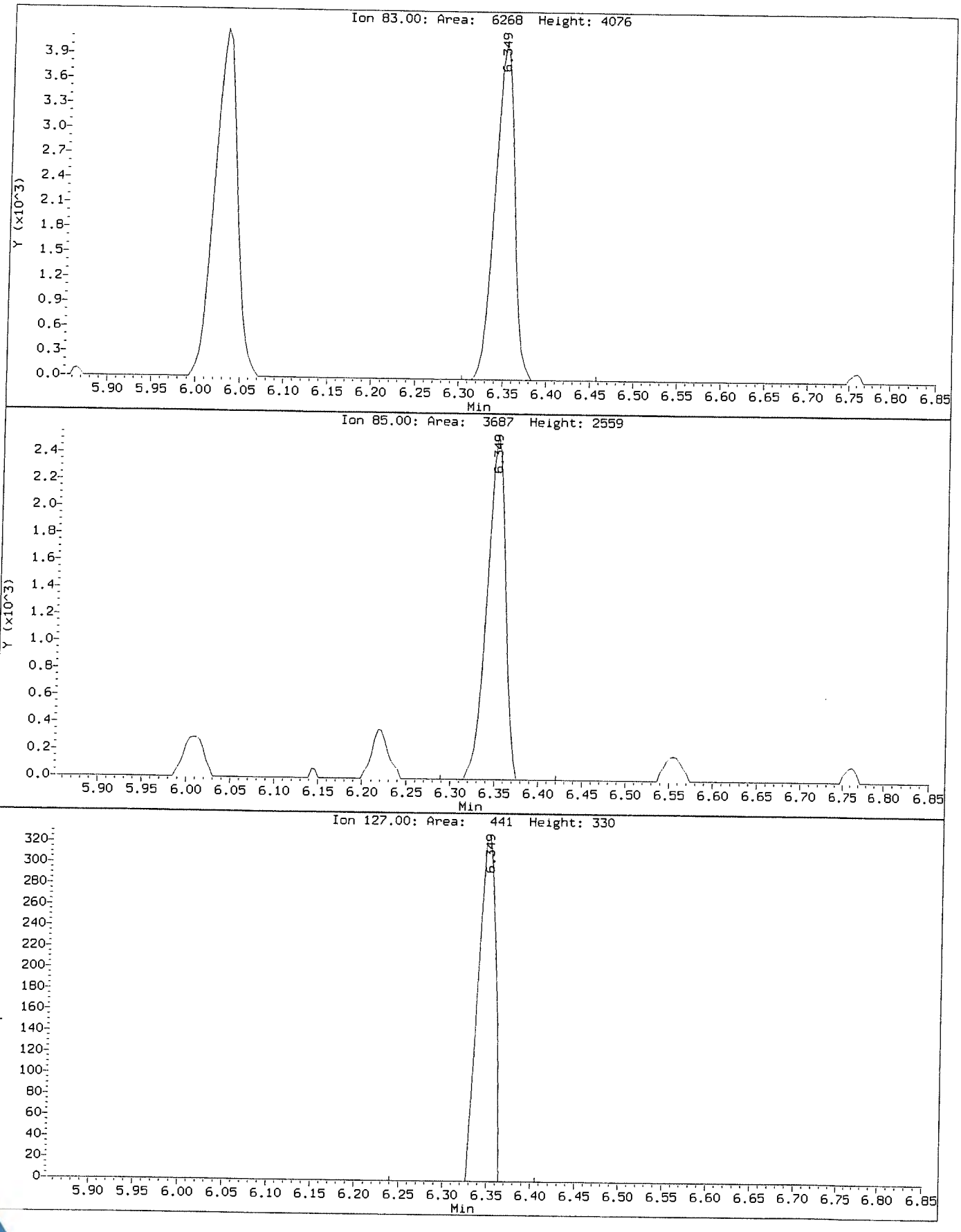
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4



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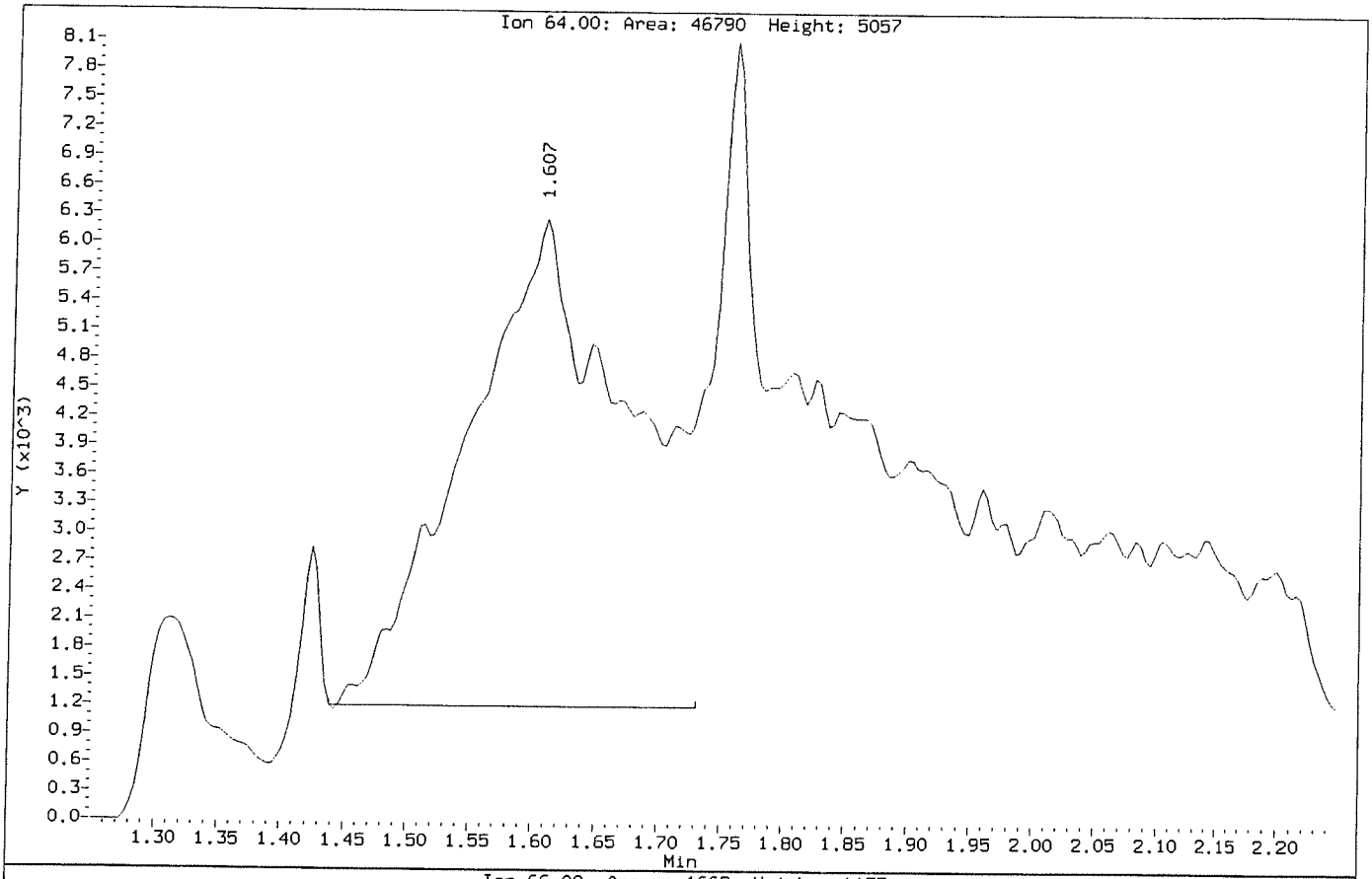
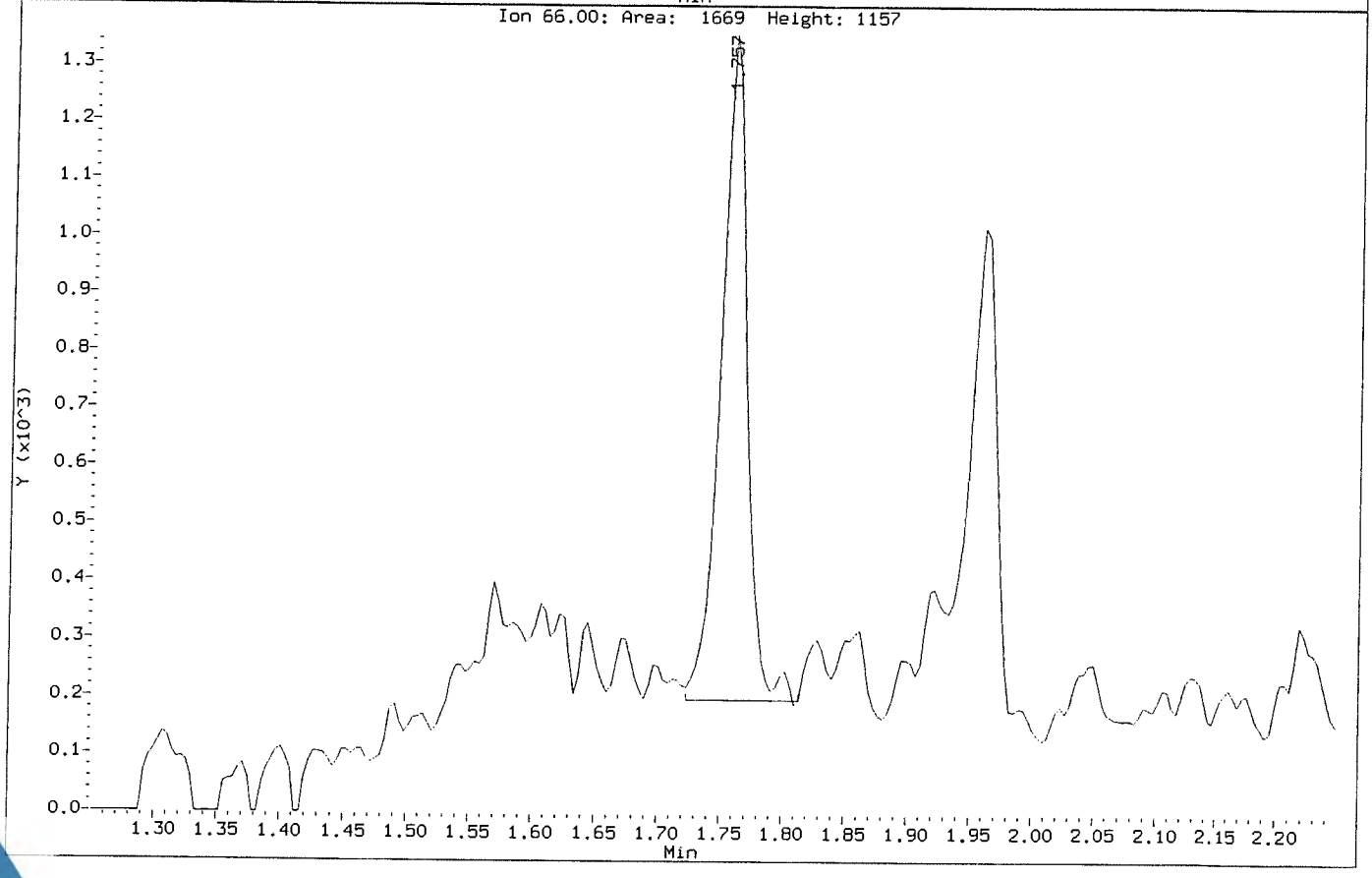
Injection Date: 13-NOV-2018 12:36
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3





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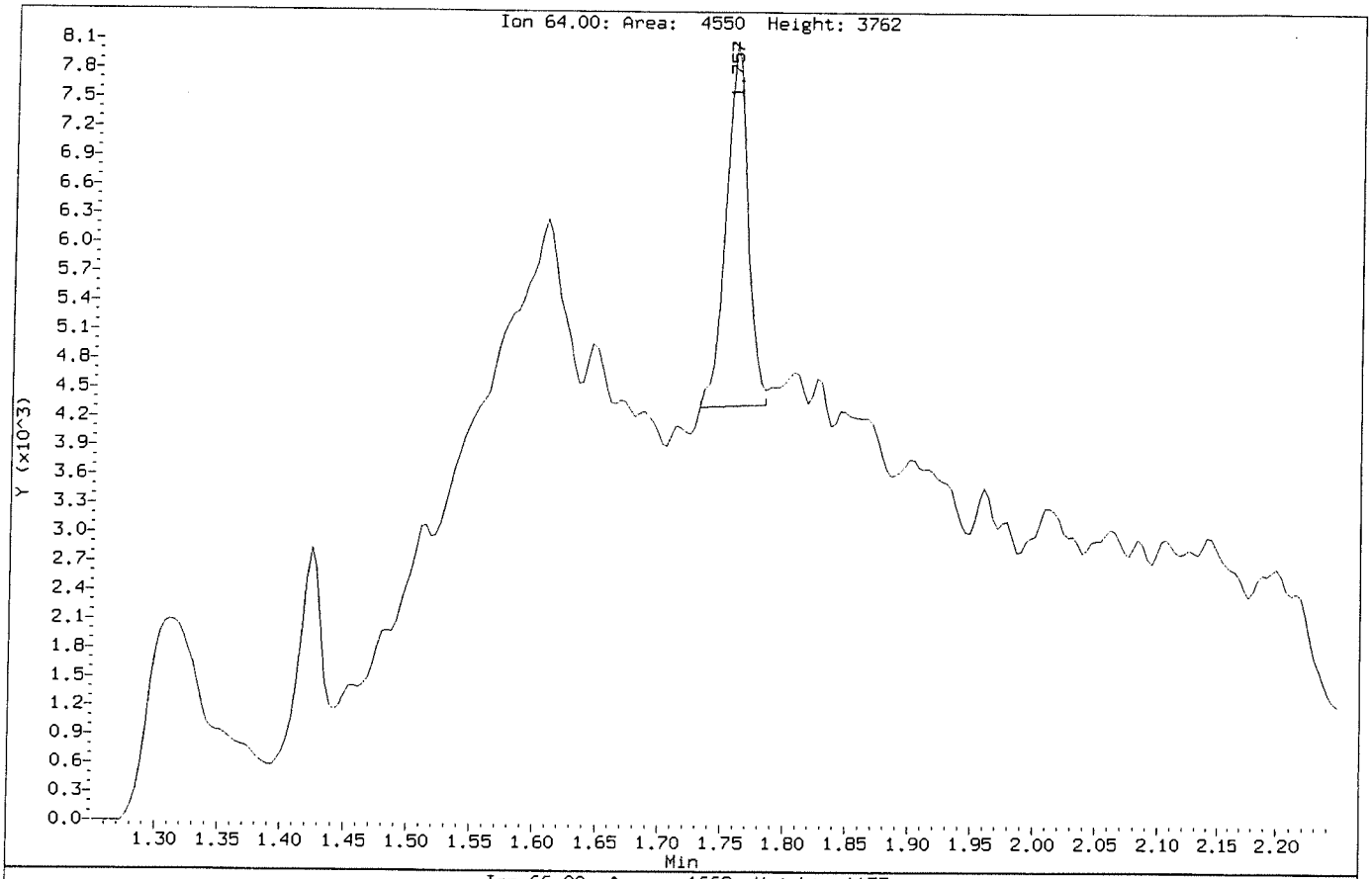
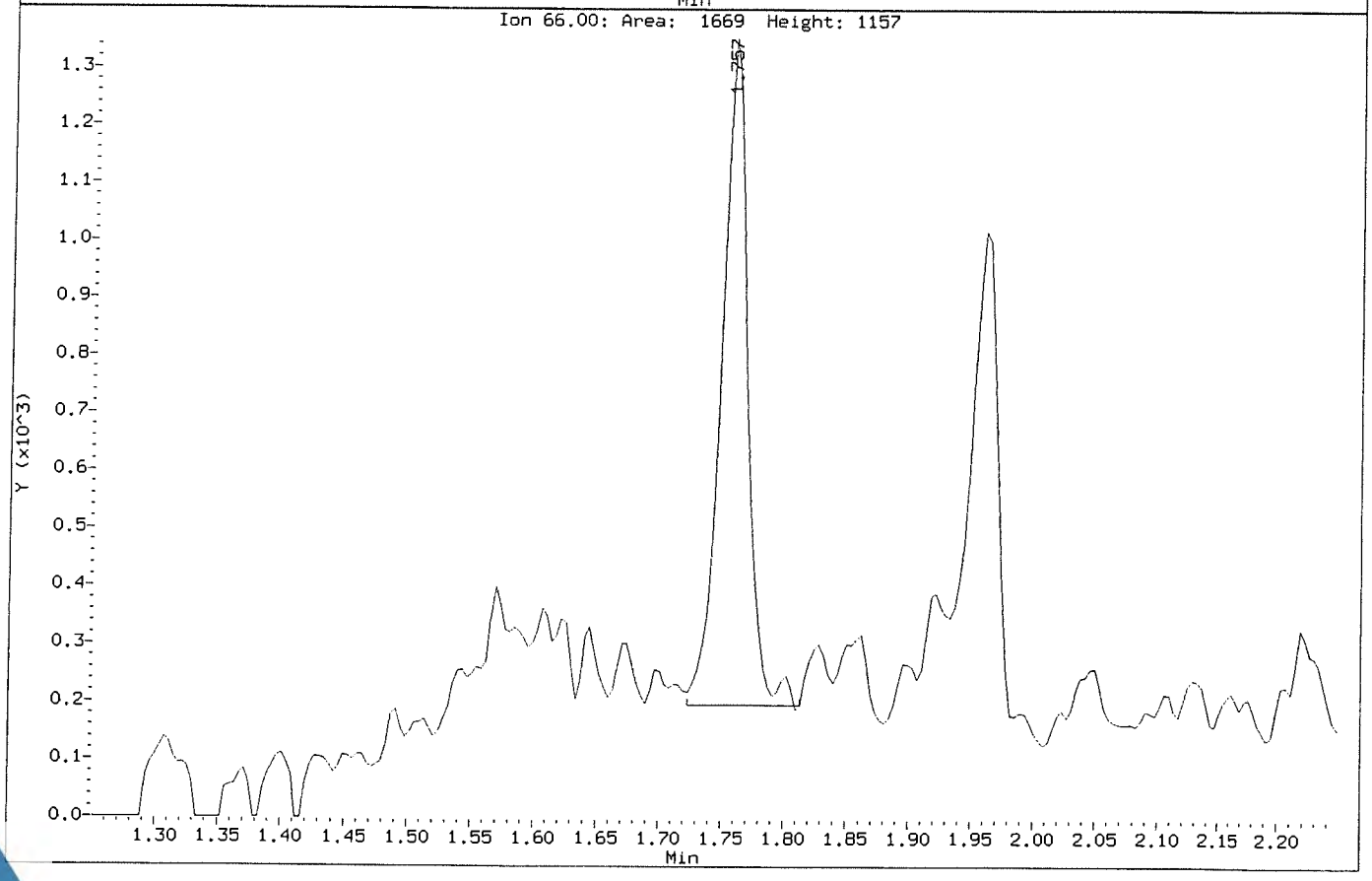
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3





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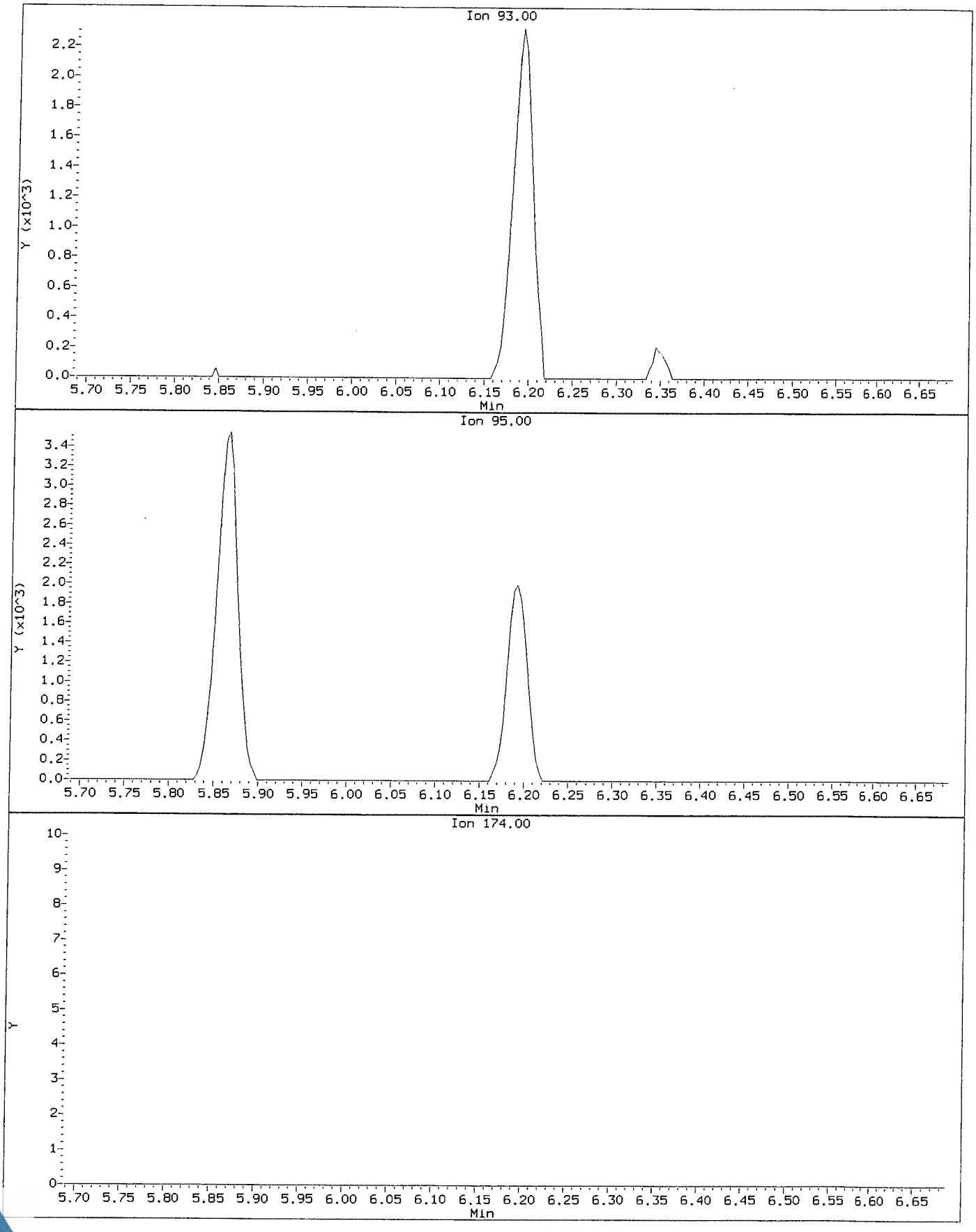
Injection Date: 13-NOV-2018 12:36
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Dibromomethane
CAS Number: 74-95-3



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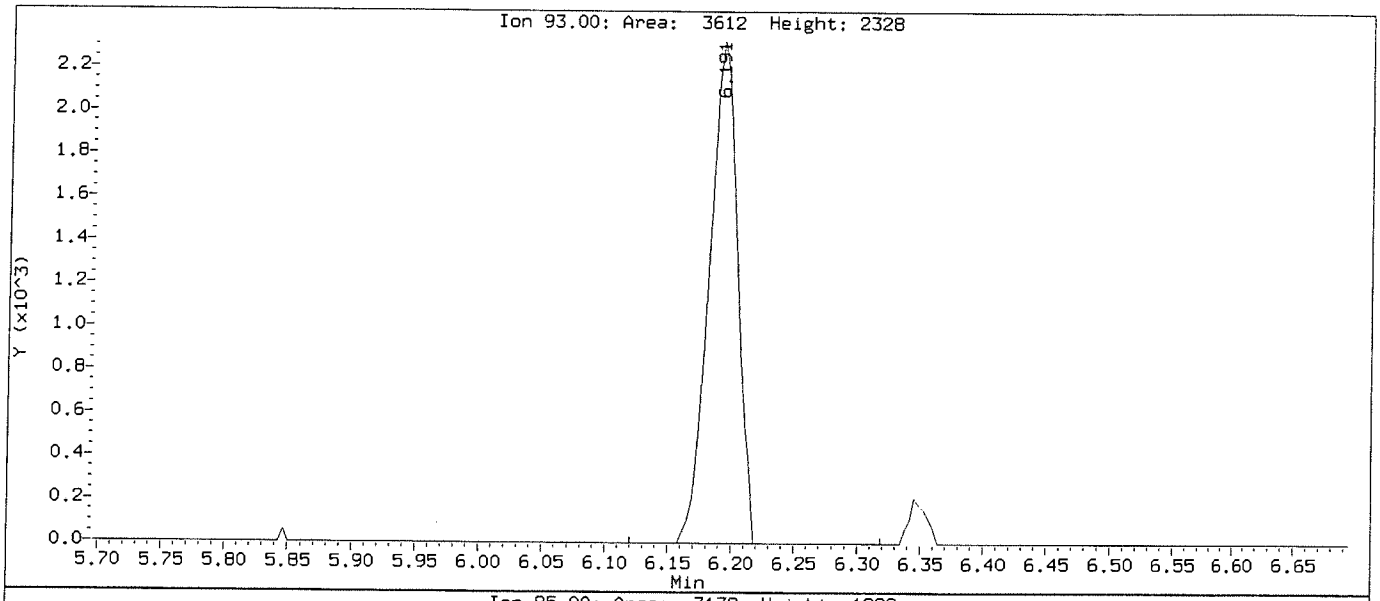
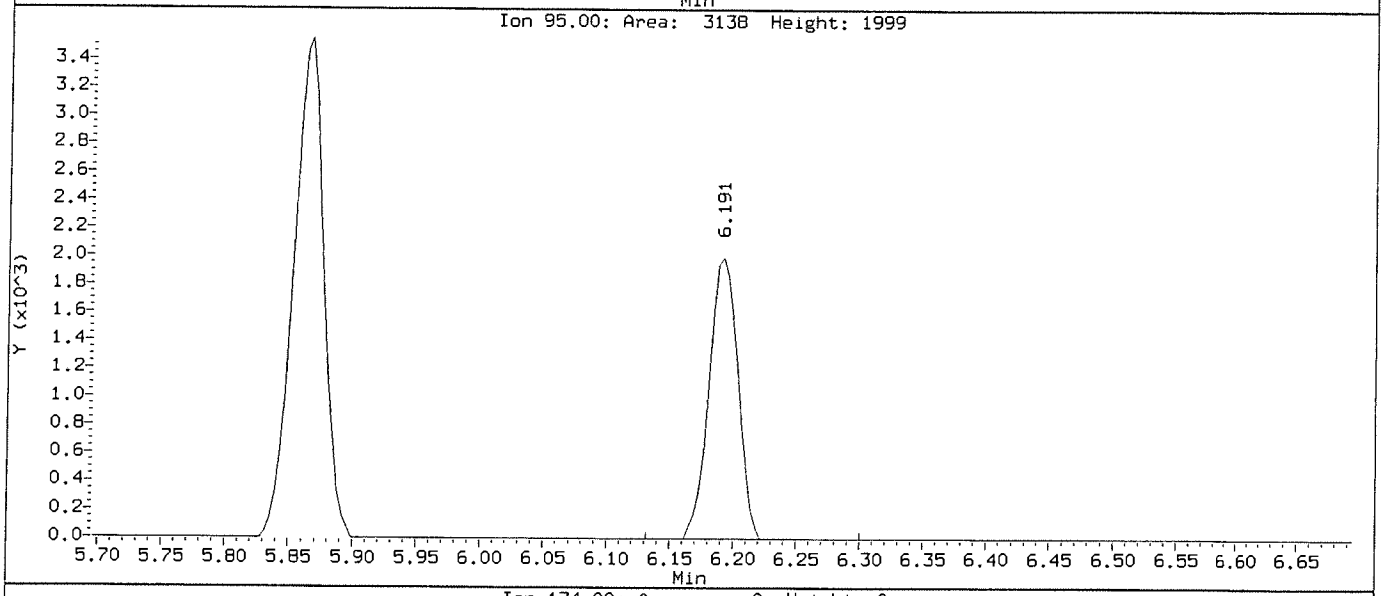
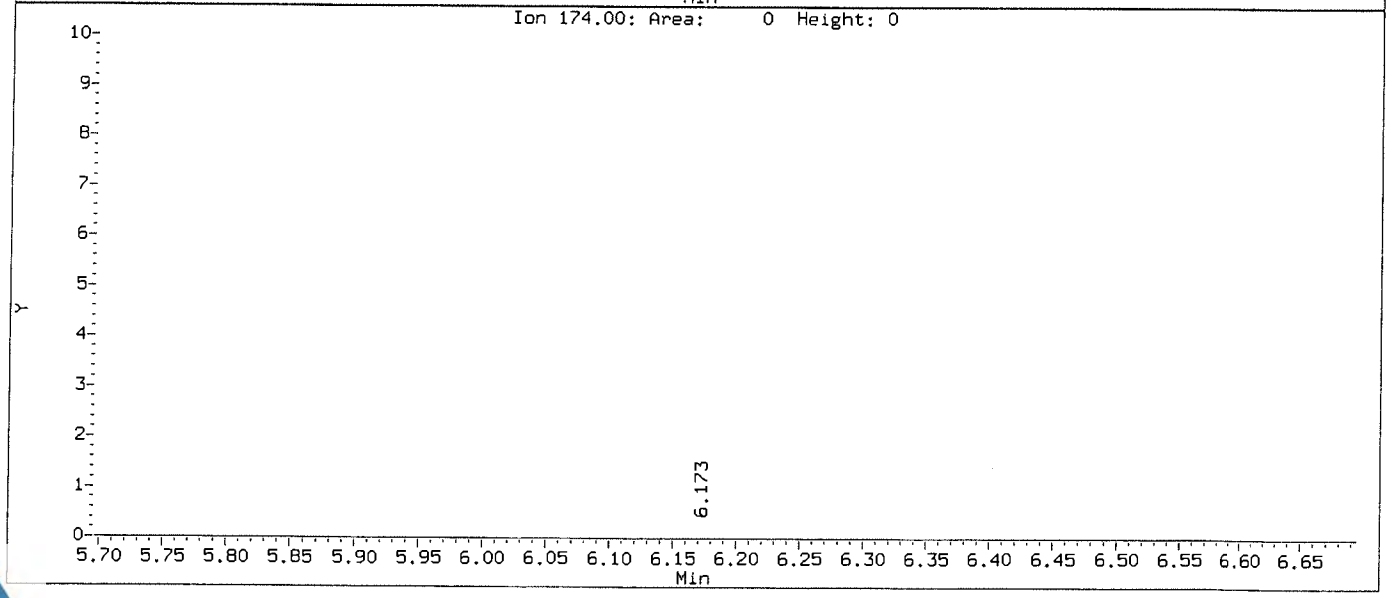
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Dibromomethane
CAS Number: 74-95-3







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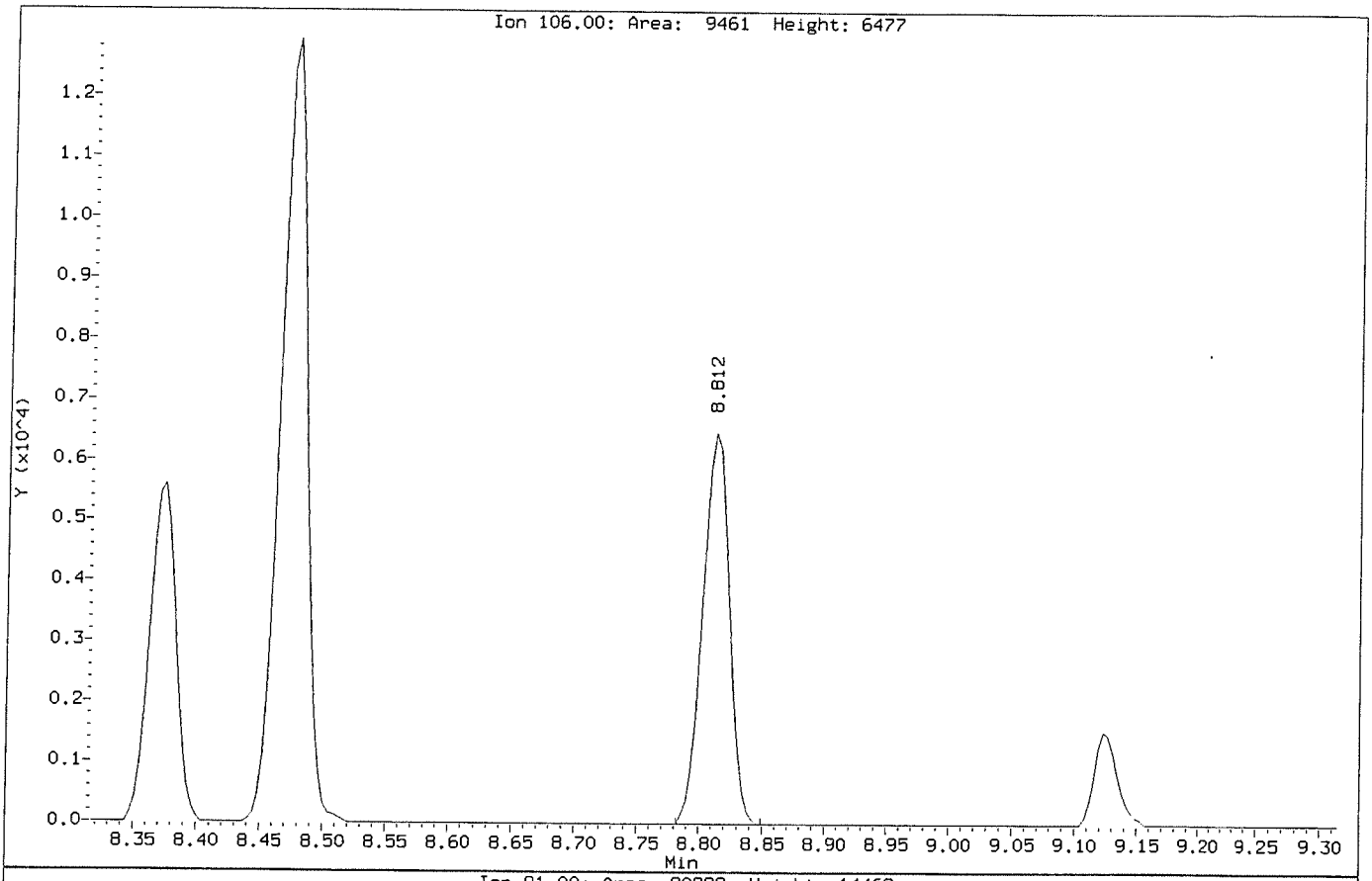
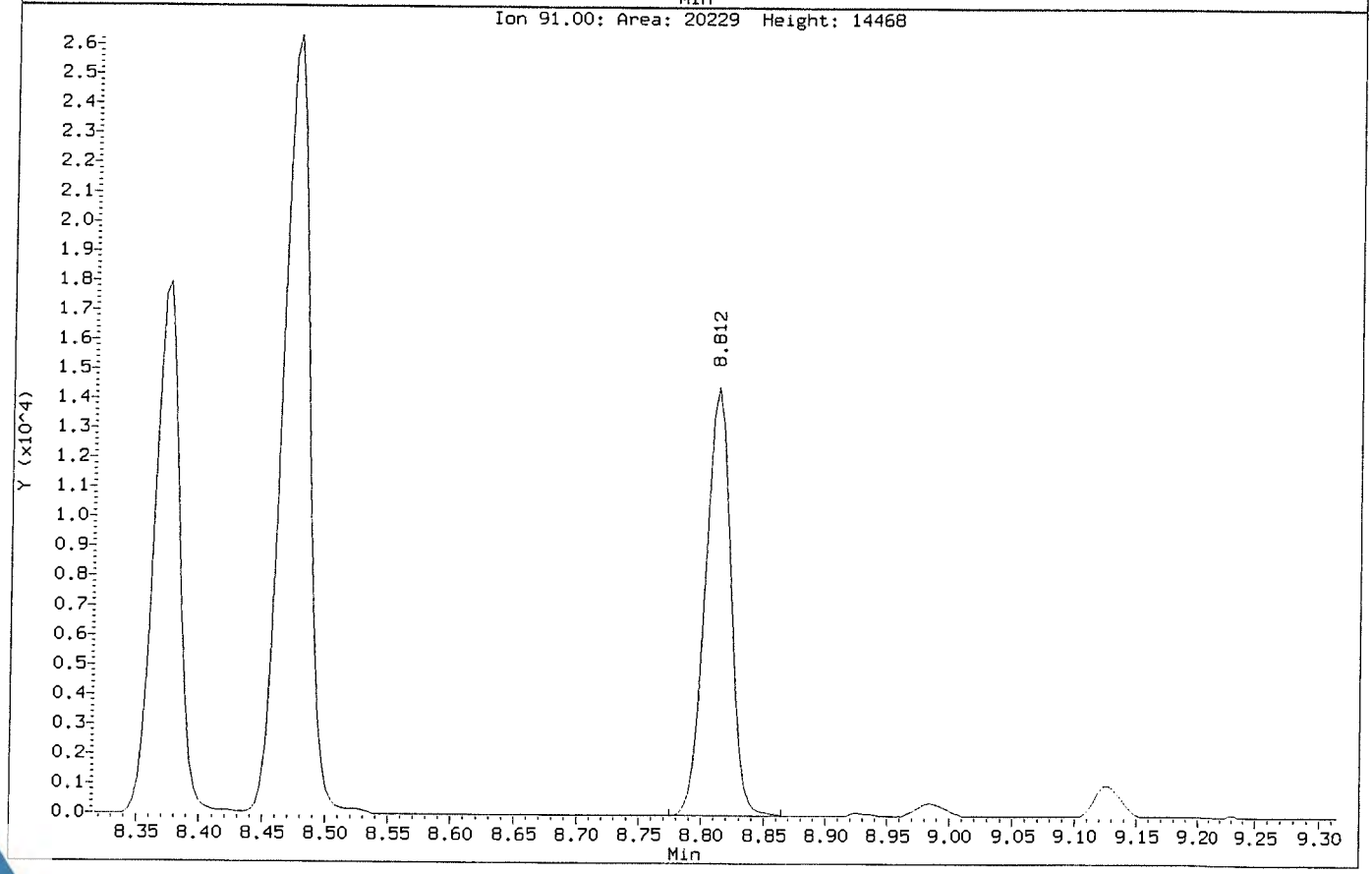
Injection Date: 13-NOV-2018 12:36
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: o-Xylene
CAS Number: 95-47-6





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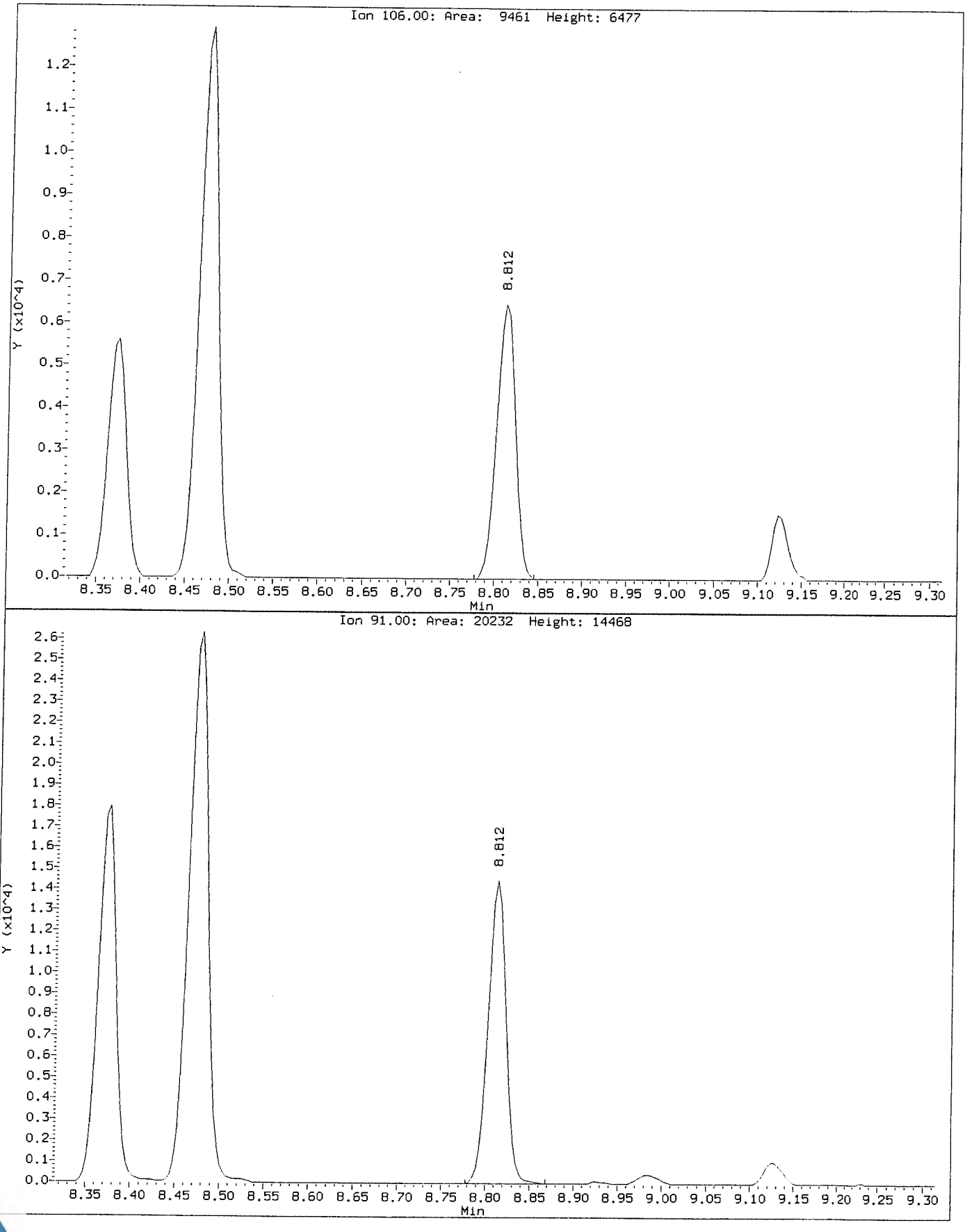
Injection Date: 13-NOV-2018 12:36
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: o-Xylene
CAS Number: 95-47-6



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111305.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111305.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 13-NOV-2018 13:01
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD002;VSTD002;1;4;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 12:36 Cal File: U111304.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

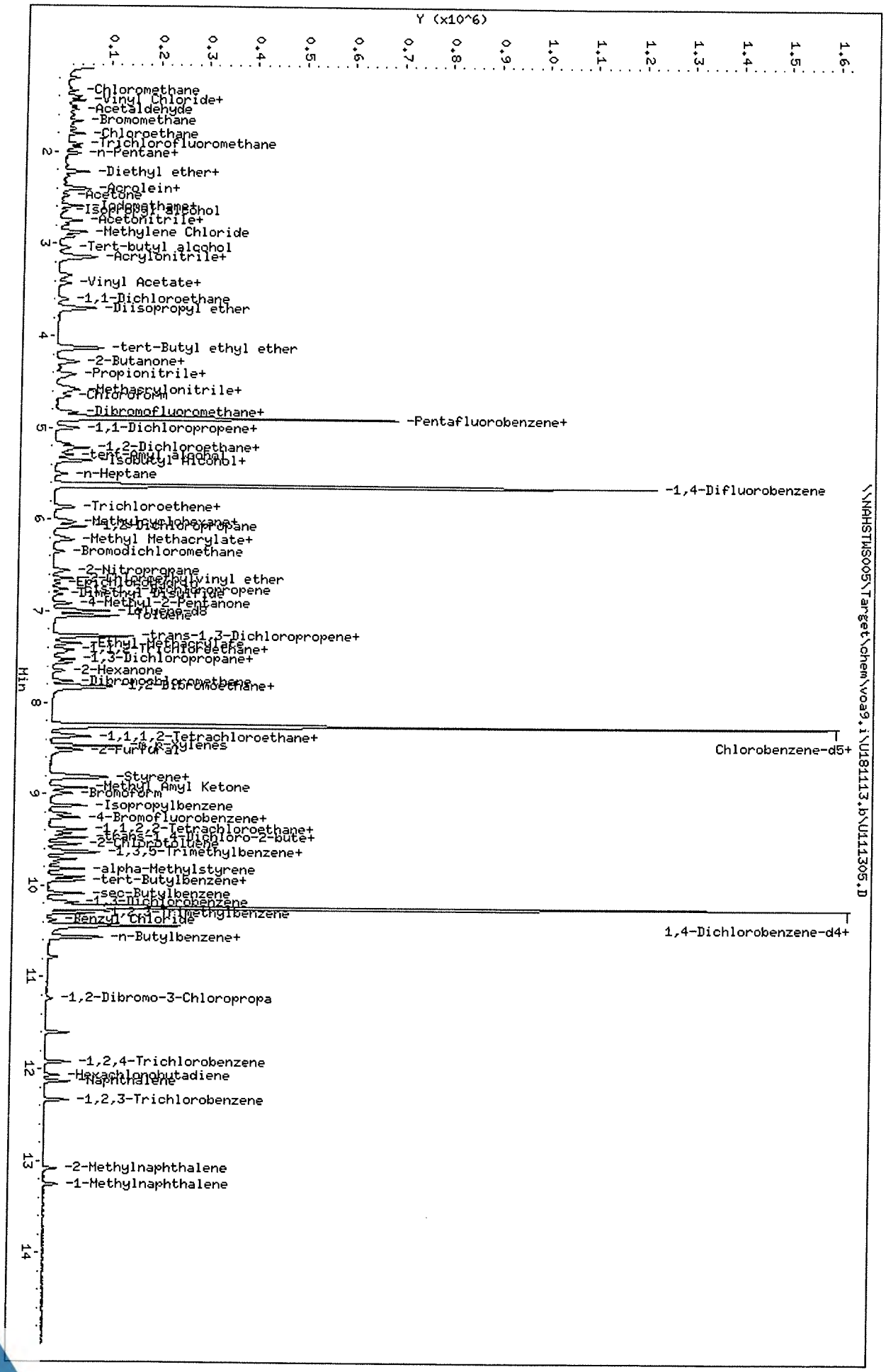
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	414744	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	809284	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	755385	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	352080	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.987)	12925	2.00000	1.52(a)
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	18531	2.00000	1.28(a)
$ 48 Toluene-d8	98	6.990	6.990	(0.847)	51591	2.00000	1.05(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	18827	2.00000	1.50(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	8223	2.00000	1.72(a)
31 1,1,1-Trichloroethane	97	4.827	4.827	(0.986)	14071	2.00000	1.93(a)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	16127	2.00000	1.93(a)
138 Freon TF	101	2.401	2.401	(0.491)	8834	2.00000	2.12(a)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	9196	2.00000	1.91(a)
22 1,1-Dichloroethane	63	3.604	3.604	(0.737)	18719	2.00000	1.96(a)
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	9368	2.00000	2.00(a)
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	14736	2.00000	1.97(a)
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	12553	2.00000	1.88(a)
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	15506	2.00000	1.78(a)
90 1,2,4-Trichlorobenzene	180	11.927	11.927	(1.165)	12849	2.00000	1.85(a)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	36765	2.00000	1.88(a)
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	1762	2.00000	2.38(a)
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	10196	2.00000	1.83(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111305.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	21603	2.00000	1.92(a)
33 1,2-Dichloroethane	62	5.250	5.250	(0.933)	17243	2.00000	2.03(a)
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	10957	2.00000	1.90(a)
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	35537	2.00000	1.87(a)
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	21971	2.00000	1.98(a)
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	19816	2.00000	1.92(a)
84 1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	22453	2.00000	2.02(a)
26 2,2-Dichloropropane	77	4.275	4.275	(0.874)	10687	2.00000	1.81(a)
24 2-Butanone	43	4.343	4.343	(0.887)	10886	4.00000	3.73(a)
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	33012	2.00000	1.91(a)
52 2-Hexanone	43	7.649	7.649	(0.927)	15967	4.00000	3.63(a)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	38540	2.00000	1.93(a)
82 p-Isopropyltoluene	119	10.210	10.210	(0.997)	36591	2.00000	1.89(a)
45 4-Methyl-2-Pentanone	43	6.915	6.915	(0.838)	23062	4.00000	3.65(a)
10 Acetone	43	2.480	2.480	(0.507)	12023	4.00000	2.16(a)
37 Benzene	78	5.216	5.216	(0.927)	43114	2.00000	1.92(a)
74 Bromobenzene	156	9.381	9.381	(0.917)	10831	2.00000	1.87(a)
29 Bromochloromethane	128	4.553	4.553	(0.930)	5091	2.00000	2.08(a)
39 Bromodichloromethane	83	6.348	6.348	(1.129)	12072	2.00000	1.79(a)
66 Bromoform	173	8.984	8.984	(1.089)	4530	2.00000	2.48(Ta)
6 Bromomethane	94	1.670	1.670	(0.341)	7606	2.00000	4.02(a)
19 Carbon Disulfide	76	2.589	2.589	(0.529)	55277	4.00000	3.82(a)
34 Carbon Tetrachloride	117	4.995	4.995	(0.888)	10688	2.00000	1.83(a)
59 Chlorobenzene	112	8.275	8.275	(1.003)	29617	2.00000	1.89(a)
7 Chloroethane	64	1.749	1.749	(0.357)	9074	2.00000	2.09(aM)
28 Chloroform	83	4.658	4.658	(0.952)	18550	2.00000	1.94(a)
3 Chloromethane	50	1.336	1.336	(0.273)	12000	2.00000	2.38(a)
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	11719	2.00000	1.99(a)
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	13722	2.00000	1.62(a)
55 Dibromochloromethane	129	7.758	7.758	(0.940)	7733	2.00000	1.61(a)
44 Dibromomethane	93	6.191	6.191	(1.101)	7013	2.00000	1.94(aM)
2 Dichlorodifluoromethane	85	1.202	1.202	(0.246)	12615	2.00000	3.01(a)
61 Ethylbenzene	106	8.373	8.373	(1.015)	14817	2.00000	1.87(a)
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	4667	2.00000	2.48(a)
67 Isopropylbenzene	105	9.126	9.126	(1.106)	44094	2.00000	1.92(a)
62 m,p-Xylenes	106	8.474	8.474	(1.027)	36359	4.00000	3.74(a)
17 Methylene Chloride	84	2.870	2.870	(0.586)	13586	2.00000	1.90(a)
87 n-Butylbenzene	91	10.558	10.558	(1.031)	36189	2.00000	2.36(a)
73 n-Propylbenzene	91	9.475	9.475	(0.926)	53805	2.00000	1.93(a)
92 Naphthalene	128	12.133	12.133	(1.185)	35700	2.00000	1.71(a)
63 o-Xylene	106	8.811	8.811	(1.068)	18379	2.00000	1.89(aH)
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	43610	2.00000	1.88(a)
64 Styrene	104	8.826	8.826	(1.070)	30570	2.00000	1.86(a)
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	31095	2.00000	1.92(a)
56 Tetrachloroethene	164	7.526	7.526	(0.912)	7936	2.00000	2.00(a)
50 Toluene	91	7.046	7.046	(0.854)	47615	2.00000	1.98(a)
20 trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	10067	2.00000	1.96(a)
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.291)	10881	2.00000	2.73(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	10685	2.00000	1.93(a)
8 Trichlorofluoromethane	101	1.951	1.951	(0.399)	17301	2.00000	2.08(a)
5 Vinyl Chloride	62	1.415	1.415	(0.289)	13465	2.00000	2.47(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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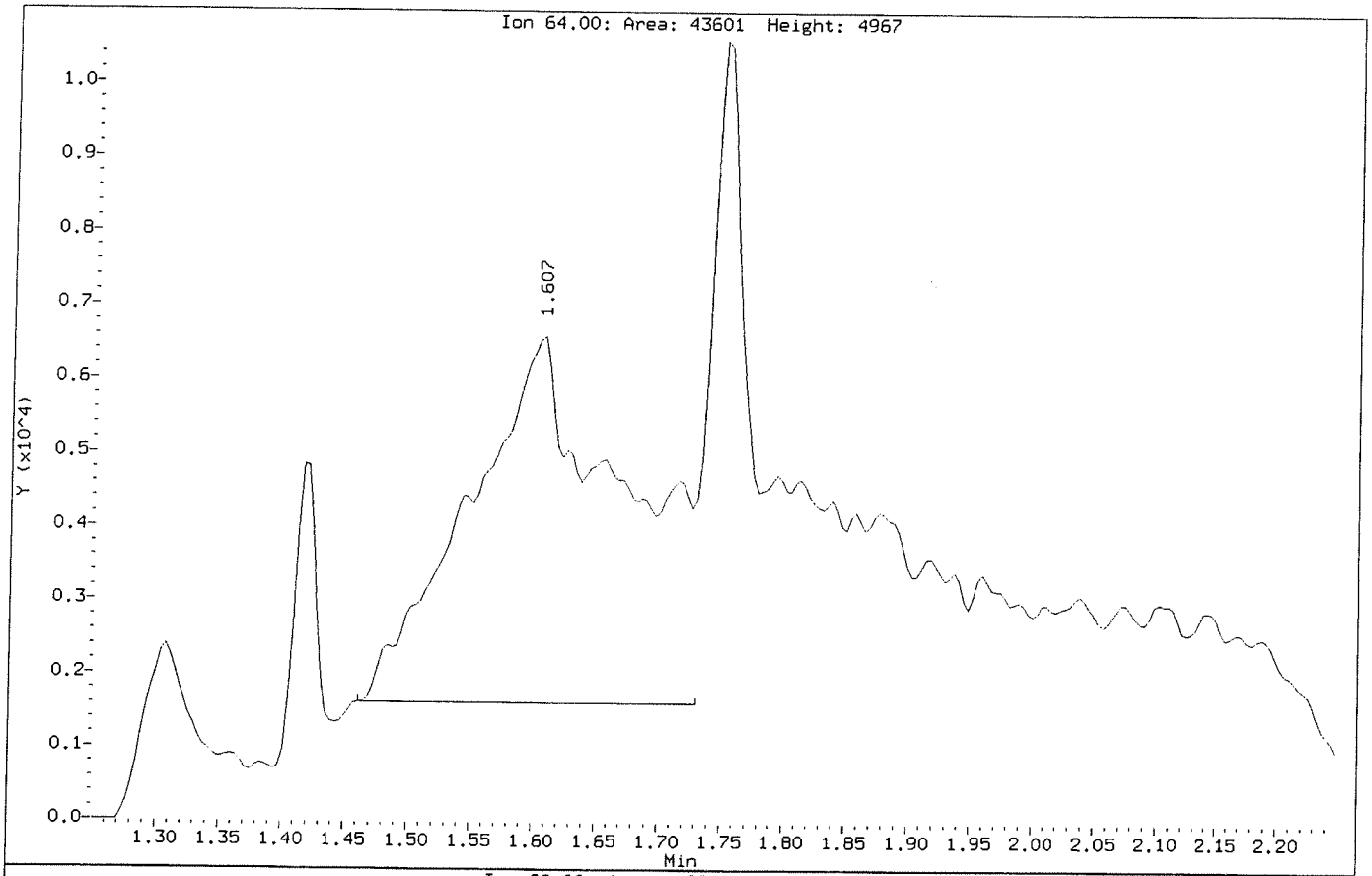
Date : 13-NOV-2018 13:01
Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;
Purge Volume: 5.0
Column phase: DB624

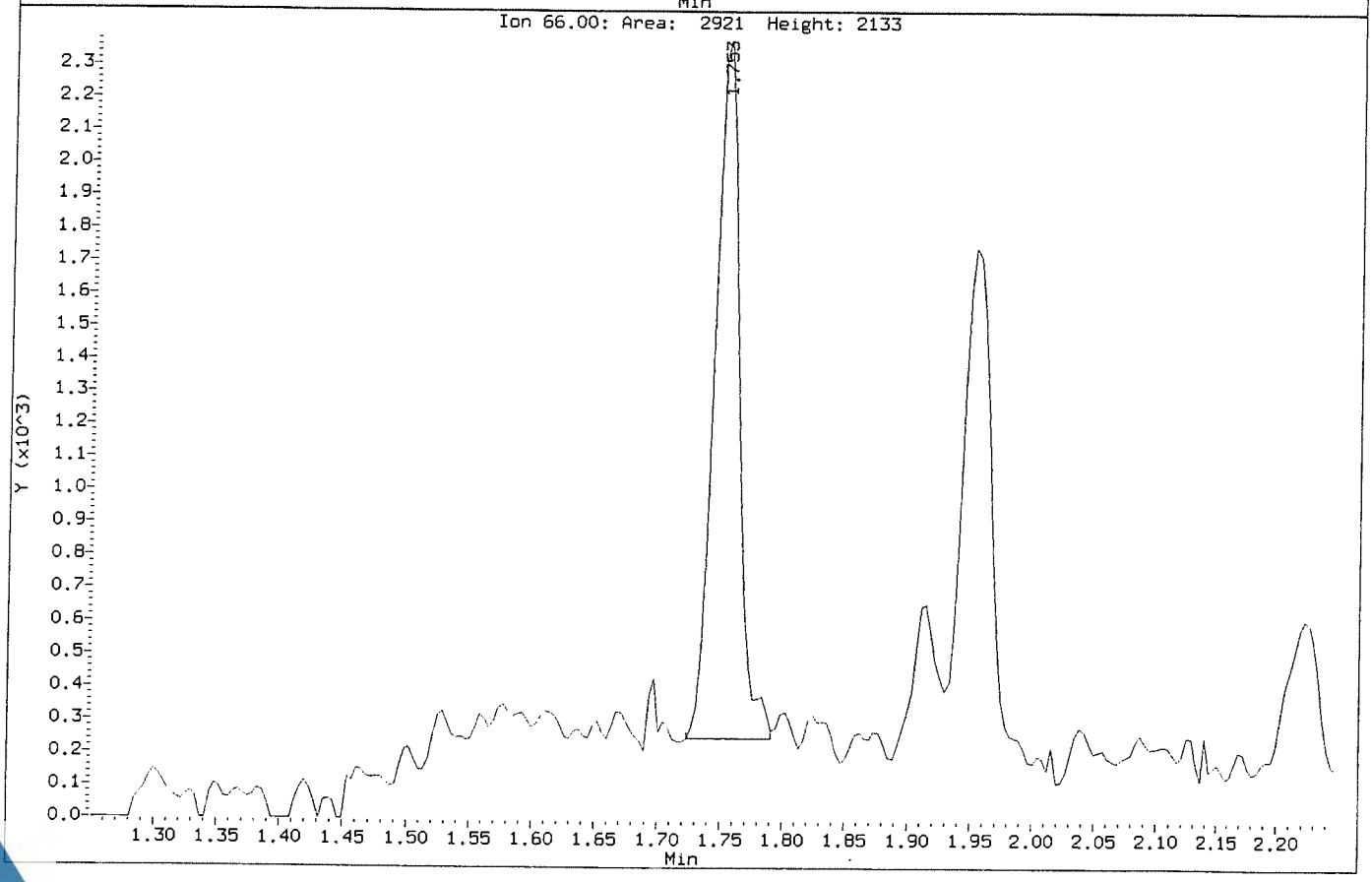
\\NAHSTWS005\Target\chem\voa9,i\U181113,b\U111305.D

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111305.D
Injection Date: 13-NOV-2018 13:01
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Chloroethane
CAS Number: 75-00-3





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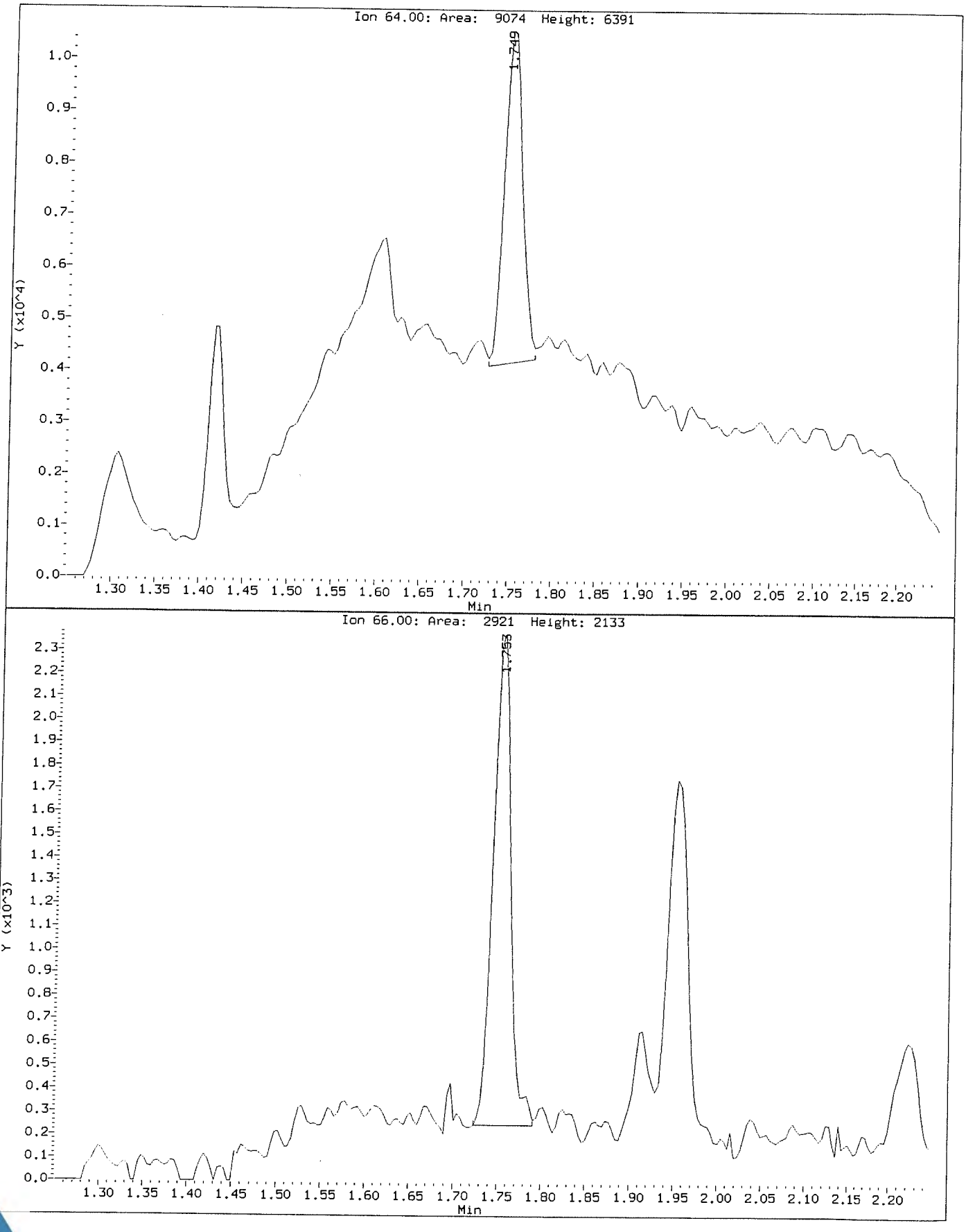
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Chloroethane
CAS Number: 75-00-3



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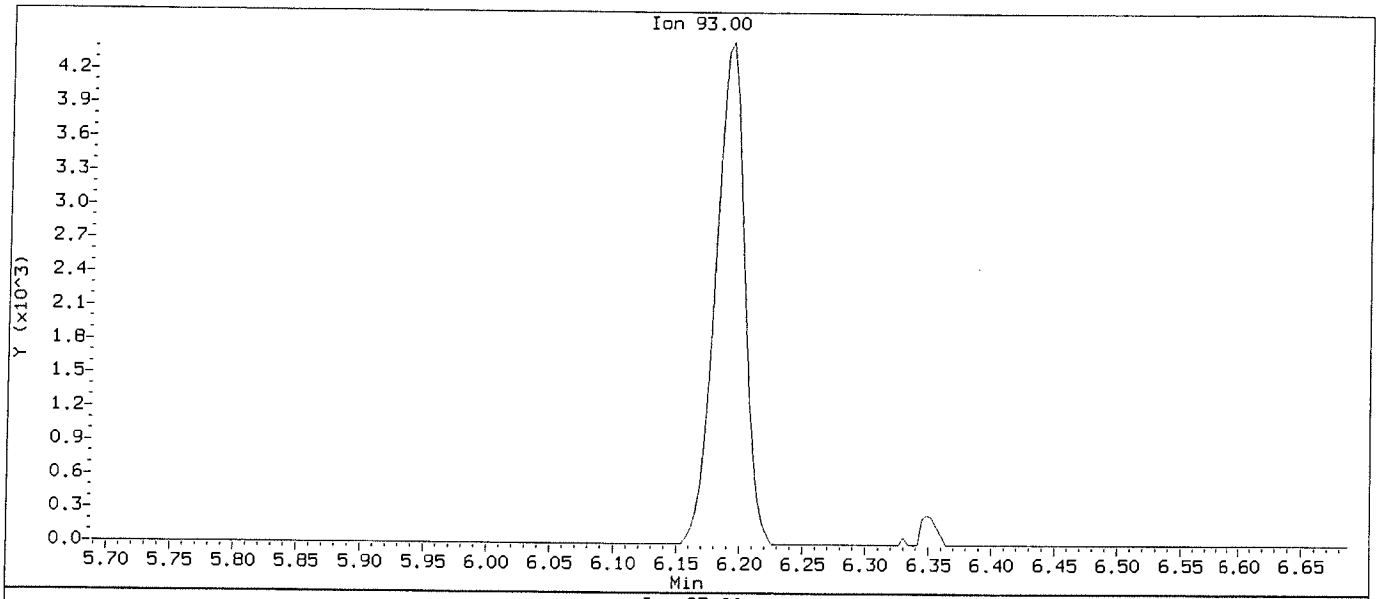
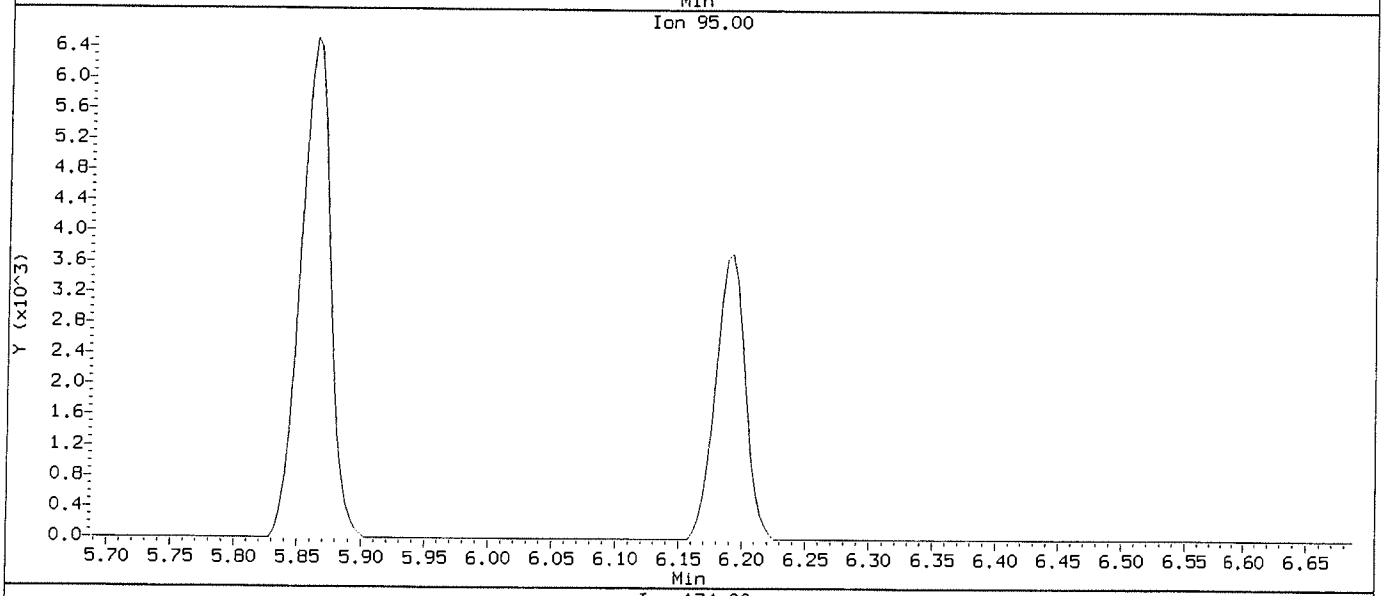
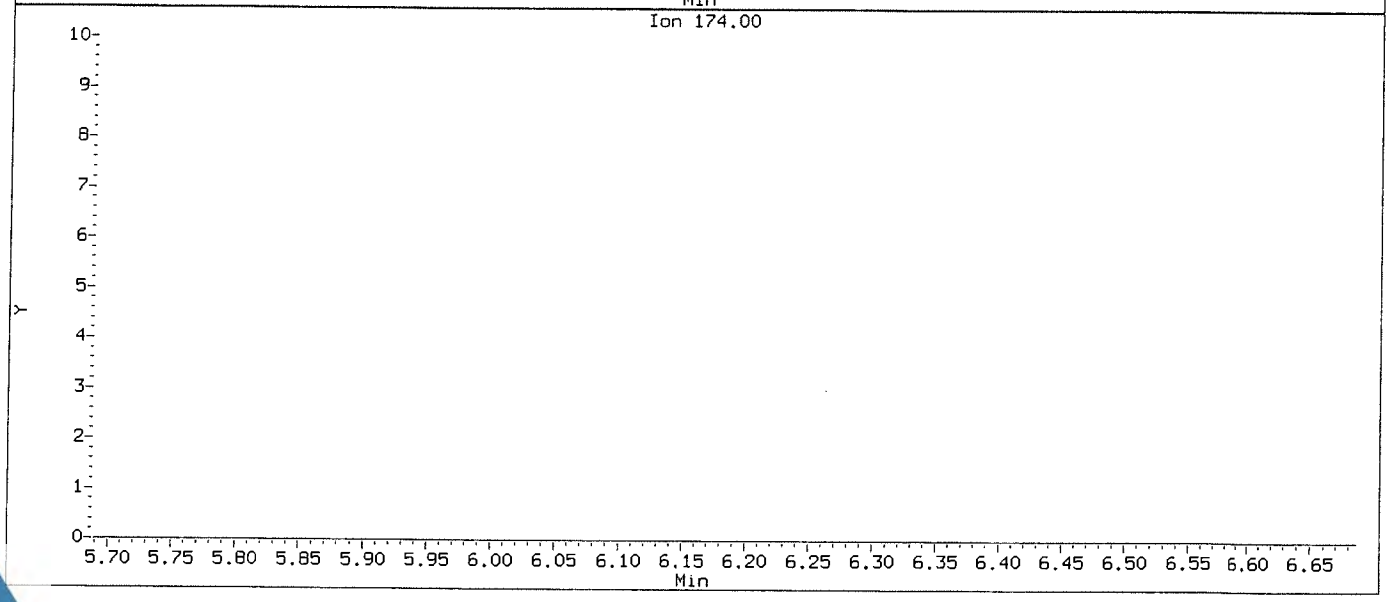
Injection Date: 13-NOV-2018 13:01
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3







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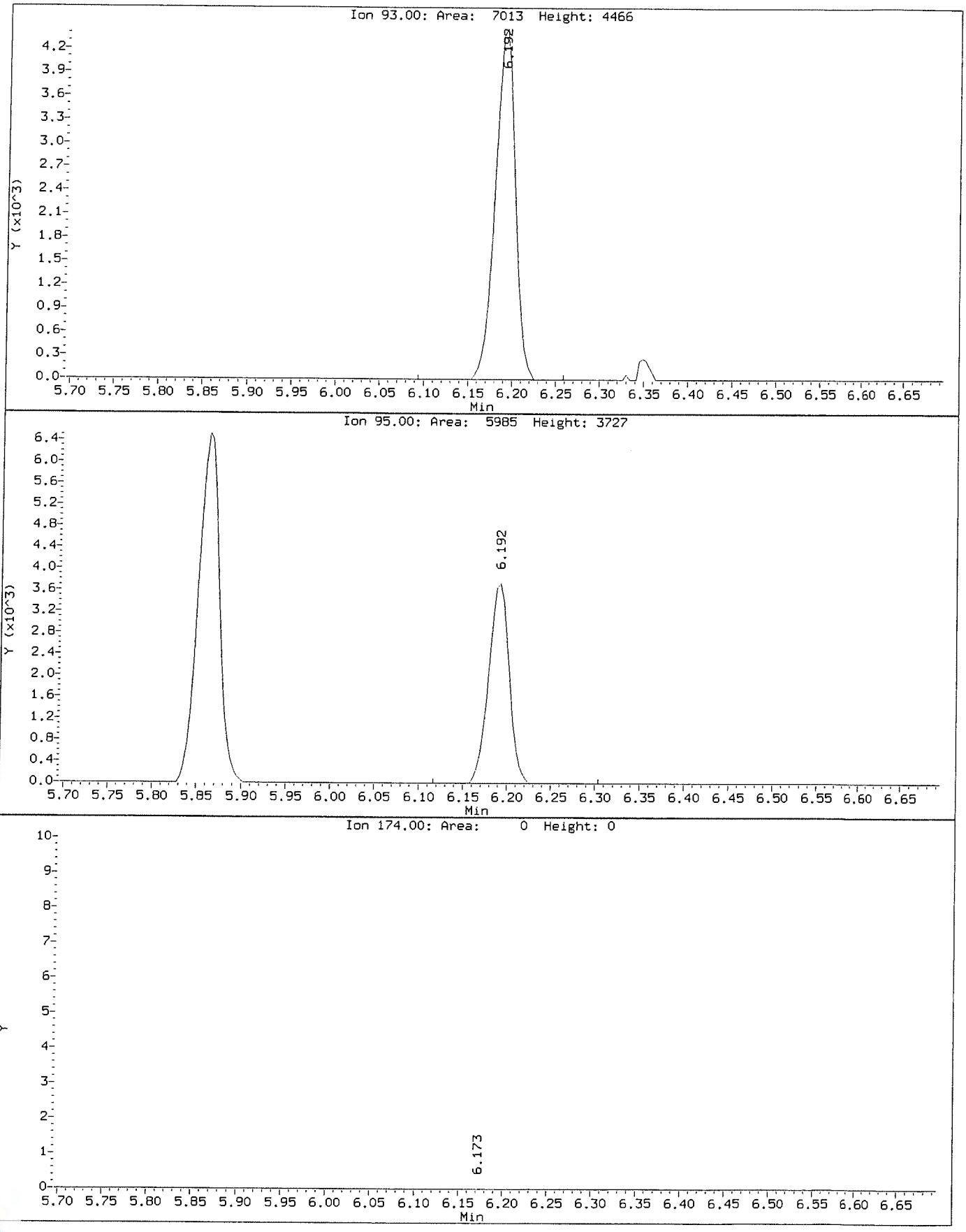
Injection Date: 13-NOV-2018 13:01
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3



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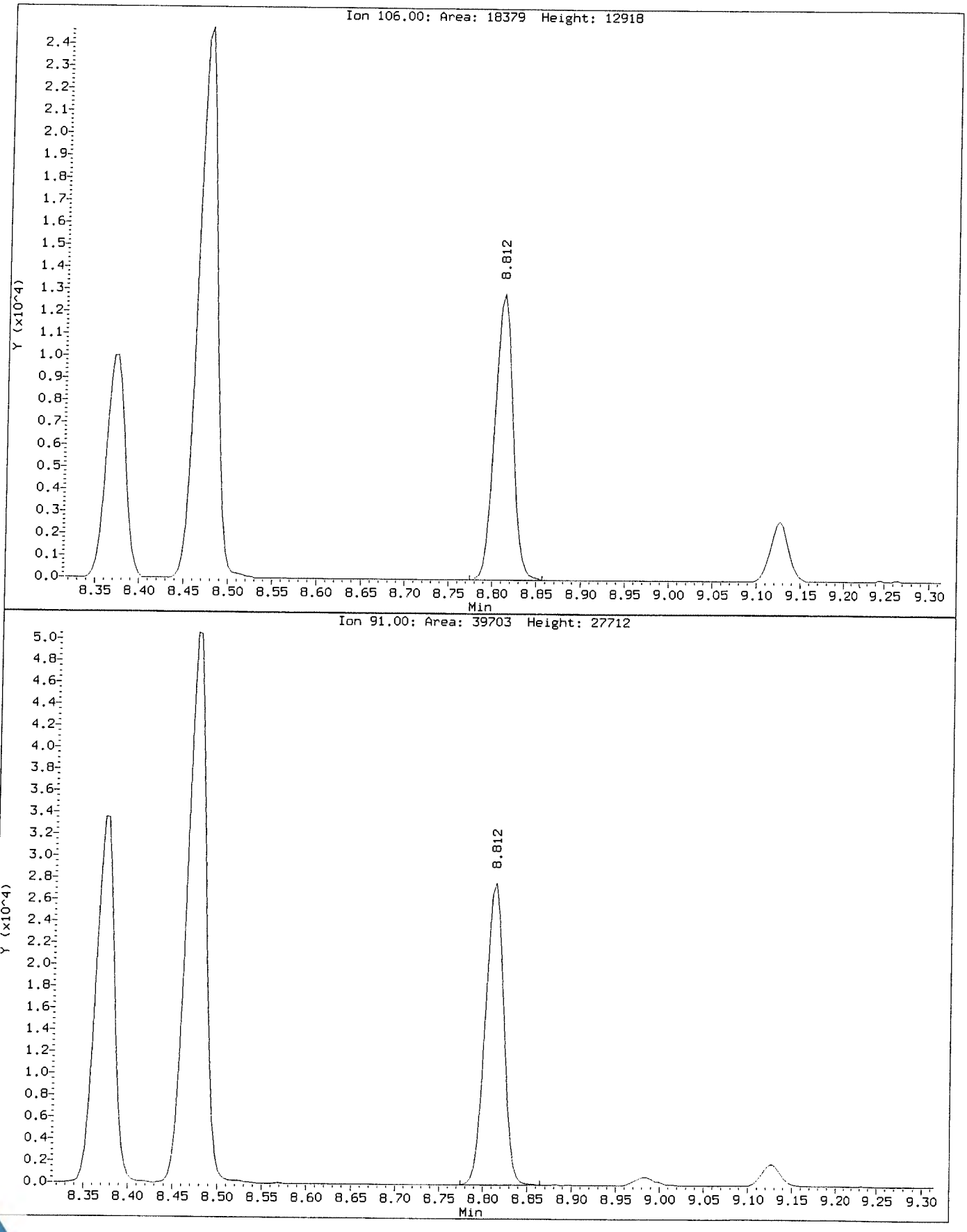
Injection Date: 13-NOV-2018 13:01
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: o-Xylene
CAS Number: 95-47-6



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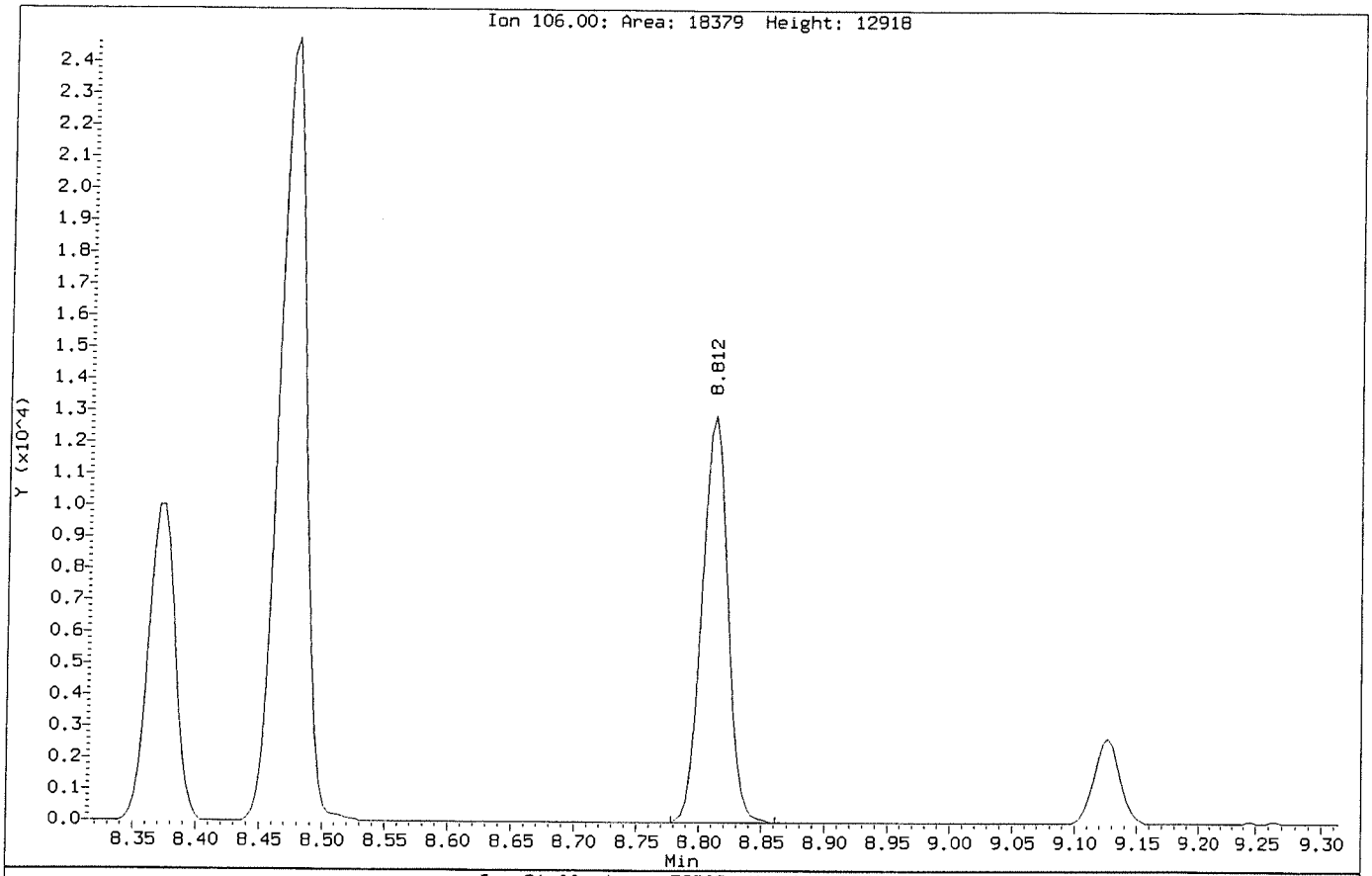
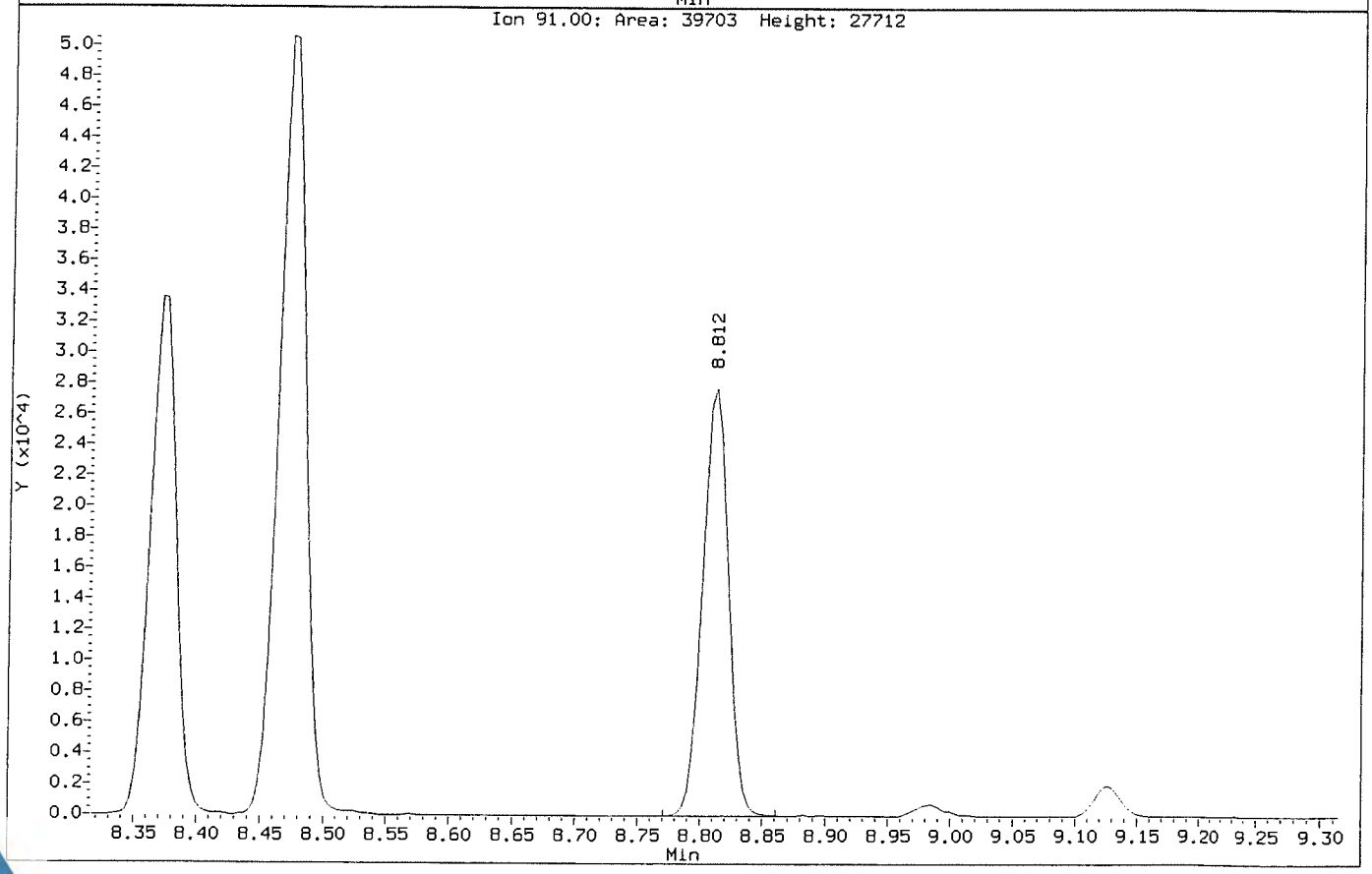
Injection Date: 13-NOV-2018 13:01
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: o-Xylene
CAS Number: 95-47-6





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Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111306.D
Lab Smp Id: VSTD005 Client Smp ID: VSTD005
Inj Date : 13-NOV-2018 13:25
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD005;VSTD005;1;5;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 13:01 Cal File: U111305.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

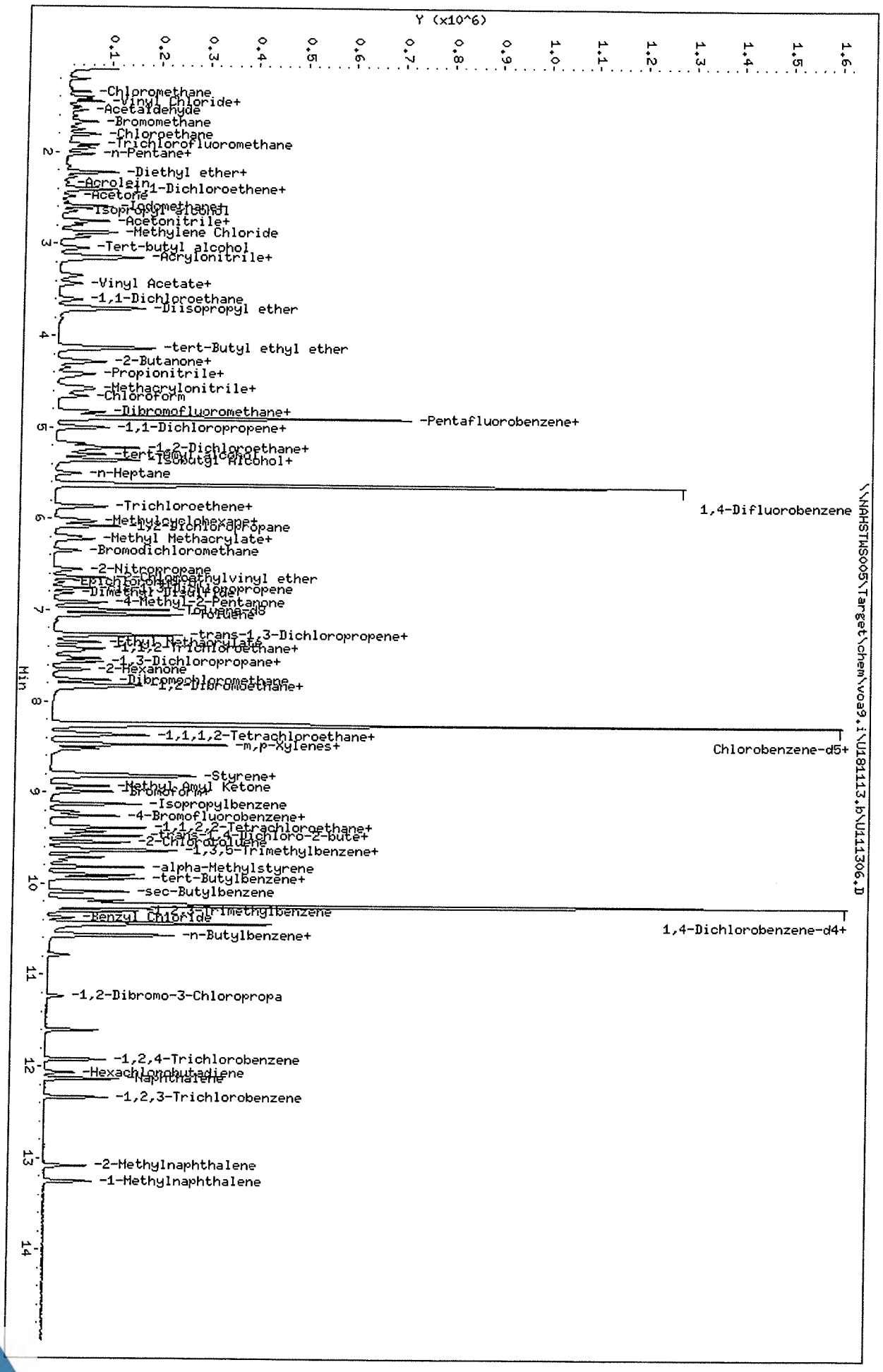
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	422530	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	813180	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	744948	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	348698	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.987)	27004	5.00000	4.44(a)
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	38984	5.00000	4.54(a)
$ 48 Toluene-d8	98	6.990	6.990	(0.847)	112942	5.00000	4.42(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	41214	5.00000	4.64(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	21915	5.00000	4.66(a)
31 1,1,1-Trichloroethane	97	4.827	4.827	(0.986)	31327	5.00000	4.22(a)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	42360	5.00000	5.12
138 Freon TF	101	2.405	2.405	(0.491)	17279	5.00000	4.08(a)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	23401	5.00000	4.94(a)
22 1,1-Dichloroethane	63	3.604	3.604	(0.737)	45506	5.00000	4.69(a)
11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	20013	5.00000	4.19(a)
32 1,1-Dichloropropene	75	5.006	5.006	(0.890)	33087	5.00000	4.40(a)
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	31782	5.00000	4.82(a)
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	42556	5.00000	4.93(a)
90 1,2,4-Trichlorobenzene	180	11.927	11.927	(1.165)	31441	5.00000	4.58(a)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	93787	5.00000	4.84(a)
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	5351	5.00000	5.17
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	27191	5.00000	4.95(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111306.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	55248	5.00000	4.96(a)
33 1,2-Dichloroethane	62	5.254	5.254	(0.934)	41764	5.00000	4.90(a)
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	27675	5.00000	4.78(a)
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	88227	5.00000	4.70(a)
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	52374	5.00000	4.77(a)
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	51002	5.00000	5.01
84 1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	55298	5.00000	5.11
26 2,2-Dichloropropane	77	4.275	4.275	(0.874)	25227	5.00000	4.20(a)
24 2-Butanone	43	4.343	4.343	(0.887)	30016	10.0000	10.10
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	82685	5.00000	4.84(a)
52 2-Hexanone	43	7.653	7.653	(0.928)	44101	10.0000	10.18
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	97151	5.00000	4.93(a)
82 p-Isopropyltoluene	119	10.210	10.210	(0.997)	85956	5.00000	4.50(a)
45 4-Methyl-2-Pentanone	43	6.915	6.915	(0.838)	62316	10.0000	10.02
10 Acetone	43	2.484	2.484	(0.508)	24249	10.0000	8.62
37 Benzene	78	5.220	5.220	(0.928)	105397	5.00000	4.68(a)
74 Bromobenzene	156	9.381	9.381	(0.917)	27842	5.00000	4.86(a)
29 Bromochloromethane	128	4.557	4.557	(0.931)	12948	5.00000	5.19
39 Bromodichloromethane	83	6.349	6.349	(1.129)	30775	5.00000	4.55(a)
66 Bromoform	173	8.984	8.984	(1.089)	13391	5.00000	5.07(T)
6 Bromomethane	94	1.674	1.674	(0.342)	17760	5.00000	6.77
19 Carbon Disulfide	76	2.592	2.592	(0.530)	124164	10.0000	8.43
34 Carbon Tetrachloride	117	4.995	4.995	(0.888)	23569	5.00000	4.01(a)
59 Chlorobenzene	112	8.275	8.275	(1.003)	72938	5.00000	4.74(a)
7 Chloroethane	64	1.756	1.756	(0.359)	19233	5.00000	4.36(aMH)
28 Chloroform	83	4.658	4.658	(0.952)	45918	5.00000	4.72(a)
3 Chloromethane	50	1.340	1.340	(0.274)	26431	5.00000	4.89(a)
27 cis-1,2-Dichloroethene	96	4.290	4.290	(0.877)	27696	5.00000	4.62(a)
46 cis-1,3-Dichloropropene	75	6.761	6.761	(1.202)	37232	5.00000	4.37(a)
55 Dibromochloromethane	129	7.758	7.758	(0.940)	21374	5.00000	4.53(a)
44 Dibromomethane	93	6.191	6.191	(1.101)	17227	5.00000	4.74(aM)
2 Dichlorodifluoromethane	85	1.205	1.205	(0.246)	24157	5.00000	4.79(a)
61 Ethylbenzene	106	8.373	8.373	(1.015)	35416	5.00000	4.55(a)
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	8782	5.00000	4.49(a)
67 Isopropylbenzene	105	9.126	9.126	(1.106)	106616	5.00000	4.70(a)
62 m,p-Xylenes	106	8.474	8.474	(1.027)	89708	10.0000	9.36
17 Methylene Chloride	84	2.873	2.873	(0.587)	29126	5.00000	4.77(a)
87 n-Butylbenzene	91	10.558	10.558	(1.031)	79206	5.00000	4.76(a)
73 n-Propylbenzene	91	9.475	9.475	(0.926)	128990	5.00000	4.68(a)
92 Naphthalene	128	12.133	12.133	(1.185)	100680	5.00000	4.87(a)
63 o-Xylene	106	8.811	8.811	(1.068)	46119	5.00000	4.81(aH)
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	99437	5.00000	4.34(a)
64 Styrene	104	8.826	8.826	(1.070)	78010	5.00000	4.81(a)
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	73015	5.00000	4.57(a)
56 Tetrachloroethene	164	7.526	7.526	(0.912)	17447	5.00000	4.47(a)
50 Toluene	91	7.050	7.050	(0.855)	113936	5.00000	4.81(a)
20 trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	23739	5.00000	4.54(a)
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	30108	5.00000	4.94(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	24849	5.00000	4.48(a)
8 Trichlorofluoromethane	101	1.955	1.955	(0.400)	34539	5.00000	4.08(a)
5 Vinyl Chloride	62	1.419	1.419	(0.290)	29718	5.00000	4.77(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.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1.3
1.4
1.5
1.6
Min
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11
12
13
14
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-n-Pentane+
-Diethyl ether+
-Acrolein
-1,1-Dichloroethene+
-Acetone
-Iodomethane+
-Isopropyl alcohol
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-Vinyl Acetate+
-1,1-Dichloroethane
-Diisopropyl ether
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile+
-Methacrylonitrile+
-Chloroform
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-tert-Amyl alcohol
-Isobutyl Alcohol+
-n-Heptane
1,4-Difluorobenzene
-Trichloroethene+
-Methylcyclohexane+
-1,2-Dichloropropane
-Methyl Methacrylate+
-Bromodichloromethane
-2-Nitropropane
-Chloroethylvinyl ether
-Ethyl Methacrylate
-cis-1,3-Dichloropropene
-Dimethyl disulfide
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-trans-1,3-Dichloropropene+
-Ethyl Methacrylate
-1,1,2-Trichloroethane+
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes+
Chlorobenzene-d5+
-Styrene+
-Methyl Amyl Ketone
-Bromoform+
-Isopropylbenzene
-4-Bromofluorobenzene+
-1,1,2,2-Tetrachloroethane+
-trans-1,4-Dichloro-2-bute+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene
-1,2,4-Trimethylbenzene
-Benzyl Chloride
1,4-Dichlorobenzene-d4+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
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-2-Methylnaphthalene
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Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

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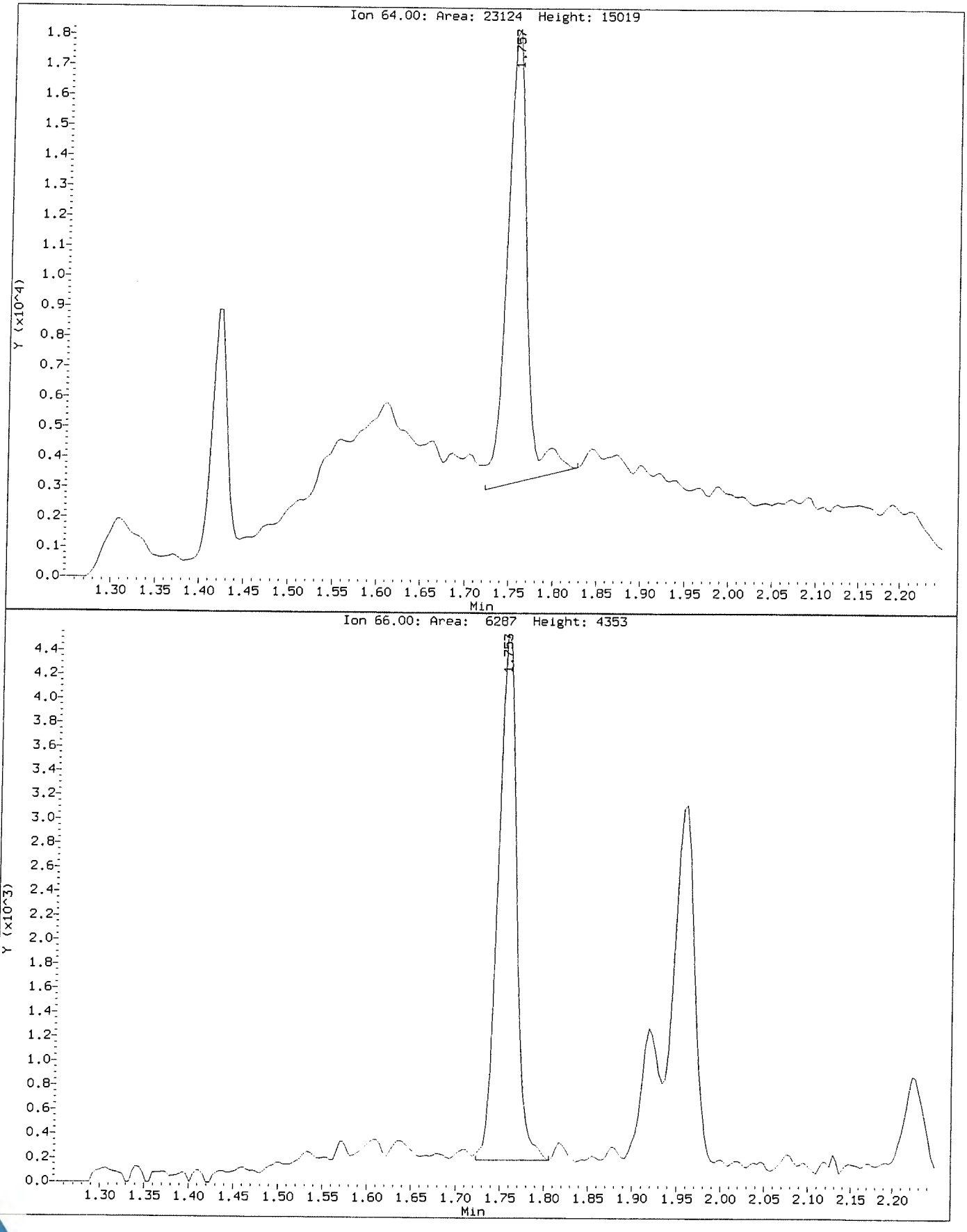
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Chloroethane
CAS Number: 75-00-3



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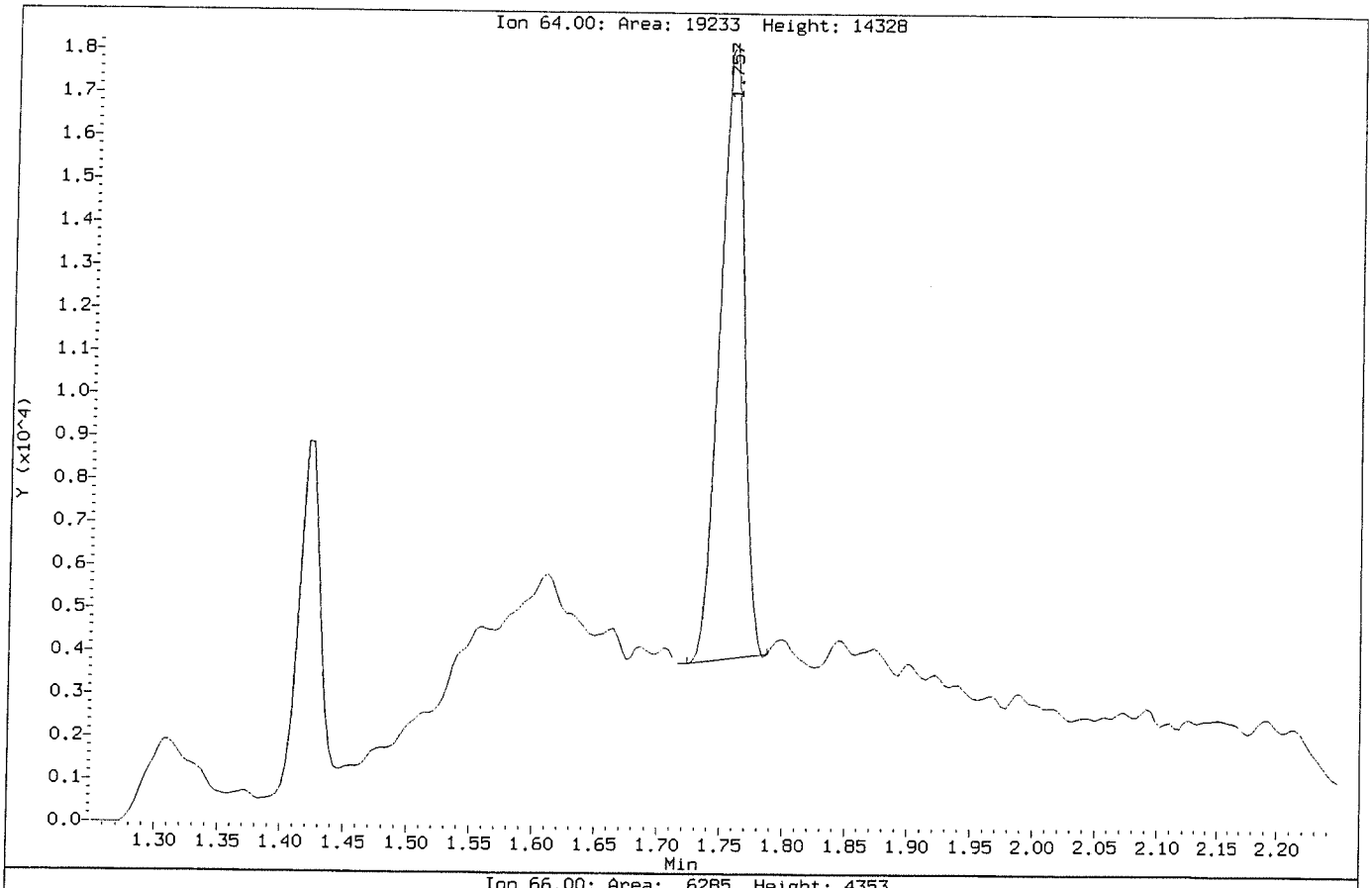
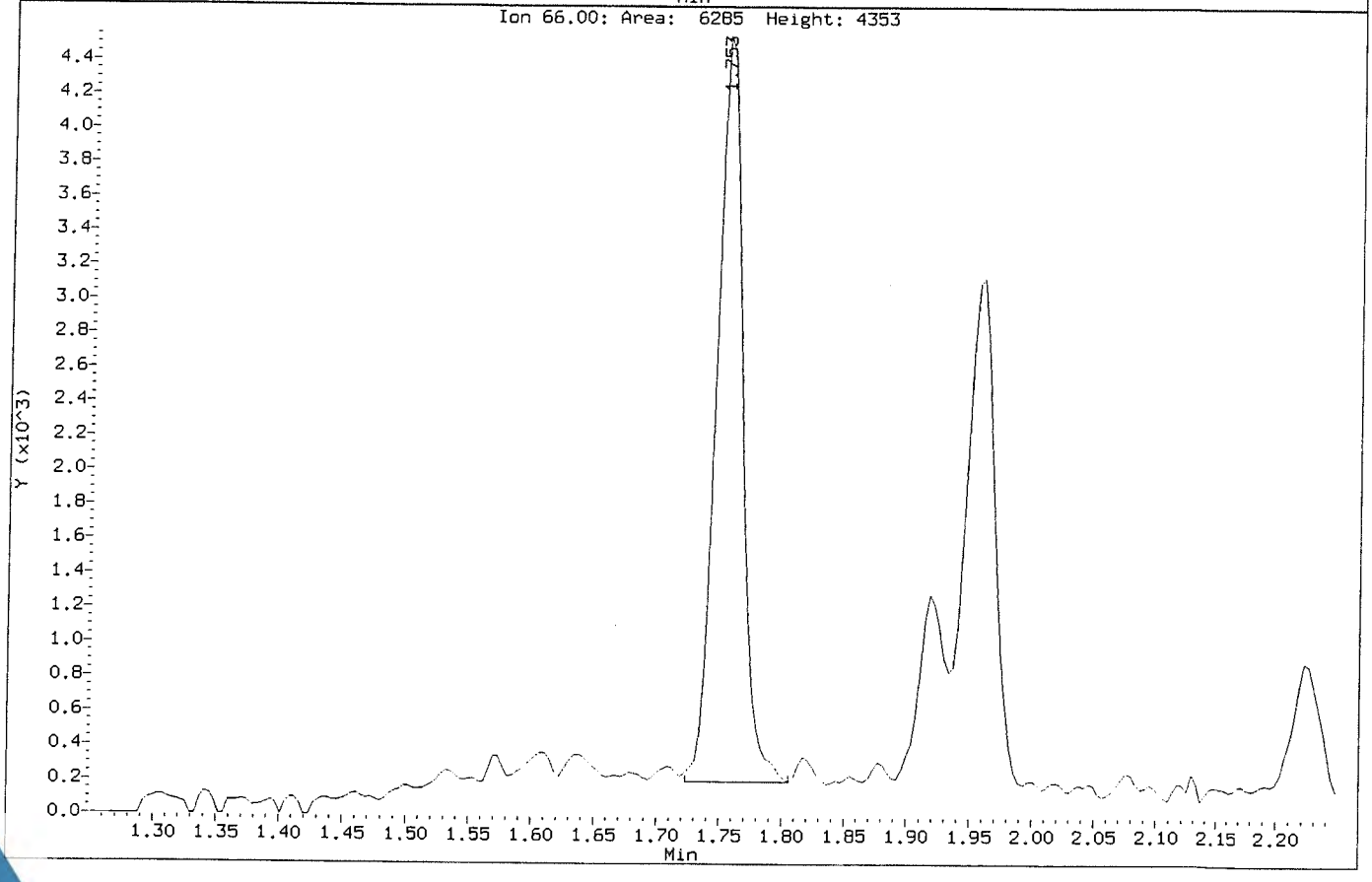
Compound: Chloroethane
CAS Number: 75-00-3





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Compound: Dibromomethane
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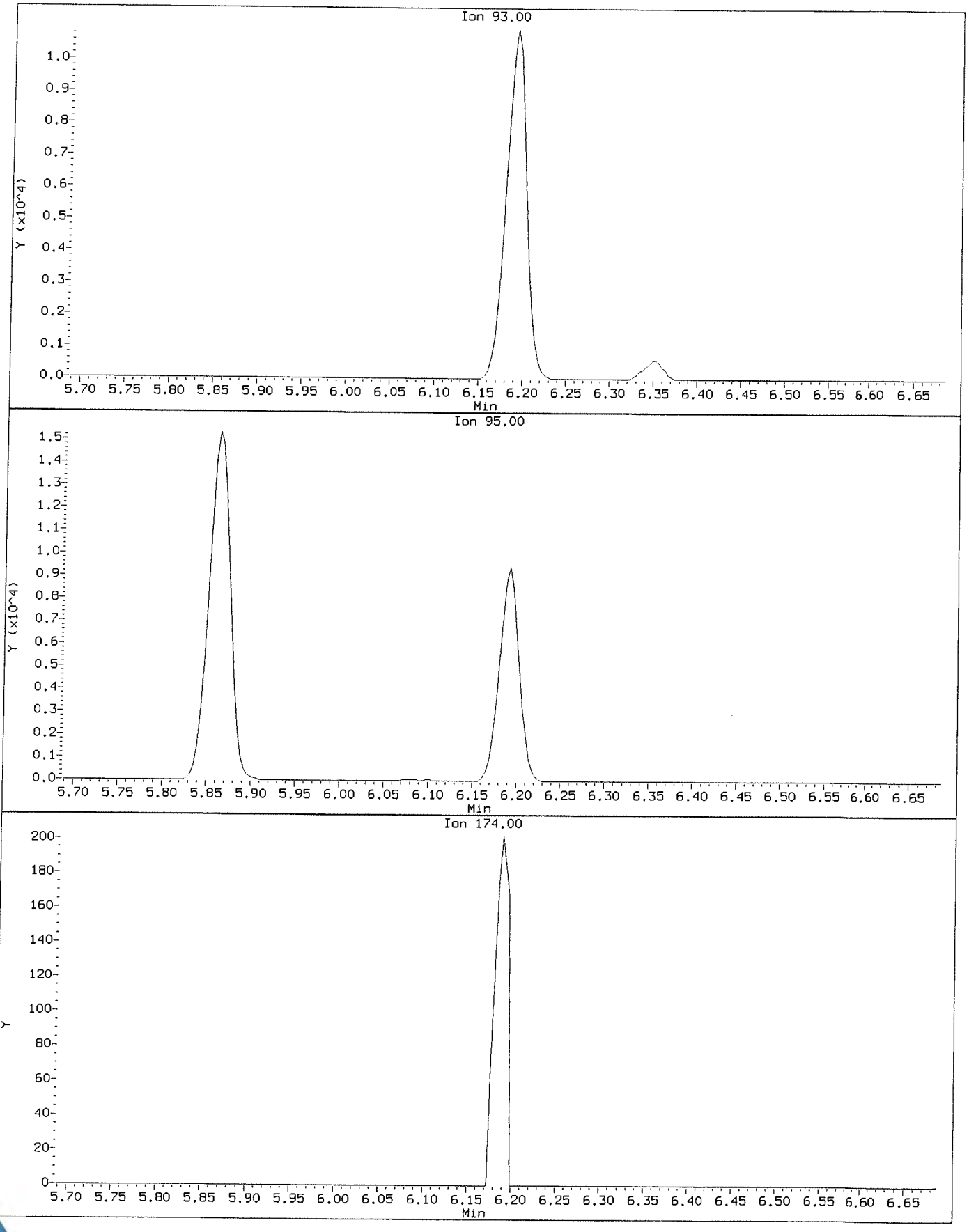

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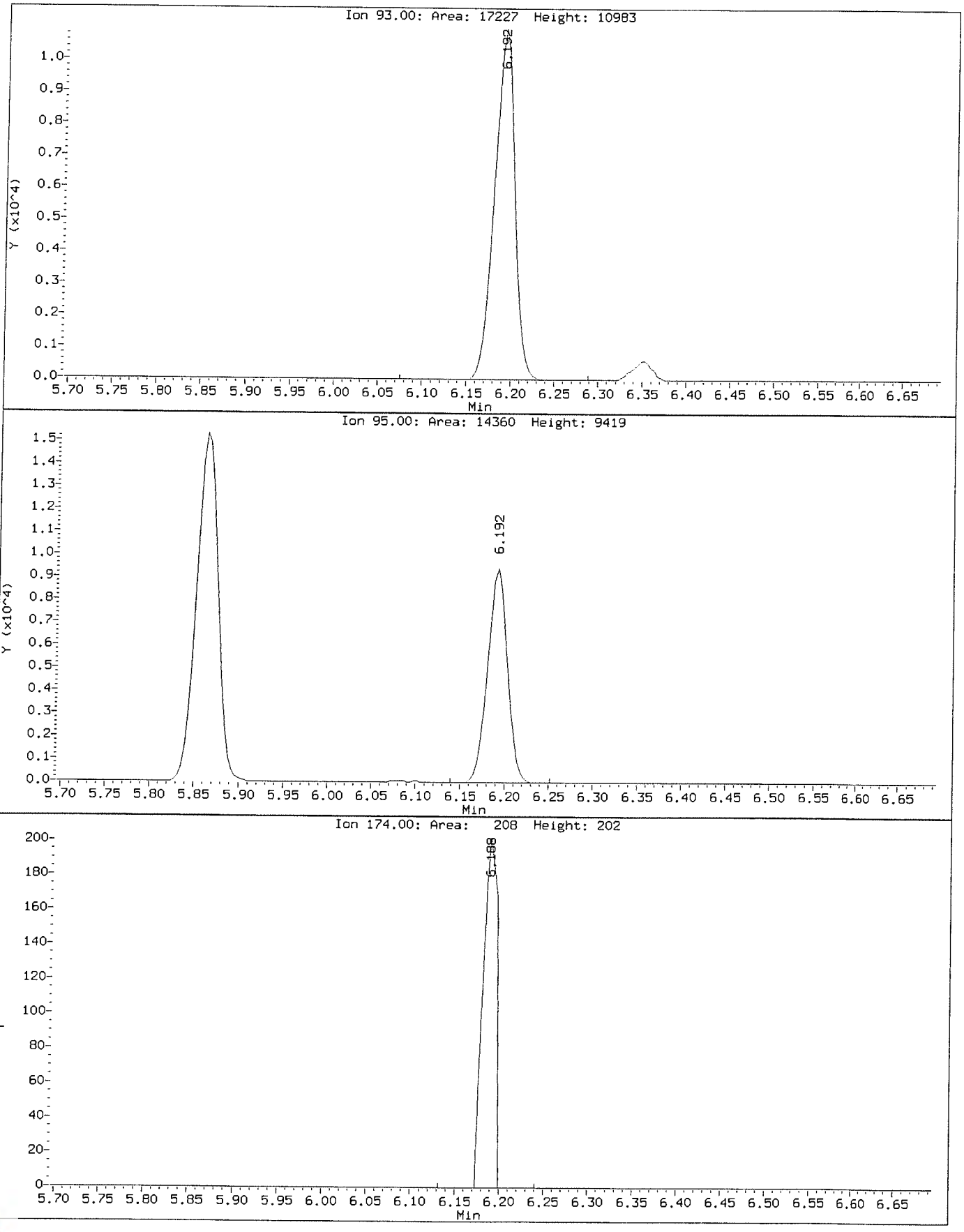
Compound: Dibromomethane
CAS Number: 74-95-3



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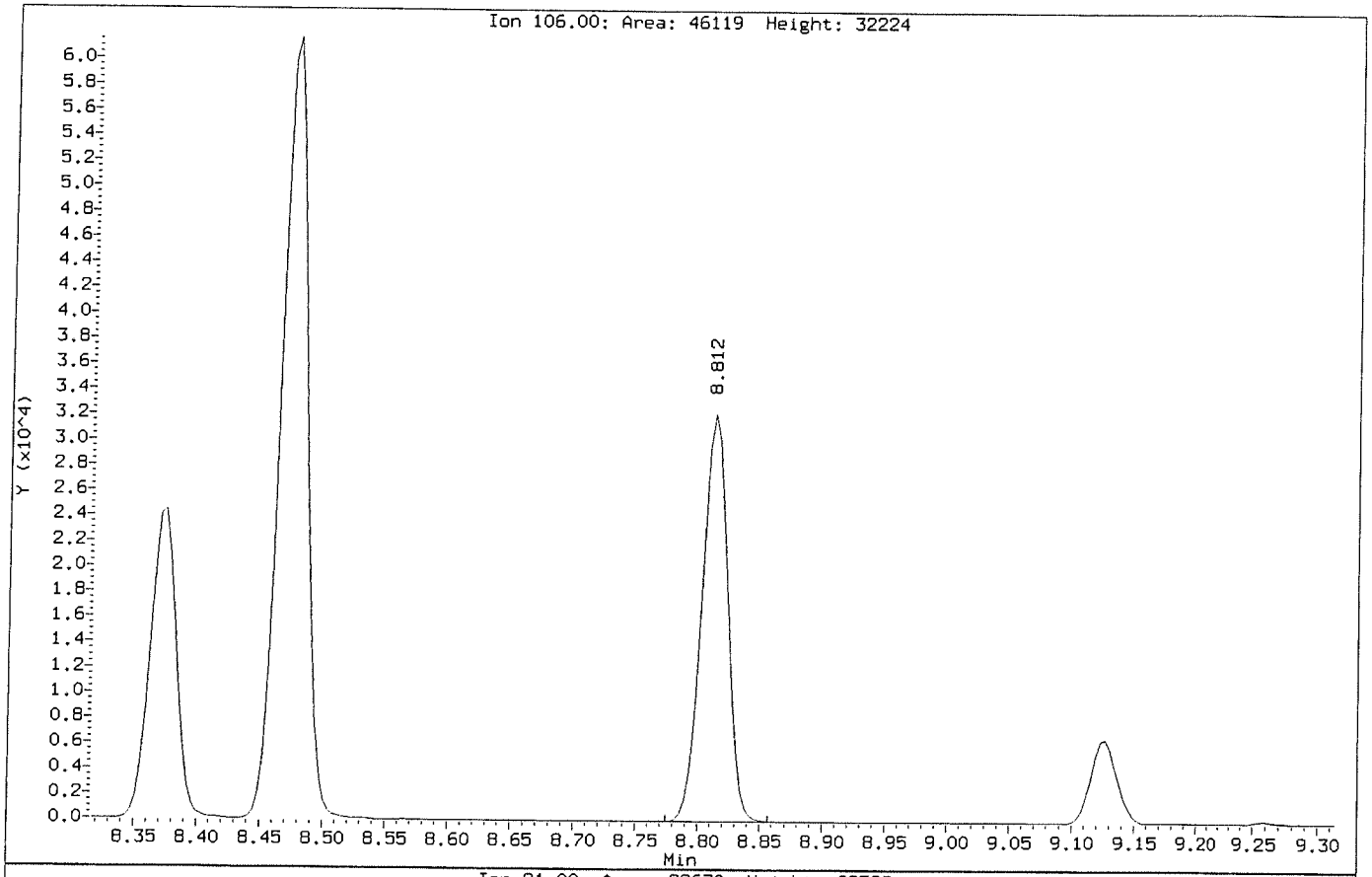
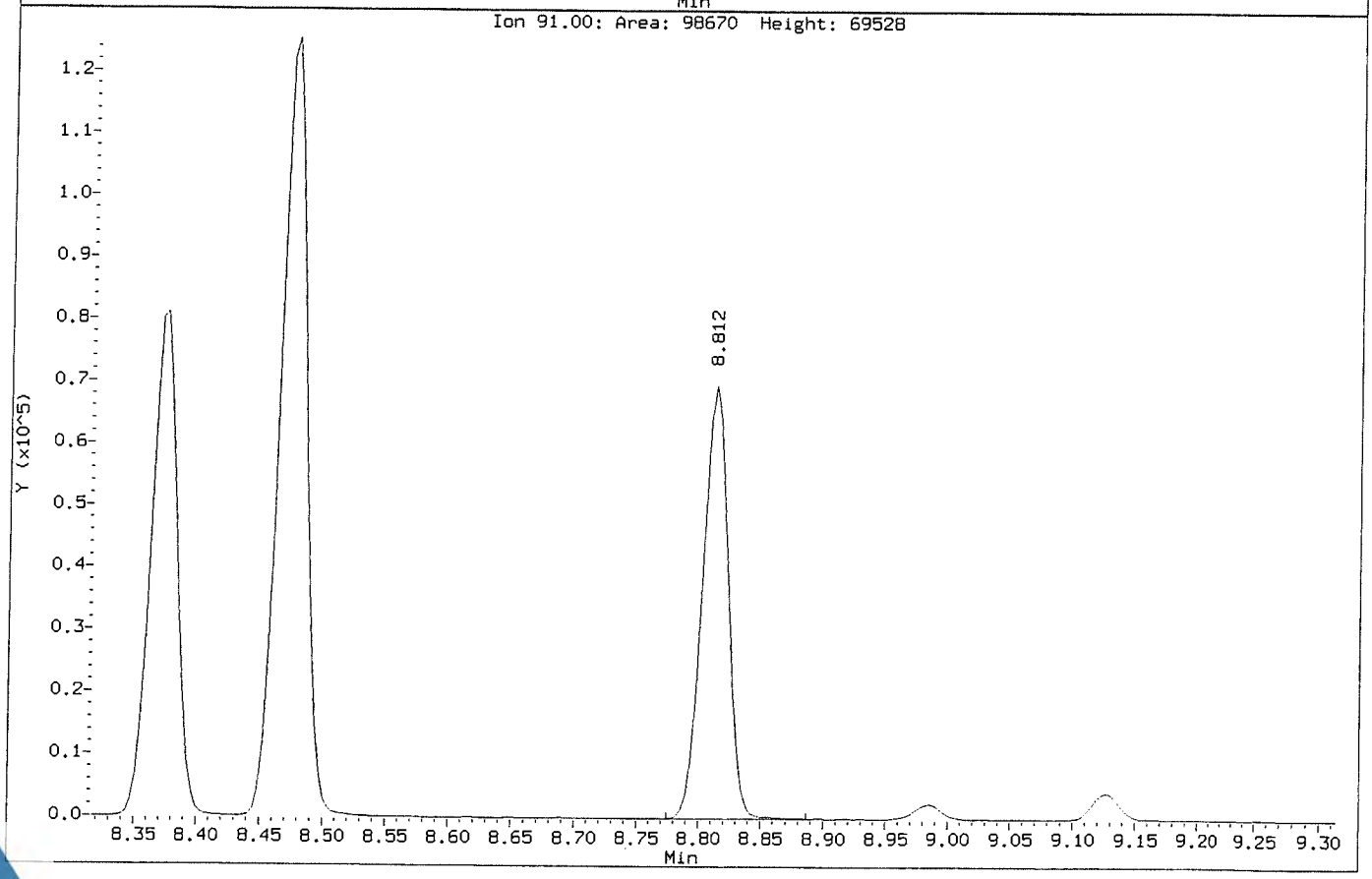
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: o-Xylene
CAS Number: 95-47-6





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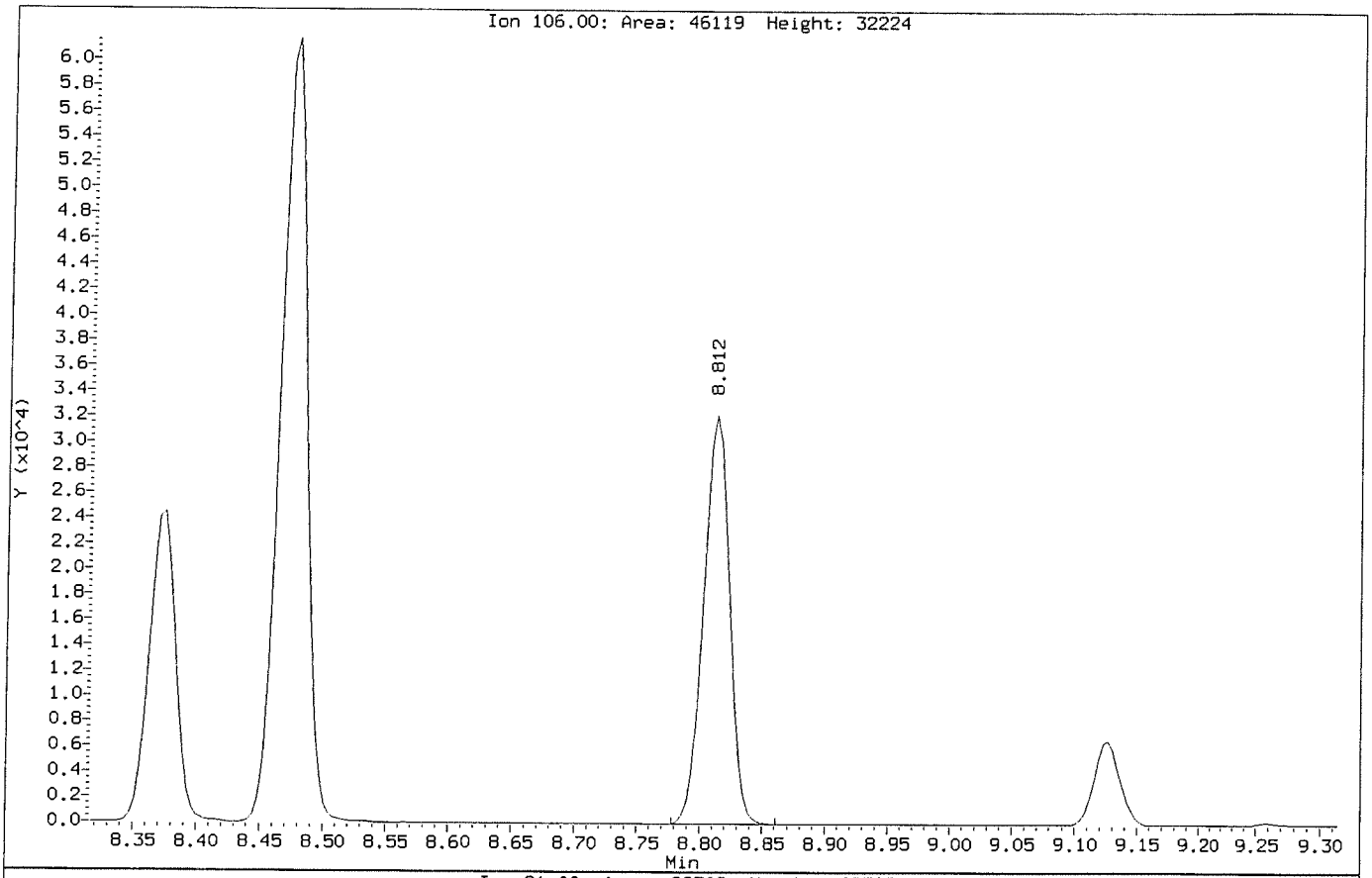
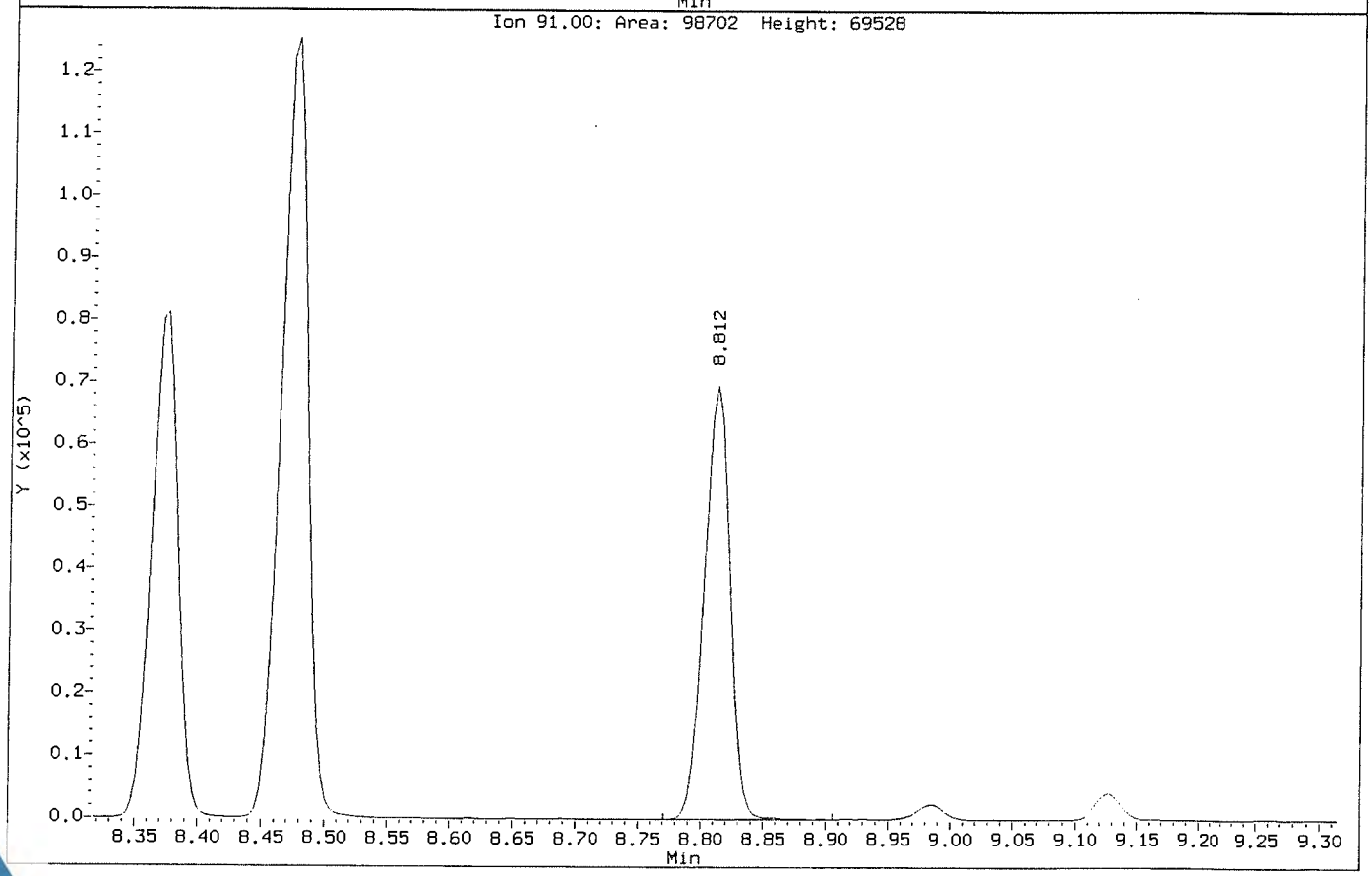
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: o-Xylene
CAS Number: 95-47-6





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111307.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111307.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 13-NOV-2018 13:50
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD020;VSTD020;1;6;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 13:25 Cal File: U111306.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

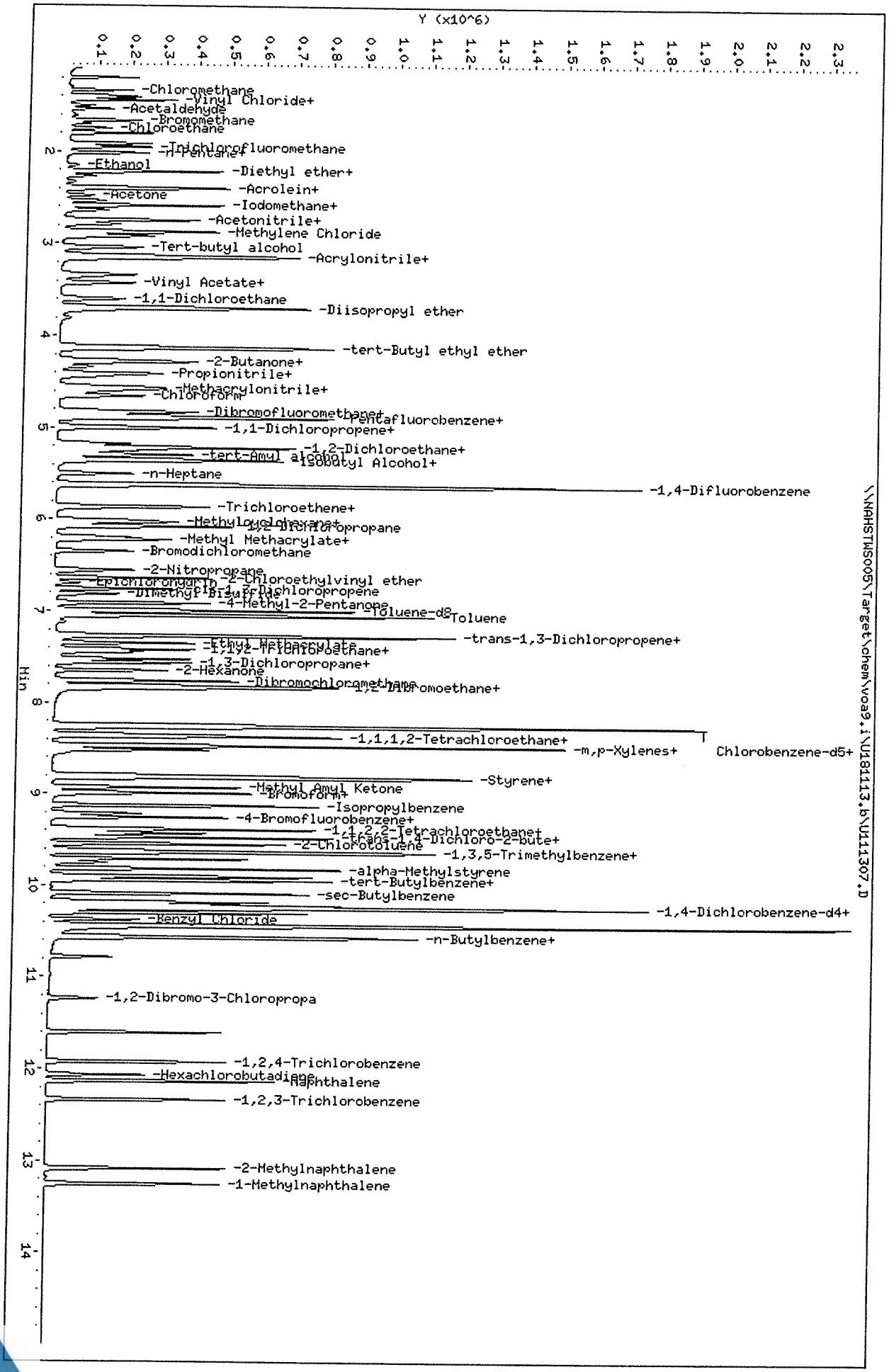
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	441430	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	825527	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	767763	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	370767	50.0000	
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.986)	102630	20.0000	19.47
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	138453	20.0000	19.70
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	412445	20.0000	20.02
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	154498	20.0000	19.71
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	94836	20.0000	19.58
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	144369	20.0000	18.61
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	170546	20.0000	19.41
138 Freon TF	101	2.397	2.397	(0.490)	81210	20.0000	18.36
53 1,1,2-Trichloroethane	83	7.420	7.420	(0.900)	94236	20.0000	19.30
22 1,1-Dichloroethane	63	3.601	3.601	(0.736)	188042	20.0000	18.58
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	92859	20.0000	18.63
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	142695	20.0000	18.71
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	136668	20.0000	19.52
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	178640	20.0000	19.49
90 1,2,4-Trichlorobenzene	180	11.926	11.926	(1.165)	137085	20.0000	18.80
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	410829	20.0000	19.94
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	24969	20.0000	19.13
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	112223	20.0000	19.85

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111307.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	222900	20.0000	18.82
33 1,2-Dichloroethane	62	5.250	5.250	(0.933)	165626	20.0000	19.17
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	114197	20.0000	19.42
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	396843	20.0000	19.92
83 1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	220218	20.0000	18.86
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	202833	20.0000	19.35
84 1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	228900	20.0000	20.02
26 2,2-Dichloropropane	77	4.272	4.272	(0.873)	113941	20.0000	18.18
24 2-Butanone	43	4.335	4.335	(0.886)	118404	40.0000	38.15
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	350860	20.0000	19.32
52 2-Hexanone	43	7.649	7.649	(0.927)	181765	40.0000	40.72
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	410588	20.0000	19.59
82 p-Isopropyltoluene	119	10.209	10.209	(0.997)	404381	20.0000	19.91
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	257102	40.0000	40.14
10 Acetone	43	2.476	2.476	(0.506)	87797	40.0000	40.81
37 Benzene	78	5.216	5.216	(0.927)	436595	20.0000	19.13
74 Bromobenzene	156	9.381	9.381	(0.917)	115775	20.0000	19.03
29 Bromochloromethane	128	4.553	4.553	(0.930)	53724	20.0000	20.64
39 Bromodichloromethane	83	6.348	6.348	(1.129)	132026	20.0000	19.24
66 Bromoform	173	8.984	8.984	(1.089)	60993	20.0000	18.33(T)
6 Bromomethane	94	1.666	1.666	(0.341)	65394	20.0000	19.07
19 Carbon Disulfide	76	2.585	2.585	(0.528)	579343	40.0000	37.64
34 Carbon Tetrachloride	117	4.995	4.995	(0.888)	113726	20.0000	19.09
59 Chlorobenzene	112	8.275	8.275	(1.003)	302097	20.0000	19.06
7 Chloroethane	64	1.749	1.749	(0.357)	85496	20.0000	18.56(M)
28 Chloroform	83	4.654	4.654	(0.951)	190532	20.0000	18.74
3 Chloromethane	50	1.336	1.336	(0.273)	114171	20.0000	19.51
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	119044	20.0000	19.03
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	172818	20.0000	20.00
55 Dibromochloromethane	129	7.758	7.758	(0.940)	96570	20.0000	19.87
44 Dibromomethane	93	6.191	6.191	(1.101)	71419	20.0000	19.38
2 Dichlorodifluoromethane	85	1.201	1.201	(0.246)	119108	20.0000	18.89
61 Ethylbenzene	106	8.369	8.369	(1.015)	154131	20.0000	19.23
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	45235	20.0000	20.48
67 Isopropylbenzene	105	9.126	9.126	(1.106)	456275	20.0000	19.55
62 m,p-Xylenes	106	8.474	8.474	(1.027)	389423	40.0000	39.44
17 Methylene Chloride	84	2.866	2.866	(0.586)	113894	20.0000	19.80
87 n-Butylbenzene	91	10.558	10.558	(1.031)	381141	20.0000	20.10
73 n-Propylbenzene	91	9.475	9.475	(0.926)	574080	20.0000	19.62
92 Naphthalene	128	12.133	12.133	(1.185)	458615	20.0000	20.88
63 o-Xylene	106	8.811	8.811	(1.068)	197393	20.0000	19.97(H)
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	477299	20.0000	19.59
64 Styrene	104	8.826	8.826	(1.070)	337037	20.0000	20.20
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	334318	20.0000	19.69
56 Tetrachloroethene	164	7.525	7.525	(0.912)	75404	20.0000	18.74
50 Toluene	91	7.046	7.046	(0.854)	470397	20.0000	19.29
20 trans-1,2-Dichloroethene	96	3.139	3.139	(0.642)	101477	20.0000	18.58
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	147063	20.0000	18.17
38 Trichloroethene	130	5.861	5.861	(1.042)	107204	20.0000	19.05
8 Trichlorofluoromethane	101	1.951	1.951	(0.399)	161290	20.0000	18.27
5 Vinyl Chloride	62	1.415	1.415	(0.289)	136290	20.0000	19.25

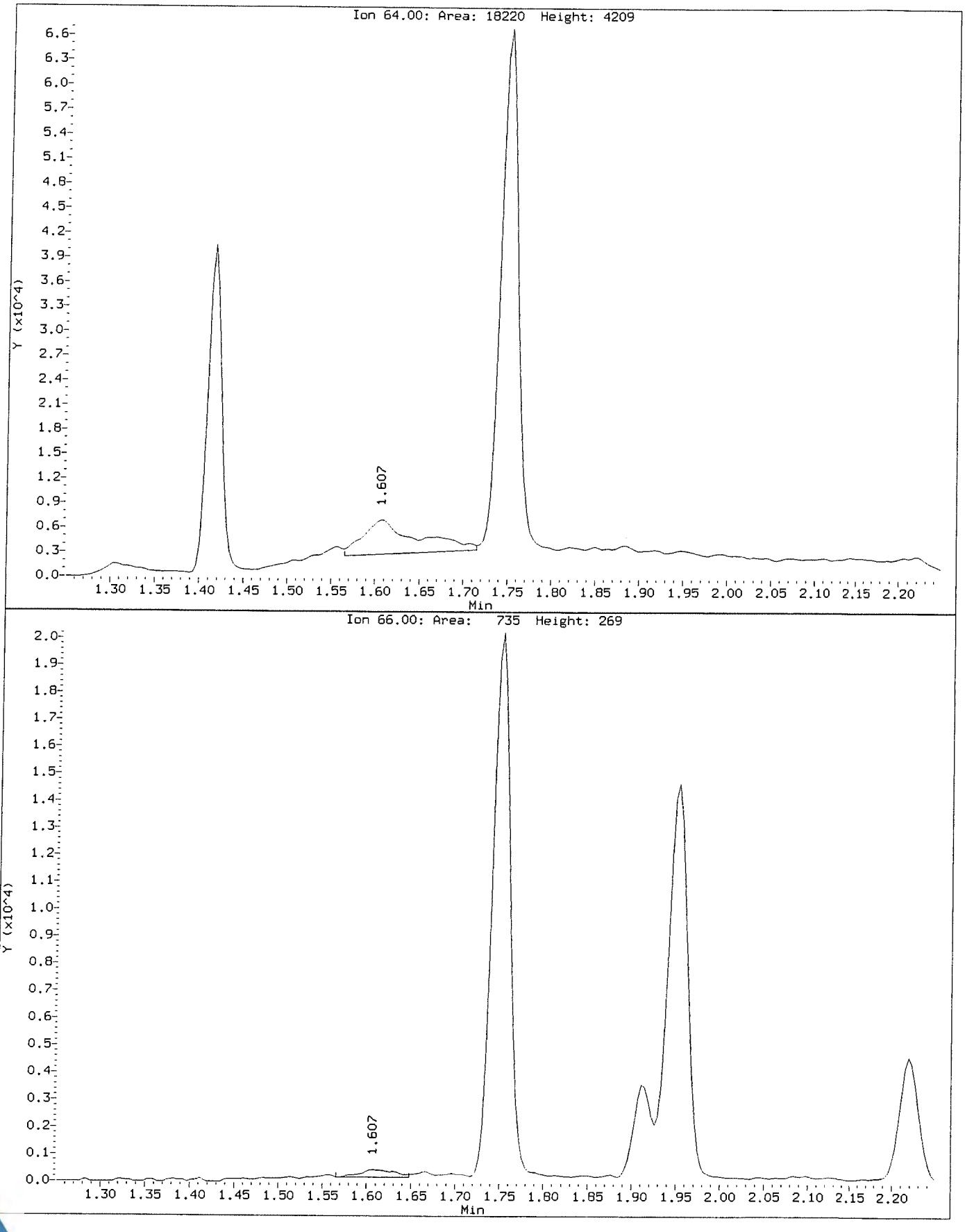
QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.


Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111307.D
Date : 13-NOV-2018 13:50
Client ID: VSTD020
Sample Info: VSTD020;VSTD020;1;6;
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18
\\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111307.D
Y (x10^6)
Min
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-n-Pentane+
-Ethanol
-Diethyl ether+
-Acrolein+
-Acetone
-Iodomethane+
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-Vinyl Acetate+
-1,1-Dichloroethane
-Diisopropyl ether
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile+
-Methacrylonitrile+
-Chloroform
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-tert-Amyl alcohol
-Isobutyl Alcohol+
-n-Heptane
-1,4-Difluorobenzene
-Trichloroethene+
-Methylcyclohexane+
-1,2-Dichloropropane
-Methyl Methacrylate+
-Bromodichloromethane
-2-Nitropropane
-2-Chloroethylvinyl ether
-Epichlorohydrin
-1,3-Dichloropropene
-Dimethyl Disulfide
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-trans-1,3-Dichloropropene+
-Ethyl Methacrylate
-1,1,2-Trichloroethane+
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes+
Chlorobenzene-d5+
-Styrene+
-Methyl Amyl Ketone
-Bromoform+
-Isopropylbenzene
-4-Bromofluorobenzene+
-1,1,2,2-Tetrachloroethane+
-trans-1,4-Dichloro-2-bute+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
-Benzyl Chloride
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
-2-Methylnaphthalene
-1-Methylnaphthalene

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111307.D
Injection Date: 13-NOV-2018 13:50
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Chloroethane
CAS Number: 75-00-3



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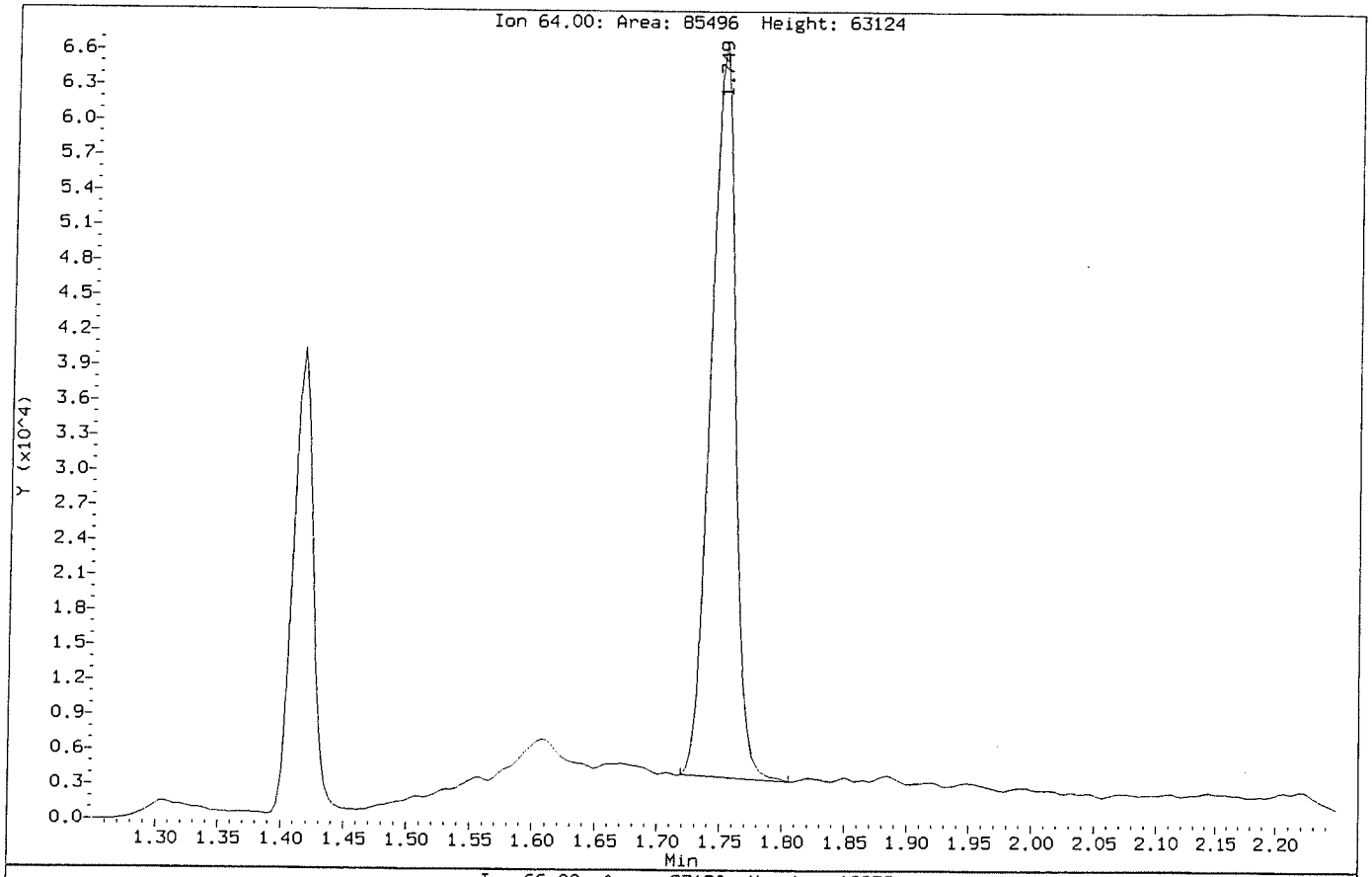
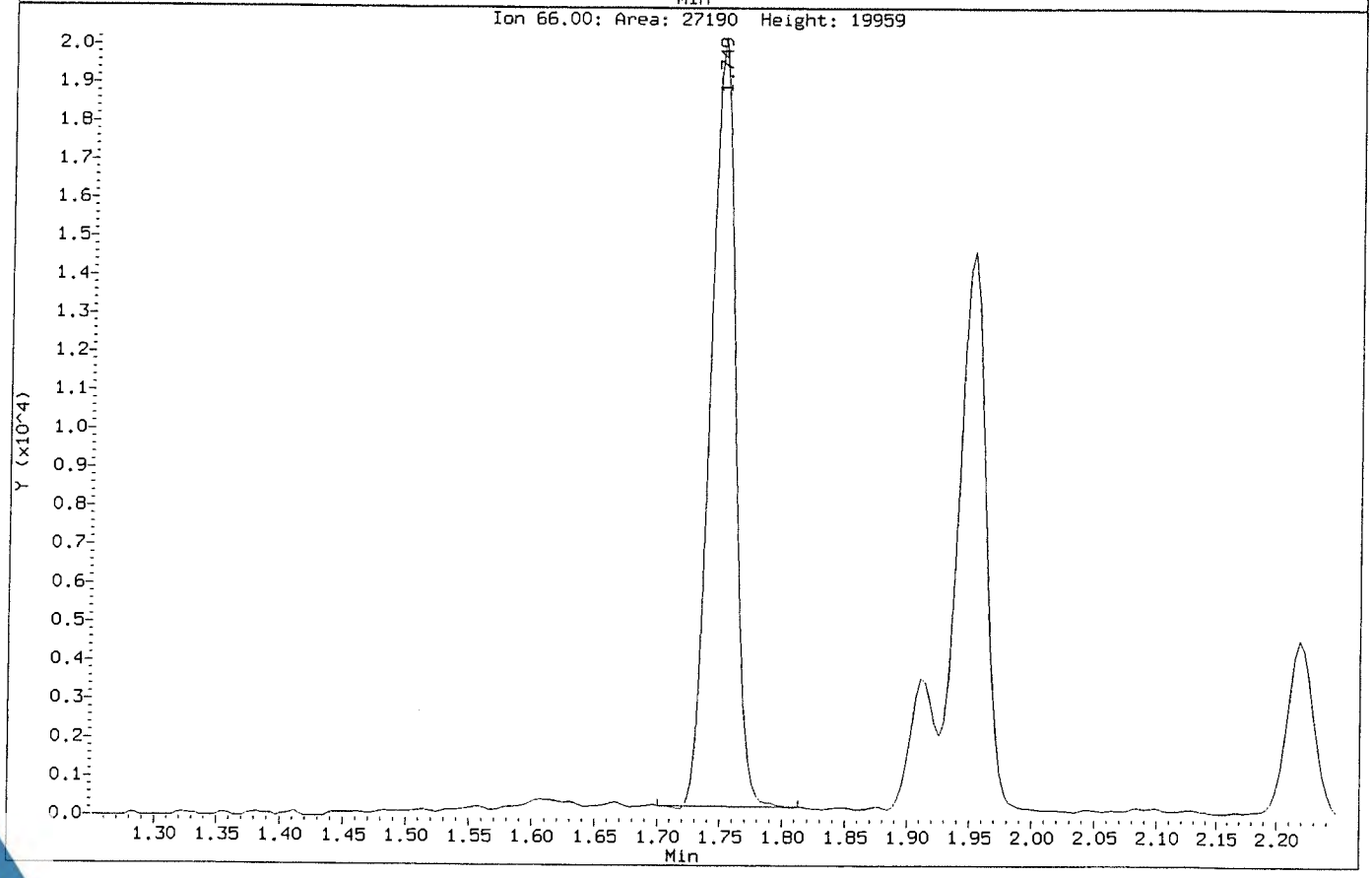
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Chloroethane
CAS Number: 75-00-3





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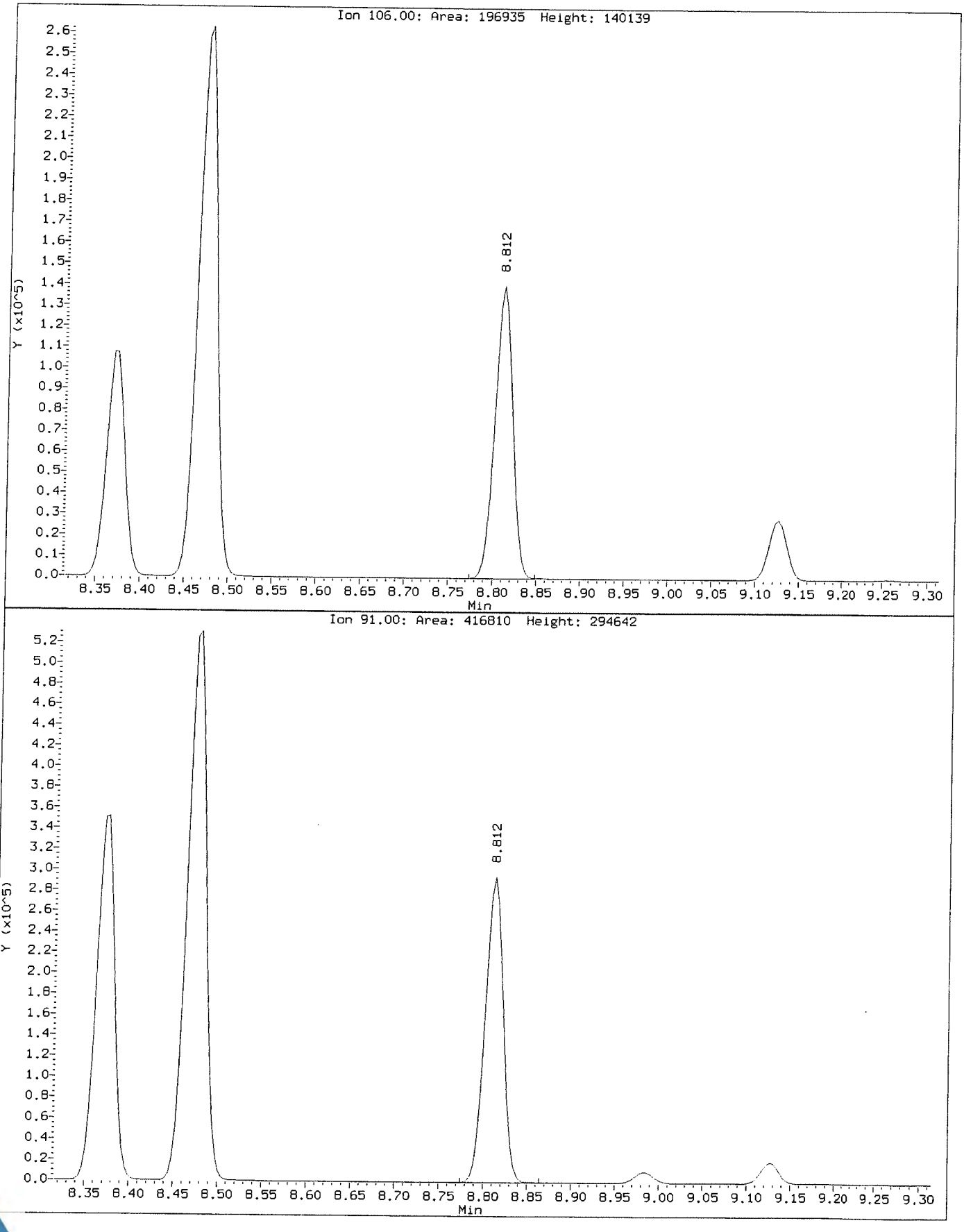
Injection Date: 13-NOV-2018 13:50
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: o-Xylene
CAS Number: 95-47-6



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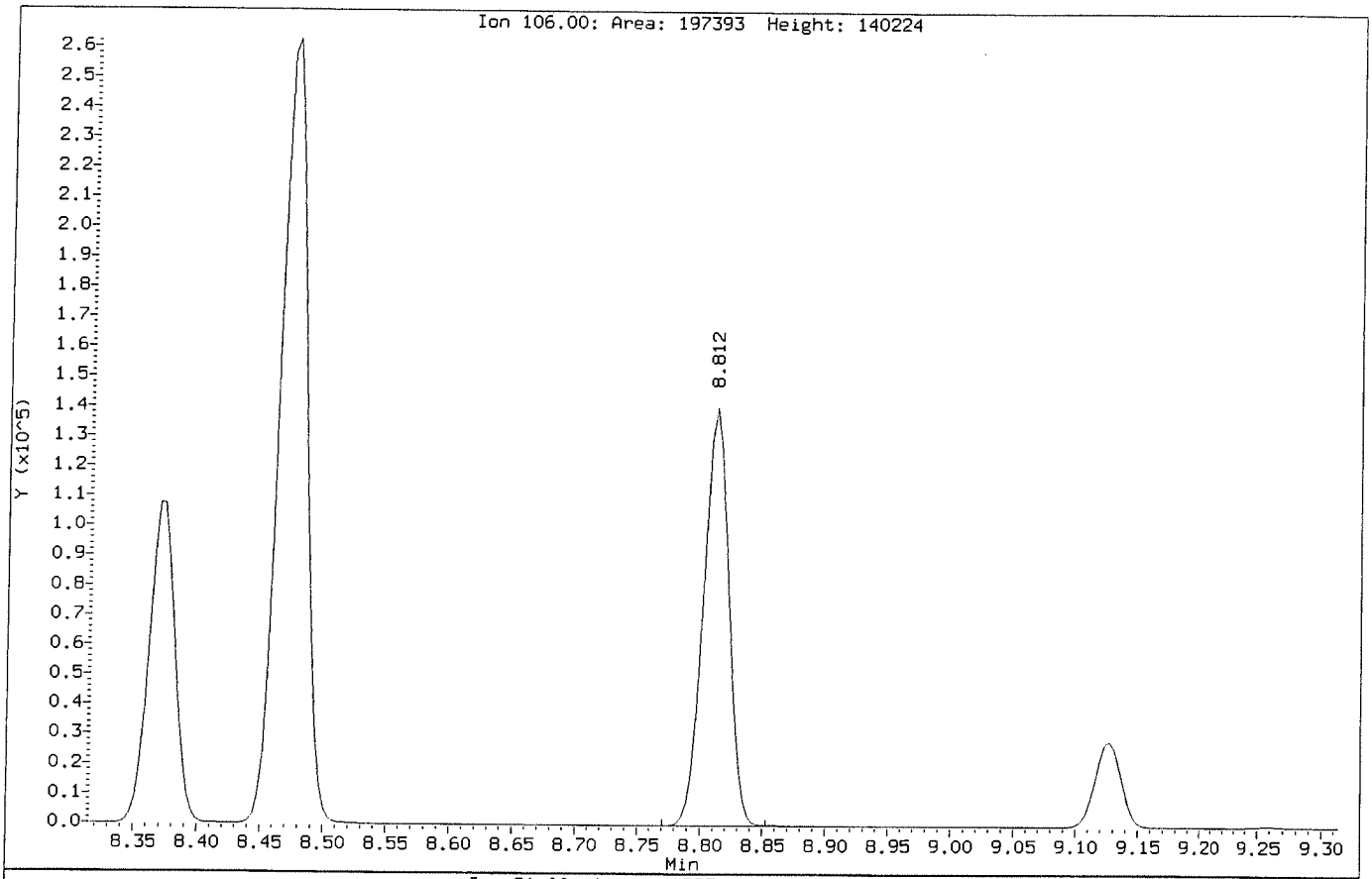
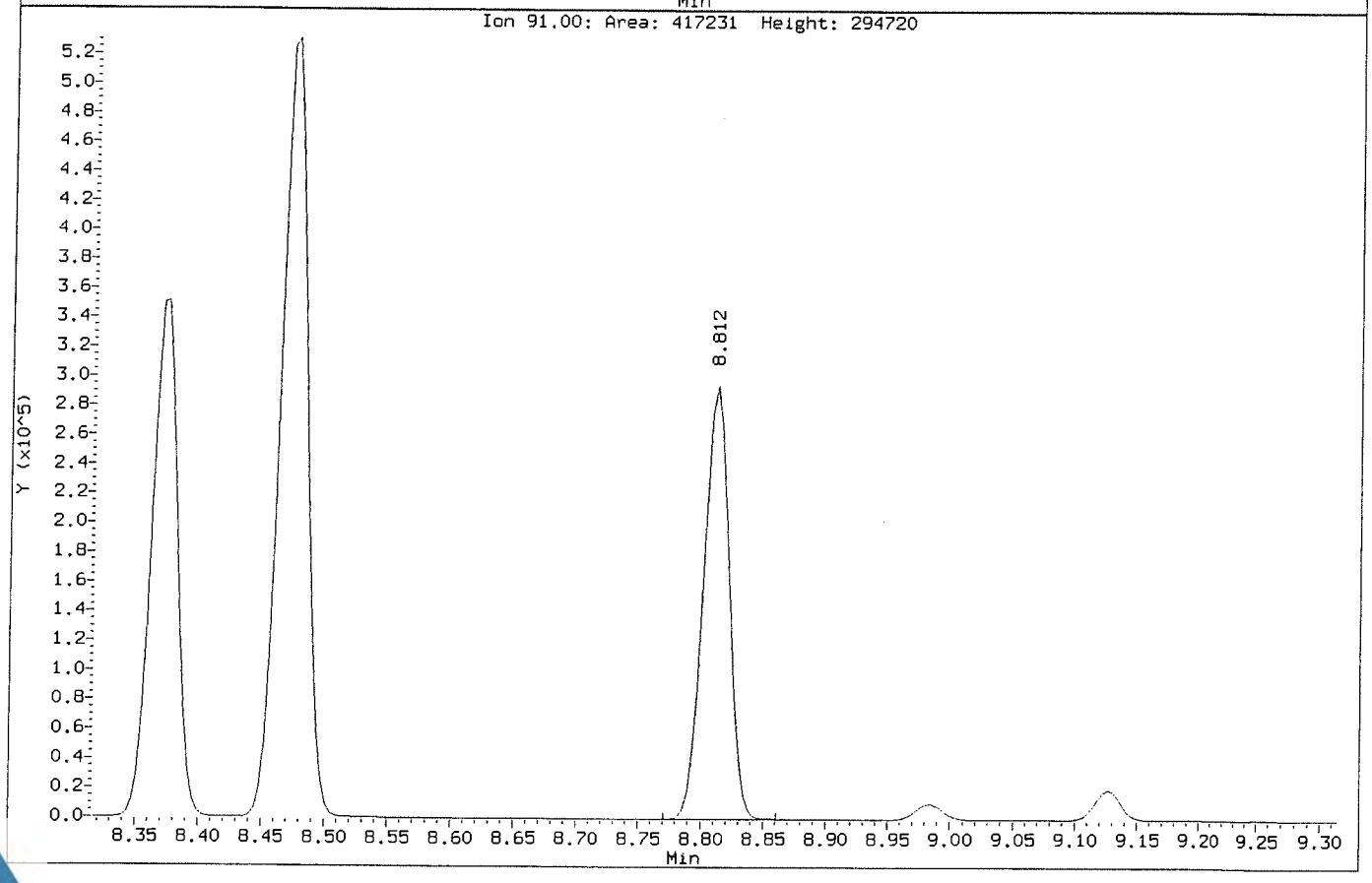
Injection Date: 13-NOV-2018 13:50
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: o-Xylene
CAS Number: 95-47-6





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Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111308.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 13-NOV-2018 14:15
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;1;7;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 13:50 Cal File: U111307.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

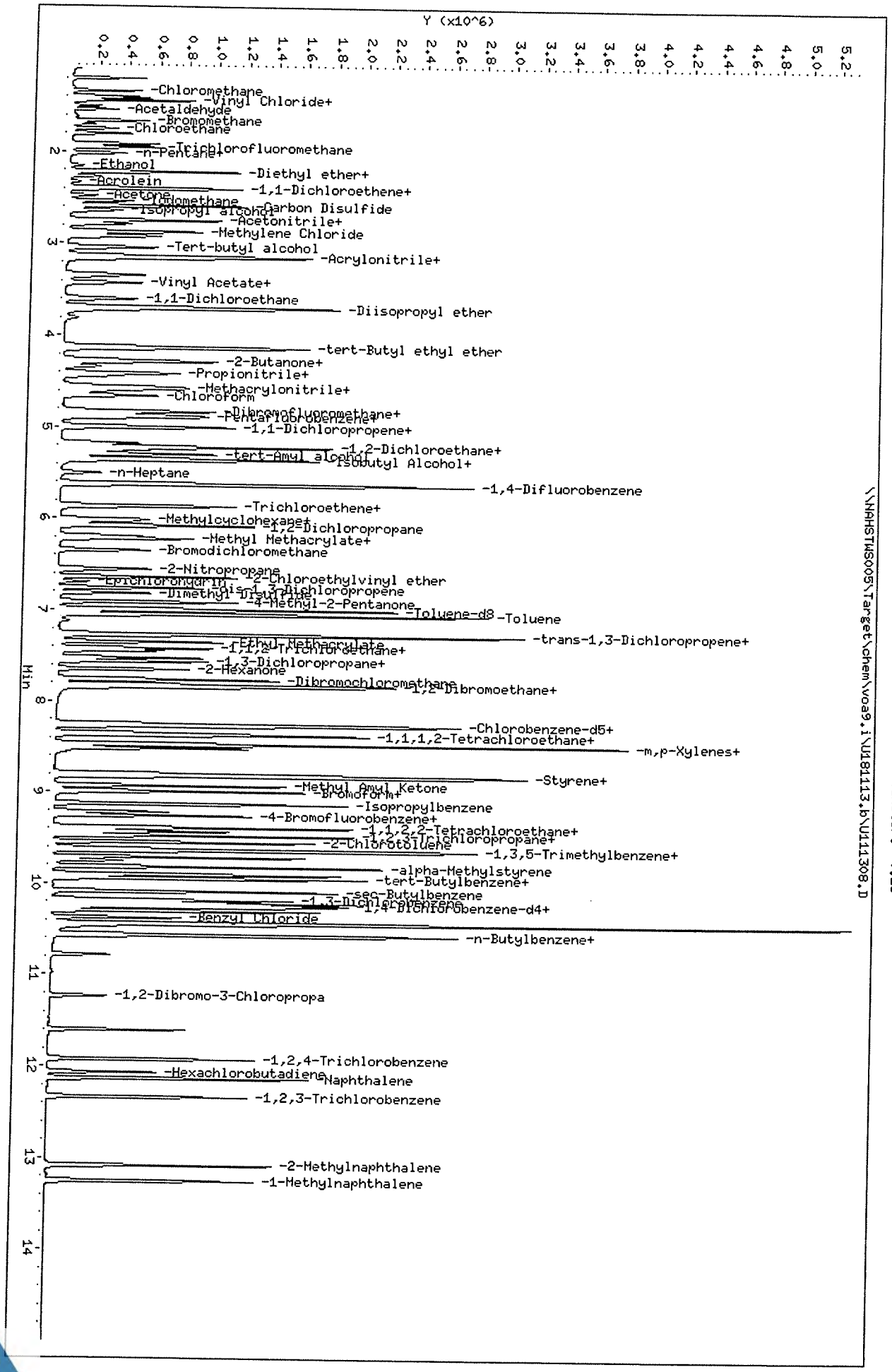
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	442076	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	849587	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	790877	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	387587	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.987)	255826	50.0000	50.35
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	335901	50.0000	50.27
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	1045096	50.0000	51.75
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	396604	50.0000	50.72
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	253286	50.0000	50.77
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	369959	50.0000	47.64
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	434682	50.0000	47.34
138 Freon TF	101	2.401	2.401	(0.491)	191531	50.0000	43.24
53 1,1,2-Trichloroethane	83	7.420	7.420	(0.900)	234031	50.0000	46.54
22 1,1-Dichloroethane	63	3.604	3.604	(0.737)	476032	50.0000	46.99
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	224107	50.0000	44.91
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	351415	50.0000	44.78
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	346843	50.0000	47.39
71 1,2,3-Trichloropropane	75	9.430	9.430	(0.921)	480640	50.0000	50.17
90 1,2,4-Trichlorobenzene	180	11.926	11.926	(1.165)	355891	50.0000	46.69
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	1025451	50.0000	47.63
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	66581	50.0000	47.02
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	287318	50.0000	49.34

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111308.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	569575	50.0000	46.01
33 1,2-Dichloroethane	62	5.254	5.254	(0.934)	409387	50.0000	46.04
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	288083	50.0000	47.62
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	989153	50.0000	47.49
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	558678	50.0000	45.78
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	507685	50.0000	47.02
84 1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	576011	50.0000	48.25
26 2,2-Dichloropropane	77	4.275	4.275	(0.874)	295338	50.0000	47.07
24 2-Butanone	43	4.339	4.339	(0.887)	300842	100.000	96.81
76 2-Chlorotoluene	91	9.550	9.550	(0.933)	883069	50.0000	46.52
52 2-Hexanone	43	7.649	7.649	(0.927)	469848	100.000	102.19
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	1023060	50.0000	46.71
82 p-Isopropyltoluene	119	10.210	10.210	(0.997)	1018309	50.0000	47.97
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	657858	100.000	99.71
10 Acetone	43	2.480	2.480	(0.507)	201617	100.000	99.32
37 Benzene	78	5.216	5.216	(0.927)	1096105	50.0000	46.67
74 Bromobenzene	156	9.385	9.385	(0.917)	293372	50.0000	46.14
29 Bromochloromethane	128	4.553	4.553	(0.930)	136269	50.0000	52.28
39 Bromodichloromethane	83	6.348	6.348	(1.129)	344674	50.0000	48.82
66 Bromoform	173	8.984	8.984	(1.089)	170886	50.0000	47.61(T)
6 Bromomethane	94	1.666	1.666	(0.341)	154362	50.0000	42.38
19 Carbon Disulfide	76	2.588	2.588	(0.529)	1468777	100.000	95.31
34 Carbon Tetrachloride	117	4.995	4.995	(0.888)	286167	50.0000	46.68
59 Chlorobenzene	112	8.275	8.275	(1.003)	750956	50.0000	46.00
7 Chloroethane	64	1.749	1.749	(0.357)	213028	50.0000	46.18(M)
28 Chloroform	83	4.658	4.658	(0.952)	478555	50.0000	47.01
3 Chloromethane	50	1.340	1.340	(0.274)	285521	50.0000	48.38
27 cis-1,2-Dichloroethene	96	4.287	4.287	(0.876)	293496	50.0000	46.85
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	464679	50.0000	52.27
55 Dibromochloromethane	129	7.758	7.758	(0.940)	263139	50.0000	52.58
44 Dibromomethane	93	6.191	6.191	(1.101)	181664	50.0000	47.92
2 Dichlorodifluoromethane	85	1.205	1.205	(0.246)	293949	50.0000	45.08
61 Ethylbenzene	106	8.373	8.373	(1.015)	388724	50.0000	47.09
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	110558	50.0000	46.37
67 Isopropylbenzene	105	9.126	9.126	(1.106)	1128288	50.0000	46.94
62 m,p-Xylenes	106	8.474	8.474	(1.027)	962791	100.000	94.66
17 Methylene Chloride	84	2.870	2.870	(0.586)	276248	50.0000	48.96
87 n-Butylbenzene	91	10.558	10.558	(1.031)	954951	50.0000	47.12
73 n-Propylbenzene	91	9.475	9.475	(0.926)	1421540	50.0000	46.47
92 Naphthalene	128	12.133	12.133	(1.185)	1186850	50.0000	51.71
63 o-Xylene	106	8.811	8.811	(1.068)	497517	50.0000	48.87(H)
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	1186653	50.0000	46.59
64 Styrene	104	8.826	8.826	(1.070)	870320	50.0000	50.64
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	827990	50.0000	46.65
56 Tetrachloroethene	164	7.525	7.525	(0.912)	182495	50.0000	44.04
50 Toluene	91	7.049	7.049	(0.855)	1170933	50.0000	46.63
20 trans-1,2-Dichloroethene	96	3.139	3.139	(0.642)	255498	50.0000	46.71
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.291)	407060	50.0000	46.38
38 Trichloroethene	130	5.861	5.861	(1.042)	263822	50.0000	45.57
8 Trichlorofluoromethane	101	1.951	1.951	(0.399)	392628	50.0000	44.42
5 Vinyl Chloride	62	1.419	1.419	(0.290)	335638	50.0000	46.60

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

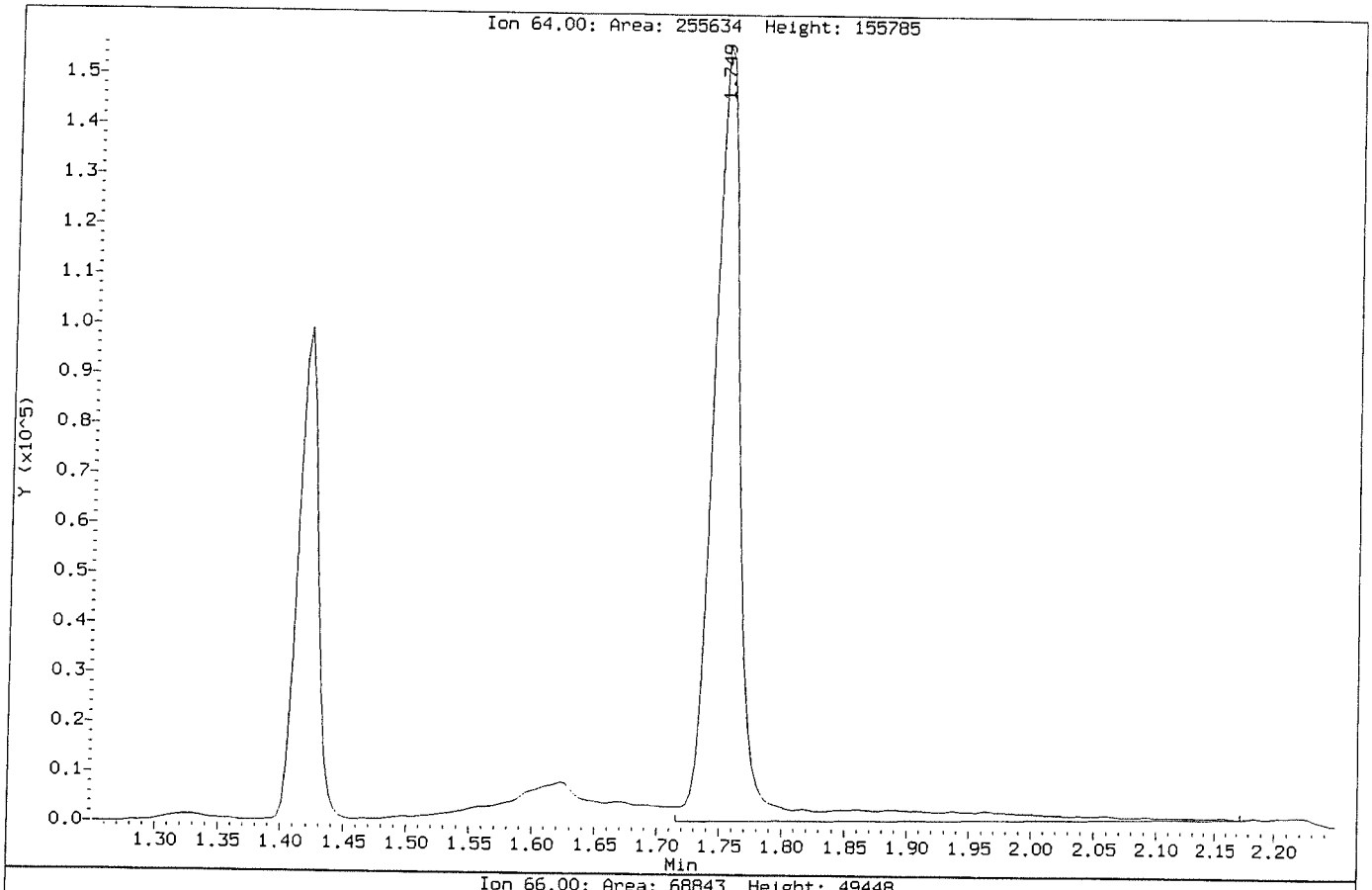


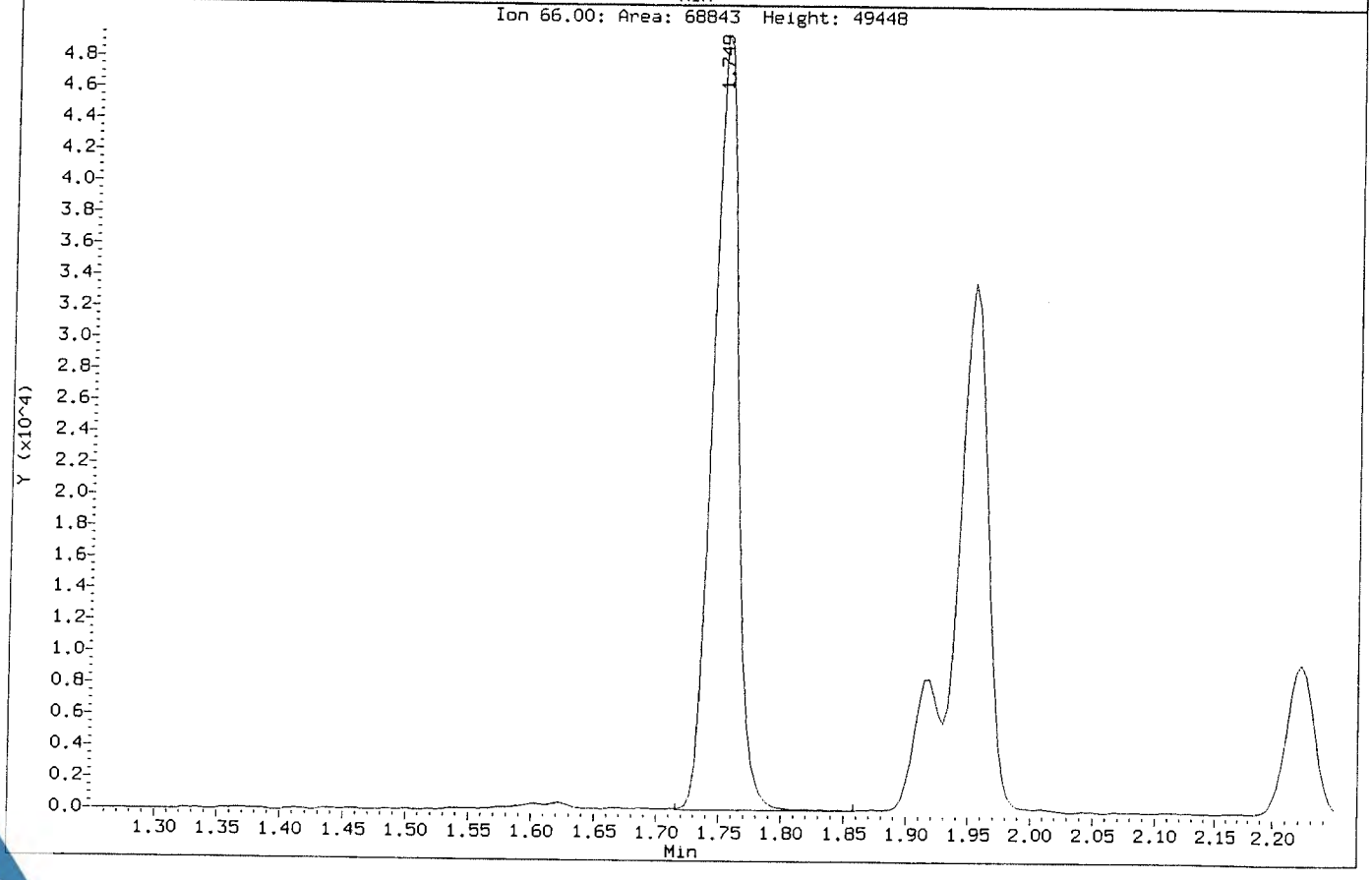
Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111308.D
Date : 13-NOV-2018 14:15
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111308.D
Injection Date: 13-NOV-2018 14:15
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





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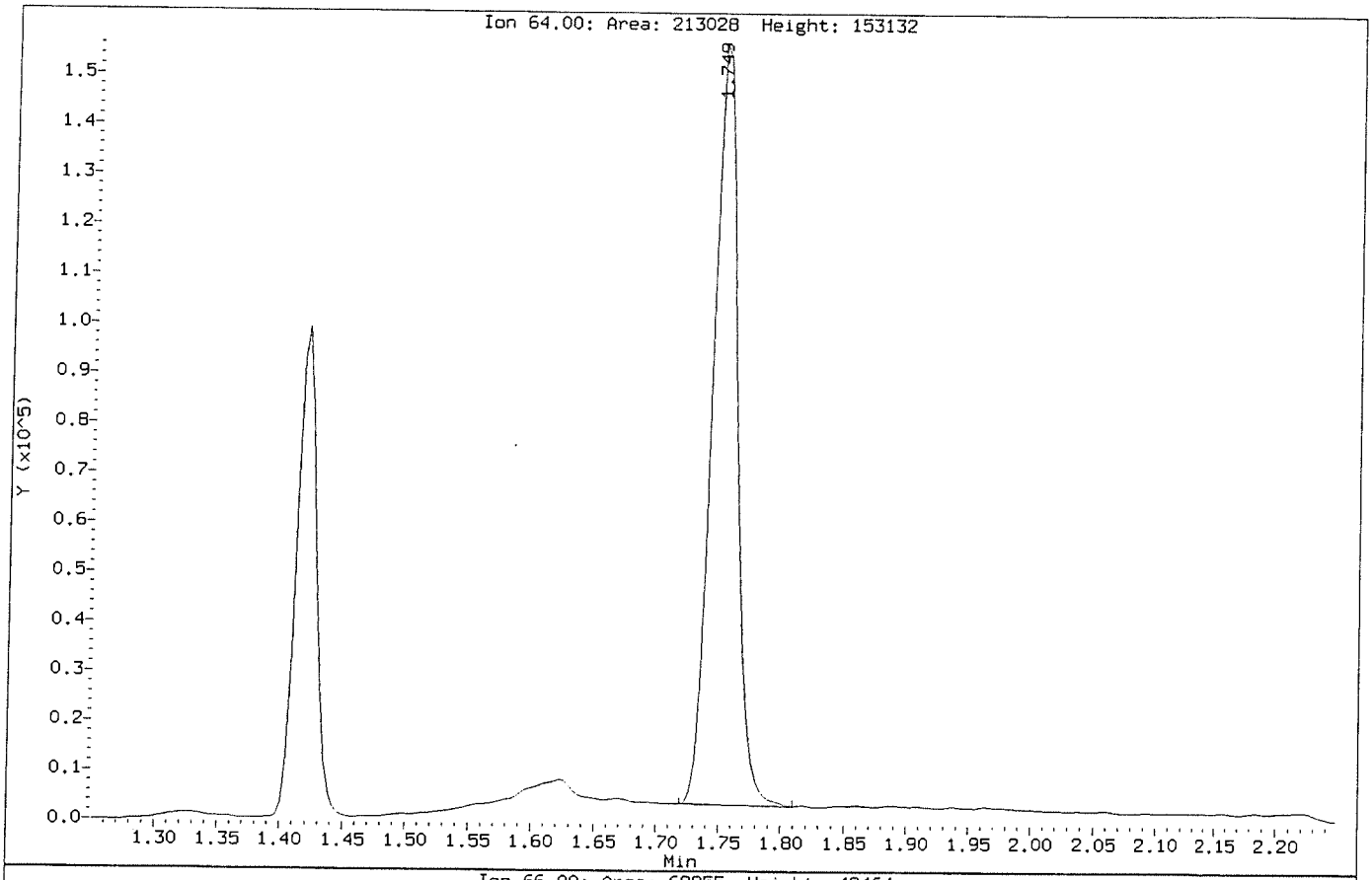
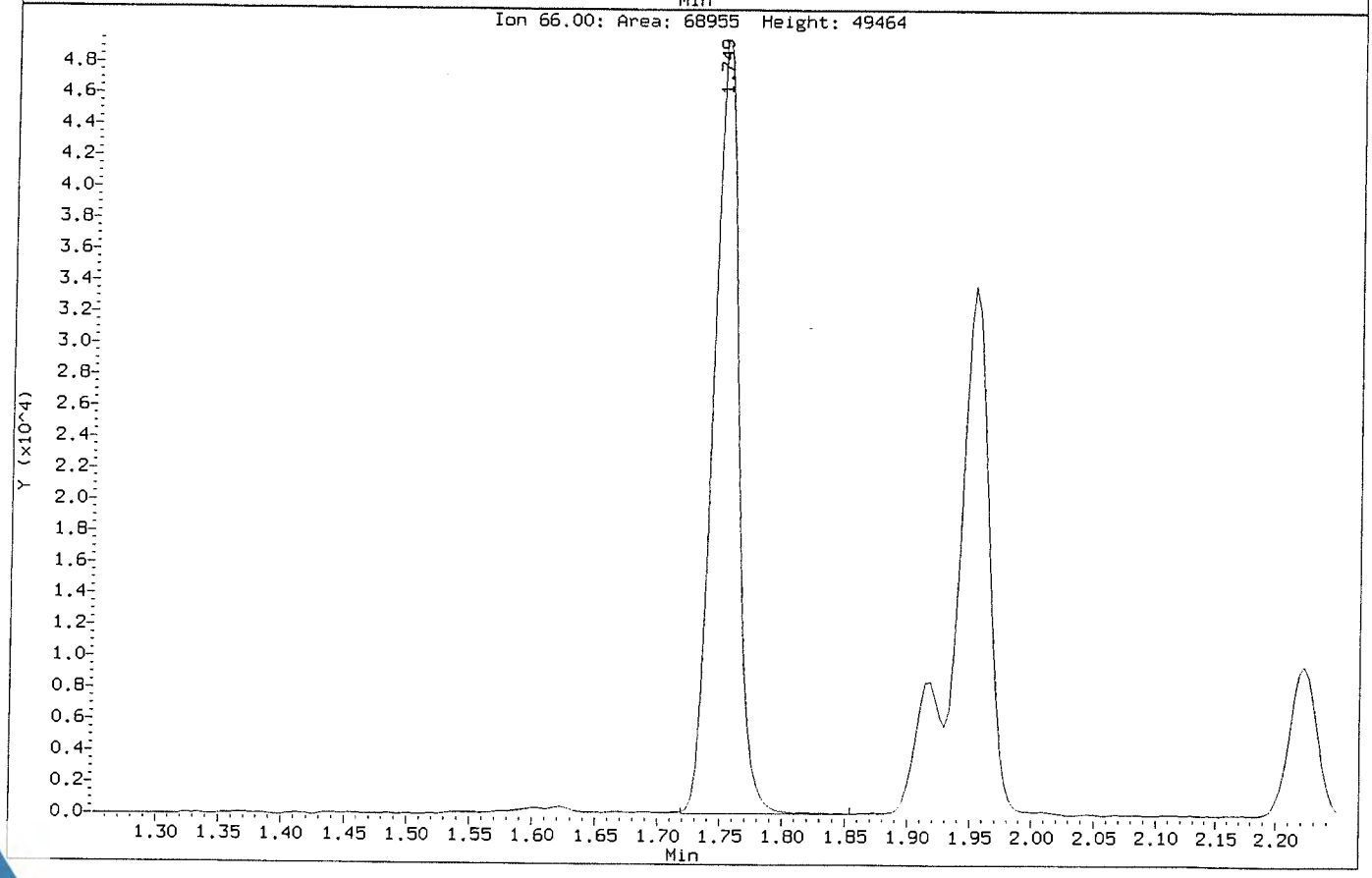
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





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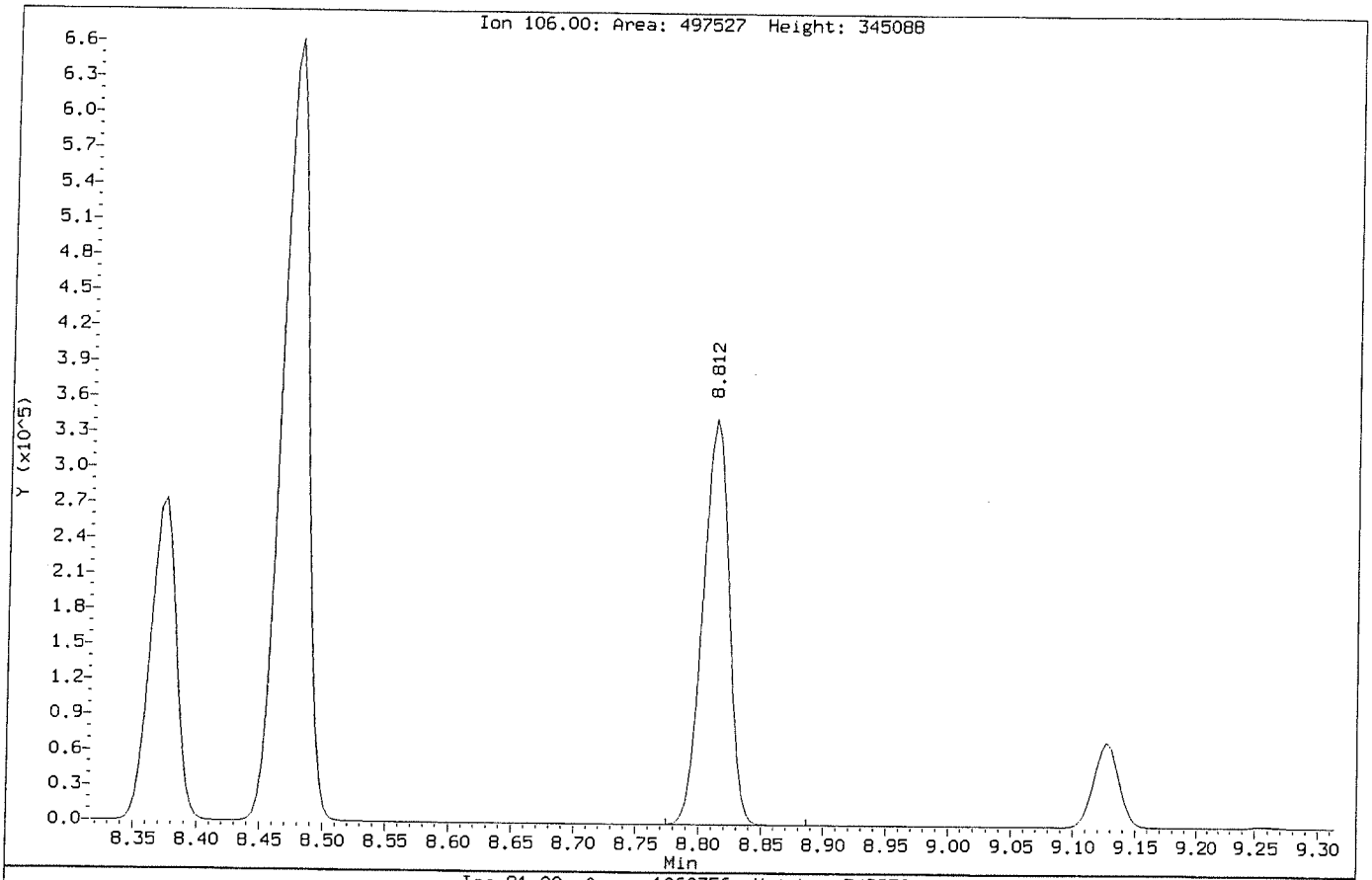
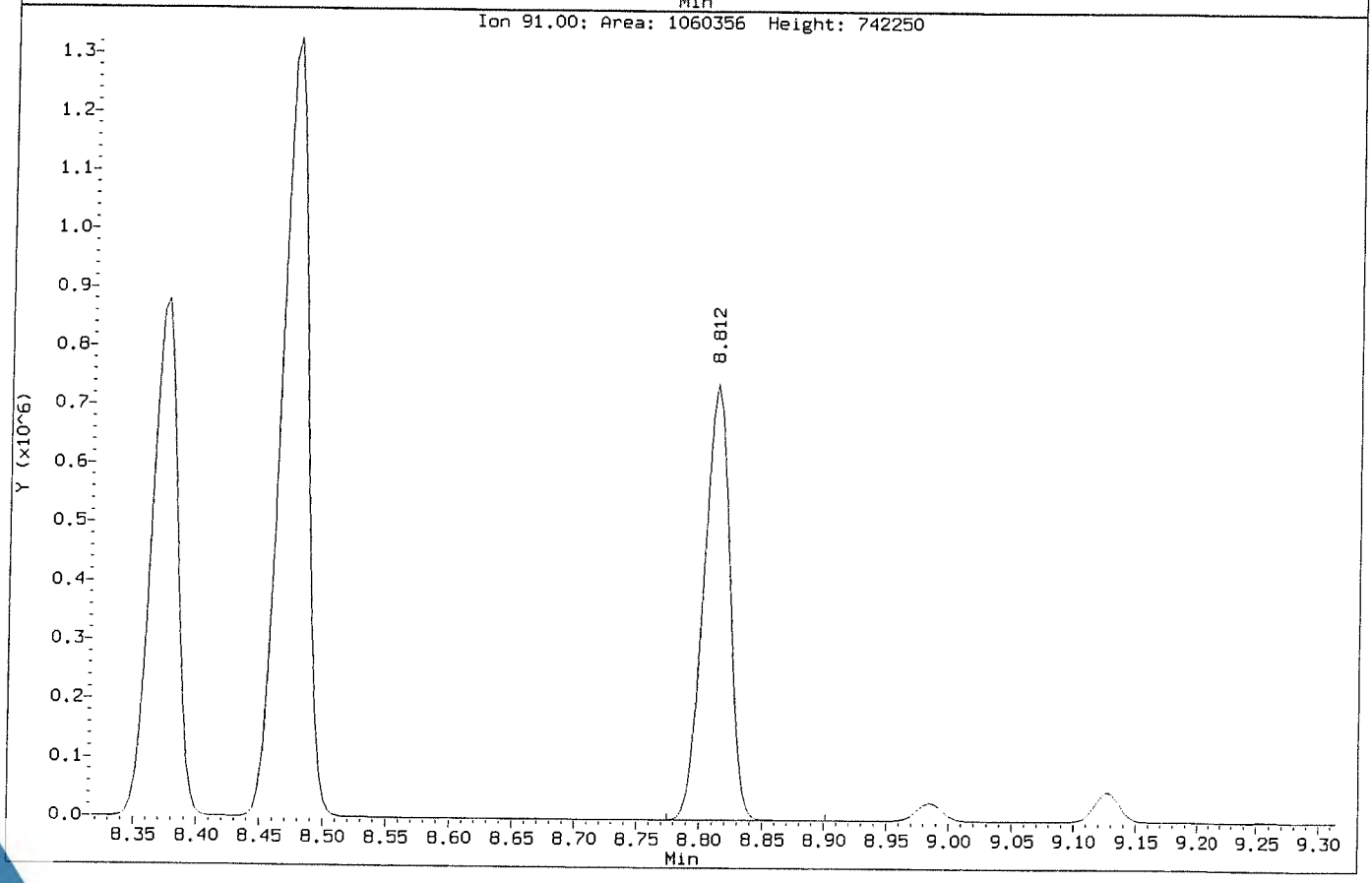
Injection Date: 13-NOV-2018 14:15
Instrument: VOA9.i
Client Sample ID: VSTD050

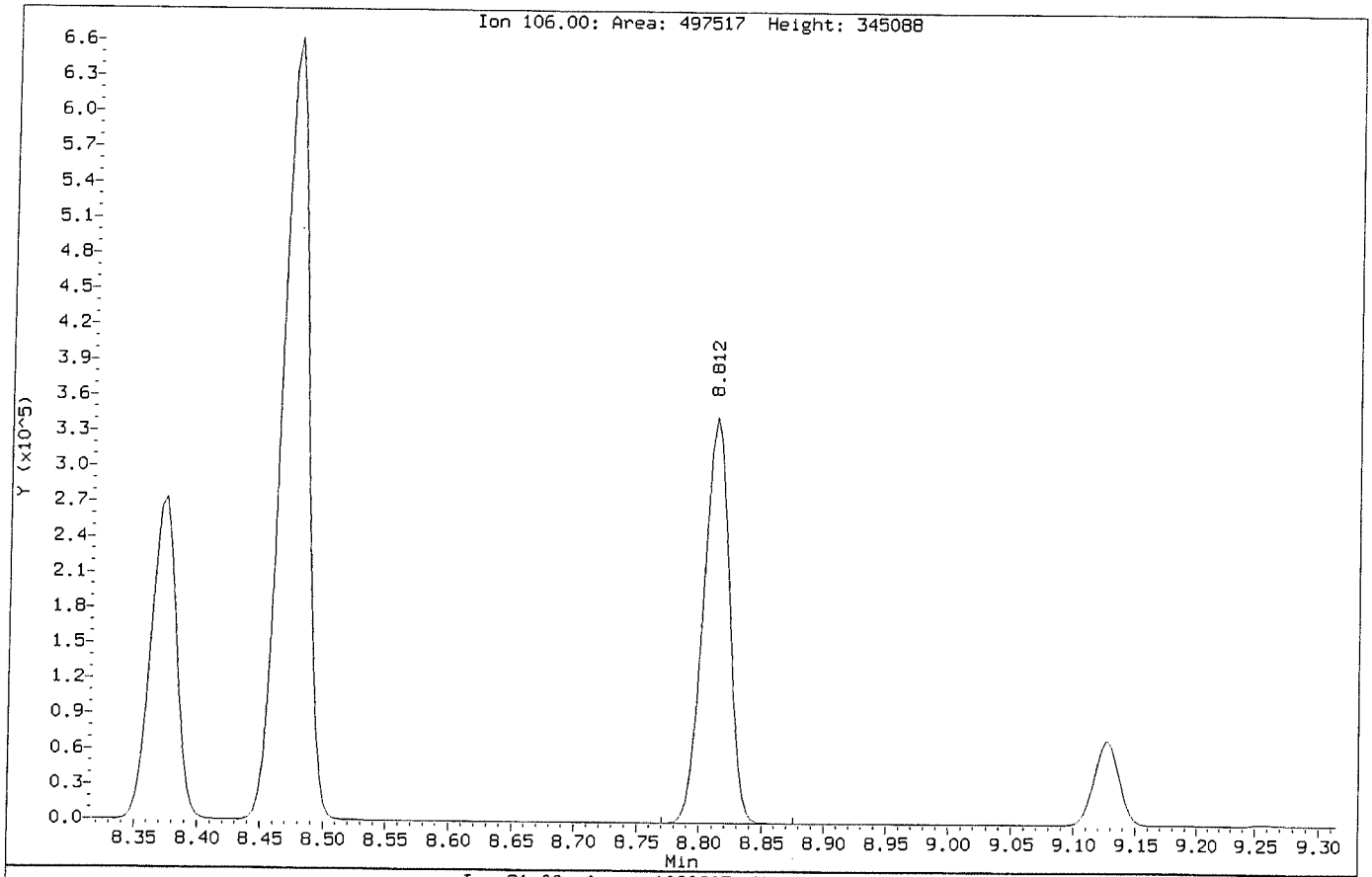
Compound: o-Xylene
CAS Number: 95-47-6

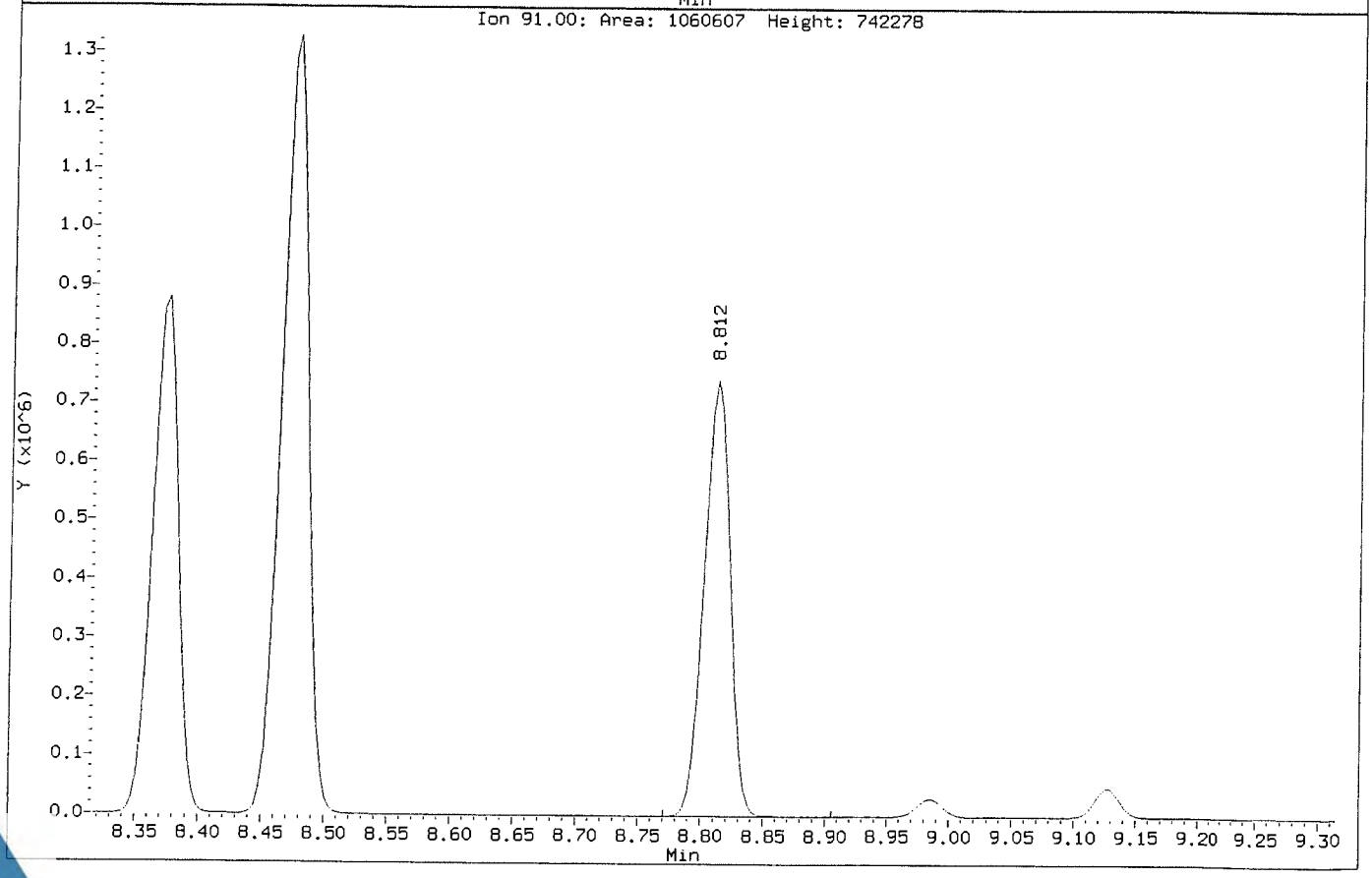




Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111308.D
Injection Date: 13-NOV-2018 14:15
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: o-Xylene
CAS Number: 95-47-6





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111309.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111309.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 13-NOV-2018 14:39
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD100;VSTD100;1;8;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

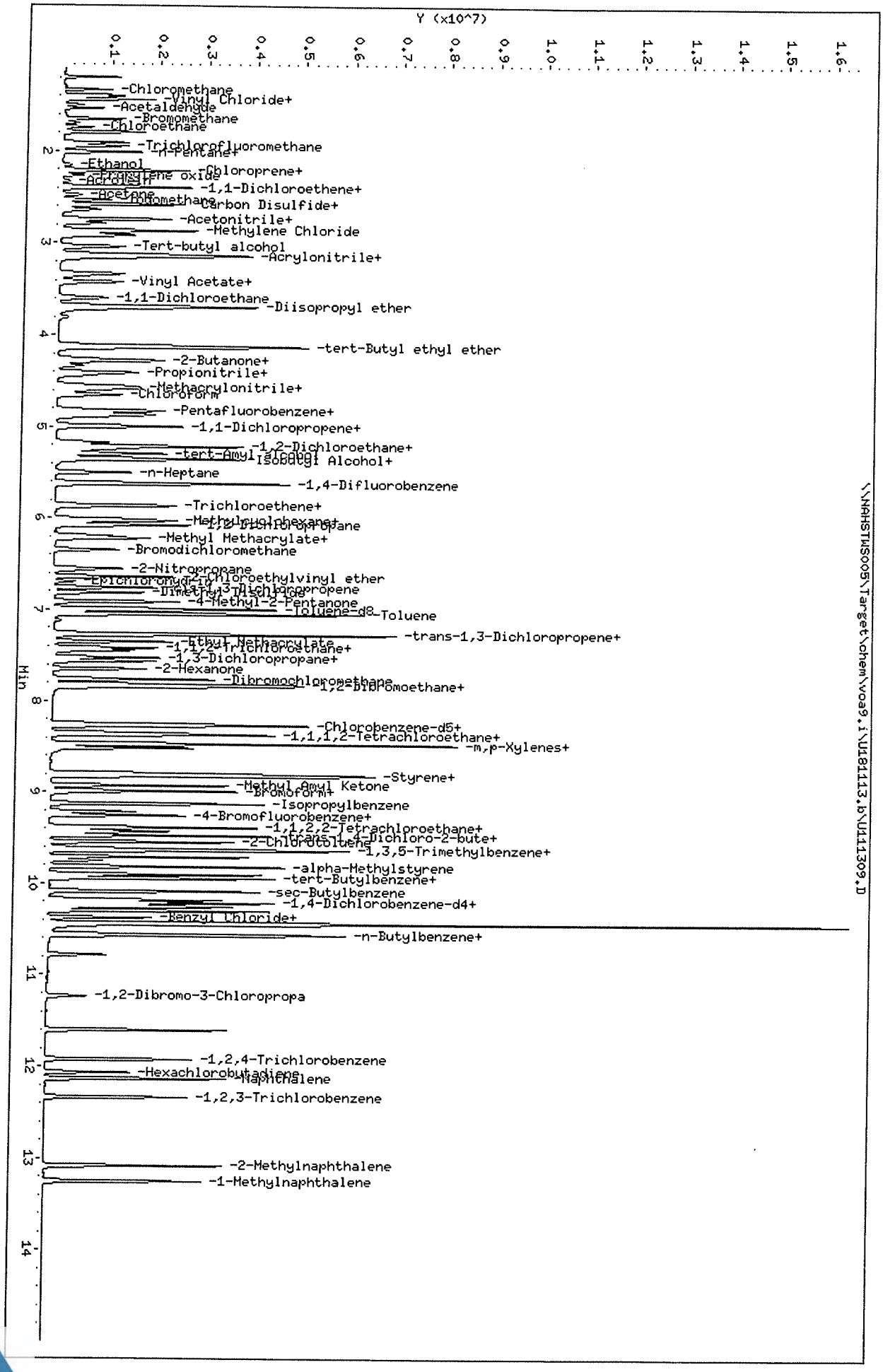
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	450542	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	856582	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	821336	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	399019	50.0000	
$ 30 Dibromofluoromethane	113	4.827	4.827	(0.987)	526814	100.000	103.01
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	696595	100.000	104.13
$ 48 Toluene-d8	98	6.990	6.990	(0.847)	2142731	100.000	103.85
$ 69 4-Bromofluorobenzene	95	9.258	9.258	(1.122)	823996	100.000	102.55
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	547424	100.000	105.66
31 1,1,1-Trichloroethane	97	4.823	4.823	(0.986)	826811	100.000	104.47
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	905540	100.000	95.80
138 Freon TF	101	2.394	2.394	(0.490)	456374	100.000	101.11
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	496464	100.000	95.07
22 1,1-Dichloroethane	63	3.597	3.597	(0.736)	991209	100.000	96.00
11 1,1-Dichloroethene	96	2.394	2.394	(0.490)	489401	100.000	96.23
32 1,1-Dichloropropene	75	4.999	4.999	(0.889)	782616	100.000	98.92
93 1,2,3-Trichlorobenzene	180	12.339	12.339	(1.205)	769767	100.000	102.18
71 1,2,3-Trichloropropane	75	9.430	9.430	(0.921)	1033869	100.000	104.82
90 1,2,4-Trichlorobenzene	180	11.927	11.927	(1.165)	795857	100.000	101.42
79 1,2,4-Trimethylbenzene	105	9.944	9.944	(0.971)	2240667	100.000	101.09
89 1,2-Dibromo-3-Chloropropane	155	11.237	11.237	(1.098)	149236	100.000	100.38
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	601967	100.000	99.55

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111309.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	1221135	100.000	95.83
33 1,2-Dichloroethane	62	5.250	5.250	(0.933)	845716	100.000	94.35
42 1,2-Dichloropropane	63	6.079	6.079	(1.081)	607568	100.000	99.62
75 1,3,5-Trimethylbenzene	105	9.629	9.629	(0.941)	2179527	100.000	101.66
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	1206946	100.000	96.07
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	1063077	100.000	94.81
84 1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	1240019	100.000	100.95
26 2,2-Dichloropropane	77	4.268	4.268	(0.873)	666488	100.000	104.24
24 2-Butanone	43	4.332	4.332	(0.886)	626648	200.000	197.86
76 2-Chlorotoluene	91	9.550	9.550	(0.933)	1897282	100.000	97.10
52 2-Hexanone	43	7.649	7.649	(0.927)	1009723	200.000	211.48(A)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	2209785	100.000	98.01
82 p-Isopropyltoluene	119	10.213	10.213	(0.998)	2303162	100.000	105.40
45 4-Methyl-2-Pentanone	43	6.915	6.915	(0.838)	1416197	200.000	206.69(A)
10 Acetone	43	2.476	2.476	(0.506)	430350	200.000	212.87(A)
37 Benzene	78	5.216	5.216	(0.927)	2279526	100.000	96.27
74 Bromobenzene	156	9.385	9.385	(0.917)	640019	100.000	97.78
29 Bromochloromethane	128	4.549	4.549	(0.930)	269321	100.000	101.39
39 Bromodichloromethane	83	6.345	6.345	(1.128)	740758	100.000	104.07
66 Bromoform	173	8.984	8.984	(1.089)	383125	100.000	100.58
6 Bromomethane	94	1.655	1.655	(0.339)	367005	100.000	96.33
19 Carbon Disulfide	76	2.581	2.581	(0.528)	3169516	200.000	201.81(A)
34 Carbon Tetrachloride	117	4.991	4.991	(0.887)	664499	100.000	107.51
59 Chlorobenzene	112	8.275	8.275	(1.003)	1606902	100.000	94.79
7 Chloroethane	64	1.741	1.741	(0.356)	444513	100.000	94.55(M)
28 Chloroform	83	4.654	4.654	(0.952)	994934	100.000	95.91
3 Chloromethane	50	1.333	1.333	(0.273)	595590	100.000	98.79
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.876)	613605	100.000	96.11
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	1019257	100.000	113.72
55 Dibromochloromethane	129	7.758	7.758	(0.940)	576245	100.000	110.87
44 Dibromomethane	93	6.187	6.187	(1.100)	378115	100.000	98.92
2 Dichlorodifluoromethane	85	1.198	1.198	(0.245)	680233	100.000	101.10
61 Ethylbenzene	106	8.373	8.373	(1.015)	844002	100.000	98.46
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	270039	100.000	102.92
67 Isopropylbenzene	105	9.126	9.126	(1.106)	2535018	100.000	101.55
62 m,p-Xylenes	106	8.474	8.474	(1.027)	2096282	200.000	198.47
17 Methylene Chloride	84	2.866	2.866	(0.586)	577262	100.000	101.12
87 n-Butylbenzene	91	10.558	10.558	(1.031)	2203969	100.000	102.68
73 n-Propylbenzene	91	9.479	9.479	(0.926)	3164922	100.000	100.51
92 Naphthalene	128	12.133	12.133	(1.185)	2576616	100.000	109.04
63 o-Xylene	106	8.811	8.811	(1.068)	1070218	100.000	101.23(H)
81 sec-Butylbenzene	105	10.090	10.090	(0.986)	2704732	100.000	103.16
64 Styrene	104	8.826	8.826	(1.070)	1856392	100.000	104.02
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	1862977	100.000	101.96
56 Tetrachloroethene	164	7.526	7.526	(0.912)	415217	100.000	96.50
50 Toluene	91	7.046	7.046	(0.854)	2482746	100.000	95.21
20 trans-1,2-Dichloroethene	96	3.136	3.136	(0.641)	538852	100.000	96.67
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	912116	100.000	101.29
38 Trichloroethene	130	5.861	5.861	(1.042)	566649	100.000	97.08
8 Trichlorofluoromethane	101	1.944	1.944	(0.398)	897271	100.000	99.61
5 Vinyl Chloride	62	1.411	1.411	(0.289)	744825	100.000	100.88

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Sample Info: VSTD100;VSTD100;1;8;
Purge Volume: 5.0
Column phase: DB624

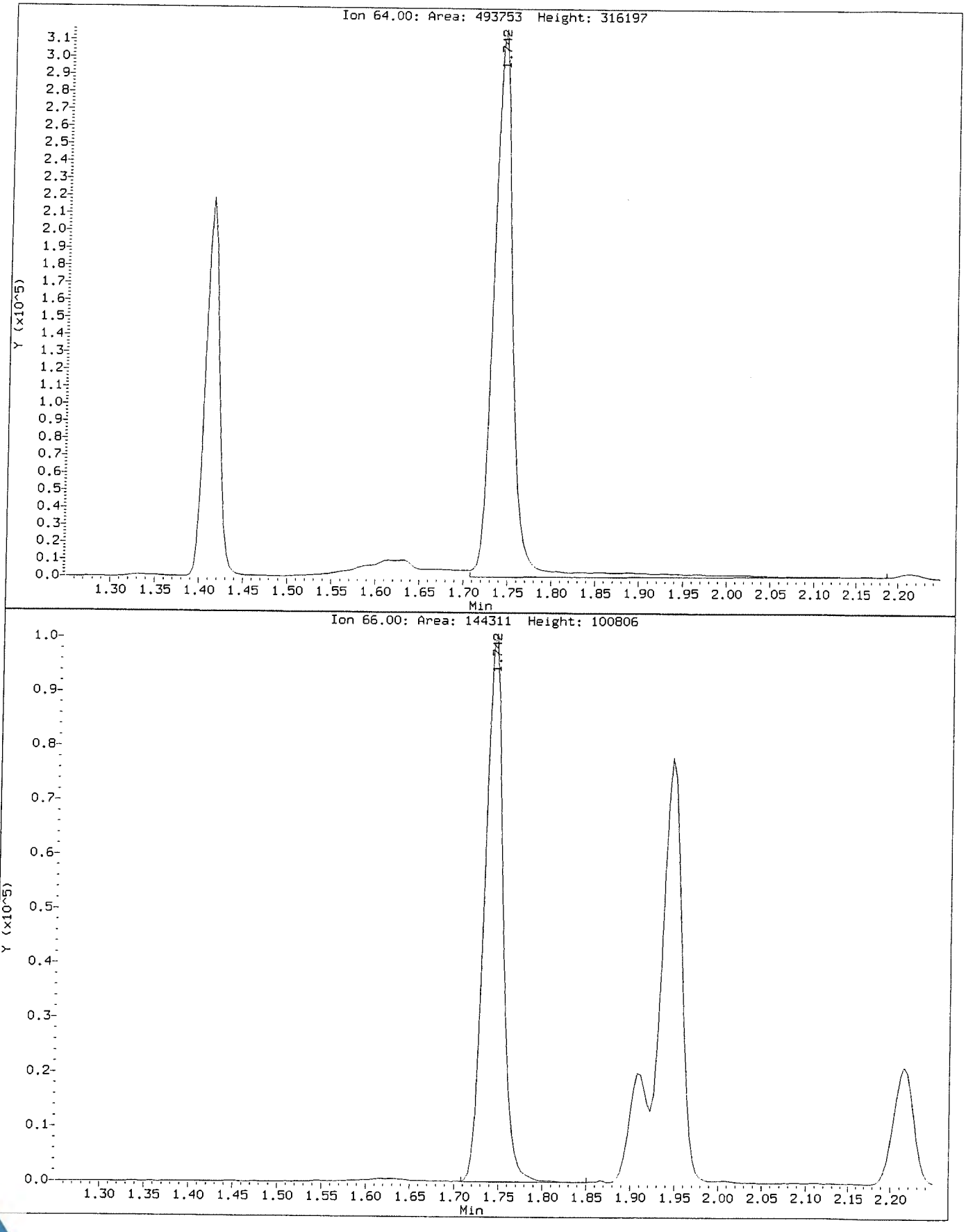
\\NAHSTNS005\Target\chem\voa9.i\U181113.b\U111309.D

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Page 4

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111309.D
Injection Date: 13-NOV-2018 14:39
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: Chloroethane
CAS Number: 75-00-3



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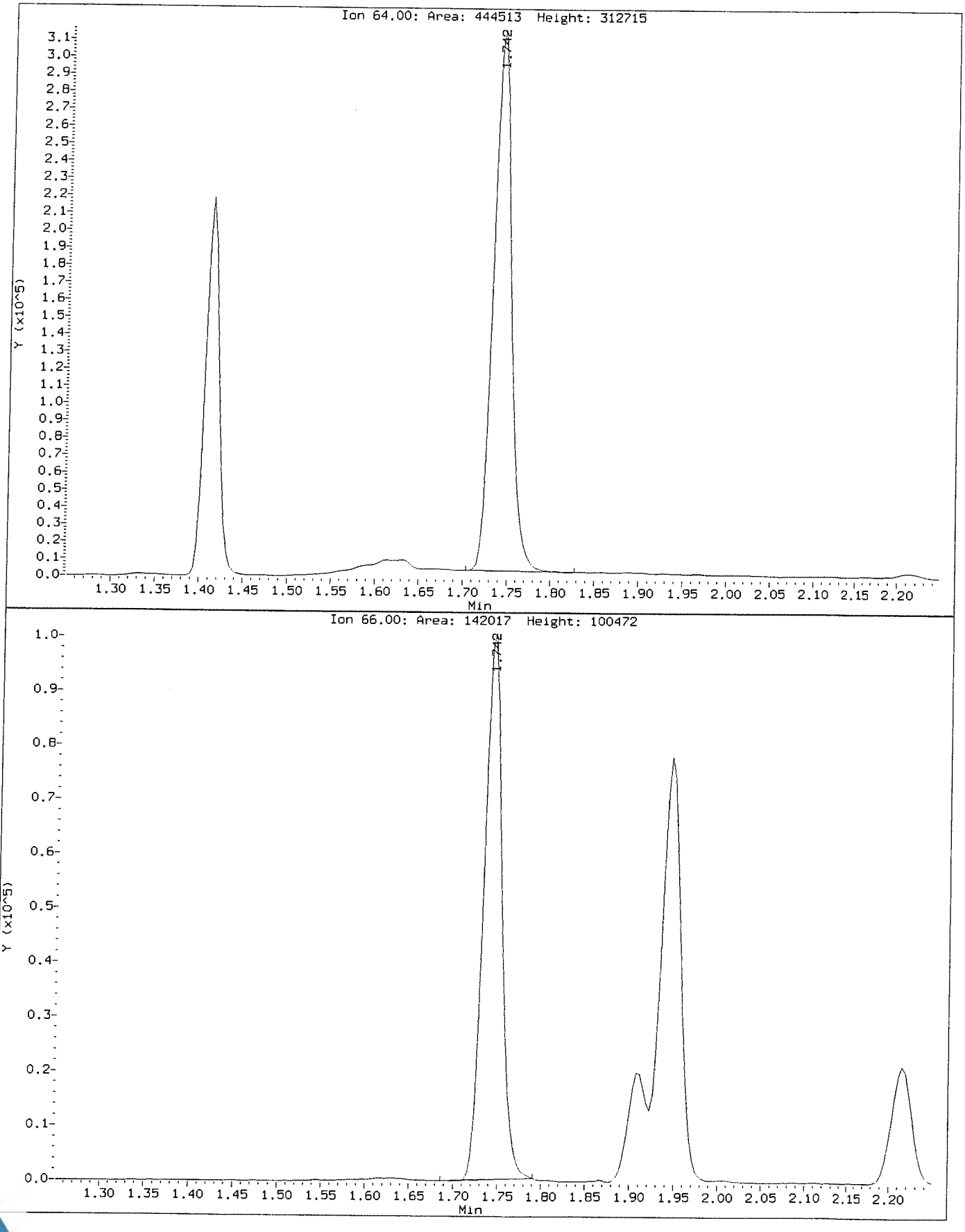
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: Chloroethane
CAS Number: 75-00-3



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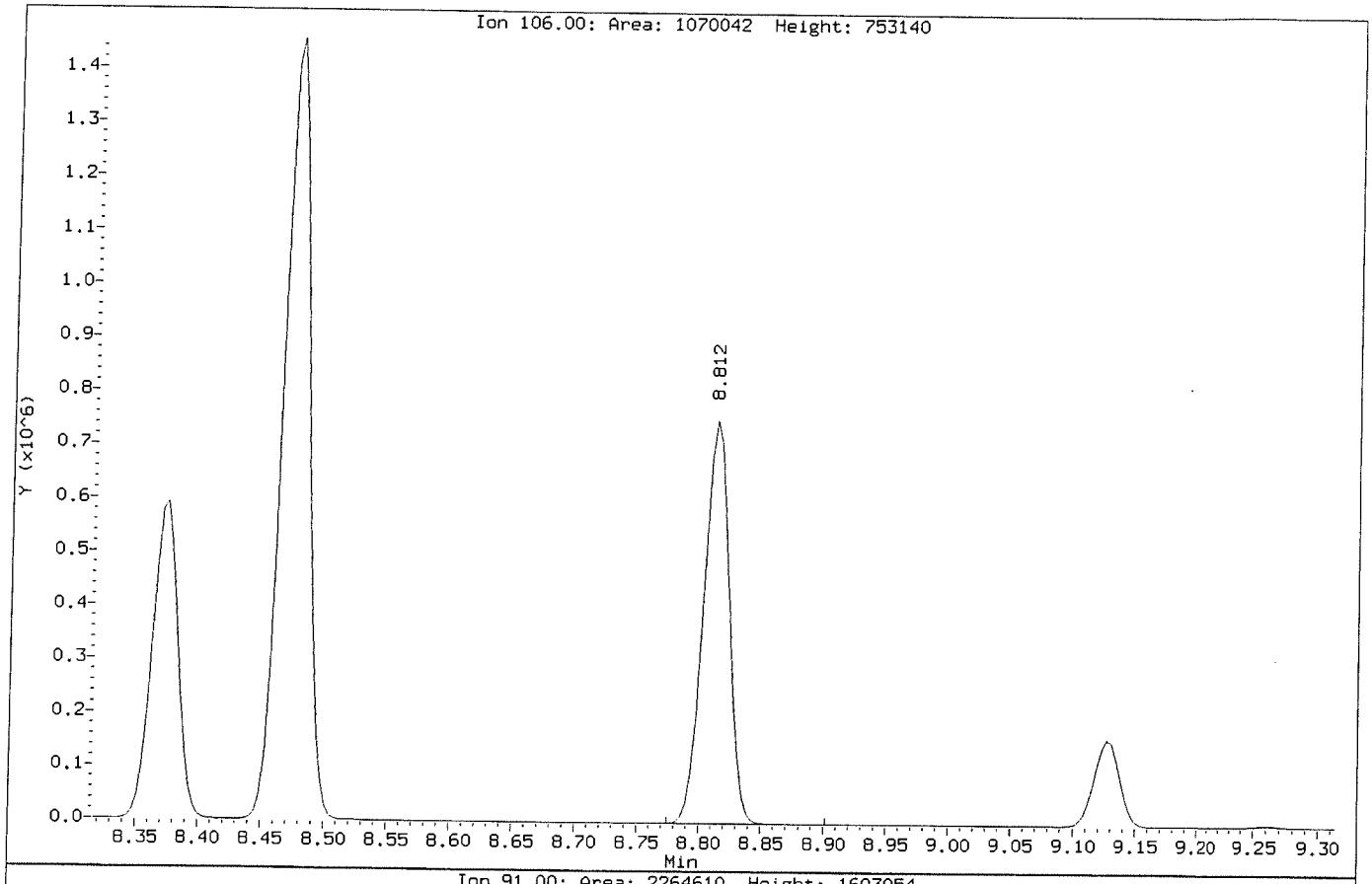
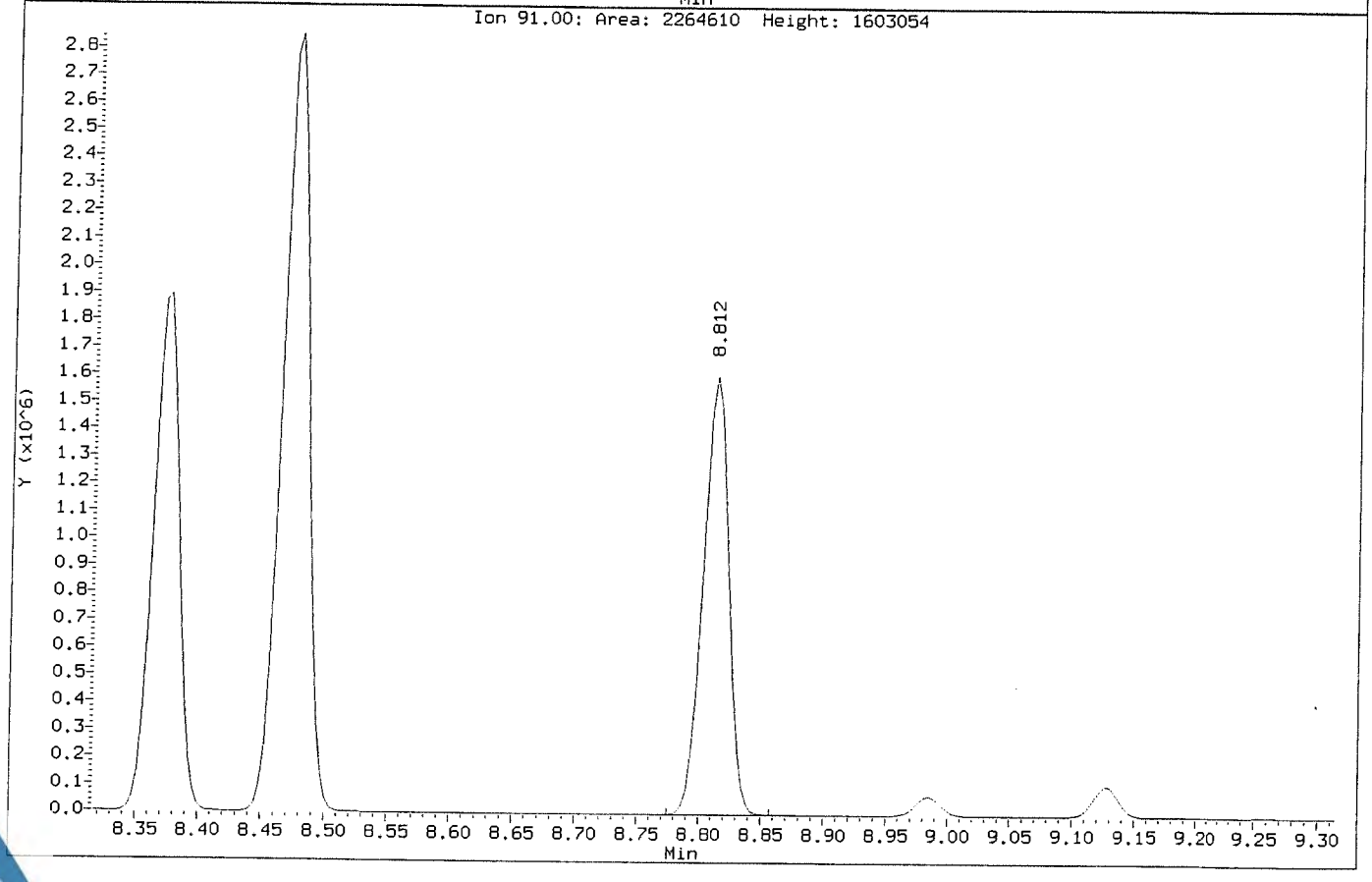
Injection Date: 13-NOV-2018 14:39
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: o-Xylene
CAS Number: 95-47-6





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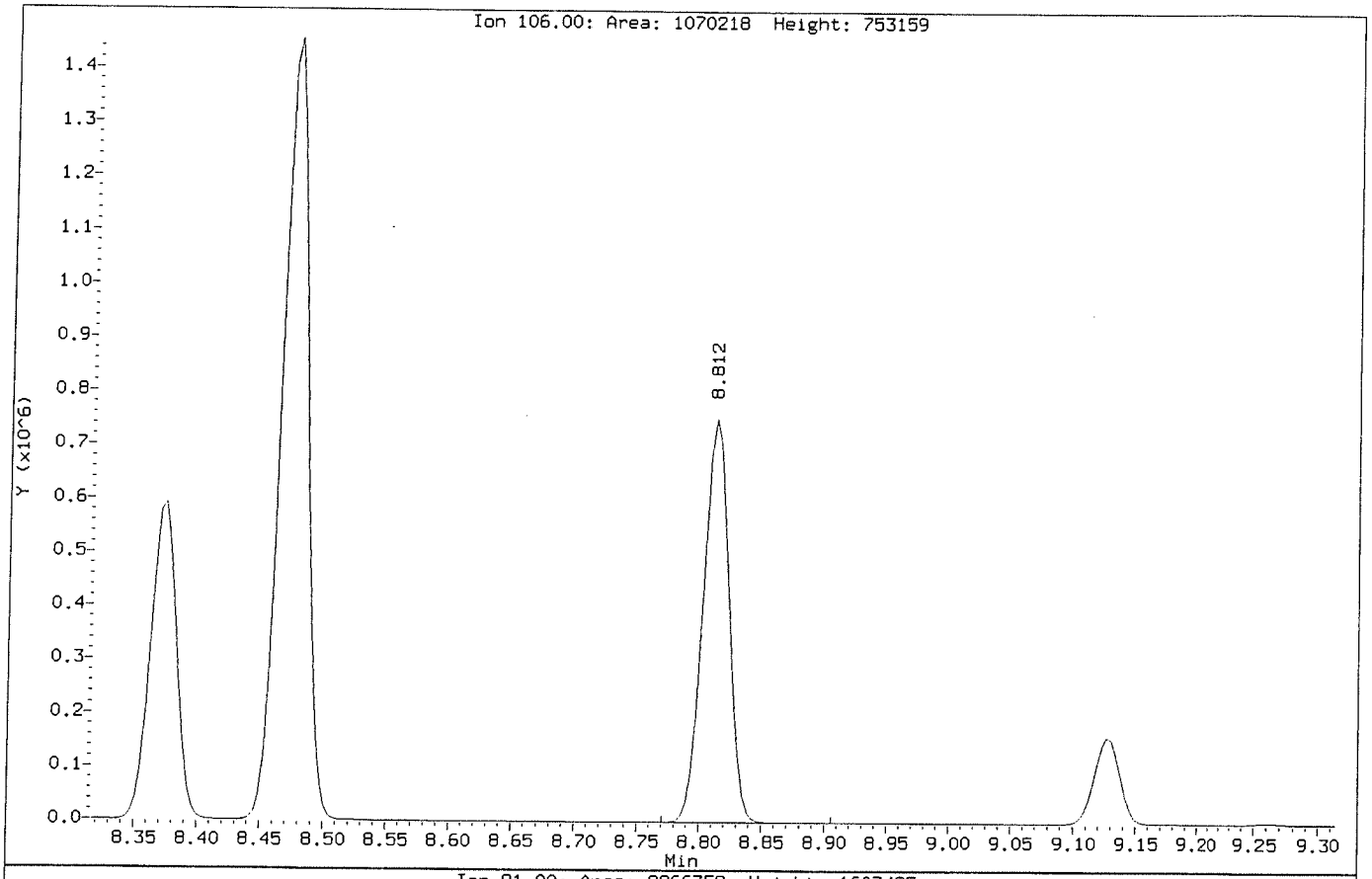
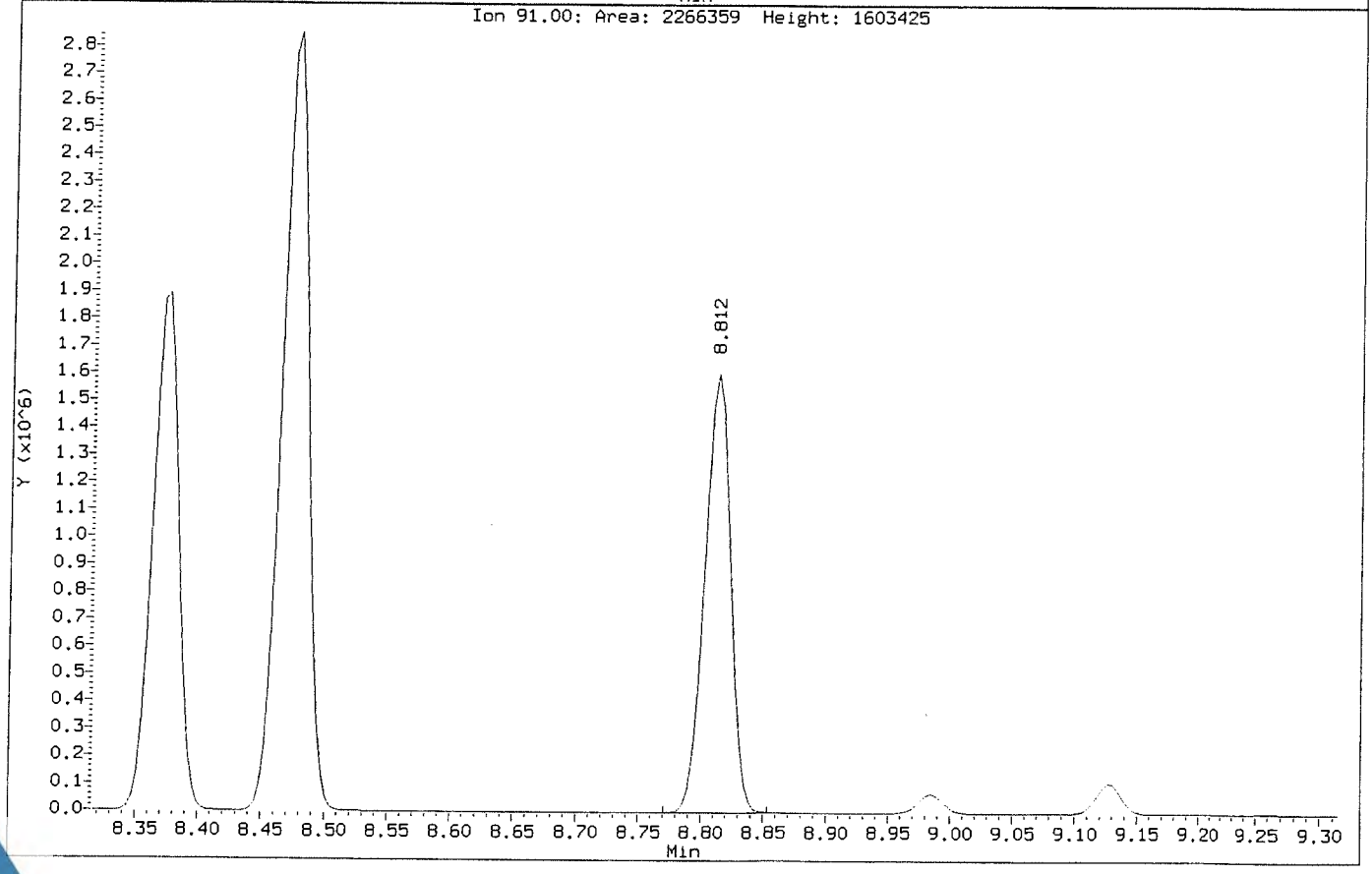
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: o-Xylene
CAS Number: 95-47-6





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111310.D
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Inj Date : 13-NOV-2018 15:04
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD150;VSTD150;1;9;
Misc Info : 180315V9;WATER;0;1;
Comment :
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Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:39 Cal File: U111309.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

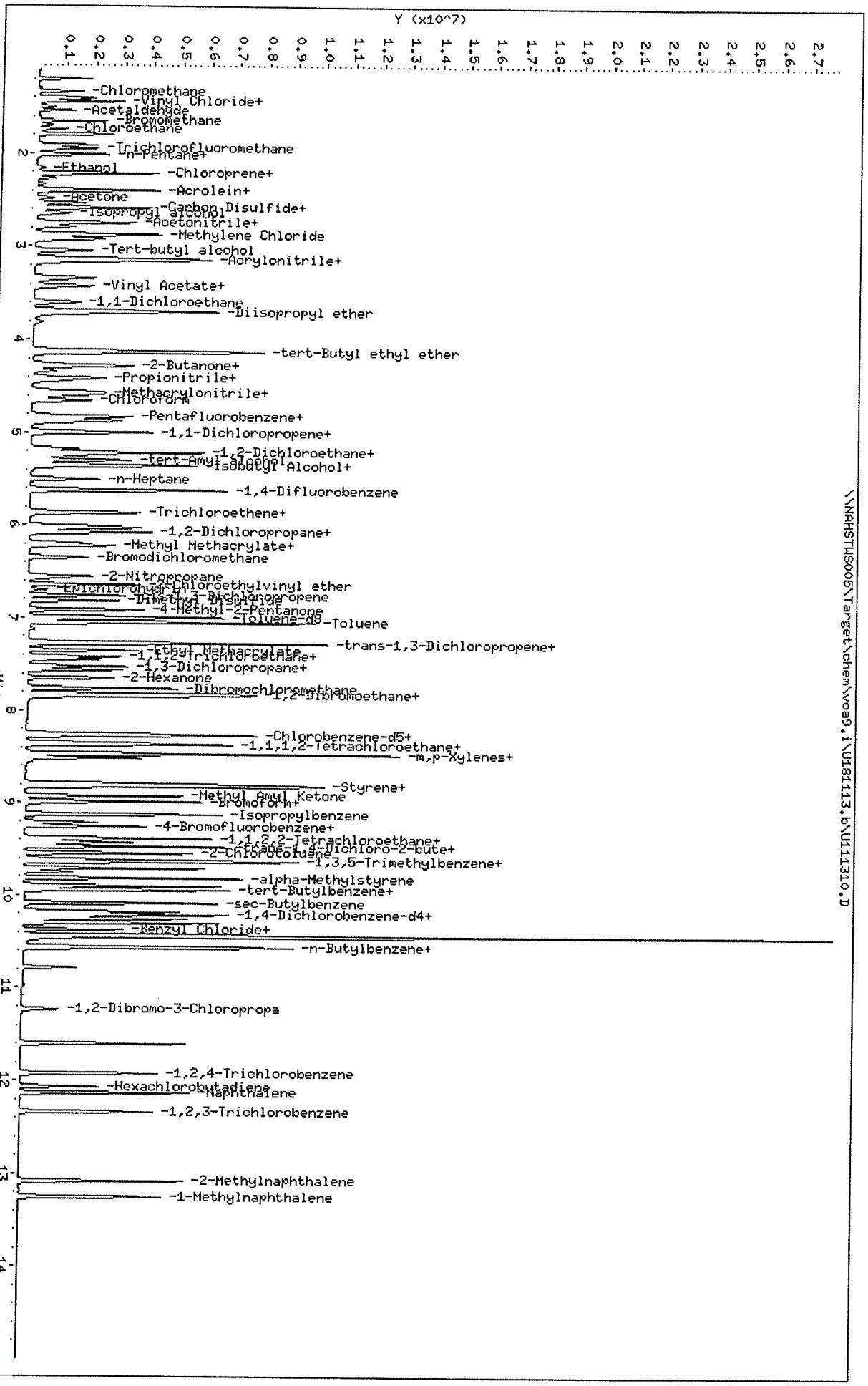
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	463456	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	890799	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	854800	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	408174	50.0000	
$ 30 Dibromofluoromethane	113	4.827	4.827	(0.986)	809097	150.000	154.42
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	1062364	150.000	155.24
$ 48 Toluene-d8	98	6.990	6.990	(0.847)	3238162	150.000	151.57
$ 69 4-Bromofluorobenzene	95	9.258	9.258	(1.122)	1261578	150.000	151.36
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	858465	150.000	159.21
31 1,1,1-Trichloroethane	97	4.827	4.827	(0.986)	1329534	150.000	163.31
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	1394090	150.000	144.19
138 Freon TF	101	2.397	2.397	(0.490)	735007	150.000	158.31
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	767365	150.000	141.20
22 1,1-Dichloroethane	63	3.601	3.601	(0.736)	1566973	150.000	147.54
11 1,1-Dichloroethene	96	2.394	2.394	(0.489)	789917	150.000	150.99
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	1250083	150.000	151.94
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	1201294	150.000	155.88
71 1,2,3-Trichloropropane	75	9.430	9.430	(0.921)	1603390	150.000	158.92
90 1,2,4-Trichlorobenzene	180	11.927	11.927	(1.165)	1246599	150.000	155.30
79 1,2,4-Trimethylbenzene	105	9.944	9.944	(0.971)	3425922	150.000	151.11
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	234820	150.000	152.68
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	923726	150.000	146.78

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111310.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	1872904	150.000	143.68
33 1,2-Dichloroethane	62	5.250	5.250	(0.933)	1302354	150.000	139.71
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	950163	150.000	149.81
75 1,3,5-Trimethylbenzene	105	9.629	9.629	(0.941)	3367895	150.000	153.56
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	1864119	150.000	145.05
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	1651259	150.000	141.50
84 1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	1907496	150.000	151.83
26 2,2-Dichloropropane	77	4.272	4.272	(0.873)	1089497	150.000	165.65
24 2-Butanone	43	4.336	4.336	(0.886)	955107	300.000	293.17(A)
76 2-Chlorotoluene	91	9.550	9.550	(0.933)	2905161	150.000	145.35
52 2-Hexanone	43	7.653	7.653	(0.928)	1563288	300.000	314.60(A)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	3405553	150.000	147.66
82 p-Isopropyltoluene	119	10.213	10.213	(0.998)	3559913	150.000	159.26
45 4-Methyl-2-Pentanone	43	6.915	6.915	(0.838)	2161270	300.000	303.08(A)
10 Acetone	43	2.480	2.480	(0.507)	636098	300.000	307.81(A)
37 Benzene	78	5.216	5.216	(0.927)	3563563	150.000	144.72
74 Bromobenzene	156	9.385	9.385	(0.917)	991935	150.000	148.14
29 Bromochloromethane	128	4.553	4.553	(0.930)	396590	150.000	145.15
39 Bromodichloromethane	83	6.349	6.349	(1.129)	1169536	150.000	158.01
66 Bromoform	173	8.984	8.984	(1.089)	610635	150.000	152.14
6 Bromomethane	94	1.655	1.655	(0.338)	609177	150.000	154.28
19 Carbon Disulfide	76	2.585	2.585	(0.528)	5076235	300.000	314.21(A)
34 Carbon Tetrachloride	117	4.995	4.995	(0.888)	1081499	150.000	168.27
59 Chlorobenzene	112	8.275	8.275	(1.003)	2477986	150.000	140.45
7 Chloroethane	64	1.741	1.741	(0.356)	708077	150.000	146.42(M)
28 Chloroform	83	4.654	4.654	(0.951)	1558200	150.000	146.02
3 Chloromethane	50	1.337	1.337	(0.273)	963160	150.000	155.17
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	965405	150.000	147.00
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	1623779	150.000	174.21
55 Dibromochloromethane	129	7.758	7.758	(0.940)	908238	150.000	167.91
44 Dibromomethane	93	6.191	6.191	(1.101)	587501	150.000	147.80
2 Dichlorodifluoromethane	85	1.202	1.202	(0.246)	1086406	150.000	156.42
61 Ethylbenzene	106	8.373	8.373	(1.015)	1325471	150.000	148.58
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	426795	150.000	149.03
67 Isopropylbenzene	105	9.126	9.126	(1.106)	3937489	150.000	151.57
62 m,p-Xylenes	106	8.474	8.474	(1.027)	3241074	300.000	294.85(A)
17 Methylene Chloride	84	2.866	2.866	(0.586)	911224	150.000	155.55
87 n-Butylbenzene	91	10.558	10.558	(1.031)	3347969	150.000	149.04
73 n-Propylbenzene	91	9.479	9.479	(0.926)	4851775	150.000	150.63
92 Naphthalene	128	12.133	12.133	(1.185)	3933835	150.000	162.75
63 o-Xylene	106	8.811	8.811	(1.068)	1663910	150.000	151.23(H)
81 sec-Butylbenzene	105	10.090	10.090	(0.986)	4188144	150.000	156.16
64 Styrene	104	8.826	8.826	(1.070)	2865534	150.000	154.28
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	2893337	150.000	154.80
56 Tetrachloroethene	164	7.526	7.526	(0.912)	658457	150.000	147.04
50 Toluene	91	7.050	7.050	(0.855)	3865080	150.000	142.41
20 trans-1,2-Dichloroethene	96	3.140	3.140	(0.642)	855722	150.000	149.25
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	1439550	150.000	152.95
38 Trichloroethene	130	5.861	5.861	(1.042)	898620	150.000	148.04
8 Trichlorofluoromethane	101	1.948	1.948	(0.398)	1438631	150.000	155.26
5 Vinyl Chloride	62	1.415	1.415	(0.289)	1189386	150.000	156.33

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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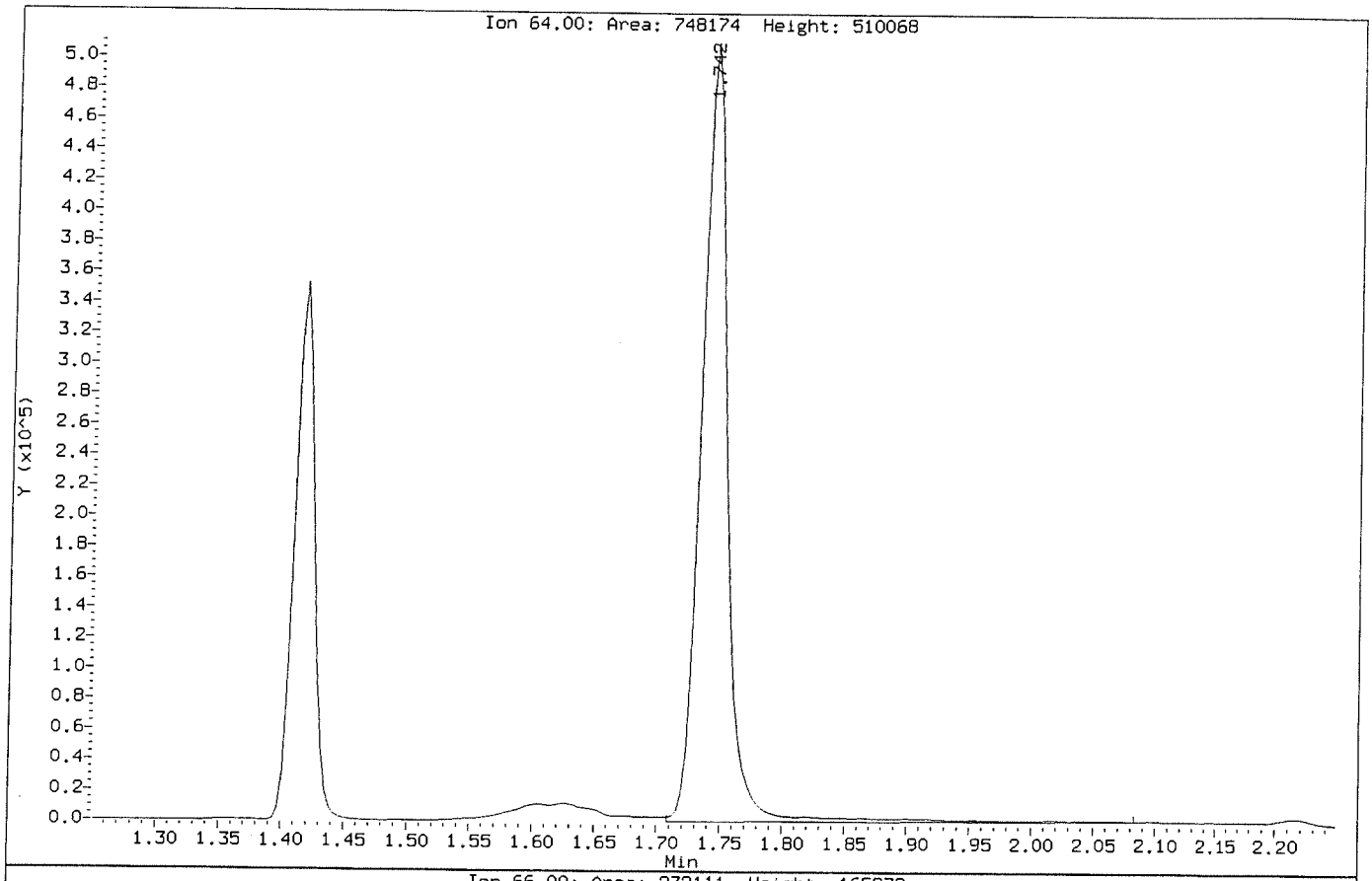
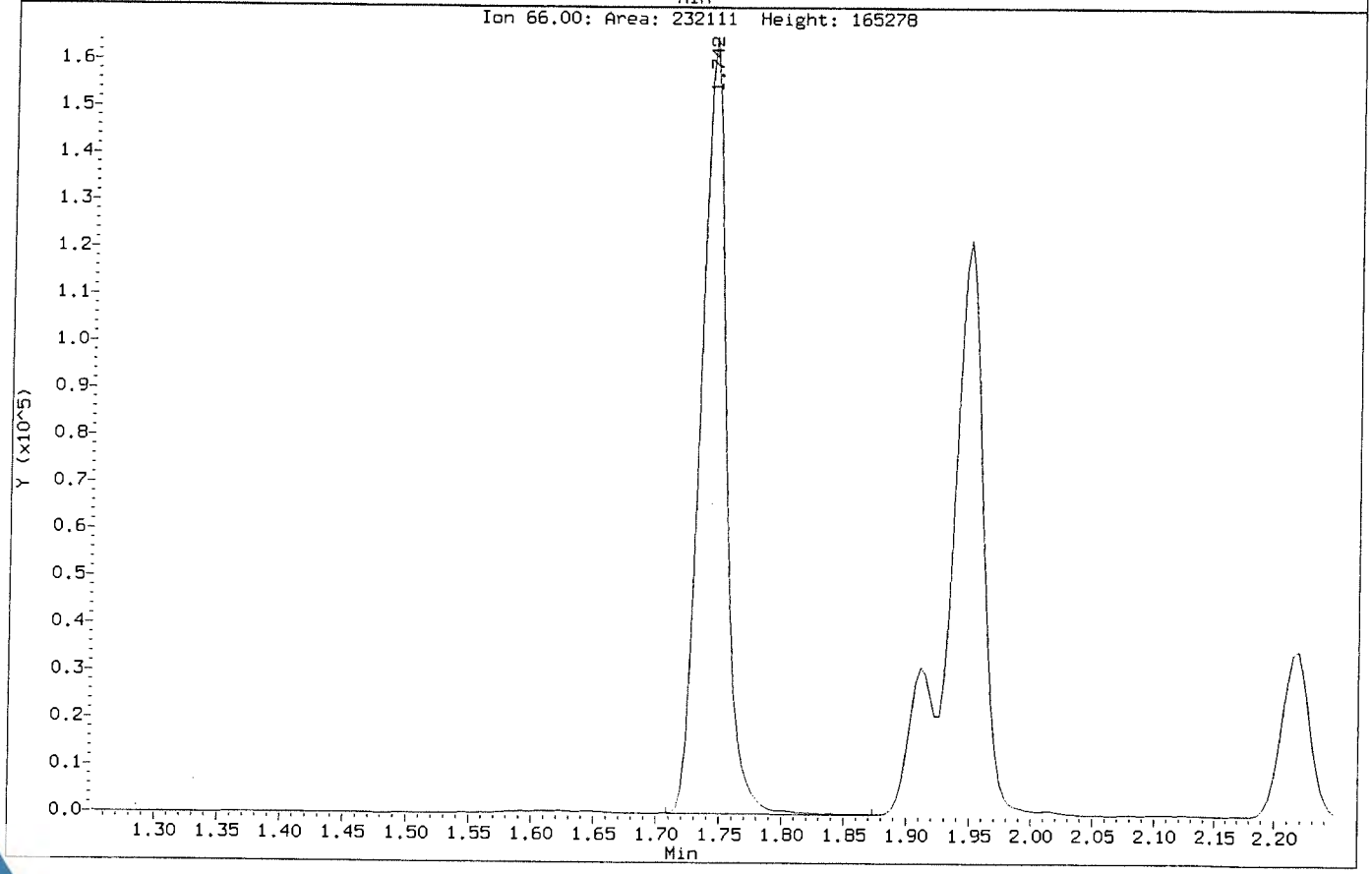
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111310.D
Injection Date: 13-NOV-2018 15:04
Instrument: VOA9.i
Client Sample ID: VSTD150

Compound: Chloroethane
CAS Number: 75-00-3





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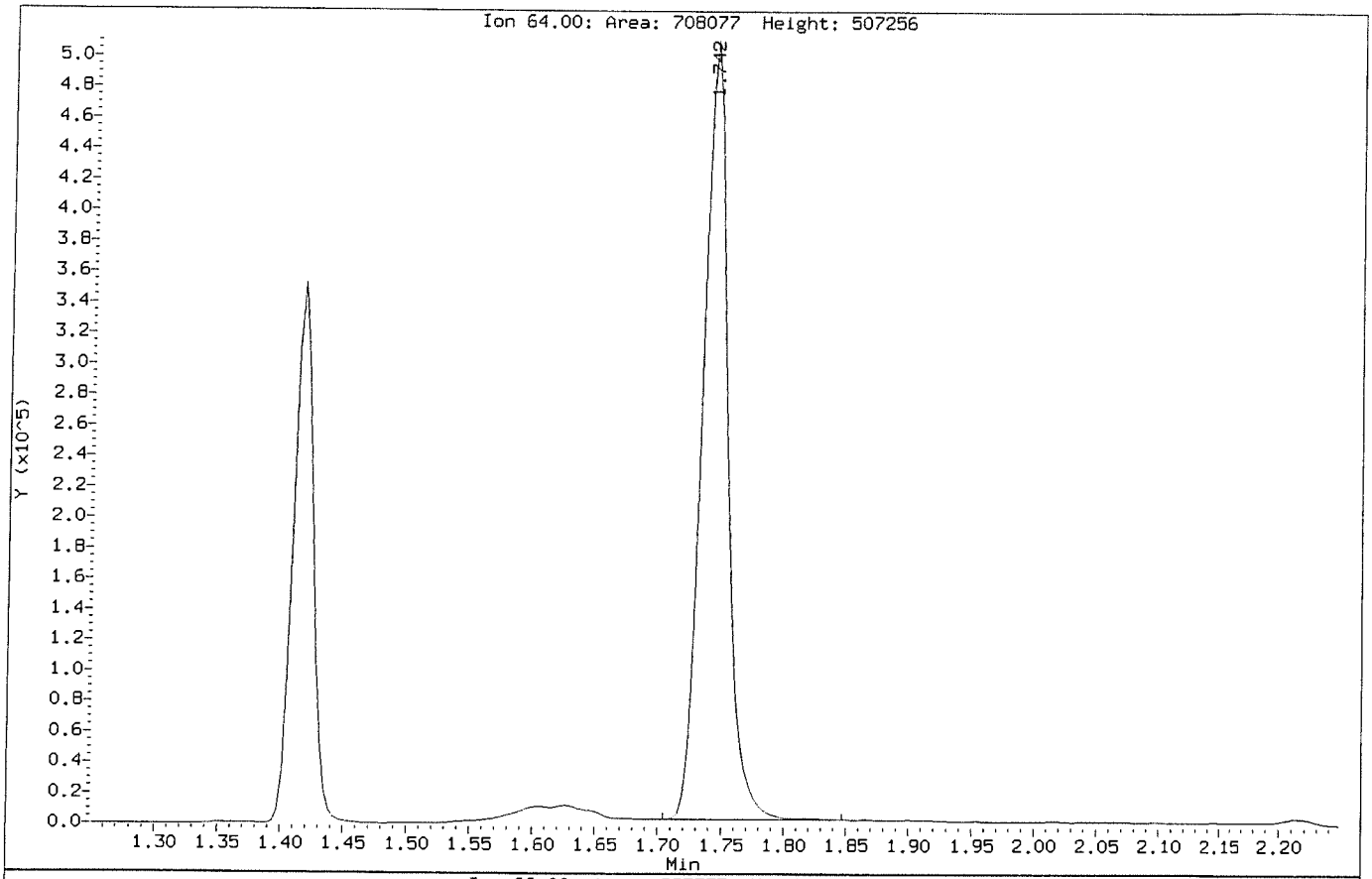
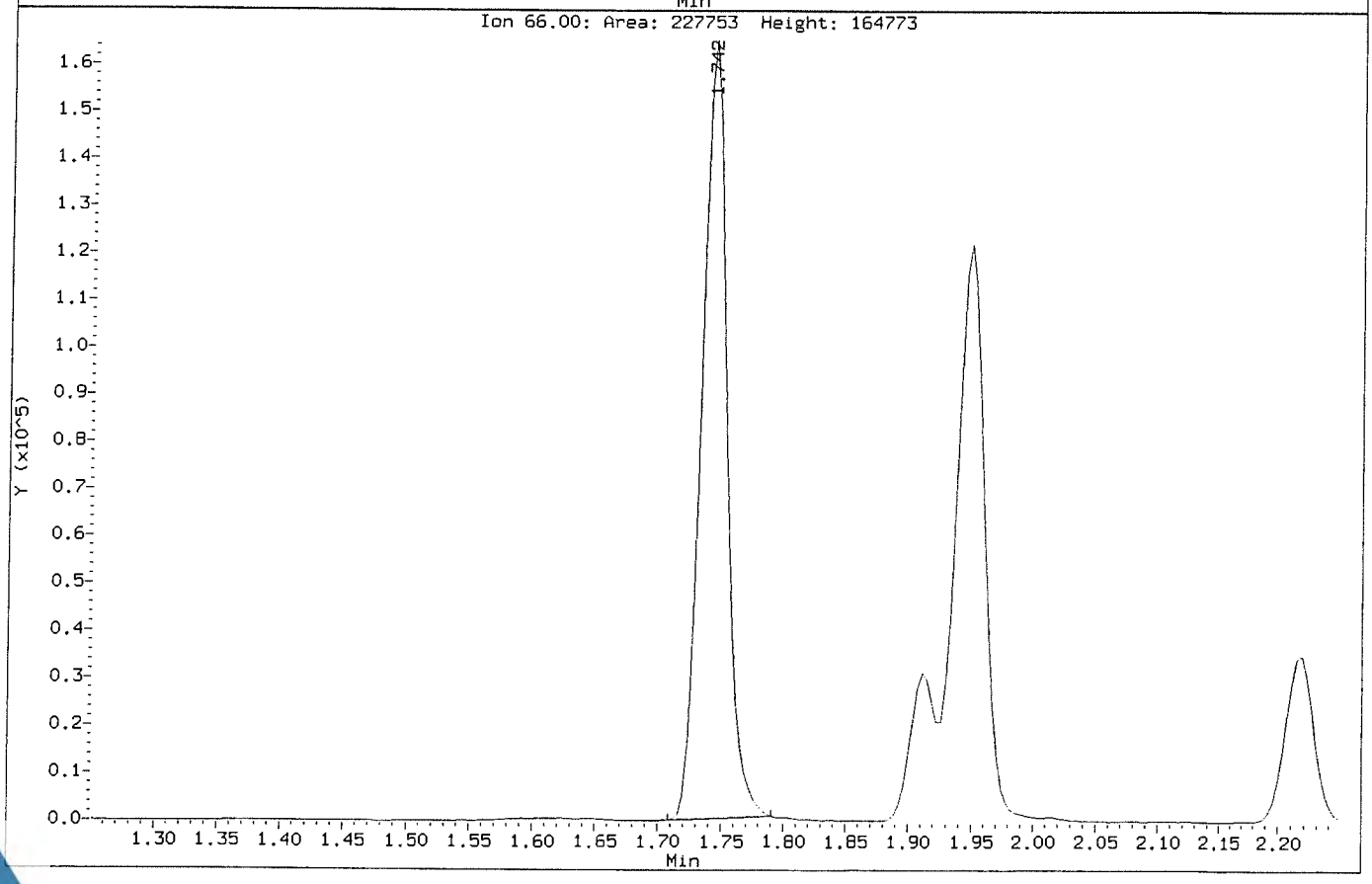
Injection Date: 13-NOV-2018 15:04
Instrument: VOA9.i
Client Sample ID: VSTD150

Compound: Chloroethane
CAS Number: 75-00-3





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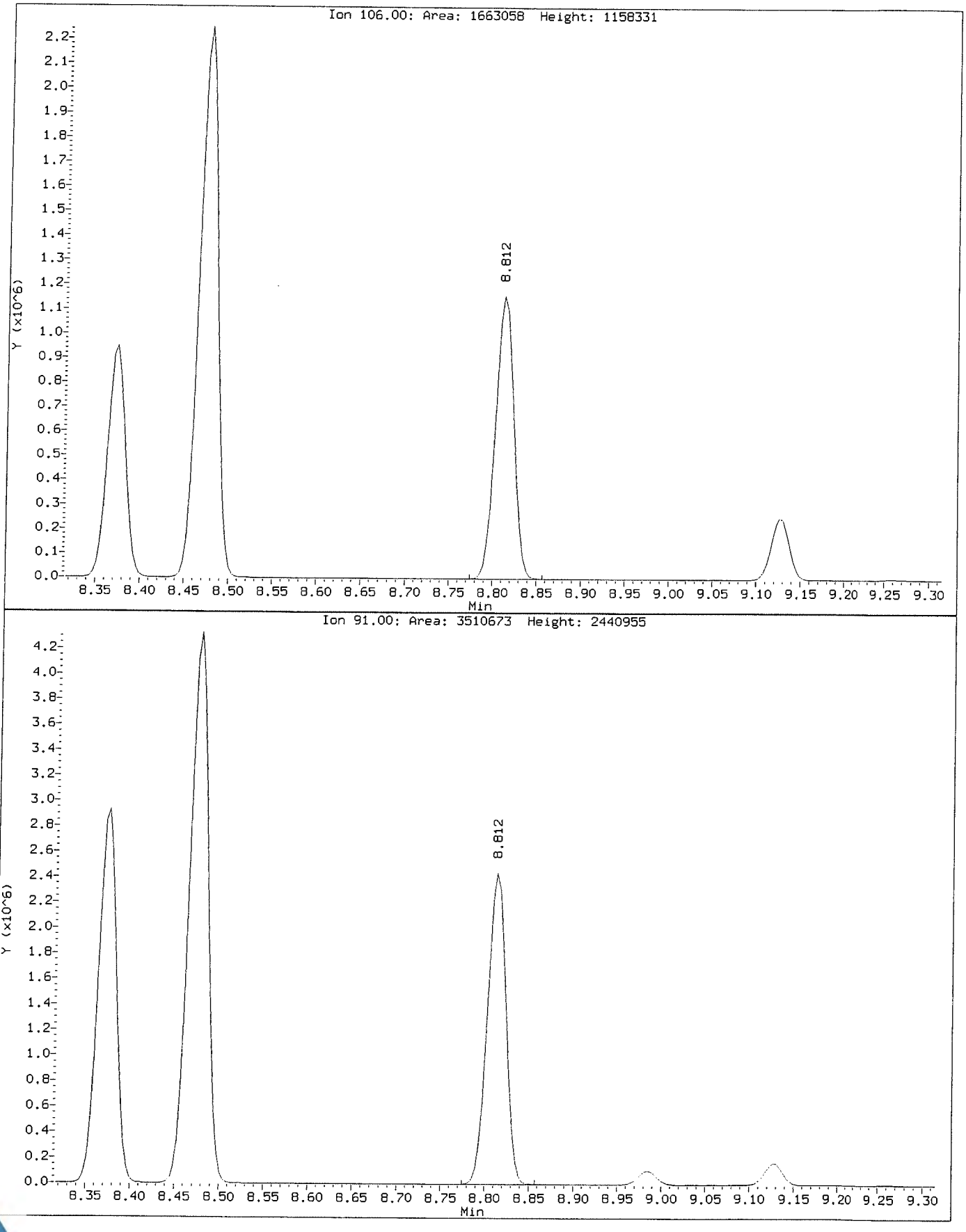
Injection Date: 13-NOV-2018 15:04
Instrument: VOA9.i
Client Sample ID: VSTD150

Compound: o-Xylene
CAS Number: 95-47-6



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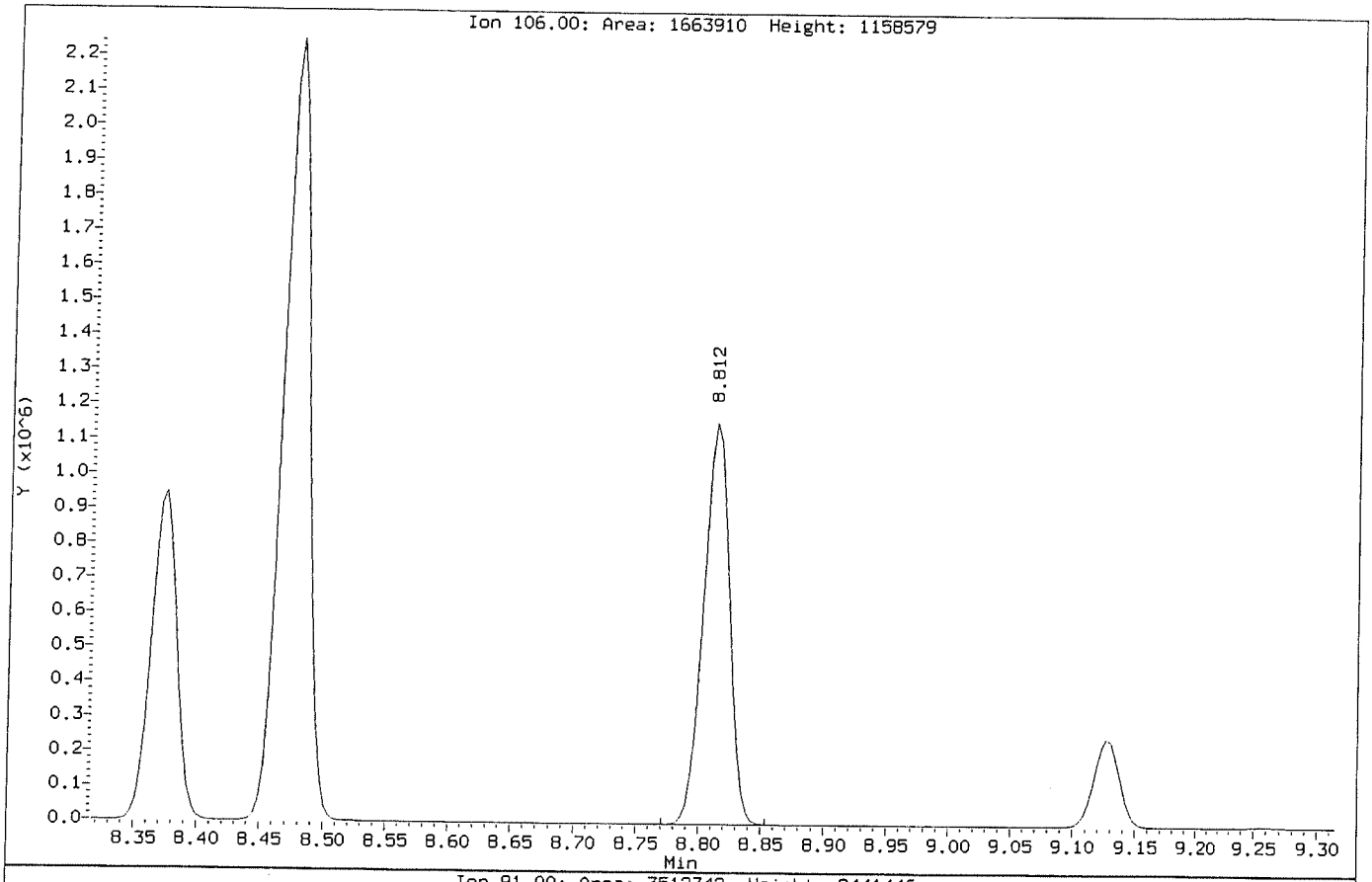
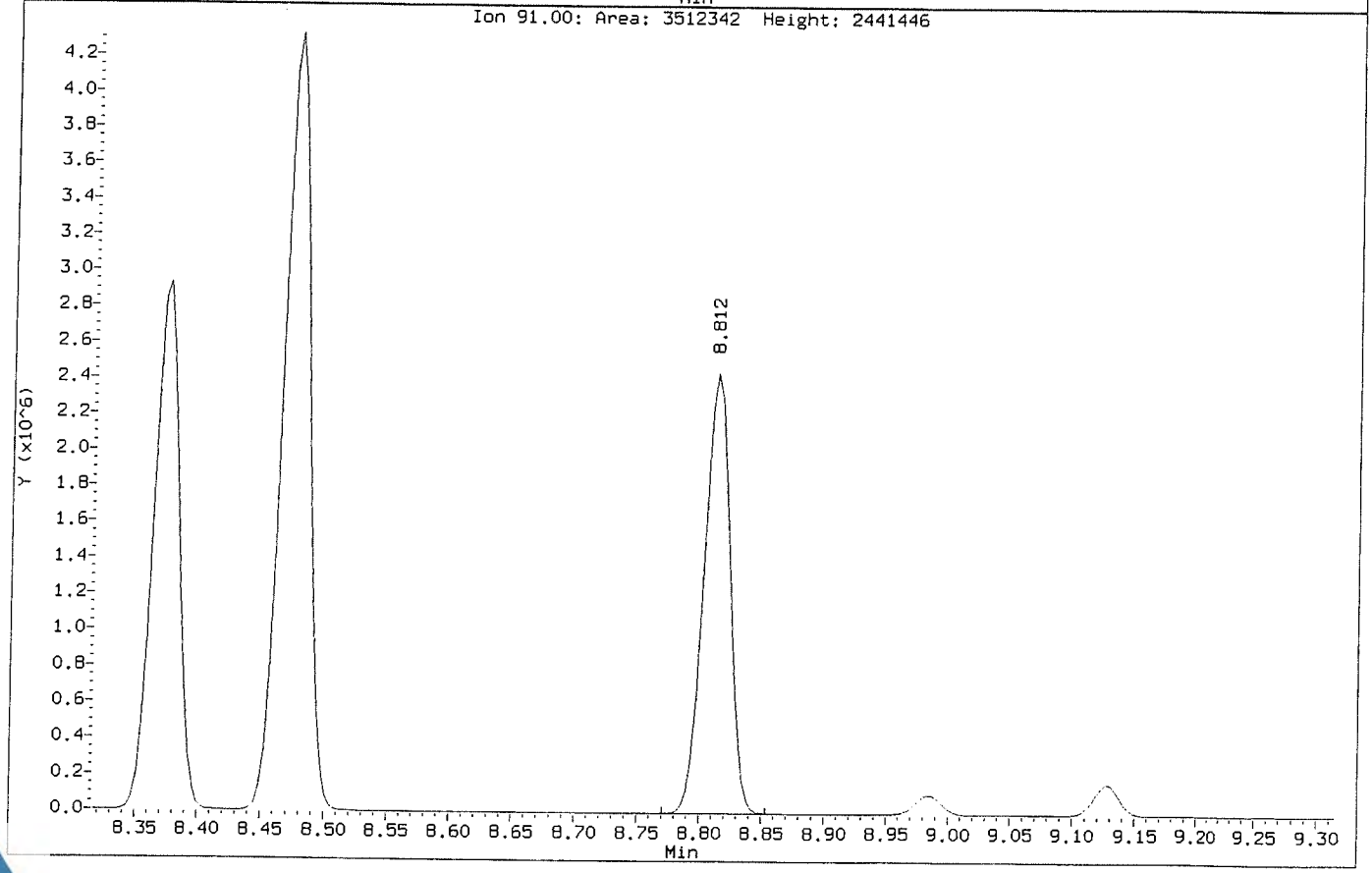
Instrument: VOA9.i
Client Sample ID: VSTD150

Compound: o-Xylene
CAS Number: 95-47-6





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111311.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111311.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 13-NOV-2018 15:28
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD200;VSTD200;1;10;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 15:04 Cal File: U111310.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

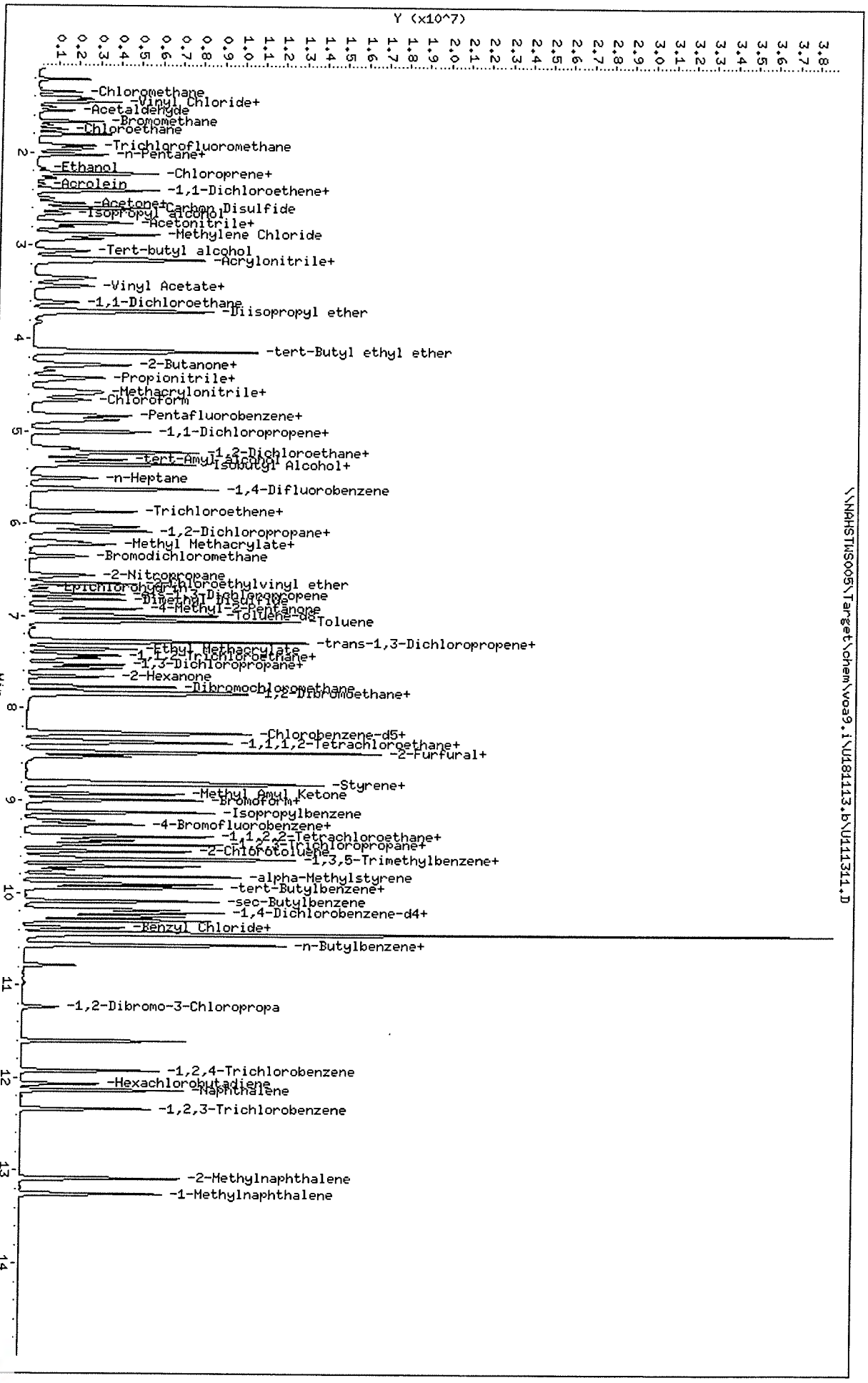
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.898	(1.000)	505644	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.629	(1.000)	946062	50.0000	
* 47 Chlorobenzene-d5	117	8.253	8.253	(1.000)	896349	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.239	10.239	(1.000)	426550	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	1112100	200.000	194.87
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	1441844	200.000	193.54
$ 48 Toluene-d8	98	6.993	6.993	(0.847)	4386438	200.000	196.29
$ 69 4-Bromofluorobenzene	95	9.261	9.261	(1.122)	1723103	200.000	197.48
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	1191494	200.000	210.73(A)
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	1824622	200.000	205.42(A)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.917)	1884161	200.000	186.48
138 Freon TF	101	2.405	2.405	(0.491)	1007022	200.000	198.80
53 1,1,2-Trichloroethane	83	7.424	7.424	(0.900)	1043779	200.000	183.16
22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	2138732	200.000	184.57
11 1,1-Dichloroethene	96	2.405	2.405	(0.491)	1081090	200.000	189.41
32 1,1-Dichloropropene	75	5.010	5.010	(0.890)	1707700	200.000	195.44
93 1,2,3-Trichlorobenzene	180	12.339	12.339	(1.205)	1636643	200.000	203.23(A)
71 1,2,3-Trichloropropane	75	9.434	9.434	(0.921)	2176006	200.000	206.38(A)
90 1,2,4-Trichlorobenzene	180	11.926	11.926	(1.165)	1712716	200.000	204.18(A)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	4631542	200.000	195.48
89 1,2-Dibromo-3-Chloropropane	155	11.237	11.237	(1.097)	321770	200.000	198.50
57 1,2-Dibromoethane	107	7.855	7.855	(0.952)	1265930	200.000	191.84

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111311.D Page 2
Report Date: 24-Jan-2019 18:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	2535364	200.000	186.12
33	1,2-Dichloroethane	62	5.257	5.257	(0.934)	1770998	200.000	178.89
42	1,2-Dichloropropane	63	6.086	6.086	(1.081)	1294674	200.000	192.20
75	1,3,5-Trimethylbenzene	105	9.628	9.628	(0.940)	4535917	200.000	197.91
83	1,3-Dichlorobenzene	146	10.183	10.183	(0.995)	2548608	200.000	189.77
54	1,3-Dichloropropane	76	7.567	7.567	(0.917)	2235193	200.000	182.67
84	1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	2606334	200.000	198.53
26	2,2-Dichloropropane	77	4.279	4.279	(0.874)	1492829	200.000	208.03(A)
24	2-Butanone	43	4.343	4.343	(0.887)	1287268	400.000	362.16(A)
76	2-Chlorotoluene	91	9.550	9.550	(0.933)	3934986	200.000	188.39
52	2-Hexanone	43	7.653	7.653	(0.927)	2091584	400.000	401.41(A)
77	4-Chlorotoluene	91	9.643	9.643	(0.942)	4615489	200.000	191.50
82	p-Isopropyltoluene	119	10.213	10.213	(0.997)	4810748	200.000	205.94(A)
45	4-Methyl-2-Pentanone	43	6.918	6.918	(0.838)	2944165	400.000	393.73(A)
10	Acetone	43	2.491	2.491	(0.509)	869596	400.000	386.81(A)
37	Benzene	78	5.224	5.224	(0.928)	4810692	200.000	183.96(M)
74	Bromobenzene	156	9.385	9.385	(0.917)	1358088	200.000	194.09
29	Bromochloromethane	128	4.560	4.560	(0.931)	537789	200.000	180.41
39	Bromodichloromethane	83	6.352	6.352	(1.129)	1603888	200.000	204.03(A)
66	Bromoform	173	8.987	8.987	(1.089)	844522	200.000	198.75
6	Bromomethane	94	1.662	1.662	(0.340)	794649	200.000	184.09
19	Carbon Disulfide	76	2.596	2.596	(0.530)	6896612	400.000	391.27(A)
34	Carbon Tetrachloride	117	4.999	4.999	(0.888)	1483776	200.000	217.37(A)
59	Chlorobenzene	112	8.279	8.279	(1.003)	3391468	200.000	183.32
7	Chloroethane	64	1.749	1.749	(0.357)	955282	200.000	181.06(M)
28	Chloroform	83	4.661	4.661	(0.952)	2117243	200.000	181.86
3	Chloromethane	50	1.344	1.344	(0.274)	1334230	200.000	196.96
27	cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	1322041	200.000	184.51
46	cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	2224591	200.000	224.72(A)
55	Dibromochloromethane	129	7.762	7.762	(0.940)	1258930	200.000	221.96(A)
44	Dibromomethane	93	6.195	6.195	(1.101)	803081	200.000	190.24
2	Dichlorodifluoromethane	85	1.213	1.213	(0.248)	1483355	200.000	195.50
61	Ethylbenzene	106	8.373	8.373	(1.015)	1806514	200.000	193.12(M)
91	Hexachlorobutadiene	225	12.065	12.065	(1.178)	582613	200.000	183.44
67	Isopropylbenzene	105	9.130	9.130	(1.106)	5274717	200.000	193.63
62	m,p-Xylenes	106	8.474	8.474	(1.027)	4413064	400.000	382.86(AM)
17	Methylene Chloride	84	2.877	2.877	(0.587)	1246871	200.000	195.27
87	n-Butylbenzene	91	10.558	10.558	(1.031)	4531778	200.000	189.12
73	n-Propylbenzene	91	9.478	9.478	(0.926)	6433909	200.000	191.14
92	Naphthalene	128	12.136	12.136	(1.185)	5280797	200.000	209.07(A)
63	o-Xylene	106	8.815	8.815	(1.068)	2277275	200.000	197.39(MH)
81	sec-Butylbenzene	105	10.090	10.090	(0.985)	5603961	200.000	199.95
64	Styrene	104	8.826	8.826	(1.069)	3881020	200.000	199.27
78	tert-Butylbenzene	119	9.906	9.906	(0.967)	3887715	200.000	199.04
56	Tetrachloroethene	164	7.525	7.525	(0.912)	907758	200.000	193.32
50	Toluene	91	7.049	7.049	(0.854)	5182031	200.000	182.09
20	trans-1,2-Dichloroethene	96	3.147	3.147	(0.643)	1173691	200.000	187.63
51	trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	1983766	200.000	198.03
38	Trichloroethene	130	5.865	5.865	(1.042)	1238549	200.000	192.12
8	Trichlorofluoromethane	101	1.955	1.955	(0.399)	1950000	200.000	192.89
5	Vinyl Chloride	62	1.426	1.426	(0.291)	1622522	200.000	195.34

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.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Min
1 2 3 4 5 6 7 8 9 10 11 12 13 14
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-n-Pentane+
-Ethanol
-Chloroprene+
-Acrolein
-1,1-Dichloroethene+
-Acetone+
-Carbon Disulfide
-Isopropyl alcohol
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-Vinyl Acetate+
-1,1-Dichloroethane
-Diisopropyl ether
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile+
-Methacrylonitrile+
-Chloroform
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-tert-Amyl alcohol
-Isobutyl Alcohol+
-n-Heptane
-1,4-Difluorobenzene
-Trichloroethene+
-1,2-Dichloropropane+
-Methyl Methacrylate+
-Bromodichloromethane
-2-Nitropropane
-Chloroethylvinyl ether
-Epichlorohydrin
-cis-1,3-Dichloropropene
-Dimethyl Disulfide
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-trans-1,3-Dichloropropene+
-Ethyl Methacrylate
-1,1,2-Trichloroethane+
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane+
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-2-Furfural+
-Styrene+
-Methyl Amyl Ketone
-Bromoform+
-Isopropylbenzene
-4-Bromofluorobenzene+
-1,1,2,2-Tetrachloroethane+
-1,2,3-Trichloropropane+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
-Benzyl Chloride+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
-2-Methylnaphthalene
-1-Methylnaphthalene
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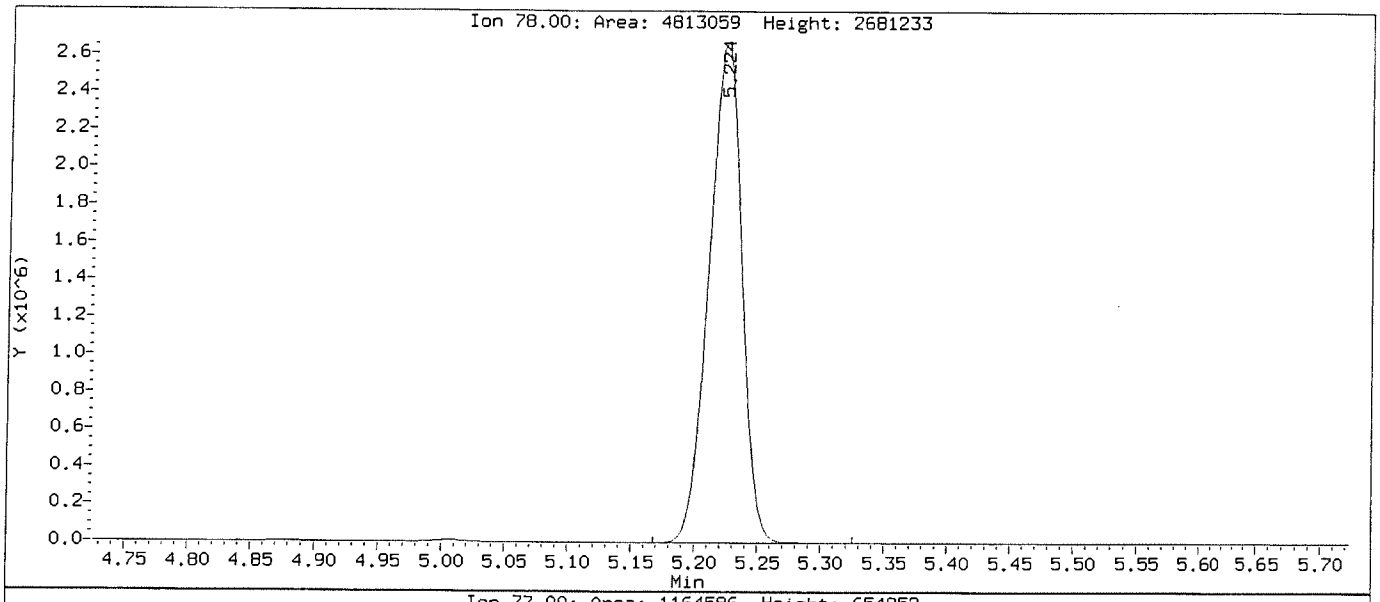
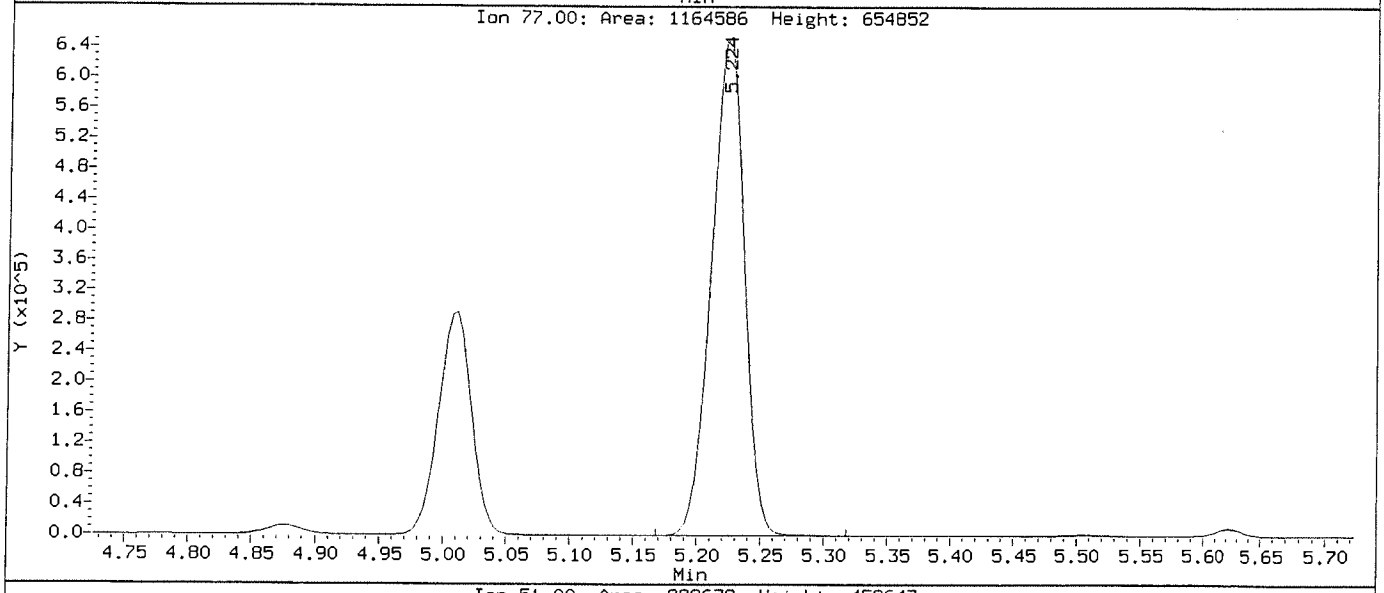
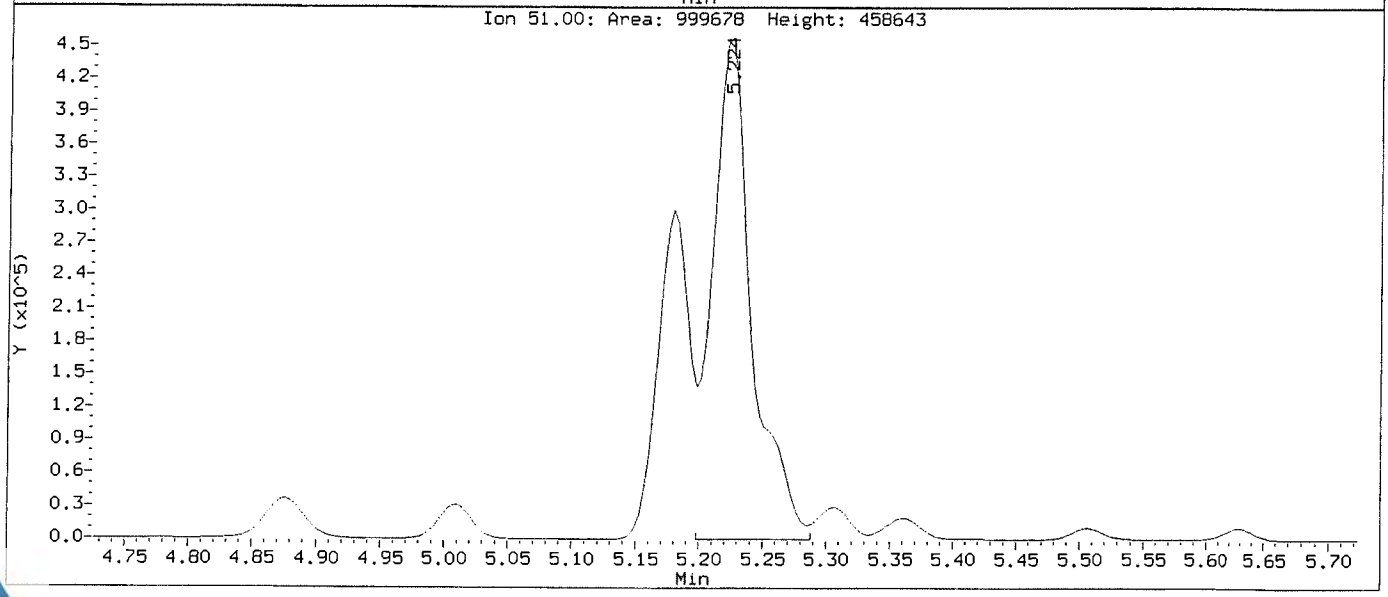
Date : 13-NOV-2018 15:28
Client ID: VSTD200
Sample Info: VSTD200;VSTD200;1;10;
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18
Page 4

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111311.D
Injection Date: 13-NOV-2018 15:28
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Benzene
CAS Number: 71-43-2







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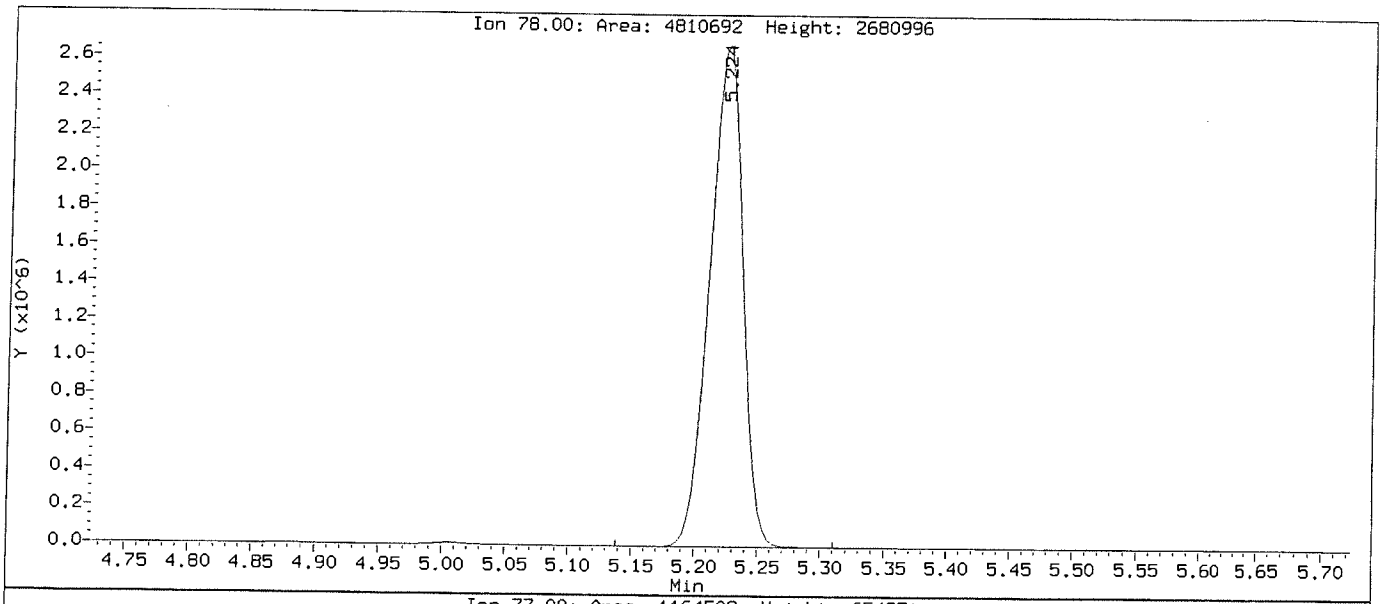
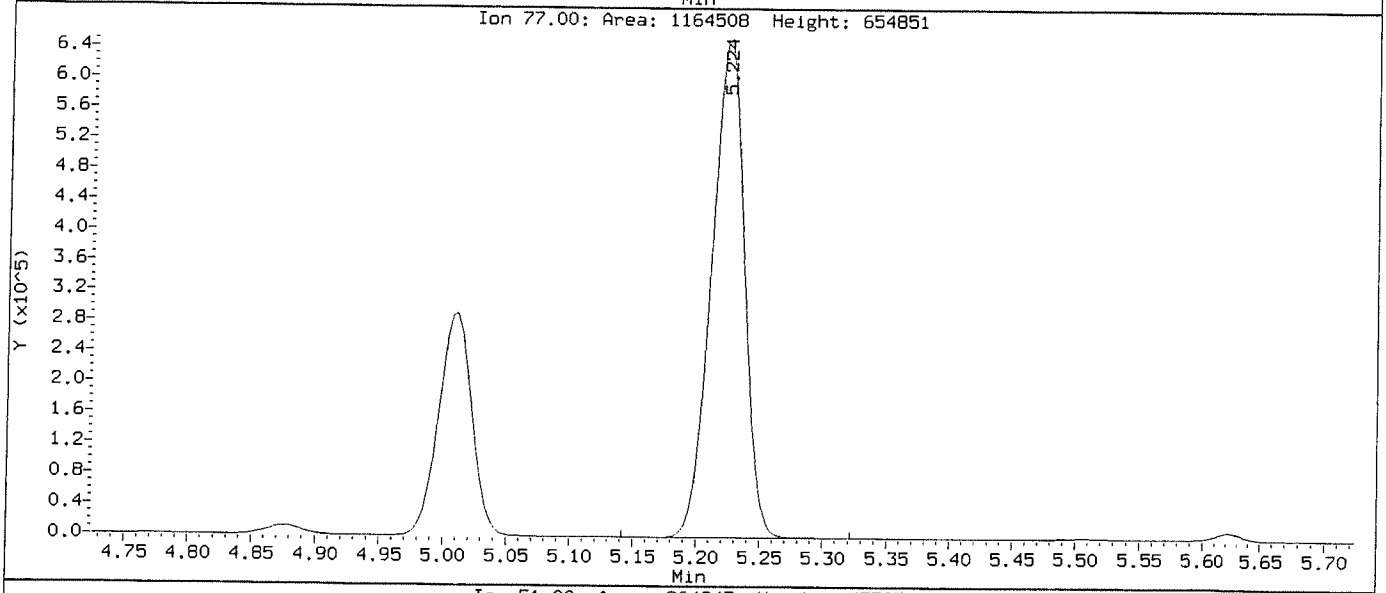
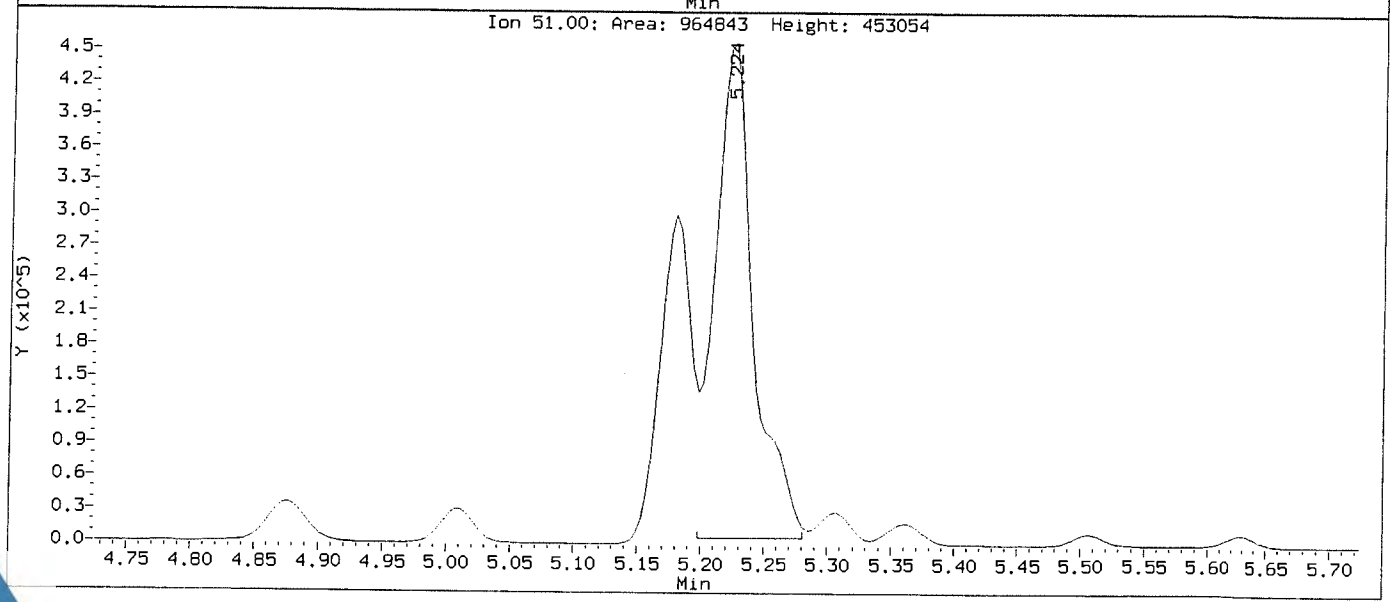
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Benzene
CAS Number: 71-43-2







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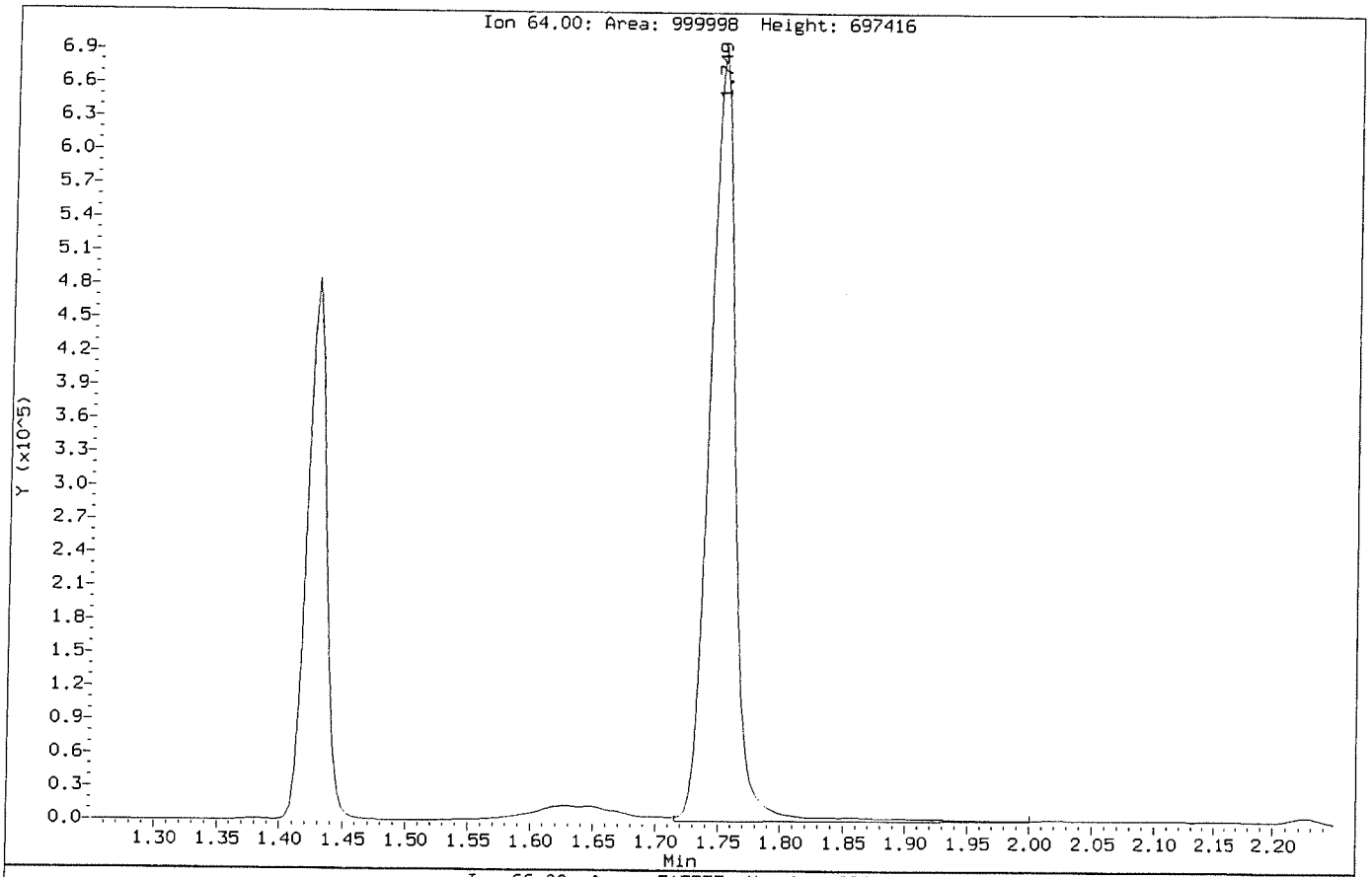
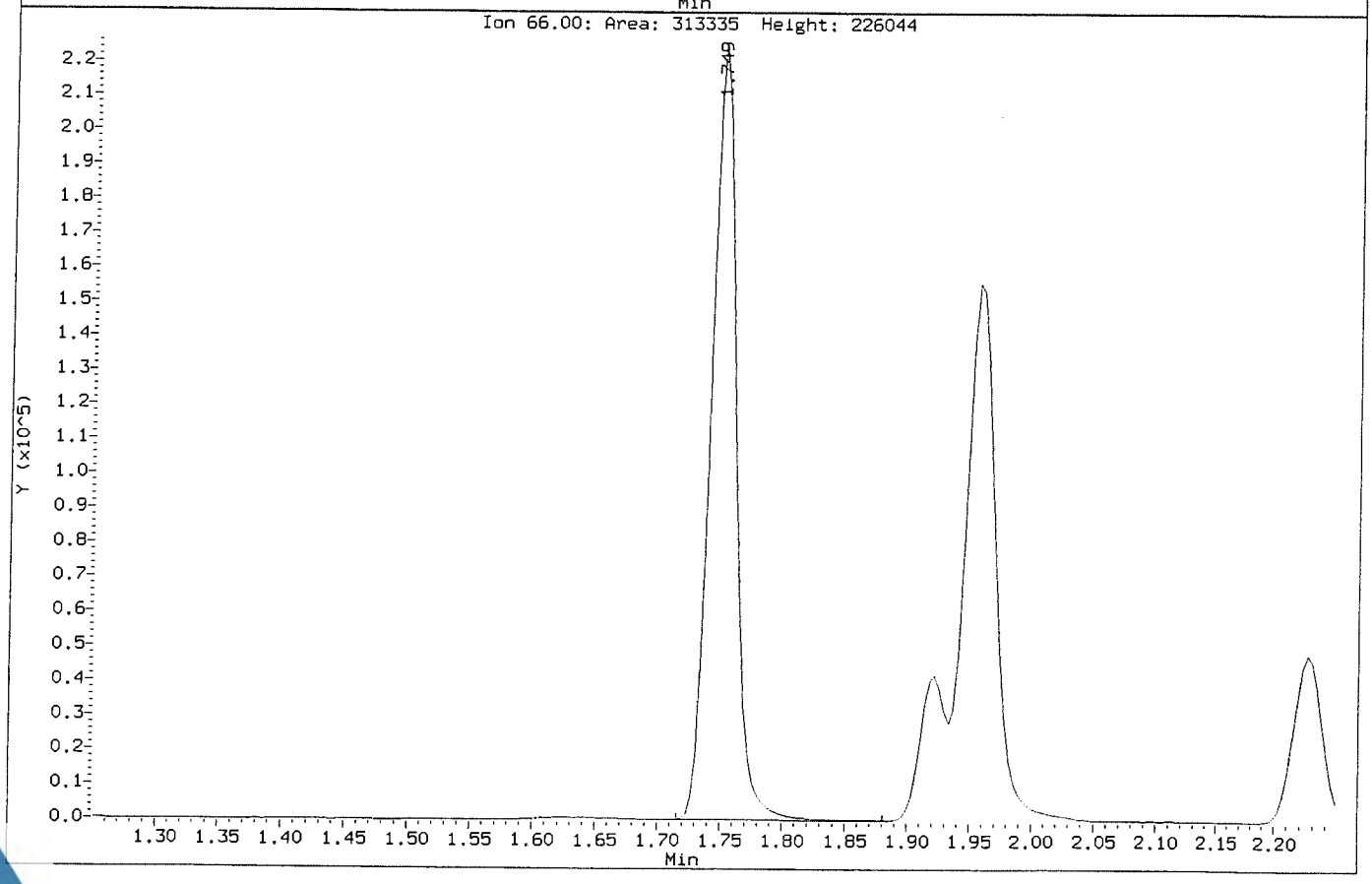
Injection Date: 13-NOV-2018 15:28
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Chloroethane
CAS Number: 75-00-3





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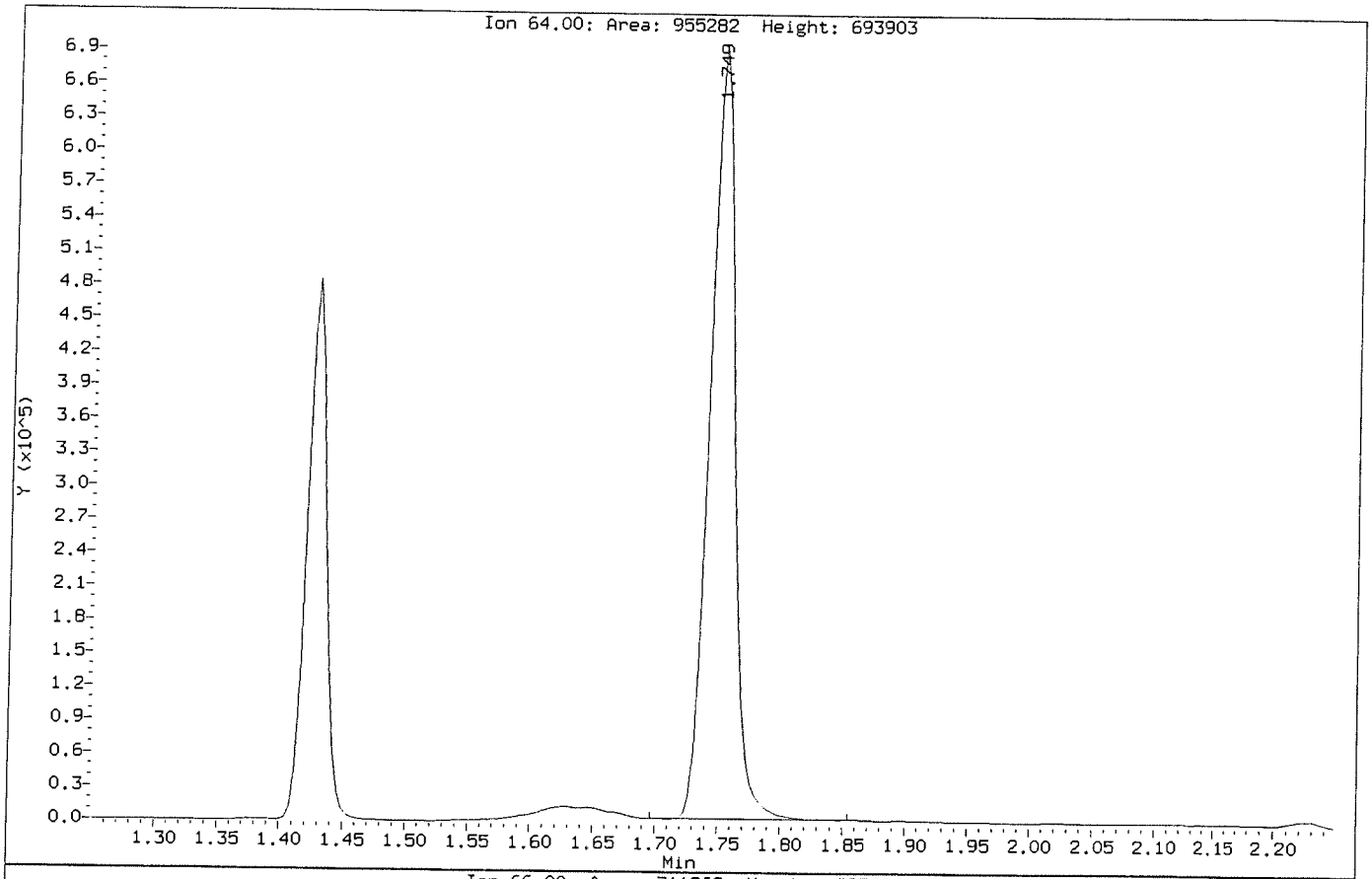
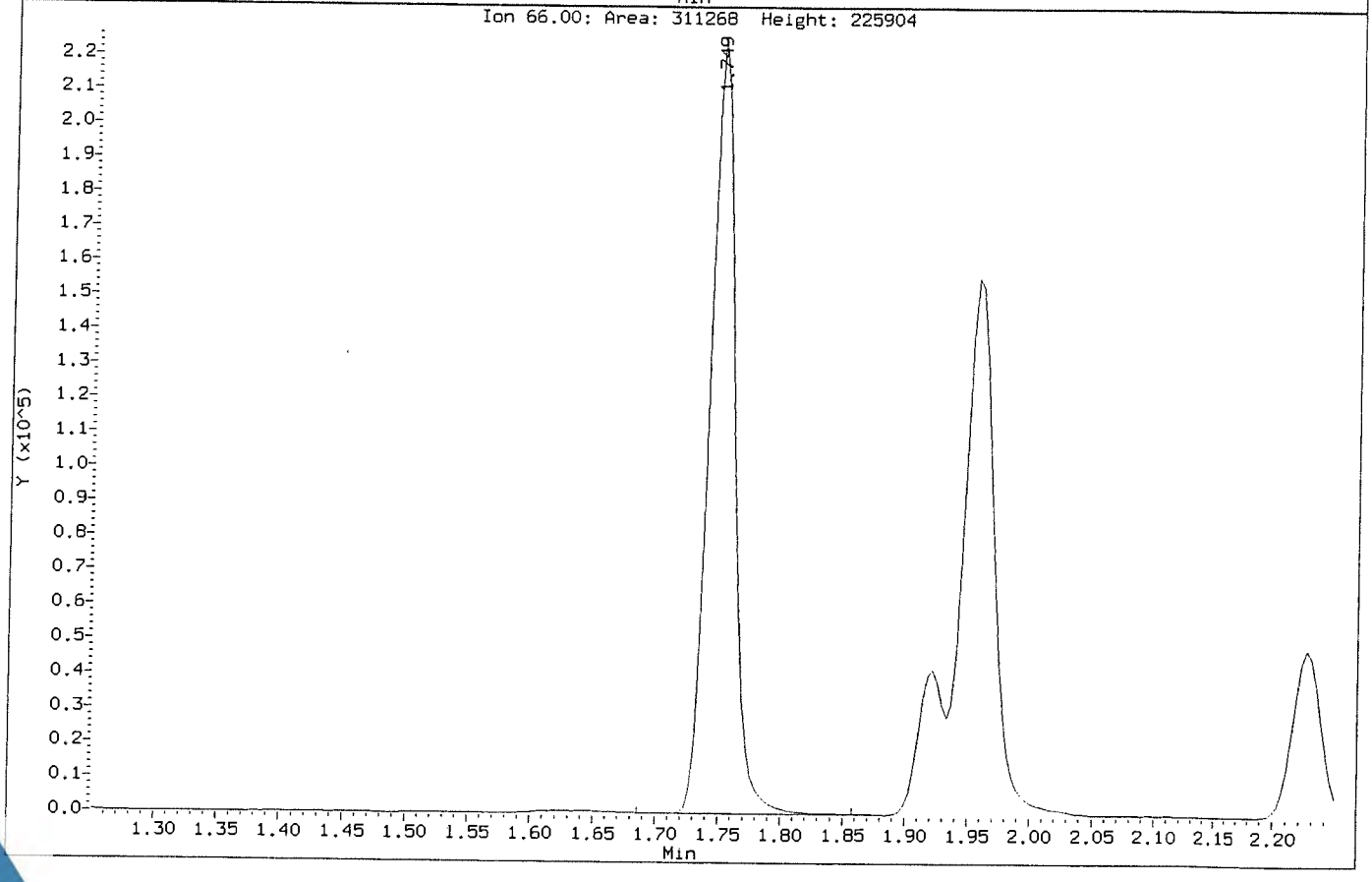
Injection Date: 13-NOV-2018 15:28
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Chloroethane
CAS Number: 75-00-3





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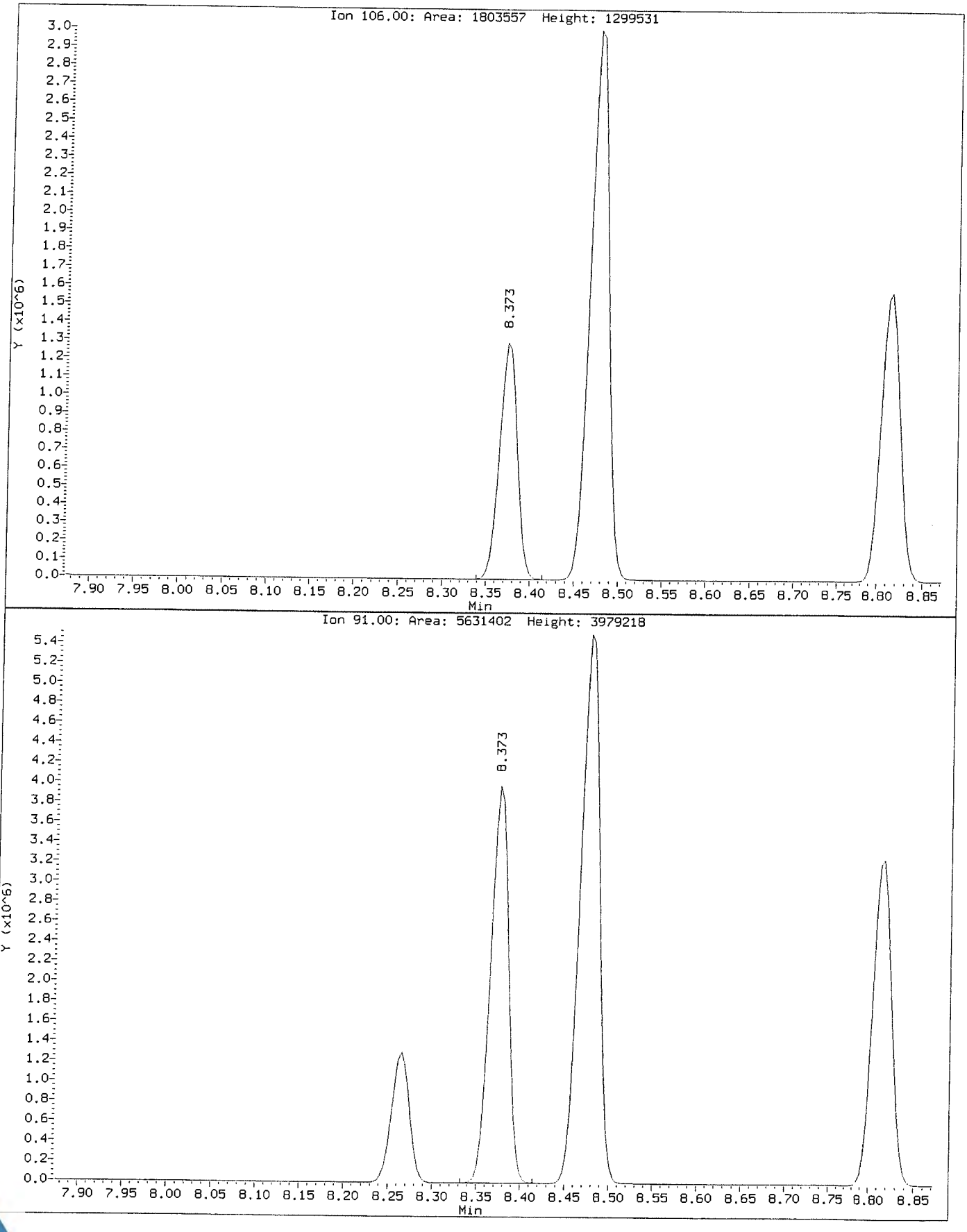
Injection Date: 13-NOV-2018 15:28
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Ethylbenzene
CAS Number: 100-41-4



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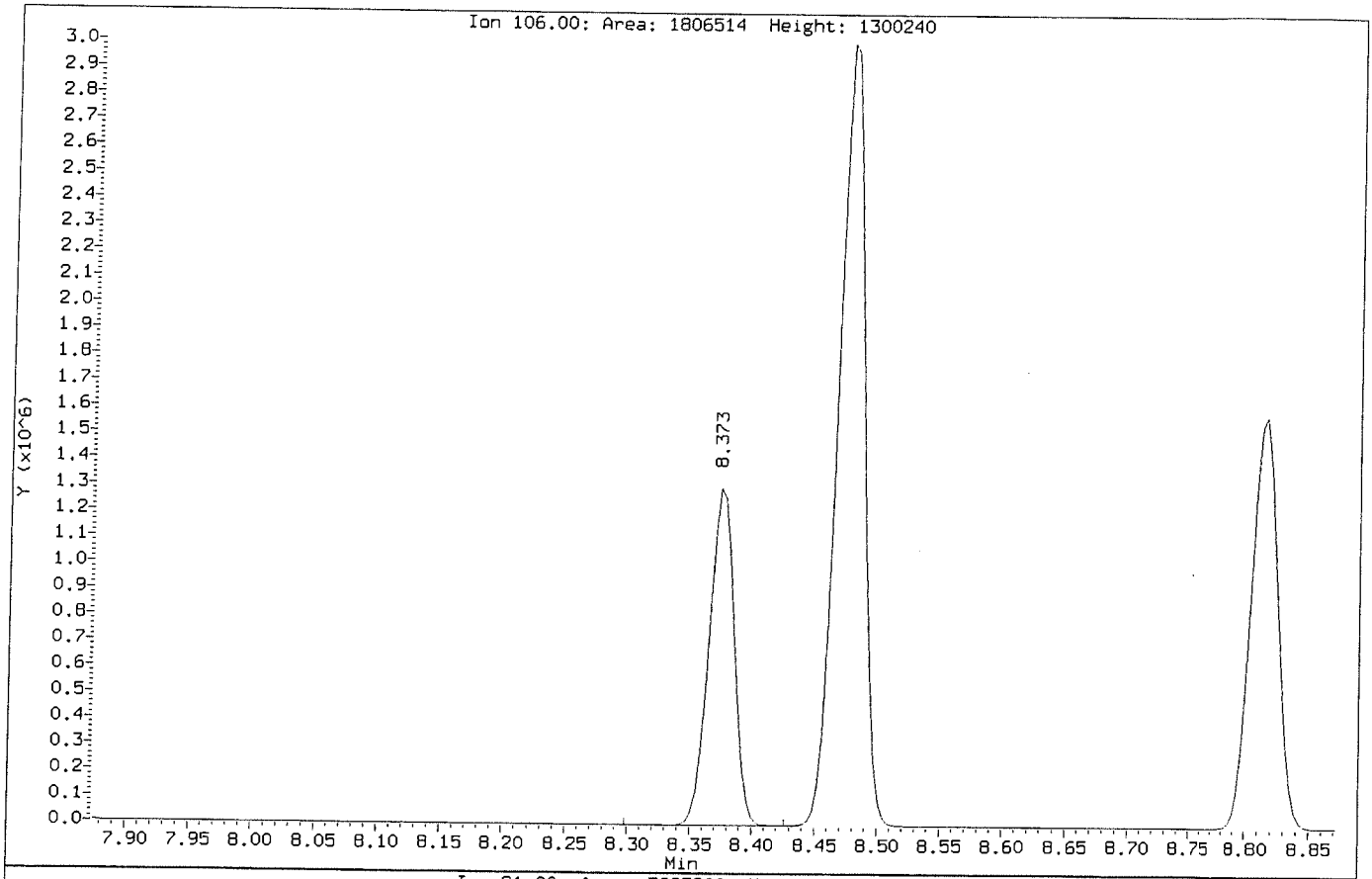
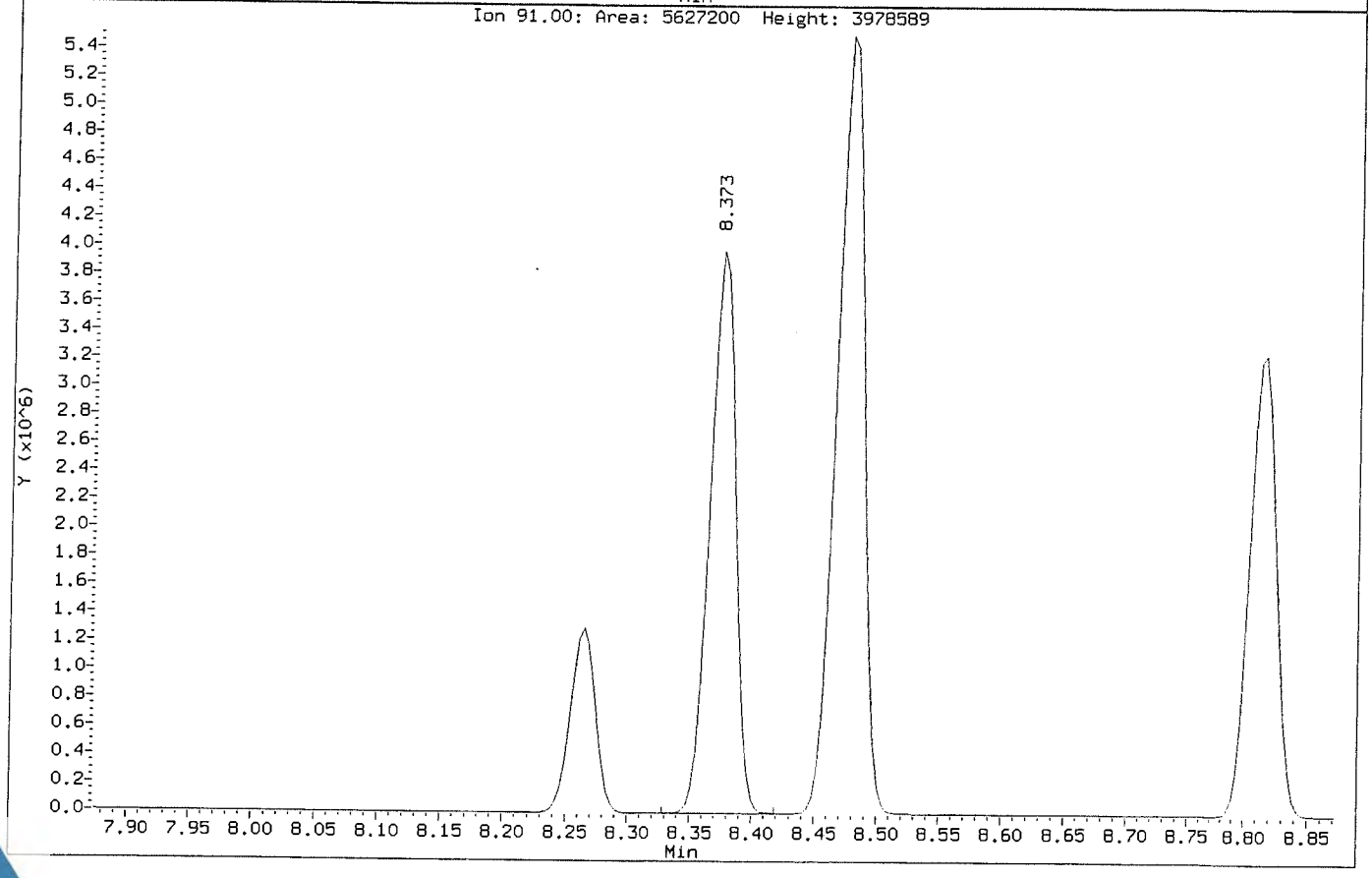
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Ethylbenzene
CAS Number: 100-41-4





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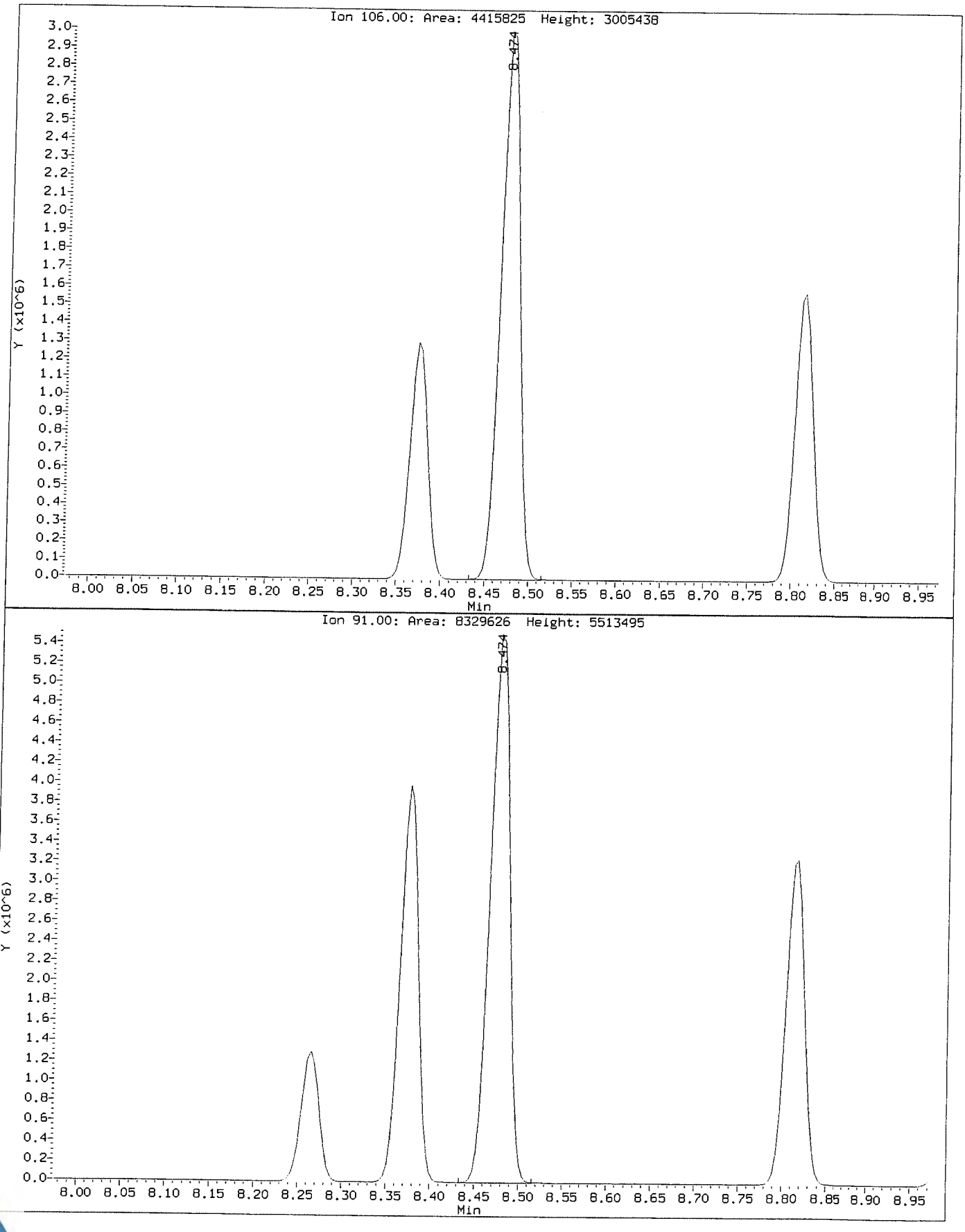
Injection Date: 13-NOV-2018 15:28
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: m,p-Xylenes
CAS Number:



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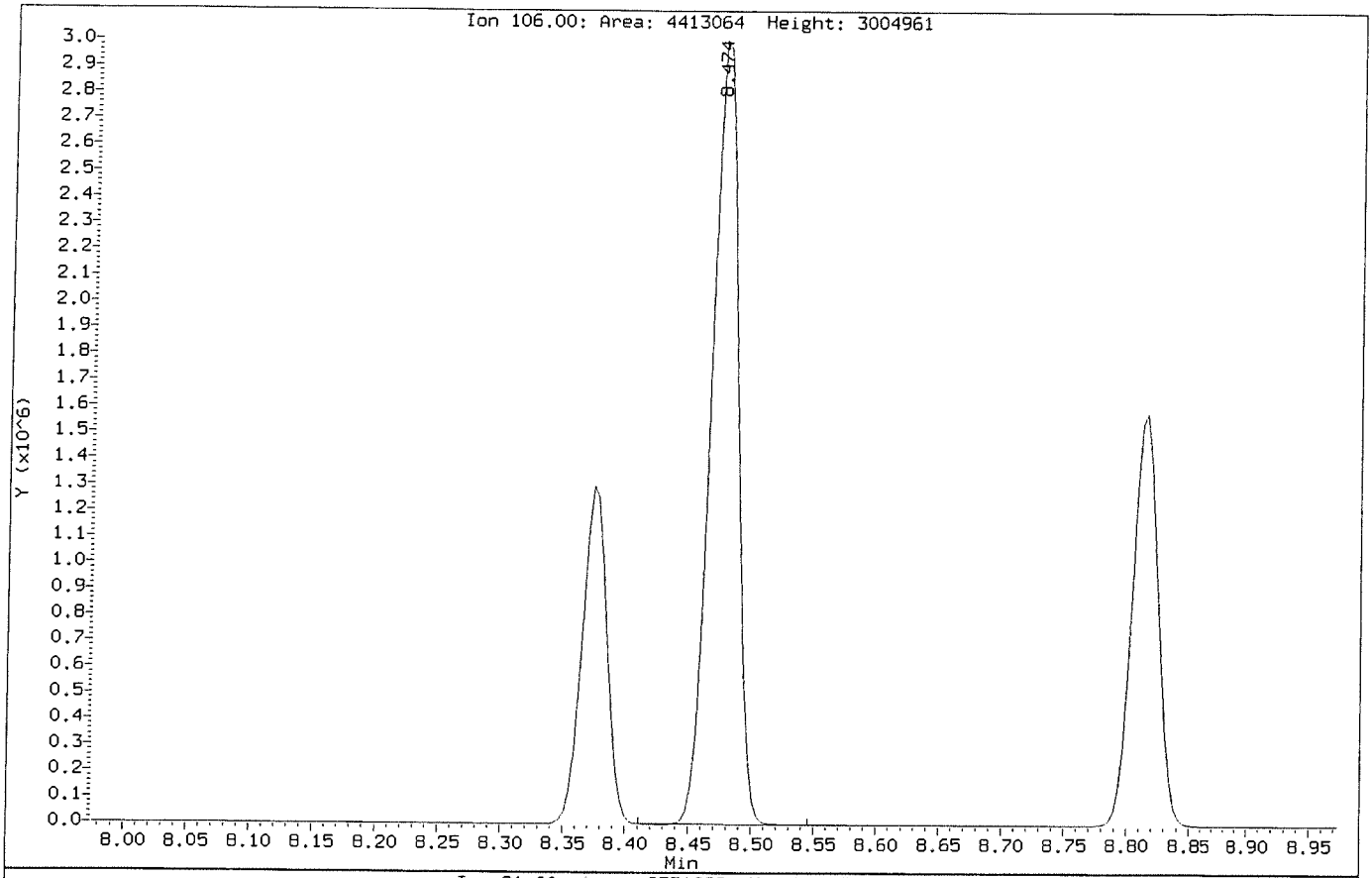
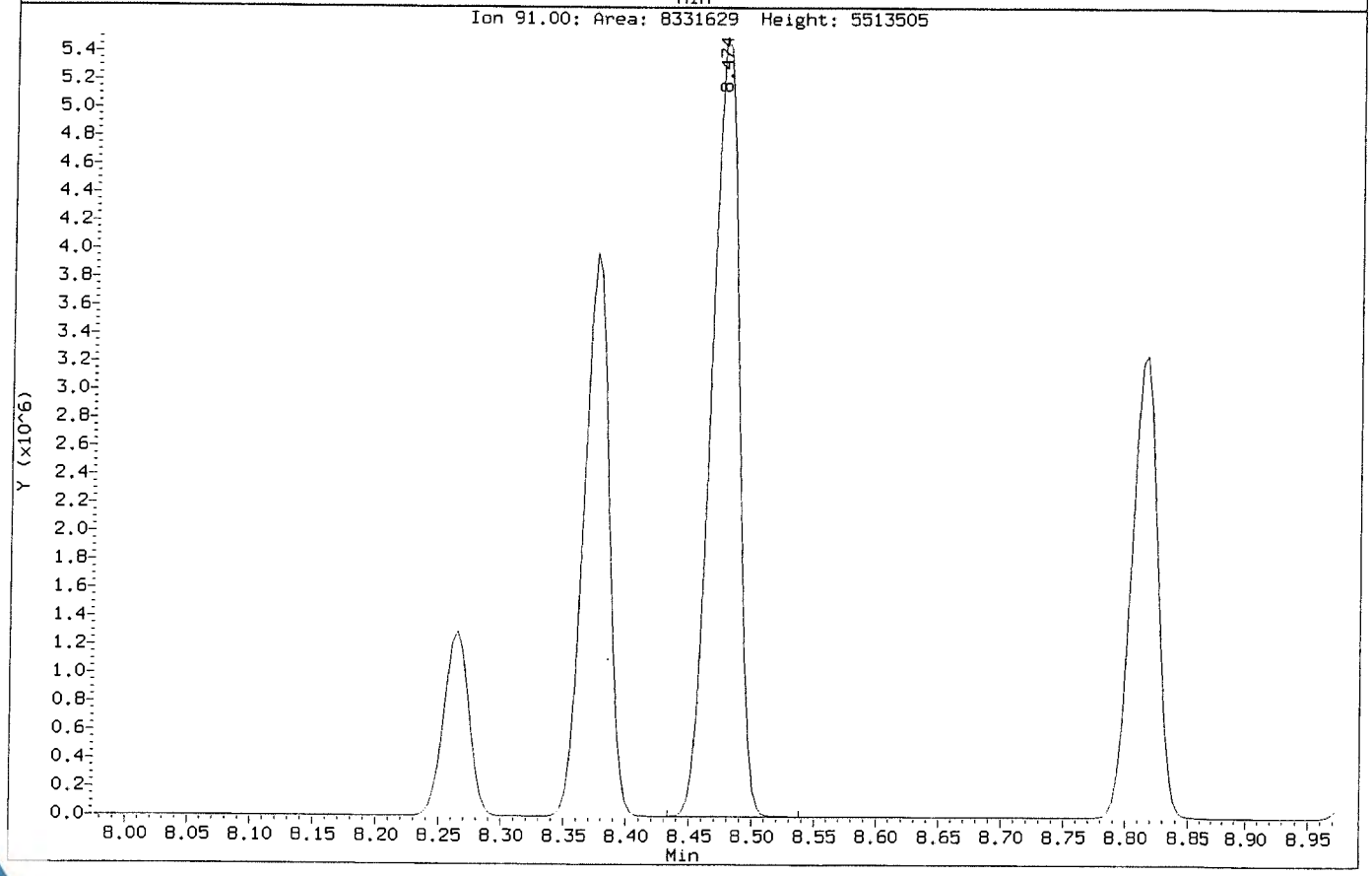
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: m,p-Xylenes
CAS Number:





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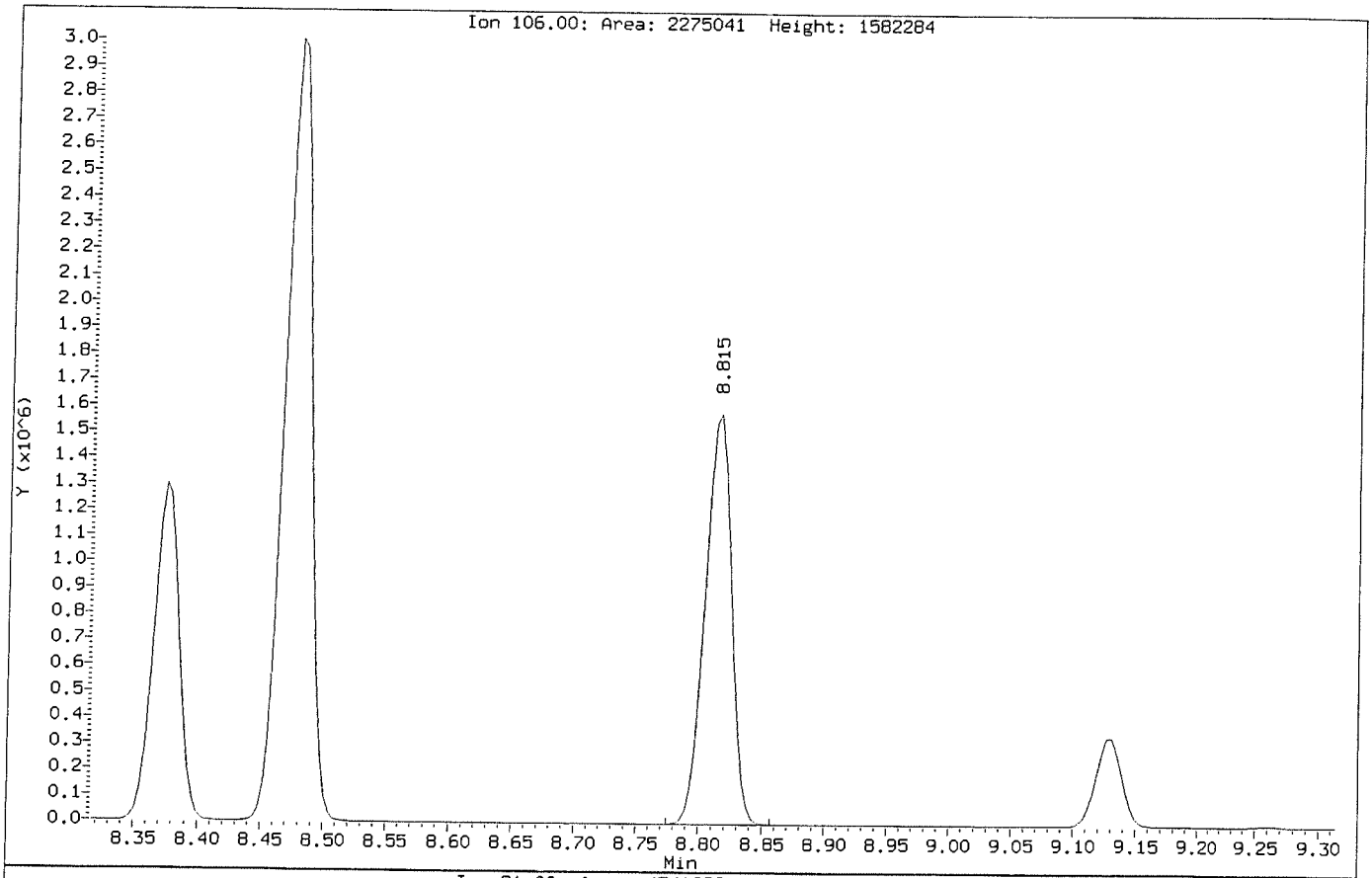
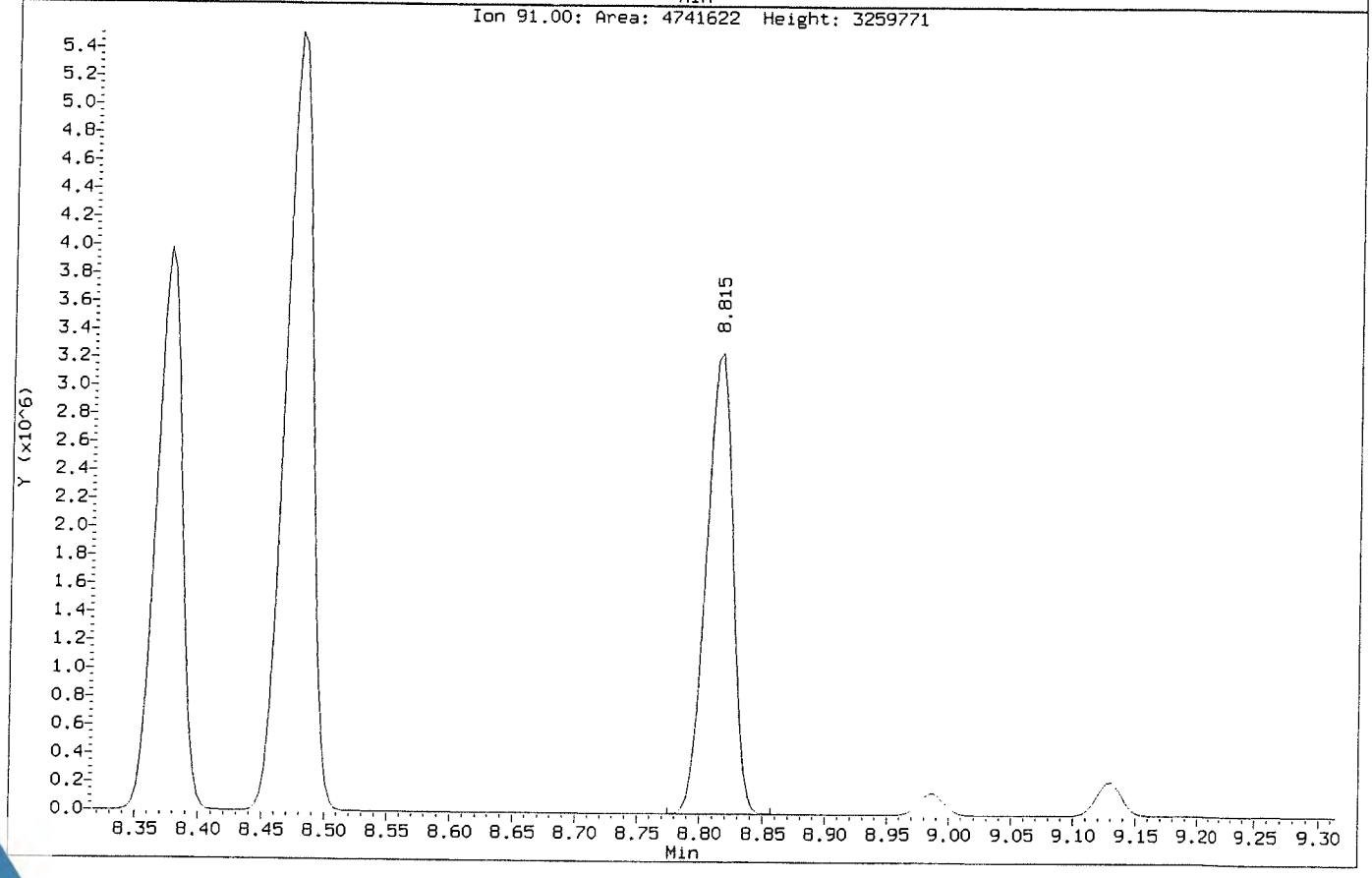
Injection Date: 13-NOV-2018 15:28
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: o-Xylene
CAS Number: 95-47-6





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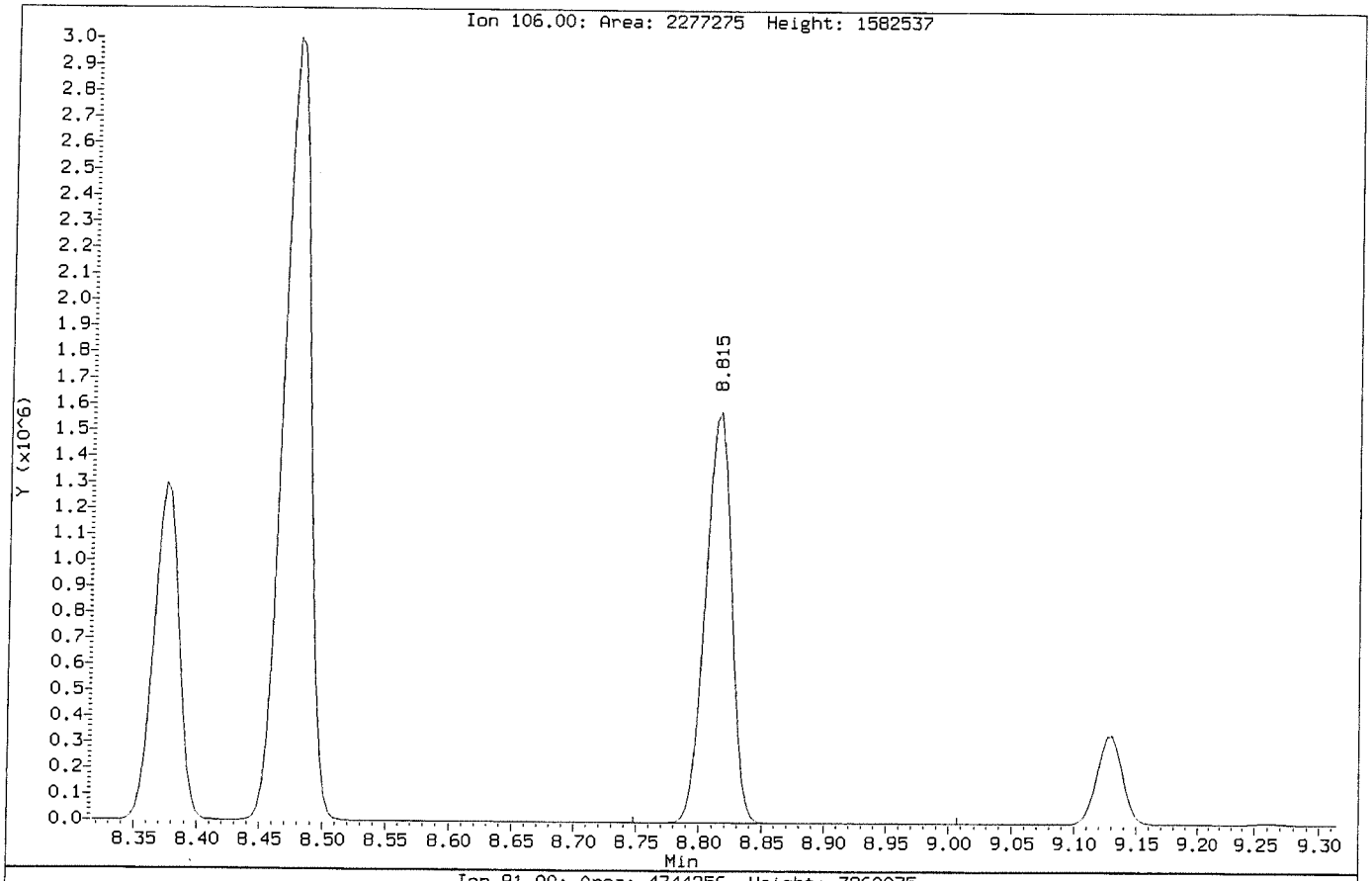
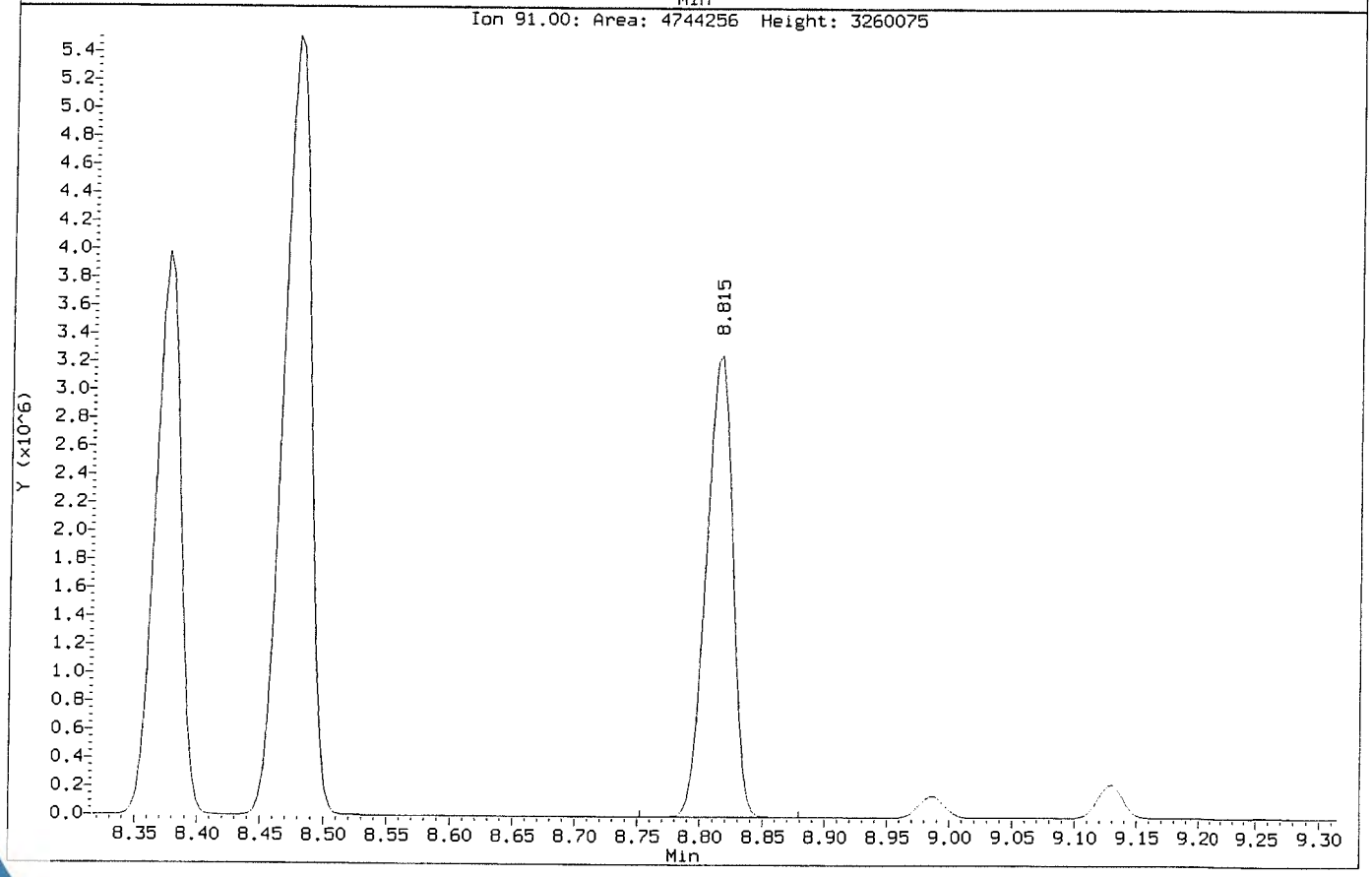
Injection Date: 13-NOV-2018 15:28
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: o-Xylene
CAS Number: 95-47-6





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111313.D Page 1
Report Date: 24-Jan-2019 18:55

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111313.D
Lab Smp Id: VICV050 Client Smp ID: VICV050
Inj Date : 13-NOV-2018 16:18
Operator : PC Inst ID: VOA9.i
Smp Info : VICV050;VICV050;2;;ICV
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181113.b\8260C.m
Meth Date : 24-Jan-2019 18:55 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 15:28 Cal File: U111311.D
Als bottle: 14 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

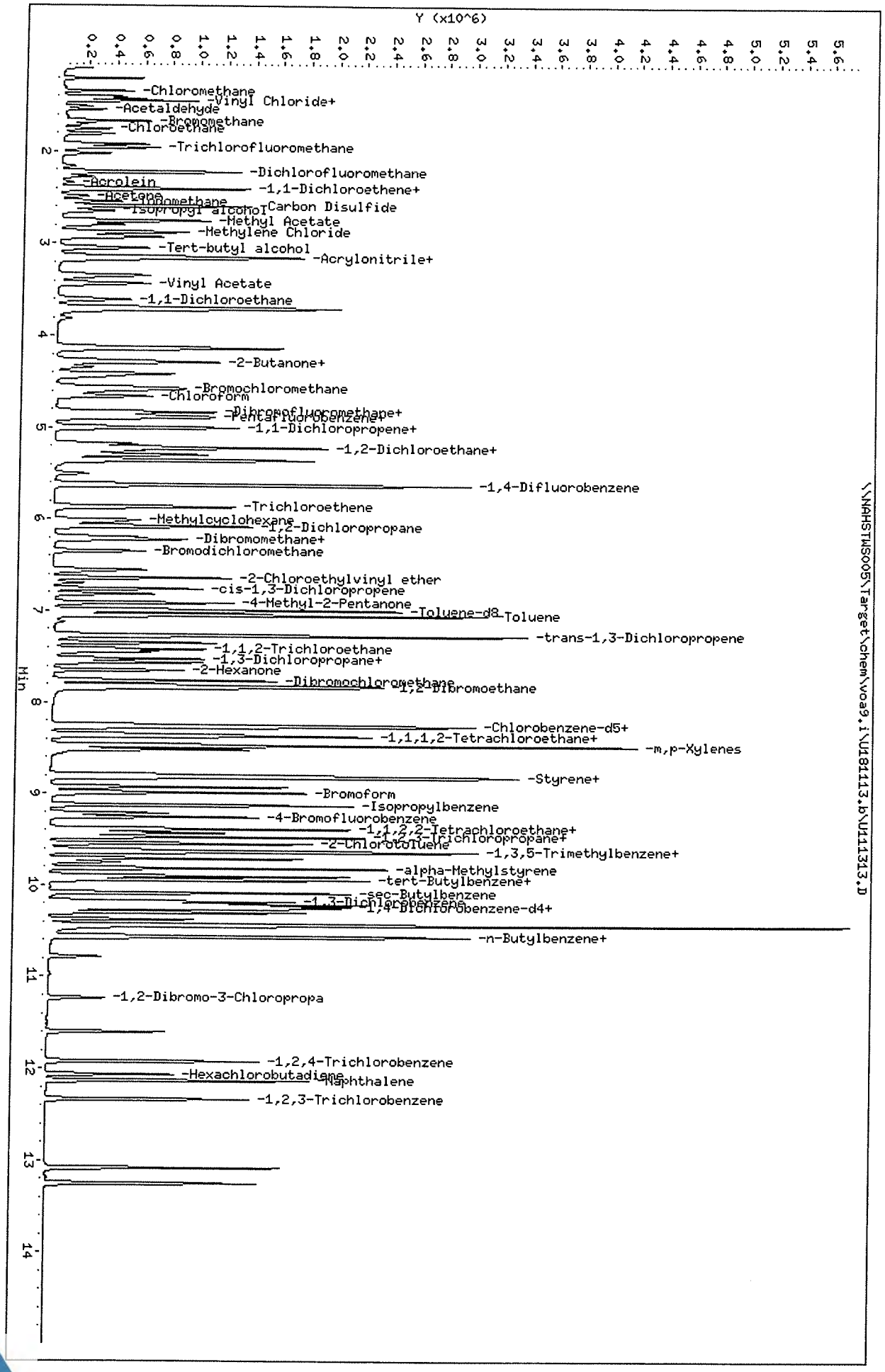
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.898	(1.000)	492069	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.629	(1.000)	927951	50.0000	
* 47 Chlorobenzene-d5	117	8.253	8.253	(1.000)	869612	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.239	(1.000)	424507	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	285495	50.4842	50.48
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	379384	51.0366	51.03
$ 48 Toluene-d8	98	6.990	6.993	(0.847)	1145021	51.5678	51.56
$ 69 4-Bromofluorobenzene	95	9.258	9.261	(1.122)	441801	51.4072	51.40
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	274179	49.9849	49.98
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	416232	48.1554	48.15
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	462139	45.9603	45.96
138 Freon TF	101	2.409	2.405	(0.492)	226905	46.0312	46.03
53 1,1,2-Trichloroethane	83	7.421	7.424	(0.899)	253396	45.8339	45.83
22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	513902	45.5744	45.57
11 1,1-Dichloroethene	96	2.405	2.405	(0.491)	253613	45.6608	45.66
32 1,1-Dichloropropene	75	5.006	5.010	(0.889)	399473	46.6112	46.61
93 1,2,3-Trichlorobenzene	180	12.335	12.339	(1.205)	387107	48.3006	48.30
71 1,2,3-Trichloropropane	75	9.430	9.434	(0.921)	517101	49.2816	49.28
90 1,2,4-Trichlorobenzene	180	11.923	11.926	(1.165)	396308	47.4733	47.47
79 1,2,4-Trimethylbenzene	105	9.944	9.943	(0.971)	1125014	47.7134	47.71
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.237	(1.097)	74206	47.8284	47.82
57 1,2-Dibromoethane	107	7.852	7.855	(0.951)	310006	48.4238	48.42

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111313.D Page 2
Report Date: 24-Jan-2019 18:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	609149	44.9344	44.93
33 1,2-Dichloroethane	62	5.254	5.257	(0.933)	438739	45.1829	45.18
42 1,2-Dichloropropane	63	6.082	6.086	(1.081)	312363	47.2789	47.27
75 1,3,5-Trimethylbenzene	105	9.629	9.628	(0.941)	1087962	47.7004	47.70
83 1,3-Dichlorobenzene	146	10.180	10.183	(0.995)	608880	45.5562	45.55
54 1,3-Dichloropropane	76	7.567	7.567	(0.917)	548032	46.1653	46.16
84 1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	631760	48.3226	48.32
26 2,2-Dichloropropane	77	4.279	4.279	(0.874)	357603	51.2102	51.21
24 2-Butanone	43	4.343	4.343	(0.887)	319364	92.3297	92.32
76 2-Chlorotoluene	91	9.550	9.550	(0.933)	950278	45.7148	45.71
52 2-Hexanone	43	7.653	7.653	(0.927)	501801	99.2665	99.26
77 4-Chlorotoluene	91	9.640	9.643	(0.942)	1123555	46.8423	46.84
82 p-Isopropyltoluene	119	10.213	10.213	(0.998)	1142647	49.1524	49.15
45 4-Methyl-2-Pentanone	43	6.915	6.918	(0.838)	699041	96.3600	96.36
10 Acetone	43	2.487	2.491	(0.508)	216067	95.4641	95.46
37 Benzene	78	5.220	5.224	(0.927)	1188078	46.3202	46.32
74 Bromobenzene	156	9.385	9.385	(0.917)	321699	46.1973	46.19
29 Bromochloromethane	128	4.557	4.560	(0.930)	147658	50.9008	50.90
39 Bromodichloromethane	83	6.349	6.352	(1.128)	374186	48.5304	48.53
66 Bromoform	173	8.984	8.987	(1.089)	188320	47.7183	47.71(T)
6 Bromomethane	94	1.670	1.662	(0.341)	208101	50.9317	50.93
19 Carbon Disulfide	76	2.596	2.596	(0.530)	1686616	98.3287	98.32
34 Carbon Tetrachloride	117	4.999	4.999	(0.888)	330709	49.3949	49.39
59 Chlorobenzene	112	8.275	8.279	(1.003)	813973	45.3514	45.35
7 Chloroethane	64	1.756	1.749	(0.359)	230904	44.9734	44.97(M)
28 Chloroform	83	4.662	4.661	(0.952)	517425	45.6713	45.67
3 Chloromethane	50	1.344	1.344	(0.274)	306744	46.7074	46.70
27 cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	320390	45.9503	45.95
46 cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	516764	53.2223	53.22
55 Dibromochloromethane	129	7.758	7.762	(0.940)	286771	52.1150	52.11
44 Dibromomethane	93	6.191	6.195	(1.100)	195311	47.1700	47.16
2 Dichlorodifluoromethane	85	1.209	1.213	(0.247)	347869	47.8726	47.87
61 Ethylbenzene	106	8.373	8.373	(1.015)	424849	46.8143	46.81
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	145238	55.0778	55.07
67 Isopropylbenzene	105	9.126	9.130	(1.106)	1266469	47.9214	47.92
62 m,p-Xylenes	106	8.474	8.474	(1.027)	1058456	94.6512	94.65
17 Methylene Chloride	84	2.877	2.877	(0.587)	301983	48.0719	48.07
87 n-Butylbenzene	91	10.558	10.558	(1.031)	1100279	49.5091	49.50
73 n-Propylbenzene	91	9.475	9.478	(0.926)	1593592	47.5729	47.57
92 Naphthalene	128	12.133	12.136	(1.185)	1287047	51.2004	51.20
63 o-Xylene	106	8.811	8.815	(1.068)	530431	47.3909	47.39(H)
81 sec-Butylbenzene	105	10.086	10.090	(0.985)	1350043	48.4022	48.40
64 Styrene	104	8.826	8.826	(1.069)	941191	49.8117	49.81
78 tert-Butylbenzene	119	9.902	9.906	(0.967)	929608	47.8232	47.82
56 Tetrachloroethene	164	7.526	7.525	(0.912)	207441	45.5377	45.53
50 Toluene	91	7.050	7.049	(0.854)	1274589	46.1658	46.16
20 trans-1,2-Dichloroethene	96	3.147	3.147	(0.643)	282235	46.3646	46.36
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	454600	47.3993	47.39
38 Trichloroethene	130	5.865	5.865	(1.042)	293292	46.3847	46.38
8 Trichlorofluoromethane	101	1.959	1.955	(0.400)	460052	46.7647	46.76
5 Vinyl Chloride	62	1.423	1.426	(0.291)	382169	47.6661	47.66

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

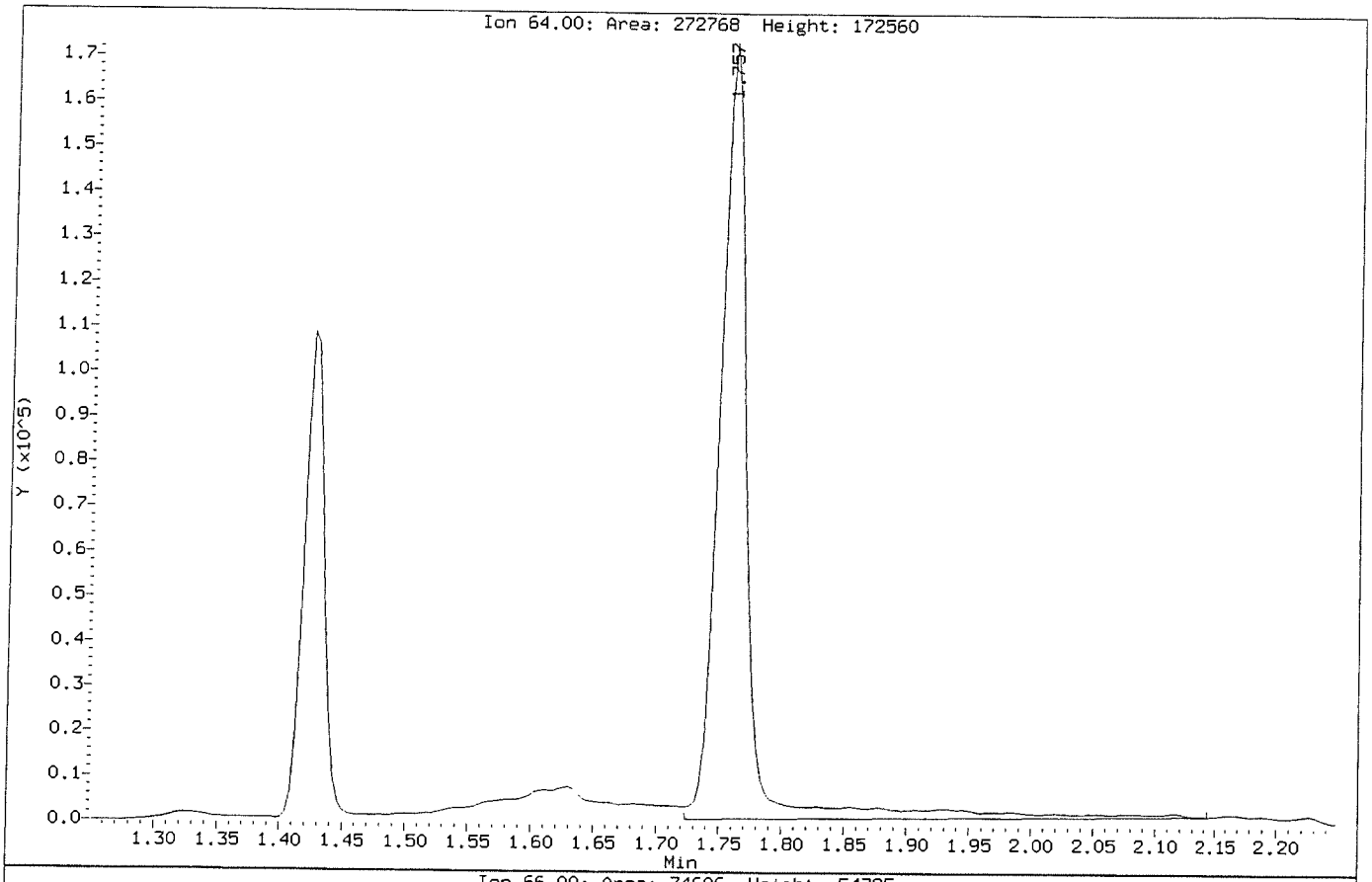


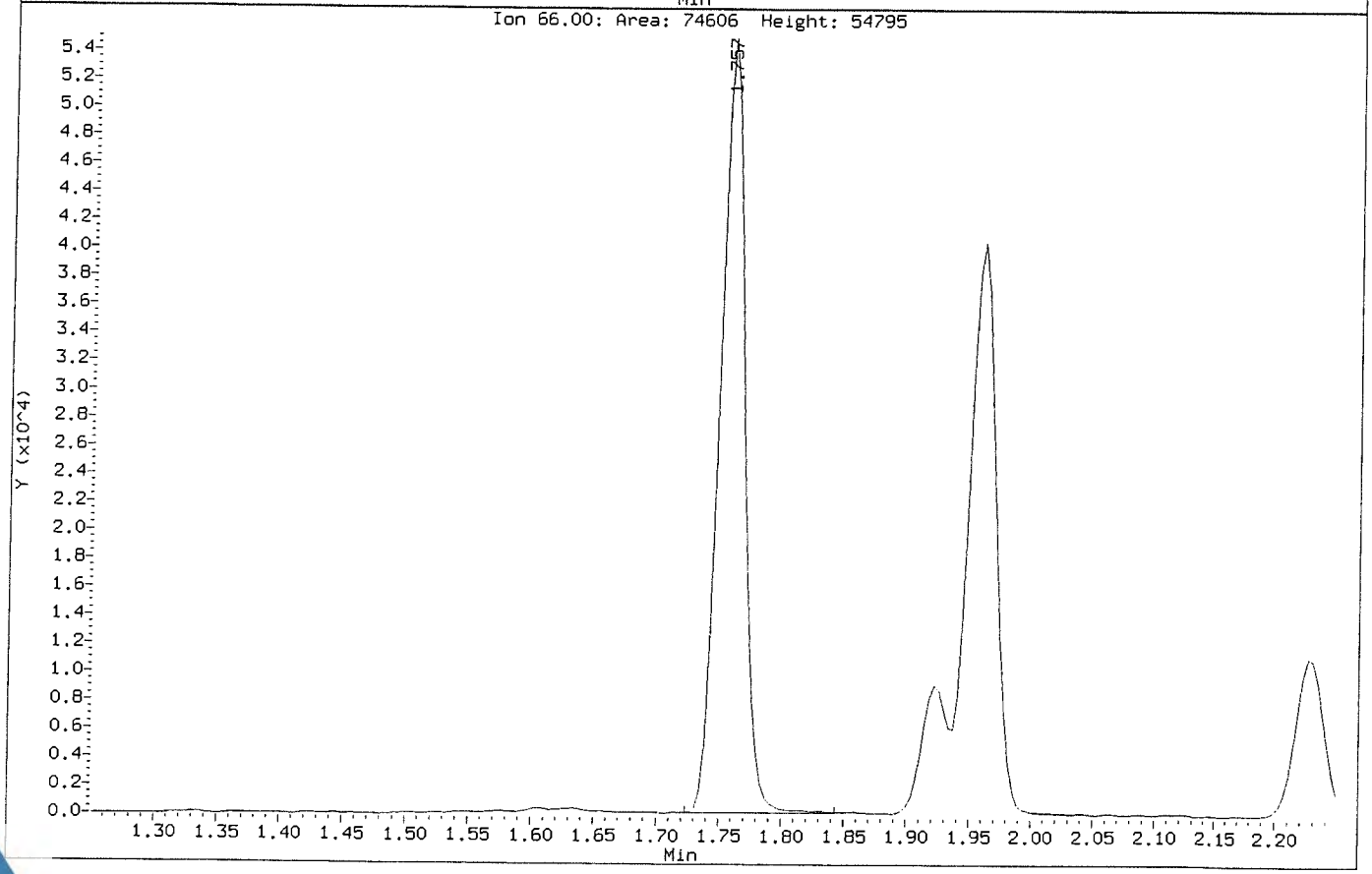
Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\U111313.D
Date : 13-NOV-2018 16:18
Client ID: VICV050
Sample Info: VICV050;VICV050;2;;ICV
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181113.b\Before\U111313.D
Injection Date: 13-NOV-2018 16:18
Instrument: VOA9.i
Client Sample ID: VICV050

Compound: Chloroethane
CAS Number: 75-00-3





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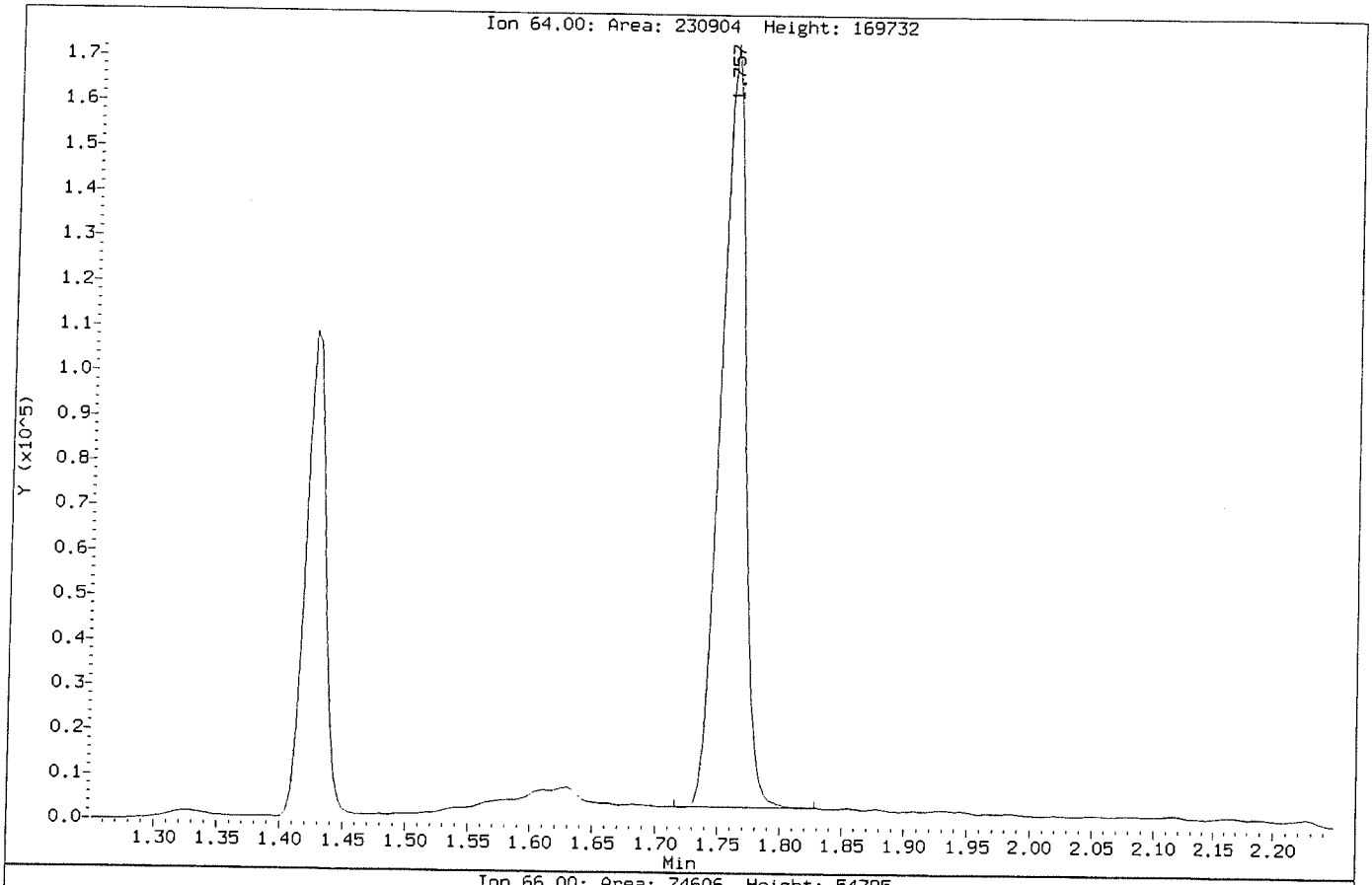
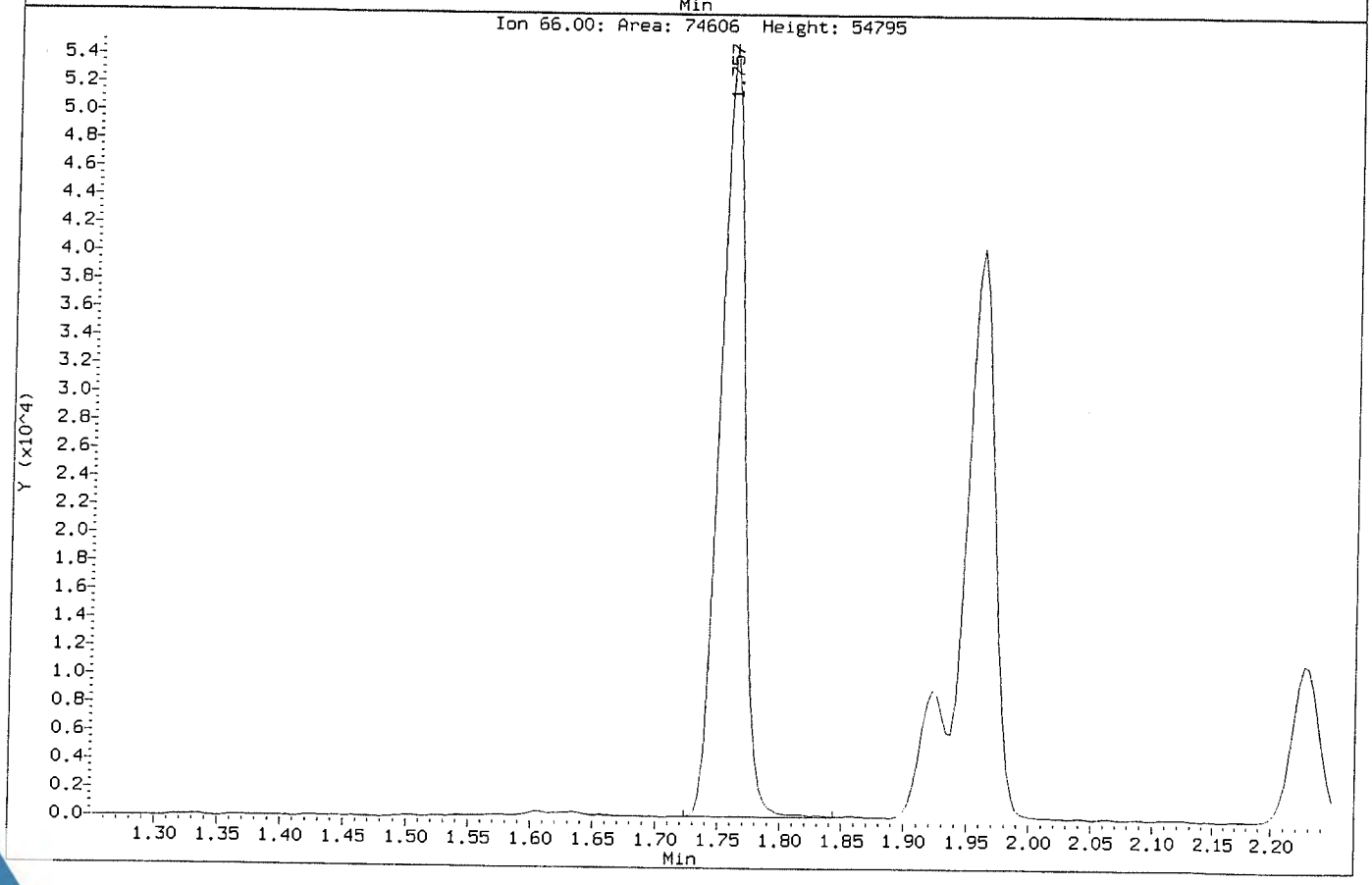
Instrument: VOA9.i
Client Sample ID: VICV050

Compound: Chloroethane
CAS Number: 75-00-3





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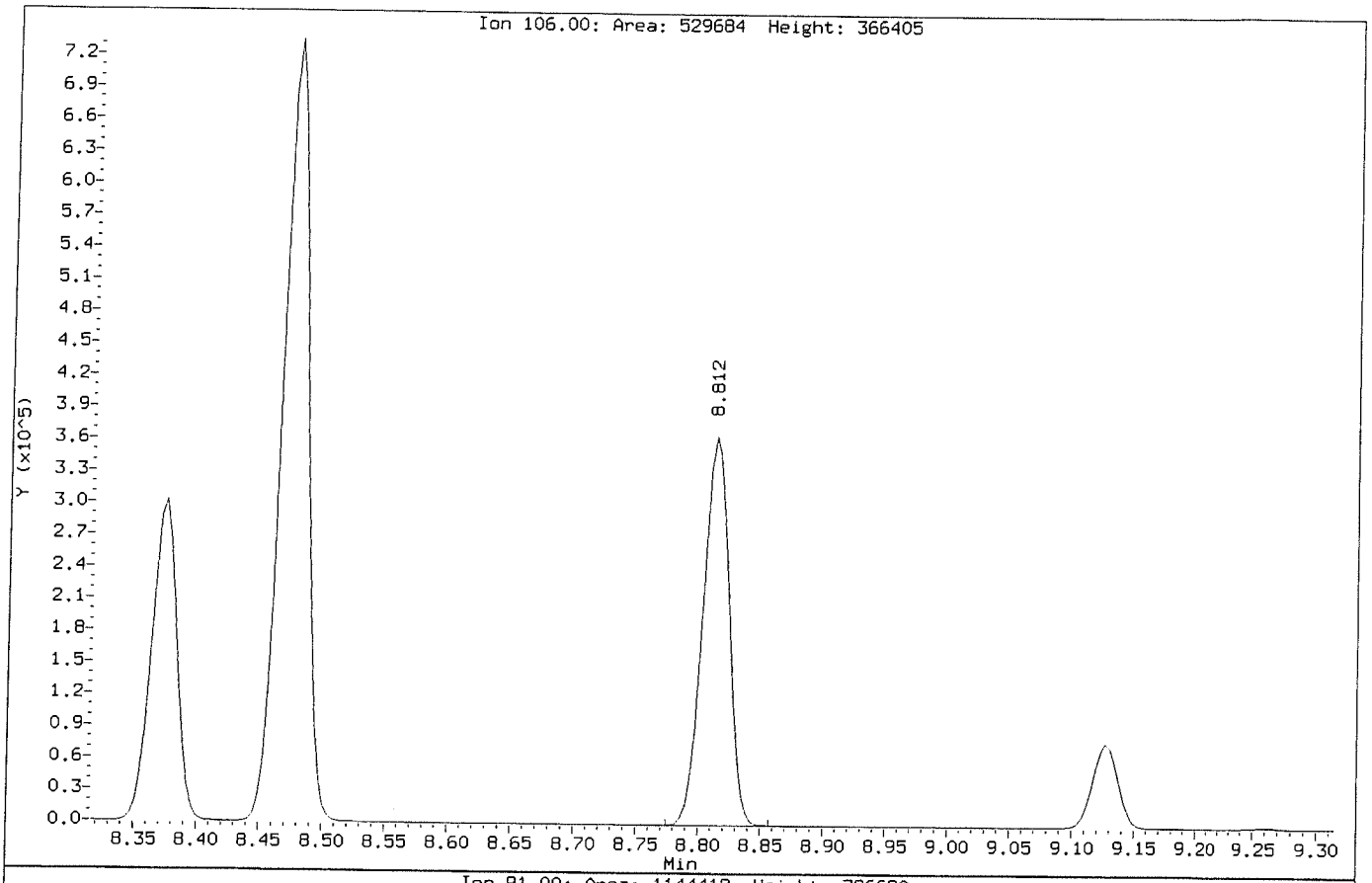
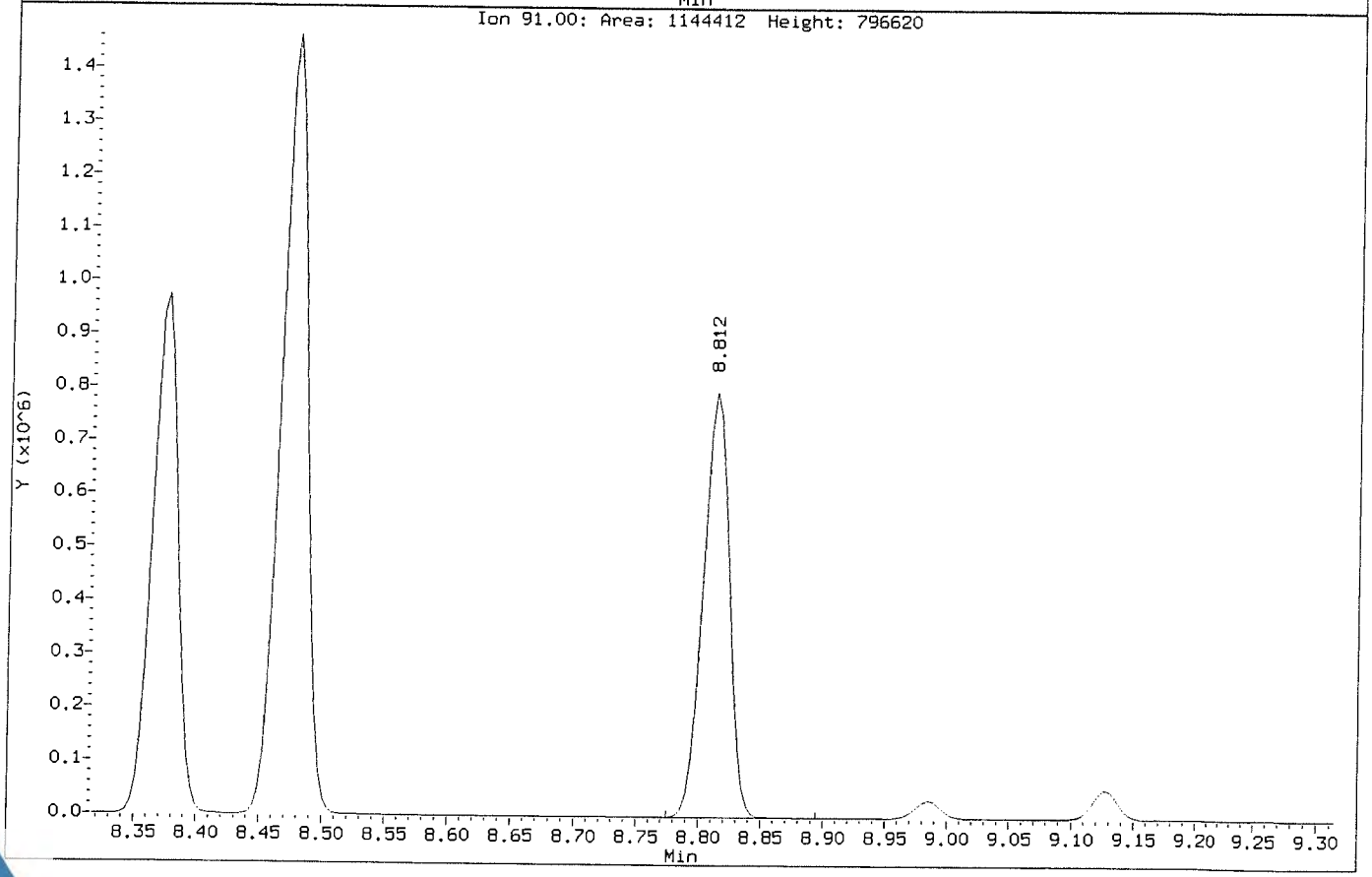
Injection Date: 13-NOV-2018 16:18
Instrument: VOA9.i
Client Sample ID: VICV050

Compound: o-Xylene
CAS Number: 95-47-6





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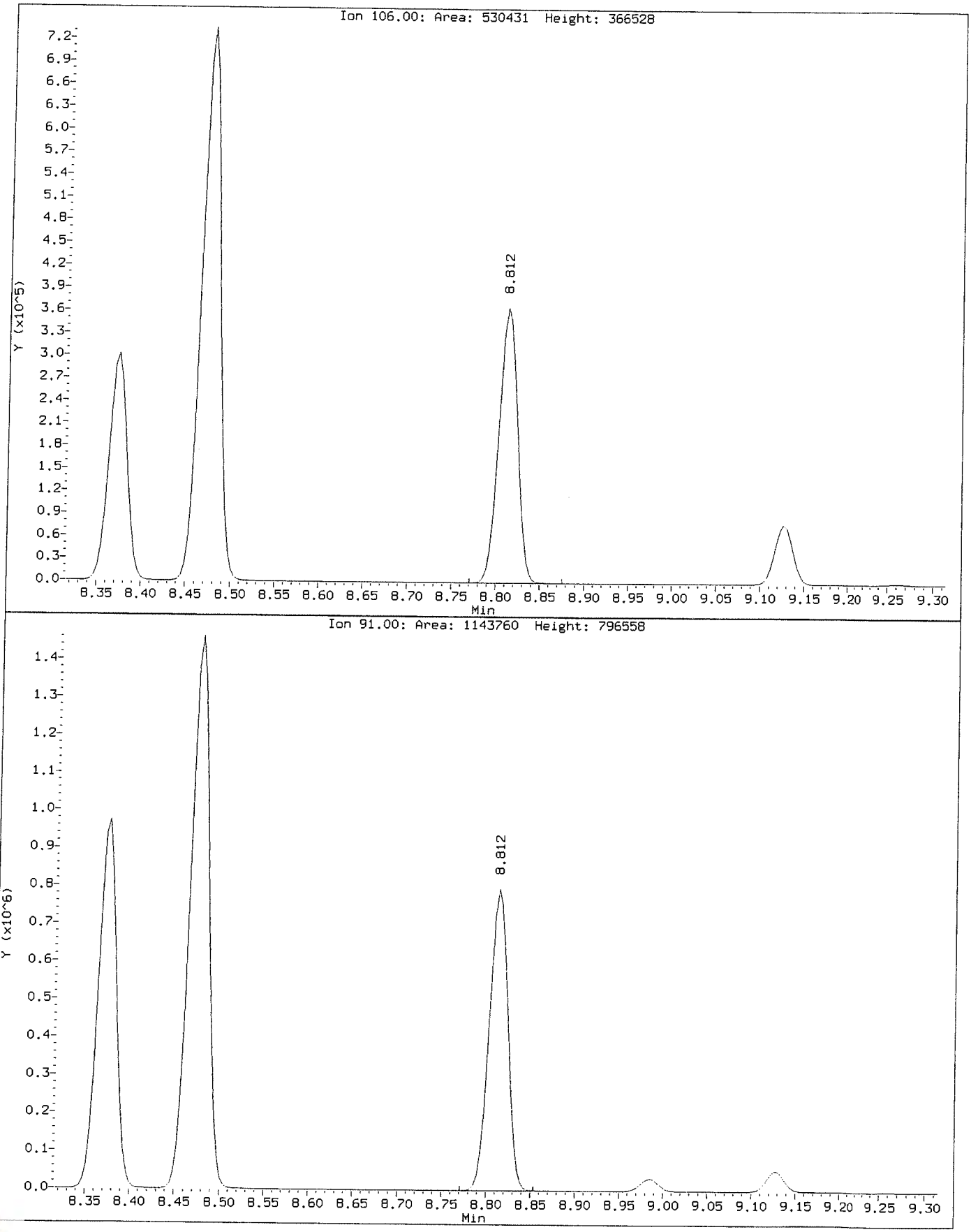
Injection Date: 13-NOV-2018 16:18
Instrument: VOA9.i
Client Sample ID: VICV050

Compound: o-Xylene
CAS Number: 95-47-6



MSVOA09 -Logbook

Batch: 34001
Date: 12-19-2018
Method: 8260
Comments:

Analyst: Presenta Cabascango
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	12-19-2018 12:33 pm	1.00	50 mL	50 mL	U121901.D	Liquid	Y	NA
	Auto find/purged									
2	VSTD050	CCV	12-19-2018 12:58 pm	1.00	50 mL	50 mL	U121902.D	Liquid	Y	NA
	10 uL cal std/50 ml DI									
3	VLCSW-1812019	LCS	12-19-2018 01:23 pm	1.00	50 mL	50 mL	U121903.D	Liquid	Y	NA
	4 uL ICVI std/50 ml DI									
4	BLANK	SAMP	12-19-2018 01:47 pm	1.00	50 mL	50 mL	U121904.D	Liquid	Y	NA
5	VBLKW-181219	MBLK	12-19-2018 02:12 pm	1.00	50 mL	50 mL	U121905.D	Liquid	Y	NA
6	HS18120734-02	SAMP	12-19-2018 02:37 pm	1.00	50 mL	50 mL	U121906.D	Liquid	Y	<2
7	HS18120734-01	SAMP	12-19-2018 03:02 pm	1.00	50 mL	50 mL	U121907.D	Liquid	Y	<2
8	HS18120734-01MS	MS	12-19-2018 03:26 pm	1.00	50 mL	50 mL	U121908.D	Liquid	Y	<2
	3.5 uL cal std/43 mL Sample									
9	HS18120734-01MSD	MSD	12-19-2018 03:51 pm	1.00	50 mL	50 mL	U121909.D	Liquid	Y	<2
	3.5 uL cal std/43 mL Sample									
10	HS18120336-12	SAMP	12-19-2018 04:16 pm	25.00	2 mL	50 mL	U121910.D	Liquid	Y	<2
11	HS18120336-03	SAMP	12-19-2018 04:41 pm	25.00	2 mL	50 mL	U121911.D	Liquid	Y	<2
12	HS18120266-06	SAMP	12-19-2018 05:05 pm	1.00	50 mL	50 mL	U121912.D	Liquid	Y	<2
13	HS18120266-01	SAMP	12-19-2018 05:30 pm	1.00	50 mL	50 mL	U121913.D	Liquid	Y	<2
14	HS18120266-02	SAMP	12-19-2018 05:55 pm	1.00	50 mL	50 mL	U121914.D	Liquid	Y	<2
15	HS18120266-05	SAMP	12-19-2018 06:20 pm	1.00	50 mL	50 mL	U121915.D	Liquid	Y	<2
16	HS18120266-03	SAMP	12-19-2018 06:45 pm	1.00	50 mL	50 mL	U121916.D	Liquid	Y	<2
17	HS18120266-04	SAMP	12-19-2018 07:09 pm	1.00	50 mL	50 mL	U121917.D	Liquid	Y	<2
18	HS18120336-21	SAMP	12-19-2018 07:34 pm	25.00	2 mL	50 mL	U121918.D	Liquid	Y	<2
19	HS18120336-05	SAMP	12-19-2018 07:59 pm	250.0(	200 µL	50 mL	U121919.D	Liquid	Y	<2
20	HS18120412-13	SAMP	12-19-2018 08:24 pm	1.00	50 mL	50 mL	U121920.D	Liquid	Y	<2
21	HS18120569-06	SAMP	12-19-2018 08:49 pm	1.00	50 mL	50 mL	U121921.D	Liquid	Y	<2
22	HS18120569-02	SAMP	12-19-2018 09:13 pm	1.00	50 mL	50 mL	U121922.D	Liquid	Y	<2
23	HS18120569-03	SAMP	12-19-2018 09:38 pm	1.00	50 mL	50 mL	U121923.D	Liquid	Y	<2
24	HS18120569-03	SAMP	12-19-2018 10:03 pm	1.00	50 mL	50 mL	U121924.D	Liquid	Y	<2
25	HS18120569-04	SAMP	12-19-2018 10:28 pm	1.00	50 mL	50 mL	U121925.D	Liquid	Y	<2
26	HS18120569-05	SAMP	12-19-2018 10:52 pm	1.00	50 mL	50 mL	U121926.D	Liquid	Y	<2
27	HS18120569-01DL	SAMP	12-19-2018 11:17 pm	25.00	2 mL	50 mL	U121927.D	Liquid	Y	<2
28	HS18120569-01	SAMP	12-19-2018 11:42 pm	1.00	50 mL	50 mL	U121928.D	Liquid	Y	<2
29	CCV_END	CCV	12-20-2018 12:07 am	1.00	50 mL	50 mL	U121929.D	Liquid	Y	NA
	10 uL cal std/50 ml DI									

MSVOA09 -Logbook

Chemical	Value
SURR SPK ID	30502-52-03
IS ID	30502-52-04
ICV STD ID	30603-46-01
LCS/MS ID	30603-46-01
CAL STD ID	30502-56-01/02
BFB ID	30502-52-03

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

	CLIENT SAMPLE NO.	SMC1 (DCE)#	SMC2 #	SMC3 (TOL)#	OTHER #	TOT OUT
01	VLCSW-181219	87	89	106	102	0
02	VBLKW-181219	91	88	104	98	0
03	HS18120734-0	87	90	106	103	0
04	HS18120734-0	87	89	105	103	0
05	HS18120569-0	93	90	106	98	0
06	HS18120569-0	93	90	104	98	0
07	HS18120569-0	93	90	106	98	0
08	HS18120569-0	90	89	102	102	0
09	HS18120569-0	91	90	105	99	0
10	HS18120569-0	93	91	105	98	0
11	HS18120569-0	92	91	104	99	0
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						

		QC LIMITS
SMC1 (DCE)	= 1,2-Dichloroethane-d4	(0-130)
SMC2	= Dibromofluoromethane	(0-130)
SMC3 (TOL)	= Toluene-d8	(0-130)
OTHER	= 4-Bromofluorobenzene	(0-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

VBLKW-181219

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Lab File ID: U121905 Lab Sample ID: VBLKW-181219

Date Analyzed: 12/19/18 Time Analyzed: 1412

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA9

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLCSW-181219	VLCSW-1812019	U121903	1323
02	HS18120734-0	HS18120734-01M	U121908	1526
03	HS18120734-0	HS18120734-01M	U121909	1551
04	HS18120569-0	HS18120569-06	U121921	2049
05	HS18120569-0	HS18120569-02	U121922	2113
06	HS18120569-0	HS18120569-03	U121923	2138
07	HS18120569-0	HS18120569-04	U121925	2228
08	HS18120569-0	HS18120569-05	U121926	2252
09	HS18120569-0	HS18120569-01D	U121927	2317
10	HS18120569-0	HS18120569-01	U121928	2342
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Lab File ID: U121901 BFB Injection Date: 12/19/18

Instrument ID: VOA9 BFB Injection Time: 1233

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.4
75	30.0 - 60.0% of mass 95	50.2
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.5 (0.7)1
174	Greater than 50.0% of mass 95	65.6
175	5.0 - 9.0% of mass 174	5.0 (7.5)1
176	95.0 - 101.0% of mass 174	63.7 (97.0)1
177	5.0 - 9.0% of mass 176	4.3 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	U121902	12/19/18	1258
02	VLCSW-181219	VLCSW-1812019	U121903	12/19/18	1323
03	VBLKW-181219	VBLKW-181219	U121905	12/19/18	1412
04	HS18120734-0	HS18120734-01M	U121908	12/19/18	1526
05	HS18120734-0	HS18120734-01M	U121909	12/19/18	1551
06	HS18120569-0	HS18120569-06	U121921	12/19/18	2049
07	HS18120569-0	HS18120569-02	U121922	12/19/18	2113
08	HS18120569-0	HS18120569-03	U121923	12/19/18	2138
09	HS18120569-0	HS18120569-04	U121925	12/19/18	2228
10	HS18120569-0	HS18120569-05	U121926	12/19/18	2252
11	HS18120569-0	HS18120569-01D	U121927	12/19/18	2317
12	HS18120569-0	HS18120569-01	U121928	12/19/18	2342
13	CCV_END	CCV_END	U121929	12/20/18	0007
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Instrument ID: VOA9 Calibration Date: 12/19/18 Time: 1258

Lab File ID: U121902 Init. Calib. Date(s): 11/13/18 11/13/18

Init. Calib. Times: 1123 1528

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
cis-1,3-Dichloropropene	0.5230000	0.6578337	0.6578337	0.2	-25.78	20.00	AVRG	<-
trans-1,3-Dichloropropene	53.754443	50.000000	0.5576940	0.1	-7.51	20.00	LINR	
1,3-Dichlorobenzene	1.5740000	1.5903947	1.5903947	0.6	-1.04	20.00	AVRG	
2,2-Dichloropropane	0.7100000	0.7457347	0.7457347	0.1	-5.03	20.00	AVRG	
1,1-Dichloropropene	0.4620000	0.4863334	0.4863334	0.1	-5.27	20.00	AVRG	
Dibromomethane	0.2230000	0.2466981	0.2466981	0.1	-10.63	20.00	AVRG	
1,2-Dibromoethane	0.3680000	0.4126418	0.4126418	0.1	-12.13	20.00	AVRG	
trans-1,2-Dichloroethene	0.6180000	0.6447012	0.6447012	0.1	-4.32	20.00	AVRG	
1,1,1,2-Tetrachloroethane	0.3150000	0.3541961	0.3541961	0.1	-12.44	20.00	AVRG	
1,1,1-Trichloroethane	0.8780000	0.8440518	0.8440518	0.1	3.87	20.00	AVRG	
1,1,2,2-Tetrachloroethane	1.1840000	1.3143495	1.3143495	0.3	-11.01	20.00	AVRG	
Freon TF	0.5010000	0.4023809	0.4023809	0.1	19.68	20.00	AVRG	
1,1,2-Trichloroethane	0.3180000	0.3537014	0.3537014	0.1	-11.23	20.00	AVRG	
1,1-Dichloroethane	1.1460000	1.2125971	1.2125971	0.2	-5.81	20.00	AVRG	
1,1-Dichloroethene	0.5640000	0.4808149	0.4808149	0.1	14.75	20.00	AVRG	
Trichlorofluoromethane	1.0000000	0.8263548	0.8263548	0.1	17.36	20.00	AVRG	
1,2,3-Trichlorobenzene	0.9440000	0.9635063	0.9635063	0.1	-2.07	20.00	AVRG	
Toluene	1.5870000	1.7380429	1.7380429	0.4	-9.52	20.00	AVRG	
1,2,4-Trichlorobenzene	0.9830000	0.9934870	0.9934870	0.2	-1.07	20.00	AVRG	
1,2,4-Trimethylbenzene	2.7770000	2.8841783	2.8841783	0.1	-3.86	20.00	AVRG	
Tetrachloroethene	0.2620000	0.2633745	0.2633745	0.2	-0.52	20.00	AVRG	
Trichloroethene	0.3410000	0.3599097	0.3599097	0.2	-5.54	20.00	AVRG	
1,2-Dichlorobenzene	1.5970000	1.5998129	1.5998129	0.4	-0.18	20.00	AVRG	
1,2-Dichloroethane	0.5230000	0.5517139	0.5517139	0.1	-5.49	20.00	AVRG	
1,2-Dichloropropane	0.3560000	0.4204861	0.4204861	0.1	-18.11	20.00	AVRG	
1,3,5-Trimethylbenzene	2.6860000	2.7373591	2.7373591	0.1	-1.91	20.00	AVRG	
1,3-Dichloropropane	0.6820000	0.7671939	0.7671939	0.1	-12.49	20.00	AVRG	
1,4-Dichlorobenzene	53.471247	50.000000	1.6466469	0.4	-6.94	20.00	LINR	
2-Butanone	0.3510000	0.3960634	0.3960634	0.1	-12.84	20.00	AVRG	
2-Chlorotoluene	2.4480000	2.5505500	2.5505500	0.1	-4.19	20.00	AVRG	
2-Hexanone	0.2910000	0.3599889	0.3599889	0.1	-23.71	20.00	AVRG	<-
4-Chlorotoluene	2.8250000	2.9804442	2.9804442	0.1	-5.50	20.00	AVRG	
tert-Butylbenzene	2.2890000	2.2480171	2.2480171	0.1	1.79	20.00	AVRG	
4-Methyl-2-Pentanone	0.4170000	0.5119048	0.5119048	0.1	-22.76	20.00	AVRG	<-
Acetone	102.83522	100.00000	0.2357498	0.1	-2.84	20.00	LINR	
Benzene	1.3820000	1.5746549	1.5746549	0.5	-13.94	20.00	AVRG	
Bromobenzene	0.8200000	0.8738413	0.8738413	0.1	-6.57	20.00	AVRG	
Bromochloromethane	0.2950000	0.3375098	0.3375098	0.1	-14.41	20.00	AVRG	
Bromodichloromethane	0.4160000	0.4615897	0.4615897	0.2	-10.96	20.00	AVRG	
Bromoform	50.142758	50.000000	0.2279253	0.1	-0.28	20.00	2RDR	
Bromomethane	40.023558	50.000000	0.3288196	0.1	19.95	20.00	LINR	
Carbon Disulfide	1.7430000	1.8410717	1.8410717	0.1	-5.63	20.00	AVRG	

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812056

Instrument ID: VOA9 Calibration Date: 12/19/18 Time: 1258

Lab File ID: U121902 Init. Calib. Date(s): 11/13/18 11/13/18

Init. Calib. Times: 1123 1528

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Carbon Tetrachloride	0.3610000	0.3625207	0.3625207	0.1	-0.42	20.00	AVRG
Chlorobenzene	1.0320000	1.0911156	1.0911156	0.5	-5.73	20.00	AVRG
Chloroethane	0.5220000	0.4768756	0.4768756	0.1	8.64	20.00	AVRG
Chloroform	1.1510000	1.1713482	1.1713482	0.2	-1.77	20.00	AVRG
Chloromethane	43.366709	50.000000	0.5785693	0.1	13.27	20.00	LINR
cis-1,2-Dichloroethene	0.7080000	0.7476908	0.7476908	0.1	-5.61	20.00	AVRG
Dibromochloromethane	0.3160000	0.3695734	0.3695734	0.1	-16.95	20.00	AVRG
Dichlorodifluoromethane	43.308002	50.000000	0.6381050	0.1	13.38	20.00	LINR
Ethylbenzene	0.5220000	0.5504362	0.5504362	0.1	-5.45	20.00	AVRG
Hexachlorobutadiene	55.230956	50.000000	0.3431445	0.1	-10.46	20.00	2RDR
Isopropylbenzene	1.5190000	1.5451961	1.5451961	0.1	-1.72	20.00	AVRG
m,p-Xylenes	0.6430000	0.6846912	0.6846912	0.1	-6.48	20.00	AVRG
Methylene Chloride	56.564167	50.000000	0.7205541	0.1	-13.13	20.00	LINR
n-Butylbenzene	49.590478	50.000000	2.5962794	0.5	0.82	20.00	2RDR
n-Propylbenzene	3.9460000	4.0301428	4.0301428	0.1	-2.13	20.00	AVRG
Naphthalene	2.9610000	3.3311015	3.3311015	0.2	-12.50	20.00	AVRG
o-Xylene	0.6430000	0.7058776	0.7058776	0.3	-9.78	20.00	AVRG
sec-Butylbenzene	3.2850000	3.2122125	3.2122125	0.1	2.22	20.00	AVRG
Styrene	1.0860000	1.2516582	1.2516582	0.3	-15.25	20.00	AVRG
Vinyl Chloride	46.117208	50.000000	0.7511485	0.1	7.76	20.00	LINR
1,2,3-Trichloropropane	1.2360000	1.4287693	1.4287693	0.1	-15.60	20.00	AVRG
p-Isopropyltoluene	2.7380000	2.7748122	2.7748122	0.1	-1.34	20.00	AVRG
1,2-Dibromo-3-Chloropropane	51.567761	50.000000	0.1888766	0.05	-3.14	20.00	2RDR
1,2-Dichloroethane-d4	44.381325	50.000000	0.6738373	0.1	11.24	20.00	LINR
Dibromofluoromethane	45.152310	50.000000	0.5204026	0.1	9.70	20.00	LINR
Toluene-d8	52.390102	50.000000	1.3370259	0.1	-4.78	20.00	LINR
4-Bromofluorobenzene	51.483262	50.000000	0.5087802	0.1	-2.97	20.00	LINR

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Instrument ID: VOA9 Calibration Date: 12/20/18 Time: 0007

Lab File ID: U121929 Init. Calib. Date(s): 11/13/18 11/13/18

Init. Calib. Times: 1123 1528

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE	
cis-1,3-Dichloropropene	0.5230000	0.6496220	0.6496220	0.2	-24.21	50.00	AVRG	
trans-1,3-Dichloropropene	53.626326	50.000000	0.5563272	0.1	-7.25	50.00	LINR	
1,3-Dichlorobenzene	1.5740000	1.6642162	1.6642162	0.6	-5.73	50.00	AVRG	
2,2-Dichloropropane	0.7100000	0.5769928	0.5769928	0.1	18.73	50.00	AVRG	
1,1-Dichloropropene	0.4620000	0.5043161	0.5043161	0.1	-9.16	50.00	AVRG	
Dibromomethane	0.2230000	0.2556351	0.2556351	0.1	-14.63	50.00	AVRG	
1,2-Dibromoethane	0.3680000	0.4277240	0.4277240	0.1	-16.23	50.00	AVRG	
trans-1,2-Dichloroethene	0.6180000	0.6520945	0.6520945	0.1	-5.52	50.00	AVRG	
1,1,1,2-Tetrachloroethane	0.3150000	0.3734590	0.3734590	0.1	-18.56	50.00	AVRG	
1,1,1-Trichloroethane	0.8780000	0.8878494	0.8878494	0.1	-1.12	50.00	AVRG	
1,1,2,2-Tetrachloroethane	1.1840000	1.3517896	1.3517896	0.3	-14.17	50.00	AVRG	
Freon TF	0.5010000	0.4023626	0.4023626	0.1	19.69	50.00	AVRG	
1,1,2-Trichloroethane	0.3180000	0.3671396	0.3671396	0.1	-15.45	50.00	AVRG	
1,1-Dichloroethane	1.1460000	1.2436787	1.2436787	0.2	-8.52	50.00	AVRG	
1,1-Dichloroethene	0.5640000	0.5249438	0.5249438	0.1	6.92	50.00	AVRG	
Trichlorofluoromethane	1.0000000	0.8175256	0.8175256	0.1	18.25	50.00	AVRG	
1,2,3-Trichlorobenzene	0.9440000	1.0309239	1.0309239	0.1	-9.21	50.00	AVRG	
Toluene	1.5870000	1.7831654	1.7831654	0.4	-12.36	50.00	AVRG	
1,2,4-Trichlorobenzene	0.9830000	1.0472683	1.0472683	0.2	-6.54	50.00	AVRG	
1,2,4-Trimethylbenzene	2.7770000	3.1052335	3.1052335	0.1	-11.82	50.00	AVRG	
Tetrachloroethene	0.2620000	0.2781523	0.2781523	0.2	-6.16	50.00	AVRG	
Trichloroethene	0.3410000	0.3786652	0.3786652	0.2	-11.04	50.00	AVRG	
1,2-Dichlorobenzene	1.5970000	1.6938881	1.6938881	0.4	-6.07	50.00	AVRG	
1,2-Dichloroethane	0.5230000	0.5684154	0.5684154	0.1	-8.68	50.00	AVRG	
1,2-Dichloropropane	0.3560000	0.4372927	0.4372927	0.1	-22.84	50.00	AVRG	
1,3,5-Trimethylbenzene	2.6860000	2.9683338	2.9683338	0.1	-10.51	50.00	AVRG	
1,3-Dichloropropane	0.6820000	0.7876155	0.7876155	0.1	-15.49	50.00	AVRG	
1,4-Dichlorobenzene	55.904781	50.000000	1.7215280	0.4	-11.81	50.00	LINR	
2-Butanone	0.3510000	0.4037244	0.4037244	0.1	-15.02	50.00	AVRG	
2-Chlorotoluene	2.4480000	2.6573097	2.6573097	0.1	-8.55	50.00	AVRG	
2-Hexanone	0.2910000	0.3799045	0.3799045	0.1	-30.55	50.00	AVRG	
4-Chlorotoluene	2.8250000	3.1063178	3.1063178	0.1	-9.96	50.00	AVRG	
tert-Butylbenzene	2.2890000	2.4747119	2.4747119	0.1	-8.11	50.00	AVRG	
4-Methyl-2-Pentanone	0.4170000	0.5327018	0.5327018	0.1	-27.75	50.00	AVRG	
Acetone	123.66689	100.00000	0.2815340	0.1	-23.67	50.00	LINR	
Benzene	1.3820000	1.6044374	1.6044374	0.5	-16.10	50.00	AVRG	
Bromobenzene	0.8200000	0.8929330	0.8929330	0.1	-8.89	50.00	AVRG	
Bromochloromethane	0.2950000	0.3410733	0.3410733	0.1	-15.62	50.00	AVRG	
Bromodichloromethane	0.4160000	0.4832830	0.4832830	0.2	-16.17	50.00	AVRG	
Bromoform	53.493219	50.000000	0.2436506	0.1	-6.99	50.00	2RDR	
Bromomethane	19.008126	50.000000	0.1475457	0.1	61.98	50.00	LINR	<-
Carbon Disulfide	1.7430000	1.9130195	1.9130195	0.1	-9.75	50.00	AVRG	

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812056

Instrument ID: VOA9 Calibration Date: 12/20/18 Time: 0007

Lab File ID: U121929 Init. Calib. Date(s): 11/13/18 11/13/18

Init. Calib. Times: 1123 1528

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Carbon Tetrachloride	0.3610000	0.3854745	0.3854745	0.1	-6.78	50.00	AVRG
Chlorobenzene	1.0320000	1.1335152	1.1335152	0.5	-9.84	50.00	AVRG
Chloroethane	0.5220000	0.4911122	0.4911122	0.1	5.92	50.00	AVRG
Chloroform	1.1510000	1.1970932	1.1970932	0.2	-4.00	50.00	AVRG
Chloromethane	37.637234	50.000000	0.5017238	0.1	24.72	50.00	LINR
cis-1,2-Dichloroethene	0.7080000	0.7543877	0.7543877	0.1	-6.55	50.00	AVRG
Dibromochloromethane	0.3160000	0.3815825	0.3815825	0.1	-20.75	50.00	AVRG
Dichlorodifluoromethane	47.013780	50.000000	0.6939981	0.1	5.97	50.00	LINR
Ethylbenzene	0.5220000	0.5788743	0.5788743	0.1	-10.90	50.00	AVRG
Hexachlorobutadiene	55.009780	50.000000	0.3416846	0.1	-10.02	50.00	2RDR
Isopropylbenzene	1.5190000	1.6914402	1.6914402	0.1	-11.35	50.00	AVRG
m,p-Xylenes	0.6430000	0.7216305	0.7216305	0.1	-12.23	50.00	AVRG
Methylene Chloride	57.832745	50.000000	0.7365160	0.1	-15.66	50.00	LINR
n-Butylbenzene	54.014257	50.000000	2.8349440	0.5	-8.03	50.00	2RDR
n-Propylbenzene	3.9460000	4.3420951	4.3420951	0.1	-10.04	50.00	AVRG
Naphthalene	2.9610000	3.5641995	3.5641995	0.2	-20.37	50.00	AVRG
o-Xylene	0.6430000	0.7404449	0.7404449	0.3	-15.15	50.00	AVRG
sec-Butylbenzene	3.2850000	3.5882852	3.5882852	0.1	-9.23	50.00	AVRG
Styrene	1.0860000	1.2963470	1.2963470	0.3	-19.37	50.00	AVRG
Vinyl Chloride	43.097230	50.000000	0.7014117	0.1	13.80	50.00	LINR
1,2,3-Trichloropropane	1.2360000	1.4085951	1.4085951	0.1	-13.96	50.00	AVRG
p-Isopropyltoluene	2.7380000	3.0495979	3.0495979	0.1	-11.38	50.00	AVRG
1,2-Dibromo-3-Chloropropane	53.827062	50.000000	0.1973858	0.05	-7.65	50.00	2RDR
1,2-Dichloroethane-d4	43.700024	50.000000	0.6638910	0.1	12.60	50.00	LINR
Dibromofluoromethane	44.954131	50.000000	0.5181802	0.1	10.09	50.00	LINR
Toluene-d8	52.718196	50.000000	1.3451346	0.1	-5.44	50.00	LINR
4-Bromofluorobenzene	51.250145	50.000000	0.5065232	0.1	-2.50	50.00	LINR

FORM VII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Lab File ID (Standard): U121902 Date Analyzed: 12/19/18

Instrument ID: VOA9 Time Analyzed: 1258

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(DCB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DFB) AREA #	RT #
	12 HOUR STD	296024	10.24	612398	8.25	655684	5.63
	UPPER LIMIT	592048	10.74	1224796	8.75	1311368	6.13
	LOWER LIMIT	148012	9.74	306199	7.75	327842	5.13
	CLIENT SAMPLE NO.						
01	VLCSW-181219	304306	10.24	634574	8.25	691666	5.63
02	VBLKW-181219	268507	10.24	589067	8.25	643819	5.63
03	HS18120734-0	294651	10.24	608271	8.25	657579	5.63
04	HS18120734-0	301438	10.24	626104	8.25	674873	5.63
05	HS18120569-0	258506	10.24	566871	8.25	623383	5.63
06	HS18120569-0	260317	10.24	574345	8.25	627542	5.63
07	HS18120569-0	260495	10.24	566711	8.25	621856	5.63
08	HS18120569-0	284964	10.24	593810	8.25	626637	5.63
09	HS18120569-0	263549	10.24	576219	8.25	629652	5.63
10	HS18120569-0	268421	10.24	582740	8.25	635092	5.63
11	HS18120569-0	274436	10.24	582649	8.25	637398	5.63
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DFB) = 1,4-Difluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120569

Lab File ID (Standard): U121902 Date Analyzed: 12/19/18

Instrument ID: VOA9 Time Analyzed: 1258

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	369610	4.89				
	UPPER LIMIT	739220	5.39				
	LOWER LIMIT	184805	4.39				
	CLIENT SAMPLE NO.						
01	VLCSW-181219	389626	4.90				
02	VBLKW-181219	360270	4.90				
03	HS18120734-0	372882	4.89				
04	HS18120734-0	385905	4.89				
05	HS18120569-0	344760	4.90				
06	HS18120569-0	345743	4.89				
07	HS18120569-0	342930	4.90				
08	HS18120569-0	354217	4.89				
09	HS18120569-0	354313	4.89				
10	HS18120569-0	353725	4.90				
11	HS18120569-0	357372	4.89				
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS4 = Pentafluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121901.D Page 1

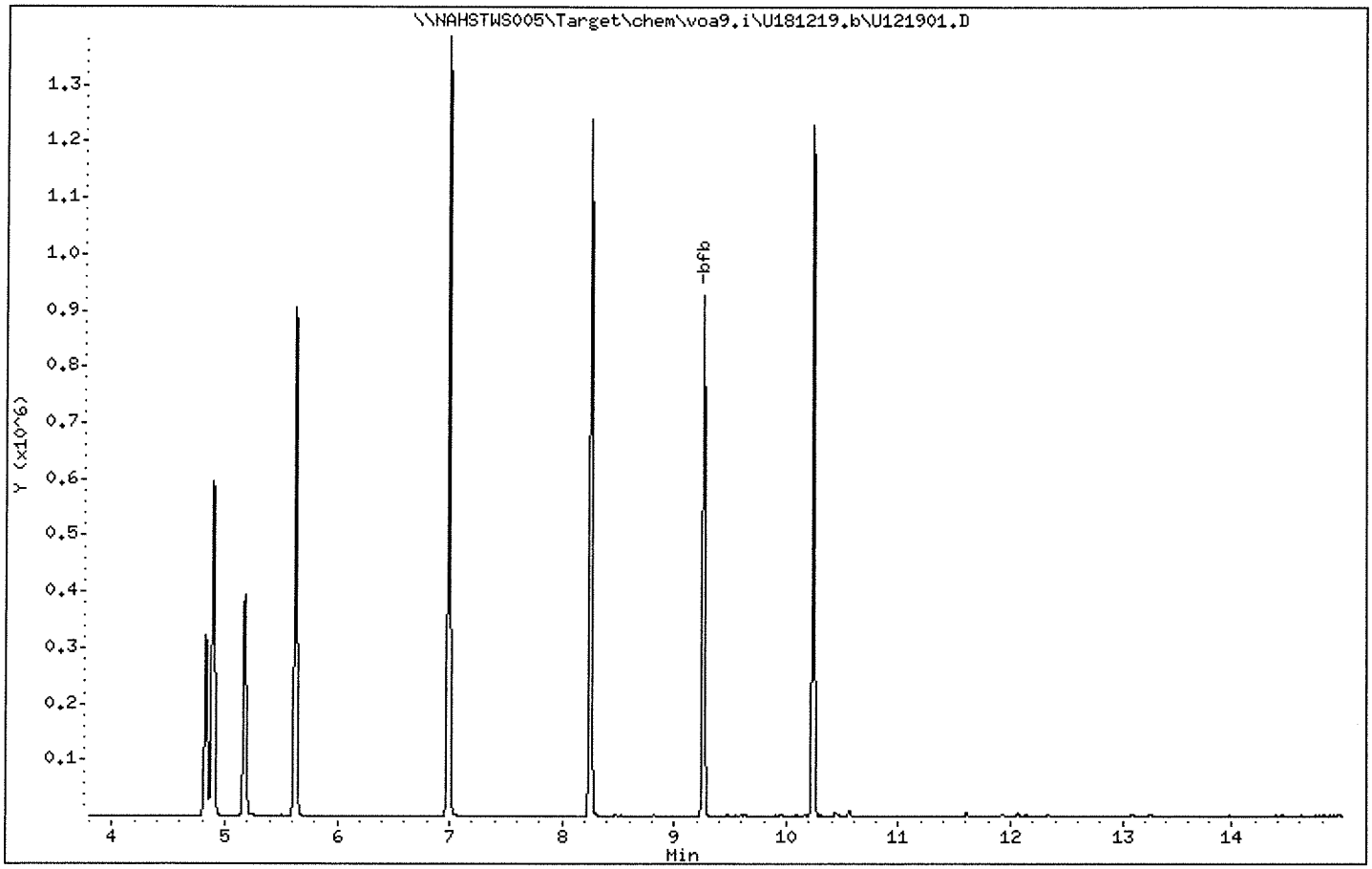
Date : 19-DEC-2018 12:33

Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121901.D Page 2

Date : 19-DEC-2018 12:33

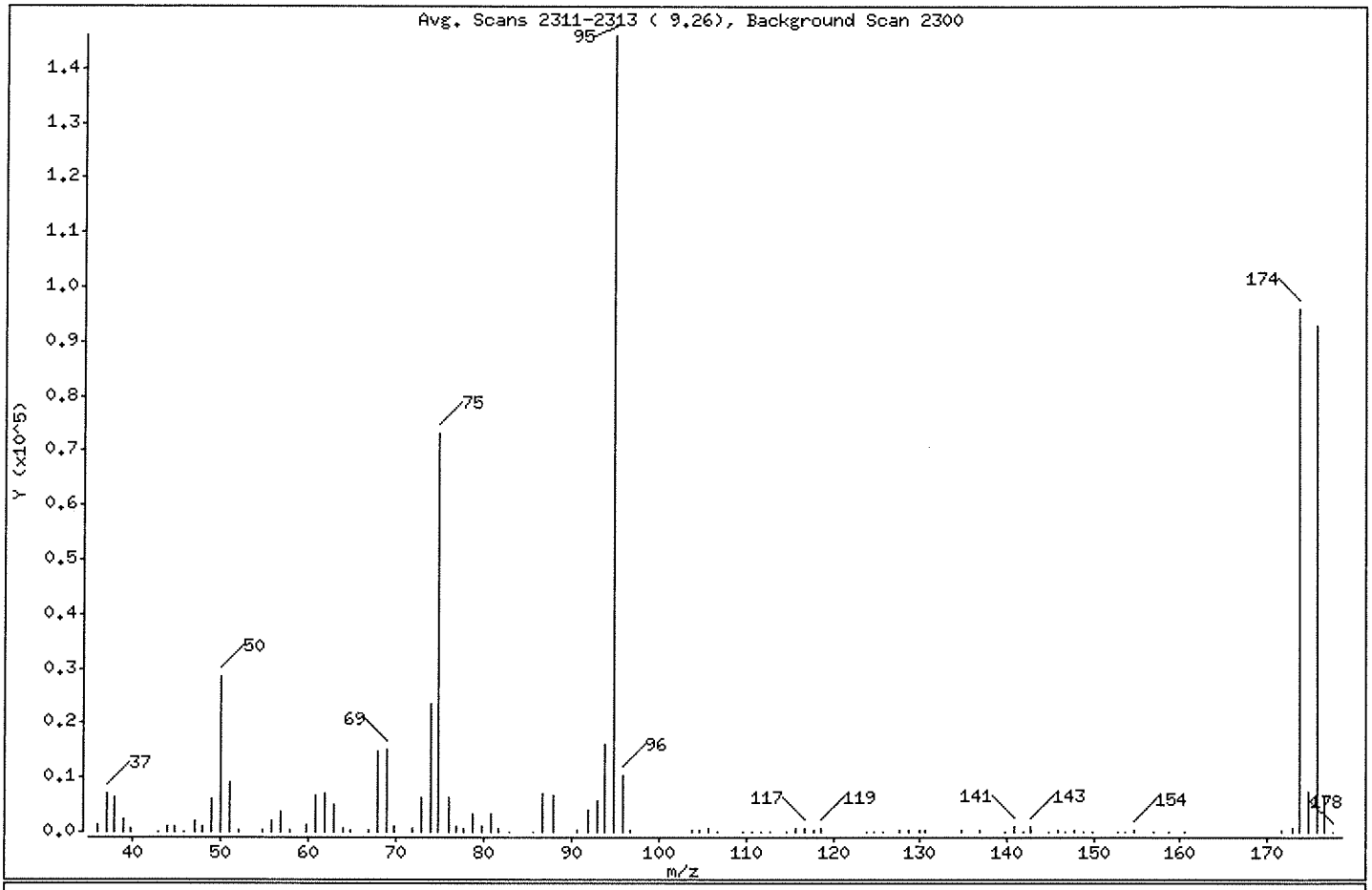
Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	19.44
75	30.00 - 60.00% of mass 95	50.17
96	5.00 - 9.00% of mass 95	7.13
173	Less than 2.00% of mass 174	0.48 (0.73)
174	Greater than 50.00% of mass 95	65.64
175	5.00 - 9.00% of mass 174	4.96 (7.55)
176	95.00 - 101.00% of mass 174	63.67 (96.99)
177	5.00 - 9.00% of mass 176	4.30 (6.75)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121901.D

Date : 19-DEC-2018 12:33

Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

Data File: U121901.D
Spectrum: Avg. Scans 2311-2313 (9.26), Background Scan 2300
Location of Maximum: 94.95
Number of points: 96

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	1334	66.90	418	96.80	280	141.80	161
37.00	7122	67.90	14798	103.80	489	142.70	1103
38.00	6484	68.90	14970	104.70	172	144.70	165
39.00	2485	69.90	1080	105.70	555	145.80	209
39.90	656	71.90	771	106.80	114	146.60	101
42.90	77	72.90	6373	109.60	54	147.70	210
43.90	941	73.90	23568	110.70	97	148.70	98
44.90	1164	74.90	73240	111.70	58	149.70	90
45.90	99	76.00	6463	112.80	85	152.60	69
47.00	2161	76.90	1059	114.60	153	153.50	52
47.90	999	77.80	778	115.70	521	154.60	220
49.00	6136	78.80	3398	116.80	708	156.70	163
50.00	28384	79.80	1066	117.70	442	158.70	157
51.00	9000	80.80	3495	118.70	598	160.60	103
52.00	386	81.80	722	123.90	64	171.70	450
54.90	348	82.90	78	124.70	68	172.80	700
55.90	1980	85.70	133	125.80	57	173.70	95824
56.90	3756	86.80	6916	127.70	421	174.70	7234
57.90	235	87.90	6648	128.70	217	175.70	92944
59.90	1319	90.70	431	129.80	440	176.70	6278
60.90	6764	91.90	3953	130.60	201	177.70	165
62.00	7009	92.90	5761	134.70	210		
62.90	4984	93.90	16110	136.70	180		
63.90	580	94.90	145984	139.70	88		
64.80	406	95.90	10408	140.80	1041		

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121902.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121902.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 19-DEC-2018 12:58
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

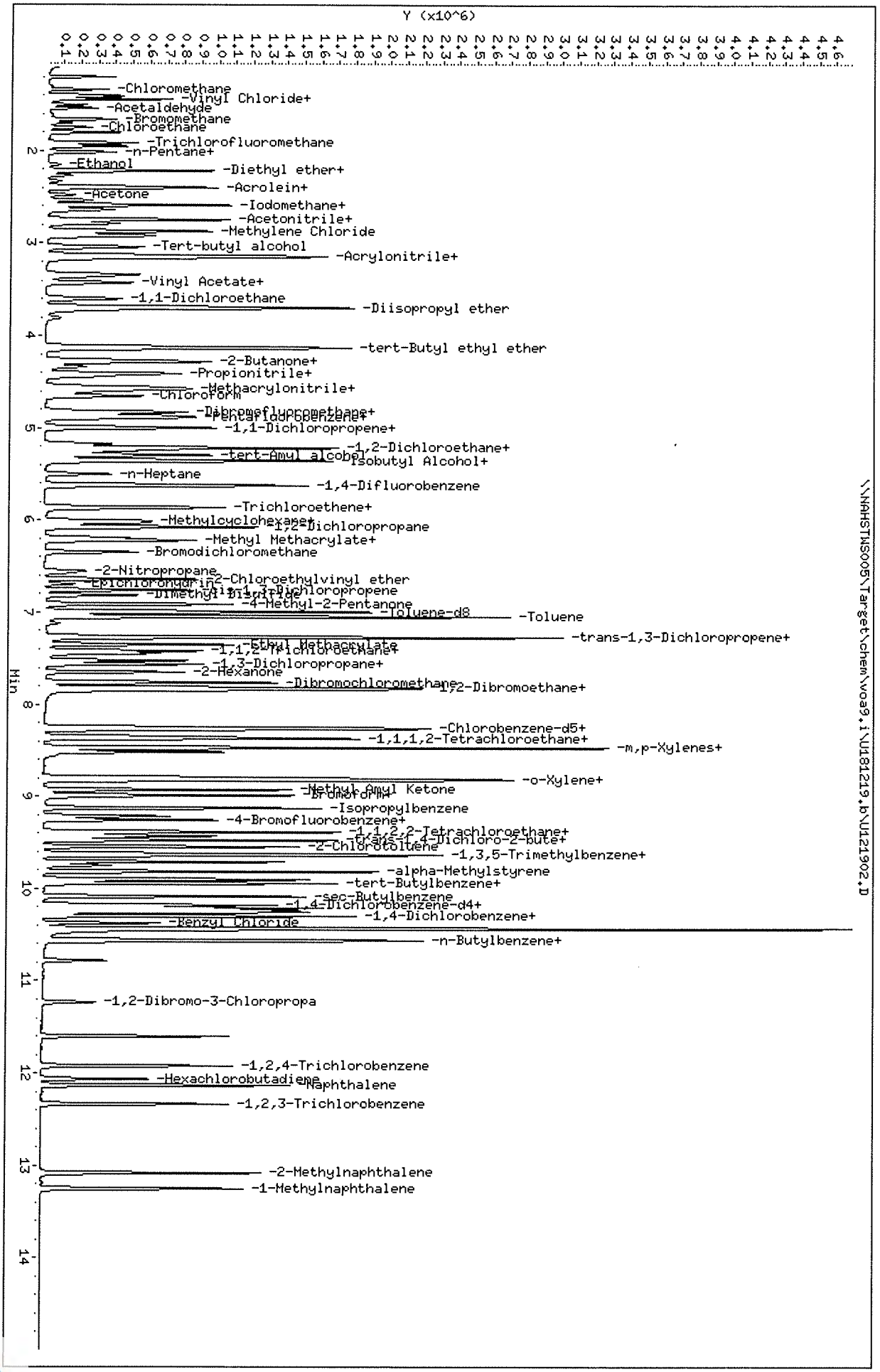
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.894	4.894	(1.000)	369610	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	655684	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	612398	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	296024	50.0000	
$	30 Dibromofluoromethane	113	4.826	4.826	(0.986)	192346	50.0000	45.15
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	249057	50.0000	44.38
$	48 Toluene-d8	98	6.989	6.989	(0.847)	818792	50.0000	52.39
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	311576	50.0000	51.48
	60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	216909	50.0000	56.15
	31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	311970	50.0000	48.05
	68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	389079	50.0000	55.48
	138 Freon TF	101	2.397	2.397	(0.490)	148724	50.0000	40.16
	53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	216606	50.0000	55.63
	22 1,1-Dichloroethane	63	3.601	3.601	(0.736)	448188	50.0000	52.91
	11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	177714	50.0000	42.59
	32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	318881	50.0000	52.65
	93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	285221	50.0000	51.03
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	422950	50.0000	57.80
	90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	294096	50.0000	50.52
	79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	853786	50.0000	51.92
	89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	55912	50.0000	51.56
	57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	252701	50.0000	56.05

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121902.D Page 2
Report Date: 25-Jan-2019 21:02

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	473583	50.0000	50.09
33	1,2-Dichloroethane	62	5.250	5.250	(0.933)	361750	50.0000	52.72
42	1,2-Dichloropropane	63	6.079	6.079	(1.081)	275706	50.0000	59.05
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	810324	50.0000	50.94
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	470795	50.0000	50.51
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	469828	50.0000	56.20
84	1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	487447	50.0000	53.47
26	2,2-Dichloropropane	77	4.272	4.272	(0.873)	275631	50.0000	52.54
24	2-Butanone	43	4.335	4.335	(0.886)	292778	100.000	112.68
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	755024	50.0000	52.08
52	2-Hexanone	43	7.649	7.649	(0.927)	440913	100.000	123.85
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	882283	50.0000	52.74
82	p-Isopropyltoluene	119	10.210	10.210	(0.997)	821411	50.0000	50.67
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	626979	100.000	122.72
10	Acetone	43	2.476	2.476	(0.506)	174271	100.000	102.83
37	Benzene	78	5.216	5.216	(0.927)	1032476	50.0000	56.96
74	Bromobenzene	156	9.381	9.381	(0.917)	258678	50.0000	53.27
29	Bromochloromethane	128	4.553	4.553	(0.930)	124747	50.0000	57.25
39	Bromodichloromethane	83	6.348	6.348	(1.129)	302657	50.0000	55.55
66	Bromoform	173	8.984	8.984	(1.089)	139581	50.0000	50.14(T)
6	Bromomethane	94	1.663	1.663	(0.340)	121535	50.0000	40.02
19	Carbon Disulfide	76	2.588	2.588	(0.529)	1360957	100.000	105.63
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	237699	50.0000	50.24
59	Chlorobenzene	112	8.275	8.275	(1.003)	668197	50.0000	52.86
7	Chloroethane	64	1.749	1.749	(0.357)	176258	50.0000	45.70(M)
28	Chloroform	83	4.654	4.654	(0.951)	432942	50.0000	50.87
3	Chloromethane	50	1.336	1.336	(0.273)	213845	50.0000	43.36
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	276354	50.0000	52.76
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	431331	50.0000	62.86
55	Dibromochloromethane	129	7.758	7.758	(0.940)	226326	50.0000	58.40
44	Dibromomethane	93	6.191	6.191	(1.101)	161756	50.0000	55.28
2	Dichlorodifluoromethane	85	1.201	1.201	(0.246)	235850	50.0000	43.30
61	Ethylbenzene	106	8.369	8.369	(1.015)	337086	50.0000	52.75
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	101579	50.0000	55.23
67	Isopropylbenzene	105	9.126	9.126	(1.106)	946275	50.0000	50.84
62	m,p-Xylenes	106	8.470	8.470	(1.027)	838607	100.000	106.48
17	Methylene Chloride	84	2.870	2.870	(0.586)	266324	50.0000	56.56
87	n-Butylbenzene	91	10.558	10.558	(1.031)	768561	50.0000	49.59
73	n-Propylbenzene	91	9.475	9.475	(0.926)	1193019	50.0000	51.07
92	Naphthalene	128	12.133	12.133	(1.185)	986086	50.0000	56.25
63	o-Xylene	106	8.811	8.811	(1.068)	432278	50.0000	54.85
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	950892	50.0000	48.88
64	Styrene	104	8.823	8.823	(1.070)	766513	50.0000	57.60
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	665467	50.0000	49.09
56	Tetrachloroethene	164	7.522	7.522	(0.912)	161290	50.0000	50.27
50	Toluene	91	7.046	7.046	(0.854)	1064374	50.0000	54.74
20	trans-1,2-Dichloroethene	96	3.140	3.140	(0.642)	238288	50.0000	52.11
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	365671	50.0000	53.75
38	Trichloroethene	130	5.861	5.861	(1.042)	235987	50.0000	52.81
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	305429	50.0000	41.33
5	Vinyl Chloride	62	1.415	1.415	(0.289)	277632	50.0000	46.11

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.



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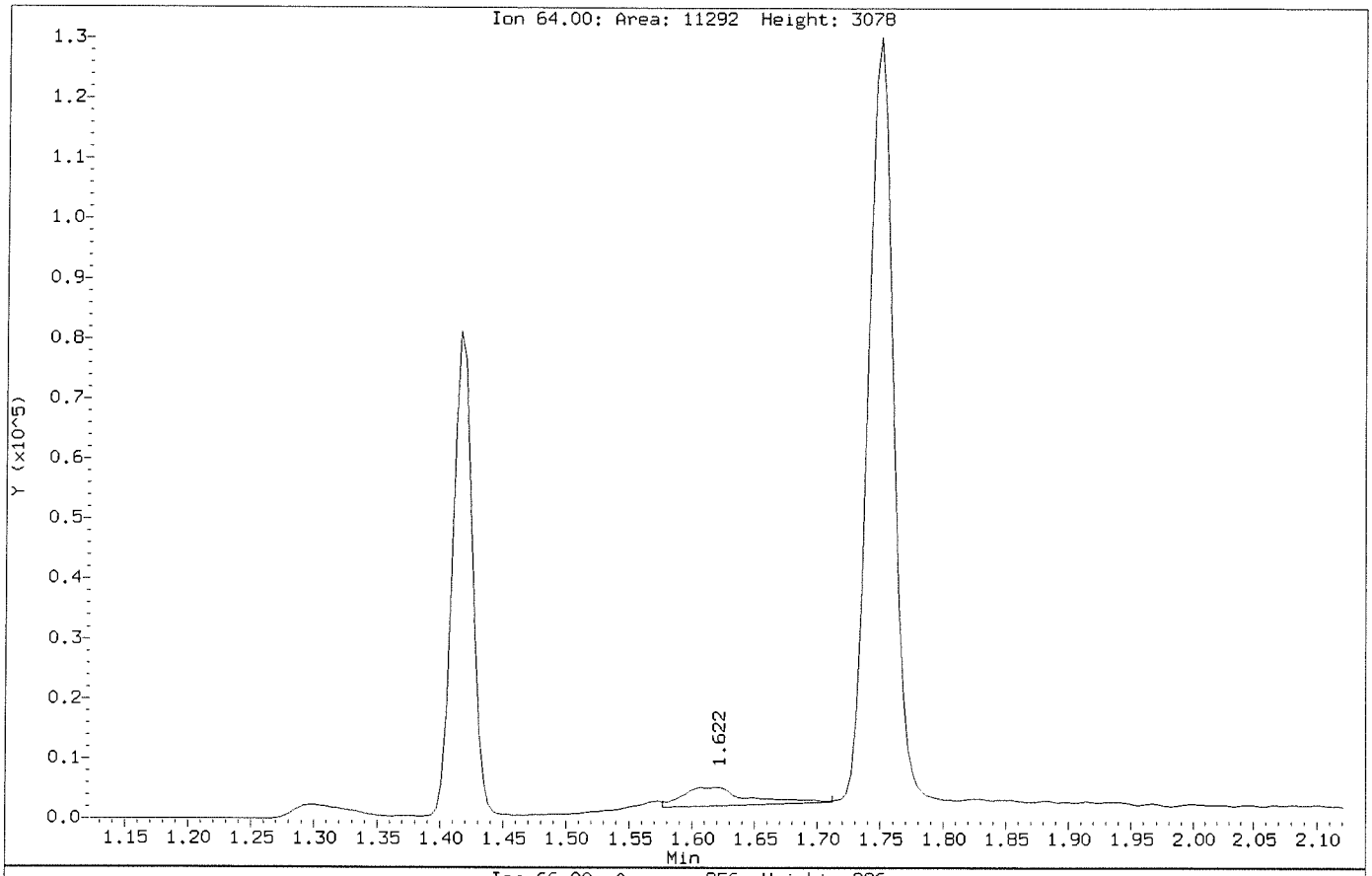
Date : 19-DEC-2018 12:58
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;2;;
Purge Volume: 5.0
Column phase: DB624

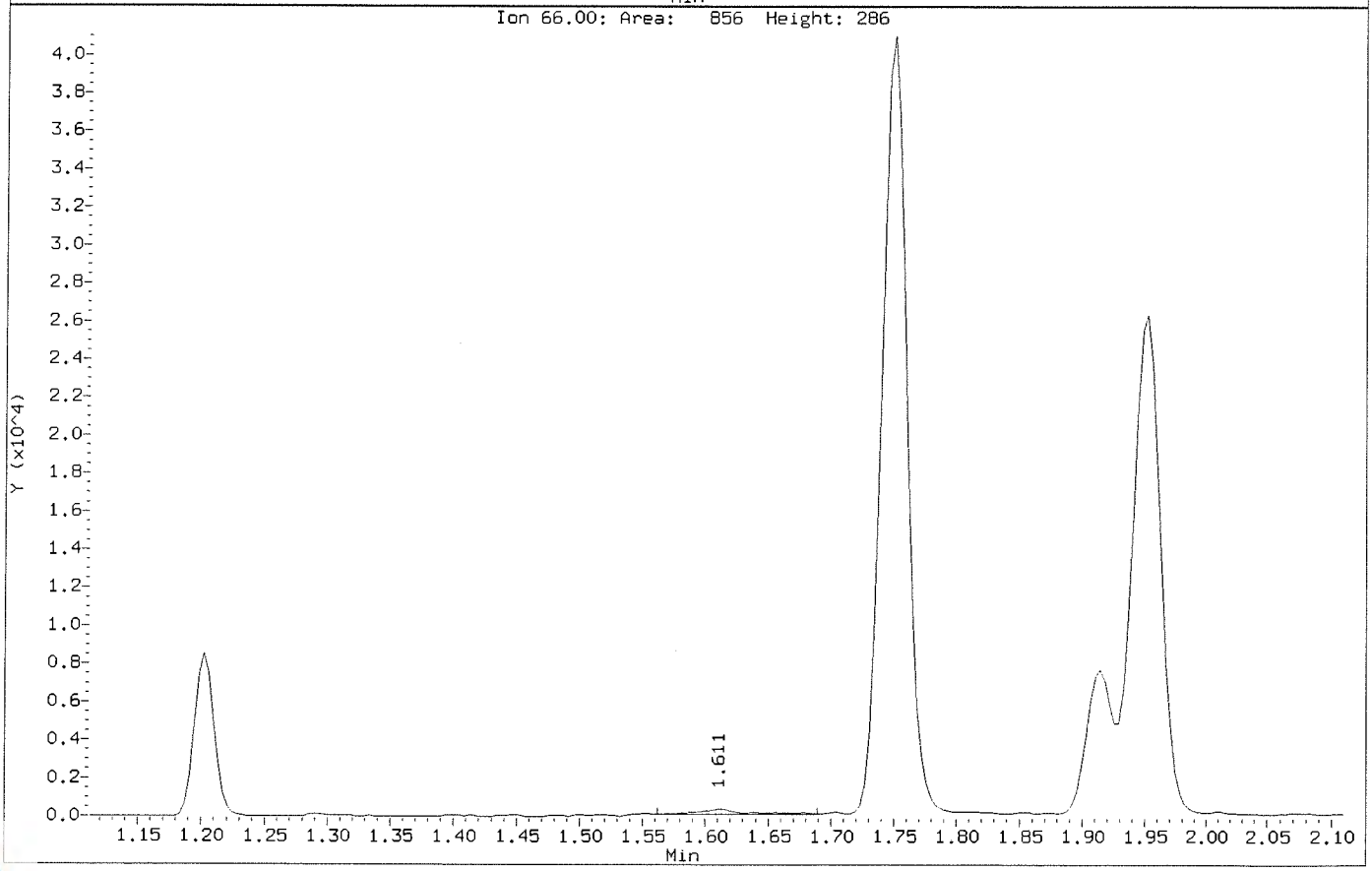
\\NAHSTWS005\Target\chem\voa9,i\U181219,b\U121902,D

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\Before\U121902.D
Injection Date: 19-DEC-2018 12:58
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





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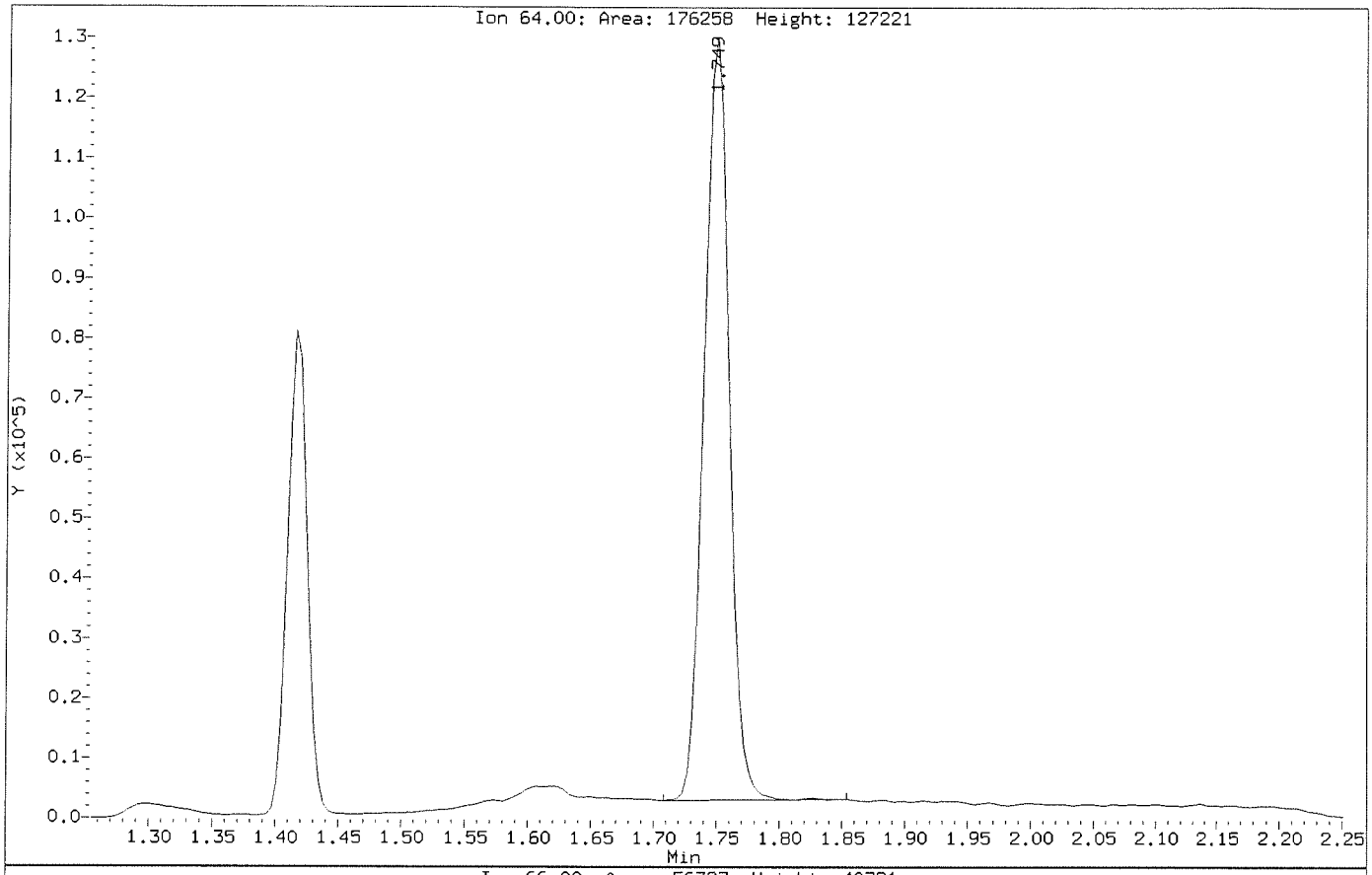
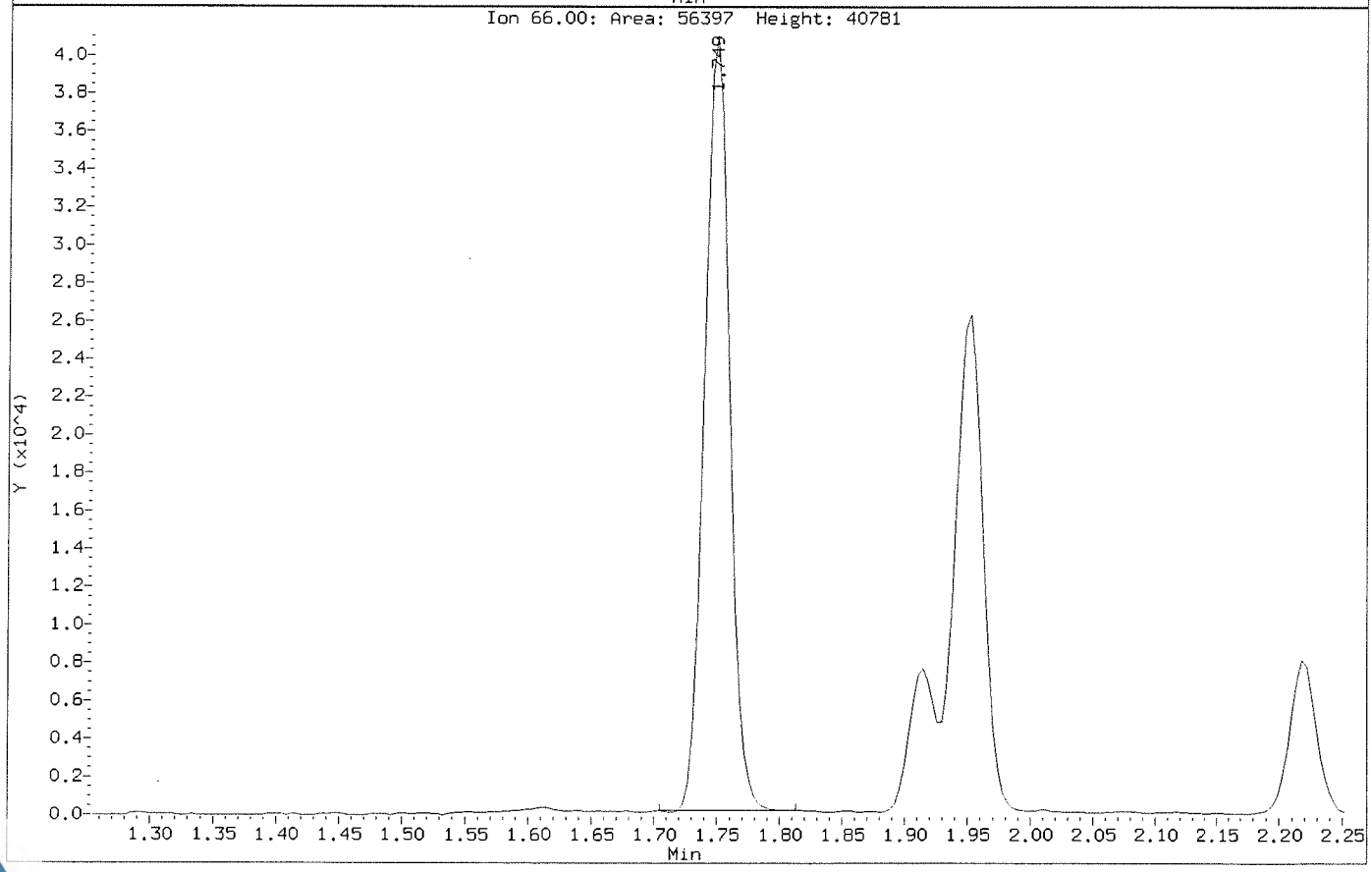
Injection Date: 19-DEC-2018 12:58
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121903.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121903.D
Lab Smp Id: VLCSW-1812019 Client Smp ID: VLCSW-181219
Inj Date : 19-DEC-2018 13:23
Operator : PC Inst ID: VOA9.i
Smp Info : VLCSW-1812019;VLCSW-181219;3;;LCS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 3 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

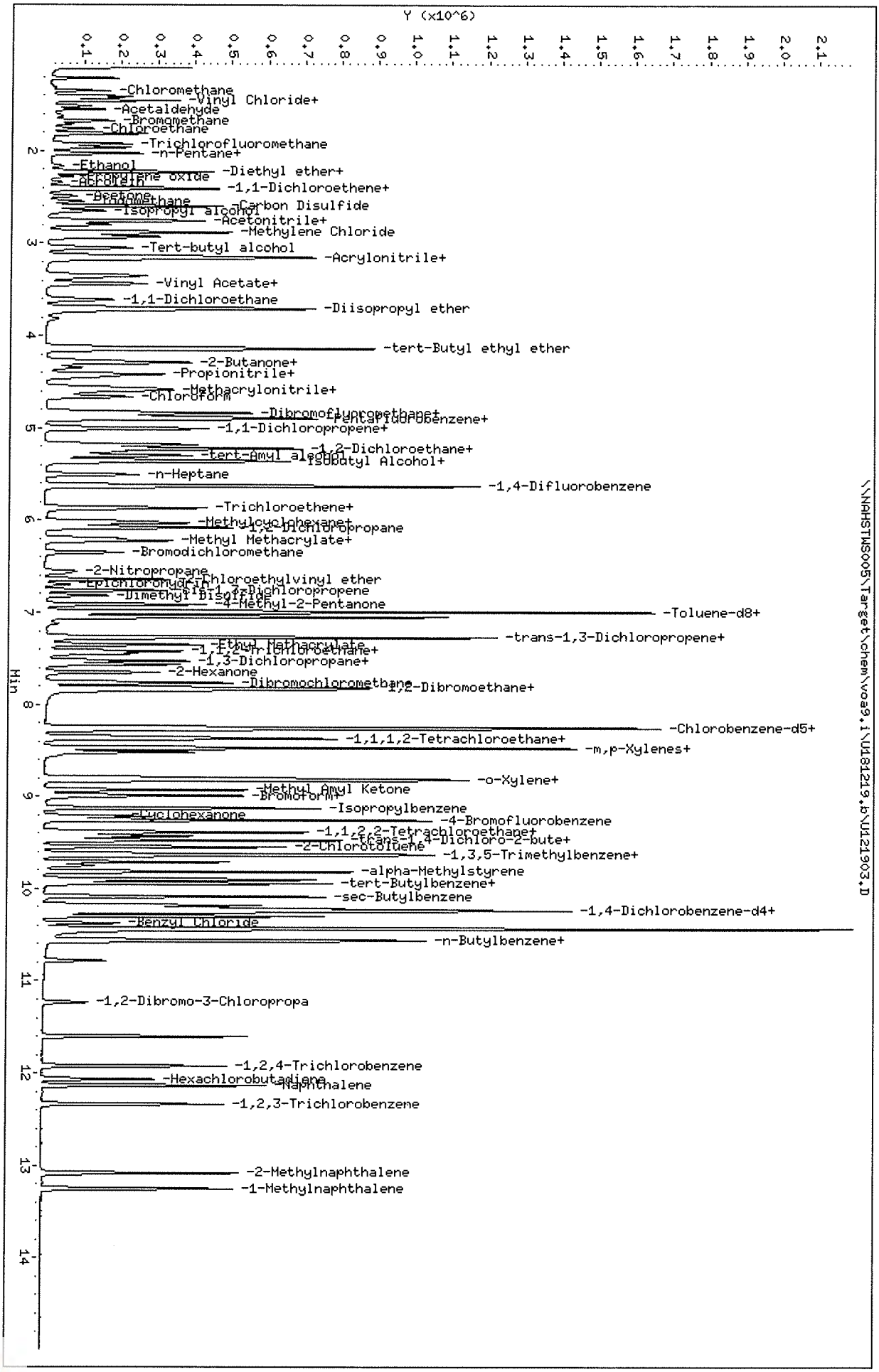
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.898	4.894	(1.000)	389626	50.0000	
*	36 1,4-Difluorobenzene	114	5.629	5.625	(1.000)	691666	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	634574	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	304306	50.0000	
$	30 Dibromofluoromethane	113	4.834	4.826	(0.987)	199748	44.4624	44.46
$	35 1,2-Dichloroethane-d4	65	5.179	5.175	(1.057)	258310	43.6369	43.63
$	48 Toluene-d8	98	6.989	6.989	(0.847)	854356	52.7672	52.76
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	321100	51.1970	51.19
	60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	85870	21.4531	21.45
	31 1,1,1-Trichloroethane	97	4.834	4.826	(0.987)	134404	19.6381	19.63
	68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	157846	21.8987	21.89
	138 Freon TF	101	2.408	2.397	(0.492)	74013	18.9624	18.96
	53 1,1,2-Trichloroethane	83	7.420	7.421	(0.900)	88547	21.9485	21.94
	22 1,1-Dichloroethane	63	3.612	3.601	(0.737)	185333	20.7573	20.75
	11 1,1-Dichloroethene	96	2.408	2.397	(0.492)	79603	18.1000	18.10
	32 1,1-Dichloropropene	75	5.010	5.003	(0.890)	141869	22.2085	22.20
	93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	130819	22.7702	22.77
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	164391	21.8555	21.85
	90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	133897	22.3750	22.37
	79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	389870	23.0662	23.06
	89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	21409	19.9455	19.94
	57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	103123	22.0743	22.07

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121903.D Page 2
Report Date: 25-Jan-2019 21:02

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	204917	21.0867	21.08
33	1,2-Dichloroethane	62	5.257	5.250	(0.934)	148607	20.5322	20.53
42	1,2-Dichloropropane	63	6.082	6.079	(1.081)	112265	22.7971	22.79
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	373942	22.8711	22.87
83	1,3-Dichlorobenzene	146	10.179	10.180	(0.995)	206418	21.5446	21.54
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	188780	21.7926	21.79
84	1,4-Dichlorobenzene	146	10.254	10.255	(1.002)	212492	22.6507	22.65
26	2,2-Dichloropropane	77	4.279	4.272	(0.874)	113150	20.4639	20.46
24	2-Butanone	43	4.343	4.335	(0.887)	120319	43.9306	43.93
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	332464	22.3113	22.31
52	2-Hexanone	43	7.649	7.649	(0.927)	176540	47.8583	47.85
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	388183	22.5764	22.57
82	p-Isopropyltoluene	119	10.209	10.210	(0.997)	397276	23.8396	23.83
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	250785	47.3739	47.37
10	Acetone	43	2.487	2.476	(0.508)	82837	43.9373	43.93
37	Benzene	78	5.220	5.216	(0.927)	429544	22.4667	22.46
74	Bromobenzene	156	9.381	9.381	(0.917)	106993	21.4337	21.43
29	Bromochloromethane	128	4.560	4.553	(0.931)	49911	21.7291	21.72
39	Bromodichloromethane	83	6.348	6.348	(1.128)	117302	20.4108	20.41
66	Bromoform	173	8.984	8.984	(1.089)	53022	19.2178	19.21
6	Bromomethane	94	1.677	1.663	(0.343)	52306	17.4664	17.46
19	Carbon Disulfide	76	2.596	2.588	(0.530)	584035	43.0012	43.00
34	Carbon Tetrachloride	117	4.999	4.995	(0.888)	104150	20.8701	20.87
59	Chlorobenzene	112	8.275	8.275	(1.003)	281277	21.4763	21.47
7	Chloroethane	64	1.760	1.749	(0.359)	73301	18.0307	18.03(M)
28	Chloroform	83	4.661	4.654	(0.952)	175909	19.6093	19.60
3	Chloromethane	50	1.348	1.336	(0.275)	94369	18.2879	18.28
27	cis-1,2-Dichloroethene	96	4.290	4.283	(0.876)	113038	20.4744	20.47
46	cis-1,3-Dichloropropene	75	6.761	6.757	(1.201)	162573	22.4635	22.46
55	Dibromochloromethane	129	7.758	7.758	(0.940)	85673	21.3361	21.33
44	Dibromomethane	93	6.191	6.191	(1.100)	64640	20.9444	20.94
2	Dichlorodifluoromethane	85	1.213	1.201	(0.248)	109935	19.7081	19.70
61	Ethylbenzene	106	8.373	8.369	(1.015)	147100	22.2165	22.21
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	49815	27.2297	27.22
67	Isopropylbenzene	105	9.126	9.126	(1.106)	441829	22.9104	22.91
62	m,p-Xylenes	106	8.474	8.470	(1.027)	367722	45.0596	45.05
17	Methylene Chloride	84	2.877	2.870	(0.587)	109342	21.6013	21.60
87	n-Butylbenzene	91	10.558	10.558	(1.031)	384125	24.5535	24.55
73	n-Propylbenzene	91	9.475	9.475	(0.926)	563446	23.4644	23.46
92	Naphthalene	128	12.133	12.133	(1.185)	420983	23.3624	23.36
63	o-Xylene	106	8.811	8.811	(1.068)	182643	22.3657	22.36
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	472480	23.6306	23.63
64	Styrene	104	8.826	8.823	(1.070)	317071	22.9961	22.99
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	322229	23.1248	23.12
56	Tetrachloroethene	164	7.525	7.522	(0.912)	75517	22.7177	22.71
50	Toluene	91	7.049	7.046	(0.855)	450012	22.3366	22.33
20	trans-1,2-Dichloroethene	96	3.147	3.140	(0.643)	101008	20.9561	20.95
51	trans-1,3-Dichloropropene	75	7.263	7.259	(1.290)	134831	19.7504	19.75
38	Trichloroethene	130	5.865	5.861	(1.042)	100119	21.2432	21.24
8	Trichlorofluoromethane	101	1.962	1.951	(0.401)	139752	17.9410	17.94
5	Vinyl Chloride	62	1.426	1.415	(0.291)	122892	19.6595	19.65

QC Flag Legend

M - Compound response manually integrated.



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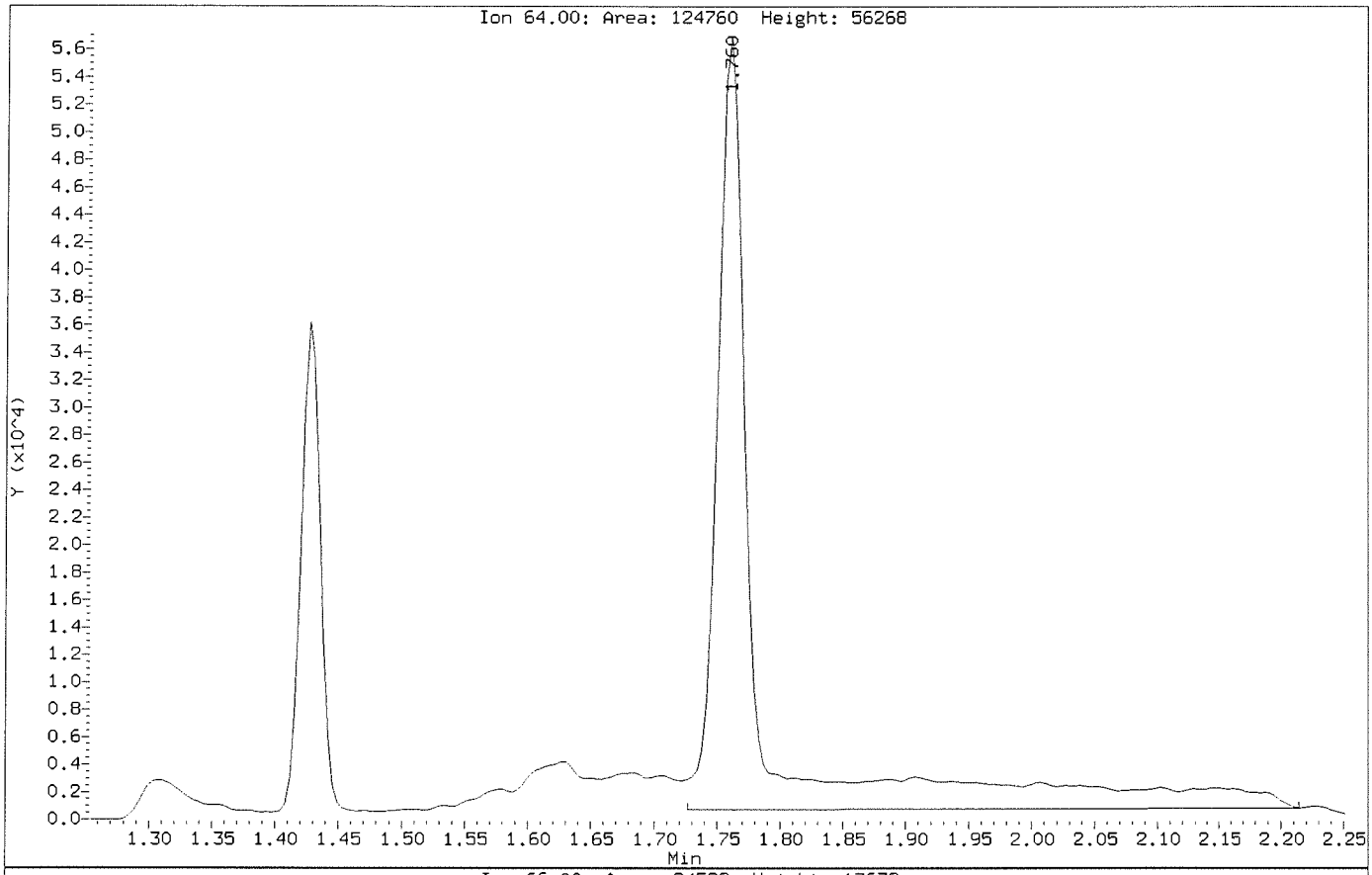
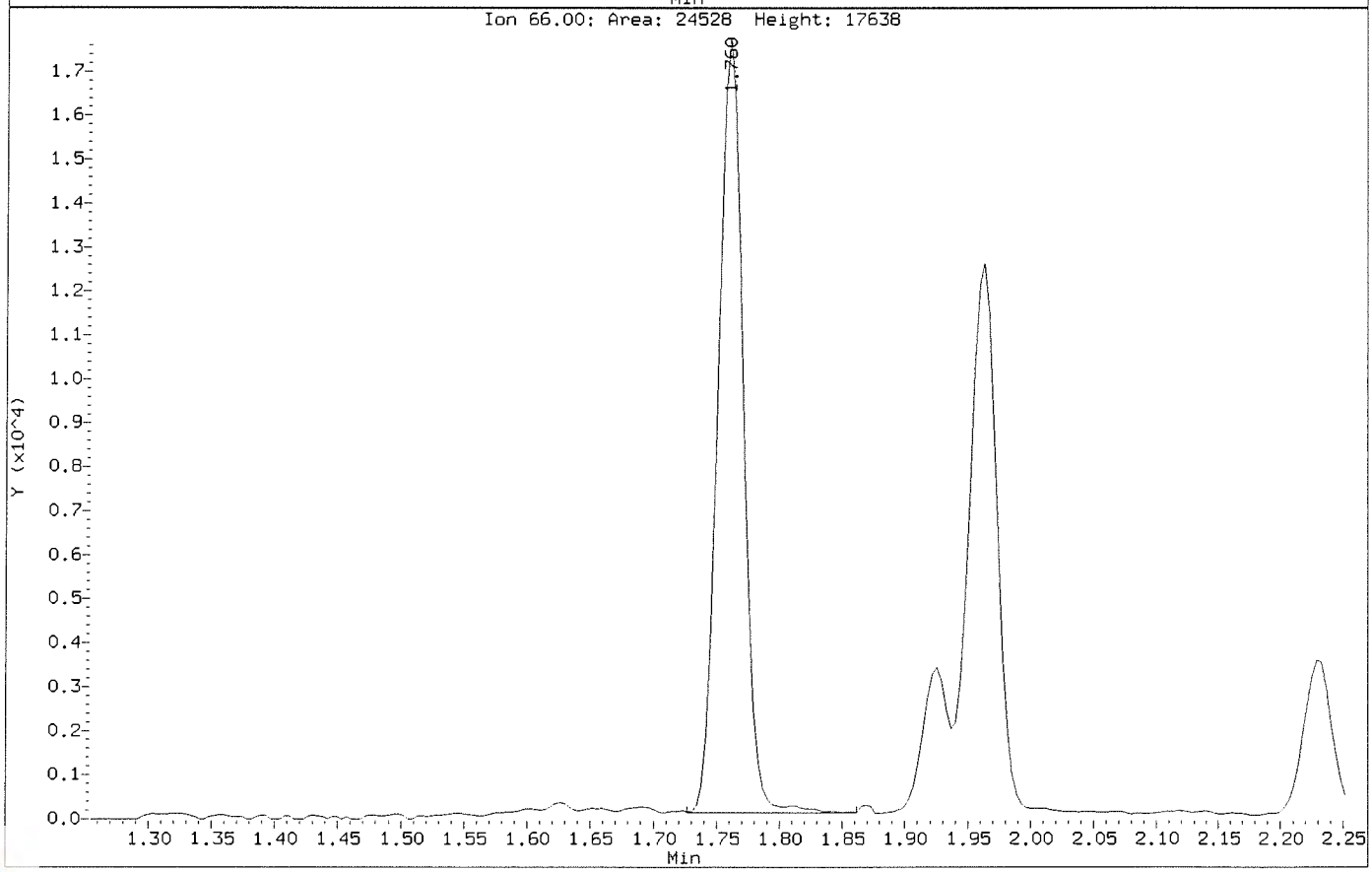
Client ID: VLCSW-181219
Sample Info: VLCSW-1812019;VLCSW-181219;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\Before\U121903.D
Injection Date: 19-DEC-2018 13:23
Instrument: VOA9.i
Client Sample ID: VLCSW-181219

Compound: Chloroethane
CAS Number: 75-00-3





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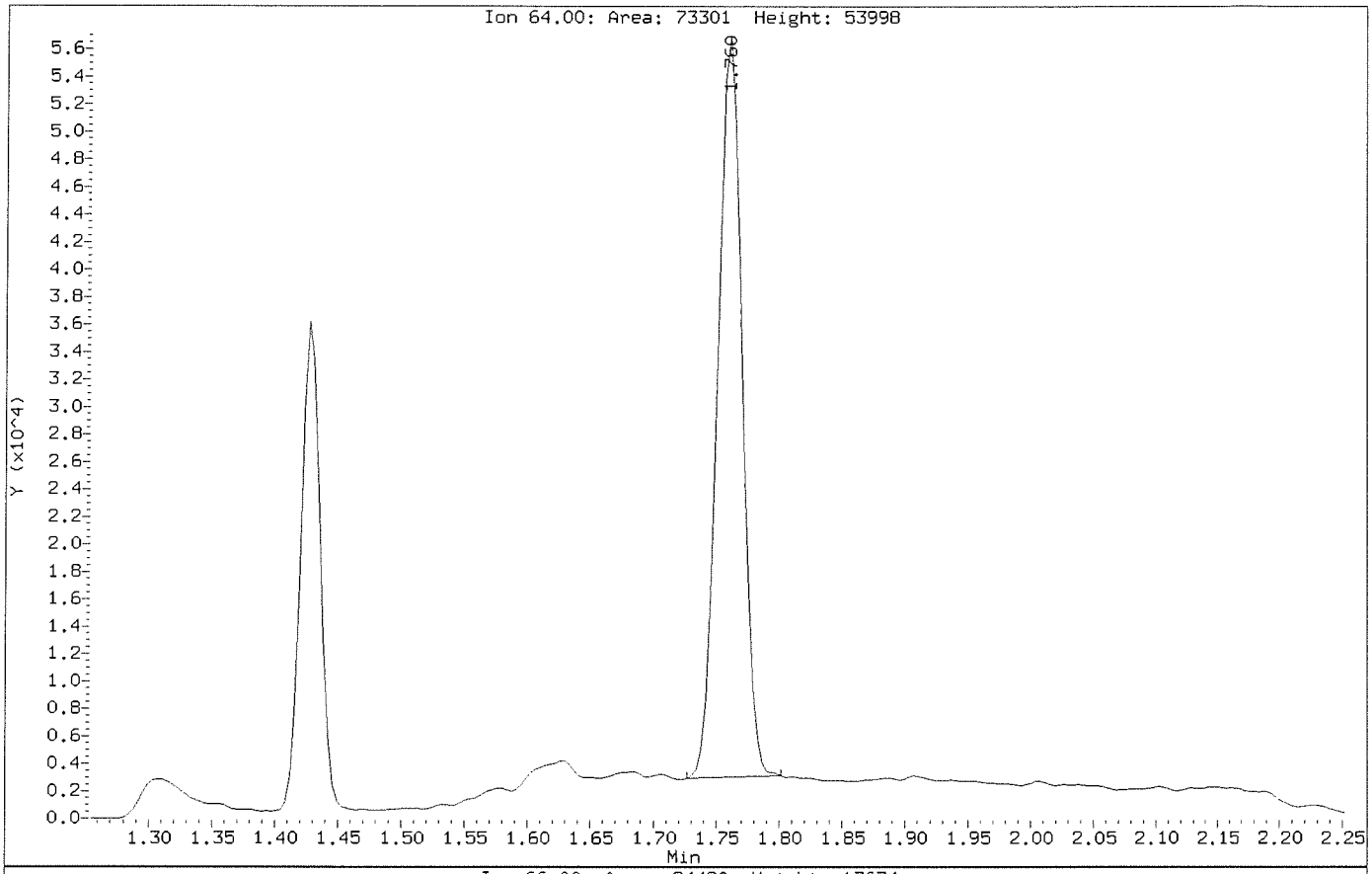
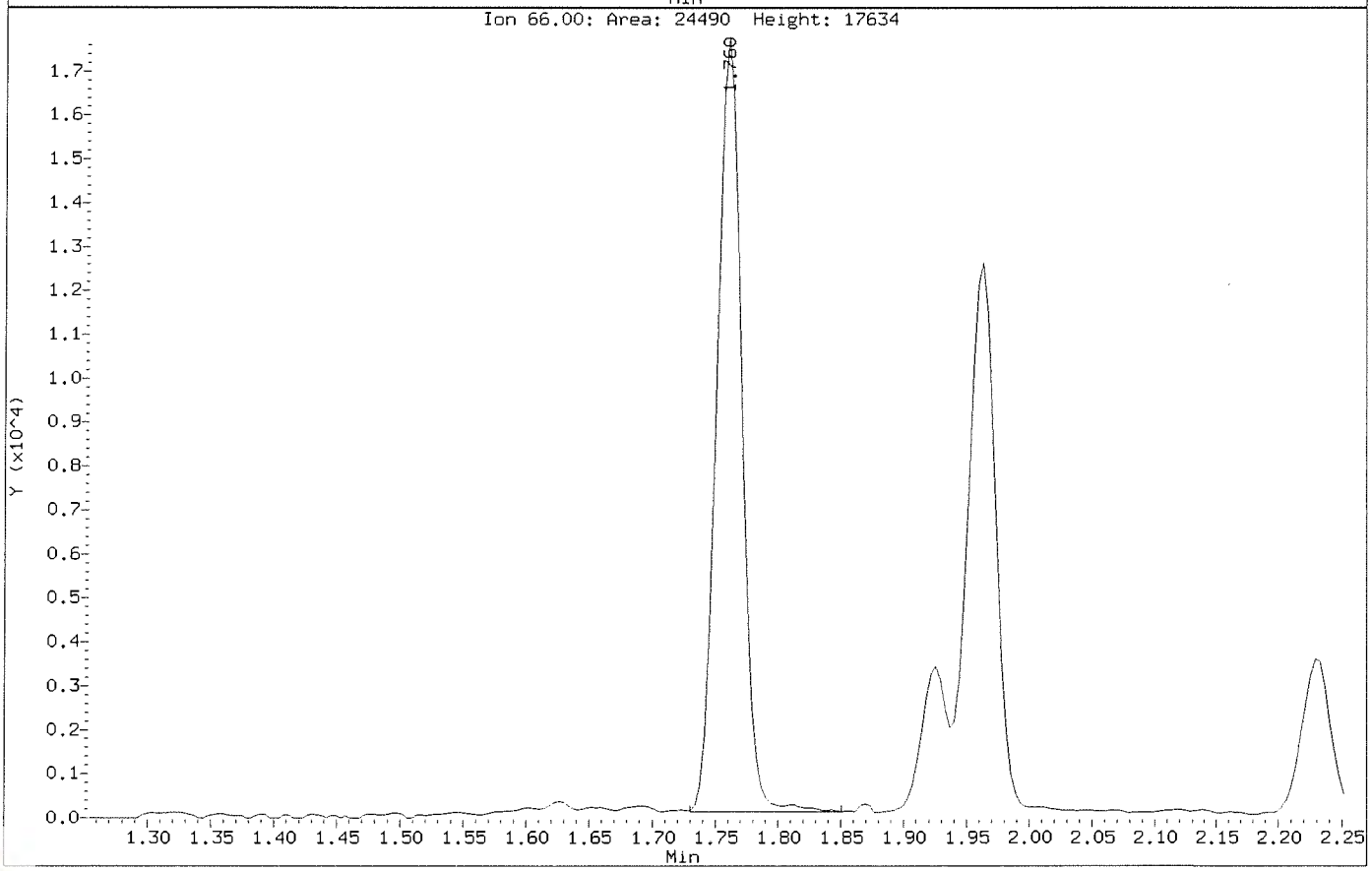
Injection Date: 19-DEC-2018 13:23
Instrument: VOA9.i
Client Sample ID: VLCSW-181219

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121905.D Page 1
Report Date: 25-Jan-2019 21:02

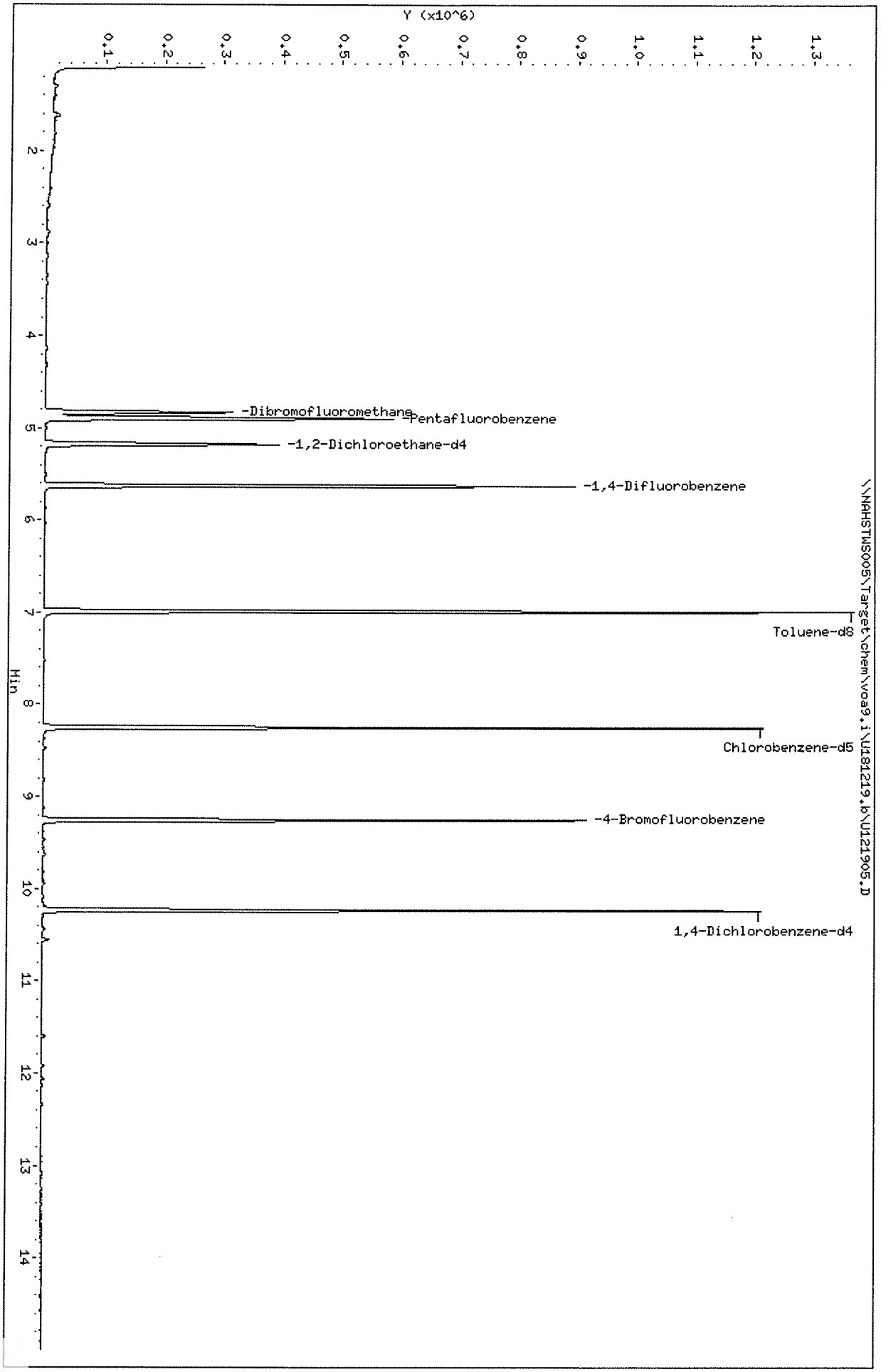
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121905.D
Lab Smp Id: VBLKW-181219 Client Smp ID: VBLKW-181219
Inj Date : 19-DEC-2018 14:12
Operator : PC Inst ID: VOA9.i
Smp Info : VBLKW-181219;VBLKW-181219;3;;BLANK
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 5 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.894	(1.000)	360270	50.0000	
* 36 1,4-Difluorobenzene	114	5.628	5.625	(1.000)	643819	50.0000	
* 47 Chlorobenzene-d5	117	8.252	8.249	(1.000)	589067	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.235	10.236	(1.000)	268507	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.826	(0.987)	182110	43.8218	43.82
$ 35 1,2-Dichloroethane-d4	65	5.178	5.175	(1.057)	248756	45.5207	45.52
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	784946	52.2080	52.20
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	284276	48.7779	48.77



Data File: \\NAHSTWS005\Target\chem\voa9,i\U181219,b\U121905,D
Date : 19-DEC-2018 14:12
Client ID: VBLKW-181219
Sample Info: VBLKW-181219;VBLKW-181219;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121908.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121908.D
Lab Smp Id: HS18120734-01MS Client Smp ID: HS18120734-01MS
Inj Date : 19-DEC-2018 15:26
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120734-01MS;HS18120734-01MS;3;;MS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 8 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

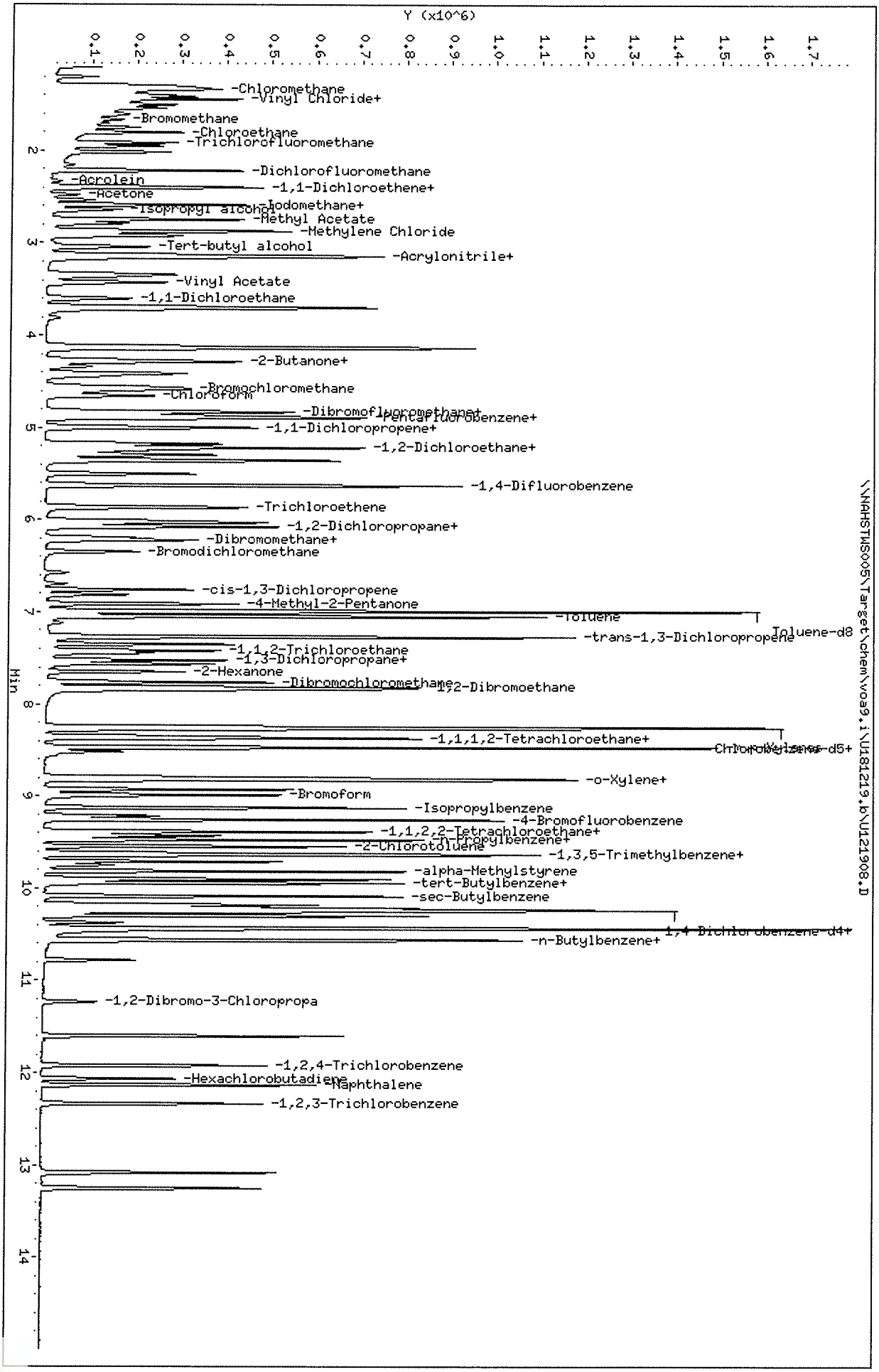
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	372882	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	657579	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	608271	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	294651	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	192670	44.8226	44.82
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	247388	43.6697	43.66
$ 48 Toluene-d8	98	6.990	6.989	(0.847)	819476	52.8027	52.80
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	309627	51.5089	51.50
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	89468	23.3185	23.31
31 1,1,1-Trichloroethane	97	4.827	4.826	(0.986)	141486	21.6012	21.60
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	159251	22.8176	22.81
138 Freon TF	101	2.401	2.397	(0.491)	71422	19.1203	19.12
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	89734	23.2045	23.20
22 1,1-Dichloroethane	63	3.604	3.601	(0.737)	189477	22.1744	22.17
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	77855	18.4975	18.49
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	151116	24.8823	24.88
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	127155	22.8576	22.85
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	158318	21.7378	21.73
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	131766	22.7404	22.74
79 1,2,4-Trimethylbenzene	105	9.944	9.943	(0.971)	404577	24.7207	24.72
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	21203	20.3760	20.37
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	104474	23.3305	23.33

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121908.D Page 2
Report Date: 25-Jan-2019 21:02

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
88	1,2-Dichlorobenzene	146	10.570	10.569	(1.033)	207750	22.0787	22.07
33	1,2-Dichloroethane	62	5.254	5.250	(0.934)	153489	22.3060	22.30
42	1,2-Dichloropropane	63	6.079	6.079	(1.081)	115473	24.6641	24.66
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	389731	24.6178	24.61
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	209082	22.5377	22.53
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	193569	23.3117	23.31
84	1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	215547	23.7313	23.73
26	2,2-Dichloropropane	77	4.275	4.272	(0.874)	118479	22.3898	22.38
24	2-Butanone	43	4.339	4.335	(0.887)	115584	44.0969	44.09
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	344739	23.8932	23.89
52	2-Hexanone	43	7.649	7.649	(0.927)	171347	48.4592	48.45
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	399920	24.0212	24.02
82	p-Isopropyltoluene	119	10.210	10.210	(0.997)	410421	25.4354	25.43
45	4-Methyl-2-Pentanone	43	6.915	6.914	(0.838)	243257	47.9389	47.93
10	Acetone	43	2.480	2.476	(0.507)	71043	38.9136	38.91
37	Benzene	78	5.216	5.216	(0.927)	445339	24.5003	24.50
74	Bromobenzene	156	9.381	9.381	(0.917)	110102	22.7792	22.77
29	Bromochloromethane	128	4.553	4.553	(0.930)	50150	22.8136	22.81
39	Bromodichloromethane	83	6.349	6.348	(1.129)	122186	22.3627	22.36
66	Bromoform	173	8.984	8.984	(1.089)	53376	20.1206	20.12
6	Bromomethane	94	1.666	1.663	(0.341)	28555	10.7808	10.78
19	Carbon Disulfide	76	2.589	2.588	(0.529)	585803	45.0682	45.06
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	114201	24.0704	24.07
59	Chlorobenzene	112	8.275	8.275	(1.003)	292584	23.3056	23.30
7	Chloroethane	64	1.749	1.749	(0.357)	72305	18.5843	18.58(M)
28	Chloroform	83	4.654	4.654	(0.951)	183549	21.3798	21.37
3	Chloromethane	50	1.337	1.336	(0.273)	90007	18.2266	18.22
27	cis-1,2-Dichloroethene	96	4.287	4.283	(0.876)	127923	24.2110	24.21
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	162251	23.5812	23.58
55	Dibromochloromethane	129	7.758	7.758	(0.940)	88850	23.0841	23.08
44	Dibromomethane	93	6.191	6.191	(1.101)	66222	22.5693	22.56
2	Dichlorodifluoromethane	85	1.205	1.201	(0.246)	52909	10.4085	10.40
61	Ethylbenzene	106	8.369	8.369	(1.015)	152510	24.0296	24.02
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	47631	26.9007	26.90
67	Isopropylbenzene	105	9.126	9.126	(1.106)	463458	25.0711	25.07
62	m,p-Xylenes	106	8.470	8.470	(1.027)	382407	48.8854	48.88
17	Methylene Chloride	84	2.870	2.870	(0.586)	113173	23.4193	23.41
87	n-Butylbenzene	91	10.555	10.558	(1.031)	394132	25.9813	25.98
73	n-Propylbenzene	91	9.475	9.475	(0.926)	582637	25.0586	25.05
92	Naphthalene	128	12.133	12.133	(1.185)	412397	23.6359	23.63
63	o-Xylene	106	8.811	8.811	(1.068)	191940	24.5206	24.52
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	493620	25.4969	25.49
64	Styrene	104	8.823	8.823	(1.070)	325132	24.6004	24.60
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	336438	24.9357	24.93
56	Tetrachloroethene	164	7.522	7.522	(0.912)	77207	24.2304	24.23
50	Toluene	91	7.046	7.046	(0.854)	469025	24.2871	24.28
20	trans-1,2-Dichloroethene	96	3.140	3.140	(0.642)	104077	22.5624	22.56
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	138224	21.1813	21.18
38	Trichloroethene	130	5.861	5.861	(1.042)	109649	24.4712	24.47
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	134145	17.9945	17.99
5	Vinyl Chloride	62	1.419	1.415	(0.290)	99503	16.7109	16.71

QC Flag Legend

M - Compound response manually integrated.



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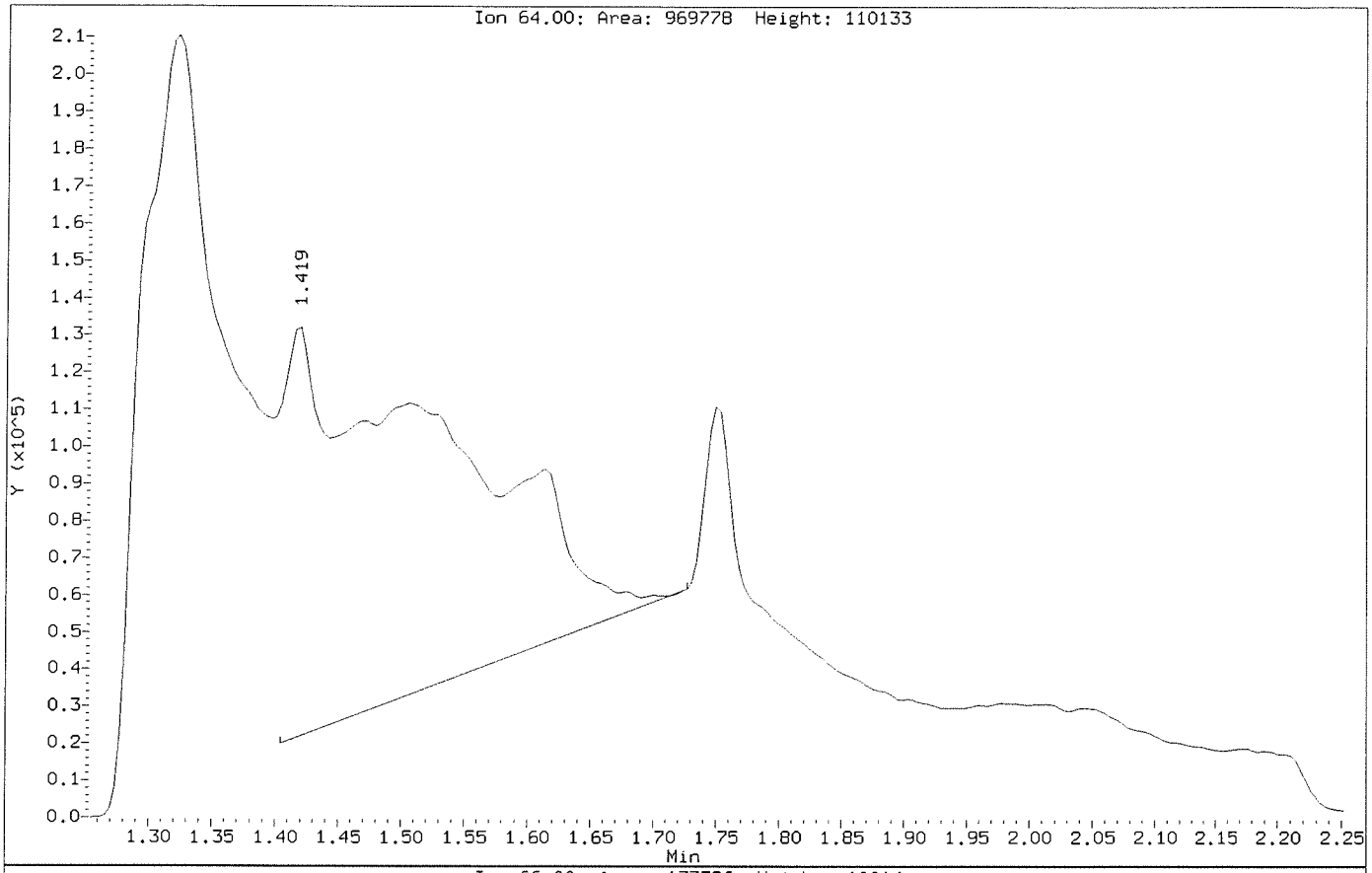
Client ID: HS18120734-01MS
Sample Info: HS18120734-01MS;HS18120734-01MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

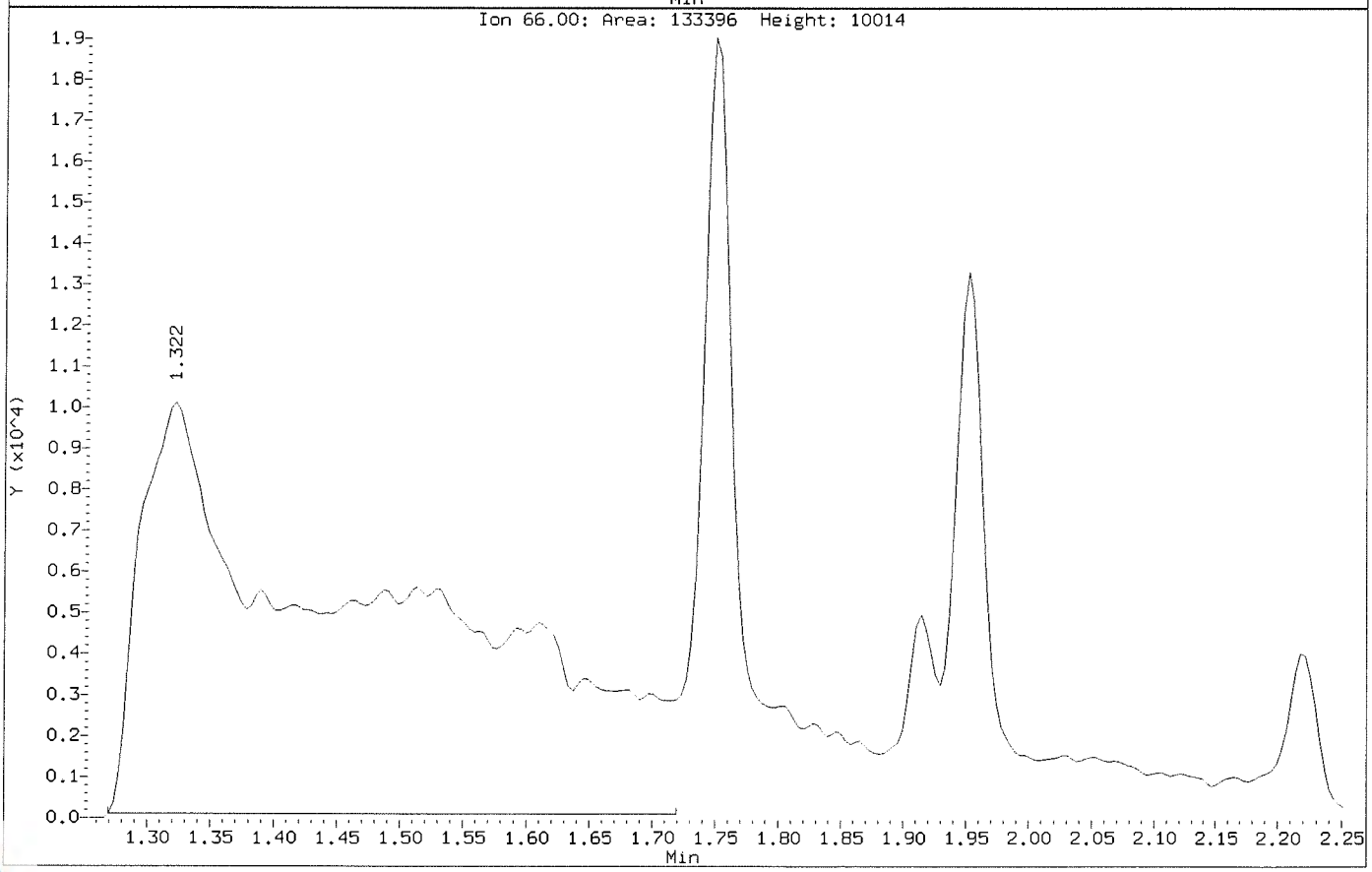
\\NAHSTWS005\Target\chem\voa9,i\U181219,b\U121908,D

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\Before\U121908.D
Injection Date: 19-DEC-2018 15:26
Instrument: VOA9.i
Client Sample ID: HS18120734-01MS

Compound: Chloroethane
CAS Number: 75-00-3





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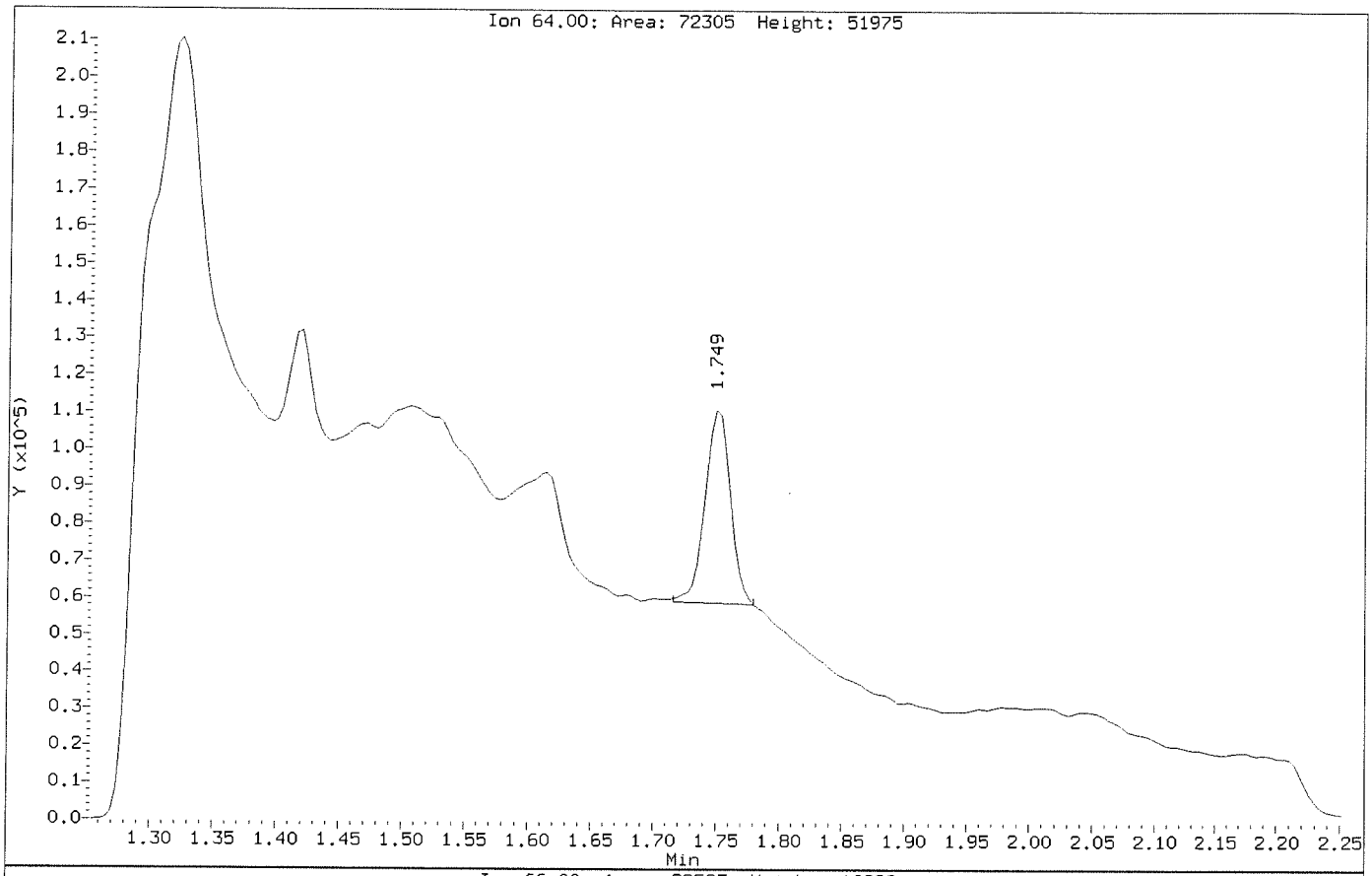
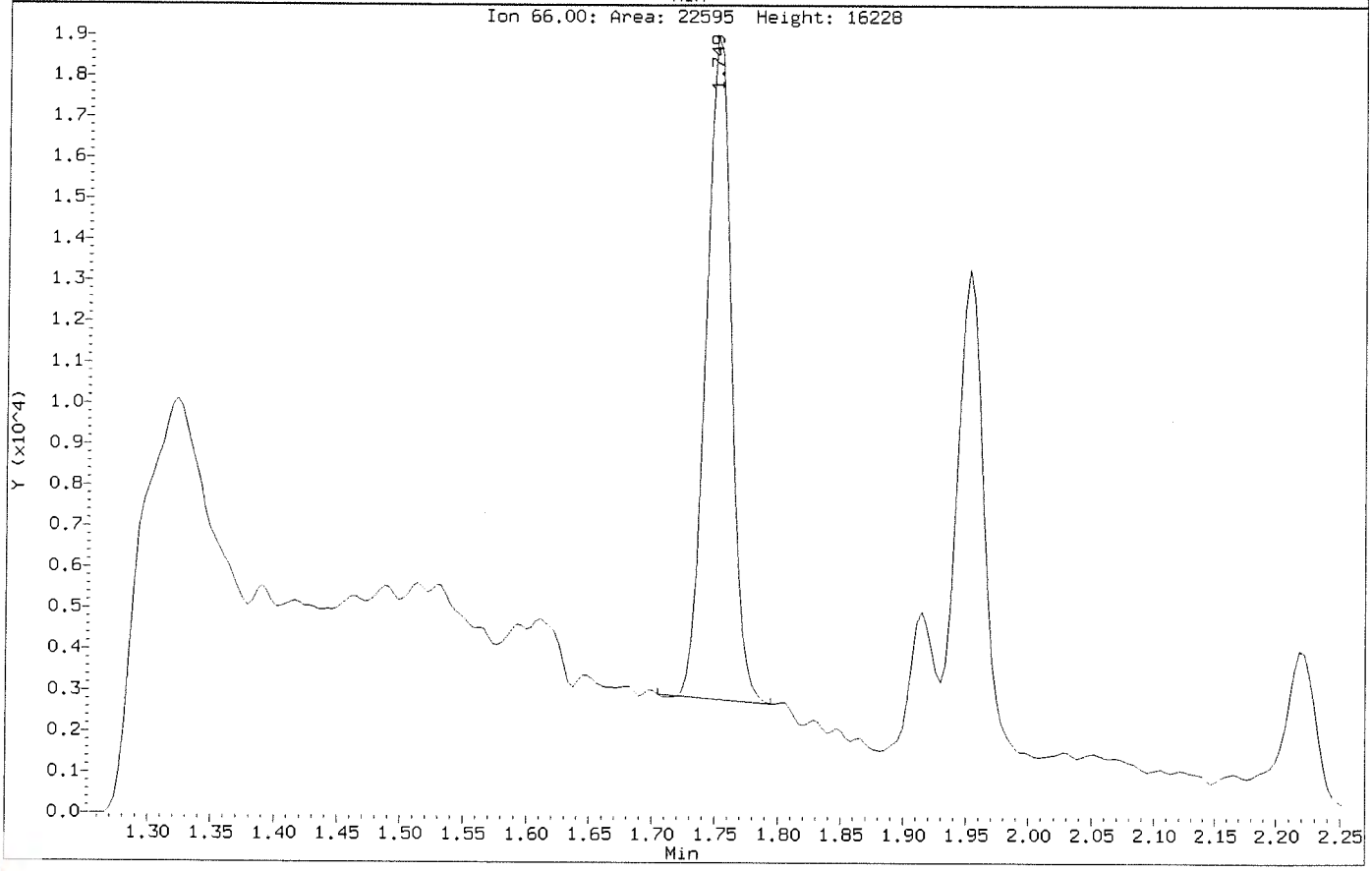
Injection Date: 19-DEC-2018 15:26
Instrument: VOA9.i
Client Sample ID: HS18120734-01MS

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121909.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121909.D
Lab Smp Id: HS18120734-01MSD Client Smp ID: HS18120734-01MSD
Inj Date : 19-DEC-2018 15:51
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120734-01MSD;HS18120734-01MSD;3;;MSD
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 8 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

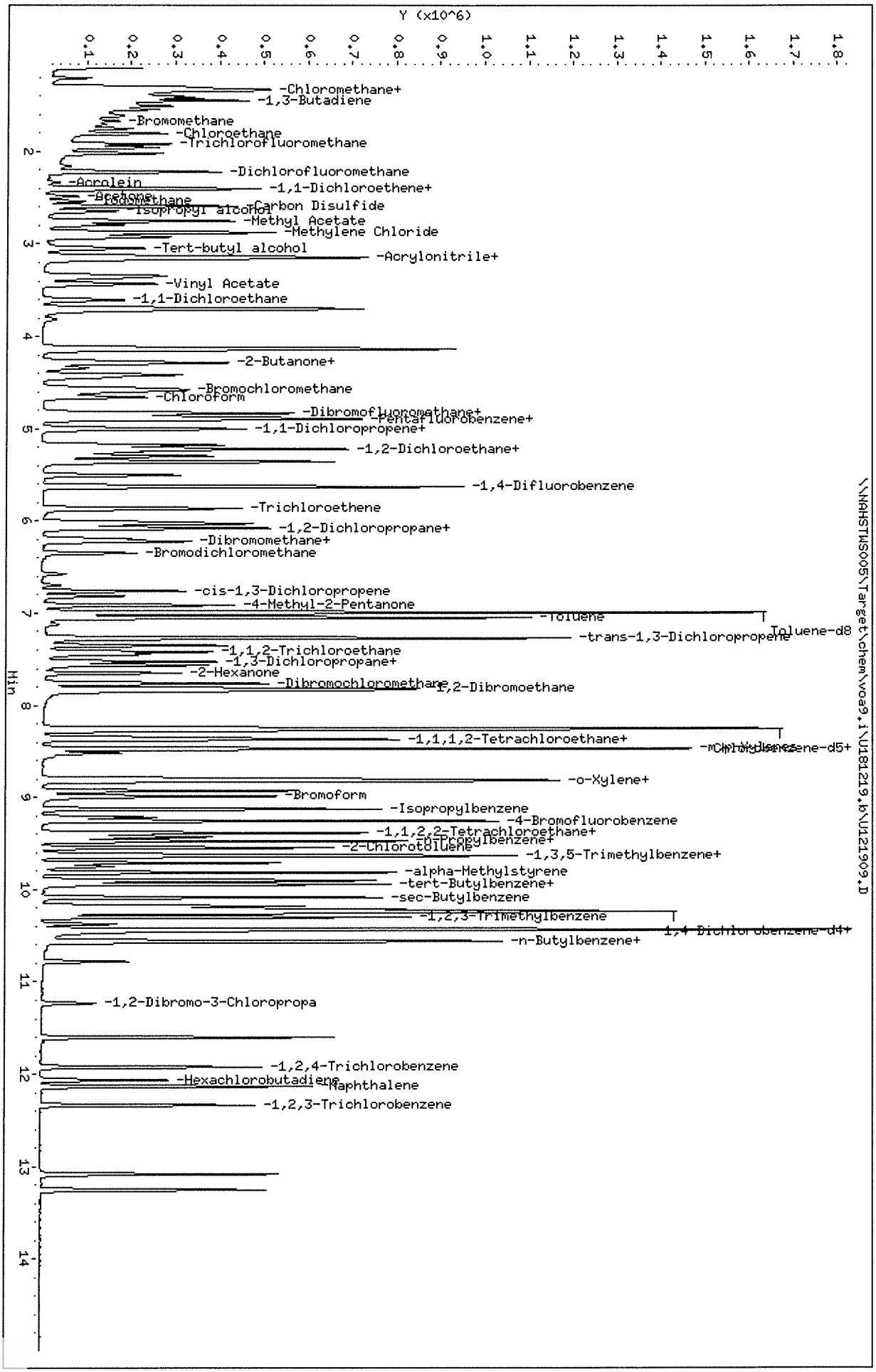
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	385905	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	674873	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	626104	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	301438	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	198784	44.6804	44.68
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	255124	43.5092	43.50
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	842208	52.7191	52.71
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	318422	51.4623	51.46
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	87766	22.2234	22.22
31 1,1,1-Trichloroethane	97	4.830	4.826	(0.987)	138121	20.3758	20.37
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	159626	22.3563	22.35
138 Freon TF	101	2.405	2.397	(0.491)	73108	18.9112	18.91
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	89067	22.3760	22.37
22 1,1-Dichloroethane	63	3.604	3.601	(0.737)	187612	21.2152	21.21
11 1,1-Dichloroethene	96	2.401	2.397	(0.491)	79598	18.2734	18.27
32 1,1-Dichloropropene	75	5.006	5.003	(0.890)	145958	23.4172	23.41
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	127961	22.4846	22.48
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	161456	21.6696	21.66
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	130728	22.0532	22.05
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	395511	23.6226	23.62
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	20883	19.6573	19.65
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	103653	22.4879	22.48

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121909.D Page 2
Report Date: 25-Jan-2019 21:02

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	203391	21.1288	21.12
33	1,2-Dichloroethane	62	5.254	5.250	(0.934)	151077	21.3929	21.39
42	1,2-Dichloropropane	63	6.082	6.079	(1.081)	114664	23.8637	23.86
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	377189	23.2892	23.28
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	204419	21.5389	21.53
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	193350	22.6221	22.62
84	1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	212639	22.8825	22.88
26	2,2-Dichloropropane	77	4.275	4.272	(0.874)	114892	20.9793	20.97
24	2-Butanone	43	4.339	4.335	(0.887)	119039	43.8824	43.88
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	334350	22.6514	22.65
52	2-Hexanone	43	7.649	7.649	(0.927)	175704	48.2761	48.27
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	392027	23.0169	23.01
82	p-Isopropyltoluene	119	10.210	10.210	(0.997)	404641	24.5126	24.51
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	248037	47.4886	47.48
10	Acetone	43	2.484	2.476	(0.508)	82138	43.9916	43.99
37	Benzene	78	5.220	5.216	(0.928)	429491	23.0229	23.02
74	Bromobenzene	156	9.381	9.381	(0.917)	107088	21.6568	21.65
29	Bromochloromethane	128	4.557	4.553	(0.931)	51147	22.4819	22.48
39	Bromodichloromethane	83	6.348	6.348	(1.129)	121725	21.7075	21.70
66	Bromoform	173	8.984	8.984	(1.089)	52541	19.2957	19.29
6	Bromomethane	94	1.670	1.663	(0.341)	25959	9.70137	9.70
19	Carbon Disulfide	76	2.592	2.588	(0.530)	579817	43.1023	43.10
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	110392	22.6713	22.67
59	Chlorobenzene	112	8.275	8.275	(1.003)	284976	22.0530	22.05
7	Chloroethane	64	1.753	1.749	(0.358)	66960	16.6297	16.62(M)
28	Chloroform	83	4.658	4.654	(0.952)	179488	20.2012	20.20
3	Chloromethane	50	1.340	1.336	(0.274)	92180	18.0391	18.03
27	cis-1,2-Dichloroethene	96	4.287	4.283	(0.876)	126688	23.1681	23.16
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	162155	22.9633	22.96
55	Dibromochloromethane	129	7.758	7.758	(0.940)	87712	22.1394	22.13
44	Dibromomethane	93	6.191	6.191	(1.101)	66506	22.0853	22.08
2	Dichlorodifluoromethane	85	1.209	1.201	(0.247)	50708	9.71284	9.71
61	Ethylbenzene	106	8.369	8.369	(1.015)	149892	22.9444	22.94
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	46285	25.5963	25.59
67	Isopropylbenzene	105	9.126	9.126	(1.106)	451930	23.7512	23.75
62	m,p-Xylenes	106	8.474	8.470	(1.027)	375180	46.5954	46.59
17	Methylene Chloride	84	2.873	2.870	(0.587)	111047	22.1675	22.16
87	n-Butylbenzene	91	10.554	10.558	(1.031)	386222	24.9132	24.91
73	n-Propylbenzene	91	9.475	9.475	(0.926)	565640	23.7799	23.77
92	Naphthalene	128	12.133	12.133	(1.185)	416374	23.3265	23.32
63	o-Xylene	106	8.811	8.811	(1.068)	186498	23.1467	23.14
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	478803	24.1747	24.17
64	Styrene	104	8.823	8.823	(1.070)	320949	23.5922	23.59
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	328366	23.7894	23.78
56	Tetrachloroethene	164	7.526	7.522	(0.912)	77080	23.5016	23.50
50	Toluene	91	7.049	7.046	(0.855)	458471	23.0644	23.06
20	trans-1,2-Dichloroethene	96	3.143	3.140	(0.642)	99839	20.9132	20.91
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	136043	20.3735	20.37
38	Trichloroethene	130	5.861	5.861	(1.042)	106319	23.1200	23.12
8	Trichlorofluoromethane	101	1.955	1.951	(0.400)	133129	17.2556	17.25
5	Vinyl Chloride	62	1.423	1.415	(0.291)	98900	16.0692	16.06

QC Flag Legend

M - Compound response manually integrated.



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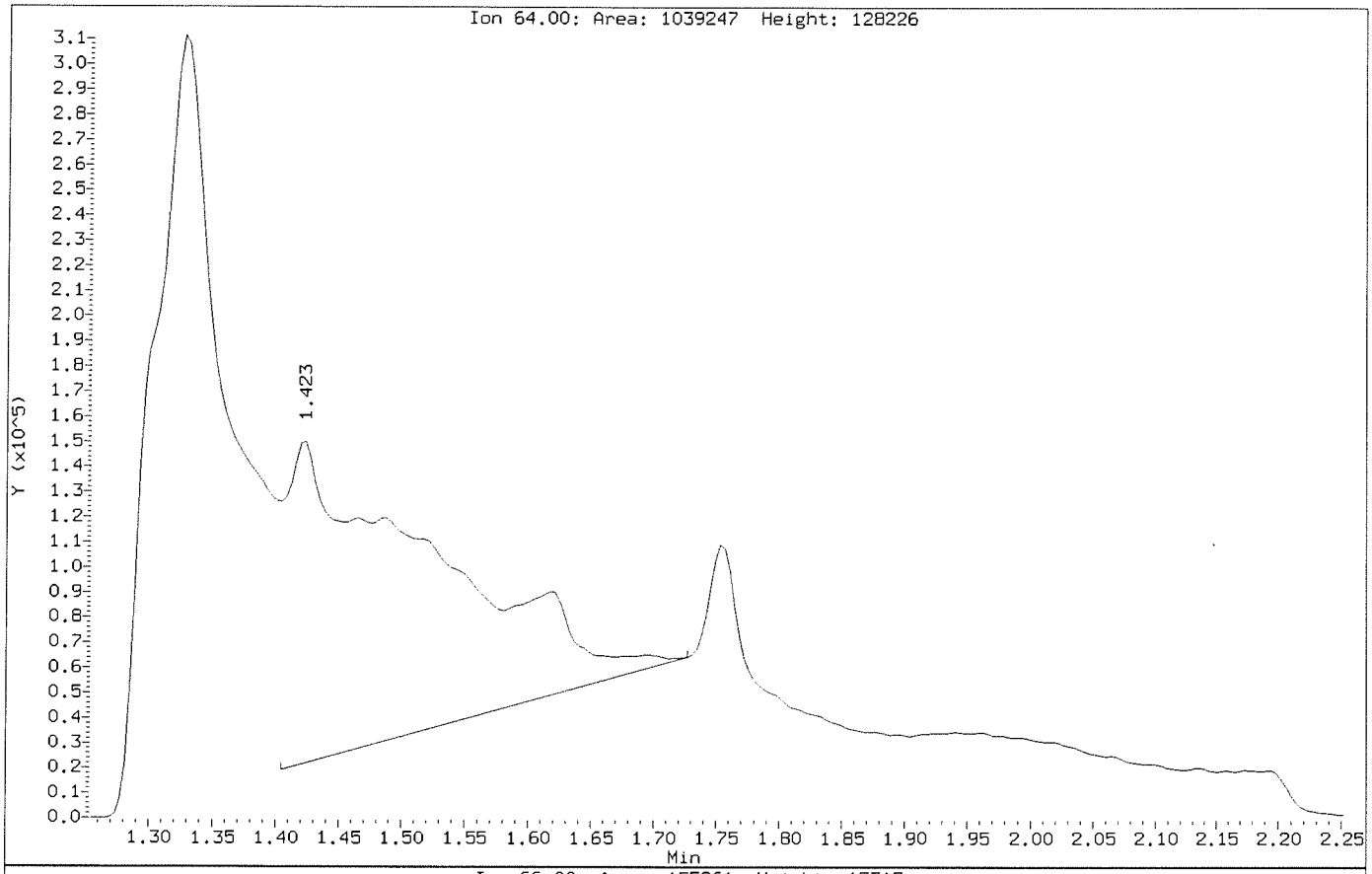
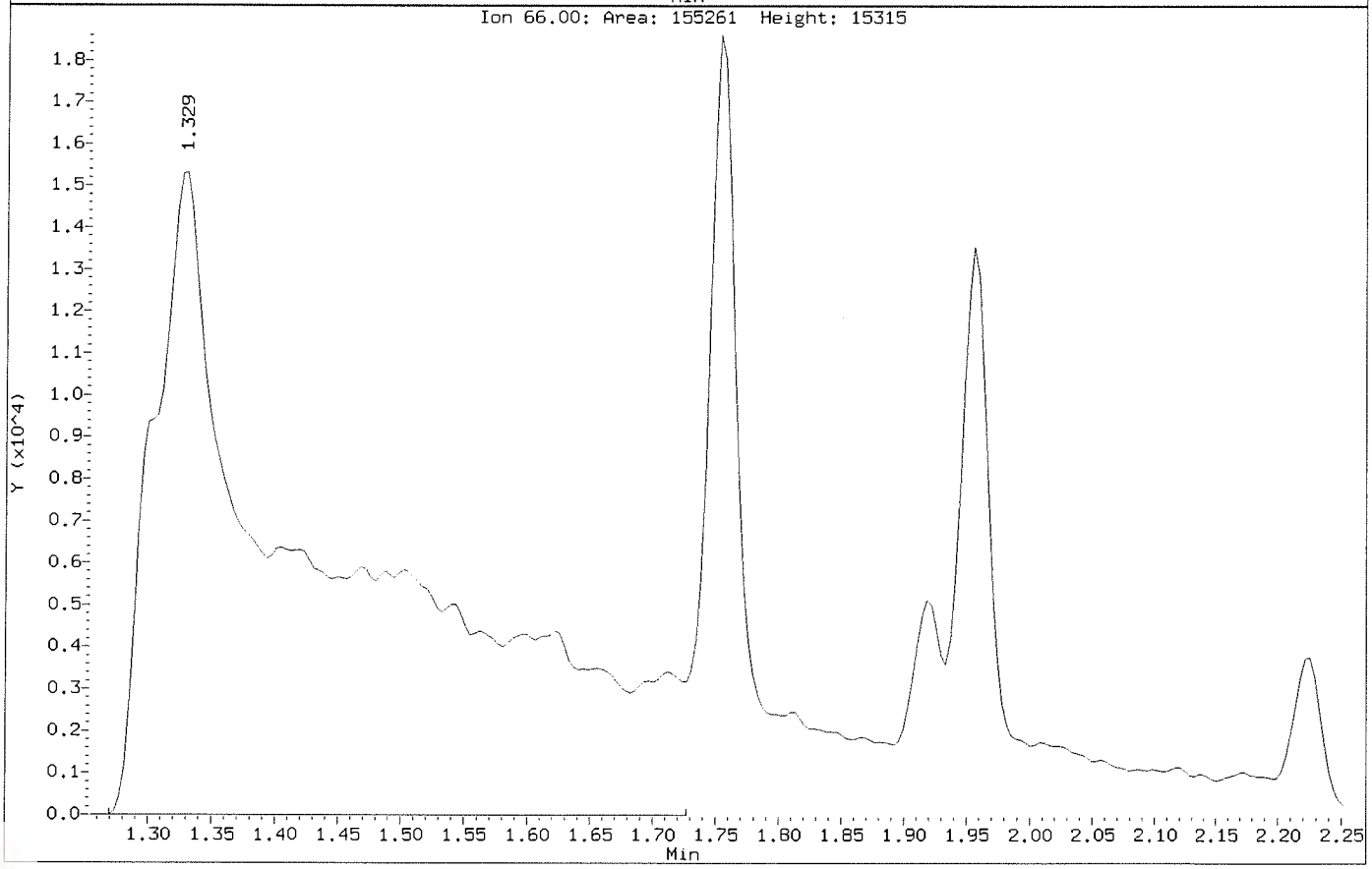
Client ID: HS18120734-01MSD
Sample Info: HS18120734-01MSD;HS18120734-01MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\Before\U121909.D
Injection Date: 19-DEC-2018 15:51
Instrument: VOA9.i
Client Sample ID: HS18120734-01MSD

Compound: Chloroethane
CAS Number: 75-00-3





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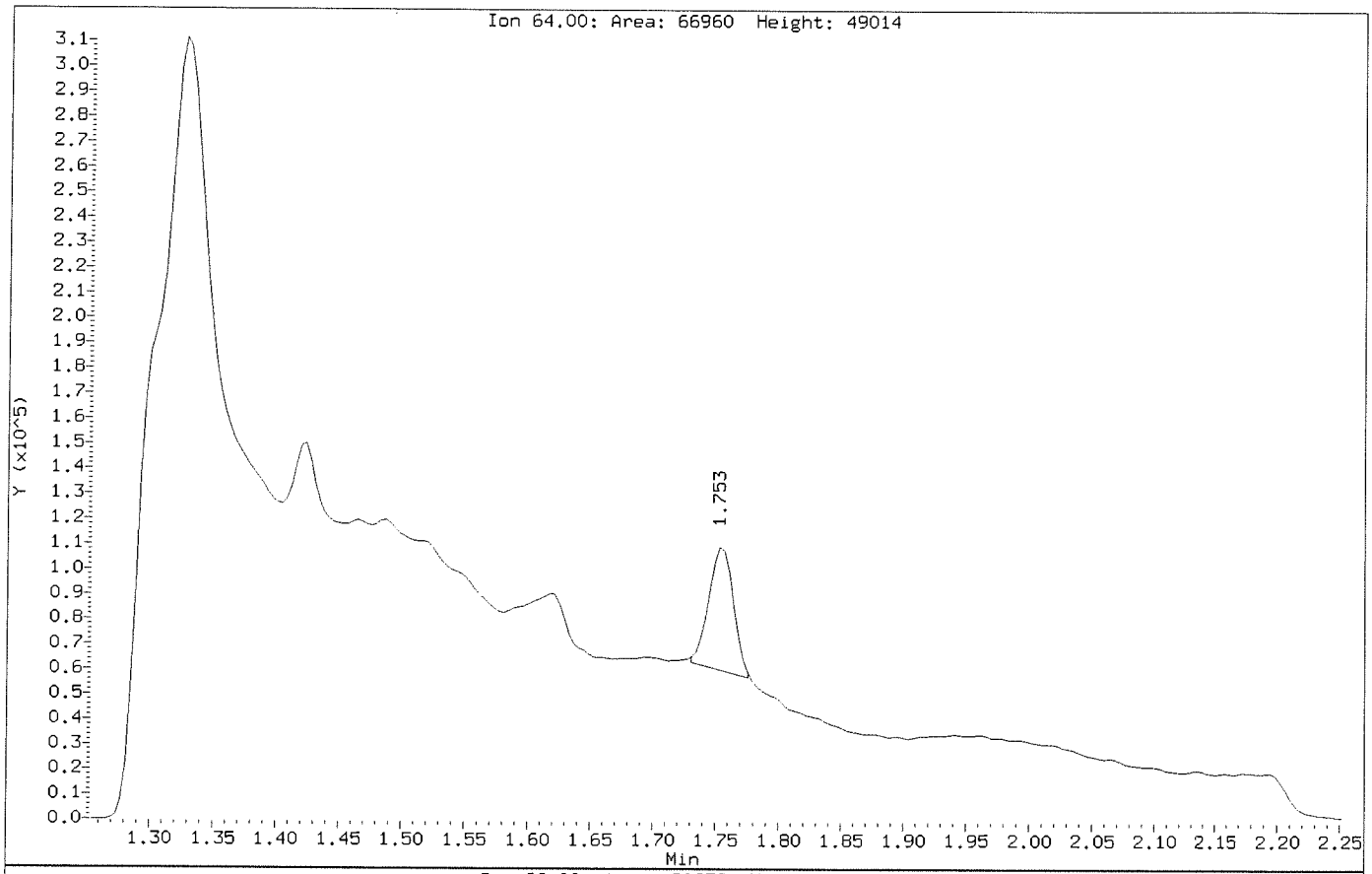
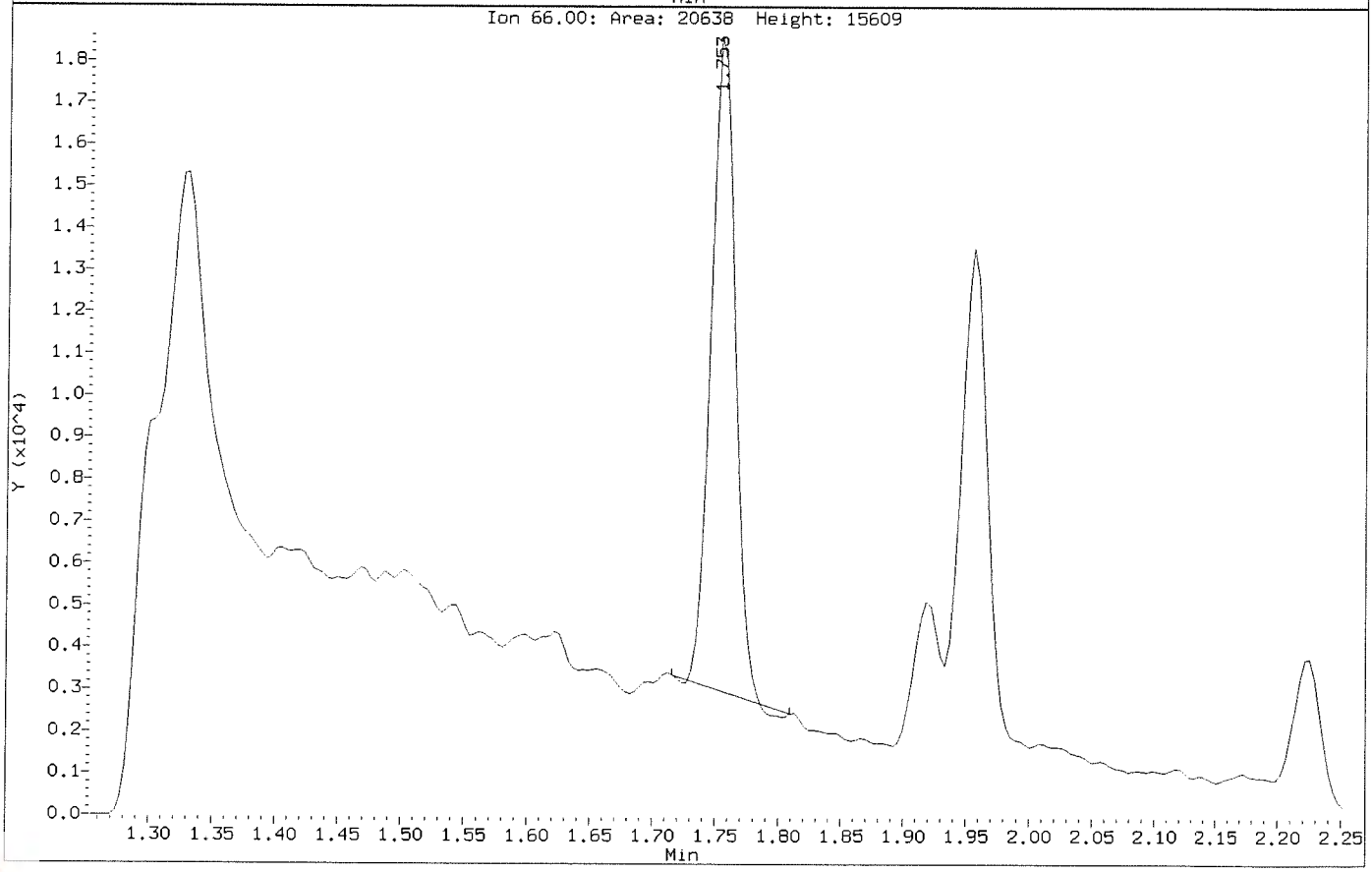
Instrument: VOA9.i
Client Sample ID: HS18120734-01MSD

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121921.D Page 1
Report Date: 25-Jan-2019 21:02

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Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121921.D
Lab Smp Id: HS18120569-06 Client Smp ID: HS18120569-06
Inj Date : 19-DEC-2018 20:49
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120569-06;HS18120569-06;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

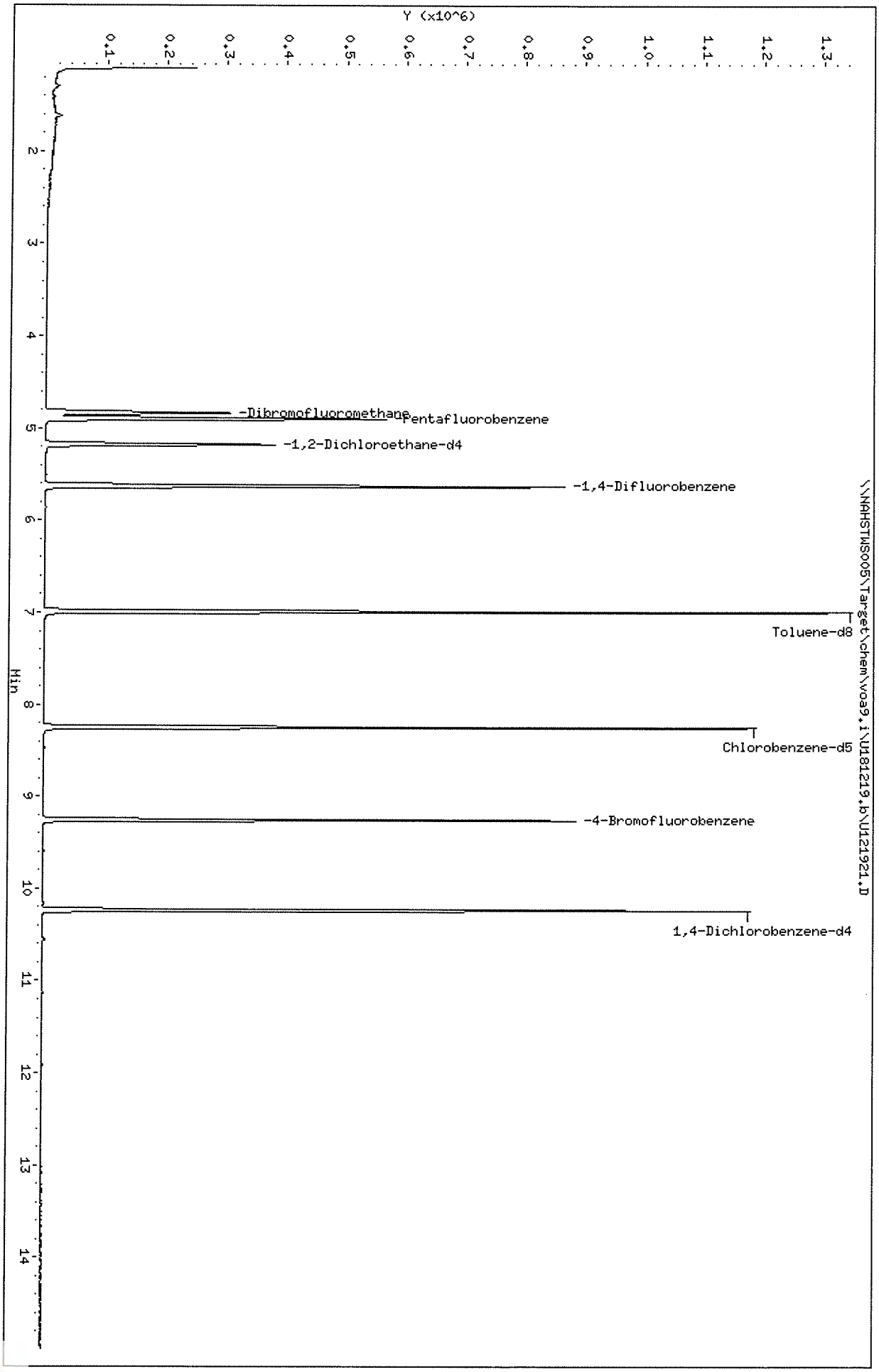
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.894	(1.000)	344760	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	623383	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	566871	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	258506	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.826	(0.987)	178429	44.8975	44.89
$ 35 1,2-Dichloroethane-d4	65	5.179	5.175	(1.057)	242220	46.3499	46.34
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	764542	52.8627	52.86
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	273910	48.8409	48.84

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121921.D
Date : 19-DEC-2018 20:49
Client ID: HS181205669-06
Sample Info: HS181205669-06;HS181205669-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18



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Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121922.D
Lab Smp Id: HS18120569-02 Client Smp ID: HS18120569-02
Inj Date : 19-DEC-2018 21:13
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120569-02;HS18120569-02;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

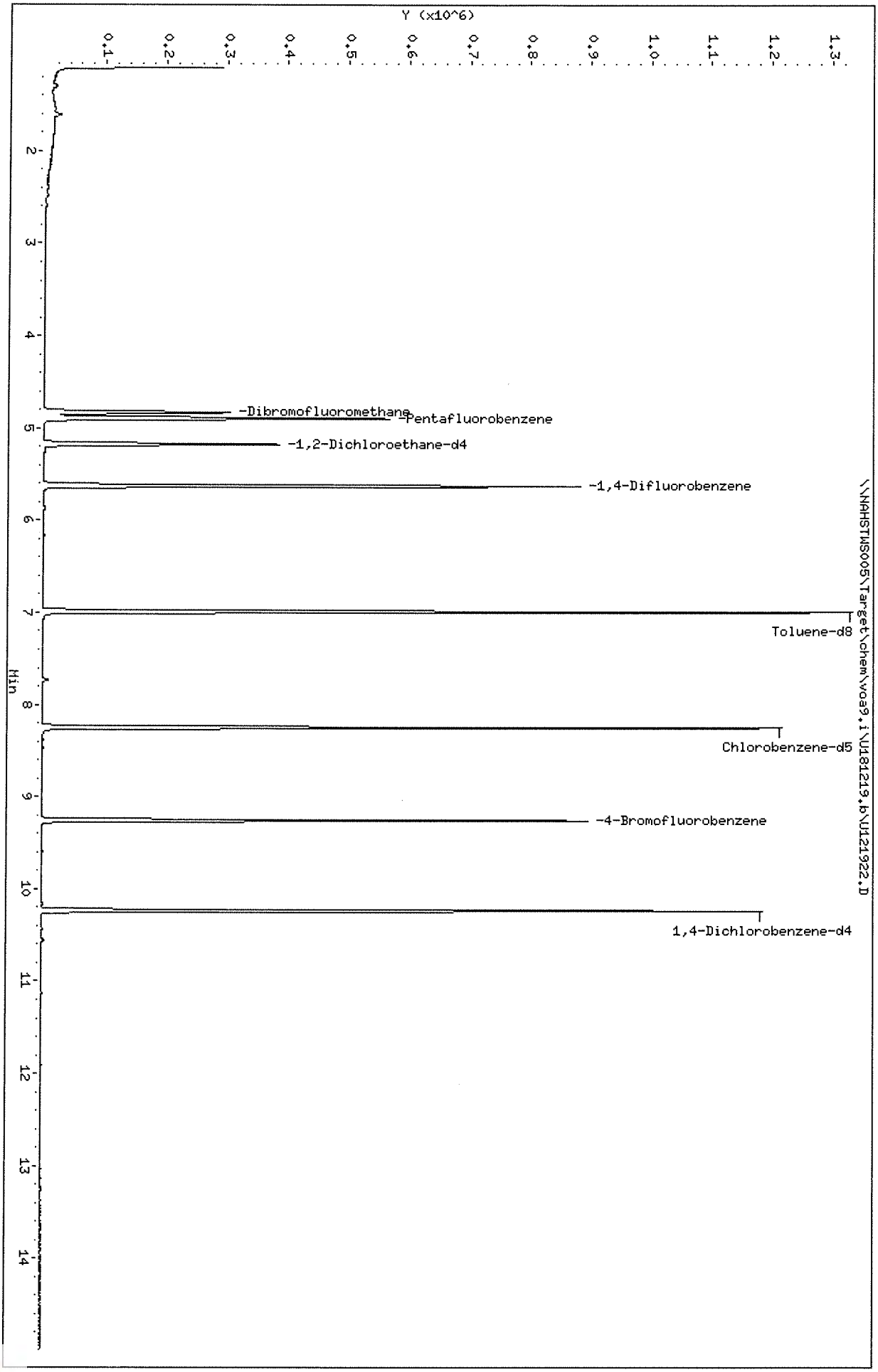
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.894	4.894	(1.000)	345743	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	627542	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	574345	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	260317	50.0000	
$	30 Dibromofluoromethane	113	4.830	4.826	(0.987)	178658	44.8254	44.82
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	243855	46.5370	46.53
$	48 Toluene-d8	98	6.990	6.989	(0.847)	763341	52.0679	52.06
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	277746	48.8813	48.88

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121922.D
Date : 19-DEC-2018 21:13
Client ID: HS18120569-02
Sample Info: HS18120569-02;HS18120569-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121923.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121923.D
Lab Smp Id: HS18120569-03 Client Smp ID: HS18120569-03
Inj Date : 19-DEC-2018 21:38
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120569-03;HS18120569-03;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 22
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

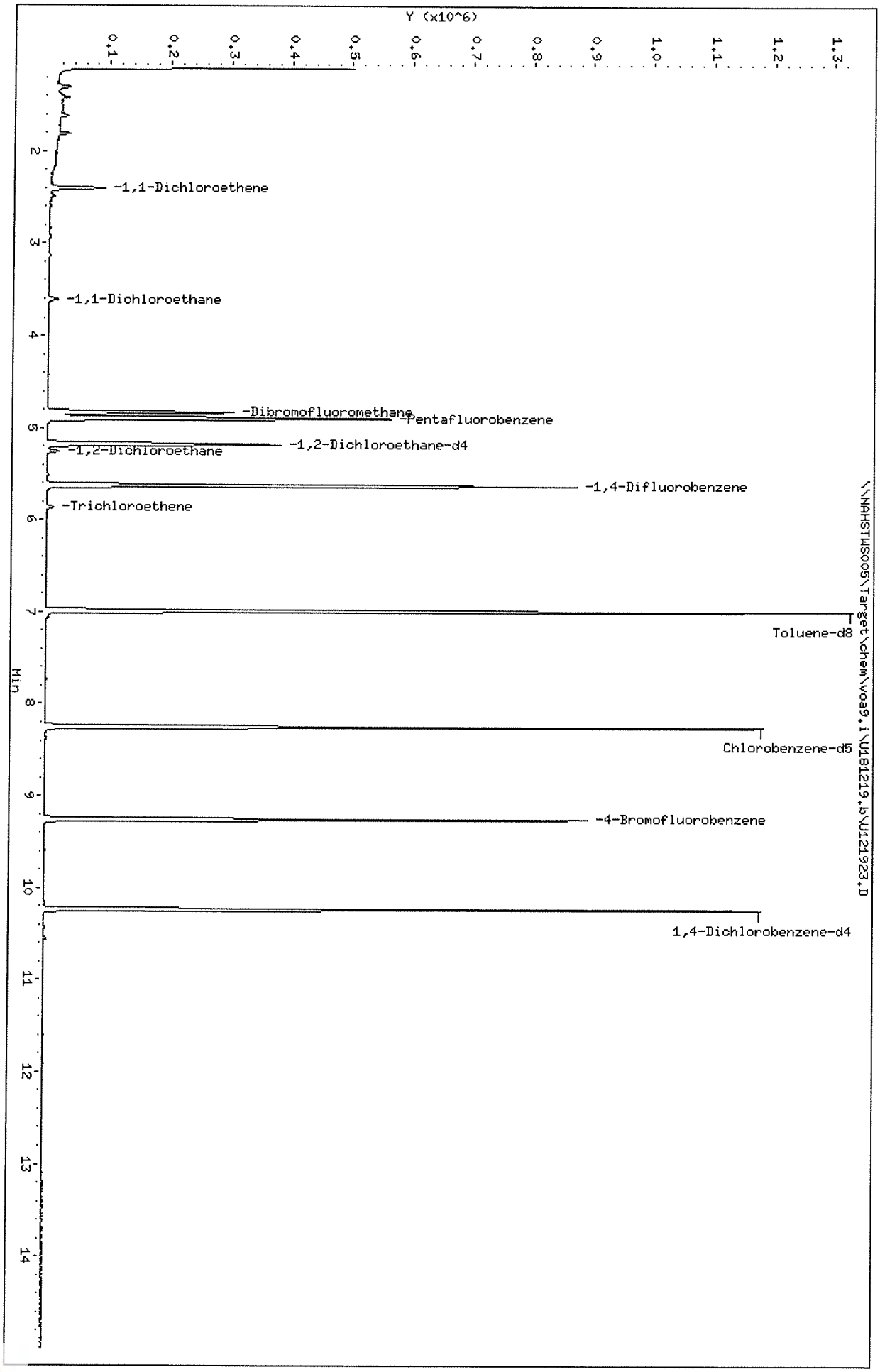
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.894	(1.000)	342930	50.0000	
* 36 1,4-Difluorobenzene	114	5.628	5.625	(1.000)	621856	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	566711	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.235	10.236	(1.000)	260495	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.986)	177903	45.0070	45.00
$ 35 1,2-Dichloroethane-d4	65	5.178	5.175	(1.057)	242795	46.7215	46.72
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	763635	52.8133	52.81
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	276335	49.2969	49.29
22 1,1-Dichloroethane	63	3.608	3.601	(0.737)	14259	1.81447	1.81(a)
11 1,1-Dichloroethene	96	2.404	2.397	(0.491)	29062	7.50789	7.50
33 1,2-Dichloroethane	62	5.253	5.250	(0.933)	13935	2.14146	2.14(a)
38 Trichloroethene	130	5.864	5.861	(1.042)	2514	0.59330	0.59(aH)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
H - Operator selected an alternate compound hit.



Data File: \\NAHSTWS005\Target\chem\voa9,i\U181219,b\U121923,D
Date : 19-DEC-2018 21:38
Client ID: HS18120569-03
Sample Info: HS18120569-03;HS18120569-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121923.D

Date : 19-DEC-2018 21:38

Client ID: HS18120569-03

Instrument: VOA9.i

Sample Info: HS18120569-03;HS18120569-03;;;

Purge Volume: 5.0

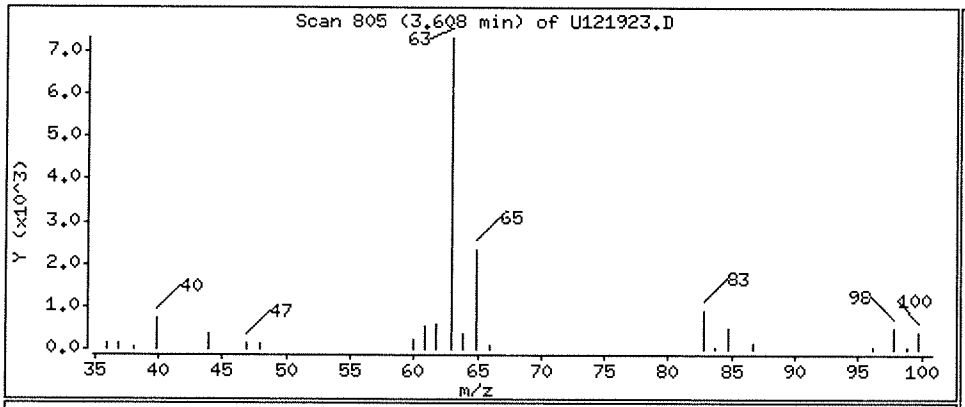
Operator: PC

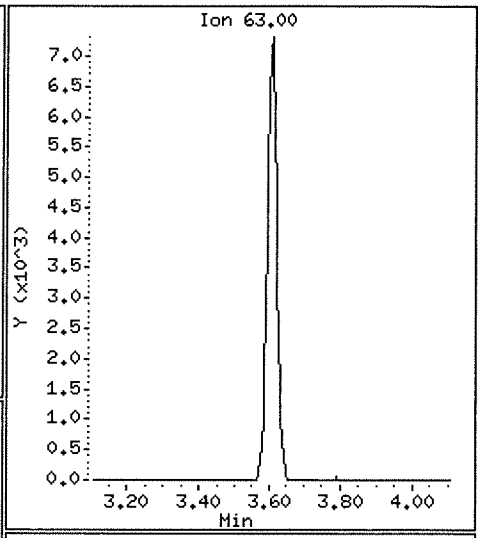
Column phase: DB624

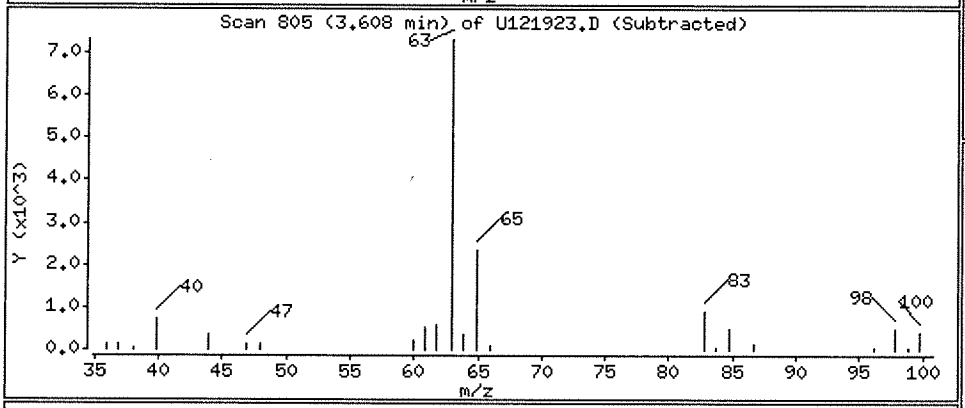
Column diameter: 0.18

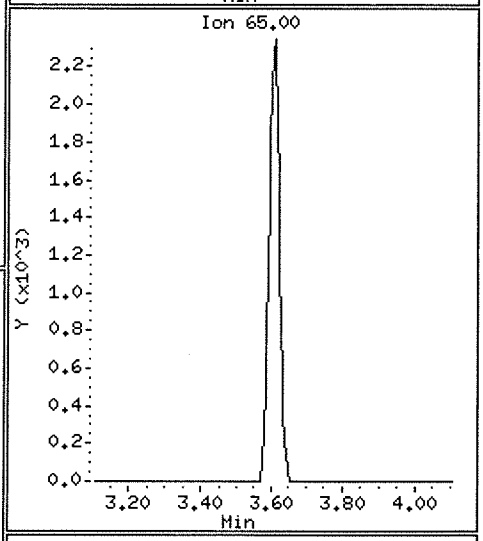
22 1,1-Dichloroethane

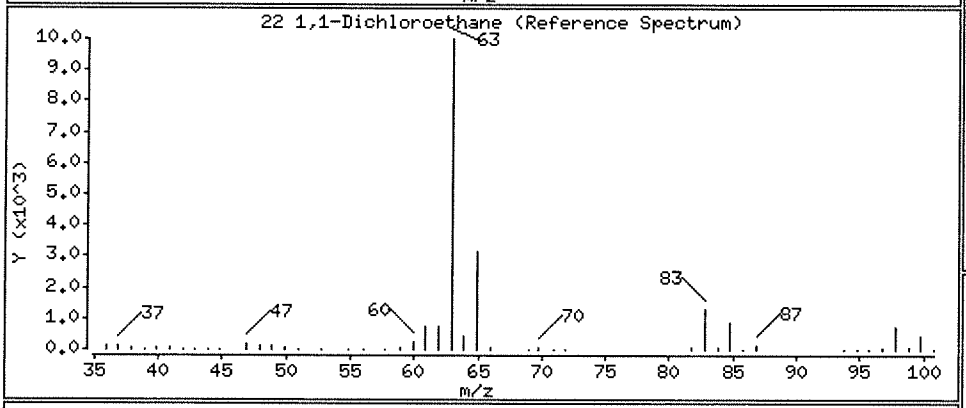
Concentration: 1.81 ug/l

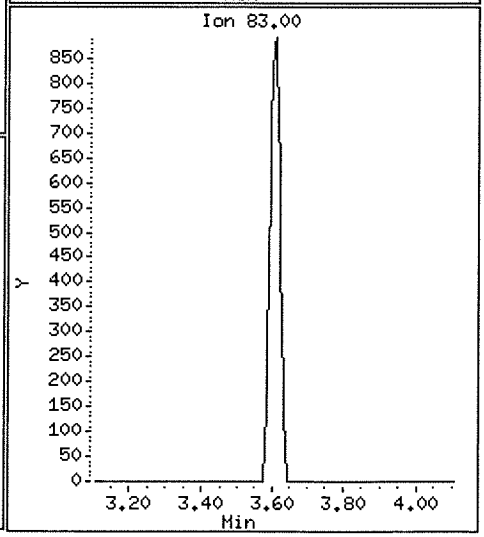


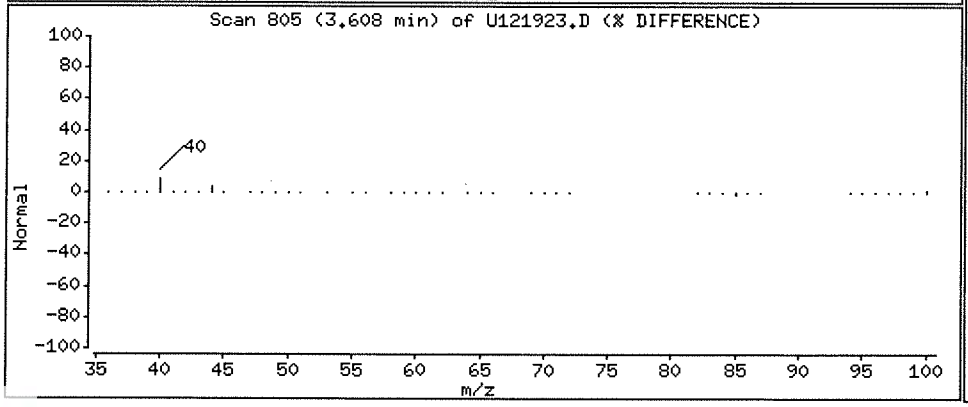












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121923.D Page 4

Date : 19-DEC-2018 21:38

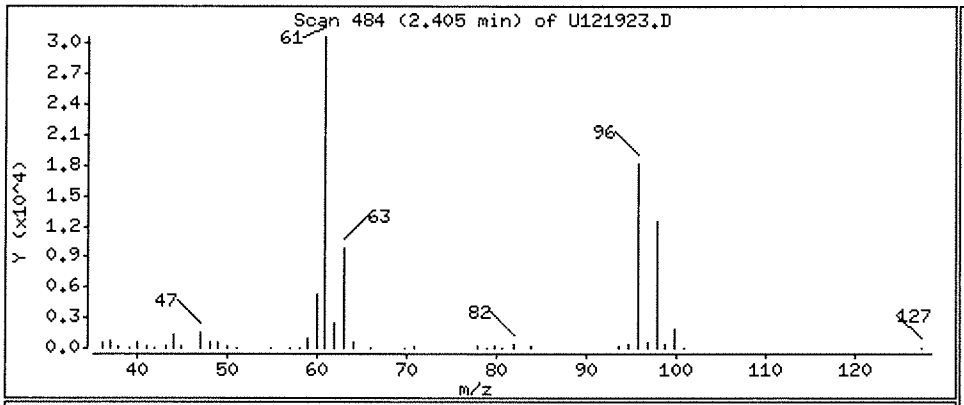
Client ID: HS18120569-03 Instrument: VOA9.i

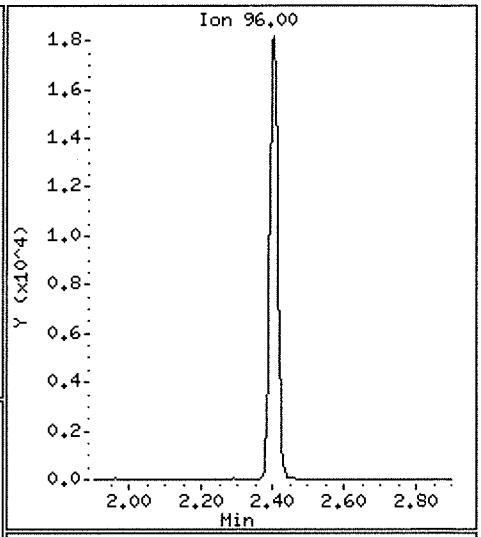
Sample Info: HS18120569-03;HS18120569-03;;;

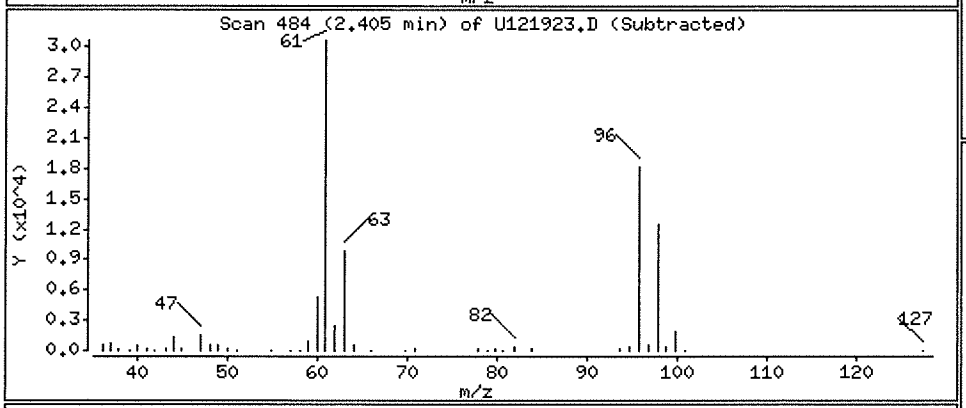
Purge Volume: 5.0 Operator: PC

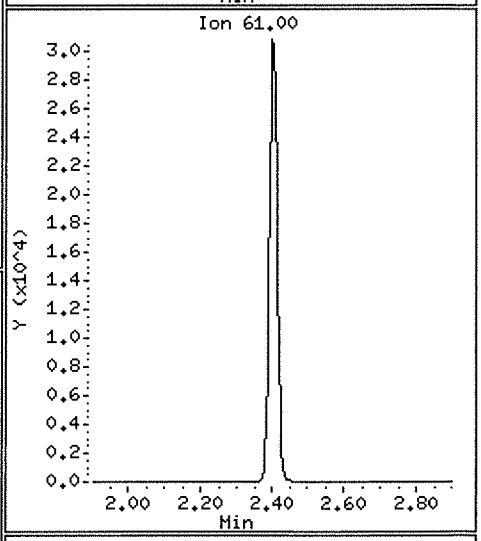
Column phase: DB624 Column diameter: 0.18

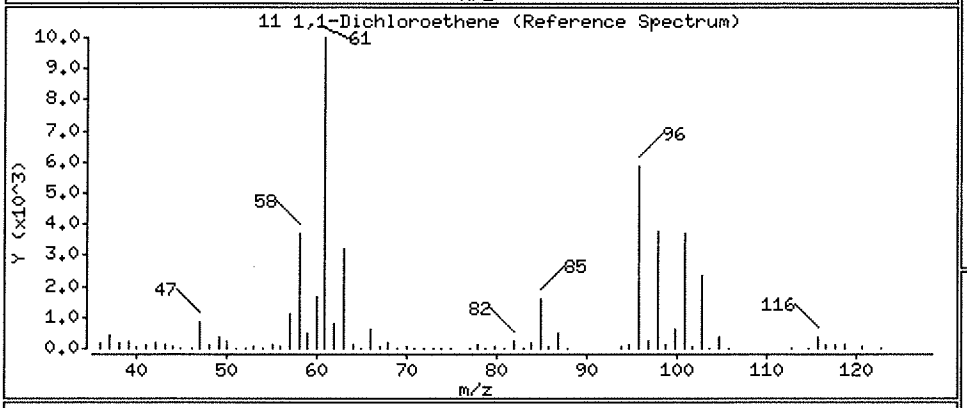
11 1,1-Dichloroethene Concentration: 7.50 ug/l

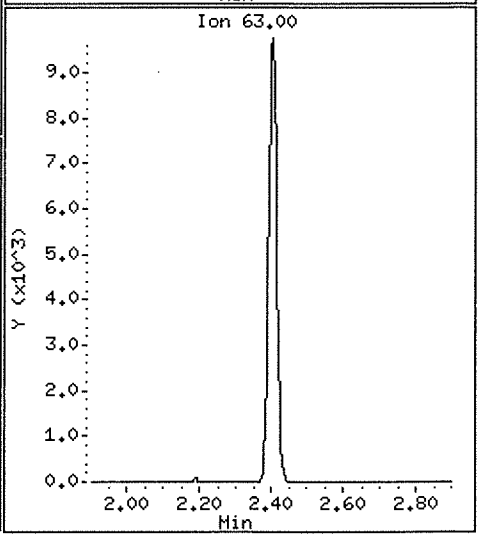


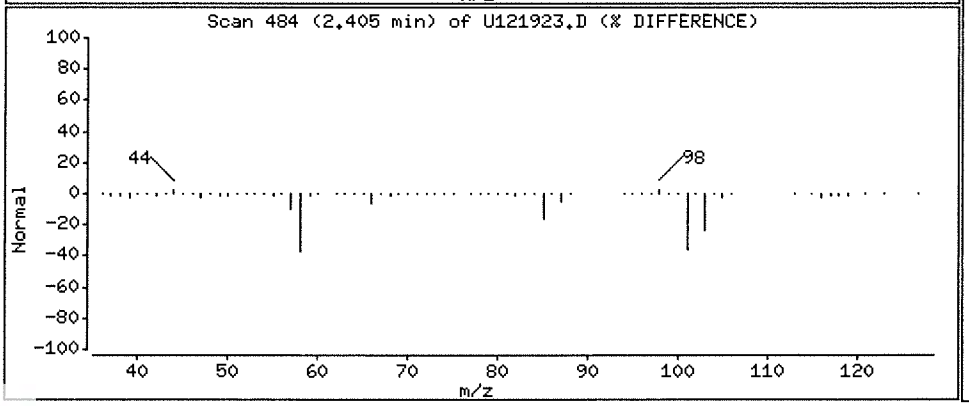












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121923.D Page 5

Date : 19-DEC-2018 21:38

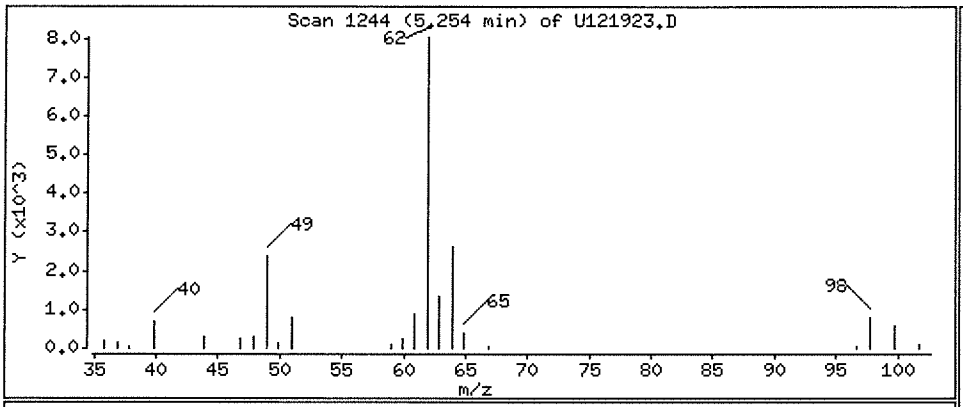
Client ID: HS18120569-03 Instrument: VOA9.i

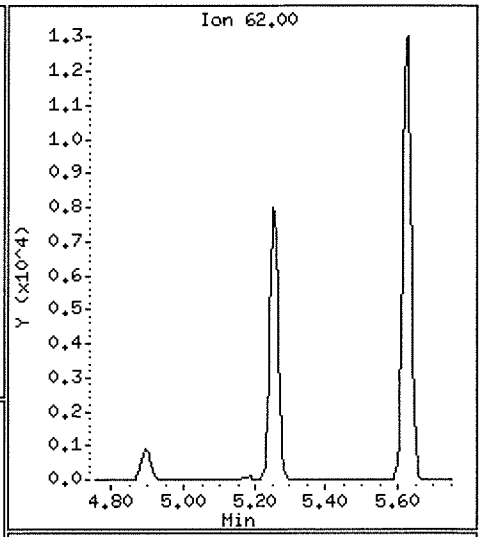
Sample Info: HS18120569-03;HS18120569-03;;;

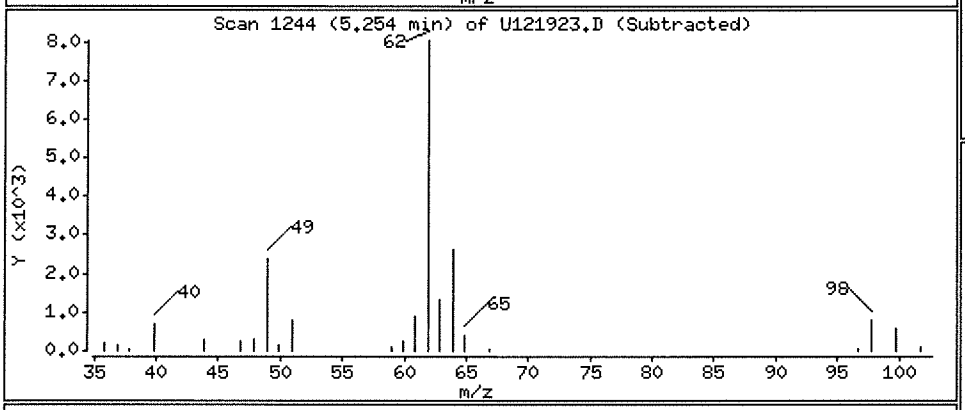
Purge Volume: 5.0 Operator: PC

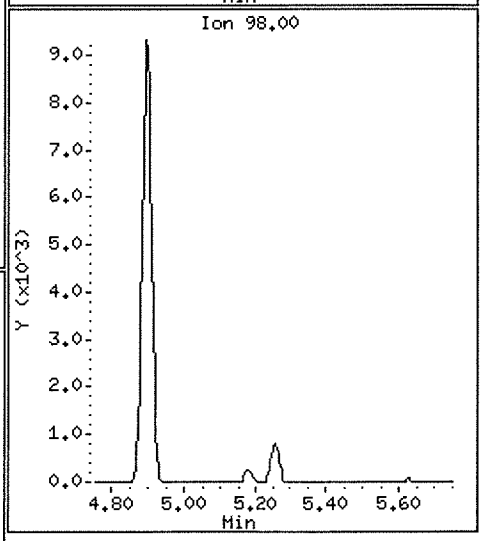
Column phase: DB624 Column diameter: 0.18

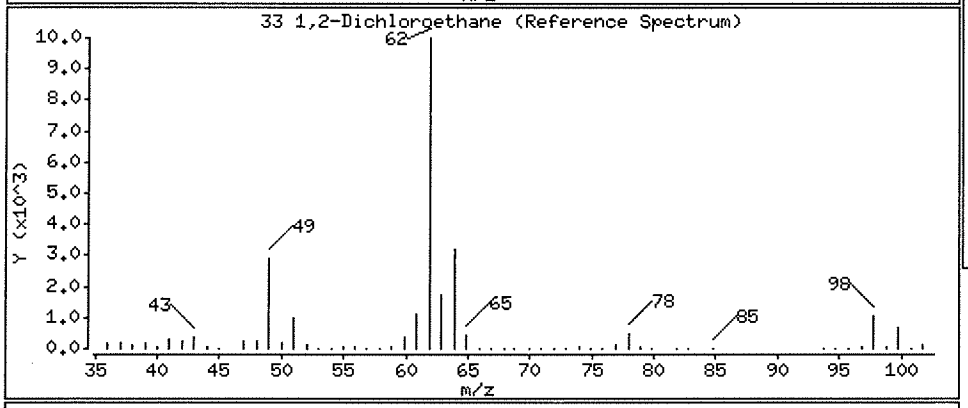
33 1,2-Dichloroethane Concentration: 2.14 ug/l

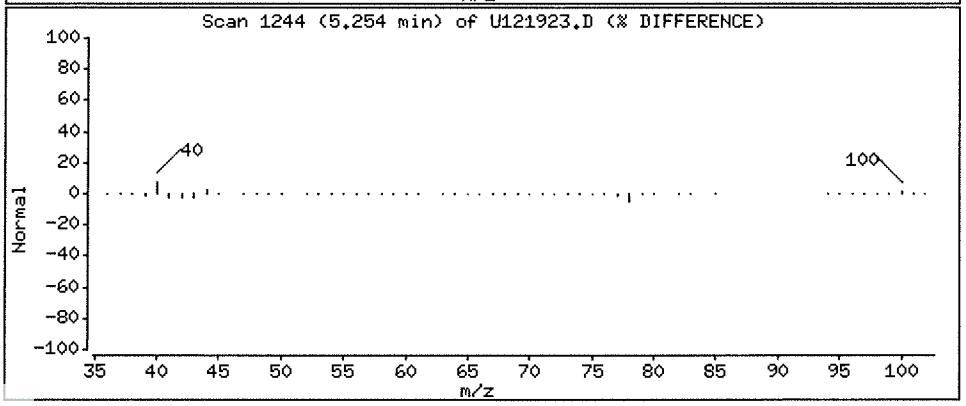












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121923.D

Date : 19-DEC-2018 21:38

Client ID: HS18120569-03

Instrument: VOA9.i

Sample Info: HS18120569-03;HS18120569-03;;;

Purge Volume: 5.0

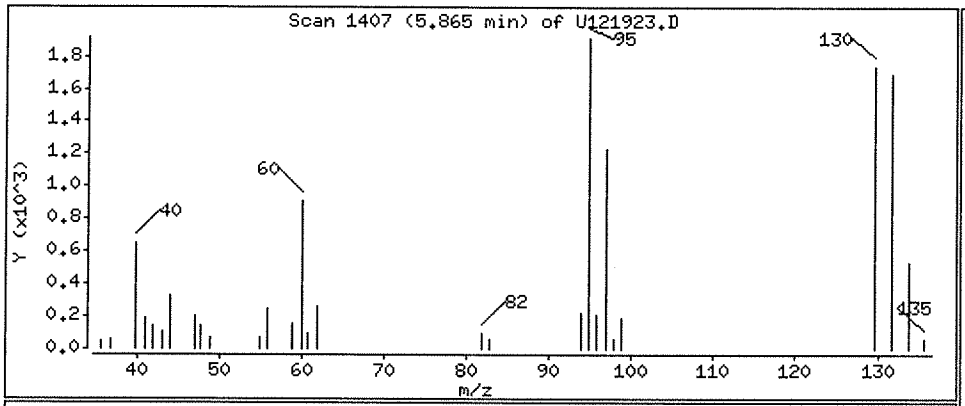
Operator: PC

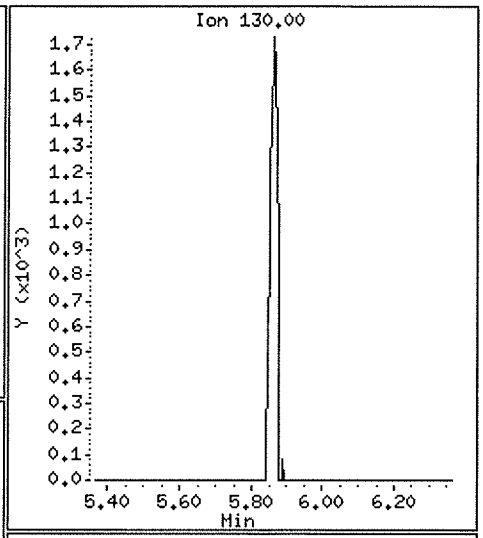
Column phase: DB624

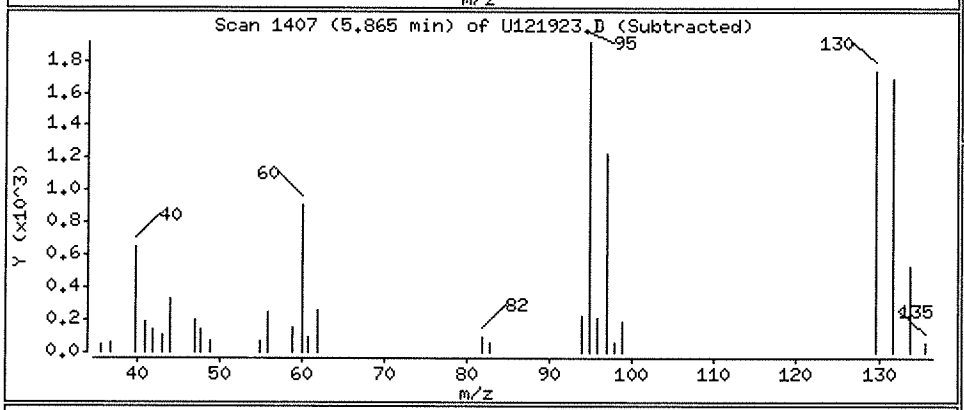
Column diameter: 0.18

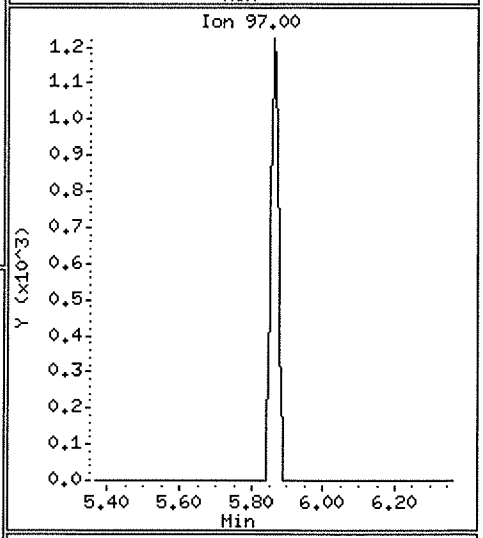
38 Trichloroethene

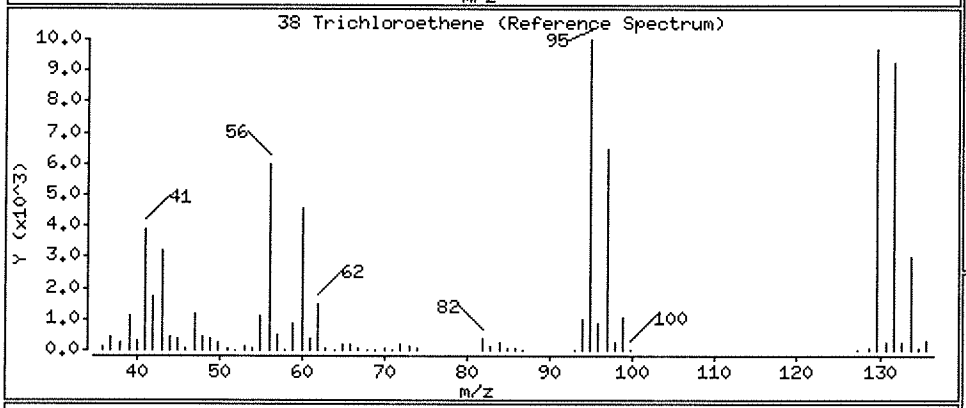
Concentration: 0.59 ug/l

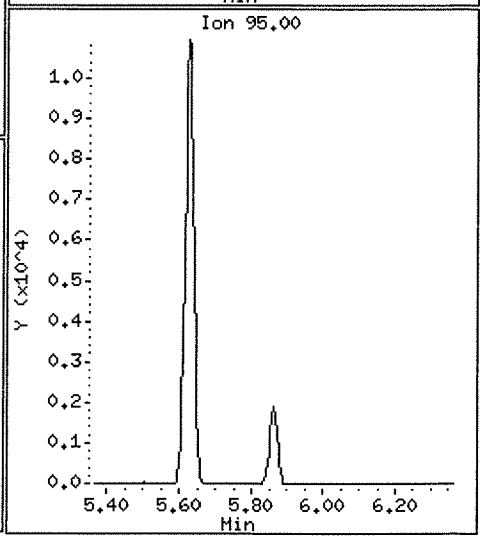


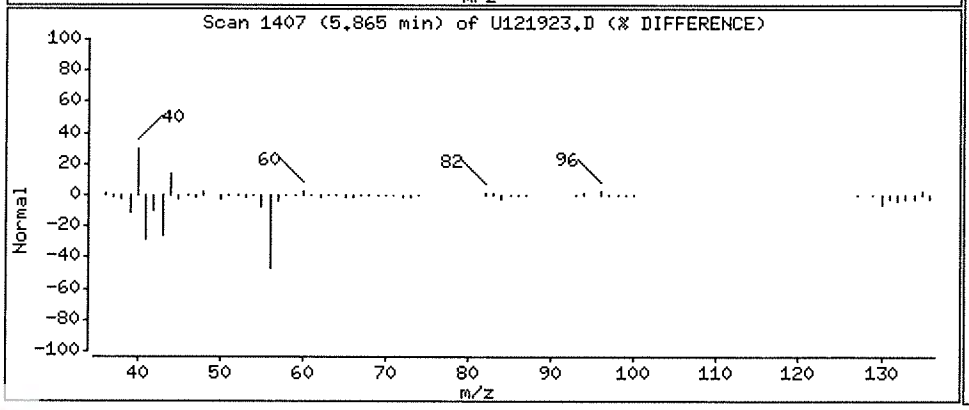












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D Page 1
Report Date: 25-Jan-2019 22:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D
Lab Smp Id: HS18120569-04 Client Smp ID: HS18120569-05
Inj Date : 19-DEC-2018 22:28
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120569-05;HS18120569-05;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:15 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 24
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14

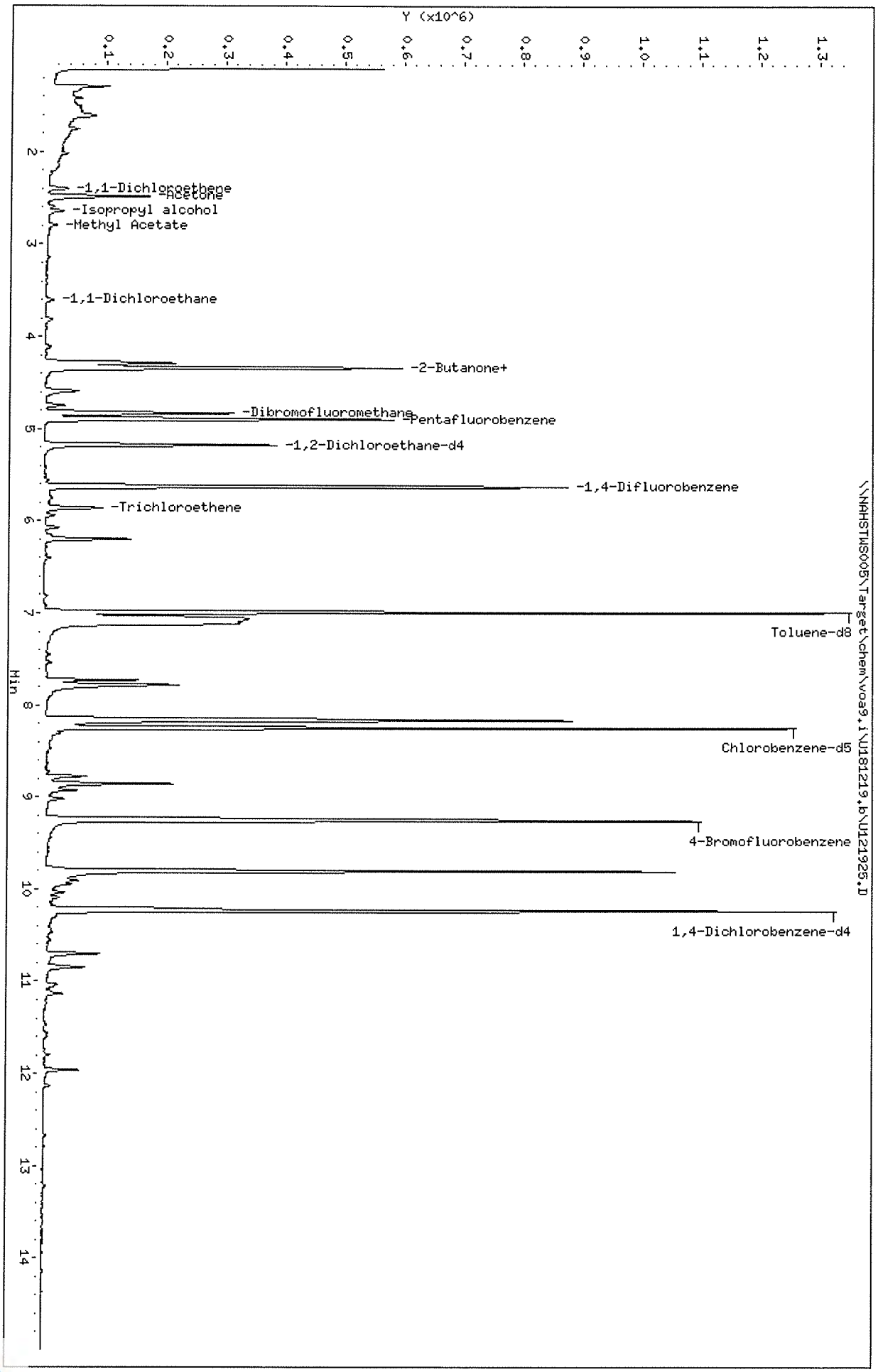
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.897	(1.000)	354217	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	626637	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.252	(1.000)	593810	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.235	10.235	(1.000)	284964	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.987)	181274	44.3816	44.38
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	243188	45.2522	45.25
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	772922	50.9580	50.95
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	298873	50.9187	50.91
22 1,1-Dichloroethane	63	3.604	3.608	(0.737)	13272	1.63506	1.63(a)
11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	9851	2.46382	2.46(a)
24 2-Butanone	43	4.339	4.339	(0.887)	748792	300.727	300.72(A)
10 Acetone	43	2.479	2.483	(0.507)	185977	115.015	115.01
27 cis-1,2-Dichloroethene	96	4.286	4.290	(0.876)	100553	20.0337	20.03
38 Trichloroethene	130	5.861	5.864	(1.042)	22584	5.28913	5.28

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount
exceeded maximum amount.



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Date : 19-DEC-2018 22:28
Client ID: HS18120569-05
Sample Info: HS18120569-05;HS18120569-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D

Date : 19-DEC-2018 22:28

Client ID: HS18120569-05

Instrument: VOA9.i

Sample Info: HS18120569-05;HS18120569-05;;;

Purge Volume: 5.0

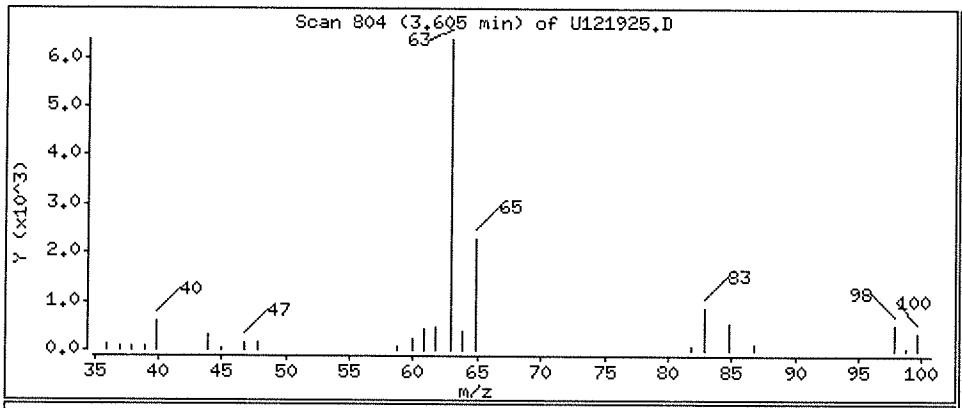
Operator: PC

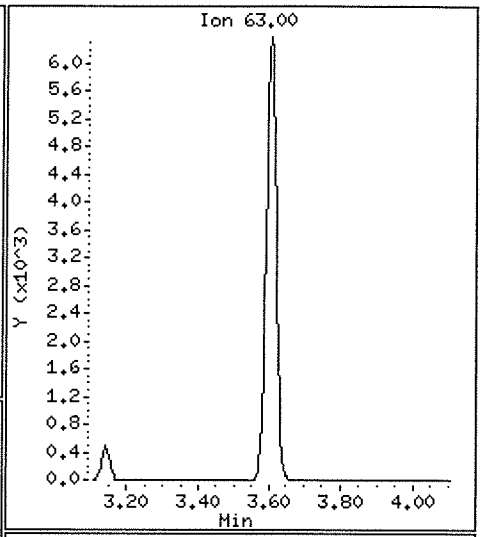
Column phase: DB624

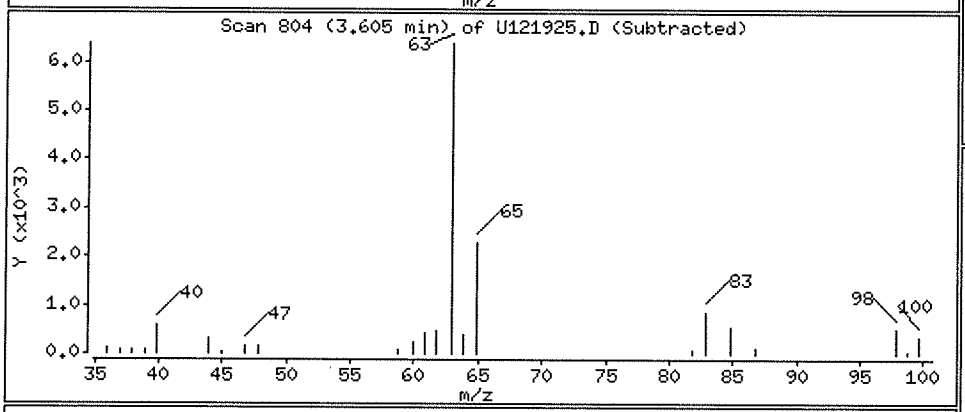
Column diameter: 0.18

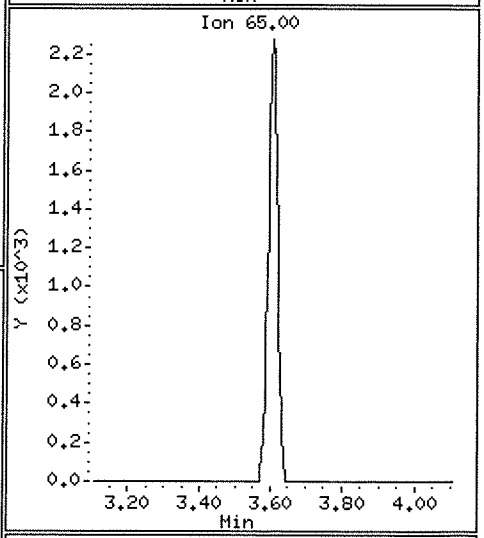
22 1,1-Dichloroethane

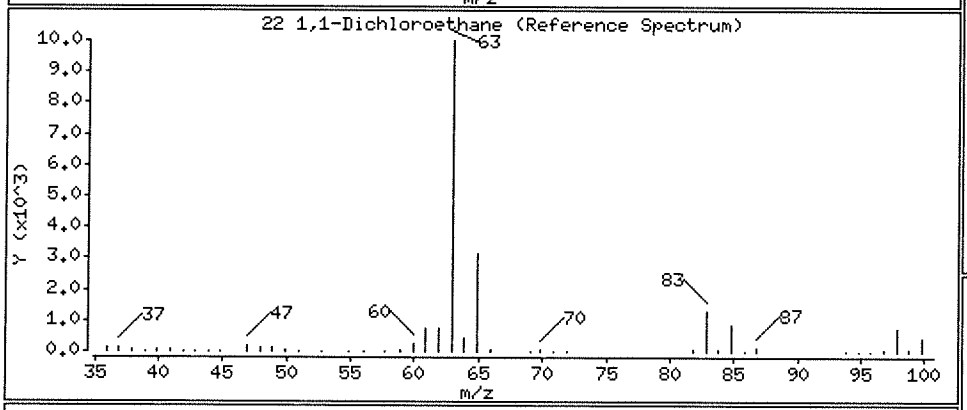
Concentration: 1.63 ug/l

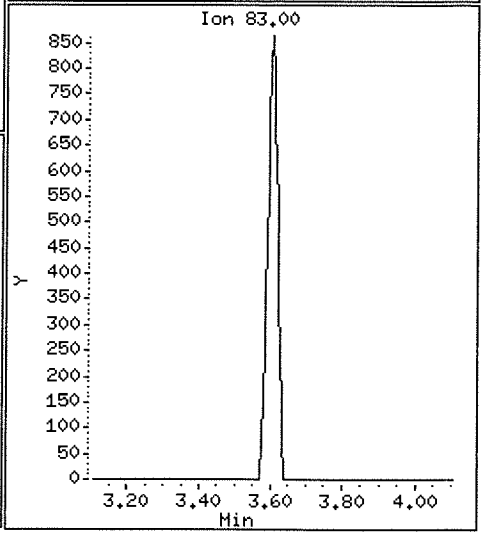


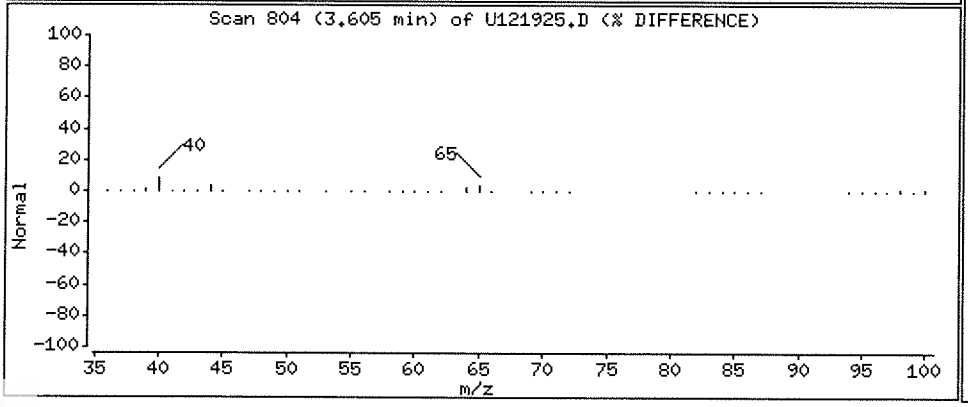












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D Page 4

Date : 19-DEC-2018 22:28

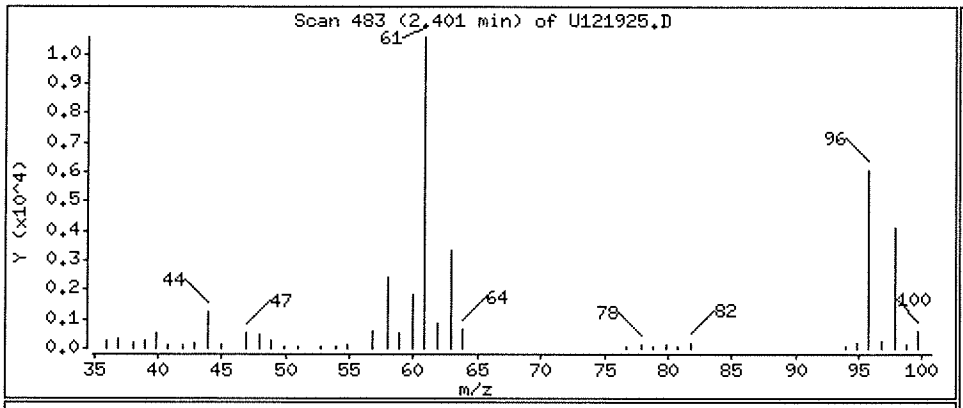
Client ID: HS18120569-05 Instrument: VOA9.i

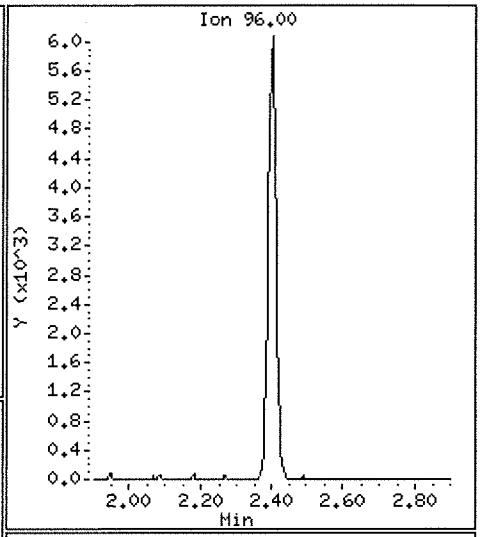
Sample Info: HS18120569-05;HS18120569-05;;;

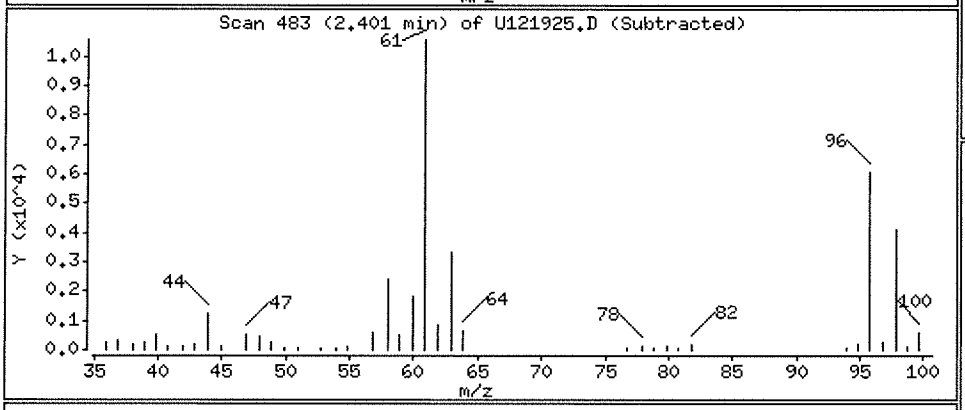
Purge Volume: 5.0 Operator: PC

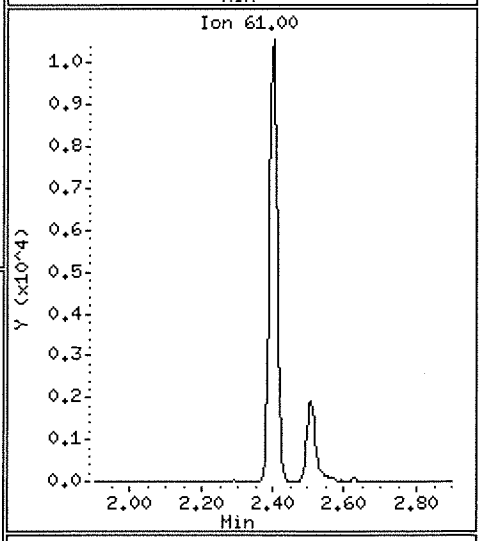
Column phase: DB624 Column diameter: 0.18

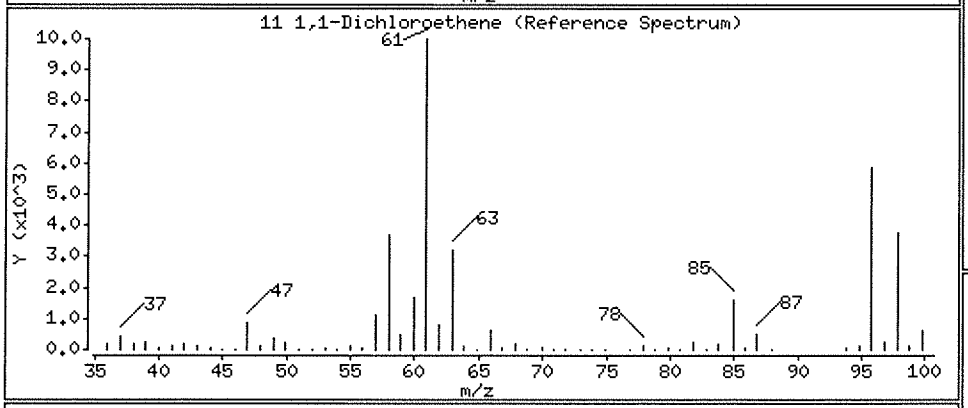
11 1,1-Dichloroethene Concentration: 2.46 ug/l

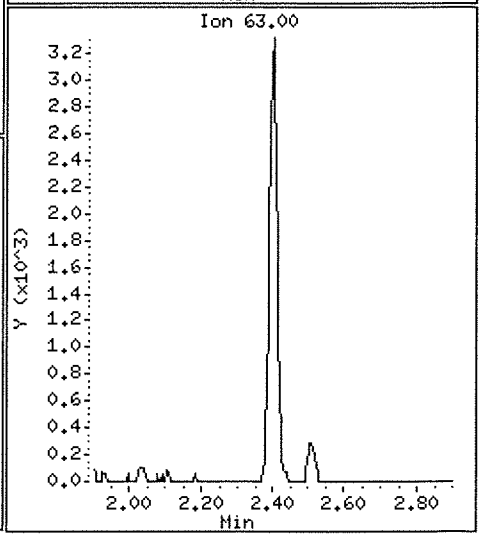


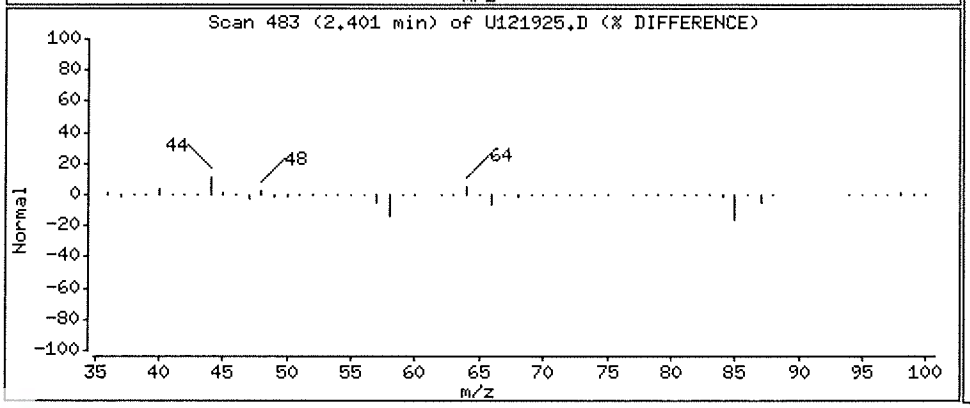












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D

Date : 19-DEC-2018 22:28

Client ID: HS18120569-05

Instrument: VOA9.i

Sample Info: HS18120569-05;HS18120569-05;;;

Purge Volume: 5.0

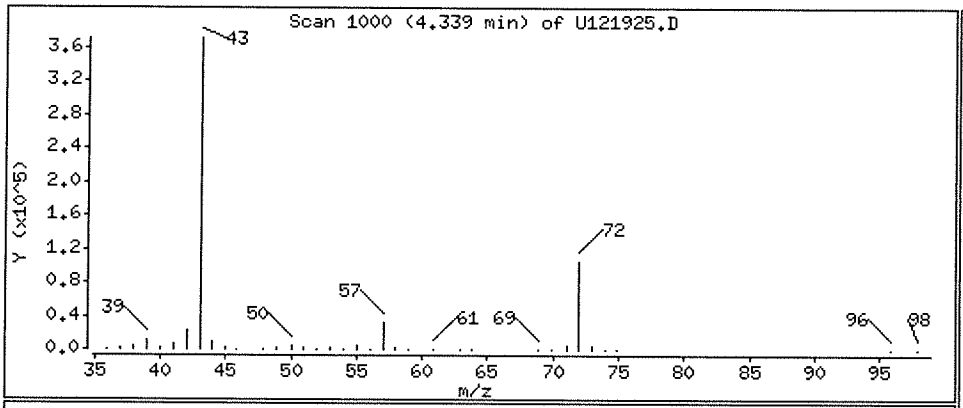
Operator: PC

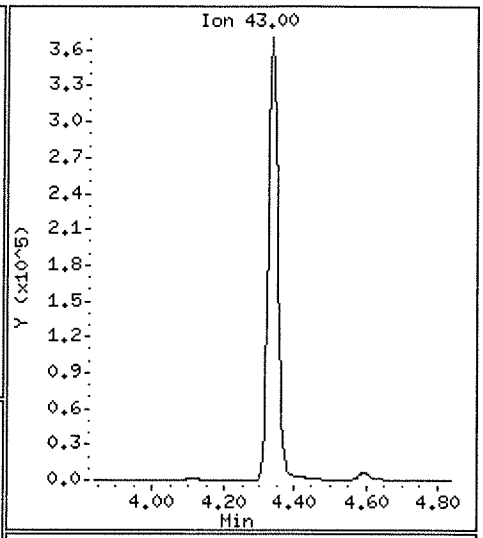
Column phase: DB624

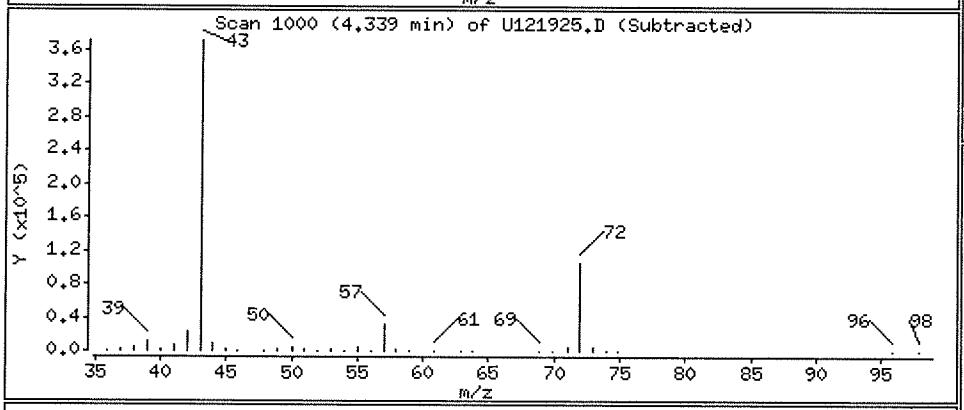
Column diameter: 0.18

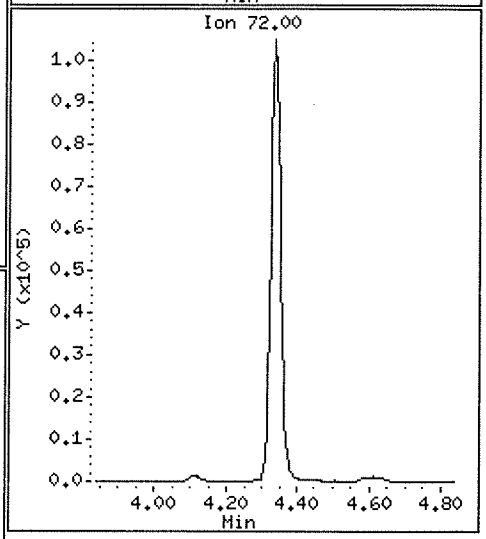
24 2-Butanone

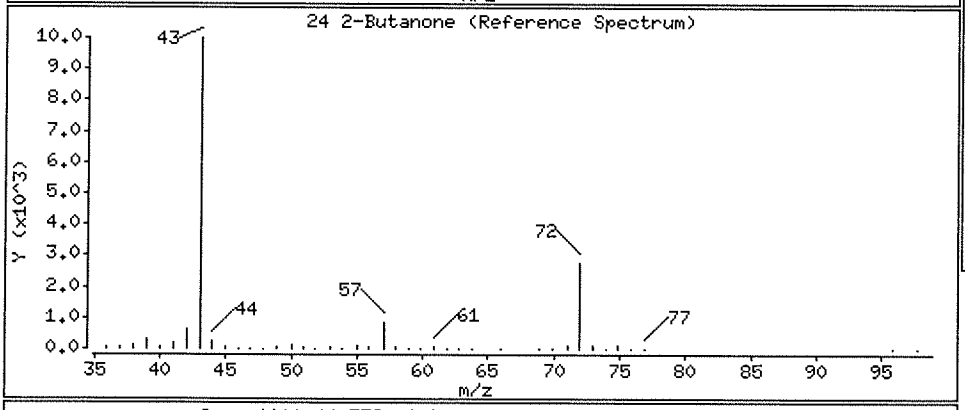
Concentration: 300.72 ug/l

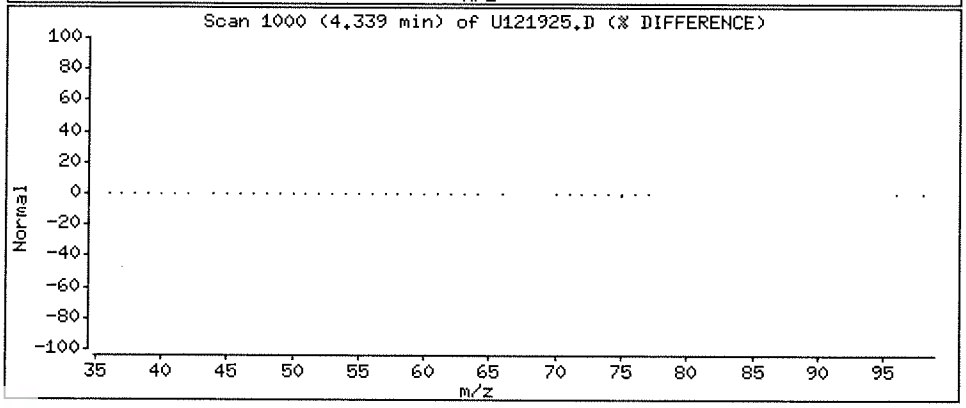












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D

Date : 19-DEC-2018 22:28

Client ID: HS18120569-05

Instrument: VOA9.i

Sample Info: HS18120569-05;HS18120569-05;;;

Purge Volume: 5.0

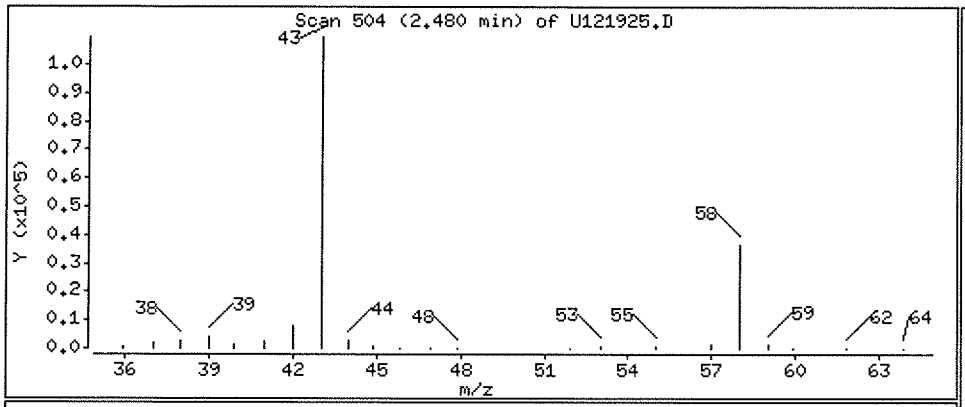
Operator: PC

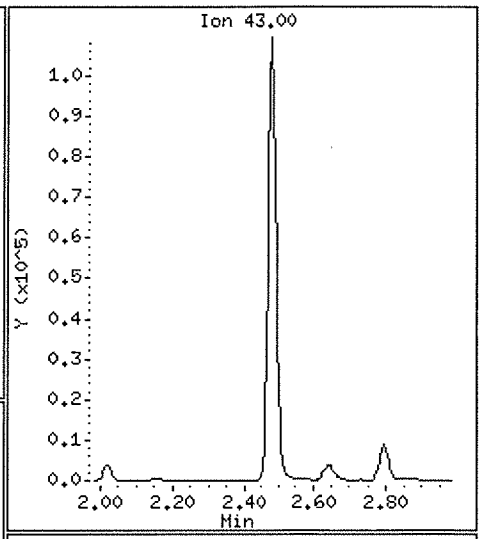
Column phase: DB624

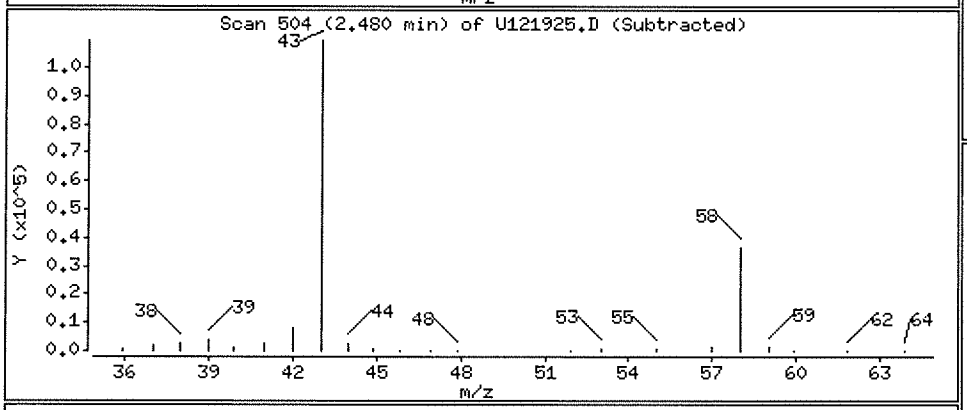
Column diameter: 0.18

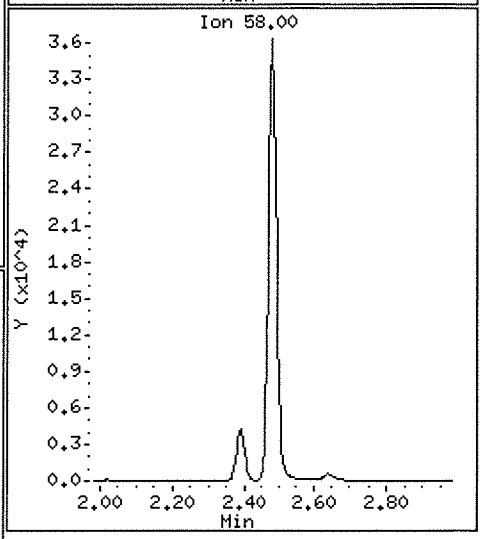
10 Acetone

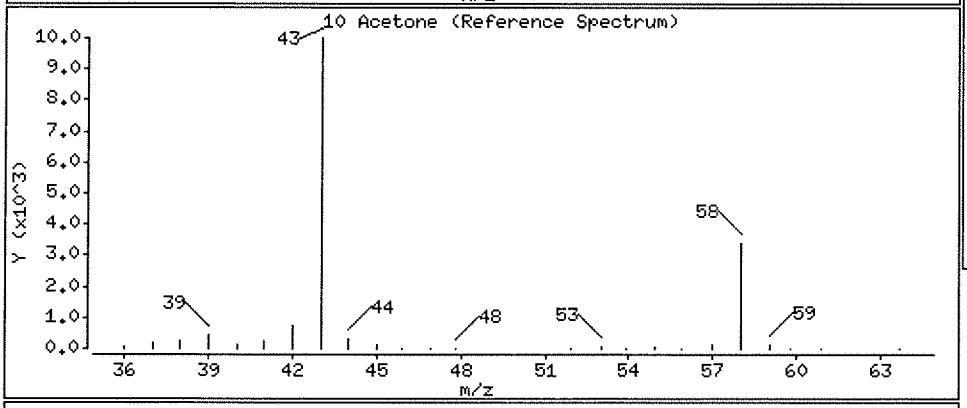
Concentration: 115.01 ug/l

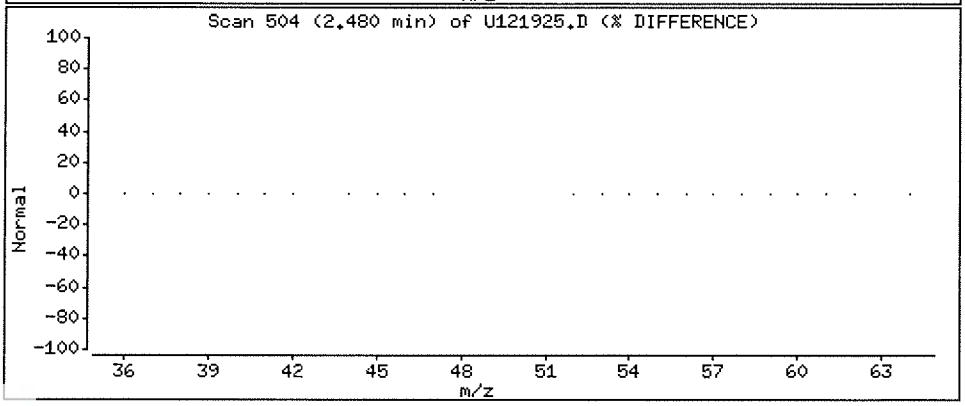












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D

Date : 19-DEC-2018 22:28

Client ID: HS18120569-05

Instrument: VOA9.i

Sample Info: HS18120569-05;HS18120569-05;;;

Purge Volume: 5.0

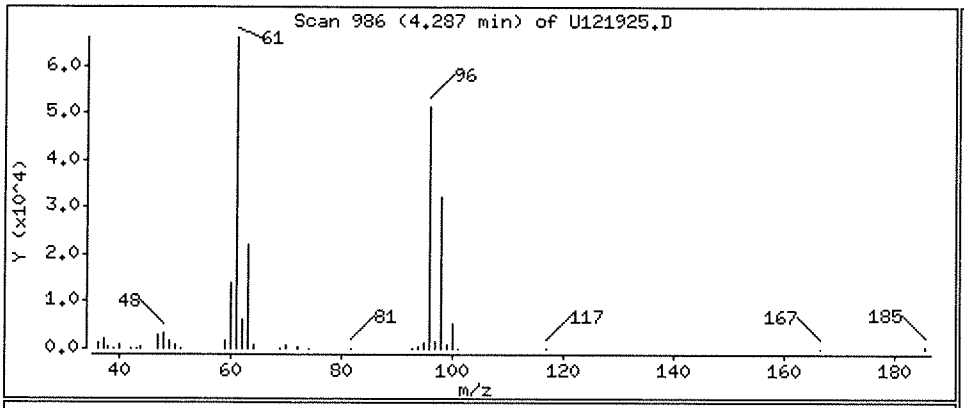
Operator: PC

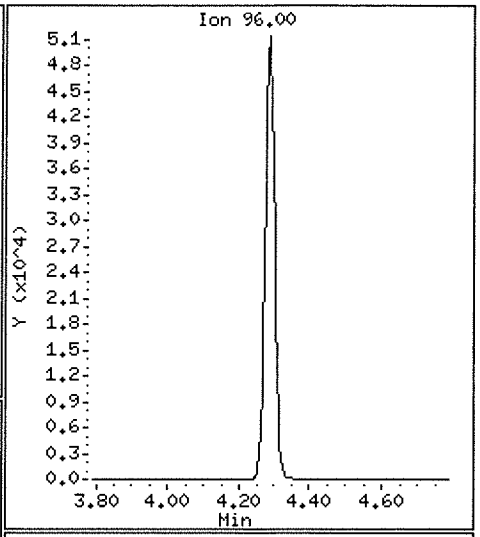
Column phase: DB624

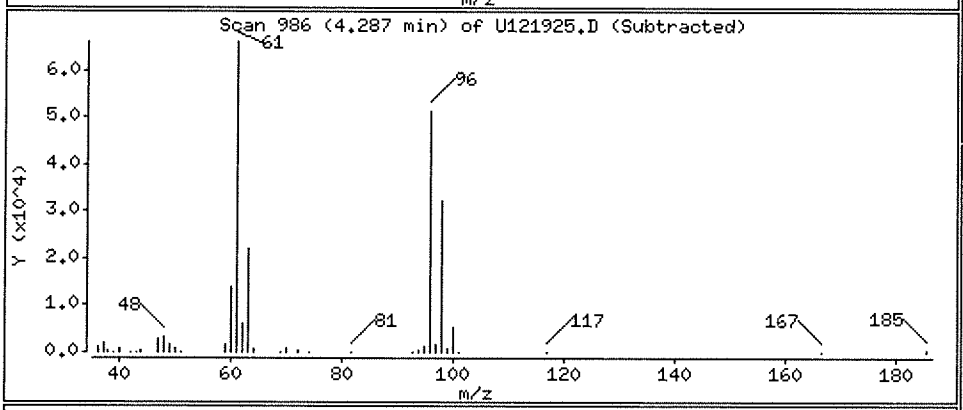
Column diameter: 0.18

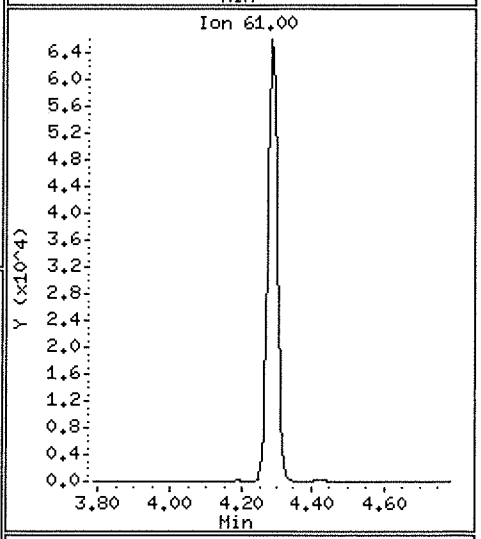
27 cis-1,2-Dichloroethene

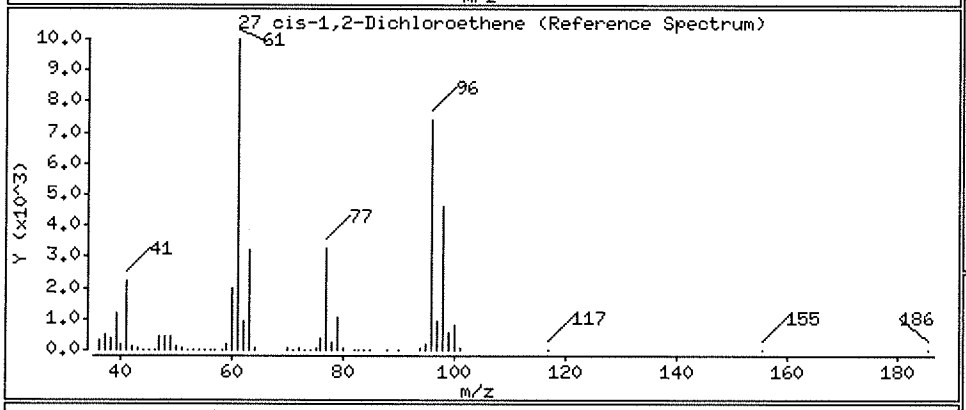
Concentration: 20.03 ug/l

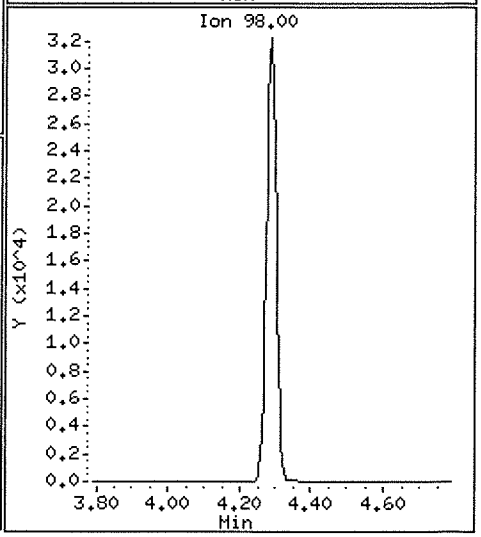


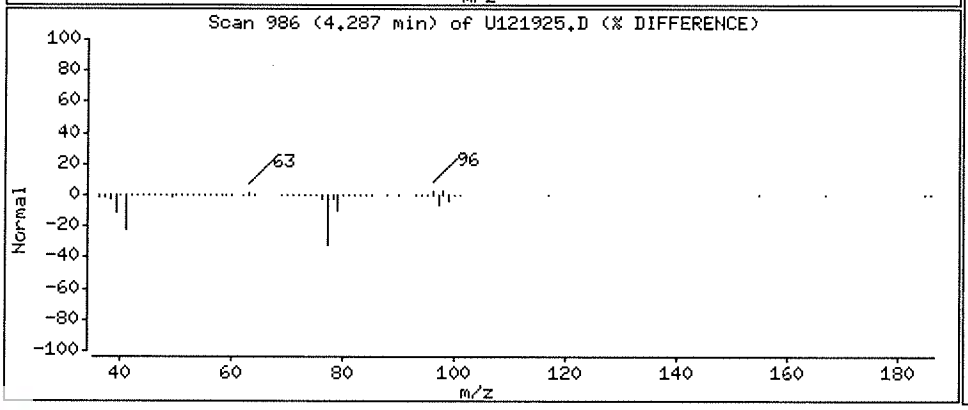












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121925.D

Date : 19-DEC-2018 22:28

Client ID: HS18120569-05

Instrument: VOA9.i

Sample Info: HS18120569-05;HS18120569-05;;;

Purge Volume: 5.0

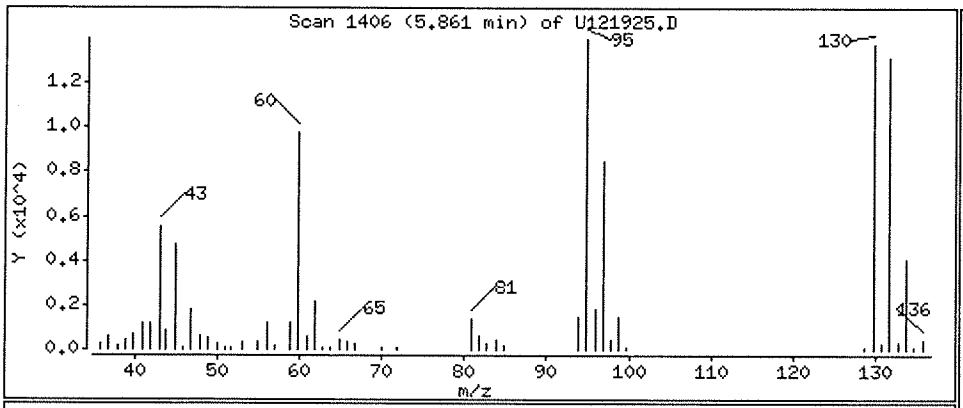
Operator: PC

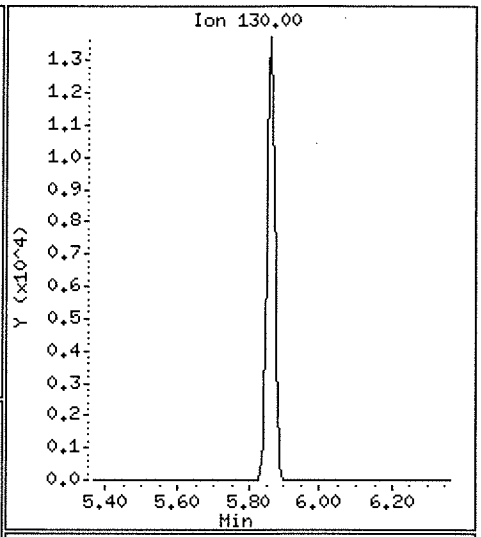
Column phase: DB624

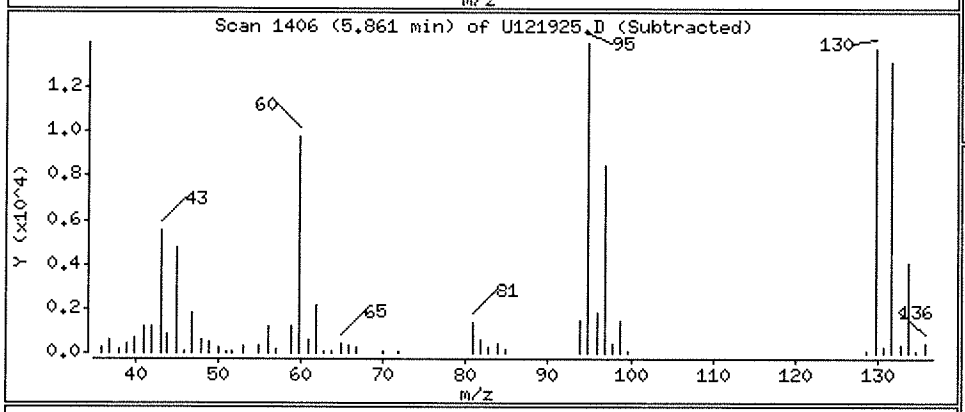
Column diameter: 0.18

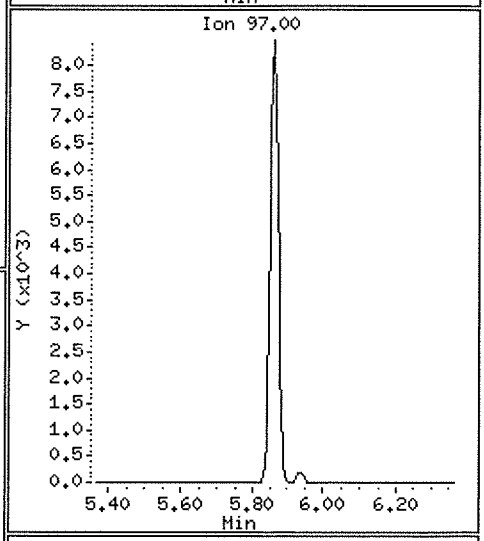
38 Trichloroethene

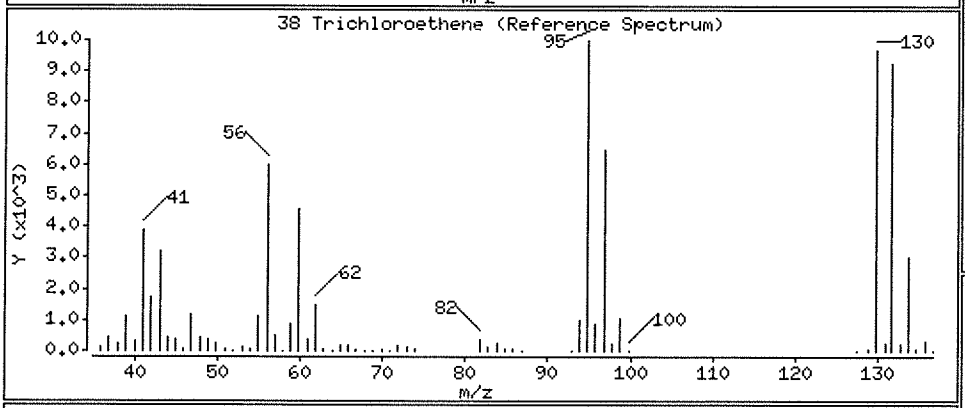
Concentration: 5.28 ug/l

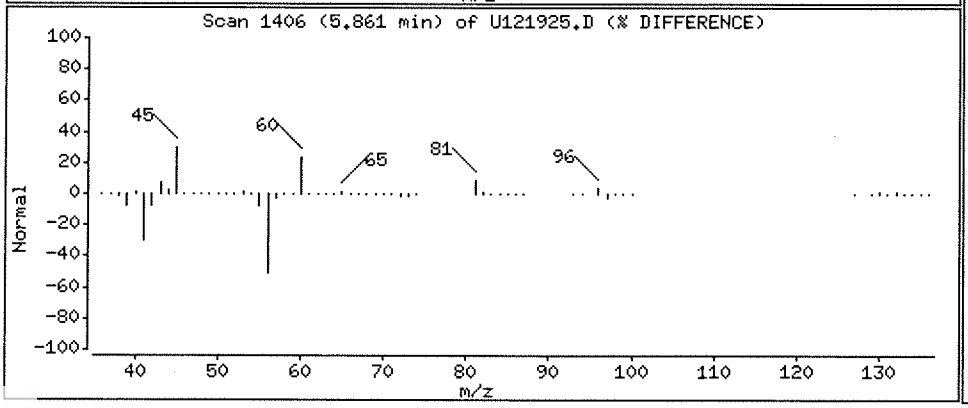


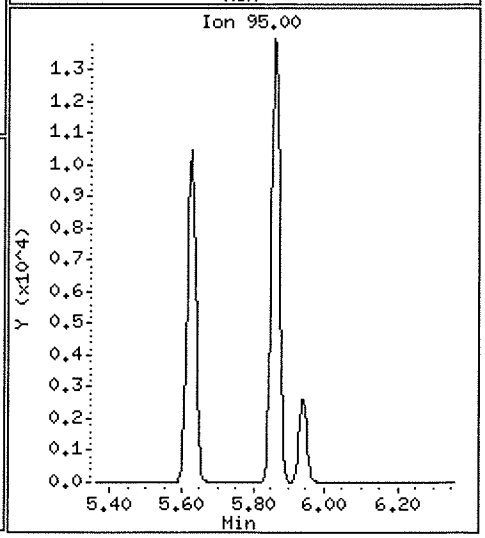












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121926.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121926.D
Lab Smp Id: HS18120569-05 Client Smp ID: HS18120569-01
Inj Date : 19-DEC-2018 22:52
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120569-01;HS18120569-01;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 25
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

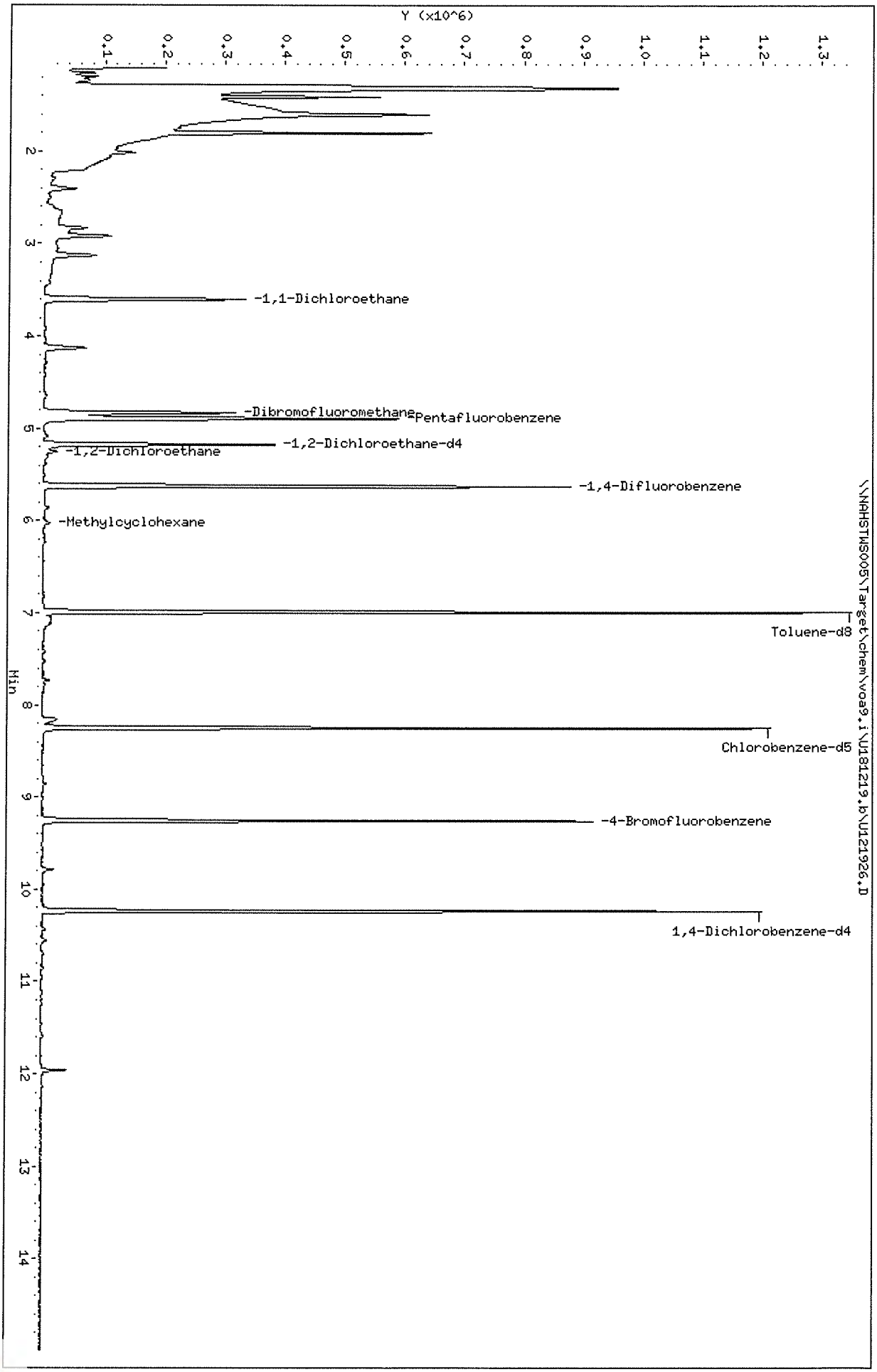
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	354313	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	629652	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	576219	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	263549	50.0000	
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.986)	183865	45.0213	45.02
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	244814	45.5538	45.55
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	775182	52.7245	52.72
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	281321	49.3596	49.35
22 1,1-Dichloroethane	63	3.601	3.601	(0.736)	338202	41.6539	41.65
33 1,2-Dichloroethane	62	5.250	5.250	(0.933)	12621	1.91552	1.91(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9,i\U181219,b\U121926,D
Date : 19-DEC-2018 22:52
Client ID: HS18120569-01
Sample Info: HS18120569-01;HS18120569-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121926.D

Date : 19-DEC-2018 22:52

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

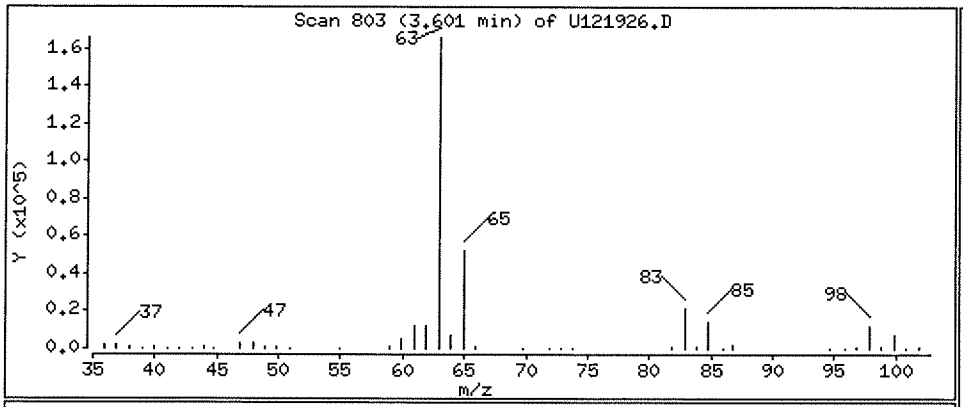
Operator: PC

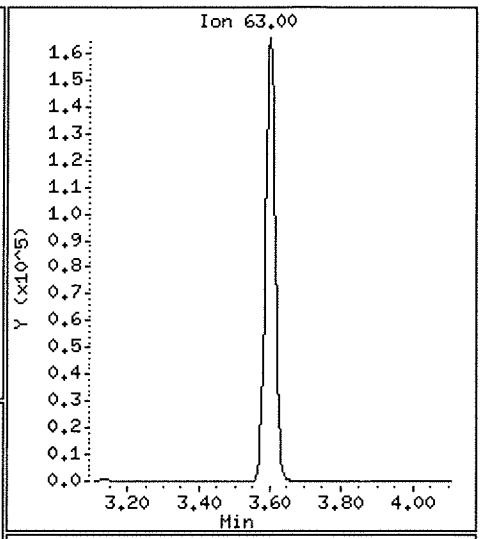
Column phase: DB624

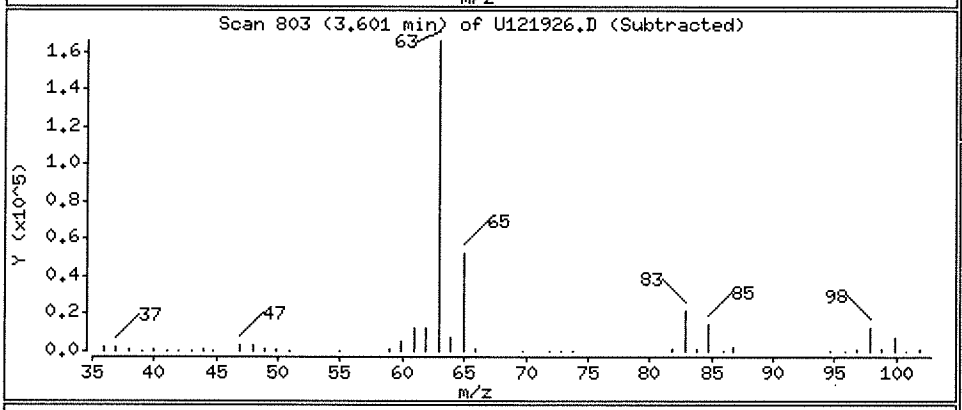
Column diameter: 0.18

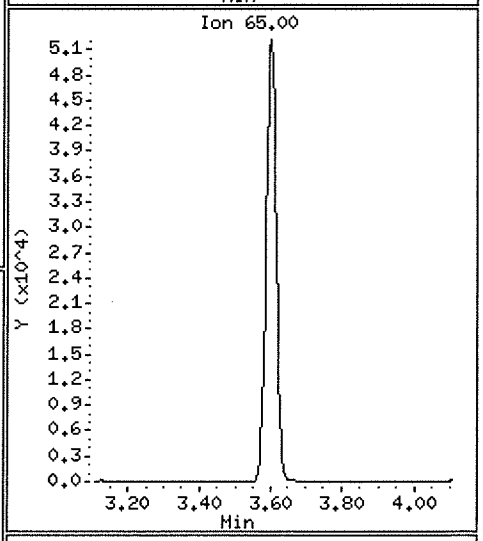
22 1,1-Dichloroethane

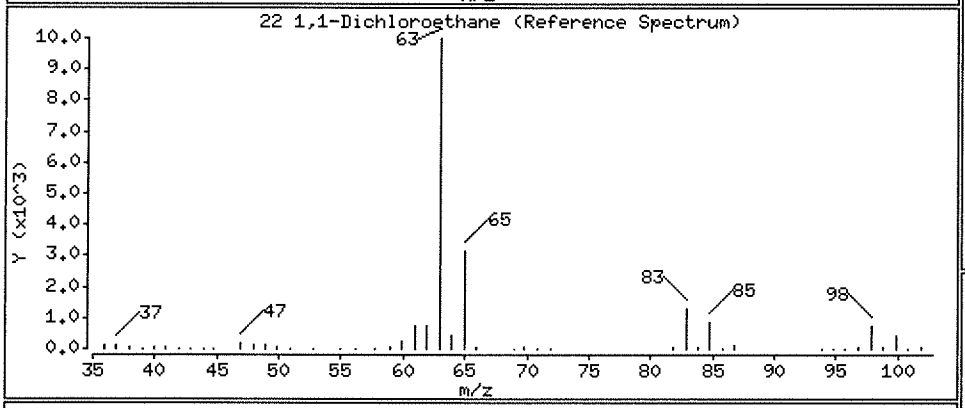
Concentration: 41.65 ug/l

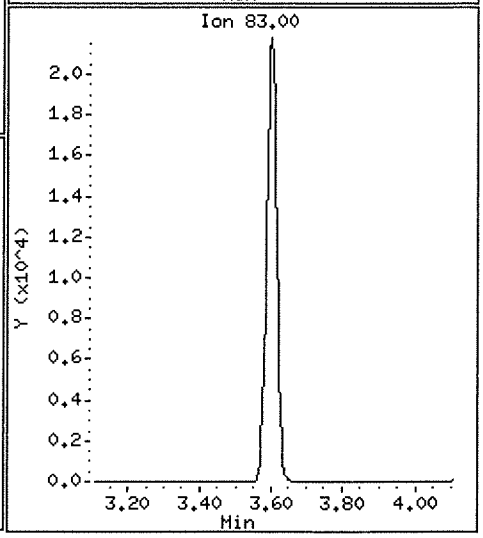


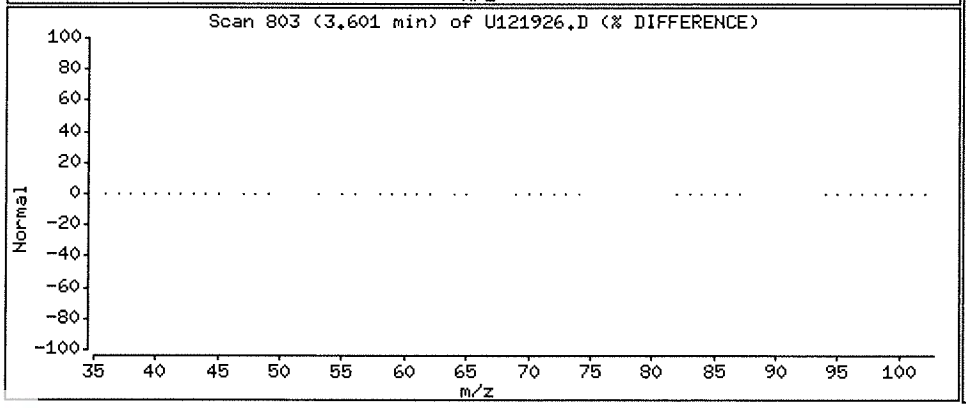












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121926.D

Date : 19-DEC-2018 22:52

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

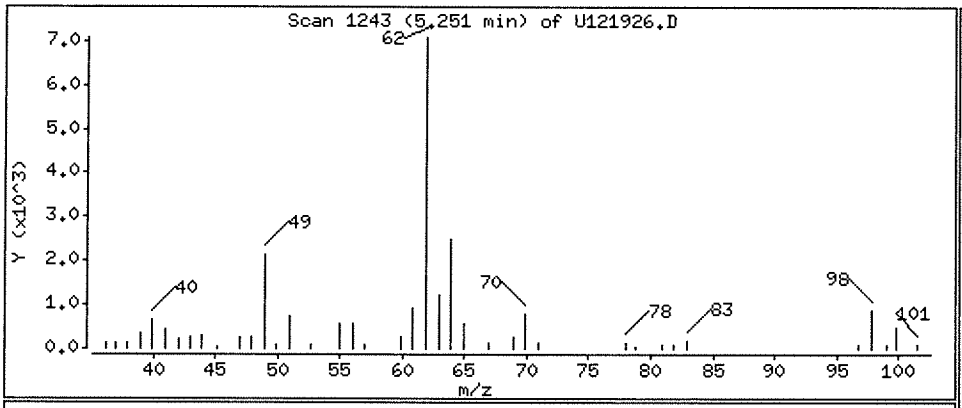
Operator: PC

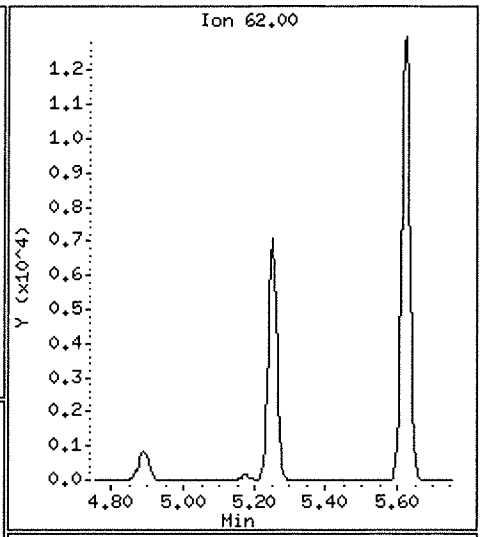
Column phase: DB624

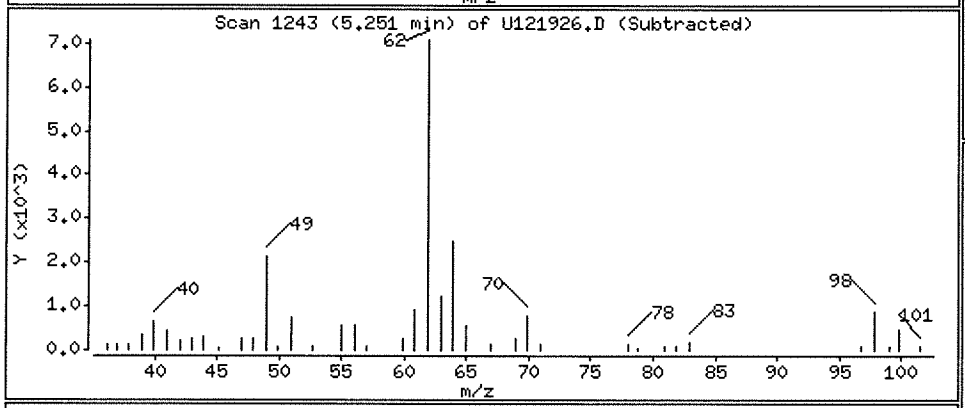
Column diameter: 0.18

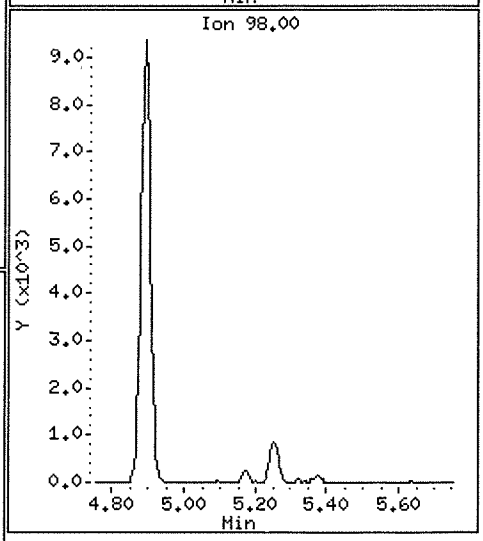
33 1,2-Dichloroethane

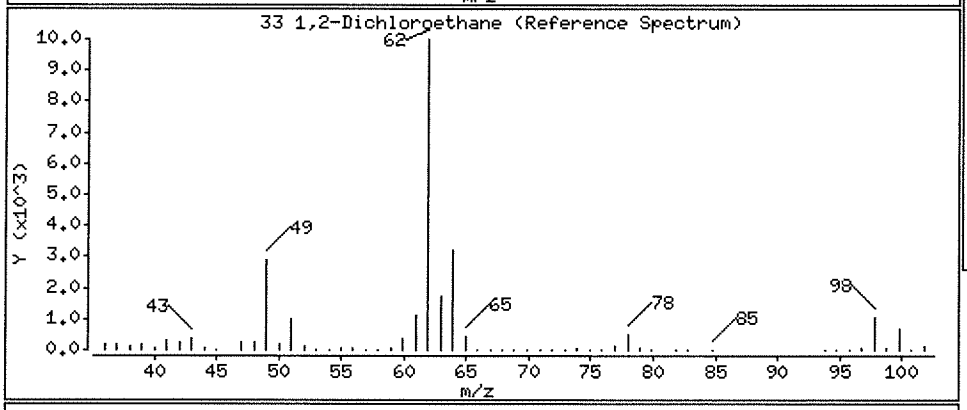
Concentration: 1.91 ug/l

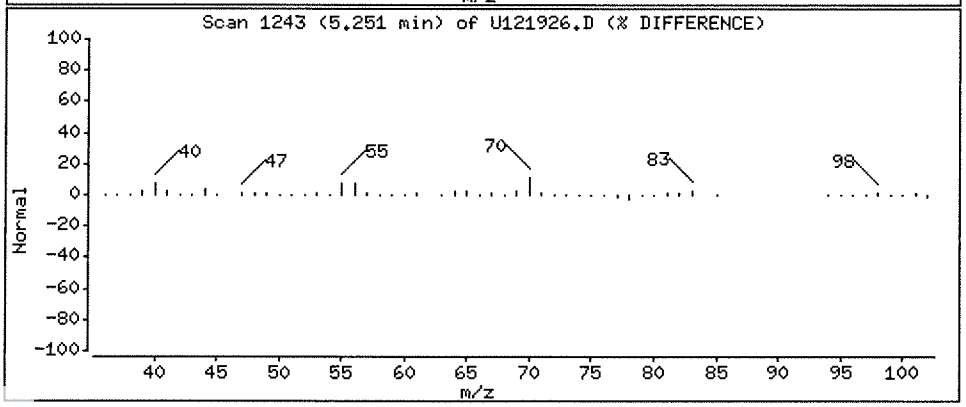












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121927.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121927.D
Lab Smp Id: HS18120569-01DL Client Smp ID: HS18120569-01DL
Inj Date : 19-DEC-2018 23:17
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120569-01;HS18120569-01;;;
Misc Info : 180315V9;WATER;0;25;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 26
Dil Factor: 25.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

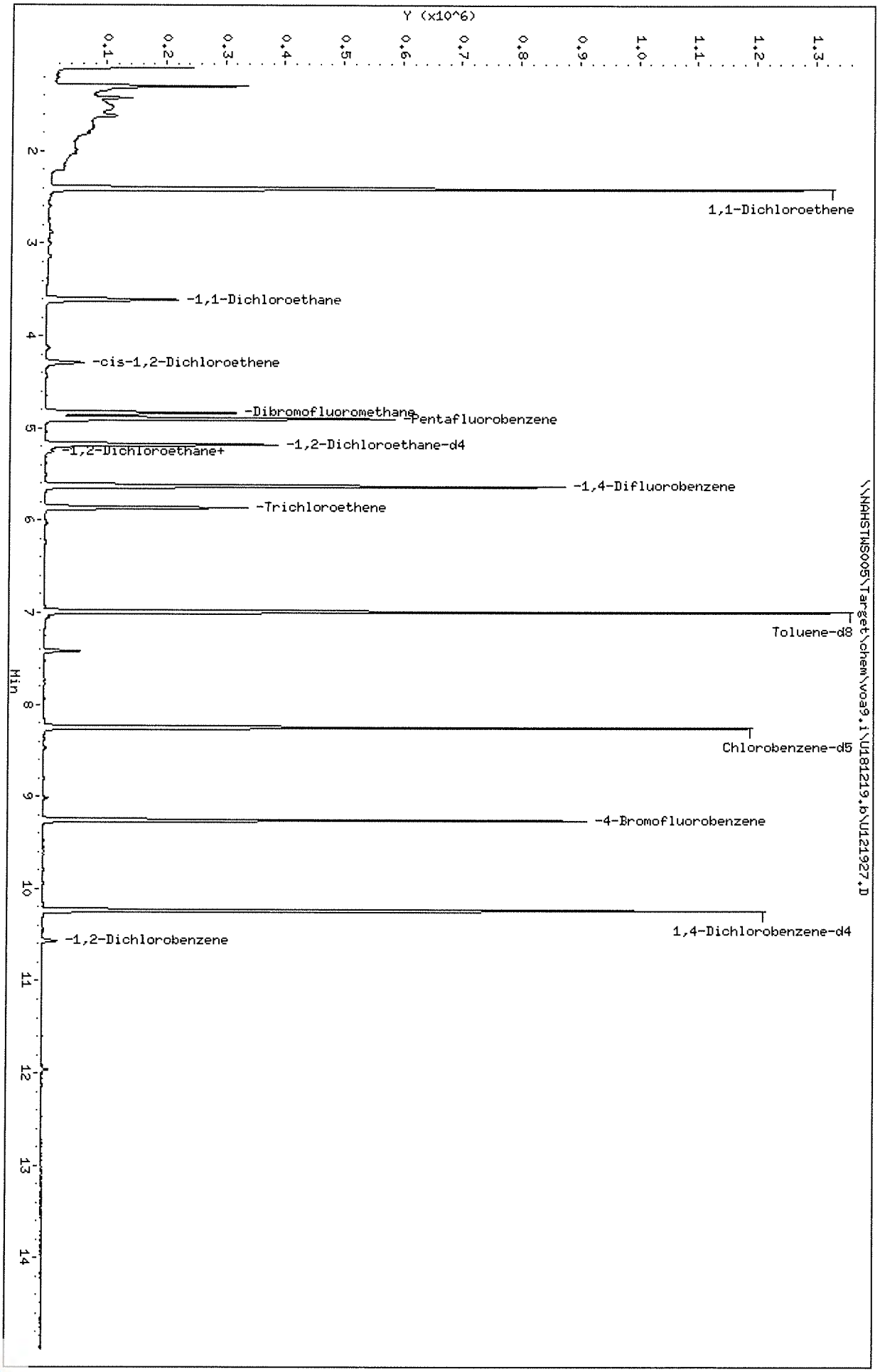
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	25.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.894	(1.000)	353725	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.625	(1.000)	635092	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	582740	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	268421	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.826	(0.987)	186419	45.7421	45.74
$ 35 1,2-Dichloroethane-d4	65	5.179	5.175	(1.057)	248581	46.3619	46.36
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	781359	52.5443	52.54
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	281498	48.8267	48.82
22 1,1-Dichloroethane	63	3.608	3.601	(0.737)	222601	27.4617	686.54
11 1,1-Dichloroethene	96	2.405	2.397	(0.491)	438069	109.717	2742.92
88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	8047	0.93877	23.46(a)
33 1,2-Dichloroethane	62	5.258	5.250	(0.934)	9168	1.37953	34.48(a)
37 Benzene	78	5.220	5.216	(0.927)	11013	0.62733	15.68(a)
27 cis-1,2-Dichloroethene	96	4.290	4.283	(0.876)	28969	5.77967	144.49
38 Trichloroethene	130	5.865	5.861	(1.042)	99195	22.9220	573.04

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



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Date : 19-DEC-2018 23:17
Client ID: HS18120569-01DL
Sample Info: HS18120569-01;HS18120569-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121927.D

Date : 19-DEC-2018 23:17

Client ID: HS18120569-01DL

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

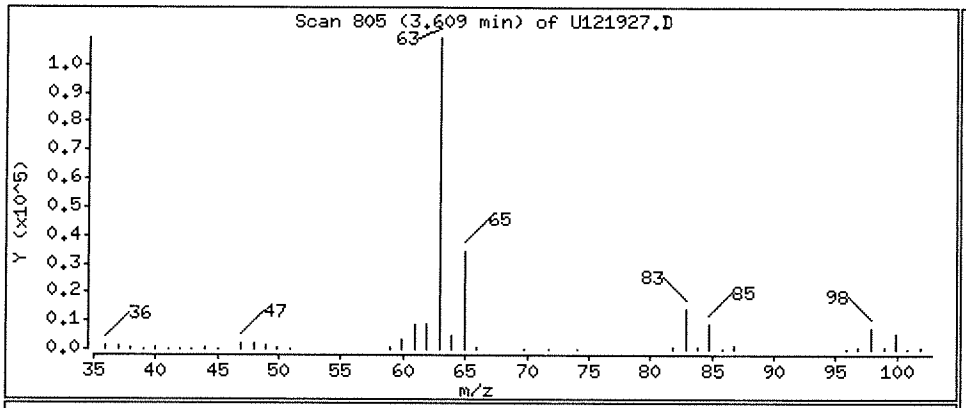
Operator: PC

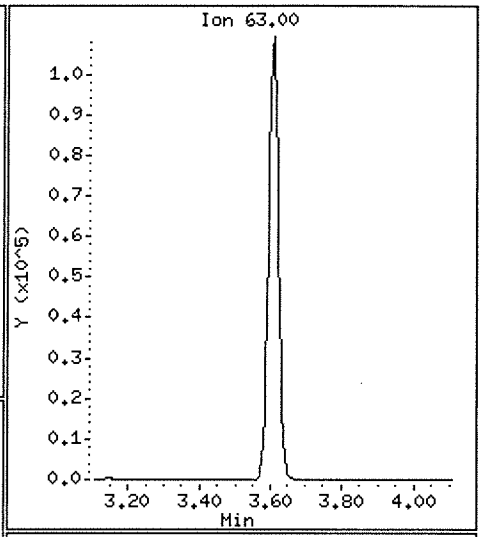
Column phase: DB624

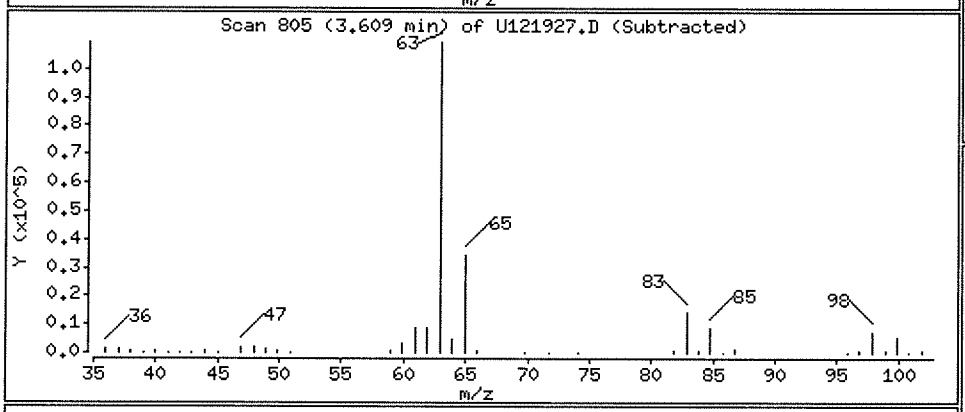
Column diameter: 0.18

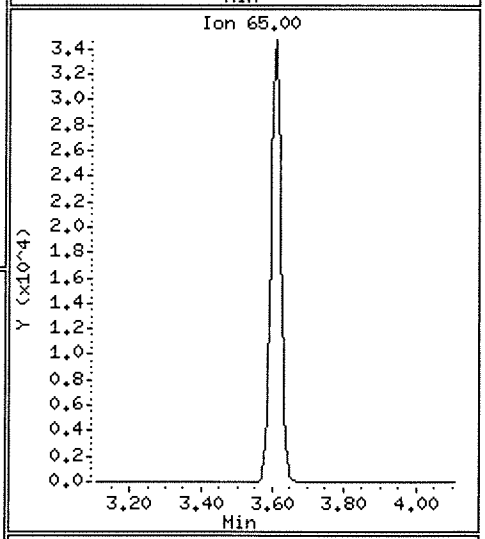
22 1,1-Dichloroethane

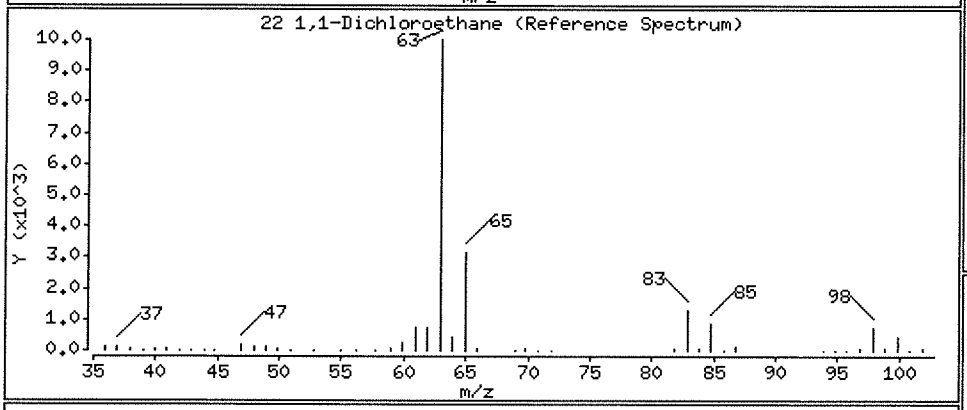
Concentration: 686.54 ug/l

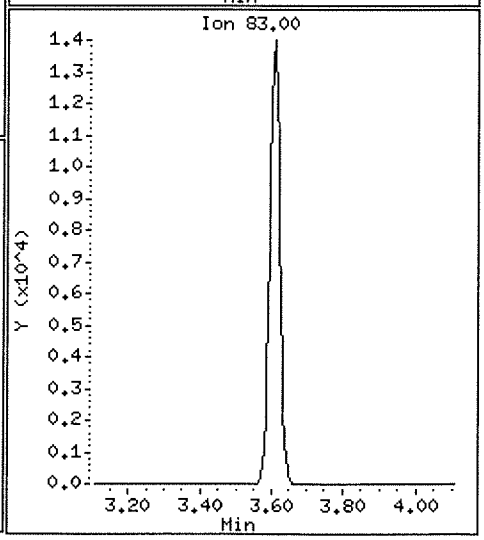


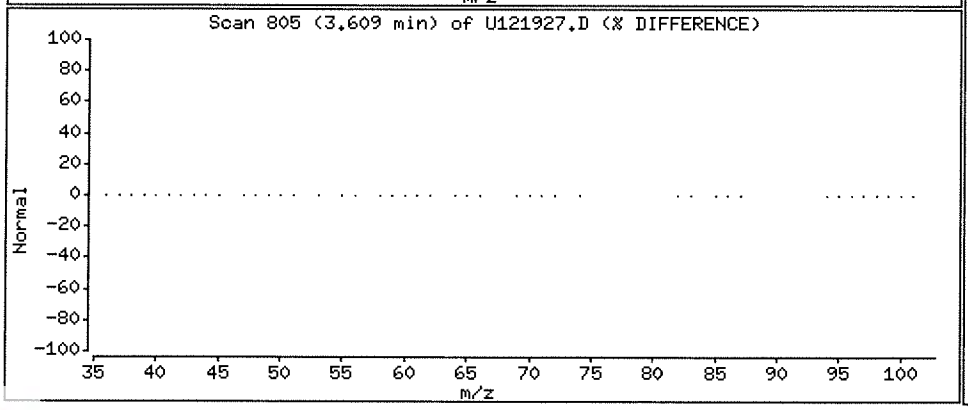












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Date : 19-DEC-2018 23:17

Client ID: HS18120569-01DL

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

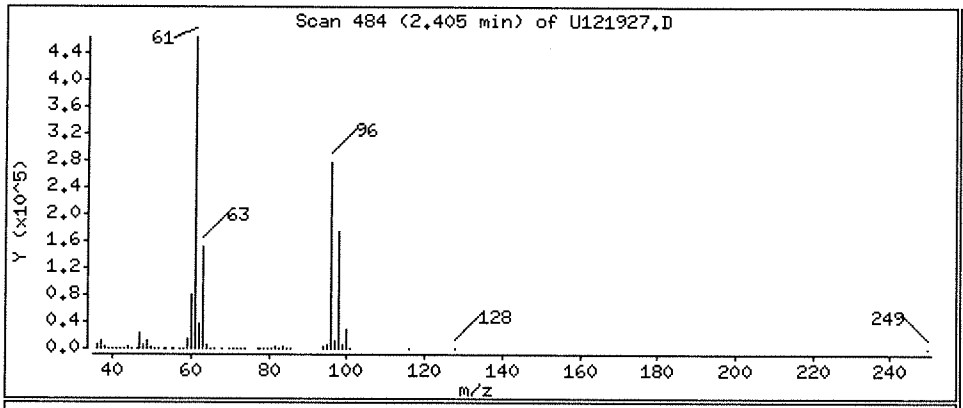
Operator: PC

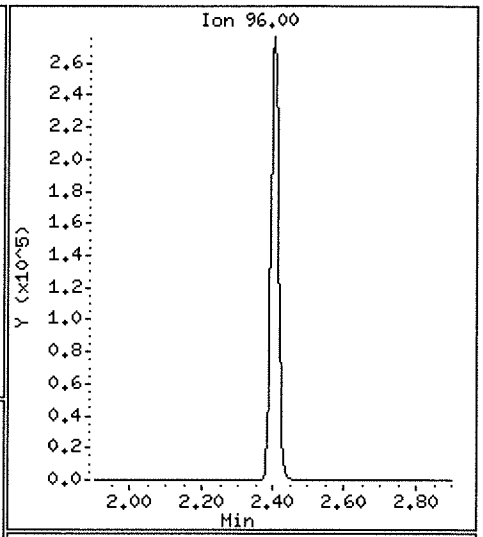
Column phase: DB624

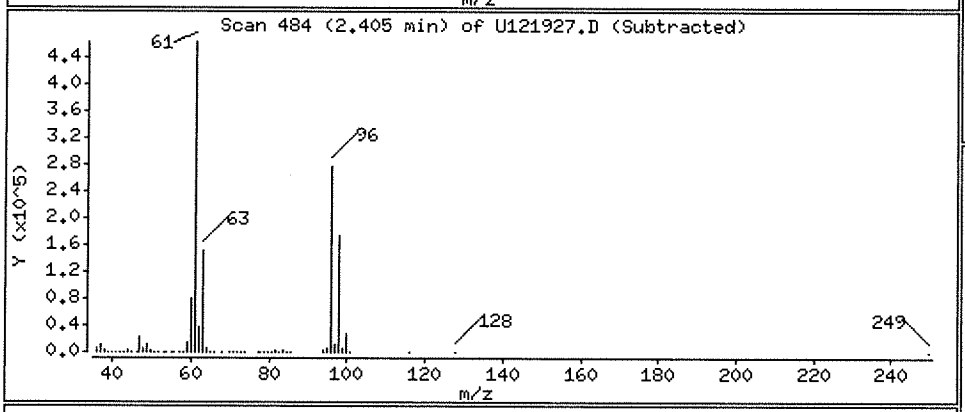
Column diameter: 0.18

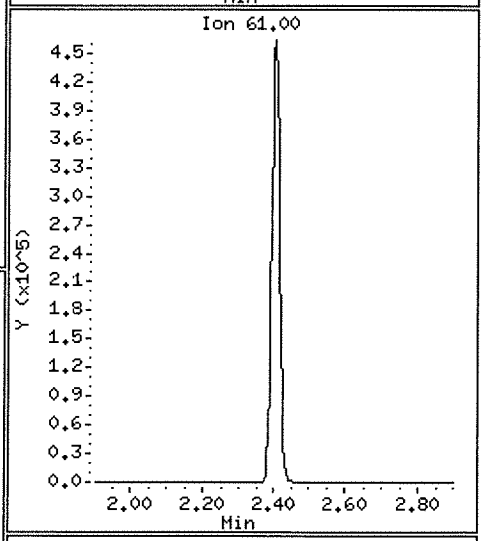
11 1,1-Dichloroethene

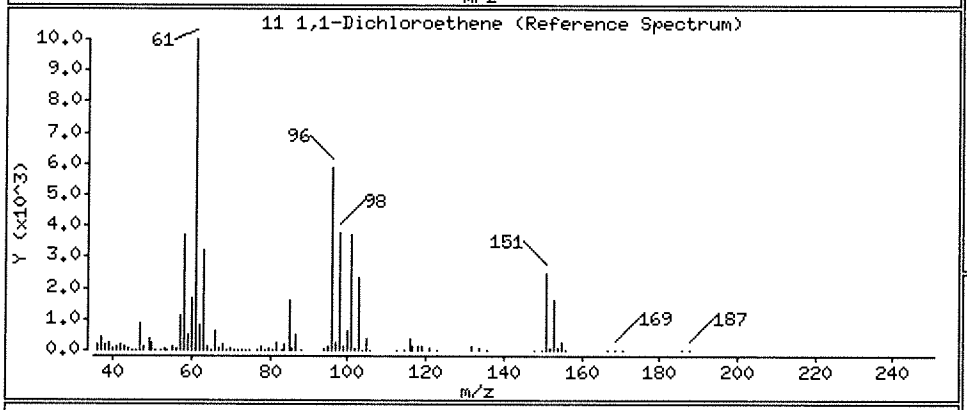
Concentration: 2742.92 ug/l

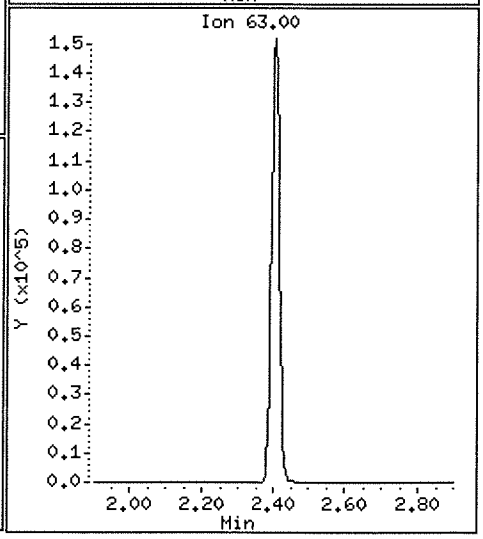


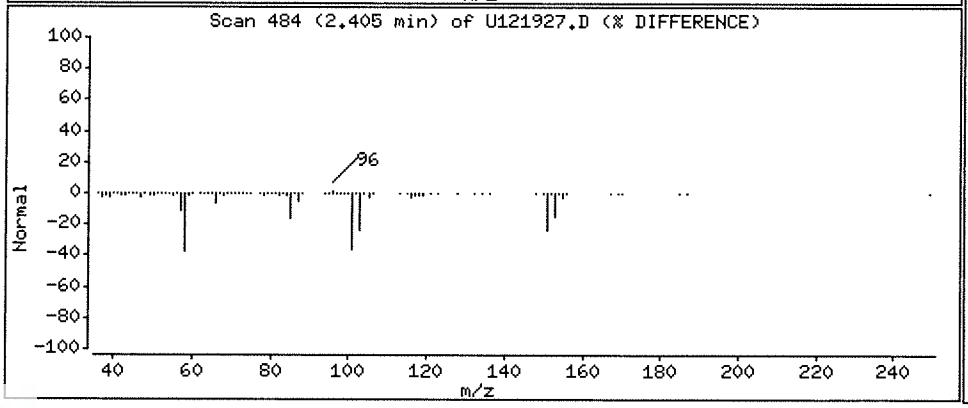












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Date : 19-DEC-2018 23:17

Client ID: HS18120569-01DL

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

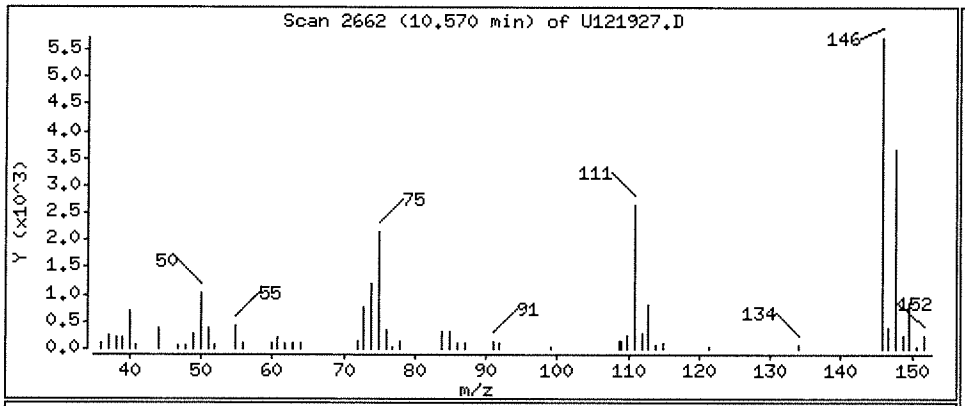
Operator: PC

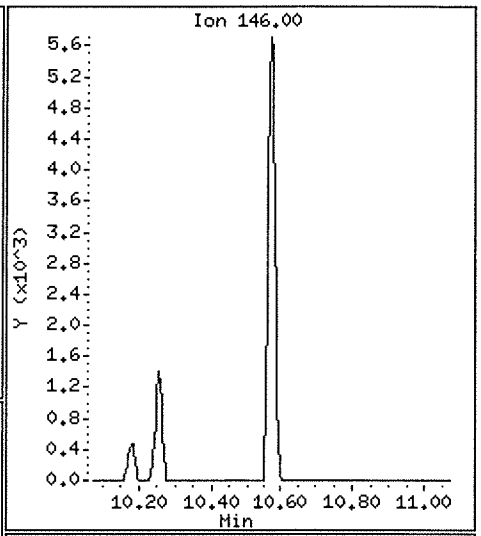
Column phase: DB624

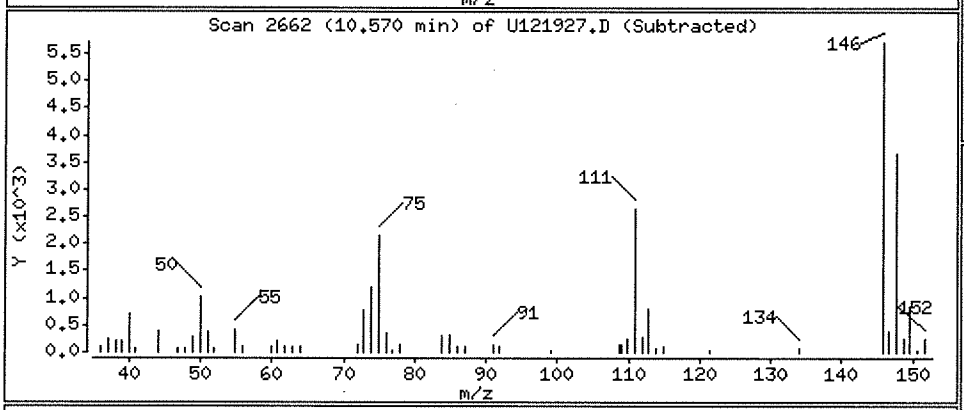
Column diameter: 0.18

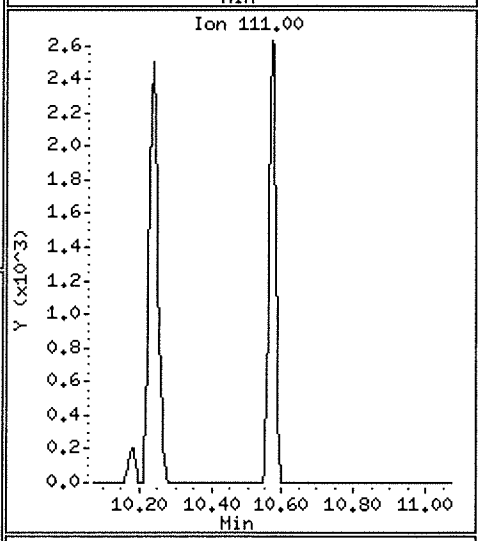
88 1,2-Dichlorobenzene

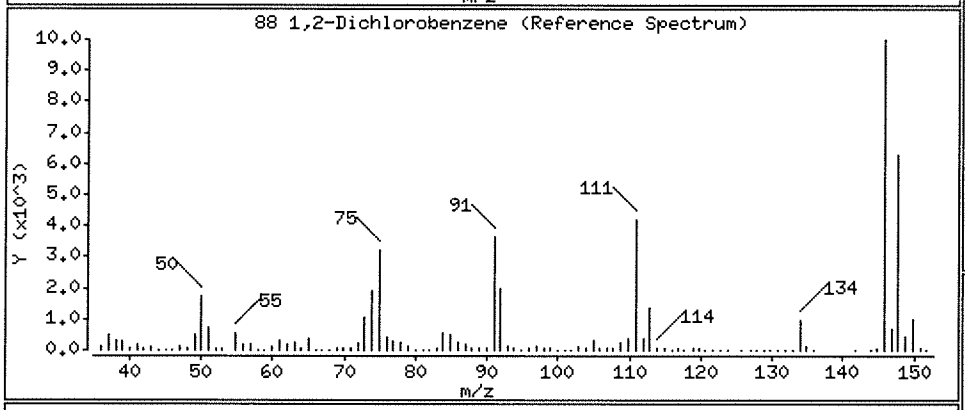
Concentration: 23.46 ug/l

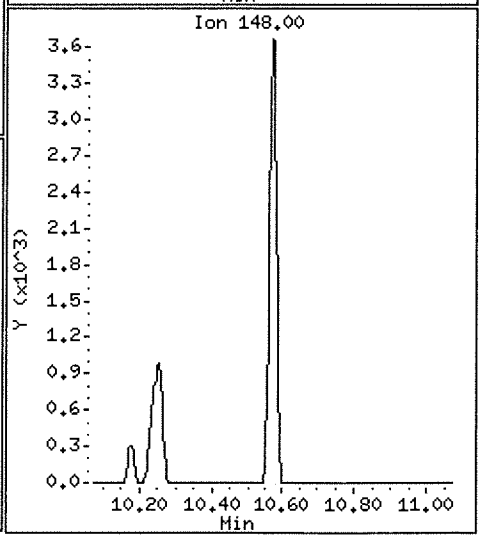


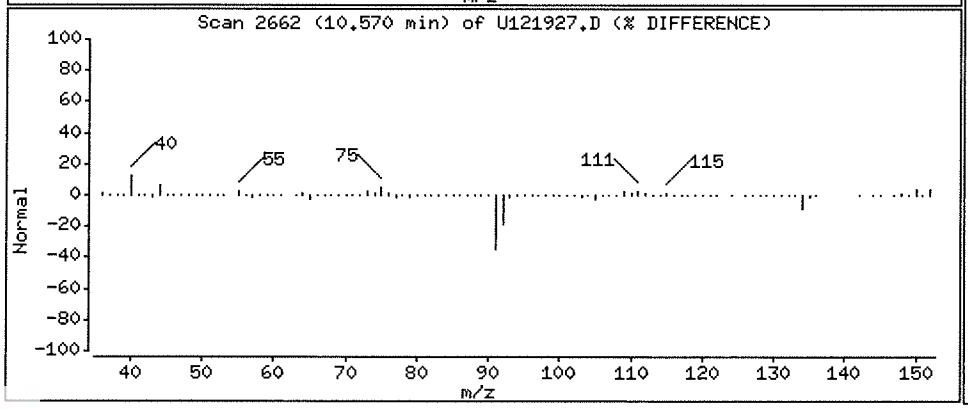












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Date : 19-DEC-2018 23:17

Client ID: HS18120569-01DL

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

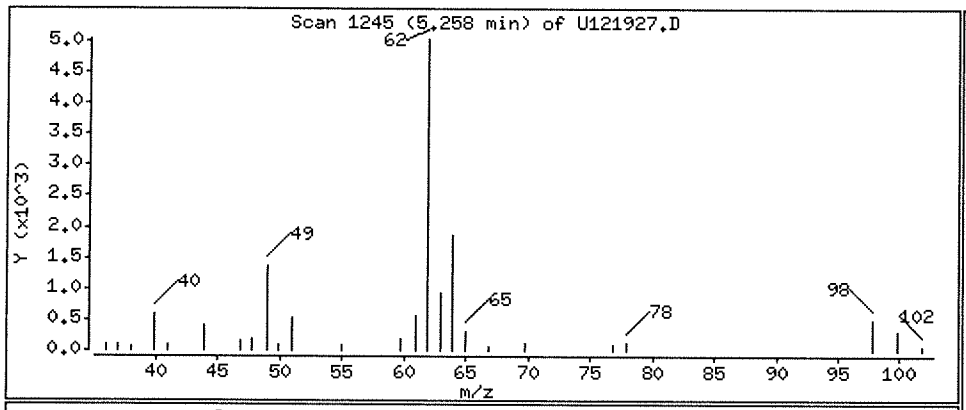
Operator: PC

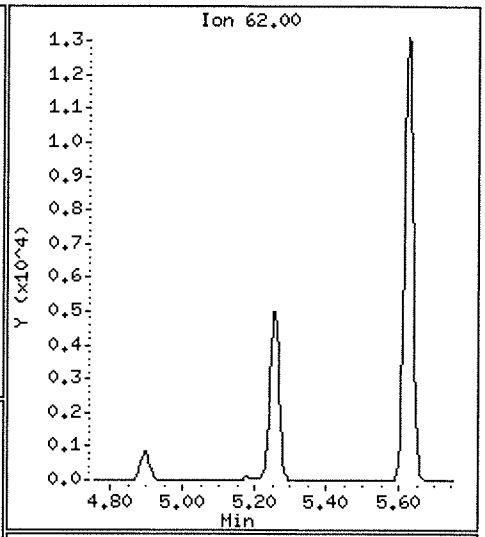
Column phase: DB624

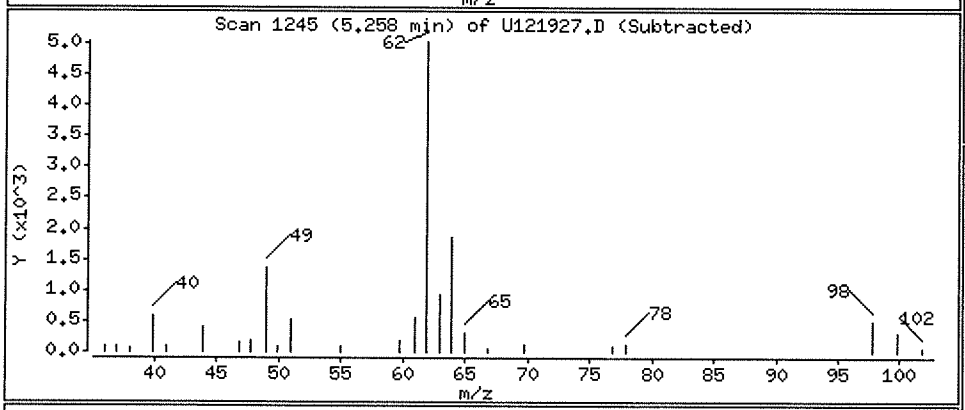
Column diameter: 0.18

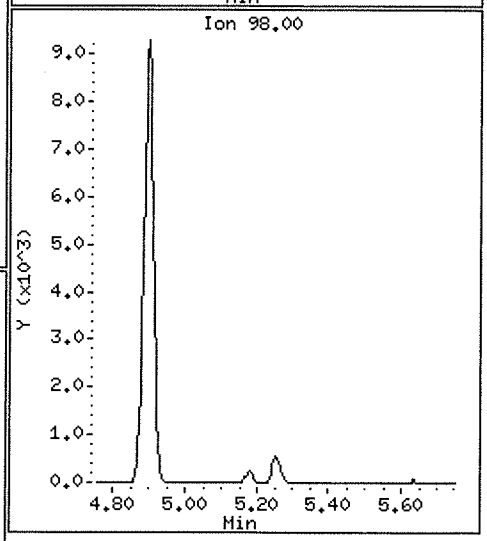
33 1,2-Dichloroethane

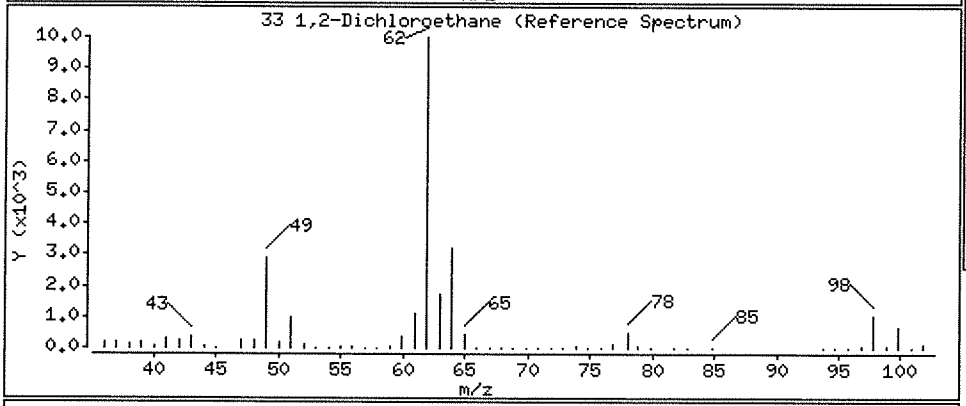
Concentration: 34.48 ug/l

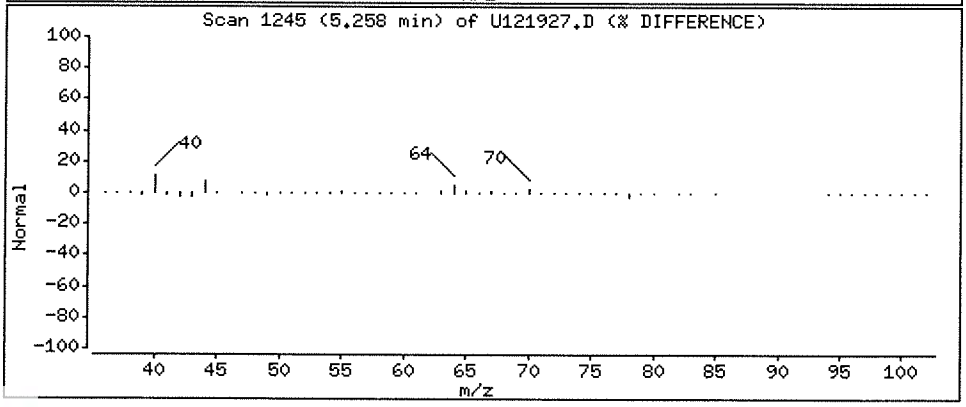












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121927.D Page 7

Date : 19-DEC-2018 23:17

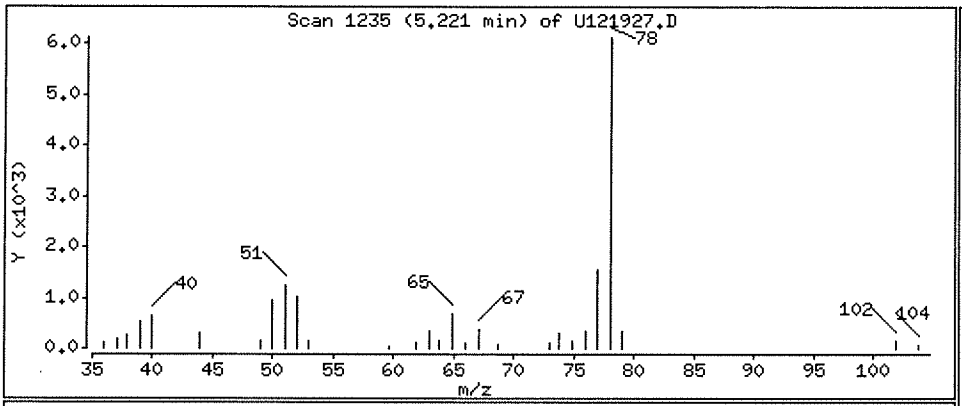
Client ID: HS18120569-01DL Instrument: VOA9.i

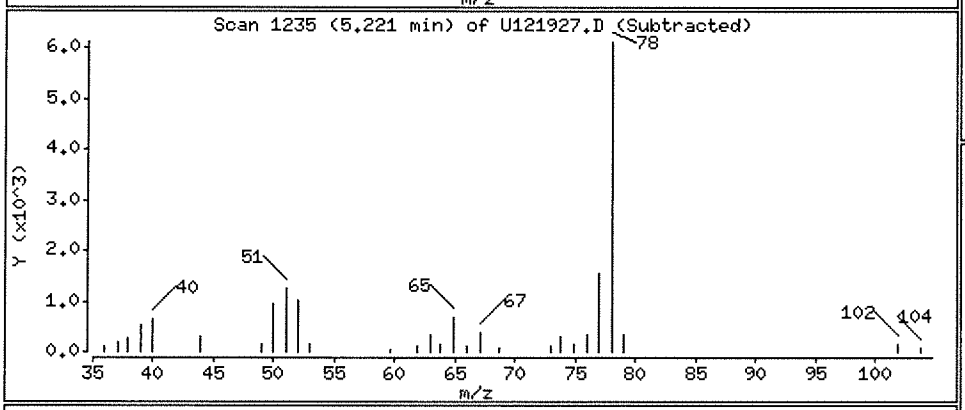
Sample Info: HS18120569-01;HS18120569-01;;;

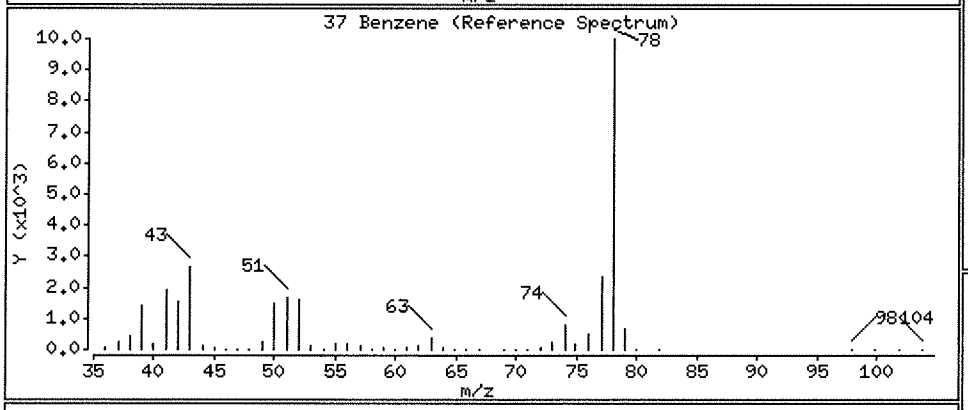
Purge Volume: 5.0 Operator: PC

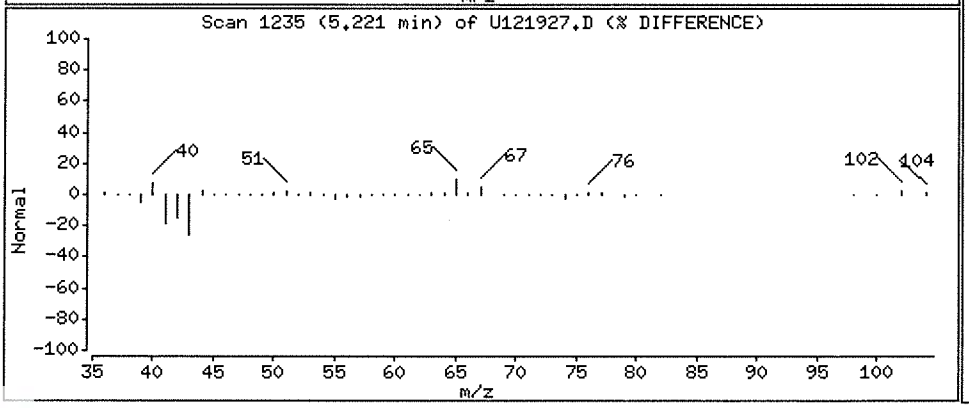
Column phase: DB624 Column diameter: 0.18

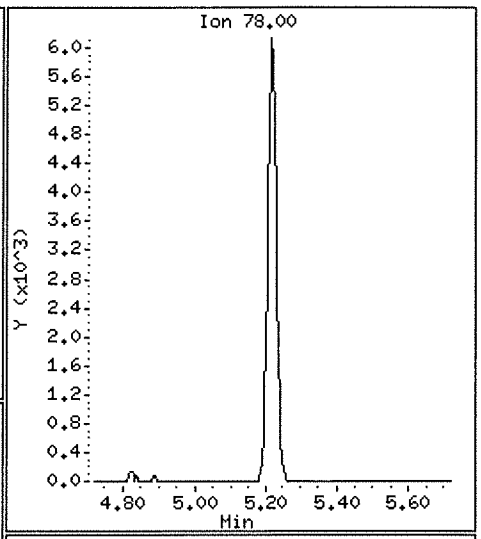
37 Benzene Concentration: 15.68 ug/l

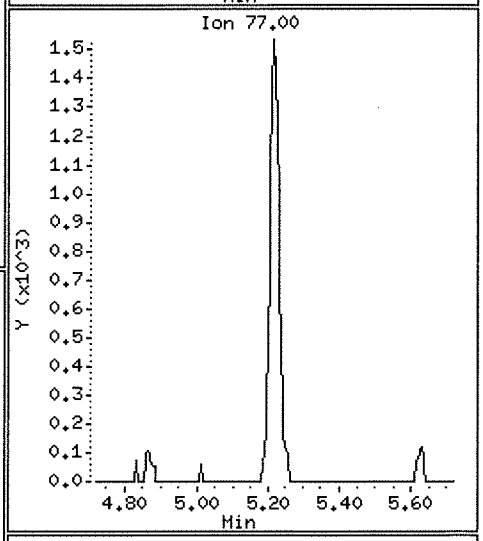


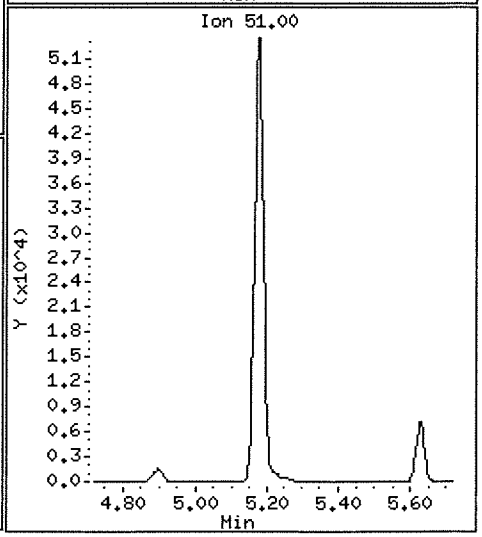












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Date : 19-DEC-2018 23:17

Client ID: HS18120569-01DL

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

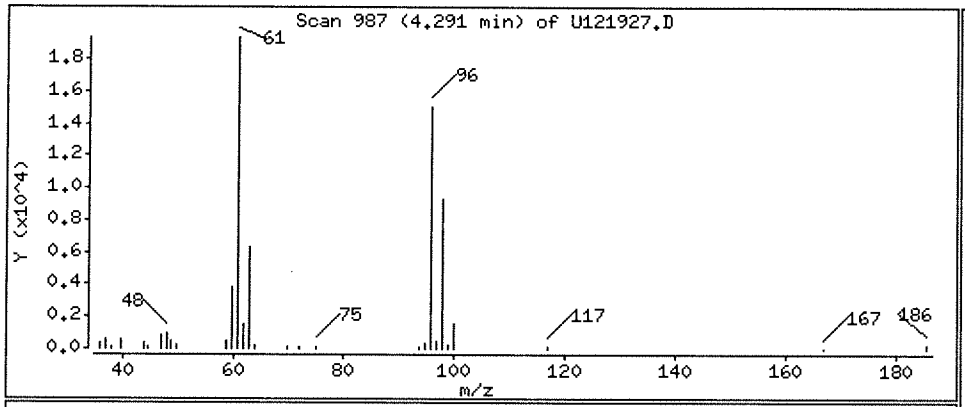
Operator: PC

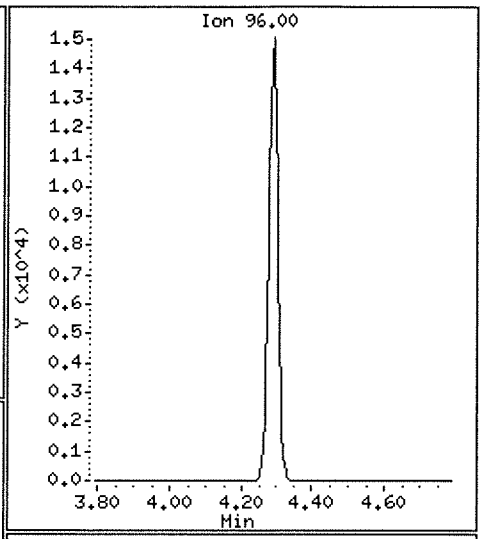
Column phase: DB624

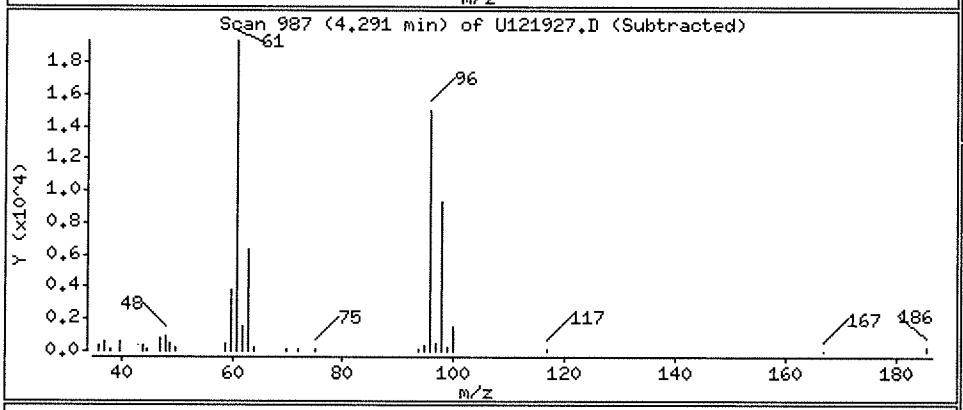
Column diameter: 0.18

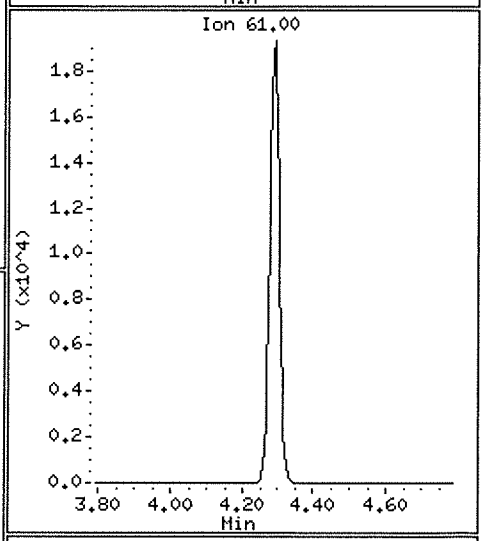
27 cis-1,2-Dichloroethene

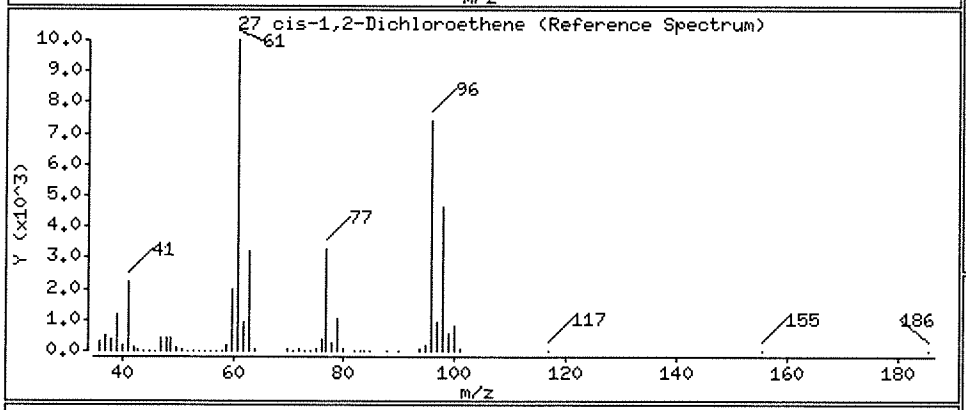
Concentration: 144.49 ug/l

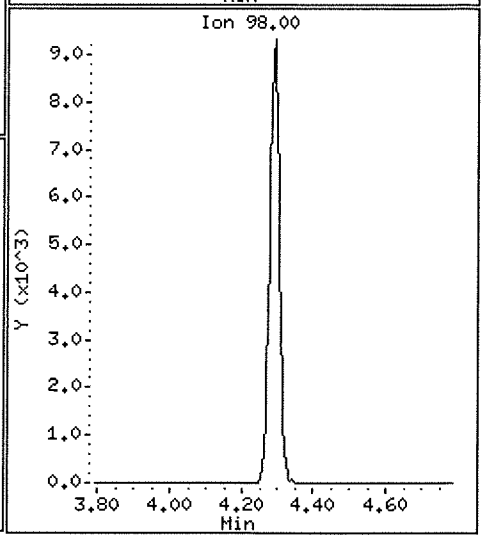


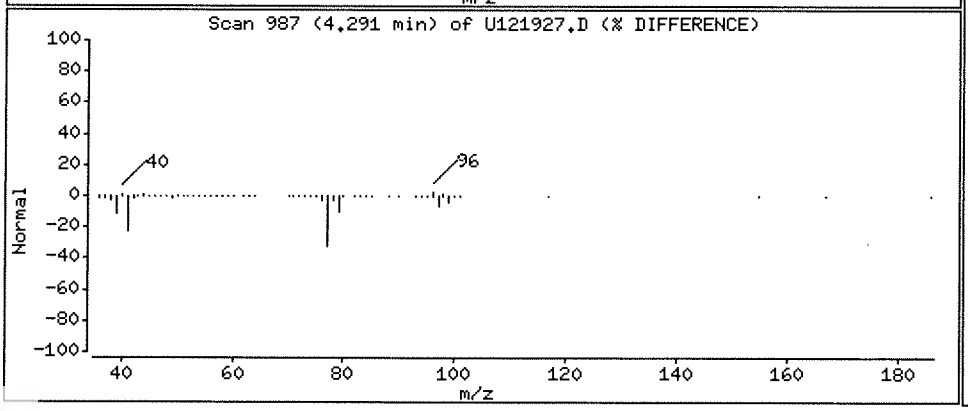












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121927.D

Date : 19-DEC-2018 23:17

Client ID: HS18120569-01DL

Instrument: VOA9.i

Sample Info: HS18120569-01;HS18120569-01;;;

Purge Volume: 5.0

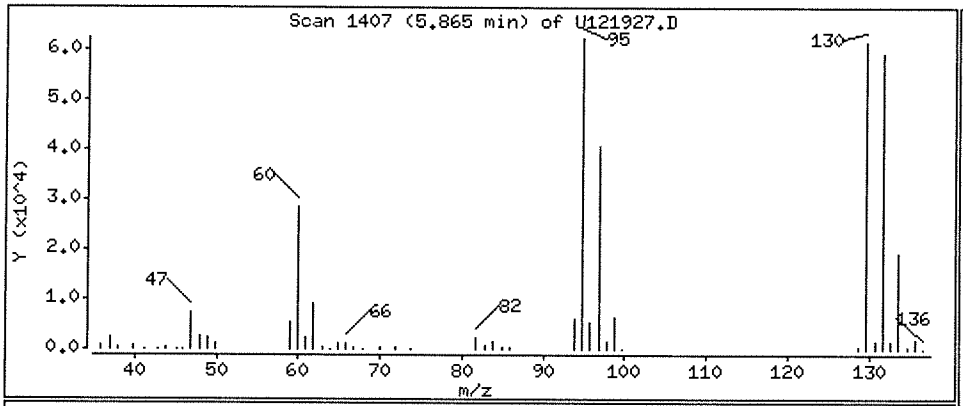
Operator: PC

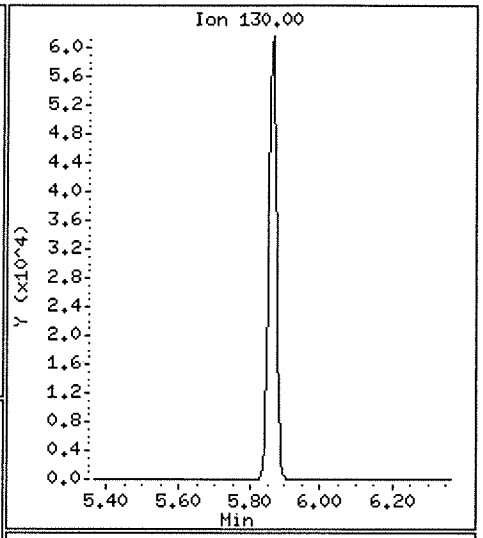
Column phase: DB624

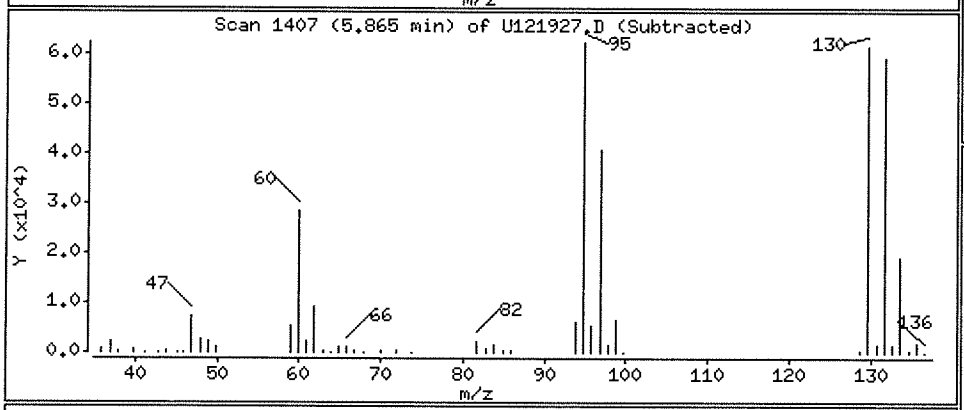
Column diameter: 0.18

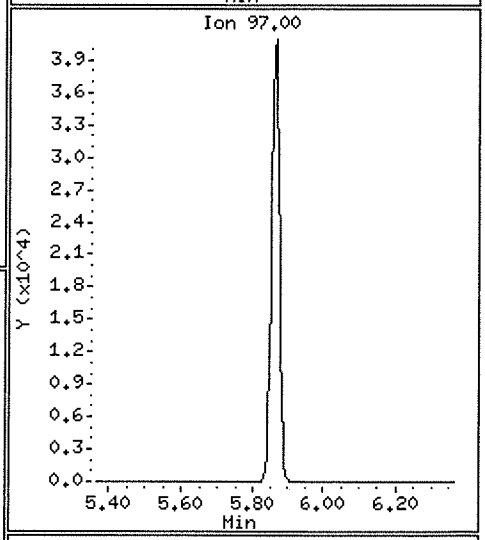
38 Trichloroethene

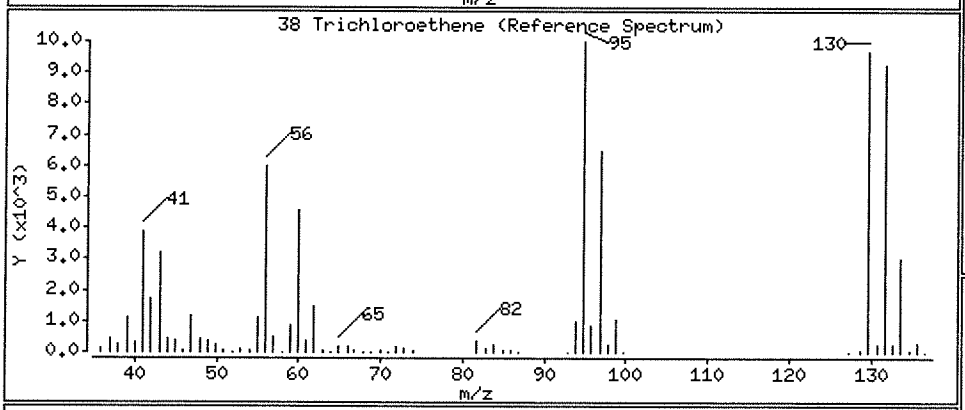
Concentration: 573.04 ug/l

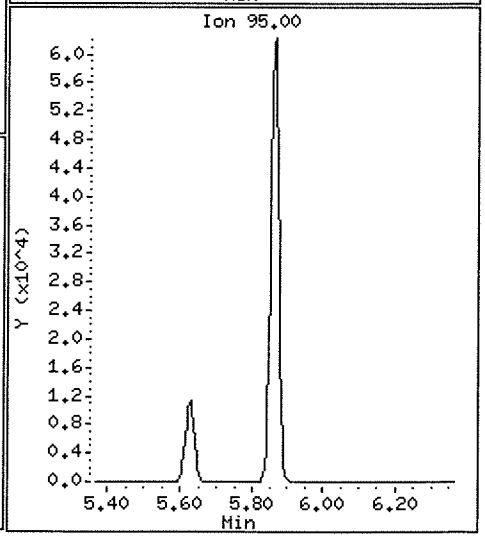


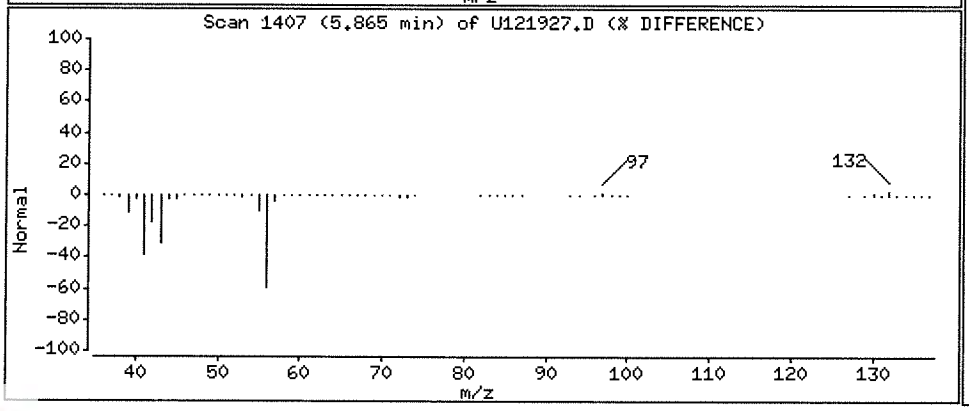












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D
Lab Smp Id: HS18120569-01 Client Smp ID: HS18120569-01
Inj Date : 19-DEC-2018 23:42
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120569-01
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 27
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

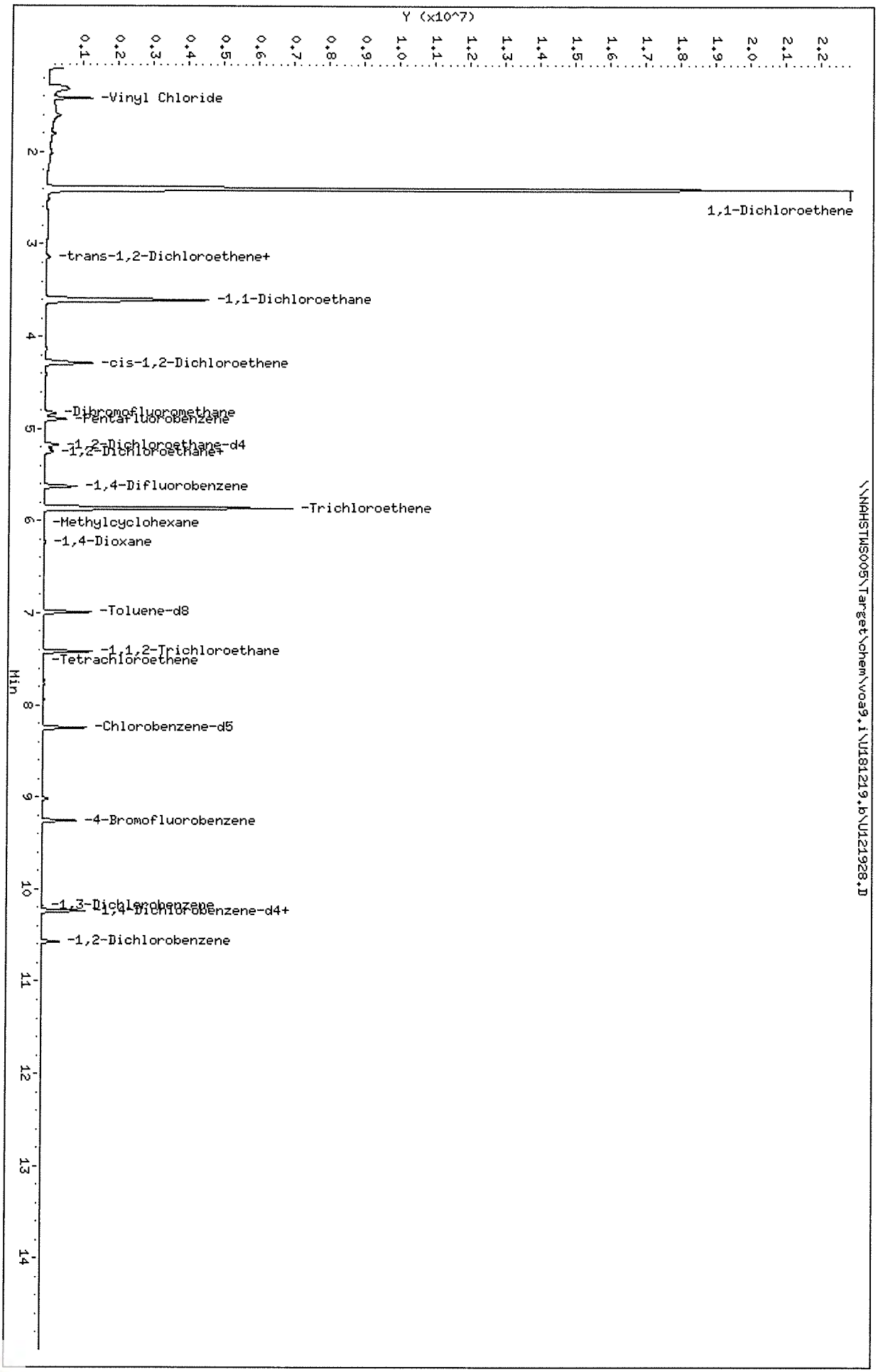
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	357372	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	637398	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	582649	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	274436	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	187362	45.4978	45.49
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	248583	45.8711	45.87
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	777463	52.2822	52.28
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	285685	49.5767	49.57
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	326851	88.2380	88.23
22 1,1-Dichloroethane	63	3.604	3.601	(0.737)	4647777	567.533	567.53(A)
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	8049133	1995.38	1995.38(A)
88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	177029	20.1996	20.19
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	174561	26.1716	26.17
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	8590	0.99415	0.99(a)
84 1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	29845	3.49171	3.49(a)
37 Benzene	78	5.216	5.216	(0.927)	158516	8.99686	8.99
27 cis-1,2-Dichloroethene	96	4.287	4.283	(0.876)	621619	122.755	122.75
56 Tetrachloroethene	164	7.526	7.522	(0.912)	4082	1.33742	1.33(a)
20 trans-1,2-Dichloroethene	96	3.140	3.140	(0.642)	26791	6.05996	6.05
38 Trichloroethene	130	5.861	5.861	(1.042)	2057831	473.803	473.80(A)
5 Vinyl Chloride	62	1.419	1.415	(0.290)	670558	114.439	114.43

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount
exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9,i\U181219,b\U121928,D
Date : 19-DEC-2018 23:42
Client ID: HS18120569-01
Sample Info: HS18120569-01
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

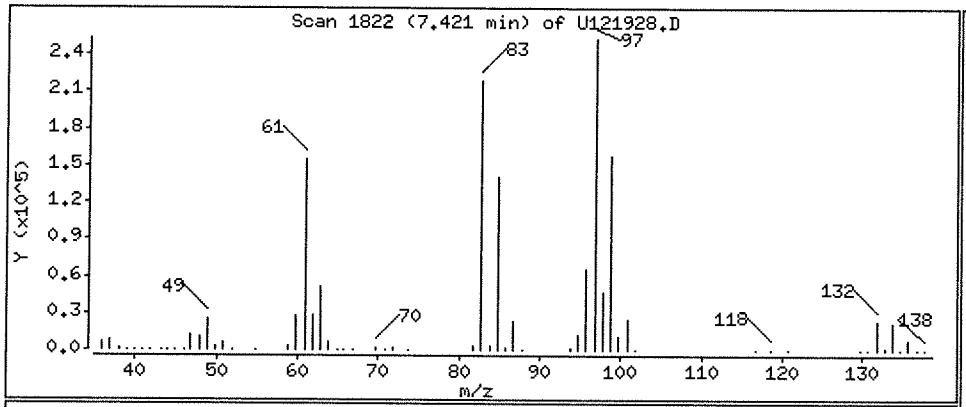
Operator: PC

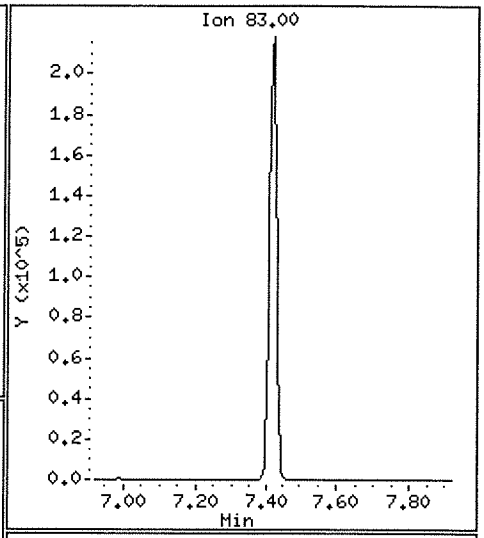
Column phase: DB624

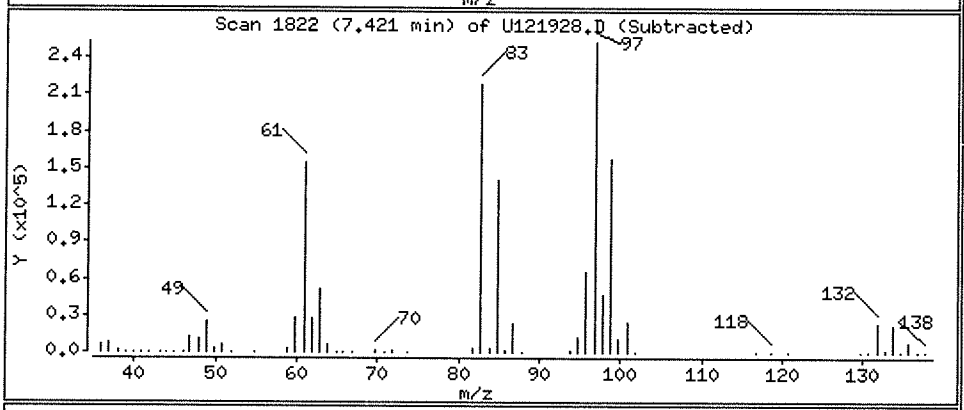
Column diameter: 0.18

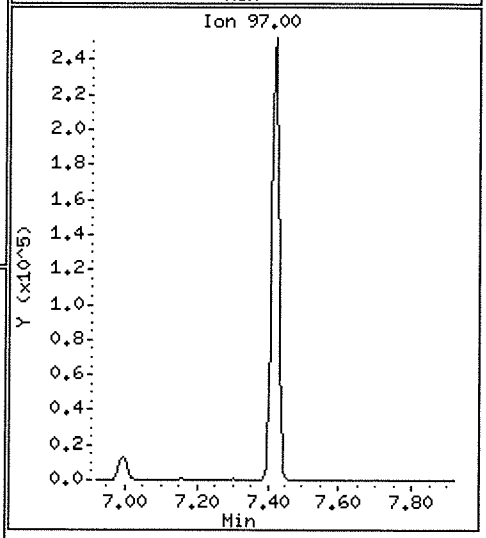
53 1,1,2-Trichloroethane

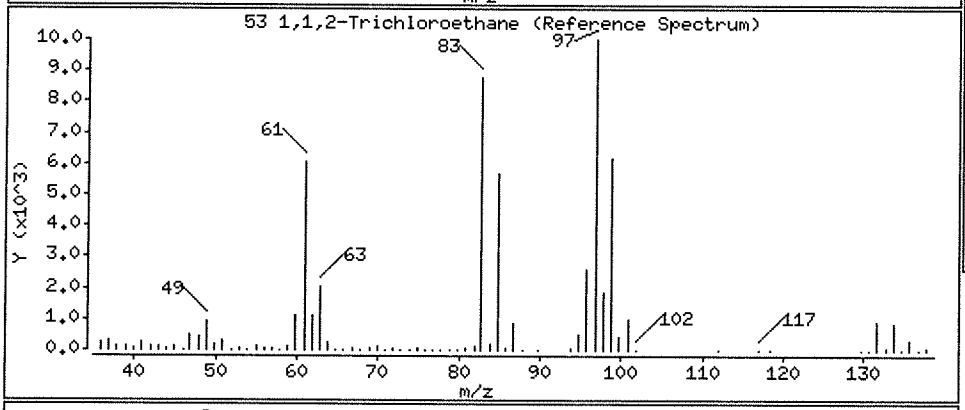
Concentration: 88.23 ug/l

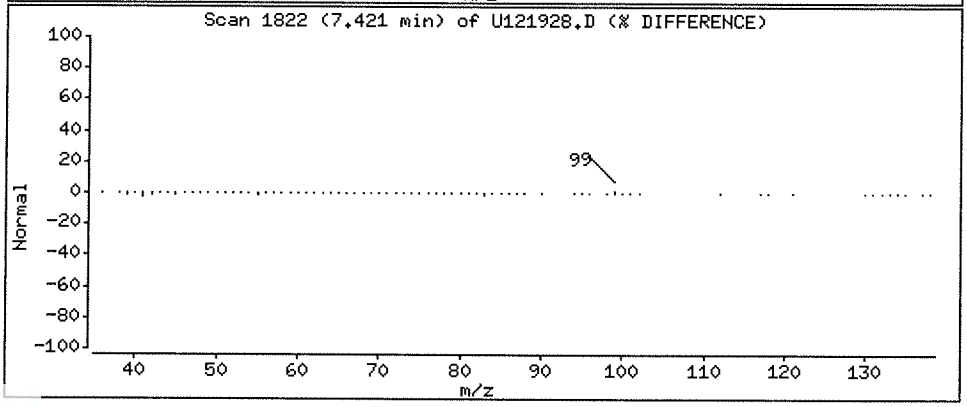












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

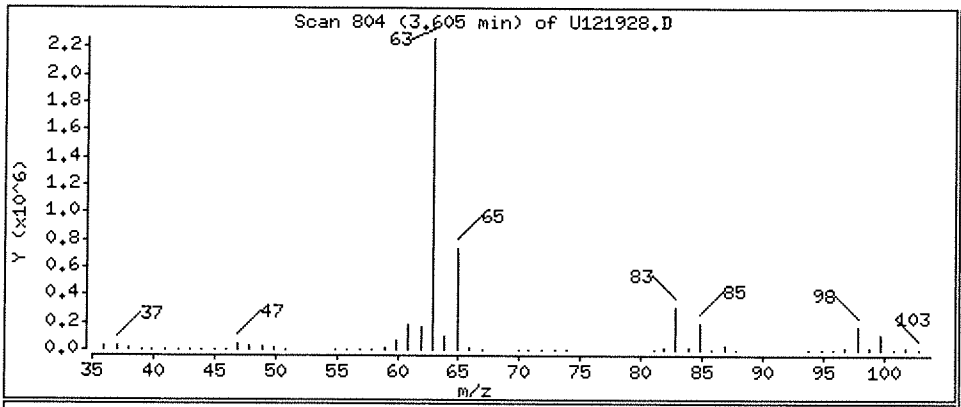
Operator: PC

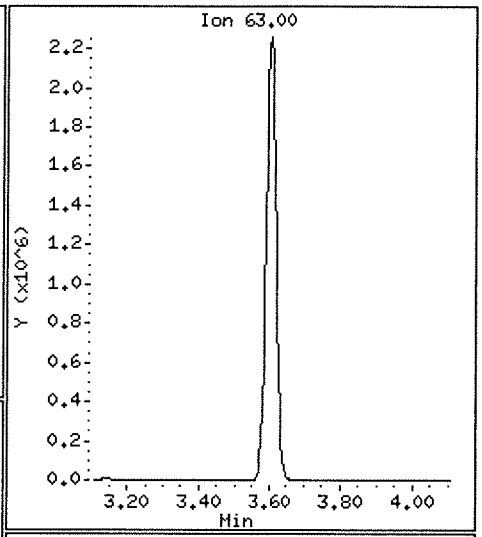
Column phase: DB624

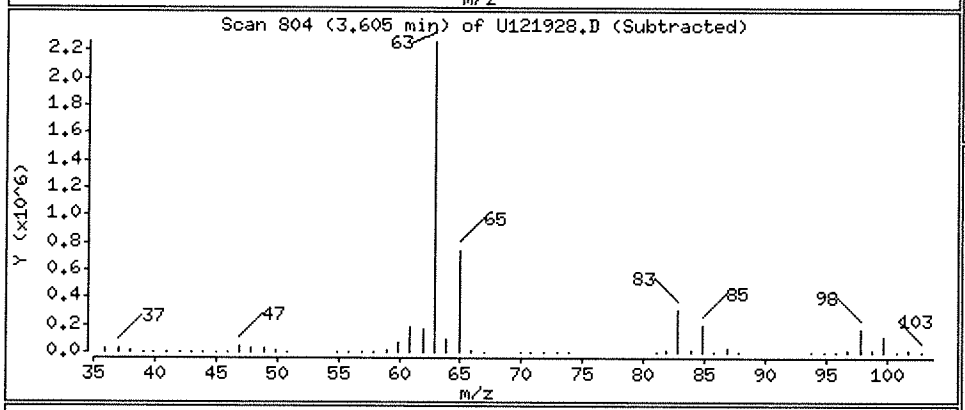
Column diameter: 0.18

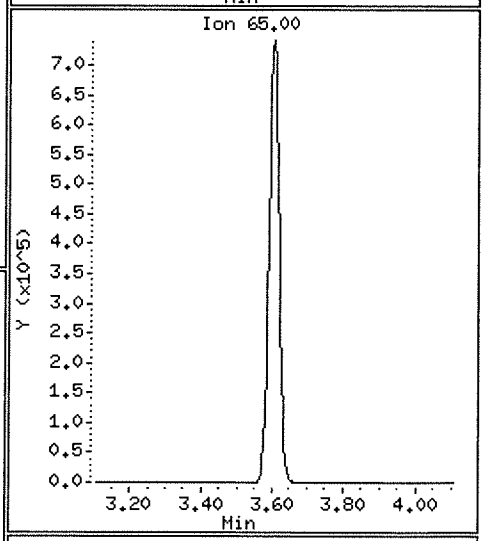
22 1,1-Dichloroethane

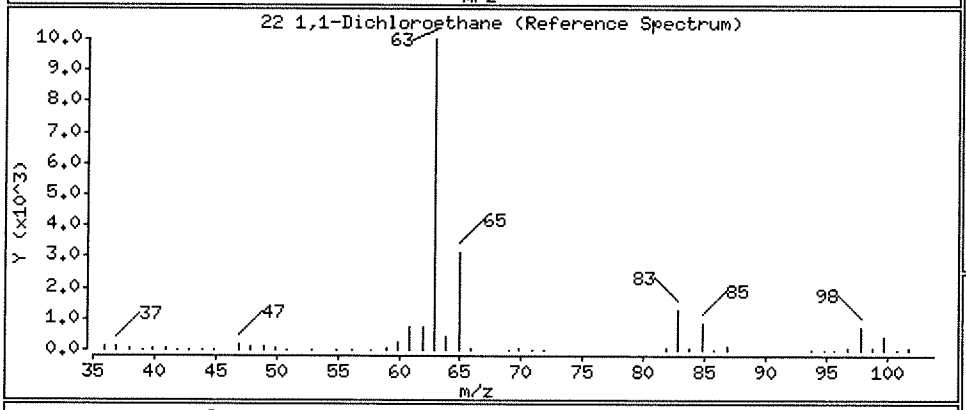
Concentration: 567.53 ug/l

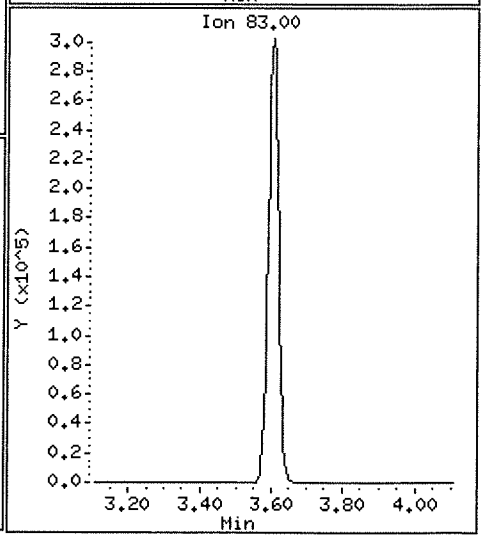


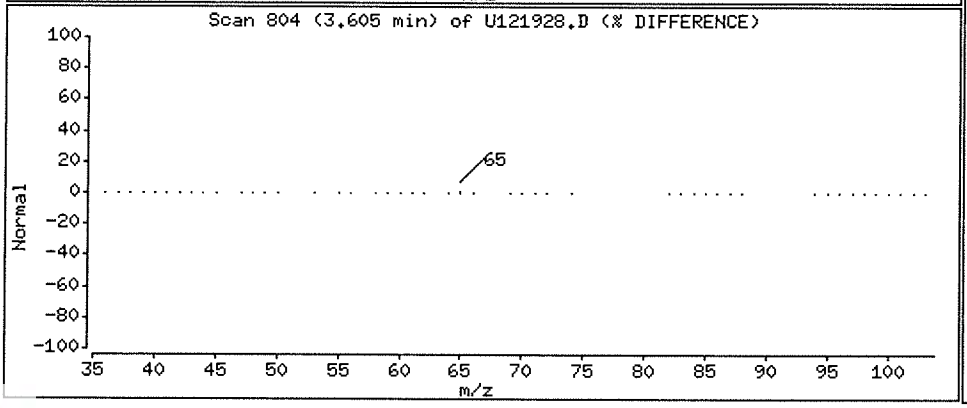












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

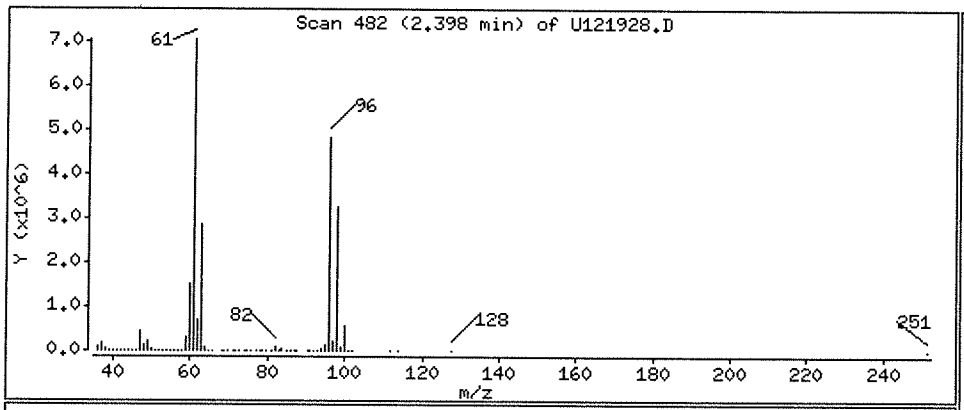
Operator: PC

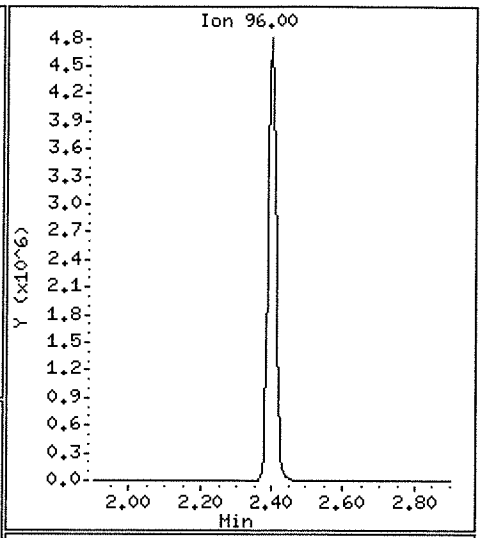
Column phase: DB624

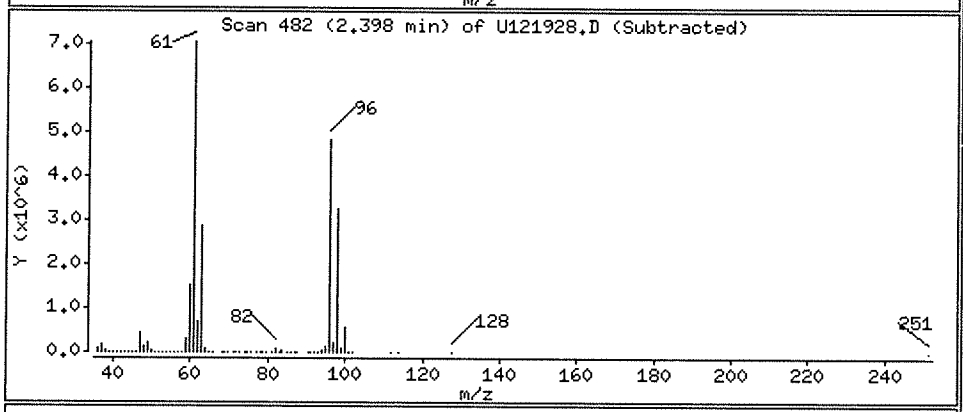
Column diameter: 0.18

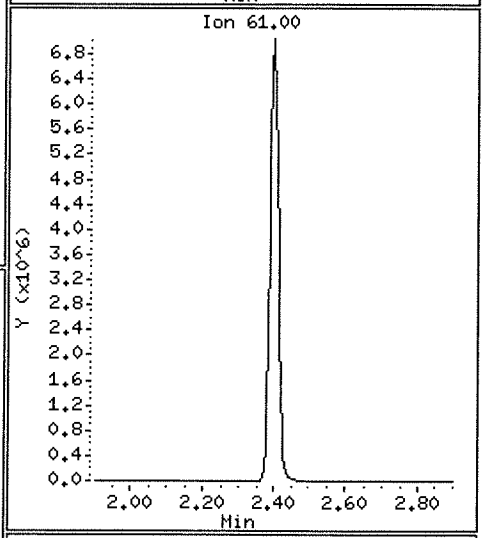
11 1,1-Dichloroethene

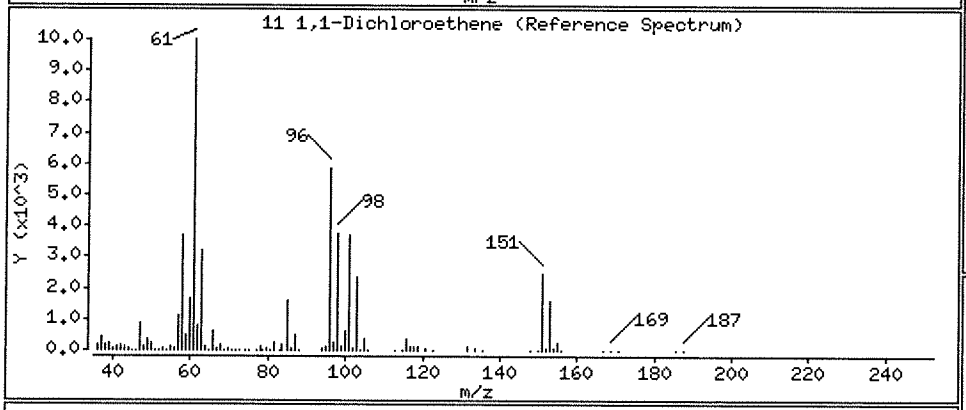
Concentration: 1995.38 ug/l

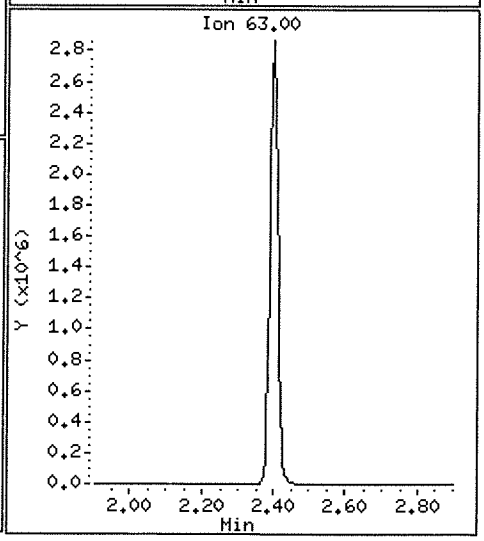


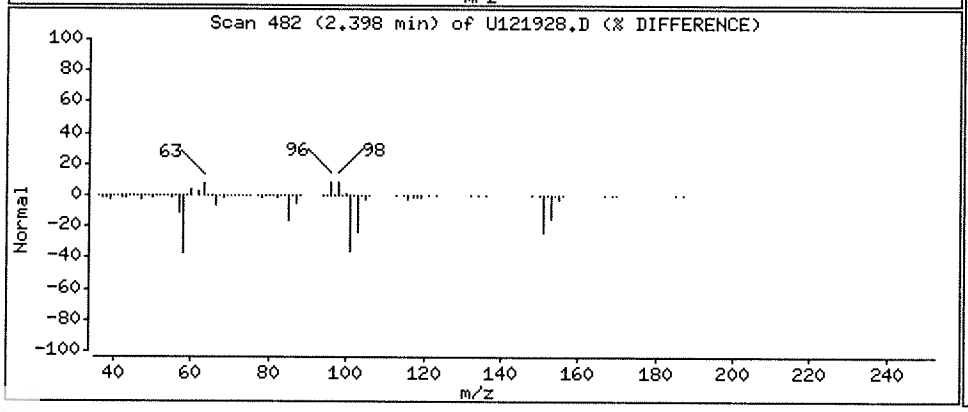












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

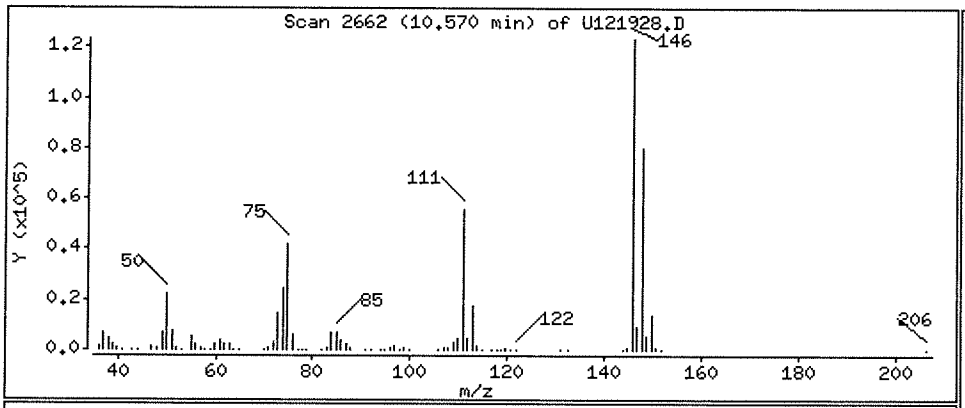
Operator: PC

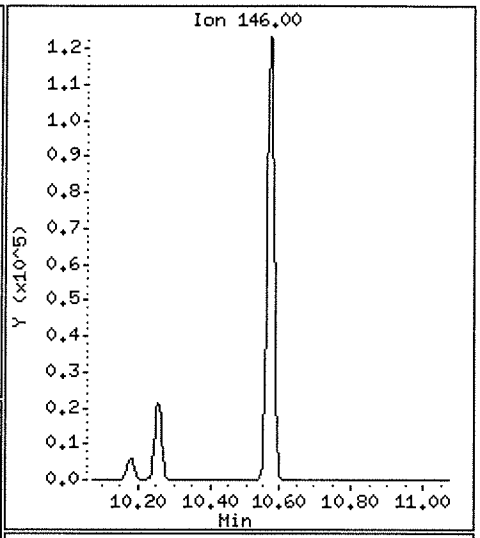
Column phase: DB624

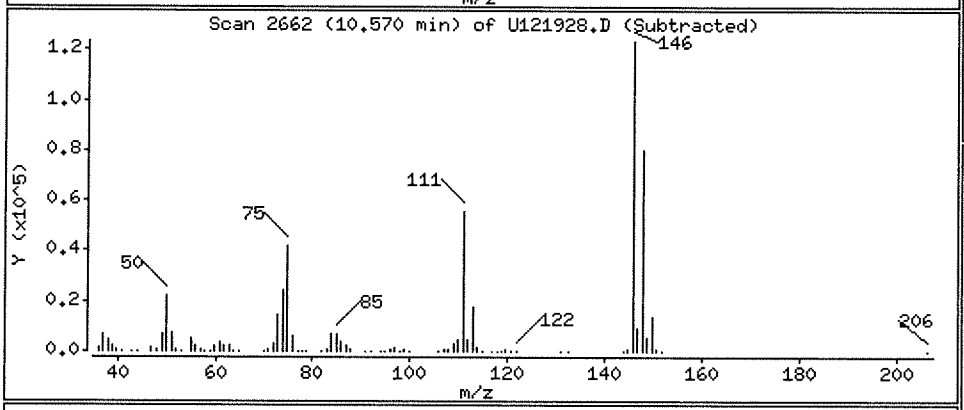
Column diameter: 0.18

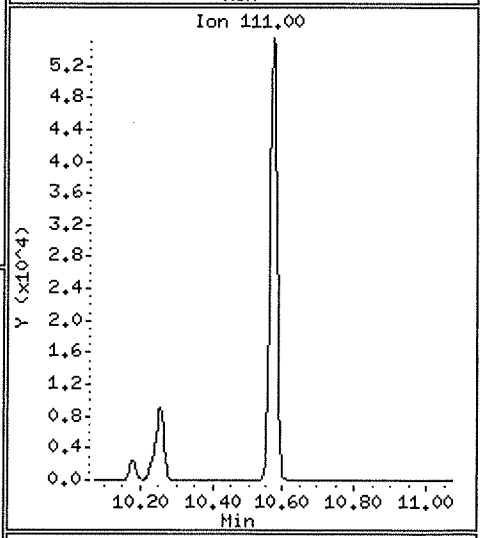
88 1,2-Dichlorobenzene

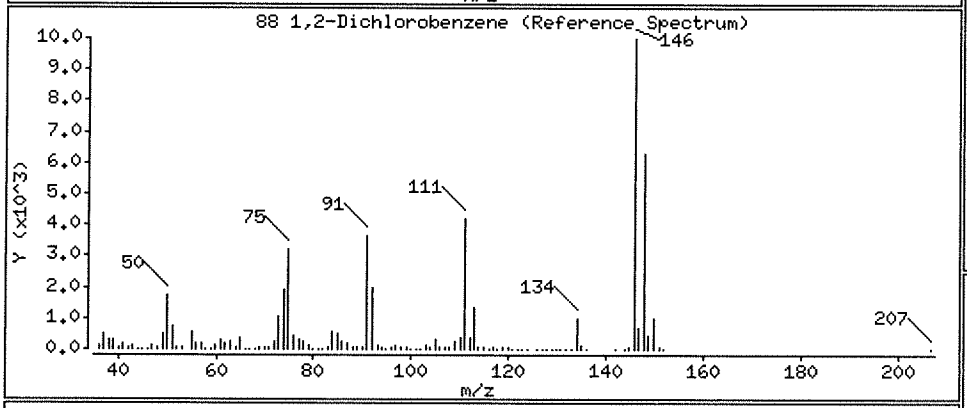
Concentration: 20.19 ug/l

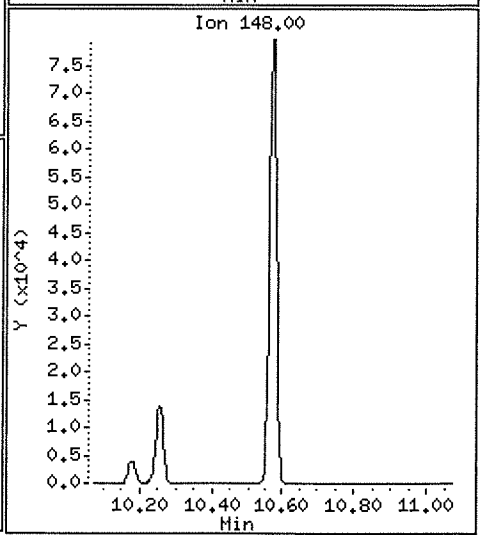


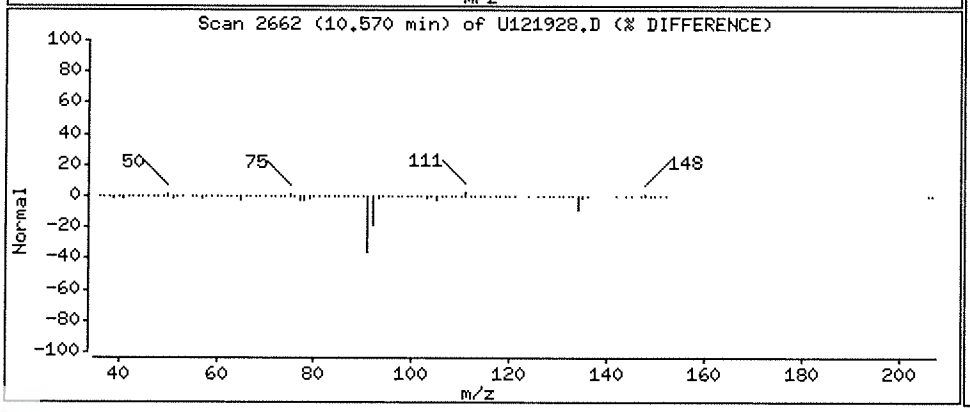












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

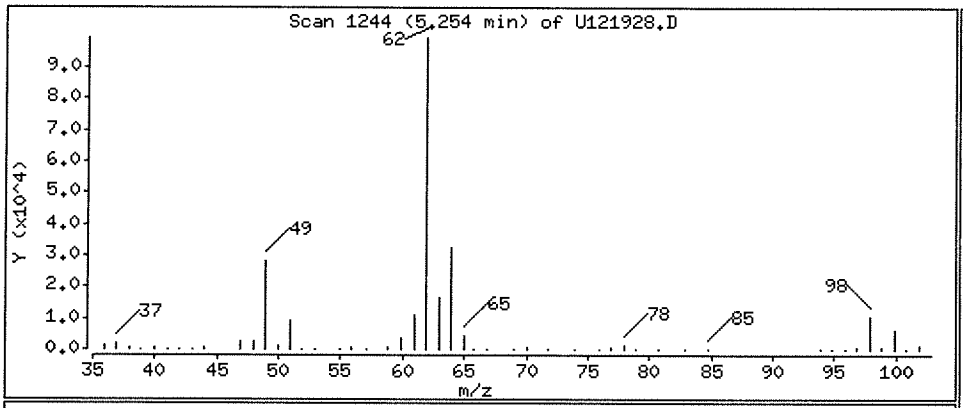
Operator: PC

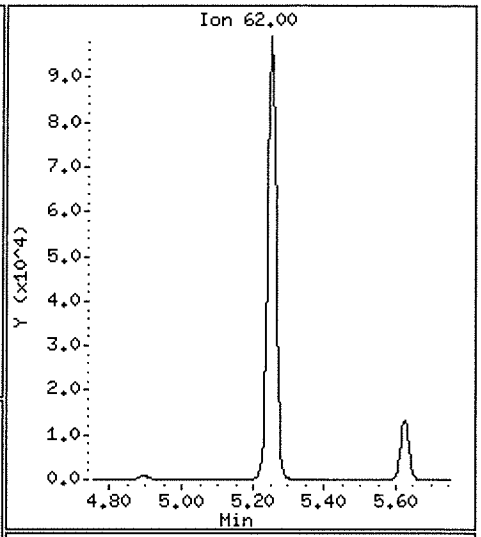
Column phase: DB624

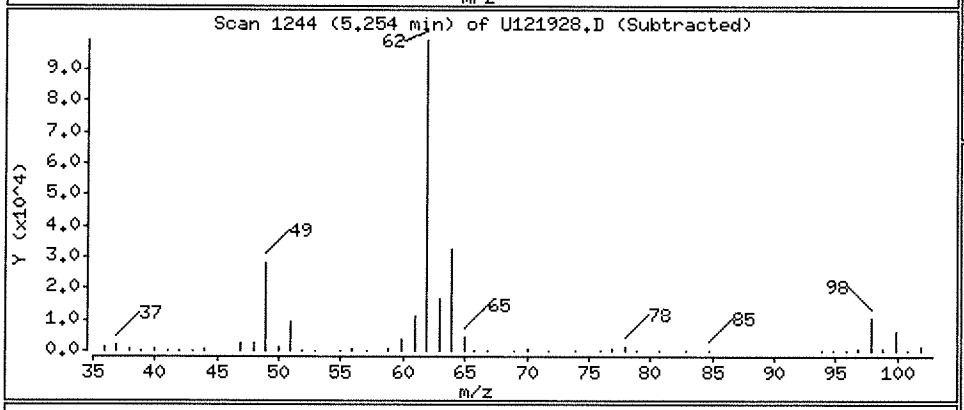
Column diameter: 0.18

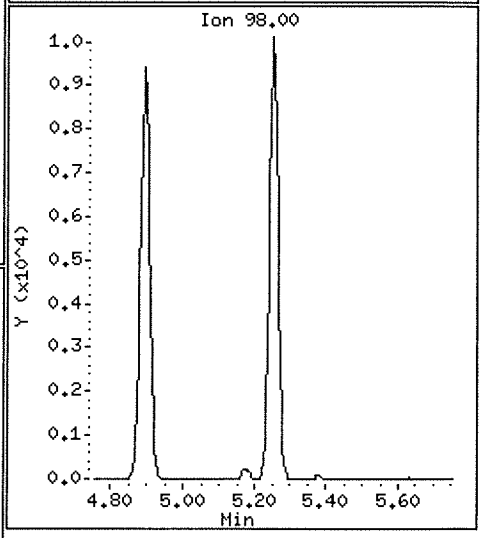
33 1,2-Dichloroethane

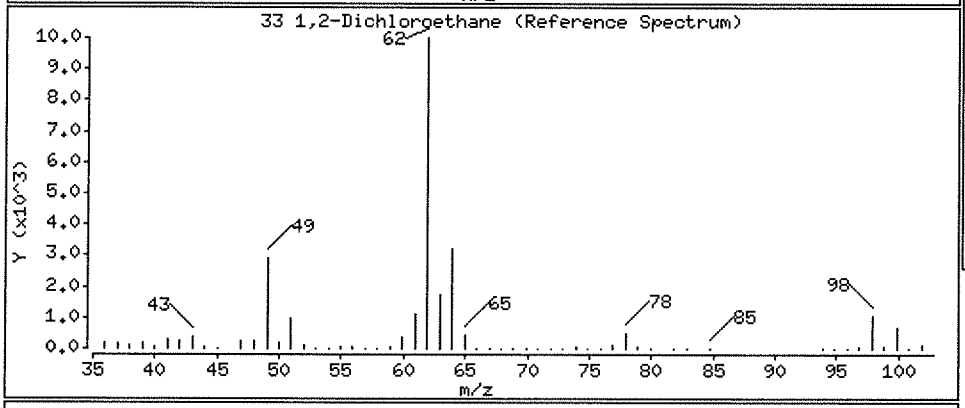
Concentration: 26.17 ug/l

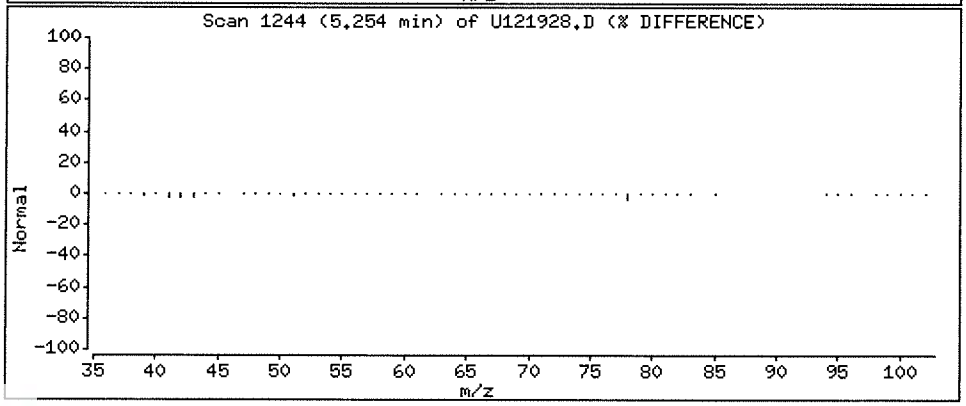












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

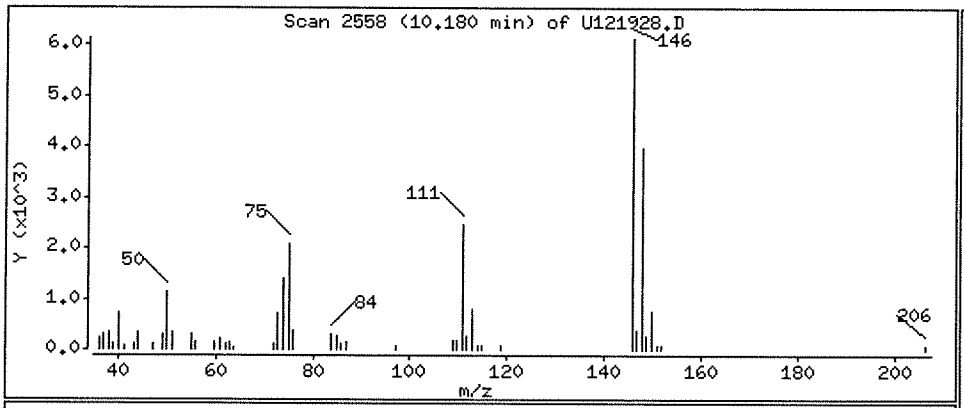
Operator: PC

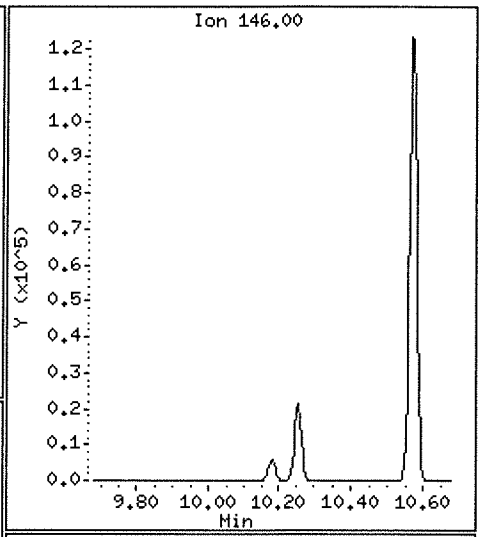
Column phase: DB624

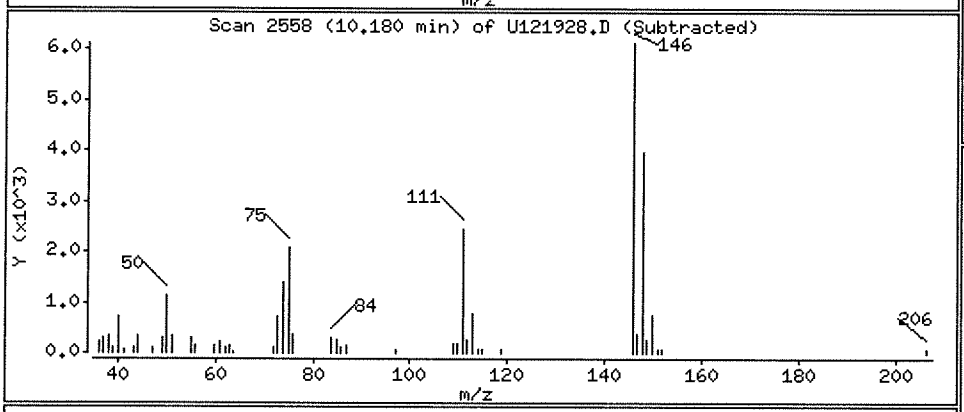
Column diameter: 0.18

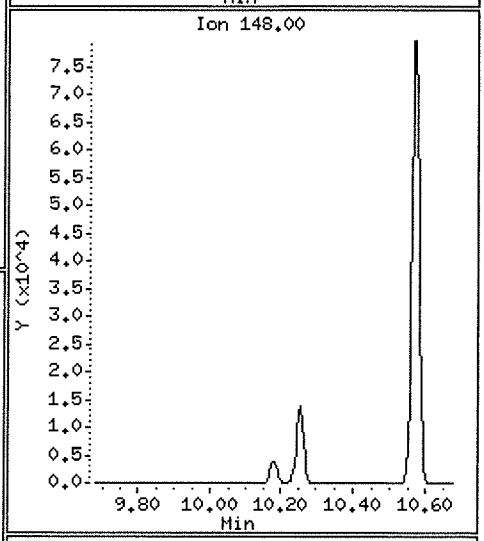
83 1,3-Dichlorobenzene

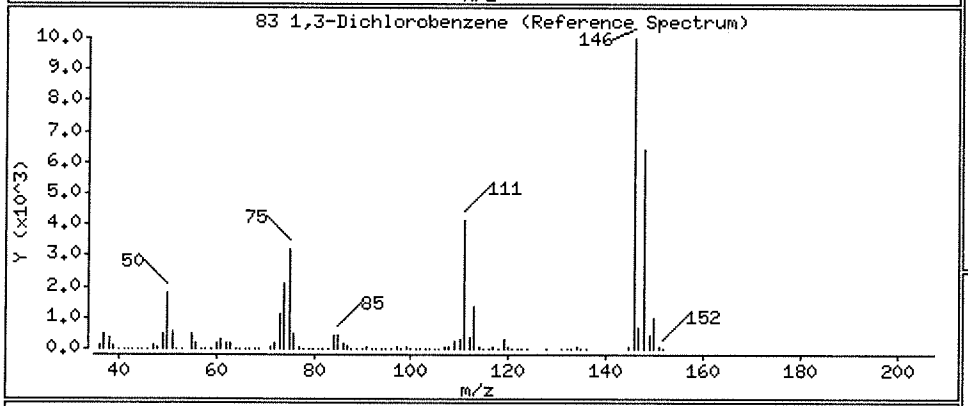
Concentration: 0.99 ug/l

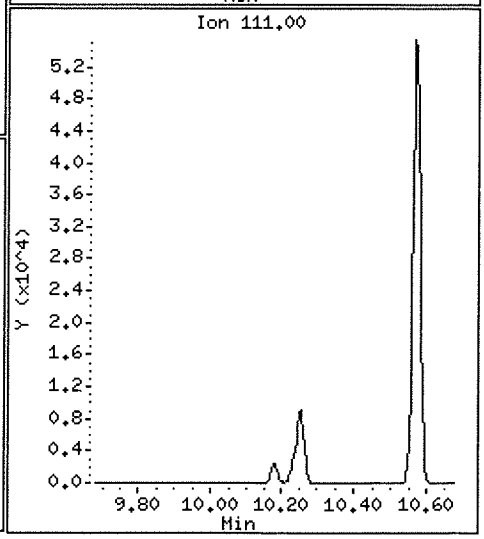


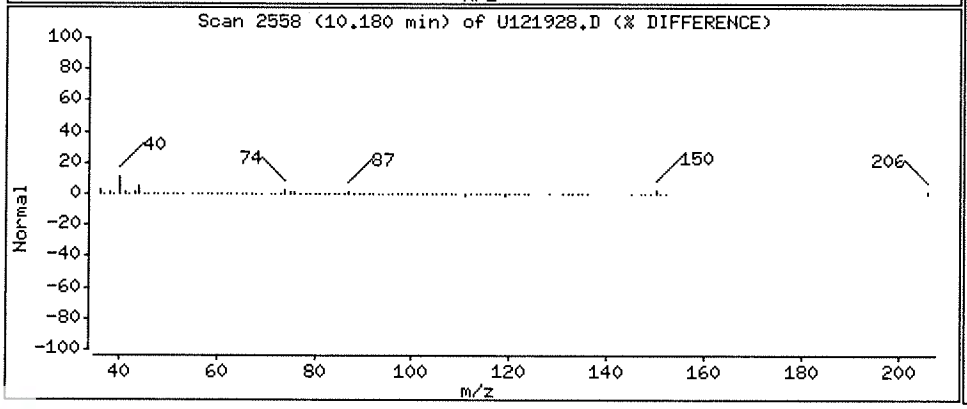












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

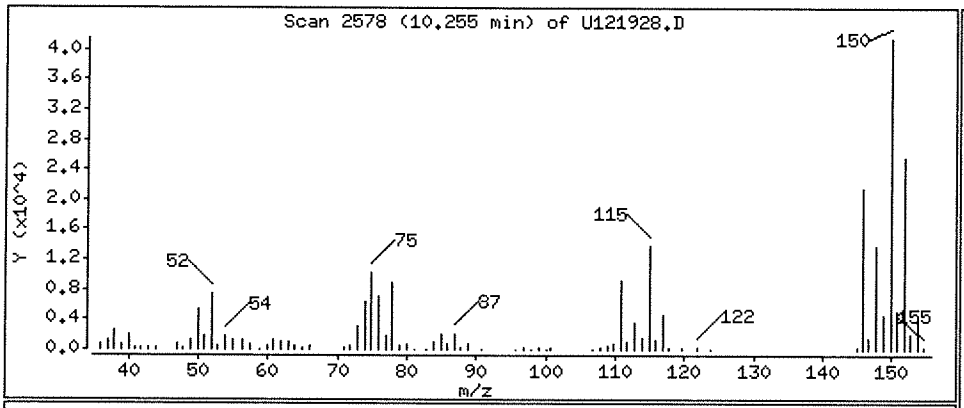
Operator: PC

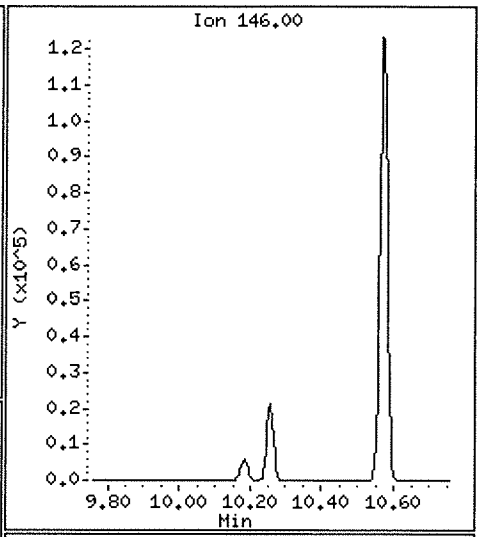
Column phase: DB624

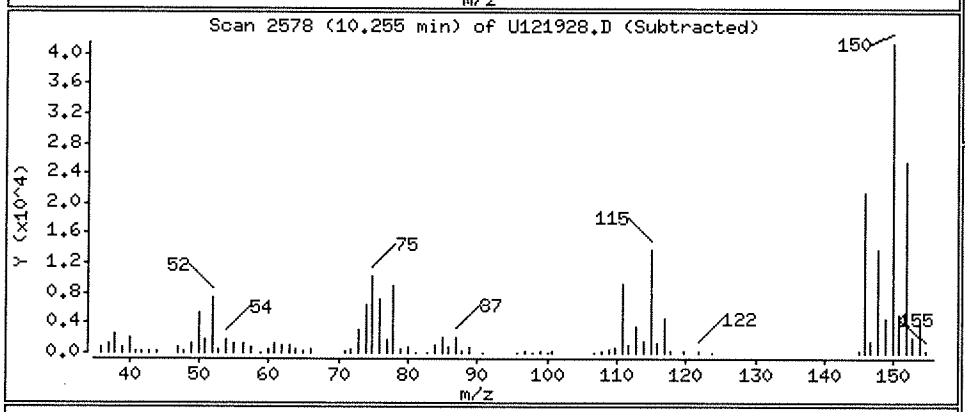
Column diameter: 0.18

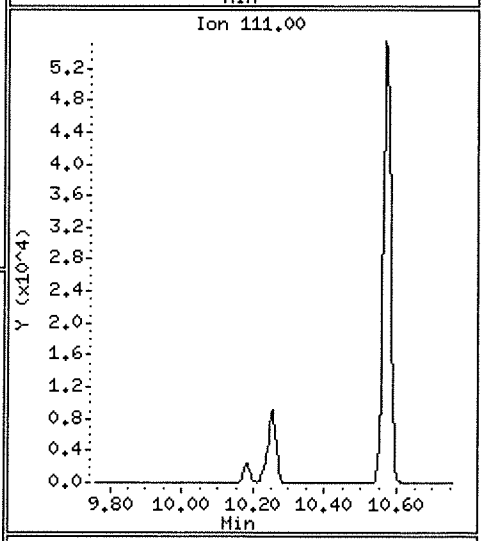
84 1,4-Dichlorobenzene

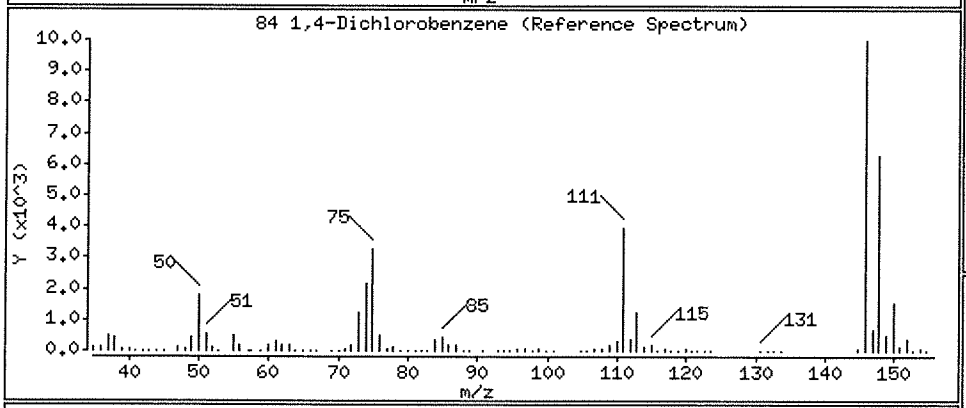
Concentration: 3.49 ug/l

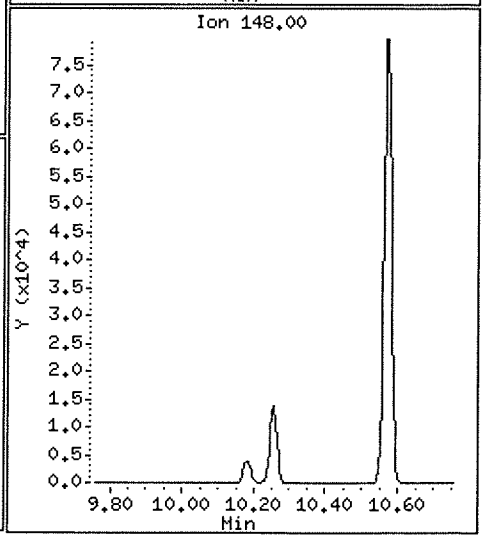


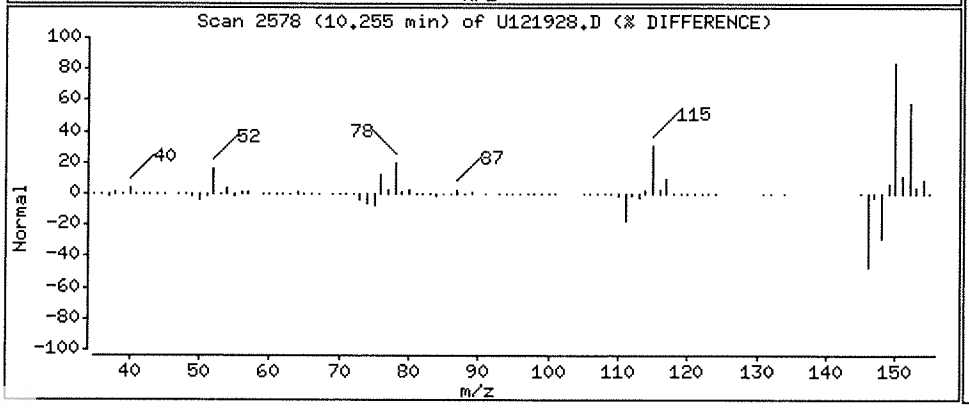












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

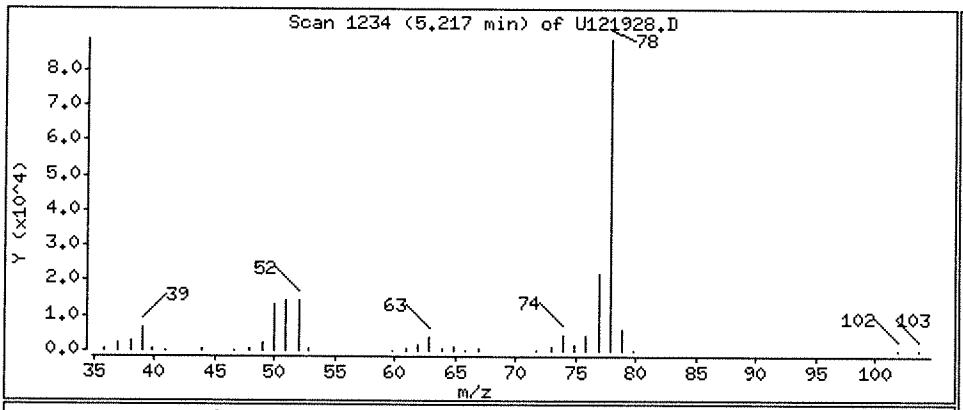
Operator: PC

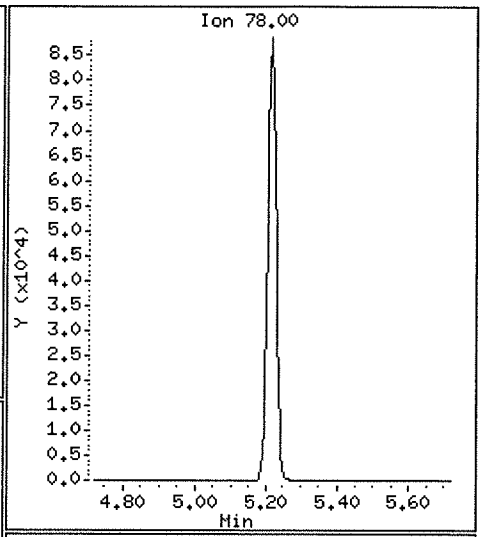
Column phase: DB624

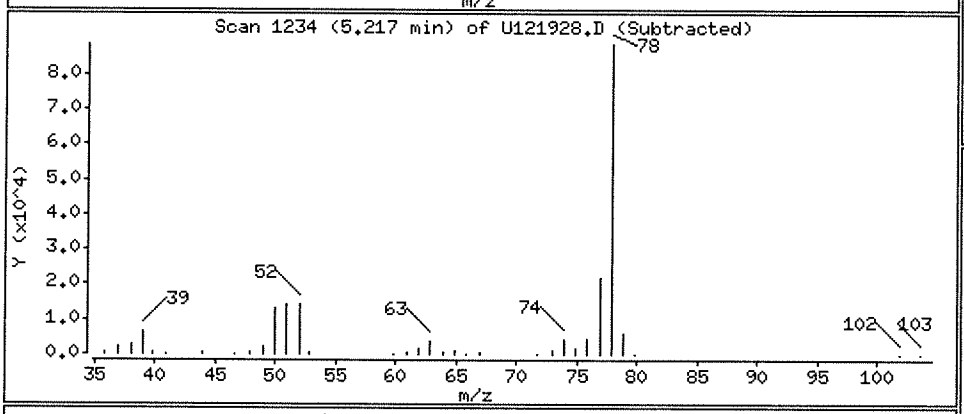
Column diameter: 0.18

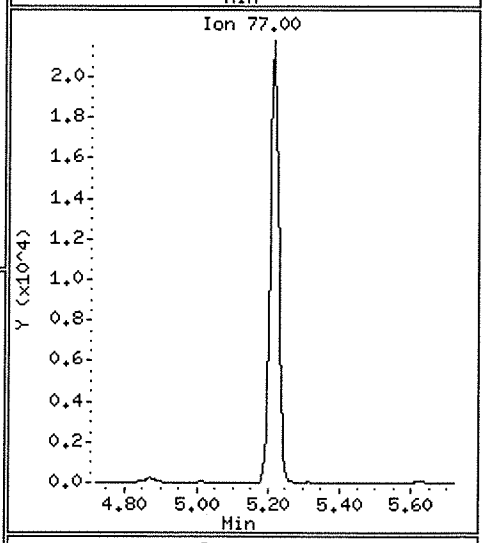
37 Benzene

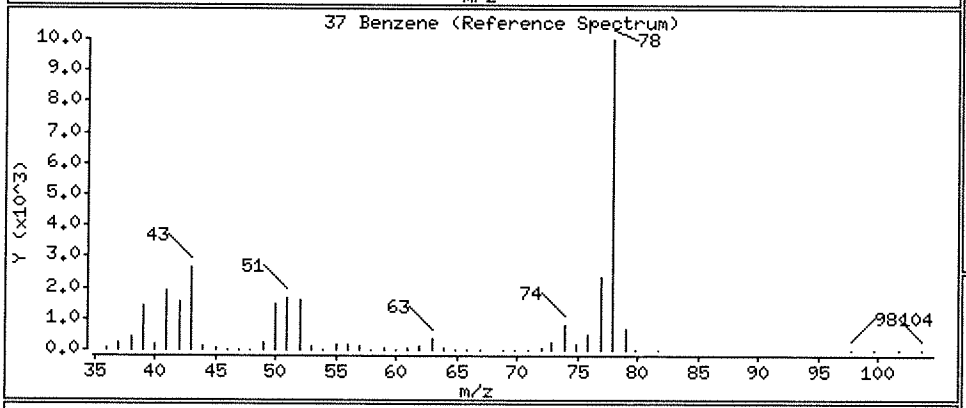
Concentration: 8.99 ug/l

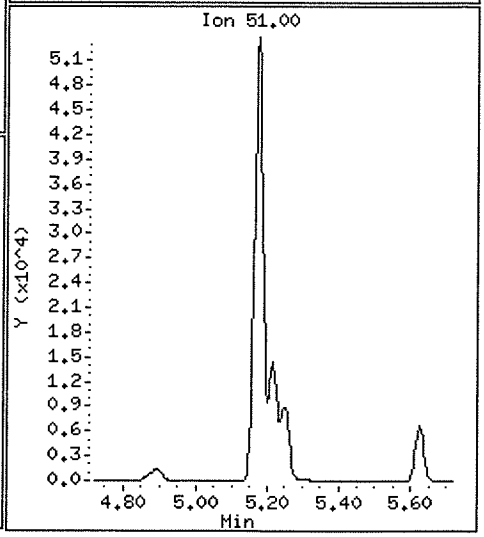


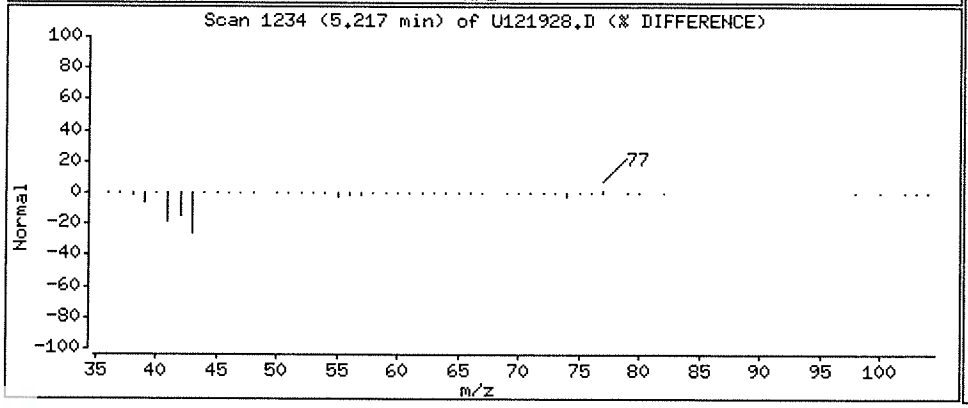












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

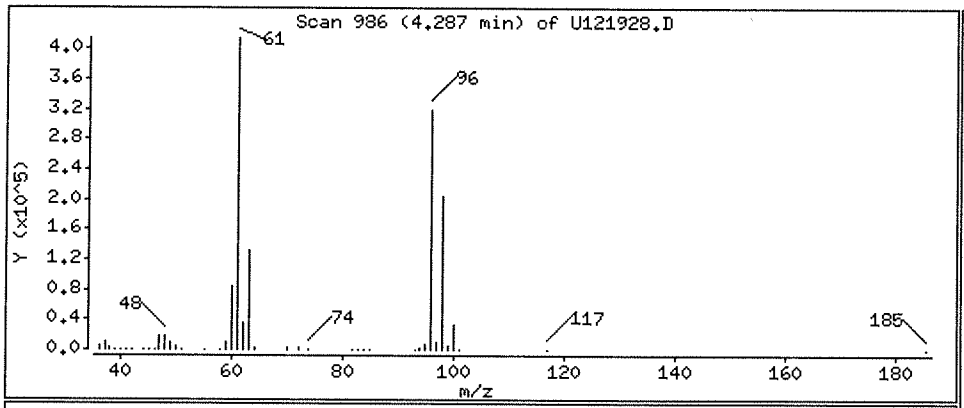
Operator: PC

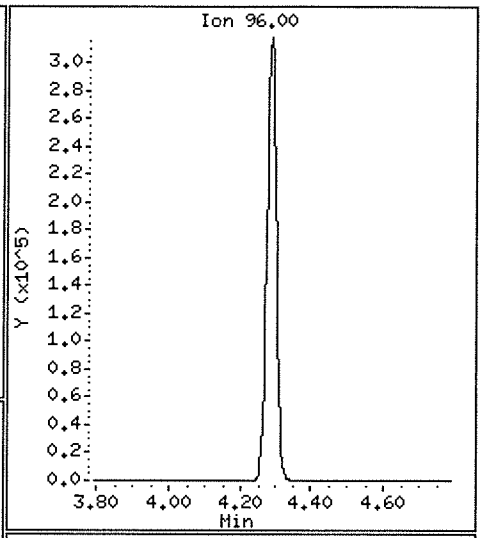
Column phase: DB624

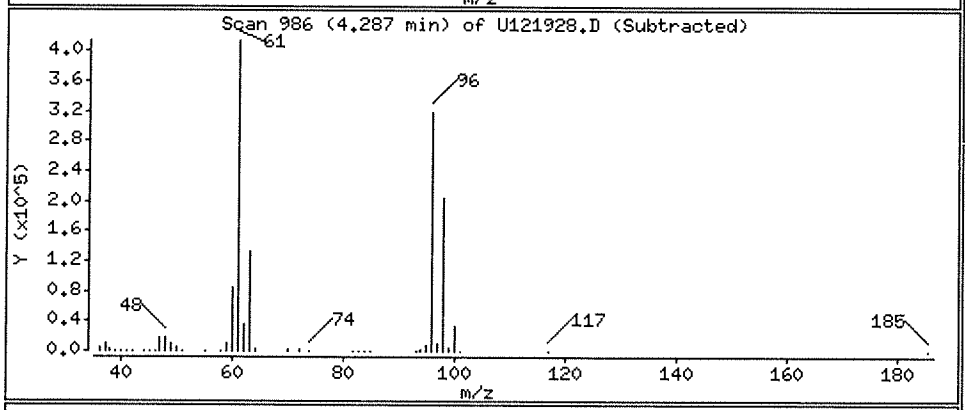
Column diameter: 0.18

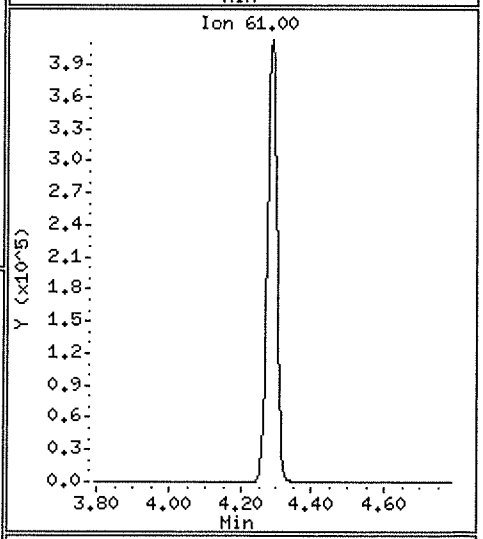
27 cis-1,2-Dichloroethene

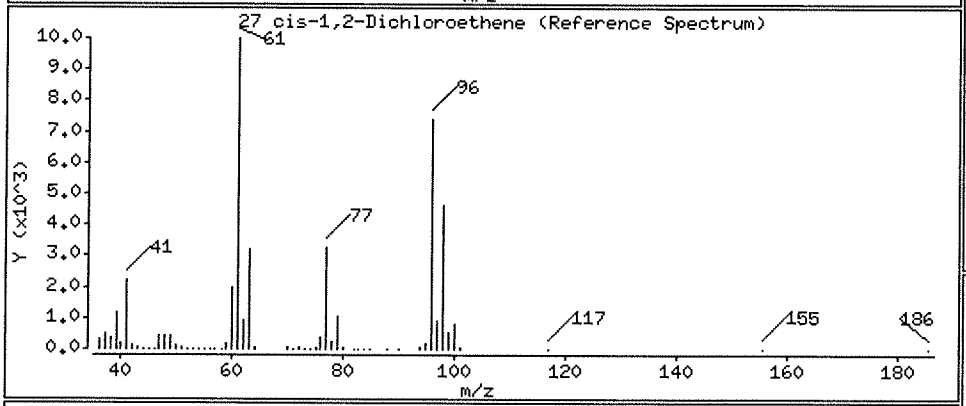
Concentration: 122.75 ug/l

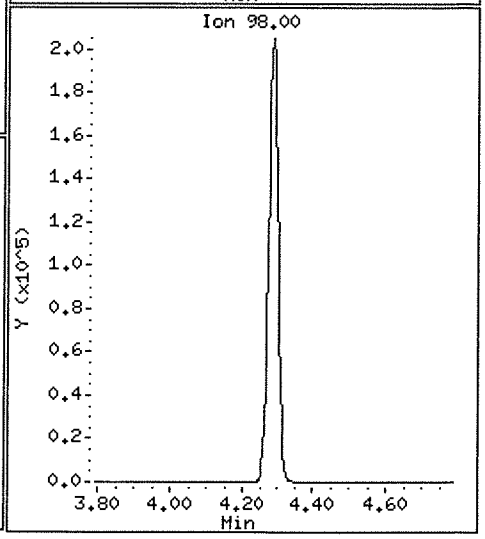


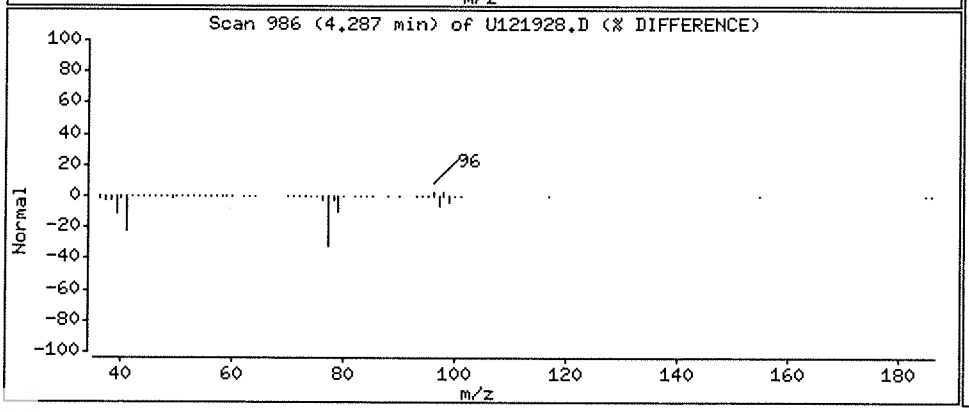












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

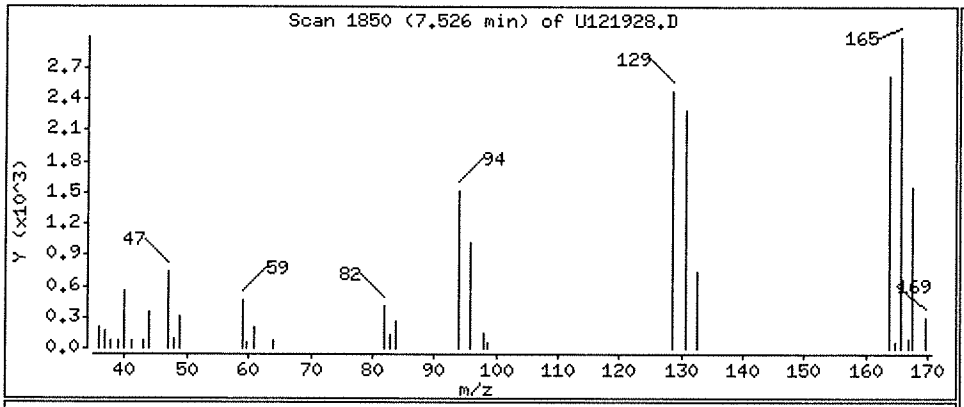
Operator: PC

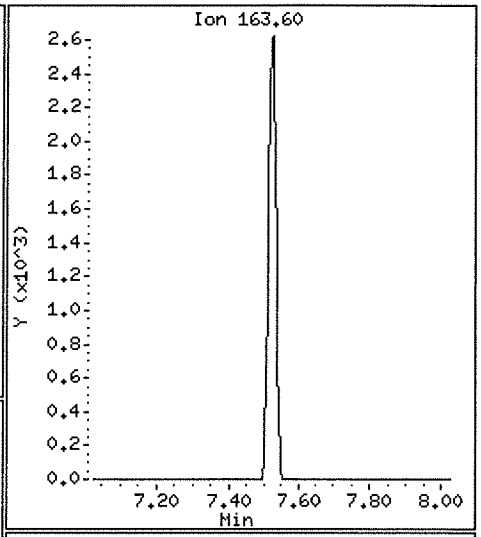
Column phase: DB624

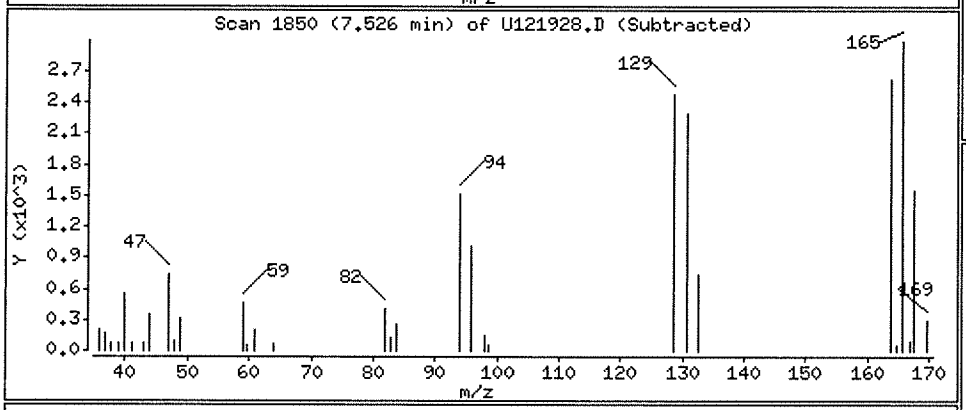
Column diameter: 0.18

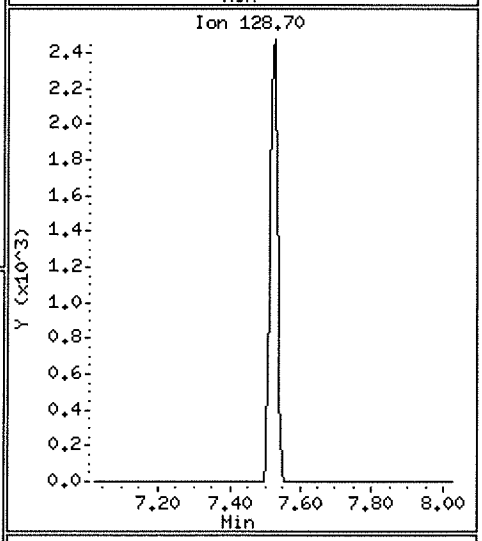
56 Tetrachloroethene

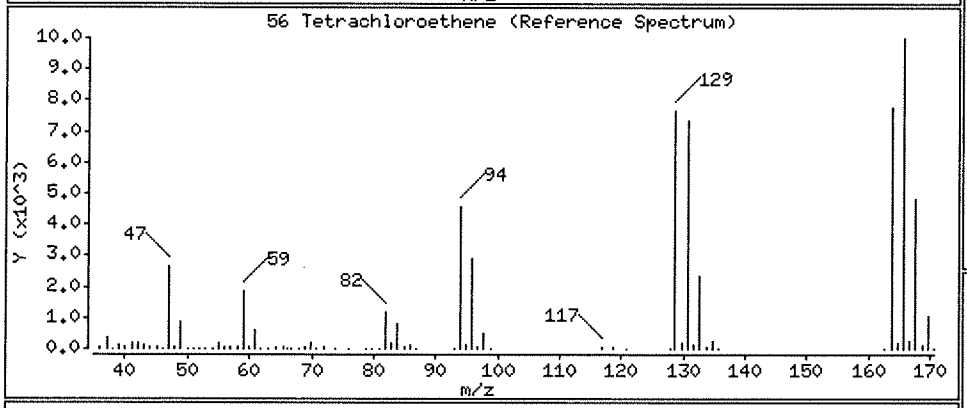
Concentration: 1.33 ug/l

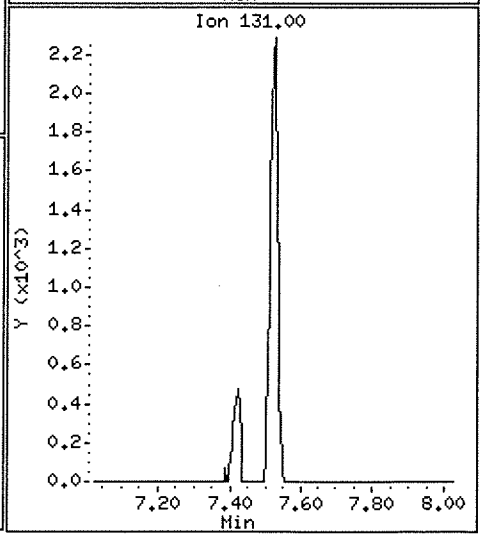


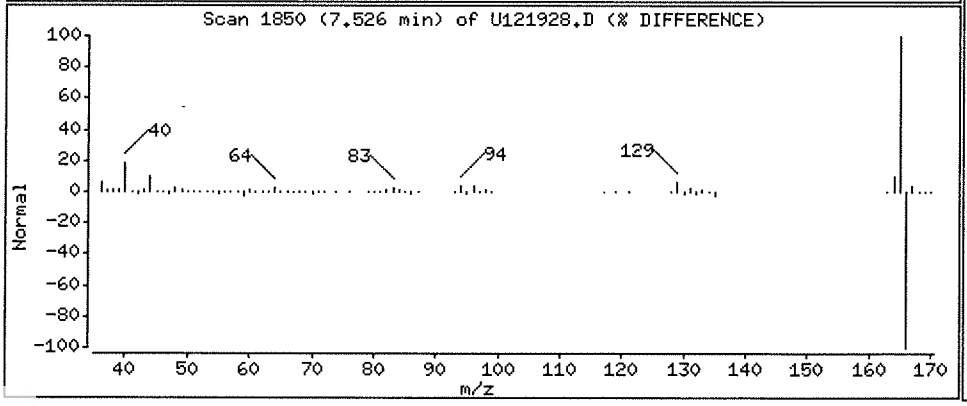












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

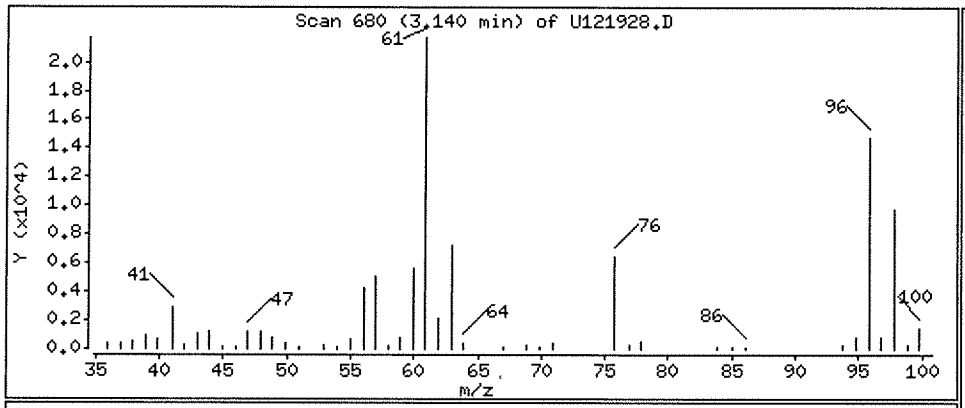
Operator: PC

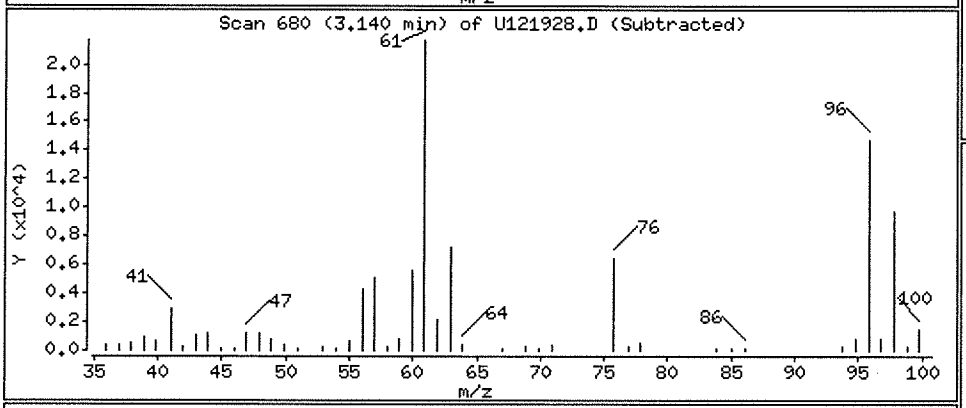
Column phase: DB624

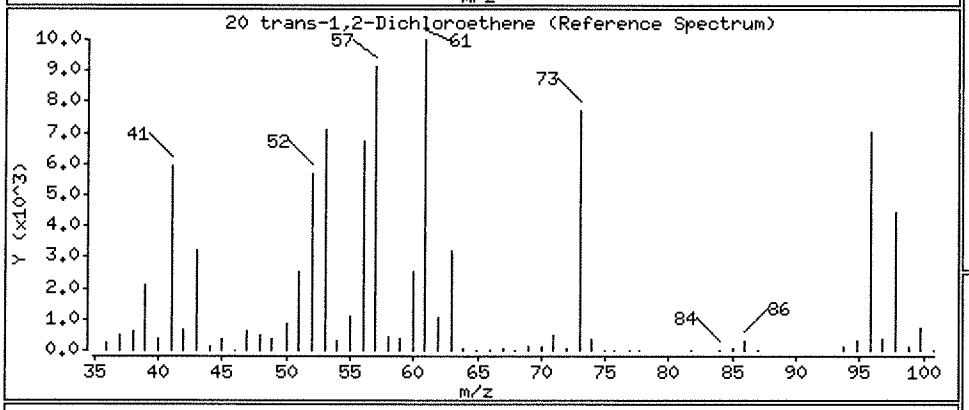
Column diameter: 0.18

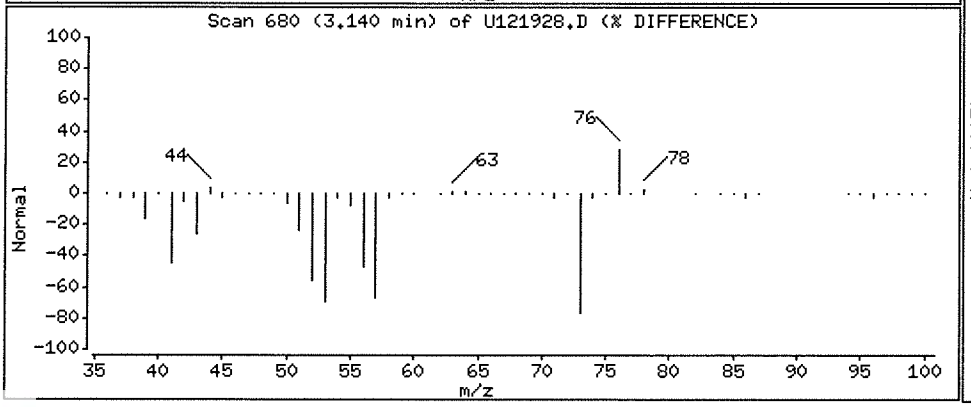
20 trans-1,2-Dichloroethene

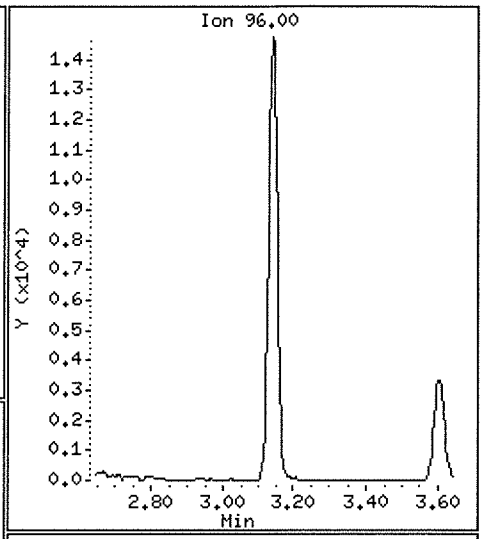
Concentration: 6.05 ug/l

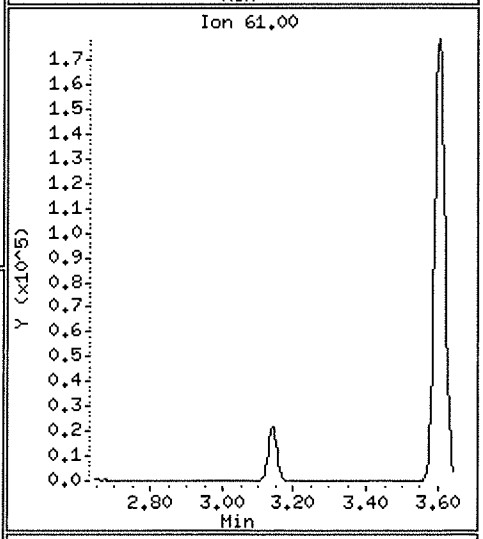


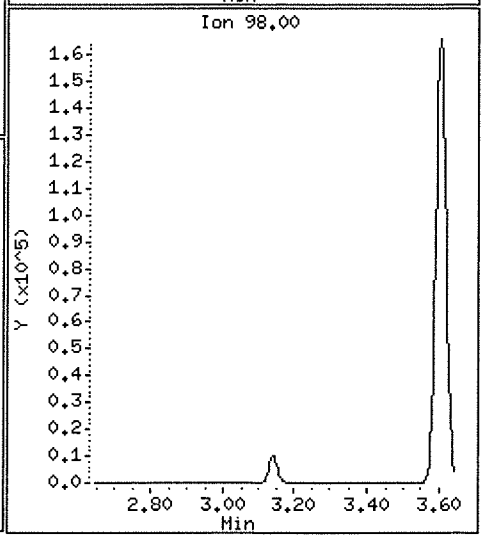












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121928.D

Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

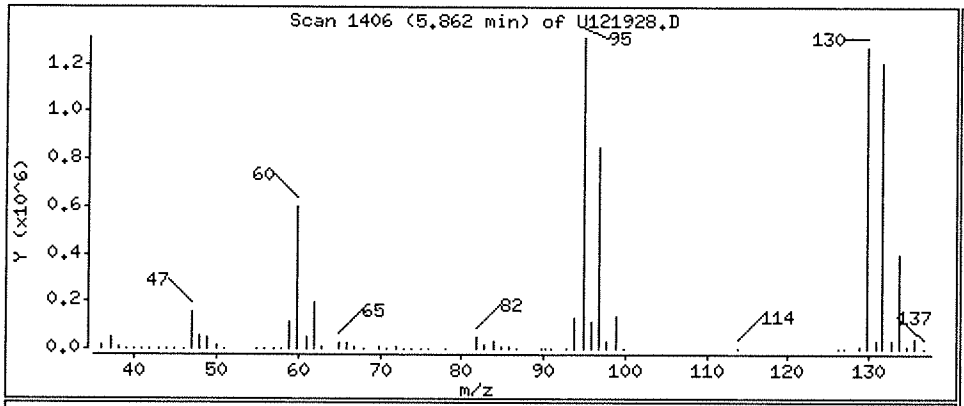
Operator: PC

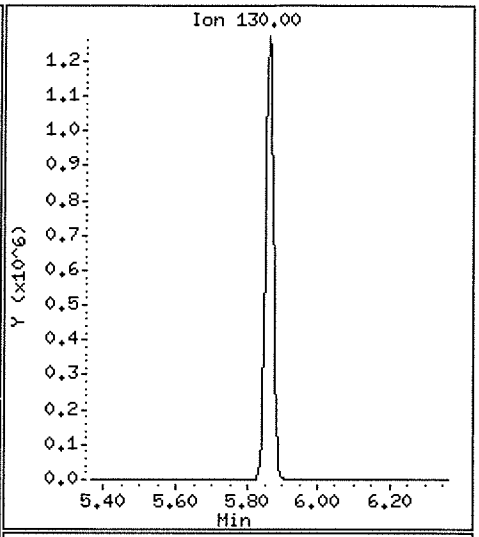
Column phase: DB624

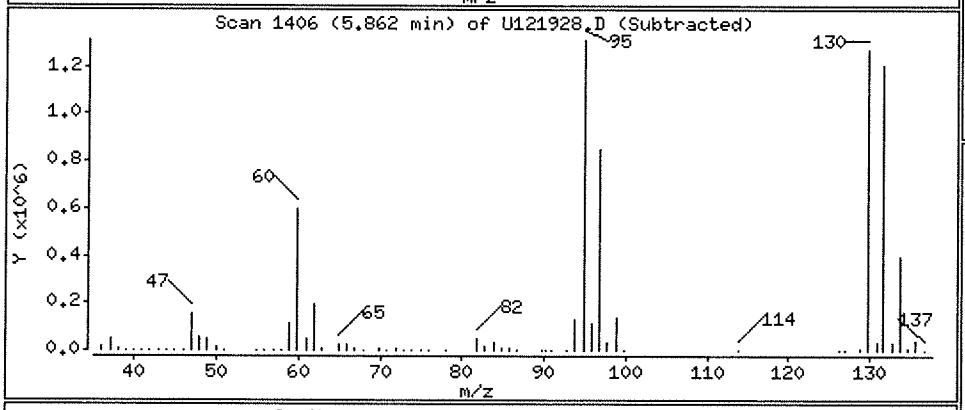
Column diameter: 0.18

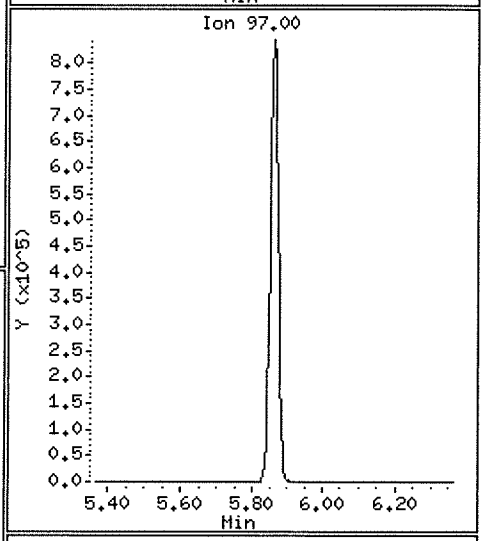
38 Trichloroethene

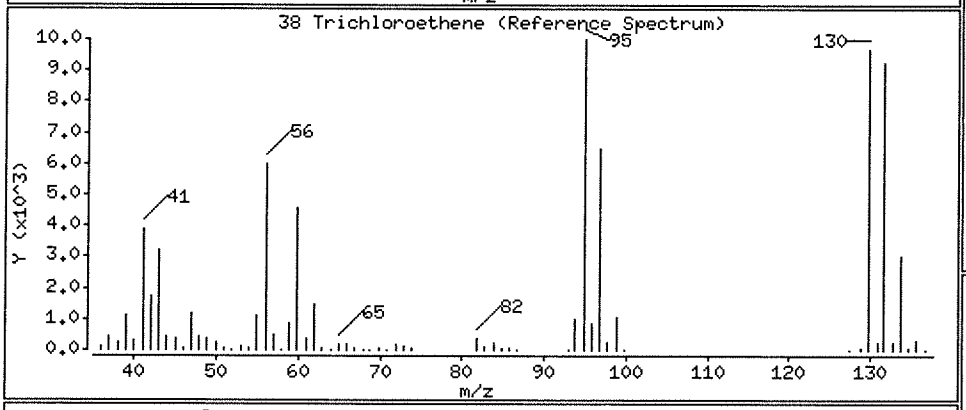
Concentration: 473.80 ug/l

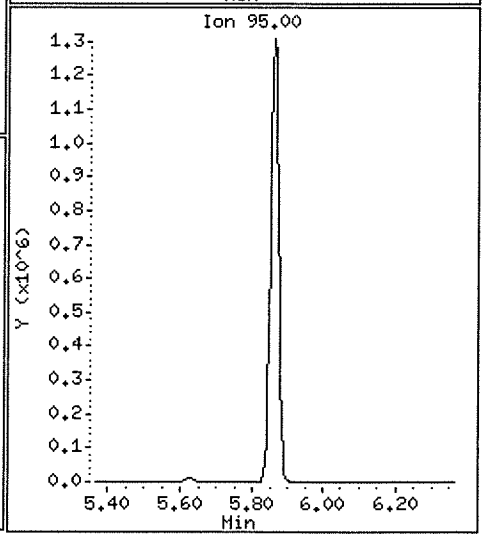


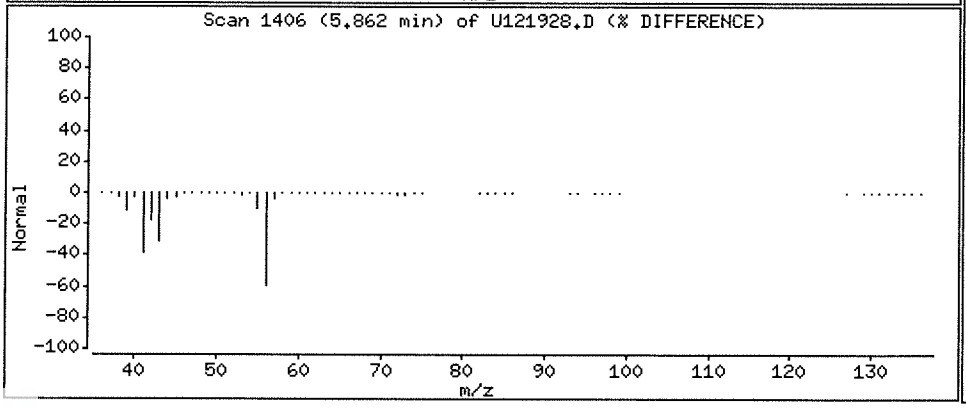












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Date : 19-DEC-2018 23:42

Client ID: HS18120569-01

Instrument: VOA9.i

Sample Info: HS18120569-01

Purge Volume: 5.0

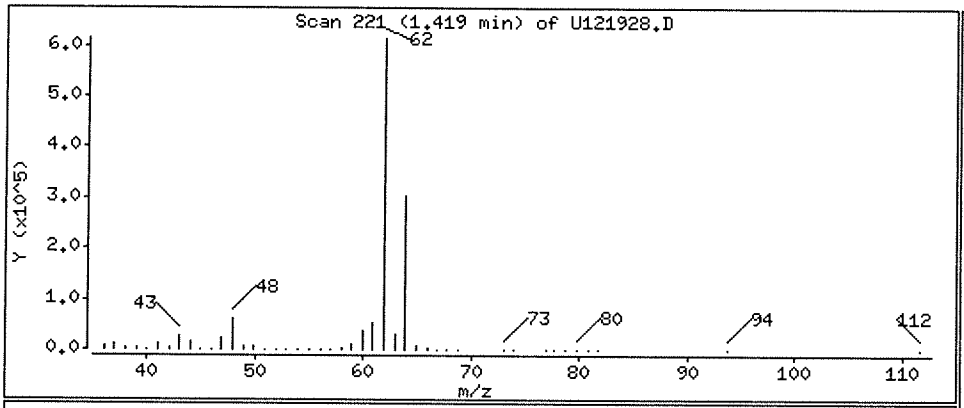
Operator: PC

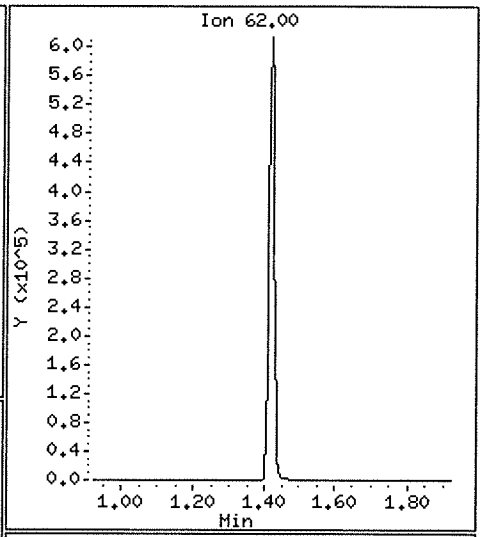
Column phase: DB624

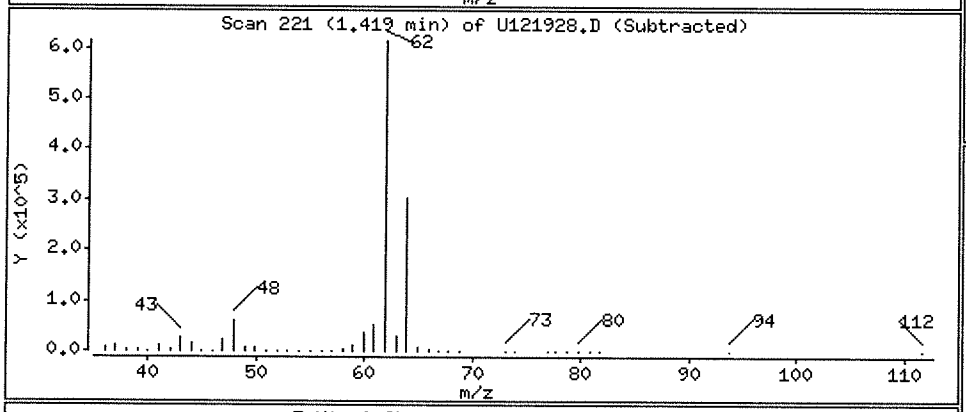
Column diameter: 0.18

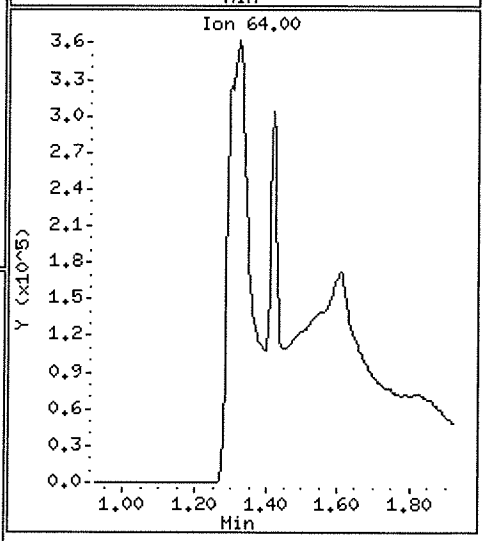
5 Vinyl Chloride

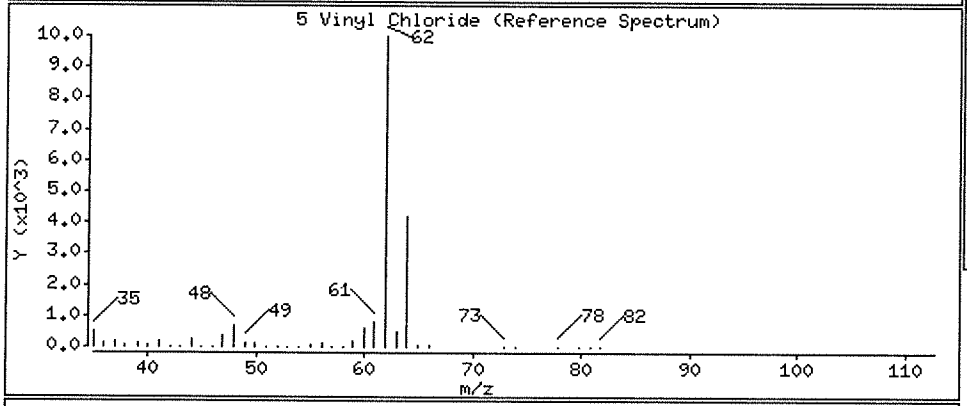
Concentration: 114.43 ug/l

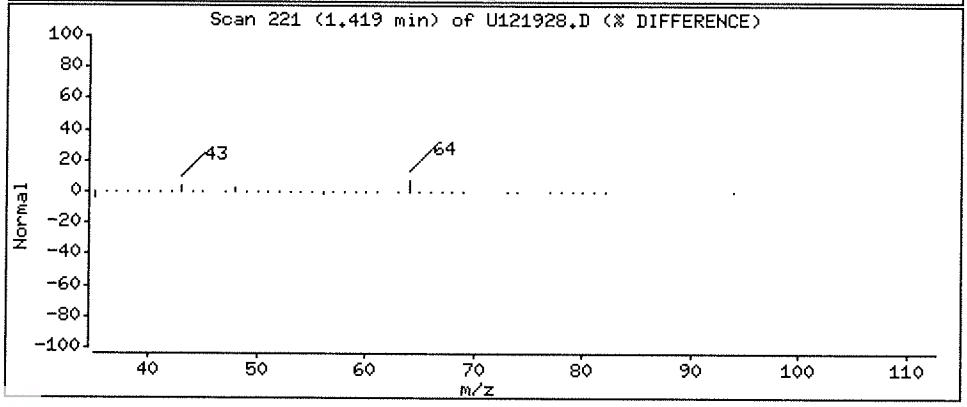












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121929.D Page 1
Report Date: 25-Jan-2019 21:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121929.D
Lab Smp Id: CCV_END Client Smp ID: CCV_END
Inj Date : 20-DEC-2018 00:07
Operator : PC Inst ID: VOA9.i
Smp Info : CCV_END;CCV_END;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181219.b\8260C.m
Meth Date : 25-Jan-2019 21:02 VOA9.i Quant Type: ISTD
Cal Date : 13-NOV-2018 14:15 Cal File: U111308.D
Als bottle: 28 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

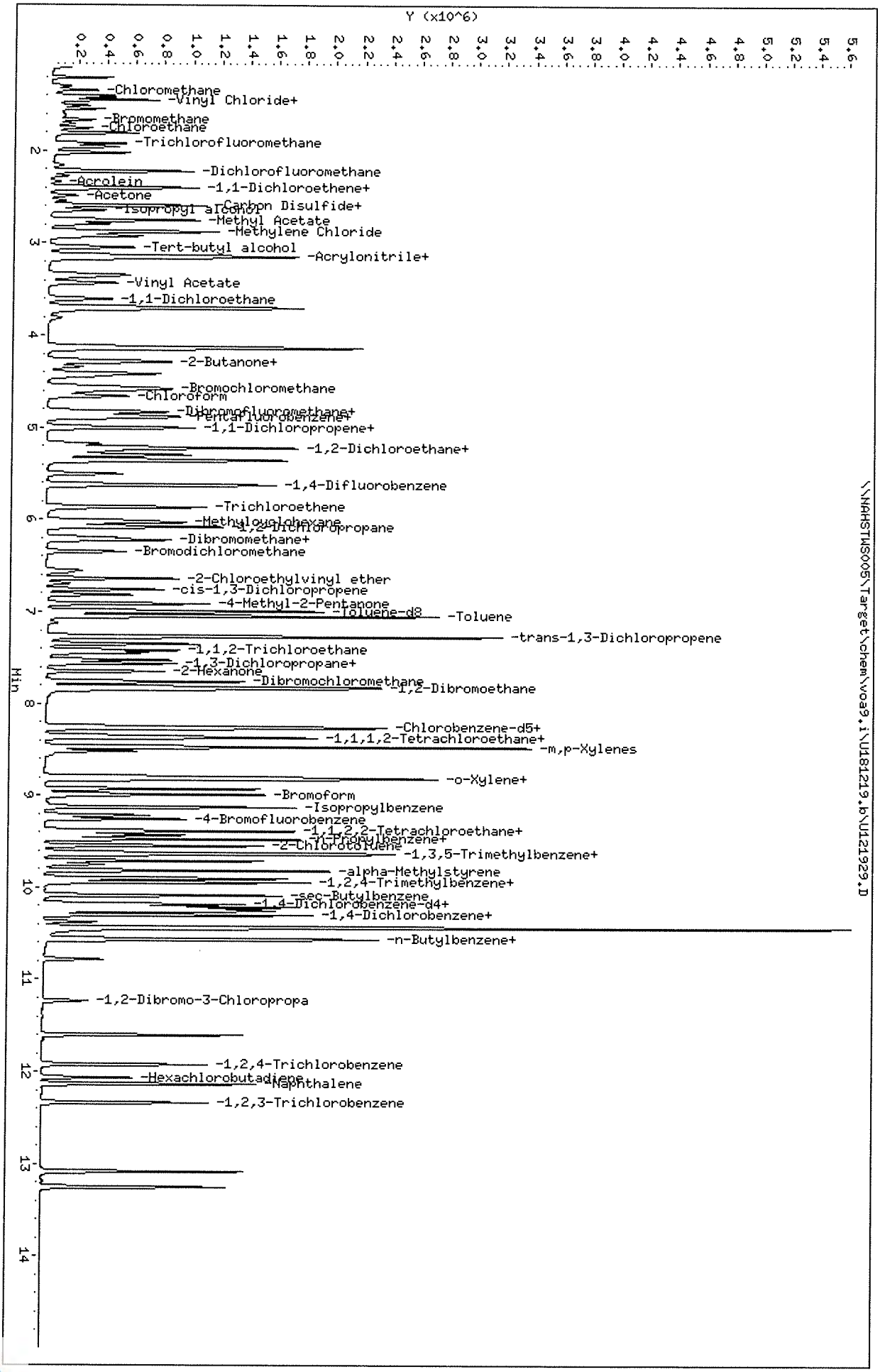
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.897	(1.000)	364599	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	642940	50.0000	
* 47 Chlorobenzene-d5	117	8.252	8.252	(1.000)	598636	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.235	10.235	(1.000)	292331	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.986)	188928	50.0000	44.95
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	242054	50.0000	43.70
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	805246	50.0000	52.71
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	303223	50.0000	51.25
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	223566	50.0000	59.20
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	323709	50.0000	50.54
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	395170	50.0000	57.06
138 Freon TF	101	2.404	2.404	(0.491)	146701	50.0000	40.16(M)
53 1,1,2-Trichloroethane	83	7.420	7.420	(0.899)	219783	50.0000	57.74
22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	453444	50.0000	54.27
11 1,1-Dichloroethene	96	2.401	2.401	(0.490)	191394	50.0000	46.50
32 1,1-Dichloropropene	75	5.006	5.006	(0.890)	324245	50.0000	54.60(H)
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	301371	50.0000	54.60
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	411776	50.0000	56.98(H)
90 1,2,4-Trichlorobenzene	180	11.926	11.926	(1.165)	306149	50.0000	53.25
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	907756	50.0000	55.90
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	57702	50.0000	53.82
57 1,2-Dibromoethane	107	7.851	7.851	(0.951)	256051	50.0000	58.10

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\U121929.D Page 2
Report Date: 25-Jan-2019 21:02

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	495176	50.0000	53.04
33 1,2-Dichloroethane	62	5.253	5.253	(0.934)	365457	50.0000	54.31
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	281153	50.0000	61.41(M)
75 1,3,5-Trimethylbenzene	105	9.624	9.624	(0.940)	867736	50.0000	55.24
83 1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	486502	50.0000	52.85
54 1,3-Dichloropropane	76	7.563	7.563	(0.916)	471495	50.0000	57.69
84 1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	503256	50.0000	55.90
26 2,2-Dichloropropane	77	4.275	4.275	(0.873)	210371	50.0000	40.65
24 2-Butanone	43	4.339	4.339	(0.886)	294395	100.000	114.86
76 2-Chlorotoluene	91	9.549	9.549	(0.933)	776814	50.0000	54.26
52 2-Hexanone	43	7.649	7.649	(0.927)	454849	100.000	130.70(H)
77 4-Chlorotoluene	91	9.639	9.639	(0.942)	908073	50.0000	54.97
82 p-Isopropyltoluene	119	10.209	10.209	(0.997)	891492	50.0000	55.68
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	637789	100.000	127.71(H)
10 Acetone	43	2.483	2.483	(0.507)	205294	100.000	123.66
37 Benzene	78	5.220	5.220	(0.928)	1031557	50.0000	58.04
74 Bromobenzene	156	9.384	9.384	(0.917)	261032	50.0000	54.43
29 Bromochloromethane	128	4.556	4.556	(0.930)	124355	50.0000	57.85
39 Bromodichloromethane	83	6.348	6.348	(1.129)	310722	50.0000	58.16
66 Bromoform	173	8.983	8.983	(1.089)	145858	50.0000	53.49(TH)
6 Bromomethane	94	1.666	1.666	(0.340)	53795	50.0000	19.00
19 Carbon Disulfide	76	2.592	2.592	(0.529)	1394970	100.000	109.75
34 Carbon Tetrachloride	117	4.999	4.999	(0.889)	247837	50.0000	53.42(H)
59 Chlorobenzene	112	8.275	8.275	(1.003)	678563	50.0000	54.92
7 Chloroethane	64	1.752	1.752	(0.358)	179059	50.0000	47.06(M)
28 Chloroform	83	4.657	4.657	(0.951)	436459	50.0000	51.99
3 Chloromethane	50	1.344	1.344	(0.274)	182928	50.0000	37.63
27 cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	275049	50.0000	53.23
46 cis-1,3-Dichloropropene	75	6.760	6.760	(1.202)	417668	50.0000	62.08
55 Dibromochloromethane	129	7.758	7.758	(0.940)	228429	50.0000	60.30
44 Dibromomethane	93	6.191	6.191	(1.101)	164358	50.0000	57.29
2 Dichlorodifluoromethane	85	1.209	1.209	(0.247)	253031	50.0000	47.01
61 Ethylbenzene	106	8.372	8.372	(1.015)	346535	50.0000	55.47(H)
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	99885	50.0000	55.00
67 Isopropylbenzene	105	9.126	9.126	(1.106)	1012557	50.0000	55.65
62 m,p-Xylenes	106	8.474	8.474	(1.027)	863988	100.000	112.22
17 Methylene Chloride	84	2.873	2.873	(0.587)	268533	50.0000	57.83
87 n-Butylbenzene	91	10.558	10.558	(1.031)	828742	50.0000	54.01
73 n-Propylbenzene	91	9.474	9.474	(0.926)	1269329	50.0000	55.02
92 Naphthalene	128	12.132	12.132	(1.185)	1041926	50.0000	60.19
63 o-Xylene	106	8.811	8.811	(1.068)	443257	50.0000	57.53
81 sec-Butylbenzene	105	10.085	10.085	(0.985)	1048967	50.0000	54.61
64 Styrene	104	8.826	8.826	(1.069)	776040	50.0000	59.66
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	723435	50.0000	54.04(H)
56 Tetrachloroethene	164	7.525	7.525	(0.912)	166512	50.0000	53.09
50 Toluene	91	7.049	7.049	(0.854)	1067467	50.0000	56.16
20 trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	237753	50.0000	52.71
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.291)	357685	50.0000	53.62
38 Trichloroethene	130	5.864	5.864	(1.043)	243459	50.0000	55.57
8 Trichlorofluoromethane	101	1.955	1.955	(0.399)	298069	50.0000	40.89
5 Vinyl Chloride	62	1.422	1.422	(0.290)	255734	50.0000	43.09

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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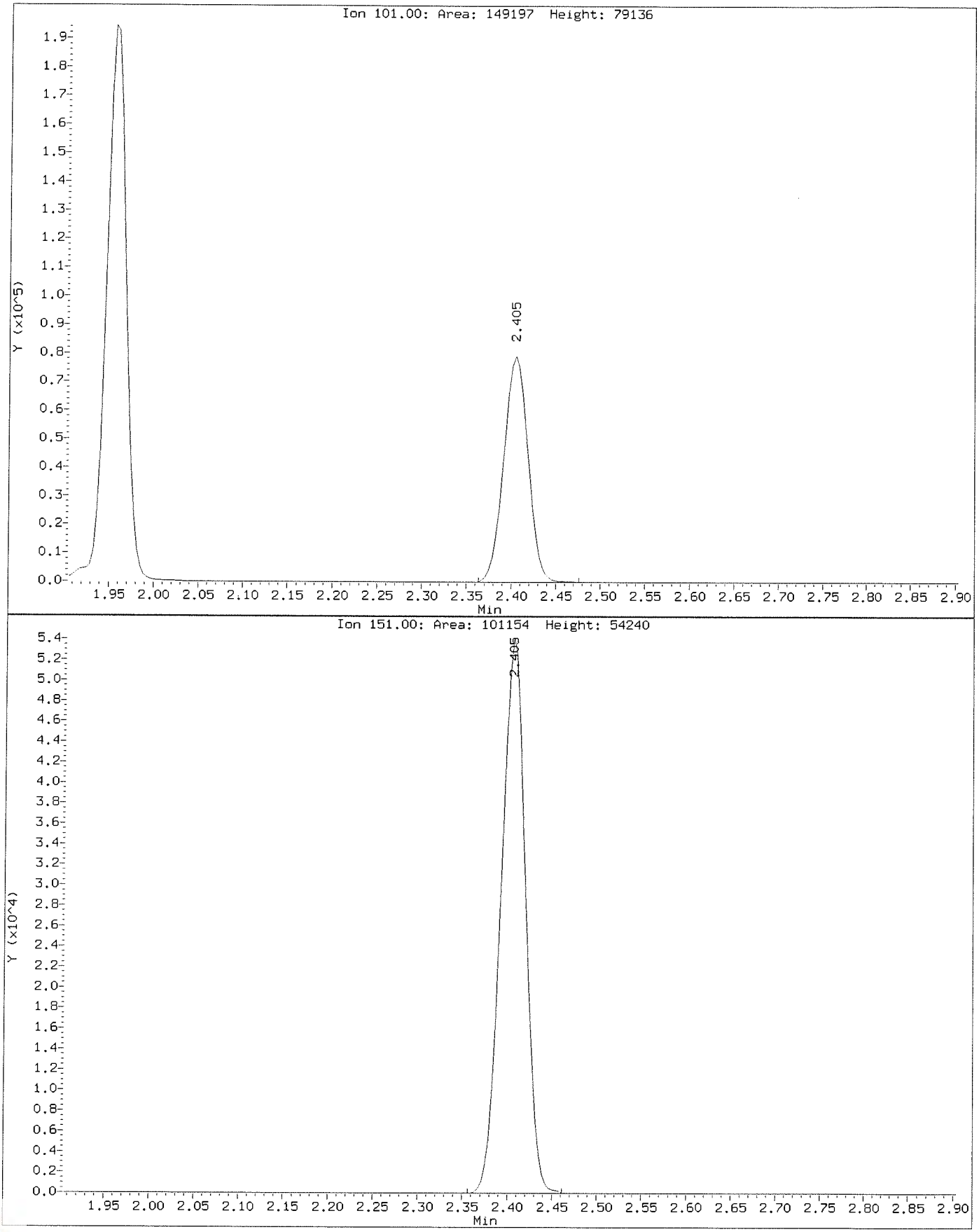
Date : 20-DEC-2018 00:07
Client ID: CCV_END
Sample Info: CCV_END;CCV_END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181219.b\Before\U121929.D
Injection Date: 20-DEC-2018 00:07
Instrument: VOA9.i
Client Sample ID: CCV_END

Compound: Freon TF
CAS Number: 76-13-1



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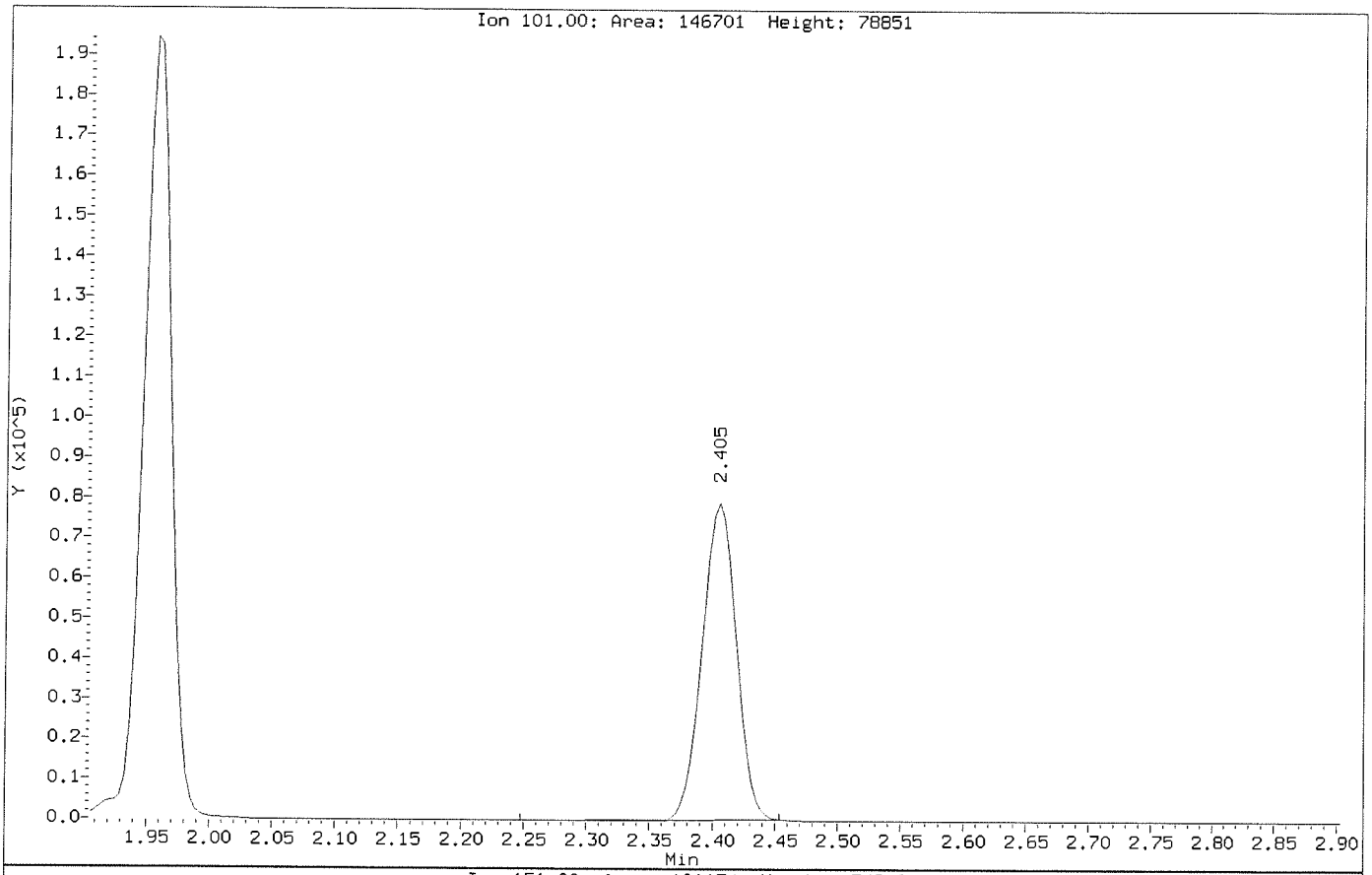
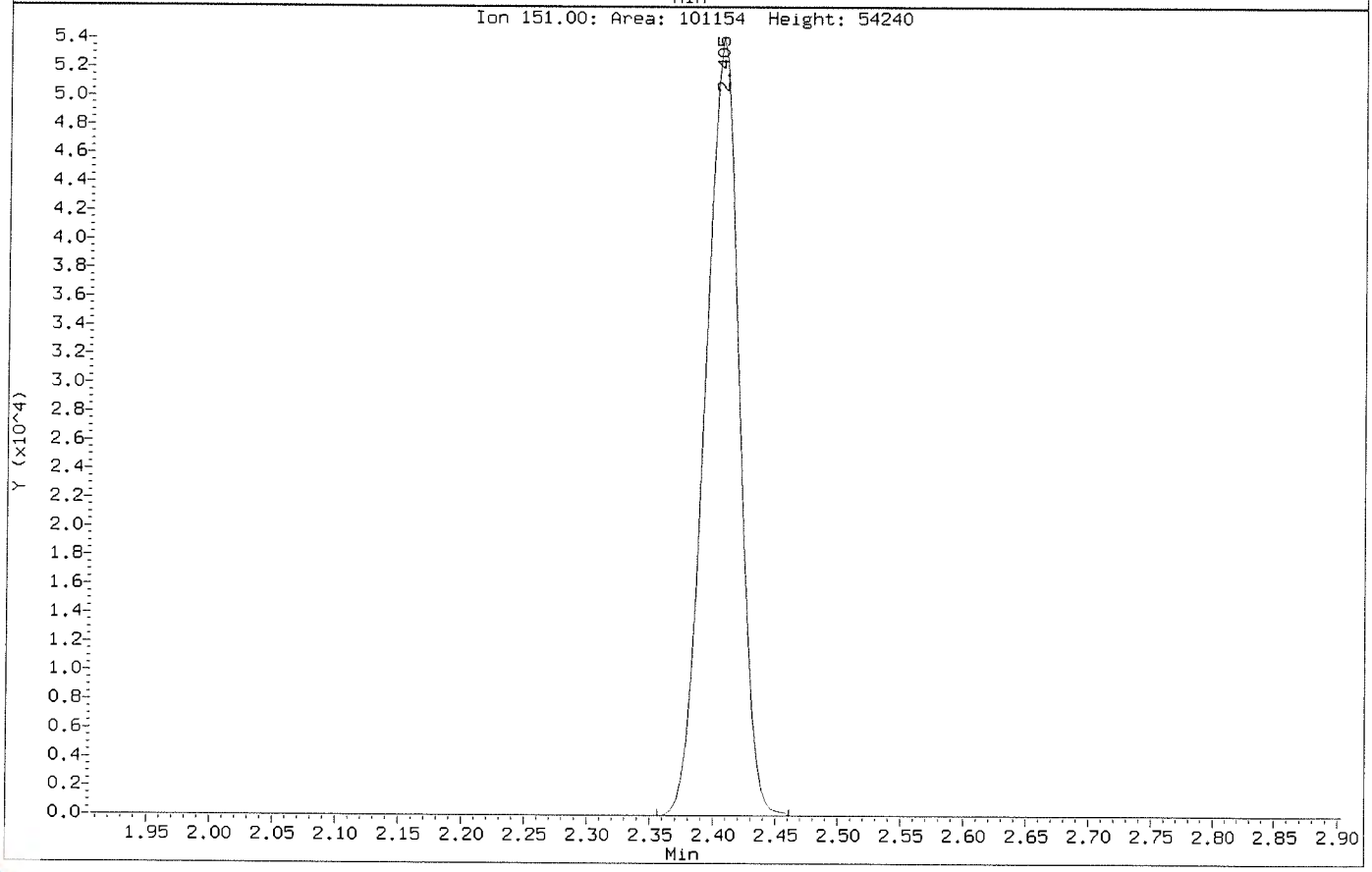
Instrument: VOA9.i
Client Sample ID: CCV_END

Compound: Freon TF
CAS Number: 76-13-1





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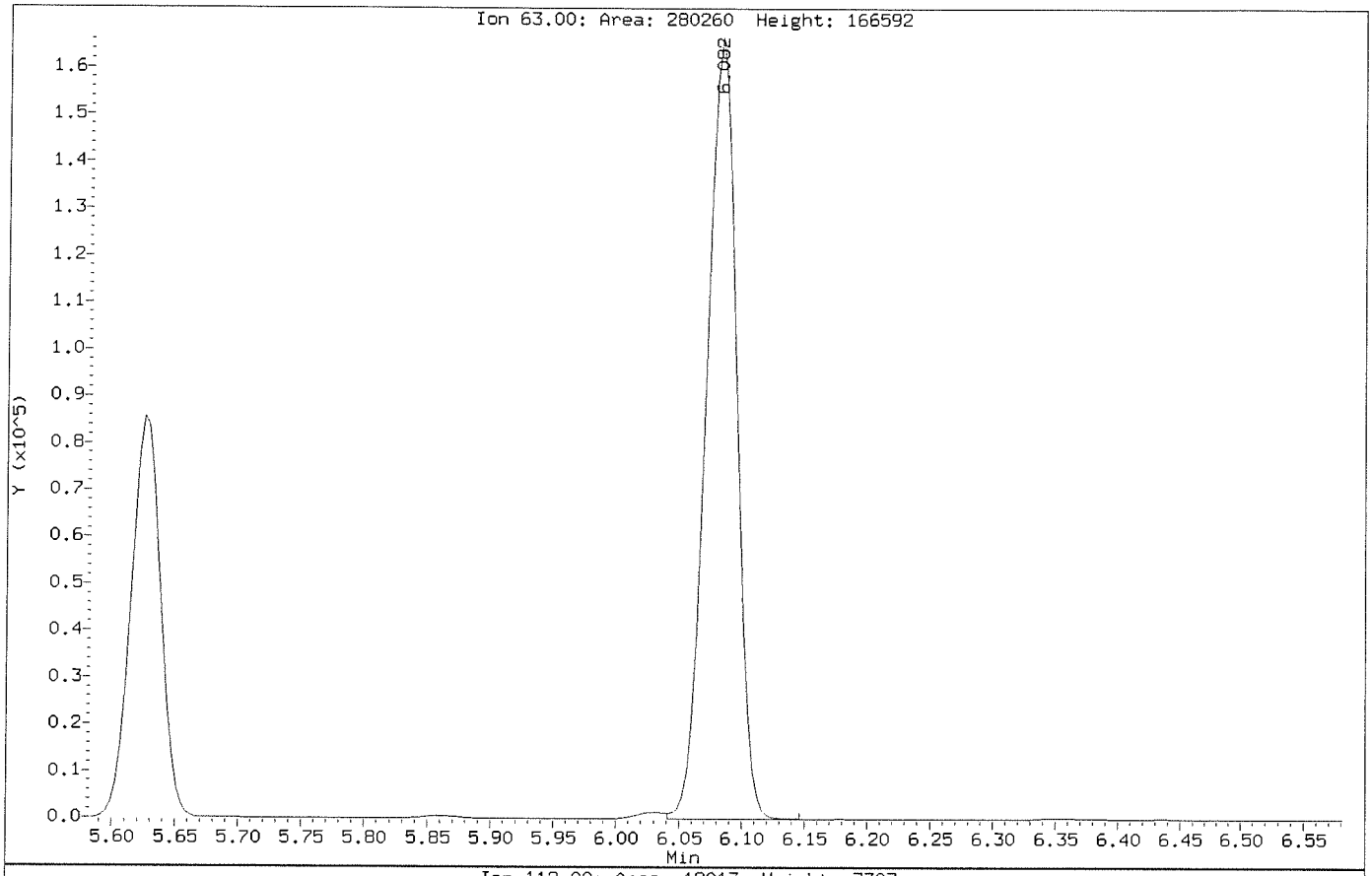
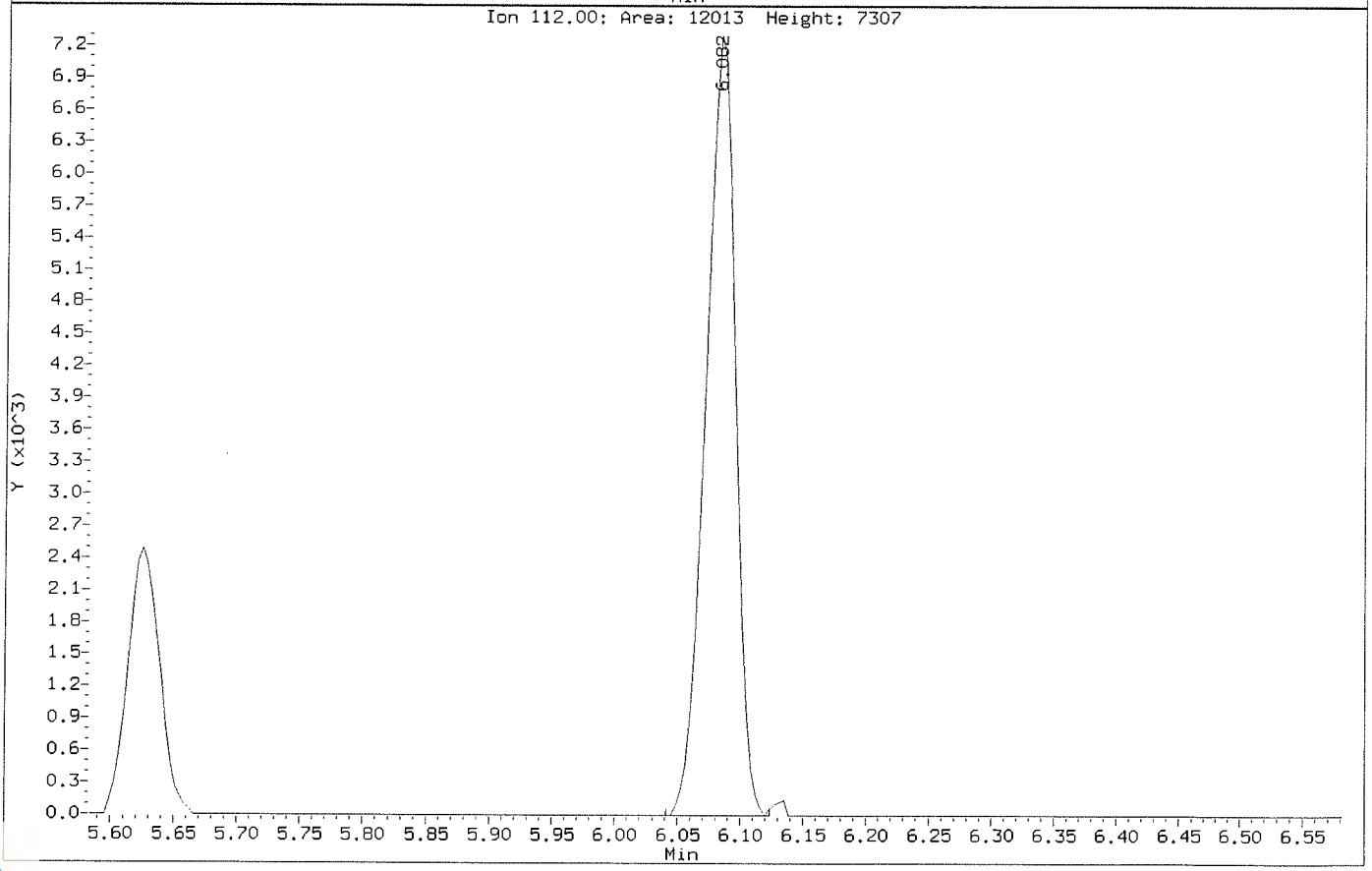
Injection Date: 20-DEC-2018 00:07
Instrument: VOA9.i
Client Sample ID: CCV_END

Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





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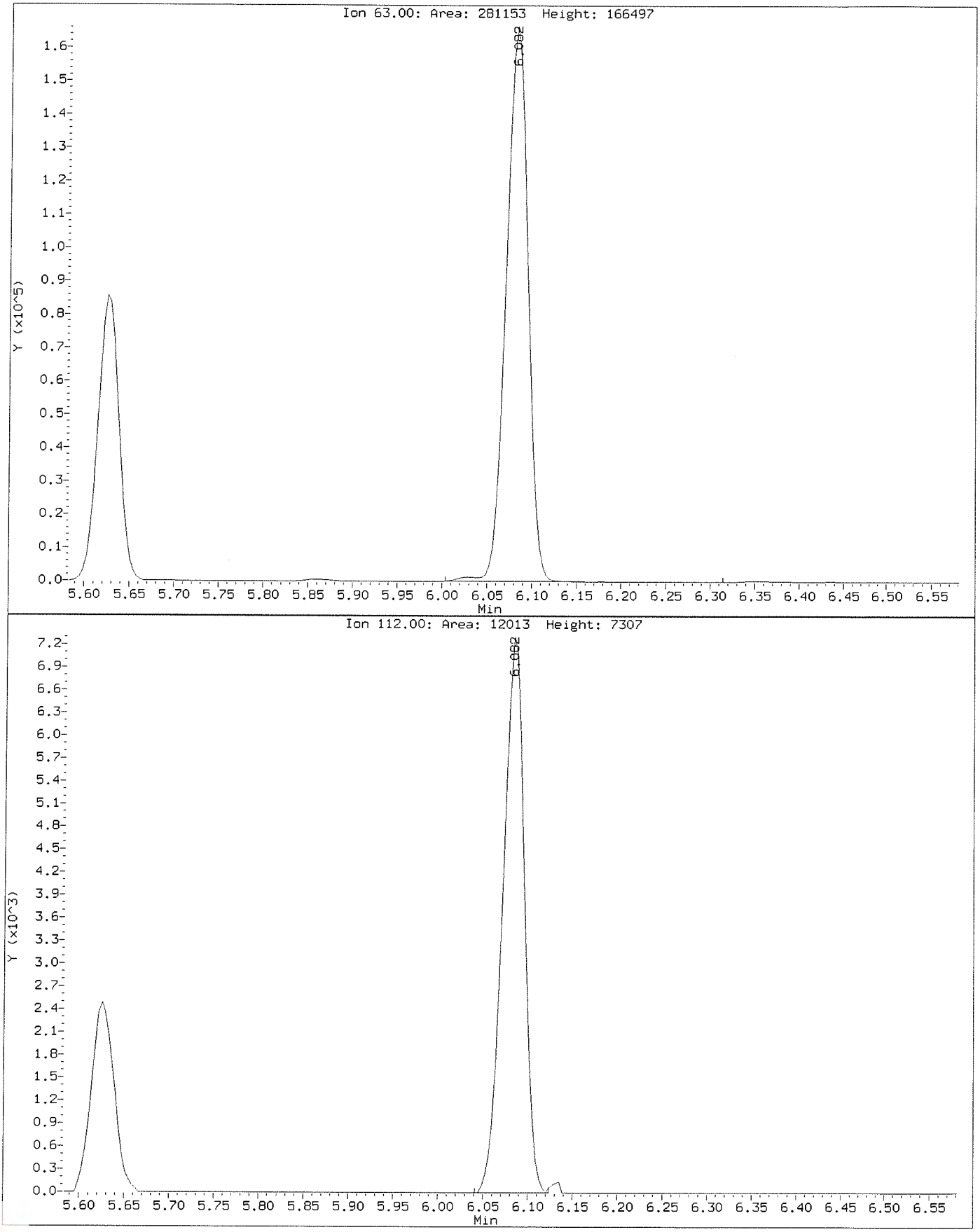
Instrument: VOA9.i
Client Sample ID: CCV_END

Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



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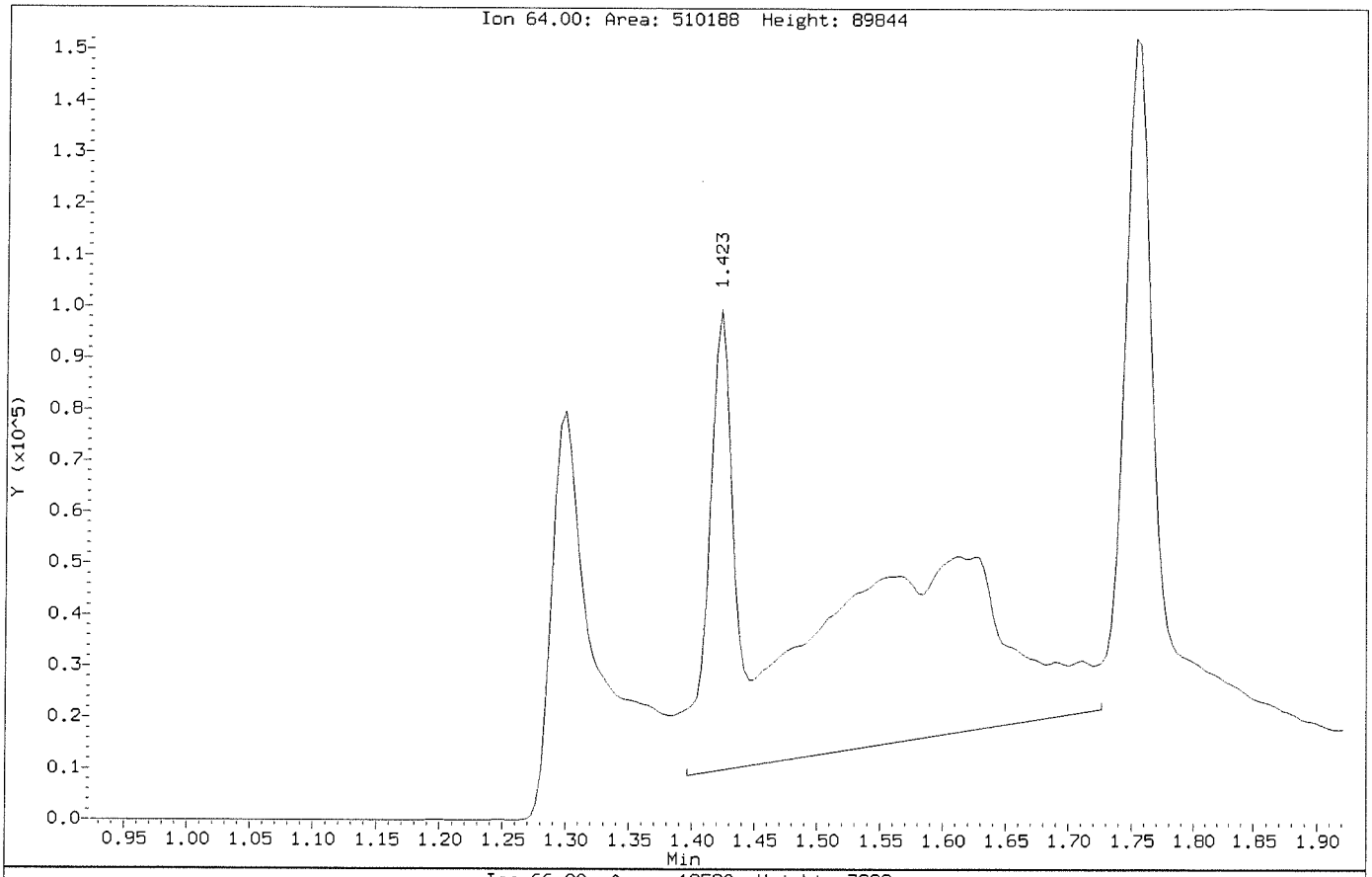
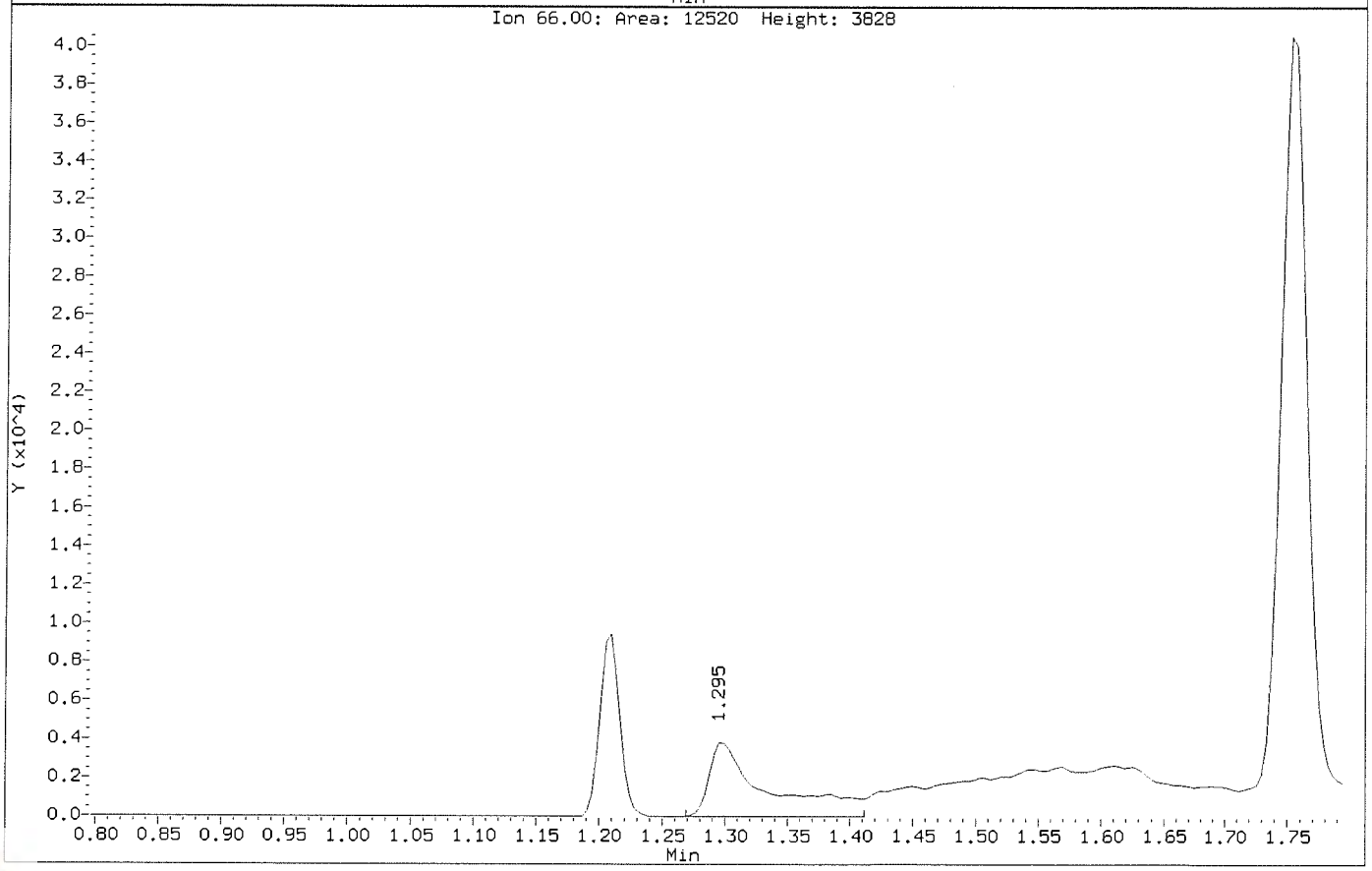
Injection Date: 20-DEC-2018 00:07
Instrument: VOA9.i
Client Sample ID: CCV_END

Compound: Chloroethane
CAS Number: 75-00-3





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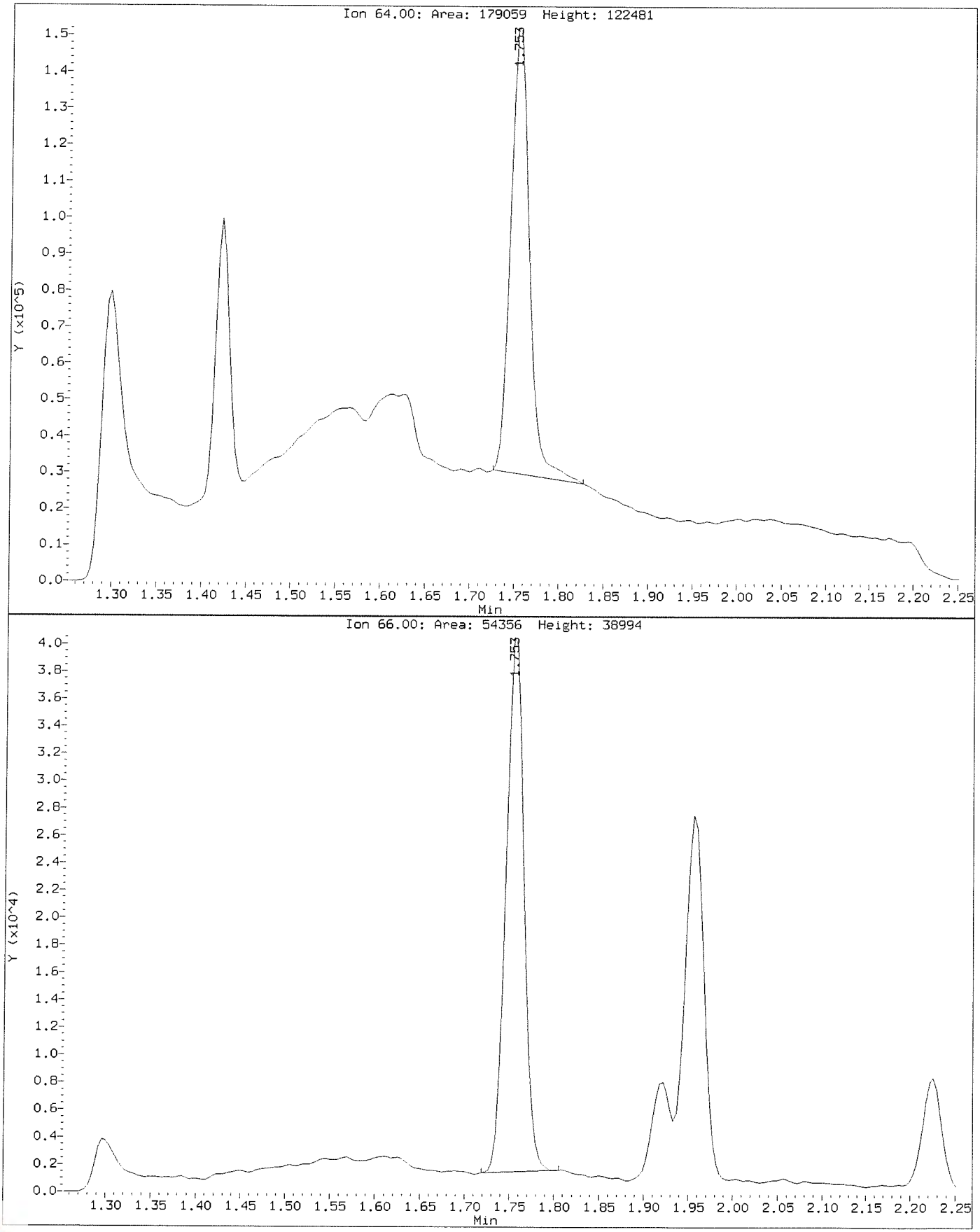
Injection Date: 20-DEC-2018 00:07
Instrument: VOA9.i
Client Sample ID: CCV_END

Compound: Chloroethane
CAS Number: 75-00-3



HS18120569 LHAAP58

ALS WO# HS18120569

Form 11 - INTERNAL STANDARD ASSOCIATION

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Instrument:ICPMS04

Mass	Analyte	Assoc Int Standard 1	Assoc Int Standard 2	Mode
9	Beryllium	Lithium		Ar
11	Boron	Lithium		Ar
23	Sodium	Germanium		Ar
24	Magnesium	Germanium		Ar
27	Aluminum	Germanium		Ar
39	Potassium	Germanium		Ar
44	Calcium	Germanium		ArHe
47	Titanium	Germanium		Ar
51	Vanadium	Germanium		ArHe
52	Chromium	Germanium		ArHe
55	Manganese	Germanium		ArHe
56	Iron	Germanium		ArHe
59	Cobalt	Germanium		ArHe
60	Nickel	Germanium		ArHe
63	Copper	Germanium		ArHe
66	Zinc	Germanium		ArHe
75	Arsenic	Germanium		ArHe
78	Selenium	Germanium		ArHe
88	Strontium	Germanium		Ar
95	Molybdenum	Germanium		Ar
105	Palladium	Germanium		Ar
107	Silver	Germanium		Ar
111	Cadmium	Indium		Ar
118	Tin	Germanium		Ar
121	Antimony	Germanium		ArHe
135	Barium	Indium		Ar
203	Thallium	Bismuth		Ar
208	Lead	Bismuth		Ar

Form 11 - INTERNAL STANDARD ASSOCIATION

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Instrument:ICPMS05

Mass	Analyte	Assoc Int Standard 1	Assoc Int Standard 2	Mode
9	Beryllium	Lithium		Ar
11	Boron	Lithium		Ar
23	Sodium	Germanium		Ar
24	Magnesium	Germanium		Ar
27	Aluminum	Germanium		Ar
39	Potassium	Germanium		Ar
44	Calcium	Germanium		Ar
47	Titanium	Germanium		Ar
51	Vanadium	Germanium		ArHe
52	Chromium	Germanium		ArHe
55	Manganese	Germanium		ArHe
56	Iron	Germanium		ArHe
59	Cobalt	Germanium		ArHe
60	Nickel	Germanium		ArHe
63	Copper	Germanium		ArHe
66	Zinc	Germanium		ArHe
75	Arsenic	Germanium		ArHe
78	Selenium	Germanium		ArHe
88	Strontium	Germanium		Ar
95	Molybdenum	Germanium		Ar
105	Palladium	Germanium		Ar
107	Silver	Germanium		Ar
114	Cadmium	Indium		Ar
118	Tin	Germanium		Ar
121	Antimony	Germanium		ArHe
137	Barium	Indium		Ar
205	Thallium	Bismuth		Ar
208	Lead	Bismuth		Ar

FORM 12 - PREPARATION LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569
Start Date: 19-Dec-2018 13:00 End Date: 19-Dec-2018 17:00

Batch ID: 135804
Prep Code: 3010A
Method: SW3010A
Technician:

SampID	ClientID	Matrix	Init Wt	Init Vol	FinalVol (mL)	PrepFac
HS18120569-01	35AWW20_121018	Groundwater		10	10	1
HS18120569-02	35AWW24_121018	Groundwater		10	10	1
HS18120569-03	35AWW19_121018	Groundwater		10	10	1
HS18120569-04	35AWW23_121018	Groundwater		10	10	1
HS18120569-05	LHSMW07_121018	Groundwater		10	10	1
HS18120913-04MS				10	10	1
HS18120913-04MSD				10	10	1
HS18120913-04PDS				10	10	1
HS18120913-04SD				10	10	1
LCS-135804				10	10	1
MBLK-135804				10	10	1

FORM 12 - PREPARATION LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569
Start Date: 19-Dec-2018 13:00 End Date: 19-Dec-2018 17:00

Batch ID: 135805
Prep Code: 3010A Diss
Method: SW3010A
Technician:

SampID	ClientID	Matrix	Init Wt	Init Vol	FinalVol (mL)	PrepFac
HS18120569-01	35AWW20_121018	Groundwater		10	10	1
HS18120569-02	35AWW24_121018	Groundwater		10	10	1
HS18120569-03	35AWW19_121018	Groundwater		10	10	1
HS18120569-04	35AWW23_121018	Groundwater		10	10	1
HS18120569-05	LHSMW07_121018	Groundwater		10	10	1
HS18120927-08MS				10	10	1
HS18120927-08MSD				10	10	1
HS18120927-08PDS				10	10	1
HS18120927-08SD				10	10	1
LCS-135805				10	10	1
MBLK-135805				10	10	1

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569
Start Date: 21-Dec-2018 End Date: 22-Dec-2018

Run ID:ICPMS04_329719
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CAL BLK	1	21-Dec-2018 12:57	014CALB.d_4877193	FE MN
2/10/200	1	21-Dec-2018 12:59	015CALS.d_4877194	FE MN
5/25/500	1	21-Dec-2018 13:01	016CALS.d_4877195	FE MN
10/50/1000	1	21-Dec-2018 13:03	017CALS.d_4877196	FE MN
100/500/10K	1	21-Dec-2018 13:06	018CALS.d_4877197	FE MN
200/1000/20K	1	21-Dec-2018 13:08	019CALS.d_4877198	FE MN
ICV	1	21-Dec-2018 13:12	021_ICV.d_4877200	FE MN
LLICV2	1	21-Dec-2018 13:14	022SMPL.d_4877201	FE MN
LLICV5	1	21-Dec-2018 13:17	023LICV.d_4877202	FE MN
ICB	1	21-Dec-2018 13:19	024_ICB.d_4877203	FE MN
ICSA	1	21-Dec-2018 13:36	025ICSA.d_4877204	FE MN
ICSAB	1	21-Dec-2018 13:38	026ICSB.d_4877205	FE MN
CCV 1	1	21-Dec-2018 14:07	038_CCV.d_4877419	FE MN
CCB 1	1	21-Dec-2018 14:09	039_CCB.d_4877420	FE MN
CCB 2	1	21-Dec-2018 14:47	051_CCB.d_4877517	FE MN
CCV 2	1	21-Dec-2018 15:12	053_CCV.d_4877562	FE MN
CCB 3	1	21-Dec-2018 15:45	064_CCB.d_4877606	FE MN
CCV 3	1	21-Dec-2018 15:57	066_CCV.d_4877806	FE MN
CCV 4	1	21-Dec-2018 16:59	076_CCV.d_4877824	FE MN
CCB 4	1	21-Dec-2018 17:01	077_CCB.d_4877825	FE MN
CCV 5	1	21-Dec-2018 17:32	088_CCV.d_4877944	FE MN
CCB 5	1	21-Dec-2018 17:34	089_CCB.d_4877945	FE MN
CCV 6	1	21-Dec-2018 18:09	093_CCV.d_4878002	FE MN
CCB 6	1	21-Dec-2018 18:11	094_CCB.d_4878003	FE MN
CCV 7	1	21-Dec-2018 18:44	105_CCV.d_4878027	FE MN
CCB 7	1	21-Dec-2018 18:46	106_CCB.d_4878028	FE MN
CCV 8	1	21-Dec-2018 19:16	117_CCV.d_4878173	FE MN
CCB 8	1	21-Dec-2018 19:18	118_CCB.d_4878174	FE MN
CCV 9	1	21-Dec-2018 19:51	129_CCV.d_4878188	FE MN
CCB 9	1	21-Dec-2018 19:53	130_CCB.d_4878189	FE MN
CCV 10	1	21-Dec-2018 20:23	141_CCV.d_4878292	FE MN
CCB 10	1	21-Dec-2018 20:25	142_CCB.d_4878293	FE MN
CCV 11	1	21-Dec-2018 20:40	148_CCV.d_4878299	FE MN
CCB 11	1	21-Dec-2018 20:42	149_CCB.d_4878300	FE MN
MBLK-135804	1	21-Dec-2018 21:07	151SMPL.d_4879116	FE MN
LCS-135804	1	21-Dec-2018 21:10	152SMPL.d_4879117	FE MN
35AWW20_121018	1	21-Dec-2018 21:12	153SMPL.d_4879118	FE
35AWW24_121018	1	21-Dec-2018 21:14	154SMPL.d_4879119	FE MN
35AWW19_121018	1	21-Dec-2018 21:16	155SMPL.d_4879120	FE
35AWW23_121018	1	21-Dec-2018 21:19	156SMPL.d_4879121	FE
LHSMW07_121018	1	21-Dec-2018 21:21	157SMPL.d_4879122	FE
CCV 12	1	21-Dec-2018 21:28	160_CCV.d_4879125	FE MN
CCB 12	1	21-Dec-2018 21:30	161_CCB.d_4879126	FE MN
CCV 13	1	21-Dec-2018 21:55	172_CCV.d_4879137	FE MN
CCB 13	1	21-Dec-2018 21:57	173_CCB.d_4879138	FE MN
ZZZZZZSD	5	21-Dec-2018 22:10	176SMPL.d_4879141	FE MN
ZZZZZZMS	1	21-Dec-2018 22:12	177SMPL.d_4879142	FE MN
ZZZZZZMSD	1	21-Dec-2018 22:14	178SMPL.d_4879143	FE MN
ZZZZZZPDS	1	21-Dec-2018 22:17	179SMPL.d_4879144	FE MN
CCV 14	1	21-Dec-2018 22:21	181_CCV.d_4879146	FE MN
CCB 14	1	21-Dec-2018 22:23	182_CCB.d_4879147	FE MN

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569
Start Date: 21-Dec-2018 End Date: 22-Dec-2018

Run ID:ICPMS04_329719
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CAL BLK	1	21-Dec-2018 22:57	193CALB.d_4879261	FE MN
2/10/200	1	21-Dec-2018 22:59	194CALS.d_4879262	FE MN
5/25/500	1	21-Dec-2018 23:01	195CALS.d_4879263	FE MN
10/50/1000	1	21-Dec-2018 23:03	196CALS.d_4879264	FE MN
100/500/10K	1	21-Dec-2018 23:06	197CALS.d_4879265	FE MN
200/1000/20K	1	21-Dec-2018 23:08	198CALS.d_4879269	FE MN
ICCV 15	1	21-Dec-2018 23:12	200_ICV.d_4879271	FE MN
LLCCV2	1	21-Dec-2018 23:15	201SMPL.d_4879272	FE MN
LLCCV5	1	21-Dec-2018 23:17	202LICV.d_4879273	FE MN
ICCB 15	1	21-Dec-2018 23:19	203_ICB.d_4879274	FE MN
MBLK-135805	1	21-Dec-2018 23:24	205SMPL.d_4879287	FE MN
LCS-135805	1	21-Dec-2018 23:26	206SMPL.d_4879288	FE MN
35AWW20_121018	1	21-Dec-2018 23:28	207SMPL.d_4879289	FE
35AWW24_121018	1	21-Dec-2018 23:30	208SMPL.d_4879290	FE MN
35AWW19_121018	1	21-Dec-2018 23:33	209SMPL.d_4879291	FE
35AWW23_121018	1	21-Dec-2018 23:35	210SMPL.d_4879292	FE
LHSMW07_121018	1	21-Dec-2018 23:37	211SMPL.d_4879293	FE
CCV 16	1	21-Dec-2018 23:42	213_CCV.d_4879295	FE MN
CCB 16	1	21-Dec-2018 23:44	214_CCB.d_4879296	FE MN
CCV 17	1	22-Dec-2018 00:02	222_CCV.d_4879304	FE MN
CCB 17	1	22-Dec-2018 00:04	223_CCB.d_4879305	FE MN
CCV 18	1	22-Dec-2018 00:36	231_CCV.d_4879319	FE MN
CCB 18	1	22-Dec-2018 00:38	232_CCB.d_4879320	FE MN
ZZZZZZSD	50	22-Dec-2018 00:43	234SMPL.d_4879322	FE MN
ZZZZZZMS	10	22-Dec-2018 00:45	235SMPL.d_4879323	FE MN
ZZZZZZMSD	10	22-Dec-2018 00:47	236SMPL.d_4879324	FE MN
ZZZZZZPDS	10	22-Dec-2018 00:50	237SMPL.d_4879325	FE MN
CCV 19	1	22-Dec-2018 00:56	240_CCV.d_4879328	FE MN
CCB 19	1	22-Dec-2018 00:59	241_CCB.d_4879329	FE MN
LLICV2	1	22-Dec-2018 01:01	242SMPL.d_4879330	FE MN
LLICV5	1	22-Dec-2018 01:03	243LICV.d_4879331	FE MN
ICSA	1	22-Dec-2018 01:05	244ICSA.d_4879332	FE MN
ICSAB	1	22-Dec-2018 01:08	245ICSB.d_4879333	FE MN

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569
Start Date: 24-Dec-2018 End Date: 25-Dec-2018

Run ID:ICPMS05_329812
Instrument:ICPMS05
Method:

Sample No.	D/F	Time	FileID	Analytes
ICPMS05_329812_Tune	1	24-Dec-2018 00:00	ICPMS05_329812_Tune_1	
CAL BLK	1	24-Dec-2018 11:33	013CALB.d_4879781	MN
2/10/200	1	24-Dec-2018 11:35	014CALS.d_4879782	MN
5/25/500	1	24-Dec-2018 11:37	015CALS.d_4879783	MN
10/50/1000	1	24-Dec-2018 11:39	016CALS.d_4879784	MN
100/500/10K	1	24-Dec-2018 11:41	017CALS.d_4879785	MN
200/1000/20K	1	24-Dec-2018 11:43	018CALS.d_4879786	MN
LLICV2	1	24-Dec-2018 11:49	021SMPL.d_4879789	MN
LLICV5	1	24-Dec-2018 11:51	022LICV.d_4879790	MN
ICB	1	24-Dec-2018 11:53	023_ICB.d_4879791	FE MN
ICV	1	24-Dec-2018 12:13	025_ICV.d_4879793	FE MN
ICSA	1	24-Dec-2018 12:27	026ICSA.d_4879794	MN
ICSAB	1	24-Dec-2018 12:29	027ICSB.d_4879795	MN
CCV 1	1	24-Dec-2018 13:12	039_CCV.d_4879947	FE MN
CCB 1	1	24-Dec-2018 13:14	040_CCB.d_4879948	FE MN
35AWW20_121018	50	24-Dec-2018 13:26	043SMPL.d_4880202	MN
35AWW19_121018	50	24-Dec-2018 13:28	044SMPL.d_4880203	MN
35AWW23_121018	100	24-Dec-2018 13:30	045SMPL.d_4880204	MN
LHSMW07_121018	100	24-Dec-2018 13:32	046SMPL.d_4880205	MN
CCV 2	1	24-Dec-2018 13:42	051_CCV.d_4880210	FE MN
CCB 2	1	24-Dec-2018 13:44	052_CCB.d_4880211	FE MN
CCV 3	1	24-Dec-2018 13:46	053_CCV.d_4880212	FE MN
CCB 3	1	24-Dec-2018 13:48	054_CCB.d_4880213	FE MN
35AWW20_121018	50	24-Dec-2018 13:50	055SMPL.d_4880256	MN
35AWW19_121018	50	24-Dec-2018 13:52	056SMPL.d_4880257	MN
35AWW23_121018	100	24-Dec-2018 13:54	057SMPL.d_4880258	MN
LHSMW07_121018	100	24-Dec-2018 13:56	058SMPL.d_4880259	MN
CCV 4	1	24-Dec-2018 14:10	065_CCV.d_4880266	FE MN
CCB 4	1	24-Dec-2018 14:12	066_CCB.d_4880267	FE MN
CCV 5	1	24-Dec-2018 14:20	070_CCV.d_4880594	FE MN
CCB 5	1	24-Dec-2018 14:22	071_CCB.d_4880595	FE MN
CCB 6	1	24-Dec-2018 17:00	083_CCB.d_4880607	FE MN
CCV 6	1	24-Dec-2018 17:05	084_CCV.d_4880608	FE MN
CCB 7	1	24-Dec-2018 17:24	092_CCB.d_4880616	FE MN
CCV 7	1	24-Dec-2018 17:32	094_CCV.d_4880618	FE MN
CCV 8	1	24-Dec-2018 17:50	103_CCV.d_4880669	FE MN
CCB 8	1	24-Dec-2018 17:52	104_CCB.d_4880670	FE MN
CCV 9	1	24-Dec-2018 18:33	113_CCV.d_4880729	FE MN
CCB 9	1	24-Dec-2018 18:35	114_CCB.d_4880730	FE MN
CCV 10	1	24-Dec-2018 18:49	118_CCV.d_4880734	FE MN
CCB 10	1	24-Dec-2018 18:51	119_CCB.d_4880735	FE MN
CAL BLK	1	24-Dec-2018 18:59	123CALB.d_4881006	MN
2/10/200	1	24-Dec-2018 19:01	124CALS.d_4881007	MN
5/25/500	1	24-Dec-2018 19:03	125CALS.d_4881008	MN
10/50/1000	1	24-Dec-2018 19:05	126CALS.d_4881009	MN
100/500/10K	1	24-Dec-2018 19:07	127CALS.d_4881010	MN
200/1000/20K	1	24-Dec-2018 19:09	128CALS.d_4881011	MN
ICCV 11	1	24-Dec-2018 19:11	129_ICV.d_4881012	FE MN
LLCCV5	1	24-Dec-2018 19:15	131LICV.d_4881014	MN
ICCB 11	1	24-Dec-2018 19:17	132_ICB.d_4881015	FE MN
LLCCV2	1	24-Dec-2018 19:19	133SMPL.d_4881016	MN

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569
Start Date: 24-Dec-2018 End Date: 25-Dec-2018

Run ID:ICPMS05_329812
Instrument:ICPMS05
Method:

Sample No.	D/F	Time	FileID	Analytes
CCB 12	1	24-Dec-2018 19:33	138_CCB.d_4881048	FE MN
CCV 12	1	24-Dec-2018 19:41	141_CCV.d_4881051	FE MN
CCV 13	1	24-Dec-2018 19:53	147_CCV.d_4881057	FE MN
CCB 13	1	24-Dec-2018 19:55	148_CCB.d_4881058	FE MN
CCV 14	1	24-Dec-2018 20:17	159_CCV.d_4881069	FE MN
CCB 14	1	24-Dec-2018 20:19	160_CCB.d_4881070	FE MN
CCV 15	1	24-Dec-2018 20:34	168_CCV.d_4881078	FE MN
CCB 15	1	24-Dec-2018 20:36	169_CCB.d_4881079	FE MN
CCV 16	1	24-Dec-2018 20:54	178_CCV.d_4881088	FE MN
CCB 16	1	24-Dec-2018 20:56	179_CCB.d_4881089	FE MN
CCV 17	1	24-Dec-2018 21:18	190_CCV.d_4881167	FE MN
CCB 17	1	24-Dec-2018 21:20	191_CCB.d_4881168	FE MN
CCV 18	1	24-Dec-2018 21:36	199_CCV.d_4881176	FE MN
CCB 18	1	24-Dec-2018 21:38	200_CCB.d_4881177	FE MN
CCV 19	1	24-Dec-2018 22:00	211_CCV.d_4881188	FE MN
CCB 19	1	24-Dec-2018 22:02	212_CCB.d_4881189	FE MN
CCV 20	1	24-Dec-2018 22:23	223_CCV.d_4881200	FE MN
CCB 20	1	24-Dec-2018 22:25	224_CCB.d_4881201	FE MN
CAL BLK	1	24-Dec-2018 22:39	231CALB.d_4881324	MN
2/10/200	1	24-Dec-2018 22:41	232CALS.d_4881325	MN
5/25/500	1	24-Dec-2018 22:43	233CALS.d_4881326	MN
10/50/1000	1	24-Dec-2018 22:45	234CALS.d_4881327	MN
100/500/10K	1	24-Dec-2018 22:47	235CALS.d_4881328	MN
200/1000/20K	1	24-Dec-2018 22:49	236CALS.d_4881329	MN
ICCV 21	1	24-Dec-2018 22:51	237_ICV.d_4881330	FE MN
LLCCV2	1	24-Dec-2018 22:53	238SMPL.d_4881331	MN
LLCCV5	1	24-Dec-2018 22:55	239LICV.d_4881332	MN
ICCB 21	1	24-Dec-2018 22:57	240_ICB.d_4881333	FE MN
CCV 22	1	24-Dec-2018 23:21	252_CCV.d_4881399	FE MN
CCB 22	1	24-Dec-2018 23:23	253_CCB.d_4881400	FE MN
CCV 23	1	24-Dec-2018 23:45	264_CCV.d_4881411	FE MN
CCB 23	1	24-Dec-2018 23:47	265_CCB.d_4881412	FE MN
CCV 24	1	24-Dec-2018 23:53	268_CCV.d_4881415	FE MN
CCB 24	1	24-Dec-2018 23:55	269_CCB.d_4881416	FE MN
LLCCV5	1	24-Dec-2018 23:57	270LICV.d_4881417	MN
LLCCV2	1	24-Dec-2018 23:59	271SMPL.d_4881418	MN
ICSA	1	25-Dec-2018 00:01	272ICSA.d_4881419	MN
ICSAB	1	25-Dec-2018 00:03	273ICSB.d_4881420	MN

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

ICV	Date: 21-Dec-2018 13:12		Seq: 4877200	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10574.02	106	90-110	
Manganese	100	103.623	104	90-110	

CCV1	Date: 21-Dec-2018 14:07		Seq: 4877419	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10839.127	108	90-110	
Manganese	100	103.031	103	90-110	

CCV2	Date: 21-Dec-2018 15:12		Seq: 4877562	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10556.643	106	90-110	
Manganese	100	103.792	104	90-110	

CCV3	Date: 21-Dec-2018 15:57		Seq: 4877806	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10257.711	103	90-110	
Manganese	100	101.308	101	90-110	

CCV4	Date: 21-Dec-2018 16:59		Seq: 4877824	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10046.499	100	90-110	
Manganese	100	96.481	97	90-110	

CCV5	Date: 21-Dec-2018 17:32		Seq: 4877944	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9882.79	99	90-110	
Manganese	100	95.811	96	90-110	

CCV6	Date: 21-Dec-2018 18:09		Seq: 4878002	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10409.029	104	90-110	
Manganese	100	96.201	96	90-110	

CCV7	Date: 21-Dec-2018 18:44		Seq: 4878027	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10070.795	101	90-110	
Manganese	100	100.473	100	90-110	

CCV8	Date: 21-Dec-2018 19:16		Seq: 4878173	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10124.033	101	90-110	
Manganese	100	94.326	94	90-110	

CCV9	Date: 21-Dec-2018 19:51		Seq: 4878188	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10071.437	101	90-110	
Manganese	100	99.427	99	90-110	

CCV10	Date: 21-Dec-2018 20:23		Seq: 4878292	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9853.148	99	90-110	
Manganese	100	94.9	95	90-110	

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

CCV11	Date: 21-Dec-2018 20:40		Seq: 4878299	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10376.441	104	90-110	
Manganese	100	92.065	92	90-110	

CCV12	Date: 21-Dec-2018 21:28		Seq: 4879125	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10422.832	104	90-110	
Manganese	100	98.617	99	90-110	

CCV13	Date: 21-Dec-2018 21:55		Seq: 4879137	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9696.836	97	90-110	
Manganese	100	93.952	94	90-110	

CCV14	Date: 21-Dec-2018 22:21		Seq: 4879146	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9974.439	100	90-110	
Manganese	100	94.062	94	90-110	

ICCV15	Date: 21-Dec-2018 23:12		Seq: 4879271	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9759.1	98	90-110	
Manganese	100	103.783	104	90-110	

CCV16	Date: 21-Dec-2018 23:42		Seq: 4879295	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10276.043	103	90-110	
Manganese	100	97.859	98	90-110	

CCV17	Date: 22-Dec-2018 00:02		Seq: 4879304	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9312.665	93	90-110	
Manganese	100	102.304	102	90-110	

CCV18	Date: 22-Dec-2018 00:36		Seq: 4879319	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9837.847	98	90-110	
Manganese	100	100.804	101	90-110	

CCV19	Date: 22-Dec-2018 00:56		Seq: 4879328	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9418.586	94	90-110	
Manganese	100	98.991	99	90-110	

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

ICV	Date: 24-Dec-2018 12:13		Seq: 4879793	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.824	100	90-110	

CCV1	Date: 24-Dec-2018 13:12		Seq: 4879947	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	93.055	93	90-110	

CCV2	Date: 24-Dec-2018 13:42		Seq: 4880210	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	94.979	95	90-110	

CCV3	Date: 24-Dec-2018 13:46		Seq: 4880212	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	93.043	93	90-110	

CCV4	Date: 24-Dec-2018 14:10		Seq: 4880266	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	94.844	95	90-110	

CCV5	Date: 24-Dec-2018 14:20		Seq: 4880594	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	93.871	94	90-110	

CCV6	Date: 24-Dec-2018 17:05		Seq: 4880608	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.304	98	90-110	

CCV7	Date: 24-Dec-2018 17:32		Seq: 4880618	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.278	98	90-110	

CCV8	Date: 24-Dec-2018 17:50		Seq: 4880669	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.614	99	90-110	

CCV9	Date: 24-Dec-2018 18:33		Seq: 4880729	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	97.733	98	90-110	

CCV10	Date: 24-Dec-2018 18:49		Seq: 4880734	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	96.382	96	90-110	

ICCV11	Date: 24-Dec-2018 19:11		Seq: 4881012	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.04	99	90-110	

CCV12	Date: 24-Dec-2018 19:41		Seq: 4881051	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	102.015	102	90-110	

CCV13	Date: 24-Dec-2018 19:53		Seq: 4881057	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.325	99	90-110	

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

CCV14	Date: 24-Dec-2018 20:17		Seq: 4881069	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	101.031	101	90-110	

CCV15	Date: 24-Dec-2018 20:34		Seq: 4881078	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	101.139	101	90-110	

CCV16	Date: 24-Dec-2018 20:54		Seq: 4881088	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.897	100	90-110	

CCV17	Date: 24-Dec-2018 21:18		Seq: 4881167	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.277	98	90-110	

CCV18	Date: 24-Dec-2018 21:36		Seq: 4881176	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.544	99	90-110	

CCV19	Date: 24-Dec-2018 22:00		Seq: 4881188	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.793	99	90-110	

CCV20	Date: 24-Dec-2018 22:23		Seq: 4881200	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	97.133	97	90-110	

ICCV21	Date: 24-Dec-2018 22:51		Seq: 4881330	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	96.404	96	90-110	

CCV22	Date: 24-Dec-2018 23:21		Seq: 4881399	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.414	99	90-110	

CCV23	Date: 24-Dec-2018 23:45		Seq: 4881411	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.399	99	90-110	

CCV24	Date: 24-Dec-2018 23:53		Seq: 4881415	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	100.691	101	90-110	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

ICB	Date: 21-Dec-2018 13:19		Seq: 4877203	ICB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB1	Date: 21-Dec-2018 14:09		Seq: 4877420	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB2	Date: 21-Dec-2018 14:47		Seq: 4877517	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB3	Date: 21-Dec-2018 15:45		Seq: 4877606	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB4	Date: 21-Dec-2018 17:01		Seq: 4877825	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB5	Date: 21-Dec-2018 17:34		Seq: 4877945	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB6	Date: 21-Dec-2018 18:11		Seq: 4878003	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB7	Date: 21-Dec-2018 18:46		Seq: 4878028	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	0.884	0.7	5	J	

CCB8	Date: 21-Dec-2018 19:18		Seq: 4878174	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB9	Date: 21-Dec-2018 19:53		Seq: 4878189	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB10	Date: 21-Dec-2018 20:25		Seq: 4878293	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB11	Date: 21-Dec-2018 20:42		Seq: 4878300	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

CCB11	Date: 21-Dec-2018 20:42		Seq: 4878300	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	
MBLK-135804	Date: 21-Dec-2018 21:07		Seq: 4879116	MBLK	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB12	Date: 21-Dec-2018 21:30		Seq: 4879126	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB13	Date: 21-Dec-2018 21:57		Seq: 4879138	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB14	Date: 21-Dec-2018 22:23		Seq: 4879147	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
ICCB15	Date: 21-Dec-2018 23:19		Seq: 4879274	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
MBLK-135805	Date: 21-Dec-2018 23:24		Seq: 4879287	MBLK	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB16	Date: 21-Dec-2018 23:44		Seq: 4879296	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	23.09	12	200	J	
Manganese	5	0.7	5	U	
CCB17	Date: 22-Dec-2018 00:04		Seq: 4879305	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	12.66	12	200	J	
Manganese	5	0.7	5	U	
CCB18	Date: 22-Dec-2018 00:38		Seq: 4879320	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	25.87	12	200	J	
Manganese	5	0.7	5	U	
CCB19	Date: 22-Dec-2018 00:59		Seq: 4879329	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	17.81	12	200	J	
Manganese	5	0.7	5	U	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

ICB	Date: 24-Dec-2018 11:53		Seq: 4879791	ICB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB1	Date: 24-Dec-2018 13:14		Seq: 4879948	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB2	Date: 24-Dec-2018 13:44		Seq: 4880211	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB3	Date: 24-Dec-2018 13:48		Seq: 4880213	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB4	Date: 24-Dec-2018 14:12		Seq: 4880267	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB5	Date: 24-Dec-2018 14:22		Seq: 4880595	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB6	Date: 24-Dec-2018 17:00		Seq: 4880607	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB7	Date: 24-Dec-2018 17:24		Seq: 4880616	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB8	Date: 24-Dec-2018 17:52		Seq: 4880670	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB9	Date: 24-Dec-2018 18:35		Seq: 4880730	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB10	Date: 24-Dec-2018 18:51		Seq: 4880735	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

ICCB11	Date: 24-Dec-2018 19:17		Seq: 4881015	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB12	Date: 24-Dec-2018 19:33		Seq: 4881048	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.853	0.7	5	J	

CCB13	Date: 24-Dec-2018 19:55		Seq: 4881058	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.84	0.7	5	J	

CCB14	Date: 24-Dec-2018 20:19		Seq: 4881070	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.761	0.7	5	J	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

CCB15	Date: 24-Dec-2018 20:36		Seq: 4881079	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.884	0.7	5	J	

CCB16	Date: 24-Dec-2018 20:56		Seq: 4881089	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.829	0.7	5	J	

CCB17	Date: 24-Dec-2018 21:20		Seq: 4881168	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.804	0.7	5	J	

CCB18	Date: 24-Dec-2018 21:38		Seq: 4881177	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.909	0.7	5	J	

CCB19	Date: 24-Dec-2018 22:02		Seq: 4881189	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.897	0.7	5	J	

CCB20	Date: 24-Dec-2018 22:25		Seq: 4881201	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.803	0.7	5	J	

ICCB21	Date: 24-Dec-2018 22:57		Seq: 4881333	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB22	Date: 24-Dec-2018 23:23		Seq: 4881400	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.956	0.7	5	J	

CCB23	Date: 24-Dec-2018 23:47		Seq: 4881412	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	1.068	0.7	5	J	

CCB24	Date: 24-Dec-2018 23:55		Seq: 4881416	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	1.056	0.7	5	J	

Form 4 - ICP Interference Check Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

ICSA	Date: 21-Dec-2018 13:36	Seq: 4877204	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	100000	106000	106	
Manganese		0.99	0	

ICSAB	Date: 21-Dec-2018 13:38	Seq: 4877205	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	110000	111700	102	
Manganese	100	111.4	111	

ICSA	Date: 22-Dec-2018 01:05	Seq: 4879332	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	100000	95310	95.3	
Manganese		0.473	0	

ICSAB	Date: 22-Dec-2018 01:08	Seq: 4879333	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	110000	111000	101	
Manganese	100	105.3	105	

Form 4 - ICP Interference Check Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

ICSA	Date: 24-Dec-2018 12:27	Seq: 4879794	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese		0.675	0	

ICSAB	Date: 24-Dec-2018 12:29	Seq: 4879795	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese	100	107.8	108	

ICSA	Date: 25-Dec-2018 00:01	Seq: 4881419	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese		0.748	0	

ICSAB	Date: 25-Dec-2018 00:03	Seq: 4881420	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese	100	109.5	109	

Form 5A - Matrix Spike/Matrix Spike Duplicate Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Date Analyzed: 21-Dec-2018 22:14
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Matrix Spike: HS18120913-04MS — Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	MS Result	Spike Amount	% Rec	MSD Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Iron	10760	15560	5000	96.0	15340	5000	91.6	80-120	1.43	20
Manganese	65.87	113.5	50.00	95.3	108.4	50.00	85.0	80-120	4.65	20

Matrix Spike: HS18120927-08MS — Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	MS Result	Spike Amount	% Rec	MSD Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Iron	2000	4965	5000	97.3	4346	5000	84.9	75-125	13.3	20
Manganese	50.00	41.04	50.00	72.1	35.26	50.00	60.5	75-125	0	20

Form 5B - Post Digest Sample Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Date Analyzed: 21-Dec-2018 22:17
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Lab Sample ID: HS18120913-04PDS Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	PDS Result	Spike Amount	% Rec	% Rec Limits
Iron	10760	22170	10000	114	75-125
Manganese	65.87	163.2	100	97	75-125

Lab Sample ID: HS18120927-08PDS Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	PDS Result	Spike Amount	% Rec	% Rec Limits
Iron	0	99190	100000	99	75-125
Manganese	0	1104	1000	110	75-125

Form 7 - Laboratory Control Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Date Analyzed: 21-Dec-2018 21:10
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Lab Sample ID: LCS-135804 — Analysis Method: SW6020

Analyte	Spike Amount	LCS Result	% Rec	% Rec Limits
Iron	5000	4811	96	80-120
Manganese	50	47.29	95	80-120

Lab Sample ID: LCS-135805 — Analysis Method: SW6020

Analyte	Spike Amount	LCS Result	% Rec	% Rec Limits
Iron	5000	4612	92	80-120
Manganese	50	47.44	95	80-120

Form 8 - ICP Serial Dilutions

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120569

Date Analyzed: 21-Dec-2018 22:10
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Lab Sample ID: HS18120913-04SD
Client Sample ID:
Analysis Method: SW6020

Analyte	Sample Result	C	SD Result	C	RPD	Q
Iron	10760		11500		7	
Manganese	65.87		66.12		0	

Lab Sample ID: HS18120927-08SD
Client Sample ID:
Analysis Method: SW6020

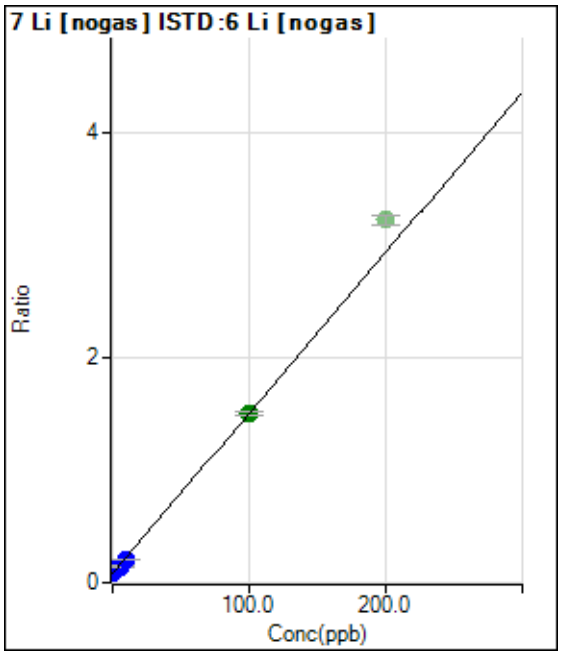
Analyte	Sample Result	C	SD Result	C	RPD	Q
Iron	0	U	620.1	J	514	
Manganese	0	U	0	U	0	

Calibration for 020_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\122418A.b\
Analysis File: 122418A.batch.bin
DA Date-Time: 2018-12-24 19:19:15
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	013CALB.d	CAL BLK	2018-12-24 11:33:27
2	014CALS.d	2/10/200	2018-12-24 11:35:28
3	015CALS.d	5/25/500	2018-12-24 11:37:27
4	016CALS.d	10/50/1000	2018-12-24 11:39:27
5	017CALS.d	100/500/10K	2018-12-24 11:41:25
6	018CALS.d	200/1000/20K	2018-12-24 11:43:24
7			

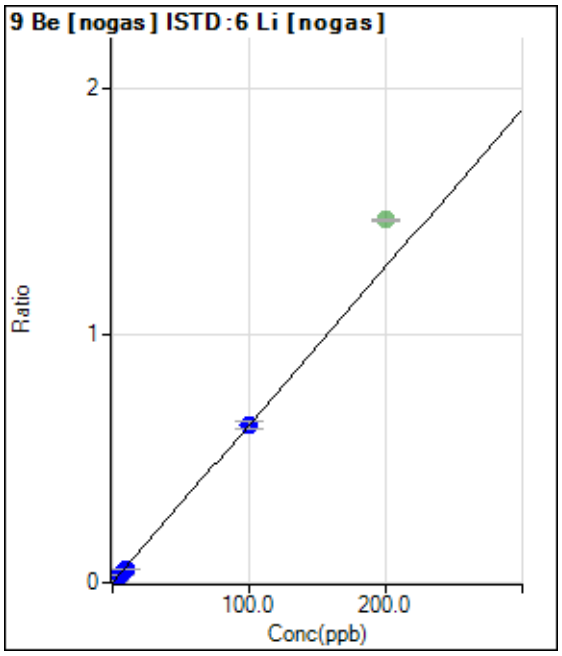
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	111277.55	0.0820	P	5.2
2	☐	2.000	2.088	150039.46	0.1118	P	5.6
3	☐	5.000	4.342	198349.20	0.1440	P	3.6
4	☐	10.000	8.841	280071.44	0.2082	P	0.7
5	☐	100.000	100.147	1883791.43	1.5117	A	2.5
6	☑	200.000		3654384.84	3.2289	A	2.4
7	☐	1.000					

y = 0.0143 * x + 0.0820
R = 0.9999
DL = 0.8936
BEC = 5.741

Weight: <None>
Min Conc: <None>

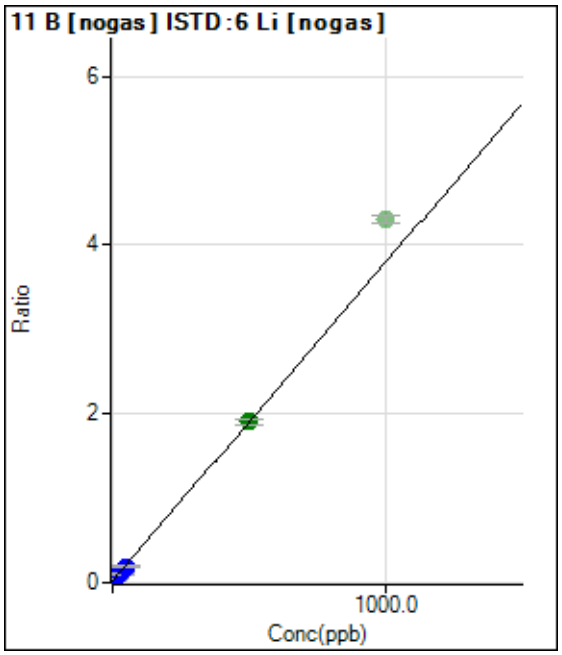


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56.67	0.0000	P	17.
2	☐	2.000	1.830	15760.07	0.0117	P	2.6
3	☐	5.000	4.323	38124.79	0.0277	P	2.0
4	☐	10.000	8.875	76314.45	0.0567	P	2.9
5	☐	100.000	100.150	796335.72	0.6397	P	4.5
6	☑	200.000		1661599.45	1.4681	A	0.3
7	☐	1.000					

y = 0.0064 * x + 4.1581E-005
R = 0.9999
DL = 0.003466
BEC = 0.00651

Weight: <None>
Min Conc: <None>

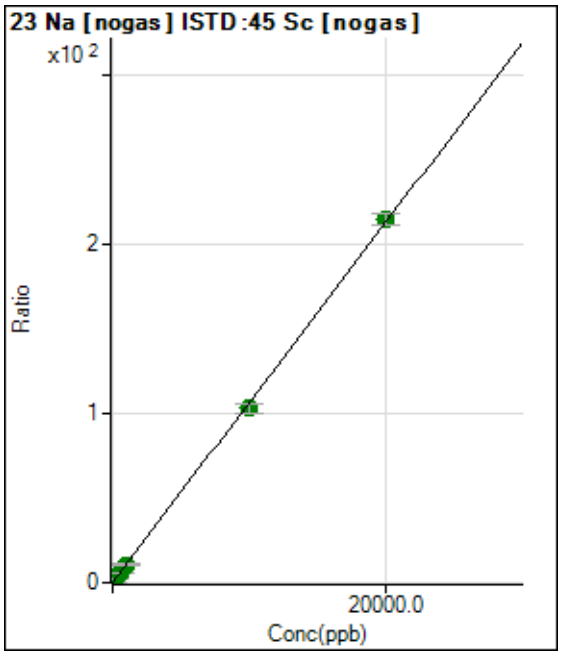
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30501.10	0.0225	P	5.1
2	☐	10.000	8.961	75501.49	0.0563	P	5.3
3	☐	25.000	21.386	141990.64	0.1031	P	5.2
4	☐	50.000	45.152	259170.40	0.1927	P	3.8
5	☐	500.000	500.686	2379058.14	1.9105	A	3.4
6	☑	1000.000		4863367.74	4.2970	A	2.1
7	☐	5.000					

y = 0.0038 * x + 0.0225
R = 1.0000
DL = 0.9088
BEC = 5.958

Weight: <None>
Min Conc: <None>

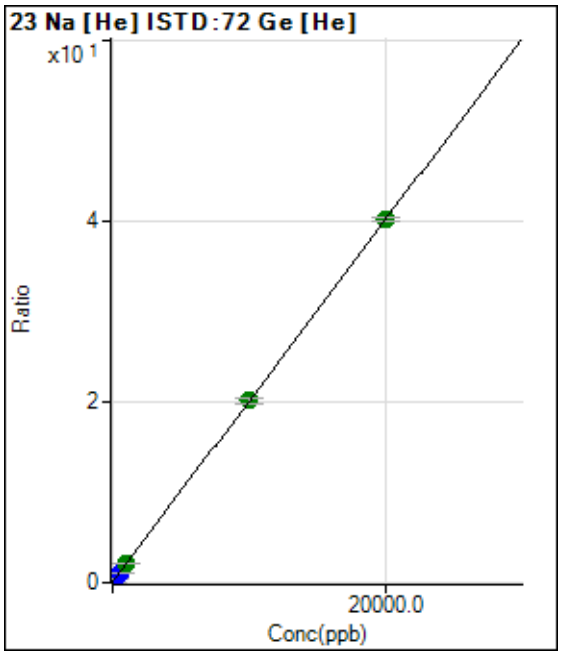


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	417456.77	0.1780	P	5.2
2	☐	200.000	197.753	5379648.04	2.2781	A	2.2
3	☐	500.000	497.504	12786651.07	5.4614	A	3.7
4	☐	1000.000	975.070	24675953.16	10.5330	A	7.1
5	☐	10000.00	9678.099	242452630.4	102.957	A	5.0
6	☐	20000.00	20162.282	494803094.4	214.296	A	3.1
7	☐	100.000					

y = 0.0106 * x + 0.1780
R = 0.9998
DL = 2.637
BEC = 16.76

Weight: <None>
Min Conc: <None>

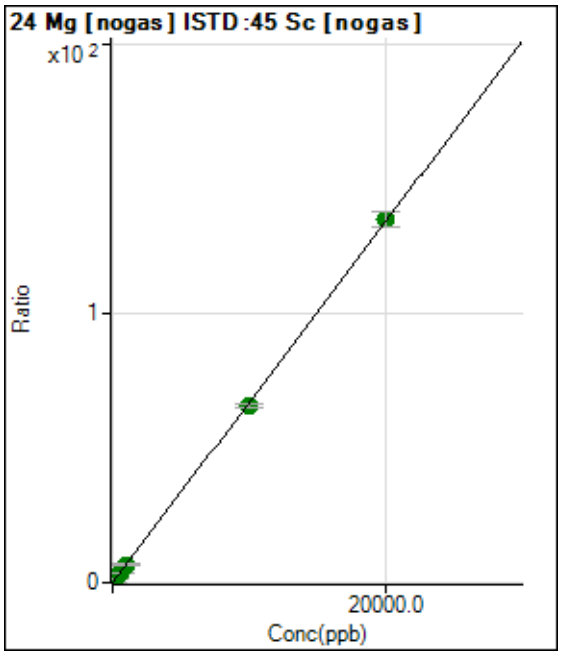
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	54678.81	0.0697	P	3.3
2	☐	200.000	189.988	360618.21	0.4508	P	2.2
3	☐	500.000	493.692	816355.53	1.0601	P	2.8
4	☐	1000.000	994.952	1592790.03	2.0657	A	3.1
5	☐	10000.00	10016.109	15131845.61	20.1637	A	2.6
6	☐	20000.00	19992.456	29835737.89	40.1780	A	1.2
7	☐	100.000					

y = 0.0020 * x + 0.0697
R = 1.0000
DL = 3.479
BEC = 34.73

Weight: <None>
Min Conc: <None>

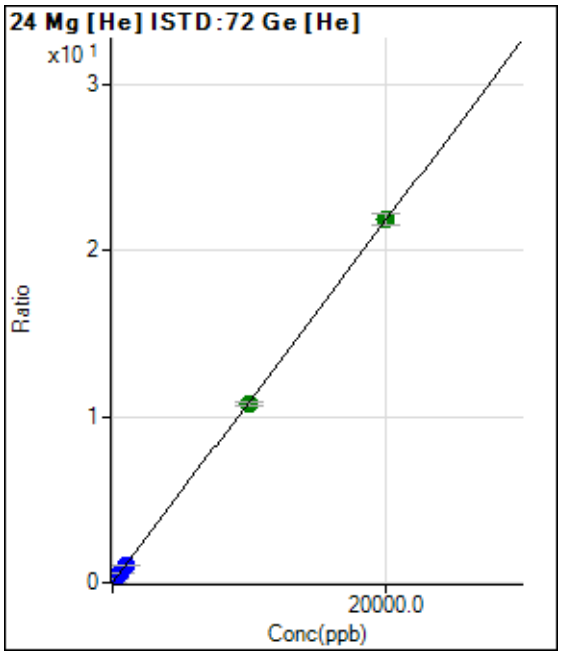


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5901.75	0.0025	P	6.9
2	☐	200.000	206.073	3271575.14	1.3859	A	5.2
3	☐	500.000	504.053	7926348.09	3.3863	A	4.9
4	☐	1000.000	994.333	15657513.37	6.6776	A	5.3
5	☐	10000.00	9795.789	154983028.4	65.7631	A	2.5
6	☐	20000.00	20102.227	311533323.6	134.951	A	4.3
7	☐	100.000					

y = 0.0067 * x + 0.0025
R = 0.9999
DL = 0.07734
BEC = 0.3751

Weight: <None>
Min Conc: <None>

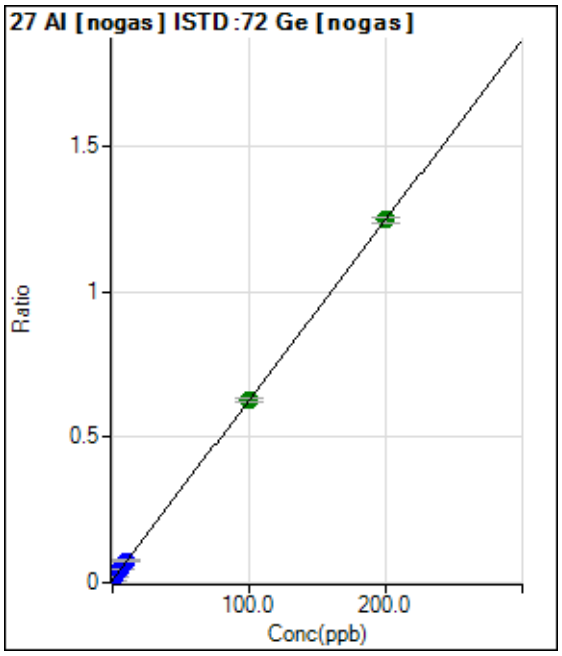
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	453.34	0.0006	P	18.
2	☐	200.000	193.705	169302.41	0.2116	P	0.5
3	☐	500.000	501.933	421390.51	0.5474	P	5.2
4	☐	1000.000	971.240	816215.90	1.0587	P	3.5
5	☐	10000.00	9892.844	8087589.05	10.7782	A	3.0
6	☐	20000.00	20055.031	16222332.26	21.8492	A	3.1
7	☐	100.000					

y = 0.0011 * x + 5.7837E-004
R = 1.0000
DL = 0.3001
BEC = 0.5309

Weight: <None>
Min Conc: <None>

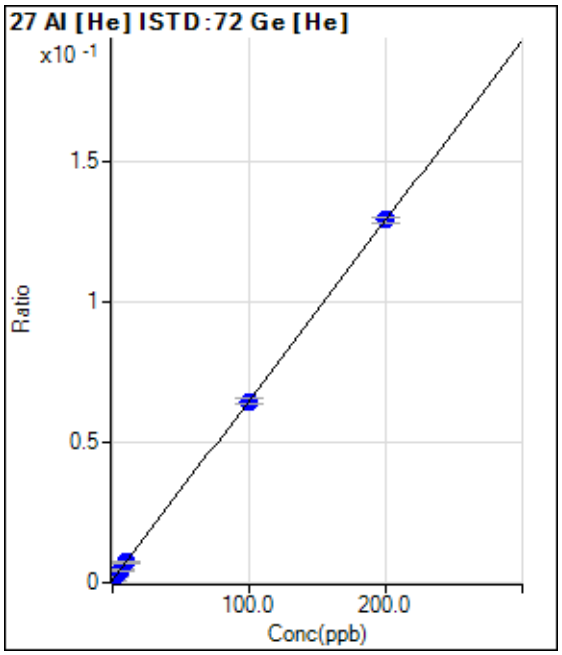


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27887.50	0.0089	P	3.7
2	☐	2.000	1.973	67747.78	0.0211	P	2.7
3	☐	5.000	6.059	146244.49	0.0464	P	1.3
4	☐	10.000	10.753	238007.68	0.0754	P	2.9
5	☐	100.000	99.846	1956520.08	0.6268	A	2.1
6	☐	200.000	200.013	3801721.92	1.2467	A	1.4
7	☐	1.000					

y = 0.0062 * x + 0.0089
R = 1.0000
DL = 0.1587
BEC = 1.433

Weight: <None>
Min Conc: <None>

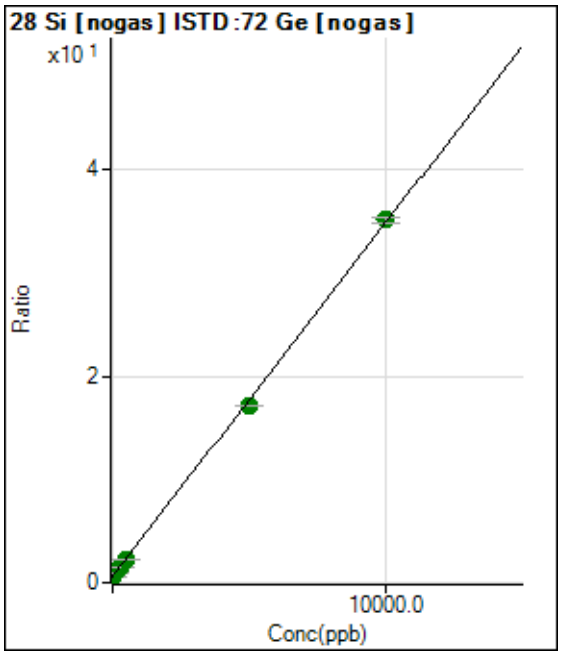
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.178	643.35	0.0008	P	9.4
2	☐	2.000	1.992	1766.78	0.0022	P	11.
3	☐	5.000	5.326	3350.35	0.0043	P	8.4
4	☐	10.000	10.204	5757.64	0.0075	P	9.5
5	☐	100.000	99.349	48475.43	0.0646	P	3.6
6	☐	200.000	200.307	96018.78	0.1293	P	1.5
7	☐	1.000					

y = 6.4090E-004 * x + 9.3424E-004
R = 1.0000
DL = 0.3609
BEC = 1.458

Weight: <None>
Min Conc: <None>

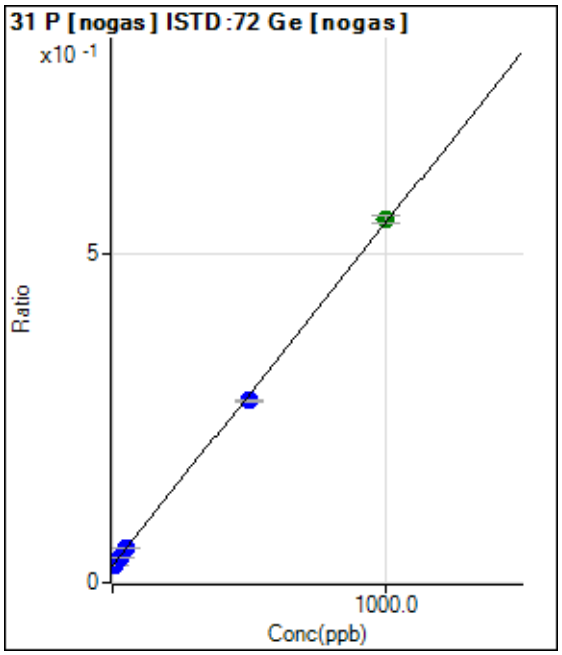


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1941965.44	0.6175	A	1.0
2	☐	100.000	90.473	2979669.96	0.9273	A	0.6
3	☐	250.000	241.405	4555456.60	1.4442	A	1.6
4	☐	500.000	477.424	7109444.47	2.2525	A	2.0
5	☐	5000.000	4831.629	53576002.53	17.1639	A	0.6
6	☐	10000.00	10085.624	107207228.4	35.1567	A	1.6
7	☐	5.000					

y = 0.0034 * x + 0.6175
R = 0.9998
DL = 5.362
BEC = 180.3

Weight: <None>
Min Conc: <None>

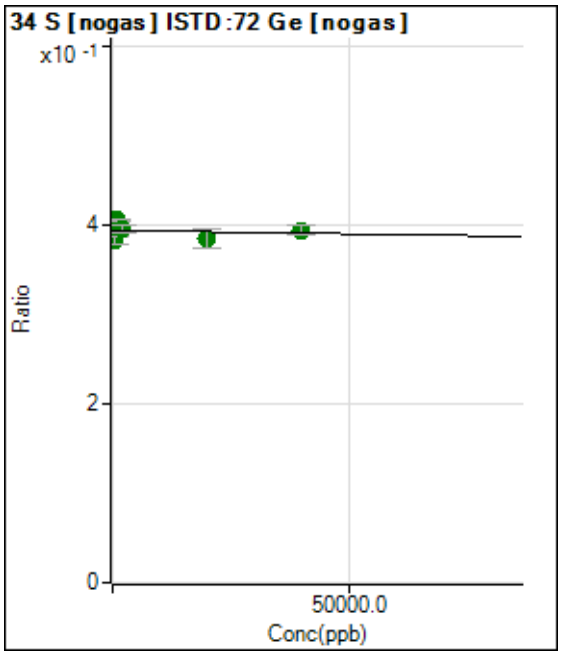
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	81129.62	0.0258	P	1.7
2	☐	10.000	-0.335	82335.14	0.0256	P	1.8
3	☐	25.000	25.323	122878.83	0.0390	P	2.1
4	☐	50.000	51.846	166448.38	0.0527	P	2.1
5	☐	500.000	481.240	861073.53	0.2759	P	0.5
6	☐	1000.000	1009.383	1677933.41	0.5503	A	2.2
7	☐	5.000					

y = 5.1962E-004 * x + 0.0258
R = 0.9997
DL = 2.532
BEC = 49.65

Weight: <None>
Min Conc: <None>

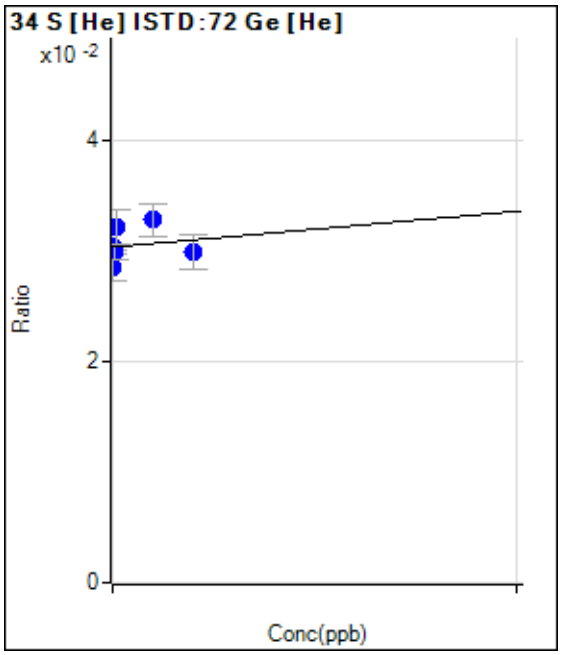


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1240192.18	0.3944	A	2.2
2	☐	400.000	139725.830	1231135.18	0.3832	A	1.8
3	☐	1000.000	-144160.379	1280446.25	0.4059	A	0.8
4	☐	2000.000	-18556.861	1249745.83	0.3959	A	1.8
5	☐	20000.00	111238.432	1203226.78	0.3855	A	5.4
6	☐	40000.00	-2355.622	1202967.12	0.3946	A	3.1
7	☐	100.000					

y = -8.0160E-008 * x + 0.3944
R = -0.1320
DL = -3.312E+05
BEC = -4.92E+06

Weight: <None>
Min Conc: <None>

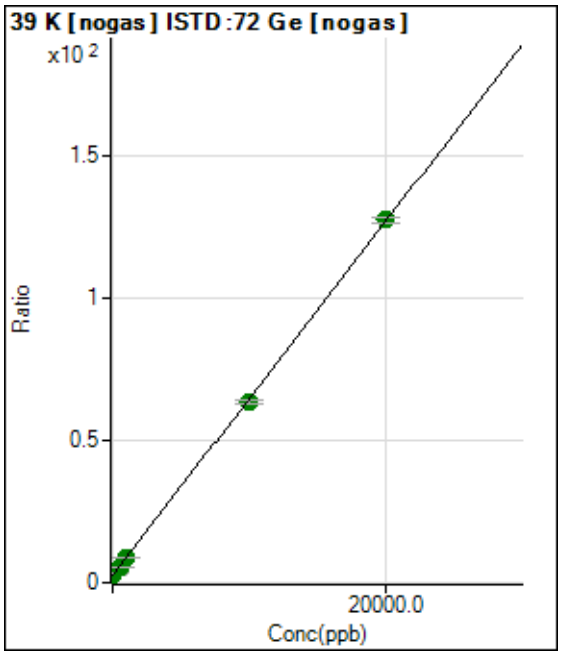
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23818.47	0.0303	P	1.4
2	☐	400.000	-113916.726	22785.07	0.0285	P	8.1
3	☐	1000.000	-22461.142	23084.41	0.0300	P	4.6
4	☐	2000.000	115974.513	24821.47	0.0322	P	9.8
5	☐	20000.00	151642.131	24620.58	0.0328	P	8.8
6	☐	40000.00	-29790.095	22184.52	0.0299	P	10.
7	☐	100.000					

y = 1.6193E-008 * x + 0.0303
R = 0.1153
DL = 8.051E+04
BEC = 1.874E+06

Weight: <None>
Min Conc: <None>

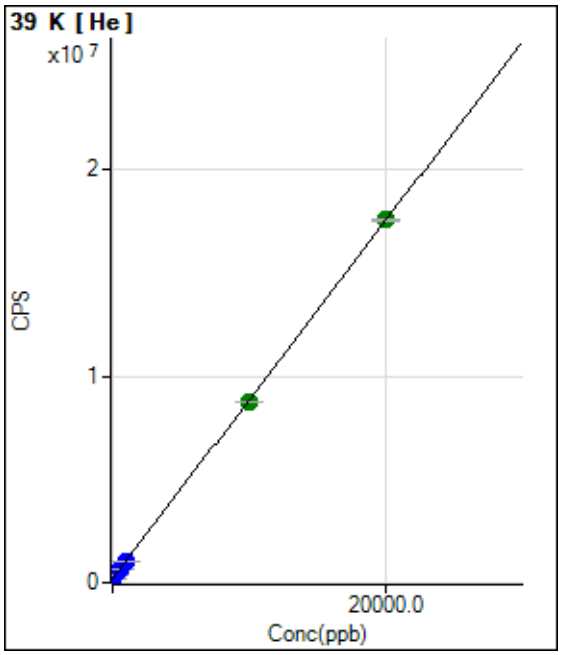


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7950833.77	2.5282	A	1.6
2	☐	200.000	192.139	11954391.93	3.7205	A	1.3
3	☐	500.000	497.868	17719817.06	5.6176	A	1.2
4	☐	1000.000	983.290	27236219.36	8.6297	A	2.3
5	☐	10000.00	9805.112	197795387.7	63.3700	A	2.1
6	☐	20000.00	20098.411	388084200.3	127.241	A	1.8
7	☐	100.000					

y = 0.0062 * x + 2.5282
R = 0.9999
DL = 19.9
BEC = 407.4

Weight: <None>
Min Conc: <None>

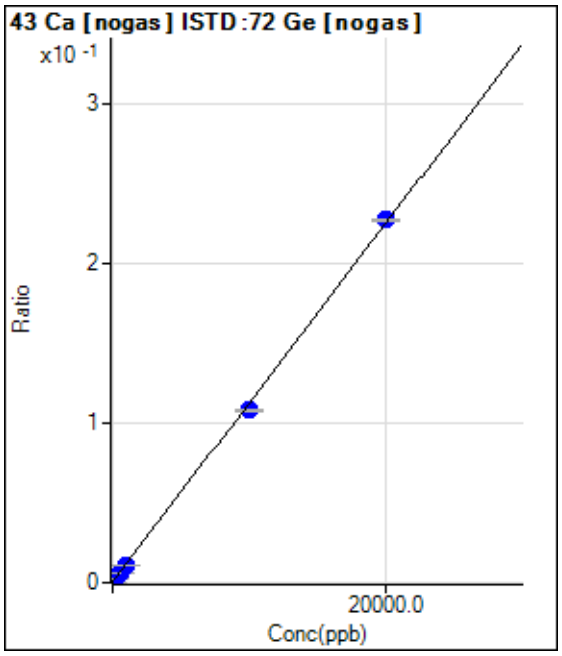
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	191802.98		P	0.2
2	☐	200.000	205.494	370064.71		P	0.3
3	☐	500.000	502.285	627524.74		P	1.3
4	☐	1000.000	998.569	1058041.36		P	1.0
5	☐	10000.00	9891.039	8772076.33		A	0.5
6	☐	20000.00	20054.440	17588618.49		A	0.7
7	☐	100.000					

y = 867.4795 * x + 191802.9833
R = 1.0000
DL = 1.119
BEC = 221.1

Weight: <None>
Min Conc: <None>

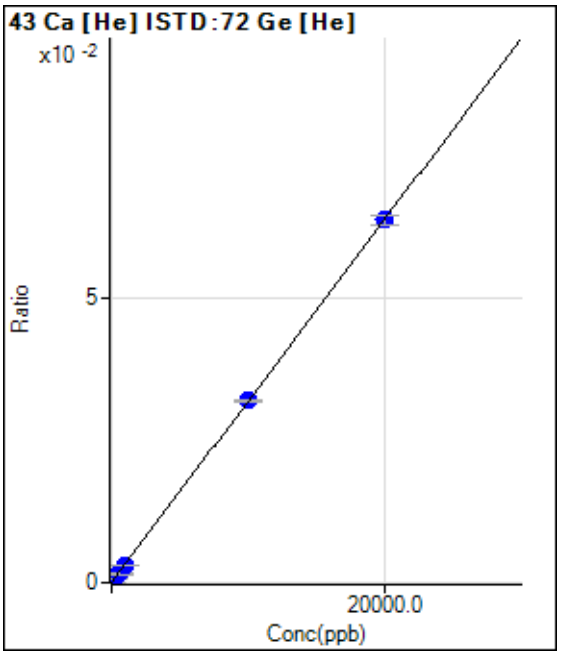


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1386.74	0.0004	P	3.5
2	☐	200.000	190.602	8301.99	0.0026	P	6.1
3	☐	500.000	486.445	18639.59	0.0059	P	1.8
4	☐	1000.000	957.601	35377.28	0.0112	P	3.0
5	☐	10000.00	9577.352	337418.86	0.1081	P	1.4
6	☐	20000.00	20213.877	694444.26	0.2277	P	0.4
7	☐	100.000					

y = 1.1241E-005 * x + 4.4103E-004
R = 0.9997
DL = 4.09
BEC = 39.23

Weight: <None>
Min Conc: <None>

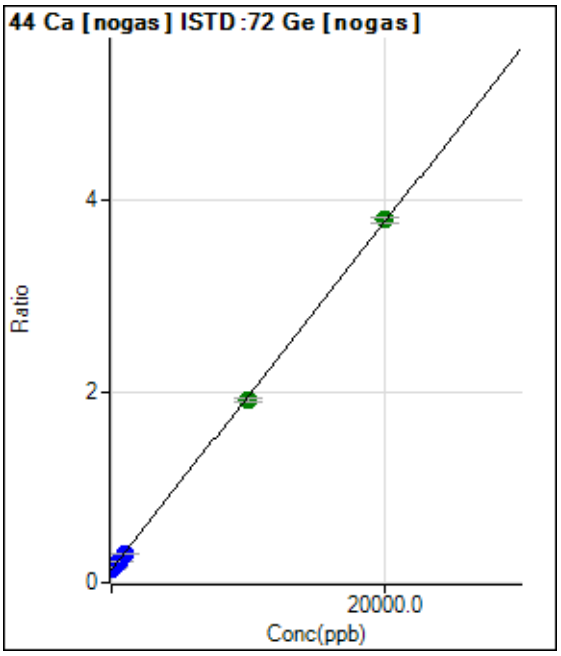
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	36.67	0.0000	P	14.
2	☐	200.000	185.924	510.01	0.0006	P	16.
3	☐	500.000	476.126	1203.39	0.0016	P	12.
4	☐	1000.000	950.440	2363.52	0.0031	P	5.9
5	☐	10000.00	10022.864	23949.08	0.0319	P	1.4
6	☐	20000.00	19991.784	47213.18	0.0636	P	2.3
7	☐	100.000					

y = 3.1775E-006 * x + 4.6654E-005
R = 1.0000
DL = 6.448
BEC = 14.68

Weight: <None>
Min Conc: <None>

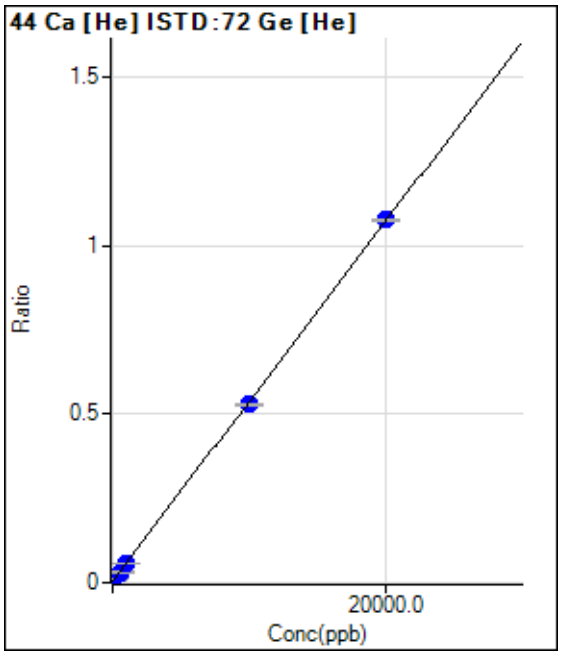


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	427469.51	0.1359	P	1.1
2	☐	200.000	145.767	521914.18	0.1624	P	1.1
3	☐	500.000	440.032	681186.71	0.2159	P	0.9
4	☐	1000.000	887.572	938664.86	0.2973	P	0.3
5	☐	10000.00	9755.300	5961691.37	1.9101	A	2.2
6	☐	20000.00	20130.013	11581260.24	3.7969	A	1.7
7	☐	100.000					

y = 1.8187E-004 * x + 0.1359
R = 0.9999
DL = 23.94
BEC = 747.4

Weight: <None>
Min Conc: <None>

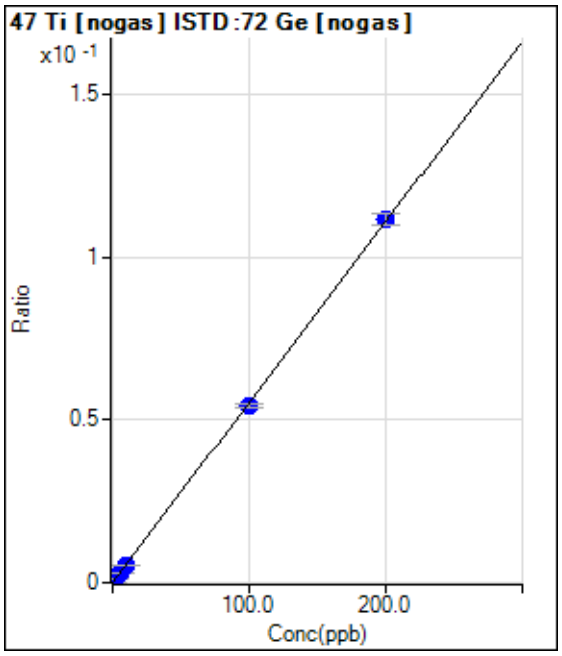
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3250.34	0.0041	P	6.5
2	☐	200.000	191.057	11456.99	0.0143	P	2.6
3	☐	500.000	510.029	24112.53	0.0313	P	6.8
4	☐	1000.000	961.502	42709.23	0.0554	P	4.3
5	☐	10000.00	9817.224	395860.85	0.5274	P	1.4
6	☐	20000.00	20093.152	798401.45	1.0752	P	0.8
7	☐	100.000					

y = 5.3303E-005 * x + 0.0041
R = 0.9999
DL = 15.08
BEC = 77.64

Weight: <None>
Min Conc: <None>

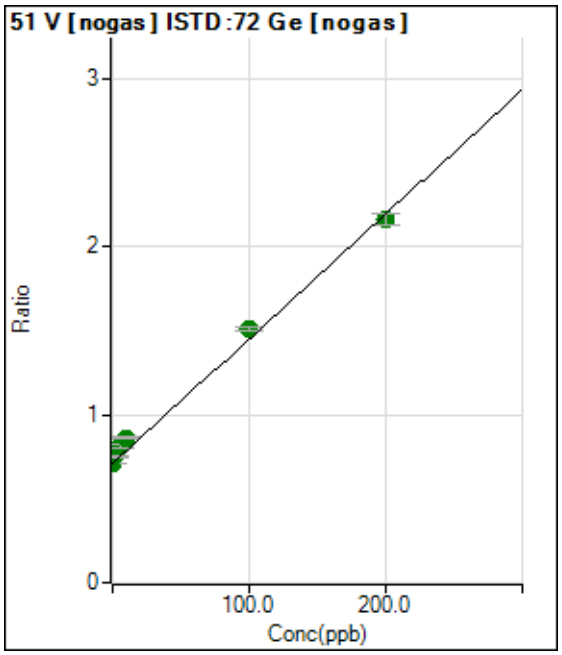


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	293.34	0.0001	P	5.9
2	☐	2.000	1.989	3840.46	0.0012	P	3.7
3	☐	5.000	4.721	8542.09	0.0027	P	3.0
4	☐	10.000	9.795	17421.72	0.0055	P	0.5
5	☐	100.000	97.753	169280.73	0.0542	P	2.4
6	☐	200.000	201.141	339933.58	0.1115	P	3.0
7	☐	1.000					

y = 5.5385E-004 * x + 9.3297E-005
R = 0.9999
DL = 0.02997
BEC = 0.1685

Weight: <None>
Min Conc: <None>

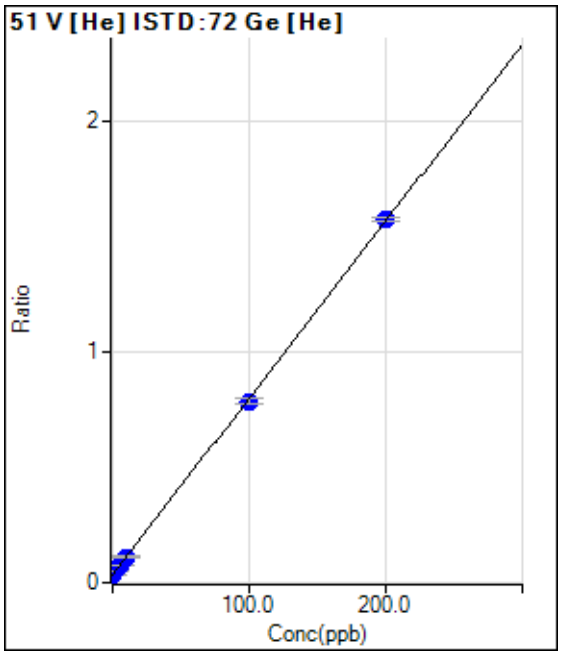
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2231666.65	0.7096	A	0.7
2	☐	2.000	5.461	2409766.40	0.7500	A	2.4
3	☐	5.000	14.093	2567511.26	0.8140	A	3.4
4	☐	10.000	20.640	2722696.22	0.8625	A	0.9
5	☐	100.000	107.667	4705398.80	1.5075	A	1.5
6	☐	200.000	195.372	6578225.28	2.1576	A	3.0
7	☐	1.000					

y = 0.0074 * x + 0.7096
R = 0.9981
DL = 2.021
BEC = 95.74

Weight: <None>
Min Conc: <None>

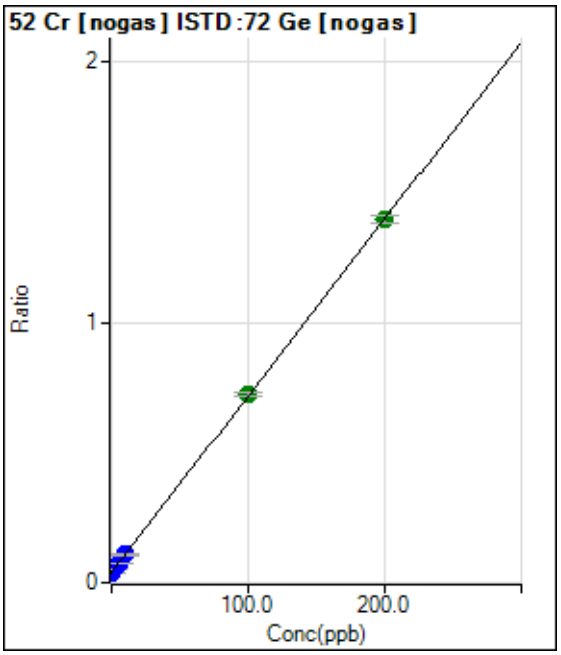


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.065	27333.93	0.0348	P	1.9
2	☐	2.000	2.198	40946.02	0.0512	P	2.3
3	☐	5.000	5.491	58867.50	0.0764	P	2.6
4	☐	10.000	10.166	86588.64	0.1123	P	2.1
5	☐	100.000	98.206	590835.87	0.7874	P	3.3
6	☐	200.000	200.874	1169324.83	1.5747	P	1.2
7	☐	1.000					

y = 0.0077 * x + 0.0343
R = 0.9999
DL = 0.2614
BEC = 4.477

Weight: <None>
Min Conc: <None>

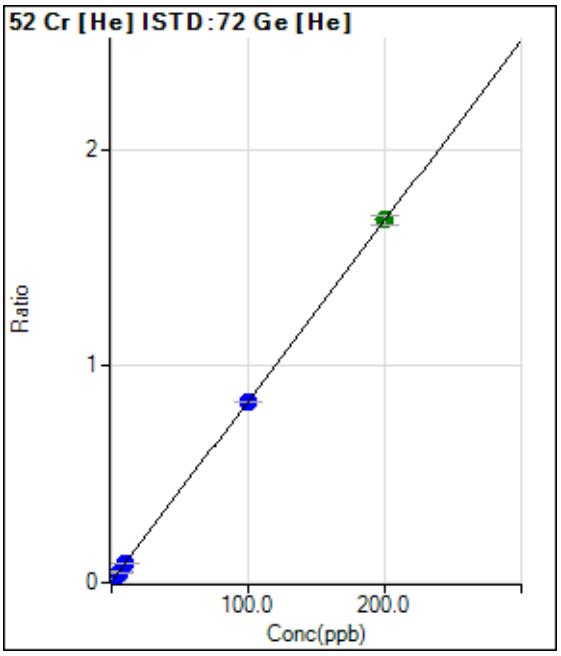
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	123313.64	0.0392	P	1.4
2	☐	2.000	1.981	169203.60	0.0527	P	0.8
3	☐	5.000	5.431	240004.07	0.0761	P	0.4
4	☐	10.000	10.342	345311.34	0.1094	P	4.6
5	☐	100.000	100.722	2257468.30	0.7233	A	1.8
6	☐	200.000	199.612	4253262.23	1.3949	A	2.2
7	☐	1.000					

y = 0.0068 * x + 0.0392
R = 1.0000
DL = 0.2509
BEC = 5.772

Weight: <None>
Min Conc: <None>

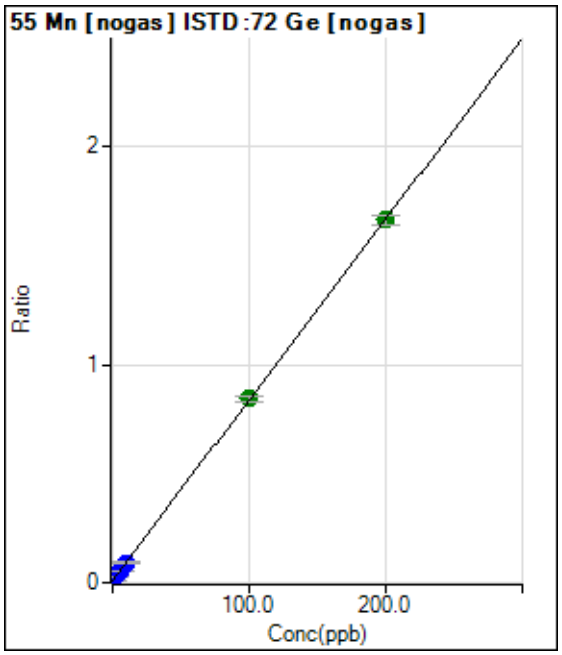


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5294.16	0.0067	P	6.5
2	☐	2.000	1.855	17758.77	0.0222	P	1.7
3	☐	5.000	4.962	37013.70	0.0481	P	4.6
4	☐	10.000	9.636	67101.71	0.0870	P	1.9
5	☐	100.000	99.333	626074.49	0.8341	P	0.8
6	☐	200.000	200.354	1244109.96	1.6754	A	2.4
7	☐	1.000					

y = 0.0083 * x + 0.0067
R = 1.0000
DL = 0.1586
BEC = 0.8104

Weight: <None>
Min Conc: <None>

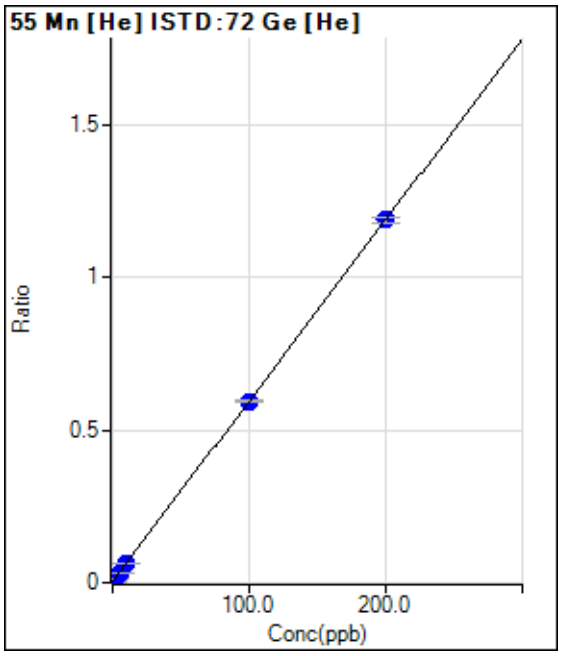
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30719.02	0.0098	P	1.4
2	☐	2.000	1.759	78208.66	0.0243	P	1.6
3	☐	5.000	5.046	162683.94	0.0516	P	1.3
4	☐	10.000	9.952	291039.40	0.0922	P	3.5
5	☐	100.000	100.608	2632425.54	0.8434	A	3.6
6	☐	200.000	199.700	5075225.45	1.6644	A	2.4
7	☐	1.000					

y = 0.0083 * x + 0.0098
R = 1.0000
DL = 0.04863
BEC = 1.179

Weight: <None>
Min Conc: <None>

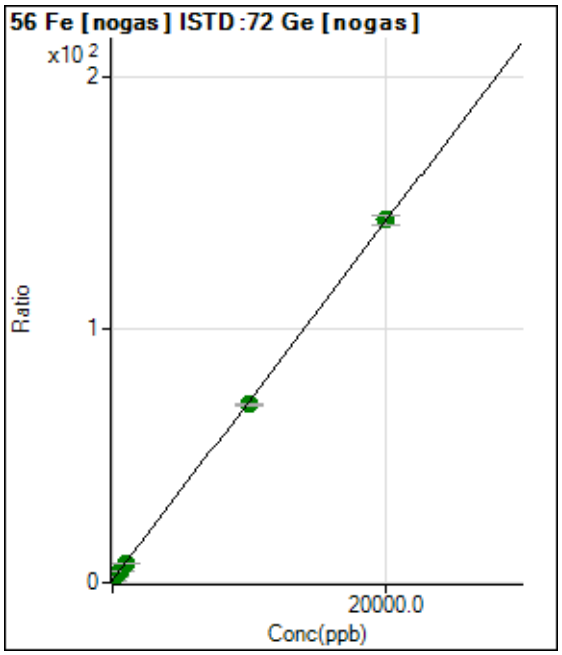


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2523.54	0.0032	P	10.
2	☐	2.000	1.713	10696.63	0.0134	P	6.3
3	☐	5.000	4.970	25187.41	0.0327	P	3.3
4	☐	10.000	10.024	48353.55	0.0627	P	1.1
5	☐	100.000	99.851	447094.04	0.5956	P	1.1
6	☐	200.000	200.077	883838.08	1.1903	P	1.5
7	☐	1.000					

y = 0.0059 * x + 0.0032
R = 1.0000
DL = 0.1694
BEC = 0.5425

Weight: <None>
Min Conc: <None>

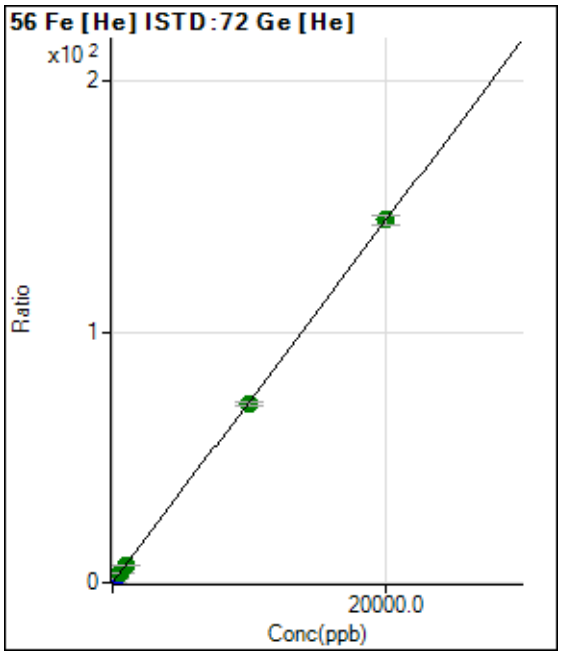
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3039831.91	0.9667	A	2.8
2	☐	200.000	193.286	7507901.21	2.3368	A	2.8
3	☐	500.000	497.123	14164128.44	4.4904	A	1.5
4	☐	1000.000	962.034	24575025.55	7.7858	A	1.9
5	☐	10000.00	9813.214	220141371.5	70.5249	A	0.8
6	☐	20000.00	20095.430	437250959.7	143.407	A	2.7
7	☐	100.000					

y = 0.0071 * x + 0.9667
R = 0.9999
DL = 11.33
BEC = 136.4

Weight: <None>
Min Conc: <None>

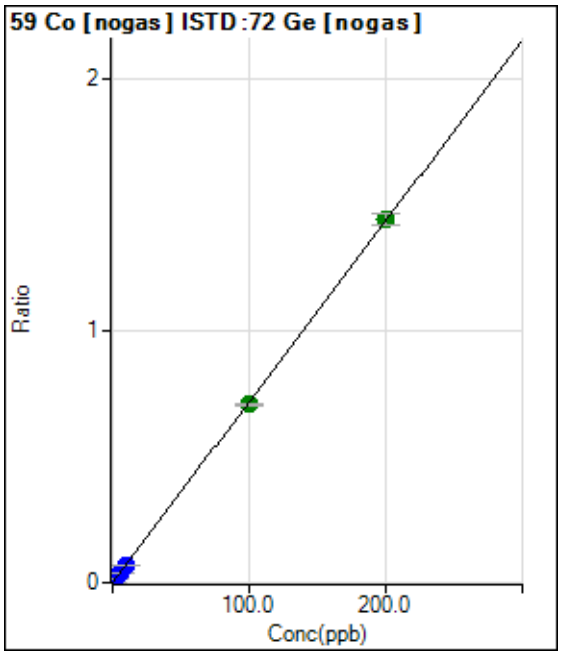


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12284.25	0.0157	P	6.4
2	☐	200.000	189.314	1104282.98	1.3807	P	3.4
3	☐	500.000	495.508	2763312.04	3.5886	A	3.5
4	☐	1000.000	984.058	5485164.71	7.1113	A	0.5
5	☐	10000.00	9895.238	53558117.53	71.3659	A	2.2
6	☐	20000.00	20053.397	107380421.7	144.612	A	2.6
7	☐	100.000					

y = 0.0072 * x + 0.0157
R = 1.0000
DL = 0.4138
BEC = 2.172

Weight: <None>
Min Conc: <None>

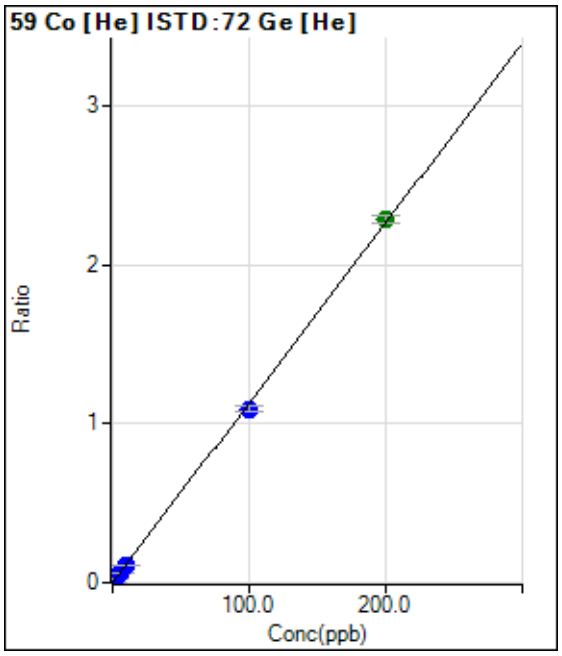
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1063.38	0.0003	P	9.6
2	☐	2.000	1.963	46295.30	0.0144	P	2.8
3	☐	5.000	4.909	112057.49	0.0355	P	2.3
4	☐	10.000	9.648	219439.60	0.0695	P	1.4
5	☐	100.000	98.584	2207038.56	0.7070	A	0.6
6	☐	200.000	200.728	4388040.25	1.4393	A	3.2
7	☐	1.000					

y = 0.0072 * x + 3.3794E-004
R = 1.0000
DL = 0.01354
BEC = 0.04714

Weight: <None>
Min Conc: <None>

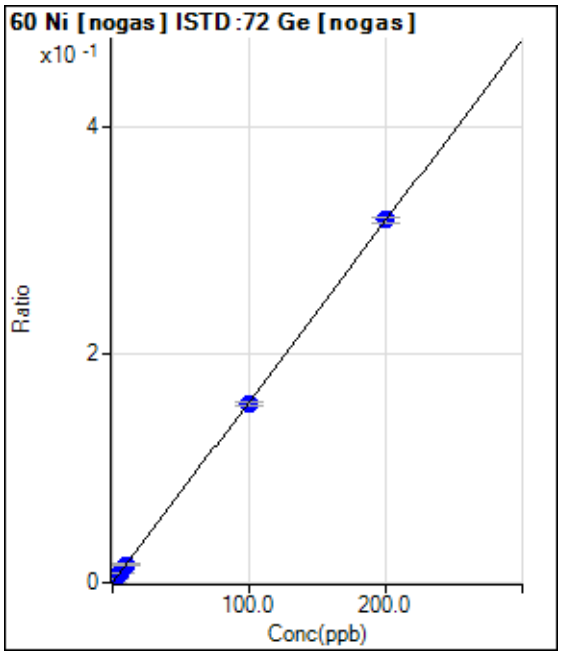


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	396.68	0.0005	P	13.
2	☐	2.000	1.896	17575.26	0.0220	P	3.9
3	☐	5.000	4.914	43214.33	0.0561	P	3.1
4	☐	10.000	9.689	84932.28	0.1102	P	3.8
5	☐	100.000	96.494	819857.80	1.0926	P	3.0
6	☐	200.000	201.772	1696000.70	2.2841	A	2.2
7	☐	1.000					

y = 0.0113 * x + 5.0594E-004
R = 0.9998
DL = 0.01755
BEC = 0.0447

Weight: <None>
Min Conc: <None>

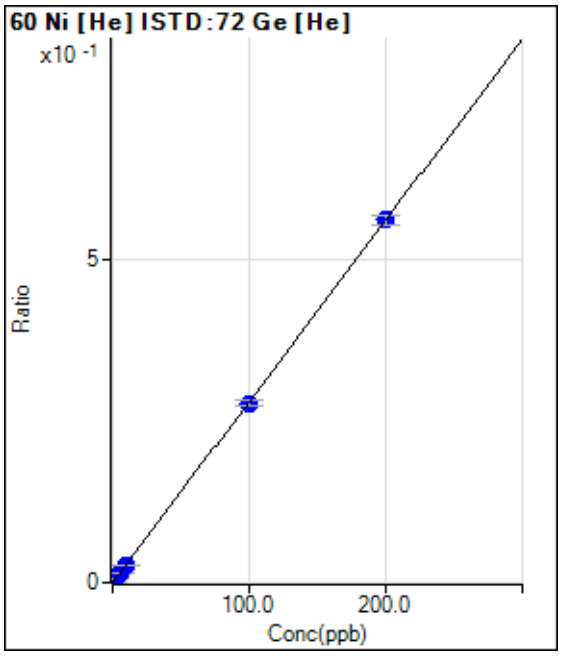
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.119	450.01	0.0001	P	5.5
2	☐	2.000	2.148	10796.68	0.0034	P	4.4
3	☐	5.000	5.248	26108.79	0.0083	P	1.5
4	☐	10.000	10.077	50315.75	0.0159	P	2.2
5	☐	100.000	98.837	489050.58	0.1567	P	2.1
6	☐	200.000	200.570	969721.60	0.3180	P	1.7
7	☐	1.000					

y = 0.0016 * x - 4.5824E-005
R = 1.0000
DL = 0.0148
BEC = -0.0289

Weight: <None>
Min Conc: <None>

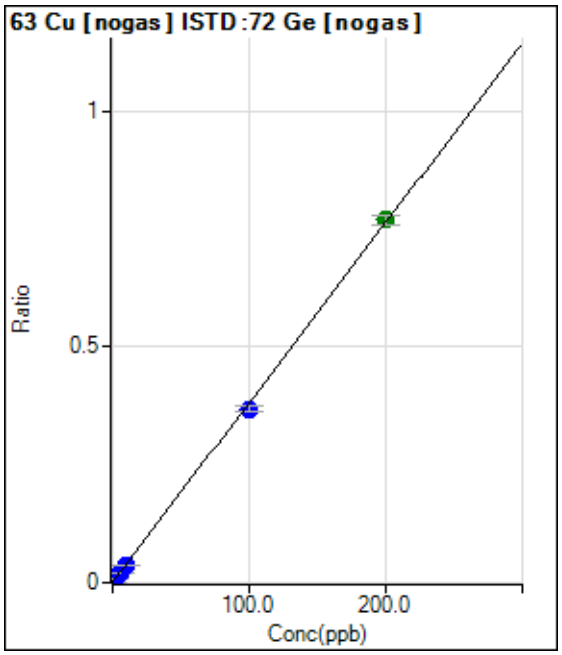


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.122	133.33	0.0002	P	22.
2	☐	2.000	2.063	4480.62	0.0056	P	6.2
3	☐	5.000	5.168	10996.76	0.0143	P	5.8
4	☐	10.000	10.004	21439.45	0.0278	P	2.5
5	☐	100.000	99.298	208204.37	0.2775	P	3.9
6	☐	200.000	200.346	415855.75	0.5601	P	2.8
7	☐	1.000					

y = 0.0028 * x - 1.7175E-004
R = 1.0000
DL = 0.04022
BEC = -0.06142

Weight: <None>
Min Conc: <None>

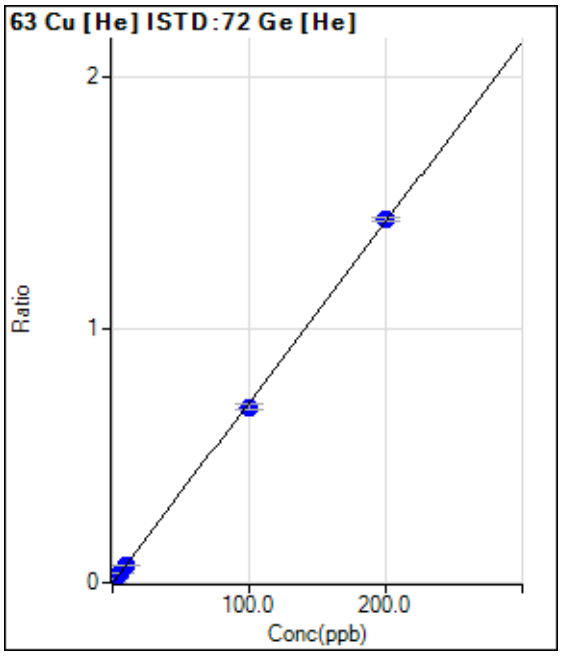
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2390.19	0.0008	P	2.8
2	☐	2.000	1.902	25731.69	0.0080	P	1.6
3	☐	5.000	4.966	62088.55	0.0197	P	0.4
4	☐	10.000	9.747	119631.74	0.0379	P	2.0
5	☐	100.000	96.589	1151186.75	0.3688	P	2.9
6	☐	200.000	201.720	2346111.74	0.7695	A	2.6
7	☐	1.000					

y = 0.0038 * x + 7.5978E-004
R = 0.9998
DL = 0.01703
BEC = 0.1994

Weight: <None>
Min Conc: <None>

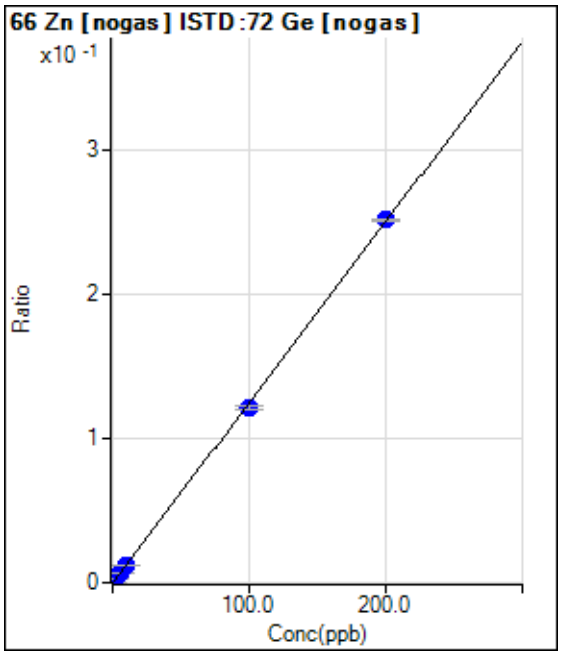


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.407	933.37	0.0012	P	0.9
2	☐	2.000	2.343	11984.10	0.0150	P	5.3
3	☐	5.000	5.452	28602.68	0.0372	P	4.4
4	☐	10.000	9.987	53571.57	0.0695	P	3.3
5	☐	100.000	97.651	521094.98	0.6944	P	2.6
6	☐	200.000	201.160	1063553.26	1.4323	P	1.2
7	☐	1.000					

y = 0.0071 * x - 0.0017
R = 0.9999
DL = 0.004517
BEC = -0.2403

Weight: <None>
Min Conc: <None>

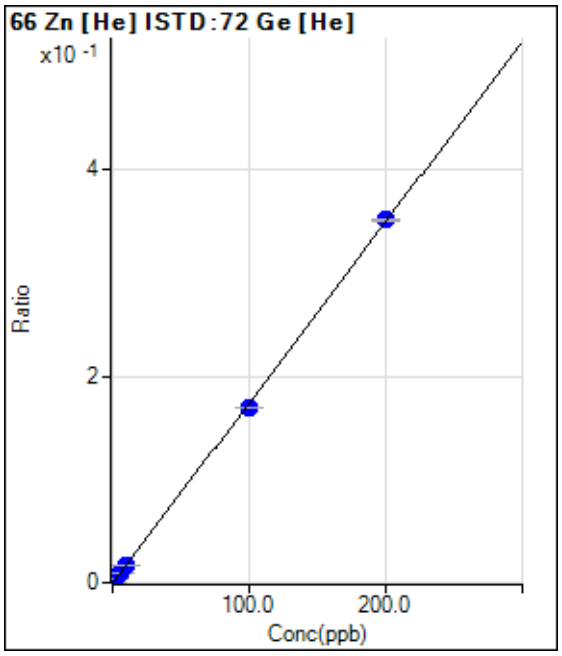
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.302	416.68	0.0001	P	19.
2	☐	2.000	2.291	8425.42	0.0026	P	3.0
3	☐	5.000	5.555	21159.06	0.0067	P	4.1
4	☐	10.000	10.247	39713.40	0.0126	P	1.4
5	☐	100.000	97.268	379268.48	0.1215	P	2.2
6	☐	200.000	201.337	767982.31	0.2518	P	0.4
7	☐	1.000					

y = 0.0013 * x - 2.4569E-004
R = 0.9999
DL = 0.06107
BEC = -0.1963

Weight: <None>
Min Conc: <None>

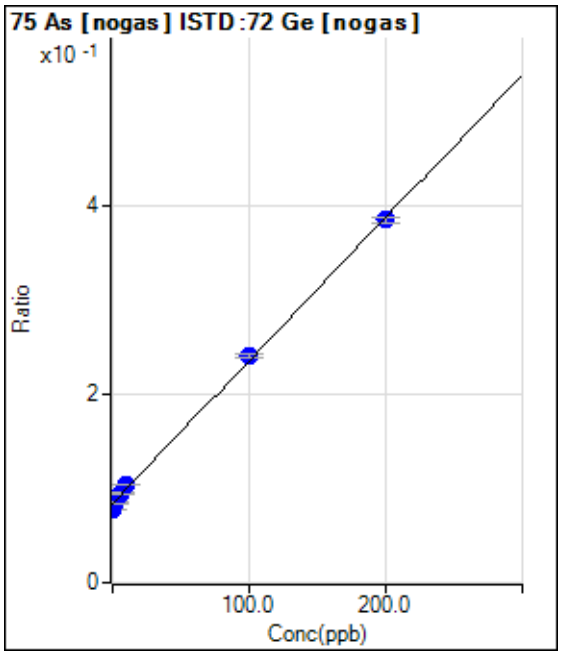


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.494	150.00	0.0002	P	4.9
2	☐	2.000	2.296	2676.90	0.0033	P	3.0
3	☐	5.000	5.573	6991.44	0.0091	P	2.1
4	☐	10.000	10.014	13001.43	0.0168	P	2.3
5	☐	100.000	97.283	127289.02	0.1696	P	0.8
6	☐	200.000	201.341	261124.72	0.3516	P	0.3
7	☐	1.000					

y = 0.0017 * x - 6.7339E-004
R = 0.9999
DL = 0.01604
BEC = -0.3848

Weight: <None>
Min Conc: <None>

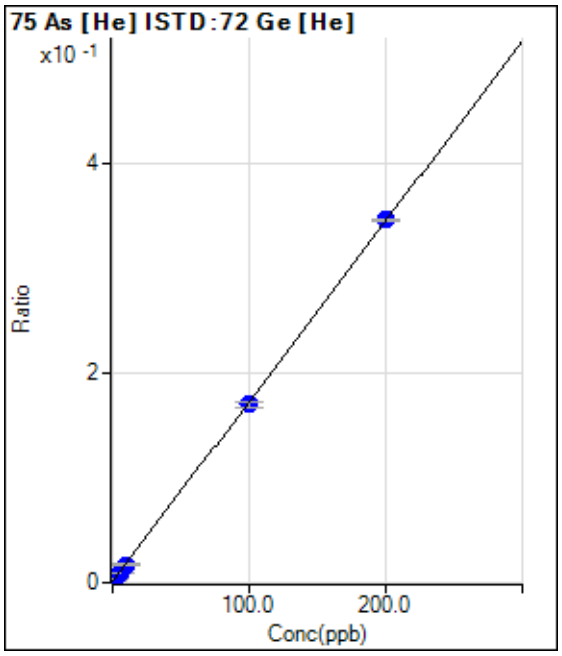
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-4.482	242660.55	0.0772	P	1.4
2	☐	2.000	0.356	271444.50	0.0845	P	2.7
3	☐	5.000	6.863	297594.35	0.0943	P	2.0
4	☐	10.000	12.876	326589.32	0.1035	P	0.9
5	☐	100.000	103.121	749783.24	0.2402	P	1.5
6	☐	200.000	198.265	1172252.04	0.3844	P	1.6
7	☐	1.000					

y = 0.0015 * x + 0.0839
R = 0.9993
DL = 2.109
BEC = 55.4

Weight: <None>
Min Conc: <None>

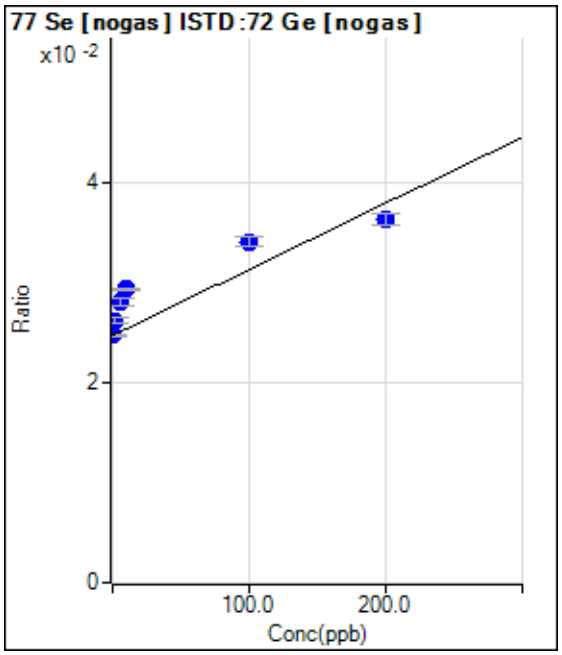


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	812.25	0.0010	P	7.7
2	☐	2.000	1.958	3524.80	0.0044	P	4.2
3	☐	5.000	4.915	7310.38	0.0095	P	3.3
4	☐	10.000	9.422	13301.54	0.0173	P	3.5
5	☐	100.000	98.477	127952.24	0.1705	P	2.9
6	☐	200.000	200.793	257379.97	0.3466	P	0.7
7	☐	1.000					

y = 0.0017 * x + 0.0010
R = 1.0000
DL = 0.1392
BEC = 0.6017

Weight: <None>
Min Conc: <None>

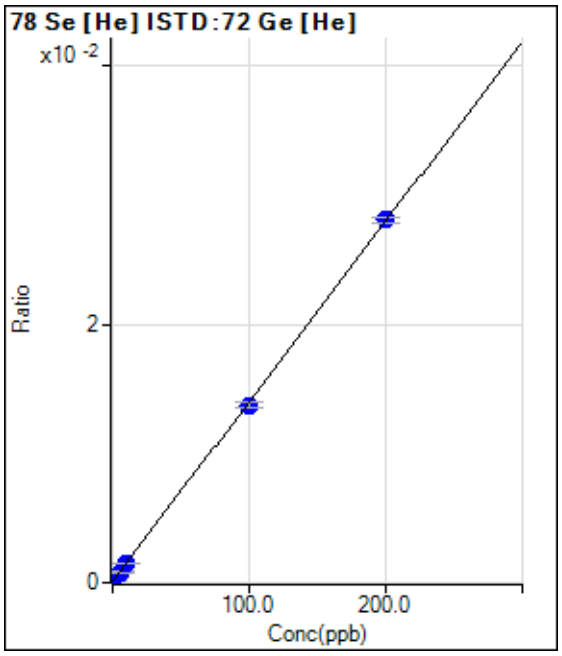
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	77721.89	0.0247	P	0.7
2	☐	2.000	22.658	84207.17	0.0262	P	2.2
3	☐	5.000	49.849	88340.38	0.0280	P	2.9
4	☐	10.000	70.838	92788.44	0.0294	P	0.7
5	☐	100.000	142.006	106428.92	0.0341	P	2.8
6	☐	200.000	174.627	110539.49	0.0363	P	3.1
7	☐	1.000					

y = 6.6121E-005 * x + 0.0247
R = 0.9238
DL = 7.935
BEC = 373.7

Weight: <None>
Min Conc: <None>

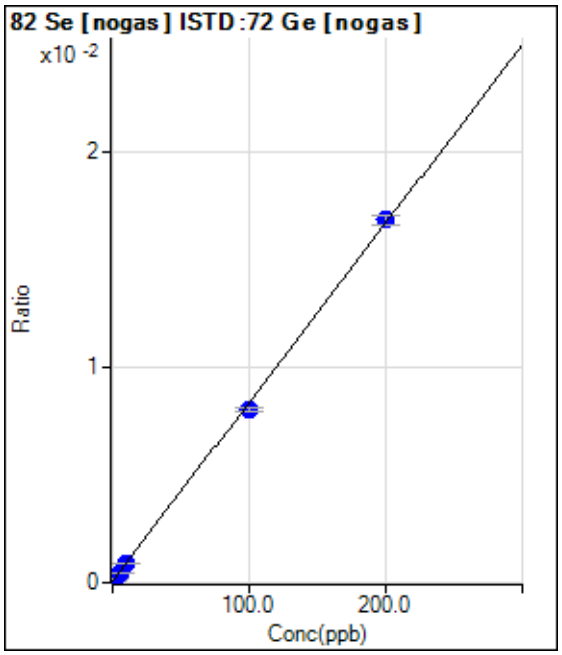


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.637	142.00	0.0002	P	7.4
2	☐	2.000	2.392	340.00	0.0004	P	10.
3	☐	5.000	5.150	622.68	0.0008	P	11.
4	☐	10.000	9.773	1120.04	0.0015	P	3.4
5	☐	100.000	98.089	10317.60	0.0137	P	2.4
6	☐	200.000	200.959	20841.90	0.0281	P	1.6
7	☐	1.000					

y = 1.3921E-004 * x + 9.2096E-005
R = 0.9999
DL = 0.2872
BEC = 0.6615

Weight: <None>
Min Conc: <None>

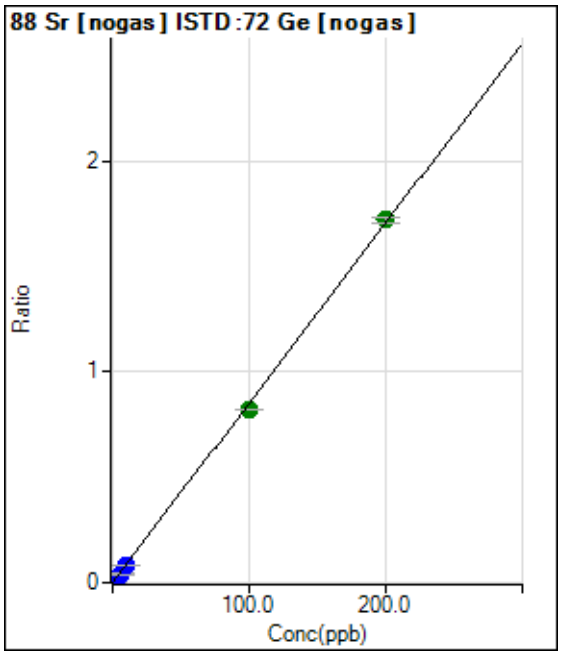
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	240.01	0.0001	P	34.
2	☐	2.000	1.669	690.02	0.0002	P	22.
3	☐	5.000	4.245	1353.41	0.0004	P	7.0
4	☐	10.000	9.600	2756.91	0.0009	P	3.1
5	☐	100.000	96.048	25131.04	0.0081	P	1.5
6	☐	200.000	202.018	51393.05	0.0169	P	2.8
7	☐	1.000					

y = 8.3033E-005 * x + 7.6479E-005
R = 0.9997
DL = 0.9411
BEC = 0.9211

Weight: <None>
Min Conc: <None>

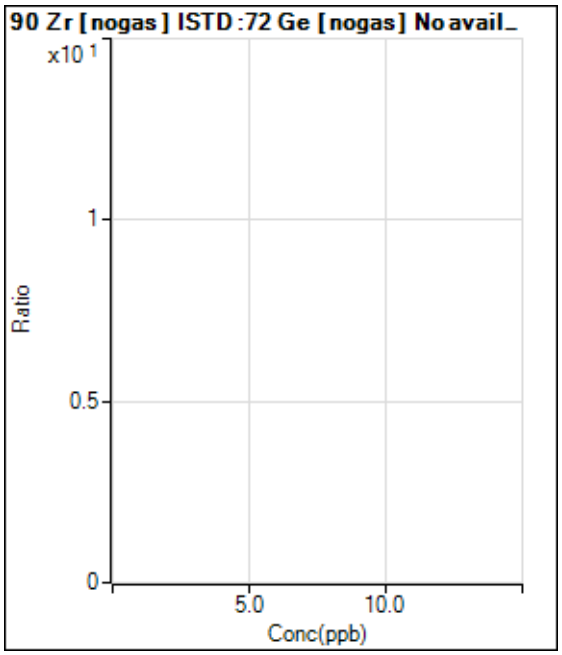


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	810.03	0.0003	P	3.9
2	☐	2.000	1.922	53470.05	0.0166	P	4.2
3	☐	5.000	4.773	129199.14	0.0410	P	2.6
4	☐	10.000	9.392	253599.04	0.0803	P	1.3
5	☐	100.000	96.277	2563408.66	0.8212	A	0.6
6	☐	200.000	201.898	5250985.44	1.7219	A	1.8
7	☐	1.000					

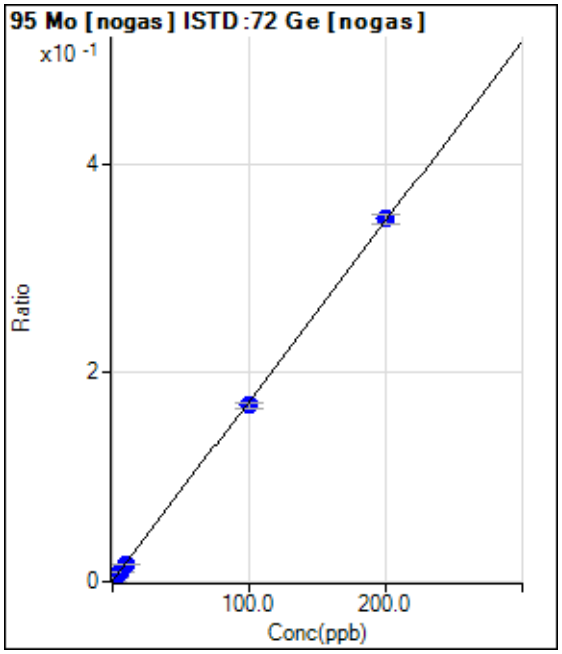
y = 0.0085 * x + 2.5760E-004
R = 0.9998
DL = 0.003553
BEC = 0.03021

Weight: <None>
Min Conc: <None>

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

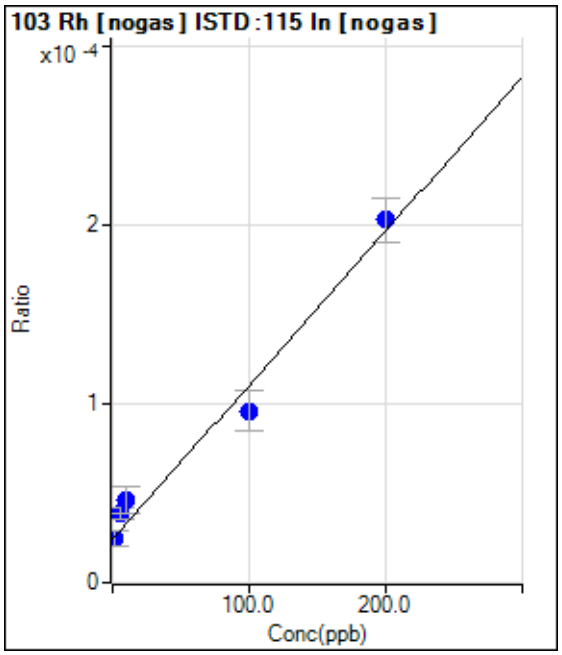


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2346.86	0.0007	P	8.4
2	☐	2.000	1.858	12691.37	0.0039	P	0.6
3	☐	5.000	4.830	28616.63	0.0091	P	3.7
4	☐	10.000	9.509	54099.29	0.0171	P	2.0
5	☐	100.000	97.437	526515.83	0.1687	P	2.3
6	☐	200.000	201.312	1060404.51	0.3477	P	2.8
7	☐	1.000					

y = 0.0017 * x + 7.4666E-004
R = 0.9999
DL = 0.1091
BEC = 0.4332

Weight: <None>
Min Conc: <None>

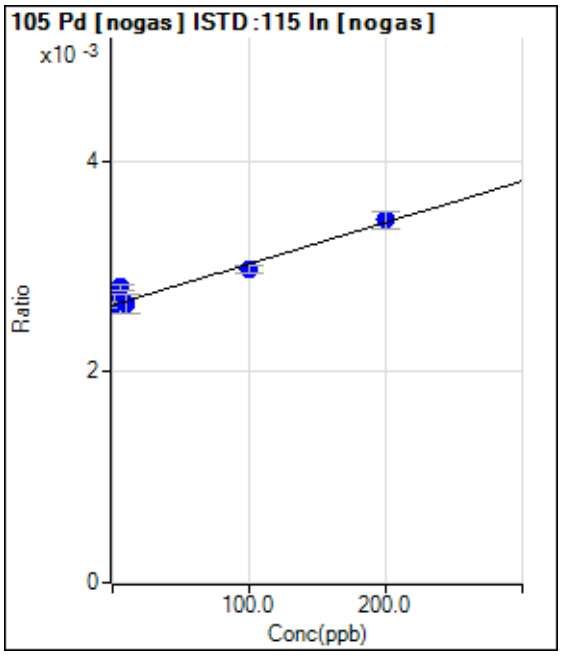
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0000	P	35.
2	☐	2.000	0.528	70.00	0.0000	P	33.
3	☐	5.000	17.218	110.00	0.0000	P	16.
4	☐	10.000	25.475	126.67	0.0000	P	33.
5	☐	100.000	83.468	266.67	0.0001	P	23.
6	☐	200.000	207.201	536.68	0.0002	P	12.
7	☐	1.000					

y = 8.6114E-007 * x + 2.4223E-005
R = 0.9900
DL = 30.06
BEC = 28.13

Weight: <None>
Min Conc: <None>

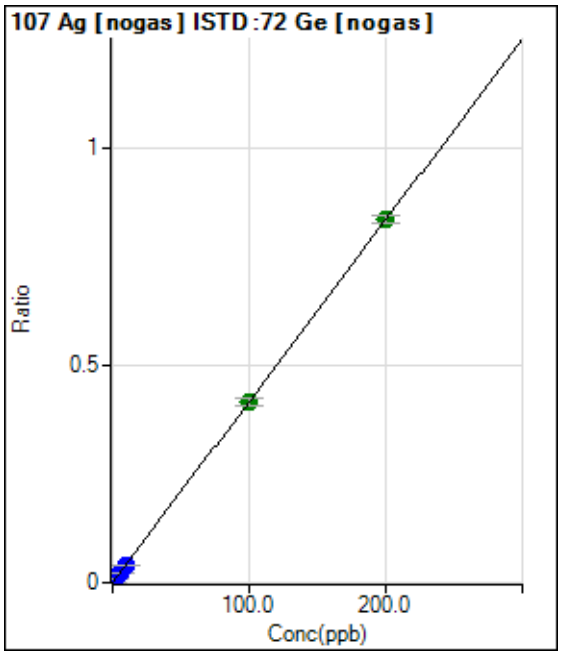


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7274.94	0.0026	P	1.9
2	☐	2.000	25.052	7825.18	0.0027	P	4.8
3	☐	5.000	42.617	7895.25	0.0028	P	1.8
4	☐	10.000	1.560	7281.63	0.0026	P	6.9
5	☐	100.000	86.483	8272.06	0.0030	P	2.7
6	☐	200.000	206.009	9092.51	0.0034	P	4.7
7	☐	1.000					

y = 3.9266E-006 * x + 0.0026
R = 0.9712
DL = 37.3
BEC = 670.8

Weight: <None>
Min Conc: <None>

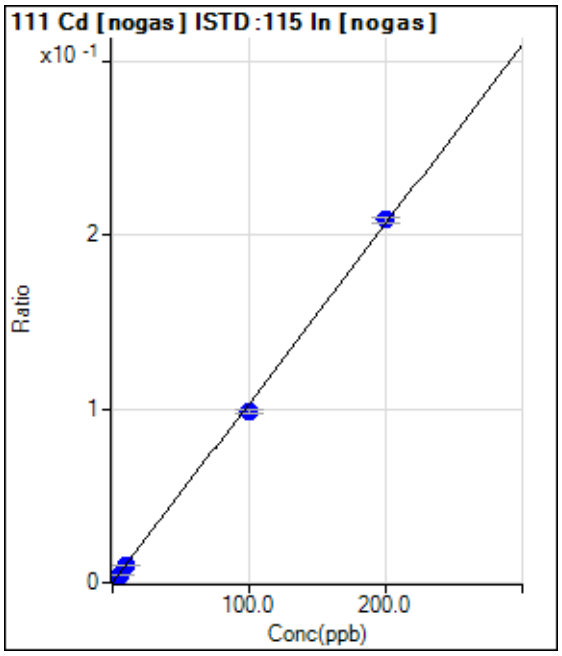
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	313.34	0.0001	P	18.
2	☐	2.000	1.993	27057.61	0.0084	P	2.1
3	☐	5.000	4.847	64139.82	0.0203	P	1.8
4	☐	10.000	9.691	127992.66	0.0406	P	2.9
5	☐	100.000	99.590	1297879.88	0.4158	A	4.7
6	☐	200.000	200.224	2548997.25	0.8360	A	2.2
7	☐	1.000					

y = 0.0042 * x + 9.9494E-005
R = 1.0000
DL = 0.01299
BEC = 0.02383

Weight: <None>
Min Conc: <None>

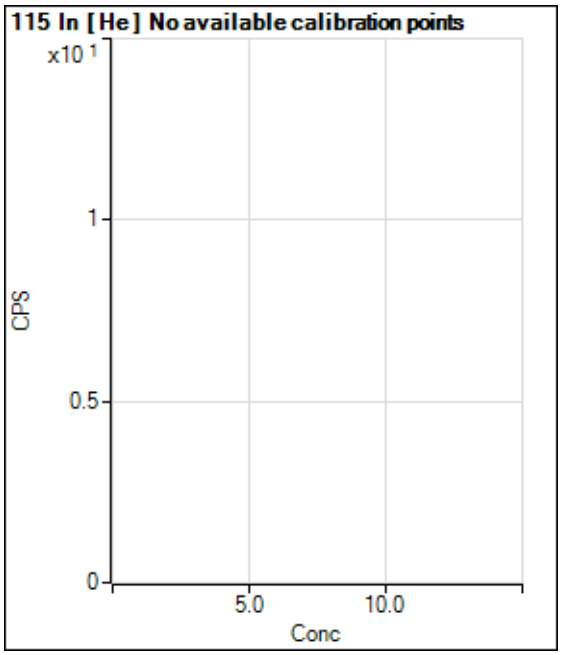


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	16.67	0.0000	P	36.
2	☐	2.000	1.913	5661.00	0.0020	P	9.1
3	☐	5.000	4.673	13618.78	0.0048	P	0.8
4	☐	10.000	9.523	27167.91	0.0098	P	0.3
5	☐	100.000	95.439	273998.84	0.0985	P	1.7
6	☐	200.000	202.314	551807.61	0.2089	P	1.9
7	☐	1.000					

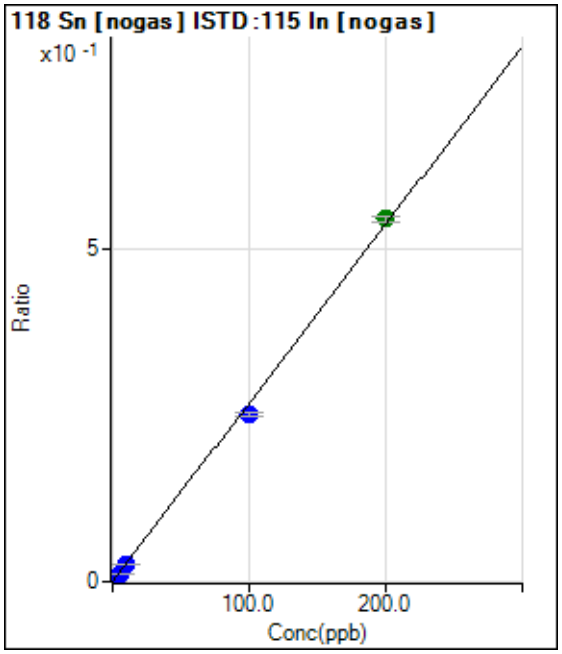
y = 0.0010 * x + 6.0777E-006
R = 0.9996
DL = 0.00647
BEC = 0.005887

Weight: <None>
Min Conc: <None>

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			929411.46		P	0.5
2	☐			963801.71		P	1.7
3	☐			912139.59		P	2.3
4	☐			935971.63		P	0.6
5	☐			884579.95		P	1.9
6	☐			894182.83		P	1.3
7	☐						

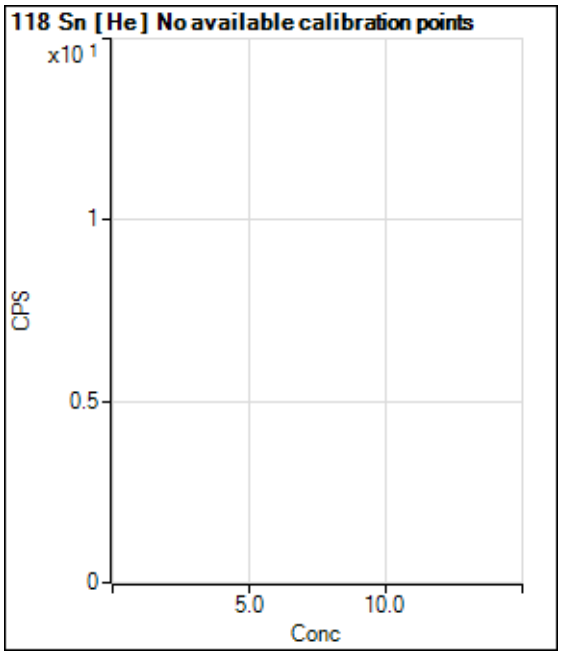


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	900.04	0.0003	P	22.
2	☐	2.000	1.789	14713.08	0.0051	P	1.3
3	☐	5.000	4.547	35382.89	0.0126	P	3.0
4	☐	10.000	9.435	70960.99	0.0257	P	1.0
5	☐	100.000	93.586	700595.80	0.2520	P	2.3
6	☐	200.000	203.248	1444717.17	0.5468	A	1.8
7	☐	1.000					

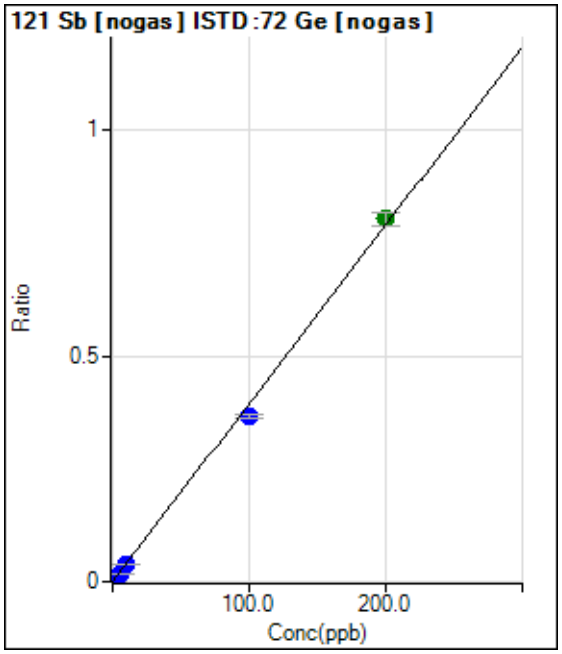
y = 0.0027 * x + 3.2733E-004
R = 0.9993
DL = 0.08178
BEC = 0.1217

Weight: <None>
Min Conc: <None>

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			346.68		P	31.
2	☐			5827.72		P	1.5
3	☐			14075.82		P	4.8
4	☐			27051.31		P	2.0
5	☐			269593.39		P	1.8
6	☐			551640.48		P	0.7
7	☐						

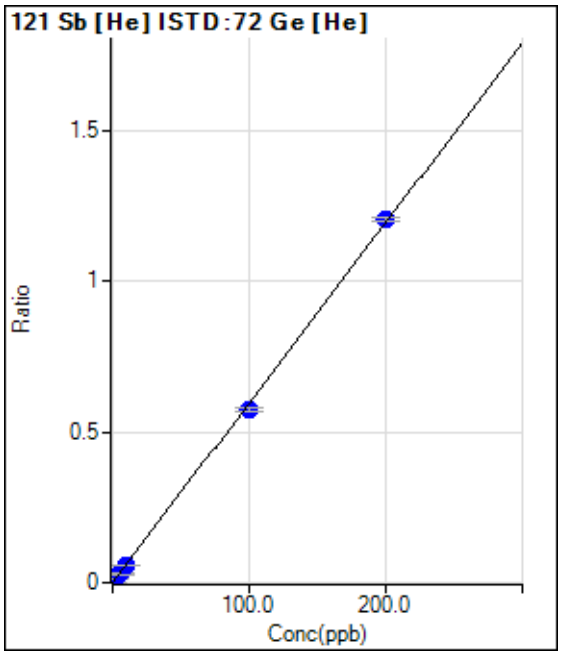


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	220.00	0.0001	P	5.0
2	☐	2.000	1.854	23726.40	0.0074	P	2.2
3	☐	5.000	4.748	59290.80	0.0188	P	2.8
4	☐	10.000	9.562	119295.20	0.0378	P	1.3
5	☐	100.000	92.731	1141841.70	0.3659	P	3.1
6	☐	200.000	203.664	2449177.36	0.8034	A	4.0
7	☐	1.000					

y = 0.0039 * x + 6.9961E-005
R = 0.9991
DL = 0.002662
BEC = 0.01774

Weight: <None>
Min Conc: <None>

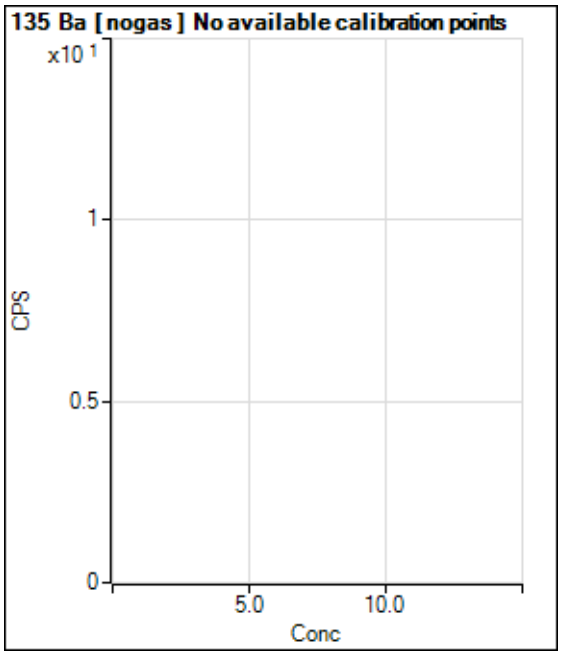
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	93.33	0.0001	P	33.
2	☐	2.000	1.839	8885.72	0.0111	P	3.3
3	☐	5.000	4.805	22200.94	0.0288	P	2.4
4	☐	10.000	9.649	44553.84	0.0578	P	2.3
5	☐	100.000	96.563	433078.86	0.5771	P	2.1
6	☐	200.000	201.742	895149.57	1.2055	P	1.0
7	☐	1.000					

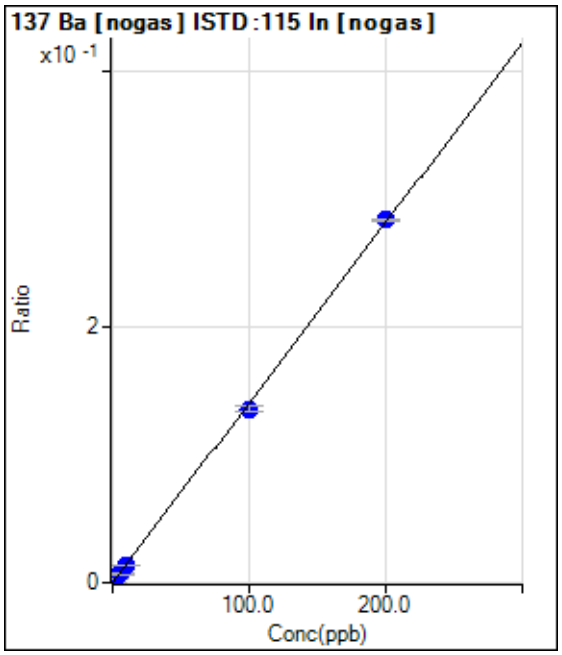
y = 0.0060 * x + 1.1896E-004
R = 0.9998
DL = 0.01984
BEC = 0.01991

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			50.00		P	0.0
2	☐			4527.33		P	5.2
3	☐			11167.10		P	0.4
4	☐			22127.70		P	1.3
5	☐			219963.50		P	2.6
6	☐			443919.46		P	0.7
7	☐						

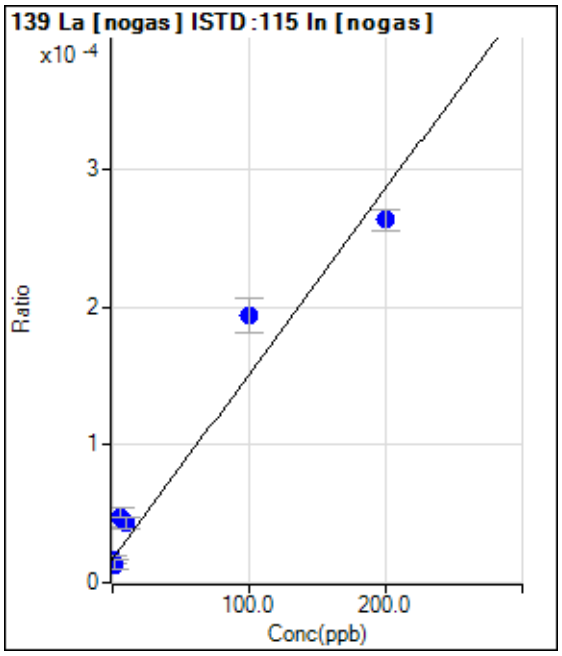
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	58.
2	☐	2.000	1.835	7428.38	0.0026	P	4.8
3	☐	5.000	4.801	19077.54	0.0068	P	3.2
4	☐	10.000	9.553	37116.85	0.0134	P	4.5
5	☐	100.000	96.668	377867.18	0.1359	P	3.2
6	☐	200.000	201.695	749343.66	0.2836	P	0.6
7	☐	1.000					

y = 0.0014 * x + 1.8059E-005
R = 0.9998
DL = 0.02242
BEC = 0.01285

Weight: <None>
Min Conc: <None>

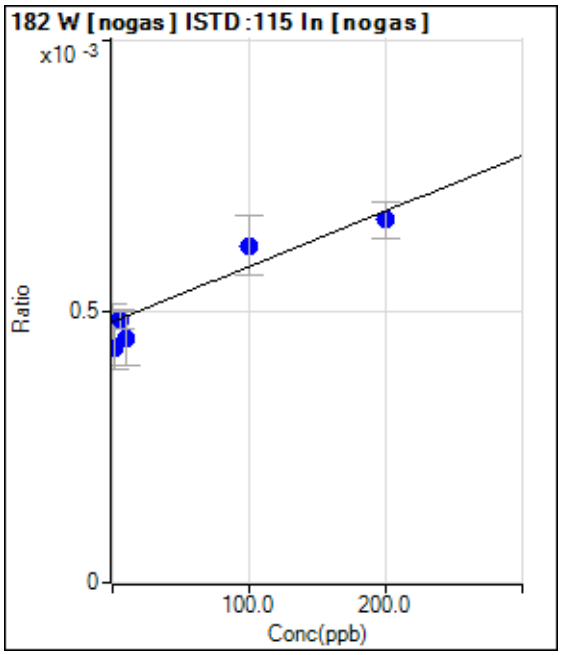


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	46.67	0.0000	P	35.
2	☐	2.000	-3.147	36.67	0.0000	P	54.
3	☐	5.000	22.464	133.33	0.0000	P	30.
4	☐	10.000	19.781	120.00	0.0000	P	19.
5	☐	100.000	131.828	540.02	0.0002	P	13.
6	☐	200.000	183.212	696.69	0.0003	P	6.1
7	☐	1.000					

y = 1.3460E-006 * x + 1.6995E-005
R = 0.9775
DL = 13.32
BEC = 12.63

Weight: <None>
Min Conc: <None>

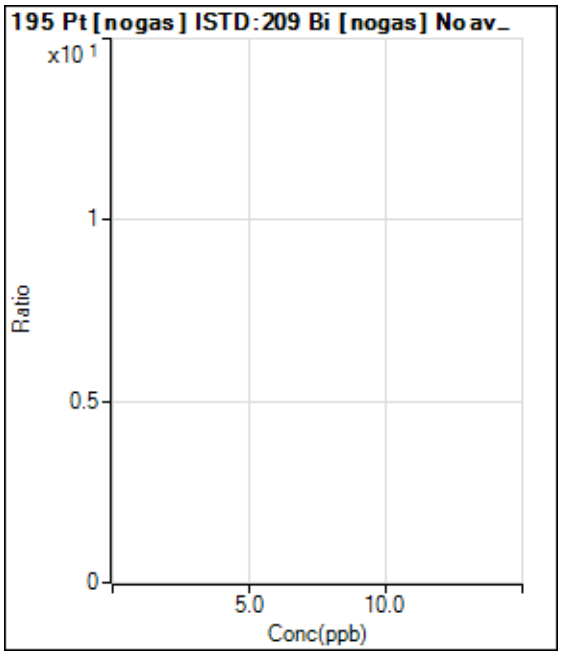
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1323.41	0.0005	P	13.
2	☐	2.000	-46.758	1233.40	0.0004	P	19.
3	☐	5.000	5.083	1370.08	0.0005	P	7.6
4	☐	10.000	-30.301	1236.73	0.0004	P	22.
5	☐	100.000	137.403	1726.86	0.0006	P	17.
6	☐	200.000	183.799	1766.78	0.0007	P	10.
7	☐	1.000					

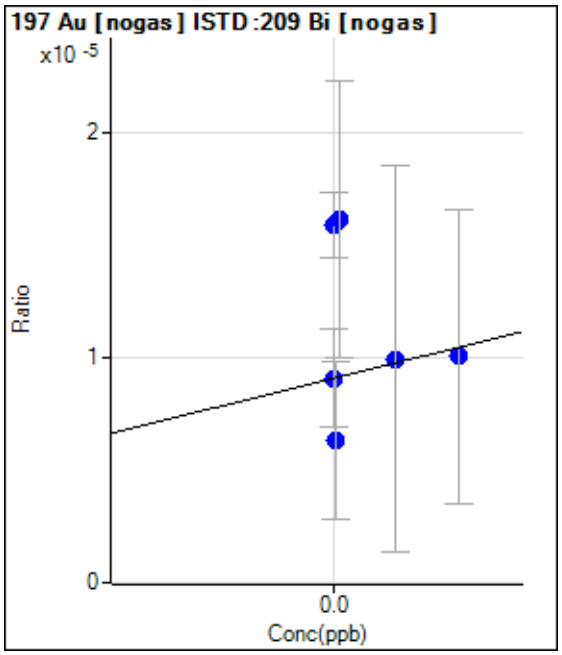
y = 1.0216E-006 * x + 4.8084E-004
R = 0.9490
DL = 189.8
BEC = 470.7

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

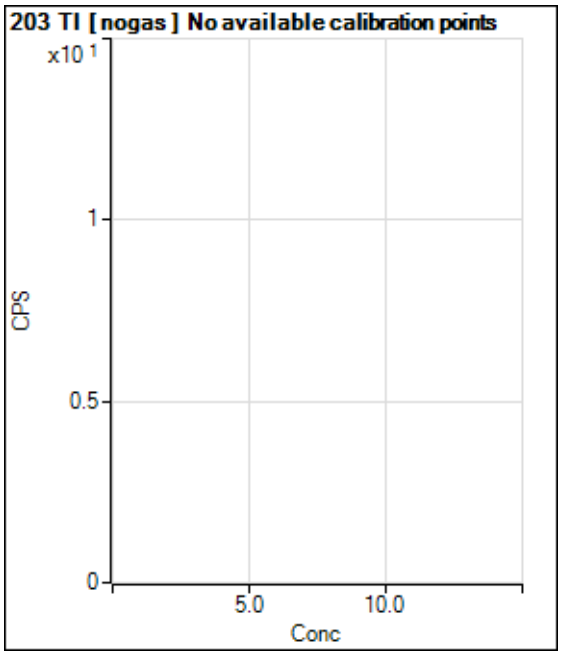
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	48.
2	☐	2.000	984.237	33.33	0.0000	P	18.
3	☐	5.000	-400.848	13.33	0.0000	P	111
4	☐	10.000	1013.815	33.33	0.0000	P	76.
5	☐	100.000	122.077	20.00	0.0000	P	173
6	☐	200.000	139.095	20.00	0.0000	P	130
7	☐	1.000					

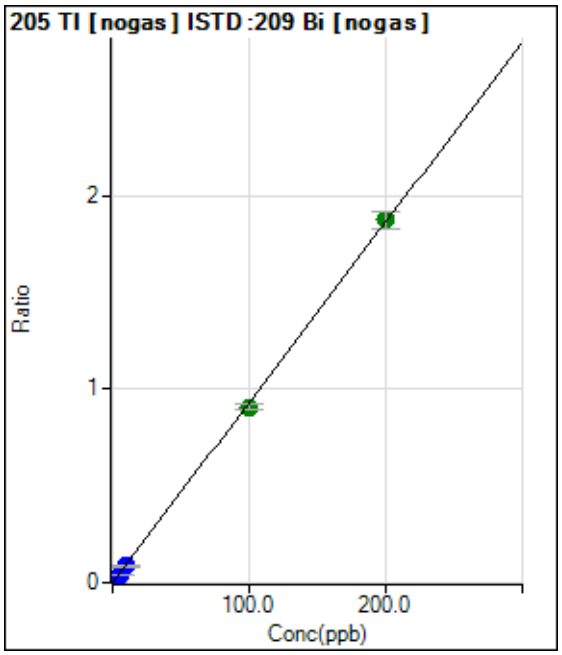
y = 6.9401E-009 * x + 9.0850E-006
R = -0.2069
DL = 1901
BEC = 1309

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			396.68		P	6.3
2	☐			15177.28		P	1.9
3	☐			37206.19		P	2.6
4	☐			74657.31		P	2.8
5	☐			754513.63		P	0.6
6	☐			1615787.06		A	4.1
7	☐						

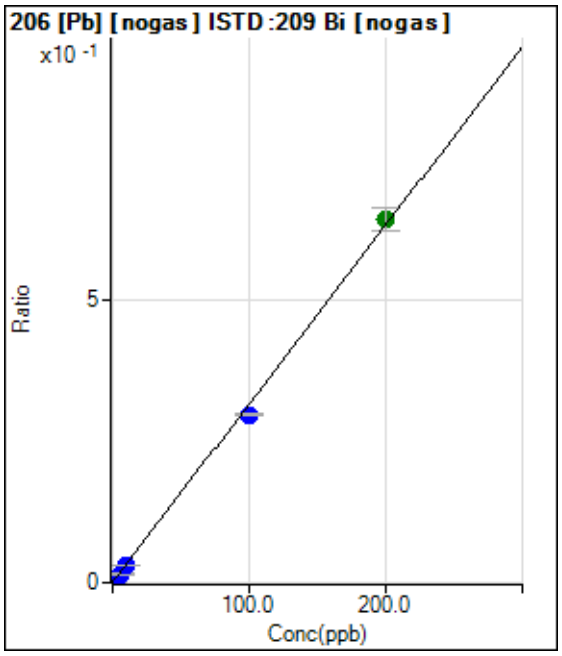
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	950.04	0.0004	P	26.
2	☐	2.000	1.846	36978.93	0.0176	P	5.3
3	☐	5.000	4.650	90889.89	0.0438	P	3.6
4	☐	10.000	9.123	177386.68	0.0855	P	3.5
5	☐	100.000	97.375	1871198.98	0.9080	A	3.2
6	☐	200.000	201.366	3729505.46	1.8773	A	5.1
7	☐	1.000					

y = 0.0093 * x + 4.3290E-004
R = 0.9999
DL = 0.03734
BEC = 0.04645

Weight: <None>
Min Conc: <None>

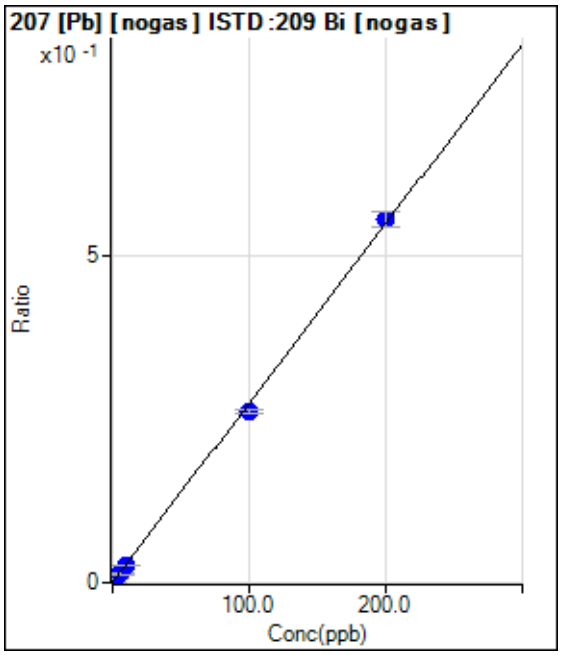


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1443.42	0.0007	P	2.7
2	☐	2.000	1.898	13959.54	0.0067	P	2.6
3	☐	5.000	4.594	31470.82	0.0152	P	8.4
4	☐	10.000	9.218	61834.71	0.0298	P	3.3
5	☐	100.000	93.880	612633.70	0.2974	P	1.3
6	☐	200.000	203.110	1276227.35	0.6426	A	6.3
7	☐	1.000					

y = 0.0032 * x + 6.5882E-004
R = 0.9994
DL = 0.01697
BEC = 0.2084

Weight: <None>
Min Conc: <None>

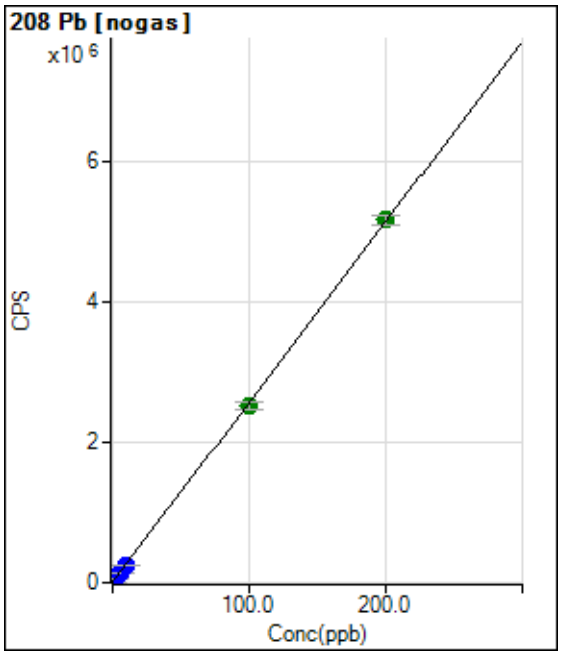
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1286.74	0.0006	P	10.
2	☐	2.000	1.901	12171.41	0.0058	P	1.7
3	☐	5.000	4.736	28181.32	0.0136	P	5.2
4	☐	10.000	9.431	54919.53	0.0265	P	3.7
5	☐	100.000	95.639	541907.69	0.2630	P	2.5
6	☐	200.000	202.216	1103714.62	0.5554	P	4.3
7	☐	1.000					

y = 0.0027 * x + 5.8827E-004
R = 0.9997
DL = 0.06788
BEC = 0.2144

Weight: <None>
Min Conc: <None>

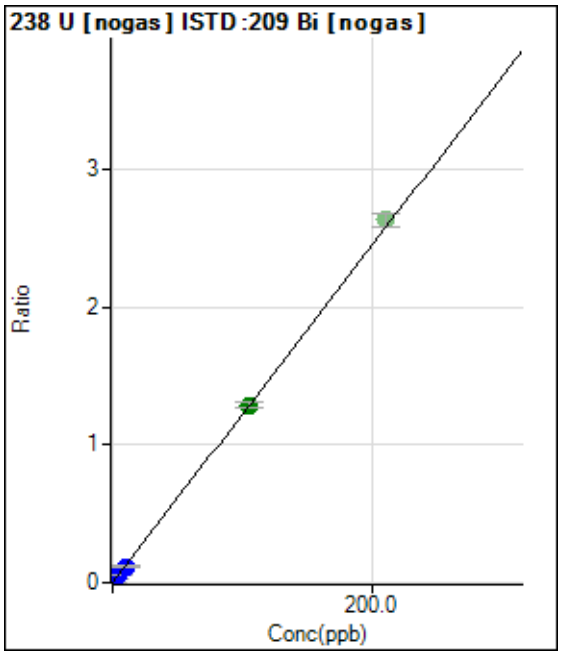


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5600.46		P	3.4
2	☐	2.000	1.947	55658.05		P	1.7
3	☐	5.000	4.775	128327.18		P	0.4
4	☐	10.000	9.450	248511.29		P	1.3
5	☐	100.000	97.744	2517963.92		A	4.1
6	☐	200.000	201.162	5176179.64		A	2.9
7	☐	1.000					

y = 25703.5855 * x + 5600.4633
R = 0.9999
DL = 0.02227
BEC = 0.2179

Weight: <None>
Min Conc: <None>

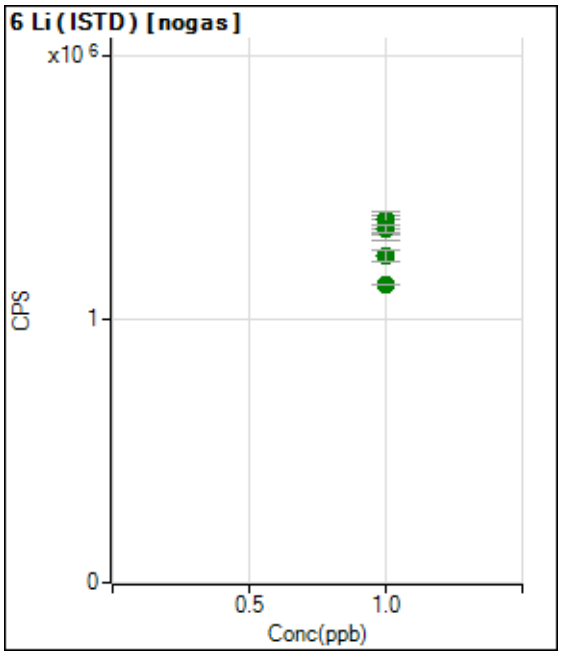
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.33	0.0000	P	22.
2	☐	2.000	1.905	49056.52	0.0234	P	1.0
3	☐	5.000	4.872	124200.91	0.0598	P	1.6
4	☐	10.000	9.631	245233.03	0.1181	P	1.8
5	☐	105.000	105.043	2655341.11	1.2884	A	2.6
6	☑	210.000		5233637.32	2.6334	A	3.4
7	☐	1.000					

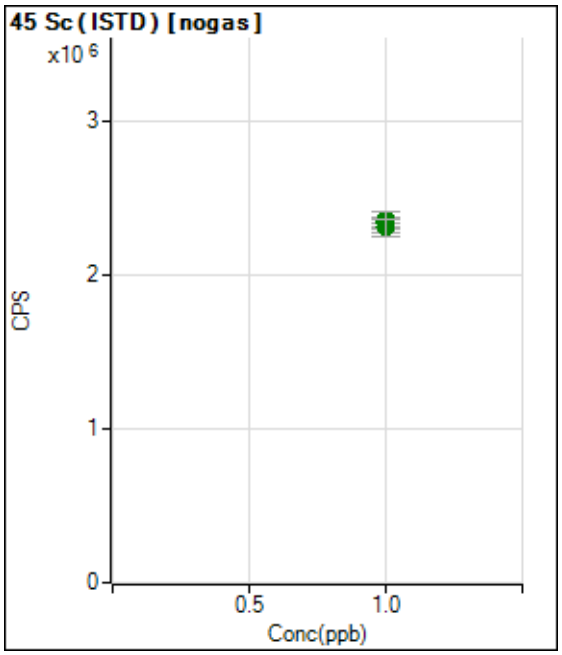
y = 0.0123 * x + 2.8842E-005
R = 1.0000
DL = 0.001568
BEC = 0.002352

Weight: <None>
Min Conc: <None>

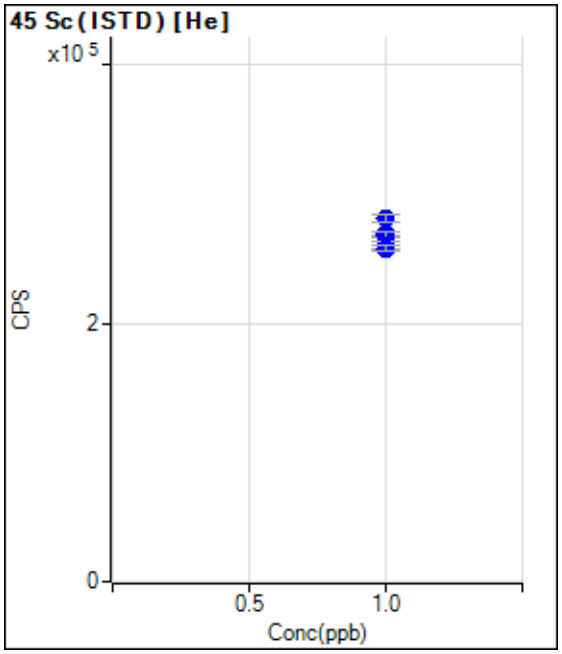


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1359891.36		A	4.9
2	☐	1.000		1344970.86		A	6.0
3	☐	1.000		1379508.00		A	5.0
4	☐	1.000		1345500.42		A	2.3
5	☐	1.000		1246083.87		A	3.4
6	☐	1.000		1131773.55		A	0.1
7	☐	1.000					

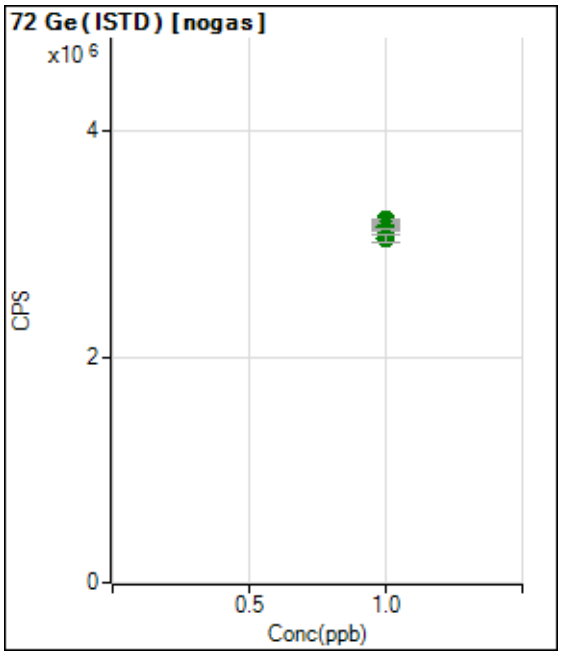
Calibration for 020_ICV.d



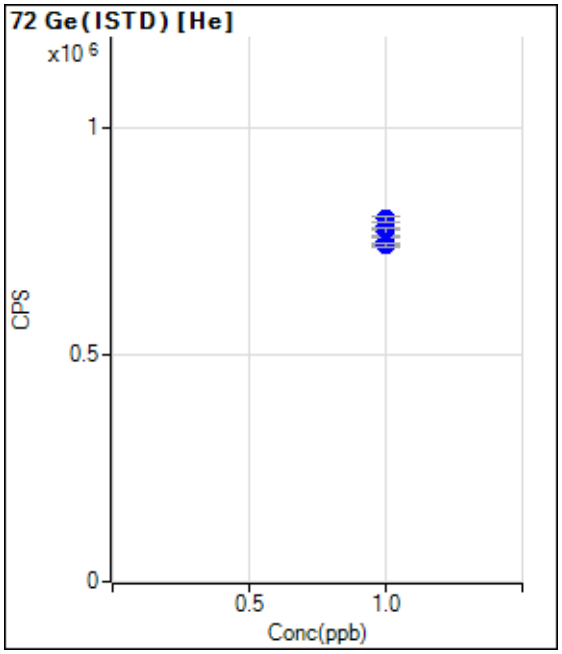
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2346055.54		A	2.6
2	☐	1.000		2362147.52		A	1.9
3	☐	1.000		2342697.83		A	2.7
4	☐	1.000		2348832.83		A	5.5
5	☐	1.000		2358413.77		A	4.5
6	☐	1.000		2311042.67		A	4.5
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		268993.35		P	1.0
2	☐	1.000		280693.89		P	2.1
3	☐	1.000		266646.73		P	0.5
4	☐	1.000		267248.55		P	2.8
5	☐	1.000		260197.88		P	2.3
6	☐	1.000		257615.65		P	1.6
7	☐	1.000					

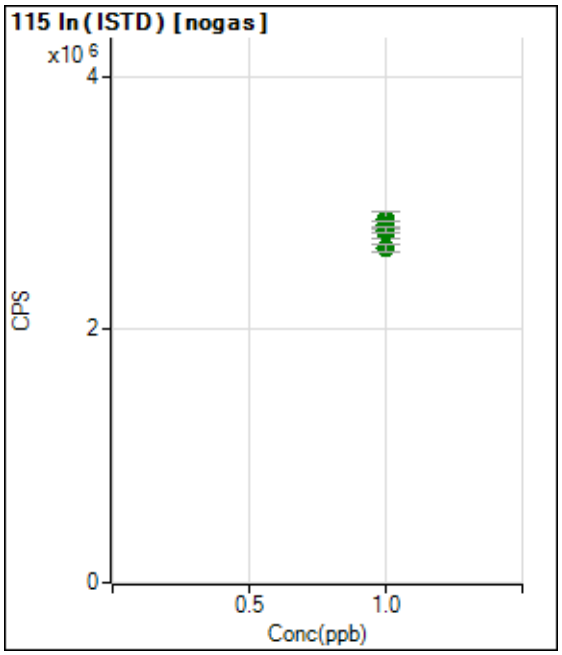


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3145209.43		A	1.2
2	☐	1.000		3213340.79		A	0.9
3	☐	1.000		3154457.97		A	0.5
4	☐	1.000		3156956.72		A	1.8
5	☐	1.000		3121481.00		A	0.8
6	☐	1.000		3050026.83		A	2.0
7	☐	1.000					

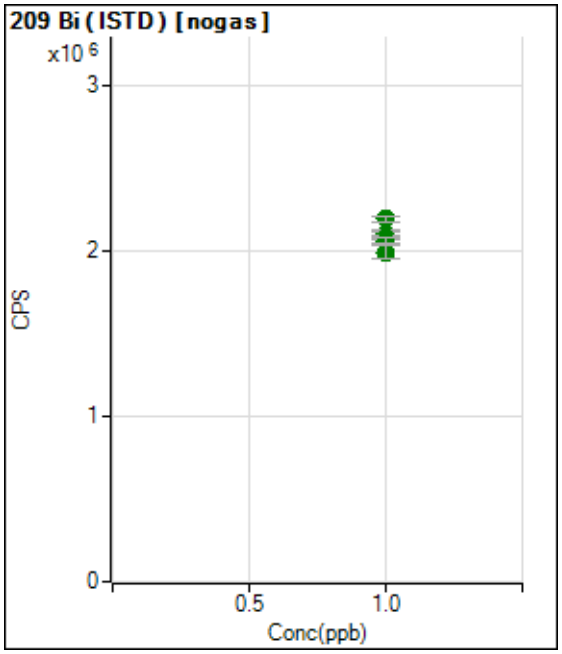


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		785019.94		P	1.9
2	☐	1.000		800121.60		P	1.9
3	☐	1.000		770398.48		P	2.3
4	☐	1.000		771369.03		P	2.2
5	☐	1.000		750724.47		P	2.4
6	☐	1.000		742606.29		P	0.9
7	☐	1.000					

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2761163.82		A	3.7
2	☐	1.000		2864140.74		A	4.8
3	☐	1.000		2819102.61		A	2.0
4	☐	1.000		2761826.92		A	3.1
5	☐	1.000		2781244.33		A	1.7
6	☐	1.000		2642789.96		A	2.6
7	☐	1.000					



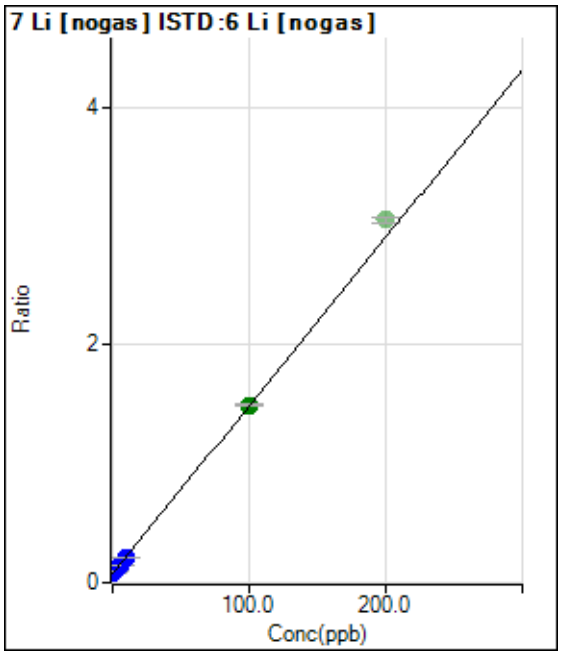
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2190176.74		A	1.9
2	☐	1.000		2096933.25		A	1.0
3	☐	1.000		2078205.39		A	4.3
4	☐	1.000		2075763.61		A	0.8
5	☐	1.000		2060332.52		A	2.0
6	☐	1.000		1989046.90		A	3.9
7	☐	1.000					

Calibration for 129_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\122418A.b\
Analysis File: 122418A.batch.bin
DA Date-Time: 2018-12-24 19:19:15
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	123CALB.d	CAL BLK	2018-12-24 18:59:56
2	124CALS.d	2/10/200	2018-12-24 19:01:55
3	125CALS.d	5/25/500	2018-12-24 19:03:54
4	126CALS.d	10/50/1000	2018-12-24 19:05:53
5	127CALS.d	100/500/10K	2018-12-24 19:07:51
6	128CALS.d	200/1000/20K	2018-12-24 19:09:49
7			

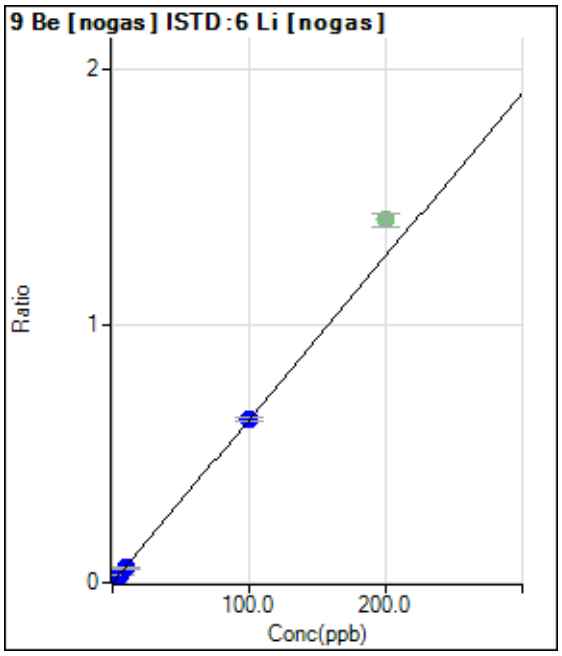
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	109987.48	0.0761	P	4.0
2	☐	2.000	2.015	144042.98	0.1046	P	3.7
3	☐	5.000	5.051	196257.95	0.1475	P	4.2
4	☐	10.000	9.293	278269.37	0.2074	P	4.0
5	☐	100.000	100.068	1809426.95	1.4908	A	1.3
6	☑	200.000		3539333.70	3.0537	A	1.8
7	☐	1.000					

y = 0.0141 * x + 0.0761
R = 1.0000
DL = 0.6449
BEC = 5.38

Weight: <None>
Min Conc: <None>

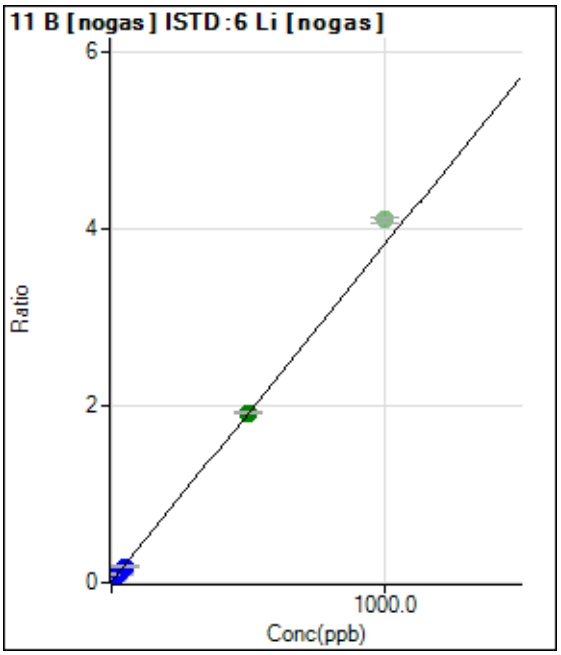


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	70.00	0.0000	P	37.
2	☐	2.000	1.825	16016.87	0.0116	P	5.3
3	☐	5.000	4.751	40216.01	0.0302	P	3.1
4	☐	10.000	9.062	77147.95	0.0576	P	6.7
5	☐	100.000	100.110	770857.12	0.6353	P	1.3
6	☑	200.000		1635048.00	1.4106	A	3.5
7	☐	1.000					

y = 0.0063 * x + 4.8377E-005
R = 1.0000
DL = 0.008578
BEC = 0.007624

Weight: <None>
Min Conc: <None>

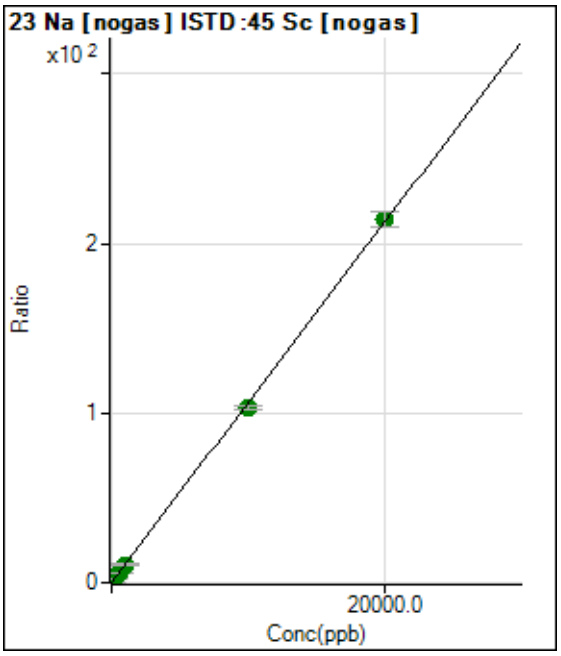
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	18916.23	0.0131	P	2.2
2	☐	10.000	8.712	63562.20	0.0462	P	6.2
3	☐	25.000	22.388	130645.87	0.0982	P	3.7
4	☐	50.000	44.565	244624.14	0.1824	P	5.6
5	☐	500.000	500.700	2325500.28	1.9158	A	1.0
6	☑	1000.000		4747091.91	4.0959	A	1.8
7	☐	5.000					

y = 0.0038 * x + 0.0131
R = 1.0000
DL = 0.2234
BEC = 3.442

Weight: <None>
Min Conc: <None>

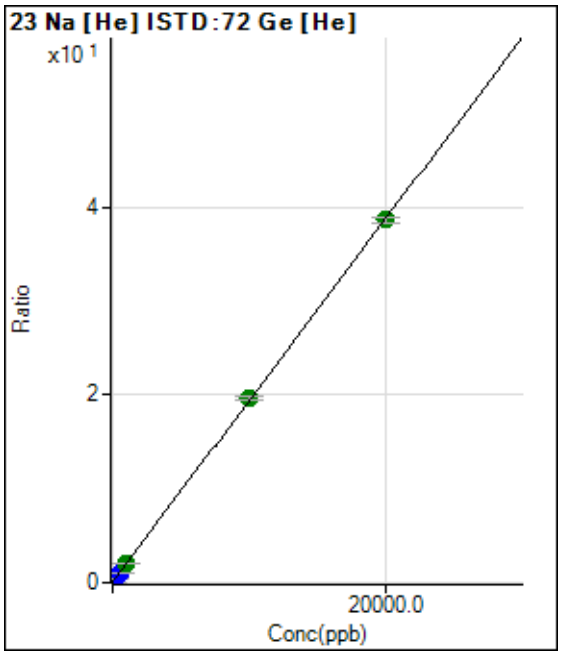


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	400648.68	0.1735	P	0.5
2	☐	200.000	196.654	5490362.49	2.2612	A	3.5
3	☐	500.000	506.361	12844224.25	5.5491	A	3.5
4	☐	1000.000	993.358	25250872.44	10.7190	A	2.4
5	☐	10000.00	9722.634	242498655.4	103.389	A	1.5
6	☐	20000.00	20138.890	487938144.2	213.968	A	4.4
7	☐	100.000					

y = 0.0106 * x + 0.1735
R = 0.9999
DL = 0.2609
BEC = 16.34

Weight: <None>
Min Conc: <None>

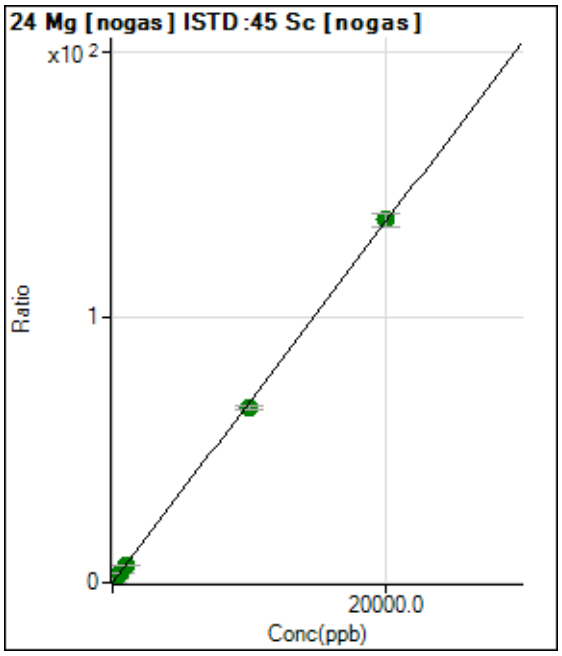
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	45584.69	0.0604	P	3.2
2	☐	200.000	199.795	338996.83	0.4467	P	2.9
3	☐	500.000	478.901	782019.52	0.9862	P	1.4
4	☐	1000.000	1043.104	1603255.50	2.0769	A	3.7
5	☐	10000.00	10100.867	14697812.28	19.5869	A	1.8
6	☐	20000.00	19947.941	28670344.57	38.6227	A	1.8
7	☐	100.000					

y = 0.0019 * x + 0.0604
R = 1.0000
DL = 3.039
BEC = 31.26

Weight: <None>
Min Conc: <None>

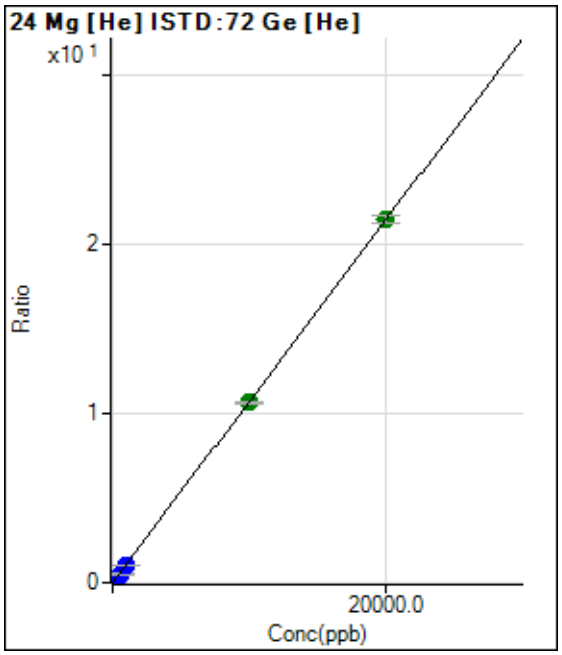


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8169.72	0.0035	P	17.
2	☐	200.000	207.727	3430175.73	1.4130	A	5.2
3	☐	500.000	509.339	8008672.58	3.4594	A	2.3
4	☐	1000.000	990.209	15834309.73	6.7222	A	2.5
5	☐	10000.00	9731.414	154874207.6	66.0318	A	2.7
6	☐	20000.00	20134.472	311599648.6	136.617	A	3.7
7	☐	100.000					

y = 0.0068 * x + 0.0035
R = 0.9999
DL = 0.276
BEC = 0.5222

Weight: <None>
Min Conc: <None>

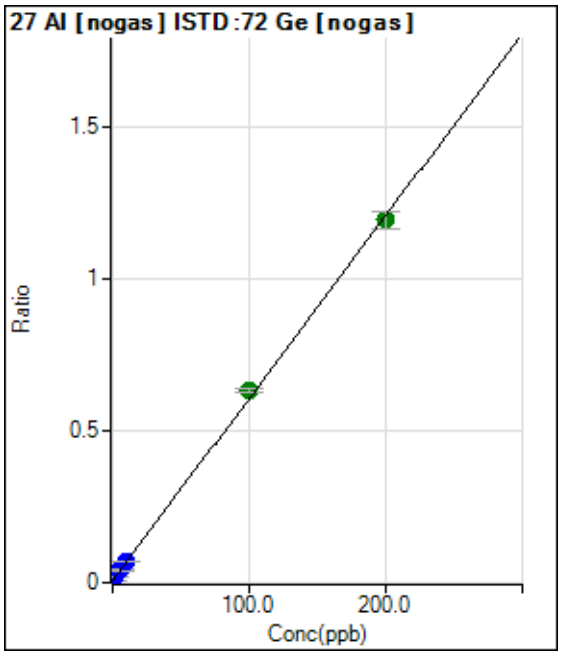
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	583.35	0.0008	P	14.
2	☐	200.000	200.524	163587.70	0.2155	P	2.7
3	☐	500.000	475.935	404818.80	0.5105	P	1.2
4	☐	1000.000	985.076	815125.67	1.0558	P	2.7
5	☐	10000.00	9942.707	7992093.84	10.6500	A	0.8
6	☐	20000.00	20029.989	15925250.18	21.4541	A	2.0
7	☐	100.000					

y = 0.0011 * x + 7.7207E-004
R = 1.0000
DL = 0.303
BEC = 0.7208

Weight: <None>
Min Conc: <None>

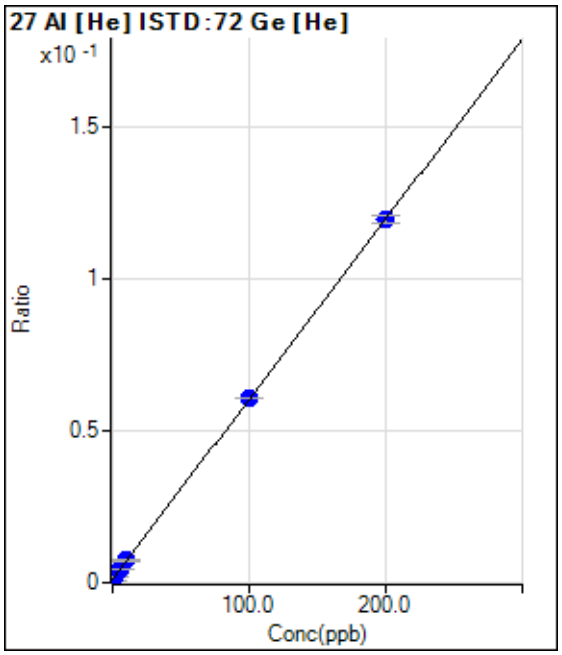


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	21442.36	0.0067	P	4.3
2	☐	2.000	2.061	62001.74	0.0190	P	3.2
3	☐	5.000	5.801	140606.19	0.0415	P	3.0
4	☐	10.000	10.560	232007.90	0.0700	P	0.4
5	☐	100.000	104.066	1990080.39	0.6309	A	2.4
6	☐	200.000	197.918	3720618.90	1.1938	A	5.1
7	☐	1.000					

y = 0.0060 * x + 0.0067
R = 0.9997
DL = 0.144
BEC = 1.115

Weight: <None>
Min Conc: <None>

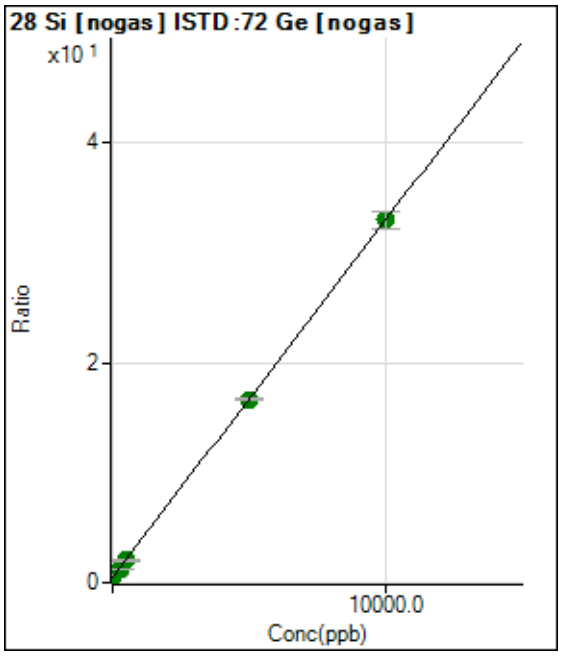
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.865	436.68	0.0006	P	18.
2	☐	2.000	1.605	1553.42	0.0020	P	8.1
3	☐	5.000	5.532	3467.04	0.0044	P	1.9
4	☐	10.000	10.454	5627.60	0.0073	P	5.8
5	☐	100.000	100.613	45588.36	0.0607	P	0.6
6	☐	200.000	199.662	88686.85	0.1195	P	2.0
7	☐	1.000					

y = 5.9290E-004 * x + 0.0011
R = 1.0000
DL = 0.5335
BEC = 1.843

Weight: <None>
Min Conc: <None>

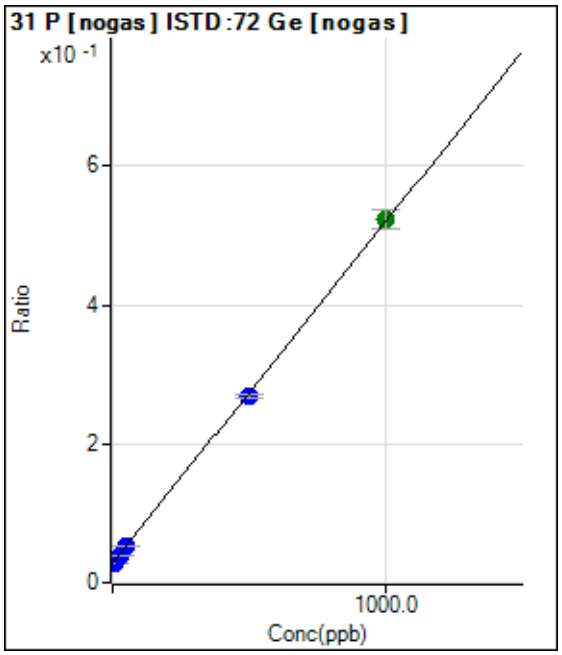


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1541531.96	0.4807	A	2.8
2	☐	100.000	95.072	2570600.17	0.7897	A	3.4
3	☐	250.000	231.577	4181612.54	1.2334	A	1.6
4	☐	500.000	471.512	6670116.15	2.0133	A	0.5
5	☐	5000.000	4990.719	52692804.22	16.7021	A	1.9
6	☐	10000.00	10006.575	102886088.4	33.0051	A	4.6
7	☐	5.000					

y = 0.0033 * x + 0.4807
R = 1.0000
DL = 12.53
BEC = 147.9

Weight: <None>
Min Conc: <None>

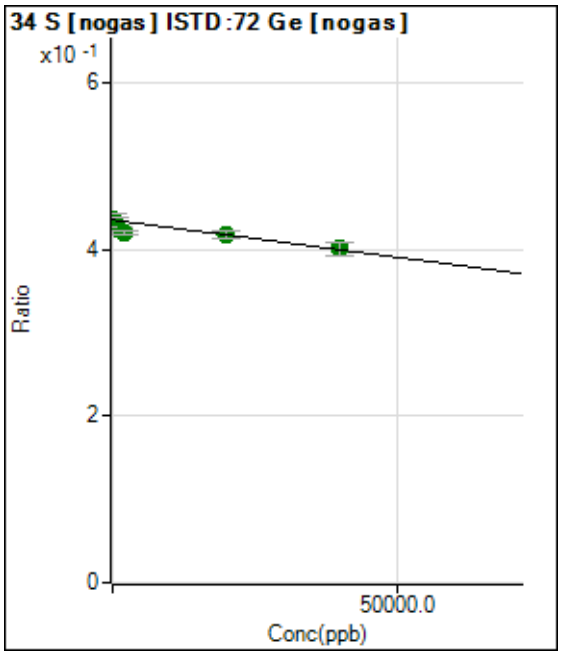
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90461.85	0.0282	P	1.7
2	☐	10.000	-2.420	87959.88	0.0270	P	3.0
3	☐	25.000	21.272	131059.88	0.0387	P	3.5
4	☐	50.000	49.693	174335.07	0.0526	P	2.4
5	☐	500.000	488.610	846504.44	0.2683	P	2.4
6	☐	1000.000	1005.928	1628622.27	0.5226	A	5.4
7	☐	5.000					

y = 4.9145E-004 * x + 0.0282
R = 0.9999
DL = 2.983
BEC = 57.4

Weight: <None>
Min Conc: <None>

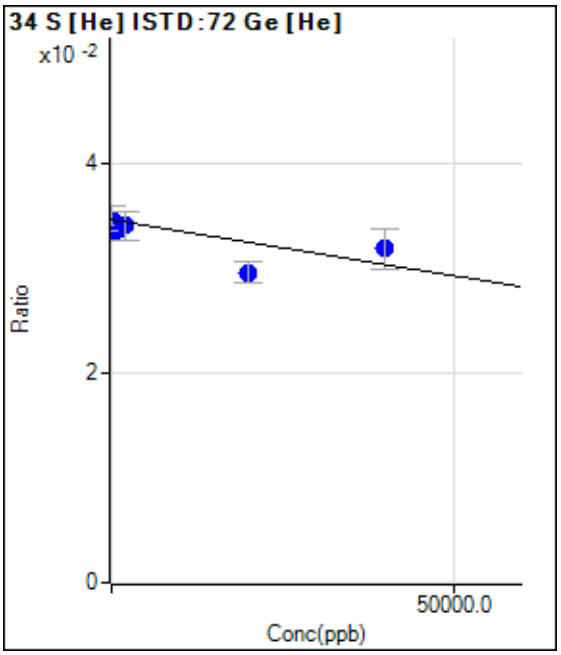


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1396824.77	0.4356	A	3.9
2	☐	400.000	3152.730	1408824.22	0.4328	A	2.8
3	☐	1000.000	13056.907	1437071.29	0.4239	A	1.5
4	☐	2000.000	17104.652	1392253.03	0.4203	A	1.1
5	☐	20000.00	19982.618	1317836.85	0.4177	A	1.8
6	☐	40000.00	38924.509	1249132.51	0.4007	A	4.4
7	☐	100.000					

y = -8.9599E-007 * x + 0.4356
R = -0.9057
DL = -5.671E+04
BEC = -4.862E+05

Weight: <None>
Min Conc: <None>

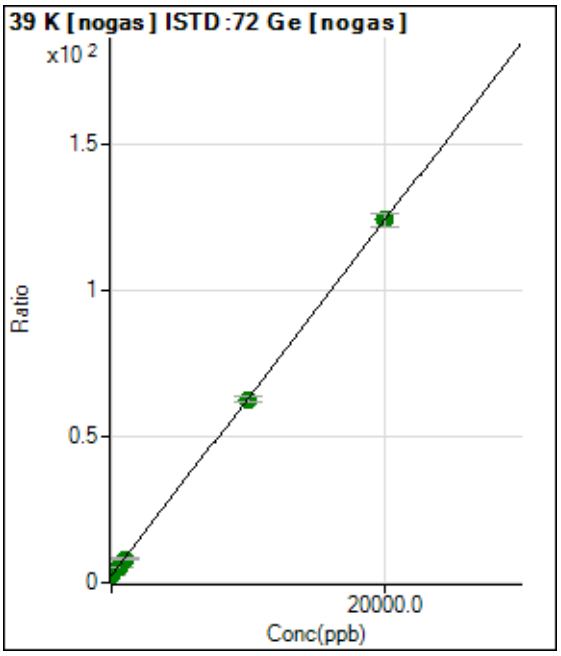
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	26123.34	0.0346	P	7.8
2	☐	400.000	11341.660	25388.79	0.0334	P	0.6
3	☐	1000.000	7300.970	26857.01	0.0339	P	1.5
4	☐	2000.000	5032.600	26322.65	0.0341	P	8.1
5	☐	20000.00	46969.867	22250.35	0.0296	P	6.8
6	☐	40000.00	26096.495	23652.87	0.0319	P	11.
7	☐	100.000					

y = -1.0641E-007 * x + 0.0346
R = -0.6867
DL = -7.658E+04
BEC = -3.256E+05

Weight: <None>
Min Conc: <None>

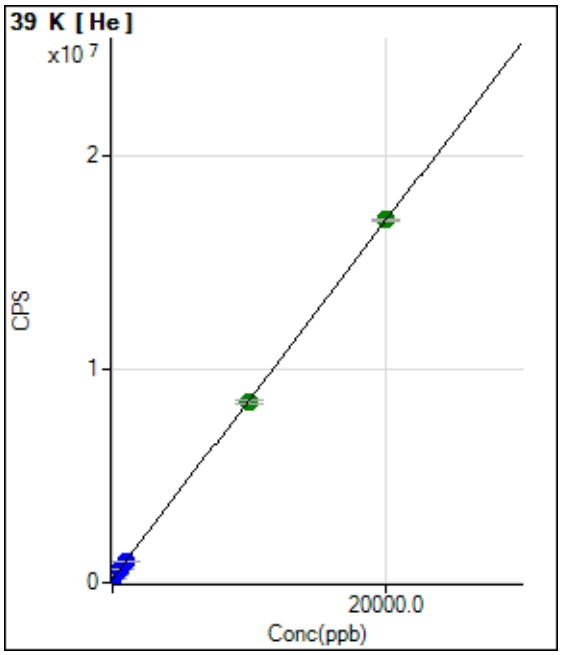


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7853188.46	2.4490	A	0.9
2	☐	200.000	201.119	11948323.96	3.6702	A	2.3
3	☐	500.000	465.004	17872185.82	5.2724	A	2.8
4	☐	1000.000	947.779	27175798.52	8.2036	A	1.5
5	☐	10000.00	9928.145	197878504.4	62.7298	A	3.1
6	☐	20000.00	20039.402	387013200.3	124.122	A	3.8
7	☐	100.000					

y = 0.0061 * x + 2.4490
R = 1.0000
DL = 10.79
BEC = 403.3

Weight: <None>
Min Conc: <None>

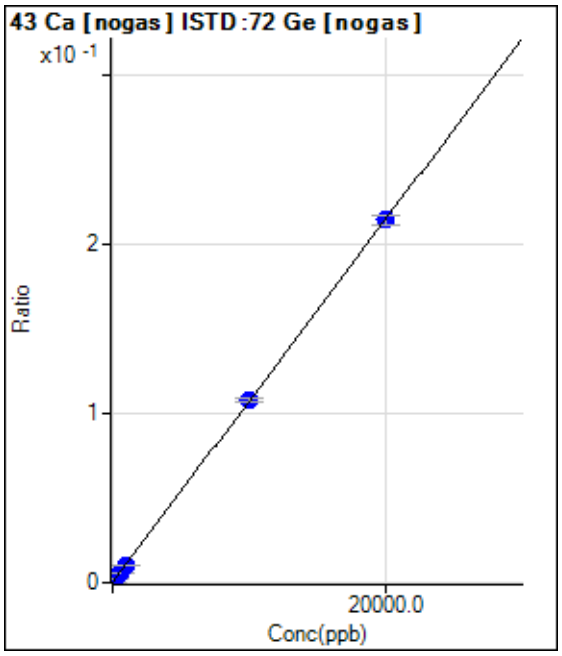
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	181917.03		P	1.6
2	☐	200.000	200.744	350063.77		P	0.8
3	☐	500.000	496.267	597599.06		P	0.8
4	☐	1000.000	976.799	1000101.37		P	0.3
5	☐	10000.00	9873.819	8452403.42		A	1.7
6	☐	20000.00	20064.336	16988162.25		A	0.8
7	☐	100.000					

y = 837.6178 * x + 181917.0300
R = 1.0000
DL = 10.5
BEC = 217.2

Weight: <None>
Min Conc: <None>

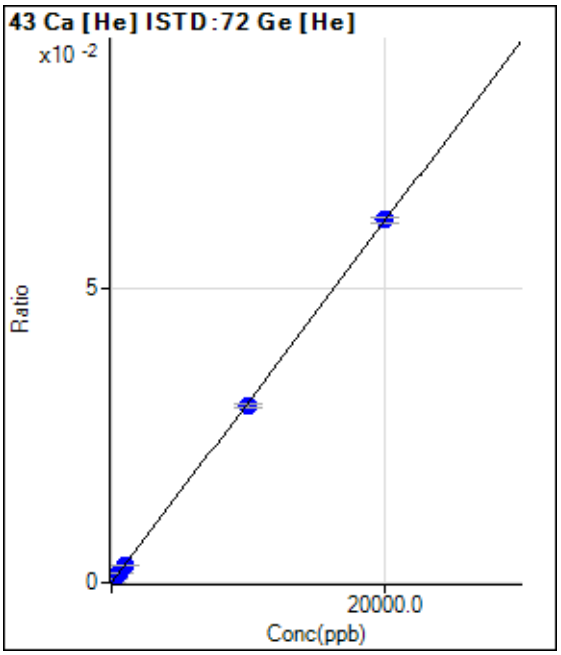


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.35	0.0002	P	15.
2	☐	200.000	205.812	7758.39	0.0024	P	5.1
3	☐	500.000	483.954	18202.48	0.0054	P	1.1
4	☐	1000.000	968.960	35026.59	0.0106	P	0.9
5	☐	10000.00	10035.124	340305.98	0.1079	P	1.5
6	☐	20000.00	19984.333	669374.60	0.2146	P	2.9
7	☐	100.000					

y = 1.0730E-005 * x + 1.7572E-004
R = 1.0000
DL = 7.357
BEC = 16.38

Weight: <None>
Min Conc: <None>

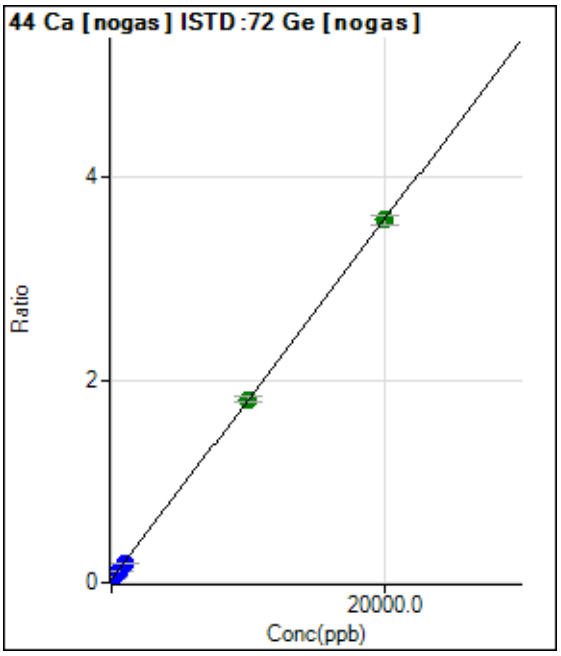
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10.00	0.0000	P	173
2	☐	200.000	211.627	503.35	0.0007	P	12.
3	☐	500.000	532.767	1306.73	0.0016	P	9.8
4	☐	1000.000	976.133	2323.51	0.0030	P	3.7
5	☐	10000.00	9819.239	22630.66	0.0302	P	2.4
6	☐	20000.00	20090.638	45786.34	0.0617	P	1.5
7	☐	100.000					

y = 3.0694E-006 * x + 1.3487E-005
R = 0.9999
DL = 22.83
BEC = 4.394

Weight: <None>
Min Conc: <None>

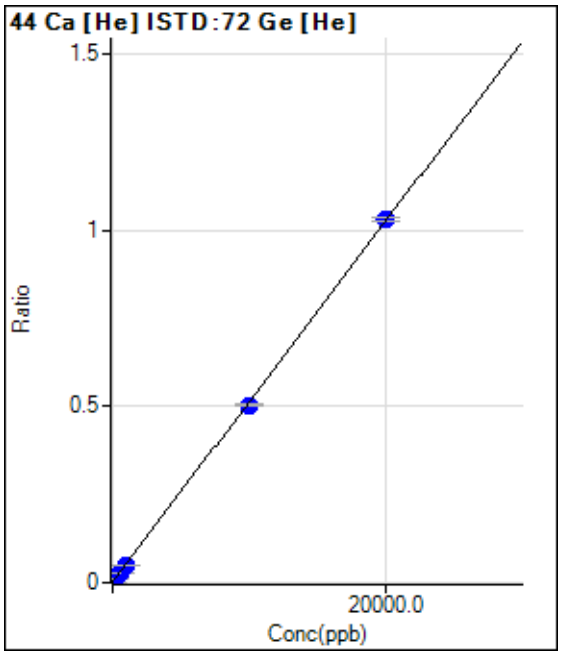


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	95927.98	0.0299	P	1.3
2	☐	200.000	183.548	203606.75	0.0625	P	2.9
3	☐	500.000	453.515	374776.73	0.1105	P	1.3
4	☐	1000.000	921.185	641708.45	0.1937	P	1.0
5	☐	10000.00	10030.191	5719862.00	1.8132	A	2.3
6	☐	20000.00	19990.172	11178437.75	3.5839	A	2.7
7	☐	100.000					

y = 1.7779E-004 * x + 0.0299
R = 1.0000
DL = 6.327
BEC = 168.3

Weight: <None>
Min Conc: <None>

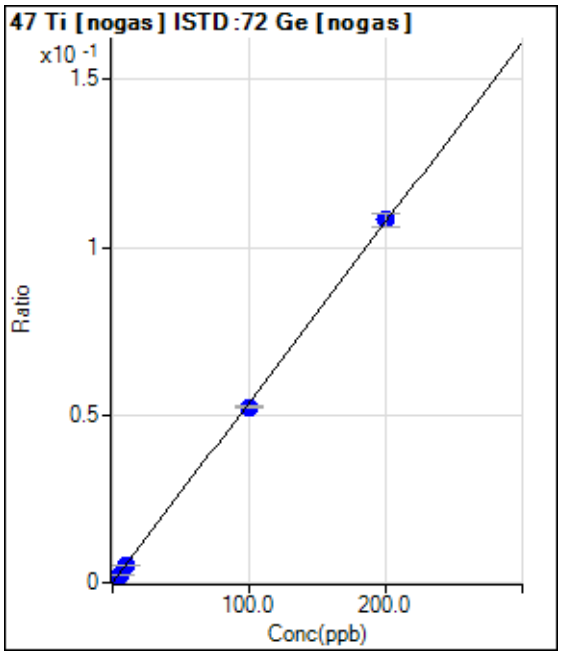
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1076.71	0.0014	P	3.7
2	☐	200.000	201.046	8882.24	0.0117	P	2.3
3	☐	500.000	472.581	20271.27	0.0256	P	5.3
4	☐	1000.000	960.055	38974.26	0.0505	P	0.6
5	☐	10000.00	9808.540	377152.79	0.5025	P	0.9
6	☐	20000.00	20098.402	763233.06	1.0282	P	1.0
7	☐	100.000					

y = 5.1089E-005 * x + 0.0014
R = 0.9999
DL = 3.109
BEC = 27.94

Weight: <None>
Min Conc: <None>

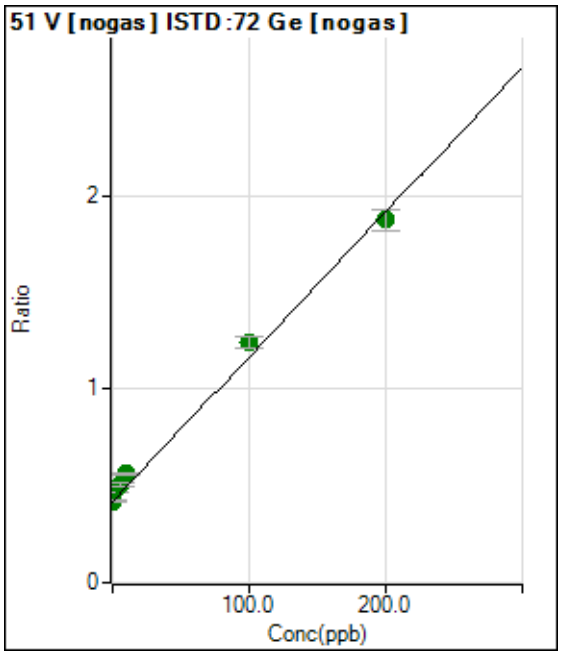


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	236.67	0.0001	P	26.
2	☐	2.000	1.976	3690.42	0.0011	P	10.
3	☐	5.000	4.628	8675.50	0.0026	P	1.6
4	☐	10.000	9.227	16657.76	0.0050	P	3.2
5	☐	100.000	97.395	165245.99	0.0524	P	0.9
6	☐	200.000	201.351	337306.81	0.1082	P	3.6
7	☐	1.000					

y = 5.3690E-004 * x + 7.3776E-005
R = 0.9999
DL = 0.111
BEC = 0.1374

Weight: <None>
Min Conc: <None>

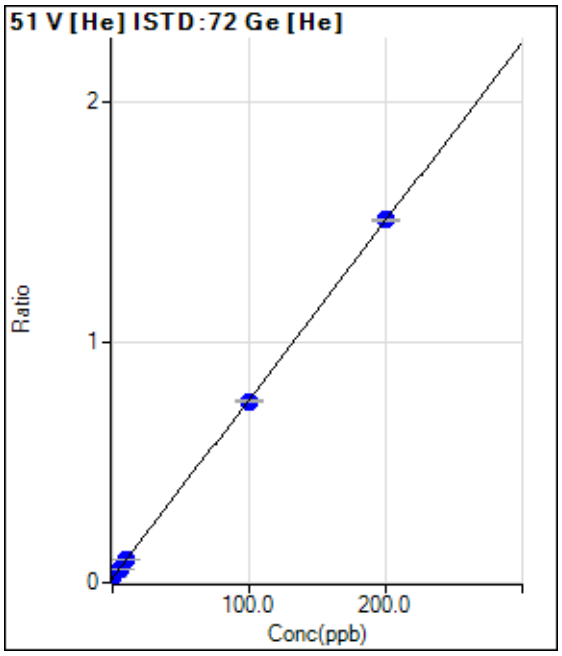
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1345869.72	0.4197	A	1.7
2	☐	2.000	7.600	1551444.86	0.4766	A	4.6
3	☐	5.000	11.570	1716980.12	0.5064	A	2.6
4	☐	10.000	19.280	1868880.05	0.5641	A	1.6
5	☐	100.000	109.718	3915445.92	1.2417	A	4.3
6	☐	200.000	194.457	5847591.93	1.8765	A	5.7
7	☐	1.000					

y = 0.0075 * x + 0.4197
R = 0.9980
DL = 2.823
BEC = 56.03

Weight: <None>
Min Conc: <None>

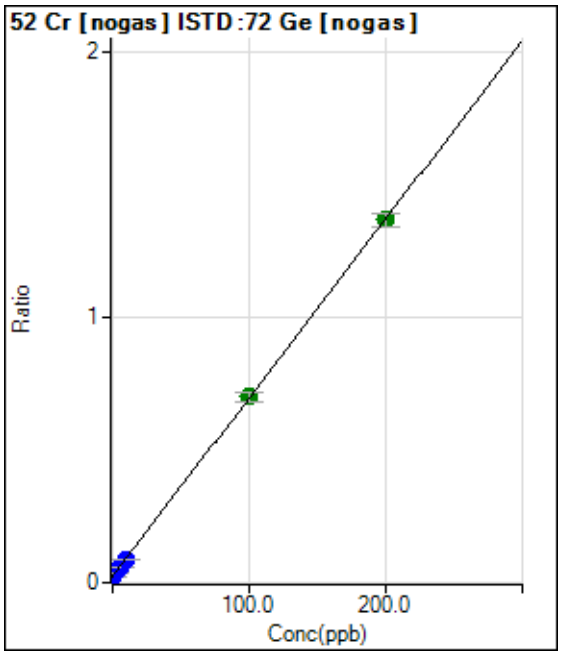


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.142	15473.08	0.0205	P	1.2
2	☐	2.000	2.262	27507.52	0.0362	P	0.3
3	☐	5.000	5.039	45060.12	0.0568	P	1.1
4	☐	10.000	10.104	72880.65	0.0944	P	0.7
5	☐	100.000	98.926	565139.19	0.7531	P	1.2
6	☐	200.000	200.528	1118348.42	1.5066	P	0.2
7	☐	1.000					

y = 0.0074 * x + 0.0195
R = 1.0000
DL = 0.09877
BEC = 2.624

Weight: <None>
Min Conc: <None>

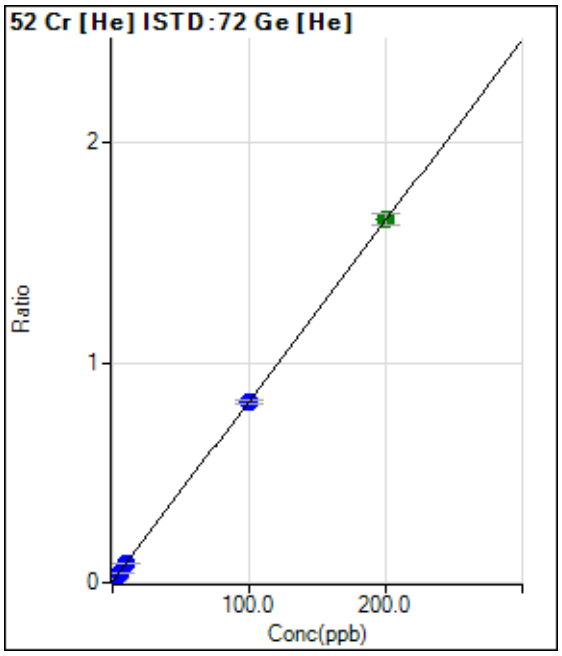
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	77474.30	0.0242	P	1.4
2	☐	2.000	1.994	122256.54	0.0376	P	4.7
3	☐	5.000	4.791	191121.94	0.0564	P	0.4
4	☐	10.000	9.499	291583.32	0.0880	P	2.4
5	☐	100.000	100.766	2212533.61	0.7017	A	5.0
6	☐	200.000	199.647	4260513.48	1.3665	A	4.0
7	☐	1.000					

y = 0.0067 * x + 0.0242
R = 1.0000
DL = 0.1503
BEC = 3.593

Weight: <None>
Min Conc: <None>

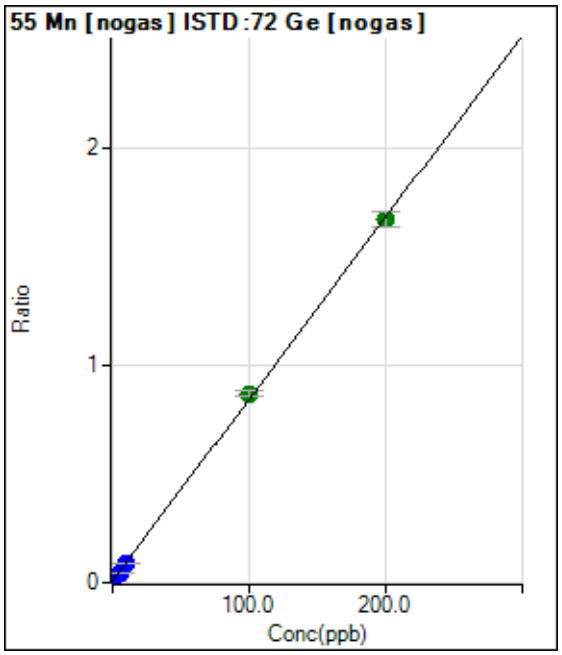


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4597.30	0.0061	P	3.4
2	☐	2.000	1.867	16257.30	0.0214	P	3.3
3	☐	5.000	4.784	35978.61	0.0454	P	1.3
4	☐	10.000	9.709	66251.86	0.0858	P	1.5
5	☐	100.000	99.373	616895.43	0.8220	P	1.4
6	☐	200.000	200.335	1225420.61	1.6509	A	3.2
7	☐	1.000					

y = 0.0082 * x + 0.0061
R = 1.0000
DL = 0.07617
BEC = 0.7421

Weight: <None>
Min Conc: <None>

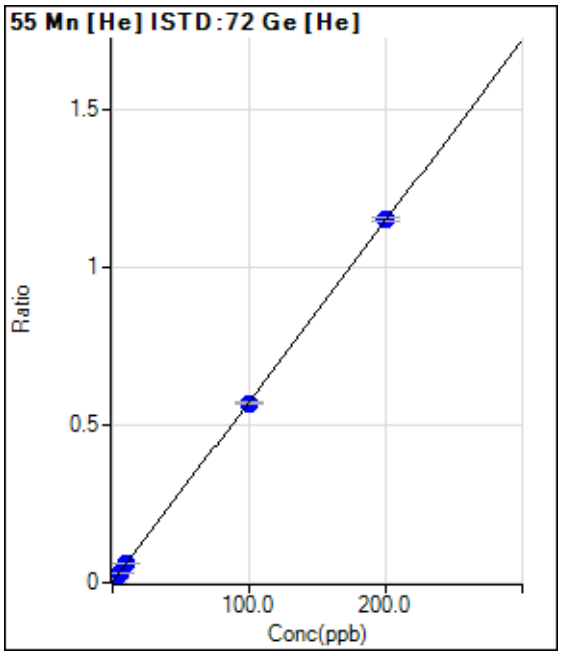
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27807.86	0.0087	P	0.8
2	☐	2.000	1.686	74188.43	0.0228	P	1.7
3	☐	5.000	4.699	162791.83	0.0480	P	1.1
4	☐	10.000	9.328	287456.10	0.0868	P	3.8
5	☐	100.000	102.828	2743316.41	0.8696	A	2.8
6	☐	200.000	198.630	5212488.15	1.6718	A	4.1
7	☐	1.000					

y = 0.0084 * x + 0.0087
R = 0.9998
DL = 0.02612
BEC = 1.036

Weight: <None>
Min Conc: <None>

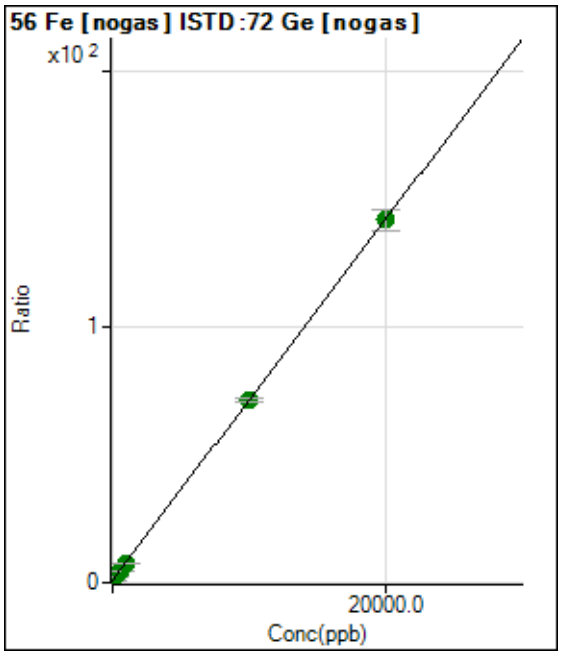


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1256.73	0.0017	P	3.9
2	☐	2.000	1.970	9842.76	0.0130	P	1.3
3	☐	5.000	4.923	23715.60	0.0299	P	0.9
4	☐	10.000	9.988	45526.55	0.0590	P	2.2
5	☐	100.000	99.099	427894.37	0.5701	P	1.7
6	☐	200.000	200.454	854743.11	1.1515	P	1.0
7	☐	1.000					

y = 0.0057 * x + 0.0017
R = 1.0000
DL = 0.03398
BEC = 0.2903

Weight: <None>
Min Conc: <None>

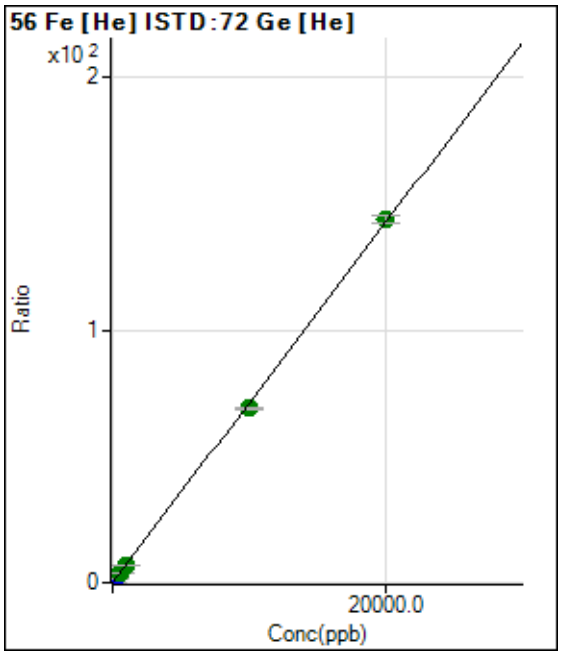
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2809088.74	0.8760	A	0.7
2	☐	200.000	189.203	7193806.41	2.2096	A	2.1
3	☐	500.000	473.883	14293152.92	4.2160	A	1.5
4	☐	1000.000	958.960	25285242.23	7.6350	A	4.1
5	☐	10000.00	10026.192	225714363.3	71.5426	A	1.7
6	☐	20000.00	19989.717	441805293.2	141.767	A	5.6
7	☐	100.000					

y = 0.0070 * x + 0.8760
R = 1.0000
DL = 2.691
BEC = 124.3

Weight: <None>
Min Conc: <None>

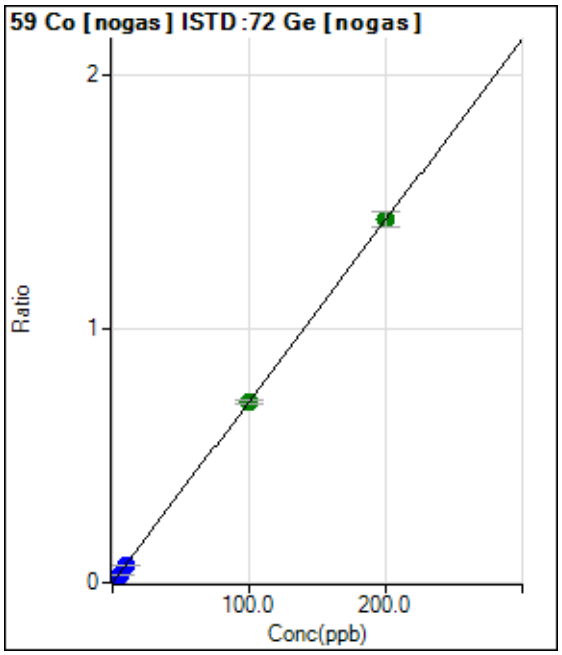


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11797.23	0.0156	P	2.6
2	☐	200.000	199.295	1088582.51	1.4341	P	1.4
3	☐	500.000	495.867	2811433.19	3.5449	A	3.8
4	☐	1000.000	984.982	5424213.25	7.0261	A	3.1
5	☐	10000.00	9671.886	51671207.56	68.8543	A	1.5
6	☐	20000.00	20164.918	106540595.0	143.537	A	2.2
7	☐	100.000					

y = 0.0071 * x + 0.0156
R = 0.9998
DL = 0.1681
BEC = 2.196

Weight: <None>
Min Conc: <None>

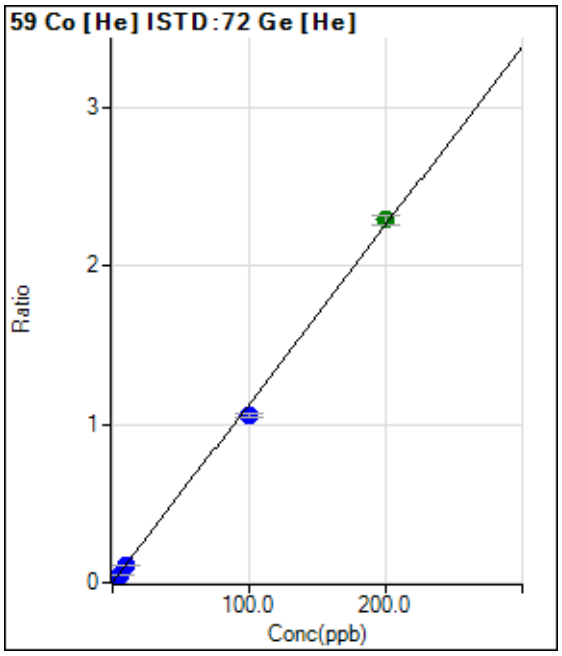
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	823.36	0.0003	P	13.
2	☐	2.000	1.931	45800.60	0.0141	P	2.3
3	☐	5.000	4.541	111007.64	0.0327	P	2.7
4	☐	10.000	9.334	221975.59	0.0670	P	3.2
5	☐	100.000	99.830	2253591.58	0.7143	A	1.5
6	☐	200.000	200.131	4462955.14	1.4316	A	4.3
7	☐	1.000					

y = 0.0072 * x + 2.5681E-004
R = 1.0000
DL = 0.01409
BEC = 0.03591

Weight: <None>
Min Conc: <None>

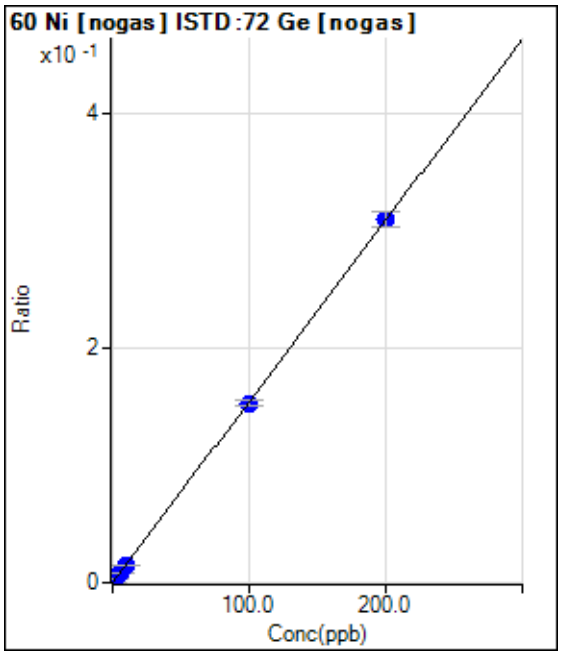


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	303.34	0.0004	P	34.
2	☐	2.000	2.008	17481.91	0.0230	P	3.6
3	☐	5.000	4.625	41647.48	0.0525	P	1.0
4	☐	10.000	9.577	83632.45	0.1083	P	4.2
5	☐	100.000	93.961	794999.44	1.0594	P	1.9
6	☐	200.000	203.050	1698959.71	2.2890	A	2.8
7	☐	1.000					

y = 0.0113 * x + 4.0067E-004
R = 0.9994
DL = 0.03644
BEC = 0.03555

Weight: <None>
Min Conc: <None>

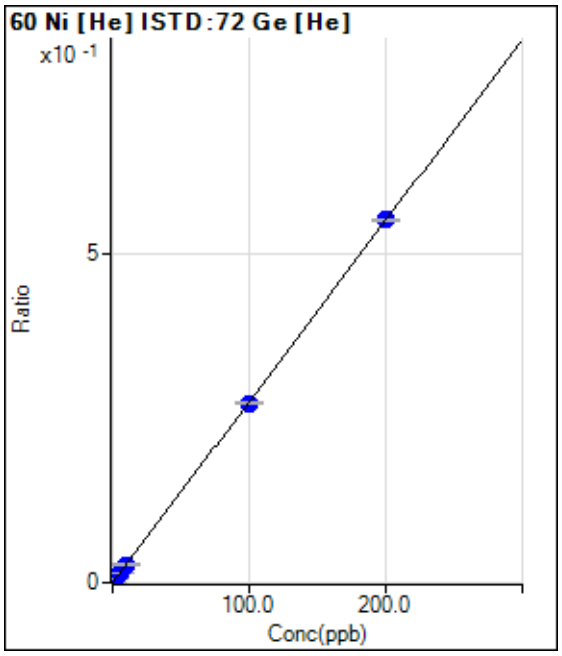
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.164	466.68	0.0001	P	14.
2	☐	2.000	2.273	11060.15	0.0034	P	5.2
3	☐	5.000	5.045	26012.14	0.0077	P	4.6
4	☐	10.000	9.871	50081.84	0.0151	P	0.9
5	☐	100.000	99.287	482568.22	0.1530	P	3.1
6	☐	200.000	200.359	962911.47	0.3089	P	4.1
7	☐	1.000					

y = 0.0015 * x - 1.0791E-004
R = 1.0000
DL = 0.0401
BEC = -0.06998

Weight: <None>
Min Conc: <None>

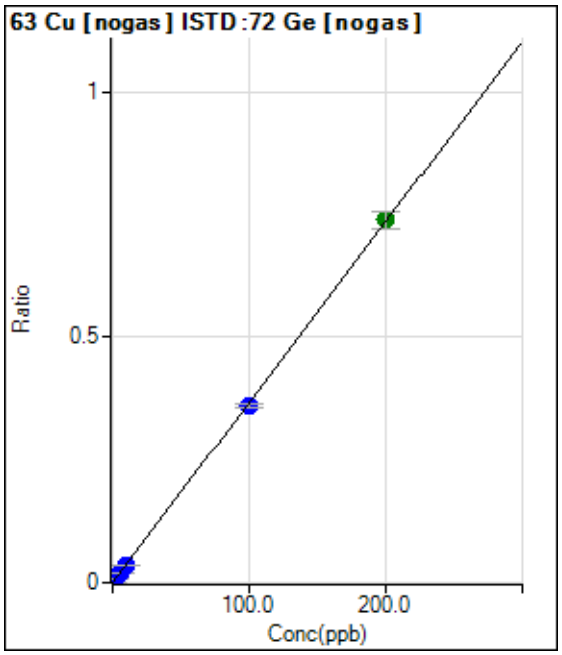


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.182	136.67	0.0002	P	27.
2	☐	2.000	2.306	4577.31	0.0060	P	7.6
3	☐	5.000	5.035	10746.59	0.0136	P	0.3
4	☐	10.000	9.957	20928.95	0.0271	P	5.1
5	☐	100.000	99.044	204531.13	0.2726	P	1.1
6	☐	200.000	200.476	409741.28	0.5520	P	0.8
7	☐	1.000					

y = 0.0028 * x - 3.1895E-004
R = 1.0000
DL = 0.05336
BEC = -0.1158

Weight: <None>
Min Conc: <None>

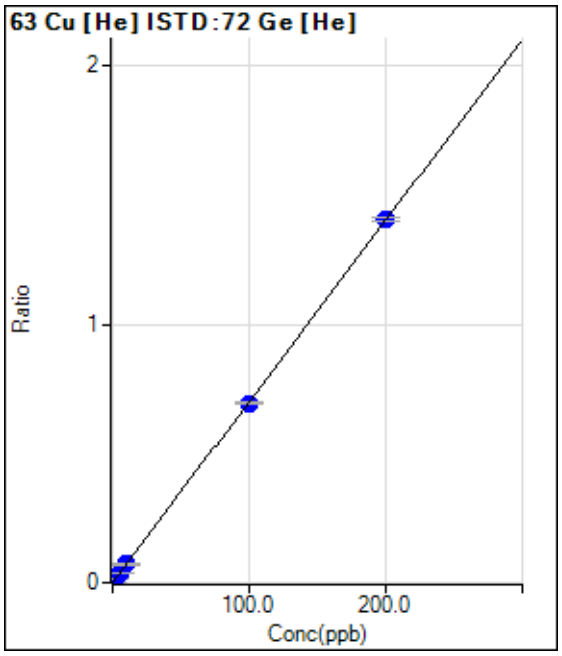
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1483.42	0.0005	P	6.5
2	☐	2.000	2.046	25972.06	0.0080	P	5.5
3	☐	5.000	4.903	62661.18	0.0185	P	0.9
4	☐	10.000	9.574	118091.77	0.0356	P	1.1
5	☐	100.000	97.756	1134783.24	0.3597	P	2.6
6	☐	200.000	201.145	2305482.72	0.7397	A	4.9
7	☐	1.000					

y = 0.0037 * x + 4.6260E-004
R = 0.9999
DL = 0.02447
BEC = 0.1259

Weight: <None>
Min Conc: <None>

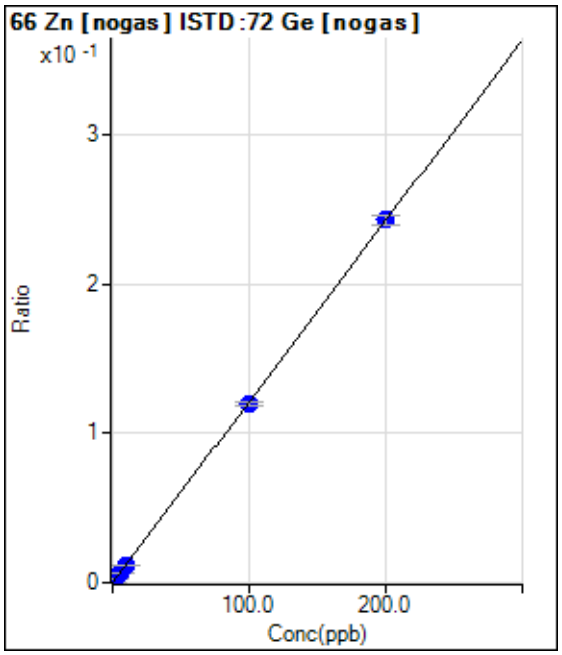


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.129	643.36	0.0009	P	13.
2	☐	2.000	2.160	11443.73	0.0151	P	5.0
3	☐	5.000	5.021	27858.12	0.0351	P	2.7
4	☐	10.000	10.108	54648.24	0.0708	P	4.3
5	☐	100.000	99.179	521586.57	0.6950	P	0.6
6	☐	200.000	200.403	1042534.70	1.4045	P	1.1
7	☐	1.000					

y = 0.0070 * x - 5.1993E-005
R = 1.0000
DL = 0.04848
BEC = -0.007419

Weight: <None>
Min Conc: <None>

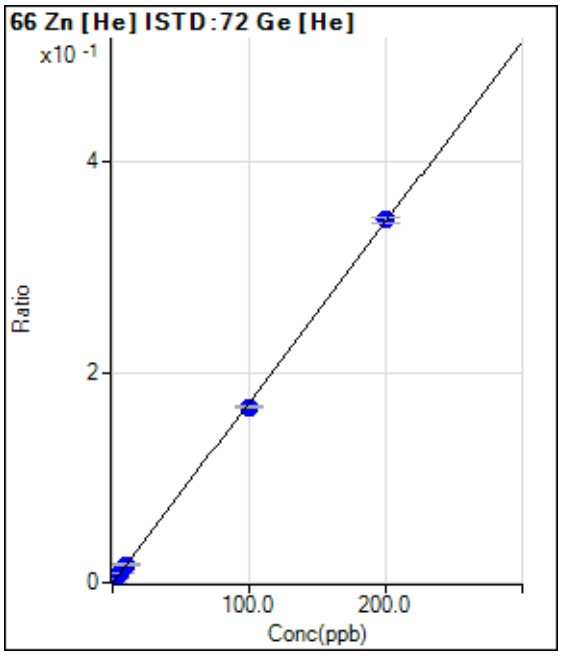
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.213	656.69	0.0002	P	1.1
2	☐	2.000	2.099	8108.57	0.0025	P	2.2
3	☐	5.000	5.451	22220.47	0.0066	P	1.9
4	☐	10.000	9.832	39309.16	0.0119	P	1.6
5	☐	100.000	98.817	377717.74	0.1197	P	2.3
6	☐	200.000	200.588	758180.98	0.2431	P	2.8
7	☐	1.000					

y = 0.0012 * x - 5.3672E-005
R = 1.0000
DL = 0.005603
BEC = -0.04428

Weight: <None>
Min Conc: <None>

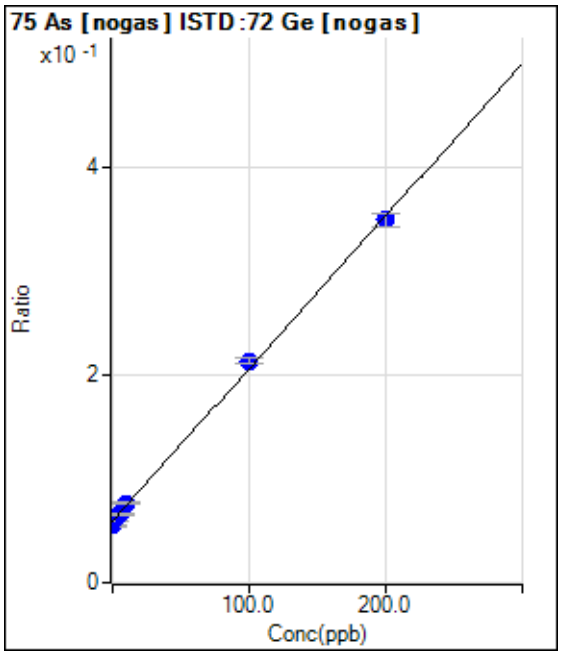


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.350	136.67	0.0002	P	5.1
2	☐	2.000	2.336	2726.91	0.0036	P	9.1
3	☐	5.000	5.428	7051.43	0.0089	P	0.9
4	☐	10.000	10.146	13118.21	0.0170	P	4.6
5	☐	100.000	97.522	125242.89	0.1669	P	1.5
6	☐	200.000	201.218	255917.88	0.3448	P	1.4
7	☐	1.000					

y = 0.0017 * x - 4.1943E-004
R = 0.9999
DL = 0.01621
BEC = -0.2445

Weight: <None>
Min Conc: <None>

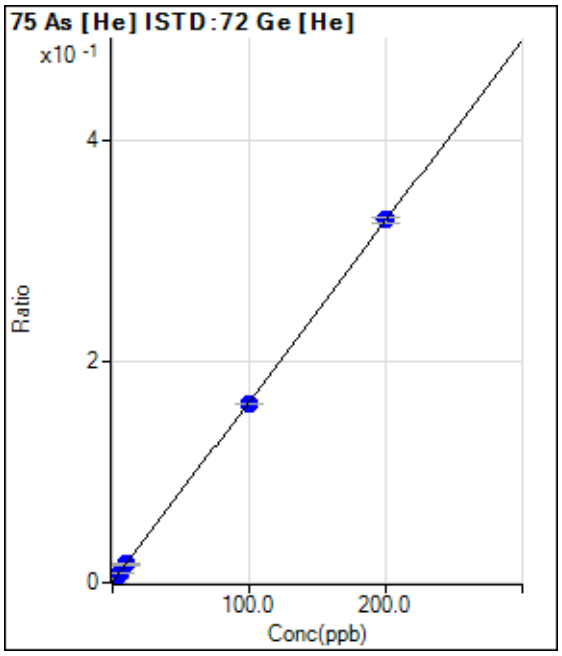
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-2.922	176956.50	0.0552	P	3.2
2	☐	2.000	1.313	199835.54	0.0614	P	4.7
3	☐	5.000	4.609	224623.49	0.0662	P	2.3
4	☐	10.000	11.544	253155.24	0.0764	P	3.3
5	☐	100.000	105.033	674391.92	0.2138	P	2.5
6	☐	200.000	197.423	1089834.52	0.3495	P	3.5
7	☐	1.000					

y = 0.0015 * x + 0.0595
R = 0.9993
DL = 3.566
BEC = 40.48

Weight: <None>
Min Conc: <None>

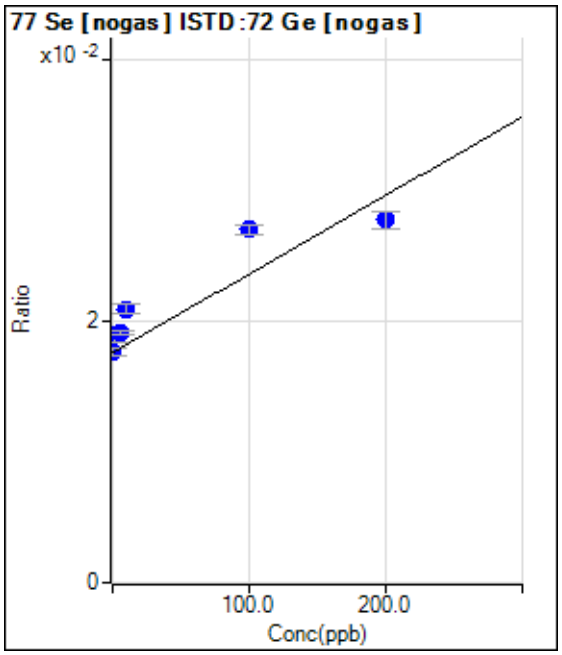


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	587.79	0.0008	P	12.
2	☐	2.000	2.092	3179.19	0.0042	P	3.8
3	☐	5.000	4.757	6767.95	0.0085	P	1.0
4	☐	10.000	9.694	12804.53	0.0166	P	1.9
5	☐	100.000	98.743	121406.67	0.1618	P	0.5
6	☐	200.000	200.649	243420.94	0.3279	P	1.5
7	☐	1.000					

y = 0.0016 * x + 7.7857E-004
R = 1.0000
DL = 0.1832
BEC = 0.4775

Weight: <None>
Min Conc: <None>

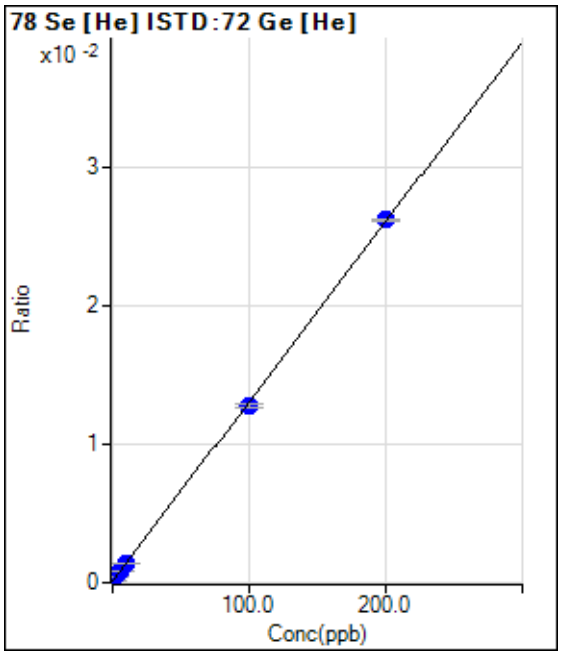
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56517.86	0.0176	P	3.6
2	☐	2.000	22.371	61734.53	0.0190	P	5.5
3	☐	5.000	24.659	64798.32	0.0191	P	1.3
4	☐	10.000	55.367	69418.67	0.0210	P	3.2
5	☐	100.000	156.673	85332.25	0.0271	P	2.7
6	☐	200.000	168.700	86585.12	0.0278	P	4.6
7	☐	1.000					

y = 6.0169E-005 * x + 0.0176
R = 0.9224
DL = 31.38
BEC = 292.9

Weight: <None>
Min Conc: <None>

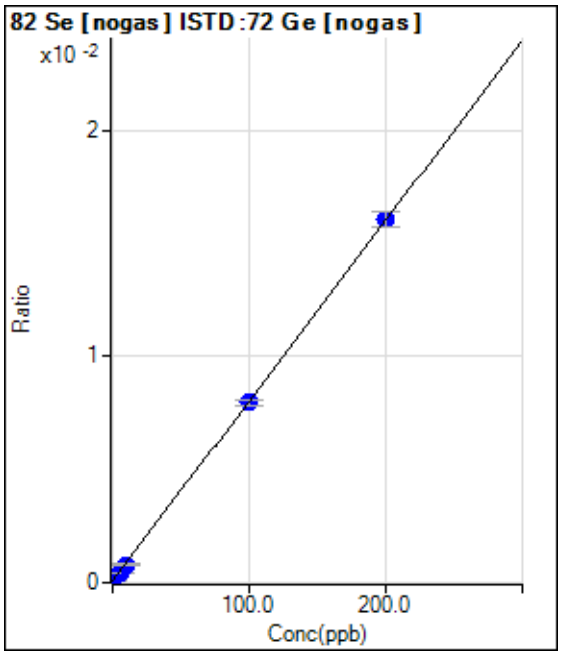


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.440	122.67	0.0002	P	5.6
2	☐	2.000	2.465	323.33	0.0004	P	8.1
3	☐	5.000	5.241	623.34	0.0008	P	0.8
4	☐	10.000	9.964	1080.70	0.0014	P	2.0
5	☐	100.000	97.799	9609.88	0.0128	P	1.9
6	☐	200.000	201.092	19463.03	0.0262	P	0.6
7	☐	1.000					

y = 1.2987E-004 * x + 1.0549E-004
R = 0.9999
DL = 0.2113
BEC = 0.8123

Weight: <None>
Min Conc: <None>

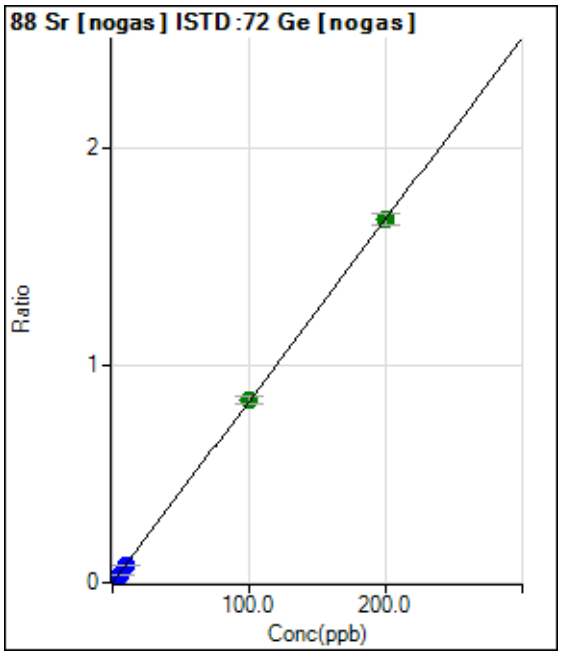
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	246.67	0.0001	P	26.
2	☐	2.000	2.248	833.37	0.0003	P	14.
3	☐	5.000	4.650	1516.75	0.0004	P	3.4
4	☐	10.000	9.068	2650.24	0.0008	P	3.9
5	☐	100.000	99.137	25164.51	0.0080	P	3.2
6	☐	200.000	200.485	50052.68	0.0161	P	4.1
7	☐	1.000					

y = 7.9697E-005 * x + 7.6897E-005
R = 1.0000
DL = 0.7576
BEC = 0.9649

Weight: <None>
Min Conc: <None>

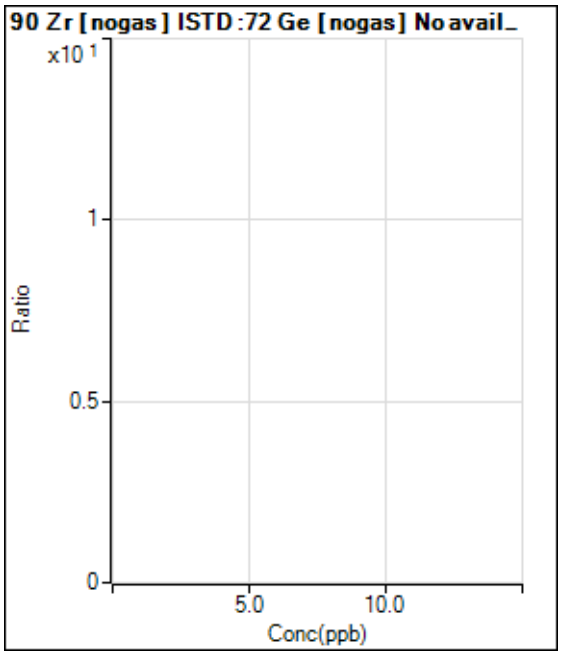


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	866.70	0.0003	P	11.
2	☐	2.000	1.940	53710.75	0.0165	P	2.5
3	☐	5.000	4.609	131562.39	0.0388	P	3.3
4	☐	10.000	9.294	258306.50	0.0780	P	5.2
5	☐	100.000	100.673	2656690.90	0.8422	A	3.5
6	☐	200.000	199.709	5208977.74	1.6704	A	3.2
7	☐	1.000					

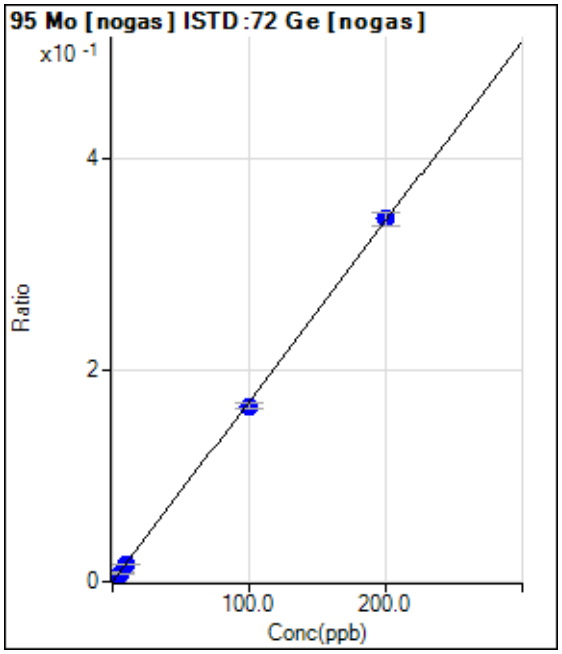
y = 0.0084 * x + 2.7023E-004
R = 1.0000
DL = 0.01099
BEC = 0.03231

Weight: <None>
Min Conc: <None>

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

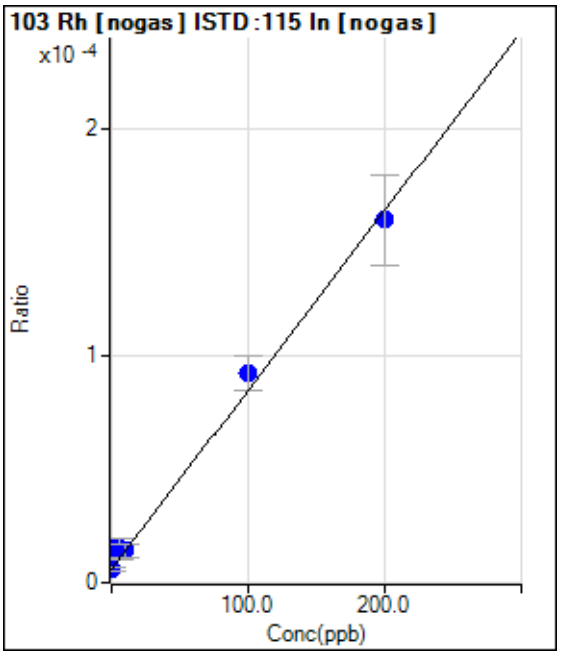


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	496.68	0.0002	P	11.
2	☐	2.000	1.886	10960.19	0.0034	P	5.8
3	☐	5.000	4.668	27484.93	0.0081	P	3.7
4	☐	10.000	9.532	54296.62	0.0164	P	3.5
5	☐	100.000	97.436	523950.83	0.1661	P	3.7
6	☐	200.000	201.315	1069772.80	0.3431	P	3.9
7	☐	1.000					

y = 0.0017 * x + 1.5487E-004
R = 0.9999
DL = 0.03185
BEC = 0.09092

Weight: <None>
Min Conc: <None>

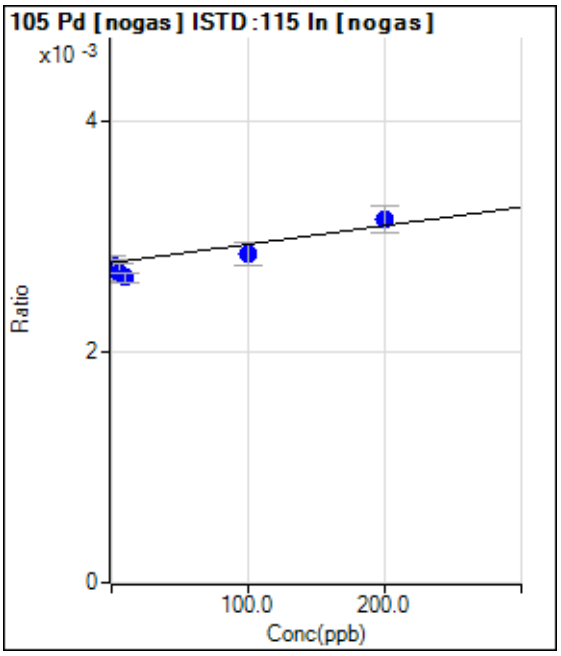
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	16.67	0.0000	P	33.
2	☐	2.000	11.751	43.33	0.0000	P	13.
3	☐	5.000	11.758	43.33	0.0000	P	60.
4	☐	10.000	10.351	40.00	0.0000	P	45.
5	☐	100.000	109.576	253.34	0.0001	P	16.
6	☐	200.000	194.928	433.35	0.0002	P	25.
7	☐	1.000					

y = 7.8982E-007 * x + 5.8977E-006
R = 0.9977
DL = 7.401
BEC = 7.467

Weight: <None>
Min Conc: <None>

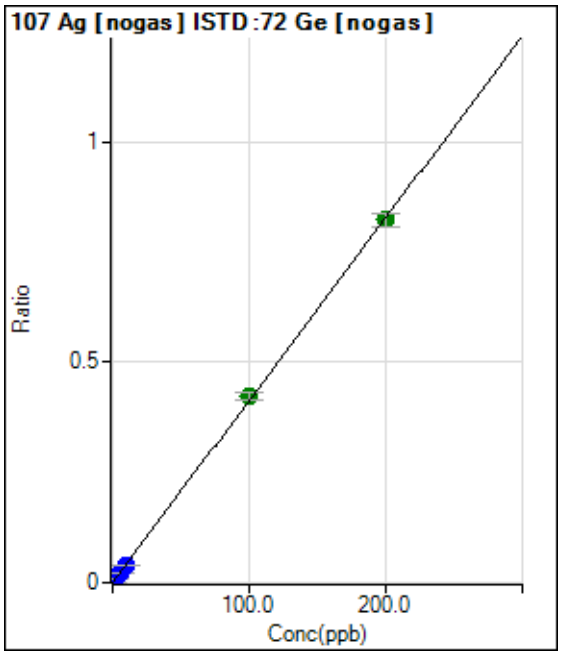


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7811.87	0.0028	P	4.0
2	☐	2.000	-24.485	7818.53	0.0027	P	5.4
3	☐	5.000	-50.386	7751.84	0.0027	P	5.9
4	☐	10.000	-76.600	7601.77	0.0027	P	3.2
5	☐	100.000	50.731	7801.88	0.0029	P	7.1
6	☐	200.000	230.614	8575.56	0.0031	P	7.3
7	☐	1.000					

y = 1.6147E-006 * x + 0.0028
R = 0.9515
DL = 207.7
BEC = 1720

Weight: <None>
Min Conc: <None>

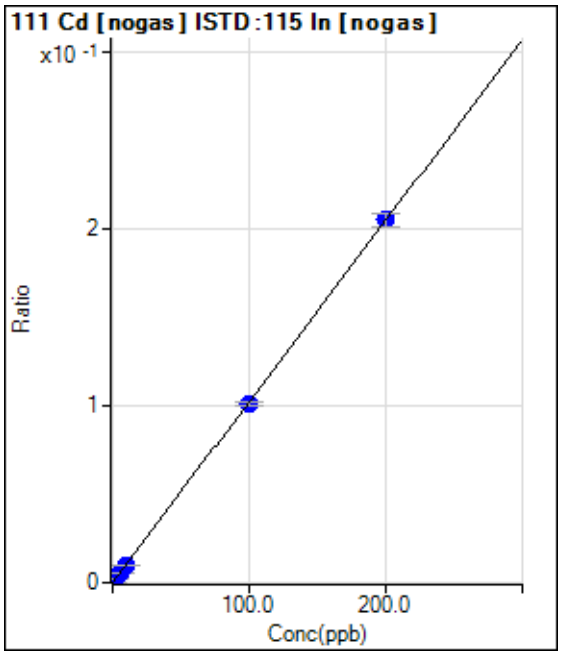
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	93.33	0.0000	P	32.
2	☐	2.000	2.027	27351.63	0.0084	P	5.2
3	☐	5.000	4.797	67315.62	0.0199	P	1.4
4	☐	10.000	9.436	129290.62	0.0390	P	1.1
5	☐	100.000	101.924	1328341.75	0.4212	A	4.3
6	☐	200.000	199.071	2566118.56	0.8227	A	4.0
7	☐	1.000					

y = 0.0041 * x + 2.9096E-005
R = 0.9999
DL = 0.006881
BEC = 0.007041

Weight: <None>
Min Conc: <None>

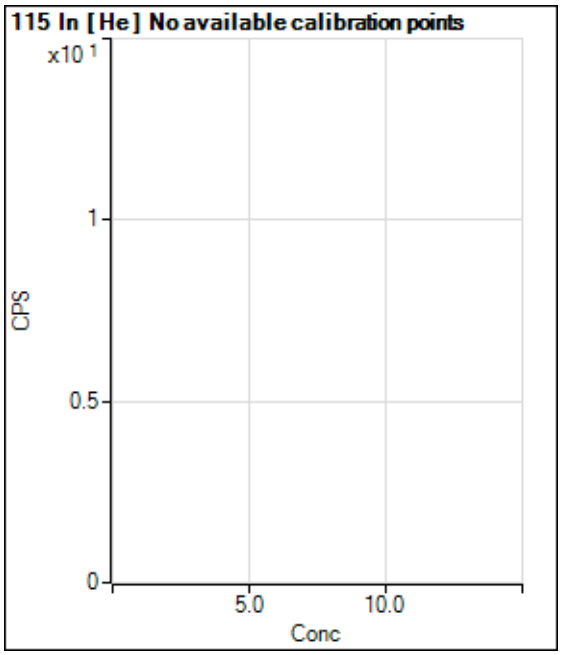


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	2.8
2	☐	2.000	1.972	5784.38	0.0020	P	6.5
3	☐	5.000	4.899	14449.45	0.0050	P	3.9
4	☐	10.000	9.543	28029.17	0.0098	P	1.3
5	☐	100.000	99.088	277142.05	0.1015	P	2.4
6	☐	200.000	200.481	558850.07	0.2053	P	3.8
7	☐	1.000					

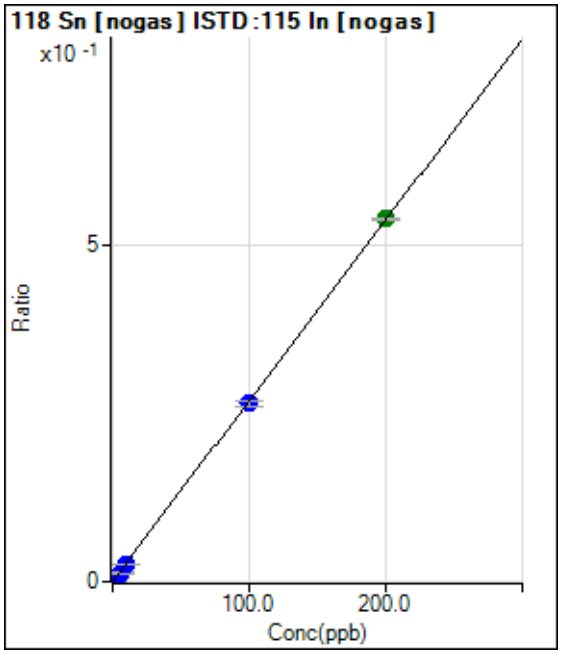
y = 0.0010 * x + 7.1151E-006
R = 1.0000
DL = 0.0005885
BEC = 0.006947

Weight: <None>
Min Conc: <None>

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			924588.48		P	2.6
2	☐			938696.40		P	1.2
3	☐			932803.78		P	0.6
4	☐			927555.38		P	1.4
5	☐			896048.56		P	2.1
6	☐			876757.50		P	1.0
7	☐						

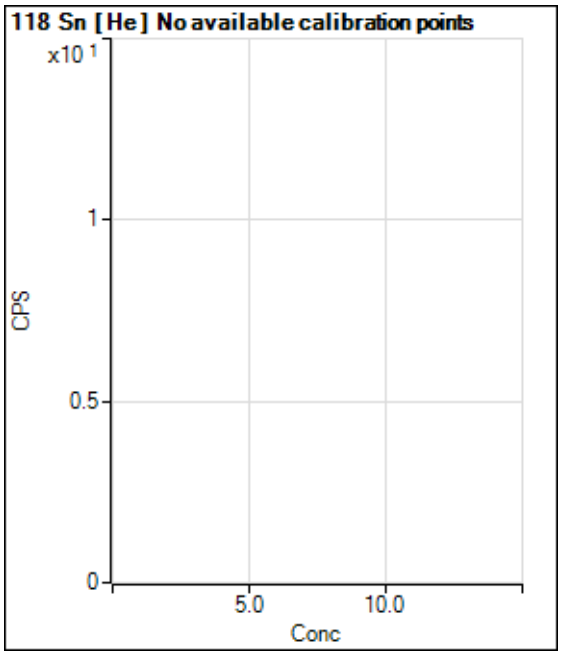


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1126.72	0.0004	P	3.4
2	☐	2.000	1.825	15113.47	0.0053	P	3.9
3	☐	5.000	4.625	36809.40	0.0128	P	1.8
4	☐	10.000	9.399	73307.27	0.0256	P	2.1
5	☐	100.000	98.638	722784.34	0.2647	P	3.4
6	☐	200.000	200.722	1465774.77	0.5383	A	0.8
7	☐	1.000					

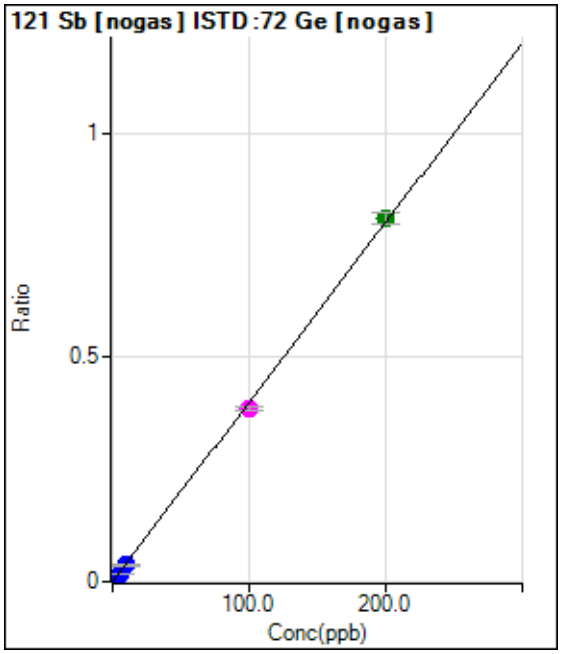
y = 0.0027 * x + 4.0036E-004
R = 1.0000
DL = 0.0152
BEC = 0.1494

Weight: <None>
Min Conc: <None>

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			373.34		P	17.
2	☐			5847.76		P	3.3
3	☐			14269.29		P	0.8
4	☐			27832.47		P	1.0
5	☐			265444.29		P	1.5
6	☐			543348.95		P	1.8
7	☐						

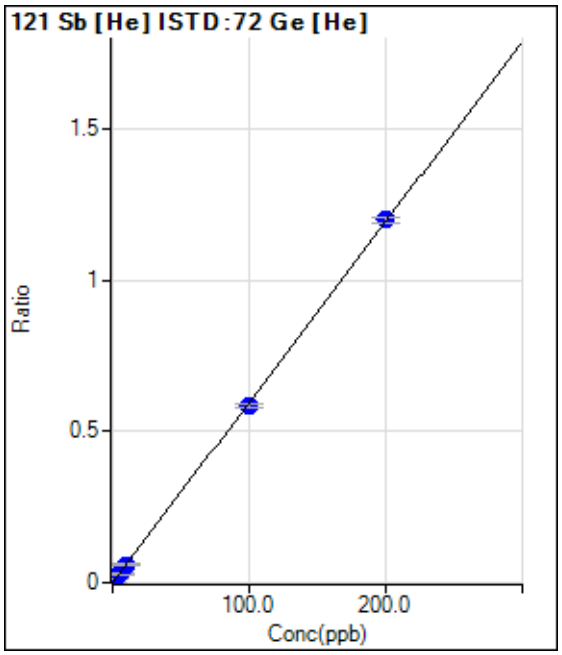


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1043.38	0.0003	P	15.
2	☐	2.000	1.857	25245.26	0.0078	P	4.7
3	☐	5.000	4.597	63499.05	0.0187	P	0.4
4	☐	10.000	9.115	121934.04	0.0368	P	2.6
5	☐	100.000	95.907	1212061.60	0.3842	M	2.4
6	☐	200.000	202.102	2523836.73	0.8093	A	3.2
7	☐	1.000					

y = 0.0040 * x + 3.2531E-004
R = 0.9997
DL = 0.03833
BEC = 0.08127

Weight: <None>
Min Conc: <None>

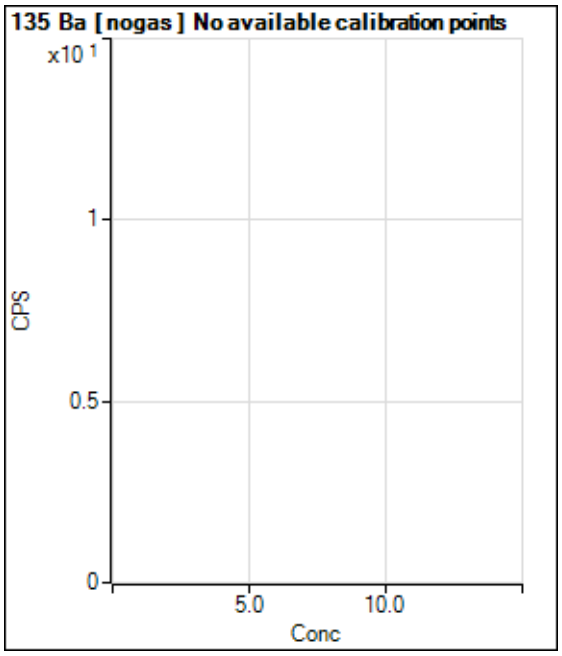
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	476.68	0.0006	P	17.
2	☐	2.000	1.995	9522.71	0.0125	P	3.1
3	☐	5.000	4.727	22875.24	0.0288	P	3.6
4	☐	10.000	9.774	45516.07	0.0590	P	5.2
5	☐	100.000	97.885	438848.72	0.5848	P	2.3
6	☐	200.000	201.076	891259.91	1.2007	P	1.8
7	☐	1.000					

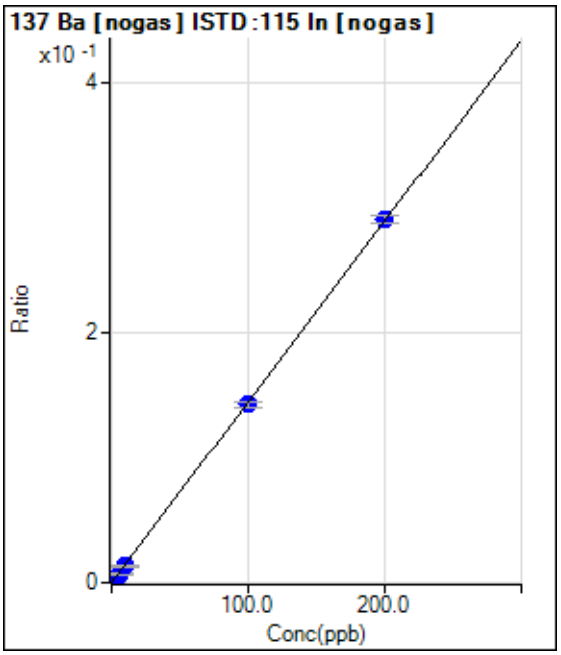
y = 0.0060 * x + 6.3200E-004
R = 0.9999
DL = 0.05422
BEC = 0.1059

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			63.33		P	32.
2	☐			4587.34		P	9.2
3	☐			11730.85		P	3.5
4	☐			22027.74		P	1.8
5	☐			228028.79		P	0.9
6	☐			456665.88		P	0.2
7	☐						

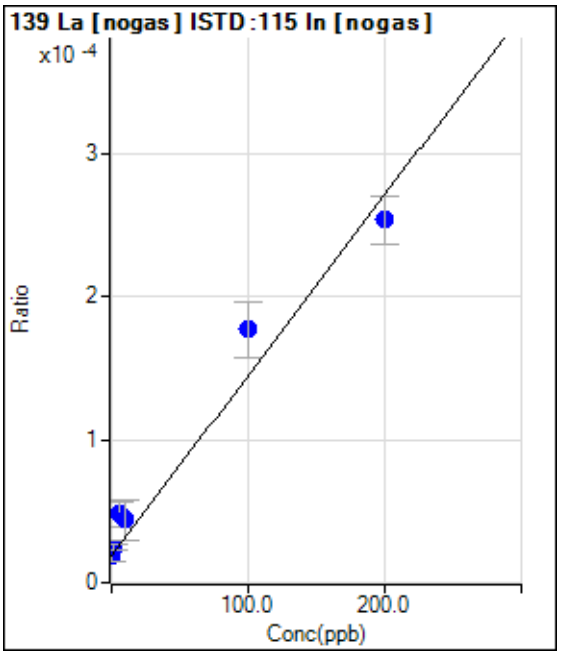
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.33	0.0000	P	24.
2	☐	2.000	2.023	8465.55	0.0030	P	4.3
3	☐	5.000	4.754	19901.80	0.0069	P	2.0
4	☐	10.000	9.158	38019.18	0.0133	P	5.6
5	☐	100.000	98.556	389153.08	0.1425	P	3.0
6	☐	200.000	200.770	790275.46	0.2903	P	2.2
7	☐	1.000					

y = 0.0014 * x + 4.0122E-005
R = 1.0000
DL = 0.02041
BEC = 0.02775

Weight: <None>
Min Conc: <None>

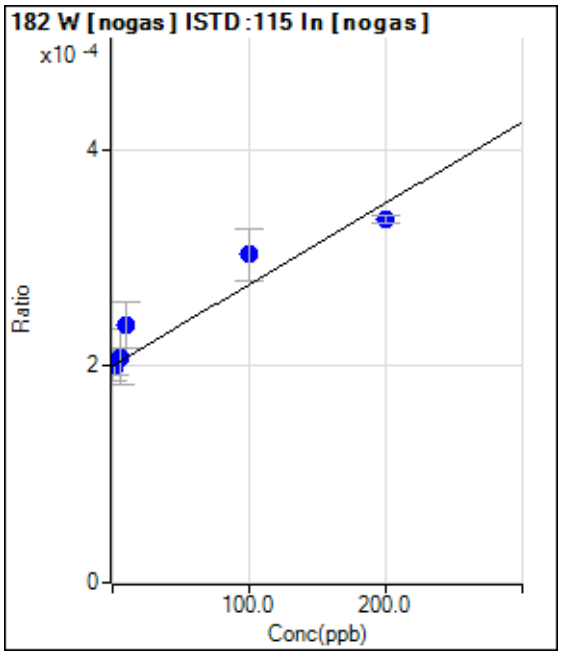


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0000	P	38.
2	☐	2.000	4.455	70.00	0.0000	P	15.
3	☐	5.000	22.918	136.67	0.0000	P	37.
4	☐	10.000	19.984	126.67	0.0000	P	63.
5	☐	100.000	125.352	483.35	0.0002	P	21.
6	☐	200.000	186.352	690.02	0.0003	P	13.
7	☐	1.000					

y = 1.2589E-006 * x + 1.8927E-005
R = 0.9863
DL = 17.18
BEC = 15.03

Weight: <None>
Min Conc: <None>

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.35	0.0002	P	13.
2	☐	2.000	-2.765	566.69	0.0002	P	6.3
3	☐	5.000	10.883	600.02	0.0002	P	23.
4	☐	10.000	50.125	680.03	0.0002	P	18.
5	☐	100.000	137.124	826.70	0.0003	P	15.
6	☐	200.000	179.332	913.37	0.0003	P	2.2
7	☐	1.000					

y = 7.5110E-007 * x + 2.0057E-004

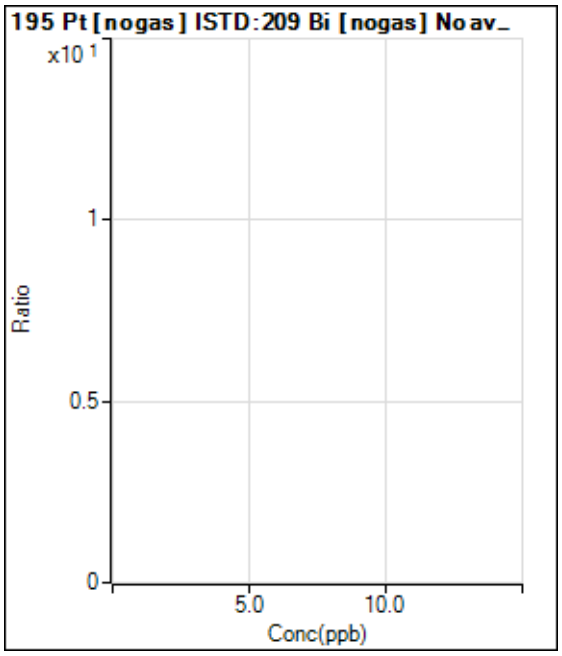
R = 0.9553

DL = 111

BEC = 267

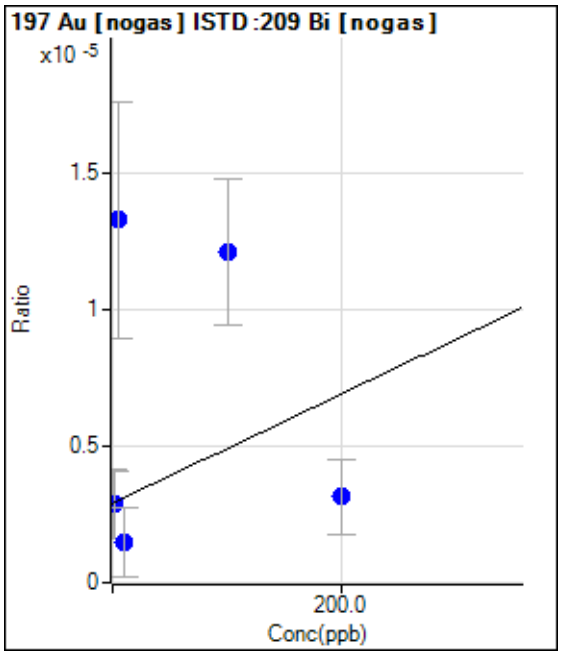
Weight: <None>

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

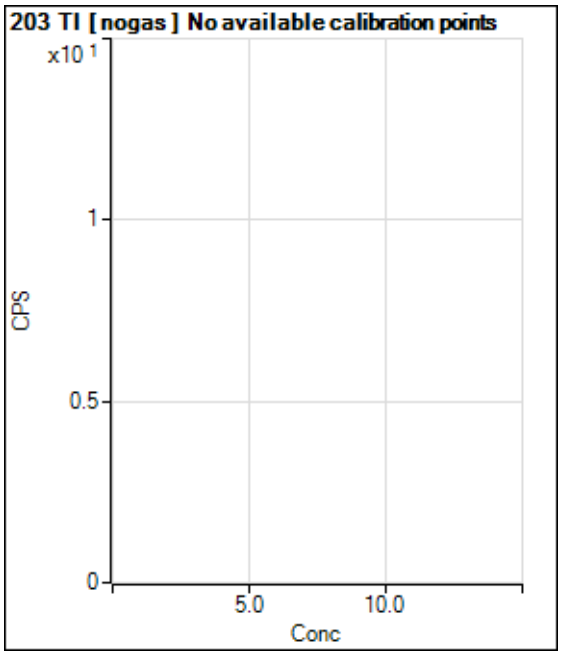
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6.67	0.0000	P	86.
2	☐	2.000	-2.739	6.67	0.0000	P	86.
3	☐	5.000	517.822	30.00	0.0000	P	65.
4	☐	10.000	-72.509	3.33	0.0000	P	173
5	☐	100.000	458.676	26.67	0.0000	P	44.
6	☐	200.000	12.014	6.67	0.0000	P	86.
7	☐	1.000					

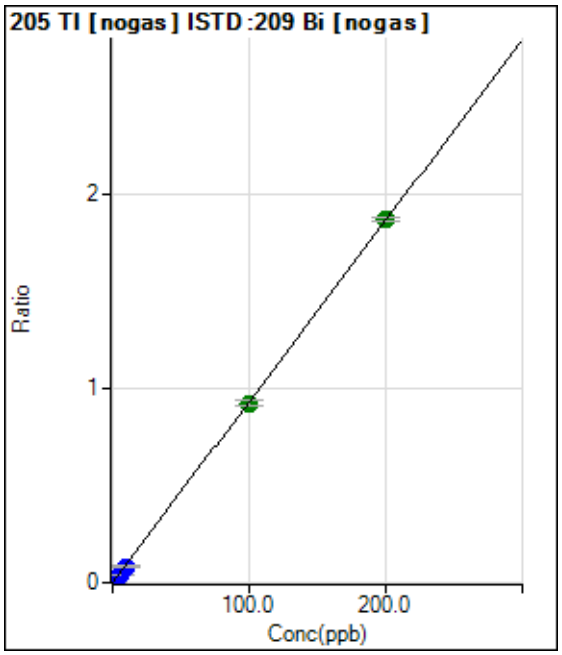
y = 2.0072E-008 * x + 2.9169E-006
R = 0.0175
DL = 377.8
BEC = 145.3

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			206.67		P	22.
2	☐			15477.57		P	3.1
3	☐			40122.92		P	3.0
4	☐			78697.21		P	2.4
5	☐			807880.77		P	1.0
6	☐			1654189.30		A	2.6
7	☐						

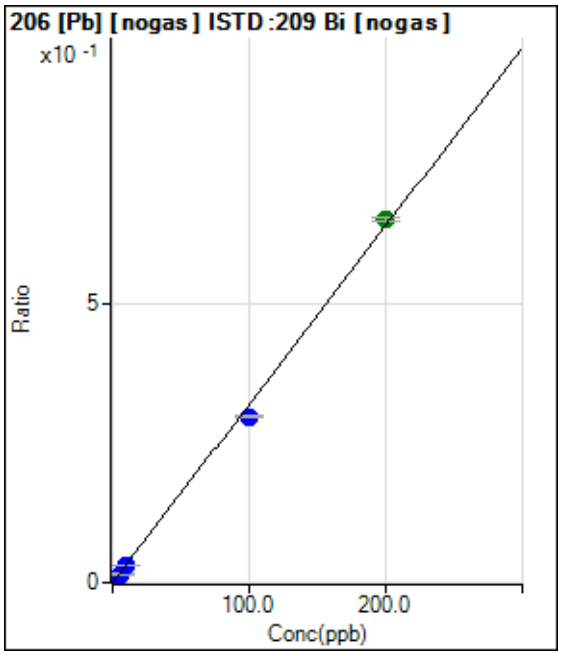
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.36	0.0002	P	11.
2	☐	2.000	1.731	37546.73	0.0164	P	4.4
3	☐	5.000	4.545	95807.61	0.0426	P	6.4
4	☐	10.000	9.002	187552.39	0.0841	P	3.4
5	☐	100.000	99.263	2038051.48	0.9248	A	2.8
6	☐	200.000	200.432	3971253.48	1.8672	A	1.1
7	☐	1.000					

y = 0.0093 * x + 2.4203E-004
R = 1.0000
DL = 0.008693
BEC = 0.02598

Weight: <None>
Min Conc: <None>

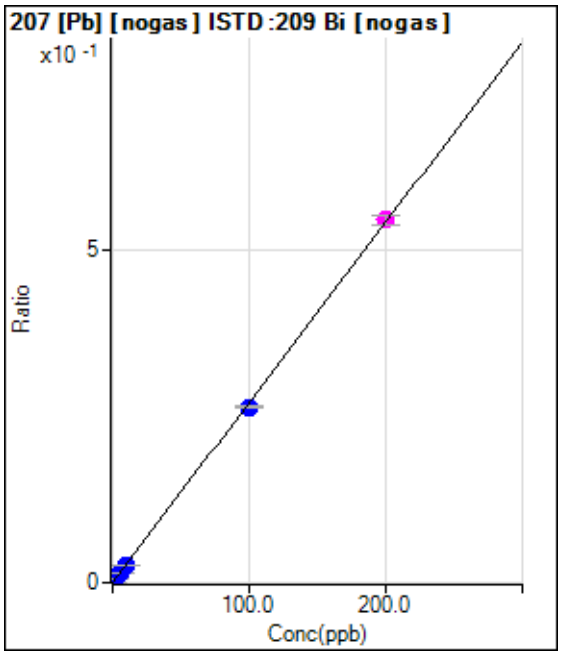


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	433.35	0.0002	P	4.9
2	☐	2.000	1.855	13999.62	0.0061	P	2.9
3	☐	5.000	4.743	34453.53	0.0153	P	5.5
4	☐	10.000	9.241	66161.27	0.0297	P	2.3
5	☐	100.000	93.101	654697.63	0.2971	P	1.6
6	☐	200.000	203.495	1380705.40	0.6491	A	1.2
7	☐	1.000					

y = 0.0032 * x + 1.8642E-004
R = 0.9992
DL = 0.008565
BEC = 0.05846

Weight: <None>
Min Conc: <None>

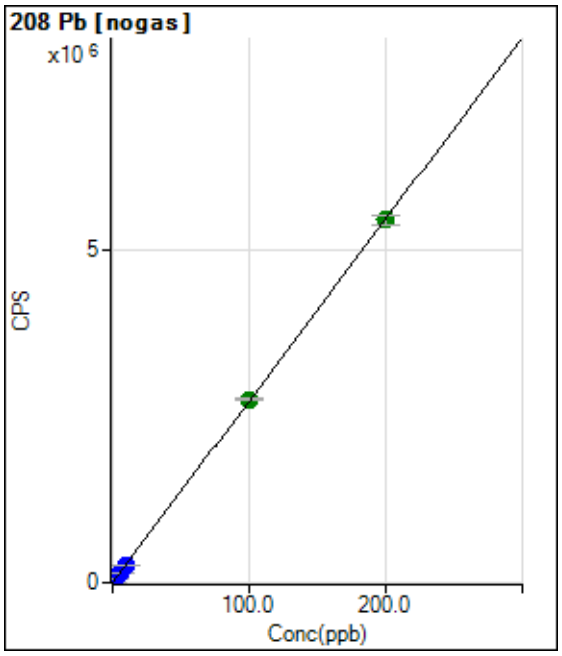
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	330.01	0.0001	P	34.
2	☐	2.000	1.923	12281.46	0.0053	P	0.3
3	☐	5.000	4.813	29667.48	0.0132	P	1.3
4	☐	10.000	9.462	57468.60	0.0258	P	2.5
5	☐	100.000	97.255	580556.16	0.2634	P	1.3
6	☐	200.000	201.405	1160139.85	0.5454	M	2.8
7	☐	1.000					

y = 0.0027 * x + 1.4312E-004
R = 0.9999
DL = 0.05483
BEC = 0.05287

Weight: <None>
Min Conc: <None>

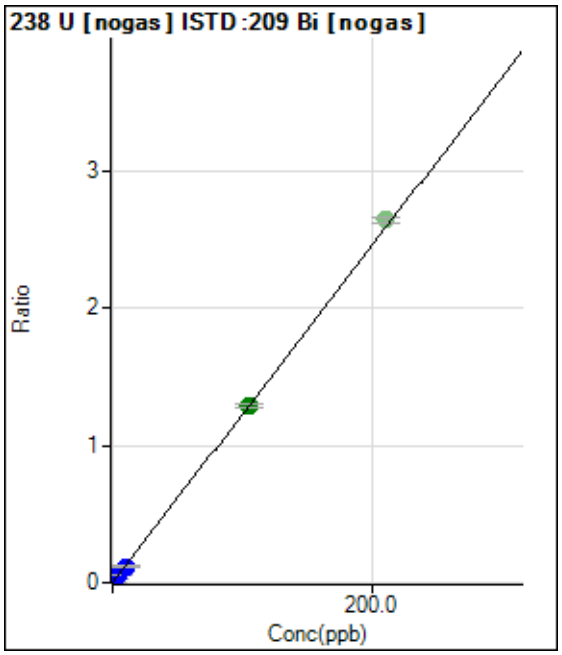


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1573.39		P	15.
2	☐	2.000	1.958	55103.58		P	1.3
3	☐	5.000	4.922	136140.68		P	1.0
4	☐	10.000	9.620	264590.69		P	1.6
5	☐	100.000	100.698	2754631.90		A	1.1
6	☐	200.000	199.672	5460578.44		A	2.7
7	☐	1.000					

y = 27339.8019 * x + 1573.3867
R = 1.0000
DL = 0.02693
BEC = 0.05755

Weight: <None>
Min Conc: <None>

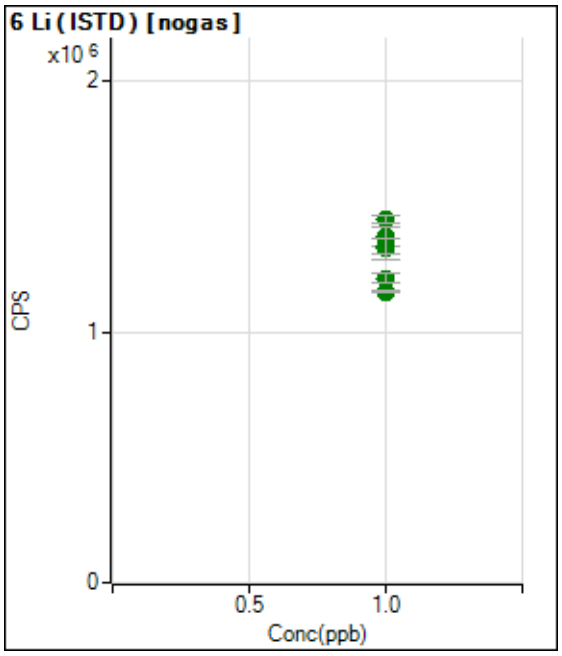
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	103.33	0.0000	P	19.
2	☐	2.000	1.902	53848.33	0.0235	P	1.9
3	☐	5.000	4.838	134181.11	0.0596	P	4.2
4	☐	10.000	9.609	263964.47	0.1184	P	4.9
5	☐	105.000	105.047	2850735.37	1.2936	A	1.7
6	☑	210.000		5626737.83	2.6457	A	1.3
7	☐	1.000					

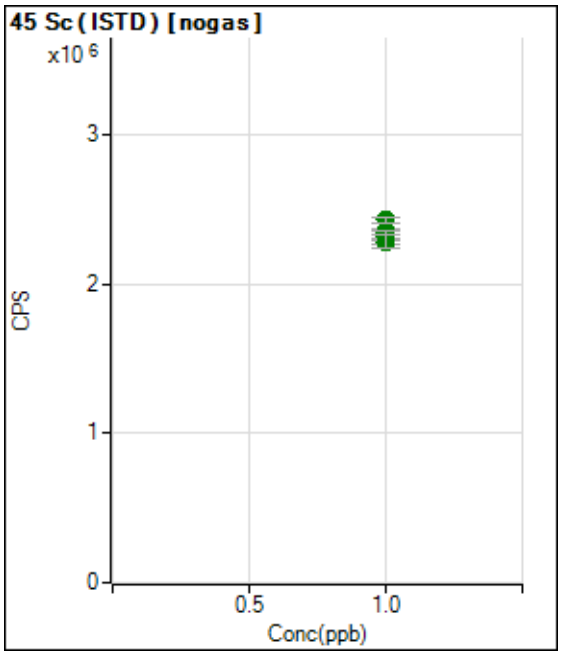
y = 0.0123 * x + 4.4356E-005
R = 1.0000
DL = 0.002109
BEC = 0.003602

Weight: <None>
Min Conc: <None>

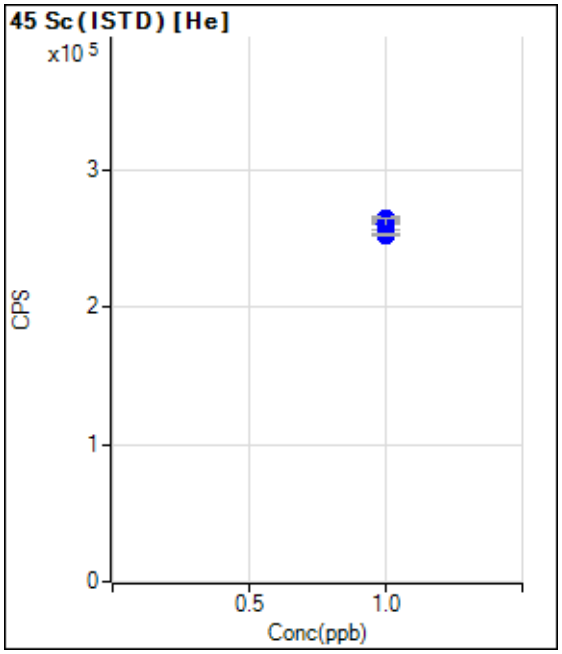


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1446752.57		A	2.1
2	☐	1.000		1379209.18		A	5.2
3	☐	1.000		1333091.36		A	6.3
4	☐	1.000		1343071.92		A	4.5
5	☐	1.000		1213625.72		A	3.2
6	☐	1.000		1159034.25		A	0.5
7	☐	1.000					

Calibration for 129_ICV.d

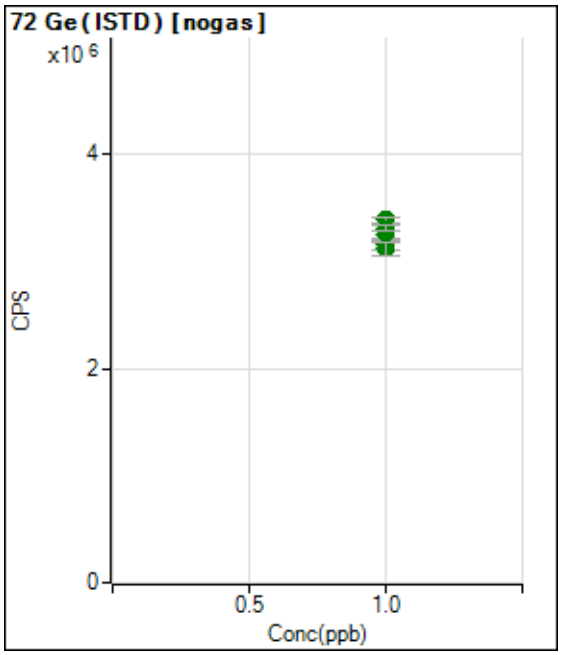


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2309011.32		A	1.7
2	☐	1.000		2428765.17		A	1.4
3	☐	1.000		2316466.74		A	4.2
4	☐	1.000		2357261.94		A	4.3
5	☐	1.000		2345627.52		A	1.3
6	☐	1.000		2282837.62		A	3.8
7	☐	1.000					

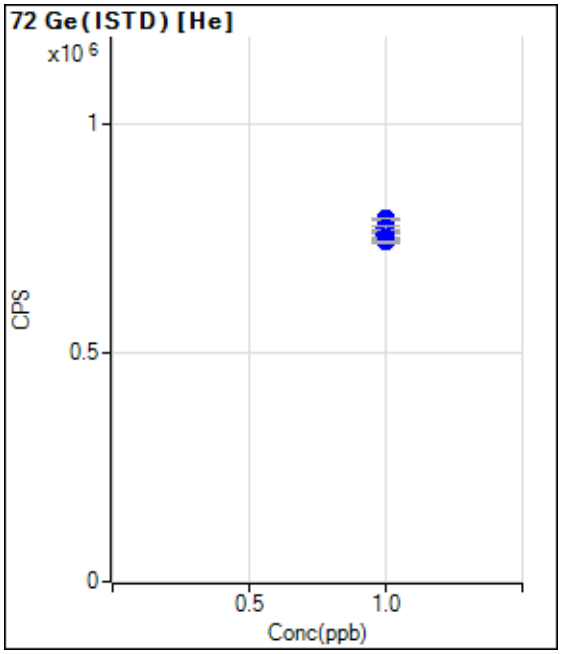


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		262357.18		P	0.7
2	☐	1.000		264294.63		P	1.9
3	☐	1.000		264479.17		P	1.0
4	☐	1.000		261102.73		P	3.0
5	☐	1.000		253211.31		P	0.8
6	☐	1.000		252623.69		P	0.7
7	☐	1.000					

Calibration for 129_ICV.d

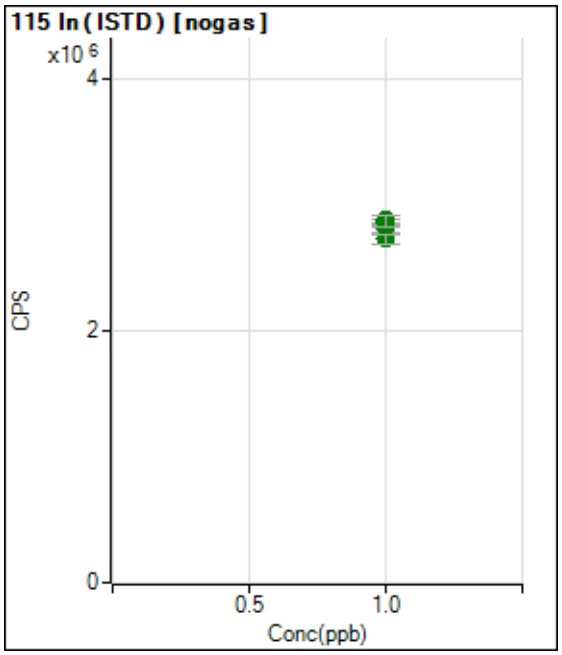


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3206703.70		A	0.2
2	☐	1.000		3256494.54		A	2.1
3	☐	1.000		3390666.51		A	1.4
4	☐	1.000		3313199.85		A	1.7
5	☐	1.000		3155984.95		A	2.9
6	☐	1.000		3121229.43		A	4.3
7	☐	1.000					

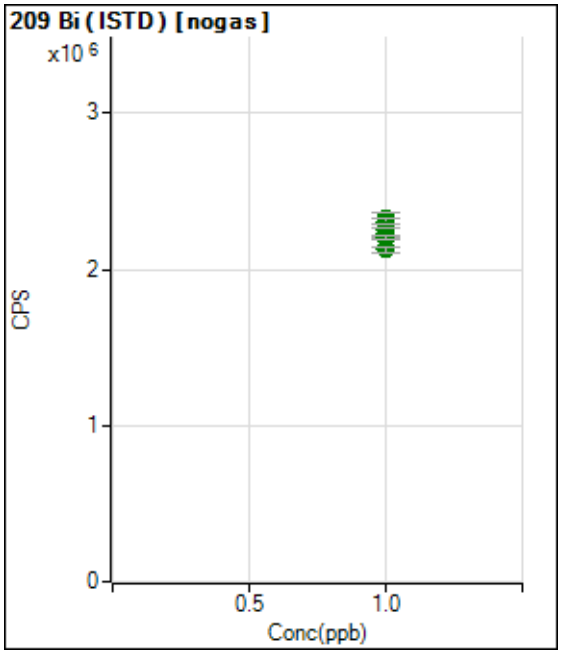


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		754516.31		P	1.5
2	☐	1.000		759218.17		P	2.0
3	☐	1.000		792957.05		P	0.8
4	☐	1.000		772137.67		P	1.0
5	☐	1.000		750459.39		P	0.8
6	☐	1.000		742295.35		P	0.5
7	☐	1.000					

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2812441.48		A	2.8
2	☐	1.000		2856142.23		A	1.5
3	☐	1.000		2877773.69		A	3.0
4	☐	1.000		2866425.42		A	3.5
5	☐	1.000		2731957.65		A	3.1
6	☐	1.000		2723277.97		A	2.9
7	☐	1.000					



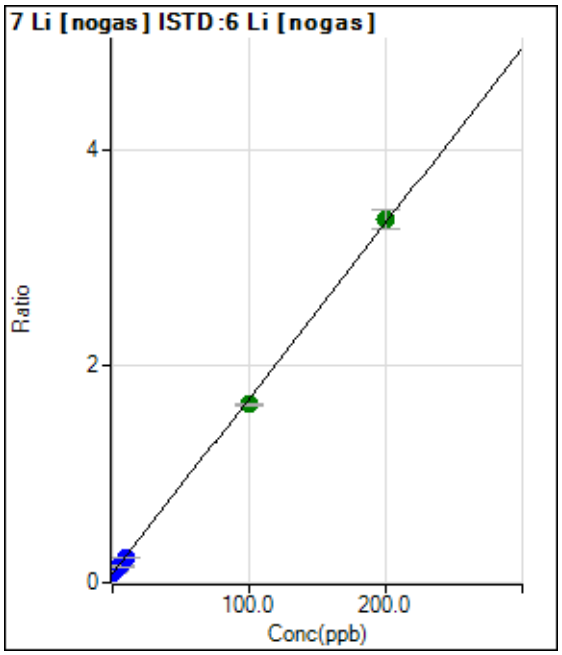
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2322159.81		A	3.3
2	☐	1.000		2295873.82		A	2.7
3	☐	1.000		2252571.94		A	2.9
4	☐	1.000		2231631.69		A	2.4
5	☐	1.000		2203864.45		A	0.7
6	☐	1.000		2126871.01		A	1.7
7	☐	1.000					

Calibration for 237_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\122418A.b\
Analysis File: 122418A.batch.bin
DA Date-Time: 2018-12-24 22:52:36
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	231CALB.d	CAL BLK	2018-12-24 22:39:46
2	232CALS.d	2/10/200	2018-12-24 22:41:46
3	233CALS.d	5/25/500	2018-12-24 22:43:44
4	234CALS.d	10/50/1000	2018-12-24 22:45:43
5	235CALS.d	100/500/10K	2018-12-24 22:47:41
6	236CALS.d	200/1000/20K	2018-12-24 22:49:41
7			

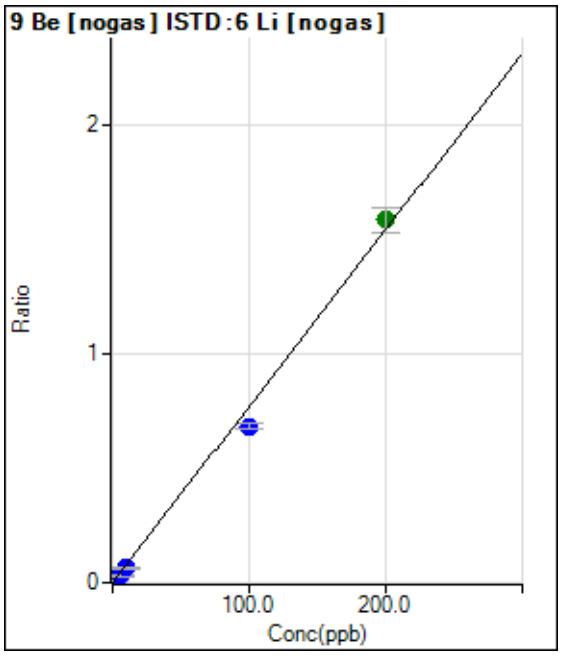
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	100282.20	0.0839	P	2.8
2	☐	2.000	1.791	131914.44	0.1129	P	2.8
3	☐	5.000	4.401	178581.34	0.1552	P	11.
4	☐	10.000	8.924	258322.35	0.2284	P	4.7
5	☐	100.000	96.401	1745197.84	1.6449	A	2.0
6	☐	200.000	201.871	3462610.88	3.3528	A	5.4
7	☐	1.000					

y = 0.0162 * x + 0.0839
R = 0.9998
DL = 0.4311
BEC = 5.182

Weight: <None>
Min Conc: <None>

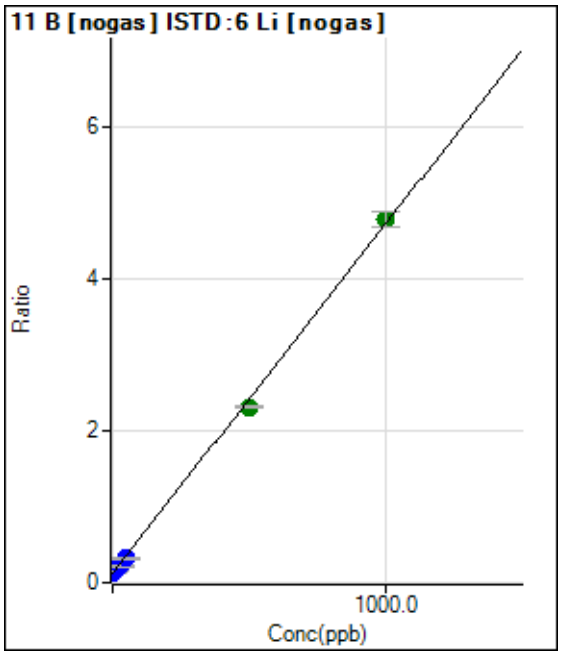


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	86.67	0.0001	P	30.
2	☐	2.000	1.617	14652.45	0.0125	P	3.6
3	☐	5.000	4.042	35793.66	0.0313	P	15.
4	☐	10.000	8.270	72216.09	0.0639	P	5.5
5	☐	100.000	88.782	726394.57	0.6849	P	3.7
6	☐	200.000	205.723	1638982.79	1.5870	A	7.0
7	☐	1.000					

y = 0.0077 * x + 7.2804E-005
R = 0.9979
DL = 0.008732
BEC = 0.009438

Weight: <None>
Min Conc: <None>

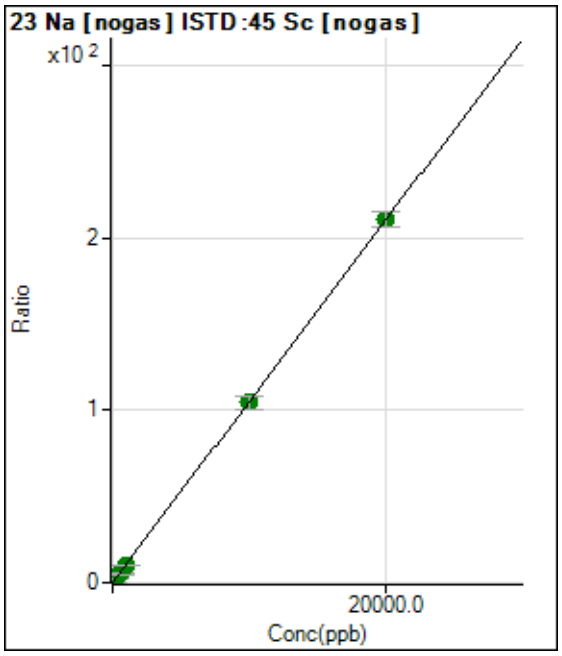
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146565.61	0.1226	P	1.5
2	☐	10.000	7.909	185683.78	0.1590	P	3.3
3	☐	25.000	21.823	255437.83	0.2230	P	15.
4	☐	50.000	42.817	361363.28	0.3195	P	4.5
5	☐	500.000	476.507	2454033.14	2.3135	A	1.9
6	☐	1000.000	1012.206	4934583.05	4.7765	A	4.1
7	☐	5.000					

y = 0.0046 * x + 0.1226
R = 0.9996
DL = 1.191
BEC = 26.67

Weight: <None>
Min Conc: <None>

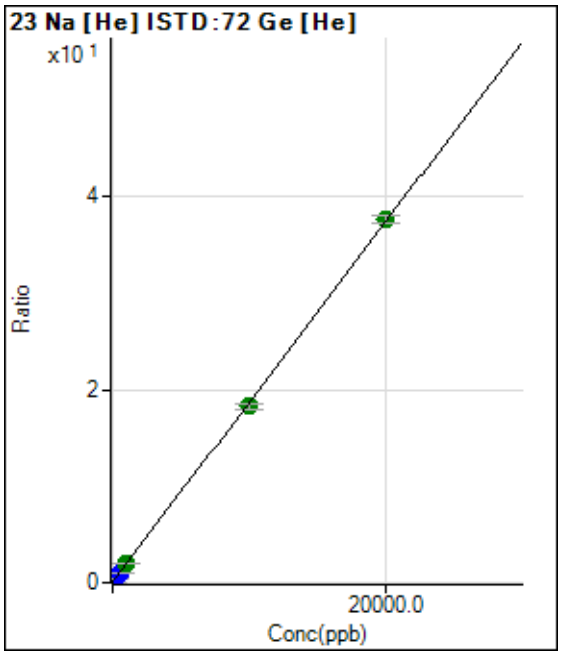


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	331428.93	0.1292	P	4.5
2	☐	200.000	193.251	5578139.71	2.1574	A	5.7
3	☐	500.000	477.044	13289388.58	5.1360	A	10.
4	☐	1000.000	960.287	26451403.72	10.2078	A	6.3
5	☐	10000.00	9941.907	259402164.1	104.473	A	7.3
6	☐	20000.00	20031.674	528973661.8	210.370	A	4.2
7	☐	100.000					

y = 0.0105 * x + 0.1292
R = 1.0000
DL = 1.657
BEC = 12.31

Weight: <None>
Min Conc: <None>

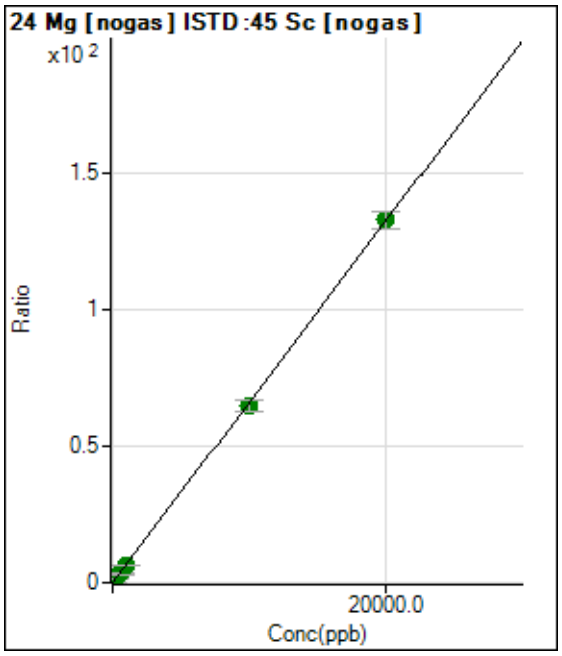
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	41901.40	0.0500	P	4.8
2	☐	200.000	191.960	342970.00	0.4085	P	2.5
3	☐	500.000	486.986	795148.82	0.9595	P	1.9
4	☐	1000.000	1035.445	1638657.99	1.9837	A	4.2
5	☐	10000.00	9749.808	15297982.69	18.2576	A	3.9
6	☐	20000.00	20123.729	30809609.54	37.6308	A	2.0
7	☐	100.000					

y = 0.0019 * x + 0.0500
R = 0.9999
DL = 3.853
BEC = 26.8

Weight: <None>
Min Conc: <None>

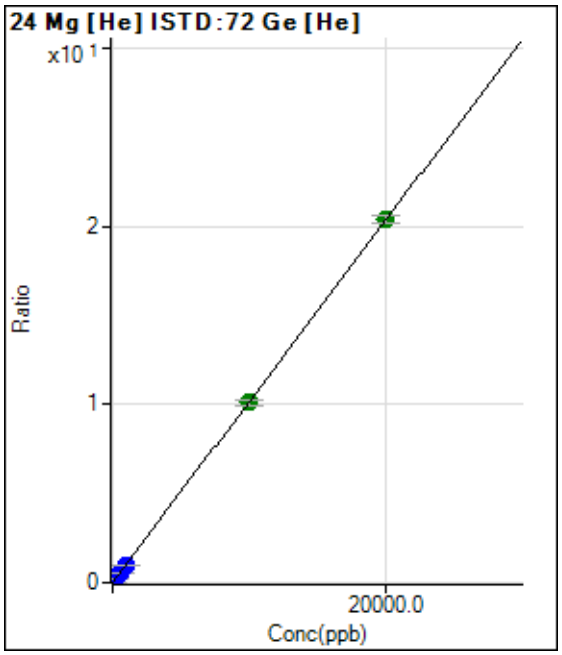


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30464.54	0.0119	P	7.1
2	☐	200.000	196.489	3393444.87	1.3123	A	5.4
3	☐	500.000	487.773	8405434.04	3.2400	A	5.0
4	☐	1000.000	971.147	16702194.13	6.4391	A	3.5
5	☐	10000.00	9812.306	161352099.4	64.9513	A	6.8
6	☐	20000.00	20095.630	334413790.8	133.008	A	4.6
7	☐	100.000					

y = 0.0066 * x + 0.0119
R = 0.9999
DL = 0.383
BEC = 1.794

Weight: <None>
Min Conc: <None>

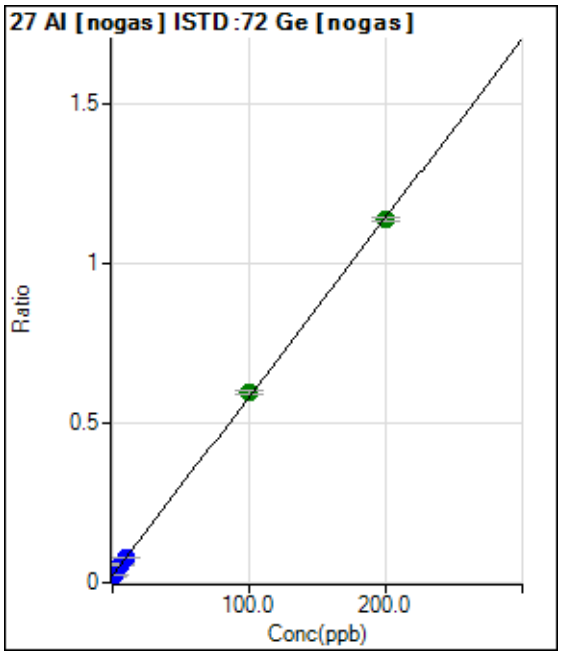
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1586.76	0.0019	P	11.
2	☐	200.000	194.116	167203.86	0.1992	P	2.3
3	☐	500.000	494.618	418151.05	0.5045	P	1.4
4	☐	1000.000	975.086	820275.85	0.9928	P	2.6
5	☐	10000.00	9930.966	8458521.33	10.0942	A	2.6
6	☐	20000.00	20035.956	16672742.25	20.3634	A	2.1
7	☐	100.000					

y = 0.0010 * x + 0.0019
R = 1.0000
DL = 0.6604
BEC = 1.863

Weight: <None>
Min Conc: <None>

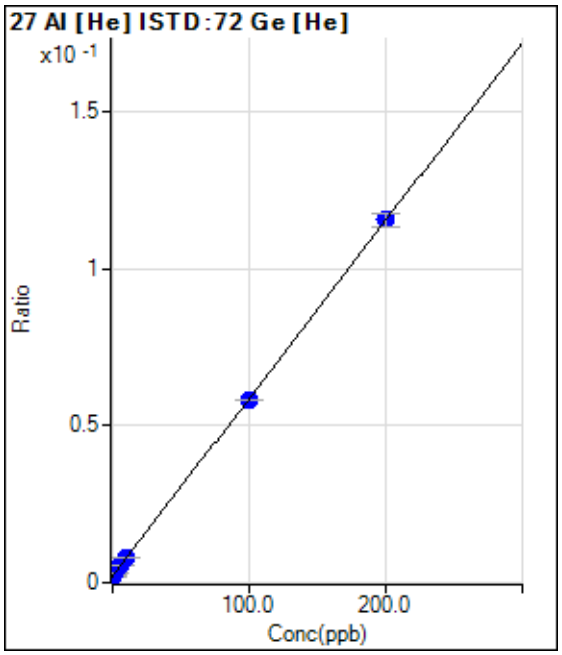


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	77457.87	0.0218	P	8.6
2	☐	2.000	0.667	91527.10	0.0256	P	3.3
3	☐	5.000	6.204	201937.25	0.0566	P	4.7
4	☐	10.000	10.379	287698.43	0.0800	P	1.7
5	☐	100.000	102.274	2058982.05	0.5953	A	1.9
6	☐	200.000	198.827	4165751.08	1.1368	A	1.0
7	☐	1.000					

y = 0.0056 * x + 0.0218
R = 0.9999
DL = 0.9989
BEC = 3.894

Weight: <None>
Min Conc: <None>

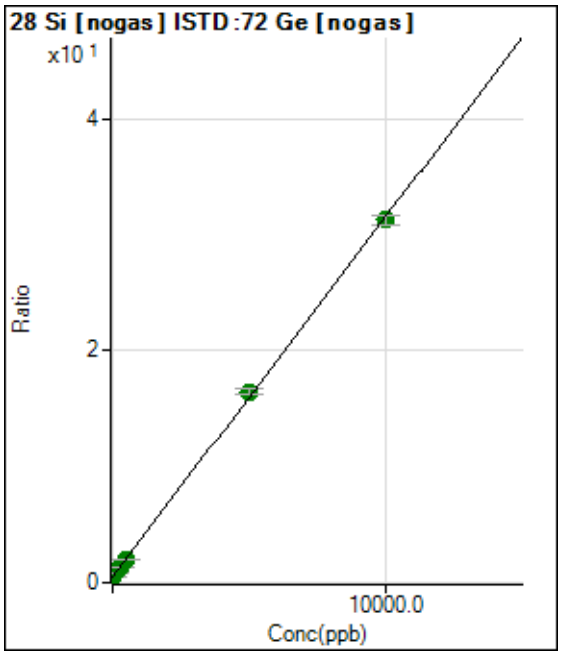
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.003	1763.45	0.0021	P	9.4
2	☐	2.000	1.485	2476.87	0.0029	P	11.
3	☐	5.000	5.705	4423.92	0.0053	P	4.2
4	☐	10.000	10.339	6584.58	0.0080	P	7.5
5	☐	100.000	99.007	48759.78	0.0582	P	0.7
6	☐	200.000	200.467	94669.15	0.1157	P	3.5
7	☐	1.000					

y = 5.6640E-004 * x + 0.0021
R = 1.0000
DL = 1.053
BEC = 3.72

Weight: <None>
Min Conc: <None>

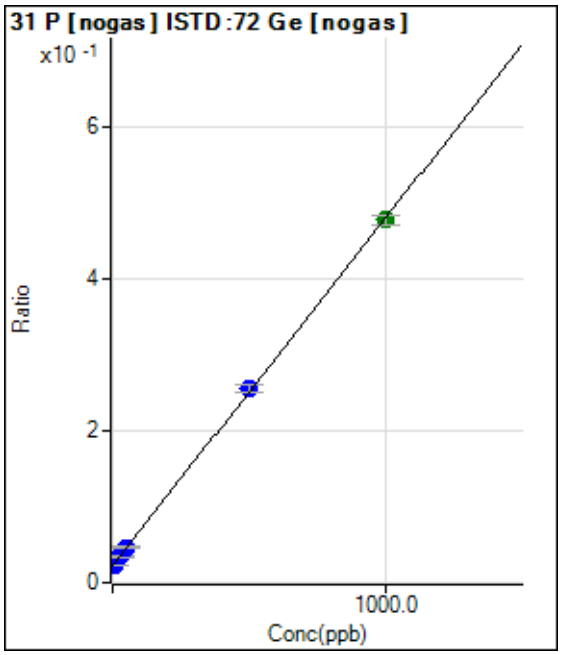


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1786795.86	0.5033	A	3.0
2	☐	100.000	87.831	2777141.21	0.7758	A	2.1
3	☐	250.000	254.258	4591023.16	1.2922	A	5.5
4	☐	500.000	487.963	7250697.18	2.0173	A	2.7
5	☐	5000.000	5153.189	57019467.49	16.4923	A	2.9
6	☐	10000.00	9924.022	114625554.9	31.2949	A	2.7
7	☐	5.000					

y = 0.0031 * x + 0.5033
R = 0.9998
DL = 14.44
BEC = 162.2

Weight: <None>
Min Conc: <None>

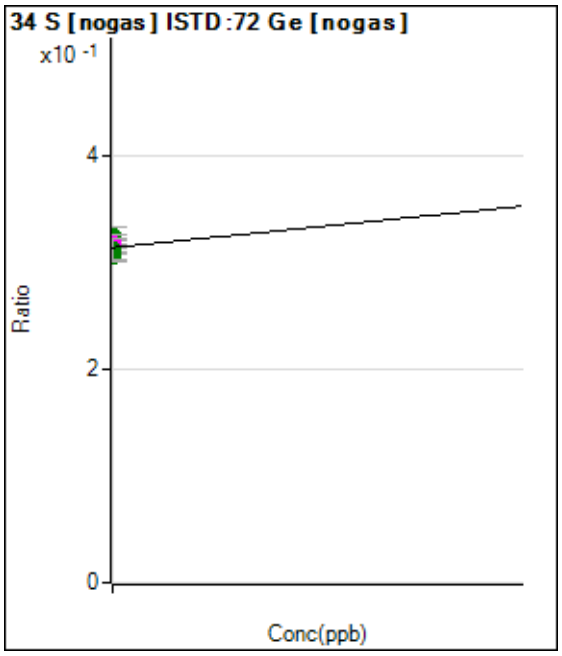
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	80236.18	0.0226	P	3.4
2	☐	10.000	-0.139	80633.97	0.0225	P	4.1
3	☐	25.000	26.987	123922.83	0.0349	P	9.8
4	☐	50.000	52.754	167931.26	0.0467	P	3.5
5	☐	500.000	509.447	883777.23	0.2557	P	3.3
6	☐	1000.000	995.190	1750887.01	0.4779	A	2.3
7	☐	5.000					

y = 4.5752E-004 * x + 0.0226
R = 0.9999
DL = 4.974
BEC = 49.4

Weight: <None>
Min Conc: <None>

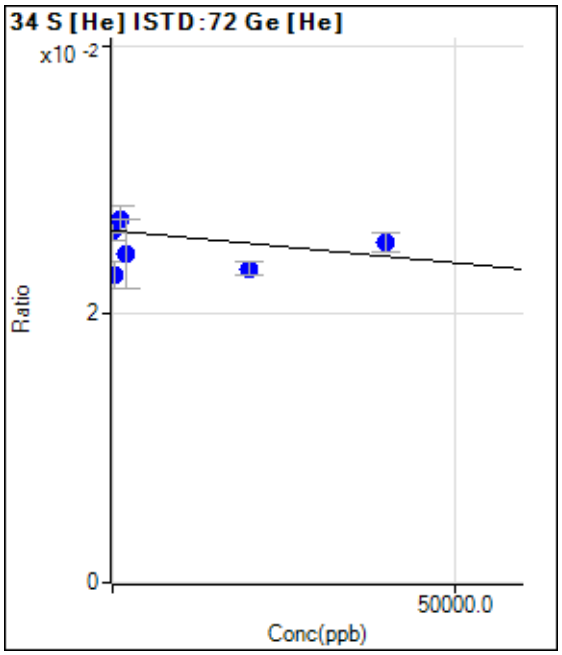


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1113053.57	0.3134	M	3.8
2	☐	400.000	-27825656.57	1097233.46	0.3063	A	2.5
3	☐	1000.000	41489022.92	1152275.19	0.3242	A	5.3
4	☐	2000.000	36090880.65	1161027.37	0.3228	A	1.3
5	☐	20000.00	14108207.03	1096116.82	0.3171	M	2.9
6	☐	40000.00	-9567487.560	1138341.66	0.3110	A	6.8
7	☐	100.000					

y = 2.5821E-010 * x + 0.3134
R = -0.2609
DL = 1.375E+08
BEC = 1.214E+09

Weight: <None>
Min Conc: <None>

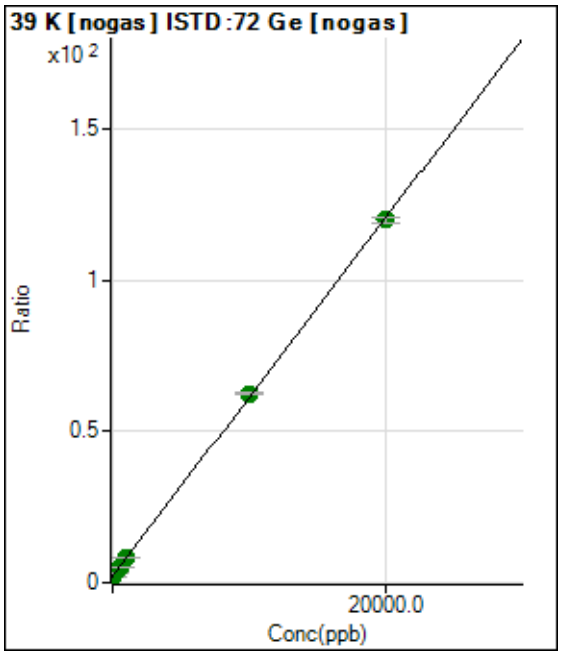
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	21950.22	0.0262	P	5.6
2	☐	400.000	68262.296	19246.23	0.0229	P	8.6
3	☐	1000.000	-16293.142	22384.11	0.0270	P	7.5
4	☐	2000.000	37018.140	20148.30	0.0244	P	20.
5	☐	20000.00	59369.552	19580.39	0.0234	P	4.5
6	☐	40000.00	18318.022	20748.34	0.0253	P	6.0
7	☐	100.000					

y = -4.8102E-008 * x + 0.0262
R = -0.0898
DL = -9.232E+04
BEC = -5.45E+05

Weight: <None>
Min Conc: <None>

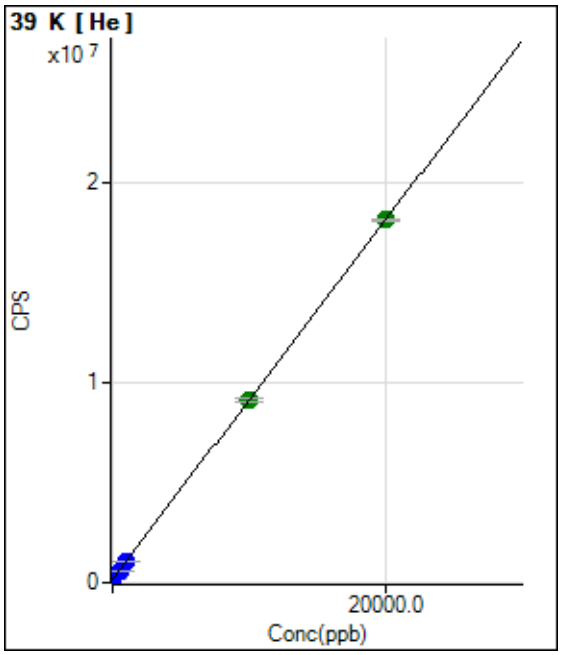


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7580101.73	2.1349	A	2.4
2	☐	200.000	202.537	11936197.14	3.3352	A	2.9
3	☐	500.000	510.936	18312033.74	5.1630	A	9.1
4	☐	1000.000	1011.498	29212752.74	8.1297	A	3.2
5	☐	10000.00	10207.707	216604788.1	62.6332	A	1.3
6	☐	20000.00	19895.273	439767909.8	120.048	A	1.8
7	☐	100.000					

y = 0.0059 * x + 2.1349
R = 0.9999
DL = 26.13
BEC = 360.2

Weight: <None>
Min Conc: <None>

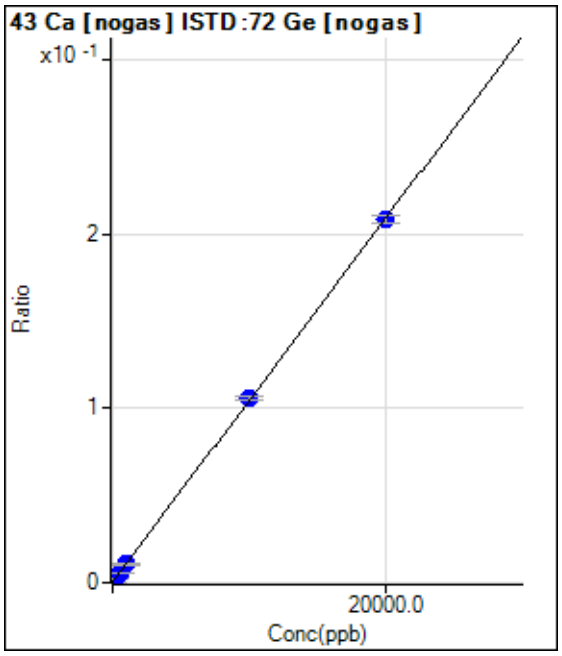
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	170285.97		P	0.3
2	☐	200.000	201.047	350759.06		P	0.7
3	☐	500.000	492.010	611946.24		P	1.1
4	☐	1000.000	968.975	1040100.25		P	0.7
5	☐	10000.00	9989.647	9137636.95		A	1.7
6	☐	20000.00	20006.917	18129783.90		A	0.5
7	☐	100.000					

y = 897.6644 * x + 170285.9667
R = 1.0000
DL = 1.483
BEC = 189.7

Weight: <None>
Min Conc: <None>

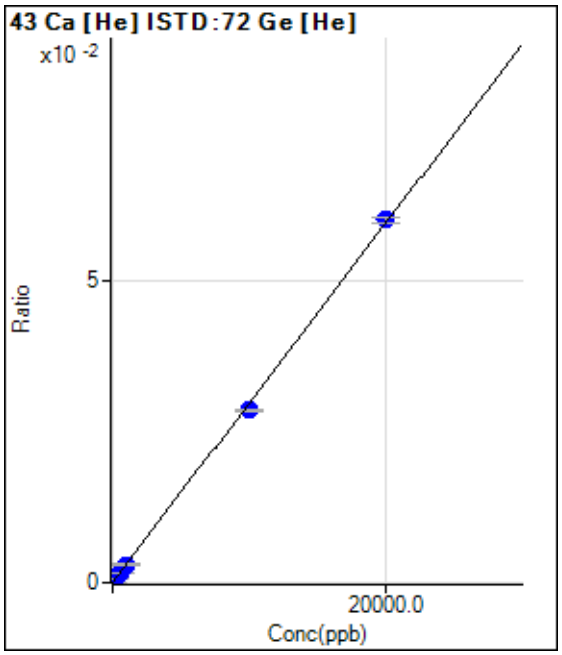


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	823.37	0.0002	P	11.
2	☐	200.000	198.398	8231.93	0.0023	P	2.7
3	☐	500.000	499.213	19320.28	0.0054	P	4.6
4	☐	1000.000	990.750	37928.98	0.0106	P	4.5
5	☐	10000.00	10146.229	366611.83	0.1060	P	1.4
6	☐	20000.00	19927.384	761679.34	0.2079	P	2.3
7	☐	100.000					

y = 1.0423E-005 * x + 2.3215E-004
R = 1.0000
DL = 7.682
BEC = 22.27

Weight: <None>
Min Conc: <None>

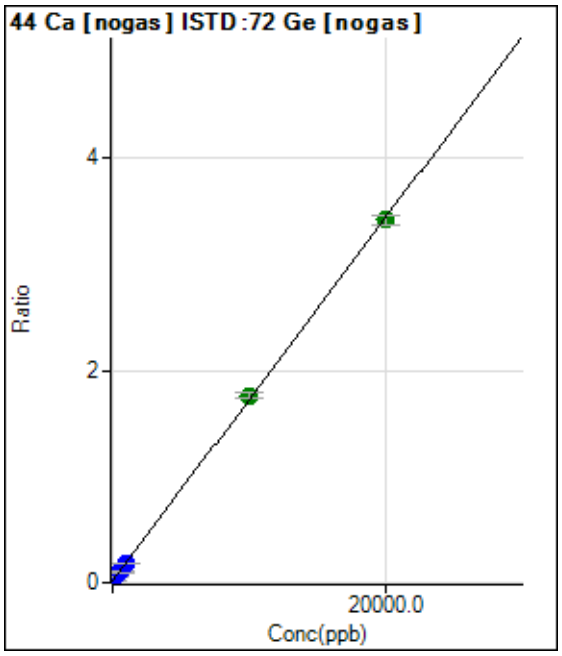
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	36.67	0.0000	P	78.
2	☐	200.000	176.102	476.68	0.0006	P	3.8
3	☐	500.000	506.136	1283.40	0.0015	P	9.9
4	☐	1000.000	993.585	2476.87	0.0030	P	9.6
5	☐	10000.00	9588.297	23948.89	0.0286	P	1.6
6	☐	20000.00	20206.258	49271.69	0.0602	P	1.8
7	☐	100.000					

y = 2.9757E-006 * x + 4.3619E-005
R = 0.9997
DL = 34.29
BEC = 14.66

Weight: <None>
Min Conc: <None>

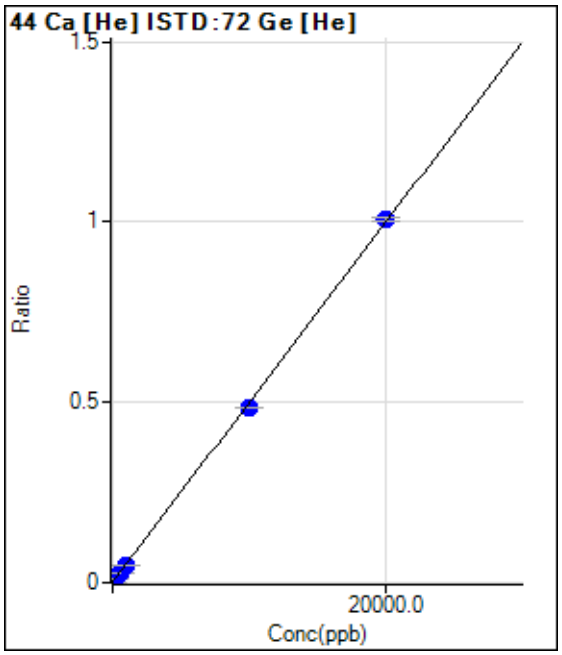


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	54583.02	0.0154	P	4.3
2	☐	200.000	191.137	172085.82	0.0481	P	2.7
3	☐	500.000	495.058	354984.02	0.1001	P	8.9
4	☐	1000.000	970.672	652308.58	0.1814	P	1.2
5	☐	10000.00	10226.911	6101094.91	1.7650	A	3.3
6	☐	20000.00	19888.223	12519365.23	3.4179	A	3.0
7	☐	100.000					

y = 1.7108E-004 * x + 0.0154
R = 0.9999
DL = 11.57
BEC = 89.89

Weight: <None>
Min Conc: <None>

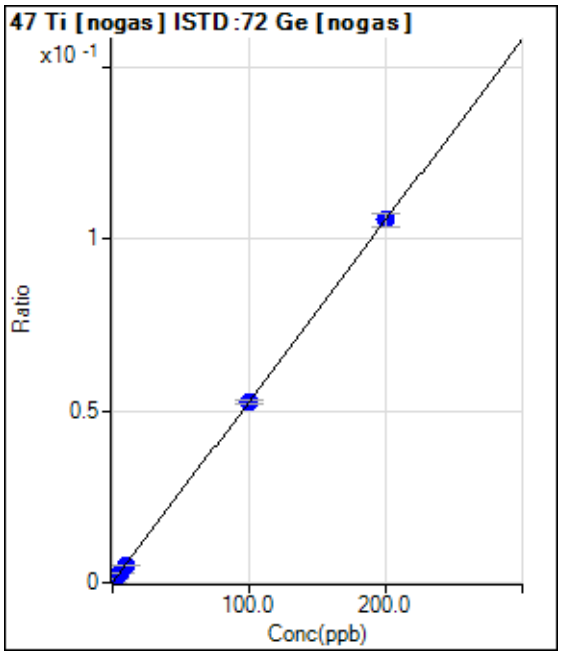
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	916.71	0.0011	P	13.
2	☐	200.000	195.242	9095.68	0.0108	P	1.7
3	☐	500.000	489.347	21132.21	0.0255	P	3.2
4	☐	1000.000	962.277	40547.68	0.0491	P	4.8
5	☐	10000.00	9714.364	406952.36	0.4856	P	0.9
6	☐	20000.00	20145.018	823613.63	1.0058	P	1.1
7	☐	100.000					

y = 4.9875E-005 * x + 0.0011
R = 0.9999
DL = 9.082
BEC = 21.96

Weight: <None>
Min Conc: <None>

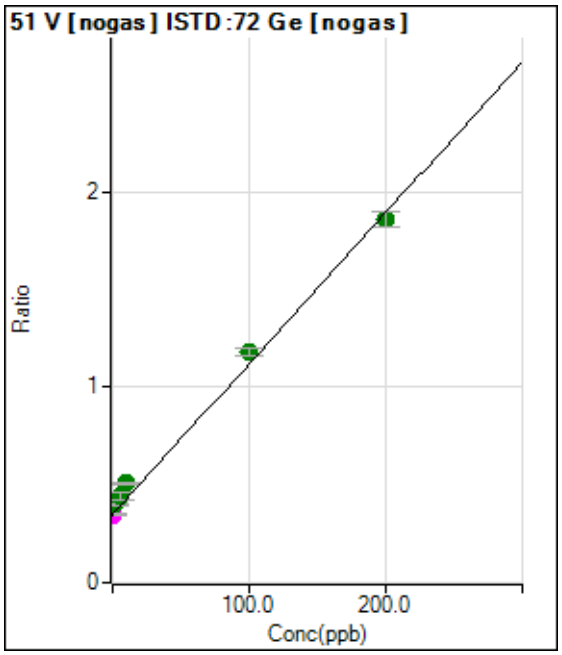


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	283.34	0.0001	P	41.
2	☐	2.000	1.783	3643.75	0.0010	P	10.
3	☐	5.000	4.942	9529.26	0.0027	P	7.9
4	☐	10.000	9.421	18139.09	0.0050	P	2.1
5	☐	100.000	99.521	181696.77	0.0525	P	2.2
6	☐	200.000	200.272	386985.39	0.1057	P	3.4
7	☐	1.000					

y = 5.2719E-004 * x + 7.9746E-005
R = 1.0000
DL = 0.1862
BEC = 0.1513

Weight: <None>
Min Conc: <None>

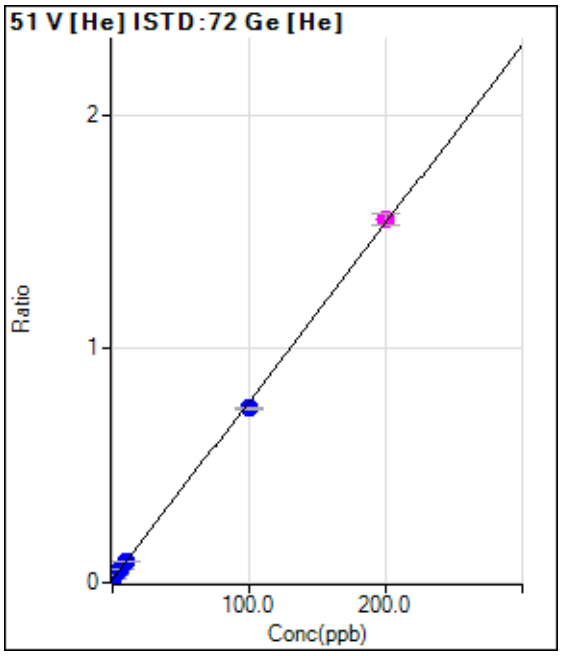
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1238421.94	0.3488	M	4.1
2	☐	2.000	6.452	1427472.62	0.3985	A	1.0
3	☐	5.000	12.441	1577439.88	0.4447	A	9.0
4	☐	10.000	20.625	1826105.38	0.5078	A	2.4
5	☐	100.000	107.948	4082141.63	1.1811	A	3.5
6	☐	200.000	195.264	6790929.32	1.8542	A	4.1
7	☐	1.000					

y = 0.0077 * x + 0.3488
R = 0.9982
DL = 5.552
BEC = 45.24

Weight: <None>
Min Conc: <None>

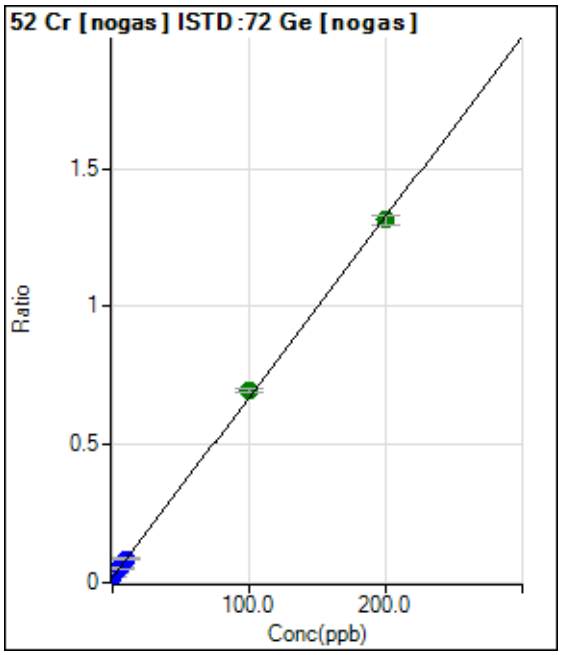


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.474	14259.45	0.0170	P	1.5
2	☐	2.000	2.475	27090.25	0.0323	P	0.5
3	☐	5.000	5.536	46057.91	0.0556	P	1.5
4	☐	10.000	10.508	77214.15	0.0934	P	1.3
5	☐	100.000	96.102	624534.88	0.7453	P	1.1
6	☐	200.000	201.905	1270034.29	1.5510	M	3.2
7	☐	1.000					

y = 0.0076 * x + 0.0134
R = 0.9997
DL = 0.1009
BEC = 1.762

Weight: <None>
Min Conc: <None>

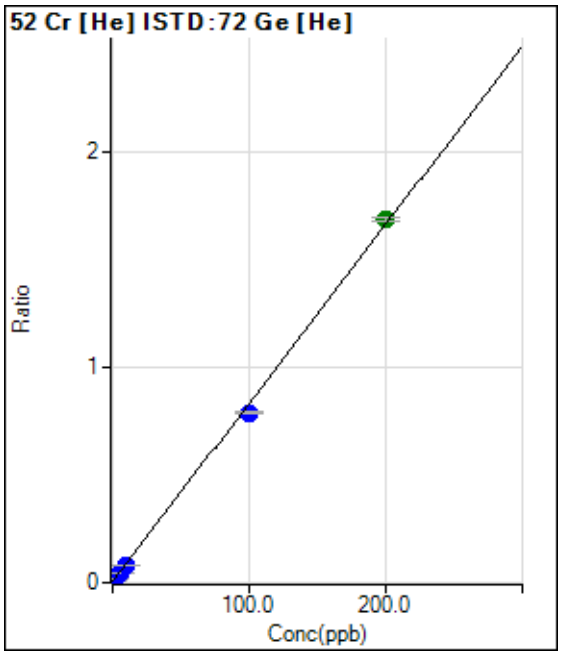
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	68853.87	0.0194	P	1.9
2	☐	2.000	1.992	115869.71	0.0324	P	5.1
3	☐	5.000	5.184	189061.97	0.0532	P	6.3
4	☐	10.000	10.108	306749.05	0.0854	P	3.9
5	☐	100.000	103.412	2401368.77	0.6945	A	2.3
6	☐	200.000	198.284	4813022.43	1.3139	A	2.6
7	☐	1.000					

y = 0.0065 * x + 0.0194
R = 0.9998
DL = 0.1677
BEC = 2.97

Weight: <None>
Min Conc: <None>

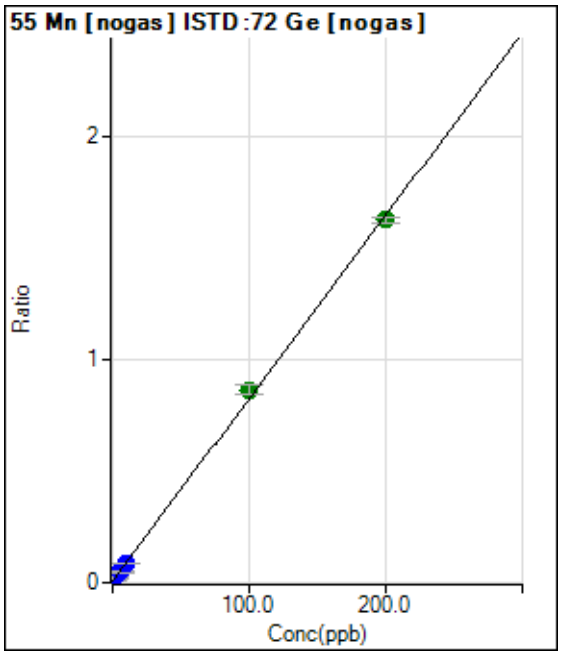


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4123.86	0.0049	P	7.9
2	☐	2.000	1.841	16961.33	0.0202	P	4.4
3	☐	5.000	4.823	37254.53	0.0450	P	1.4
4	☐	10.000	9.406	68580.62	0.0830	P	0.5
5	☐	100.000	94.594	661999.05	0.7900	P	0.9
6	☐	200.000	202.739	1381847.06	1.6874	A	1.0
7	☐	1.000					

y = 0.0083 * x + 0.0049
R = 0.9995
DL = 0.1411
BEC = 0.5935

Weight: <None>
Min Conc: <None>

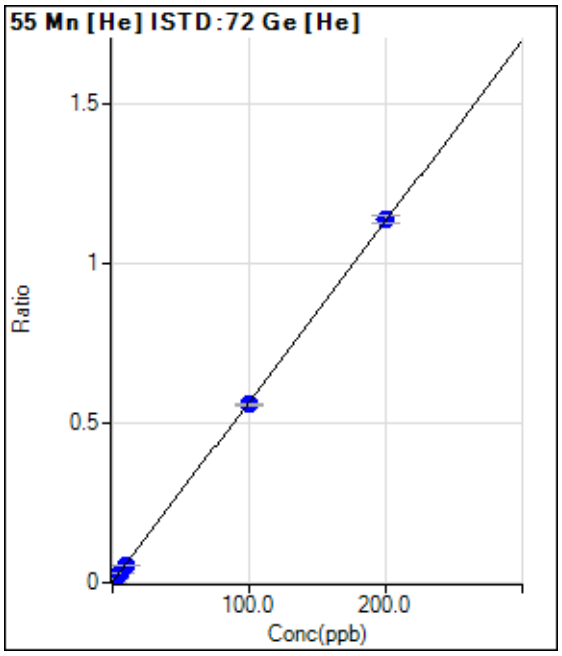
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23391.62	0.0066	P	2.2
2	☐	2.000	1.830	77277.42	0.0216	P	4.2
3	☐	5.000	5.053	170429.78	0.0480	P	9.0
4	☐	10.000	9.837	313711.41	0.0873	P	2.9
5	☐	100.000	104.638	2988634.12	0.8650	A	4.7
6	☐	200.000	197.689	5965128.45	1.6283	A	1.8
7	☐	1.000					

y = 0.0082 * x + 0.0066
R = 0.9996
DL = 0.05259
BEC = 0.8029

Weight: <None>
Min Conc: <None>

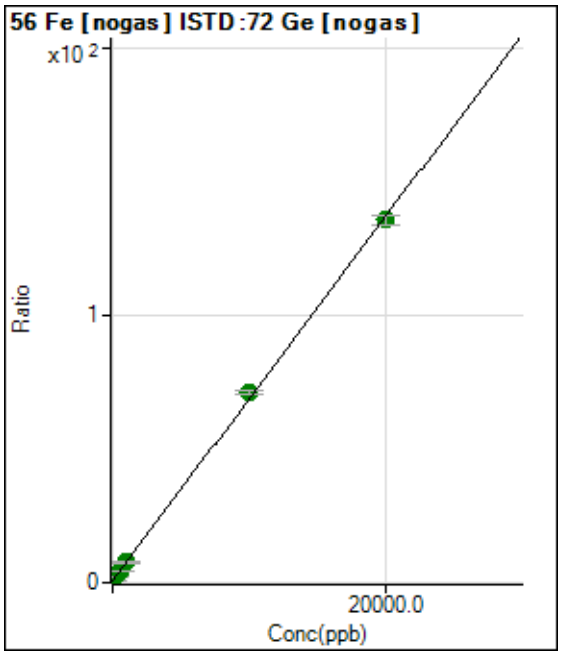


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1073.38	0.0013	P	1.3
2	☐	2.000	1.903	10109.54	0.0120	P	1.8
3	☐	5.000	5.007	24523.30	0.0296	P	2.3
4	☐	10.000	9.795	46836.19	0.0567	P	1.7
5	☐	100.000	98.581	468165.88	0.5586	P	1.0
6	☐	200.000	200.721	930186.86	1.1361	P	2.1
7	☐	1.000					

y = 0.0057 * x + 0.0013
R = 1.0000
DL = 0.00862
BEC = 0.2267

Weight: <None>
Min Conc: <None>

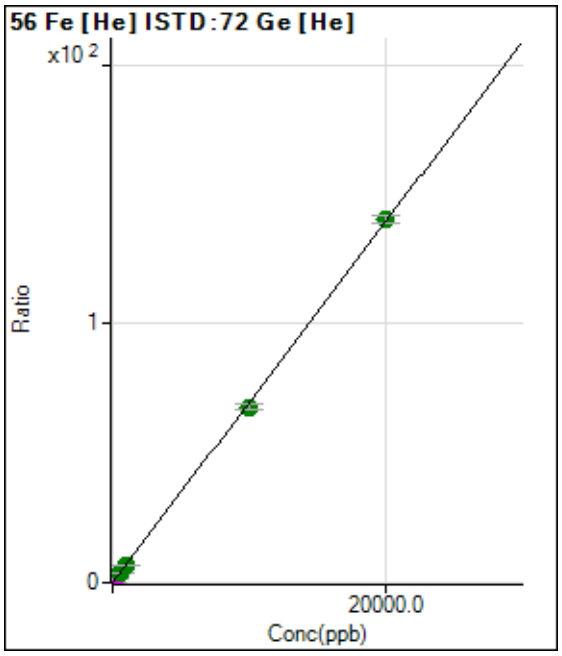
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2564814.12	0.7225	A	3.4
2	☐	200.000	202.138	7515341.57	2.1001	A	3.7
3	☐	500.000	502.916	14726538.35	4.1501	A	8.1
4	☐	1000.000	1003.383	27184109.98	7.5610	A	3.4
5	☐	10000.00	10349.989	246346363.8	71.2630	A	2.9
6	☐	20000.00	19824.742	497565694.4	135.838	A	2.9
7	☐	100.000					

y = 0.0068 * x + 0.7225
R = 0.9998
DL = 10.95
BEC = 106

Weight: <None>
Min Conc: <None>

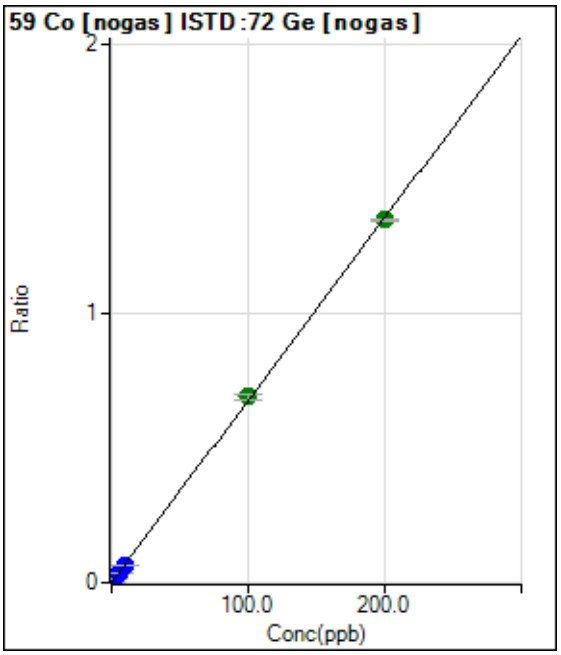


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	26058.62	0.0311	P	2.7
2	☐	200.000	195.537	1169440.84	1.3926	M	3.6
3	☐	500.000	506.315	2947197.25	3.5564	A	2.8
4	☐	1000.000	997.225	5763138.04	6.9744	A	1.4
5	☐	10000.00	9750.429	56918027.49	67.9201	A	2.9
6	☐	20000.00	20124.811	114749171.6	140.153	A	1.9
7	☐	100.000					

y = 0.0070 * x + 0.0311
R = 0.9999
DL = 0.3597
BEC = 4.468

Weight: <None>
Min Conc: <None>

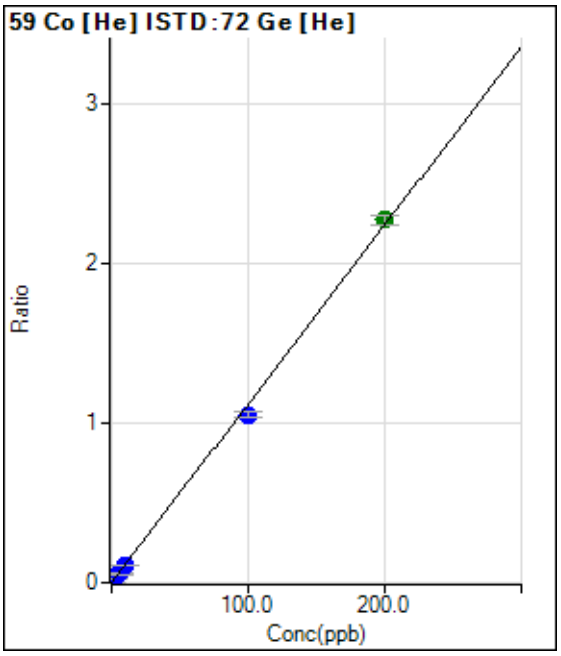
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	833.37	0.0002	P	23.
2	☐	2.000	1.968	48547.84	0.0136	P	3.8
3	☐	5.000	5.035	121849.42	0.0343	P	8.8
4	☐	10.000	9.823	240024.07	0.0668	P	2.5
5	☐	100.000	101.857	2385751.06	0.6902	A	3.3
6	☐	200.000	199.080	4942486.70	1.3488	A	0.4
7	☐	1.000					

y = 0.0068 * x + 2.3546E-004
R = 0.9999
DL = 0.0246
BEC = 0.03476

Weight: <None>
Min Conc: <None>

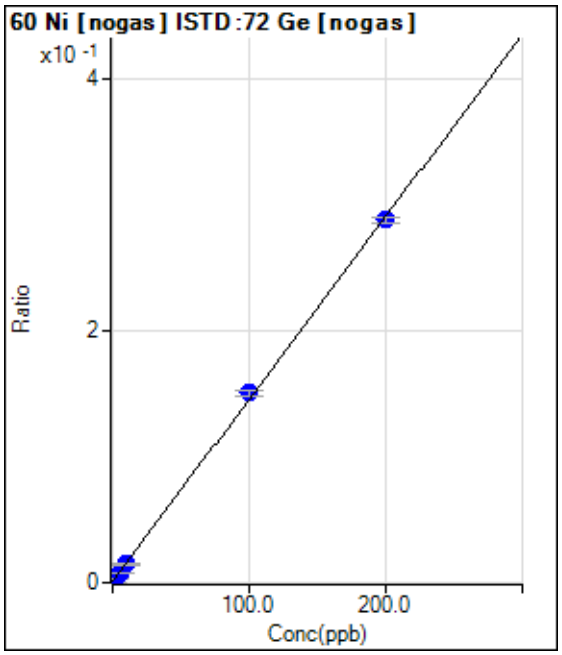


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	200.00	0.0002	P	19.
2	☐	2.000	1.909	18122.51	0.0216	P	3.9
3	☐	5.000	4.826	44908.45	0.0542	P	3.9
4	☐	10.000	9.659	89413.80	0.1082	P	2.9
5	☐	100.000	93.892	879775.77	1.0499	P	3.1
6	☐	200.000	203.076	1859116.69	2.2705	A	2.3
7	☐	1.000					

y = 0.0112 * x + 2.3910E-004
R = 0.9994
DL = 0.01221
BEC = 0.02139

Weight: <None>
Min Conc: <None>

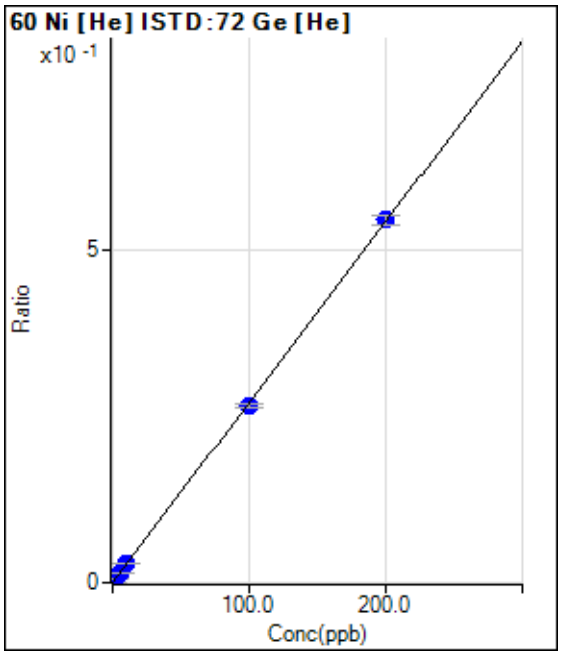
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.567	323.34	0.0001	P	33.
2	☐	2.000	1.559	11323.63	0.0032	P	2.8
3	☐	5.000	4.714	27387.42	0.0077	P	9.8
4	☐	10.000	9.584	53023.58	0.0148	P	5.1
5	☐	100.000	103.354	519375.60	0.1503	P	3.8
6	☐	200.000	198.355	1053570.63	0.2876	P	1.6
7	☐	1.000					

y = 0.0014 * x + 9.1050E-004
R = 0.9998
DL = 0.06411
BEC = 0.63

Weight: <None>
Min Conc: <None>

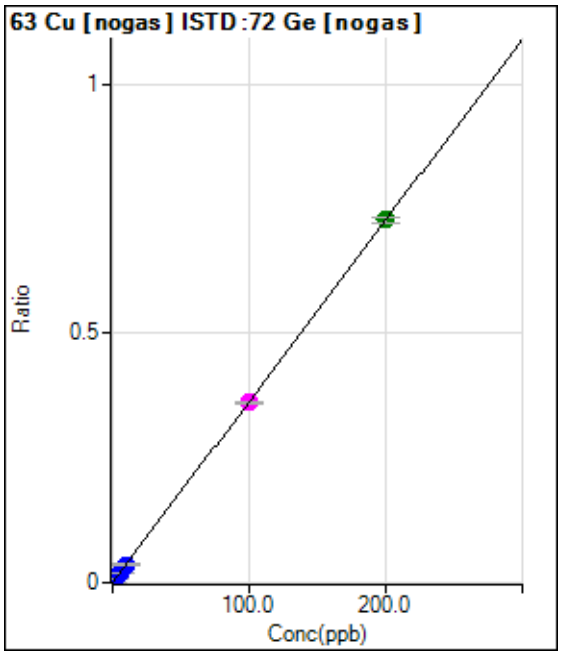


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.161	136.67	0.0002	P	41.
2	☐	2.000	2.157	4694.00	0.0056	P	4.9
3	☐	5.000	5.286	11683.86	0.0141	P	2.0
4	☐	10.000	10.568	23505.24	0.0285	P	5.5
5	☐	100.000	97.733	222439.34	0.2654	P	2.3
6	☐	200.000	201.096	447375.24	0.5465	P	2.7
7	☐	1.000					

y = 0.0027 * x - 2.7316E-004
R = 0.9999
DL = 0.07395
BEC = -0.1005

Weight: <None>
Min Conc: <None>

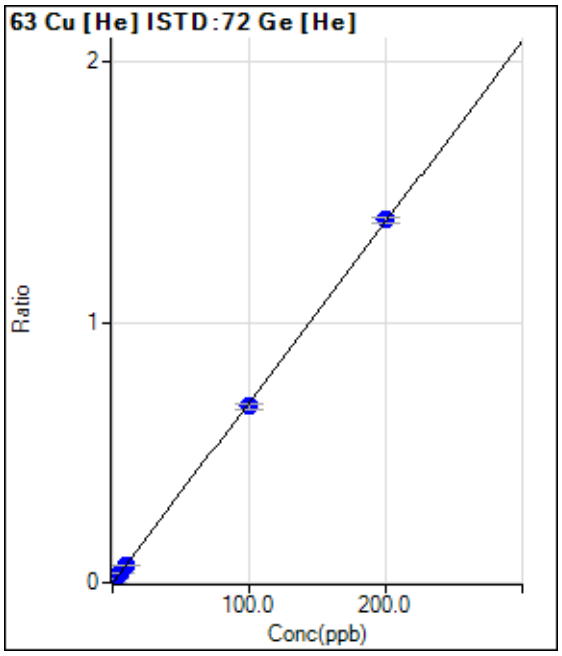
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1536.76	0.0004	P	7.2
2	☐	2.000	1.980	27267.28	0.0076	P	6.3
3	☐	5.000	5.096	67119.88	0.0189	P	9.8
4	☐	10.000	9.859	130176.97	0.0362	P	2.6
5	☐	100.000	99.382	1249207.25	0.3612	M	1.4
6	☐	200.000	200.314	2665951.31	0.7276	A	1.5
7	☐	1.000					

y = 0.0036 * x + 4.3227E-004
R = 1.0000
DL = 0.02555
BEC = 0.1191

Weight: <None>
Min Conc: <None>

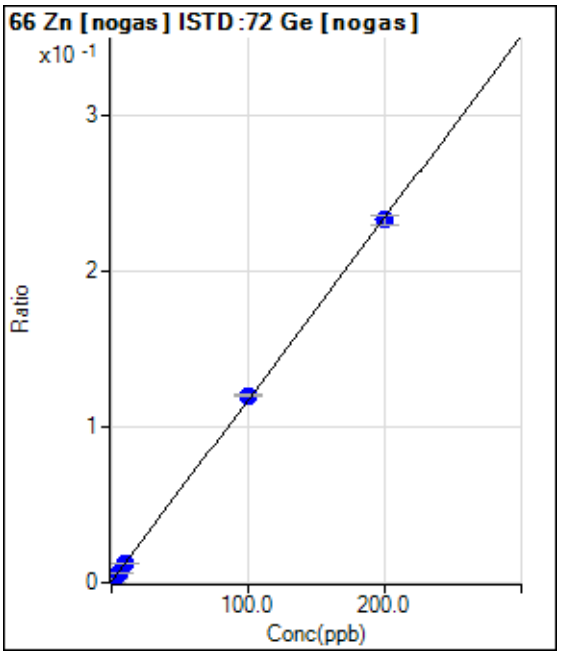


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.354	663.35	0.0008	P	6.9
2	☐	2.000	2.253	11717.23	0.0140	P	2.5
3	☐	5.000	5.415	29744.31	0.0359	P	1.2
4	☐	10.000	10.145	56751.49	0.0687	P	1.6
5	☐	100.000	97.706	566330.52	0.6758	P	2.3
6	☐	200.000	201.127	1140693.89	1.3930	P	1.7
7	☐	1.000					

y = 0.0069 * x - 0.0017
R = 0.9999
DL = 0.02375
BEC = -0.24

Weight: <None>
Min Conc: <None>

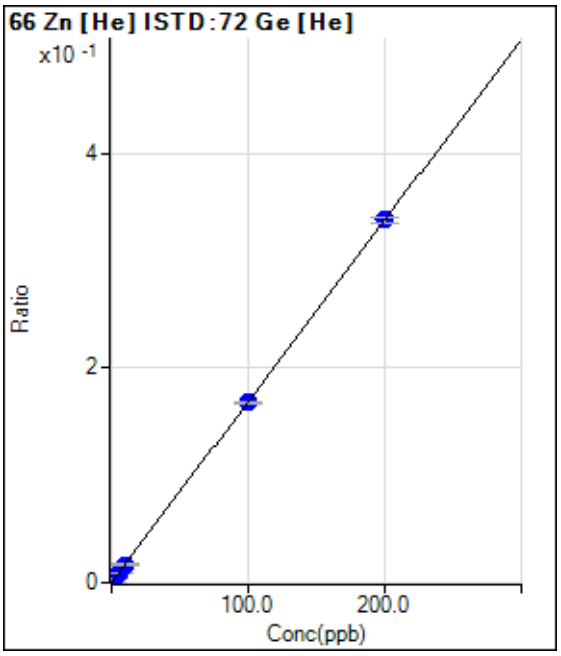
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.358	940.04	0.0003	P	11.
2	☐	2.000	1.539	8885.64	0.0025	P	2.6
3	☐	5.000	4.957	22994.75	0.0065	P	6.3
4	☐	10.000	9.742	43381.86	0.0121	P	1.5
5	☐	100.000	102.201	415264.80	0.1201	P	1.2
6	☐	200.000	198.918	853679.49	0.2331	P	2.6
7	☐	1.000					

y = 0.0012 * x + 6.8307E-004
R = 0.9999
DL = 0.07476
BEC = 0.5847

Weight: <None>
Min Conc: <None>

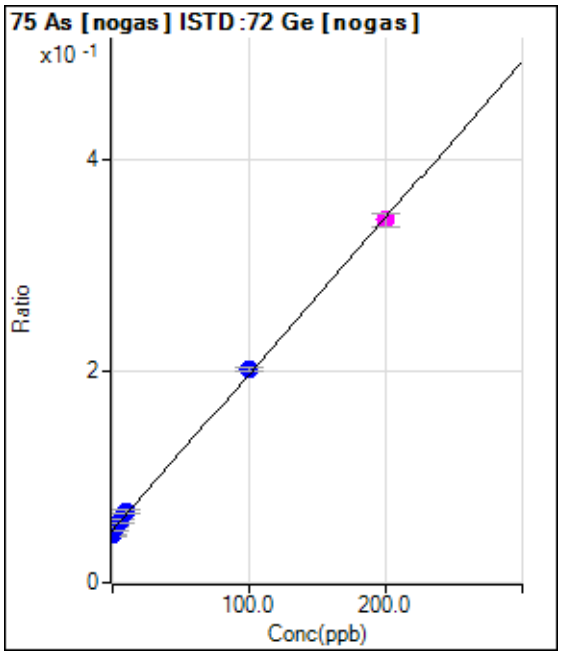


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.098	293.34	0.0004	P	8.1
2	☐	2.000	2.070	3083.65	0.0037	P	8.9
3	☐	5.000	5.272	7518.32	0.0091	P	0.8
4	☐	10.000	9.888	13932.20	0.0169	P	5.0
5	☐	100.000	99.347	140491.93	0.1676	P	1.7
6	☐	200.000	200.325	276667.38	0.3379	P	1.3
7	☐	1.000					

y = 0.0017 * x + 1.8448E-004
R = 1.0000
DL = 0.0504
BEC = 0.1094

Weight: <None>
Min Conc: <None>

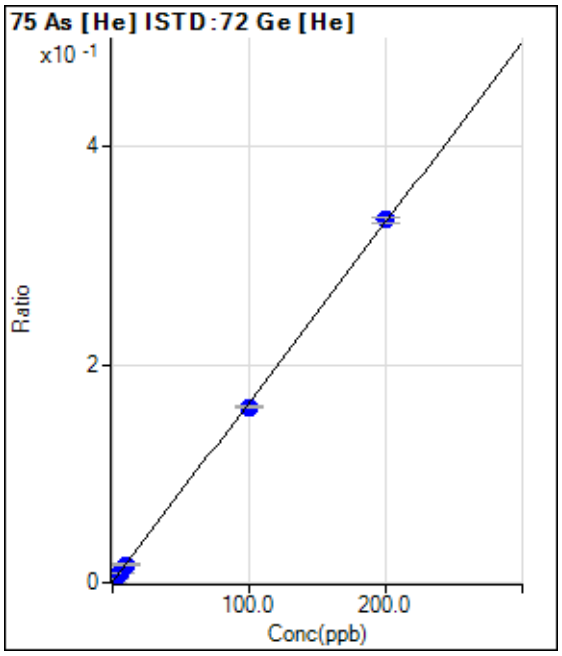
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-2.979	160545.89	0.0452	P	3.6
2	☐	2.000	0.732	181430.39	0.0507	P	5.6
3	☐	5.000	6.124	208319.85	0.0587	P	7.6
4	☐	10.000	11.865	241432.28	0.0672	P	3.9
5	☐	100.000	102.732	697353.22	0.2017	P	1.9
6	☐	200.000	198.525	1258438.00	0.3434	M	3.5
7	☐	1.000					

y = 0.0015 * x + 0.0496
R = 0.9996
DL = 3.285
BEC = 33.53

Weight: <None>
Min Conc: <None>

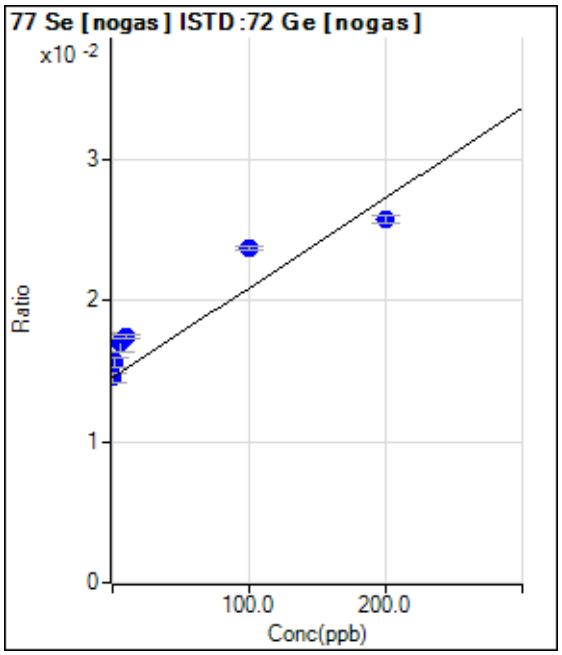


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	517.79	0.0006	P	4.1
2	☐	2.000	1.974	3250.30	0.0039	P	3.8
3	☐	5.000	4.759	7013.60	0.0085	P	1.1
4	☐	10.000	9.753	13794.13	0.0167	P	1.7
5	☐	100.000	97.310	134927.85	0.1610	P	1.5
6	☐	200.000	201.364	272270.03	0.3325	P	1.5
7	☐	1.000					

y = 0.0016 * x + 6.1815E-004
R = 0.9999
DL = 0.0466
BEC = 0.375

Weight: <None>
Min Conc: <None>

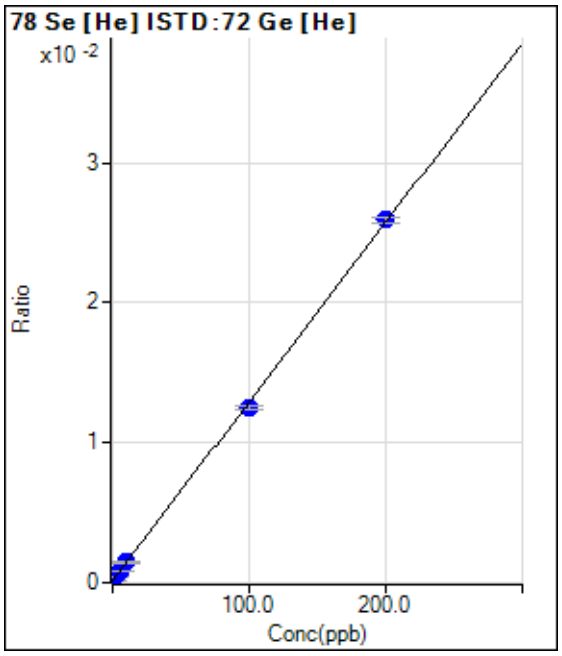
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	51536.35	0.0145	P	4.4
2	☐	2.000	17.552	55932.62	0.0156	P	4.5
3	☐	5.000	40.226	60607.48	0.0171	P	8.1
4	☐	10.000	45.725	62674.42	0.0174	P	1.1
5	☐	100.000	143.713	81930.11	0.0237	P	1.3
6	☐	200.000	175.321	94138.40	0.0257	P	2.2
7	☐	1.000					

y = 6.3804E-005 * x + 0.0145
R = 0.9502
DL = 30.25
BEC = 227.5

Weight: <None>
Min Conc: <None>

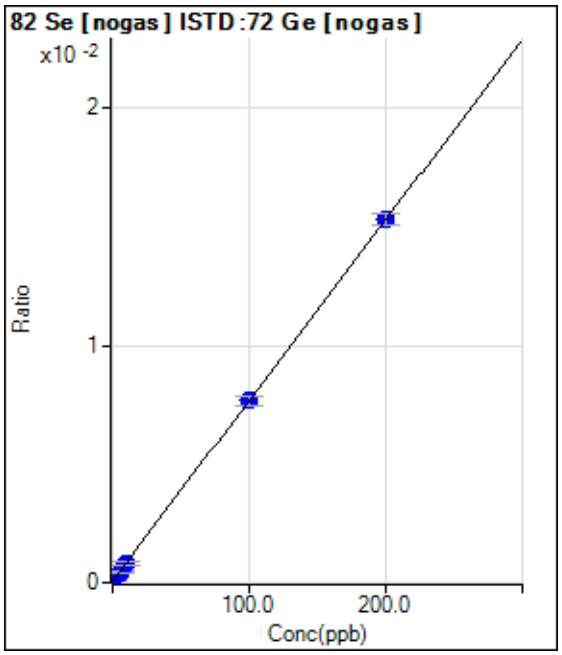


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.465	160.67	0.0002	P	11.
2	☐	2.000	2.298	358.00	0.0004	P	7.1
3	☐	5.000	5.553	698.68	0.0008	P	5.4
4	☐	10.000	10.265	1194.71	0.0014	P	2.0
5	☐	100.000	96.897	10495.03	0.0125	P	2.7
6	☐	200.000	201.522	21213.01	0.0259	P	1.7
7	☐	1.000					

y = 1.2789E-004 * x + 1.3247E-004
R = 0.9998
DL = 0.5215
BEC = 1.036

Weight: <None>
Min Conc: <None>

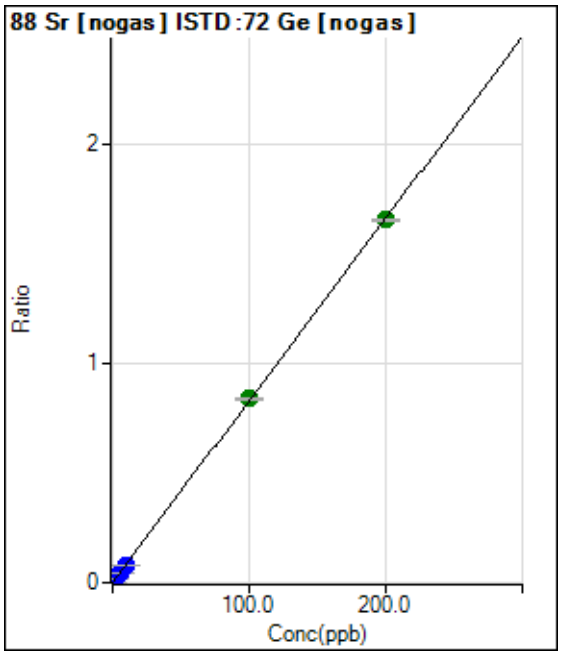
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	233.34	0.0001	P	31.
2	☐	2.000	1.895	753.36	0.0002	P	4.8
3	☐	5.000	4.759	1516.75	0.0004	P	10.
4	☐	10.000	9.753	2903.61	0.0008	P	12.
5	☐	100.000	99.844	26466.36	0.0077	P	5.1
6	☐	200.000	200.097	55986.64	0.0153	P	3.2
7	☐	1.000					

y = 7.6063E-005 * x + 6.5945E-005
R = 1.0000
DL = 0.8149
BEC = 0.867

Weight: <None>
Min Conc: <None>

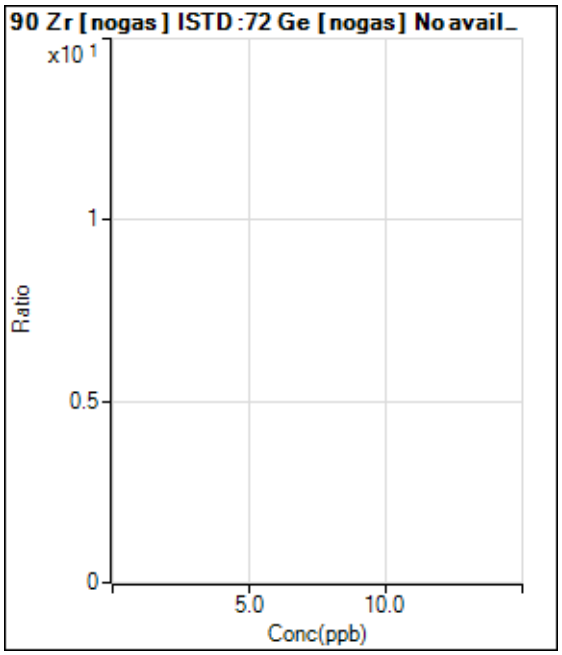


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1203.39	0.0003	P	12.
2	☐	2.000	1.967	59542.57	0.0166	P	3.6
3	☐	5.000	4.960	147098.93	0.0414	P	7.5
4	☐	10.000	9.678	289603.17	0.0805	P	3.4
5	☐	100.000	101.327	2905616.62	0.8401	A	1.0
6	☐	200.000	199.354	6055608.04	1.6525	A	0.5
7	☐	1.000					

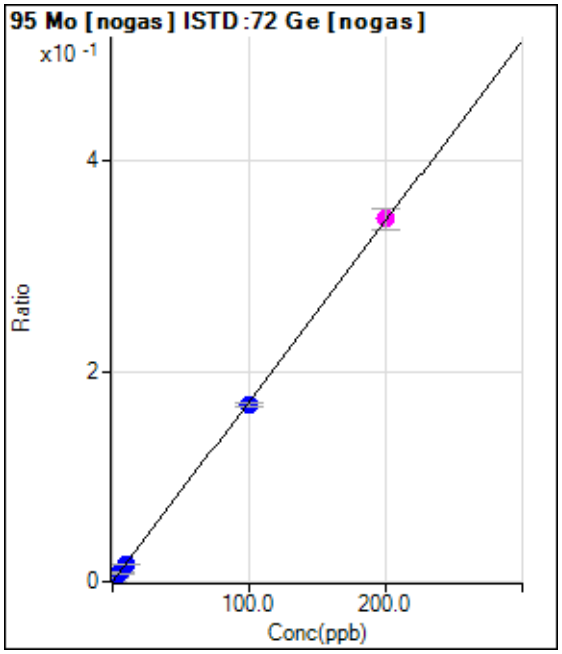
y = 0.0083 * x + 3.3852E-004
R = 1.0000
DL = 0.0149
BEC = 0.04085

Weight: <None>
Min Conc: <None>

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

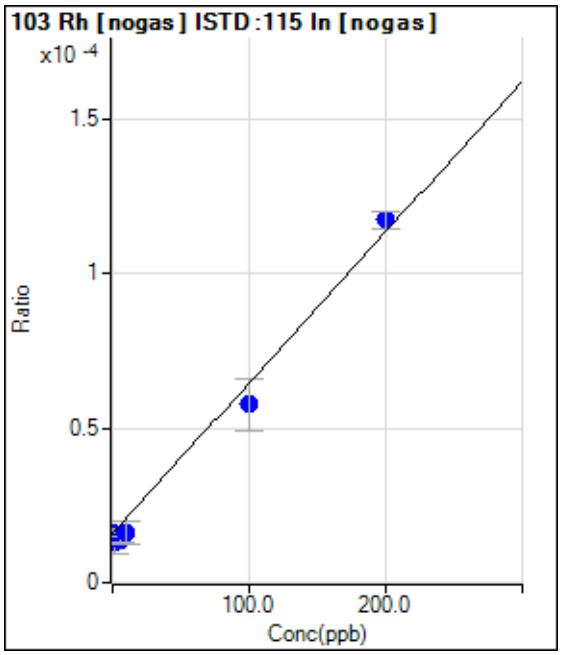


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	366.68	0.0001	P	11.
2	☐	2.000	1.897	12030.90	0.0034	P	1.0
3	☐	5.000	4.829	29718.45	0.0084	P	12.
4	☐	10.000	9.496	58958.25	0.0164	P	1.4
5	☐	100.000	97.915	581340.93	0.1681	P	2.3
6	☐	200.000	201.073	1263968.29	0.3452	M	5.6
7	☐	1.000					

y = 0.0017 * x + 1.0310E-004
R = 0.9999
DL = 0.02143
BEC = 0.06007

Weight: <None>
Min Conc: <None>

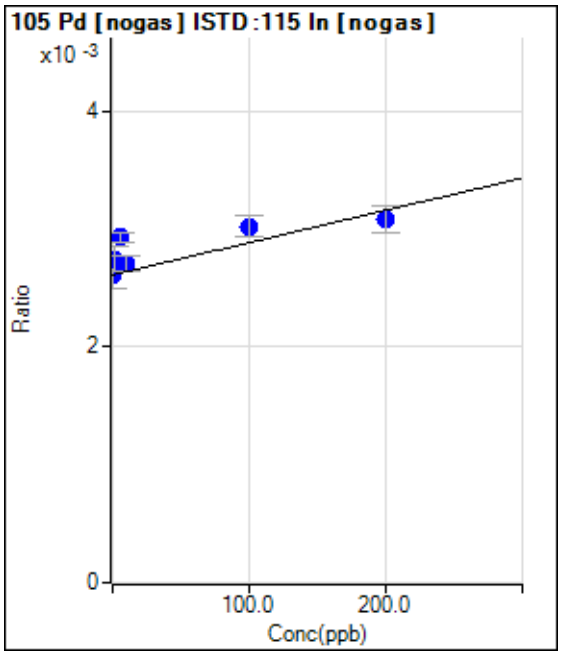
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	18.
2	☐	2.000	-6.375	40.00	0.0000	P	53.
3	☐	5.000	-4.110	43.33	0.0000	P	16.
4	☐	10.000	0.625	50.00	0.0000	P	44.
5	☐	100.000	85.526	166.67	0.0001	P	29.
6	☐	200.000	208.017	370.01	0.0001	P	4.8
7	☐	1.000					

y = 4.8684E-007 * x + 1.5924E-005
R = 0.9968
DL = 18.05
BEC = 32.71

Weight: <None>
Min Conc: <None>

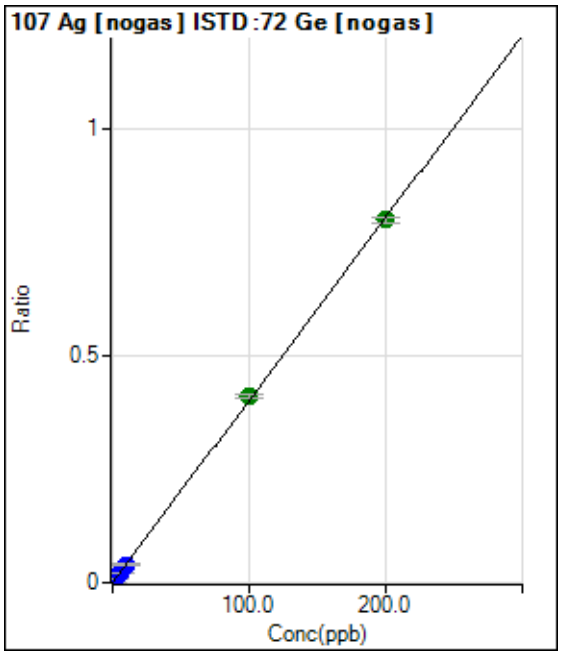


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8185.39	0.0026	P	8.5
2	☐	2.000	49.327	8632.26	0.0027	P	7.7
3	☐	5.000	115.584	9175.86	0.0029	P	2.6
4	☐	10.000	34.068	8422.14	0.0027	P	4.8
5	☐	100.000	150.972	8842.37	0.0030	P	6.4
6	☐	200.000	170.073	9722.85	0.0031	P	7.3
7	☐	1.000					

y = 2.7432E-006 * x + 0.0026
R = 0.8071
DL = 244
BEC = 952.3

Weight: <None>
Min Conc: <None>

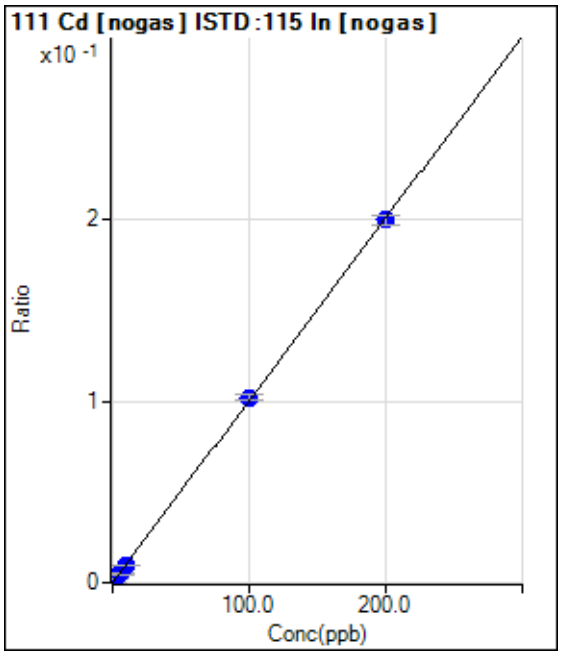
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	106.67	0.0000	P	26.
2	☐	2.000	1.969	28470.00	0.0080	P	4.9
3	☐	5.000	5.007	71682.94	0.0202	P	7.7
4	☐	10.000	9.955	144161.09	0.0401	P	3.6
5	☐	100.000	102.200	1423334.30	0.4116	A	2.3
6	☐	200.000	198.903	2935946.62	0.8011	A	1.7
7	☐	1.000					

y = 0.0040 * x + 3.0181E-005
R = 0.9999
DL = 0.005888
BEC = 0.007494

Weight: <None>
Min Conc: <None>

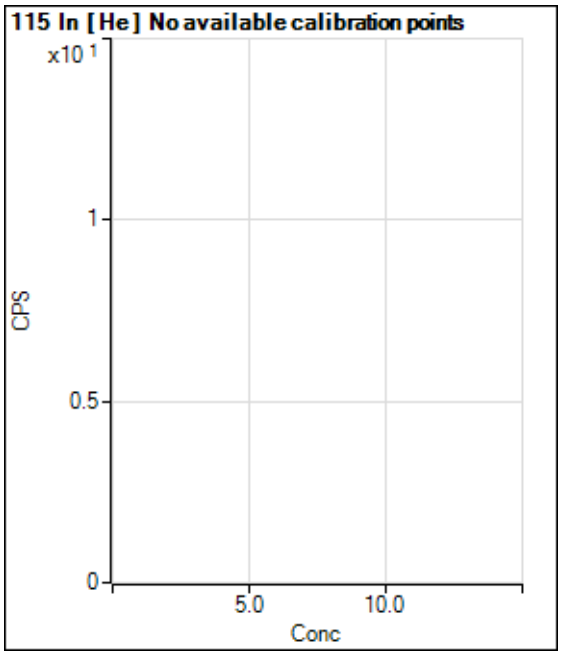


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30.00	0.0000	P	34.
2	☐	2.000	1.955	6194.56	0.0020	P	5.4
3	☐	5.000	4.899	15313.56	0.0049	P	12.
4	☐	10.000	9.562	29909.14	0.0096	P	0.8
5	☐	100.000	101.672	298090.90	0.1020	P	3.6
6	☐	200.000	199.189	630632.96	0.1998	P	2.9
7	☐	1.000					

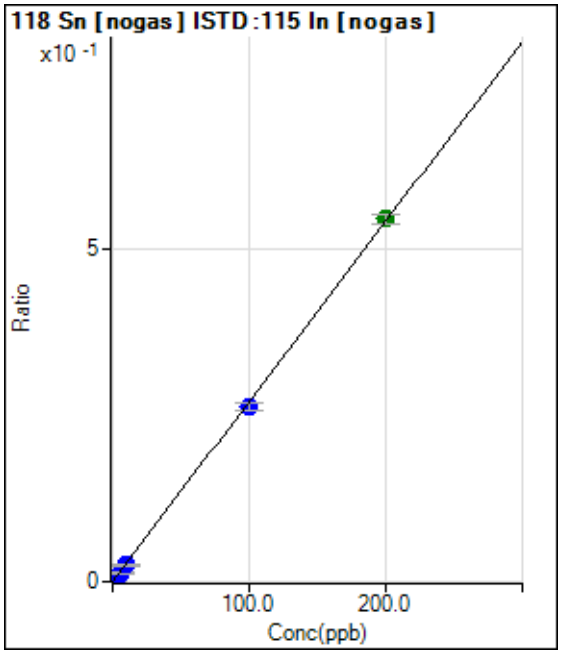
y = 0.0010 * x + 9.5819E-006
R = 0.9999
DL = 0.009776
BEC = 0.009553

Weight: <None>
Min Conc: <None>

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			971469.59		P	0.4
2	☐			996597.28		P	1.5
3	☐			978413.97		P	1.3
4	☐			968391.47		P	1.3
5	☐			972463.34		P	1.3
6	☐			957539.97		P	1.9
7	☐						

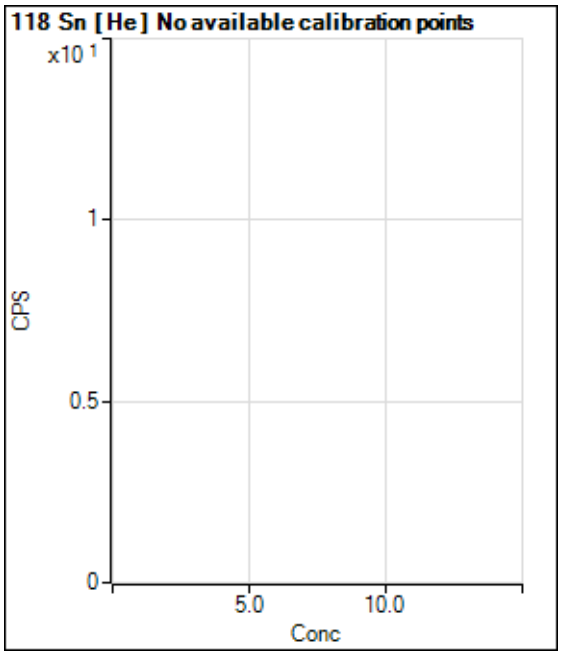


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1396.74	0.0004	P	4.8
2	☐	2.000	1.789	16651.44	0.0053	P	2.9
3	☐	5.000	4.591	40106.35	0.0129	P	10.
4	☐	10.000	9.120	78295.66	0.0252	P	4.4
5	☐	100.000	96.994	769397.70	0.2633	P	4.3
6	☐	200.000	201.559	1726992.22	0.5467	A	2.7
7	☐	1.000					

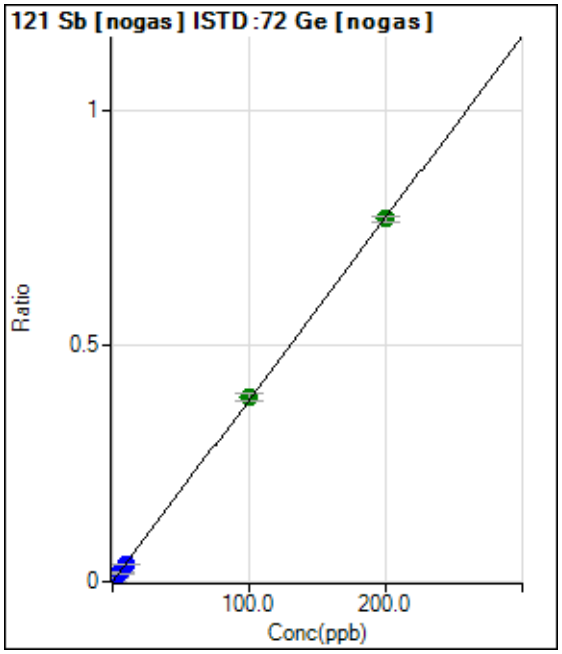
y = 0.0027 * x + 4.4587E-004
R = 0.9998
DL = 0.02353
BEC = 0.1645

Weight: <None>
Min Conc: <None>

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			463.35		P	21.
2	☐			6037.80		P	1.6
3	☐			15483.77		P	3.0
4	☐			29081.10		P	2.2
5	☐			294483.25		P	1.4
6	☐			595594.91		P	0.5
7	☐						

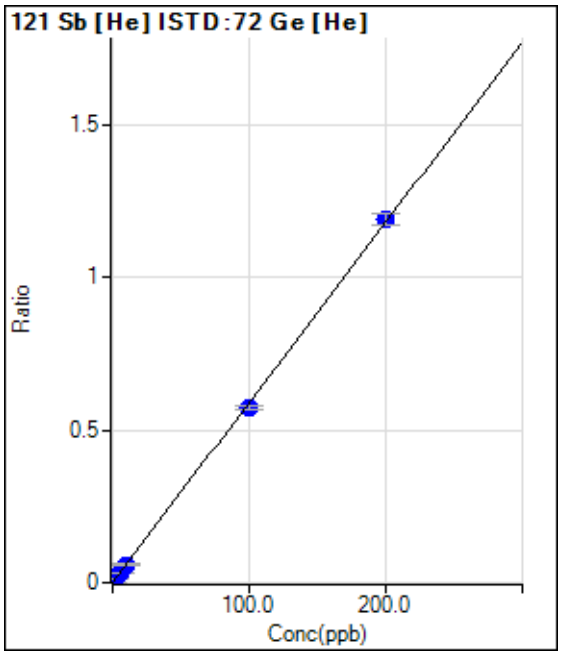


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	286.68	0.0001	P	4.7
2	☐	2.000	2.018	28126.33	0.0079	P	3.5
3	☐	5.000	4.909	67460.12	0.0190	P	7.6
4	☐	10.000	9.774	135630.07	0.0378	P	4.7
5	☐	100.000	101.191	1348371.80	0.3901	A	4.0
6	☐	200.000	199.418	2816753.71	0.7687	A	1.5
7	☐	1.000					

y = 0.0039 * x + 8.0707E-005
R = 1.0000
DL = 0.002945
BEC = 0.02094

Weight: <None>
Min Conc: <None>

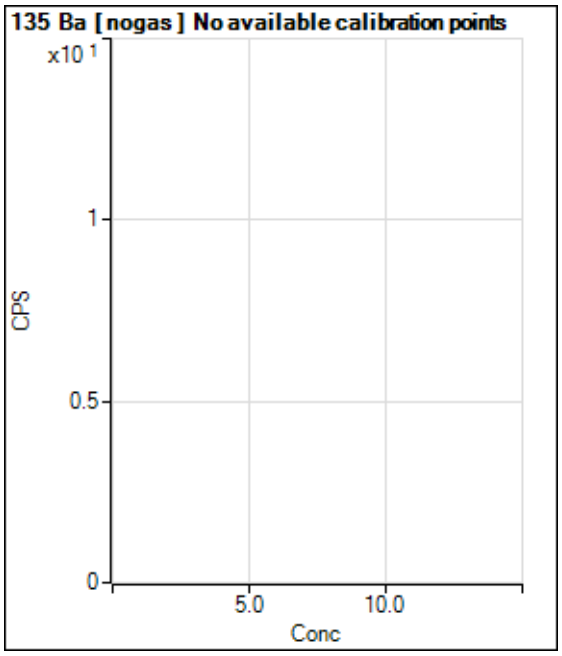
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	96.67	0.0001	P	47.
2	☐	2.000	1.920	9612.77	0.0114	P	0.6
3	☐	5.000	4.924	24190.25	0.0292	P	1.4
4	☐	10.000	10.064	49185.62	0.0595	P	3.5
5	☐	100.000	96.999	479992.53	0.5728	P	2.3
6	☐	200.000	201.500	974034.72	1.1898	P	3.0
7	☐	1.000					

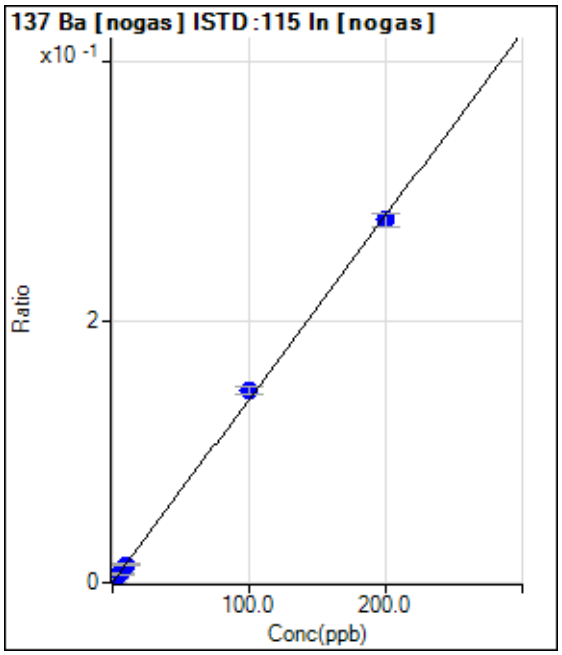
y = 0.0059 * x + 1.1517E-004
R = 0.9998
DL = 0.02749
BEC = 0.01951

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			133.33		P	11.
2	☐			5024.13		P	6.5
3	☐			12828.29		P	4.7
4	☐			24280.82		P	4.1
5	☐			249783.18		P	1.8
6	☐			511235.85		P	0.8
7	☐						

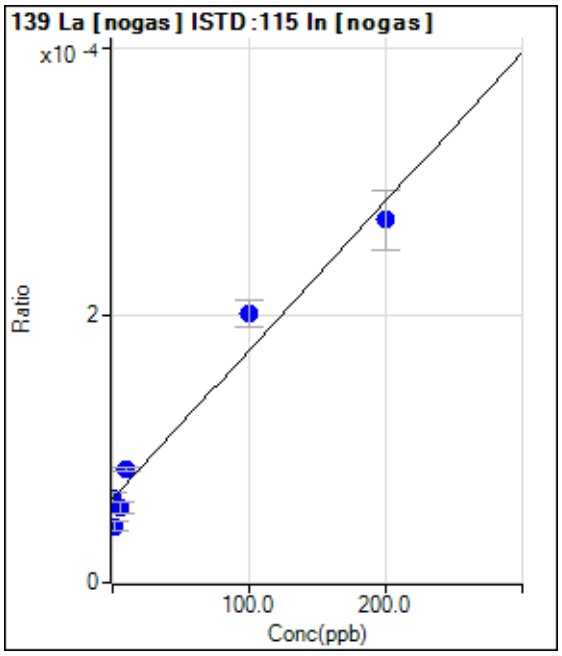
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	200.00	0.0001	P	31.
2	☐	2.000	1.970	8915.78	0.0028	P	3.0
3	☐	5.000	4.773	21053.14	0.0068	P	12.
4	☐	10.000	9.866	43341.16	0.0139	P	6.2
5	☐	100.000	104.606	429972.42	0.1471	P	4.0
6	☐	200.000	197.710	877489.42	0.2780	P	3.8
7	☐	1.000					

y = 0.0014 * x + 6.3940E-005
R = 0.9996
DL = 0.04272
BEC = 0.04548

Weight: <None>
Min Conc: <None>

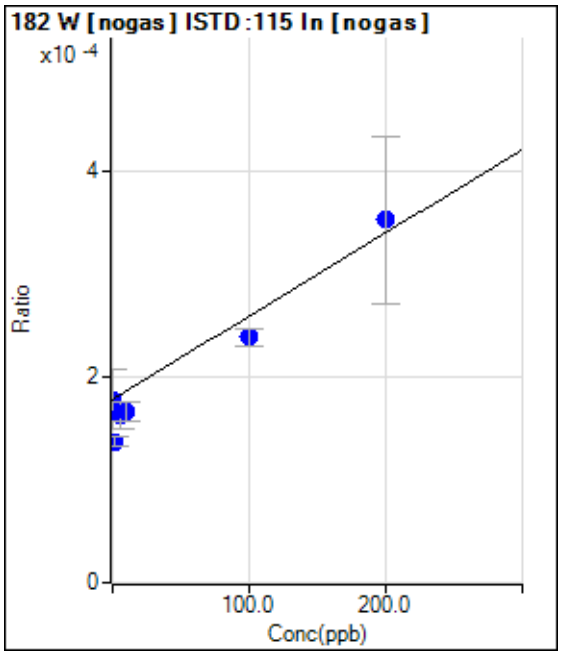


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	196.67	0.0001	P	13.
2	☐	2.000	-18.561	133.33	0.0000	P	18.
3	☐	5.000	-6.340	173.33	0.0001	P	15.
4	☐	10.000	19.422	263.34	0.0001	P	3.0
5	☐	100.000	125.119	590.02	0.0002	P	10.
6	☐	200.000	187.458	856.70	0.0003	P	16.
7	☐	1.000					

y = 1.1149E-006 * x + 6.2864E-005
R = 0.9802
DL = 22.99
BEC = 56.39

Weight: <None>
Min Conc: <None>

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	560.06	0.0002	P	32.
2	☐	2.000	-50.727	433.34	0.0001	P	7.4
3	☐	5.000	-19.118	516.68	0.0002	P	16.
4	☐	10.000	-15.695	516.68	0.0002	P	11.
5	☐	100.000	74.191	696.69	0.0002	P	7.6
6	☐	200.000	215.320	1123.86	0.0004	P	46.
7	☐	1.000					

y = 8.1069E-007 * x + 1.7857E-004

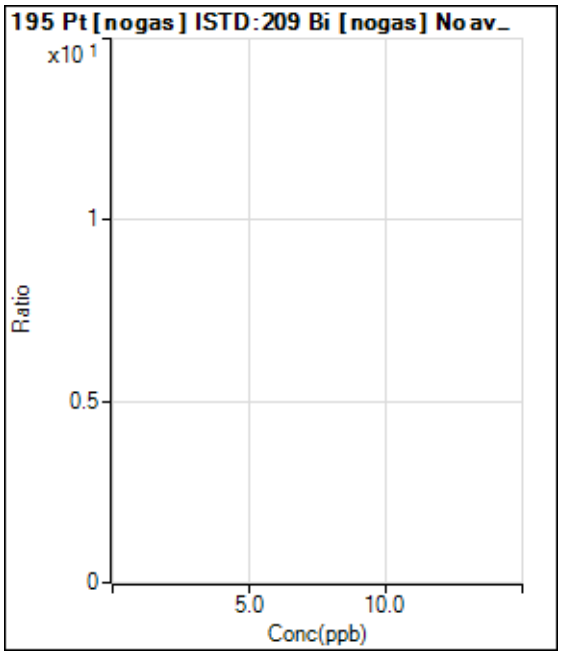
R = 0.9819

DL = 216.1

BEC = 220.3

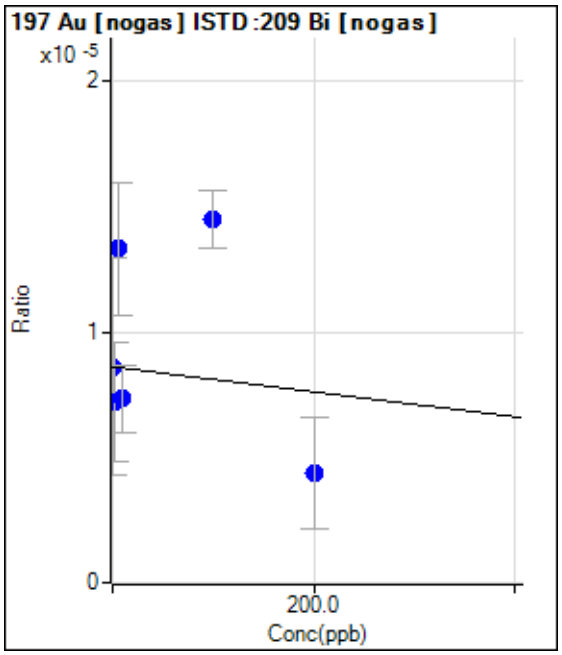
Weight: <None>

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

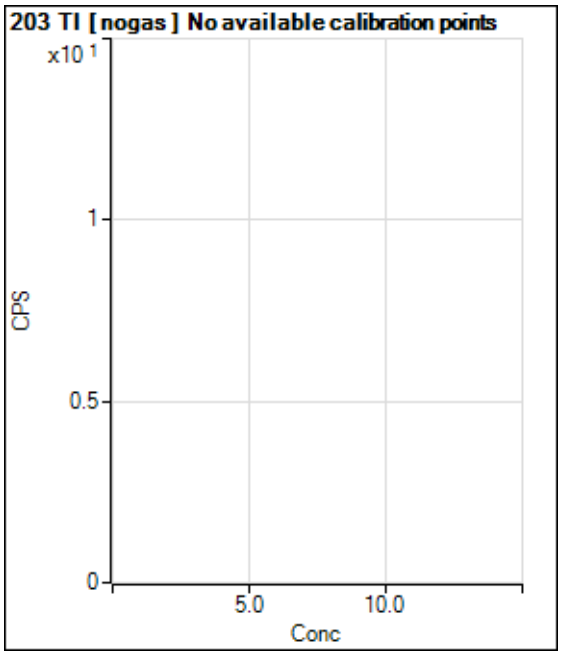
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	100
2	☐	2.000	286.194	16.67	0.0000	P	66.
3	☐	5.000	-948.969	30.00	0.0000	P	39.
4	☐	10.000	257.538	16.67	0.0000	P	36.
5	☐	100.000	-1176.891	33.33	0.0000	P	16.
6	☐	200.000	847.076	10.00	0.0000	P	101
7	☐	1.000					

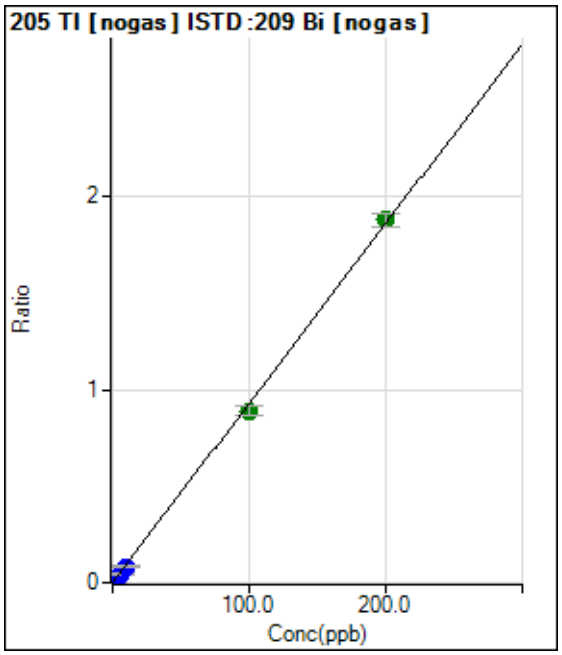
y = -4.9793E-009 * x + 8.6093E-006
R = -0.2783
DL = -5221
BEC = -1729

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			213.34		P	29.
2	☐			16331.70		P	5.6
3	☐			40684.41		P	5.7
4	☐			80267.70		P	0.2
5	☐			819156.65		P	1.2
6	☐			1844820.39		A	2.8
7	☐						

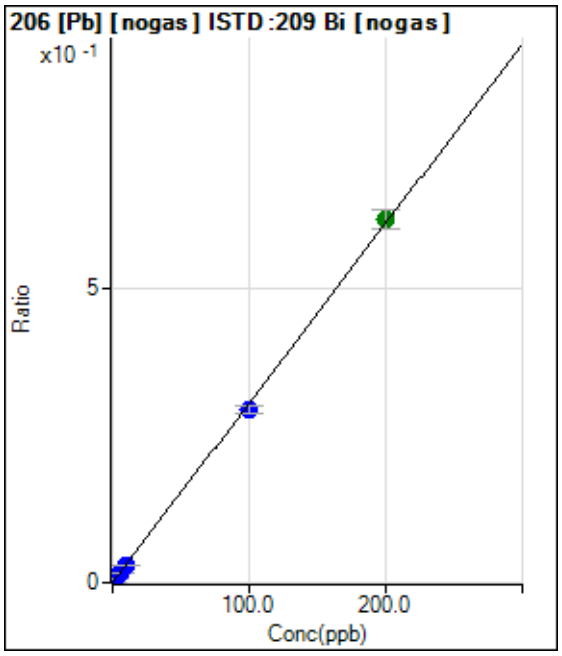
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	380.01	0.0002	P	38.
2	☐	2.000	1.830	39274.31	0.0172	P	7.1
3	☐	5.000	4.641	98185.70	0.0433	P	12.
4	☐	10.000	9.085	193554.71	0.0846	P	6.1
5	☐	100.000	95.704	2045124.29	0.8893	A	5.5
6	☐	200.000	202.204	4279644.73	1.8787	A	3.5
7	☐	1.000					

y = 0.0093 * x + 1.6261E-004
R = 0.9997
DL = 0.02021
BEC = 0.0175

Weight: <None>
Min Conc: <None>

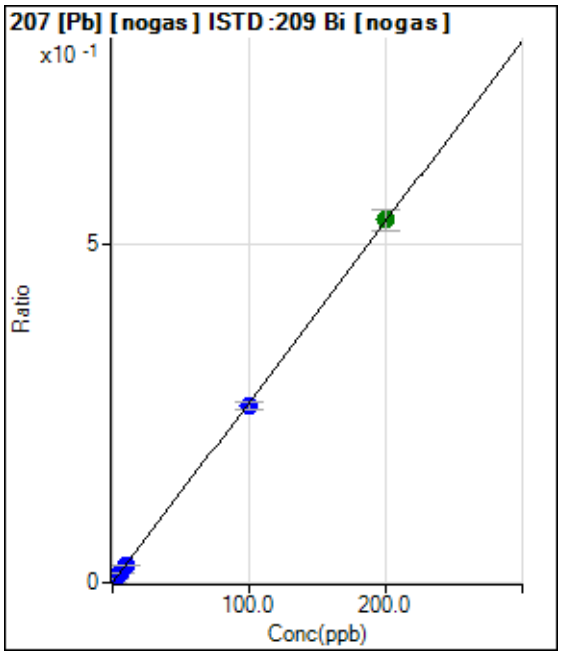


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	336.68	0.0001	P	3.5
2	☐	2.000	1.988	14209.77	0.0062	P	6.1
3	☐	5.000	5.119	35776.53	0.0158	P	10.
4	☐	10.000	9.725	68239.95	0.0298	P	5.3
5	☐	100.000	95.882	672926.50	0.2926	P	4.4
6	☐	200.000	202.070	1403975.03	0.6165	A	5.2
7	☐	1.000					

y = 0.0031 * x + 1.4405E-004
R = 0.9997
DL = 0.004993
BEC = 0.04723

Weight: <None>
Min Conc: <None>

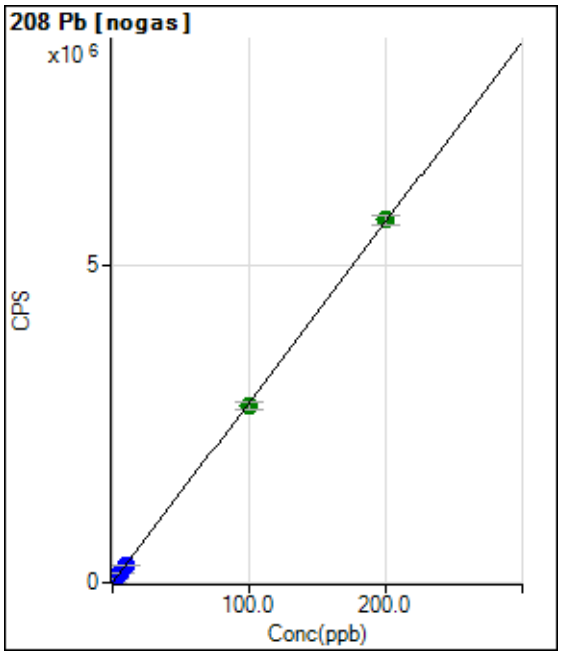
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	266.67	0.0001	P	12.
2	☐	2.000	1.941	12074.65	0.0053	P	5.6
3	☐	5.000	5.059	30829.73	0.0136	P	8.9
4	☐	10.000	9.759	59689.44	0.0261	P	3.6
5	☐	100.000	98.015	599558.95	0.2607	P	3.9
6	☐	200.000	201.004	1218131.49	0.5345	A	5.5
7	☐	1.000					

y = 0.0027 * x + 1.1419E-004
R = 0.9999
DL = 0.01632
BEC = 0.04295

Weight: <None>
Min Conc: <None>

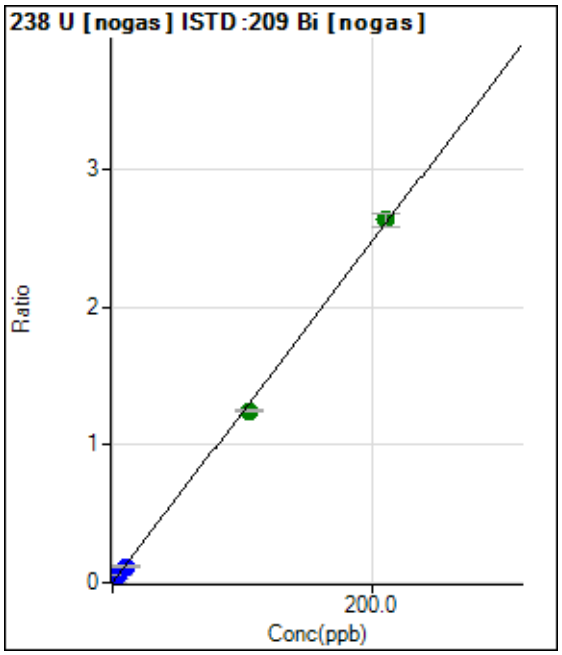


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1156.70		P	4.9
2	☐	2.000	1.929	55911.63		P	1.7
3	☐	5.000	4.909	140517.76		P	2.2
4	☐	10.000	9.642	274873.43		P	0.8
5	☐	100.000	97.879	2779809.90		A	3.6
6	☐	200.000	201.081	5709558.25		A	2.6
7	☐	1.000					

y = 28388.5398 * x + 1156.7000
R = 0.9999
DL = 0.006009
BEC = 0.04075

Weight: <None>
Min Conc: <None>

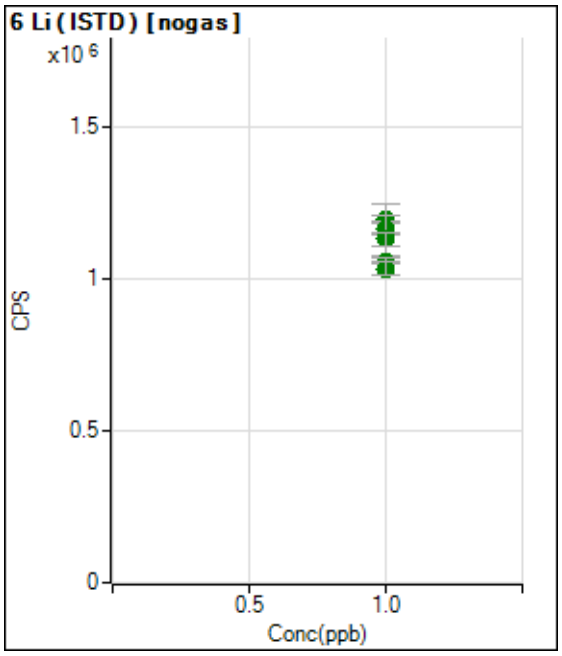
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.33	0.0000	P	33.
2	☐	2.000	1.908	54252.90	0.0237	P	4.5
3	☐	5.000	4.681	131925.35	0.0581	P	10.
4	☐	10.000	9.479	269102.50	0.1175	P	4.8
5	☐	105.000	100.536	2866775.68	1.2461	A	1.4
6	☐	210.000	212.265	5994404.08	2.6309	A	3.4
7	☐	1.000					

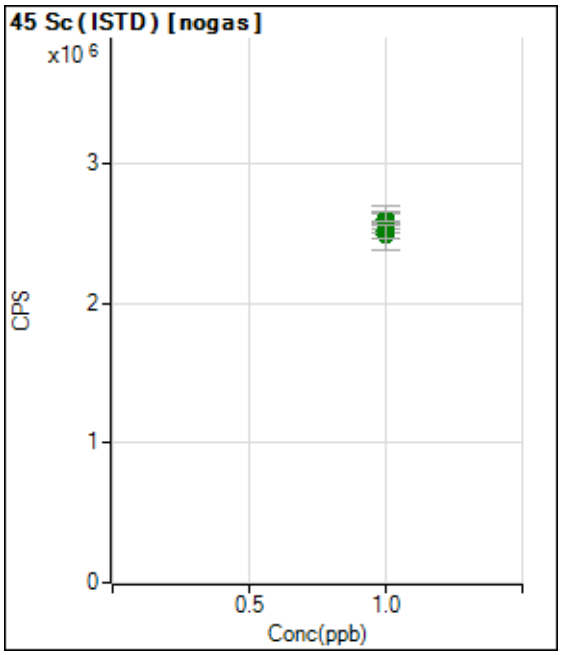
y = 0.0124 * x + 4.8561E-005
R = 0.9997
DL = 0.003965
BEC = 0.003918

Weight: <None>
Min Conc: <None>

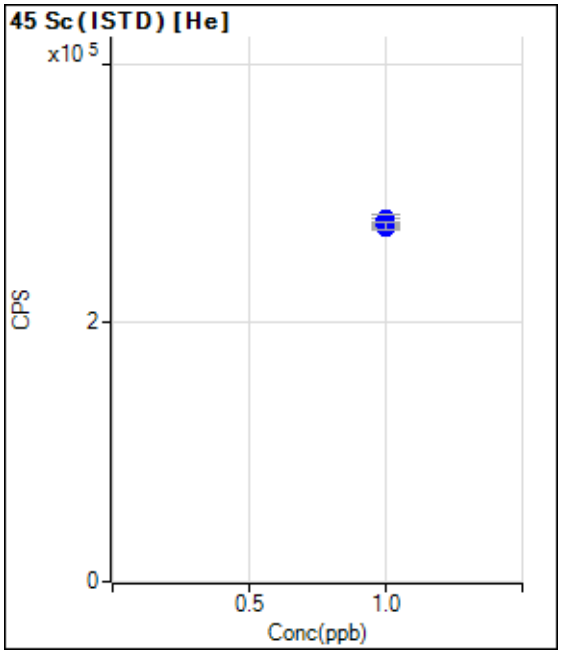


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1195275.88		A	2.0
2	☐	1.000		1168683.46		A	3.7
3	☐	1.000		1163476.39		A	14.
4	☐	1.000		1132234.16		A	3.7
5	☐	1.000		1060926.36		A	1.5
6	☐	1.000		1034178.70		A	4.0
7	☐	1.000					

Calibration for 237_ICV.d

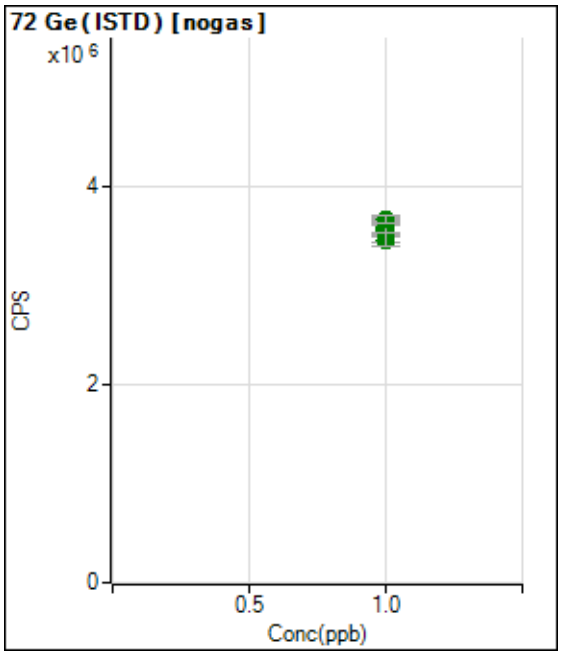


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2566071.68		A	0.7
2	☐	1.000		2589550.74		A	4.1
3	☐	1.000		2599959.86		A	7.4
4	☐	1.000		2596425.69		A	4.8
5	☐	1.000		2492914.81		A	8.3
6	☐	1.000		2517040.22		A	3.7
7	☐	1.000					

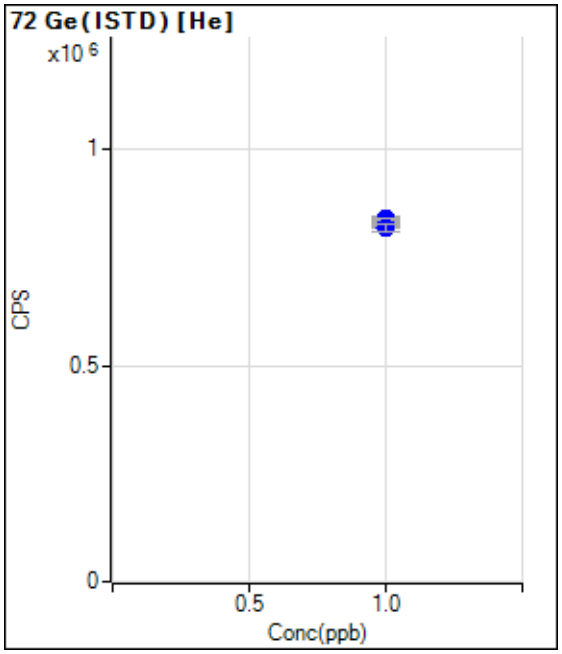


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		279368.62		P	1.3
2	☐	1.000		280028.35		P	2.6
3	☐	1.000		275242.97		P	1.8
4	☐	1.000		272484.55		P	0.7
5	☐	1.000		276038.34		P	1.1
6	☐	1.000		274476.28		P	2.6
7	☐	1.000					

Calibration for 237_ICV.d

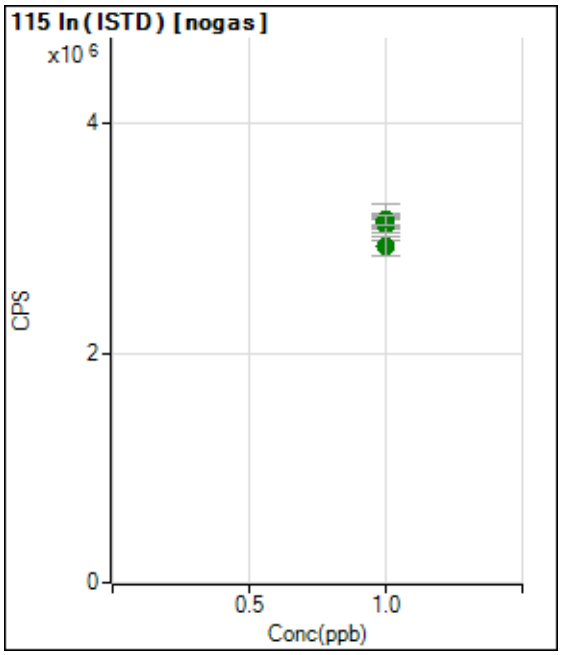


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3552236.82		A	2.9
2	☐	1.000		3581534.84		A	4.0
3	☐	1.000		3561727.86		A	6.9
4	☐	1.000		3596075.88		A	3.7
5	☐	1.000		3459543.90		A	4.0
6	☐	1.000		3664189.63		A	2.2
7	☐	1.000					

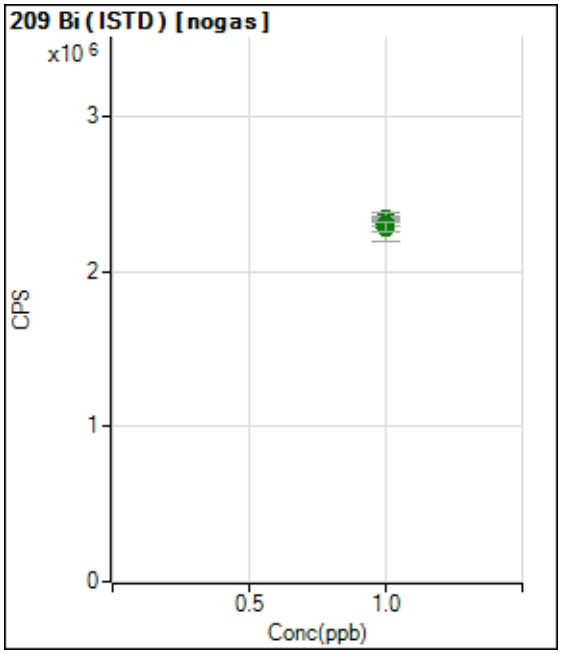


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		837497.54		P	1.0
2	☐	1.000		839654.65		P	0.9
3	☐	1.000		828863.79		P	1.3
4	☐	1.000		826445.74		P	1.7
5	☐	1.000		838051.13		P	0.7
6	☐	1.000		818977.98		P	2.3
7	☐	1.000					

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3134247.07		A	2.1
2	☐	1.000		3148097.36		A	4.4
3	☐	1.000		3134209.51		A	10.
4	☐	1.000		3115479.65		A	4.6
5	☐	1.000		2926930.47		A	5.9
6	☐	1.000		3158107.90		A	2.9
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2336630.64		A	1.1
2	☐	1.000		2292528.61		A	3.8
3	☐	1.000		2284348.25		A	8.3
4	☐	1.000		2292360.33		A	3.7
5	☐	1.000		2300731.79		A	1.3
6	☐	1.000		2279274.91		A	2.7
7	☐	1.000					

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	013CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:33:27-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	57	35.96
Na	23	1	nogas	417457	0.00
Mg	24	1	nogas	5902	0.09
Al	27	1	nogas	27888	0.01
K	39	1	nogas	7950834	0.00
Ti	47	1	nogas	293	1.78
V	51	1	nogas	2231667	0.00
Cr	52	1	nogas	123314	0.00
Mn	55	1	nogas	30719	0.00
Co	59	1	nogas	1063	0.97
Ni	60	1	nogas	450	1.31
Cu	63	1	nogas	2390	0.17
Zn	66	1	nogas	417	4.36
As	75	1	nogas	242661	0.00
Sr	88	1	nogas	810	0.40
Ag	107	1	nogas	313	6.14
Cd	111	1	nogas	17	207.85
Sb	121	1	nogas	220	2.07
Tl	205	1	nogas	950	2.93
Pb	208	1	nogas	5600	0.06
[Pb]	206	1	nogas	1443	0.32
[Pb]	207	1	nogas	1287	0.69
Na	23	2	He	54679	0.00
Mg	24	2	He	453	3.93
Al	27	2	He	643	1.33
K	39	2	He	191803	0.00
Ca	43	2	He	37	42.94
Ca	44	2	He	3250	0.24
V	51	2	He	27334	0.00
Cr	52	2	He	5294	0.09
Mn	55	2	He	2524	0.34
Fe	56	2	He	12284	0.04
Co	59	2	He	397	2.94
Ni	60	2	He	133	18.08
Cu	63	2	He	933	0.29
Zn	66	2	He	150	4.44
As	75	2	He	812	0.76
Se	78	2	He	142	6.50
B	11	1	nogas	30501	0.00
Si	28	1	nogas	1941965	0.00
Ca	43	1	nogas	1387	0.17
Ca	44	1	nogas	427470	0.00

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	3039832	0.00
Se	77	1	nogas	77722	0.00
Se	82	1	nogas	240	13.78
Mo	95	1	nogas	2347	0.31
Sn	118	1	nogas	900	2.16
Ba	137	1	nogas	50	120.00
Sb	121	2	He	93	35.07
Li	7	1	nogas	111278	0.00
P	31	1	nogas	81130	0.00
La	139	1	nogas	47	70.14

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	6	1	nogas	1359891	4.87
Ge	72	1	nogas	3145209	1.18
In	115	1	nogas	2761164	3.66
Bi	209	1	nogas	2190177	1.88
Ge	72	2	He	785020	1.85

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	014CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:35:28-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	15760	0.02
Na	23	1	nogas	5379648	0.00
Mg	24	1	nogas	3271575	0.00
Al	27	1	nogas	67748	0.01
K	39	1	nogas	11954392	0.00
Ti	47	1	nogas	3840	0.11
V	51	1	nogas	2409766	0.00
Cr	52	1	nogas	169204	0.00
Mn	55	1	nogas	78209	0.00
Co	59	1	nogas	46295	0.00
Ni	60	1	nogas	10797	0.03
Cu	63	1	nogas	25732	0.01
Zn	66	1	nogas	8425	0.04
As	75	1	nogas	271445	0.00
Sr	88	1	nogas	53470	0.01
Ag	107	1	nogas	27058	0.01
Cd	111	1	nogas	5661	0.11
Sb	121	1	nogas	23726	0.01
Tl	205	1	nogas	36979	0.01
Pb	208	1	nogas	55658	0.00
[Pb]	206	1	nogas	13960	0.01
[Pb]	207	1	nogas	12171	0.02
Na	23	2	He	360618	0.00
Mg	24	2	He	169302	0.00
Al	27	2	He	1767	0.53
K	39	2	He	370065	0.00
Ca	43	2	He	510	3.15
Ca	44	2	He	11457	0.02
V	51	2	He	40946	0.00
Cr	52	2	He	17759	0.00
Mn	55	2	He	10697	0.04
Fe	56	2	He	1104283	0.00
Co	59	2	He	17575	0.03
Ni	60	2	He	4481	0.17
Cu	63	2	He	11984	0.03
Zn	66	2	He	2677	0.17
As	75	2	He	3525	0.14
Se	78	2	He	340	3.06
B	11	1	nogas	75501	0.00
Si	28	1	nogas	2979670	0.00

Calibration Standard Report

Ca	43	1	nogas	8302	0.07
Ca	44	1	nogas	521914	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	7507901	0.00
Se	77	1	nogas	84207	0.00
Se	82	1	nogas	690	3.18
Mo	95	1	nogas	12691	0.01
Sn	118	1	nogas	14713	0.03
Ba	137	1	nogas	7428	0.01
Sb	121	2	He	8886	0.03
P	31	1	nogas	82335	0.00
La	139	1	nogas	37	154.83

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1344971	6.02	1359891	98.90	70	125	
Ge	72	1	nogas	3213341	0.87	3145209	102.17	70	125	
In	115	1	nogas	2864141	4.82	2761164	103.73	70	125	
Bi	209	1	nogas	2096933	1.01	2190177	95.74	70	125	
Ge	72	2	He	800122	1.86	785020	101.92	70	125	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	015CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:37:27-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	38125	0.01
Na	23	1	nogas	12786651	0.00
Mg	24	1	nogas	7926348	0.00
Al	27	1	nogas	146244	0.00
K	39	1	nogas	17719817	0.00
Ti	47	1	nogas	8542	0.04
V	51	1	nogas	2567511	0.00
Cr	52	1	nogas	240004	0.00
Mn	55	1	nogas	162684	0.00
Co	59	1	nogas	112057	0.00
Ni	60	1	nogas	26109	0.01
Cu	63	1	nogas	62089	0.00
Zn	66	1	nogas	21159	0.02
As	75	1	nogas	297594	0.00
Sr	88	1	nogas	129199	0.00
Ag	107	1	nogas	64140	0.00
Cd	111	1	nogas	13619	0.02
Sb	121	1	nogas	59291	0.00
Tl	205	1	nogas	90890	0.00
Pb	208	1	nogas	128327	0.00
[Pb]	206	1	nogas	31471	0.01
[Pb]	207	1	nogas	28181	0.00
Na	23	2	He	816356	0.00
Mg	24	2	He	421391	0.00
Al	27	2	He	3350	0.27
K	39	2	He	627525	0.00
Ca	43	2	He	1203	1.16
Ca	44	2	He	24113	0.02
V	51	2	He	58867	0.00
Cr	52	2	He	37014	0.01
Mn	55	2	He	25187	0.01
Fe	56	2	He	2763312	0.00
Co	59	2	He	43214	0.00
Ni	60	2	He	10997	0.05
Cu	63	2	He	28603	0.01
Zn	66	2	He	6991	0.02
As	75	2	He	7310	0.02
Se	78	2	He	623	1.62
B	11	1	nogas	141991	0.00
Si	28	1	nogas	4555457	0.00

Calibration Standard Report

Ca	43	1	nogas	18640	0.01
Ca	44	1	nogas	681187	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	14164128	0.00
Se	77	1	nogas	88340	0.00
Se	82	1	nogas	1353	0.55
Mo	95	1	nogas	28617	0.01
Sn	118	1	nogas	35383	0.01
Ba	137	1	nogas	19078	0.02
Sb	121	2	He	22201	0.00
P	31	1	nogas	122879	0.00
La	139	1	nogas	133	22.73

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1379508	5.03	1359891	101.44	70	125	
Ge	72	1	nogas	3154458	0.48	3145209	100.29	70	125	
In	115	1	nogas	2819103	1.99	2761164	102.10	70	125	
Bi	209	1	nogas	2078205	4.29	2190177	94.89	70	125	
Ge	72	2	He	770398	2.31	785020	98.14	70	125	

Calibration Standard Report

Sample Table

Sample Name	10/50/1000
Data File Name	016CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:39:27-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	76314	0.00
Na	23	1	nogas	24675953	0.00
Mg	24	1	nogas	15657513	0.00
Al	27	1	nogas	238008	0.00
K	39	1	nogas	27236219	0.00
Ti	47	1	nogas	17422	0.01
V	51	1	nogas	2722696	0.00
Cr	52	1	nogas	345311	0.00
Mn	55	1	nogas	291039	0.00
Co	59	1	nogas	219440	0.00
Ni	60	1	nogas	50316	0.01
Cu	63	1	nogas	119632	0.00
Zn	66	1	nogas	39713	0.00
As	75	1	nogas	326589	0.00
Sr	88	1	nogas	253599	0.00
Ag	107	1	nogas	127993	0.00
Cd	111	1	nogas	27168	0.01
Sb	121	1	nogas	119295	0.00
Tl	205	1	nogas	177387	0.00
Pb	208	1	nogas	248511	0.00
[Pb]	206	1	nogas	61835	0.00
[Pb]	207	1	nogas	54920	0.01
Na	23	2	He	1592790	0.00
Mg	24	2	He	816216	0.00
Al	27	2	He	5758	0.13
K	39	2	He	1058041	0.00
Ca	43	2	He	2364	0.15
Ca	44	2	He	42709	0.01
V	51	2	He	86589	0.00
Cr	52	2	He	67102	0.00
Mn	55	2	He	48354	0.00
Fe	56	2	He	5485165	0.00
Co	59	2	He	84932	0.00
Ni	60	2	He	21439	0.01
Cu	63	2	He	53572	0.00
Zn	66	2	He	13001	0.03
As	75	2	He	13302	0.02
Se	78	2	He	1120	0.12
B	11	1	nogas	259170	0.00
Si	28	1	nogas	7109444	0.00

Calibration Standard Report

Ca	43	1	nogas	35377	0.01
Ca	44	1	nogas	938665	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	24575026	0.00
Se	77	1	nogas	92788	0.00
Se	82	1	nogas	2757	0.05
Mo	95	1	nogas	54099	0.01
Sn	118	1	nogas	70961	0.00
Ba	137	1	nogas	37117	0.01
Sb	121	2	He	44554	0.01
P	31	1	nogas	166448	0.00
La	139	1	nogas	120	13.89

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1345500	2.35	1359891	98.94	70	125	
Ge	72	1	nogas	3156957	1.79	3145209	100.37	70	125	
In	115	1	nogas	2761827	3.07	2761164	100.02	70	125	
Bi	209	1	nogas	2075764	0.81	2190177	94.78	70	125	
Ge	72	2	He	771369	2.21	785020	98.26	70	125	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	017CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:41:25-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	796336	0.00
Na	23	1	nogas	242452630	0.00
Mg	24	1	nogas	154983028	0.00
Al	27	1	nogas	1956520	0.00
K	39	1	nogas	197795388	0.00
Ti	47	1	nogas	169281	0.00
V	51	1	nogas	4705399	0.00
Cr	52	1	nogas	2257468	0.00
Mn	55	1	nogas	2632426	0.00
Co	59	1	nogas	2207039	0.00
Ni	60	1	nogas	489051	0.00
Cu	63	1	nogas	1151187	0.00
Zn	66	1	nogas	379268	0.00
As	75	1	nogas	749783	0.00
Sr	88	1	nogas	2563409	0.00
Ag	107	1	nogas	1297880	0.00
Cd	111	1	nogas	273999	0.00
Sb	121	1	nogas	1141842	0.00
Tl	205	1	nogas	1871199	0.00
Pb	208	1	nogas	2517964	0.00
[Pb]	206	1	nogas	612634	0.00
[Pb]	207	1	nogas	541908	0.00
Na	23	2	He	15131846	0.00
Mg	24	2	He	8087589	0.00
Al	27	2	He	48475	0.00
K	39	2	He	8772076	0.00
Ca	43	2	He	23949	0.02
Ca	44	2	He	395861	0.00
V	51	2	He	590836	0.00
Cr	52	2	He	626074	0.00
Mn	55	2	He	447094	0.00
Fe	56	2	He	53558118	0.00
Co	59	2	He	819858	0.00
Ni	60	2	He	208204	0.00
Cu	63	2	He	521095	0.00
Zn	66	2	He	127289	0.00
As	75	2	He	127952	0.00
Se	78	2	He	10318	0.02
B	11	1	nogas	2379058	0.00
Si	28	1	nogas	53576003	0.00

Calibration Standard Report

Ca	43	1	nogas	337419	0.00
Ca	44	1	nogas	5961691	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	220141372	0.00
Se	77	1	nogas	106429	0.00
Se	82	1	nogas	25131	0.00
Mo	95	1	nogas	526516	0.00
Sn	118	1	nogas	700596	0.00
Ba	137	1	nogas	377867	0.00
Sb	121	2	He	433079	0.00
P	31	1	nogas	861074	0.00
La	139	1	nogas	540	2.14

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1246084	3.43	1359891	91.63	70	125	
Ge	72	1	nogas	3121481	0.75	3145209	99.25	70	125	
In	115	1	nogas	2781244	1.71	2761164	100.73	70	125	
Bi	209	1	nogas	2060333	1.98	2190177	94.07	70	125	
Ge	72	2	He	750724	2.40	785020	95.63	70	125	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	018CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:43:24-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	1661599	0.00
Na	23	1	nogas	494803094	0.00
Mg	24	1	nogas	311533324	0.00
Al	27	1	nogas	3801722	0.00
K	39	1	nogas	388084200	0.00
Ti	47	1	nogas	339934	0.00
V	51	1	nogas	6578225	0.00
Cr	52	1	nogas	4253262	0.00
Mn	55	1	nogas	5075225	0.00
Co	59	1	nogas	4388040	0.00
Ni	60	1	nogas	969722	0.00
Cu	63	1	nogas	2346112	0.00
Zn	66	1	nogas	767982	0.00
As	75	1	nogas	1172252	0.00
Sr	88	1	nogas	5250985	0.00
Ag	107	1	nogas	2548997	0.00
Cd	111	1	nogas	551808	0.00
Sb	121	1	nogas	2449177	0.00
Tl	205	1	nogas	3729505	0.00
Pb	208	1	nogas	5176180	0.00
[Pb]	206	1	nogas	1276227	0.00
[Pb]	207	1	nogas	1103715	0.00
Na	23	2	He	29835738	0.00
Mg	24	2	He	16222332	0.00
Al	27	2	He	96019	0.00
K	39	2	He	17588618	0.00
Ca	43	2	He	47213	0.01
Ca	44	2	He	798401	0.00
V	51	2	He	1169325	0.00
Cr	52	2	He	1244110	0.00
Mn	55	2	He	883838	0.00
Fe	56	2	He	107380422	0.00
Co	59	2	He	1696001	0.00
Ni	60	2	He	415856	0.00
Cu	63	2	He	1063553	0.00
Zn	66	2	He	261125	0.00
As	75	2	He	257380	0.00
Se	78	2	He	20842	0.00
B	11	1	nogas	4863368	0.00
Si	28	1	nogas	107207228	0.00

Calibration Standard Report

Ca	43	1	nogas	694444	0.00
Ca	44	1	nogas	11581260	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	437250960	0.00
Se	77	1	nogas	110539	0.00
Se	82	1	nogas	51393	0.01
Mo	95	1	nogas	1060405	0.00
Sn	118	1	nogas	1444717	0.00
Ba	137	1	nogas	749344	0.00
Sb	121	2	He	895150	0.00
P	31	1	nogas	1677933	0.00
La	139	1	nogas	697	0.97

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1131774	0.15	1359891	83.23	70	125	
Ge	72	1	nogas	3050027	2.04	3145209	96.97	70	125	
In	115	1	nogas	2642790	2.60	2761164	95.71	70	125	
Bi	209	1	nogas	1989047	3.85	2190177	90.82	70	125	
Ge	72	2	He	742606	0.91	785020	94.60	70	125	

Sample Report

Sample Table

Sample Name	LLICV2
Data File Name	021SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:49:21-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.709	1.709	0.77	16974	0.01	2000	
Na	23	1	nogas	212.815	212.815	2.06	5737076	0.00	200000	
Mg	24	1	nogas	217.117	217.117	3.32	3435474	0.01	200000	
Al	27	1	nogas	2.163	2.163	4.03	70217	0.00	2000	
K	39	1	nogas	212.202	212.202	1.03	12132281	0.00	200000	
Ti	47	1	nogas	2.136	2.136	6.14	4027	0.05	2000	
V	51	1	nogas	-22.939	-22.939	-6.95	1702410	0.00	2000	
Cr	52	1	nogas	1.180	1.180	4.92	148996	0.00	2000	
Mn	55	1	nogas	1.900	1.900	3.88	80502	0.00	2000	
Co	59	1	nogas	2.113	2.113	2.34	48858	0.00	2000	
Ni	60	1	nogas	2.341	2.341	2.84	11570	0.02	2000	
Cu	63	1	nogas	2.050	2.050	5.25	27044	0.01	2000	
Zn	66	1	nogas	2.332	2.332	2.35	8435	0.03	2000	
As	75	1	nogas	-8.548	-8.548	-19.04	224000	0.00	2000	
Sr	88	1	nogas	2.044	2.044	2.28	55807	0.00	2000	
Ag	107	1	nogas	2.039	2.039	5.42	27171	0.01	2000	
Cd	111	1	nogas	1.991	1.991	1.97	5764	0.03	2000	
Sb	121	1	nogas	2.412	2.412	3.30	30236	0.01	2000	
Tl	205	1	nogas	2.311	2.311	5.73	46584	0.00	2000	
Pb	208	1	nogas	2.090	2.090	2.21	59317	0.00	2000	
U	238	1	nogas	2.108	2.108	2.47	55825	0.00	2000	
[Pb]	206	1	nogas	2.000	2.000	2.90	14784	0.01	2000	
[Pb]	207	1	nogas	1.990	1.990	2.18	12809	0.02	2000	
Na	23	2	He	203.646	203.646	2.15	364998	0.06	200000	
Mg	24	2	He	210.488	210.488	2.36	175457	0.12	200000	
Al	27	2	He	2.046	2.046	16.52	1713	0.12	2000	
K	39	2	He	201.924	201.924	0.63	366968	0.06	200000	
Ca	43	2	He	199.726	199.726	1.90	520	38.41	200000	
Ca	44	2	He	188.018	188.018	5.48	10807	1.74	200000	
V	51	2	He	0.962	0.962	5.49	31838	0.00	2000	
Cr	52	2	He	1.873	1.873	1.97	17058	0.01	2000	
Mn	55	2	He	1.886	1.886	1.80	10997	0.02	2000	
Fe	56	2	He	201.929	201.929	1.72	1123251	0.02	200000	
Co	59	2	He	1.980	1.980	4.47	17485	0.01	2000	
Ni	60	2	He	2.226	2.226	2.51	4621	0.05	2000	
Cu	63	2	He	2.495	2.495	0.24	12271	0.02	2000	
Zn	66	2	He	2.589	2.589	2.65	2944	0.09	2000	
As	75	2	He	2.038	2.038	1.69	3468	0.06	2000	
Se	78	2	He	2.568	2.568	11.00	343	0.75	2000	
B	11	1	nogas	17.275	17.275	9.31	130770	0.01	2000	
Si	28	1	nogas	87.540	87.540	2.96	2894276	0.00	2000	
Ca	43	1	nogas	195.960	195.960	6.85	8342	2.35	200000	
Ca	44	1	nogas	77.831	77.831	2.17	473544	0.02	200000	
Fe	56	1	nogas	179.878	179.878	5.86	7073659	0.00	200000	
Se	77	1	nogas	-45.564	-45.564	-21.51	68462	-0.07	2000	
Se	82	1	nogas	2.031	2.031	16.98	773	0.26	2000	

Sample Report

Mo	95	1	nogas	2.236	2.236	8.08	14519	0.02	2000	
Sn	118	1	nogas	2.173	2.173	4.14	17239	0.01	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	2.000	2.000	0.72	7909	0.03	2000	
Sb	121	2	He	2.461	2.461	3.19	11314	0.02	2000	
La	139	1	nogas	-5.469	-5.469	-76.91	27	-20.51	2000	
Au	197	1	nogas	-178.475	-178.475	-213.63	17	-1070.85	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1384555	2.53	1359891	101.81	70	125	
Ge	72	1	nogas	3155369	0.15	3145209	100.32	70	125	
In	115	1	nogas	2795560	2.50	2761164	101.25	70	125	
Bi	209	1	nogas	2118182	2.58	2190177	96.71	70	125	
Ge	72	2	He	763289	0.78	785020	97.23	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLICV5
Data File Name	022LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:51:21-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.174	5.114	39164	1.77	5	83.5	70	130	
Na	23	1	nogas	502.599	3.335	12874329	1.41	500	100.5	70	130	
Mg	24	1	nogas	515.793	5.643	8083463	2.35	500	103.2	70	130	
Al	27	1	nogas	5.858	0.840	142554	0.64	5	117.2	70	130	
K	39	1	nogas	486.190	1.901	17519631	1.39	500	97.2	70	130	
Ti	47	1	nogas	4.747	1.098	8602	1.54	5	94.9	70	130	
V	51	1	nogas	-10.788	-16.663	1989136	2.11	5	-215.8	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	4.480	1.108	219990	0.61	5	89.6	70	130	
Mn	55	1	nogas	5.069	0.947	163563	1.05	5	101.4	70	130	
Co	59	1	nogas	4.844	1.674	110777	2.13	5	96.9	70	130	
Ni	60	1	nogas	5.184	2.566	25828	3.06	5	103.7	70	130	
Cu	63	1	nogas	4.849	0.870	60778	0.97	5	97.0	70	130	
Zn	66	1	nogas	5.494	0.955	20952	1.45	5	109.9	70	130	
As	75	1	nogas	-0.852	-109.424	261150	2.05	5	-17.0	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	4.723	1.482	128075	1.93	5	94.5	70	130	
Ag	107	1	nogas	4.897	0.505	64906	0.69	5	97.9	70	130	
Cd	111	1	nogas	4.969	1.811	14096	4.13	5	99.4	70	130	
Sb	121	1	nogas	5.157	1.099	64489	1.36	5	103.1	70	130	
Tl	205	1	nogas	4.422	6.055	89677	4.69	5	88.4	70	130	
Pb	208	1	nogas	4.828	1.428	129689	1.37	5	96.6	70	130	
U	238	1	nogas	4.681	0.969	125966	0.61	5	93.6	70	130	
[Pb]	206	1	nogas	4.476	3.061	31892	1.50	5	89.5	70	130	
[Pb]	207	1	nogas	4.612	4.941	28515	3.35	5	92.2	70	130	
Na	23	2	He	500.362	1.325	813261	0.86	500	100.1	70	130	
Mg	24	2	He	510.748	3.130	421959	2.75	500	102.1	70	130	
Al	27	2	He	5.806	5.547	3527	4.54	5	116.1	70	130	
K	39	2	He	490.951	1.710	617693	1.18	500	98.2	70	130	
Ca	43	2	He	526.842	8.206	1303	7.68	500	105.4	70	130	
Ca	44	2	He	494.135	3.933	23088	3.07	500	98.8	70	130	
V	51	2	He	4.347	0.999	51267	0.45	5	86.9	70	130	
Cr	52	2	He	5.155	1.199	37638	0.96	5	103.1	70	130	
Mn	55	2	He	5.082	4.065	25281	3.51	5	101.6	70	130	
Fe	56	2	He	508.044	0.726	2787234	0.98	500	101.6	70	130	
Co	59	2	He	4.962	4.127	42924	3.81	5	99.2	70	130	
Ni	60	2	He	5.463	1.332	11444	1.58	5	109.3	70	130	
Cu	63	2	He	5.589	1.492	28886	1.86	5	111.8	70	130	
Zn	66	2	He	5.922	2.434	7342	2.95	5	118.4	70	130	
As	75	2	He	4.836	1.427	7090	0.90	5	96.7	70	130	
Se	78	2	He	5.116	3.340	609	2.67	5	102.3	70	130	
B	11	1	nogas	26.535	2.752	174722	1.55	25	106.1	70	130	
Si	28	1	nogas	233.175	0.868	4473684	0.37	25	932.7	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	486.797	1.493	18683	1.71	500	97.4	70	130	
Ca	44	1	nogas	338.868	1.385	624135	0.15	500	67.8	70	130	LLICV Main CR1 Failed
Fe	56	1	nogas	469.057	1.663	13558763	1.53	500	93.8	70	130	
Se	77	1	nogas	-10.436	-122.028	75898	3.96	5	-208.7	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	5.040	13.068	1563	10.82	5	100.8	70	130	
Mo	95	1	nogas	4.898	0.911	29034	0.93	5	98.0	70	130	
Sn	118	1	nogas	4.733	5.029	35784	1.66	5	94.7	70	130	
Ba	137	1	nogas	4.889	4.426	18891	1.38	5	97.8	70	130	
Sb	121	2	He	5.369	2.593	24394	2.74	5	107.4	70	130	
Li	7	1	nogas	4.454	6.655	197703	0.37	5	89.1	70	130	
P	31	1	nogas	25.940	2.751	124087	0.54	25	103.8	70	130	
La	139	1	nogas	10.918	64.626	87	29.04	5	218.4	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	717.052	283.933	30	100.00	5	14341.0	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1312445	3.32	1359891	96.51	70	125	
Ge	72	1	nogas	3159412	0.48	3145209	100.45	70	125	
In	115	1	nogas	2744168	3.20	2761164	99.38	70	125	
Bi	209	1	nogas	2154629	1.46	2190177	98.38	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	757610	0.38	785020	96.51	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICB
Data File Name	023_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:53:21-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.022	7.4	253	4.6	1	
Na	23	1	nogas	2.816	3.2	475313	3.4	100	
Mg	24	1	nogas	2.476	5.1	43758	5.8	100	
Al	27	1	nogas	0.947	2.0	45147	0.7	5	
K	39	1	nogas	6.201	106.6	7865893	0.7	100	
Ti	47	1	nogas	0.053	11.9	377	3.1	2.5	
V	51	1	nogas	-7.345	-13.6	2007772	1.1	2.5	
Cr	52	1	nogas	-0.092	-130.4	118247	2.7	2.5	
Mn	55	1	nogas	0.041	42.4	30973	0.7	2.5	
Co	59	1	nogas	0.021	17.9	1490	6.5	2.5	
Ni	60	1	nogas	0.194	9.2	803	11.8	2.5	
Cu	63	1	nogas	0.019	25.2	2547	1.9	1	
Zn	66	1	nogas	0.438	5.7	927	10.6	2.5	
As	75	1	nogas	-4.560	-15.8	236122	2.2	2.5	
Sr	88	1	nogas	0.039	4.5	1803	2.3	2.5	
Ag	107	1	nogas	0.027	14.2	653	7.2	2.5	
Cd	111	1	nogas	0.024	47.8	80	37.5	1	
Sb	121	1	nogas	0.275	2.6	3544	1.3	2.5	
Tl	205	1	nogas	0.065	37.0	2127	18.6	1	
Pb	208	1	nogas	-0.018	-52.6	5127	4.9	2.5	
U	238	1	nogas	0.028	19.8	787	16.9	2.5	
[Pb]	206	1	nogas	0.001	2718.3	1363	8.5	2.5	
[Pb]	207	1	nogas	-0.028	-72.3	1053	6.7	2.5	
Na	23	2	He	2.852	33.1	56674	1.8	100	
Mg	24	2	He	2.219	2.9	2254	5.1	100	
Al	27	2	He	0.954	52.0	1157	17.5	5	
K	39	2	He	-4.431	-46.2	187959	0.9	100	
Ca	43	2	He	7.639	84.5	53	28.6	100	
Ca	44	2	He	-1.300	-80.5	3060	4.1	100	
V	51	2	He	-0.218	-65.3	24546	1.5	2.5	
Cr	52	2	He	0.023	12.7	5221	3.7	2.5	
Mn	55	2	He	0.068	15.0	2724	1.8	2.5	
Fe	56	2	He	2.075	5.1	23031	4.8	100	
Co	59	2	He	0.001	603.8	390	16.0	2.5	
Ni	60	2	He	0.169	26.4	227	40.0	2.5	
Cu	63	2	He	0.424	6.1	990	17.5	1	
Zn	66	2	He	0.625	5.8	317	16.2	2.5	
As	75	2	He	0.028	86.7	814	2.1	2.5	
Se	78	2	He	0.623	17.4	135	11.3	1	
B	11	1	nogas	4.387	20.4	52104	1.7	10	
Si	28	1	nogas	-5.570	-118.8	1833433	2.4	5	
Ca	43	1	nogas	4.686	33.2	1513	4.4	100	
Ca	44	1	nogas	-136.192	-5.0	340644	0.3	100	
Fe	56	1	nogas	-15.384	-14.5	2628266	0.7	100	
Se	77	1	nogas	2.132	10.8	76169	1.4	2.5	
Se	82	1	nogas	0.272	66.4	303	13.7	1	

Initial Calibration Blank (ICB) Report

Mo	95	1	nogas	-0.020	-202.1	2180	8.4	2.5	
Sn	118	1	nogas	0.051	35.8	1213	8.1	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.043	36.5	207	28.4	2.5	
Sb	121	2	He	0.265	14.9	1277	12.5	2.5	
P	31	1	nogas	0.916	129.3	80524	2.4	10	
La	139	1	nogas	9.998	73.9	80	33.1	2.5	ICB Main CR1 Failed
Au	197	1	nogas	554.422	198.1	27	57.3	2.5	ICB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1284061	7.78	1359891	94.42	70	125	
Ge	72	1	nogas	3065001	1.44	3145209	97.45	70	125	
In	115	1	nogas	2622503	2.58	2761164	94.98	70	125	
Bi	209	1	nogas	2067529	4.45	2190177	94.40	70	125	
Ge	72	2	He	752035	3.44	785020	95.80	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICV
Data File Name	025_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T12:13:20-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	86.278	7.101	788269	0.87	100	86.3	90	110	ICV Main CR1 Failed
Na	23	1	nogas	9835.947	3.389	247382022	5.53	10000	98.4	90	110	
Mg	24	1	nogas	9774.600	2.568	155052749	2.65	10000	97.7	90	110	
Al	27	1	nogas	99.512	2.704	1946605	3.69	100	99.5	90	110	
K	39	1	nogas	9915.206	4.341	199452296	1.52	10000	99.2	90	110	
Ti	47	1	nogas	98.680	2.638	170521	0.48	100	98.7	90	110	
V	51	1	nogas	109.991	5.857	4748856	1.02	100	110.0	90	110	
Cr	52	1	nogas	102.420	5.132	2287925	2.73	100	102.4	90	110	
Mn	55	1	nogas	103.177	4.151	2692605	2.03	100	103.2	90	110	
Co	59	1	nogas	99.431	2.905	2221032	0.32	100	99.4	90	110	
Ni	60	1	nogas	97.326	2.563	480569	0.31	100	97.3	90	110	
Cu	63	1	nogas	95.347	1.804	1134262	1.33	100	95.3	90	110	
Zn	66	1	nogas	98.877	1.385	384862	1.91	100	98.9	90	110	
As	75	1	nogas	104.155	3.535	753131	0.64	100	104.2	90	110	
Sr	88	1	nogas	98.158	1.102	2608702	2.01	100	98.2	90	110	
Ag	107	1	nogas	97.958	2.606	1274157	1.81	100	98.0	90	110	
Cd	111	1	nogas	96.514	1.365	270878	0.99	100	96.5	90	110	
Sb	121	1	nogas	92.612	2.792	1138283	2.68	100	92.6	90	110	
Tl	205	1	nogas	95.528	3.474	1857320	2.88	100	95.5	90	110	
Pb	208	1	nogas	98.619	1.214	2540456	1.21	100	98.6	90	110	
U	238	1	nogas	100.972	1.695	2628695	1.84	100	101.0	90	110	
[Pb]	206	1	nogas	92.352	3.212	610013	3.04	100	92.4	90	110	
[Pb]	207	1	nogas	94.744	3.567	543016	0.91	100	94.7	90	110	
Na	23	2	He	10051.013	1.491	15112106	0.53	10000	100.5	90	110	
Mg	24	2	He	10214.835	3.764	8310797	2.82	10000	102.1	90	110	
Al	27	2	He	99.157	1.120	48165	1.13	100	99.2	90	110	
K	39	2	He	9937.260	0.822	8812172	0.80	10000	99.4	90	110	
Ca	43	2	He	9668.727	3.205	22984	3.62	10000	96.7	90	110	
Ca	44	2	He	9774.487	0.757	392242	0.67	10000	97.7	90	110	
V	51	2	He	99.204	1.198	593851	0.87	100	99.2	90	110	
Cr	52	2	He	98.054	0.491	615025	0.71	100	98.1	90	110	
Mn	55	2	He	99.824	1.199	444759	0.25	100	99.8	90	110	
Fe	56	2	He	9975.439	0.848	53735766	0.36	10000	99.8	90	110	
Co	59	2	He	97.805	2.181	827079	1.06	100	97.8	90	110	
Ni	60	2	He	100.737	2.217	210262	1.17	100	100.7	90	110	
Cu	63	2	He	98.771	1.892	524582	0.74	100	98.8	90	110	
Zn	66	2	He	97.943	1.344	127503	0.81	100	97.9	90	110	
As	75	2	He	97.414	1.577	125990	1.02	100	97.4	90	110	
Se	78	2	He	97.012	0.971	10156	0.61	100	97.0	90	110	
B	11	1	nogas	450.167	8.096	2428887	2.24	500	90.0	90	110	
Si	28	1	nogas	4947.472	2.024	54719164	3.13	5000	98.9	90	110	
Ca	43	1	nogas	9776.353	3.579	343708	2.99	10000	97.8	90	110	
Ca	44	1	nogas	9751.848	3.584	5947167	1.71	10000	97.5	90	110	
Fe	56	1	nogas	9935.397	4.796	222306388	2.90	10000	99.4	90	110	
Se	77	1	nogas	146.148	3.350	107103	2.24	100	146.1	90	110	ICV Main CR1 Failed
Se	82	1	nogas	98.113	2.380	25615	1.44	100	98.1	90	110	
Mo	95	1	nogas	99.123	1.162	534676	2.38	100	99.1	90	110	
Sn	118	1	nogas	95.187	0.718	696674	0.90	100	95.2	90	110	
Ba	137	1	nogas	98.937	1.792	378120	0.25	100	98.9	90	110	
Sb	121	2	He	96.957	1.005	432768	0.54	100	97.0	90	110	
Li	7	1	nogas	89.962	6.707	1880704	0.43	100	90.0	90	110	ICV Main CR1 Failed
P	31	1	nogas	487.791	1.616	870045	1.80	500	97.6	90	110	
La	139	1	nogas	112.367	21.626	457	18.23	100	112.4	90	110	ICV Main CR1 Failed
Au	197	1	nogas	1024.820	164.588	33	69.28	100	1024.8	90	110	ICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1281982	6.39	1359891	94.27	70	125	
Ge	72	1	nogas	3116223	2.81	3145209	99.08	70	125	
In	115	1	nogas	2718798	1.59	2761164	98.47	70	125	
Bi	209	1	nogas	2085992	3.21	2190177	95.24	70	125	

Initial Calibration Verification (ICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	746958	1.19	785020	95.15	70	125	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	026ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T12:27:37-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	-0.003	-45.4	27	43.3	0	ICSA Main CR1 Failed
Na	23	1	nogas	99772.419	2.6	2268122384	1.6	0	
Mg	24	1	nogas	98284.273	1.1	1412465198	2.0	0	
Al	27	1	nogas	91269.915	3.0	1627286056	2.1	0	
K	39	1	nogas	100855.122	2.2	1810364040	1.4	0	
Ti	47	1	nogas	2111.723	1.2	3370309	1.1	0	
V	51	1	nogas	-35.932	-0.7	1277173	0.7	0	ICSA Main CR1 Failed
Cr	52	1	nogas	-0.515	-9.4	102886	1.4	0	ICSA Main CR1 Failed
Mn	55	1	nogas	0.883	6.0	49239	3.5	0	ICSA Main CR1 Failed
Co	59	1	nogas	0.478	0.6	10850	1.3	0	ICSA Main CR1 Failed
Ni	60	1	nogas	1.509	0.4	6765	1.0	0	ICSA Main CR1 Failed
Cu	63	1	nogas	1.054	5.0	13765	4.2	0	ICSA Main CR1 Failed
Zn	66	1	nogas	3.426	3.1	11647	2.5	0	ICSA Main CR1 Failed
As	75	1	nogas	-14.028	-10.0	180601	2.5	0	ICSA Main CR1 Failed
Sr	88	1	nogas	0.845	1.9	21513	1.6	0	ICSA Main CR1 Failed
Ag	107	1	nogas	0.037	26.3	727	16.8	0	ICSA Main CR1 Failed
Cd	111	1	nogas	1.887	5.1	4861	3.3	0	ICSA Main CR1 Failed
Sb	121	1	nogas	1.289	11.4	14867	12.1	0	ICSA Main CR1 Failed
Tl	205	1	nogas	0.050	83.5	1894	51.3	0	ICSA Main CR1 Failed
Pb	208	1	nogas	0.111	38.4	8444	12.9	0	ICSA Main CR1 Failed
[Pb]	206	1	nogas	0.131	26.0	2210	14.7	0	ICSA Main CR1 Failed
[Pb]	207	1	nogas	0.091	30.5	1727	13.7	0	ICSA Main CR1 Failed
Na	23	2	He	97693.153	1.3	141335218	1.7	0	
Mg	24	2	He	97265.766	1.4	76387947	1.7	0	
Al	27	2	He	91579.752	0.5	42312337	1.4	0	
K	39	2	He	94564.302	1.0	82224395	1.0	0	
Ca	43	2	He	93346.096	2.9	213857	3.2	0	
Ca	44	2	He	97704.215	1.5	3757513	2.3	0	
V	51	2	He	-1.531	-3.7	16283	1.8	0	ICSA Main CR1 Failed
Cr	52	2	He	0.266	25.5	6465	6.1	0	ICSA Main CR1 Failed
Mn	55	2	He	0.675	7.2	5207	3.6	0	ICSA Main CR1 Failed
Fe	56	2	He	96155.471	0.6	499799473	0.3	0	
Co	59	2	He	0.246	9.4	2367	7.1	0	ICSA Main CR1 Failed
Ni	60	2	He	0.719	9.9	1327	11.3	0	ICSA Main CR1 Failed
Cu	63	2	He	0.752	3.0	2630	5.0	0	ICSA Main CR1 Failed
Zn	66	2	He	2.156	1.0	2234	0.5	0	ICSA Main CR1 Failed
As	75	2	He	0.041	68.5	798	5.2	0	ICSA Main CR1 Failed
Se	78	2	He	0.700	21.0	137	11.1	0	ICSA Main CR1 Failed
B	11	1	nogas	1.423	38.1	37567	4.5	0	ICSA Main CR1 Failed
Si	28	1	nogas	71.978	8.3	2489176	1.5	0	
Ca	43	1	nogas	95597.549	1.5	3098104	2.3	0	
Ca	44	1	nogas	96363.689	1.0	50888596	0.2	0	
Fe	56	1	nogas	98346.164	2.0	2011258512	1.2	0	
Se	77	1	nogas	-70.143	-13.1	57829	2.2	0	ICSA Main CR1 Failed
Se	82	1	nogas	0.278	59.1	287	13.2	0	ICSA Main CR1 Failed
Mo	95	1	nogas	1966.748	2.1	9770045	2.0	0	
Sn	118	1	nogas	0.195	15.8	2123	11.8	0	ICSA Main CR1 Failed
Ba	137	1	nogas	0.238	14.5	880	15.9	0	ICSA Main CR1 Failed
Sb	121	2	He	0.939	3.9	4131	3.4	0	ICSA Main CR1 Failed

Interference Check Solution A (ICS-A) Report

P	31	1	nogas	95539.734	1.6	143110505	0.7	0	
La	139	1	nogas	66.059	13.3	263	9.6	0	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1325005	3.60	1359891	97.43	70	125	
Ge	72	1	nogas	2881516	0.91	3145209	91.62	70	125	
In	115	1	nogas	2489400	2.22	2761164	90.16	70	125	
Bi	209	1	nogas	2056783	8.29	2190177	93.91	70	125	
Ge	72	2	He	720869	0.83	785020	91.83	70	125	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	027ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T12:29:40-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	88.896	7.631	826908	0.53	100	88.9	80	120	
Na	23	1	nogas	107475.280	6.996	2496804056	0.21	100	107475.3	80	120	ICSB Main CR1 Failed
Mg	24	1	nogas	104767.308	8.522	1537287468	1.60	100	104767.3	80	120	ICSB Main CR1 Failed
Al	27	1	nogas	89501.065	6.489	1635600669	0.84	100	89501.1	80	120	ICSB Main CR1 Failed
K	39	1	nogas	106208.920	6.969	1953231644	0.86	100	106208.9	80	120	ICSB Main CR1 Failed
Ti	47	1	nogas	2184.702	5.537	3575601	2.72	100	2184.7	80	120	ICSB Main CR1 Failed
V	51	1	nogas	84.153	10.178	3940234	2.22	100	84.2	80	120	ICSB Main CR1 Failed
Cr	52	1	nogas	106.120	2.684	2248532	4.98	100	106.1	80	120	
Mn	55	1	nogas	109.119	1.679	2706396	6.77	100	109.1	80	120	
Co	59	1	nogas	108.027	2.536	2291703	4.04	100	108.0	80	120	
Ni	60	1	nogas	106.971	6.590	500763	0.83	100	107.0	80	120	
Cu	63	1	nogas	103.370	6.564	1165497	1.32	100	103.4	80	120	
Zn	66	1	nogas	110.844	6.542	409045	1.71	100	110.8	80	120	
As	75	1	nogas	99.913	10.639	694935	1.33	100	99.9	80	120	
Sr	88	1	nogas	106.906	2.308	2699990	6.74	100	106.9	80	120	
Ag	107	1	nogas	99.024	6.987	1220737	0.49	100	99.0	80	120	
Cd	111	1	nogas	108.286	3.933	284388	2.08	100	108.3	80	120	
Sb	121	1	nogas	104.806	5.416	1221638	1.76	100	104.8	80	120	
Tl	205	1	nogas	107.582	3.091	1847373	6.61	100	107.6	80	120	
Pb	208	1	nogas	96.871	6.416	2495535	6.40	100	96.9	80	120	
U	238	1	nogas	117.360	4.268	2694410	2.99	100	117.4	80	120	
[Pb]	206	1	nogas	106.892	7.419	621587	1.38	100	106.9	80	120	
[Pb]	207	1	nogas	107.937	7.726	544763	1.53	100	107.9	80	120	
Na	23	2	He	106806.913	2.230	155707248	2.06	100	106806.9	80	120	
Mg	24	2	He	105680.566	1.366	83634235	0.36	100	105680.6	80	120	
Al	27	2	He	89413.345	0.471	41631124	0.85	100	89413.3	80	120	ICSB Main CR1 Failed
K	39	2	He	105046.267	0.664	91317285	0.66	100	105046.3	80	120	
Ca	43	2	He	102464.222	0.437	236569	1.37	100	102464.2	80	120	
Ca	44	2	He	107334.985	1.617	4159308	1.74	100	107335.0	80	120	
V	51	2	He	104.576	0.666	607511	0.47	100	104.6	80	120	
Cr	52	2	He	104.304	0.708	636023	1.58	100	104.3	80	120	
Mn	55	2	He	107.790	1.529	466980	2.40	100	107.8	80	120	
Fe	56	2	He	106340.940	0.882	557089938	1.81	100	106340.9	80	120	
Co	59	2	He	104.046	0.847	855814	0.19	100	104.0	80	120	
Ni	60	2	He	106.452	2.151	216120	1.64	100	106.5	80	120	
Cu	63	2	He	103.551	1.564	535015	1.59	100	103.6	80	120	
Zn	66	2	He	107.351	1.635	135978	1.87	100	107.4	80	120	
As	75	2	He	105.233	0.241	132323	0.82	100	105.2	80	120	
Se	78	2	He	106.610	1.027	10850	2.02	100	106.6	80	120	
B	11	1	nogas	449.643	7.894	2470720	1.63	100	449.6	80	120	
Si	28	1	nogas	5381.151	7.053	56232369	0.34	100	5381.2	80	120	ICSB Main CR1 Failed
Ca	43	1	nogas	105287.348	8.179	3493725	1.60	100	105287.3	80	120	
Ca	44	1	nogas	105851.660	6.889	57243939	1.32	100	105851.7	80	120	
Fe	56	1	nogas	105420.584	4.862	2211100116	2.18	100	105420.6	80	120	ICSB Main CR1 Failed
Se	77	1	nogas	59.857	56.308	84609	1.29	100	59.9	80	120	ICSB Main CR1 Failed
Se	82	1	nogas	107.720	5.571	26650	1.61	100	107.7	80	120	
Mo	95	1	nogas	2069.610	5.399	10541086	1.18	100	2069.6	80	120	
Sn	118	1	nogas	104.910	4.972	718104	1.49	100	104.9	80	120	
Ba	137	1	nogas	109.134	4.275	390261	1.76	100	109.1	80	120	
Sb	121	2	He	107.148	1.025	465148	0.83	100	107.1	80	120	
La	139	1	nogas	240.588	6.523	867	4.05	100	240.6	80	120	ICSB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1305981	7.06	1359891	96.04	70	125	
Ge	72	1	nogas	2961308	6.55	3145209	94.15	70	125	
In	115	1	nogas	2547892	6.13	2761164	92.28	70	125	
Bi	209	1	nogas	1842791	7.32	2190177	84.14	70	125	
Ge	72	2	He	726482	1.00	785020	92.54	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	039_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:12:56-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	82.581	4.416	731555	0.94	100	82.6	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	9534.220	0.951	233218130	1.31	10000	95.3	90	110	
Mg	24	1	nogas	9729.392	1.174	150187274	1.59	10000	97.3	90	110	
Al	27	1	nogas	114.025	1.651	2272225	1.51	100	114.0	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9403.535	4.665	193492221	1.80	10000	94.0	90	110	
Ti	47	1	nogas	94.023	2.202	165882	1.13	100	94.0	90	110	
V	51	1	nogas	88.641	9.067	4343756	2.37	100	88.6	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	94.363	2.955	2162226	0.85	100	94.4	90	110	
Mn	55	1	nogas	96.837	4.544	2581103	1.37	100	96.8	90	110	
Co	59	1	nogas	93.619	4.322	2134156	1.48	100	93.6	90	110	
Ni	60	1	nogas	92.348	2.509	465475	0.99	100	92.3	90	110	
Cu	63	1	nogas	90.028	4.450	1092858	2.11	100	90.0	90	110	
Zn	66	1	nogas	93.492	2.903	371300	0.41	100	93.5	90	110	
As	75	1	nogas	85.298	2.877	678016	1.50	100	85.3	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.941	1.717	2629593	1.51	100	96.9	90	110	
Ag	107	1	nogas	95.934	1.678	1273939	1.81	100	95.9	90	110	
Cd	111	1	nogas	96.242	1.367	273977	0.58	100	96.2	90	110	
Sb	121	1	nogas	89.518	2.825	1122878	0.73	100	89.5	90	110	CCV Main CR1-2 Failed
Tl	205	1	nogas	96.005	0.857	1912662	1.77	100	96.0	90	110	
Pb	208	1	nogas	97.695	2.651	2516717	2.64	100	97.7	90	110	
U	238	1	nogas	98.363	3.842	2622706	2.63	100	98.4	90	110	
[Pb]	206	1	nogas	90.186	2.464	610277	1.74	100	90.2	90	110	
[Pb]	207	1	nogas	91.278	3.329	536100	2.19	100	91.3	90	110	
Na	23	2	He	9623.064	3.235	14415564	1.68	10000	96.2	90	110	
Mg	24	2	He	9540.055	1.642	7734491	0.19	10000	95.4	90	110	
Al	27	2	He	107.256	1.192	51865	2.95	100	107.3	90	110	
K	39	2	He	9322.177	1.535	8278600	1.50	10000	93.2	90	110	
Ca	43	2	He	9498.496	2.213	22494	1.34	10000	95.0	90	110	
Ca	44	2	He	9331.236	2.330	373183	1.11	10000	93.3	90	110	
V	51	2	He	93.345	2.417	558196	1.25	100	93.3	90	110	
Cr	52	2	He	94.422	2.820	590140	1.03	100	94.4	90	110	
Mn	55	2	He	93.055	1.725	413235	0.34	100	93.1	90	110	
Fe	56	2	He	9491.722	1.050	50950106	1.93	10000	94.9	90	110	
Co	59	2	He	93.403	0.242	787182	1.78	100	93.4	90	110	
Ni	60	2	He	95.865	0.471	199406	1.94	100	95.9	90	110	
Cu	63	2	He	95.724	2.377	506501	1.50	100	95.7	90	110	
Zn	66	2	He	95.179	1.678	123436	0.78	100	95.2	90	110	
As	75	2	He	92.664	0.757	119458	1.12	100	92.7	90	110	
Se	78	2	He	93.170	1.117	9721	0.93	100	93.2	90	110	
B	11	1	nogas	433.350	1.839	2270764	3.33	500	86.7	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4547.796	1.635	51492616	1.59	5000	91.0	90	110	
Ca	43	1	nogas	9148.026	4.787	328218	1.64	10000	91.5	90	110	
Ca	44	1	nogas	8874.170	5.333	5560960	1.88	10000	88.7	90	110	CCV Main CR1-2 Failed
Fe	56	1	nogas	9453.672	1.340	216186963	1.85	10000	94.5	90	110	
Se	77	1	nogas	52.203	33.980	89512	1.23	100	52.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.835	4.194	25008	1.16	100	93.8	90	110	
Mo	95	1	nogas	94.673	3.017	521161	0.18	100	94.7	90	110	
Sn	118	1	nogas	91.988	1.885	682853	0.71	100	92.0	90	110	
Ba	137	1	nogas	96.340	1.964	373465	0.74	100	96.3	90	110	
Sb	121	2	He	93.010	2.014	413602	0.60	100	93.0	90	110	
Li	7	1	nogas	96.477	3.818	1809007	1.98	100	96.5	90	110	
P	31	1	nogas	444.547	2.197	816596	1.56	500	88.9	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	156.420	17.540	627	15.17	100	156.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	271.125	292.305	23	49.49	100	271.1	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1241092	5.04	1359891	91.26	70	125	
Ge	72	1	nogas	3181162	3.09	3145209	101.14	70	125	
In	115	1	nogas	2757635	1.24	2761164	99.87	70	125	
Bi	209	1	nogas	2136405	1.24	2190177	97.54	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	744285	1.78	785020	94.81	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	040_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:14:54-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.029	56.4	330	47.6	1	
Na	23	1	nogas	8.110	23.9	628294	5.8	100	
Mg	24	1	nogas	5.524	31.5	93958	27.5	100	
Al	27	1	nogas	19.975	4.0	426475	2.1	5	CCB Main CR1 Failed
K	39	1	nogas	-14.388	-133.8	7847500	0.6	100	
Ti	47	1	nogas	0.095	72.4	467	21.5	2.5	
V	51	1	nogas	-7.112	-37.1	2114627	1.5	2.5	
Cr	52	1	nogas	-1.421	-13.5	95109	2.0	2.5	
Mn	55	1	nogas	0.153	50.7	35494	1.8	2.5	
Co	59	1	nogas	0.031	40.6	1790	11.7	2.5	
Ni	60	1	nogas	0.201	17.1	873	15.9	2.5	
Cu	63	1	nogas	0.012	171.5	2584	5.1	2	
Zn	66	1	nogas	0.603	9.8	1633	10.0	2.5	
As	75	1	nogas	-8.727	-15.2	227700	2.0	2.5	
Sr	88	1	nogas	0.375	9.7	11104	5.9	2.5	
Ag	107	1	nogas	0.016	53.9	537	17.3	2.5	
Cd	111	1	nogas	0.042	88.7	143	76.9	1	
Sb	121	1	nogas	1.928	27.7	24528	22.8	2.5	
Tl	205	1	nogas	0.115	71.1	3254	51.0	1	
Pb	208	1	nogas	-0.011	-357.9	5327	18.4	2.5	
U	238	1	nogas	0.133	64.9	3634	64.2	2.5	
[Pb]	206	1	nogas	-0.002	-803.1	1403	9.0	2.5	
[Pb]	207	1	nogas	-0.010	-442.3	1210	21.4	2.5	
Na	23	2	He	7.836	7.2	64051	1.3	100	
Mg	24	2	He	3.613	7.8	3387	7.5	100	
Al	27	2	He	20.645	2.6	10623	1.1	5	CCB Main CR1 Failed
K	39	2	He	-13.863	-15.0	179777	1.0	100	
Ca	43	2	He	71.958	42.3	207	35.7	100	
Ca	44	2	He	57.380	4.1	5398	1.0	100	
V	51	2	He	-0.066	-94.6	25371	0.7	2.5	
Cr	52	2	He	-0.017	-214.6	4957	3.9	2.5	
Mn	55	2	He	0.070	34.4	2724	3.9	2.5	
Fe	56	2	He	3.397	5.2	30125	4.1	100	
Co	59	2	He	0.002	425.2	393	15.5	2.5	
Ni	60	2	He	0.176	12.9	240	20.8	2.5	
Cu	63	2	He	0.443	10.7	1083	22.2	2	
Zn	66	2	He	0.766	5.6	500	10.0	2.5	
As	75	2	He	0.060	101.2	853	8.7	2.5	
Se	78	2	He	0.629	19.5	135	8.4	2	
B	11	1	nogas	4.069	8.9	52001	3.5	10	
Si	28	1	nogas	-28.516	-29.5	1672283	1.5	5	
Ca	43	1	nogas	77.086	15.6	4201	5.9	100	
Ca	44	1	nogas	-316.270	-4.0	252410	1.6	100	
Fe	56	1	nogas	-18.838	-54.1	2677824	4.2	100	
Se	77	1	nogas	-35.408	-40.2	71999	2.1	2.5	
Se	82	1	nogas	0.073	283.3	267	22.6	2	
Mo	95	1	nogas	0.156	123.5	3240	28.1	2.5	
Sn	118	1	nogas	0.207	31.9	2567	19.3	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.262	13.6	1123	12.2	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.229	9.8	5601	10.8	2.5	
P	31	1	nogas	-1.781	-74.9	80079	1.8	10	
La	139	1	nogas	70.702	17.2	327	15.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	477.217	324.2	27	86.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1318699	2.38	1359891	96.97	70	125	
Ge	72	1	nogas	3222207	4.42	3145209	102.45	70	125	
In	115	1	nogas	2910199	0.94	2761164	105.40	70	125	
Bi	209	1	nogas	2155319	0.75	2190177	98.41	70	125	
Ge	72	2	He	750098	1.35	785020	95.55	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-01
Data File Name	043SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:26:38-06:00
Sample Type	Sample
Dilution	50
Comment	TW135804Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.008	0.382	44.12	123	0.01	2000	
Na	23	1	nogas	18889.193	944459.651	2.93	461386144	0.00	200000	
Mg	24	1	nogas	4089.126	204456.307	3.19	63084308	0.01	200000	
Al	27	1	nogas	2.356	117.809	4.62	74346	0.00	2000	
K	39	1	nogas	15.410	770.493	30.78	8319765	0.00	200000	
Ti	47	1	nogas	0.097	4.872	31.93	467	0.02	2000	
V	51	1	nogas	0.506	25.316	367.55	2261646	0.00	2000	
Cr	52	1	nogas	-1.075	-53.757	-7.26	101147	0.00	2000	
Mn	55	1	nogas	130.457	6522.866	1.56	3458535	0.00	2000	
Co	59	1	nogas	0.042	2.123	4.87	2037	0.00	2000	
Ni	60	1	nogas	0.311	15.535	5.73	1417	0.02	2000	
Cu	63	1	nogas	0.033	1.644	78.14	2807	0.00	2000	
Zn	66	1	nogas	0.531	26.550	7.77	1330	0.04	2000	
As	75	1	nogas	-6.427	-321.336	-14.30	235281	0.00	2000	
Sr	88	1	nogas	189.960	9498.011	2.46	5138052	0.00	2000	
Ag	107	1	nogas	-0.014	-0.701	-14.28	130	-0.01	2000	
Cd	111	1	nogas	0.008	0.392	150.93	40	0.02	2000	
Sb	121	1	nogas	0.156	7.779	6.51	2167	0.01	2000	
Tl	205	1	nogas	-0.015	-0.762	-16.86	633	0.00	2000	
Pb	208	1	nogas	-0.076	-3.820	-11.30	3637	0.00	2000	
U	238	1	nogas	0.057	2.845	7.04	1610	0.00	2000	
[Pb]	206	1	nogas	-0.067	-3.359	-11.78	973	-0.01	2000	
[Pb]	207	1	nogas	-0.075	-3.730	-22.55	837	-0.01	2000	
Na	23	2	He	18858.119	942905.953	2.08	28349391	0.07	200000	
Mg	24	2	He	4110.483	205524.161	1.44	3349881	0.12	200000	
Al	27	2	He	2.185	109.239	18.59	1747	0.13	2000	
K	39	2	He	12.009	600.457	26.63	202221	0.01	200000	
Ca	43	2	He	8131.048	406552.389	2.28	19360	42.00	200000	
Ca	44	2	He	7784.090	389204.520	0.98	313448	2.48	200000	
V	51	2	He	0.029	1.446	202.95	25847	0.00	2000	
Cr	52	2	He	0.021	1.066	80.39	5181	0.00	2000	
Mn	55	2	He	123.892	6194.587	1.20	552214	0.02	2000	
Fe	56	2	He	102.304	5115.187	0.71	563471	0.02	200000	
Co	59	2	He	0.027	1.326	47.96	603	0.00	2000	
Ni	60	2	He	0.224	11.196	7.36	340	0.07	2000	
Cu	63	2	He	0.385	19.234	3.32	770	0.05	2000	
Zn	66	2	He	0.731	36.557	2.82	453	0.16	2000	
As	75	2	He	0.058	2.887	25.57	849	0.01	2000	
Se	78	2	He	0.658	32.885	25.93	137	0.48	2000	
B	11	1	nogas	-0.128	-6.417	-83.73	28131	0.00	2000	
Si	28	1	nogas	313.562	15678.086	0.22	5363228	0.01	2000	
Ca	43	1	nogas	7690.007	384500.372	0.95	275505	2.79	200000	
Ca	44	1	nogas	7287.818	364390.879	2.96	4633589	0.16	200000	
Fe	56	1	nogas	94.189	4709.441	3.82	5181954	0.00	200000	
Se	77	1	nogas	-14.866	-743.324	-37.16	75232	-0.02	2000	
Se	82	1	nogas	0.194	9.694	114.93	293	0.07	2000	

Sample Report

Mo	95	1	nogas	-0.142	-7.121	-54.53	1587	-0.01	2000	
Sn	118	1	nogas	0.080	4.017	191.35	1535	0.01	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	1.929	96.450	0.39	7688	0.03	2000	
Sb	121	2	He	0.134	6.691	19.52	687	0.02	2000	
La	139	1	nogas	28.754	1437.687	29.57	157	18.35	2000	
Au	197	1	nogas	-204.259	-10212.975	-498.62	17	-1225.56	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1283035	1.72	1359891	94.35	70	125	
Ge	72	1	nogas	3171098	1.30	3145209	100.82	70	125	
In	115	1	nogas	2816532	1.07	2761164	102.01	70	125	
Bi	209	1	nogas	2179187	1.11	2190177	99.50	70	125	
Ge	72	2	He	747992	0.48	785020	95.28	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-03
Data File Name	044SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:28:38-06:00
Sample Type	Sample
Dilution	50
Comment	TW135804Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.003	0.158	75.01	87	0.00	2000	
Na	23	1	nogas	11359.286	567964.288	1.08	281889123	0.00	200000	
Mg	24	1	nogas	4837.012	241850.622	1.90	75768108	0.01	200000	
Al	27	1	nogas	2.324	116.212	2.68	73376	0.00	2000	
K	39	1	nogas	29.262	1463.121	7.97	8551436	0.00	200000	
Ti	47	1	nogas	0.118	5.881	22.18	500	0.02	2000	
V	51	1	nogas	-5.296	-264.808	-8.84	2115276	0.00	2000	
Cr	52	1	nogas	-1.343	-67.170	-3.17	94925	0.00	2000	
Mn	55	1	nogas	142.477	7123.847	0.72	3756397	0.00	2000	
Co	59	1	nogas	1.383	69.163	0.90	32359	0.00	2000	
Ni	60	1	nogas	1.009	50.470	3.03	4907	0.02	2000	
Cu	63	1	nogas	0.004	0.218	321.36	2450	0.00	2000	
Zn	66	1	nogas	0.881	44.040	4.25	2704	0.03	2000	
As	75	1	nogas	-8.193	-409.640	-5.85	225732	0.00	2000	
Sr	88	1	nogas	142.778	7138.907	3.21	3842599	0.00	2000	
Ag	107	1	nogas	-0.014	-0.685	-18.34	133	-0.01	2000	
Cd	111	1	nogas	0.006	0.280	35.74	33	0.02	2000	
Sb	121	1	nogas	0.121	6.060	8.36	1730	0.01	2000	
Tl	205	1	nogas	-0.019	-0.957	-19.29	553	0.00	2000	
Pb	208	1	nogas	-0.091	-4.546	-10.68	3264	0.00	2000	
U	238	1	nogas	0.010	0.492	3.32	330	0.00	2000	
[Pb]	206	1	nogas	-0.085	-4.231	-15.94	850	-0.01	2000	
[Pb]	207	1	nogas	-0.091	-4.551	-14.99	737	-0.01	2000	
Na	23	2	He	11074.654	553732.698	0.11	16759985	0.07	200000	
Mg	24	2	He	4701.535	235076.754	1.76	3851958	0.12	200000	
Al	27	2	He	2.904	145.185	37.39	2101	0.14	2000	
K	39	2	He	25.931	1296.567	7.01	214298	0.01	200000	
Ca	43	2	He	6632.276	331613.791	4.31	15880	41.76	200000	
Ca	44	2	He	6457.252	322862.585	1.13	261932	2.47	200000	
V	51	2	He	-0.132	-6.594	-1.09	25057	0.00	2000	
Cr	52	2	He	-0.038	-1.904	-43.44	4837	0.00	2000	
Mn	55	2	He	132.963	6648.159	0.63	595643	0.02	2000	
Fe	56	2	He	92.990	4649.478	2.17	515951	0.02	200000	
Co	59	2	He	1.391	69.539	2.96	12218	0.01	2000	
Ni	60	2	He	0.916	45.806	7.84	1797	0.05	2000	
Cu	63	2	He	0.395	19.726	1.43	827	0.05	2000	
Zn	66	2	He	1.043	52.157	7.77	867	0.12	2000	
As	75	2	He	0.100	5.024	42.52	909	0.01	2000	
Se	78	2	He	0.631	31.539	15.35	135	0.47	2000	
B	11	1	nogas	-1.086	-54.275	-14.00	24099	0.00	2000	
Si	28	1	nogas	410.920	20545.976	2.23	6389128	0.01	2000	
Ca	43	1	nogas	6305.014	315250.707	2.43	225055	2.80	200000	
Ca	44	1	nogas	6011.939	300596.937	3.47	3878903	0.15	200000	
Fe	56	1	nogas	91.731	4586.548	0.56	5102678	0.00	200000	

Sample Report

Se	77	1	nogas	-28.993	-1449.652	-22.32	71925	-0.04	2000	
Se	82	1	nogas	0.198	9.919	8.81	293	0.07	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	-0.130	-6.485	-30.52	1650	-0.01	2000	
Sn	118	1	nogas	-0.018	-0.886	-88.89	787	0.00	2000	
Ba	137	1	nogas	0.814	40.684	7.83	3267	0.02	2000	
Sb	121	2	He	0.119	5.944	12.00	623	0.02	2000	
La	139	1	nogas	146.694	7334.684	23.64	603	24.31	2000	
Au	197	1	nogas	236.470	11823.517	1132.03	23	1013.44	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1344541	3.04	1359891	98.87	70	125	
Ge	72	1	nogas	3155794	0.67	3145209	100.34	70	125	
In	115	1	nogas	2811002	0.63	2761164	101.80	70	125	
Bi	209	1	nogas	2173893	1.34	2190177	99.26	70	125	
Ge	72	2	He	751998	0.63	785020	95.79	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-04
Data File Name	045SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:30:39-06:00
Sample Type	Sample
Dilution	100
Comment	TW135804Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.001	0.135	274.74	67	0.00	2000	
Na	23	1	nogas	5403.034	540303.371	1.52	138575678	0.00	200000	
Mg	24	1	nogas	1339.082	133908.240	1.70	21648140	0.01	200000	
Al	27	1	nogas	1.043	104.301	9.86	48716	0.00	2000	
K	39	1	nogas	93.470	9346.959	14.03	9881635	0.00	200000	
Ti	47	1	nogas	0.065	6.520	109.64	410	0.02	2000	
V	51	1	nogas	7.300	730.015	18.49	2428206	0.00	2000	
Cr	52	1	nogas	-1.035	-103.506	-8.92	102294	0.00	2000	
Mn	55	1	nogas	84.326	8432.648	1.11	2253347	0.00	2000	
Co	59	1	nogas	0.735	73.545	1.25	17842	0.00	2000	
Ni	60	1	nogas	1.115	111.489	4.59	5478	0.02	2000	
Cu	63	1	nogas	-0.025	-2.479	-31.33	2117	0.00	2000	
Zn	66	1	nogas	0.598	59.816	7.64	1600	0.04	2000	
As	75	1	nogas	-5.396	-539.585	-3.71	240953	0.00	2000	
Sr	88	1	nogas	51.539	5153.916	3.49	1398443	0.00	2000	
Ag	107	1	nogas	-0.007	-0.702	-13.75	223	0.00	2000	
Cd	111	1	nogas	0.000	-0.027	-723.85	17	0.00	2000	
Sb	121	1	nogas	0.111	11.098	12.92	1617	0.01	2000	
Tl	205	1	nogas	-0.019	-1.913	-35.85	563	0.00	2000	
Pb	208	1	nogas	-0.109	-10.947	-6.05	2787	0.00	2000	
U	238	1	nogas	0.007	0.679	12.97	253	0.00	2000	
[Pb]	206	1	nogas	-0.121	-12.131	-6.49	617	-0.02	2000	
[Pb]	207	1	nogas	-0.101	-10.132	-13.23	690	-0.01	2000	
Na	23	2	He	5524.025	552402.512	3.93	8385339	0.07	200000	
Mg	24	2	He	1333.610	133361.027	2.64	1093048	0.12	200000	
Al	27	2	He	1.103	110.251	28.74	1233	0.09	2000	
K	39	2	He	84.766	8476.613	1.84	265336	0.03	200000	
Ca	43	2	He	1674.900	167489.955	5.65	4037	41.49	200000	
Ca	44	2	He	1699.264	169926.407	1.23	71239	2.39	200000	
V	51	2	He	0.593	59.261	10.60	29239	0.00	2000	
Cr	52	2	He	0.004	0.369	1091.70	5097	0.00	2000	
Mn	55	2	He	80.417	8041.679	2.38	361233	0.02	2000	
Fe	56	2	He	470.988	47098.838	2.09	2566259	0.02	200000	
Co	59	2	He	0.704	70.382	2.20	6371	0.01	2000	
Ni	60	2	He	1.068	106.786	1.40	2117	0.05	2000	
Cu	63	2	He	0.381	38.091	5.06	753	0.05	2000	
Zn	66	2	He	0.767	76.745	8.22	503	0.15	2000	
As	75	2	He	0.117	11.657	19.32	930	0.01	2000	
Se	78	2	He	0.760	75.994	29.22	149	0.51	2000	
B	11	1	nogas	-0.380	-38.003	-21.82	27013	0.00	2000	
Si	28	1	nogas	245.767	24576.662	5.16	4638627	0.01	2000	
Ca	43	1	nogas	1751.708	175170.841	4.19	64006	2.74	200000	
Ca	44	1	nogas	1293.272	129327.188	4.81	1179851	0.11	200000	
Fe	56	1	nogas	472.526	47252.638	2.41	13724479	0.00	200000	

Sample Report

Se	77	1	nogas	0.957	95.722	358.20	78783	0.00	2000	
Se	82	1	nogas	-0.038	-3.836	-205.45	233	-0.02	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	-0.185	-18.543	-13.90	1357	-0.01	2000	
Sn	118	1	nogas	-0.015	-1.541	-73.95	823	0.00	2000	
Ba	137	1	nogas	5.358	535.759	1.11	21761	0.02	2000	
Sb	121	2	He	0.102	10.169	28.93	547	0.02	2000	
La	139	1	nogas	14.920	1492.038	38.76	107	13.99	2000	
Au	197	1	nogas	-1.317	-131.683	-53884.66	20	-6.58	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1293389	2.32	1359891	95.11	70	125	
Ge	72	1	nogas	3180165	1.86	3145209	101.11	70	125	
In	115	1	nogas	2882296	1.44	2761164	104.39	70	125	
Bi	209	1	nogas	2233028	5.36	2190177	101.96	70	125	
Ge	72	2	He	752164	1.29	785020	95.81	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-05
Data File Name	046SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:32:37-06:00
Sample Type	Sample
Dilution	100
Comment	TW135804Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.003	0.263	135.62	77	0.00	2000	
Na	23	1	nogas	13707.299	1370729.890	4.38	342538174	0.00	200000	
Mg	24	1	nogas	4636.923	463692.271	3.70	73175864	0.01	200000	
Al	27	1	nogas	0.779	77.894	8.60	43778	0.00	2000	
K	39	1	nogas	24.092	2409.184	74.54	8559538	0.00	200000	
Ti	47	1	nogas	0.119	11.907	56.95	507	0.02	2000	
V	51	1	nogas	0.669	66.909	727.51	2283516	0.00	2000	
Cr	52	1	nogas	-1.181	-118.078	-25.12	99633	0.00	2000	
Mn	55	1	nogas	95.779	9577.921	4.53	2567906	0.00	2000	
Co	59	1	nogas	0.023	2.297	39.38	1603	0.00	2000	
Ni	60	1	nogas	0.204	20.426	6.59	890	0.02	2000	
Cu	63	1	nogas	-0.004	-0.376	-469.98	2390	0.00	2000	
Zn	66	1	nogas	0.386	38.570	6.27	757	0.05	2000	
As	75	1	nogas	-7.793	-779.282	-22.06	230627	0.00	2000	
Sr	88	1	nogas	190.793	19079.296	5.74	5199954	0.00	2000	
Ag	107	1	nogas	-0.011	-1.062	-3.69	177	-0.01	2000	
Cd	111	1	nogas	0.003	0.318	61.45	27	0.01	2000	
Sb	121	1	nogas	0.077	7.669	7.31	1193	0.01	2000	
Tl	205	1	nogas	-0.018	-1.834	-6.75	553	0.00	2000	
Pb	208	1	nogas	-0.108	-10.778	-7.33	2830	0.00	2000	
U	238	1	nogas	0.012	1.158	37.17	367	0.00	2000	
[Pb]	206	1	nogas	-0.100	-10.004	-8.90	723	-0.01	2000	
[Pb]	207	1	nogas	-0.110	-10.960	-16.26	607	-0.02	2000	
Na	23	2	He	14266.985	1426698.523	1.82	20955495	0.07	200000	
Mg	24	2	He	4860.959	486095.897	0.46	3868603	0.13	200000	
Al	27	2	He	0.928	92.765	14.64	1117	0.08	2000	
K	39	2	He	23.799	2379.927	2.46	212448	0.01	200000	
Ca	43	2	He	7543.410	754340.973	2.53	17539	43.01	200000	
Ca	44	2	He	7340.537	734053.693	1.53	288783	2.54	200000	
V	51	2	He	0.190	18.988	52.83	26137	0.00	2000	
Cr	52	2	He	0.097	9.737	26.87	5521	0.00	2000	
Mn	55	2	He	93.984	9398.408	1.19	409630	0.02	2000	
Fe	56	2	He	8.338	833.810	2.96	55346	0.02	200000	
Co	59	2	He	0.007	0.737	110.23	430	0.00	2000	
Ni	60	2	He	0.136	13.642	6.93	153	0.09	2000	
Cu	63	2	He	0.385	38.451	8.57	750	0.05	2000	
Zn	66	2	He	0.523	52.298	2.01	177	0.30	2000	
As	75	2	He	-0.001	-0.062	-1573.65	756	0.00	2000	
Se	78	2	He	0.683	68.266	3.68	137	0.50	2000	
B	11	1	nogas	-0.193	-19.338	-74.46	27513	0.00	2000	
Si	28	1	nogas	144.862	14486.154	6.72	3560609	0.00	2000	
Ca	43	1	nogas	7002.562	700256.157	2.02	253194	2.77	200000	
Ca	44	1	nogas	6608.494	660849.404	2.82	4279290	0.15	200000	
Fe	56	1	nogas	9.279	927.940	55.65	3300856	0.00	200000	
Se	77	1	nogas	-21.913	-2191.271	-57.08	74368	-0.03	2000	
Se	82	1	nogas	0.014	1.357	2016.61	247	0.01	2000	

Sample Report

Mo	95	1	nogas	-0.197	-19.691	-15.13	1300	-0.02	2000	
Sn	118	1	nogas	-0.023	-2.343	-29.50	753	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	1.000	99.978	0.81	4057	0.02	2000	
Sb	121	2	He	0.082	8.249	8.30	447	0.02	2000	
La	139	1	nogas	25.776	2577.650	69.59	147	17.57	2000	
Au	197	1	nogas	49.491	4949.075	1351.13	20	247.45	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1270163	1.37	1359891	93.40	70	125	
Ge	72	1	nogas	3199737	3.58	3145209	101.73	70	125	
In	115	1	nogas	2849863	1.51	2761164	103.21	70	125	
Bi	209	1	nogas	2112621	1.58	2190177	96.46	70	125	
Ge	72	2	He	730414	1.07	785020	93.04	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	051_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:42:32-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	85.242	6.233	746063	1.73	100	85.2	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10106.138	2.238	246517314	3.04	10000	101.1	90	110	
Mg	24	1	nogas	9753.154	0.324	150136603	1.50	10000	97.5	90	110	
Al	27	1	nogas	115.336	0.376	2224526	2.15	100	115.3	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9662.862	0.870	192340267	1.47	10000	96.6	90	110	
Ti	47	1	nogas	95.923	2.146	163795	1.48	100	95.9	90	110	
V	51	1	nogas	89.335	8.821	4220449	2.78	100	89.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	98.016	2.515	2170398	4.15	100	98.0	90	110	
Mn	55	1	nogas	99.358	2.694	2564559	3.81	100	99.4	90	110	
Co	59	1	nogas	97.725	1.543	2157428	2.10	100	97.7	90	110	
Ni	60	1	nogas	95.974	2.462	468269	2.20	100	96.0	90	110	
Cu	63	1	nogas	93.300	2.775	1096403	0.78	100	93.3	90	110	
Zn	66	1	nogas	95.730	3.590	367953	1.40	100	95.7	90	110	
As	75	1	nogas	87.720	2.643	667491	0.75	100	87.7	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	95.720	3.206	2512412	1.60	100	95.7	90	110	
Ag	107	1	nogas	95.939	5.097	1232494	3.63	100	95.9	90	110	
Cd	111	1	nogas	94.231	4.648	268218	1.23	100	94.2	90	110	
Sb	121	1	nogas	95.509	0.887	1159997	2.50	100	95.5	90	110	
Tl	205	1	nogas	97.225	1.215	1894554	1.38	100	97.2	90	110	
Pb	208	1	nogas	99.053	2.991	2551610	2.98	100	99.1	90	110	
U	238	1	nogas	101.132	1.514	2638473	1.86	100	101.1	90	110	
[Pb]	206	1	nogas	94.107	2.097	622917	2.20	100	94.1	90	110	
[Pb]	207	1	nogas	95.903	1.744	551041	2.01	100	95.9	90	110	
Na	23	2	He	9649.507	2.347	14165282	1.26	10000	96.5	90	110	
Mg	24	2	He	9691.734	1.730	7699047	0.65	10000	96.9	90	110	
Al	27	2	He	110.540	1.509	52339	0.84	100	110.5	90	110	CCV Main CR1-2 Failed
K	39	2	He	9295.201	2.150	8255199	2.10	10000	93.0	90	110	
Ca	43	2	He	9536.295	0.885	22130	0.82	10000	95.4	90	110	
Ca	44	2	He	9331.597	1.256	365726	1.35	10000	93.3	90	110	
V	51	2	He	93.814	1.456	549598	0.05	100	93.8	90	110	
Cr	52	2	He	96.799	0.973	592797	0.61	100	96.8	90	110	
Mn	55	2	He	94.979	1.041	413254	0.70	100	95.0	90	110	
Fe	56	2	He	9516.557	0.942	50048763	0.84	10000	95.2	90	110	
Co	59	2	He	94.625	0.357	781346	1.15	100	94.6	90	110	
Ni	60	2	He	98.902	0.511	201557	0.87	100	98.9	90	110	
Cu	63	2	He	98.270	1.498	509545	0.32	100	98.3	90	110	
Zn	66	2	He	95.432	1.086	121289	1.93	100	95.4	90	110	
As	75	2	He	92.654	0.852	117034	0.85	100	92.7	90	110	
Se	78	2	He	91.542	1.101	9360	0.32	100	91.5	90	110	
B	11	1	nogas	446.060	3.907	2308220	1.49	500	89.2	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4691.460	1.641	51348961	0.99	5000	93.8	90	110	
Ca	43	1	nogas	9441.217	1.581	328041	2.05	10000	94.4	90	110	
Ca	44	1	nogas	9164.330	1.999	5548196	1.65	10000	91.6	90	110	
Fe	56	1	nogas	9769.863	2.054	216224221	4.24	10000	97.7	90	110	
Se	77	1	nogas	61.316	19.398	88514	0.58	100	61.3	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	91.927	4.064	23719	1.89	100	91.9	90	110	
Mo	95	1	nogas	95.679	1.848	509849	0.74	100	95.7	90	110	
Sn	118	1	nogas	93.453	1.993	694199	2.66	100	93.5	90	110	
Ba	137	1	nogas	95.989	6.293	371905	2.14	100	96.0	90	110	
Sb	121	2	He	94.319	1.364	410995	0.68	100	94.3	90	110	
Li	7	1	nogas	96.753	5.390	1792971	3.83	100	96.8	90	110	
P	31	1	nogas	459.962	2.074	814948	0.37	500	92.0	90	110	
La	139	1	nogas	147.731	23.151	593	18.49	100	147.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	65.504	1805.300	20	86.60	100	65.5	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1226650	4.46	1359891	90.20	70	125	
Ge	72	1	nogas	3078432	2.24	3145209	97.88	70	125	
In	115	1	nogas	2760799	4.57	2761164	99.99	70	125	
Bi	209	1	nogas	2089691	0.60	2190177	95.41	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	729245	1.34	785020	92.90	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	052_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:44:32-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.030	17.8	337	17.4	1	
Na	23	1	nogas	7.972	14.5	620749	3.9	100	
Mg	24	1	nogas	5.200	27.3	88363	24.7	100	
Al	27	1	nogas	19.442	2.2	419698	0.8	5	CCB Main CR1 Failed
K	39	1	nogas	-21.004	-43.6	7789812	0.6	100	
Ti	47	1	nogas	0.026	200.0	350	25.7	2.5	
V	51	1	nogas	-17.572	-12.9	1882430	3.3	2.5	
Cr	52	1	nogas	-1.778	-7.0	88145	3.2	2.5	
Mn	55	1	nogas	0.061	58.0	33360	1.3	2.5	
Co	59	1	nogas	0.020	99.1	1557	27.6	2.5	
Ni	60	1	nogas	0.209	20.9	927	22.2	2.5	
Cu	63	1	nogas	0.015	293.7	2647	18.6	2	
Zn	66	1	nogas	0.600	14.3	1637	19.3	2.5	
As	75	1	nogas	-12.684	-4.5	210322	2.2	2.5	
Sr	88	1	nogas	0.382	8.9	11410	7.6	2.5	
Ag	107	1	nogas	0.017	45.0	557	17.3	2.5	
Cd	111	1	nogas	0.032	89.5	107	71.6	1	
Sb	121	1	nogas	1.801	22.1	23263	20.2	2.5	
Tl	205	1	nogas	0.113	62.1	3337	46.7	1	
Pb	208	1	nogas	-0.036	-74.3	4684	14.5	2.5	
U	238	1	nogas	0.114	65.8	3254	67.2	2.5	
[Pb]	206	1	nogas	-0.032	-35.2	1240	9.3	2.5	
[Pb]	207	1	nogas	-0.058	-40.4	957	17.5	2.5	
Na	23	2	He	6.831	14.1	61138	1.6	100	
Mg	24	2	He	3.616	10.1	3314	9.2	100	
Al	27	2	He	19.200	6.6	9709	6.1	5	CCB Main CR1 Failed
K	39	2	He	-13.503	-31.0	180090	2.0	100	
Ca	43	2	He	71.055	14.4	200	13.2	100	
Ca	44	2	He	57.537	2.2	5284	2.1	100	
V	51	2	He	-0.521	-18.8	22241	0.6	2.5	
Cr	52	2	He	-0.042	-96.7	4689	3.9	2.5	
Mn	55	2	He	-0.019	-144.0	2277	3.2	2.5	
Fe	56	2	He	3.107	6.5	27931	5.9	100	
Co	59	2	He	-0.003	-116.6	347	6.0	2.5	
Ni	60	2	He	0.179	21.1	240	31.5	2.5	
Cu	63	2	He	0.415	3.4	913	8.4	2	
Zn	66	2	He	0.761	12.1	480	21.9	2.5	
As	75	2	He	0.026	278.1	791	9.1	2.5	
Se	78	2	He	0.672	30.2	136	14.2	2	
B	11	1	nogas	4.318	6.4	52489	3.7	10	
Si	28	1	nogas	-35.874	-15.5	1608009	5.6	5	
Ca	43	1	nogas	66.822	12.9	3870	6.4	100	
Ca	44	1	nogas	-359.633	-1.8	229096	0.6	100	
Fe	56	1	nogas	-20.693	-33.4	2662709	4.1	100	
Se	77	1	nogas	-52.315	-16.9	69037	1.7	2.5	
Se	82	1	nogas	0.158	206.3	290	28.2	2	
Mo	95	1	nogas	0.132	171.8	3150	38.2	2.5	
Sn	118	1	nogas	0.226	26.2	2607	12.5	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.258	1.9	1067	4.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.217	6.1	5421	7.4	2.5	
P	31	1	nogas	-1.912	-45.0	80584	0.6	10	
La	139	1	nogas	85.569	17.8	370	16.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-27.213	-4753.9	20	100.0	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1296977	4.14	1359891	95.37	70	125	
Ge	72	1	nogas	3249536	1.87	3145209	103.32	70	125	
In	115	1	nogas	2798792	4.43	2761164	101.36	70	125	
Bi	209	1	nogas	2223599	3.08	2190177	101.53	70	125	
Ge	72	2	He	733533	3.03	785020	93.44	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	053_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:46:30-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	90.368	9.962	747571	0.68	100	90.4	90	110	
Na	23	1	nogas	9593.978	3.767	237573905	2.25	10000	95.9	90	110	
Mg	24	1	nogas	9547.284	3.352	149194324	1.46	10000	95.5	90	110	
Al	27	1	nogas	119.921	1.852	2275102	2.27	100	119.9	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9873.448	5.090	193108779	1.59	10000	98.7	90	110	
Ti	47	1	nogas	97.014	2.439	163023	1.21	100	97.0	90	110	
V	51	1	nogas	88.584	7.816	4136299	0.26	100	88.6	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	99.085	4.473	2156617	2.95	100	99.1	90	110	
Mn	55	1	nogas	100.306	2.333	2547094	1.96	100	100.3	90	110	
Co	59	1	nogas	97.255	2.302	2112769	1.60	100	97.3	90	110	
Ni	60	1	nogas	95.594	3.860	458860	1.30	100	95.6	90	110	
Cu	63	1	nogas	93.901	2.337	1086155	1.61	100	93.9	90	110	
Zn	66	1	nogas	97.100	2.322	367427	1.60	100	97.1	90	110	
As	75	1	nogas	89.380	5.368	664359	0.38	100	89.4	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.583	1.486	2496956	4.26	100	96.6	90	110	
Ag	107	1	nogas	96.700	2.042	1223158	2.00	100	96.7	90	110	
Cd	111	1	nogas	96.072	3.712	267828	1.14	100	96.1	90	110	
Sb	121	1	nogas	94.466	1.051	1129440	3.64	100	94.5	90	110	
Tl	205	1	nogas	96.544	5.096	1926371	3.06	100	96.5	90	110	
Pb	208	1	nogas	100.485	1.404	2588429	1.40	100	100.5	90	110	
U	238	1	nogas	99.352	3.108	2657124	5.23	100	99.4	90	110	
[Pb]	206	1	nogas	90.818	3.030	615788	1.16	100	90.8	90	110	
[Pb]	207	1	nogas	94.072	2.743	553673	0.86	100	94.1	90	110	
Na	23	2	He	9578.242	0.745	14197159	1.46	10000	95.8	90	110	
Mg	24	2	He	9508.536	2.207	7625536	1.84	10000	95.1	90	110	
Al	27	2	He	111.041	2.937	53071	2.45	100	111.0	90	110	CCV Main CR1-2 Failed
K	39	2	He	9329.340	2.402	8284814	2.35	10000	93.3	90	110	
Ca	43	2	He	8980.647	1.061	21042	1.78	10000	89.8	90	110	CCV Main CR1-2 Failed
Ca	44	2	He	9378.342	0.787	371025	0.51	10000	93.8	90	110	
V	51	2	He	92.449	1.718	547116	1.01	100	92.4	90	110	
Cr	52	2	He	95.230	1.886	588773	1.20	100	95.2	90	110	
Mn	55	2	He	93.043	0.444	408731	0.29	100	93.0	90	110	
Fe	56	2	He	9558.381	0.181	50747584	0.89	10000	95.6	90	110	
Co	59	2	He	92.916	0.430	774495	0.45	100	92.9	90	110	
Ni	60	2	He	95.727	0.981	196944	1.70	100	95.7	90	110	
Cu	63	2	He	96.187	1.838	503452	1.13	100	96.2	90	110	
Zn	66	2	He	94.123	2.979	120729	2.28	100	94.1	90	110	
As	75	2	He	92.640	0.339	118128	0.59	100	92.6	90	110	
Se	78	2	He	91.354	4.538	9428	3.78	100	91.4	90	110	
B	11	1	nogas	465.693	8.979	2276480	1.53	500	93.1	90	110	
Si	28	1	nogas	4733.570	2.114	50974519	1.73	5000	94.7	90	110	
Ca	43	1	nogas	9536.096	4.468	325862	1.11	10000	95.4	90	110	
Ca	44	1	nogas	9637.238	5.332	5718126	2.90	10000	96.4	90	110	
Fe	56	1	nogas	9813.913	5.086	213491396	1.71	10000	98.1	90	110	
Se	77	1	nogas	51.381	26.338	85118	0.74	100	51.4	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	95.239	0.974	24193	2.94	100	95.2	90	110	
Mo	95	1	nogas	97.206	2.345	509775	1.88	100	97.2	90	110	
Sn	118	1	nogas	95.603	3.005	695156	1.93	100	95.6	90	110	
Ba	137	1	nogas	97.031	3.832	368365	1.06	100	97.0	90	110	
Sb	121	2	He	93.344	0.406	410632	0.38	100	93.3	90	110	
Li	7	1	nogas	98.575	6.181	1730151	7.36	100	98.6	90	110	
P	31	1	nogas	470.188	3.669	817951	0.47	500	94.0	90	110	
La	139	1	nogas	186.390	13.941	727	16.99	100	186.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-640.567	-102.870	10	100.00	100	-640.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1164707	9.61	1359891	85.65	70	125	
Ge	72	1	nogas	3030619	3.70	3145209	96.36	70	125	
In	115	1	nogas	2703077	4.34	2761164	97.90	70	125	
Bi	209	1	nogas	2141308	2.17	2190177	97.77	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	736138	0.73	785020	93.77	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	054_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:48:28-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.043	48.6	457	41.0	1	
Na	23	1	nogas	8.160	31.2	619447	6.9	100	
Mg	24	1	nogas	5.870	27.3	97810	22.4	100	
Al	27	1	nogas	20.026	1.6	419687	1.7	5	CCB Main CR1 Failed
K	39	1	nogas	-10.580	-12.6	7782219	0.5	100	
Ti	47	1	nogas	0.112	44.7	490	17.4	2.5	
V	51	1	nogas	-17.498	-11.2	1832599	2.9	2.5	
Cr	52	1	nogas	-1.633	-4.6	88842	2.2	2.5	
Mn	55	1	nogas	0.088	21.6	33163	1.5	2.5	
Co	59	1	nogas	0.027	42.2	1673	15.0	2.5	
Ni	60	1	nogas	0.222	4.3	967	5.3	2.5	
Cu	63	1	nogas	0.012	157.2	2544	8.7	2	
Zn	66	1	nogas	0.612	9.0	1643	13.0	2.5	
As	75	1	nogas	-11.362	-8.0	210875	2.1	2.5	
Sr	88	1	nogas	0.395	1.0	11467	0.7	2.5	
Ag	107	1	nogas	0.023	53.3	623	26.1	2.5	
Cd	111	1	nogas	0.043	49.4	147	45.4	1	
Sb	121	1	nogas	1.918	21.3	24121	20.9	2.5	
Tl	205	1	nogas	0.140	68.8	3831	50.7	1	
Pb	208	1	nogas	-0.027	-156.0	4894	22.5	2.5	
U	238	1	nogas	0.141	66.3	3951	64.4	2.5	
[Pb]	206	1	nogas	-0.026	-119.4	1273	16.2	2.5	
[Pb]	207	1	nogas	-0.063	-57.6	920	22.8	2.5	
Na	23	2	He	6.332	17.8	60402	2.2	100	
Mg	24	2	He	4.097	3.9	3697	3.7	100	
Al	27	2	He	19.422	7.0	9813	6.4	5	CCB Main CR1 Failed
K	39	2	He	-15.256	-15.2	178569	1.1	100	
Ca	43	2	He	86.999	32.6	237	27.2	100	
Ca	44	2	He	55.840	0.3	5217	1.4	100	
V	51	2	He	-0.676	-10.5	21374	0.7	2.5	
Cr	52	2	He	-0.007	-674.8	4904	4.7	2.5	
Mn	55	2	He	0.021	130.1	2450	3.7	2.5	
Fe	56	2	He	3.581	3.4	30425	3.3	100	
Co	59	2	He	0.004	79.1	403	5.2	2.5	
Ni	60	2	He	0.144	8.5	170	15.6	2.5	
Cu	63	2	He	0.410	6.8	890	17.3	2	
Zn	66	2	He	0.746	3.7	463	7.6	2.5	
As	75	2	He	0.026	238.6	791	8.6	2.5	
Se	78	2	He	0.749	23.6	144	12.7	2	
B	11	1	nogas	5.665	13.8	60813	4.1	10	
Si	28	1	nogas	-33.448	-15.6	1589172	3.1	5	
Ca	43	1	nogas	74.227	6.8	4030	4.3	100	
Ca	44	1	nogas	-348.767	-0.5	229086	0.7	100	
Fe	56	1	nogas	-18.613	-20.5	2637835	2.9	100	
Se	77	1	nogas	-47.999	-14.2	68061	2.3	2.5	
Se	82	1	nogas	0.184	165.8	290	27.6	2	
Mo	95	1	nogas	0.138	121.0	3107	28.9	2.5	
Sn	118	1	nogas	0.214	14.3	2577	9.2	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.255	11.0	1073	7.8	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.376	1.7	6118	2.9	2.5	
P	31	1	nogas	-0.298	-148.5	81036	1.0	10	
La	139	1	nogas	98.010	16.0	427	17.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-442.743	-224.9	13	114.6	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1320998	3.17	1359891	97.14	70	125	
Ge	72	1	nogas	3160184	0.43	3145209	100.48	70	125	
In	115	1	nogas	2855874	3.49	2761164	103.43	70	125	
Bi	209	1	nogas	2212615	0.95	2190177	101.02	70	125	
Ge	72	2	He	733334	1.27	785020	93.42	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-01
Data File Name	055SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:50:26-06:00
Sample Type	Sample
Dilution	50
Comment	Diss135805Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.013	0.626	20.82	163	0.01	2000	
Na	23	1	nogas	16426.592	821329.582	4.00	397959776	0.00	200000	
Mg	24	1	nogas	3588.432	179421.575	1.24	54931557	0.01	200000	
Al	27	1	nogas	1.871	93.564	10.68	64744	0.00	2000	
K	39	1	nogas	10.332	516.603	201.89	8210707	0.00	200000	
Ti	47	1	nogas	0.140	6.994	24.22	540	0.03	2000	
V	51	1	nogas	-17.488	-874.413	-15.03	1837902	0.00	2000	
Cr	52	1	nogas	-1.508	-75.378	-11.32	91803	0.00	2000	
Mn	55	1	nogas	116.319	5815.950	4.66	3084039	0.00	2000	
Co	59	1	nogas	0.037	1.852	28.07	1907	0.00	2000	
Ni	60	1	nogas	0.255	12.730	4.84	1133	0.02	2000	
Cu	63	1	nogas	-0.003	-0.136	-479.25	2380	0.00	2000	
Zn	66	1	nogas	0.505	25.264	6.16	1223	0.04	2000	
As	75	1	nogas	-10.607	-530.338	-18.65	215017	0.00	2000	
Sr	88	1	nogas	169.663	8483.151	5.59	4582095	0.00	2000	
Ag	107	1	nogas	-0.011	-0.563	-5.07	167	-0.01	2000	
Cd	111	1	nogas	0.008	0.387	92.53	40	0.02	2000	
Sb	121	1	nogas	0.570	28.507	10.21	7332	0.01	2000	
Tl	205	1	nogas	-0.005	-0.247	-214.23	847	0.00	2000	
Pb	208	1	nogas	-0.110	-5.480	-10.53	2783	0.00	2000	
U	238	1	nogas	0.054	2.687	7.96	1533	0.00	2000	
[Pb]	206	1	nogas	-0.121	-6.062	-16.77	607	-0.02	2000	
[Pb]	207	1	nogas	-0.102	-5.099	-16.76	677	-0.02	2000	
Na	23	2	He	15699.425	784971.229	1.48	23548541	0.07	200000	
Mg	24	2	He	3473.785	173689.239	0.83	2823889	0.12	200000	
Al	27	2	He	1.998	99.890	20.78	1653	0.12	2000	
K	39	2	He	6.399	319.945	17.10	197354	0.00	200000	
Ca	43	2	He	7022.169	351108.432	1.54	16681	42.10	200000	
Ca	44	2	He	6620.964	331048.212	1.33	266375	2.49	200000	
V	51	2	He	-0.643	-32.131	-7.91	21938	0.00	2000	
Cr	52	2	He	-0.047	-2.344	-149.34	4742	0.00	2000	
Mn	55	2	He	106.318	5315.922	1.26	473044	0.02	2000	
Fe	56	2	He	89.781	4489.070	1.93	494693	0.02	200000	
Co	59	2	He	0.020	1.005	75.64	547	0.00	2000	
Ni	60	2	He	0.188	9.383	4.27	263	0.07	2000	
Cu	63	2	He	0.368	18.378	3.29	677	0.05	2000	
Zn	66	2	He	0.671	33.540	1.26	373	0.18	2000	
As	75	2	He	0.011	0.549	756.22	787	0.00	2000	
Se	78	2	He	0.846	42.316	13.59	157	0.54	2000	
B	11	1	nogas	2.546	127.296	6.50	41292	0.01	2000	
Si	28	1	nogas	258.538	12926.903	9.00	4759621	0.01	2000	
Ca	43	1	nogas	6644.754	332237.682	5.49	237938	2.79	200000	
Ca	44	1	nogas	6294.301	314715.036	5.53	4056363	0.16	200000	
Fe	56	1	nogas	71.577	3578.858	11.43	4671542	0.00	200000	
Se	77	1	nogas	-40.001	-2000.039	-26.30	69934	-0.06	2000	
Se	82	1	nogas	0.066	3.307	415.62	260	0.03	2000	

Sample Report

Mo	95	1	nogas	-0.179	-8.951	-21.52	1383	-0.01	2000	
Sn	118	1	nogas	0.008	0.414	185.52	1000	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	1.693	84.628	0.44	6875	0.02	2000	
Sb	121	2	He	0.567	28.371	8.75	2617	0.02	2000	
La	139	1	nogas	22.673	1133.632	61.92	137	16.59	2000	
Au	197	1	nogas	-425.772	-21288.604	-95.94	13	-3193.29	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1247996	1.60	1359891	91.77	70	125	
Ge	72	1	nogas	3173024	5.46	3145209	100.88	70	125	
In	115	1	nogas	2867386	3.03	2761164	103.85	70	125	
Bi	209	1	nogas	2192705	2.72	2190177	100.12	70	125	
Ge	72	2	He	746086	0.87	785020	95.04	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-03
Data File Name	056SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:52:26-06:00
Sample Type	Sample
Dilution	50
Comment	Diss135805Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.004	0.185	155.80	90	0.00	2000	
Na	23	1	nogas	11759.681	587984.072	2.76	284981373	0.00	200000	
Mg	24	1	nogas	4950.442	247522.085	3.71	75726652	0.01	200000	
Al	27	1	nogas	2.051	102.548	5.01	67638	0.00	2000	
K	39	1	nogas	34.313	1715.641	11.77	8599471	0.00	200000	
Ti	47	1	nogas	0.062	3.081	28.60	400	0.02	2000	
V	51	1	nogas	-13.179	-658.935	-6.12	1919569	0.00	2000	
Cr	52	1	nogas	-1.497	-74.837	-4.09	91096	0.00	2000	
Mn	55	1	nogas	144.376	7218.806	2.01	3784170	0.00	2000	
Co	59	1	nogas	1.387	69.344	4.16	32242	0.00	2000	
Ni	60	1	nogas	1.016	50.776	4.54	4907	0.02	2000	
Cu	63	1	nogas	-0.003	-0.155	-40.19	2347	0.00	2000	
Zn	66	1	nogas	0.803	40.167	2.83	2384	0.03	2000	
As	75	1	nogas	-10.572	-528.581	-4.70	213103	0.00	2000	
Sr	88	1	nogas	141.344	7067.178	0.87	3781971	0.00	2000	
Ag	107	1	nogas	-0.011	-0.555	-2.82	167	-0.01	2000	
Cd	111	1	nogas	0.002	0.107	371.75	23	0.01	2000	
Sb	121	1	nogas	0.330	16.501	3.80	4304	0.01	2000	
Tl	205	1	nogas	-0.018	-0.910	-21.44	583	0.00	2000	
Pb	208	1	nogas	-0.107	-5.337	-7.44	2857	0.00	2000	
U	238	1	nogas	0.014	0.722	13.95	463	0.00	2000	
[Pb]	206	1	nogas	-0.103	-5.137	-8.24	740	-0.01	2000	
[Pb]	207	1	nogas	-0.116	-5.783	-3.47	600	-0.02	2000	
Na	23	2	He	11607.183	580359.159	2.84	17258537	0.07	200000	
Mg	24	2	He	4953.510	247675.482	1.40	3987964	0.12	200000	
Al	27	2	He	1.884	94.193	13.70	1583	0.12	2000	
K	39	2	He	24.910	1245.498	2.49	213412	0.01	200000	
Ca	43	2	He	6639.824	331991.209	1.37	15627	42.49	200000	
Ca	44	2	He	6398.375	319918.768	2.40	255046	2.51	200000	
V	51	2	He	-0.525	-26.253	-8.88	22393	0.00	2000	
Cr	52	2	He	-0.021	-1.042	-180.31	4857	0.00	2000	
Mn	55	2	He	137.631	6881.546	1.49	605745	0.02	2000	
Fe	56	2	He	94.337	4716.864	1.50	514185	0.02	200000	
Co	59	2	He	1.406	70.301	1.34	12134	0.01	2000	
Ni	60	2	He	1.036	51.821	9.49	2013	0.05	2000	
Cu	63	2	He	0.381	19.074	6.96	743	0.05	2000	
Zn	66	2	He	0.872	43.611	8.07	630	0.14	2000	
As	75	2	He	0.121	6.041	19.51	919	0.01	2000	
Se	78	2	He	0.569	28.428	28.61	127	0.45	2000	
B	11	1	nogas	0.735	36.751	20.85	33950	0.00	2000	
Si	28	1	nogas	406.191	20309.528	1.74	6300897	0.01	2000	
Ca	43	1	nogas	6295.230	314761.487	0.56	223407	2.82	200000	
Ca	44	1	nogas	6001.074	300053.714	1.75	3850794	0.16	200000	
Fe	56	1	nogas	81.358	4067.886	1.61	4841965	0.00	200000	
Se	77	1	nogas	-41.619	-2080.950	-3.18	68890	-0.06	2000	
Se	82	1	nogas	0.104	5.191	305.73	267	0.04	2000	

Sample Report

Mo	95	1	nogas	-0.120	-6.017	-36.36	1690	-0.01	2000	
Sn	118	1	nogas	0.002	0.112	395.69	940	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	0.833	41.663	0.36	3354	0.02	2000	
Sb	121	2	He	0.321	16.073	7.67	1507	0.02	2000	
La	139	1	nogas	130.482	6524.117	4.60	543	24.01	2000	
Au	197	1	nogas	-872.242	-43612.116	-43.37	7	-13083.63	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1330116	2.28	1359891	97.81	70	125	
Ge	72	1	nogas	3137392	1.18	3145209	99.75	70	125	
In	115	1	nogas	2819446	1.76	2761164	102.11	70	125	
Bi	209	1	nogas	2214026	1.17	2190177	101.09	70	125	
Ge	72	2	He	738958	1.10	785020	94.13	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-04
Data File Name	057SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:54:25-06:00
Sample Type	Sample
Dilution	100
Comment	Diss135805Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.005	0.494	92.59	100	0.00	2000	
Na	23	1	nogas	5317.331	531733.068	2.79	130532682	0.00	200000	
Mg	24	1	nogas	1343.643	134364.309	4.19	20786215	0.01	200000	
Al	27	1	nogas	0.974	97.362	8.54	47443	0.00	2000	
K	39	1	nogas	87.592	8759.168	9.40	9786075	0.00	200000	
Ti	47	1	nogas	0.079	7.928	78.98	437	0.02	2000	
V	51	1	nogas	-3.551	-355.081	-89.26	2177202	0.00	2000	
Cr	52	1	nogas	-1.251	-125.109	-8.67	97856	0.00	2000	
Mn	55	1	nogas	80.913	8091.312	3.13	2167232	0.00	2000	
Co	59	1	nogas	0.705	70.529	4.56	17192	0.00	2000	
Ni	60	1	nogas	0.987	98.664	4.55	4837	0.02	2000	
Cu	63	1	nogas	-0.042	-4.174	-37.14	1913	0.00	2000	
Zn	66	1	nogas	0.420	41.956	5.24	890	0.05	2000	
As	75	1	nogas	-8.303	-830.324	-2.17	227402	0.00	2000	
Sr	88	1	nogas	51.757	5175.691	3.67	1406791	0.00	2000	
Ag	107	1	nogas	-0.009	-0.903	-15.46	197	0.00	2000	
Cd	111	1	nogas	0.009	0.918	84.96	43	0.02	2000	
Sb	121	1	nogas	0.247	24.702	3.03	3327	0.01	2000	
Tl	205	1	nogas	-0.017	-1.663	-16.21	613	0.00	2000	
Pb	208	1	nogas	-0.120	-12.010	-8.03	2513	0.00	2000	
U	238	1	nogas	0.012	1.188	11.99	390	0.00	2000	
[Pb]	206	1	nogas	-0.115	-11.510	-3.44	650	-0.02	2000	
[Pb]	207	1	nogas	-0.110	-10.998	-3.80	630	-0.02	2000	
Na	23	2	He	5327.004	532700.359	4.19	7909576	0.07	200000	
Mg	24	2	He	1285.596	128559.595	2.50	1030524	0.12	200000	
Al	27	2	He	1.226	122.614	24.58	1267	0.10	2000	
K	39	2	He	78.367	7836.659	4.11	259784	0.03	200000	
Ca	43	2	He	1785.203	178520.276	7.78	4204	42.47	200000	
Ca	44	2	He	1665.056	166505.642	1.90	68325	2.44	200000	
V	51	2	He	0.037	3.710	214.68	25463	0.00	2000	
Cr	52	2	He	-0.010	-1.032	-363.91	4901	0.00	2000	
Mn	55	2	He	77.325	7732.516	3.58	339742	0.02	2000	
Fe	56	2	He	484.747	48474.723	1.39	2582637	0.02	200000	
Co	59	2	He	0.699	69.886	8.20	6191	0.01	2000	
Ni	60	2	He	1.082	108.194	4.80	2100	0.05	2000	
Cu	63	2	He	0.371	37.052	1.91	683	0.05	2000	
Zn	66	2	He	0.621	62.054	10.96	303	0.20	2000	
As	75	2	He	0.105	10.465	10.12	894	0.01	2000	
Se	78	2	He	0.309	30.928	45.53	99	0.31	2000	
B	11	1	nogas	0.927	92.709	30.06	33727	0.00	2000	
Si	28	1	nogas	221.199	22119.885	2.77	4380546	0.01	2000	
Ca	43	1	nogas	1642.582	164258.222	4.29	60214	2.73	200000	
Ca	44	1	nogas	1190.469	119046.923	4.62	1122625	0.11	200000	
Fe	56	1	nogas	460.485	46048.498	0.74	13481079	0.00	200000	

Sample Report

Se	77	1	nogas	-24.958	-2495.786	-9.56	73484	-0.03	2000	
Se	82	1	nogas	-0.013	-1.340	-1985.88	240	-0.01	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	-0.162	-16.203	-24.77	1487	-0.01	2000	
Sn	118	1	nogas	-0.001	-0.136	-968.93	897	0.00	2000	
Ba	137	1	nogas	5.171	517.114	2.84	20205	0.03	2000	
Sb	121	2	He	0.292	29.245	2.22	1373	0.02	2000	
La	139	1	nogas	13.437	1343.681	124.05	97	13.90	2000	
Au	197	1	nogas	412.094	41209.390	232.28	27	1545.35	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1282582	5.07	1359891	94.32	70	125	
Ge	72	1	nogas	3186428	1.73	3145209	101.31	70	125	
In	115	1	nogas	2772419	1.43	2761164	100.41	70	125	
Bi	209	1	nogas	2200136	5.20	2190177	100.45	70	125	
Ge	72	2	He	735735	2.12	785020	93.72	70	125	

Sample Report

Sample Table

Sample Name	HS18120569-05
Data File Name	058SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:56:23-06:00
Sample Type	Sample
Dilution	100
Comment	Diss135805Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.006	0.610	151.15	110	0.01	2000	
Na	23	1	nogas	13905.681	1390568.056	1.63	337386116	0.00	200000	
Mg	24	1	nogas	4745.292	474529.246	2.24	72689302	0.01	200000	
Al	27	1	nogas	0.643	64.265	6.38	40407	0.00	2000	
K	39	1	nogas	33.134	3313.382	29.01	8598781	0.00	200000	
Ti	47	1	nogas	0.096	9.572	12.65	460	0.02	2000	
V	51	1	nogas	-6.638	-663.751	-49.93	2076567	0.00	2000	
Cr	52	1	nogas	-1.240	-124.026	-14.84	96774	0.00	2000	
Mn	55	1	nogas	95.037	9503.662	3.19	2507061	0.00	2000	
Co	59	1	nogas	0.013	1.327	44.53	1360	0.00	2000	
Ni	60	1	nogas	0.323	32.335	7.76	1467	0.02	2000	
Cu	63	1	nogas	0.000	0.030	5755.30	2394	0.00	2000	
Zn	66	1	nogas	0.477	47.715	8.23	1103	0.04	2000	
As	75	1	nogas	-8.682	-868.207	-15.58	222622	0.00	2000	
Sr	88	1	nogas	196.563	19656.291	1.58	5274503	0.00	2000	
Ag	107	1	nogas	-0.011	-1.144	-24.92	163	-0.01	2000	
Cd	111	1	nogas	0.006	0.574	123.89	33	0.02	2000	
Sb	121	1	nogas	0.153	15.261	3.39	2113	0.01	2000	
Tl	205	1	nogas	-0.023	-2.325	-11.55	490	0.00	2000	
Pb	208	1	nogas	-0.124	-12.399	-4.10	2413	-0.01	2000	
U	238	1	nogas	0.012	1.228	21.10	413	0.00	2000	
[Pb]	206	1	nogas	-0.116	-11.619	-4.50	663	-0.02	2000	
[Pb]	207	1	nogas	-0.140	-13.981	-7.18	467	-0.03	2000	
Na	23	2	He	13560.132	1356013.231	2.16	20427185	0.07	200000	
Mg	24	2	He	4590.216	459021.564	2.20	3745850	0.12	200000	
Al	27	2	He	0.534	53.434	47.44	957	0.06	2000	
K	39	2	He	23.440	2344.035	9.76	212137	0.01	200000	
Ca	43	2	He	7444.567	744456.746	1.70	17755	41.93	200000	
Ca	44	2	He	7167.021	716702.067	2.66	289227	2.48	200000	
V	51	2	He	-0.247	-24.740	-6.31	24296	0.00	2000	
Cr	52	2	He	0.065	6.467	69.00	5458	0.00	2000	
Mn	55	2	He	90.633	9063.283	1.06	405192	0.02	2000	
Fe	56	2	He	8.010	800.986	0.95	54992	0.01	200000	
Co	59	2	He	-0.001	-0.137	-1086.12	367	0.00	2000	
Ni	60	2	He	0.219	21.900	7.76	330	0.07	2000	
Cu	63	2	He	0.395	39.465	8.33	823	0.05	2000	
Zn	66	2	He	0.593	59.325	3.83	273	0.22	2000	
As	75	2	He	0.018	1.752	583.61	799	0.00	2000	
Se	78	2	He	0.424	42.417	50.15	113	0.37	2000	
B	11	1	nogas	0.387	38.739	57.36	31226	0.00	2000	
Si	28	1	nogas	154.118	15411.752	4.92	3602300	0.00	2000	
Ca	43	1	nogas	7168.774	716877.385	2.06	254907	2.81	200000	
Ca	44	1	nogas	6619.148	661914.848	2.64	4214178	0.16	200000	
Fe	56	1	nogas	2.925	292.508	191.33	3104608	0.00	200000	
Se	77	1	nogas	-30.726	-3072.606	-20.17	71339	-0.04	2000	
Se	82	1	nogas	0.127	12.694	81.87	273	0.05	2000	

Sample Report

Mo	95	1	nogas	-0.150	-15.031	-18.15	1533	-0.01	2000	
Sn	118	1	nogas	-0.028	-2.772	-68.52	700	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	1.077	107.666	8.56	4234	0.03	2000	
Sb	121	2	He	0.163	16.254	13.63	817	0.02	2000	
La	139	1	nogas	29.474	2947.351	21.05	157	18.81	2000	
Au	197	1	nogas	582.792	58279.183	101.33	30	1942.64	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1297317	2.32	1359891	95.40	70	125	
Ge	72	1	nogas	3146702	3.06	3145209	100.05	70	125	
In	115	1	nogas	2772065	5.38	2761164	100.39	70	125	
Bi	209	1	nogas	2272686	3.47	2190177	103.77	70	125	
Ge	72	2	He	749054	0.83	785020	95.42	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	065_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:10:18-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	84.030	2.983	747275	0.89	100	84.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	9718.500	6.889	241232972	3.35	10000	97.2	90	110	
Mg	24	1	nogas	9486.793	5.035	148666299	0.20	10000	94.9	90	110	
Al	27	1	nogas	111.770	2.280	2181116	1.59	100	111.8	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9672.968	0.905	194755579	0.46	10000	96.7	90	110	
Ti	47	1	nogas	93.669	0.797	161834	1.70	100	93.7	90	110	
V	51	1	nogas	86.759	4.931	4211268	2.02	100	86.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	96.546	2.836	2164102	3.60	100	96.5	90	110	
Mn	55	1	nogas	100.714	3.108	2628924	3.46	100	100.7	90	110	
Co	59	1	nogas	97.628	0.888	2180229	1.28	100	97.6	90	110	
Ni	60	1	nogas	94.674	0.744	467342	1.65	100	94.7	90	110	
Cu	63	1	nogas	93.612	0.465	1113153	1.39	100	93.6	90	110	
Zn	66	1	nogas	96.061	0.900	373651	0.82	100	96.1	90	110	
As	75	1	nogas	86.737	2.376	670605	0.56	100	86.7	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.629	0.720	2566521	1.45	100	96.6	90	110	
Ag	107	1	nogas	99.873	3.595	1298716	4.27	100	99.9	90	110	
Cd	111	1	nogas	94.779	1.881	270017	1.38	100	94.8	90	110	
Sb	121	1	nogas	93.547	1.738	1149140	1.66	100	93.5	90	110	
Tl	205	1	nogas	90.605	1.718	1882106	3.13	100	90.6	90	110	
Pb	208	1	nogas	101.662	2.801	2618675	2.79	100	101.7	90	110	
U	238	1	nogas	99.708	2.569	2772504	3.01	100	99.7	90	110	
[Pb]	206	1	nogas	88.164	1.064	622059	1.54	100	88.2	90	110	CCV Main CR1-2 Failed
[Pb]	207	1	nogas	90.351	1.226	553360	1.73	100	90.4	90	110	
Na	23	2	He	9678.006	0.923	14225419	1.52	10000	96.8	90	110	
Mg	24	2	He	9682.787	1.259	7700863	0.46	10000	96.8	90	110	
Al	27	2	He	115.023	2.521	54489	1.22	100	115.0	90	110	CCV Main CR1-2 Failed
K	39	2	He	9402.050	1.601	8347889	1.56	10000	94.0	90	110	
Ca	43	2	He	9448.418	0.457	21953	1.71	10000	94.5	90	110	
Ca	44	2	He	9395.441	1.469	368594	0.58	10000	94.0	90	110	
V	51	2	He	93.613	1.116	549110	0.80	100	93.6	90	110	
Cr	52	2	He	95.528	1.579	585756	1.81	100	95.5	90	110	
Mn	55	2	He	94.844	2.185	413157	2.41	100	94.8	90	110	
Fe	56	2	He	9712.651	2.126	51132256	1.26	10000	97.1	90	110	
Co	59	2	He	94.268	1.256	779197	0.31	100	94.3	90	110	
Ni	60	2	He	97.527	2.499	198954	1.81	100	97.5	90	110	
Cu	63	2	He	97.719	2.490	507224	1.64	100	97.7	90	110	
Zn	66	2	He	95.237	1.444	121158	0.70	100	95.2	90	110	
As	75	2	He	93.352	1.473	118033	0.34	100	93.4	90	110	
Se	78	2	He	90.869	3.548	9300	2.12	100	90.9	90	110	
B	11	1	nogas	437.566	5.335	2298706	3.21	500	87.5	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4671.641	0.437	51739239	1.34	5000	93.4	90	110	
Ca	43	1	nogas	9428.537	1.984	331375	1.67	10000	94.3	90	110	
Ca	44	1	nogas	9088.714	2.844	5569923	2.62	10000	90.9	90	110	
Fe	56	1	nogas	9642.451	1.451	215844896	2.31	10000	96.4	90	110	
Se	77	1	nogas	45.031	23.558	86203	1.97	100	45.0	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.429	3.075	24393	3.12	100	93.4	90	110	
Mo	95	1	nogas	94.456	0.962	509287	1.72	100	94.5	90	110	
Sn	118	1	nogas	91.618	1.203	680731	1.74	100	91.6	90	110	
Ba	137	1	nogas	96.287	4.067	373403	1.32	100	96.3	90	110	
Sb	121	2	He	94.704	2.273	413182	2.65	100	94.7	90	110	
Li	7	1	nogas	95.337	4.565	1794920	2.40	100	95.3	90	110	
P	31	1	nogas	456.604	0.863	819121	1.60	500	91.3	90	110	
La	139	1	nogas	181.158	11.806	720	11.37	100	181.2	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	833.064	111.744	33	45.83	100	833.1	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1244588	2.12	1359891	91.52	70	125	
Ge	72	1	nogas	3113742	0.92	3145209	99.00	70	125	
In	115	1	nogas	2760370	2.91	2761164	99.97	70	125	
Bi	209	1	nogas	2227461	2.33	2190177	101.70	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	730077	1.55	785020	93.00	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	066_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:12:17-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.039	37.2	443	29.0	1	
Na	23	1	nogas	10.866	13.4	670765	5.3	100	
Mg	24	1	nogas	6.202	18.3	100961	17.3	100	
Al	27	1	nogas	19.828	1.3	424873	2.4	5	CCB Main CR1 Failed
K	39	1	nogas	-14.951	-45.9	7862592	0.7	100	
Ti	47	1	nogas	0.087	54.6	457	17.6	2.5	
V	51	1	nogas	-21.480	-5.6	1777174	2.8	2.5	
Cr	52	1	nogas	-1.796	-3.1	87190	1.4	2.5	
Mn	55	1	nogas	0.060	30.3	33150	0.7	2.5	
Co	59	1	nogas	0.033	55.4	1857	21.8	2.5	
Ni	60	1	nogas	0.237	20.4	1063	22.1	2.5	
Cu	63	1	nogas	0.020	48.5	2694	3.2	2	
Zn	66	1	nogas	0.581	6.6	1553	8.7	2.5	
As	75	1	nogas	-13.362	-4.7	205660	1.7	2.5	
Sr	88	1	nogas	0.387	3.5	11490	3.7	2.5	
Ag	107	1	nogas	0.028	30.6	703	15.7	2.5	
Cd	111	1	nogas	0.049	23.0	157	18.4	1	
Sb	121	1	nogas	1.657	21.7	21290	20.3	2.5	
Tl	205	1	nogas	0.129	66.5	3727	46.5	1	
Pb	208	1	nogas	-0.044	-76.8	4474	19.4	2.5	
U	238	1	nogas	0.116	60.2	3351	56.7	2.5	
[Pb]	206	1	nogas	-0.055	-32.8	1107	11.2	2.5	
[Pb]	207	1	nogas	-0.062	-61.6	953	22.4	2.5	
Na	23	2	He	6.386	19.8	61563	2.1	100	
Mg	24	2	He	4.313	4.6	3940	5.3	100	
Al	27	2	He	20.018	3.4	10273	2.7	5	CCB Main CR1 Failed
K	39	2	He	-11.824	-18.0	181546	1.0	100	
Ca	43	2	He	91.911	40.7	253	35.8	100	
Ca	44	2	He	48.128	5.0	5004	2.2	100	
V	51	2	He	-0.802	-4.2	21038	0.6	2.5	
Cr	52	2	He	-0.093	-16.4	4457	1.0	2.5	
Mn	55	2	He	-0.055	-65.4	2157	6.9	2.5	
Fe	56	2	He	3.633	11.3	31237	6.7	100	
Co	59	2	He	0.004	132.8	413	12.2	2.5	
Ni	60	2	He	0.178	14.7	243	23.7	2.5	
Cu	63	2	He	0.433	1.2	1027	3.7	2	
Zn	66	2	He	0.775	6.7	510	14.1	2.5	
As	75	2	He	0.055	69.6	843	6.4	2.5	
Se	78	2	He	0.731	22.2	145	11.2	2	
B	11	1	nogas	3.822	23.2	53324	5.8	10	
Si	28	1	nogas	-40.245	-30.6	1547600	7.6	5	
Ca	43	1	nogas	68.120	13.8	3894	7.5	100	
Ca	44	1	nogas	-376.219	-1.5	217915	0.6	100	
Fe	56	1	nogas	-19.758	-29.7	2668004	3.8	100	
Se	77	1	nogas	-60.697	-5.8	66826	1.6	2.5	
Se	82	1	nogas	0.111	8.6	277	2.1	2	
Mo	95	1	nogas	0.142	120.1	3194	28.5	2.5	
Sn	118	1	nogas	0.226	36.8	2577	24.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.286	20.3	1157	19.8	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.048	6.0	4764	6.3	2.5	
P	31	1	nogas	0.875	99.8	84752	0.8	10	
La	139	1	nogas	80.810	23.2	347	22.0	2.5	CCB Main CR1 Failed
Au	197	1	nogas	576.966	109.1	30	33.3	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1391875	4.52	1359891	102.35	70	125	
Ge	72	1	nogas	3228810	1.21	3145209	102.66	70	125	
In	115	1	nogas	2749225	2.08	2761164	99.57	70	125	
Bi	209	1	nogas	2289745	3.47	2190177	104.55	70	125	
Ge	72	2	He	746487	1.15	785020	95.09	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	070_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:20:17-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	80.564	2.167	752794	2.03	100	80.6	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	9714.897	4.961	236686914	2.88	10000	97.1	90	110	
Mg	24	1	nogas	9640.629	2.894	148266416	0.30	10000	96.4	90	110	
Al	27	1	nogas	112.601	2.304	2225662	2.10	100	112.6	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9403.085	1.183	191997288	1.30	10000	94.0	90	110	
Ti	47	1	nogas	92.590	3.648	162026	3.56	100	92.6	90	110	
V	51	1	nogas	80.346	0.517	4116000	0.47	100	80.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	93.742	3.282	2131691	3.35	100	93.7	90	110	
Mn	55	1	nogas	99.328	0.944	2626399	0.56	100	99.3	90	110	
Co	59	1	nogas	95.818	0.646	2167381	0.34	100	95.8	90	110	
Ni	60	1	nogas	92.440	1.729	462169	1.60	100	92.4	90	110	
Cu	63	1	nogas	90.086	1.177	1085073	0.80	100	90.1	90	110	
Zn	66	1	nogas	92.984	0.366	366334	0.63	100	93.0	90	110	
As	75	1	nogas	84.341	1.186	667880	1.08	100	84.3	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.137	3.476	2586363	3.52	100	96.1	90	110	
Ag	107	1	nogas	94.903	2.712	1249808	2.59	100	94.9	90	110	
Cd	111	1	nogas	92.505	1.356	274151	3.29	100	92.5	90	110	
Sb	121	1	nogas	91.000	1.547	1132366	1.92	100	91.0	90	110	
Tl	205	1	nogas	100.910	0.449	1981863	2.53	100	100.9	90	110	
Pb	208	1	nogas	98.472	1.531	2536672	1.53	100	98.5	90	110	
U	238	1	nogas	100.679	0.931	2647304	2.52	100	100.7	90	110	
[Pb]	206	1	nogas	93.253	1.744	621983	0.84	100	93.3	90	110	
[Pb]	207	1	nogas	93.192	0.878	539636	1.42	100	93.2	90	110	
Na	23	2	He	9667.026	1.478	14308121	1.56	10000	96.7	90	110	
Mg	24	2	He	9758.610	1.904	7817162	3.00	10000	97.6	90	110	
Al	27	2	He	109.756	1.745	52406	2.85	100	109.8	90	110	
K	39	2	He	9292.220	1.049	8252613	1.02	10000	92.9	90	110	
Ca	43	2	He	9503.449	2.367	22230	1.22	10000	95.0	90	110	
Ca	44	2	He	9426.638	2.543	372367	1.58	10000	94.3	90	110	
V	51	2	He	93.157	2.020	550333	0.82	100	93.2	90	110	
Cr	52	2	He	94.328	1.652	582440	0.50	100	94.3	90	110	
Mn	55	2	He	93.871	0.984	411786	1.01	100	93.9	90	110	
Fe	56	2	He	9567.227	2.513	50720341	2.04	10000	95.7	90	110	
Co	59	2	He	93.193	0.974	775730	0.63	100	93.2	90	110	
Ni	60	2	He	96.856	1.983	198977	1.61	100	96.9	90	110	
Cu	63	2	He	96.255	2.054	503204	2.64	100	96.3	90	110	
Zn	66	2	He	94.657	1.738	121285	2.78	100	94.7	90	110	
As	75	2	He	92.483	1.913	117758	1.02	100	92.5	90	110	
Se	78	2	He	91.203	1.732	9401	1.37	100	91.2	90	110	
B	11	1	nogas	412.178	2.969	2277104	1.12	500	82.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4567.310	1.793	51276331	1.36	5000	91.3	90	110	
Ca	43	1	nogas	9087.777	1.291	323596	1.52	10000	90.9	90	110	
Ca	44	1	nogas	8582.125	0.448	5351323	0.27	10000	85.8	90	110	CCV Main CR1-2 Failed
Fe	56	1	nogas	9623.248	2.423	218189247	2.61	10000	96.2	90	110	
Se	77	1	nogas	39.883	22.838	86247	1.86	100	39.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	91.485	3.283	24200	3.37	100	91.5	90	110	
Mo	95	1	nogas	94.326	1.851	515121	1.70	100	94.3	90	110	
Sn	118	1	nogas	89.591	2.164	692288	2.82	100	89.6	90	110	CCV Main CR1-2 Failed
Ba	137	1	nogas	92.430	3.651	372780	1.13	100	92.4	90	110	
Sb	121	2	He	94.228	2.753	413889	1.76	100	94.2	90	110	
Li	7	1	nogas	93.017	0.539	1843280	2.17	100	93.0	90	110	
P	31	1	nogas	453.830	1.181	825104	0.98	500	90.8	90	110	
La	139	1	nogas	170.533	21.702	710	22.67	100	170.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-172.412	-221.503	17	34.64	100	-172.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1307344	1.83	1359891	96.14	70	125	
Ge	72	1	nogas	3153911	0.38	3145209	100.28	70	125	
In	115	1	nogas	2871676	4.53	2761164	104.00	70	125	
Bi	209	1	nogas	2106084	2.09	2190177	96.16	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	735155	1.17	785020	93.65	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	071_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:22:16-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.043	26.3	467	23.7	1	
Na	23	1	nogas	8.090	18.8	623864	4.8	100	
Mg	24	1	nogas	6.083	22.4	102329	19.3	100	
Al	27	1	nogas	20.074	5.9	422190	1.3	5	CCB Main CR1 Failed
K	39	1	nogas	-6.602	-328.0	7889992	0.4	100	
Ti	47	1	nogas	0.082	99.2	437	28.3	2.5	
V	51	1	nogas	-19.277	-20.8	1798084	2.8	2.5	
Cr	52	1	nogas	-1.629	-9.3	89320	1.5	2.5	
Mn	55	1	nogas	0.068	179.1	32736	4.9	2.5	
Co	59	1	nogas	0.032	60.4	1787	19.6	2.5	
Ni	60	1	nogas	0.208	1.7	903	5.5	2.5	
Cu	63	1	nogas	0.017	178.7	2614	11.3	2	
Zn	66	1	nogas	0.576	8.4	1503	7.7	2.5	
As	75	1	nogas	-11.229	-22.7	212323	2.7	2.5	
Sr	88	1	nogas	0.391	18.6	11337	12.2	2.5	
Ag	107	1	nogas	0.025	61.0	643	27.4	2.5	
Cd	111	1	nogas	0.047	64.7	160	60.3	1	
Sb	121	1	nogas	1.710	27.0	21514	22.7	2.5	
Tl	205	1	nogas	0.138	67.0	3814	49.0	1	
Pb	208	1	nogas	-0.052	-35.5	4260	11.2	2.5	
U	238	1	nogas	0.128	64.2	3597	61.8	2.5	
[Pb]	206	1	nogas	-0.045	-51.0	1143	12.8	2.5	
[Pb]	207	1	nogas	-0.065	-51.2	910	23.2	2.5	
Na	23	2	He	6.399	18.0	60894	2.4	100	
Mg	24	2	He	4.420	4.8	3980	3.9	100	
Al	27	2	He	20.254	5.7	10266	4.1	5	CCB Main CR1 Failed
K	39	2	He	-11.944	-15.9	181442	0.9	100	
Ca	43	2	He	94.450	39.7	257	35.4	100	
Ca	44	2	He	42.765	8.2	4737	3.7	100	
V	51	2	He	-0.695	-9.2	21404	0.7	2.5	
Cr	52	2	He	-0.078	-43.0	4504	5.3	2.5	
Mn	55	2	He	-0.098	-15.3	1947	2.6	2.5	
Fe	56	2	He	3.790	3.9	31734	3.4	100	
Co	59	2	He	0.006	145.6	420	16.5	2.5	
Ni	60	2	He	0.194	19.5	273	29.6	2.5	
Cu	63	2	He	0.430	3.8	1000	7.8	2	
Zn	66	2	He	0.757	11.9	480	24.0	2.5	
As	75	2	He	0.027	212.6	798	8.1	2.5	
Se	78	2	He	0.611	32.5	131	15.3	2	
B	11	1	nogas	4.695	11.8	56504	5.2	10	
Si	28	1	nogas	-29.824	-33.1	1634119	1.6	5	
Ca	43	1	nogas	66.223	25.2	3747	10.8	100	
Ca	44	1	nogas	-379.380	-4.5	212348	0.6	100	
Fe	56	1	nogas	-19.939	-42.5	2616656	2.4	100	
Se	77	1	nogas	-46.556	-47.4	68619	4.2	2.5	
Se	82	1	nogas	-0.093	-270.2	217	27.0	2	
Mo	95	1	nogas	0.001	10528.5	2360	24.5	2.5	
Sn	118	1	nogas	0.216	27.3	2627	19.9	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.249	12.6	1063	14.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.166	6.6	5231	7.6	2.5	
P	31	1	nogas	1.432	175.6	84207	0.2	10	
La	139	1	nogas	67.892	13.9	313	14.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-438.731	-229.4	13	114.6	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1343762	1.49	1359891	98.81	70	125	
Ge	72	1	nogas	3177961	5.10	3145209	101.04	70	125	
In	115	1	nogas	2885254	2.71	2761164	104.49	70	125	
Bi	209	1	nogas	2222796	1.44	2190177	101.49	70	125	
Ge	72	2	He	738075	1.27	785020	94.02	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	083_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:00:51-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.062	13.3	667	10.6	1	
Na	23	1	nogas	29.264	8.1	1122579	3.9	100	
Mg	24	1	nogas	9.489	16.7	151945	14.8	100	
Al	27	1	nogas	20.159	1.3	421847	1.9	5	CCB Main CR1 Failed
K	39	1	nogas	12.688	126.2	8225653	0.8	100	
Ti	47	1	nogas	0.079	12.5	433	3.5	2.5	
V	51	1	nogas	-31.887	-3.8	1494711	4.6	2.5	
Cr	52	1	nogas	-2.062	-4.0	79556	2.5	2.5	
Mn	55	1	nogas	0.190	39.9	35775	2.3	2.5	
Co	59	1	nogas	0.061	16.7	2444	6.9	2.5	
Ni	60	1	nogas	0.312	14.3	1413	12.8	2.5	
Cu	63	1	nogas	0.079	24.9	3347	5.8	2	
Zn	66	1	nogas	0.618	11.1	1663	13.2	2.5	
As	75	1	nogas	-17.069	-5.2	183322	1.5	2.5	
Sr	88	1	nogas	0.441	5.3	12671	2.2	2.5	
Ag	107	1	nogas	0.042	29.6	863	15.8	2.5	
Cd	111	1	nogas	0.068	65.8	210	60.8	1	
Sb	121	1	nogas	0.137	10.0	1927	6.4	2.5	
Tl	205	1	nogas	0.605	65.1	13157	61.9	1	
Pb	208	1	nogas	-0.014	-271.3	5230	19.2	2.5	
U	238	1	nogas	0.151	47.9	4161	48.6	2.5	
[Pb]	206	1	nogas	-0.020	-170.2	1287	19.1	2.5	
[Pb]	207	1	nogas	-0.023	-253.8	1137	31.3	2.5	
Na	23	2	He	22.508	6.4	85383	1.5	100	
Mg	24	2	He	7.584	2.9	6575	2.8	100	
Al	27	2	He	20.943	3.8	10680	4.7	5	CCB Main CR1 Failed
K	39	2	He	-0.969	-121.0	190963	0.5	100	
Ca	43	2	He	85.578	19.9	237	16.0	100	
Ca	44	2	He	49.281	6.5	5031	2.4	100	
V	51	2	He	-1.386	-2.5	17631	1.9	2.5	
Cr	52	2	He	-0.004	-703.5	4994	3.5	2.5	
Mn	55	2	He	0.063	59.0	2670	5.0	2.5	
Fe	56	2	He	6.469	9.8	46312	6.3	100	
Co	59	2	He	0.039	33.2	703	15.7	2.5	
Ni	60	2	He	0.222	12.3	333	16.5	2.5	
Cu	63	2	He	0.443	4.4	1073	10.0	2	
Zn	66	2	He	0.738	8.7	460	19.0	2.5	
As	75	2	He	-0.050	-52.6	707	5.9	2.5	
Se	78	2	He	0.685	19.4	139	8.8	2	
B	11	1	nogas	5.836	16.4	64883	7.2	10	
Si	28	1	nogas	-29.597	-22.2	1628314	1.6	5	
Ca	43	1	nogas	70.202	14.5	3877	6.1	100	
Ca	44	1	nogas	-445.331	-2.2	173334	0.4	100	
Fe	56	1	nogas	-25.754	-29.0	2472802	3.8	100	
Se	77	1	nogas	-92.997	-5.9	58594	2.2	2.5	
Se	82	1	nogas	-0.040	-413.7	230	15.7	2	
Mo	95	1	nogas	0.106	179.4	2914	31.8	2.5	
Sn	118	1	nogas	0.282	26.7	2970	19.6	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.286	2.5	1150	4.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.097	3.0	520	1.9	2.5	
P	31	1	nogas	3.794	53.6	87618	0.9	10	
La	139	1	nogas	75.823	24.1	327	23.0	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-414.995	-97.2	13	43.3	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1387049	1.70	1359891	102.00	70	125	
Ge	72	1	nogas	3157720	3.12	3145209	100.40	70	125	
In	115	1	nogas	2734738	2.44	2761164	99.04	70	125	
Bi	209	1	nogas	2159308	1.77	2190177	98.59	70	125	
Ge	72	2	He	743688	1.13	785020	94.73	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	084_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:05:07-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	87.005	2.572	788394	0.81	100	87.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10296.773	2.910	246228039	1.10	10000	103.0	90	110	
Mg	24	1	nogas	10191.867	3.440	153829612	2.56	10000	101.9	90	110	
Al	27	1	nogas	105.822	2.917	2002895	2.86	100	105.8	90	110	
K	39	1	nogas	10155.845	1.701	197801621	2.14	10000	101.6	90	110	
Ti	47	1	nogas	99.853	0.541	167185	2.08	100	99.9	90	110	
V	51	1	nogas	89.502	1.209	4143023	1.38	100	89.5	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.068	1.068	2169045	0.89	100	100.1	90	110	
Mn	55	1	nogas	103.134	1.587	2608311	2.31	100	103.1	90	110	
Co	59	1	nogas	103.791	4.936	2245161	3.36	100	103.8	90	110	
Ni	60	1	nogas	100.669	1.517	481547	0.88	100	100.7	90	110	
Cu	63	1	nogas	97.030	1.734	1118259	2.98	100	97.0	90	110	
Zn	66	1	nogas	98.709	0.799	372121	0.94	100	98.7	90	110	
As	75	1	nogas	94.568	1.778	685814	1.97	100	94.6	90	110	
Sr	88	1	nogas	100.231	1.806	2580061	2.39	100	100.2	90	110	
Ag	107	1	nogas	102.514	1.086	1291949	2.74	100	102.5	90	110	
Cd	111	1	nogas	96.592	2.501	272319	2.04	100	96.6	90	110	
Sb	121	1	nogas	98.042	2.093	1167213	2.20	100	98.0	90	110	
Tl	205	1	nogas	93.424	4.118	1921521	1.37	100	93.4	90	110	
Pb	208	1	nogas	101.230	0.944	2607582	0.94	100	101.2	90	110	
U	238	1	nogas	99.630	4.033	2743538	1.56	100	99.6	90	110	
[Pb]	206	1	nogas	90.731	4.667	633819	0.55	100	90.7	90	110	
[Pb]	207	1	nogas	93.241	5.895	565175	1.60	100	93.2	90	110	
Na	23	2	He	9924.085	2.070	14715864	0.86	10000	99.2	90	110	
Mg	24	2	He	9966.378	2.759	7997483	1.70	10000	99.7	90	110	
Al	27	2	He	99.103	2.451	47470	1.18	100	99.1	90	110	
K	39	2	He	9765.013	2.729	8662752	2.67	10000	97.7	90	110	
Ca	43	2	He	9603.067	0.264	22514	1.38	10000	96.0	90	110	
Ca	44	2	He	9655.031	2.478	382114	1.63	10000	96.6	90	110	
V	51	2	He	96.015	0.378	567727	1.63	100	96.0	90	110	
Cr	52	2	He	96.700	0.510	598260	0.76	100	96.7	90	110	
Mn	55	2	He	98.304	1.621	432010	1.51	100	98.3	90	110	
Fe	56	2	He	9988.294	2.063	53060028	0.98	10000	99.9	90	110	
Co	59	2	He	96.671	1.323	806305	0.18	100	96.7	90	110	
Ni	60	2	He	100.002	2.173	205854	1.11	100	100.0	90	110	
Cu	63	2	He	98.261	1.807	514685	0.58	100	98.3	90	110	
Zn	66	2	He	98.198	1.292	126078	0.77	100	98.2	90	110	
As	75	2	He	94.497	1.441	120559	0.64	100	94.5	90	110	
Se	78	2	He	96.980	2.171	10013	1.63	100	97.0	90	110	
B	11	1	nogas	450.809	2.865	2414011	3.71	500	90.2	90	110	
Si	28	1	nogas	4893.989	1.882	52433873	1.19	5000	97.9	90	110	
Ca	43	1	nogas	9823.491	0.859	334599	2.17	10000	98.2	90	110	
Ca	44	1	nogas	9456.412	1.025	5599707	0.69	10000	94.6	90	110	
Fe	56	1	nogas	10091.338	2.819	218752097	2.55	10000	100.9	90	110	
Se	77	1	nogas	79.226	4.945	90376	1.52	100	79.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	96.442	5.038	24394	4.81	100	96.4	90	110	
Mo	95	1	nogas	99.697	1.940	520942	3.52	100	99.7	90	110	
Sn	118	1	nogas	95.477	2.127	701880	1.08	100	95.5	90	110	
Ba	137	1	nogas	99.459	1.676	381903	2.08	100	99.5	90	110	
Sb	121	2	He	97.420	2.372	428802	1.19	100	97.4	90	110	
Li	7	1	nogas	99.324	3.702	1901974	3.91	100	99.3	90	110	
P	31	1	nogas	485.793	0.832	839560	0.93	500	97.2	90	110	
La	139	1	nogas	115.400	17.925	470	14.89	100	115.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-21.764	-2731.739	20	50.00	100	-21.8	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1268052	1.93	1359891	93.25	70	125	
Ge	72	1	nogas	3017813	1.65	3145209	95.95	70	125	
In	115	1	nogas	2731094	1.33	2761164	98.91	70	125	
Bi	209	1	nogas	2208247	4.50	2190177	100.83	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	736688	1.26	785020	93.84	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	092_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:24:05-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.064	13.4	697	6.8	1	
Na	23	1	nogas	26.644	8.7	1046678	3.5	100	
Mg	24	1	nogas	10.031	3.8	158718	3.9	100	
Al	27	1	nogas	20.471	1.5	427281	1.1	5	CCB Main CR1 Failed
K	39	1	nogas	0.301	773.7	7975381	0.3	100	
Ti	47	1	nogas	0.101	23.8	470	9.3	2.5	
V	51	1	nogas	-45.862	-1.2	1165180	1.2	2.5	
Cr	52	1	nogas	-2.525	-2.9	69523	1.9	2.5	
Mn	55	1	nogas	0.120	21.3	33935	2.2	2.5	
Co	59	1	nogas	0.071	17.1	2667	10.7	2.5	
Ni	60	1	nogas	0.293	5.9	1320	6.2	2.5	
Cu	63	1	nogas	0.097	10.0	3560	3.7	2	
Zn	66	1	nogas	0.621	3.2	1677	4.3	2.5	
As	75	1	nogas	-22.700	-4.2	156173	2.7	2.5	
Sr	88	1	nogas	0.438	5.5	12588	5.5	2.5	
Ag	107	1	nogas	0.038	37.5	810	23.1	2.5	
Cd	111	1	nogas	0.071	29.0	220	25.3	1	
Sb	121	1	nogas	1.346	14.6	16959	14.7	2.5	
Tl	205	1	nogas	0.317	54.8	7759	47.8	1	
Pb	208	1	nogas	-0.037	-55.4	4637	11.5	2.5	
U	238	1	nogas	0.137	43.0	3981	42.2	2.5	
[Pb]	206	1	nogas	-0.054	-13.1	1120	4.7	2.5	
[Pb]	207	1	nogas	-0.044	-94.9	1070	24.5	2.5	
Na	23	2	He	17.268	8.0	78220	1.6	100	
Mg	24	2	He	8.083	12.2	7031	10.3	100	
Al	27	2	He	20.831	4.3	10713	4.3	5	CCB Main CR1 Failed
K	39	2	He	-6.792	-26.1	185911	0.8	100	
Ca	43	2	He	81.927	15.0	230	11.5	100	
Ca	44	2	He	55.245	10.5	5311	3.8	100	
V	51	2	He	-2.077	-1.5	13802	0.6	2.5	
Cr	52	2	He	-0.090	-54.5	4504	7.9	2.5	
Mn	55	2	He	0.064	64.2	2700	6.4	2.5	
Fe	56	2	He	7.218	7.7	50753	4.7	100	
Co	59	2	He	0.039	13.3	713	5.3	2.5	
Ni	60	2	He	0.213	10.0	317	13.1	2.5	
Cu	63	2	He	0.492	6.4	1343	11.6	2	
Zn	66	2	He	0.758	5.6	490	10.8	2.5	
As	75	2	He	-0.074	-54.6	681	6.5	2.5	
Se	78	2	He	0.602	13.2	132	6.9	2	
B	11	1	nogas	12.116	13.1	101926	3.6	10	CCB Main CR1 Failed
Si	28	1	nogas	-23.283	-9.8	1695065	1.5	5	
Ca	43	1	nogas	78.734	6.4	4181	4.6	100	
Ca	44	1	nogas	-443.355	-0.2	174281	0.2	100	
Fe	56	1	nogas	-23.142	-11.4	2530181	2.4	100	
Se	77	1	nogas	-131.096	-4.3	50567	2.2	2.5	
Se	82	1	nogas	0.149	42.4	280	6.2	2	
Mo	95	1	nogas	0.089	98.7	2837	17.0	2.5	
Sn	118	1	nogas	0.286	16.8	3057	9.4	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.293	12.1	1197	8.4	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.984	4.9	4497	4.4	2.5	
P	31	1	nogas	4.647	13.6	88928	0.8	10	
La	139	1	nogas	75.934	12.5	333	12.1	2.5	CCB Main CR1 Failed
Au	197	1	nogas	156.515	231.1	23	24.7	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1400382	5.40	1359891	102.98	70	125	
Ge	72	1	nogas	3152228	0.41	3145209	100.22	70	125	
In	115	1	nogas	2794576	3.28	2761164	101.21	70	125	
Bi	209	1	nogas	2293933	0.96	2190177	104.74	70	125	
Ge	72	2	He	749964	1.19	785020	95.53	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	094_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:32:55-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	86.504	1.884	796478	0.71	100	86.5	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10259.893	5.486	247743922	1.35	10000	102.6	90	110	
Mg	24	1	nogas	10099.943	3.412	154007349	0.83	10000	101.0	90	110	
Al	27	1	nogas	99.187	2.071	1940040	1.03	100	99.2	90	110	
K	39	1	nogas	9853.819	1.023	198393971	0.75	10000	98.5	90	110	
Ti	47	1	nogas	96.371	0.395	166610	1.34	100	96.4	90	110	
V	51	1	nogas	79.821	4.509	4053736	0.47	100	79.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	99.499	1.900	2227928	2.44	100	99.5	90	110	
Mn	55	1	nogas	103.552	2.976	2704690	4.20	100	103.6	90	110	
Co	59	1	nogas	100.211	1.083	2239355	0.50	100	100.2	90	110	
Ni	60	1	nogas	97.807	0.073	483162	1.51	100	97.8	90	110	
Cu	63	1	nogas	96.175	2.072	1144177	0.61	100	96.2	90	110	
Zn	66	1	nogas	98.307	1.759	382645	0.22	100	98.3	90	110	
As	75	1	nogas	89.158	1.166	682573	0.99	100	89.2	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	99.198	3.198	2635843	1.61	100	99.2	90	110	
Ag	107	1	nogas	98.635	1.507	1283579	2.82	100	98.6	90	110	
Cd	111	1	nogas	97.136	2.691	276426	1.69	100	97.1	90	110	
Sb	121	1	nogas	98.556	0.871	1211543	0.71	100	98.6	90	110	
Tl	205	1	nogas	98.897	2.974	1973409	2.54	100	98.9	90	110	
Pb	208	1	nogas	103.057	1.048	2654527	1.05	100	103.1	90	110	
U	238	1	nogas	104.005	0.832	2778699	0.23	100	104.0	90	110	
[Pb]	206	1	nogas	95.112	2.910	644661	2.27	100	95.1	90	110	
[Pb]	207	1	nogas	96.435	2.356	567386	1.74	100	96.4	90	110	
Na	23	2	He	9906.302	0.339	14581438	1.59	10000	99.1	90	110	
Mg	24	2	He	10042.396	0.538	7999488	1.65	10000	100.4	90	110	
Al	27	2	He	97.329	3.466	46283	3.13	100	97.3	90	110	
K	39	2	He	9533.132	0.309	8461600	0.30	10000	95.3	90	110	
Ca	43	2	He	9656.450	2.663	22470	3.57	10000	96.6	90	110	
Ca	44	2	He	9653.701	1.469	379200	0.92	10000	96.5	90	110	
V	51	2	He	97.466	2.411	571449	1.22	100	97.5	90	110	
Cr	52	2	He	98.356	1.209	603798	0.75	100	98.4	90	110	
Mn	55	2	He	98.278	1.103	428635	1.00	100	98.3	90	110	
Fe	56	2	He	10050.643	1.571	52989324	0.39	10000	100.5	90	110	
Co	59	2	He	97.125	1.270	804018	1.41	100	97.1	90	110	
Ni	60	2	He	99.039	2.010	202330	0.75	100	99.0	90	110	
Cu	63	2	He	100.560	2.882	522754	2.06	100	100.6	90	110	
Zn	66	2	He	97.996	2.318	124859	1.59	100	98.0	90	110	
As	75	2	He	96.478	0.750	122153	1.43	100	96.5	90	110	
Se	78	2	He	94.329	1.565	9668	1.62	100	94.3	90	110	
B	11	1	nogas	446.875	2.776	2430521	1.00	500	89.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4755.042	1.807	52658589	0.22	5000	95.1	90	110	
Ca	43	1	nogas	9500.408	3.657	334045	2.08	10000	95.0	90	110	
Ca	44	1	nogas	9098.566	2.526	5578895	1.43	10000	91.0	90	110	
Fe	56	1	nogas	10018.598	1.135	224311588	2.18	10000	100.2	90	110	
Se	77	1	nogas	50.938	16.751	87479	0.64	100	50.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	94.211	3.149	24607	1.59	100	94.2	90	110	
Mo	95	1	nogas	99.500	3.401	536595	2.27	100	99.5	90	110	
Sn	118	1	nogas	95.774	0.295	710912	2.10	100	95.8	90	110	
Ba	137	1	nogas	98.895	2.753	383224	0.61	100	98.9	90	110	
Sb	121	2	He	100.801	1.915	440343	0.67	100	100.8	90	110	
Li	7	1	nogas	97.483	2.030	1898321	1.83	100	97.5	90	110	
P	31	1	nogas	474.614	2.324	848708	0.70	500	94.9	90	110	
La	139	1	nogas	107.163	21.532	443	16.93	100	107.2	90	110	
Au	197	1	nogas	487.563	81.155	27	21.65	100	487.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1288484	2.61	1359891	94.75	70	125	
Ge	72	1	nogas	3116163	1.57	3145209	99.08	70	125	
In	115	1	nogas	2757260	2.24	2761164	99.86	70	125	
Bi	209	1	nogas	2140093	0.68	2190177	97.71	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	731118	1.26	785020	93.13	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	103_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:50:44-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	87.309	5.651	779798	0.91	100	87.3	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10329.644	3.724	245290539	1.58	10000	103.3	90	110	
Mg	24	1	nogas	10029.838	3.837	150307858	1.15	10000	100.3	90	110	
Al	27	1	nogas	97.737	3.407	1913733	3.79	100	97.7	90	110	
K	39	1	nogas	9703.465	1.843	195612138	1.57	10000	97.0	90	110	
Ti	47	1	nogas	96.222	1.672	166464	2.19	100	96.2	90	110	
V	51	1	nogas	68.720	2.173	3800313	0.57	100	68.7	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.919	3.136	2259087	2.58	100	100.9	90	110	
Mn	55	1	nogas	103.054	4.024	2692423	3.50	100	103.1	90	110	
Co	59	1	nogas	100.858	7.439	2254762	6.89	100	100.9	90	110	
Ni	60	1	nogas	95.307	1.592	471062	1.19	100	95.3	90	110	
Cu	63	1	nogas	94.051	0.868	1119859	1.13	100	94.1	90	110	
Zn	66	1	nogas	96.728	1.202	376787	1.68	100	96.7	90	110	
As	75	1	nogas	84.388	0.202	660476	0.56	100	84.4	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	98.189	4.588	2611103	4.22	100	98.2	90	110	
Ag	107	1	nogas	105.294	5.805	1370589	5.33	100	105.3	90	110	
Cd	111	1	nogas	96.101	1.755	276572	3.88	100	96.1	90	110	
Sb	121	1	nogas	102.456	12.279	1259786	11.73	100	102.5	90	110	
Tl	205	1	nogas	99.422	1.020	2040585	4.55	100	99.4	90	110	
Pb	208	1	nogas	104.476	2.123	2691005	2.12	100	104.5	90	110	
U	238	1	nogas	101.358	5.926	2780217	1.10	100	101.4	90	110	
[Pb]	206	1	nogas	91.979	6.448	640068	1.76	100	92.0	90	110	
[Pb]	207	1	nogas	92.696	5.599	560135	1.72	100	92.7	90	110	
Na	23	2	He	9967.136	3.927	14529269	3.38	10000	99.7	90	110	
Mg	24	2	He	10068.846	2.432	7943662	1.91	10000	100.7	90	110	
Al	27	2	He	97.743	1.753	46040	1.24	100	97.7	90	110	
K	39	2	He	9574.604	3.208	8497576	3.14	10000	95.7	90	110	
Ca	43	2	He	9783.857	0.729	22547	0.20	10000	97.8	90	110	
Ca	44	2	He	9844.691	1.225	383001	0.74	10000	98.4	90	110	
V	51	2	He	96.682	0.370	561787	0.81	100	96.7	90	110	
Cr	52	2	He	99.526	1.744	605153	1.38	100	99.5	90	110	
Mn	55	2	He	98.614	1.806	426029	1.55	100	98.6	90	110	
Fe	56	2	He	10086.179	0.737	52679304	0.78	10000	100.9	90	110	
Co	59	2	He	97.794	3.497	801862	3.24	100	97.8	90	110	
Ni	60	2	He	101.586	2.952	205593	2.69	100	101.6	90	110	
Cu	63	2	He	99.691	1.890	513391	1.57	100	99.7	90	110	
Zn	66	2	He	99.249	2.794	125286	3.01	100	99.2	90	110	
As	75	2	He	96.312	0.552	120786	0.29	100	96.3	90	110	
Se	78	2	He	95.610	1.922	9706	1.99	100	95.6	90	110	
B	11	1	nogas	450.315	2.284	2378365	2.41	500	90.1	90	110	
Si	28	1	nogas	4731.874	1.988	52454666	2.44	5000	94.6	90	110	
Ca	43	1	nogas	9324.015	1.615	328174	1.49	10000	93.2	90	110	
Ca	44	1	nogas	8880.845	1.185	5459733	1.17	10000	88.8	90	110	CCV Main CR1-2 Failed
Fe	56	1	nogas	9658.433	2.421	216457447	1.96	10000	96.6	90	110	
Se	77	1	nogas	22.409	18.680	81662	0.53	100	22.4	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.338	3.578	24400	3.04	100	93.3	90	110	
Mo	95	1	nogas	95.848	0.531	517431	0.26	100	95.8	90	110	
Sn	118	1	nogas	93.308	4.250	699559	0.41	100	93.3	90	110	
Ba	137	1	nogas	98.090	2.969	384208	1.67	100	98.1	90	110	
Sb	121	2	He	101.481	2.411	439149	1.97	100	101.5	90	110	
Li	7	1	nogas	98.989	2.529	1870517	3.69	100	99.0	90	110	
P	31	1	nogas	463.793	0.578	831844	0.65	500	92.8	90	110	
La	139	1	nogas	125.777	20.347	517	14.53	100	125.8	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	863.675	29.758	33	17.32	100	863.7	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1251628	4.61	1359891	92.04	70	125	
Ge	72	1	nogas	3117959	0.53	3145209	99.13	70	125	
In	115	1	nogas	2788278	4.47	2761164	100.98	70	125	
Bi	209	1	nogas	2201715	5.39	2190177	100.53	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	724192	0.53	785020	92.25	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	104_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:52:41-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.052	16.0	550	14.4	1	
Na	23	1	nogas	13.867	19.0	756707	6.0	100	
Mg	24	1	nogas	5.777	21.1	95896	17.2	100	
Al	27	1	nogas	0.102	23.6	29917	1.1	5	
K	39	1	nogas	-8.733	-139.3	7791166	0.7	100	
Ti	47	1	nogas	0.095	33.7	460	11.5	2.5	
V	51	1	nogas	-42.275	-3.1	1248831	4.7	2.5	
Cr	52	1	nogas	-2.327	-1.8	73723	2.4	2.5	
Mn	55	1	nogas	0.036	61.9	31707	0.8	2.5	
Co	59	1	nogas	0.052	28.1	2237	12.4	2.5	
Ni	60	1	nogas	0.236	8.4	1033	9.3	2.5	
Cu	63	1	nogas	0.041	20.1	2890	3.3	2	
Zn	66	1	nogas	0.441	0.4	963	2.2	2.5	
As	75	1	nogas	-20.238	-3.1	167886	3.6	2.5	
Sr	88	1	nogas	0.064	21.4	2527	13.0	2.5	
Ag	107	1	nogas	0.028	25.9	687	12.4	2.5	
Cd	111	1	nogas	0.055	59.7	170	56.7	1	
Sb	121	1	nogas	1.104	21.1	13902	18.4	2.5	
Tl	205	1	nogas	0.282	70.2	6695	58.2	1	
Pb	208	1	nogas	-0.076	-36.6	3657	19.5	2.5	
U	238	1	nogas	0.126	51.7	3517	48.5	2.5	
[Pb]	206	1	nogas	-0.061	-68.7	1023	25.5	2.5	
[Pb]	207	1	nogas	-0.087	-21.7	770	11.7	2.5	
Na	23	2	He	9.830	12.5	66666	3.2	100	
Mg	24	2	He	3.951	1.4	3640	0.5	100	
Al	27	2	He	0.389	60.2	883	13.5	5	
K	39	2	He	-15.581	-23.5	178286	1.8	100	
Ca	43	2	He	-3.462	-183.3	27	57.3	100	
Ca	44	2	He	-40.173	-8.3	1490	10.0	100	
V	51	2	He	-1.971	-1.9	14331	0.7	2.5	
Cr	52	2	He	-0.042	-32.1	4774	1.2	2.5	
Mn	55	2	He	-0.126	-42.1	1843	11.8	2.5	
Fe	56	2	He	3.847	7.5	32359	4.7	100	
Co	59	2	He	0.020	116.2	547	35.5	2.5	
Ni	60	2	He	0.164	22.2	213	35.2	2.5	
Cu	63	2	He	0.434	4.1	1030	10.2	2	
Zn	66	2	He	0.640	6.0	333	15.1	2.5	
As	75	2	He	-0.107	-16.7	634	2.5	2.5	
Se	78	2	He	0.704	60.3	142	31.8	2	
B	11	1	nogas	4.662	16.5	53582	6.9	10	

Continuing Calibration Blank (CCB) Report

Si	28	1	nogas	-30.138	-34.4	1618622	4.8	5	
Ca	43	1	nogas	-15.217	-7.7	850	3.1	100	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ca	44	1	nogas	-547.123	-0.9	114696	0.9	100	
Fe	56	1	nogas	-25.414	-22.4	2476263	2.9	100	
Se	77	1	nogas	-112.280	-4.7	54472	3.8	2.5	
Se	82	1	nogas	-0.092	-248.7	217	27.0	2	
Mo	95	1	nogas	-0.037	-406.7	2140	35.2	2.5	
Sn	118	1	nogas	0.194	37.3	2287	22.3	5	
Ba	137	1	nogas	0.088	6.5	383	3.0	2.5	
Sb	121	2	He	0.758	2.3	3467	3.1	2.5	
P	31	1	nogas	8.229	12.2	94726	0.6	10	
La	139	1	nogas	0.352	2061.8	47	53.9	2.5	
Au	197	1	nogas	-1086.852	-35.4	3	173.2	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1339493	5.37	1359891	98.50	70	125	
Ge	72	1	nogas	3150615	2.28	3145209	100.17	70	125	
In	115	1	nogas	2700027	2.84	2761164	97.79	70	125	
Bi	209	1	nogas	2210528	3.82	2190177	100.93	70	125	
Ge	72	2	He	745712	1.16	785020	94.99	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	113_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:33:07-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	91.027	6.203	768390	1.98	100	91.0	90	110	
Na	23	1	nogas	9911.914	5.260	237655589	1.63	10000	99.1	90	110	
Mg	24	1	nogas	10092.400	3.062	152806091	1.54	10000	100.9	90	110	
Al	27	1	nogas	100.703	2.355	1943447	3.08	100	100.7	90	110	
K	39	1	nogas	9756.080	4.952	193737971	0.30	10000	97.6	90	110	
Ti	47	1	nogas	96.904	3.383	165240	1.87	100	96.9	90	110	
V	51	1	nogas	87.826	10.525	4179048	0.44	100	87.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.608	4.956	2219518	0.12	100	100.6	90	110	
Mn	55	1	nogas	101.330	4.348	2609988	2.15	100	101.3	90	110	
Co	59	1	nogas	100.041	1.248	2206587	3.56	100	100.0	90	110	
Ni	60	1	nogas	95.426	4.549	464897	3.19	100	95.4	90	110	
Cu	63	1	nogas	92.995	5.368	1090864	1.89	100	93.0	90	110	
Zn	66	1	nogas	97.644	4.234	374800	0.69	100	97.6	90	110	
As	75	1	nogas	93.195	6.840	691848	0.96	100	93.2	90	110	
Sr	88	1	nogas	97.264	2.516	2550579	2.49	100	97.3	90	110	
Ag	107	1	nogas	101.749	2.810	1307861	6.93	100	101.7	90	110	
Cd	111	1	nogas	95.714	4.449	274579	1.26	100	95.7	90	110	
Sb	121	1	nogas	96.183	4.570	1165792	0.53	100	96.2	90	110	
Tl	205	1	nogas	97.000	4.405	1957504	3.33	100	97.0	90	110	
Pb	208	1	nogas	103.281	0.704	2660287	0.70	100	103.3	90	110	
U	238	1	nogas	103.764	3.219	2803894	2.57	100	103.8	90	110	
[Pb]	206	1	nogas	92.027	2.121	630964	0.65	100	92.0	90	110	
[Pb]	207	1	nogas	95.788	2.523	570047	1.47	100	95.8	90	110	
Na	23	2	He	9822.871	1.990	14312438	2.07	10000	98.2	90	110	
Mg	24	2	He	9964.856	1.302	7856922	0.95	10000	99.6	90	110	
Al	27	2	He	95.220	1.689	44840	1.18	100	95.2	90	110	
K	39	2	He	9463.572	0.664	8401258	0.65	10000	94.6	90	110	
Ca	43	2	He	9900.468	3.742	22804	4.24	10000	99.0	90	110	
Ca	44	2	He	9620.873	1.056	374130	1.05	10000	96.2	90	110	
V	51	2	He	96.251	1.240	559037	1.44	100	96.3	90	110	
Cr	52	2	He	98.926	0.516	601168	0.51	100	98.9	90	110	
Mn	55	2	He	97.733	0.521	421992	1.01	100	97.7	90	110	
Fe	56	2	He	9859.495	0.456	51463333	0.95	10000	98.6	90	110	
Co	59	2	He	95.221	1.430	780325	1.53	100	95.2	90	110	
Ni	60	2	He	97.869	1.045	197956	1.54	100	97.9	90	110	
Cu	63	2	He	98.652	0.882	507708	0.43	100	98.7	90	110	
Zn	66	2	He	99.495	1.339	125507	0.92	100	99.5	90	110	
As	75	2	He	96.278	1.297	120669	1.46	100	96.3	90	110	
Se	78	2	He	93.595	0.727	9496	0.68	100	93.6	90	110	
B	11	1	nogas	459.256	5.877	2319083	2.98	500	91.9	90	110	
Si	28	1	nogas	4669.768	3.971	51043859	1.84	5000	93.4	90	110	
Ca	43	1	nogas	9616.145	6.266	333292	2.13	10000	96.2	90	110	
Ca	44	1	nogas	9193.067	8.063	5550277	4.03	10000	91.9	90	110	
Fe	56	1	nogas	9699.768	4.199	214235096	1.55	10000	97.0	90	110	
Se	77	1	nogas	88.786	25.360	93941	0.17	100	88.8	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	94.156	1.305	24283	4.24	100	94.2	90	110	
Mo	95	1	nogas	96.519	4.194	513456	0.67	100	96.5	90	110	
Sn	118	1	nogas	93.515	4.532	699561	1.43	100	93.5	90	110	
Ba	137	1	nogas	96.994	3.945	379121	3.62	100	97.0	90	110	
Sb	121	2	He	100.280	1.346	433704	1.40	100	100.3	90	110	
Li	7	1	nogas	92.949	1.224	1865625	5.16	100	92.9	90	110	
P	31	1	nogas	466.033	3.663	823549	1.63	500	93.2	90	110	
La	139	1	nogas	88.870	18.808	380	17.26	100	88.9	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	233.999	422.642	23	65.47	100	234.0	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1324116	4.92	1359891	97.37	70	125	
Ge	72	1	nogas	3076636	4.77	3145209	97.82	70	125	
In	115	1	nogas	2781876	4.05	2761164	100.75	70	125	
Bi	209	1	nogas	2164882	1.51	2190177	98.85	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	723722	0.49	785020	92.19	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	114_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:35:05-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.054	32.2	527	29.4	1	
Na	23	1	nogas	10.349	32.0	641042	8.0	100	
Mg	24	1	nogas	6.276	39.6	98736	33.0	100	
Al	27	1	nogas	0.121	90.8	29697	3.2	5	
K	39	1	nogas	-3.461	-613.8	7745088	0.2	100	
Ti	47	1	nogas	0.062	89.3	393	20.7	2.5	
V	51	1	nogas	-26.907	-4.4	1579748	6.6	2.5	
Cr	52	1	nogas	-1.936	-7.6	80558	2.5	2.5	
Mn	55	1	nogas	0.170	56.9	34506	2.0	2.5	
Co	59	1	nogas	0.055	58.2	2237	26.0	2.5	
Ni	60	1	nogas	0.225	14.5	957	12.2	2.5	
Cu	63	1	nogas	0.035	141.3	2747	15.7	2	
Zn	66	1	nogas	0.460	9.8	1017	11.7	2.5	
As	75	1	nogas	-13.783	-10.3	194965	2.1	2.5	
Sr	88	1	nogas	0.060	46.5	2350	25.8	2.5	
Ag	107	1	nogas	0.023	40.2	603	14.5	2.5	
Cd	111	1	nogas	0.059	45.8	180	38.9	1	
Sb	121	1	nogas	1.067	26.7	13132	21.1	2.5	
Tl	205	1	nogas	0.321	62.7	7622	56.0	1	
Pb	208	1	nogas	-0.070	-54.0	3814	25.3	2.5	
U	238	1	nogas	0.151	55.0	4267	55.3	2.5	
[Pb]	206	1	nogas	-0.059	-56.0	1050	23.3	2.5	
[Pb]	207	1	nogas	-0.078	-44.9	833	26.5	2.5	
Na	23	2	He	5.203	5.7	58225	0.5	100	
Mg	24	2	He	3.067	10.5	2850	9.8	100	
Al	27	2	He	-0.011	-1357.9	673	9.7	5	
K	39	2	He	-15.880	-2.3	178027	0.2	100	
Ca	43	2	He	-0.253	-4943.6	33	86.6	100	
Ca	44	2	He	-47.114	-8.7	1183	14.4	100	
V	51	2	He	-1.218	-2.0	18163	0.5	2.5	
Cr	52	2	He	-0.007	-671.3	4861	5.7	2.5	
Mn	55	2	He	-0.038	-32.5	2173	2.2	2.5	
Fe	56	2	He	3.193	10.5	28122	6.8	100	
Co	59	2	He	0.021	61.5	540	20.0	2.5	
Ni	60	2	He	0.170	5.5	220	9.1	2.5	
Cu	63	2	He	0.412	9.1	890	22.4	2	
Zn	66	2	He	0.574	2.9	240	8.3	2.5	
As	75	2	He	0.042	84.4	804	4.6	2.5	
Se	78	2	He	0.651	43.2	133	20.6	2	
B	11	1	nogas	3.162	26.8	46484	9.3	10	

Continuing Calibration Blank (CCB) Report

Si	28	1	nogas	-27.354	-33.1	1618000	0.8	5	
Ca	43	1	nogas	-14.249	-16.3	867	4.8	100	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ca	44	1	nogas	-571.267	-2.3	98870	2.4	100	
Fe	56	1	nogas	-16.559	-36.0	2624823	2.4	100	
Se	77	1	nogas	-65.256	-15.8	63056	1.8	2.5	
Se	82	1	nogas	-0.113	-136.2	207	15.6	2	
Mo	95	1	nogas	0.006	3187.0	2310	36.5	2.5	
Sn	118	1	nogas	0.210	46.7	2397	26.6	5	
Ba	137	1	nogas	0.103	39.8	437	32.6	2.5	
Sb	121	2	He	0.721	7.2	3220	7.8	2.5	
P	31	1	nogas	9.542	30.6	95037	0.8	10	
La	139	1	nogas	1.050	685.1	50	52.9	2.5	
Au	197	1	nogas	-215.528	-635.2	17	124.9	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1351813	1.88	1359891	99.41	70	125	
Ge	72	1	nogas	3095115	5.02	3145209	98.41	70	125	
In	115	1	nogas	2701826	3.73	2761164	97.85	70	125	
Bi	209	1	nogas	2216122	1.20	2190177	101.18	70	125	
Ge	72	2	He	726803	0.89	785020	92.58	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	118_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:49:57-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	96.700	1.963	783523	1.51	100	96.7	90	110	
Na	23	1	nogas	10242.178	0.797	245346164	1.44	10000	102.4	90	110	
Mg	24	1	nogas	10305.105	3.127	155792799	3.29	10000	103.1	90	110	
Al	27	1	nogas	102.039	4.546	1984207	4.47	100	102.0	90	110	
K	39	1	nogas	9950.587	0.339	199167625	1.13	10000	99.5	90	110	
Ti	47	1	nogas	96.005	1.189	165051	1.12	100	96.0	90	110	
V	51	1	nogas	68.817	6.619	3778913	2.42	100	68.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	96.501	2.313	2152149	1.58	100	96.5	90	110	
Mn	55	1	nogas	100.903	3.423	2620537	2.70	100	100.9	90	110	
Co	59	1	nogas	99.319	1.312	2207195	1.17	100	99.3	90	110	
Ni	60	1	nogas	97.208	1.591	477510	1.54	100	97.2	90	110	
Cu	63	1	nogas	95.696	2.045	1132318	1.83	100	95.7	90	110	
Zn	66	1	nogas	98.043	2.246	379508	1.57	100	98.0	90	110	
As	75	1	nogas	82.487	2.574	647425	0.77	100	82.5	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	98.743	1.141	2609811	0.56	100	98.7	90	110	
Ag	107	1	nogas	99.093	1.880	1282341	2.85	100	99.1	90	110	
Cd	111	1	nogas	96.404	2.945	273554	0.79	100	96.4	90	110	
Sb	121	1	nogas	98.681	2.623	1206601	3.51	100	98.7	90	110	
Tl	205	1	nogas	97.752	2.473	1940284	1.64	100	97.8	90	110	
Pb	208	1	nogas	102.612	0.309	2643106	0.31	100	102.6	90	110	
U	238	1	nogas	103.897	1.901	2761020	0.48	100	103.9	90	110	
[Pb]	206	1	nogas	94.908	2.191	639894	1.00	100	94.9	90	110	
[Pb]	207	1	nogas	96.355	1.781	563937	0.39	100	96.4	90	110	
Na	23	2	He	9647.815	0.905	14255185	0.72	10000	96.5	90	110	
Mg	24	2	He	9836.313	1.889	7864143	1.36	10000	98.4	90	110	
Al	27	2	He	94.018	2.366	44900	1.28	100	94.0	90	110	
K	39	2	He	9499.093	1.508	8432071	1.47	10000	95.0	90	110	
Ca	43	2	He	9571.467	1.817	22357	2.74	10000	95.7	90	110	
Ca	44	2	He	9569.290	1.086	377374	1.46	10000	95.7	90	110	
V	51	2	He	94.641	1.360	557797	1.09	100	94.6	90	110	
Cr	52	2	He	96.962	0.731	597615	1.18	100	97.0	90	110	
Mn	55	2	He	96.382	0.891	422034	1.43	100	96.4	90	110	
Fe	56	2	He	9796.663	0.779	51850966	0.46	10000	98.0	90	110	
Co	59	2	He	95.268	0.393	791661	0.73	100	95.3	90	110	
Ni	60	2	He	99.200	0.552	203460	0.87	100	99.2	90	110	
Cu	63	2	He	98.512	1.548	514082	0.97	100	98.5	90	110	
Zn	66	2	He	97.601	1.086	124836	0.14	100	97.6	90	110	
As	75	2	He	93.580	0.540	118962	1.65	100	93.6	90	110	
Se	78	2	He	93.373	0.713	9607	0.91	100	93.4	90	110	
B	11	1	nogas	490.077	1.791	2372749	1.30	500	98.0	90	110	
Si	28	1	nogas	4757.427	1.207	52398789	1.37	5000	95.1	90	110	
Ca	43	1	nogas	9638.702	1.251	337149	2.20	10000	96.4	90	110	
Ca	44	1	nogas	9130.681	1.808	5566356	0.73	10000	91.3	90	110	
Fe	56	1	nogas	9711.833	2.598	216284705	1.88	10000	97.1	90	110	
Se	77	1	nogas	10.413	49.457	78699	0.70	100	10.4	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.625	2.303	24323	1.42	100	93.6	90	110	
Mo	95	1	nogas	98.133	1.527	526409	0.56	100	98.1	90	110	
Sn	118	1	nogas	96.290	1.821	712646	1.60	100	96.3	90	110	
Ba	137	1	nogas	99.573	3.117	384764	0.80	100	99.6	90	110	
Sb	121	2	He	98.690	2.223	432759	1.09	100	98.7	90	110	
Li	7	1	nogas	97.880	3.544	1876630	3.27	100	97.9	90	110	
P	31	1	nogas	469.825	2.090	836365	1.35	500	94.0	90	110	
La	139	1	nogas	94.120	32.360	393	25.97	100	94.1	90	110	
Au	197	1	nogas	-1083.363	-36.082	3	173.21	100	-1083.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1268610	0.50	1359891	93.29	70	125	
Ge	72	1	nogas	3098768	0.97	3145209	98.52	70	125	
In	115	1	nogas	2749695	2.33	2761164	99.58	70	125	
Bi	209	1	nogas	2128987	1.43	2190177	97.21	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	733900	1.12	785020	93.49	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	119_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:51:57-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.051	23.8	490	23.2	1	
Na	23	1	nogas	8.641	26.2	627778	3.4	100	
Mg	24	1	nogas	5.450	29.0	90333	20.5	100	
Al	27	1	nogas	0.155	39.0	30618	1.8	5	
K	39	1	nogas	-1.661	-569.5	7844785	0.5	100	
Ti	47	1	nogas	0.027	114.8	337	14.0	2.5	
V	51	1	nogas	-43.373	-4.0	1209871	4.9	2.5	
Cr	52	1	nogas	-2.421	-2.6	70938	3.2	2.5	
Mn	55	1	nogas	0.110	27.1	33277	0.3	2.5	
Co	59	1	nogas	0.045	29.6	2043	12.3	2.5	
Ni	60	1	nogas	0.217	4.1	930	3.2	2.5	
Cu	63	1	nogas	0.020	137.8	2604	10.8	2	
Zn	66	1	nogas	0.460	17.8	1027	29.1	2.5	
As	75	1	nogas	-21.878	-3.1	158336	4.0	2.5	
Sr	88	1	nogas	0.058	16.2	2354	9.2	2.5	
Ag	107	1	nogas	0.025	46.0	630	21.5	2.5	
Cd	111	1	nogas	0.043	53.3	143	44.9	1	
Sb	121	1	nogas	0.969	22.1	12091	19.6	2.5	
Tl	205	1	nogas	0.382	48.1	9313	47.3	1	
Pb	208	1	nogas	-0.087	-36.9	3374	24.4	2.5	
U	238	1	nogas	0.131	53.3	3904	56.9	2.5	
[Pb]	206	1	nogas	-0.097	-14.2	813	16.7	2.5	
[Pb]	207	1	nogas	-0.109	-15.7	670	20.9	2.5	
Na	23	2	He	3.600	38.9	58101	3.3	100	
Mg	24	2	He	3.296	10.5	3150	9.1	100	
Al	27	2	He	0.049	437.0	730	14.5	5	
K	39	2	He	-12.854	-13.1	180652	0.8	100	
Ca	43	2	He	6.125	65.8	50	20.0	100	
Ca	44	2	He	-41.375	-8.7	1460	9.5	100	
V	51	2	He	-2.121	-3.1	13657	3.5	2.5	
Cr	52	2	He	-0.076	-10.1	4624	1.4	2.5	
Mn	55	2	He	-0.111	-36.6	1937	9.7	2.5	
Fe	56	2	He	3.289	5.8	29748	3.0	100	
Co	59	2	He	0.009	58.0	460	9.5	2.5	
Ni	60	2	He	0.175	16.7	240	25.3	2.5	
Cu	63	2	He	0.407	4.5	900	11.8	2	
Zn	66	2	He	0.632	3.9	327	9.4	2.5	
As	75	2	He	-0.115	-48.5	632	10.8	2.5	
Se	78	2	He	0.365	5.6	108	1.9	2	
B	11	1	nogas	3.838	14.0	49337	7.3	10	
Si	28	1	nogas	-33.061	-4.6	1571735	3.1	5	
Ca	43	1	nogas	-13.628	-5.0	897	0.6	100	
Ca	44	1	nogas	-561.325	-0.9	105405	0.8	100	
Fe	56	1	nogas	-17.110	-14.3	2634236	1.5	100	
Se	77	1	nogas	-126.878	-3.1	50875	3.5	2.5	
Se	82	1	nogas	-0.111	-258.7	210	36.0	2	
Mo	95	1	nogas	-0.034	-334.6	2137	26.5	2.5	
Sn	118	1	nogas	0.181	37.1	2320	17.5	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.149	44.6	657	44.1	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.632	8.4	2944	7.5	2.5	
P	31	1	nogas	9.320	17.4	95456	0.7	10	
La	139	1	nogas	52.151	184.6	257	149.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-682.662	-4.1	10	0.0	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1334937	2.40	1359891	98.16	70	125	
Ge	72	1	nogas	3116553	2.08	3145209	99.09	70	125	
In	115	1	nogas	2864732	4.32	2761164	103.75	70	125	
Bi	209	1	nogas	2303506	4.57	2190177	105.17	70	125	
Ge	72	2	He	755645	0.72	785020	96.26	70	125	

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	123CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:59:56-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	70	53.99
Na	23	1	nogas	400649	0.00
Mg	24	1	nogas	8170	0.20
Al	27	1	nogas	21442	0.02
K	39	1	nogas	7853188	0.00
Ti	47	1	nogas	237	11.48
V	51	1	nogas	1345870	0.00
Cr	52	1	nogas	77474	0.00
Mn	55	1	nogas	27808	0.00
Co	59	1	nogas	823	1.56
Ni	60	1	nogas	467	3.06
Cu	63	1	nogas	1483	0.44
Zn	66	1	nogas	657	0.13
As	75	1	nogas	176957	0.00
Sr	88	1	nogas	867	1.33
Ag	107	1	nogas	93	35.07
Cd	111	1	nogas	20	0.00
Sb	121	1	nogas	1043	1.53
Tl	205	1	nogas	563	2.55
Pb	208	1	nogas	1573	0.99
[Pb]	206	1	nogas	433	1.87
[Pb]	207	1	nogas	330	9.72
Na	23	2	He	45585	0.00
Mg	24	2	He	583	2.63
Al	27	2	He	437	3.79
K	39	2	He	181917	0.00
Ca	43	2	He	10	1732.05
Ca	44	2	He	1077	0.30
V	51	2	He	15473	0.01
Cr	52	2	He	4597	0.08
Mn	55	2	He	1257	0.41
Fe	56	2	He	11797	0.03
Co	59	2	He	303	11.62
Ni	60	2	He	137	18.80
Cu	63	2	He	643	1.97
Zn	66	2	He	137	3.09
As	75	2	He	588	2.31
Se	78	2	He	123	3.84
B	11	1	nogas	18916	0.01
Si	28	1	nogas	1541532	0.00
Ca	43	1	nogas	563	2.62
Ca	44	1	nogas	95928	0.00

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	2809089	0.00
Se	77	1	nogas	56518	0.01
Se	82	1	nogas	247	10.69
Mo	95	1	nogas	497	2.38
Sn	118	1	nogas	1127	0.55
Ba	137	1	nogas	113	23.78
Sb	121	2	He	477	3.56
Li	7	1	nogas	109987	0.00
P	31	1	nogas	90462	0.00
La	139	1	nogas	53	73.18

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	6	1	nogas	1446753	2.09
Ge	72	1	nogas	3206704	0.23
In	115	1	nogas	2812441	2.84
Bi	209	1	nogas	2322160	3.31
Ge	72	2	He	754516	1.50

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	124CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:01:55-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	16017	0.01
Na	23	1	nogas	5490362	0.00
Mg	24	1	nogas	3430176	0.00
Al	27	1	nogas	62002	0.00
K	39	1	nogas	11948324	0.00
Ti	47	1	nogas	3690	0.22
V	51	1	nogas	1551445	0.00
Cr	52	1	nogas	122257	0.00
Mn	55	1	nogas	74188	0.00
Co	59	1	nogas	45801	0.00
Ni	60	1	nogas	11060	0.04
Cu	63	1	nogas	25972	0.01
Zn	66	1	nogas	8109	0.02
As	75	1	nogas	199836	0.00
Sr	88	1	nogas	53711	0.00
Ag	107	1	nogas	27352	0.01
Cd	111	1	nogas	5784	0.09
Sb	121	1	nogas	25245	0.01
Tl	205	1	nogas	37547	0.01
Pb	208	1	nogas	55104	0.00
[Pb]	206	1	nogas	14000	0.01
[Pb]	207	1	nogas	12281	0.02
Na	23	2	He	338997	0.00
Mg	24	2	He	163588	0.00
Al	27	2	He	1553	0.65
K	39	2	He	350064	0.00
Ca	43	2	He	503	2.54
Ca	44	2	He	8882	0.04
V	51	2	He	27508	0.01
Cr	52	2	He	16257	0.01
Mn	55	2	He	9843	0.03
Fe	56	2	He	1088583	0.00
Co	59	2	He	17482	0.01
Ni	60	2	He	4577	0.13
Cu	63	2	He	11444	0.03
Zn	66	2	He	2727	0.41
As	75	2	He	3179	0.07
Se	78	2	He	323	2.97
B	11	1	nogas	63562	0.00
Si	28	1	nogas	2570600	0.00

Calibration Standard Report

Ca	43	1	nogas	7758	0.04
Ca	44	1	nogas	203607	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	7193806	0.00
Se	77	1	nogas	61735	0.01
Se	82	1	nogas	833	1.72
Mo	95	1	nogas	10960	0.04
Sn	118	1	nogas	15113	0.02
Ba	137	1	nogas	8466	0.04
Sb	121	2	He	9523	0.05
P	31	1	nogas	87960	0.00
La	139	1	nogas	70	20.41

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1379209	5.18	1446753	95.33	70	125	
Ge	72	1	nogas	3256495	2.07	3206704	101.55	70	125	
In	115	1	nogas	2856142	1.49	2812441	101.55	70	125	
Bi	209	1	nogas	2295874	2.67	2322160	98.87	70	125	
Ge	72	2	He	759218	2.00	754516	100.62	70	125	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	125CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:03:54-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	40216	0.01
Na	23	1	nogas	12844224	0.00
Mg	24	1	nogas	8008673	0.00
Al	27	1	nogas	140606	0.00
K	39	1	nogas	17872186	0.00
Ti	47	1	nogas	8675	0.03
V	51	1	nogas	1716980	0.00
Cr	52	1	nogas	191122	0.00
Mn	55	1	nogas	162792	0.00
Co	59	1	nogas	111008	0.00
Ni	60	1	nogas	26012	0.02
Cu	63	1	nogas	62661	0.00
Zn	66	1	nogas	22220	0.00
As	75	1	nogas	224623	0.00
Sr	88	1	nogas	131562	0.00
Ag	107	1	nogas	67316	0.00
Cd	111	1	nogas	14449	0.02
Sb	121	1	nogas	63499	0.00
Tl	205	1	nogas	95808	0.00
Pb	208	1	nogas	136141	0.00
[Pb]	206	1	nogas	34454	0.01
[Pb]	207	1	nogas	29667	0.01
Na	23	2	He	782020	0.00
Mg	24	2	He	404819	0.00
Al	27	2	He	3467	0.06
K	39	2	He	597599	0.00
Ca	43	2	He	1307	0.69
Ca	44	2	He	20271	0.02
V	51	2	He	45060	0.00
Cr	52	2	He	35979	0.01
Mn	55	2	He	23716	0.01
Fe	56	2	He	2811433	0.00
Co	59	2	He	41647	0.00
Ni	60	2	He	10747	0.01
Cu	63	2	He	27858	0.01
Zn	66	2	He	7051	0.01
As	75	2	He	6768	0.02
Se	78	2	He	623	0.23
B	11	1	nogas	130646	0.00
Si	28	1	nogas	4181613	0.00

Calibration Standard Report

Ca	43	1	nogas	18202	0.01
Ca	44	1	nogas	374777	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	14293153	0.00
Se	77	1	nogas	64798	0.00
Se	82	1	nogas	1517	0.13
Mo	95	1	nogas	27485	0.01
Sn	118	1	nogas	36809	0.01
Ba	137	1	nogas	19902	0.03
Sb	121	2	He	22875	0.02
P	31	1	nogas	131060	0.00
La	139	1	nogas	137	26.41

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1333091	6.34	1446753	92.14	70	125	
Ge	72	1	nogas	3390667	1.43	3206704	105.74	70	125	
In	115	1	nogas	2877774	3.00	2812441	102.32	70	125	
Bi	209	1	nogas	2252572	2.89	2322160	97.00	70	125	
Ge	72	2	He	792957	0.80	754516	105.09	70	125	

Calibration Standard Report

Sample Table

Sample Name	10/50/1000
Data File Name	126CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:05:53-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	77148	0.00
Na	23	1	nogas	25250872	0.00
Mg	24	1	nogas	15834310	0.00
Al	27	1	nogas	232008	0.00
K	39	1	nogas	27175799	0.00
Ti	47	1	nogas	16658	0.02
V	51	1	nogas	1868880	0.00
Cr	52	1	nogas	291583	0.00
Mn	55	1	nogas	287456	0.00
Co	59	1	nogas	221976	0.00
Ni	60	1	nogas	50082	0.01
Cu	63	1	nogas	118092	0.00
Zn	66	1	nogas	39309	0.00
As	75	1	nogas	253155	0.00
Sr	88	1	nogas	258307	0.00
Ag	107	1	nogas	129291	0.00
Cd	111	1	nogas	28029	0.01
Sb	121	1	nogas	121934	0.00
Tl	205	1	nogas	187552	0.00
Pb	208	1	nogas	264591	0.00
[Pb]	206	1	nogas	66161	0.00
[Pb]	207	1	nogas	57469	0.00
Na	23	2	He	1603255	0.00
Mg	24	2	He	815126	0.00
Al	27	2	He	5628	0.09
K	39	2	He	1000101	0.00
Ca	43	2	He	2324	0.13
Ca	44	2	He	38974	0.00
V	51	2	He	72881	0.00
Cr	52	2	He	66252	0.00
Mn	55	2	He	45527	0.01
Fe	56	2	He	5424213	0.00
Co	59	2	He	83632	0.00
Ni	60	2	He	20929	0.02
Cu	63	2	He	54648	0.01
Zn	66	2	He	13118	0.04
As	75	2	He	12805	0.01
Se	78	2	He	1081	0.27
B	11	1	nogas	244624	0.00
Si	28	1	nogas	6670116	0.00

Calibration Standard Report

Ca	43	1	nogas	35027	0.00
Ca	44	1	nogas	641708	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	25285242	0.00
Se	77	1	nogas	69419	0.00
Se	82	1	nogas	2650	0.21
Mo	95	1	nogas	54297	0.01
Sn	118	1	nogas	73307	0.00
Ba	137	1	nogas	38019	0.01
Sb	121	2	He	45516	0.01
P	31	1	nogas	174335	0.00
La	139	1	nogas	127	50.38

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1343072	4.51	1446753	92.83	70	125	
Ge	72	1	nogas	3313200	1.72	3206704	103.32	70	125	
In	115	1	nogas	2866425	3.53	2812441	101.92	70	125	
Bi	209	1	nogas	2231632	2.44	2322160	96.10	70	125	
Ge	72	2	He	772138	1.02	754516	102.34	70	125	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	127CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:07:51-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	770857	0.00
Na	23	1	nogas	242498655	0.00
Mg	24	1	nogas	154874208	0.00
Al	27	1	nogas	1990080	0.00
K	39	1	nogas	197878504	0.00
Ti	47	1	nogas	165246	0.00
V	51	1	nogas	3915446	0.00
Cr	52	1	nogas	2212534	0.00
Mn	55	1	nogas	2743316	0.00
Co	59	1	nogas	2253592	0.00
Ni	60	1	nogas	482568	0.00
Cu	63	1	nogas	1134783	0.00
Zn	66	1	nogas	377718	0.00
As	75	1	nogas	674392	0.00
Sr	88	1	nogas	2656691	0.00
Ag	107	1	nogas	1328342	0.00
Cd	111	1	nogas	277142	0.00
Sb	121	1	nogas	1212062	0.00
Tl	205	1	nogas	2038051	0.00
Pb	208	1	nogas	2754632	0.00
[Pb]	206	1	nogas	654698	0.00
[Pb]	207	1	nogas	580556	0.00
Na	23	2	He	14697812	0.00
Mg	24	2	He	7992094	0.00
Al	27	2	He	45588	0.00
K	39	2	He	8452403	0.00
Ca	43	2	He	22631	0.01
Ca	44	2	He	377153	0.00
V	51	2	He	565139	0.00
Cr	52	2	He	616895	0.00
Mn	55	2	He	427894	0.00
Fe	56	2	He	51671208	0.00
Co	59	2	He	794999	0.00
Ni	60	2	He	204531	0.00
Cu	63	2	He	521587	0.00
Zn	66	2	He	125243	0.00
As	75	2	He	121407	0.00
Se	78	2	He	9610	0.02
B	11	1	nogas	2325500	0.00
Si	28	1	nogas	52692804	0.00

Calibration Standard Report

Ca	43	1	nogas	340306	0.00
Ca	44	1	nogas	5719862	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	225714363	0.00
Se	77	1	nogas	85332	0.00
Se	82	1	nogas	25165	0.01
Mo	95	1	nogas	523951	0.00
Sn	118	1	nogas	722784	0.00
Ba	137	1	nogas	389153	0.00
Sb	121	2	He	438849	0.00
P	31	1	nogas	846504	0.00
La	139	1	nogas	483	4.72

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1213626	3.21	1446753	83.89	70	125	
Ge	72	1	nogas	3155985	2.86	3206704	98.42	70	125	
In	115	1	nogas	2731958	3.08	2812441	97.14	70	125	
Bi	209	1	nogas	2203864	0.68	2322160	94.91	70	125	
Ge	72	2	He	750459	0.80	754516	99.46	70	125	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	128CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:09:49-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	1635048	0.00
Na	23	1	nogas	487938144	0.00
Mg	24	1	nogas	311599649	0.00
Al	27	1	nogas	3720619	0.00
K	39	1	nogas	387013200	0.00
Ti	47	1	nogas	337307	0.00
V	51	1	nogas	5847592	0.00
Cr	52	1	nogas	4260513	0.00
Mn	55	1	nogas	5212488	0.00
Co	59	1	nogas	4462955	0.00
Ni	60	1	nogas	962911	0.00
Cu	63	1	nogas	2305483	0.00
Zn	66	1	nogas	758181	0.00
As	75	1	nogas	1089835	0.00
Sr	88	1	nogas	5208978	0.00
Ag	107	1	nogas	2566119	0.00
Cd	111	1	nogas	558850	0.00
Sb	121	1	nogas	2523837	0.00
Tl	205	1	nogas	3971253	0.00
Pb	208	1	nogas	5460578	0.00
[Pb]	206	1	nogas	1380705	0.00
[Pb]	207	1	nogas	1160140	0.00
Na	23	2	He	28670345	0.00
Mg	24	2	He	15925250	0.00
Al	27	2	He	88687	0.00
K	39	2	He	16988162	0.00
Ca	43	2	He	45786	0.00
Ca	44	2	He	763233	0.00
V	51	2	He	1118348	0.00
Cr	52	2	He	1225421	0.00
Mn	55	2	He	854743	0.00
Fe	56	2	He	106540595	0.00
Co	59	2	He	1698960	0.00
Ni	60	2	He	409741	0.00
Cu	63	2	He	1042535	0.00
Zn	66	2	He	255918	0.00
As	75	2	He	243421	0.00
Se	78	2	He	19463	0.00
B	11	1	nogas	4747092	0.00
Si	28	1	nogas	102886088	0.00

Calibration Standard Report

Ca	43	1	nogas	669375	0.00
Ca	44	1	nogas	11178438	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	441805293	0.00
Se	77	1	nogas	86585	0.00
Se	82	1	nogas	50053	0.00
Mo	95	1	nogas	1069773	0.00
Sn	118	1	nogas	1465775	0.00
Ba	137	1	nogas	790275	0.00
Sb	121	2	He	891260	0.00
P	31	1	nogas	1628622	0.00
La	139	1	nogas	690	1.87

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1159034	0.52	1446753	80.11	70	125	
Ge	72	1	nogas	3121229	4.29	3206704	97.33	70	125	
In	115	1	nogas	2723278	2.90	2812441	96.83	70	125	
Bi	209	1	nogas	2126871	1.71	2322160	91.59	70	125	
Ge	72	2	He	742295	0.54	754516	98.38	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICCV
Data File Name	129_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:11:49-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	90.301	4.598	786718	2.51	100	90.3	90	110	
Na	23	1	nogas	10384.490	4.839	254714922	1.49	10000	103.8	90	110	
Mg	24	1	nogas	10216.194	4.105	159942195	1.00	10000	102.2	90	110	
Al	27	1	nogas	100.587	5.820	1978560	2.61	100	100.6	90	110	
K	39	1	nogas	10263.903	4.337	210149896	1.02	10000	102.6	90	110	
Ti	47	1	nogas	100.515	5.206	175305	2.20	100	100.5	90	110	
V	51	1	nogas	78.579	5.035	3273331	2.45	100	78.6	90	110	ICV Main CR1 Failed
Cr	52	1	nogas	95.915	0.426	2172786	3.25	100	95.9	90	110	
Mn	55	1	nogas	98.108	3.002	2694291	1.34	100	98.1	90	110	
Co	59	1	nogas	97.795	2.315	2271185	0.95	100	97.8	90	110	
Ni	60	1	nogas	97.599	4.497	487945	1.48	100	97.6	90	110	
Cu	63	1	nogas	96.507	2.348	1152762	1.19	100	96.5	90	110	
Zn	66	1	nogas	98.631	2.099	387944	1.34	100	98.6	90	110	
As	75	1	nogas	88.407	5.316	614466	0.51	100	88.4	90	110	ICV Main CR1 Failed
Sr	88	1	nogas	100.095	2.438	2717900	1.04	100	100.1	90	110	
Ag	107	1	nogas	96.628	1.502	1296693	2.79	100	96.6	90	110	
Cd	111	1	nogas	101.761	1.019	285954	1.10	100	101.8	90	110	
Sb	121	1	nogas	100.652	0.288	1309455	3.17	100	100.7	90	110	
Tl	205	1	nogas	100.746	4.261	2013533	4.36	100	100.7	90	110	
Pb	208	1	nogas	97.632	2.193	2670818	2.19	100	97.6	90	110	
U	238	1	nogas	89.697	1.525	2413131	1.56	100	89.7	90	110	ICV Main CR1 Failed
[Pb]	206	1	nogas	98.621	1.406	675010	0.65	100	98.6	90	110	
[Pb]	207	1	nogas	96.898	1.884	562952	0.91	100	96.9	90	110	
Na	23	2	He	10474.107	2.100	15647264	0.58	10000	104.7	90	110	
Mg	24	2	He	10151.008	1.080	8378945	1.49	10000	101.5	90	110	
Al	27	2	He	101.205	2.229	47076	1.36	100	101.2	90	110	
K	39	2	He	10491.084	0.429	8969435	0.42	10000	104.9	90	110	
Ca	43	2	He	10065.061	3.960	23815	3.76	10000	100.7	90	110	
Ca	44	2	He	10033.963	2.027	396076	0.67	10000	100.3	90	110	
V	51	2	He	98.605	1.094	578483	0.64	100	98.6	90	110	
Cr	52	2	He	96.922	1.559	617857	0.49	100	96.9	90	110	
Mn	55	2	He	99.040	1.904	439081	2.12	100	99.0	90	110	
Fe	56	2	He	9957.403	2.767	54623416	2.72	10000	99.6	90	110	
Co	59	2	He	94.907	1.887	824547	1.17	100	94.9	90	110	
Ni	60	2	He	99.154	2.596	210237	1.87	100	99.2	90	110	
Cu	63	2	He	99.383	1.107	536715	1.70	100	99.4	90	110	
Zn	66	2	He	98.604	1.440	130032	1.95	100	98.6	90	110	
As	75	2	He	99.804	2.341	125983	1.29	100	99.8	90	110	
Se	78	2	He	98.760	3.198	9962	1.69	100	98.8	90	110	
B	11	1	nogas	437.724	2.810	2239070	2.43	500	87.5	90	110	ICV Main CR1 Failed
Si	28	1	nogas	507.303	6.864	6908083	2.09	5000	10.1	90	110	ICV Main CR1 Failed
Ca	43	1	nogas	9993.413	4.144	348511	1.52	10000	99.9	90	110	
Ca	44	1	nogas	9827.861	3.325	5768005	1.71	10000	98.3	90	110	
Fe	56	1	nogas	9810.284	5.205	227146205	2.03	10000	98.1	90	110	
Se	77	1	nogas	28.175	49.147	62688	1.61	100	28.2	90	110	ICV Main CR1 Failed
Se	82	1	nogas	95.569	5.992	24954	2.86	100	95.6	90	110	
Mo	95	1	nogas	96.081	3.743	531609	1.03	100	96.1	90	110	
Sn	118	1	nogas	102.400	1.837	753861	0.40	100	102.4	90	110	
Ba	137	1	nogas	99.957	1.470	396552	0.55	100	100.0	90	110	
Sb	121	2	He	101.772	0.899	468578	1.72	100	101.8	90	110	
Li	7	1	nogas	99.125	3.686	1937876	1.69	100	99.1	90	110	
P	31	1	nogas	445.692	5.088	802166	1.30	500	89.1	90	110	ICV Main CR1 Failed
La	139	1	nogas	139.329	16.802	533	15.61	100	139.3	90	110	ICV Main CR1 Failed
Au	197	1	nogas	238.391	200.378	17	124.90	100	238.4	90	110	ICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1261564	2.14	1446753	87.20	70	125	
Ge	72	1	nogas	3247576	3.27	3206704	101.27	70	125	
In	115	1	nogas	2743656	1.57	2812441	97.55	70	125	
Bi	209	1	nogas	2145193	1.08	2322160	92.38	70	125	

Initial Calibration Verification (ICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	770652	1.61	754516	102.14	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLCCV5
Data File Name	131LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:15:48-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.255	3.454	37998	2.70	5	85.1	70	130	
Na	23	1	nogas	499.242	2.195	12873645	2.74	500	99.8	70	130	
Mg	24	1	nogas	512.335	3.599	8184982	4.27	500	102.5	70	130	
Al	27	1	nogas	6.095	2.904	141154	3.05	5	121.9	70	130	
K	39	1	nogas	486.238	5.330	17624482	1.33	500	97.2	70	130	
Ti	47	1	nogas	5.232	7.021	9420	9.15	5	104.6	70	130	
V	51	1	nogas	-6.283	-22.118	1216227	2.87	5	-125.7	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	4.473	0.892	177047	2.39	5	89.5	70	130	
Mn	55	1	nogas	5.009	1.429	165200	1.51	5	100.2	70	130	
Co	59	1	nogas	4.733	4.242	111279	2.42	5	94.7	70	130	
Ni	60	1	nogas	5.315	1.560	26396	0.80	5	106.3	70	130	
Cu	63	1	nogas	5.045	2.503	62005	0.18	5	100.9	70	130	
Zn	66	1	nogas	5.552	3.479	21783	1.98	5	111.0	70	130	
As	75	1	nogas	-2.705	-11.160	181175	2.69	5	-54.1	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	4.780	1.920	131338	0.41	5	95.6	70	130	
Ag	107	1	nogas	4.957	1.445	66943	0.84	5	99.1	70	130	
Cd	111	1	nogas	4.876	5.119	14386	2.78	5	97.5	70	130	
Sb	121	1	nogas	5.026	3.099	66704	1.22	5	100.5	70	130	
Tl	205	1	nogas	4.611	3.786	96348	4.14	5	92.2	70	130	
Pb	208	1	nogas	4.932	2.201	136423	2.18	5	98.6	70	130	
U	238	1	nogas	4.789	0.734	134083	2.16	5	95.8	70	130	
[Pb]	206	1	nogas	4.732	2.820	34076	3.37	5	94.6	70	130	
[Pb]	207	1	nogas	4.809	4.102	29343	2.62	5	96.2	70	130	
Na	23	2	He	498.970	4.063	792259	1.09	500	99.8	70	130	
Mg	24	2	He	494.997	4.875	410285	1.85	500	99.0	70	130	
Al	27	2	He	5.852	7.510	3527	5.25	5	117.0	70	130	
K	39	2	He	506.396	2.047	606084	1.43	500	101.3	70	130	
Ca	43	2	He	491.416	14.325	1173	10.52	500	98.3	70	130	
Ca	44	2	He	496.079	4.147	20692	0.88	500	99.2	70	130	
V	51	2	He	4.386	5.926	40180	0.32	5	87.7	70	130	
Cr	52	2	He	4.874	6.575	35625	2.28	5	97.5	70	130	
Mn	55	2	He	5.090	5.175	23849	1.62	5	101.8	70	130	
Fe	56	2	He	504.862	2.218	2790513	1.75	500	101.0	70	130	
Co	59	2	He	4.795	3.819	42098	3.30	5	95.9	70	130	
Ni	60	2	He	5.348	1.558	11154	4.76	5	107.0	70	130	
Cu	63	2	He	5.165	2.576	27965	4.78	5	103.3	70	130	
Zn	66	2	He	5.473	6.880	6928	4.04	5	109.5	70	130	
As	75	2	He	4.975	3.427	6872	0.50	5	99.5	70	130	
Se	78	2	He	5.009	13.099	583	8.04	5	100.2	70	130	
B	11	1	nogas	30.841	3.806	177033	2.05	25	123.4	70	130	
Si	28	1	nogas	249.369	3.184	4214325	2.02	25	997.5	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	509.856	6.326	18416	4.14	500	102.0	70	130	
Ca	44	1	nogas	474.314	2.975	372822	1.35	500	94.9	70	130	
Fe	56	1	nogas	478.755	2.307	13872788	2.19	500	95.8	70	130	
Se	77	1	nogas	-24.944	-3.683	52633	2.27	5	-498.9	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	4.839	17.649	1507	12.76	5	96.8	70	130	
Mo	95	1	nogas	4.829	0.906	27351	1.49	5	96.6	70	130	
Sn	118	1	nogas	4.772	2.072	37958	1.83	5	95.4	70	130	
Ba	137	1	nogas	4.742	4.076	19838	1.91	5	94.8	70	130	
Sb	121	2	He	5.265	4.079	24788	3.90	5	105.3	70	130	
Li	7	1	nogas	5.160	4.362	196270	2.54	5	103.2	70	130	
P	31	1	nogas	28.079	5.950	137092	0.42	25	112.3	70	130	
La	139	1	nogas	9.723	50.979	90	22.22	5	194.5	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	301.460	2.209	20	0.00	5	6029.2	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1290480	1.84	1446753	89.20	70	125	
Ge	72	1	nogas	3264303	2.29	3206704	101.80	70	125	
In	115	1	nogas	2878758	2.35	2812441	102.36	70	125	
Bi	209	1	nogas	2230517	1.48	2322160	96.05	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	773591	3.51	754516	102.53	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICCB
Data File Name	132_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:17:46-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.013	4.8	167	3.5	1	
Na	23	1	nogas	0.207	280.8	412239	2.5	100	
Mg	24	1	nogas	0.620	26.4	18112	8.7	100	
Al	27	1	nogas	2.320	102.5	69027	73.1	5	
K	39	1	nogas	-8.421	-138.7	7898197	0.8	100	
Ti	47	1	nogas	0.021	141.8	280	16.4	2.5	
V	51	1	nogas	-8.276	-5.8	1179353	4.6	2.5	
Cr	52	1	nogas	-0.384	-19.7	71092	2.4	2.5	
Mn	55	1	nogas	-0.015	-280.8	28148	3.7	2.5	
Co	59	1	nogas	-0.006	-51.6	700	14.3	2.5	
Ni	60	1	nogas	0.181	2.3	563	7.4	2.5	
Cu	63	1	nogas	0.037	16.8	1970	2.2	1	
Zn	66	1	nogas	0.269	5.7	897	7.6	2.5	
As	75	1	nogas	-6.762	-9.3	163234	2.5	2.5	
Sr	88	1	nogas	0.022	24.7	1500	8.8	2.5	
Ag	107	1	nogas	0.004	34.4	153	16.4	2.5	
Cd	111	1	nogas	0.012	65.2	57	44.4	1	
Sb	121	1	nogas	0.157	9.7	3140	4.1	2.5	
Tl	205	1	nogas	0.093	43.0	2510	36.4	1	
Pb	208	1	nogas	0.011	58.4	1863	9.1	2.5	
U	238	1	nogas	0.015	30.6	533	28.7	2.5	
[Pb]	206	1	nogas	0.001	454.9	423	8.9	2.5	
[Pb]	207	1	nogas	0.018	20.0	430	4.0	2.5	
Na	23	2	He	-0.581	-104.0	46597	1.6	100	
Mg	24	2	He	0.607	18.6	1117	7.6	100	
Al	27	2	He	0.447	31.4	1067	6.0	5	
K	39	2	He	-2.860	-88.1	179521	1.2	100	
Ca	43	2	He	12.124	117.0	40	86.6	100	
Ca	44	2	He	2.221	142.5	1210	9.9	100	
V	51	2	He	-0.476	-12.0	12512	2.3	2.5	
Cr	52	2	He	-0.075	-48.7	4301	4.6	2.5	
Mn	55	2	He	0.068	45.2	1617	9.0	2.5	
Fe	56	2	He	0.433	9.9	14706	2.5	100	
Co	59	2	He	-0.008	-47.9	243	13.2	2.5	
Ni	60	2	He	0.220	17.7	227	38.0	2.5	
Cu	63	2	He	0.145	11.1	760	12.6	1	
Zn	66	2	He	0.435	4.0	257	9.0	2.5	
As	75	2	He	-0.006	-317.5	604	3.0	2.5	
Se	78	2	He	0.626	20.9	147	8.2	1	
B	11	1	nogas	6.668	5.8	49812	1.3	10	
Si	28	1	nogas	0.052	8967.4	1584000	1.4	5	
Ca	43	1	nogas	9.121	54.2	903	20.9	100	
Ca	44	1	nogas	-0.468	-1366.5	98243	0.7	100	
Fe	56	1	nogas	-10.589	-37.4	2639254	0.1	100	

Initial Calibration Blank (ICB) Report

Se	77	1	nogas	-30.346	-17.1	52075	4.0	2.5	
Se	82	1	nogas	-0.029	-417.0	247	16.4	1	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Mo	95	1	nogas	0.035	83.0	703	19.9	2.5	
Sn	118	1	nogas	0.039	67.2	1420	9.9	5	
Ba	137	1	nogas	0.017	6.4	183	6.3	2.5	
Sb	121	2	He	0.123	27.9	1073	15.1	2.5	
P	31	1	nogas	-0.016	-5605.1	92937	2.9	10	
La	139	1	nogas	5.719	90.3	73	20.8	2.5	ICB Main CR1 Failed
Au	197	1	nogas	162.485	222.8	13	114.6	2.5	ICB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1297781	3.56	1446753	89.70	70	125	
Ge	72	1	nogas	3296160	3.64	3206704	102.79	70	125	
In	115	1	nogas	2824301	3.91	2812441	100.42	70	125	
Bi	209	1	nogas	2246613	5.11	2322160	96.75	70	125	
Ge	72	2	He	785684	0.89	754516	104.13	70	125	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	133SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:19:46-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	123CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.882	1.882	5.62	15770	0.01	2000	
Na	23	1	nogas	201.336	201.336	2.88	5469477	0.00	200000	
Mg	24	1	nogas	205.217	205.217	3.10	3303223	0.01	200000	
Al	27	1	nogas	1.933	1.933	3.87	61601	0.00	2000	
K	39	1	nogas	185.801	185.801	4.93	12054502	0.00	200000	
Ti	47	1	nogas	1.806	1.806	4.19	3517	0.05	2000	
V	51	1	nogas	-6.160	-6.160	-14.00	1258913	0.00	2000	
Cr	52	1	nogas	1.455	1.455	10.77	114367	0.00	2000	
Mn	55	1	nogas	1.651	1.651	7.03	75799	0.00	2000	
Co	59	1	nogas	1.840	1.840	4.00	45193	0.00	2000	
Ni	60	1	nogas	2.090	2.090	3.98	10500	0.02	2000	
Cu	63	1	nogas	1.917	1.917	3.45	25308	0.01	2000	
Zn	66	1	nogas	2.084	2.084	2.76	8335	0.03	2000	
As	75	1	nogas	-4.977	-4.977	-26.69	175762	0.00	2000	
Sr	88	1	nogas	1.912	1.912	2.87	54784	0.00	2000	
Ag	107	1	nogas	1.965	1.965	4.33	27458	0.01	2000	
Cd	111	1	nogas	2.001	2.001	2.31	5994	0.03	2000	
Sb	121	1	nogas	1.906	1.906	2.02	26811	0.01	2000	
Tl	205	1	nogas	1.816	1.816	7.34	39168	0.00	2000	
Pb	208	1	nogas	1.957	1.957	1.65	55080	0.00	2000	
U	238	1	nogas	1.904	1.904	3.13	53621	0.00	2000	
[Pb]	206	1	nogas	1.863	1.863	2.76	13996	0.01	2000	
[Pb]	207	1	nogas	1.906	1.906	0.63	12111	0.02	2000	
Na	23	2	He	196.462	196.462	0.70	349443	0.06	200000	
Mg	24	2	He	198.864	198.864	0.86	169682	0.12	200000	
Al	27	2	He	1.431	1.431	18.44	1540	0.09	2000	
K	39	2	He	202.776	202.776	1.30	351766	0.06	200000	
Ca	43	2	He	246.074	246.074	21.96	610	40.34	200000	
Ca	44	2	He	191.830	191.830	1.03	8912	2.15	200000	
V	51	2	He	1.557	1.557	2.27	24613	0.01	2000	
Cr	52	2	He	1.692	1.692	0.69	15864	0.01	2000	
Mn	55	2	He	1.873	1.873	3.83	9849	0.02	2000	
Fe	56	2	He	192.979	192.979	1.59	1102649	0.02	200000	
Co	59	2	He	1.896	1.896	2.10	17282	0.01	2000	
Ni	60	2	He	2.085	2.085	6.24	4307	0.05	2000	
Cu	63	2	He	2.038	2.038	2.10	11294	0.02	2000	
Zn	66	2	He	2.293	2.293	7.40	2790	0.08	2000	
As	75	2	He	1.932	1.932	1.48	3119	0.06	2000	
Se	78	2	He	2.240	2.240	2.71	315	0.71	2000	
B	11	1	nogas	13.939	13.939	6.27	86879	0.02	2000	
Si	28	1	nogas	90.823	90.823	5.09	2614779	0.00	2000	
Ca	43	1	nogas	188.371	188.371	2.11	7405	2.54	200000	

Sample Report

Ca	44	1	nogas	170.299	170.299	2.45	202849	0.08	200000	
Fe	56	1	nogas	176.064	176.064	4.53	7133054	0.00	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	-26.984	-26.984	-2.66	53930	-0.05	2000	
Se	82	1	nogas	1.877	1.877	0.88	763	0.25	2000	
Mo	95	1	nogas	1.909	1.909	2.06	11481	0.02	2000	
Sn	118	1	nogas	1.823	1.823	5.27	15400	0.01	2000	
Ba	137	1	nogas	1.970	1.970	7.76	8416	0.02	2000	
Sb	121	2	He	2.007	2.007	4.82	10006	0.02	2000	
La	139	1	nogas	-7.752	-7.752	-21.51	27	-29.07	2000	
Au	197	1	nogas	437.229	437.229	29.88	27	1639.61	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1316939	3.63	1446753	91.03	70	125	
Ge	72	1	nogas	3370304	1.34	3206704	105.10	70	125	
In	115	1	nogas	2915299	1.61	2812441	103.66	70	125	
Bi	209	1	nogas	2283724	1.07	2322160	98.34	70	125	
Ge	72	2	He	793775	0.77	754516	105.20	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	138_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:33:43-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.034	32.1	357	26.1	1	
Na	23	1	nogas	8.695	38.6	619732	5.4	100	
Mg	24	1	nogas	4.329	35.2	76039	23.2	100	
Al	27	1	nogas	3.334	4.1	85623	1.7	5	
K	39	1	nogas	3.908	261.5	7935173	1.1	100	
Ti	47	1	nogas	0.071	50.4	360	18.2	2.5	
V	51	1	nogas	-10.161	-1.0	1103147	3.0	2.5	
Cr	52	1	nogas	-0.455	-18.2	67716	1.5	2.5	
Mn	55	1	nogas	0.835	5.9	50258	0.9	2.5	
Co	59	1	nogas	0.060	22.4	2197	11.1	2.5	
Ni	60	1	nogas	0.274	4.3	1010	3.0	2.5	
Cu	63	1	nogas	0.103	19.1	2697	8.5	2	
Zn	66	1	nogas	0.548	6.5	1957	5.5	2.5	
As	75	1	nogas	-7.871	-10.2	153746	0.7	2.5	
Sr	88	1	nogas	0.049	28.1	2184	13.9	2.5	
Ag	107	1	nogas	0.029	13.7	473	8.5	2.5	
Cd	111	1	nogas	0.044	50.9	147	41.7	1	
Sb	121	1	nogas	0.977	27.0	13539	22.3	2.5	
Tl	205	1	nogas	0.369	56.7	8410	56.0	1	
Pb	208	1	nogas	0.051	52.5	2957	24.6	2.5	
U	238	1	nogas	0.139	61.5	4007	63.0	2.5	
[Pb]	206	1	nogas	0.033	83.8	663	31.4	2.5	
[Pb]	207	1	nogas	0.053	30.6	653	18.5	2.5	
Na	23	2	He	7.915	11.9	57831	2.4	100	
Mg	24	2	He	2.673	10.9	2777	9.5	100	
Al	27	2	He	2.569	8.4	1997	3.7	5	
K	39	2	He	1.563	161.5	183226	1.2	100	
Ca	43	2	He	6.977	34.8	27	21.7	100	
Ca	44	2	He	9.659	3.4	1467	1.4	100	
V	51	2	He	-0.495	-5.6	12053	0.5	2.5	
Cr	52	2	He	-0.027	-76.0	4481	2.5	2.5	
Mn	55	2	He	0.853	6.4	5007	4.8	2.5	
Fe	56	2	He	3.313	9.4	29938	5.1	100	
Co	59	2	He	0.032	37.7	580	16.6	2.5	
Ni	60	2	He	0.282	8.5	350	15.9	2.5	
Cu	63	2	He	0.213	8.5	1097	7.1	2	
Zn	66	2	He	0.727	7.7	633	12.9	2.5	
As	75	2	He	0.001	3616.8	596	6.0	2.5	
Se	78	2	He	0.554	61.2	135	24.0	2	
B	11	1	nogas	9.981	7.6	68838	6.0	10	
Si	28	1	nogas	5.313	30.7	1598930	3.4	5	CCB Main CR1 Failed
Ca	43	1	nogas	15.667	5.1	1103	1.4	100	
Ca	44	1	nogas	2.448	207.5	97385	0.3	100	
Fe	56	1	nogas	-17.295	-46.9	2417812	4.9	100	
Se	77	1	nogas	-39.790	-11.7	48882	1.5	2.5	
Se	82	1	nogas	-0.064	-228.4	230	15.1	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.353	47.3	2410	34.5	2.5	
Sn	118	1	nogas	0.243	40.4	2980	20.8	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.065	33.6	383	21.7	2.5	
Sb	121	2	He	0.692	9.4	3634	6.8	2.5	
P	31	1	nogas	6.323	34.3	100485	1.3	10	
La	139	1	nogas	-3.812	-85.5	40	25.0	2.5	
Au	197	1	nogas	227.151	208.2	17	124.9	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1349535	1.36	1446753	93.28	70	125	
Ge	72	1	nogas	3210634	3.09	3206704	100.12	70	125	
In	115	1	nogas	2854242	4.17	2812441	101.49	70	125	
Bi	209	1	nogas	2266004	3.07	2322160	97.58	70	125	
Ge	72	2	He	763674	1.80	754516	101.21	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	141_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:41:27-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	102.812	3.292	795235	2.22	100	102.8	90	110	
Na	23	1	nogas	10340.483	2.172	255082981	1.86	10000	103.4	90	110	
Mg	24	1	nogas	10062.903	3.553	158367295	1.64	10000	100.6	90	110	
Al	27	1	nogas	97.706	1.884	1888953	0.61	100	97.7	90	110	
K	39	1	nogas	10467.538	2.061	210404055	2.73	10000	104.7	90	110	
Ti	47	1	nogas	100.690	1.427	172538	0.99	100	100.7	90	110	
V	51	1	nogas	101.563	1.884	3762915	1.39	100	101.6	90	110	
Cr	52	1	nogas	100.273	2.268	2225655	1.25	100	100.3	90	110	
Mn	55	1	nogas	100.838	2.787	2718536	2.31	100	100.8	90	110	
Co	59	1	nogas	101.097	4.476	2304952	3.64	100	101.1	90	110	
Ni	60	1	nogas	99.660	3.112	489389	2.00	100	99.7	90	110	
Cu	63	1	nogas	97.470	1.514	1143128	0.23	100	97.5	90	110	
Zn	66	1	nogas	100.054	0.756	386412	0.74	100	100.1	90	110	
As	75	1	nogas	101.369	1.547	664239	0.99	100	101.4	90	110	
Sr	88	1	nogas	103.326	4.120	2754507	3.42	100	103.3	90	110	
Ag	107	1	nogas	102.557	3.834	1350925	3.74	100	102.6	90	110	
Cd	111	1	nogas	98.383	0.869	288138	0.13	100	98.4	90	110	
Sb	121	1	nogas	102.522	3.257	1308764	2.00	100	102.5	90	110	
Tl	205	1	nogas	102.511	6.470	2132674	1.73	100	102.5	90	110	
Pb	208	1	nogas	100.066	3.028	2737353	3.03	100	100.1	90	110	
U	238	1	nogas	88.815	3.127	2445212	2.90	100	88.8	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	93.339	6.660	665109	2.58	100	93.3	90	110	
[Pb]	207	1	nogas	92.365	4.473	559268	3.84	100	92.4	90	110	
Na	23	2	He	10540.257	2.502	15329537	1.74	10000	105.4	90	110	
Mg	24	2	He	10273.068	1.083	8254690	0.23	10000	102.7	90	110	
Al	27	2	He	101.254	3.206	45852	2.74	100	101.3	90	110	
K	39	2	He	10456.458	2.356	8940433	2.31	10000	104.6	90	110	
Ca	43	2	He	10208.892	1.111	23518	1.42	10000	102.1	90	110	
Ca	44	2	He	10384.631	0.455	399093	1.05	10000	103.8	90	110	
V	51	2	He	101.688	1.780	580312	1.15	100	101.7	90	110	
Cr	52	2	He	100.269	1.996	622205	2.44	100	100.3	90	110	
Mn	55	2	He	102.015	1.065	440245	0.79	100	102.0	90	110	
Fe	56	2	He	10160.819	2.283	54259449	1.52	10000	101.6	90	110	
Co	59	2	He	96.621	2.055	817210	1.32	100	96.6	90	110	
Ni	60	2	He	101.382	3.156	209279	2.67	100	101.4	90	110	
Cu	63	2	He	102.238	1.594	537465	1.02	100	102.2	90	110	
Zn	66	2	He	98.935	1.620	127001	0.77	100	98.9	90	110	
As	75	2	He	102.351	0.299	125785	1.14	100	102.4	90	110	
Se	78	2	He	102.187	1.326	10034	0.50	100	102.2	90	110	
B	11	1	nogas	457.541	4.746	2134011	0.91	500	91.5	90	110	
Si	28	1	nogas	485.486	0.407	6562317	1.60	5000	9.7	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10236.072	1.117	350670	1.98	10000	102.4	90	110	
Ca	44	1	nogas	10091.318	2.995	5813739	2.86	10000	100.9	90	110	
Fe	56	1	nogas	10039.854	2.717	228322572	2.28	10000	100.4	90	110	
Se	77	1	nogas	102.366	1.568	75810	1.09	100	102.4	90	110	
Se	82	1	nogas	98.580	1.539	25285	0.53	100	98.6	90	110	
Mo	95	1	nogas	96.190	1.639	522713	0.58	100	96.2	90	110	
Sn	118	1	nogas	98.748	2.361	757826	2.28	100	98.7	90	110	
Ba	137	1	nogas	96.297	3.275	398138	2.29	100	96.3	90	110	
Sb	121	2	He	101.639	1.280	455531	0.51	100	101.6	90	110	
Li	7	1	nogas	108.415	0.288	1962769	4.85	100	108.4	90	110	
P	31	1	nogas	459.663	0.076	809994	1.36	500	91.9	90	110	
La	139	1	nogas	112.708	8.028	460	7.84	100	112.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	156.141	167.682	13	86.60	100	156.1	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1220140	5.12	1446753	84.34	70	125	
Ge	72	1	nogas	3187513	1.29	3206704	99.40	70	125	
In	115	1	nogas	2859495	1.00	2812441	101.67	70	125	
Bi	209	1	nogas	2237658	4.90	2322160	96.36	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	750211	0.86	754516	99.43	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	147_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:53:20-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	100.098	6.666	777669	1.61	100	100.1	90	110	
Na	23	1	nogas	10321.189	4.890	250356081	1.73	10000	103.2	90	110	
Mg	24	1	nogas	10223.789	3.802	158311658	1.97	10000	102.2	90	110	
Al	27	1	nogas	104.558	5.640	2023351	1.57	100	104.6	90	110	
K	39	1	nogas	10030.938	5.820	202260767	1.88	10000	100.3	90	110	
Ti	47	1	nogas	102.108	3.332	175380	2.08	100	102.1	90	110	
V	51	1	nogas	86.769	3.694	3418815	3.03	100	86.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	97.861	1.319	2181601	5.20	100	97.9	90	110	
Mn	55	1	nogas	98.906	1.603	2676280	5.34	100	98.9	90	110	
Co	59	1	nogas	98.935	4.108	2261816	3.82	100	98.9	90	110	
Ni	60	1	nogas	97.546	3.540	480128	0.79	100	97.5	90	110	
Cu	63	1	nogas	96.916	3.481	1139211	0.93	100	96.9	90	110	
Zn	66	1	nogas	99.377	2.539	384762	2.22	100	99.4	90	110	
As	75	1	nogas	93.103	4.874	626920	1.04	100	93.1	90	110	
Sr	88	1	nogas	104.161	4.050	2783763	3.15	100	104.2	90	110	
Ag	107	1	nogas	98.657	3.570	1302396	0.89	100	98.7	90	110	
Cd	111	1	nogas	99.568	5.051	284769	1.96	100	99.6	90	110	
Sb	121	1	nogas	99.088	7.094	1267428	5.04	100	99.1	90	110	
Tl	205	1	nogas	102.826	6.816	2042064	7.56	100	102.8	90	110	
Pb	208	1	nogas	97.148	1.113	2657590	1.11	100	97.1	90	110	
U	238	1	nogas	92.603	1.618	2430110	2.21	100	92.6	90	110	
[Pb]	206	1	nogas	98.972	1.824	672913	1.27	100	99.0	90	110	
[Pb]	207	1	nogas	97.694	3.833	563696	2.45	100	97.7	90	110	
Na	23	2	He	10168.292	0.763	15099804	1.14	10000	101.7	90	110	
Mg	24	2	He	10061.984	0.209	8253815	0.90	10000	100.6	90	110	
Al	27	2	He	100.373	1.211	46414	1.91	100	100.4	90	110	
K	39	2	He	10252.470	0.212	8769568	0.21	10000	102.5	90	110	
Ca	43	2	He	10055.173	1.556	23645	1.31	10000	100.6	90	110	
Ca	44	2	He	10091.529	2.272	395879	1.52	10000	100.9	90	110	
V	51	2	He	99.097	1.138	577684	0.49	100	99.1	90	110	
Cr	52	2	He	97.225	1.301	616010	1.93	100	97.2	90	110	
Mn	55	2	He	99.325	0.637	437593	0.47	100	99.3	90	110	
Fe	56	2	He	10032.096	0.710	54692263	0.81	10000	100.3	90	110	
Co	59	2	He	94.864	0.381	819129	0.74	100	94.9	90	110	
Ni	60	2	He	99.541	1.725	209754	0.80	100	99.5	90	110	
Cu	63	2	He	99.129	2.779	531913	1.88	100	99.1	90	110	
Zn	66	2	He	97.982	1.482	128410	2.15	100	98.0	90	110	
As	75	2	He	100.041	0.871	125511	0.68	100	100.0	90	110	
Se	78	2	He	98.655	2.732	9891	1.73	100	98.7	90	110	
B	11	1	nogas	472.280	7.270	2212422	1.13	500	94.5	90	110	
Si	28	1	nogas	496.346	8.308	6683269	2.29	5000	9.9	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	9976.656	5.079	342356	0.93	10000	99.8	90	110	
Ca	44	1	nogas	9847.424	5.776	5686667	3.60	10000	98.5	90	110	
Fe	56	1	nogas	9901.329	2.506	225806405	2.54	10000	99.0	90	110	
Se	77	1	nogas	55.954	31.335	67023	0.91	100	56.0	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	95.577	2.944	24584	2.19	100	95.6	90	110	
Mo	95	1	nogas	98.344	4.641	535433	0.49	100	98.3	90	110	
Sn	118	1	nogas	99.238	4.175	743825	0.96	100	99.2	90	110	
Ba	137	1	nogas	97.909	2.120	395716	3.03	100	97.9	90	110	
Sb	121	2	He	101.105	1.590	462572	1.21	100	101.1	90	110	
Li	7	1	nogas	105.849	5.883	1926457	3.09	100	105.8	90	110	
P	31	1	nogas	448.209	4.482	793643	0.98	500	89.6	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	130.154	10.808	510	7.07	100	130.2	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	637.362	57.958	33	45.83	100	637.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1227694	6.59	1446753	84.86	70	125	
Ge	72	1	nogas	3197421	4.25	3206704	99.71	70	125	
In	115	1	nogas	2796582	5.01	2812441	99.44	70	125	
Bi	209	1	nogas	2131008	1.38	2322160	91.77	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	765831	1.10	754516	101.50	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	148_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:55:18-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.061	32.3	570	25.3	1	
Na	23	1	nogas	17.047	14.7	833421	3.8	100	
Mg	24	1	nogas	6.237	25.1	107433	19.5	100	
Al	27	1	nogas	3.314	5.0	86122	2.3	5	
K	39	1	nogas	8.210	234.2	8097944	0.8	100	
Ti	47	1	nogas	0.104	16.0	420	6.3	2.5	
V	51	1	nogas	-18.661	-8.2	908686	6.9	2.5	
Cr	52	1	nogas	-0.764	-8.8	61702	2.6	2.5	
Mn	55	1	nogas	0.777	12.5	49179	1.5	2.5	
Co	59	1	nogas	0.069	30.2	2417	16.2	2.5	
Ni	60	1	nogas	0.310	2.3	1200	4.2	2.5	
Cu	63	1	nogas	0.120	36.7	2924	14.0	2	
Zn	66	1	nogas	0.556	2.1	2013	2.5	2.5	
As	75	1	nogas	-11.844	-4.3	136474	3.3	2.5	
Sr	88	1	nogas	0.072	22.0	2824	11.2	2.5	
Ag	107	1	nogas	0.039	32.1	617	23.1	2.5	
Cd	111	1	nogas	0.056	12.9	183	12.6	1	
Sb	121	1	nogas	0.522	13.9	7809	8.8	2.5	
Tl	205	1	nogas	0.769	62.7	16434	60.4	1	
Pb	208	1	nogas	0.060	47.7	3200	24.2	2.5	
U	238	1	nogas	0.147	52.8	4114	51.3	2.5	
[Pb]	206	1	nogas	0.051	77.8	777	36.1	2.5	
[Pb]	207	1	nogas	0.079	52.3	790	31.2	2.5	
Na	23	2	He	15.472	17.0	68540	4.1	100	
Mg	24	2	He	4.287	3.7	4070	1.6	100	
Al	27	2	He	2.420	20.3	1917	10.3	5	
K	39	2	He	4.765	38.5	185909	0.8	100	
Ca	43	2	He	18.614	67.7	53	54.1	100	
Ca	44	2	He	17.171	14.8	1750	7.0	100	
V	51	2	He	-0.722	-2.8	10706	0.9	2.5	
Cr	52	2	He	-0.001	-3292.1	4621	3.5	2.5	
Mn	55	2	He	0.840	7.5	4924	6.7	2.5	
Fe	56	2	He	4.440	9.9	35828	5.1	100	
Co	59	2	He	0.045	21.9	687	10.9	2.5	
Ni	60	2	He	0.257	8.6	297	16.6	2.5	
Cu	63	2	He	0.213	9.2	1093	8.2	2	
Zn	66	2	He	0.639	7.8	513	11.4	2.5	
As	75	2	He	-0.054	-72.0	523	7.7	2.5	
Se	78	2	He	0.709	12.4	150	6.9	2	
B	11	1	nogas	12.149	18.7	78187	9.1	10	CCB Main CR1 Failed
Si	28	1	nogas	10.023	70.5	1663537	0.8	5	CCB Main CR1 Failed
Ca	43	1	nogas	18.341	34.6	1203	14.5	100	
Ca	44	1	nogas	0.067	8720.5	97014	0.4	100	
Fe	56	1	nogas	-13.397	-66.0	2530743	4.1	100	
Se	77	1	nogas	-67.312	-2.8	44040	3.7	2.5	
Se	82	1	nogas	0.043	959.9	260	40.7	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.438	45.9	2897	34.2	2.5	
Sn	118	1	nogas	0.298	30.6	3394	16.4	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.104	21.5	540	13.0	2.5	
Sb	121	2	He	0.431	5.0	2434	2.6	2.5	
P	31	1	nogas	5.293	34.0	99898	1.3	10	
La	139	1	nogas	1.838	303.1	60	28.9	2.5	
Au	197	1	nogas	601.050	77.1	33	62.4	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1326497	5.41	1446753	91.69	70	125	
Ge	72	1	nogas	3244478	3.79	3206704	101.18	70	125	
In	115	1	nogas	2847870	3.71	2812441	101.26	70	125	
Bi	209	1	nogas	2219885	0.68	2322160	95.60	70	125	
Ge	72	2	He	759079	1.55	754516	100.60	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	159_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:17:04-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	103.960	4.988	788231	1.56	100	104.0	90	110	
Na	23	1	nogas	10259.326	1.218	254488314	0.96	10000	102.6	90	110	
Mg	24	1	nogas	10091.346	0.918	159772699	2.43	10000	100.9	90	110	
Al	27	1	nogas	100.470	5.061	1936392	1.37	100	100.5	90	110	
K	39	1	nogas	10728.759	3.033	214946438	1.96	10000	107.3	90	110	
Ti	47	1	nogas	104.238	4.626	178113	0.46	100	104.2	90	110	
V	51	1	nogas	100.850	8.654	3734390	1.46	100	100.8	90	110	
Cr	52	1	nogas	101.197	6.665	2239156	4.14	100	101.2	90	110	
Mn	55	1	nogas	101.045	4.345	2717178	1.93	100	101.0	90	110	
Co	59	1	nogas	99.371	2.298	2261453	2.62	100	99.4	90	110	
Ni	60	1	nogas	99.278	4.998	486173	0.13	100	99.3	90	110	
Cu	63	1	nogas	98.934	4.759	1157057	0.36	100	98.9	90	110	
Zn	66	1	nogas	100.419	2.467	387014	2.65	100	100.4	90	110	
As	75	1	nogas	100.819	5.137	660007	1.18	100	100.8	90	110	
Sr	88	1	nogas	102.255	4.272	2719070	0.60	100	102.3	90	110	
Ag	107	1	nogas	100.428	2.722	1320027	2.37	100	100.4	90	110	
Cd	111	1	nogas	99.814	1.082	284692	2.23	100	99.8	90	110	
Sb	121	1	nogas	103.435	5.354	1316899	2.40	100	103.4	90	110	
Tl	205	1	nogas	98.427	5.989	2029796	5.71	100	98.4	90	110	
Pb	208	1	nogas	99.002	0.800	2708274	0.80	100	99.0	90	110	
U	238	1	nogas	89.831	2.873	2448207	0.93	100	89.8	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	95.749	3.659	676152	2.11	100	95.7	90	110	
[Pb]	207	1	nogas	94.536	1.635	566812	0.93	100	94.5	90	110	
Na	23	2	He	10575.884	3.846	15452084	1.59	10000	105.8	90	110	
Mg	24	2	He	10399.832	3.366	8395441	1.55	10000	104.0	90	110	
Al	27	2	He	102.480	2.501	46621	0.58	100	102.5	90	110	
K	39	2	He	10375.651	1.673	8872747	1.64	10000	103.8	90	110	
Ca	43	2	He	10182.161	1.280	23575	2.53	10000	101.8	90	110	
Ca	44	2	He	10090.987	1.421	389758	1.98	10000	100.9	90	110	
V	51	2	He	101.702	2.362	583175	0.50	100	101.7	90	110	
Cr	52	2	He	99.254	1.936	618866	0.52	100	99.3	90	110	
Mn	55	2	He	101.031	1.211	438179	1.57	100	101.0	90	110	
Fe	56	2	He	10174.869	2.605	54598609	1.54	10000	101.7	90	110	
Co	59	2	He	97.431	2.860	827978	1.04	100	97.4	90	110	
Ni	60	2	He	101.725	4.799	210925	2.66	100	101.7	90	110	
Cu	63	2	He	101.818	3.004	537764	0.75	100	101.8	90	110	
Zn	66	2	He	99.810	1.792	128757	1.03	100	99.8	90	110	
As	75	2	He	101.203	1.848	124974	0.46	100	101.2	90	110	
Se	78	2	He	101.348	0.938	10002	1.35	100	101.3	90	110	
B	11	1	nogas	473.013	6.810	2161676	1.37	500	94.6	90	110	
Si	28	1	nogas	485.909	5.283	6549028	1.12	5000	9.7	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10239.294	4.633	349762	0.33	10000	102.4	90	110	
Ca	44	1	nogas	10005.055	5.446	5747401	0.58	10000	100.1	90	110	
Fe	56	1	nogas	10090.460	3.278	228930030	1.62	10000	100.9	90	110	
Se	77	1	nogas	98.227	16.644	74813	0.68	100	98.2	90	110	
Se	82	1	nogas	101.457	4.908	25942	0.33	100	101.5	90	110	
Mo	95	1	nogas	97.445	5.423	527943	0.64	100	97.4	90	110	
Sn	118	1	nogas	100.535	3.014	751069	1.35	100	100.5	90	110	
Ba	137	1	nogas	100.286	2.008	403781	1.49	100	100.3	90	110	
Sb	121	2	He	101.698	1.169	458067	1.46	100	101.7	90	110	
Li	7	1	nogas	105.962	4.516	1881192	2.15	100	106.0	90	110	
P	31	1	nogas	460.175	5.056	808506	0.78	500	92.0	90	110	
La	139	1	nogas	136.995	2.865	533	5.73	100	137.0	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	378.334	31.524	23	24.74	100	378.3	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1197250	6.32	1446753	82.75	70	125	
Ge	72	1	nogas	3183053	4.78	3206704	99.26	70	125	
In	115	1	nogas	2785286	3.29	2812441	99.03	70	125	
Bi	209	1	nogas	2214088	2.32	2322160	95.35	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	754009	2.28	754516	99.93	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	160_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:19:01-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.046	19.4	440	15.9	1	
Na	23	1	nogas	12.809	12.1	734140	3.0	100	
Mg	24	1	nogas	5.667	22.4	99378	18.2	100	
Al	27	1	nogas	3.408	2.8	86508	1.4	5	
K	39	1	nogas	13.562	60.0	8072156	0.6	100	
Ti	47	1	nogas	0.283	111.7	717	74.6	2.5	
V	51	1	nogas	-11.423	-14.0	1065497	2.9	2.5	
Cr	52	1	nogas	-0.373	-2.8	69068	1.8	2.5	
Mn	55	1	nogas	0.799	5.4	48992	1.1	2.5	
Co	59	1	nogas	0.068	24.4	2377	14.8	2.5	
Ni	60	1	nogas	0.322	2.9	1240	2.9	2.5	
Cu	63	1	nogas	0.097	12.4	2607	4.3	2	
Zn	66	1	nogas	0.555	5.1	1977	6.6	2.5	
As	75	1	nogas	-8.138	-11.6	151588	4.1	2.5	
Sr	88	1	nogas	0.069	25.2	2704	15.9	2.5	
Ag	107	1	nogas	0.035	30.9	553	24.5	2.5	
Cd	111	1	nogas	0.053	82.8	173	68.8	1	
Sb	121	1	nogas	0.051	47.9	1690	17.3	2.5	
Tl	205	1	nogas	0.731	59.1	15613	58.6	1	
Pb	208	1	nogas	0.059	38.5	3197	19.6	2.5	
U	238	1	nogas	0.137	56.7	3824	56.6	2.5	
[Pb]	206	1	nogas	0.053	11.6	783	5.2	2.5	
[Pb]	207	1	nogas	0.062	58.7	687	32.9	2.5	
Na	23	2	He	11.656	1.3	62526	0.3	100	
Mg	24	2	He	3.790	10.2	3640	8.4	100	
Al	27	2	He	2.805	12.4	2077	7.8	5	
K	39	2	He	4.445	165.4	185640	3.3	100	
Ca	43	2	He	25.848	57.6	70	49.5	100	
Ca	44	2	He	14.654	21.7	1640	7.8	100	
V	51	2	He	-0.320	-14.1	12877	1.7	2.5	
Cr	52	2	He	0.003	962.9	4611	4.3	2.5	
Mn	55	2	He	0.761	7.6	4544	5.7	2.5	
Fe	56	2	He	3.819	11.0	32262	7.0	100	
Co	59	2	He	0.045	16.1	687	9.2	2.5	
Ni	60	2	He	0.272	7.4	323	12.5	2.5	
Cu	63	2	He	0.218	11.5	1110	11.5	2	
Zn	66	2	He	0.693	8.0	580	11.9	2.5	
As	75	2	He	-0.027	-30.1	553	1.6	2.5	
Se	78	2	He	0.598	31.5	138	12.9	2	
B	11	1	nogas	7.477	11.4	54104	8.0	10	
Si	28	1	nogas	8.191	18.2	1618137	1.5	5	CCB Main CR1 Failed
Ca	43	1	nogas	17.426	5.5	1157	2.8	100	
Ca	44	1	nogas	-7.461	-33.7	91171	0.7	100	
Fe	56	1	nogas	-13.329	-64.3	2492840	6.6	100	
Se	77	1	nogas	-34.875	-12.5	49527	3.0	2.5	
Se	82	1	nogas	-0.086	-82.9	223	6.8	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.351	59.0	2394	45.8	2.5	
Sn	118	1	nogas	0.238	41.6	2974	21.5	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.101	34.9	537	26.6	2.5	
Sb	121	2	He	0.001	1187.4	480	9.1	2.5	
P	31	1	nogas	6.704	25.2	100459	1.3	10	
La	139	1	nogas	-3.930	-186.9	40	66.1	2.5	
Au	197	1	nogas	153.406	221.1	13	114.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1304191	3.41	1446753	90.15	70	125	
Ge	72	1	nogas	3189465	1.47	3206704	99.46	70	125	
In	115	1	nogas	2884666	4.12	2812441	102.57	70	125	
Bi	209	1	nogas	2203694	1.44	2322160	94.90	70	125	
Ge	72	2	He	753619	0.46	754516	99.88	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	168_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:34:46-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	106.169	0.951	724460	0.90	100	106.2	90	110	
Na	23	1	nogas	10222.546	4.778	262375206	2.88	10000	102.2	90	110	
Mg	24	1	nogas	9870.243	3.028	161697770	1.11	10000	98.7	90	110	
Al	27	1	nogas	101.644	0.520	2033078	0.44	100	101.6	90	110	
K	39	1	nogas	10367.424	0.700	215722096	0.27	10000	103.7	90	110	
Ti	47	1	nogas	103.352	1.148	183279	0.31	100	103.4	90	110	
V	51	1	nogas	98.046	4.291	3806926	1.91	100	98.0	90	110	
Cr	52	1	nogas	102.129	2.490	2344578	1.65	100	102.1	90	110	
Mn	55	1	nogas	101.438	1.782	2830369	1.94	100	101.4	90	110	
Co	59	1	nogas	97.918	0.685	2310999	0.40	100	97.9	90	110	
Ni	60	1	nogas	100.043	2.457	508493	1.92	100	100.0	90	110	
Cu	63	1	nogas	100.676	2.390	1221929	1.84	100	100.7	90	110	
Zn	66	1	nogas	100.553	1.939	401875	1.06	100	100.6	90	110	
As	75	1	nogas	98.412	2.259	673090	1.11	100	98.4	90	110	
Sr	88	1	nogas	102.509	0.975	2828727	1.13	100	102.5	90	110	
Ag	107	1	nogas	96.662	0.810	1317785	0.81	100	96.7	90	110	
Cd	111	1	nogas	99.600	1.656	291656	1.46	100	99.6	90	110	
Sb	121	1	nogas	104.611	1.966	1382247	1.04	100	104.6	90	110	
Tl	205	1	nogas	102.529	3.337	1988130	1.89	100	102.5	90	110	
Pb	208	1	nogas	97.054	1.593	2655018	1.59	100	97.1	90	110	
U	238	1	nogas	93.161	3.899	2387296	1.59	100	93.2	90	110	
[Pb]	206	1	nogas	98.846	4.652	656292	2.54	100	98.8	90	110	
[Pb]	207	1	nogas	98.169	2.266	553492	1.39	100	98.2	90	110	
Na	23	2	He	10499.901	3.520	16016712	2.21	10000	105.0	90	110	
Mg	24	2	He	10017.487	3.217	8442024	1.92	10000	100.2	90	110	
Al	27	2	He	98.983	0.373	47045	1.35	100	99.0	90	110	
K	39	2	He	11002.774	2.123	9398036	2.08	10000	110.0	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10331.871	2.108	24967	2.17	10000	103.3	90	110	
Ca	44	2	He	10281.543	1.277	414482	1.25	10000	102.8	90	110	
V	51	2	He	101.396	2.517	606967	1.17	100	101.4	90	110	
Cr	52	2	He	99.575	0.070	648186	1.26	100	99.6	90	110	
Mn	55	2	He	101.139	1.328	457924	2.40	100	101.1	90	110	
Fe	56	2	He	10121.089	0.603	56705459	1.82	10000	101.2	90	110	
Co	59	2	He	96.677	2.303	857683	1.04	100	96.7	90	110	
Ni	60	2	He	103.013	3.565	223031	2.27	100	103.0	90	110	
Cu	63	2	He	101.587	3.055	560131	2.02	100	101.6	90	110	
Zn	66	2	He	99.270	0.922	133682	0.71	100	99.3	90	110	
As	75	2	He	102.570	1.611	132212	0.65	100	102.6	90	110	
Se	78	2	He	100.516	3.385	10353	2.08	100	100.5	90	110	
B	11	1	nogas	2272.710	9.279	9296038	8.52	500	454.5	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	564.091	2.364	7633273	1.16	5000	11.3	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10633.821	1.299	376971	1.39	10000	106.3	90	110	
Ca	44	1	nogas	10292.644	1.412	6134662	0.46	10000	102.9	90	110	
Fe	56	1	nogas	10056.283	2.041	236678139	1.29	10000	100.6	90	110	
Se	77	1	nogas	95.294	2.454	77052	0.49	100	95.3	90	110	
Se	82	1	nogas	101.050	4.082	26813	3.14	100	101.1	90	110	
Mo	95	1	nogas	101.746	1.461	572246	1.58	100	101.7	90	110	
Sn	118	1	nogas	100.710	1.213	772788	1.83	100	100.7	90	110	
Ba	137	1	nogas	97.276	0.585	402188	0.31	100	97.3	90	110	
Sb	121	2	He	101.693	3.546	478004	2.37	100	101.7	90	110	
Li	7	1	nogas	111.250	2.256	1772833	1.65	100	111.3	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	449.201	1.190	821268	0.75	500	89.8	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	155.429	17.227	613	15.41	100	155.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	173.556	79.018	13	43.30	100	173.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1075314	1.37	1446753	74.33	70	125	
Ge	72	1	nogas	3298798	0.95	3206704	102.87	70	125	
In	115	1	nogas	2858972	0.65	2812441	101.65	70	125	
Bi	209	1	nogas	2082212	2.43	2322160	89.67	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	786980	1.30	754516	104.30	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	169_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:36:44-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.064	26.7	560	23.4	1	
Na	23	1	nogas	95.761	8.0	2912460	2.0	100	
Mg	24	1	nogas	8.433	18.3	148156	11.6	100	
Al	27	1	nogas	3.550	2.3	92429	0.7	5	
K	39	1	nogas	18.674	63.5	8463341	0.8	100	
Ti	47	1	nogas	0.081	39.6	387	12.2	2.5	
V	51	1	nogas	-5.729	-47.7	1245510	6.8	2.5	
Cr	52	1	nogas	-0.142	-22.7	76658	1.4	2.5	
Mn	55	1	nogas	0.848	9.2	52080	1.7	2.5	
Co	59	1	nogas	0.082	37.6	2767	23.7	2.5	
Ni	60	1	nogas	0.516	6.5	2270	5.8	2.5	
Cu	63	1	nogas	0.242	13.7	4464	8.2	2	
Zn	66	1	nogas	0.600	7.6	2224	7.3	2.5	
As	75	1	nogas	-5.087	-10.6	171807	2.1	2.5	
Sr	88	1	nogas	0.111	6.4	3951	5.2	2.5	
Ag	107	1	nogas	0.041	32.8	650	25.3	2.5	
Cd	111	1	nogas	0.063	17.6	213	16.5	1	
Sb	121	1	nogas	0.336	2.5	5518	2.9	2.5	
Tl	205	1	nogas	0.659	63.2	14405	61.4	1	
Pb	208	1	nogas	0.052	69.5	3004	33.1	2.5	
U	238	1	nogas	0.139	59.4	3967	58.6	2.5	
[Pb]	206	1	nogas	0.054	67.3	807	32.9	2.5	
[Pb]	207	1	nogas	0.047	49.1	610	23.6	2.5	
Na	23	2	He	91.360	2.9	187800	1.1	100	
Mg	24	2	He	6.372	11.3	6014	8.9	100	
Al	27	2	He	2.756	4.2	2160	0.8	5	
K	39	2	He	16.515	16.5	195751	1.2	100	
Ca	43	2	He	55.164	110.6	143	101.0	100	
Ca	44	2	He	32.174	65.3	2425	33.2	100	
V	51	2	He	-0.137	-33.8	14614	0.9	2.5	
Cr	52	2	He	0.048	79.5	5141	3.2	2.5	
Mn	55	2	He	0.884	7.6	5341	6.9	2.5	
Fe	56	2	He	8.058	11.2	57839	9.3	100	
Co	59	2	He	0.044	3.6	707	0.8	2.5	
Ni	60	2	He	0.267	14.0	330	22.9	2.5	
Cu	63	2	He	0.253	14.8	1360	14.2	2	
Zn	66	2	He	0.694	6.7	610	8.7	2.5	
As	75	2	He	0.066	20.6	702	4.3	2.5	
Se	78	2	He	0.704	17.1	156	7.8	2	
B	11	1	nogas	981.451	4.1	4601279	5.2	10	CCB Main CR1 Failed
Si	28	1	nogas	29.712	27.3	1906442	2.9	5	CCB Main CR1 Failed
Ca	43	1	nogas	168.723	5.5	6558	2.9	100	CCB Main CR1 Failed
Ca	44	1	nogas	21.978	17.0	111728	0.8	100	
Fe	56	1	nogas	-13.578	-69.5	2575101	6.2	100	
Se	77	1	nogas	-16.693	-8.2	54916	2.1	2.5	
Se	82	1	nogas	0.290	73.8	330	15.7	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	1.093	23.4	6645	19.5	2.5	
Sn	118	1	nogas	0.307	41.2	3627	24.6	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.142	5.1	730	6.8	2.5	
Sb	121	2	He	0.236	16.9	1617	11.7	2.5	
P	31	1	nogas	1.680	138.6	95885	1.7	10	
La	139	1	nogas	13.289	40.9	107	21.7	2.5	CCB Main CR1 Failed
Au	197	1	nogas	147.764	226.8	13	114.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1229035	1.29	1446753	84.95	70	125	
Ge	72	1	nogas	3304307	2.36	3206704	103.04	70	125	
In	115	1	nogas	2980582	2.90	2812441	105.98	70	125	
Bi	209	1	nogas	2254777	0.70	2322160	97.10	70	125	
Ge	72	2	He	792420	1.80	754516	105.02	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	178_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:54:25-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	107.563	1.874	731375	0.78	100	107.6	90	110	
Na	23	1	nogas	10091.516	0.731	260743664	1.33	10000	100.9	90	110	
Mg	24	1	nogas	9758.920	2.090	160878495	0.74	10000	97.6	90	110	
Al	27	1	nogas	102.746	2.679	2030892	2.38	100	102.7	90	110	
K	39	1	nogas	10652.651	0.698	218859955	0.30	10000	106.5	90	110	
Ti	47	1	nogas	103.870	0.598	182065	0.92	100	103.9	90	110	
V	51	1	nogas	104.253	2.568	3914874	1.95	100	104.3	90	110	
Cr	52	1	nogas	100.939	1.075	2291564	1.48	100	100.9	90	110	
Mn	55	1	nogas	103.320	2.285	2848648	1.96	100	103.3	90	110	
Co	59	1	nogas	100.175	1.145	2336714	0.77	100	100.2	90	110	
Ni	60	1	nogas	102.202	0.703	513469	0.38	100	102.2	90	110	
Cu	63	1	nogas	103.891	2.398	1246437	2.86	100	103.9	90	110	
Zn	66	1	nogas	102.510	1.426	404958	1.01	100	102.5	90	110	
As	75	1	nogas	102.770	1.420	686151	0.56	100	102.8	90	110	
Sr	88	1	nogas	108.083	1.782	2947668	1.40	100	108.1	90	110	
Ag	107	1	nogas	103.517	2.732	1394860	2.86	100	103.5	90	110	
Cd	111	1	nogas	97.827	0.879	298139	0.64	100	97.8	90	110	
Sb	121	1	nogas	103.126	1.721	1346994	2.14	100	103.1	90	110	
Tl	205	1	nogas	101.834	1.471	2045506	1.58	100	101.8	90	110	
Pb	208	1	nogas	102.046	1.643	2791483	1.64	100	102.0	90	110	
U	238	1	nogas	90.107	5.690	2390700	3.54	100	90.1	90	110	
[Pb]	206	1	nogas	99.942	0.183	687638	2.08	100	99.9	90	110	
[Pb]	207	1	nogas	98.675	2.233	576131	0.84	100	98.7	90	110	
Na	23	2	He	10283.694	2.193	15614934	2.23	10000	102.8	90	110	
Mg	24	2	He	10020.446	1.158	8404626	0.27	10000	100.2	90	110	
Al	27	2	He	100.538	3.529	47537	3.68	100	100.5	90	110	
K	39	2	He	10879.850	1.576	9295073	1.55	10000	108.8	90	110	
Ca	43	2	He	9873.796	1.516	23745	2.23	10000	98.7	90	110	
Ca	44	2	He	10090.920	3.848	404717	2.62	10000	100.9	90	110	
V	51	2	He	102.018	0.695	607699	0.74	100	102.0	90	110	
Cr	52	2	He	99.598	1.446	645102	1.09	100	99.6	90	110	
Mn	55	2	He	99.897	3.247	450007	2.86	100	99.9	90	110	
Fe	56	2	He	10198.383	4.302	56851709	4.21	10000	102.0	90	110	
Co	59	2	He	98.093	1.240	866092	1.16	100	98.1	90	110	
Ni	60	2	He	100.671	0.905	216949	1.38	100	100.7	90	110	
Cu	63	2	He	99.370	0.937	545312	0.91	100	99.4	90	110	
Zn	66	2	He	97.461	2.994	130586	2.55	100	97.5	90	110	
As	75	2	He	103.110	1.256	132257	0.51	100	103.1	90	110	
Se	78	2	He	99.399	3.113	10190	2.26	100	99.4	90	110	
B	11	1	nogas	698.239	2.424	2856827	1.36	500	139.6	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	519.893	1.828	7076587	1.26	5000	10.4	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10566.872	0.885	370240	0.75	10000	105.7	90	110	
Ca	44	1	nogas	10385.476	1.564	6117304	1.22	10000	103.9	90	110	
Fe	56	1	nogas	10390.176	1.720	241607114	1.27	10000	103.9	90	110	
Se	77	1	nogas	106.960	7.576	78442	1.63	100	107.0	90	110	
Se	82	1	nogas	102.641	2.201	26920	2.05	100	102.6	90	110	
Mo	95	1	nogas	100.070	1.970	556244	1.53	100	100.1	90	110	
Sn	118	1	nogas	99.066	1.294	791075	0.56	100	99.1	90	110	
Ba	137	1	nogas	95.579	1.972	411299	2.38	100	95.6	90	110	
Sb	121	2	He	100.744	1.074	471349	1.42	100	100.7	90	110	
Li	7	1	nogas	112.232	0.960	1781672	0.44	100	112.2	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	452.041	1.611	816269	1.24	500	90.4	90	110	
La	139	1	nogas	142.467	7.956	590	7.39	100	142.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	83.203	275.182	10	100.00	100	83.2	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1071602	1.27	1446753	74.07	70	125	
Ge	72	1	nogas	3260364	0.46	3206704	101.67	70	125	
In	115	1	nogas	2975481	0.93	2812441	105.80	70	125	
Bi	209	1	nogas	2156260	2.10	2322160	92.86	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	783119	1.25	754516	103.79	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	179_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:56:24-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.060	31.2	510	25.7	1	
Na	23	1	nogas	29.484	6.1	1207165	0.9	100	
Mg	24	1	nogas	6.131	25.3	111523	19.6	100	
Al	27	1	nogas	4.444	19.2	111108	13.8	5	
K	39	1	nogas	2.019	373.3	8212336	0.2	100	
Ti	47	1	nogas	0.097	20.4	420	7.1	2.5	
V	51	1	nogas	-5.864	-48.5	1254556	6.7	2.5	
Cr	52	1	nogas	-0.324	-8.2	73361	1.8	2.5	
Mn	55	1	nogas	0.744	7.5	49703	1.9	2.5	
Co	59	1	nogas	0.074	20.6	2614	11.9	2.5	
Ni	60	1	nogas	0.364	9.5	1513	10.2	2.5	
Cu	63	1	nogas	0.150	21.1	3377	9.5	2	
Zn	66	1	nogas	0.603	7.6	2260	6.5	2.5	
As	75	1	nogas	-7.039	-3.3	163963	1.5	2.5	
Sr	88	1	nogas	0.080	14.9	3130	8.6	2.5	
Ag	107	1	nogas	0.033	47.4	543	37.2	2.5	
Cd	111	1	nogas	0.046	34.3	163	28.3	1	
Sb	121	1	nogas	0.030	79.1	1483	19.5	2.5	
Tl	205	1	nogas	0.526	66.8	11486	63.7	1	
Pb	208	1	nogas	0.048	67.0	2880	30.4	2.5	
U	238	1	nogas	0.132	60.8	3714	59.2	2.5	
[Pb]	206	1	nogas	0.046	73.1	747	32.2	2.5	
[Pb]	207	1	nogas	0.050	53.8	623	26.1	2.5	
Na	23	2	He	33.664	2.1	98526	0.6	100	
Mg	24	2	He	4.339	7.7	4257	7.9	100	
Al	27	2	He	3.529	2.3	2500	1.6	5	
K	39	2	He	10.734	28.1	190908	1.3	100	
Ca	43	2	He	25.970	79.3	73	68.6	100	
Ca	44	2	He	13.165	32.1	1647	8.6	100	
V	51	2	He	-0.189	-17.4	14177	1.5	2.5	
Cr	52	2	He	-0.051	-86.8	4454	5.8	2.5	
Mn	55	2	He	0.829	5.8	5037	3.4	2.5	
Fe	56	2	He	8.823	2.2	61579	3.1	100	
Co	59	2	He	0.037	36.4	637	17.2	2.5	
Ni	60	2	He	0.288	5.7	373	11.2	2.5	
Cu	63	2	He	0.236	1.9	1260	2.9	2	
Zn	66	2	He	0.685	8.2	593	13.6	2.5	
As	75	2	He	0.059	45.4	687	6.3	2.5	
Se	78	2	He	0.704	23.2	155	11.1	2	
B	11	1	nogas	161.530	4.6	751912	1.0	10	CCB Main CR1 Failed
Si	28	1	nogas	19.410	38.2	1813970	2.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	39.055	19.5	1987	14.9	100	
Ca	44	1	nogas	-22.749	-11.3	86324	0.9	100	
Fe	56	1	nogas	-12.847	-83.4	2618170	7.7	100	
Se	77	1	nogas	-33.786	-6.6	52031	1.2	2.5	
Se	82	1	nogas	-0.051	-339.2	243	19.4	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.407	40.6	2817	31.3	2.5	
Sn	118	1	nogas	0.226	49.4	3027	27.6	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.107	21.8	587	15.3	2.5	
Sb	121	2	He	-0.012	-248.6	440	31.2	2.5	
P	31	1	nogas	-2.088	-62.8	90706	1.7	10	
La	139	1	nogas	9.650	119.4	93	44.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	373.899	123.2	23	89.2	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1200688	3.57	1446753	82.99	70	125	
Ge	72	1	nogas	3337458	2.02	3206704	104.08	70	125	
In	115	1	nogas	3022626	2.14	2812441	107.47	70	125	
Bi	209	1	nogas	2235581	1.38	2322160	96.27	70	125	
Ge	72	2	He	785091	1.64	754516	104.05	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	190_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:18:13-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	109.023	2.722	730878	1.06	100	109.0	90	110	
Na	23	1	nogas	10367.449	5.763	261920789	2.90	10000	103.7	90	110	
Mg	24	1	nogas	10062.041	5.296	162212699	0.78	10000	100.6	90	110	
Al	27	1	nogas	100.829	3.912	2038320	1.49	100	100.8	90	110	
K	39	1	nogas	10130.921	2.768	213288846	1.89	10000	101.3	90	110	
Ti	47	1	nogas	101.477	1.100	181982	2.54	100	101.5	90	110	
V	51	1	nogas	102.685	4.161	3964509	1.15	100	102.7	90	110	
Cr	52	1	nogas	99.385	2.866	2308572	0.35	100	99.4	90	110	
Mn	55	1	nogas	102.809	2.847	2899057	0.63	100	102.8	90	110	
Co	59	1	nogas	98.385	4.190	2346470	1.52	100	98.4	90	110	
Ni	60	1	nogas	97.197	2.923	499363	0.29	100	97.2	90	110	
Cu	63	1	nogas	96.751	0.960	1187503	1.94	100	96.8	90	110	
Zn	66	1	nogas	100.440	0.968	405914	1.81	100	100.4	90	110	
As	75	1	nogas	100.479	2.185	690641	1.13	100	100.5	90	110	
Sr	88	1	nogas	102.688	3.157	2864259	1.89	100	102.7	90	110	
Ag	107	1	nogas	99.612	3.106	1372545	0.53	100	99.6	90	110	
Cd	111	1	nogas	99.261	0.591	299874	0.64	100	99.3	90	110	
Sb	121	1	nogas	100.664	1.220	1344952	1.43	100	100.7	90	110	
Tl	205	1	nogas	98.316	1.549	2057284	2.97	100	98.3	90	110	
Pb	208	1	nogas	101.634	2.080	2780240	2.08	100	101.6	90	110	
U	238	1	nogas	87.541	2.788	2421032	3.56	100	87.5	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	96.546	1.000	691844	2.13	100	96.5	90	110	
[Pb]	207	1	nogas	96.367	1.276	586194	2.41	100	96.4	90	110	
Na	23	2	He	10409.044	1.576	15560005	1.65	10000	104.1	90	110	
Mg	24	2	He	10091.378	1.236	8333714	1.60	10000	100.9	90	110	
Al	27	2	He	97.196	1.771	45271	1.86	100	97.2	90	110	
K	39	2	He	10478.139	0.889	8958593	0.87	10000	104.8	90	110	
Ca	43	2	He	9822.292	5.651	23241	4.06	10000	98.2	90	110	
Ca	44	2	He	9944.985	3.678	392674	1.78	10000	99.4	90	110	
V	51	2	He	101.819	1.895	597083	0.17	100	101.8	90	110	
Cr	52	2	He	99.778	0.756	636383	2.43	100	99.8	90	110	
Mn	55	2	He	98.277	1.800	435860	0.21	100	98.3	90	110	
Fe	56	2	He	10138.108	2.685	55629329	0.76	10000	101.4	90	110	
Co	59	2	He	97.208	4.067	844655	2.11	100	97.2	90	110	
Ni	60	2	He	102.509	4.064	217400	2.15	100	102.5	90	110	
Cu	63	2	He	103.094	3.117	556912	2.32	100	103.1	90	110	
Zn	66	2	He	99.869	1.895	131775	2.63	100	99.9	90	110	
As	75	2	He	100.845	3.408	127327	1.45	100	100.8	90	110	
Se	78	2	He	99.664	2.288	10058	0.60	100	99.7	90	110	
B	11	1	nogas	602.997	2.113	2434612	0.67	500	120.6	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	474.841	4.818	6747808	1.16	5000	9.5	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10149.708	1.140	363812	1.52	10000	101.5	90	110	
Ca	44	1	nogas	10036.793	1.104	6053513	3.70	10000	100.4	90	110	
Fe	56	1	nogas	10332.408	2.934	245736380	0.94	10000	103.3	90	110	
Se	77	1	nogas	97.883	7.402	78415	0.88	100	97.9	90	110	
Se	82	1	nogas	100.102	4.347	26857	3.43	100	100.1	90	110	
Mo	95	1	nogas	96.834	1.796	550639	1.80	100	96.8	90	110	
Sn	118	1	nogas	99.773	1.889	789737	1.09	100	99.8	90	110	
Ba	137	1	nogas	96.906	2.672	413293	1.82	100	96.9	90	110	
Sb	121	2	He	101.343	1.911	466738	0.06	100	101.3	90	110	
Li	7	1	nogas	110.381	4.823	1728290	2.27	100	110.4	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	437.580	1.498	811292	1.36	500	87.5	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	160.095	27.901	650	25.19	100	160.1	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	297.717	128.449	20	86.60	100	297.7	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1056780	2.30	1446753	73.04	70	125	
Ge	72	1	nogas	3335844	2.63	3206704	104.03	70	125	
In	115	1	nogas	2949511	0.87	2812441	104.87	70	125	
Bi	209	1	nogas	2245617	1.48	2322160	96.70	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	771054	1.98	754516	102.19	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	191_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:20:13-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.068	28.4	543	19.9	1	
Na	23	1	nogas	22.778	21.6	942411	0.3	100	
Mg	24	1	nogas	6.263	27.1	103436	12.1	100	
Al	27	1	nogas	4.160	24.3	100207	9.3	5	
K	39	1	nogas	23.235	179.2	8251191	0.4	100	
Ti	47	1	nogas	0.097	39.6	400	6.6	2.5	
V	51	1	nogas	-7.862	-46.1	1151109	2.7	2.5	
Cr	52	1	nogas	-0.204	-125.4	72695	2.2	2.5	
Mn	55	1	nogas	0.851	21.4	50339	0.1	2.5	
Co	59	1	nogas	0.070	34.9	2387	14.0	2.5	
Ni	60	1	nogas	0.326	15.5	1250	9.7	2.5	
Cu	63	1	nogas	0.117	4.4	2857	9.2	2	
Zn	66	1	nogas	0.626	14.5	2240	8.6	2.5	
As	75	1	nogas	-5.364	-57.2	164488	2.7	2.5	
Sr	88	1	nogas	0.072	33.4	2747	14.4	2.5	
Ag	107	1	nogas	0.036	27.4	560	12.9	2.5	
Cd	111	1	nogas	0.047	29.1	157	20.5	1	
Sb	121	1	nogas	0.134	13.1	2744	3.1	2.5	
Tl	205	1	nogas	0.618	60.5	12393	51.4	1	
Pb	208	1	nogas	0.038	31.9	2600	12.6	2.5	
U	238	1	nogas	0.112	47.7	2960	38.9	2.5	
[Pb]	206	1	nogas	0.039	40.7	657	9.9	2.5	
[Pb]	207	1	nogas	0.042	26.9	543	11.2	2.5	
Na	23	2	He	23.165	7.1	82089	2.5	100	
Mg	24	2	He	4.422	6.6	4297	5.2	100	
Al	27	2	He	3.181	8.4	2324	4.2	5	
K	39	2	He	8.089	2.3	188692	0.1	100	
Ca	43	2	He	30.379	6.1	83	6.9	100	
Ca	44	2	He	11.850	6.5	1587	4.1	100	
V	51	2	He	-0.329	-4.2	13283	2.0	2.5	
Cr	52	2	He	-0.007	-373.8	4711	4.7	2.5	
Mn	55	2	He	0.804	4.1	4901	3.8	2.5	
Fe	56	2	He	6.254	3.4	46943	3.9	100	
Co	59	2	He	0.051	30.1	760	19.6	2.5	
Ni	60	2	He	0.274	6.3	340	12.8	2.5	
Cu	63	2	He	0.231	12.6	1223	14.7	2	
Zn	66	2	He	0.702	7.5	613	13.6	2.5	
As	75	2	He	0.055	20.5	678	4.0	2.5	
Se	78	2	He	0.859	8.6	169	3.8	2	
B	11	1	nogas	85.735	8.9	384397	0.6	10	CCB Main CR1 Failed
Si	28	1	nogas	15.803	117.2	1693468	1.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	30.922	6.8	1630	12.8	100	
Ca	44	1	nogas	-23.212	-72.3	82062	1.8	100	
Fe	56	1	nogas	-13.469	-94.8	2485607	1.8	100	
Se	77	1	nogas	-18.032	-70.8	52857	4.8	2.5	
Se	82	1	nogas	0.167	128.6	290	23.9	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.307	36.3	2134	17.7	2.5	
Sn	118	1	nogas	0.248	34.2	2994	15.6	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.121	12.5	610	12.4	2.5	
Sb	121	2	He	0.103	28.2	973	15.7	2.5	
P	31	1	nogas	5.702	128.3	98685	1.9	10	
La	139	1	nogas	8.584	176.3	83	60.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	787.140	73.8	40	66.1	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1139544	8.09	1446753	78.77	70	125	
Ge	72	1	nogas	3204804	9.17	3206704	99.94	70	125	
In	115	1	nogas	2837543	5.85	2812441	100.89	70	125	
Bi	209	1	nogas	2119125	6.58	2322160	91.26	70	125	
Ge	72	2	He	780405	2.19	754516	103.43	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	199_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:36:11-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	105.963	3.667	758935	1.52	100	106.0	90	110	
Na	23	1	nogas	10269.909	0.903	261157281	1.93	10000	102.7	90	110	
Mg	24	1	nogas	10214.768	2.077	165741112	1.82	10000	102.1	90	110	
Al	27	1	nogas	147.794	14.013	3010165	13.13	100	147.8	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9980.316	3.447	212558659	1.56	10000	99.8	90	110	
Ti	47	1	nogas	103.105	2.480	186903	0.94	100	103.1	90	110	
V	51	1	nogas	69.979	2.880	3183140	0.16	100	70.0	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	97.160	1.615	2284563	1.58	100	97.2	90	110	
Mn	55	1	nogas	101.145	4.230	2884150	2.44	100	101.1	90	110	
Co	59	1	nogas	96.933	1.079	2339080	1.81	100	96.9	90	110	
Ni	60	1	nogas	98.631	0.971	512552	0.81	100	98.6	90	110	
Cu	63	1	nogas	98.659	0.808	1224352	1.07	100	98.7	90	110	
Zn	66	1	nogas	102.286	1.022	417998	1.60	100	102.3	90	110	
As	75	1	nogas	83.733	1.020	615458	1.23	100	83.7	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	103.404	0.893	2917198	1.07	100	103.4	90	110	
Ag	107	1	nogas	101.238	1.703	1410937	1.09	100	101.2	90	110	
Cd	111	1	nogas	100.529	2.738	309393	1.12	100	100.5	90	110	
Sb	121	1	nogas	101.534	1.247	1371877	2.18	100	101.5	90	110	
Tl	205	1	nogas	102.649	2.740	2164239	0.96	100	102.6	90	110	
Pb	208	1	nogas	103.037	1.236	2818579	1.24	100	103.0	90	110	
U	238	1	nogas	90.297	3.543	2516131	1.84	100	90.3	90	110	
[Pb]	206	1	nogas	99.166	0.621	716262	1.25	100	99.2	90	110	
[Pb]	207	1	nogas	97.332	1.635	596704	1.17	100	97.3	90	110	
Na	23	2	He	9660.603	1.411	14967809	1.26	10000	96.6	90	110	
Mg	24	2	He	9533.278	0.241	8157990	0.46	10000	95.3	90	110	
Al	27	2	He	111.180	2.664	53536	2.72	100	111.2	90	110	CCV Main CR1-2 Failed
K	39	2	He	10332.649	0.509	8836728	0.50	10000	103.3	90	110	
Ca	43	2	He	9629.485	4.266	23625	4.46	10000	96.3	90	110	
Ca	44	2	He	9775.627	1.211	400143	1.43	10000	97.8	90	110	
V	51	2	He	97.492	0.507	593159	0.29	100	97.5	90	110	
Cr	52	2	He	97.910	1.108	647077	0.91	100	97.9	90	110	
Mn	55	2	He	98.544	0.585	452933	0.80	100	98.5	90	110	
Fe	56	2	He	9802.638	1.186	55751918	1.35	10000	98.0	90	110	
Co	59	2	He	95.347	0.216	858874	0.41	100	95.3	90	110	
Ni	60	2	He	100.812	1.332	221637	1.42	100	100.8	90	110	
Cu	63	2	He	99.351	0.688	556228	0.88	100	99.4	90	110	
Zn	66	2	He	97.395	1.700	133147	1.85	100	97.4	90	110	
As	75	2	He	99.782	0.526	130600	0.61	100	99.8	90	110	
Se	78	2	He	96.907	2.853	10138	2.71	100	96.9	90	110	
B	11	1	nogas	563.851	4.596	2432269	1.17	500	112.8	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	513.383	2.972	7247443	0.73	5000	10.3	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10244.423	2.124	371288	1.82	10000	102.4	90	110	
Ca	44	1	nogas	10156.515	1.637	6190007	0.43	10000	101.6	90	110	
Fe	56	1	nogas	10067.602	2.284	242218597	0.70	10000	100.7	90	110	
Se	77	1	nogas	-26.637	-9.837	54040	2.24	100	-26.6	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	98.157	3.387	26633	1.62	100	98.2	90	110	
Mo	95	1	nogas	97.475	1.344	560466	0.84	100	97.5	90	110	
Sn	118	1	nogas	98.720	0.509	796502	2.94	100	98.7	90	110	
Ba	137	1	nogas	100.285	3.962	435653	1.15	100	100.3	90	110	
Sb	121	2	He	100.602	0.667	480185	0.77	100	100.6	90	110	
Li	7	1	nogas	109.838	2.422	1839051	2.26	100	109.8	90	110	
P	31	1	nogas	432.694	1.294	812283	1.22	500	86.5	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	420.605	28.930	1640	24.97	100	420.6	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	294.395	73.482	20	50.00	100	294.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1129481	3.55	1446753	78.07	70	125	
Ge	72	1	nogas	3372768	1.76	3206704	105.18	70	125	
In	115	1	nogas	3006134	2.86	2812441	106.89	70	125	
Bi	209	1	nogas	2263748	1.86	2322160	97.48	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	798901	0.22	754516	105.88	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	200_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:38:11-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.075	31.4	673	29.0	1	
Na	23	1	nogas	13.233	12.9	762480	4.7	100	
Mg	24	1	nogas	8.644	19.5	150903	17.2	100	
Al	27	1	nogas	13.670	53.6	304933	50.9	5	CCB Main CR1 Failed
K	39	1	nogas	-26.164	-29.1	7843630	1.1	100	
Ti	47	1	nogas	0.173	17.9	570	9.3	2.5	
V	51	1	nogas	-35.315	-2.3	531389	3.5	2.5	
Cr	52	1	nogas	-1.598	-3.3	45950	2.1	2.5	
Mn	55	1	nogas	0.780	8.7	52060	3.3	2.5	
Co	59	1	nogas	0.080	23.9	2827	15.8	2.5	
Ni	60	1	nogas	0.286	4.7	1140	7.0	2.5	
Cu	63	1	nogas	0.162	13.1	3624	8.0	2	
Zn	66	1	nogas	0.581	3.9	2227	4.1	2.5	
As	75	1	nogas	-21.639	-3.4	94816	3.8	2.5	
Sr	88	1	nogas	0.124	24.4	4477	19.1	2.5	
Ag	107	1	nogas	0.045	44.4	743	38.2	2.5	
Cd	111	1	nogas	0.060	24.2	200	18.0	1	
Sb	121	1	nogas	0.095	10.7	2417	6.3	2.5	
Tl	205	1	nogas	0.738	64.0	16648	61.8	1	
Pb	208	1	nogas	0.072	45.8	3540	25.4	2.5	
U	238	1	nogas	0.128	54.2	3794	52.7	2.5	
[Pb]	206	1	nogas	0.060	58.2	883	29.2	2.5	
[Pb]	207	1	nogas	0.066	45.2	750	26.0	2.5	
Na	23	2	He	12.134	6.1	64077	2.2	100	
Mg	24	2	He	6.073	6.4	5558	5.9	100	
Al	27	2	He	6.244	11.6	3664	9.9	5	CCB Main CR1 Failed
K	39	2	He	-6.511	-62.9	176463	1.9	100	
Ca	43	2	He	28.286	6.9	77	7.5	100	
Ca	44	2	He	23.419	16.1	2003	6.9	100	
V	51	2	He	-1.536	-2.6	6159	2.1	2.5	
Cr	52	2	He	-0.098	-25.9	4044	5.3	2.5	
Mn	55	2	He	0.909	2.9	5254	2.4	2.5	
Fe	56	2	He	7.753	11.4	54127	10.2	100	
Co	59	2	He	0.058	24.3	803	14.6	2.5	
Ni	60	2	He	0.292	12.9	370	21.6	2.5	
Cu	63	2	He	0.243	6.9	1260	5.5	2	
Zn	66	2	He	0.733	1.6	640	2.7	2.5	
As	75	2	He	-0.128	-23.6	436	8.5	2.5	
Se	78	2	He	0.723	35.4	152	15.2	2	
B	11	1	nogas	56.773	4.5	293036	2.9	10	CCB Main CR1 Failed
Si	28	1	nogas	1.130	198.9	1659430	2.6	5	
Ca	43	1	nogas	44.564	37.4	2240	27.2	100	
Ca	44	1	nogas	-17.489	-51.5	91804	5.6	100	
Fe	56	1	nogas	-19.471	-45.4	2530138	8.1	100	
Se	77	1	nogas	-148.399	-3.6	29785	3.7	2.5	
Se	82	1	nogas	-0.025	-380.3	257	9.8	2	
Mo	95	1	nogas	0.356	49.0	2604	38.6	2.5	
Sn	118	1	nogas	0.223	37.6	2927	18.9	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.360	24.8	1647	19.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.042	57.6	677	17.8	2.5	
P	31	1	nogas	-3.628	-50.0	90509	2.7	10	
La	139	1	nogas	57.325	40.7	267	28.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	1.272	19964.0	7	173.2	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1281708	3.91	1446753	88.59	70	125	
Ge	72	1	nogas	3425422	1.18	3206704	106.82	70	125	
In	115	1	nogas	2951342	4.02	2812441	104.94	70	125	
Bi	209	1	nogas	2335081	3.02	2322160	100.56	70	125	
Ge	72	2	He	763822	1.60	754516	101.23	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	211_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:00:10-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	109.744	5.238	750975	1.07	100	109.7	90	110	
Na	23	1	nogas	9941.517	2.735	269524356	1.65	10000	99.4	90	110	
Mg	24	1	nogas	9966.554	1.116	172462725	1.95	10000	99.7	90	110	
Al	27	1	nogas	175.118	16.945	3691247	16.47	100	175.1	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10405.391	3.191	229260372	1.95	10000	104.1	90	110	
Ti	47	1	nogas	103.697	2.033	194761	0.63	100	103.7	90	110	
V	51	1	nogas	94.203	0.230	3932631	1.72	100	94.2	90	110	
Cr	52	1	nogas	101.226	0.268	2462680	1.71	100	101.2	90	110	
Mn	55	1	nogas	103.473	2.204	3057270	1.86	100	103.5	90	110	
Co	59	1	nogas	101.423	3.421	2534721	1.83	100	101.4	90	110	
Ni	60	1	nogas	100.360	2.018	540311	1.44	100	100.4	90	110	
Cu	63	1	nogas	100.911	3.277	1297241	2.68	100	100.9	90	110	
Zn	66	1	nogas	100.457	2.284	425270	1.77	100	100.5	90	110	
As	75	1	nogas	95.915	1.090	700160	0.85	100	95.9	90	110	
Sr	88	1	nogas	105.682	2.077	3088549	1.05	100	105.7	90	110	
Ag	107	1	nogas	100.293	3.490	1447930	2.39	100	100.3	90	110	
Cd	111	1	nogas	99.536	0.929	311655	1.77	100	99.5	90	110	
Sb	121	1	nogas	103.581	1.974	1449791	1.85	100	103.6	90	110	
Tl	205	1	nogas	102.035	4.190	2185705	2.11	100	102.0	90	110	
Pb	208	1	nogas	105.727	2.997	2892122	3.00	100	105.7	90	110	
U	238	1	nogas	88.520	1.381	2507386	1.45	100	88.5	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	99.346	0.607	729264	2.16	100	99.3	90	110	
[Pb]	207	1	nogas	97.375	0.964	606745	2.13	100	97.4	90	110	
Na	23	2	He	10004.291	1.384	16209107	1.19	10000	100.0	90	110	
Mg	24	2	He	9887.381	1.562	8848515	1.15	10000	98.9	90	110	
Al	27	2	He	133.074	2.530	66839	2.74	100	133.1	90	110	CCV Main CR1-2 Failed
K	39	2	He	11151.701	1.440	9522780	1.41	10000	111.5	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	9859.021	1.828	25297	2.33	10000	98.6	90	110	
Ca	44	2	He	9916.431	1.131	424503	1.46	10000	99.2	90	110	
V	51	2	He	100.996	0.790	642065	0.58	100	101.0	90	110	
Cr	52	2	He	97.796	2.186	675959	2.05	100	97.8	90	110	
Mn	55	2	He	98.793	1.520	474871	1.08	100	98.8	90	110	
Fe	56	2	He	9843.026	1.947	58542711	1.19	10000	98.4	90	110	
Co	59	2	He	96.223	1.505	906489	1.36	100	96.2	90	110	
Ni	60	2	He	100.879	2.759	231941	2.58	100	100.9	90	110	
Cu	63	2	He	99.387	1.259	581946	1.43	100	99.4	90	110	
Zn	66	2	He	95.549	0.965	136608	1.38	100	95.5	90	110	
As	75	2	He	101.844	1.493	139392	1.13	100	101.8	90	110	
Se	78	2	He	96.860	1.244	10598	0.75	100	96.9	90	110	
B	11	1	nogas	546.574	5.678	2253653	1.96	500	109.3	90	110	
Si	28	1	nogas	541.639	3.318	7829344	1.05	5000	10.8	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10233.898	2.228	384241	0.88	10000	102.3	90	110	
Ca	44	1	nogas	10063.326	1.843	6355161	0.51	10000	100.6	90	110	
Fe	56	1	nogas	10313.795	0.635	257063356	1.27	10000	103.1	90	110	
Se	77	1	nogas	64.207	12.220	75074	1.67	100	64.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.338	0.523	27932	1.37	100	99.3	90	110	
Mo	95	1	nogas	98.867	2.457	588908	1.51	100	98.9	90	110	
Sn	118	1	nogas	101.002	2.563	828429	1.24	100	101.0	90	110	
Ba	137	1	nogas	100.090	1.352	442422	0.66	100	100.1	90	110	
Sb	121	2	He	100.739	1.281	502866	0.79	100	100.7	90	110	
Li	7	1	nogas	117.533	5.590	1874442	3.54	100	117.5	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	436.458	1.719	848016	1.41	500	87.3	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	972.731	35.484	3787	33.44	100	972.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	509.576	86.184	30	66.67	100	509.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1080526	6.00	1446753	74.69	70	125	
Ge	72	1	nogas	3494299	1.59	3206704	108.97	70	125	
In	115	1	nogas	3057011	1.91	2812441	108.70	70	125	
Bi	209	1	nogas	2300762	2.77	2322160	99.08	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	835546	0.83	754516	110.74	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	212_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:02:11-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.052	37.2	460	31.4	1	
Na	23	1	nogas	10.373	14.1	714582	1.9	100	
Mg	24	1	nogas	7.940	22.2	144115	17.0	100	
Al	27	1	nogas	17.788	19.0	395476	17.1	5	CCB Main CR1 Failed
K	39	1	nogas	-39.486	-25.4	7712879	2.1	100	
Ti	47	1	nogas	0.147	48.6	533	24.5	2.5	
V	51	1	nogas	-16.718	-2.5	1028212	1.7	2.5	
Cr	52	1	nogas	-0.773	-5.0	66208	1.2	2.5	
Mn	55	1	nogas	0.817	8.4	54139	2.8	2.5	
Co	59	1	nogas	0.071	36.6	2657	23.8	2.5	
Ni	60	1	nogas	0.287	3.6	1167	4.1	2.5	
Cu	63	1	nogas	0.119	17.5	3137	7.9	2	
Zn	66	1	nogas	0.613	5.2	2407	6.7	2.5	
As	75	1	nogas	-12.193	-3.8	145113	1.8	2.5	
Sr	88	1	nogas	0.090	13.4	3570	9.0	2.5	
Ag	107	1	nogas	0.033	11.9	580	9.1	2.5	
Cd	111	1	nogas	0.034	16.6	130	15.4	1	
Sb	121	1	nogas	0.009	136.1	1260	12.8	2.5	
Tl	205	1	nogas	0.604	60.3	14135	59.5	1	
Pb	208	1	nogas	0.061	43.9	3254	22.7	2.5	
U	238	1	nogas	0.118	54.4	3607	54.6	2.5	
[Pb]	206	1	nogas	0.056	53.1	873	27.2	2.5	
[Pb]	207	1	nogas	0.059	27.4	723	15.5	2.5	
Na	23	2	He	7.665	13.8	62004	1.1	100	
Mg	24	2	He	5.507	5.0	5501	6.5	100	
Al	27	2	He	11.299	5.7	6425	6.3	5	CCB Main CR1 Failed
K	39	2	He	-5.417	-39.0	177380	1.0	100	
Ca	43	2	He	37.591	42.4	107	39.0	100	
Ca	44	2	He	11.986	29.3	1680	7.9	100	
V	51	2	He	-0.669	-3.7	11947	2.5	2.5	
Cr	52	2	He	-0.062	-72.2	4601	4.4	2.5	
Mn	55	2	He	0.897	5.2	5614	3.8	2.5	
Fe	56	2	He	10.837	7.8	76526	8.6	100	
Co	59	2	He	0.030	14.1	613	7.4	2.5	
Ni	60	2	He	0.265	4.7	340	10.2	2.5	
Cu	63	2	He	0.211	6.7	1173	7.2	2	
Zn	66	2	He	0.756	7.2	723	10.0	2.5	
As	75	2	He	-0.077	-38.9	538	5.3	2.5	
Se	78	2	He	0.792	39.7	171	18.3	2	
B	11	1	nogas	44.680	3.2	221136	1.9	10	CCB Main CR1 Failed
Si	28	1	nogas	17.871	15.1	1881138	0.6	5	CCB Main CR1 Failed
Ca	43	1	nogas	36.257	19.9	1970	12.8	100	
Ca	44	1	nogas	-42.891	-11.7	77808	3.0	100	
Fe	56	1	nogas	-8.133	-144.8	2857002	9.4	100	
Se	77	1	nogas	-73.013	-6.4	46205	3.0	2.5	
Se	82	1	nogas	-0.232	-142.7	203	44.6	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.302	56.4	2334	42.7	2.5	
Sn	118	1	nogas	0.214	40.7	3014	21.5	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.245	9.5	1227	5.9	2.5	
Sb	121	2	He	-0.024	-21.4	403	7.6	2.5	
P	31	1	nogas	-8.287	-13.4	84280	2.5	10	
La	139	1	nogas	160.616	40.2	683	33.9	2.5	CCB Main CR1 Failed
Au	197	1	nogas	762.601	84.6	43	70.5	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1209527	1.10	1446753	83.60	70	125	
Ge	72	1	nogas	3491653	1.02	3206704	108.89	70	125	
In	115	1	nogas	3109819	2.59	2812441	110.57	70	125	
Bi	209	1	nogas	2395987	1.68	2322160	103.18	70	125	
Ge	72	2	He	824251	2.20	754516	109.24	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	223_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:23:51-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	109.517	1.837	736165	1.84	100	109.5	90	110	
Na	23	1	nogas	9896.047	6.073	267727589	1.75	10000	99.0	90	110	
Mg	24	1	nogas	9805.076	4.940	169329179	0.99	10000	98.1	90	110	
Al	27	1	nogas	112.091	3.896	2404943	2.03	100	112.1	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10210.366	2.622	228314063	1.74	10000	102.1	90	110	
Ti	47	1	nogas	100.016	3.134	190471	0.86	100	100.0	90	110	
V	51	1	nogas	86.262	5.846	3775697	1.73	100	86.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	96.626	2.441	2387298	1.45	100	96.6	90	110	
Mn	55	1	nogas	98.721	3.456	2958562	1.35	100	98.7	90	110	
Co	59	1	nogas	96.998	5.126	2457285	2.11	100	97.0	90	110	
Ni	60	1	nogas	99.358	3.028	542340	0.96	100	99.4	90	110	
Cu	63	1	nogas	100.086	2.481	1305349	3.91	100	100.1	90	110	
Zn	66	1	nogas	99.480	1.391	427184	2.85	100	99.5	90	110	
As	75	1	nogas	89.884	4.559	678418	0.63	100	89.9	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	103.683	0.994	3074003	2.96	100	103.7	90	110	
Ag	107	1	nogas	100.611	3.035	1472972	1.51	100	100.6	90	110	
Cd	111	1	nogas	97.024	2.437	315550	0.46	100	97.0	90	110	
Sb	121	1	nogas	99.390	2.071	1410760	1.82	100	99.4	90	110	
Tl	205	1	nogas	102.566	3.635	2182623	1.49	100	102.6	90	110	
Pb	208	1	nogas	104.133	0.674	2848545	0.67	100	104.1	90	110	
U	238	1	nogas	88.553	2.854	2491021	0.74	100	88.6	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	97.822	3.439	712953	0.80	100	97.8	90	110	
[Pb]	207	1	nogas	95.746	2.801	592417	0.43	100	95.7	90	110	
Na	23	2	He	9854.404	0.974	15942207	0.60	10000	98.5	90	110	
Mg	24	2	He	9607.042	1.302	8584426	0.97	10000	96.1	90	110	
Al	27	2	He	110.706	2.298	55669	2.36	100	110.7	90	110	CCV Main CR1-2 Failed
K	39	2	He	11289.247	1.095	9637991	1.07	10000	112.9	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10078.164	1.912	25818	2.08	10000	100.8	90	110	
Ca	44	2	He	9901.816	0.514	423208	0.41	10000	99.0	90	110	
V	51	2	He	98.886	0.612	628011	0.22	100	98.9	90	110	
Cr	52	2	He	97.003	2.682	669448	2.30	100	97.0	90	110	
Mn	55	2	He	97.133	0.874	466203	0.65	100	97.1	90	110	
Fe	56	2	He	9828.631	2.693	58370346	2.62	10000	98.3	90	110	
Co	59	2	He	96.227	1.600	905109	1.34	100	96.2	90	110	
Ni	60	2	He	101.170	1.289	232252	0.96	100	101.2	90	110	
Cu	63	2	He	100.743	2.189	588970	2.26	100	100.7	90	110	
Zn	66	2	He	96.736	2.059	138094	2.21	100	96.7	90	110	
As	75	2	He	100.474	0.625	137316	0.36	100	100.5	90	110	
Se	78	2	He	95.638	1.222	10449	0.87	100	95.6	90	110	
B	11	1	nogas	542.736	1.827	2198400	1.75	500	108.5	90	110	
Si	28	1	nogas	530.537	4.021	7811003	0.96	5000	10.6	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10207.701	4.270	388484	0.61	10000	102.1	90	110	
Ca	44	1	nogas	10020.231	5.748	6412303	2.08	10000	100.2	90	110	
Fe	56	1	nogas	9928.592	3.292	250975922	1.00	10000	99.3	90	110	
Se	77	1	nogas	33.897	31.117	69653	0.75	100	33.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.506	2.322	28376	3.10	100	99.5	90	110	
Mo	95	1	nogas	95.748	2.254	578409	1.53	100	95.7	90	110	
Sn	118	1	nogas	97.611	1.640	831954	0.81	100	97.6	90	110	
Ba	137	1	nogas	96.139	1.639	441597	2.44	100	96.1	90	110	
Sb	121	2	He	100.220	1.897	499501	1.62	100	100.2	90	110	
Li	7	1	nogas	113.125	3.062	1774552	2.83	100	113.1	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	422.612	3.770	835569	0.46	500	84.5	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	269.702	14.992	1137	12.51	100	269.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	80.215	486.985	10	173.21	100	80.2	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1059214	0.09	1446753	73.21	70	125	
Ge	72	1	nogas	3544923	3.75	3206704	110.55	70	125	
In	115	1	nogas	3176231	2.04	2812441	112.94	70	125	
Bi	209	1	nogas	2285557	2.90	2322160	98.42	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	834235	0.37	754516	110.57	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	224_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:25:50-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.074	15.2	600	12.0	1	
Na	23	1	nogas	7.733	19.4	665828	6.4	100	
Mg	24	1	nogas	6.928	21.8	131687	20.4	100	
Al	27	1	nogas	10.335	12.7	244304	9.0	5	CCB Main CR1 Failed
K	39	1	nogas	-46.645	-25.2	7714249	0.8	100	
Ti	47	1	nogas	0.162	38.6	570	18.2	2.5	
V	51	1	nogas	-19.527	-5.4	974167	2.6	2.5	
Cr	52	1	nogas	-1.064	-10.6	60569	2.5	2.5	
Mn	55	1	nogas	0.658	7.5	50506	1.0	2.5	
Co	59	1	nogas	0.069	20.7	2660	13.1	2.5	
Ni	60	1	nogas	0.260	14.2	1040	18.0	2.5	
Cu	63	1	nogas	0.095	39.3	2889	15.1	2	
Zn	66	1	nogas	0.545	15.3	2160	16.1	2.5	
As	75	1	nogas	-14.377	-4.1	136630	0.8	2.5	
Sr	88	1	nogas	0.088	9.2	3574	4.6	2.5	
Ag	107	1	nogas	0.042	24.2	723	18.7	2.5	
Cd	111	1	nogas	0.046	11.3	163	7.1	1	
Sb	121	1	nogas	0.013	186.0	1347	24.2	2.5	
Tl	205	1	nogas	0.690	58.8	15513	57.8	1	
Pb	208	1	nogas	0.076	45.3	3660	25.8	2.5	
U	238	1	nogas	0.134	65.5	3957	65.1	2.5	
[Pb]	206	1	nogas	0.087	20.6	1077	13.0	2.5	
[Pb]	207	1	nogas	0.063	59.1	730	33.2	2.5	
Na	23	2	He	6.180	13.3	59242	0.8	100	
Mg	24	2	He	5.233	4.9	5217	1.4	100	
Al	27	2	He	9.400	8.5	5451	4.4	5	CCB Main CR1 Failed
K	39	2	He	-6.621	-24.8	176371	0.8	100	
Ca	43	2	He	23.308	57.7	70	49.5	100	
Ca	44	2	He	13.132	17.5	1717	4.1	100	
V	51	2	He	-0.688	-9.2	11752	2.0	2.5	
Cr	52	2	He	-0.034	-74.3	4761	4.5	2.5	
Mn	55	2	He	0.803	7.1	5131	2.7	2.5	
Fe	56	2	He	10.749	3.0	75407	0.6	100	
Co	59	2	He	0.047	13.8	763	5.0	2.5	
Ni	60	2	He	0.257	4.5	320	11.3	2.5	
Cu	63	2	He	0.216	8.9	1193	7.8	2	
Zn	66	2	He	0.767	4.7	733	4.4	2.5	
As	75	2	He	-0.101	-40.3	502	8.9	2.5	
Se	78	2	He	1.081	17.1	201	10.3	2	
B	11	1	nogas	37.653	4.1	181958	3.3	10	CCB Main CR1 Failed
Si	28	1	nogas	16.297	29.1	1901084	0.6	5	CCB Main CR1 Failed
Ca	43	1	nogas	29.809	3.7	1767	4.8	100	
Ca	44	1	nogas	-58.924	-8.1	69228	1.8	100	
Fe	56	1	nogas	-10.844	-127.1	2844146	9.7	100	
Se	77	1	nogas	-89.430	-7.4	43633	4.0	2.5	
Se	82	1	nogas	-0.121	-62.2	240	11.0	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.314	55.8	2440	40.7	2.5	
Sn	118	1	nogas	0.270	40.1	3340	21.3	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.209	3.5	1023	1.1	2.5	
Sb	121	2	He	-0.034	-42.7	353	19.9	2.5	
P	31	1	nogas	-8.395	-19.9	85784	0.9	10	
La	139	1	nogas	110.528	30.5	470	22.2	2.5	CCB Main CR1 Failed
Au	197	1	nogas	213.916	59.6	17	34.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1165420	1.77	1446753	80.55	70	125	
Ge	72	1	nogas	3563819	2.52	3206704	111.14	70	125	
In	115	1	nogas	2995581	4.15	2812441	106.51	70	125	
Bi	209	1	nogas	2318074	1.43	2322160	99.82	70	125	
Ge	72	2	He	818849	3.07	754516	108.53	70	125	

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	231CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:39:46-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	87	33.51
Na	23	1	nogas	331429	0.00
Mg	24	1	nogas	30465	0.02
Al	27	1	nogas	77458	0.01
K	39	1	nogas	7580102	0.00
Ti	47	1	nogas	283	14.44
V	51	1	nogas	1238422	0.00
Cr	52	1	nogas	68854	0.00
Mn	55	1	nogas	23392	0.01
Co	59	1	nogas	833	2.61
Ni	60	1	nogas	323	9.63
Cu	63	1	nogas	1537	0.60
Zn	66	1	nogas	940	0.88
As	75	1	nogas	160546	0.00
Sr	88	1	nogas	1203	1.09
Ag	107	1	nogas	107	22.12
Cd	111	1	nogas	30	111.11
Sb	121	1	nogas	287	1.86
Tl	205	1	nogas	380	10.20
Pb	208	1	nogas	1157	0.42
[Pb]	206	1	nogas	337	1.35
[Pb]	207	1	nogas	267	4.52
Na	23	2	He	41901	0.01
Mg	24	2	He	1587	0.80
Al	27	2	He	1763	0.57
K	39	2	He	170286	0.00
Ca	43	2	He	37	214.72
Ca	44	2	He	917	1.43
V	51	2	He	14259	0.00
Cr	52	2	He	4124	0.18
Mn	55	2	He	1073	0.13
Fe	56	2	He	26059	0.01
Co	59	2	He	200	9.01
Ni	60	2	He	137	29.49
Cu	63	2	He	663	1.14
Zn	66	2	He	293	2.92
As	75	2	He	518	0.93
Se	78	2	He	161	6.59
B	11	1	nogas	146566	0.00
Si	28	1	nogas	1786796	0.00
Ca	43	1	nogas	823	1.19
Ca	44	1	nogas	54583	0.00

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	2564814	0.00
Se	77	1	nogas	51536	0.01
Se	82	1	nogas	233	12.50
Mo	95	1	nogas	367	3.67
Sn	118	1	nogas	1397	0.24
Ba	137	1	nogas	200	15.21
Sb	121	2	He	97	49.43
Li	7	1	nogas	100282	0.00
P	31	1	nogas	80236	0.00
La	139	1	nogas	197	5.97

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	6	1	nogas	1195276	2.00
Ge	72	1	nogas	3552237	2.91
In	115	1	nogas	3134247	2.05
Bi	209	1	nogas	2336631	1.06
Ge	72	2	He	837498	0.96

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	232CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:41:46-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	14652	0.01
Na	23	1	nogas	5578140	0.00
Mg	24	1	nogas	3393445	0.00
Al	27	1	nogas	91527	0.00
K	39	1	nogas	11936197	0.00
Ti	47	1	nogas	3644	0.21
V	51	1	nogas	1427473	0.00
Cr	52	1	nogas	115870	0.00
Mn	55	1	nogas	77277	0.00
Co	59	1	nogas	48548	0.00
Ni	60	1	nogas	11324	0.02
Cu	63	1	nogas	27267	0.02
Zn	66	1	nogas	8886	0.05
As	75	1	nogas	181430	0.00
Sr	88	1	nogas	59543	0.00
Ag	107	1	nogas	28470	0.00
Cd	111	1	nogas	6195	0.04
Sb	121	1	nogas	28126	0.00
Tl	205	1	nogas	39274	0.01
Pb	208	1	nogas	55912	0.00
[Pb]	206	1	nogas	14210	0.02
[Pb]	207	1	nogas	12075	0.02
Na	23	2	He	342970	0.00
Mg	24	2	He	167204	0.00
Al	27	2	He	2477	0.49
K	39	2	He	350759	0.00
Ca	43	2	He	477	0.92
Ca	44	2	He	9096	0.02
V	51	2	He	27090	0.00
Cr	52	2	He	16961	0.02
Mn	55	2	He	10110	0.02
Fe	56	2	He	1169441	0.00
Co	59	2	He	18123	0.03
Ni	60	2	He	4694	0.10
Cu	63	2	He	11717	0.02
Zn	66	2	He	3084	0.27
As	75	2	He	3250	0.09
Se	78	2	He	358	1.95
B	11	1	nogas	185684	0.00
Si	28	1	nogas	2777141	0.00

Calibration Standard Report

Ca	43	1	nogas	8232	0.02
Ca	44	1	nogas	172086	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	7515342	0.00
Se	77	1	nogas	55933	0.00
Se	82	1	nogas	753	1.17
Mo	95	1	nogas	12031	0.04
Sn	118	1	nogas	16651	0.01
Ba	137	1	nogas	8916	0.03
Sb	121	2	He	9613	0.01
P	31	1	nogas	80634	0.00
La	139	1	nogas	133	16.24

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1168683	3.75	1195276	97.78	70	125	
Ge	72	1	nogas	3581535	3.98	3552237	100.82	70	125	
In	115	1	nogas	3148097	4.38	3134247	100.44	70	125	
Bi	209	1	nogas	2292529	3.78	2336631	98.11	70	125	
Ge	72	2	He	839655	0.93	837498	100.26	70	125	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	233CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:43:44-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	35794	0.01
Na	23	1	nogas	13289389	0.00
Mg	24	1	nogas	8405434	0.00
Al	27	1	nogas	201937	0.01
K	39	1	nogas	18312034	0.00
Ti	47	1	nogas	9529	0.01
V	51	1	nogas	1577440	0.00
Cr	52	1	nogas	189062	0.00
Mn	55	1	nogas	170430	0.00
Co	59	1	nogas	121849	0.00
Ni	60	1	nogas	27387	0.01
Cu	63	1	nogas	67120	0.00
Zn	66	1	nogas	22995	0.01
As	75	1	nogas	208320	0.00
Sr	88	1	nogas	147099	0.00
Ag	107	1	nogas	71683	0.00
Cd	111	1	nogas	15314	0.04
Sb	121	1	nogas	67460	0.00
Tl	205	1	nogas	98186	0.00
Pb	208	1	nogas	140518	0.00
[Pb]	206	1	nogas	35777	0.01
[Pb]	207	1	nogas	30830	0.00
Na	23	2	He	795149	0.00
Mg	24	2	He	418151	0.00
Al	27	2	He	4424	0.08
K	39	2	He	611946	0.00
Ca	43	2	He	1283	0.67
Ca	44	2	He	21132	0.01
V	51	2	He	46058	0.00
Cr	52	2	He	37255	0.00
Mn	55	2	He	24523	0.01
Fe	56	2	He	2947197	0.00
Co	59	2	He	44908	0.01
Ni	60	2	He	11684	0.01
Cu	63	2	He	29744	0.01
Zn	66	2	He	7518	0.01
As	75	2	He	7014	0.00
Se	78	2	He	699	0.91
B	11	1	nogas	255438	0.00
Si	28	1	nogas	4591023	0.00

Calibration Standard Report

Ca	43	1	nogas	19320	0.01
Ca	44	1	nogas	354984	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	14726538	0.00
Se	77	1	nogas	60607	0.00
Se	82	1	nogas	1517	0.25
Mo	95	1	nogas	29718	0.02
Sn	118	1	nogas	40106	0.01
Ba	137	1	nogas	21053	0.01
Sb	121	2	He	24190	0.00
P	31	1	nogas	123923	0.00
La	139	1	nogas	173	5.08

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1163476	14.78	1195276	97.34	70	125	
Ge	72	1	nogas	3561728	6.92	3552237	100.27	70	125	
In	115	1	nogas	3134210	10.14	3134247	100.00	70	125	
Bi	209	1	nogas	2284348	8.33	2336631	97.76	70	125	
Ge	72	2	He	828864	1.32	837498	98.97	70	125	

Calibration Standard Report

Sample Table

Sample Name	10/50/1000
Data File Name	234CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:45:43-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	72216	0.00
Na	23	1	nogas	26451404	0.00
Mg	24	1	nogas	16702194	0.00
Al	27	1	nogas	287698	0.00
K	39	1	nogas	29212753	0.00
Ti	47	1	nogas	18139	0.01
V	51	1	nogas	1826105	0.00
Cr	52	1	nogas	306749	0.00
Mn	55	1	nogas	313711	0.00
Co	59	1	nogas	240024	0.00
Ni	60	1	nogas	53024	0.00
Cu	63	1	nogas	130177	0.00
Zn	66	1	nogas	43382	0.01
As	75	1	nogas	241432	0.00
Sr	88	1	nogas	289603	0.00
Ag	107	1	nogas	144161	0.00
Cd	111	1	nogas	29909	0.02
Sb	121	1	nogas	135630	0.00
Tl	205	1	nogas	193555	0.00
Pb	208	1	nogas	274873	0.00
[Pb]	206	1	nogas	68240	0.00
[Pb]	207	1	nogas	59689	0.00
Na	23	2	He	1638658	0.00
Mg	24	2	He	820276	0.00
Al	27	2	He	6585	0.13
K	39	2	He	1040100	0.00
Ca	43	2	He	2477	0.32
Ca	44	2	He	40548	0.01
V	51	2	He	77214	0.00
Cr	52	2	He	68581	0.00
Mn	55	2	He	46836	0.01
Fe	56	2	He	5763138	0.00
Co	59	2	He	89414	0.00
Ni	60	2	He	23505	0.02
Cu	63	2	He	56751	0.00
Zn	66	2	He	13932	0.04
As	75	2	He	13794	0.01
Se	78	2	He	1195	0.31
B	11	1	nogas	361363	0.00
Si	28	1	nogas	7250697	0.00

Calibration Standard Report

Ca	43	1	nogas	37929	0.00
Ca	44	1	nogas	652309	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	27184110	0.00
Se	77	1	nogas	62674	0.01
Se	82	1	nogas	2904	0.43
Mo	95	1	nogas	58958	0.00
Sn	118	1	nogas	78296	0.00
Ba	137	1	nogas	43341	0.01
Sb	121	2	He	49186	0.00
P	31	1	nogas	167931	0.00
La	139	1	nogas	263	2.20

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1132234	3.66	1195276	94.73	70	125	
Ge	72	1	nogas	3596076	3.70	3552237	101.23	70	125	
In	115	1	nogas	3115480	4.58	3134247	99.40	70	125	
Bi	209	1	nogas	2292360	3.72	2336631	98.11	70	125	
Ge	72	2	He	826446	1.69	837498	98.68	70	125	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	235CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:47:41-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	726395	0.00
Na	23	1	nogas	259402164	0.00
Mg	24	1	nogas	161352099	0.00
Al	27	1	nogas	2058982	0.00
K	39	1	nogas	216604788	0.00
Ti	47	1	nogas	181697	0.00
V	51	1	nogas	4082142	0.00
Cr	52	1	nogas	2401369	0.00
Mn	55	1	nogas	2988634	0.00
Co	59	1	nogas	2385751	0.00
Ni	60	1	nogas	519376	0.00
Cu	63	1	nogas	1249207	0.00
Zn	66	1	nogas	415265	0.00
As	75	1	nogas	697353	0.00
Sr	88	1	nogas	2905617	0.00
Ag	107	1	nogas	1423334	0.00
Cd	111	1	nogas	298091	0.00
Sb	121	1	nogas	1348372	0.00
Tl	205	1	nogas	2045124	0.00
Pb	208	1	nogas	2779810	0.00
[Pb]	206	1	nogas	672927	0.00
[Pb]	207	1	nogas	599559	0.00
Na	23	2	He	15297983	0.00
Mg	24	2	He	8458521	0.00
Al	27	2	He	48760	0.00
K	39	2	He	9137637	0.00
Ca	43	2	He	23949	0.01
Ca	44	2	He	406952	0.00
V	51	2	He	624535	0.00
Cr	52	2	He	661999	0.00
Mn	55	2	He	468166	0.00
Fe	56	2	He	56918027	0.00
Co	59	2	He	879776	0.00
Ni	60	2	He	222439	0.00
Cu	63	2	He	566331	0.00
Zn	66	2	He	140492	0.00
As	75	2	He	134928	0.00
Se	78	2	He	10495	0.02
B	11	1	nogas	2454033	0.00
Si	28	1	nogas	57019467	0.00

Calibration Standard Report

Ca	43	1	nogas	366612	0.00
Ca	44	1	nogas	6101095	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	246346364	0.00
Se	77	1	nogas	81930	0.01
Se	82	1	nogas	26466	0.01
Mo	95	1	nogas	581341	0.00
Sn	118	1	nogas	769398	0.00
Ba	137	1	nogas	429972	0.00
Sb	121	2	He	479993	0.00
P	31	1	nogas	883777	0.00
La	139	1	nogas	590	0.76

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1060926	1.54	1195276	88.76	70	125	
Ge	72	1	nogas	3459544	4.03	3552237	97.39	70	125	
In	115	1	nogas	2926930	5.89	3134247	93.39	70	125	
Bi	209	1	nogas	2300732	1.28	2336631	98.46	70	125	
Ge	72	2	He	838051	0.73	837498	100.07	70	125	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	236CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:49:41-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	1638983	0.00
Na	23	1	nogas	528973662	0.00
Mg	24	1	nogas	334413791	0.00
Al	27	1	nogas	4165751	0.00
K	39	1	nogas	439767910	0.00
Ti	47	1	nogas	386985	0.00
V	51	1	nogas	6790929	0.00
Cr	52	1	nogas	4813022	0.00
Mn	55	1	nogas	5965128	0.00
Co	59	1	nogas	4942487	0.00
Ni	60	1	nogas	1053571	0.00
Cu	63	1	nogas	2665951	0.00
Zn	66	1	nogas	853679	0.00
As	75	1	nogas	1258438	0.00
Sr	88	1	nogas	6055608	0.00
Ag	107	1	nogas	2935947	0.00
Cd	111	1	nogas	630633	0.00
Sb	121	1	nogas	2816754	0.00
Tl	205	1	nogas	4279645	0.00
Pb	208	1	nogas	5709558	0.00
[Pb]	206	1	nogas	1403975	0.00
[Pb]	207	1	nogas	1218131	0.00
Na	23	2	He	30809610	0.00
Mg	24	2	He	16672742	0.00
Al	27	2	He	94669	0.00
K	39	2	He	18129784	0.00
Ca	43	2	He	49272	0.00
Ca	44	2	He	823614	0.00
V	51	2	He	1270034	0.00
Cr	52	2	He	1381847	0.00
Mn	55	2	He	930187	0.00
Fe	56	2	He	114749172	0.00
Co	59	2	He	1859117	0.00
Ni	60	2	He	447375	0.00
Cu	63	2	He	1140694	0.00
Zn	66	2	He	276667	0.00
As	75	2	He	272270	0.00
Se	78	2	He	21213	0.01
B	11	1	nogas	4934583	0.00
Si	28	1	nogas	114625555	0.00

Calibration Standard Report

Ca	43	1	nogas	761679	0.00
Ca	44	1	nogas	12519365	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	497565694	0.00
Se	77	1	nogas	94138	0.00
Se	82	1	nogas	55987	0.00
Mo	95	1	nogas	1263968	0.00
Sn	118	1	nogas	1726992	0.00
Ba	137	1	nogas	877489	0.00
Sb	121	2	He	974035	0.00
P	31	1	nogas	1750887	0.00
La	139	1	nogas	857	1.70

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1034179	4.01	1195276	86.52	70	125	
Ge	72	1	nogas	3664190	2.17	3552237	103.15	70	125	
In	115	1	nogas	3158108	2.87	3134247	100.76	70	125	
Bi	209	1	nogas	2279275	2.70	2336631	97.55	70	125	
Ge	72	2	He	818978	2.26	837498	97.79	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICCV
Data File Name	237_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:51:40-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	83.848	0.814	744799	1.68	100	83.8	90	110	ICV Main CR1 Failed
Na	23	1	nogas	9473.067	5.158	257674256	1.59	10000	94.7	90	110	
Mg	24	1	nogas	9458.791	3.408	162157504	2.39	10000	94.6	90	110	
Al	27	1	nogas	123.163	6.727	2519908	2.50	100	123.2	90	110	ICV Main CR1 Failed
K	39	1	nogas	10070.174	5.002	218747330	1.47	10000	100.7	90	110	
Ti	47	1	nogas	98.615	4.900	184262	2.22	100	98.6	90	110	
V	51	1	nogas	98.785	7.338	3929371	2.24	100	98.8	90	110	
Cr	52	1	nogas	99.376	6.943	2363220	2.85	100	99.4	90	110	
Mn	55	1	nogas	96.139	5.599	2813361	1.63	100	96.1	90	110	
Co	59	1	nogas	98.503	7.880	2360011	3.78	100	98.5	90	110	
Ni	60	1	nogas	100.308	5.793	516068	1.85	100	100.3	90	110	
Cu	63	1	nogas	97.046	4.866	1248080	0.78	100	97.0	90	110	
Zn	66	1	nogas	99.904	3.042	415569	1.07	100	99.9	90	110	
As	75	1	nogas	94.192	3.025	669338	1.83	100	94.2	90	110	
Sr	88	1	nogas	98.328	5.314	2884457	1.68	100	98.3	90	110	
Ag	107	1	nogas	99.452	3.828	1418022	2.48	100	99.5	90	110	
Cd	111	1	nogas	96.549	1.316	298612	2.35	100	96.5	90	110	
Sb	121	1	nogas	101.649	7.001	1385989	3.36	100	101.6	90	110	
Tl	205	1	nogas	96.489	5.000	2071395	3.23	100	96.5	90	110	
Pb	208	1	nogas	97.753	1.335	2776234	1.33	100	97.8	90	110	
U	238	1	nogas	99.133	2.988	2839626	1.94	100	99.1	90	110	
[Pb]	206	1	nogas	95.225	4.964	671276	2.54	100	95.2	90	110	
[Pb]	207	1	nogas	97.381	2.566	598545	0.93	100	97.4	90	110	
Na	23	2	He	9545.903	2.850	14839266	0.64	10000	95.5	90	110	
Mg	24	2	He	9556.307	3.231	8062486	1.00	10000	95.6	90	110	
Al	27	2	He	115.494	1.159	56063	1.12	100	115.5	90	110	ICV Main CR1 Failed
K	39	2	He	9904.423	0.473	9061134	0.46	10000	99.0	90	110	
Ca	43	2	He	9659.751	3.386	23909	4.40	10000	96.6	90	110	
Ca	44	2	He	9743.988	1.700	404385	0.57	10000	97.4	90	110	
V	51	2	He	94.206	2.359	606696	0.37	100	94.2	90	110	
Cr	52	2	He	93.363	2.651	647309	1.31	100	93.4	90	110	
Mn	55	2	He	96.404	1.324	453614	1.04	100	96.4	90	110	
Fe	56	2	He	9562.688	1.193	55312104	1.86	10000	95.6	90	110	
Co	59	2	He	93.457	2.764	867467	0.58	100	93.5	90	110	
Ni	60	2	He	97.000	4.252	218644	2.03	100	97.0	90	110	
Cu	63	2	He	95.689	4.025	549293	1.81	100	95.7	90	110	
Zn	66	2	He	94.294	2.680	132120	2.57	100	94.3	90	110	
As	75	2	He	96.645	1.892	132758	0.41	100	96.6	90	110	
Se	78	2	He	95.670	3.454	10266	1.33	100	95.7	90	110	
B	11	1	nogas	449.770	1.233	2522051	1.40	500	90.0	90	110	ICV Main CR1 Failed
Si	28	1	nogas	5024.767	3.947	56961241	0.29	5000	100.5	90	110	
Ca	43	1	nogas	10068.410	3.841	372307	2.19	10000	100.7	90	110	
Ca	44	1	nogas	10091.344	3.500	6165577	0.74	10000	100.9	90	110	
Fe	56	1	nogas	9859.966	2.794	240470664	1.30	10000	98.6	90	110	
Se	77	1	nogas	90.576	11.463	71848	2.72	100	90.6	90	110	
Se	82	1	nogas	100.935	3.252	27411	1.03	100	100.9	90	110	
Mo	95	1	nogas	95.675	3.362	581598	1.07	100	95.7	90	110	
Sn	118	1	nogas	93.246	2.550	780269	1.00	100	93.2	90	110	
Ba	137	1	nogas	98.047	2.279	425148	1.98	100	98.0	90	110	
Sb	121	2	He	99.497	1.789	487836	1.57	100	99.5	90	110	
Li	7	1	nogas	93.698	4.466	1843806	4.90	100	93.7	90	110	
P	31	1	nogas	503.287	4.209	895021	1.33	500	100.7	90	110	
La	139	1	nogas	158.627	15.772	740	13.03	100	158.6	90	110	ICV Main CR1 Failed
Au	197	1	nogas	271.390	486.350	17	91.65	100	271.4	90	110	ICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1151366	1.39	1195276	96.33	70	125	
Ge	72	1	nogas	3542945	4.01	3552237	99.74	70	125	
In	115	1	nogas	3084221	3.57	3134247	98.40	70	125	
Bi	209	1	nogas	2312209	3.10	2336631	98.95	70	125	

Initial Calibration Verification (ICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	830435	2.25	837498	99.16	70	125	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	238SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:53:38-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	231CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.628	1.628	11.47	16020	0.01	2000	
Na	23	1	nogas	207.294	207.294	2.13	6001586	0.00	200000	
Mg	24	1	nogas	205.541	205.541	3.69	3571595	0.01	200000	
Al	27	1	nogas	0.431	0.431	25.46	88441	0.00	2000	
K	39	1	nogas	220.006	220.006	6.80	12540609	0.00	200000	
Ti	47	1	nogas	2.230	2.230	0.68	4581	0.05	2000	
V	51	1	nogas	8.852	8.852	25.57	1521333	0.00	2000	
Cr	52	1	nogas	2.253	2.253	6.07	124331	0.00	2000	
Mn	55	1	nogas	1.881	1.881	4.21	80287	0.00	2000	
Co	59	1	nogas	2.103	2.103	3.00	52816	0.00	2000	
Ni	60	1	nogas	1.662	1.662	5.85	12077	0.01	2000	
Cu	63	1	nogas	2.078	2.078	3.04	29087	0.01	2000	
Zn	66	1	nogas	1.745	1.745	9.52	9916	0.02	2000	
As	75	1	nogas	1.863	1.863	32.54	191066	0.00	2000	
Sr	88	1	nogas	2.004	2.004	1.98	61817	0.00	2000	
Ag	107	1	nogas	2.072	2.072	1.01	30550	0.01	2000	
Cd	111	1	nogas	1.938	1.938	2.12	6408	0.03	2000	
Sb	121	1	nogas	3.159	3.159	5.57	44687	0.01	2000	
Tl	205	1	nogas	2.268	2.268	13.54	52492	0.00	2000	
Pb	208	1	nogas	2.139	2.139	1.55	61887	0.00	2000	
U	238	1	nogas	2.026	2.026	6.08	62203	0.00	2000	
[Pb]	206	1	nogas	1.993	1.993	6.96	15377	0.01	2000	
[Pb]	207	1	nogas	2.023	2.023	2.74	13589	0.01	2000	
Na	23	2	He	209.802	209.802	1.99	369617	0.06	200000	
Mg	24	2	He	213.119	213.119	0.65	182803	0.12	200000	
Al	27	2	He	0.994	0.994	26.74	2234	0.04	2000	
K	39	2	He	219.547	219.547	0.46	367366	0.06	200000	
Ca	43	2	He	191.411	191.411	6.41	513	37.29	200000	
Ca	44	2	He	196.609	196.609	2.93	9122	2.16	200000	
V	51	2	He	2.918	2.918	2.97	29813	0.01	2000	
Cr	52	2	He	1.961	1.961	3.50	17739	0.01	2000	
Mn	55	2	He	2.065	2.065	5.86	10843	0.02	2000	
Fe	56	2	He	210.766	210.766	3.42	1253761	0.02	200000	
Co	59	2	He	2.048	2.048	4.05	19344	0.01	2000	
Ni	60	2	He	2.342	2.342	7.24	5097	0.05	2000	
Cu	63	2	He	2.529	2.529	6.57	13268	0.02	2000	
Zn	66	2	He	2.087	2.087	1.06	3097	0.07	2000	
As	75	2	He	2.176	2.176	0.56	3518	0.06	2000	
Se	78	2	He	2.810	2.810	8.05	411	0.68	2000	
B	11	1	nogas	13.867	13.867	15.71	237077	0.01	2000	
Si	28	1	nogas	99.677	99.677	14.63	2963510	0.00	2000	
Ca	43	1	nogas	208.155	208.155	2.27	8759	2.38	200000	

Sample Report

Ca	44	1	nogas	197.239	197.239	2.30	179157	0.11	200000	
Fe	56	1	nogas	209.399	209.399	6.85	7837006	0.00	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	26.571	26.571	46.96	59116	0.04	2000	
Se	82	1	nogas	2.370	2.370	15.23	897	0.26	2000	
Mo	95	1	nogas	2.253	2.253	8.30	14463	0.02	2000	
Sn	118	1	nogas	2.103	2.103	3.08	20172	0.01	2000	
Ba	137	1	nogas	1.981	1.981	3.96	9343	0.02	2000	
Sb	121	2	He	3.107	3.107	2.70	15444	0.02	2000	
La	139	1	nogas	-37.203	-37.203	-8.32	70	-53.15	2000	
Au	197	1	nogas	649.630	649.630	186.19	13	4872.23	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1275207	7.51	1195276	106.69	70	125	
Ge	72	1	nogas	3647931	2.22	3552237	102.69	70	125	
In	115	1	nogas	3280686	2.68	3134247	104.67	70	125	
Bi	209	1	nogas	2475617	4.11	2336631	105.95	70	125	
Ge	72	2	He	836673	1.49	837498	99.90	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLCCV5
Data File Name	239LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:55:37-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.530	9.453	37901	1.37	5	90.6	70	130	
Na	23	1	nogas	468.673	10.476	13683101	3.06	500	93.7	70	130	
Mg	24	1	nogas	468.089	9.387	8433335	2.81	500	93.6	70	130	
Al	27	1	nogas	4.734	6.322	181334	3.53	5	94.7	70	130	
K	39	1	nogas	498.228	6.152	19061074	0.11	500	99.6	70	130	
Ti	47	1	nogas	4.705	6.193	9586	2.65	5	94.1	70	130	
V	51	1	nogas	20.671	21.678	1906283	8.33	5	413.4	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	5.178	7.065	199255	0.95	5	103.6	70	130	
Mn	55	1	nogas	4.808	4.378	172449	0.94	5	96.2	70	130	
Co	59	1	nogas	4.805	5.906	122761	2.66	5	96.1	70	130	
Ni	60	1	nogas	4.684	7.140	28763	4.19	5	93.7	70	130	
Cu	63	1	nogas	4.813	6.059	67046	3.27	5	96.3	70	130	
Zn	66	1	nogas	4.743	6.717	23305	2.48	5	94.9	70	130	
As	75	1	nogas	6.789	34.112	223455	2.24	5	135.8	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	4.822	3.420	150992	0.61	5	96.4	70	130	
Ag	107	1	nogas	4.879	2.723	73754	2.35	5	97.6	70	130	
Cd	111	1	nogas	4.976	4.174	15921	0.57	5	99.5	70	130	
Sb	121	1	nogas	5.342	4.712	77424	1.15	5	106.8	70	130	
Tl	205	1	nogas	4.975	1.935	101479	1.48	5	99.5	70	130	
Pb	208	1	nogas	5.034	2.373	144051	2.35	5	100.7	70	130	
U	238	1	nogas	5.139	2.329	139440	0.78	5	102.8	70	130	
[Pb]	206	1	nogas	5.405	3.777	36381	3.16	5	108.1	70	130	
[Pb]	207	1	nogas	5.370	4.884	31464	2.27	5	107.4	70	130	
Na	23	2	He	501.112	1.227	822290	1.00	500	100.2	70	130	
Mg	24	2	He	503.854	2.023	428633	1.30	500	100.8	70	130	
Al	27	2	He	4.762	16.015	4007	9.10	5	95.2	70	130	
K	39	2	He	508.721	0.350	626947	0.25	500	101.7	70	130	
Ca	43	2	He	463.254	10.843	1187	11.19	500	92.7	70	130	
Ca	44	2	He	509.433	0.991	22110	2.47	500	101.9	70	130	
V	51	2	He	5.915	2.841	48755	0.77	5	118.3	70	130	
Cr	52	2	He	4.903	2.277	38056	3.21	5	98.1	70	130	
Mn	55	2	He	5.126	1.692	25241	1.38	5	102.5	70	130	
Fe	56	2	He	504.462	1.773	2955918	2.51	500	100.9	70	130	
Co	59	2	He	4.878	2.450	45684	2.41	5	97.6	70	130	
Ni	60	2	He	5.428	5.165	12081	5.17	5	108.6	70	130	
Cu	63	2	He	5.413	2.735	29911	1.30	5	108.3	70	130	
Zn	66	2	He	5.094	4.879	7315	4.52	5	101.9	70	130	
As	75	2	He	5.025	3.440	7425	4.15	5	100.5	70	130	
Se	78	2	He	6.027	3.636	753	2.41	5	120.5	70	130	
B	11	1	nogas	30.057	13.879	282626	0.67	25	120.2	70	130	
Si	28	1	nogas	240.868	14.210	4682363	6.32	25	963.5	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	487.462	5.687	19898	2.33	500	97.5	70	130	
Ca	44	1	nogas	472.137	4.437	360231	0.67	500	94.4	70	130	
Fe	56	1	nogas	491.450	4.324	15257974	2.17	500	98.3	70	130	
Se	77	1	nogas	47.180	32.878	65621	2.32	5	943.6	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	4.849	2.638	1630	4.02	5	97.0	70	130	
Mo	95	1	nogas	4.673	5.813	30420	2.35	5	93.5	70	130	
Sn	118	1	nogas	4.775	4.284	42625	2.59	5	95.5	70	130	
Ba	137	1	nogas	4.915	3.456	22208	2.21	5	98.3	70	130	
Sb	121	2	He	5.474	1.513	27051	1.07	5	109.5	70	130	
Li	7	1	nogas	5.564	17.680	188357	1.10	5	111.3	70	130	
P	31	1	nogas	27.947	14.489	132540	2.34	25	111.8	70	130	
La	139	1	nogas	6.001	342.949	220	29.81	5	120.0	70	130	
Au	197	1	nogas	-91.200	-949.432	20	50.00	5	-1824.0	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1087629	7.70	1195276	90.99	70	125	
Ge	72	1	nogas	3749725	3.63	3552237	105.56	70	125	
In	115	1	nogas	3186690	3.57	3134247	101.67	70	125	
Bi	209	1	nogas	2188629	2.80	2336631	93.67	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	834160	1.58	837498	99.60	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICCB
Data File Name	240_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:57:35-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.022	33.5	287	26.2	1	
Na	23	1	nogas	3.189	35.7	384853	3.7	100	
Mg	24	1	nogas	1.016	38.6	43794	3.6	100	
Al	27	1	nogas	-0.380	-64.1	66457	1.2	5	
K	39	1	nogas	40.124	72.0	8002143	0.8	100	
Ti	47	1	nogas	0.126	166.2	477	68.7	2.5	
V	51	1	nogas	17.152	29.5	1621827	1.6	2.5	ICB Main CR1 Failed
Cr	52	1	nogas	0.858	25.9	84337	2.1	2.5	
Mn	55	1	nogas	0.087	74.6	24610	1.3	2.5	
Co	59	1	nogas	0.001	834.3	807	11.1	2.5	
Ni	60	1	nogas	-0.510	-1.6	587	1.0	2.5	
Cu	63	1	nogas	0.057	22.9	2157	3.3	1	
Zn	66	1	nogas	-0.349	-6.0	927	1.6	2.5	
As	75	1	nogas	5.554	40.1	195257	2.3	2.5	ICB Main CR1 Failed
Sr	88	1	nogas	0.020	40.0	1690	7.7	2.5	
Ag	107	1	nogas	0.005	86.7	173	29.6	2.5	
Cd	111	1	nogas	0.016	30.3	73	20.8	1	
Sb	121	1	nogas	0.257	3.4	3624	4.7	2.5	
Tl	205	1	nogas	0.090	43.4	2144	30.0	1	
Pb	208	1	nogas	0.003	125.1	1253	9.7	2.5	
U	238	1	nogas	0.014	29.1	493	20.3	2.5	
[Pb]	206	1	nogas	0.002	696.1	323	20.6	2.5	
[Pb]	207	1	nogas	0.007	121.0	290	15.0	2.5	
Na	23	2	He	2.300	38.3	44729	3.2	100	
Mg	24	2	He	1.038	12.8	2427	5.0	100	
Al	27	2	He	0.191	277.8	1823	13.7	5	
K	39	2	He	15.090	13.3	183831	1.0	100	
Ca	43	2	He	8.488	74.2	57	27.0	100	
Ca	44	2	He	2.081	47.4	987	3.6	100	
V	51	2	He	1.200	2.2	18565	1.4	2.5	
Cr	52	2	He	0.058	17.0	4451	2.1	2.5	
Mn	55	2	He	0.068	23.2	1370	5.1	2.5	
Fe	56	2	He	0.104	486.7	26203	11.2	100	
Co	59	2	He	0.003	220.3	223	26.2	2.5	
Ni	60	2	He	0.206	12.7	237	24.4	2.5	
Cu	63	2	He	0.395	3.7	887	9.7	1	
Zn	66	2	He	0.138	30.2	343	16.6	2.5	
As	75	2	He	0.086	65.7	626	12.0	2.5	
Se	78	2	He	0.762	26.3	189	11.6	1	
B	11	1	nogas	3.281	40.0	159852	2.6	10	
Si	28	1	nogas	7.551	152.6	1776849	1.2	5	ICB Main CR1 Failed
Ca	43	1	nogas	6.277	19.1	1007	7.5	100	
Ca	44	1	nogas	6.129	106.2	55415	1.0	100	
Fe	56	1	nogas	8.009	125.4	2618680	2.3	100	

Initial Calibration Blank (ICB) Report

Se	77	1	nogas	65.522	24.2	63119	3.5	2.5	ICB Main CR1 Failed
Se	82	1	nogas	-0.025	-217.1	217	9.6	1	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Mo	95	1	nogas	0.031	32.7	527	12.4	2.5	
Sn	118	1	nogas	0.013	178.8	1380	6.3	5	
Ba	137	1	nogas	0.029	76.7	297	22.4	2.5	
Sb	121	2	He	0.261	6.9	1363	6.1	2.5	
P	31	1	nogas	5.499	75.8	84699	0.4	10	
La	139	1	nogas	-16.882	-9.2	127	4.6	2.5	
Au	197	1	nogas	806.992	7.4	10	0.0	2.5	ICB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1161998	4.83	1195276	97.22	70	125	
Ge	72	1	nogas	3385374	7.82	3552237	95.30	70	125	
In	115	1	nogas	2881253	7.72	3134247	91.93	70	125	
Bi	209	1	nogas	2184286	6.51	2336631	93.48	70	125	
Ge	72	2	He	823081	0.55	837498	98.28	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	252_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:21:23-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	86.986	4.957	747728	1.22	100	87.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10445.514	0.351	282560673	2.13	10000	104.5	90	110	
Mg	24	1	nogas	10115.302	1.611	172357862	2.17	10000	101.2	90	110	
Al	27	1	nogas	111.418	5.099	2251866	0.28	100	111.4	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10659.147	6.487	227342897	1.63	10000	106.6	90	110	
Ti	47	1	nogas	101.182	5.359	186021	0.67	100	101.2	90	110	
V	51	1	nogas	128.716	4.983	4672770	1.51	100	128.7	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	101.495	4.686	2378656	6.21	100	101.5	90	110	
Mn	55	1	nogas	101.172	3.658	2919480	7.24	100	101.2	90	110	
Co	59	1	nogas	99.828	4.093	2356538	0.76	100	99.8	90	110	
Ni	60	1	nogas	103.247	5.355	522772	0.79	100	103.2	90	110	
Cu	63	1	nogas	96.636	7.627	1222207	3.14	100	96.6	90	110	
Zn	66	1	nogas	100.708	4.093	412200	0.66	100	100.7	90	110	
As	75	1	nogas	110.350	4.666	741953	1.52	100	110.3	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	101.161	3.714	2922477	2.12	100	101.2	90	110	
Ag	107	1	nogas	100.143	4.117	1405201	1.66	100	100.1	90	110	
Cd	111	1	nogas	98.636	2.864	295347	0.64	100	98.6	90	110	
Sb	121	1	nogas	100.023	3.737	1343594	1.96	100	100.0	90	110	
Tl	205	1	nogas	99.834	0.958	2010797	0.79	100	99.8	90	110	
Pb	208	1	nogas	92.751	2.827	2634221	2.83	100	92.8	90	110	
U	238	1	nogas	85.700	2.006	2302180	0.35	100	85.7	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	98.188	2.189	649389	0.96	100	98.2	90	110	
[Pb]	207	1	nogas	94.486	5.172	544532	4.09	100	94.5	90	110	
Na	23	2	He	10801.288	0.275	16808372	1.67	10000	108.0	90	110	
Mg	24	2	He	10287.141	0.348	8691425	1.71	10000	102.9	90	110	
Al	27	2	He	105.962	2.105	51628	0.65	100	106.0	90	110	
K	39	2	He	10644.298	0.776	9725294	0.76	10000	106.4	90	110	
Ca	43	2	He	10304.580	0.270	25524	1.64	10000	103.0	90	110	
Ca	44	2	He	10363.457	1.309	430502	0.94	10000	103.6	90	110	
V	51	2	He	98.868	0.738	636938	0.97	100	98.9	90	110	
Cr	52	2	He	94.391	0.966	655256	2.21	100	94.4	90	110	
Mn	55	2	He	99.414	3.584	468126	2.41	100	99.4	90	110	
Fe	56	2	He	9761.148	1.914	56508889	1.09	10000	97.6	90	110	
Co	59	2	He	92.601	1.858	860524	0.47	100	92.6	90	110	
Ni	60	2	He	97.011	2.593	218963	1.52	100	97.0	90	110	
Cu	63	2	He	95.412	2.123	548444	1.14	100	95.4	90	110	
Zn	66	2	He	93.814	0.662	131591	1.20	100	93.8	90	110	
As	75	2	He	97.803	1.873	134482	0.56	100	97.8	90	110	
Se	78	2	He	97.982	0.980	10526	1.45	100	98.0	90	110	
B	11	1	nogas	619.414	4.036	3310898	1.20	500	123.9	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	555.125	5.911	7752419	1.23	5000	11.1	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10657.415	5.749	387586	1.64	10000	106.6	90	110	
Ca	44	1	nogas	10455.927	6.997	6279410	2.44	10000	104.6	90	110	
Fe	56	1	nogas	10238.822	3.934	245884455	5.65	10000	102.4	90	110	
Se	77	1	nogas	209.743	8.568	97174	0.61	100	209.7	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.319	5.519	26536	1.73	100	99.3	90	110	
Mo	95	1	nogas	91.802	4.168	549206	1.33	100	91.8	90	110	
Sn	118	1	nogas	95.955	0.702	777906	2.46	100	96.0	90	110	
Ba	137	1	nogas	99.351	3.799	417102	1.93	100	99.4	90	110	
Sb	121	2	He	97.913	1.343	480556	0.81	100	97.9	90	110	
Li	7	1	nogas	96.445	4.701	1834127	2.28	100	96.4	90	110	
P	31	1	nogas	473.343	5.372	832948	0.83	500	94.7	90	110	
La	139	1	nogas	199.325	11.967	850	6.55	100	199.3	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-442.941	-435.383	23	89.21	100	-442.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1115999	4.98	1195276	93.37	70	125	
Ge	72	1	nogas	3488105	4.84	3552237	98.19	70	125	
In	115	1	nogas	2986720	2.93	3134247	95.29	70	125	
Bi	209	1	nogas	2167806	1.66	2336631	92.77	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	831202	1.41	837498	99.25	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	253_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:23:23-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.079	27.5	830	21.7	1	
Na	23	1	nogas	367.394	6.7	10106001	1.1	100	CCB Main CR1 Failed
Mg	24	1	nogas	18.654	14.1	342464	7.6	100	
Al	27	1	nogas	2.756	1.6	126404	0.8	5	
K	39	1	nogas	73.620	5.1	8716121	1.2	100	
Ti	47	1	nogas	0.149	19.5	537	10.9	2.5	
V	51	1	nogas	17.404	21.0	1636644	4.8	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	0.424	17.8	75088	1.1	2.5	
Mn	55	1	nogas	1.104	3.4	53053	3.2	2.5	
Co	59	1	nogas	0.102	20.7	3140	16.6	2.5	
Ni	60	1	nogas	1.350	6.8	9696	3.4	2.5	
Cu	63	1	nogas	0.643	0.7	9376	0.8	2	
Zn	66	1	nogas	0.499	9.0	4291	4.2	2.5	
As	75	1	nogas	4.398	40.8	190232	3.6	2.5	CCB Main CR1 Failed
Sr	88	1	nogas	0.392	6.0	12174	6.6	2.5	
Ag	107	1	nogas	0.072	17.9	1087	17.1	2.5	
Cd	111	1	nogas	0.067	44.9	230	35.6	1	
Sb	121	1	nogas	0.134	21.7	2027	19.8	2.5	
Tl	205	1	nogas	0.902	56.7	19384	55.7	1	
Pb	208	1	nogas	0.088	45.1	3644	30.8	2.5	
U	238	1	nogas	0.171	48.3	4904	47.4	2.5	
[Pb]	206	1	nogas	0.077	46.6	857	28.9	2.5	
[Pb]	207	1	nogas	0.094	37.5	823	25.7	2.5	
Na	23	2	He	375.898	4.2	627445	2.3	100	CCB Main CR1 Failed
Mg	24	2	He	21.051	11.1	19430	9.7	100	
Al	27	2	He	3.287	3.8	3314	3.7	5	
K	39	2	He	39.126	6.4	205408	1.1	100	
Ca	43	2	He	25.702	33.8	100	20.0	100	
Ca	44	2	He	31.599	4.2	2230	4.0	100	
V	51	2	He	1.368	3.4	19893	1.1	2.5	
Cr	52	2	He	0.101	36.7	4814	5.4	2.5	
Mn	55	2	He	0.956	8.8	5581	6.2	2.5	
Fe	56	2	He	7.398	7.7	68928	3.1	100	
Co	59	2	He	0.077	8.3	920	6.8	2.5	
Ni	60	2	He	0.340	8.5	543	10.8	2.5	
Cu	63	2	He	0.475	3.4	1360	5.8	2	
Zn	66	2	He	0.410	10.8	730	7.2	2.5	
As	75	2	He	0.170	17.3	749	4.0	2.5	
Se	78	2	He	0.895	19.1	206	7.6	2	
B	11	1	nogas	177.387	9.1	1141533	4.5	10	CCB Main CR1 Failed
Si	28	1	nogas	25.836	12.9	1977801	1.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	41.427	18.7	2250	12.0	100	
Ca	44	1	nogas	46.577	3.7	79157	2.6	100	
Fe	56	1	nogas	53.311	11.5	3681656	4.8	100	
Se	77	1	nogas	51.555	29.8	60340	5.1	2.5	CCB Main CR1 Failed
Se	82	1	nogas	0.026	546.4	230	15.1	2	
Mo	95	1	nogas	0.478	40.4	3140	36.8	2.5	
Sn	118	1	nogas	0.256	31.3	3417	14.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.218	33.9	1107	23.2	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.124	23.1	707	18.8	2.5	
P	31	1	nogas	6.887	13.2	87294	1.0	10	
La	139	1	nogas	-18.657	-65.7	127	32.9	2.5	
Au	197	1	nogas	257.284	524.0	17	91.7	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1219280	4.78	1195276	102.01	70	125	
Ge	72	1	nogas	3390051	1.32	3552237	95.43	70	125	
In	115	1	nogas	3013427	4.53	3134247	96.15	70	125	
Bi	209	1	nogas	2268399	0.43	2336631	97.08	70	125	
Ge	72	2	He	834717	1.92	837498	99.67	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	264_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:45:19-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	87.096	2.669	753350	2.24	100	87.1	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10371.125	3.451	271943106	1.66	10000	103.7	90	110	
Mg	24	1	nogas	10167.893	2.619	167980516	1.76	10000	101.7	90	110	
Al	27	1	nogas	113.354	2.985	2182729	2.47	100	113.4	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	11358.738	1.619	230634547	2.63	10000	113.6	90	110	CCV Main CR1-2 Failed
Ti	47	1	nogas	107.627	3.818	188561	0.60	100	107.6	90	110	
V	51	1	nogas	117.291	5.274	4159320	2.58	100	117.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	106.520	3.833	2372744	2.52	100	106.5	90	110	
Mn	55	1	nogas	108.748	6.502	2980584	3.29	100	108.7	90	110	
Co	59	1	nogas	107.085	3.898	2408282	1.86	100	107.1	90	110	
Ni	60	1	nogas	106.648	4.511	514445	1.24	100	106.6	90	110	
Cu	63	1	nogas	101.206	2.681	1220988	0.91	100	101.2	90	110	
Zn	66	1	nogas	102.769	2.938	400777	1.54	100	102.8	90	110	
As	75	1	nogas	107.757	2.827	694201	1.25	100	107.8	90	110	
Sr	88	1	nogas	107.660	2.283	2964268	3.51	100	107.7	90	110	
Ag	107	1	nogas	105.883	3.397	1415401	0.11	100	105.9	90	110	
Cd	111	1	nogas	99.511	2.244	292953	0.95	100	99.5	90	110	
Sb	121	1	nogas	103.757	3.597	1327631	1.65	100	103.8	90	110	
Tl	205	1	nogas	99.995	0.921	2031167	3.00	100	100.0	90	110	
Pb	208	1	nogas	94.831	3.171	2693257	3.17	100	94.8	90	110	
U	238	1	nogas	87.015	2.961	2356580	1.77	100	87.0	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	100.023	1.226	667069	1.58	100	100.0	90	110	
[Pb]	207	1	nogas	94.940	1.831	551810	1.33	100	94.9	90	110	
Na	23	2	He	10468.489	1.550	16012758	2.26	10000	104.7	90	110	
Mg	24	2	He	10459.216	0.611	8685904	2.20	10000	104.6	90	110	
Al	27	2	He	106.833	1.647	51149	0.83	100	106.8	90	110	
K	39	2	He	10673.170	2.487	9751211	2.44	10000	106.7	90	110	
Ca	43	2	He	10084.810	4.259	24540	2.17	10000	100.8	90	110	
Ca	44	2	He	10216.425	2.719	417050	0.47	10000	102.2	90	110	
V	51	2	He	98.121	1.379	621371	1.26	100	98.1	90	110	
Cr	52	2	He	94.468	2.442	644347	0.20	100	94.5	90	110	
Mn	55	2	He	99.399	1.765	460098	0.50	100	99.4	90	110	
Fe	56	2	He	9940.074	0.475	56574426	2.48	10000	99.4	90	110	
Co	59	2	He	93.848	2.642	857549	4.15	100	93.8	90	110	
Ni	60	2	He	98.691	2.132	218996	2.68	100	98.7	90	110	
Cu	63	2	He	97.127	2.672	548715	1.17	100	97.1	90	110	
Zn	66	2	He	96.184	1.489	132597	1.57	100	96.2	90	110	
As	75	2	He	97.008	1.879	131110	0.79	100	97.0	90	110	
Se	78	2	He	97.921	0.518	10340	1.76	100	97.9	90	110	
B	11	1	nogas	734.652	5.522	3922075	2.64	500	146.9	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	619.251	6.286	8044260	1.71	5000	12.4	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10818.810	3.150	375061	1.14	10000	108.2	90	110	
Ca	44	1	nogas	10814.241	3.490	6192753	2.60	10000	108.1	90	110	
Fe	56	1	nogas	10614.070	2.923	242517922	0.94	10000	106.1	90	110	
Se	77	1	nogas	156.226	7.427	81264	1.72	100	156.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	104.622	4.299	26630	2.63	100	104.6	90	110	
Mo	95	1	nogas	96.099	2.410	547826	0.92	100	96.1	90	110	
Sn	118	1	nogas	97.048	0.658	773423	2.47	100	97.0	90	110	
Ba	137	1	nogas	101.742	2.322	419981	0.87	100	101.7	90	110	
Sb	121	2	He	100.436	0.248	484615	2.53	100	100.4	90	110	
Li	7	1	nogas	96.803	3.712	1851175	1.98	100	96.8	90	110	
P	31	1	nogas	598.157	7.880	982856	5.22	500	119.6	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	209.530	15.389	870	11.95	100	209.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-1971.920	-86.092	40	43.30	100	-1971.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1122032	4.54	1195276	93.87	70	125	
Ge	72	1	nogas	3321355	3.34	3552237	93.50	70	125	
In	115	1	nogas	2936215	3.13	3134247	93.68	70	125	
Bi	209	1	nogas	2185904	2.54	2336631	93.55	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	817052	2.28	837498	97.56	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	265_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:47:18-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.076	33.1	793	25.5	1	
Na	23	1	nogas	125.336	9.2	3523086	2.6	100	CCB Main CR1 Failed
Mg	24	1	nogas	13.816	25.1	250642	16.3	100	
Al	27	1	nogas	2.293	6.4	116198	1.6	5	
K	39	1	nogas	155.734	8.5	10240559	0.9	100	CCB Main CR1 Failed
Ti	47	1	nogas	0.411	34.5	990	23.3	2.5	
V	51	1	nogas	6.074	45.7	1326165	7.1	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	0.663	5.1	79456	1.7	2.5	
Mn	55	1	nogas	1.388	1.5	60191	1.0	2.5	
Co	59	1	nogas	0.147	11.8	4131	8.2	2.5	
Ni	60	1	nogas	-0.136	-42.4	2390	9.9	2.5	
Cu	63	1	nogas	0.300	14.4	5091	8.4	2	
Zn	66	1	nogas	0.200	42.0	3070	10.7	2.5	
As	75	1	nogas	1.294	62.1	172710	4.1	2.5	
Sr	88	1	nogas	0.218	18.9	7182	14.0	2.5	
Ag	107	1	nogas	0.070	9.5	1043	7.7	2.5	
Cd	111	1	nogas	0.098	45.9	327	40.0	1	
Sb	121	1	nogas	0.288	10.5	3981	7.9	2.5	
Tl	205	1	nogas	0.976	53.1	20573	54.9	1	
Pb	208	1	nogas	0.099	48.0	3970	34.0	2.5	
U	238	1	nogas	0.212	55.6	5971	57.4	2.5	
[Pb]	206	1	nogas	0.087	51.5	913	36.1	2.5	
[Pb]	207	1	nogas	0.099	54.8	840	41.2	2.5	
Na	23	2	He	121.939	6.9	229267	2.2	100	CCB Main CR1 Failed
Mg	24	2	He	11.996	6.7	11630	4.3	100	
Al	27	2	He	2.535	31.6	2917	8.2	5	
K	39	2	He	103.286	1.1	263002	0.4	100	CCB Main CR1 Failed
Ca	43	2	He	31.876	58.4	113	36.7	100	
Ca	44	2	He	25.081	5.8	1940	6.2	100	
V	51	2	He	0.705	26.3	15496	2.7	2.5	
Cr	52	2	He	0.070	49.3	4547	1.9	2.5	
Mn	55	2	He	1.068	8.0	6038	2.1	2.5	
Fe	56	2	He	7.513	6.5	68896	2.2	100	
Co	59	2	He	0.119	15.4	1297	8.9	2.5	
Ni	60	2	He	0.314	0.7	480	5.5	2.5	
Cu	63	2	He	0.523	5.0	1623	10.3	2	
Zn	66	2	He	0.427	5.3	747	4.3	2.5	
As	75	2	He	0.109	54.0	658	10.1	2.5	
Se	78	2	He	1.138	38.9	229	18.8	2	
B	11	1	nogas	203.047	9.6	1278371	3.9	10	CCB Main CR1 Failed
Si	28	1	nogas	54.289	10.9	2249803	2.1	5	CCB Main CR1 Failed
Ca	43	1	nogas	63.208	7.0	2984	4.4	100	
Ca	44	1	nogas	70.107	12.3	91637	3.5	100	
Fe	56	1	nogas	33.063	30.2	3172265	5.3	100	
Se	77	1	nogas	31.669	9.5	55394	2.9	2.5	CCB Main CR1 Failed
Se	82	1	nogas	0.573	19.5	367	6.3	2	
Mo	95	1	nogas	0.489	56.8	3137	48.7	2.5	
Sn	118	1	nogas	0.319	37.1	3967	22.0	5	
Ba	137	1	nogas	0.222	24.4	1140	18.1	2.5	

Continuing Calibration Blank (CCB) Report

Sb	121	2	He	0.237	6.4	1250	7.9	2.5	
P	31	1	nogas	21.447	16.2	108526	3.2	10	CCB Main CR1 Failed
La	139	1	nogas	-24.976	-16.3	107	14.3	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Au	197	1	nogas	-1627.090	-89.8	37	41.7	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1213799	5.29	1195276	101.55	70	125	
Ge	72	1	nogas	3349960	1.85	3552237	94.31	70	125	
In	115	1	nogas	3042287	2.61	3134247	97.07	70	125	
Bi	209	1	nogas	2211162	2.71	2336631	94.63	70	125	
Ge	72	2	He	826869	5.10	837498	98.73	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	268_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:53:12-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	85.009	1.863	750986	0.84	100	85.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10337.709	5.012	263320848	2.07	10000	103.4	90	110	
Mg	24	1	nogas	10313.860	5.918	165426145	1.62	10000	103.1	90	110	
Al	27	1	nogas	112.635	5.285	2206420	3.53	100	112.6	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10814.002	1.682	223706480	0.68	10000	108.1	90	110	
Ti	47	1	nogas	102.995	1.931	183688	1.48	100	103.0	90	110	
V	51	1	nogas	115.791	3.875	4193468	1.94	100	115.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	101.725	6.789	2308106	5.65	100	101.7	90	110	
Mn	55	1	nogas	101.476	4.822	2834606	5.05	100	101.5	90	110	
Co	59	1	nogas	104.527	2.762	2392616	2.37	100	104.5	90	110	
Ni	60	1	nogas	103.430	4.116	507860	2.32	100	103.4	90	110	
Cu	63	1	nogas	96.530	3.615	1184854	1.74	100	96.5	90	110	
Zn	66	1	nogas	99.495	2.826	394851	0.97	100	99.5	90	110	
As	75	1	nogas	107.510	3.917	704994	1.12	100	107.5	90	110	
Sr	88	1	nogas	104.558	3.506	2928233	3.11	100	104.6	90	110	
Ag	107	1	nogas	100.290	2.748	1364376	1.68	100	100.3	90	110	
Cd	111	1	nogas	100.266	5.016	294426	0.42	100	100.3	90	110	
Sb	121	1	nogas	104.997	2.300	1367523	2.63	100	105.0	90	110	
Tl	205	1	nogas	97.605	6.862	2030841	3.85	100	97.6	90	110	
Pb	208	1	nogas	95.249	2.492	2705149	2.49	100	95.2	90	110	
U	238	1	nogas	86.383	6.105	2397543	2.02	100	86.4	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	97.183	6.667	663985	2.98	100	97.2	90	110	
[Pb]	207	1	nogas	93.605	5.934	557533	2.51	100	93.6	90	110	
Na	23	2	He	10341.013	1.460	15593669	1.02	10000	103.4	90	110	
Mg	24	2	He	10238.993	0.418	8382361	0.95	10000	102.4	90	110	
Al	27	2	He	109.057	3.064	51450	3.21	100	109.1	90	110	
K	39	2	He	10367.453	1.898	9476780	1.86	10000	103.7	90	110	
Ca	43	2	He	10272.065	3.196	24657	3.63	10000	102.7	90	110	
Ca	44	2	He	10386.182	1.860	418069	1.14	10000	103.9	90	110	
V	51	2	He	98.618	0.991	615662	0.31	100	98.6	90	110	
Cr	52	2	He	95.481	1.076	642158	0.63	100	95.5	90	110	
Mn	55	2	He	100.691	2.890	459468	1.68	100	100.7	90	110	
Fe	56	2	He	10080.647	4.451	56541154	3.51	10000	100.8	90	110	
Co	59	2	He	93.785	4.023	844400	2.88	100	93.8	90	110	
Ni	60	2	He	98.145	2.449	214672	1.42	100	98.1	90	110	
Cu	63	2	He	97.820	1.483	544972	1.55	100	97.8	90	110	
Zn	66	2	He	96.810	0.821	131583	1.24	100	96.8	90	110	
As	75	2	He	97.878	1.460	130424	0.35	100	97.9	90	110	
Se	78	2	He	98.962	3.187	10298	1.97	100	99.0	90	110	
B	11	1	nogas	647.088	2.781	3546885	1.13	500	129.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	565.946	5.461	7629022	2.36	5000	11.3	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10743.652	2.437	379006	0.55	10000	107.4	90	110	
Ca	44	1	nogas	10404.255	3.959	6062831	2.06	10000	104.0	90	110	
Fe	56	1	nogas	10292.923	3.531	239373672	2.49	10000	102.9	90	110	
Se	77	1	nogas	171.580	10.022	85979	2.76	100	171.6	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	101.285	3.948	26239	2.32	100	101.3	90	110	
Mo	95	1	nogas	94.726	4.632	549331	3.27	100	94.7	90	110	
Sn	118	1	nogas	97.670	3.862	776461	1.57	100	97.7	90	110	
Ba	137	1	nogas	99.917	4.356	411573	2.46	100	99.9	90	110	
Sb	121	2	He	100.004	1.530	475603	0.27	100	100.0	90	110	
Li	7	1	nogas	96.244	5.199	1880210	3.68	100	96.2	90	110	
P	31	1	nogas	501.467	2.762	851241	0.65	500	100.3	90	110	
La	139	1	nogas	205.193	25.659	850	16.47	100	205.2	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-407.821	-365.258	23	65.47	100	-407.8	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1145347	2.03	1195276	95.82	70	125	
Ge	72	1	nogas	3378546	1.88	3552237	95.11	70	125	
In	115	1	nogas	2932676	5.39	3134247	93.57	70	125	
Bi	209	1	nogas	2243494	4.90	2336631	96.01	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	805459	1.26	837498	96.17	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	269_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:55:13-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.090	29.7	923	23.0	1	
Na	23	1	nogas	101.048	10.0	2904419	1.3	100	CCB Main CR1 Failed
Mg	24	1	nogas	12.395	24.1	227940	13.3	100	
Al	27	1	nogas	2.256	6.5	114987	2.6	5	
K	39	1	nogas	132.225	18.0	9723561	0.9	100	CCB Main CR1 Failed
Ti	47	1	nogas	0.405	8.9	977	5.2	2.5	
V	51	1	nogas	11.462	6.6	1458297	4.0	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	0.762	18.8	81186	0.7	2.5	
Mn	55	1	nogas	1.296	5.9	57392	0.7	2.5	
Co	59	1	nogas	0.131	23.2	3737	14.2	2.5	
Ni	60	1	nogas	-0.206	-1.7	2043	4.5	2.5	
Cu	63	1	nogas	0.257	11.5	4551	5.0	2	
Zn	66	1	nogas	0.166	24.2	2924	2.5	2.5	
As	75	1	nogas	2.327	17.6	176991	3.0	2.5	
Sr	88	1	nogas	0.191	21.3	6375	13.4	2.5	
Ag	107	1	nogas	0.081	17.6	1180	12.3	2.5	
Cd	111	1	nogas	0.070	23.7	230	19.0	1	
Sb	121	1	nogas	0.275	16.6	3784	11.3	2.5	
Tl	205	1	nogas	0.941	57.8	20106	56.8	1	
Pb	208	1	nogas	0.088	46.5	3664	31.8	2.5	
U	238	1	nogas	0.192	56.0	5485	55.0	2.5	
[Pb]	206	1	nogas	0.084	38.5	903	24.8	2.5	
[Pb]	207	1	nogas	0.092	33.0	810	22.5	2.5	
Na	23	2	He	98.828	1.7	191978	1.3	100	
Mg	24	2	He	10.887	1.2	10603	1.6	100	
Al	27	2	He	2.287	14.7	2784	5.2	5	
K	39	2	He	82.690	3.9	244514	1.2	100	
Ca	43	2	He	9.888	120.5	60	50.0	100	
Ca	44	2	He	25.050	8.9	1920	6.8	100	
V	51	2	He	0.765	10.4	15741	1.0	2.5	
Cr	52	2	He	0.079	32.9	4564	2.4	2.5	
Mn	55	2	He	1.056	6.2	5934	3.8	2.5	
Fe	56	2	He	7.962	2.6	70846	3.7	100	
Co	59	2	He	0.110	17.3	1203	13.0	2.5	
Ni	60	2	He	0.284	15.2	410	25.7	2.5	
Cu	63	2	He	0.520	1.0	1590	2.3	2	
Zn	66	2	He	0.432	14.8	747	10.8	2.5	
As	75	2	He	0.106	11.0	649	0.3	2.5	
Se	78	2	He	1.073	13.1	221	6.0	2	
B	11	1	nogas	206.061	8.5	1292034	3.2	10	CCB Main CR1 Failed
Si	28	1	nogas	47.064	25.5	2162808	1.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	76.383	14.4	3420	7.1	100	
Ca	44	1	nogas	70.318	11.8	91311	1.5	100	
Fe	56	1	nogas	28.541	54.7	3049600	7.4	100	
Se	77	1	nogas	42.324	2.1	57421	3.8	2.5	CCB Main CR1 Failed
Se	82	1	nogas	0.488	41.3	343	14.7	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.449	55.1	2877	44.3	2.5	
Sn	118	1	nogas	0.346	58.5	3981	35.2	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.196	8.3	987	7.3	2.5	
Sb	121	2	He	0.245	6.2	1280	5.4	2.5	
P	31	1	nogas	17.011	22.0	101212	1.7	10	CCB Main CR1 Failed
La	139	1	nogas	-19.369	-31.6	120	16.7	2.5	
Au	197	1	nogas	540.846	95.1	13	43.3	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1210124	4.48	1195276	101.24	70	125	
Ge	72	1	nogas	3335904	3.95	3552237	93.91	70	125	
In	115	1	nogas	2910023	4.03	3134247	92.85	70	125	
Bi	209	1	nogas	2254062	1.90	2336631	96.47	70	125	
Ge	72	2	He	818433	2.16	837498	97.72	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLCCV5
Data File Name	270LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:57:12-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	3.988	1.405	38051	3.80	5	79.8	70	130	
Na	23	1	nogas	594.913	5.530	15456887	1.82	500	119.0	70	130	
Mg	24	1	nogas	526.157	7.033	8469084	1.92	500	105.2	70	130	
Al	27	1	nogas	4.462	2.630	159413	0.55	5	89.2	70	130	
K	39	1	nogas	607.413	2.925	19509654	0.69	500	121.5	70	130	
Ti	47	1	nogas	5.346	5.596	9859	5.00	5	106.9	70	130	
V	51	1	nogas	22.839	5.014	1785758	1.27	5	456.8	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	5.918	1.817	197400	0.31	5	118.4	70	130	
Mn	55	1	nogas	5.366	0.950	172180	0.91	5	107.3	70	130	
Co	59	1	nogas	4.965	2.448	115223	1.08	5	99.3	70	130	
Ni	60	1	nogas	4.915	1.983	27264	0.49	5	98.3	70	130	
Cu	63	1	nogas	5.106	0.927	64540	1.80	5	102.1	70	130	
Zn	66	1	nogas	4.905	3.163	21820	2.80	5	98.1	70	130	
As	75	1	nogas	12.418	18.707	231295	3.86	5	248.4	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	5.070	2.405	144102	1.75	5	101.4	70	130	
Ag	107	1	nogas	5.032	2.088	69051	0.84	5	100.6	70	130	
Cd	111	1	nogas	5.012	7.904	14463	1.96	5	100.2	70	130	
Sb	121	1	nogas	5.107	4.594	67229	3.58	5	102.1	70	130	
Tl	205	1	nogas	4.530	4.526	93843	2.39	5	90.6	70	130	
Pb	208	1	nogas	4.613	0.389	132102	0.39	5	92.3	70	130	
U	238	1	nogas	4.692	4.024	129317	2.30	5	93.8	70	130	
[Pb]	206	1	nogas	4.958	3.388	33916	1.41	5	99.2	70	130	
[Pb]	207	1	nogas	4.888	4.190	29120	1.97	5	97.8	70	130	
Na	23	2	He	570.944	1.790	917151	0.52	500	114.2	70	130	
Mg	24	2	He	498.123	2.687	417416	0.76	500	99.6	70	130	
Al	27	2	He	4.996	10.881	4054	4.33	5	99.9	70	130	
K	39	2	He	548.704	1.251	662838	0.93	500	109.7	70	130	
Ca	43	2	He	543.253	6.536	1363	4.88	500	108.7	70	130	
Ca	44	2	He	506.627	3.493	21660	2.64	500	101.3	70	130	
V	51	2	He	5.677	0.619	46554	1.60	5	113.5	70	130	
Cr	52	2	He	4.674	3.565	35912	1.39	5	93.5	70	130	
Mn	55	2	He	5.292	6.357	25625	4.44	5	105.8	70	130	
Fe	56	2	He	478.635	1.276	2764151	2.05	500	95.7	70	130	
Co	59	2	He	4.705	2.222	43408	1.00	5	94.1	70	130	
Ni	60	2	He	4.968	6.141	10867	4.32	5	99.4	70	130	
Cu	63	2	He	5.342	3.592	29060	2.11	5	106.8	70	130	
Zn	66	2	He	5.013	4.908	7095	4.88	5	100.3	70	130	
As	75	2	He	4.716	1.755	6898	3.68	5	94.3	70	130	
Se	78	2	He	5.172	6.528	653	6.50	5	103.4	70	130	
B	11	1	nogas	189.859	5.575	1227276	2.35	25	759.4	70	130	LLICV Main CR1 Failed
Si	28	1	nogas	280.924	2.821	4677439	0.57	25	1123.7	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	577.336	1.450	21266	2.23	500	115.5	70	130	
Ca	44	1	nogas	544.355	1.483	369174	1.12	500	108.9	70	130	
Fe	56	1	nogas	522.506	1.198	14573826	0.77	500	104.5	70	130	
Se	77	1	nogas	84.076	14.586	67632	4.09	5	1681.5	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	5.019	6.081	1523	5.51	5	100.4	70	130	
Mo	95	1	nogas	4.966	5.617	29341	4.83	5	99.3	70	130	
Sn	118	1	nogas	4.958	2.748	39951	3.72	5	99.2	70	130	
Ba	137	1	nogas	5.203	6.463	21200	1.09	5	104.1	70	130	
Sb	121	2	He	4.845	4.842	23616	6.91	5	96.9	70	130	
Li	7	1	nogas	4.068	5.193	184897	5.21	5	81.4	70	130	
P	31	1	nogas	35.966	3.044	132892	1.84	25	143.9	70	130	LLICV Main CR1 Failed
La	139	1	nogas	-7.207	-207.031	157	26.57	5	-144.1	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	220.306	477.045	17	69.28	5	4406.1	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1233854	2.97	1195276	103.23	70	125	
Ge	72	1	nogas	3402500	1.38	3552237	95.78	70	125	
In	115	1	nogas	2880269	5.73	3134247	91.90	70	125	
Bi	209	1	nogas	2223022	2.65	2336631	95.14	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	821806	2.06	837498	98.13	70	125	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	271SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:59:10-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	231CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.627	1.627	2.50	15053	0.01	2000	
Na	23	1	nogas	249.638	249.638	1.88	7100862	0.00	200000	
Mg	24	1	nogas	194.388	194.388	1.40	3355377	0.01	200000	
Al	27	1	nogas	0.248	0.248	103.00	80522	0.00	2000	
K	39	1	nogas	279.208	279.208	7.34	13141152	0.00	200000	
Ti	47	1	nogas	2.243	2.243	7.31	4374	0.05	2000	
V	51	1	nogas	20.530	20.530	24.29	1756824	0.00	2000	
Cr	52	1	nogas	2.468	2.468	6.54	123119	0.00	2000	
Mn	55	1	nogas	2.075	2.075	5.47	81847	0.00	2000	
Co	59	1	nogas	1.991	1.991	7.08	47552	0.00	2000	
Ni	60	1	nogas	1.598	1.598	11.11	11157	0.01	2000	
Cu	63	1	nogas	2.083	2.083	5.08	27714	0.01	2000	
Zn	66	1	nogas	1.606	1.606	6.08	8879	0.02	2000	
As	75	1	nogas	8.032	8.032	26.08	213231	0.00	2000	
Sr	88	1	nogas	2.067	2.067	4.57	60572	0.00	2000	
Ag	107	1	nogas	1.968	1.968	4.01	27578	0.01	2000	
Cd	111	1	nogas	1.900	1.900	10.58	5941	0.03	2000	
Sb	121	1	nogas	2.038	2.038	1.65	27532	0.01	2000	
Tl	205	1	nogas	1.887	1.887	6.06	39756	0.00	2000	
Pb	208	1	nogas	1.874	1.874	3.12	54367	0.00	2000	
U	238	1	nogas	1.885	1.885	4.05	52621	0.00	2000	
[Pb]	206	1	nogas	1.901	1.901	4.65	13369	0.01	2000	
[Pb]	207	1	nogas	1.960	1.960	6.59	11961	0.02	2000	
Na	23	2	He	266.634	266.634	1.00	450199	0.06	200000	
Mg	24	2	He	200.675	200.675	3.38	169105	0.12	200000	
Al	27	2	He	0.312	0.312	18.31	1877	0.02	2000	
K	39	2	He	246.834	246.834	0.89	391860	0.06	200000	
Ca	43	2	He	235.915	235.915	5.03	613	38.46	200000	
Ca	44	2	He	200.862	200.862	6.12	9126	2.20	200000	
V	51	2	He	2.814	2.814	4.94	28616	0.01	2000	
Cr	52	2	He	1.744	1.744	5.18	15927	0.01	2000	
Mn	55	2	He	2.093	2.093	5.22	10763	0.02	2000	
Fe	56	2	He	193.195	193.195	5.22	1129490	0.02	200000	
Co	59	2	He	1.909	1.909	3.17	17722	0.01	2000	
Ni	60	2	He	2.237	2.237	4.38	4767	0.05	2000	
Cu	63	2	He	2.361	2.361	2.83	12074	0.02	2000	
Zn	66	2	He	1.929	1.929	8.90	2824	0.07	2000	
As	75	2	He	1.884	1.884	1.72	3060	0.06	2000	
Se	78	2	He	2.578	2.578	14.87	381	0.68	2000	
B	11	1	nogas	157.333	157.333	6.55	1007568	0.02	2000	
Si	28	1	nogas	112.891	112.891	5.69	2961235	0.00	2000	
Ca	43	1	nogas	247.817	247.817	9.02	9756	2.54	200000	

Sample Report

Ca	44	1	nogas	230.648	230.648	4.05	190189	0.12	200000	
Fe	56	1	nogas	215.517	215.517	6.70	7596452	0.00	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	67.543	67.543	15.96	65264	0.10	2000	
Se	82	1	nogas	2.171	2.171	18.49	800	0.27	2000	
Mo	95	1	nogas	1.880	1.880	1.18	11551	0.02	2000	
Sn	118	1	nogas	1.752	1.752	1.20	16151	0.01	2000	
Ba	137	1	nogas	1.934	1.934	3.62	8646	0.02	2000	
Sb	121	2	He	2.051	2.051	3.90	10036	0.02	2000	
La	139	1	nogas	-28.466	-28.466	-7.56	97	-29.45	2000	
Au	197	1	nogas	549.704	549.704	84.38	13	4122.78	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1192689	4.12	1195276	99.78	70	125	
Ge	72	1	nogas	3469998	3.27	3552237	97.68	70	125	
In	115	1	nogas	3109113	3.47	3134247	99.20	70	125	
Bi	209	1	nogas	2249644	3.67	2336631	96.28	70	125	
Ge	72	2	He	821667	3.58	837498	98.11	70	125	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	272ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-25T00:01:09-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.007	25.3	137	4.2	0	ICSA Main CR1 Failed
Na	23	1	nogas	101367.269	8.2	2349594453	1.7	0	
Mg	24	1	nogas	101831.323	9.4	1487158067	0.3	0	
Al	27	1	nogas	101285.905	10.9	1742370801	1.8	0	
K	39	1	nogas	108230.766	10.6	1974944177	2.7	0	
Ti	47	1	nogas	2321.774	8.8	3759910	0.7	0	
V	51	1	nogas	8.626	97.6	1270737	7.2	0	
Cr	52	1	nogas	1.366	34.2	86849	1.6	0	ICSA Main CR1 Failed
Mn	55	1	nogas	0.916	20.3	43267	2.5	0	ICSA Main CR1 Failed
Co	59	1	nogas	0.468	8.2	10460	2.3	0	ICSA Main CR1 Failed
Ni	60	1	nogas	1.035	14.0	7392	0.9	0	ICSA Main CR1 Failed
Cu	63	1	nogas	1.051	6.7	13068	3.6	0	ICSA Main CR1 Failed
Zn	66	1	nogas	3.046	14.7	13001	3.2	0	ICSA Main CR1 Failed
As	75	1	nogas	7.880	60.6	187948	2.4	0	
Sr	88	1	nogas	0.979	10.3	25936	1.9	0	ICSA Main CR1 Failed
Ag	107	1	nogas	0.025	18.8	397	6.3	0	ICSA Main CR1 Failed
Cd	111	1	nogas	1.693	5.1	4504	6.2	0	ICSA Main CR1 Failed
Sb	121	1	nogas	0.250	18.8	3197	8.2	0	ICSA Main CR1 Failed
Tl	205	1	nogas	0.044	27.5	1097	11.1	0	ICSA Main CR1 Failed
Pb	208	1	nogas	0.045	18.8	2433	9.9	0	ICSA Main CR1 Failed
[Pb]	206	1	nogas	0.066	43.3	660	19.7	0	ICSA Main CR1 Failed
[Pb]	207	1	nogas	0.059	16.7	523	1.1	0	ICSA Main CR1 Failed
Na	23	2	He	98411.987	2.5	137346271	1.2	0	
Mg	24	2	He	97925.606	1.6	74359109	0.3	0	
Al	27	2	He	94308.093	2.3	39912231	1.4	0	
K	39	2	He	92206.860	0.5	82941105	0.5	0	
Ca	43	2	He	96797.106	1.3	215258	0.3	0	
Ca	44	2	He	101586.698	1.0	3787366	2.2	0	
V	51	2	He	0.496	4.5	12850	0.9	0	ICSA Main CR1 Failed
Cr	52	2	He	0.236	9.2	5144	2.5	0	ICSA Main CR1 Failed
Mn	55	2	He	0.748	1.3	4117	1.6	0	ICSA Main CR1 Failed
Fe	56	2	He	97302.219	4.4	506125179	3.2	0	
Co	59	2	He	0.282	3.2	2534	1.6	0	ICSA Main CR1 Failed
Ni	60	2	He	0.782	3.4	1383	2.7	0	ICSA Main CR1 Failed
Cu	63	2	He	0.674	4.0	2250	6.8	0	ICSA Main CR1 Failed
Zn	66	2	He	1.839	7.0	2454	5.9	0	ICSA Main CR1 Failed
As	75	2	He	0.186	12.5	691	5.1	0	ICSA Main CR1 Failed
Se	78	2	He	0.793	41.0	175	17.4	0	ICSA Main CR1 Failed
B	11	1	nogas	155.367	13.9	901144	4.0	0	
Si	28	1	nogas	85.893	26.3	2363991	0.0	0	
Ca	43	1	nogas	107666.168	10.0	3445245	1.6	0	
Ca	44	1	nogas	105903.726	9.8	55666348	0.7	0	
Fe	56	1	nogas	104925.232	11.4	2195304782	2.2	0	
Se	77	1	nogas	76.857	46.5	59537	2.6	0	
Se	82	1	nogas	0.486	117.1	310	32.7	0	ICSA Main CR1 Failed
Mo	95	1	nogas	2049.112	11.4	10785464	2.2	0	
Sn	118	1	nogas	0.092	49.4	1854	24.0	0	ICSA Main CR1 Failed
Ba	137	1	nogas	0.263	17.0	1137	8.4	0	ICSA Main CR1 Failed
Sb	121	2	He	0.228	4.1	1093	2.8	0	ICSA Main CR1 Failed

Interference Check Solution A (ICS-A) Report

P	31	1	nogas	104595.665	12.0	146775791	2.8	0	
La	139	1	nogas	28.821	30.1	250	6.9	0	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1083094	7.51	1195276	90.61	70	125	
Ge	72	1	nogas	3087359	8.77	3552237	86.91	70	125	
In	115	1	nogas	2646821	10.32	3134247	84.45	70	125	
Bi	209	1	nogas	1938124	8.13	2336631	82.95	70	125	
Ge	72	2	He	747291	1.32	837498	89.23	70	125	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	273ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-25T00:03:11-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	106.335	13.777	772121	0.42	100	106.3	80	120	
Na	23	1	nogas	120547.122	12.828	2636618259	0.17	100	120547.1	80	120	ICSB Main CR1 Failed
Mg	24	1	nogas	117328.144	14.124	1616265869	1.82	100	117328.1	80	120	ICSB Main CR1 Failed
Al	27	1	nogas	104664.465	12.831	1706755761	0.25	100	104664.5	80	120	ICSB Main CR1 Failed
K	39	1	nogas	123908.011	12.539	2142302715	0.20	100	123908.0	80	120	ICSB Main CR1 Failed
Ti	47	1	nogas	2514.916	10.251	3863700	2.22	100	2514.9	80	120	ICSB Main CR1 Failed
V	51	1	nogas	130.437	14.157	3945968	1.98	100	130.4	80	120	ICSB Main CR1 Failed
Cr	52	1	nogas	124.132	11.644	2416175	1.94	100	124.1	80	120	ICSB Main CR1 Failed
Mn	55	1	nogas	121.557	14.297	2916099	2.25	100	121.6	80	120	ICSB Main CR1 Failed
Co	59	1	nogas	123.888	11.931	2442995	0.93	100	123.9	80	120	ICSB Main CR1 Failed
Ni	60	1	nogas	124.704	13.125	526724	1.68	100	124.7	80	120	ICSB Main CR1 Failed
Cu	63	1	nogas	119.195	14.817	1257539	2.20	100	119.2	80	120	
Zn	66	1	nogas	126.841	13.533	432640	0.96	100	126.8	80	120	ICSB Main CR1 Failed
As	75	1	nogas	128.313	14.318	697378	1.18	100	128.3	80	120	ICSB Main CR1 Failed
Sr	88	1	nogas	121.442	14.372	2924263	1.74	100	121.4	80	120	ICSB Main CR1 Failed
Ag	107	1	nogas	117.824	14.074	1378626	1.52	100	117.8	80	120	
Cd	111	1	nogas	124.944	13.744	303488	1.33	100	124.9	80	120	ICSB Main CR1 Failed
Sb	121	1	nogas	126.956	12.961	1423132	1.79	100	127.0	80	120	ICSB Main CR1 Failed
Tl	205	1	nogas	122.974	8.920	2077038	2.90	100	123.0	80	120	ICSB Main CR1 Failed
Pb	208	1	nogas	98.827	1.054	2806718	1.05	100	98.8	80	120	
U	238	1	nogas	131.189	11.900	2948829	1.00	100	131.2	80	120	ICSB Main CR1 Failed
[Pb]	206	1	nogas	123.573	11.873	683822	1.05	100	123.6	80	120	ICSB Main CR1 Failed
[Pb]	207	1	nogas	124.166	10.318	599567	1.53	100	124.2	80	120	ICSB Main CR1 Failed
Na	23	2	He	110269.342	2.780	154082611	1.70	100	110269.3	80	120	
Mg	24	2	He	108970.204	1.867	82847489	0.80	100	108970.2	80	120	
Al	27	2	He	94571.275	2.271	40072659	1.16	100	94571.3	80	120	ICSB Main CR1 Failed
K	39	2	He	99930.370	1.812	89874225	1.81	100	99930.4	80	120	ICSB Main CR1 Failed
Ca	43	2	He	105499.893	0.451	234924	1.19	100	105499.9	80	120	
Ca	44	2	He	111136.897	0.752	4148237	1.58	100	111136.9	80	120	
V	51	2	He	107.074	1.619	620061	0.64	100	107.1	80	120	
Cr	52	2	He	103.381	1.091	645583	0.82	100	103.4	80	120	
Mn	55	2	He	109.463	1.363	463985	0.82	100	109.5	80	120	
Fe	56	2	He	108165.335	1.451	563524258	1.97	100	108165.3	80	120	
Co	59	2	He	104.465	1.307	873894	0.53	100	104.5	80	120	
Ni	60	2	He	108.631	1.060	220765	0.50	100	108.6	80	120	
Cu	63	2	He	107.299	1.021	555475	2.05	100	107.3	80	120	
Zn	66	2	He	108.753	1.642	137294	1.87	100	108.8	80	120	
As	75	2	He	108.163	0.919	133843	0.22	100	108.2	80	120	
Se	78	2	He	110.618	2.030	10683	1.56	100	110.6	80	120	
B	11	1	nogas	681.333	15.432	3060974	0.61	100	681.3	80	120	
Si	28	1	nogas	6235.205	12.431	57763436	1.89	100	6235.2	80	120	ICSB Main CR1 Failed
Ca	43	1	nogas	123526.457	13.748	3741967	1.25	100	123526.5	80	120	ICSB Main CR1 Failed
Ca	44	1	nogas	124180.887	15.110	61714852	2.44	100	124180.9	80	120	ICSB Main CR1 Failed
Fe	56	1	nogas	120143.232	12.915	2383171587	0.58	100	120143.2	80	120	ICSB Main CR1 Failed
Se	77	1	nogas	202.393	18.099	80039	4.32	100	202.4	80	120	ICSB Main CR1 Failed
Se	82	1	nogas	124.846	14.787	27765	2.02	100	124.8	80	120	ICSB Main CR1 Failed
Mo	95	1	nogas	2245.357	12.315	11211017	1.78	100	2245.4	80	120	ICSB Main CR1 Failed
Sn	118	1	nogas	119.841	12.782	788088	0.49	100	119.8	80	120	
Ba	137	1	nogas	127.425	14.067	433831	1.87	100	127.4	80	120	ICSB Main CR1 Failed
Sb	121	2	He	112.272	1.712	496037	1.77	100	112.3	80	120	
La	139	1	nogas	269.373	13.116	883	8.57	100	269.4	80	120	ICSB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	952813	13.25	1195276	79.71	70	125	
Ge	72	1	nogas	2937900	11.93	3552237	82.71	70	125	
In	115	1	nogas	2448930	12.30	3134247	78.13	70	125	
Bi	209	1	nogas	1829652	11.20	2336631	78.30	70	125	
Ge	72	2	He	748210	1.09	837498	89.34	70	125	

Tune Report

Batch Folder C:\Agilent\ICPMH\1\DATA\122418A.b
Report Comment
Instrument Name G3281A JP11080910

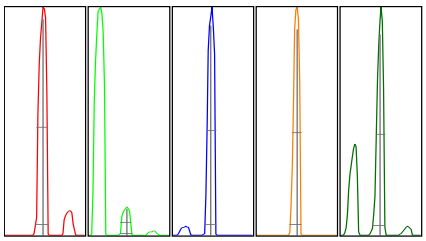
[nogas]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
9		21396				NaN	-	
24		43271				NaN	-	
59		48170				NaN	-	
115		42261				NaN	-	
208		26050				NaN	-	

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
9	0.71	5.00				
24	0.24	5.00				
59	0.34	5.00				
115	1.73	5.00				
208	0.65	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	21443	21454	21266	21221	21596
24	43115	43333	43234	43289	43386
59	48457	48041	48109	48090	48153
115	41738	41896	41658	42659	43355
208	26336	26067	25969	25909	25970

Integration Time [sec] 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
9	6029.04	8.95	8.9 - 9.1		0.37	0.467	0.750	
24	12180.39	23.95	23.9 - 24.1		0.36	0.445	0.750	
59	14533.27	58.95	58.9 - 59.1		0.33	0.436	0.750	
115	13634.77	115.05	114.9 - 115.1		0.29	0.433	0.750	
208	7923.62	208.00	207.9 - 208.1		0.31	0.486	0.750	

X = 5 **Integration Time [sec]** 0.1 **Acquisition Time [sec]** 168.5 **Y Axis** Linear

Tune Parameters
Plasma Paramters

RF Power	1600 W	Carrier Gas	0.40 L/min	S/C Temp	2 ℃
RF Matching	1.70 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.40 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Extract 1	0.0 V	Omega Lens	8.0 V	Deflect	15.0 V
Extract 2	-200.0 V	Cell Entrance	-30 V	Plate Bias	-50 V
Omega Bias	-100 V	Cell Exit	-58 V		

Cell Parameters

OctP Bias	-8.0 V	He Flow	0.0 mL/min	Energy Discrimination	5.0 V
OctP RF	190 V	H2 Flow	0.0 mL/min		
Use Gas	true	3rd Gas Flow	0 %		

[He]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
9		376				NaN	-	
24		2579				NaN	-	
59		19689				NaN	-	

Tune Report

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
9	3.23	5.00				
24	2.44	5.00				
59	1.03	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	366	393	364	383	377
24	2549	2663	2627	2511	2547
59	19803	19591	19429	19663	19960

Integration Time [sec] 0.1

Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
9	103.64	8.95	8.9 - 9.1		0.37	0.482	0.750	
24	721.03	23.95	23.9 - 24.1		0.37	0.444	0.750	
59	6137.87	58.95	58.9 - 59.1		0.31	0.431	0.750	

X = 5 **Integration Time [sec]** 0.1 **Acquisition Time [sec]** 100.6 **Y Axis** Linear

Tune Parameters

Plasma Paramters

RF Power	1600 W	Carrier Gas	0.40 L/min	S/C Temp	2 ℃
RF Matching	1.70 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.40 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Extract 1	0.0 V	Omega Lens	8.0 V	Deflect	2.0 V
Extract 2	-200.0 V	Cell Entrance	-32 V	Plate Bias	-60 V
Omega Bias	-100 V	Cell Exit	-70 V		

Cell Parameters

OctP Bias	-18.0 V	He Flow	4.0 mL/min	Energy Discrimination	5.0 V
OctP RF	190 V	H2 Flow	0.0 mL/min		
Use Gas	true	3rd Gas Flow	0 %		

HS18120569 Wet Chem Raw Data

ALS WO# HS18120569

PREP BATCH REPORT

Batch ID: **135598**

Prep Code: **P_TW_PR**

InitSampWt/Vol 0

FinSampVol: 50

Start Date: **13-Dec-18 11:00 am**

End Date: **13-Dec-18 12:30 pm**

OriginalFac: 1

Technician:

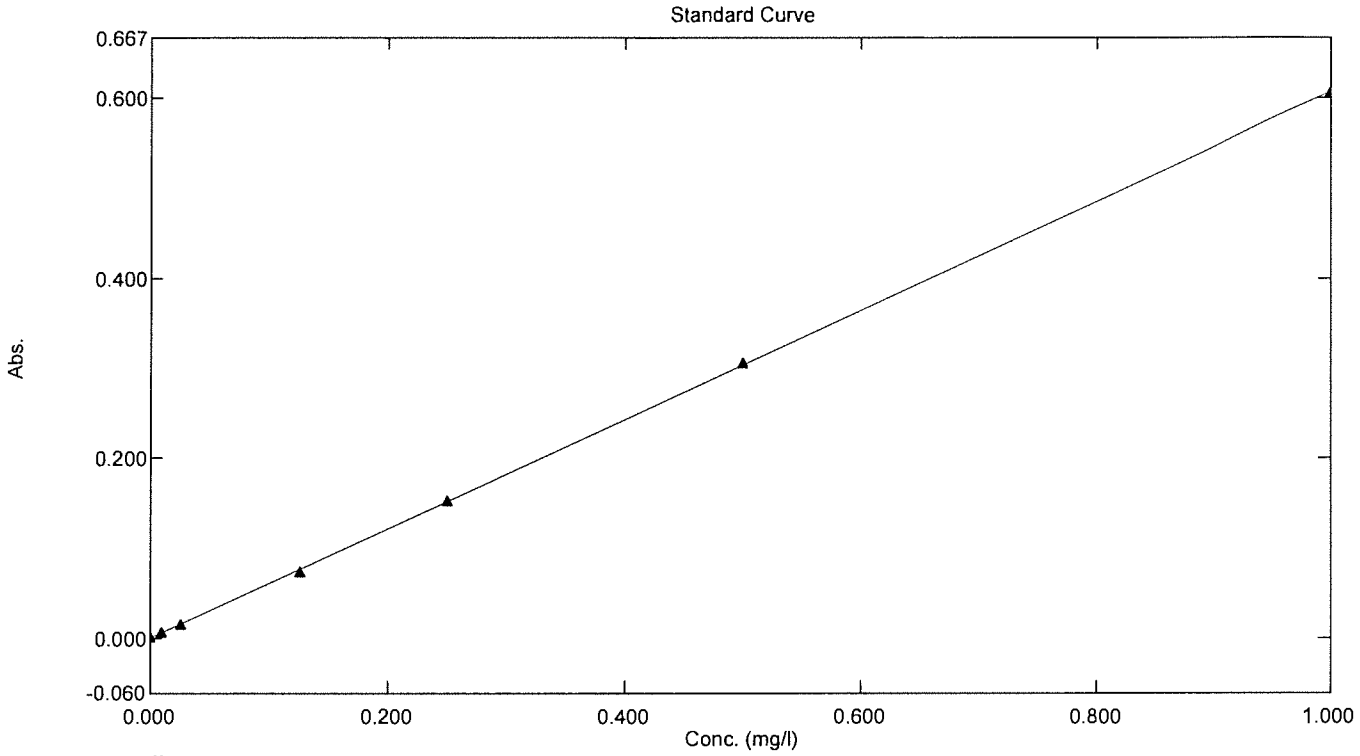
PrepUnitFac: 1

SampID	Frac	Matrix	pH	Init Wt/Vol	FinalVol (mL)	PrepFac	SpkFac	Comments
HS18120487-01	A	Water		50	50	1	1	
HS18120487-01MS	A			50	50	1	1	
HS18120487-01MSD	A			50	50	1	1	
HS18120569-01	H	Groundwater		50	50	1	1	
HS18120569-02	H	Groundwater		50	50	1	1	
HS18120569-03	H	Groundwater		50	50	1	1	
HS18120569-04	H	Groundwater		50	50	1	1	
HS18120569-05	H	Groundwater		50	50	1	1	
HS18120642-01	H	Groundwater		50	50	1	1	
HS18120642-02	H	Groundwater		50	50	1	1	
HS18120642-03	H	Groundwater		50	50	1	1	
LCS-135598	A			50	50	1	1	
MBLK-135598	A			50	50	1	1	

Standard Table Report

01/21/2019 04:56:43 PM

File Name: C:\Program Files (x86)\Shimadzu\UVProbe\Data\T_PO4_UNKNOWN\2018P_TW\181213_P_TW_.pho



Correlation Coefficient r2 = 0.99993

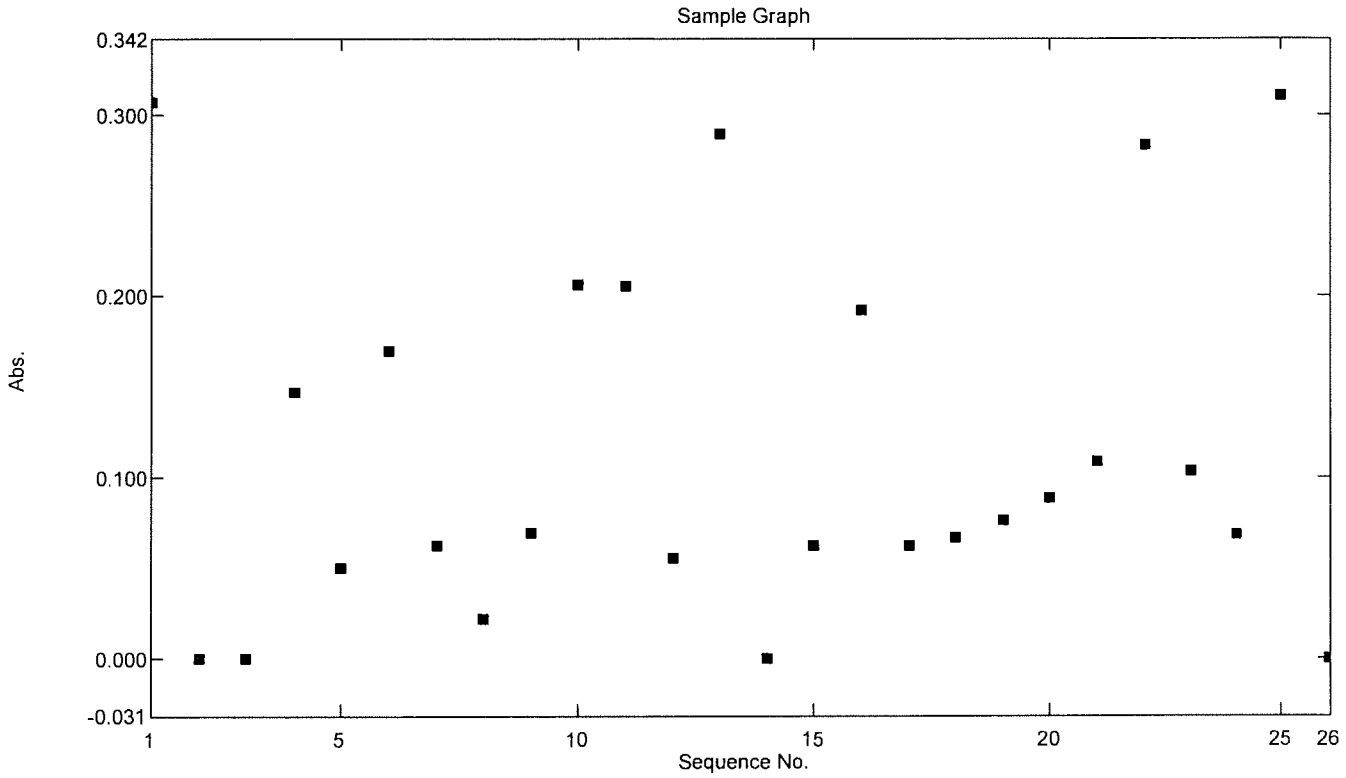
Standard Table

	Sample ID	Type	Ex	Conc	WL880.0	Wgt.Facto	Comments
1	STD1	Standard		0.000	0.001	1.000	
2	STD2	Standard		0.010	0.007	1.000	
3	STD3	Standard		0.025	0.016	1.000	
4	STD4	Standard		0.125	0.073	1.000	
5	STD5	Standard		0.250	0.153	1.000	
6	STD6	Standard		0.500	0.307	1.000	
7	STD7	Standard		1.000	0.606	1.000	
8							

Sample Table Report

01/21/2019 04:56:48 PM

File Name: C:\Program Files (x86)\Shimadzu\UVProbe\Data\T_PO4_UNKNOWN\2018P_TW\181213_P_TW_.pho



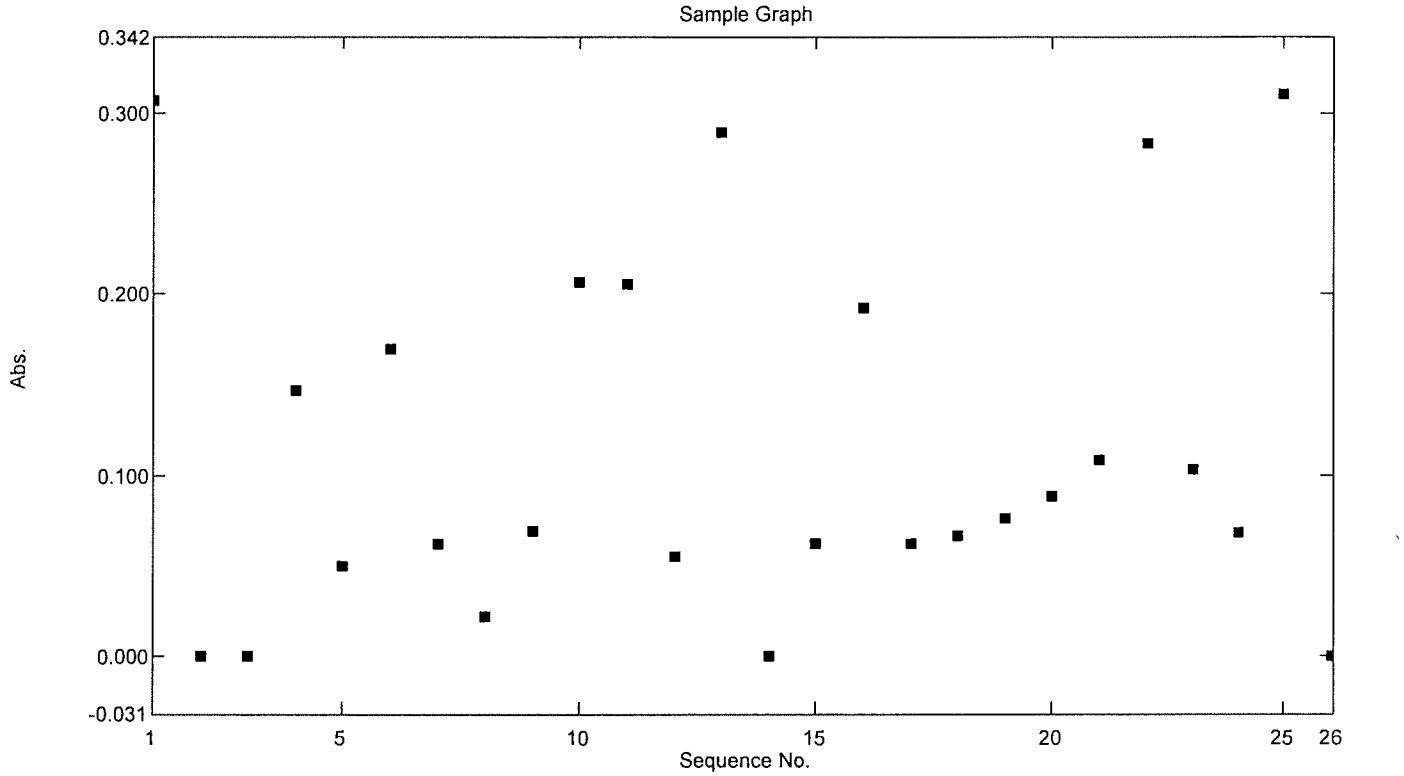
Sample Table

	Sample ID	Type	Ex	Conc	WL880.0	Comments
1	CCV	Unknown		0.505	0.307	
2	CCB	Unknown		-0.001	0.001	
3	MBLK	Unknown		-0.002	-0.000	
4	LCS	Unknown		0.241	0.147	
5	18120262.01	Unknown		0.082	0.050	
6	18120370.01	Unknown		0.279	0.170	PF:10X
7	18120370.02	Unknown		0.101	0.062	
8	18120442.01	Unknown		0.034	0.022	
9	18120487.01	Unknown		0.113	0.069	
10	18120487.01MS	Unknown		0.339	0.206	
11	18120487.01MSD	Unknown		0.338	0.206	
12	18120490.01	Unknown		0.090	0.055	
13	CCV2	Unknown		0.476	0.289	
14	CCB2	Unknown		-0.000	0.001	
15	18120569.01	Unknown		0.101	0.062	
16	18120569.02	Unknown		0.316	0.193	
17	18120569.03	Unknown		0.101	0.062	
18	18120569.04	Unknown		0.108	0.066	DF:10X
19	18120569.05	Unknown		0.125	0.076	

Sample Table Report

01/21/2019 04:56:48 PM

File Name: C:\Program Files (x86)\Shimadzu\UVProbe\Data\T_PO4_UNKNOWN\2018P_TW\181213_P_TW_.pho



Sample Table

	Sample ID	Type	Ex	Conc	WL880.0	Comments
20	18120572.01	Unknown		0.144	0.088	
21	18120574.01	Unknown		0.177	0.108	
22	18120642.01	Unknown		0.467	0.284	
23	18120642.02	Unknown		0.169	0.103	
24	18120642.03	Unknown		0.112	0.069	
25	CCV3	Unknown		0.511	0.311	
26	CCB3	Unknown		-0.001	0.000	
27						

HS18120569

Reagent ID:	Prep. Date:		Date/Time:	12/17/18 14:30	Reported by:	JHD/
2970207819			Batch ID:		Reviewed by:	
2970207820					Log Book #:	
2970207101			LCS ID# :	2970206703	Prep. Date:	
308055203	10/31/18		MS ID# :	2970206703	Prep. Date:	

Calculated Iodine Normality => 0.024875 Iodine (N)

WO	WO	Sx Vol. (mL)	Iodine (mL)	Titrant used (mL)	Sod. Thio. (N)	Iodine (N)	Init. Conc.	Final Conc.
STD1	STD1	0	20	19.90	0.0250	0.02488		
STD2	STD2	0	20	19.90	0.0250	0.02488	0.0249	
STD3	STD3	0	20	19.90	0.0250	0.02488	Iodine (N)	(mg/L)
BLK	BLK	200	20	20.00	0.0250	0.0249		-0.16
LCS	LCS	200	20	8.80	0.0250	0.0249		22.24
LCSD	LCSD	200	20	8.70	0.0250	0.0249		22.44
HS18120550-01	SAMP	200	30	14.50	0.0250	0.0249		30.76
HS18120550-02	SAMP	200	20	16.40	0.0250	0.0249		7.04
HS18120550-03	SAMP	200	20	19.10	0.0250	0.0249		1.64
HS18120569-01	SAMP	200	20	9.20	0.0250	0.0249		21.44
HS18120569-02	SAMP	200	20	20.20	0.0250	0.0249		-0.56
HS18120569-03	SAMP	200	20	20.50	0.0250	0.0249		-1.16
HS18120569-04	SAMP	200	20	19.90	0.0250	0.0249		0.04
HS18120569-05	SAMP	200	20	12.50	0.0250	0.0249		14.84
HS18120642-01	SAMP	200	20	20.00	0.0250	0.0249		-0.16
HS18120642-02	SAMP	200	20	16.00	0.0250	0.0249		7.84
HS18120642-03	SAMP	200	20	20.40	0.0250	0.0249		-0.96
HS18120569-04MS	MS	200	20	7.60	0.0250	0.0249		24.64
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			

Report Date: 12/20/2018 : 8:27

PC-TitratION PLUS
Calibration Report

HS181205 69

Calibration Record # 2064

Calibration Settings

Calibration ID	PH CAL 4-7-10	Date	12/20/2018
Channel	1	Time	8:27 PM
Probe Type	pH	Temperature	295.99 K 22.84 C
Probe ID	PH ELECTRODE	Analysis Type	Single Line Fit

Calibration Results

Slope	-57.452	CorrCoeff	0.9997
Intercept	3.867	Equation: Y = (-57.452) X + (3.867)	

Calibration Validity True Operator

	Result	Minimum	Maximum
Slope	-57.452	-65.00	-53.00
Intercept	3.867	-100.00	100.00
Correlation Coefficient	0.9997	0.99	1.00

Note: "True" means the calibration was within the specified ranges
"False" means the calibration was NOT within the specified ranges

AIKA: 329695
AIKB: 329699
AIKC: 329700

Calibration Data	Standard	Reading
	4.00	178.58
	7.00	-0.85
	10.00	-166.13

PC-TitratION PLUS by Man-Tech Associates, Inc.
CALRPRTLive1.SRW
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Report Date: 12/21/2018 : 7:56 AM

PC-TitratION PLUS
Water Analysis Report

Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
ICV-PH	12/20/2018	8:34 PM	22.92	-1.00	6.05	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TAP WATER	12/20/2018	8:41 PM	23.33	-1.00	7.72	.00	149.66	149.66	.00	.00	.00	1.43	1.43
WBLKW1-181220	12/20/2018	8:45 PM	22.78	-1.00	5.84	.00	.34	.34	.00	.00	.00	.02	.02
LCS1-181220	12/20/2018	8:54 PM	22.86	-1.00	10.95	547.45	1,060.90	.00	1,026.91	33.99	5.21	10.10	10.10
LCSD1-181220	12/20/2018	9:04 PM	22.86	-1.00	10.95	544.55	1,056.90	.00	1,024.69	32.21	5.19	10.07	10.07
HS18120569-01	12/20/2018	9:13 PM	22.74	-1.00	6.90	.00	1,193.63	1,193.63	.00	.00	.00	11.37	11.37
HS18120569-02	12/20/2018	9:18 PM	22.60	-1.00	5.95	.00	45.86	45.86	.00	.00	.00	.44	.44
HS18120569-03	12/20/2018	9:24 PM	22.43	-1.00	6.56	.00	198.03	198.03	.00	.00	.00	1.89	1.89
HS18120569-04	12/20/2018	9:34 PM	22.35	-1.00	6.11	.00	1,109.93	1,109.93	.00	.00	.00	10.57	10.57
HS18120569-05	12/20/2018	9:45 PM	22.49	-1.00	7.25	.00	1,637.90	1,637.90	.00	.00	.00	15.60	15.60
HS18120642-01	12/20/2018	9:55 PM	22.57	-1.00	6.13	.00	1,212.56	1,212.56	.00	.00	.00	11.55	11.55
CCV-PH	12/20/2018	9:57 PM	22.70	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/20/2018	10:06 PM	22.42	-1.00	10.92	542.50	1,065.15	.00	1,045.28	19.86	5.17	10.14	10.14
DI RINSE	12/20/2018	10:11 PM	22.37	-1.00	5.87	.00	.51	.51	.00	.00	.00	.02	.02
HS18120642-02	12/20/2018	10:22 PM	22.26	-1.00	6.34	.00	1,429.21	1,429.21	.00	.00	.00	13.61	13.61
HS18120642-03	12/20/2018	10:27 PM	22.23	-1.00	6.42	.00	281.92	281.92	.00	.00	.00	2.68	2.68
HS18120927-01	12/20/2018	10:34 PM	22.16	-1.00	7.56	.00	511.17	511.17	.00	.00	.00	4.87	4.87
HS18120927-03	12/20/2018	10:42 PM	22.08	-1.00	7.65	.00	515.51	515.51	.00	.00	.00	4.91	4.91
HS18120927-04	12/20/2018	10:50 PM	22.08	-1.00	7.41	.00	869.76	869.76	.00	.00	.00	8.28	8.28
HS18120927-05	12/20/2018	10:57 PM	22.13	-1.00	7.99	.00	647.59	647.59	.00	.00	.00	6.17	6.17
HS18120927-05DUP	12/20/2018	11:05 PM	22.07	-1.00	7.98	.00	650.20	650.20	.00	.00	.00	6.19	6.19
HS18120736-01DF5	12/20/2018	11:12 PM	21.87	-1.00	7.26	.00	172.44	172.44	.00	.00	.00	1.64	1.64
HS18120736-02DF10	12/20/2018	11:18 PM	21.71	-1.00	7.72	.00	342.28	342.28	.00	.00	.00	3.26	3.26
CCV-PH	12/20/2018	11:21 PM	21.56	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/20/2018	11:29 PM	21.34	-1.00	10.92	542.29	1,061.88	.00	1,039.18	22.70	5.16	10.11	10.11
DI RINSE	12/20/2018	11:34 PM	21.45	-1.00	6.11	.00	.52	.52	.00	.00	.00	.02	.02
HS18120736-03	12/20/2018	11:39 PM	21.40	-1.00	6.15	.00	50.38	50.38	.00	.00	.00	.48	.48

PC-TitratION PLUS by Man-Tech Associates, Inc.

GENERAL RESULTS REPORT.SRW

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Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS18120736-04	12/20/2018	11:45 PM	21.41	-1.00	6.13	.00	55.09	55.09	.00	.00	.00	.52	.52
HS18120779-23	12/20/2018	11:49 PM	21.58	-1.00	5.76	.00	.44	.44	.00	.00	.00	.02	.02
HS18120927-06	12/20/2018	11:57 PM	21.48	-1.00	7.87	.00	97.35	97.35	.00	.00	.00	.93	.93
HS18120927-07	12/21/2018	12:03 AM	21.38	-1.00	7.66	.00	514.19	514.19	.00	.00	.00	4.90	4.90
HS18120927-08	12/21/2018	12:11 AM	21.31	-1.00	7.79	.00	289.56	289.56	.00	.00	.00	2.76	2.76
WBLKW2-181220	12/21/2018	12:15 AM	21.19	-1.00	5.84	.00	.42	.42	.00	.00	.00	.02	.02
WLCS2-181220	12/21/2018	12:24 AM	21.06	-1.00	10.91	543.38	1,065.28	.00	1,043.80	21.48	5.18	10.15	10.15
WLCSD2-181220	12/21/2018	12:33 AM	21.06	-1.00	10.91	540.17	1,057.87	.00	1,035.40	22.47	5.14	10.07	10.07
CCV-PH	12/21/2018	12:35 AM	21.03	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	12:44 AM	20.94	-1.00	10.90	543.35	1,065.58	.00	1,044.46	21.12	5.17	10.15	10.15
DI RINSE	12/21/2018	12:49 AM	21.21	-1.00	6.13	.00	.63	.63	.00	.00	.00	.02	.02
HS18120779-01	12/21/2018	12:56 AM	21.06	-1.00	8.63	16.83	478.96	445.31	33.65	.00	.16	4.56	4.56
HS18120779-02	12/21/2018	1:03 AM	20.96	-1.00	7.51	.00	322.36	322.36	.00	.00	.00	3.07	3.07
HS18120779-02DUP	12/21/2018	1:09 AM	20.89	-1.00	7.52	.00	321.87	321.87	.00	.00	.00	3.07	3.07
HS18120779-03	12/21/2018	1:16 AM	20.81	-1.00	7.54	.00	412.60	412.60	.00	.00	.00	3.93	3.93
HS18120779-04	12/21/2018	1:23 AM	20.78	-1.00	7.72	.00	466.80	466.80	.00	.00	.00	4.45	4.45
HS18120779-05	12/21/2018	1:31 AM	20.74	-1.00	8.22	.00	634.92	634.92	.00	.00	.00	6.05	6.05
HS18120779-06	12/21/2018	1:38 AM	20.73	-1.00	8.17	.00	664.91	664.91	.00	.00	.00	6.33	6.33
HS18120779-07	12/21/2018	1:46 AM	20.91	-1.00	8.48	11.64	501.47	478.19	23.27	.00	.11	4.78	4.78
HS18120779-08	12/21/2018	1:52 AM	20.83	-1.00	7.36	.00	231.19	231.19	.00	.00	.00	2.20	2.20
CCV-PH	12/21/2018	1:55 AM	20.63	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	2:04 AM	20.48	-1.00	10.89	541.68	1,070.54	.00	1,057.72	12.82	5.16	10.20	10.20
DI RINSE	12/21/2018	2:09 AM	20.49	-1.00	6.10	.00	.57	.57	.00	.00	.00	.02	.02
HS18120779-09	12/21/2018	2:17 AM	20.43	-1.00	7.98	.00	926.02	926.02	.00	.00	.00	8.82	8.82
HS18120779-10	12/21/2018	2:22 AM	20.40	-1.00	6.01	.00	.79	.79	.00	.00	.00	.02	.02
HS18120779-12	12/21/2018	2:29 AM	20.40	-1.00	7.93	.00	515.07	515.07	.00	.00	.00	4.91	4.91
HS18120779-13	12/21/2018	2:38 AM	20.41	-1.00	8.08	.00	731.43	731.43	.00	.00	.00	6.97	6.97
HS18120779-14	12/21/2018	2:44 AM	20.49	-1.00	7.70	.00	453.37	453.37	.00	.00	.00	4.32	4.32
HS18120779-15	12/21/2018	2:51 AM	20.36	-1.00	7.50	.00	247.94	247.94	.00	.00	.00	2.36	2.36
HS18120779-16	12/21/2018	2:58 AM	20.25	-1.00	7.70	.00	395.33	395.33	.00	.00	.00	3.77	3.77

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Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS18120779-17	12/21/2018	3:05 AM	20.19	-1.00	8.41	7.88	401.51	385.76	15.76	.00	.08	3.82	3.82
HS18120779-18	12/21/2018	3:12 AM	20.08	-1.00	7.57	.00	722.42	722.42	.00	.00	.00	6.88	6.88
CCV-PH	12/21/2018	3:15 AM	20.00	-1.00	7.07	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	3:24 AM	19.92	-1.00	10.87	539.52	1,065.42	.00	1,051.80	13.62	5.14	10.15	10.15
DI RINSE	12/21/2018	3:29 AM	19.96	-1.00	6.08	.00	.53	.53	.00	.00	.00	.02	.02
HS18120779-19	12/21/2018	3:38 AM	20.15	-1.00	7.51	.00	1,226.68	1,226.68	.00	.00	.00	11.68	11.68
HS18120779-20	12/21/2018	3:47 AM	20.00	-1.00	7.48	.00	951.67	951.67	.00	.00	.00	9.06	9.06
HS18120779-21	12/21/2018	3:54 AM	19.92	-1.00	7.48	.00	681.28	681.28	.00	.00	.00	6.49	6.49
WBLKW3-181220	12/21/2018	4:00 AM	20.00	-1.00	6.38	.00	26.88	26.88	.00	.00	.00	.26	.26
LCS3-181220	12/21/2018	4:09 AM	19.68	-1.00	10.87	542.57	1,069.49	.00	1,053.85	15.64	5.17	10.19	10.19
LCSD3-181220	12/21/2018	4:18 AM	19.71	-1.00	10.87	538.56	1,061.72	.00	1,046.31	15.41	5.13	10.11	10.11
HS18121010-01	12/21/2018	4:24 AM	19.63	-1.00	6.76	.00	298.43	298.43	.00	.00	.00	2.84	2.84
HS18121010-01DUP	12/21/2018	4:30 AM	19.56	-1.00	6.78	.00	296.07	296.07	.00	.00	.00	2.82	2.82
HS18121010-02	12/21/2018	4:36 AM	19.50	-1.00	6.68	.00	267.13	267.13	.00	.00	.00	2.54	2.54
CCV-PH	12/21/2018	4:39 AM	19.63	-1.00	7.07	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	4:48 AM	19.59	-1.00	10.84	539.66	1,072.45	.00	1,065.58	6.87	5.14	10.21	10.21
DI RINSE	12/21/2018	4:53 AM	19.55	-1.00	6.08	.00	.49	.49	.00	.00	.00	.02	.02
HS18120779-22	12/21/2018	5:02 AM	19.51	-1.00	7.57	.00	1,240.44	1,240.44	.00	.00	.00	11.81	11.81
HS18120832-01DF5	12/21/2018	5:09 AM	19.43	-1.00	6.96	.00	8.33	8.33	.00	.00	.00	.10	.10
HS18120918-01	12/21/2018	5:17 AM	19.38	-1.00	8.64	33.51	956.57	889.54	67.02	.00	.32	9.11	9.11
HS18120829-01	12/21/2018	5:26 AM	19.35	-1.00	7.22	.00	1,007.30	1,007.30	.00	.00	.00	9.59	9.59
HS18120829-02	12/21/2018	5:34 AM	19.22	-1.00	7.11	.00	755.96	755.96	.00	.00	.00	7.20	7.20
HS18120829-03	12/21/2018	5:41 AM	19.36	-1.00	7.16	.00	758.73	758.73	.00	.00	.00	7.23	7.23
HS18120829-04	12/21/2018	5:54 AM	19.31	-1.00	7.52	.00	1,902.18	1,902.18	.00	.00	.00	18.12	18.12
HS18120829-05	12/21/2018	6:03 AM	19.24	-1.00	7.26	.00	895.16	895.16	.00	.00	.00	8.53	8.53
HS18120829-06	12/21/2018	6:11 AM	19.23	-1.00	7.21	.00	920.45	920.45	.00	.00	.00	8.77	8.77
CCV-PH	12/21/2018	6:13 AM	19.05	-1.00	7.07	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	6:22 AM	18.96	-1.00	10.84	536.26	1,061.91	.00	1,051.30	10.61	5.11	10.11	10.11
DI RINSE	12/21/2018	6:26 AM	18.94	-1.00	6.07	.00	.43	.43	.00	.00	.00	.02	.02
HS18120829-07	12/21/2018	6:37 AM	18.93	-1.00	7.56	.00	1,303.08	1,303.08	.00	.00	.00	12.41	12.41

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GENERAL RESULTS REPORT.SRW

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Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS18120829-08	12/21/2018	6:44 AM	18.93	-1.00	7.31	.00	774.69	774.69	.00	.00	.00	7.38	7.38
HS18120829-09	12/21/2018	6:57 AM	19.10	-1.00	7.51	.00	1,910.33	1,910.33	.00	.00	.00	18.19	18.19
HS18120947-01	12/21/2018	7:05 AM	19.18	-1.00	7.67	.00	925.75	925.75	.00	.00	.00	8.82	8.82
HS18120991-05	12/21/2018	7:10 AM	19.10	-1.00	6.41	.00	1.04	1.04	.00	.00	.00	.03	.03
HS18120991-06	12/21/2018	7:16 AM	19.07	-1.00	6.19	.00	.73	.73	.00	.00	.00	.02	.02
HS18120991-07	12/21/2018	7:24 AM	19.07	-1.00	11.73	246.49	310.75	.00	128.53	182.23	2.35	2.96	2.96
HS18120992-04	12/21/2018	7:31 AM	19.09	-1.00	7.42	.00	355.60	355.60	.00	.00	.00	3.39	3.39
HS18120992-05	12/21/2018	7:38 AM	19.05	-1.00	7.84	00.	247.09	247.09	.00	.00	.00	2.35	2.35
CCV-PH	12/21/2018	7:41 AM	19.02	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	7:49 AM	19.17	-1.00	10.80	527.01	1,061.96	7.93	1,054.03	.00	5.02	10.11	10.11
DI RINSE	12/21/2018	7:53 AM	19.38	-1.00	6.00	.00	.55	.55	.00	.00	.00	.02	.02

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HS18120569 Start on Pg. 7

Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:09 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
1	STD1		Standard	91	1.0000	10.0	1.00	1.00
2	STD2		Standard	92	1.0000	10.0	1.00	1.00
3	STD3		Standard	93	1.0000	10.0	1.00	1.00
4	STD4		Standard	94	1.0000	10.0	1.00	1.00
5	STD5		Standard	95	1.0000	10.0	1.00	1.00
6	STD6		Standard	96	1.0000	10.0	1.00	1.00
7	ICV		Unknown	97	1.0000	10.0	1.00	1.00
8	ICB		Unknown	98	1.0000	10.0	1.00	1.00
9	CCV		Unknown	1	1.0000	10.0	1.00	1.00
10	CCB		Unknown	2	1.0000	10.0	1.00	1.00
11	HS18111147-10DF5	BATCH B 12.07.18	Unknown	8	5.0000	10.0	1.00	1.00
12	CCV		Unknown	1	1.0000	10.0	1.00	1.00
13	CCB		Unknown	2	1.0000	10.0	1.00	1.00
14	MBLK-135387		Unknown	11	1.0000	10.0	1.00	1.00
15	LCS-135387		Unknown	12	1.0000	10.0	1.00	1.00
16	LCSD-135387		Unknown	13	1.0000	10.0	1.00	1.00
17	HS18120119-01		Unknown	14	1.0000	10.0	1.00	1.00
18	HS18120119-02		Unknown	15	1.0000	10.0	1.00	1.00
19	HS18120119-03		Unknown	16	1.0000	10.0	1.00	1.00
20	HS18120119-04		Unknown	17	1.0000	10.0	1.00	1.00
21	HS18120119-05		Unknown	18	1.0000	10.0	1.00	1.00
22	HS18120119-05MS		Unknown	19	1.0000	10.0	1.00	1.00
23	HS18120119-05MSD		Unknown	20	1.0000	10.0	1.00	1.00
24	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
25	CCB		Unknown	4	1.0000	10.0	1.00	1.00
26	WBLKW1-121018		Unknown	23	1.0000	10.0	1.00	1.00
27	WLCSW1-121018		Unknown	24	1.0000	10.0	1.00	1.00
28	WLCSDW1-121018		Unknown	25	1.0000	10.0	1.00	1.00
29	HS18111135-02DF5		Unknown	22	5.0000	10.0	1.00	1.00
30	HS18120457-01		Unknown	21	1.0000	10.0	1.00	1.00
31	HS18111458-02DF50		Unknown	26	50.0000	10.0	1.00	1.00
32	HS18111458-02MSDF50		Unknown	27	50.0000	10.0	1.00	1.00
33	HS18111458-02MSDDF50		Unknown	28	50.0000	10.0	1.00	1.00
34	HS18111458-03DF10		Unknown	29	10.0000	10.0	1.00	1.00
35	HS18111458-04DF10		Unknown	30	10.0000	10.0	1.00	1.00
36	CCV		Unknown	1	1.0000	10.0	1.00	1.00
37	CCB		Unknown	2	1.0000	10.0	1.00	1.00
38	HS18111458-05DF10		Unknown	31	10.0000	10.0	1.00	1.00
39	HS18111458-06		Unknown	32	1.0000	10.0	1.00	1.00
40	HS18111458-07		Unknown	33	1.0000	10.0	1.00	1.00
41	HS18111458-08DF10		Unknown	34	10.0000	10.0	1.00	1.00
42	HS18111458-09DF10		Unknown	35	10.0000	10.0	1.00	1.00

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:09 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
1	STD1	112918	Finished	11/30/2018 12:30:55 AM	Anions Gradient Program
2	STD2	112918	Finished	11/30/2018 12:45:28 AM	Anions Gradient Program
3	STD3	112918	Finished	11/30/2018 1:00:01 AM	Anions Gradient Program
4	STD4	112918	Finished	11/30/2018 1:14:34 AM	Anions Gradient Program
5	STD5	112918	Finished	11/30/2018 1:29:07 AM	Anions Gradient Program
6	STD6	112918	Finished	11/30/2018 1:43:40 AM	Anions Gradient Program
7	ICV	112918	Finished	11/30/2018 1:58:12 AM	Anions Gradient Program
8	ICB	112918	Finished	11/30/2018 2:12:45 AM	Anions Gradient Program
9	CCV	112918	Finished	12/10/2018 11:13:11 AM	Anions Gradient Program
10	CCB	112918	Finished	12/10/2018 11:27:44 AM	Anions Gradient Program
11	HS18111147-10DF5	112918	Finished	12/10/2018 11:56:44 AM	Anions Gradient Program
12	CCV	112918	Finished	12/10/2018 12:11:16 PM	Anions Gradient Program
13	CCB	112918	Finished	12/10/2018 12:25:49 PM	Anions Gradient Program
14	MBLK-135387	112918	Finished	12/10/2018 12:49:07 PM	Anions Gradient Program
15	LCS-135387	112918	Finished	12/10/2018 1:03:40 PM	Anions Gradient Program
16	LCSD-135387	112918	Finished	12/10/2018 1:18:13 PM	Anions Gradient Program
17	HS18120119-01	112918	Finished	12/10/2018 1:32:46 PM	Anions Gradient Program
18	HS18120119-02	112918	Finished	12/10/2018 1:47:19 PM	Anions Gradient Program
19	HS18120119-03	112918	Finished	12/10/2018 2:01:52 PM	Anions Gradient Program
20	HS18120119-04	112918	Finished	12/10/2018 2:16:25 PM	Anions Gradient Program
21	HS18120119-05	112918	Finished	12/10/2018 2:30:57 PM	Anions Gradient Program
22	HS18120119-05MS	112918	Finished	12/10/2018 2:45:30 PM	Anions Gradient Program
23	HS18120119-05MSD	112918	Finished	12/10/2018 3:00:03 PM	Anions Gradient Program
24	CCV1	112918	Finished	12/10/2018 3:14:36 PM	Anions Gradient Program
25	CCB	112918	Finished	12/10/2018 3:29:09 PM	Anions Gradient Program
26	WBLKW1-121018	112918	Finished	12/10/2018 3:43:42 PM	Anions Gradient Program
27	WLCSW1-121018	112918	Finished	12/10/2018 3:58:15 PM	Anions Gradient Program
28	WLCSDW1-121018	112918	Finished	12/10/2018 4:12:48 PM	Anions Gradient Program
29	HS18111135-02DF5	112918	Finished	12/10/2018 4:27:21 PM	Anions Gradient Program
30	HS18120457-01	112918	Finished	12/10/2018 4:41:54 PM	Anions Gradient Program
31	HS18111458-02DF50	112918	Finished	12/10/2018 4:56:26 PM	Anions Gradient Program
32	HS18111458-02MSDF50	112918	Finished	12/10/2018 5:11:00 PM	Anions Gradient Program
33	HS18111458-02MSDDF50	112918	Finished	12/10/2018 5:25:33 PM	Anions Gradient Program
34	HS18111458-03DF10	112918	Finished	12/10/2018 5:40:05 PM	Anions Gradient Program
35	HS18111458-04DF10	112918	Finished	12/10/2018 5:54:38 PM	Anions Gradient Program
36	CCV	112918	Finished	12/10/2018 6:31:09 PM	Anions Gradient Program
37	CCB	112918	Finished	12/10/2018 6:45:42 PM	Anions Gradient Program
38	HS18111458-05DF10	112918	Finished	12/10/2018 7:00:14 PM	Anions Gradient Program
39	HS18111458-06	112918	Finished	12/10/2018 7:14:47 PM	Anions Gradient Program
40	HS18111458-07	112918	Finished	12/10/2018 7:29:20 PM	Anions Gradient Program
41	HS18111458-08DF10	112918	Finished	12/10/2018 7:43:53 PM	Anions Gradient Program
42	HS18111458-09DF10	112918	Finished	12/10/2018 7:58:26 PM	Anions Gradient Program

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:09 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	GUID
1	STD1	5c4dd191-f469-11e8-b6da-a24899608423
2	STD2	64993f7d-f46b-11e8-b6da-a24899608423
3	STD3	6cdfe8bf-f46d-11e8-b6da-a24899608423
4	STD4	7534dfff-f46f-11e8-b6da-a24899608423
5	STD5	7d687699-f471-11e8-b6da-a24899608423
6	STD6	85cbbbd7-f473-11e8-b6da-a24899608423
7	ICV	8e126519-f475-11e8-b6da-a24899608423
8	ICB	96485e08-f477-11e8-b6da-a24899608423
9	CCV	bde30371-fc9e-11e8-b6da-a24899608423
10	CCB	c64d6fae-fca0-11e8-b6da-a24899608423
11	HS18111147-10DF5	734a3e73-fca4-11e8-b6da-a24899608423
12	CCV	db2e8eac-fca6-11e8-b6da-a24899608423
13	CCB	e3884a96-fca8-11e8-b6da-a24899608423
14	MBLK-135387	c5228820-fcab-11e8-b6da-a24899608423
15	LCS-135387	2ce0b309-fcae-11e8-b6da-a24899608423
16	LCSD-135387	358c233d-fcb0-11e8-b6da-a24899608423
17	HS18120119-01	3dd9cf33-fcb2-11e8-b6da-a24899608423
18	HS18120119-02	4611b782-fcb4-11e8-b6da-a24899608423
19	HS18120119-03	4e644c6d-fcb6-11e8-b6da-a24899608423
20	HS18120119-04	56aaf5af-fcb8-11e8-b6da-a24899608423
21	HS18120119-05	5e7a6a57-fcba-11e8-b6da-a24899608423
22	HS18120119-05MS	66d8eaeb-fcbc-11e8-b6da-a24899608423
23	HS18120119-05MSD	6f0c8185-fcbe-11e8-b6da-a24899608423
24	CCV1	77473f1e-fcc0-11e8-b6da-a24899608423
25	CCB	7fbb34af-fcc2-11e8-b6da-a24899608423
26	WBLKW1-121018	87d9564c-fcc4-11e8-b6da-a24899608423
27	WLCSW1-121018	907f5cd6-fcc6-11e8-b6da-a24899608423
28	WLCSDW1-121018	98c8686d-fcc8-11e8-b6da-a24899608423
29	HS18111135-02DF5	a107eab0-fcca-11e8-b6da-a24899608423
30	HS18120457-01	a93b814a-fccc-11e8-b6da-a24899608423
31	HS18111458-02DF50	b1848ce1-fcce-11e8-b6da-a24899608423
32	HS18111458-02MSDF50	b9eef91e-fcd0-11e8-b6da-a24899608423
33	HS18111458-02MSDDF50	c259655b-fcd2-11e8-b6da-a24899608423
34	HS18111458-03DF10	ca91c09f-fcd4-11e8-b6da-a24899608423
35	HS18111458-04DF10	d2fe8f31-fcd6-11e8-b6da-a24899608423
36	CCV	8d30d1fd-fcdb-11e8-b6da-a24899608423
37	CCB	f4a9d945-fcdd-11e8-b6da-a24899608423
38	HS18111458-05DF10	fce23489-fcdf-11e8-b6da-a24899608423
39	HS18111458-06	0540b51d-fce2-11e8-b6da-a24899608423
40	HS18111458-07	0d89c0b4-fce4-11e8-b6da-a24899608423
41	HS18111458-08DF10	15bfb9a3-fce6-11e8-b6da-a24899608423
42	HS18111458-09DF10	1df814e7-fce8-11e8-b6da-a24899608423

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:09 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
43	HS18111458-10DF10		Unknown	36	10.0000	10.0	1.00	1.00
44	HS18111458-11DF10		Unknown	37	10.0000	10.0	1.00	1.00
45	HS18111458-11MSDF10		Unknown	38	10.0000	10.0	1.00	1.00
46	HS18111458-11MSDDF10		Unknown	39	10.0000	10.0	1.00	1.00
47	HS18111458-12		Unknown	40	1.0000	10.0	1.00	1.00
48	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
49	CCB		Unknown	4	1.0000	10.0	1.00	1.00
50	HS18111458-13DF10		Unknown	41	10.0000	10.0	1.00	1.00
51	HS18111458-14DF10		Unknown	42	10.0000	10.0	1.00	1.00
52	HS18111458-15		Unknown	43	1.0000	10.0	1.00	1.00
53	HS18111458-16		Unknown	44	1.0000	10.0	1.00	1.00
54	HS18111458-17DF5		Unknown	45	5.0000	10.0	1.00	1.00
55	HS18120325-01DF5		Unknown	46	5.0000	10.0	1.00	1.00
56	HS18120325-02DF5		Unknown	47	5.0000	10.0	1.00	1.00
57	HS18120325-03DF5		Unknown	48	5.0000	10.0	1.00	1.00
58	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00
59	HS18120430-06		Unknown	59	1.0000	10.0	1.00	1.00
60	CCV		Unknown	1	1.0000	10.0	1.00	1.00
61	CCB		Unknown	2	1.0000	10.0	1.00	1.00
62	MBLK-135410		Unknown	49	1.0000	10.0	1.00	1.00
63	LCS-135410		Unknown	50	1.0000	10.0	1.00	1.00
64	LCSD-135410		Unknown	51	1.0000	10.0	1.00	1.00
65	HS18120430-01		Unknown	52	1.0000	10.0	1.00	1.00
66	HS18120430-01MS		Unknown	53	1.0000	10.0	1.00	1.00
67	HS18120430-01MSD		Unknown	54	1.0000	10.0	1.00	1.00
68	HS18120430-02		Unknown	55	1.0000	10.0	1.00	1.00
69	HS18120430-03		Unknown	56	1.0000	10.0	1.00	1.00
70	HS18120430-04		Unknown	57	1.0000	10.0	1.00	1.00
71	HS18120430-05		Unknown	58	1.0000	10.0	1.00	1.00
72	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
73	CCB		Unknown	4	1.0000	10.0	1.00	1.00
74	HS18120430-07		Unknown	60	1.0000	10.0	1.00	1.00
75	HS18120430-08		Unknown	61	1.0000	10.0	1.00	1.00
76	HS18120430-09		Unknown	62	1.0000	10.0	1.00	1.00
77	HS18120430-10		Unknown	63	1.0000	10.0	1.00	1.00
78	HS18120430-11		Unknown	64	1.0000	10.0	1.00	1.00
79	HS18120430-12		Unknown	65	1.0000	10.0	1.00	1.00
80	HS18120430-13		Unknown	66	1.0000	10.0	1.00	1.00
81	HS18120430-14		Unknown	67	1.0000	10.0	1.00	1.00
82	HS18120430-14MS		Unknown	68	1.0000	10.0	1.00	1.00
83	HS18120430-14MSD		Unknown	69	1.0000	10.0	1.00	1.00
84	CCV		Unknown	1	1.0000	10.0	1.00	1.00

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:09 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
43	HS18111458-10DF10	112918	Finished	12/10/2018 8:12:59 PM	Anions Gradient Program
44	HS18111458-11DF10	112918	Finished	12/10/2018 8:27:31 PM	Anions Gradient Program
45	HS18111458-11MSDF10	112918	Finished	12/10/2018 8:42:04 PM	Anions Gradient Program
46	HS18111458-11MSDDF10	112918	Finished	12/10/2018 8:56:37 PM	Anions Gradient Program
47	HS18111458-12	112918	Finished	12/10/2018 9:11:10 PM	Anions Gradient Program
48	CCV1	112918	Finished	12/10/2018 9:25:43 PM	Anions Gradient Program
49	CCB	112918	Finished	12/10/2018 9:40:16 PM	Anions Gradient Program
50	HS18111458-13DF10	112918	Finished	12/10/2018 9:54:48 PM	Anions Gradient Program
51	HS18111458-14DF10	112918	Finished	12/10/2018 10:09:21 PM	Anions Gradient Program
52	HS18111458-15	112918	Finished	12/10/2018 10:23:54 PM	Anions Gradient Program
53	HS18111458-16	112918	Finished	12/10/2018 10:38:27 PM	Anions Gradient Program
54	HS18111458-17DF5	112918	Finished	12/10/2018 10:53:00 PM	Anions Gradient Program
55	HS18120325-01DF5	112918	Finished	12/10/2018 11:07:33 PM	Anions Gradient Program
56	HS18120325-02DF5	112918	Finished	12/10/2018 11:22:05 PM	Anions Gradient Program
57	HS18120325-03DF5	112918	Finished	12/10/2018 11:36:38 PM	Anions Gradient Program
58	DI H2O	112918	Finished	12/10/2018 11:51:11 PM	Anions Gradient Program
59	HS18120430-06	112918	Finished	12/11/2018 12:05:44 AM	Anions Gradient Program
60	CCV	112918	Finished	12/11/2018 12:20:17 AM	Anions Gradient Program
61	CCB	112918	Finished	12/11/2018 12:34:50 AM	Anions Gradient Program
62	MBLK-135410	112918	Finished	12/11/2018 12:49:23 AM	Anions Gradient Program
63	LCS-135410	112918	Finished	12/11/2018 1:03:56 AM	Anions Gradient Program
64	LCSD-135410	112918	Finished	12/11/2018 1:18:28 AM	Anions Gradient Program
65	HS18120430-01	112918	Finished	12/11/2018 1:33:02 AM	Anions Gradient Program
66	HS18120430-01MS	112918	Finished	12/11/2018 1:47:35 AM	Anions Gradient Program
67	HS18120430-01MSD	112918	Finished	12/11/2018 2:02:08 AM	Anions Gradient Program
68	HS18120430-02	112918	Finished	12/11/2018 2:16:40 AM	Anions Gradient Program
69	HS18120430-03	112918	Finished	12/11/2018 2:31:13 AM	Anions Gradient Program
70	HS18120430-04	112918	Finished	12/11/2018 2:45:46 AM	Anions Gradient Program
71	HS18120430-05	112918	Finished	12/11/2018 3:00:19 AM	Anions Gradient Program
72	CCV1	112918	Finished	12/11/2018 3:14:52 AM	Anions Gradient Program
73	CCB	112918	Finished	12/11/2018 3:29:25 AM	Anions Gradient Program
74	HS18120430-07	112918	Finished	12/11/2018 3:43:58 AM	Anions Gradient Program
75	HS18120430-08	112918	Finished	12/11/2018 3:58:30 AM	Anions Gradient Program
76	HS18120430-09	112918	Finished	12/11/2018 4:13:03 AM	Anions Gradient Program
77	HS18120430-10	112918	Finished	12/11/2018 4:27:36 AM	Anions Gradient Program
78	HS18120430-11	112918	Finished	12/11/2018 4:42:08 AM	Anions Gradient Program
79	HS18120430-12	112918	Finished	12/11/2018 4:56:42 AM	Anions Gradient Program
80	HS18120430-13	112918	Finished	12/11/2018 5:11:15 AM	Anions Gradient Program
81	HS18120430-14	112918	Finished	12/11/2018 5:25:47 AM	Anions Gradient Program
82	HS18120430-14MS	112918	Finished	12/11/2018 5:40:20 AM	Anions Gradient Program
83	HS18120430-14MSD	112918	Finished	12/11/2018 5:54:53 AM	Anions Gradient Program
84	CCV	112918	Finished	12/11/2018 6:09:26 AM	Anions Gradient Program

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Sequence: 121018
Operator: alshs.nouser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	GUID
43	HS18111458-10DF10	2641207e-fcea-11e8-b6da-a24899608423
44	HS18111458-11DF10	2e7bde17-fcec-11e8-b6da-a24899608423
45	HS18111458-11MSDF10	36af74b1-fcee-11e8-b6da-a24899608423
46	HS18111458-11MSDDF10	3eec949f-fcf0-11e8-b6da-a24899608423
47	HS18111458-12	47465089-fcf2-11e8-b6da-a24899608423
48	CCV1	4f6dfb7a-fcf4-11e8-b6da-a24899608423
49	CCB	57b70711-fcf6-11e8-b6da-a24899608423
50	HS18111458-13DF10	5f7a9010-fcf8-11e8-b6da-a24899608423
51	HS18111458-14DF10	67d44bfa-fcfa-11e8-b6da-a24899608423
52	HS18111458-15	704e972a-fcfc-11e8-b6da-a24899608423
53	HS18111458-16	78a58e80-fcfe-11e8-b6da-a24899608423
54	HS18111458-17DF5	80de9c6c-fd00-11e8-b6da-a24899608423
55	HS18120325-01DF5	8927a803-fd02-11e8-b6da-a24899608423
56	HS18120325-02DF5	9162659c-fd04-11e8-b6da-a24899608423
57	HS18120325-03DF5	99985e8b-fd06-11e8-b6da-a24899608423
58	DI H2O	a1e16a22-fd08-11e8-b6da-a24899608423
59	HS18120430-06	aa3b260c-fd0a-11e8-b6da-a24899608423
60	CCV	b25482ff-fd0c-11e8-b6da-a24899608423
61	CCB	bab7c83d-fd0e-11e8-b6da-a24899608423
62	MBLK-135410	c31d6fd0-fd10-11e8-b6da-a24899608423
63	LCS-135410	cb5f5468-fd12-11e8-b6da-a24899608423
64	LCSD-135410	d3a5fdaa-fd14-11e8-b6da-a24899608423
65	HS18120430-01	dc1069e7-fd16-11e8-b6da-a24899608423
66	HS18120430-01MS	e473af25-fd18-11e8-b6da-a24899608423
67	HS18120430-01MSD	ecb0cf13-fd1a-11e8-b6da-a24899608423
68	HS18120430-02	f4f05156-fd1c-11e8-b6da-a24899608423
69	HS18120430-03	fd454896-fd1e-11e8-b6da-a24899608423
70	HS18120430-04	05767cdb-fd21-11e8-b6da-a24899608423
71	HS18120430-05	0dcb741b-fd23-11e8-b6da-a24899608423
72	CCV1	160fbb08-fd25-11e8-b6da-a24899608423
73	CCB	1e64b248-fd27-11e8-b6da-a24899608423
74	HS18120430-07	268ebf8e-fd29-11e8-b6da-a24899608423
75	HS18120430-08	2ef6c976-fd2b-11e8-b6da-a24899608423
76	HS18120430-09	370dc414-fd2d-11e8-b6da-a24899608423
77	HS18120430-10	3f593200-fd2f-11e8-b6da-a24899608423
78	HS18120430-11	47407dfa-fd31-11e8-b6da-a24899608423
79	HS18120430-12	4fb93835-fd33-11e8-b6da-a24899608423
80	HS18120430-13	58070876-fd35-11e8-b6da-a24899608423
81	HS18120430-14	606a4db4-fd37-11e8-b6da-a24899608423
82	HS18120430-14MS	68bce29f-fd39-11e8-b6da-a24899608423
83	HS18120430-14MSD	70ccb63e-fd3b-11e8-b6da-a24899608423
84	CCV	791a867f-fd3d-11e8-b6da-a24899608423

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Sequence: 121018 HS18120569
Operator: alshs.nouser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
85	CCB		Unknown	2	1.0000	10.0	1.00	1.00
86	MBLK-135144		Unknown	70	1.0000	10.0	1.00	1.00
87	LCS-135144		Unknown	71	1.0000	10.0	1.00	1.00
88	LCSD-135144		Unknown	72	1.0000	10.0	1.00	1.00
89	HS18111057-01		Unknown	73	1.0000	10.0	1.00	1.00
90	HS18111057-02		Unknown	74	1.0000	10.0	1.00	1.00
91	HS18111057-03		Unknown	75	1.0000	10.0	1.00	1.00
92	HS18111057-04		Unknown	76	1.0000	10.0	1.00	1.00
93	HS18111057-05		Unknown	77	1.0000	10.0	1.00	1.00
94	HS18111057-06		Unknown	78	1.0000	10.0	1.00	1.00
95	HS18111057-07		Unknown	79	1.0000	10.0	1.00	1.00
96	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
97	CCB		Unknown	4	1.0000	10.0	1.00	1.00
98	HS18111057-08		Unknown	80	1.0000	10.0	1.00	1.00
99	HS18111057-09		Unknown	81	1.0000	10.0	1.00	1.00
100	HS18111057-10DF10		Unknown	82	10.0000	10.0	1.00	1.00
101	HS18111057-11		Unknown	83	1.0000	10.0	1.00	1.00
102	HS18111057-12		Unknown	84	1.0000	10.0	1.00	1.00
103	HS18120545-02	12.11.18 START	Unknown	12	1.0000	10.0	1.00	1.00
104	HS18120545-03		Unknown	13	1.0000	10.0	1.00	1.00
105	HS18120545-04	MS/MSD below	Unknown	14	1.0000	10.0	1.00	1.00
106	HS18120545-01		Unknown	11	1.0000	10.0	1.00	1.00
107	HS18120545-01DF5		Unknown	18	5.0000	10.0	1.00	1.00
108	CCV		Unknown	1	1.0000	10.0	1.00	1.00
109	CCB		Unknown	2	1.0000	10.0	1.00	1.00
110	WBLKW1-121118		Unknown	5	1.0000	10.0	1.00	1.00
111	WLCSW1-121118		Unknown	6	1.0000	10.0	1.00	1.00
112	WLCSDW1-121118		Unknown	7	1.0000	10.0	1.00	1.00
113	HS18120545-04MS		Unknown	15	1.0000	10.0	1.00	1.00
114	HS18120545-04MSD		Unknown	16	1.0000	10.0	1.00	1.00
115	HS18120545-04DF5		Unknown	17	5.0000	10.0	1.00	1.00
116	HS18120128-01DF10	CL DUE	Unknown	26	10.0000	10.0	1.00	1.00
117	HS18120128-02DF200	CL DUE	Unknown	27	200.0000	10.0	1.00	1.00
118	HS18111458-08	BATCH 12.10.18 1X	Unknown	95	1.0000	10.0	1.00	1.00
119	HS18111458-10	BATCH 12.10.18 1X	Unknown	96	1.0000	10.0	1.00	1.00
120	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
121	CCB		Unknown	4	1.0000	10.0	1.00	1.00
122	HS18120782-01		Unknown	33	1.0000	10.0	1.00	1.00
123	HS18111059-08DF10		Unknown	92	10.0000	10.0	1.00	1.00
124	HS18111059-08MSDF10		Unknown	93	10.0000	10.0	1.00	1.00
125	HS18111059-08MSDDF10		Unknown	94	10.0000	10.0	1.00	1.00
126	HS18120545-02DF5		Unknown	19	5.0000	10.0	1.00	1.00

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:09 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser (Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
85	CCB	112918	Finished	12/11/2018 6:23:58 AM	Anions Gradient Program
86	MBLK-135144	112918	Finished	12/11/2018 6:38:31 AM	Anions Gradient Program
87	LCS-135144	112918	Finished	12/11/2018 6:53:04 AM	Anions Gradient Program
88	LCSD-135144	112918	Finished	12/11/2018 7:07:37 AM	Anions Gradient Program
89	HS18111057-01	112918	Finished	12/11/2018 7:22:10 AM	Anions Gradient Program
90	HS18111057-02	112918	Finished	12/11/2018 7:36:43 AM	Anions Gradient Program
91	HS18111057-03	112918	Finished	12/11/2018 7:51:16 AM	Anions Gradient Program
92	HS18111057-04	112918	Finished	12/11/2018 8:05:49 AM	Anions Gradient Program
93	HS18111057-05	112918	Finished	12/11/2018 8:20:22 AM	Anions Gradient Program
94	HS18111057-06	112918	Finished	12/11/2018 8:34:55 AM	Anions Gradient Program
95	HS18111057-07	112918	Finished	12/11/2018 8:49:28 AM	Anions Gradient Program
96	CCV1	112918	Finished	12/11/2018 9:04:01 AM	Anions Gradient Program
97	CCB	112918	Finished	12/11/2018 9:18:33 AM	Anions Gradient Program
98	HS18111057-08	112918	Finished	12/11/2018 9:33:06 AM	Anions Gradient Program
99	HS18111057-09	112918	Finished	12/11/2018 9:47:39 AM	Anions Gradient Program
100	HS18111057-10DF10	112918	Finished	12/11/2018 10:02:12 AM	Anions Gradient Program
101	HS18111057-11	112918	Finished	12/11/2018 10:16:45 AM	Anions Gradient Program
102	HS18111057-12	112918	Finished	12/11/2018 10:31:17 AM	Anions Gradient Program
103	HS18120545-02	112918	Finished	12/11/2018 10:45:50 AM	Anions Gradient Program
104	HS18120545-03	112918	Finished	12/11/2018 11:00:23 AM	Anions Gradient Program
105	HS18120545-04	112918	Finished	12/11/2018 11:14:56 AM	Anions Gradient Program
106	HS18120545-01	112918	Finished	12/11/2018 11:29:28 AM	Anions Gradient Program
107	HS18120545-01DF5	112918	Finished	12/11/2018 11:44:01 AM	Anions Gradient Program
108	CCV	112918	Finished	12/11/2018 11:58:34 AM	Anions Gradient Program
109	CCB	112918	Finished	12/11/2018 12:13:07 PM	Anions Gradient Program
110	WBLKW1-121118	112918	Finished	12/11/2018 12:27:40 PM	Anions Gradient Program
111	WLCSW1-121118	112918	Finished	12/11/2018 12:42:13 PM	Anions Gradient Program
112	WLCSDW1-121118	112918	Finished	12/11/2018 12:56:45 PM	Anions Gradient Program
113	HS18120545-04MS	112918	Finished	12/11/2018 1:37:54 PM	Anions Gradient Program
114	HS18120545-04MSD	112918	Finished	12/11/2018 1:52:27 PM	Anions Gradient Program
115	HS18120545-04DF5	112918	Finished	12/11/2018 2:07:00 PM	Anions Gradient Program
116	HS18120128-01DF10	112918	Finished	12/11/2018 2:21:33 PM	Anions Gradient Program
117	HS18120128-02DF200	112918	Finished	12/11/2018 2:36:05 PM	Anions Gradient Program
118	HS18111458-08	112918	Finished	12/11/2018 2:50:38 PM	Anions Gradient Program
119	HS18111458-10	112918	Finished	12/11/2018 3:05:10 PM	Anions Gradient Program
120	CCV1	112918	Finished	12/11/2018 3:19:43 PM	Anions Gradient Program
121	CCB	112918	Finished	12/11/2018 3:34:16 PM	Anions Gradient Program
122	HS18120782-01	112918	Finished	12/11/2018 3:48:49 PM	Anions Gradient Program
123	HS18111059-08DF10	112918	Finished	12/11/2018 4:03:22 PM	Anions Gradient Program
124	HS18111059-08MSDF10	112918	Finished	12/11/2018 4:17:55 PM	Anions Gradient Program
125	HS18111059-08MSDDF10	112918	Finished	12/11/2018 4:32:28 PM	Anions Gradient Program
126	HS18120545-02DF5	112918	Finished	12/11/2018 4:47:01 PM	Anions Gradient Program

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Sequence: 121018
Operator: alshs.nouser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	GUID
85	CCB	810434ce-fd3f-11e8-b6da-a24899608423
86	MBLK-135144	893ef267-fd41-11e8-b6da-a24899608423
87	LCS-135144	918f24fd-fd43-11e8-b6da-a24899608423
88	LCSD-135144	99d83094-fd45-11e8-b6da-a24899608423
89	HS18111057-01	a21c7781-fd47-11e8-b6da-a24899608423
90	HS18111057-02	aaa09296-fd49-11e8-b6da-a24899608423
91	HS18111057-03	b2d9f1c4-fd4b-11e8-b6da-a24899608423
92	HS18111057-04	bb768991-fd4d-11e8-b6da-a24899608423
93	HS18111057-05	c3c1f77d-fd4f-11e8-b6da-a24899608423
94	HS18111057-06	cc08a0bf-fd51-11e8-b6da-a24899608423
95	HS18111057-07	d451ac56-fd53-11e8-b6da-a24899608423
96	CCV1	dc95f343-fd55-11e8-b6da-a24899608423
97	CCB	e492b43a-fd57-11e8-b6da-a24899608423
98	HS18111057-08	eccb0f7e-fd59-11e8-b6da-a24899608423
99	HS18111057-09	f5167d6a-fd5b-11e8-b6da-a24899608423
100	HS18111057-10DF10	fd5ac457-fd5d-11e8-b6da-a24899608423
101	HS18111057-11	05bba740-fd60-11e8-b6da-a24899608423
102	HS18111057-12	0dde8d87-fd62-11e8-b6da-a24899608423
103	HS18120545-02	161e0fca-fd64-11e8-b6da-a24899608423
104	HS18120545-03	1e697db6-fd66-11e8-b6da-a24899608423
105	HS18120545-04	2663dc58-fd68-11e8-b6da-a24899608423
106	HS18120545-01	2eaa859a-fd6a-11e8-b6da-a24899608423
107	HS18120545-01DF5	36fab830-fd6c-11e8-b6da-a24899608423
108	CCV	3f331374-fd6e-11e8-b6da-a24899608423
109	CCB	476dd10d-fd70-11e8-b6da-a24899608423
110	WBLKW1-121118	4fd5daf5-fd72-11e8-b6da-a24899608423
111	WLCSW1-121118	57ffe83b-fd74-11e8-b6da-a24899608423
112	WLCSDW1-121118	603aa5d4-fd76-11e8-b6da-a24899608423
113	HS18120545-04MS	c0ae080c-fd7b-11e8-b6da-a24899608423
114	HS18120545-04MSD	28165f01-fd7e-11e8-b6da-a24899608423
115	HS18120545-04DF5	3068f3ec-fd80-11e8-b6da-a24899608423
116	HS18120128-01DF10	38503fe6-fd82-11e8-b6da-a24899608423
117	HS18120128-02DF200	403eb2df-fd84-11e8-b6da-a24899608423
118	HS18111458-08	486d84cf-fd86-11e8-b6da-a24899608423
119	HS18111458-10	50aaa4bd-fd88-11e8-b6da-a24899608423
120	CCV1	58eeebaa-fd8a-11e8-b6da-a24899608423
121	CCB	6124e499-fd8c-11e8-b6da-a24899608423
122	HS18120782-01	69705285-fd8e-11e8-b6da-a24899608423
123	HS18111059-08DF10	719f2475-fd90-11e8-b6da-a24899608423
124	HS18111059-08MSDF10	79ea9261-fd92-11e8-b6da-a24899608423
125	HS18111059-08MSDDF10	82417796-fd94-11e8-b6da-a24899608423
126	HS18120545-02DF5	8aaf63c0-fd96-11e8-b6da-a24899608423

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:10 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
127	HS18120487-01		Unknown	21	1.0000	10.0	1.00	1.00
128	HS18120487-01MS		Unknown	22	1.0000	10.0	1.00	1.00
129	HS18120487-01MSD		Unknown	23	1.0000	10.0	1.00	1.00
130	HS18120494-01		Unknown	25	1.0000	10.0	1.00	1.00
131	HS18120490-01		Unknown	24	1.0000	10.0	1.00	1.00
132	CCV		Unknown	1	1.0000	10.0	1.00	1.00
133	CCB		Unknown	2	1.0000	10.0	1.00	1.00
134	HS18120325-01DF100		Unknown	28	100.0000	10.0	1.00	1.00
135	HS18120325-02DF100		Unknown	29	100.0000	10.0	1.00	1.00
136	HS18120325-03DF100		Unknown	30	100.0000	10.0	1.00	1.00
137	HS18111059-01		Unknown	85	1.0000	10.0	1.00	1.00
138	HS18111059-02		Unknown	86	1.0000	10.0	1.00	1.00
139	HS18111059-03		Unknown	87	1.0000	10.0	1.00	1.00
140	HS18111059-04		Unknown	88	1.0000	10.0	1.00	1.00
141	HS18111059-05		Unknown	89	1.0000	10.0	1.00	1.00
142	HS18111059-06		Unknown	90	1.0000	10.0	1.00	1.00
143	HS18111059-07		Unknown	91	1.0000	10.0	1.00	1.00
144	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
145	CCB		Unknown	4	1.0000	10.0	1.00	1.00
146	HS18120545-03DF5		Unknown	20	5.0000	10.0	1.00	1.00
147	HS18120569-01DF2		Unknown	34	2.0000	10.0	1.00	1.00
148	HS18120569-02		Unknown	35	1.0000	10.0	1.00	1.00
149	HS18120569-03DF2		Unknown	36	2.0000	10.0	1.00	1.00
150	HS18120569-04DF2		Unknown	37	2.0000	10.0	1.00	1.00
151	HS18120569-05DF2		Unknown	38	2.0000	10.0	1.00	1.00
152	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00
153	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00
154	HS18111517-01DF100		Unknown	31	100.0000	10.0	1.00	1.00
155	HS18111517-01DF1000		Unknown	32	1000.0000	10.0	1.00	1.00
156	CCV		Unknown	1	1.0000	10.0	1.00	1.00
157	CCB		Unknown	2	1.0000	10.0	1.00	1.00
158	MBLK-135386		Unknown	39	1.0000	10.0	1.00	1.00
159	LCS-135386		Unknown	40	1.0000	10.0	1.00	1.00
160	LCSD-135386		Unknown	41	1.0000	10.0	1.00	1.00
161	HS18120218-01DF10		Unknown	42	10.0000	10.0	1.00	1.00
162	HS18120218-01MSDF10		Unknown	43	10.0000	10.0	1.00	1.00
163	HS18120218-01MSDDF10		Unknown	44	10.0000	10.0	1.00	1.00
164	HS18120218-02DF10		Unknown	45	10.0000	10.0	1.00	1.00
165	HS18120218-03DF10		Unknown	46	10.0000	10.0	1.00	1.00
166	HS18120218-04DF10		Unknown	47	10.0000	10.0	1.00	1.00
167	HS18120220-01DF10		Unknown	48	10.0000	10.0	1.00	1.00
168	CCV1		Unknown	3	1.0000	10.0	1.00	1.00

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:10 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser (Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
127	HS18120487-01	112918	Finished	12/11/2018 5:01:34 PM	Anions Gradient Program
128	HS18120487-01MS	112918	Finished	12/11/2018 5:16:07 PM	Anions Gradient Program
129	HS18120487-01MSD	112918	Finished	12/11/2018 5:30:40 PM	Anions Gradient Program
130	HS18120494-01	112918	Finished	12/11/2018 5:45:13 PM	Anions Gradient Program
131	HS18120490-01	112918	Finished	12/11/2018 5:59:45 PM	Anions Gradient Program
132	CCV	112918	Finished	12/11/2018 6:14:18 PM	Anions Gradient Program
133	CCB	112918	Finished	12/11/2018 6:28:51 PM	Anions Gradient Program
134	HS18120325-01DF100	112918	Finished	12/11/2018 6:43:24 PM	Anions Gradient Program
135	HS18120325-02DF100	112918	Finished	12/11/2018 6:57:57 PM	Anions Gradient Program
136	HS18120325-03DF100	112918	Finished	12/11/2018 7:12:30 PM	Anions Gradient Program
137	HS18111059-01	112918	Finished	12/11/2018 7:27:03 PM	Anions Gradient Program
138	HS18111059-02	112918	Finished	12/11/2018 7:41:36 PM	Anions Gradient Program
139	HS18111059-03	112918	Finished	12/11/2018 7:56:08 PM	Anions Gradient Program
140	HS18111059-04	112918	Finished	12/11/2018 8:10:41 PM	Anions Gradient Program
141	HS18111059-05	112918	Finished	12/11/2018 8:25:14 PM	Anions Gradient Program
142	HS18111059-06	112918	Finished	12/11/2018 8:39:47 PM	Anions Gradient Program
143	HS18111059-07	112918	Finished	12/11/2018 8:54:20 PM	Anions Gradient Program
144	CCV1	112918	Finished	12/11/2018 9:08:52 PM	Anions Gradient Program
145	CCB	112918	Finished	12/11/2018 9:23:25 PM	Anions Gradient Program
146	HS18120545-03DF5	112918	Finished	12/11/2018 9:37:57 PM	Anions Gradient Program
147	HS18120569-01DF2	112918	Finished	12/11/2018 9:52:30 PM	Anions Gradient Program
148	HS18120569-02	112918	Finished	12/11/2018 10:07:03 PM	Anions Gradient Program
149	HS18120569-03DF2	112918	Finished	12/11/2018 10:21:36 PM	Anions Gradient Program
150	HS18120569-04DF2	112918	Finished	12/11/2018 10:36:09 PM	Anions Gradient Program
151	HS18120569-05DF2	112918	Finished	12/11/2018 10:50:42 PM	Anions Gradient Program
152	DI H2O	112918	Finished	12/11/2018 11:05:15 PM	Anions Gradient Program
153	DI H2O	112918	Finished	12/11/2018 11:19:47 PM	Anions Gradient Program
154	HS18111517-01DF100	112918	Finished	12/11/2018 11:34:20 PM	Anions Gradient Program
155	HS18111517-01DF1000	112918	Finished	12/11/2018 11:48:53 PM	Anions Gradient Program
156	CCV	112918	Finished	12/12/2018 12:03:26 AM	Anions Gradient Program
157	CCB	112918	Finished	12/12/2018 12:17:59 AM	Anions Gradient Program
158	MBLK-135386	112918	Finished	12/12/2018 12:32:32 AM	Anions Gradient Program
159	LCS-135386	112918	Finished	12/12/2018 12:47:04 AM	Anions Gradient Program
160	LCSD-135386	112918	Finished	12/12/2018 1:01:37 AM	Anions Gradient Program
161	HS18120218-01DF10	112918	Finished	12/12/2018 1:16:10 AM	Anions Gradient Program
162	HS18120218-01MSDF10	112918	Finished	12/12/2018 1:30:42 AM	Anions Gradient Program
163	HS18120218-01MSDDF10	112918	Finished	12/12/2018 1:45:16 AM	Anions Gradient Program
164	HS18120218-02DF10	112918	Finished	12/12/2018 1:59:49 AM	Anions Gradient Program
165	HS18120218-03DF10	112918	Finished	12/12/2018 2:14:21 AM	Anions Gradient Program
166	HS18120218-04DF10	112918	Finished	12/12/2018 2:28:54 AM	Anions Gradient Program
167	HS18120220-01DF10	112918	Finished	12/12/2018 2:43:27 AM	Anions Gradient Program
168	CCV1	112918	Finished	12/12/2018 2:58:00 AM	Anions Gradient Program

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Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220
Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	GUID
127	HS18120487-01	932c4421-fd98-11e8-b6da-a24899608423
128	HS18120487-01MS	9b6e28b9-fd9a-11e8-b6da-a24899608423
129	HS18120487-01MSD	a3cca94d-fd9c-11e8-b6da-a24899608423
130	HS18120494-01	ac003fe7-fd9e-11e8-b6da-a24899608423
131	HS18120490-01	b4494b7e-fda0-11e8-b6da-a24899608423
132	CCV	bc94b96a-fda2-11e8-b6da-a24899608423
133	CCB	c4ddc501-fda4-11e8-b6da-a24899608423
134	HS18120325-01DF100	cd162045-fda6-11e8-b6da-a24899608423
135	HS18120325-02DF100	d5913cd5-fda8-11e8-b6da-a24899608423
136	HS18120325-03DF100	dd978720-fdaa-11e8-b6da-a24899608423
137	HS18111059-01	e601f35d-fdac-11e8-b6da-a24899608423
138	HS18111059-02	ee43d7f5-fdae-11e8-b6da-a24899608423
139	HS18111059-03	f685bc8d-fdb0-11e8-b6da-a24899608423
140	HS18111059-04	feb48e7d-fdb2-11e8-b6da-a24899608423
141	HS18111059-05	06f8d56a-fdb5-11e8-b6da-a24899608423
142	HS18111059-06	0f41e101-fdb7-11e8-b6da-a24899608423
143	HS18111059-07	1764c748-fdb9-11e8-b6da-a24899608423
144	CCV1	1f474e98-fdbb-11e8-b6da-a24899608423
145	CCB	2792bc84-fdbd-11e8-b6da-a24899608423
146	HS18120545-03DF5	2f88567c-fdbf-11e8-b6da-a24899608423
147	HS18120569-01DF2	37c31415-fdc1-11e8-b6da-a24899608423
148	HS18120569-02	3ff90d04-fdc3-11e8-b6da-a24899608423
149	HS18120569-03DF2	48316848-fdc5-11e8-b6da-a24899608423
150	HS18120569-04DF2	507a73df-fdc7-11e8-b6da-a24899608423
151	HS18120569-05DF2	59148ec0-fdc9-11e8-b6da-a24899608423
152	DI H2O	615ffcac-fdcb-11e8-b6da-a24899608423
153	DI H2O	69a90843-fdcd-11e8-b6da-a24899608423
154	HS18111517-01DF100	71ce50df-fdcf-11e8-b6da-a24899608423
155	HS18111517-01DF1000	7a175c76-fdd1-11e8-b6da-a24899608423
156	CCV	824fb7ba-fdd3-11e8-b6da-a24899608423
157	CCB	8a98c351-fdd5-11e8-b6da-a24899608423
158	MBLK-135386	92e1cee8-fdd7-11e8-b6da-a24899608423
159	LCS-135386	9b1a2a2c-fdd9-11e8-b6da-a24899608423
160	LCSD-135386	a2ff13d1-fddb-11e8-b6da-a24899608423
161	HS18120218-01DF10	ab304816-fddd-11e8-b6da-a24899608423
162	HS18120218-01MSDF10	b376f158-fddf-11e8-b6da-a24899608423
163	HS18120218-01MSDDF10	bc1d27b3-fde1-11e8-b6da-a24899608423
164	HS18120218-02DF10	c45ef299-fde3-11e8-b6da-a24899608423
165	HS18120218-03DF10	cca13872-fde5-11e8-b6da-a24899608423
166	HS18120218-04DF10	d4dbf60b-fde7-11e8-b6da-a24899608423
167	HS18120220-01DF10	dd1915f9-fde9-11e8-b6da-a24899608423
168	CCV1	e55afa91-fdeb-11e8-b6da-a24899608423

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Sequence: 121018
Operator: alshs.nouser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
169	CCB		Unknown	4	1.0000	10.0	1.00	1.00
170	HS18120221-01DF10		Unknown	49	10.0000	10.0	1.00	1.00
171	HS18120221-02DF10		Unknown	50	10.0000	10.0	1.00	1.00
172	HS18101385-01		Unknown	51	1.0000	10.0	1.00	1.00
173	HS18101385-01		Unknown	52	1.0000	10.0	1.00	1.00
174	HS18101384-01		Unknown	53	1.0000	10.0	1.00	1.00
175	CCV		Unknown	1	1.0000	10.0	1.00	1.00
176	CCB		Unknown	2	1.0000	10.0	1.00	1.00
177	HS18120589-01		Unknown	54	1.0000	10.0	1.00	1.00
178	HS18120589-02		Unknown	55	1.0000	10.0	1.00	1.00
179	HS18120589-03		Unknown	56	1.0000	10.0	1.00	1.00
180	HS18120589-04		Unknown	57	1.0000	10.0	1.00	1.00
181	HS18120589-05		Unknown	58	1.0000	10.0	1.00	1.00
182	HS18120589-06		Unknown	59	1.0000	10.0	1.00	1.00
183	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00
184	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00
185	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
186	CCB		Unknown	4	1.0000	10.0	1.00	1.00
187	MBLK-135196		Unknown	60	1.0000	10.0	1.00	1.00
188	LCS-135196		Unknown	61	1.0000	10.0	1.00	1.00
189	LCSD-135196		Unknown	62	1.0000	10.0	1.00	1.00
190	HS18111059-09		Unknown	63	1.0000	10.0	1.00	1.00
191	HS18111059-10		Unknown	64	1.0000	10.0	1.00	1.00
192	HS18111059-11		Unknown	65	1.0000	10.0	1.00	1.00
193	HS18111059-12		Unknown	66	1.0000	10.0	1.00	1.00
194	HS18111083-01		Unknown	67	1.0000	10.0	1.00	1.00
195	HS18111083-02DF5		Unknown	68	5.0000	10.0	1.00	1.00
196	HS18111083-03		Unknown	69	1.0000	10.0	1.00	1.00
197	CCV		Unknown	1	1.0000	10.0	1.00	1.00
198	CCB		Unknown	2	1.0000	10.0	1.00	1.00
199	HS18111083-04		Unknown	70	1.0000	10.0	1.00	1.00
200	HS18111083-05		Unknown	71	1.0000	10.0	1.00	1.00
201	HS18111083-06		Unknown	72	1.0000	10.0	1.00	1.00
202	HS18111083-07		Unknown	73	1.0000	10.0	1.00	1.00
203	HS18111083-07MS		Unknown	74	1.0000	10.0	1.00	1.00
204	HS18111083-07MSD		Unknown	75	1.0000	10.0	1.00	1.00
205	HS18111083-08		Unknown	76	1.0000	10.0	1.00	1.00
206	HS18111083-09		Unknown	77	1.0000	10.0	1.00	1.00
207	HS18111083-10		Unknown	78	1.0000	10.0	1.00	1.00
208	HS18111083-11		Unknown	79	1.0000	10.0	1.00	1.00
209	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
210	CCB		Unknown	4	1.0000	10.0	1.00	1.00

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Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100 Created: 12/11/2018 1:33:52 PM by alshs.nouser
#Samples: 220 (Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
169	CCB	112918	Finished	12/12/2018 3:12:33 AM	Anions Gradient Program
170	HS18120221-01DF10	112918	Finished	12/12/2018 3:27:06 AM	Anions Gradient Program
171	HS18120221-02DF10	112918	Finished	12/12/2018 3:41:39 AM	Anions Gradient Program
172	HS18101385-01	112918	Finished	12/12/2018 3:56:11 AM	Anions Gradient Program
173	HS18101385-01	112918	Finished	12/12/2018 4:10:44 AM	Anions Gradient Program
174	HS18101384-01	112918	Finished	12/12/2018 4:25:17 AM	Anions Gradient Program
175	CCV	112918	Finished	12/12/2018 4:39:50 AM	Anions Gradient Program
176	CCB	112918	Finished	12/12/2018 4:54:23 AM	Anions Gradient Program
177	HS18120589-01	112918	Finished	12/12/2018 5:08:56 AM	Anions Gradient Program
178	HS18120589-02	112918	Finished	12/12/2018 5:23:28 AM	Anions Gradient Program
179	HS18120589-03	112918	Finished	12/12/2018 5:38:01 AM	Anions Gradient Program
180	HS18120589-04	112918	Finished	12/12/2018 5:52:35 AM	Anions Gradient Program
181	HS18120589-05	112918	Finished	12/12/2018 6:07:07 AM	Anions Gradient Program
182	HS18120589-06	112918	Finished	12/12/2018 6:21:40 AM	Anions Gradient Program
183	DI H2O	112918	Finished	12/12/2018 6:36:13 AM	Anions Gradient Program
184	DI H2O	112918	Finished	12/12/2018 6:50:46 AM	Anions Gradient Program
185	CCV1	112918	Finished	12/12/2018 7:05:19 AM	Anions Gradient Program
186	CCB	112918	Finished	12/12/2018 7:19:52 AM	Anions Gradient Program
187	MBLK-135196	112918	Finished	12/12/2018 7:34:25 AM	Anions Gradient Program
188	LCS-135196	112918	Finished	12/12/2018 7:48:58 AM	Anions Gradient Program
189	LCSD-135196	112918	Finished	12/12/2018 8:03:31 AM	Anions Gradient Program
190	HS18111059-09	112918	Finished	12/12/2018 8:18:04 AM	Anions Gradient Program
191	HS18111059-10	112918	Finished	12/12/2018 8:32:36 AM	Anions Gradient Program
192	HS18111059-11	112918	Finished	12/12/2018 8:47:09 AM	Anions Gradient Program
193	HS18111059-12	112918	Finished	12/12/2018 9:01:42 AM	Anions Gradient Program
194	HS18111083-01	112918	Finished	12/12/2018 9:16:14 AM	Anions Gradient Program
195	HS18111083-02DF5	112918	Finished	12/12/2018 9:30:47 AM	Anions Gradient Program
196	HS18111083-03	112918	Finished	12/12/2018 9:45:21 AM	Anions Gradient Program
197	CCV	112918	Finished	12/12/2018 9:59:53 AM	Anions Gradient Program
198	CCB	112918	Finished	12/12/2018 10:14:26 AM	Anions Gradient Program
199	HS18111083-04	112918	Finished	12/12/2018 10:28:59 AM	Anions Gradient Program
200	HS18111083-05	112918	Finished	12/12/2018 10:43:31 AM	Anions Gradient Program
201	HS18111083-06	112918	Finished	12/12/2018 10:58:05 AM	Anions Gradient Program
202	HS18111083-07	112918	Finished	12/12/2018 11:12:37 AM	Anions Gradient Program
203	HS18111083-07MS	112918	Finished	12/12/2018 11:27:11 AM	Anions Gradient Program
204	HS18111083-07MSD	112918	Finished	12/12/2018 11:41:44 AM	Anions Gradient Program
205	HS18111083-08	112918	Finished	12/12/2018 11:56:17 AM	Anions Gradient Program
206	HS18111083-09	112918	Finished	12/12/2018 12:10:49 PM	Anions Gradient Program
207	HS18111083-10	112918	Finished	12/12/2018 12:25:22 PM	Anions Gradient Program
208	HS18111083-11	112918	Finished	12/12/2018 12:39:55 PM	Anions Gradient Program
209	CCV1	112918	Finished	12/12/2018 12:54:27 PM	Anions Gradient Program
210	CCB	112918	Finished	12/12/2018 1:09:00 PM	Anions Gradient Program

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:10 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220
Created: 12/11/2018 1:33:52 PM by alshs.nouser (Modified, not saved)

No.	Name	GUID
169	CCB	ed8c2ed6-fded-11e8-b6da-a24899608423
170	HS18120221-01DF10	f604e911-fdef-11e8-b6da-a24899608423
171	HS18120221-02DF10	fe230aae-fdf1-11e8-b6da-a24899608423
172	HS18101385-01	0664ef46-fdf4-11e8-b6da-a24899608423
173	HS18101385-01	0eca96d9-fdf6-11e8-b6da-a24899608423
174	HS18101384-01	16df2f22-fdf8-11e8-b6da-a24899608423
175	CCV	1f2113ba-fdfa-11e8-b6da-a24899608423
176	CCB	2773a8a5-fdfc-11e8-b6da-a24899608423
177	HS18120589-01	2fa73f3f-fdfe-11e8-b6da-a24899608423
178	HS18120589-02	37e6c182-fe00-11e8-b6da-a24899608423
179	HS18120589-03	4028a61a-fe02-11e8-b6da-a24899608423
180	HS18120589-04	48898903-fe04-11e8-b6da-a24899608423
181	HS18120589-05	50ffe0e9-fe06-11e8-b6da-a24899608423
182	HS18120589-06	593a9e82-fe08-11e8-b6da-a24899608423
183	DI H2O	61886ec3-fe0a-11e8-b6da-a24899608423
184	DI H2O	69bc055d-fe0c-11e8-b6da-a24899608423
185	CCV1	71f460a1-fe0e-11e8-b6da-a24899608423
186	CCB	7a639188-fe10-11e8-b6da-a24899608423
187	MBLK-135196	82d0601a-fe12-11e8-b6da-a24899608423
188	LCS-135196	8b0b1db3-fe14-11e8-b6da-a24899608423
189	LCSD-135196	9354294a-fe16-11e8-b6da-a24899608423
190	HS18111059-09	9b914938-fe18-11e8-b6da-a24899608423
191	HS18111059-10	a3c9a47c-fe1a-11e8-b6da-a24899608423
192	HS18111059-11	ac0926bf-fe1c-11e8-b6da-a24899608423
193	HS18111059-12	b3f799b8-fe1e-11e8-b6da-a24899608423
194	HS18111083-01	bc4307a4-fe20-11e8-b6da-a24899608423
195	HS18111083-02DF5	c484ec3c-fe22-11e8-b6da-a24899608423
196	HS18111083-03	ccf41d23-fe24-11e8-b6da-a24899608423
197	CCV	d54dd90d-fe26-11e8-b6da-a24899608423
198	CCB	dd96e4a4-fe28-11e8-b6da-a24899608423
199	HS18111083-04	e5914346-fe2a-11e8-b6da-a24899608423
200	HS18111083-05	edd99e75-fe2c-11e8-b6da-a24899608423
201	HS18111083-06	f660e231-fe2e-11e8-b6da-a24899608423
202	HS18111083-07	fe7ccbbd-fe30-11e8-b6da-a24899608423
203	HS18111083-07MS	06b52701-fe33-11e8-b6da-a24899608423
204	HS18111083-07MSD	0f51a437-fe35-11e8-b6da-a24899608423
205	HS18111083-08	178ec425-fe37-11e8-b6da-a24899608423
206	HS18111083-09	1fd0a8bd-fe39-11e8-b6da-a24899608423
207	HS18111083-10	27cb075f-fe3b-11e8-b6da-a24899608423
208	HS18111083-11	2ff776fa-fe3d-11e8-b6da-a24899608423
209	CCV1	38408291-fe3f-11e8-b6da-a24899608423
210	CCB	408e52d2-fe41-11e8-b6da-a24899608423

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Sequence: 121018
Operator: alshs.nouser

Printed: 12/26/2018 10:43:10 AM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
211	HS18111083-12		Unknown	80	1.0000	10.0	1.00	1.00
212	HS18111083-13		Unknown	81	1.0000	10.0	1.00	1.00
213	HS18111083-14DF5		Unknown	82	5.0000	10.0	1.00	1.00
214	HS18111083-15DF5		Unknown	83	5.0000	10.0	1.00	1.00
215	HS18101385-03		Unknown	84	1.0000	10.0	1.00	1.00
216	HS18101384-03		Unknown	85	1.0000	10.0	1.00	1.00
217	STD CHK		Unknown	8	1.0000	10.0	1.00	1.00
218	CCV		Unknown	1	1.0000	10.0	1.00	1.00
219	CCB		Unknown	2	1.0000	10.0	1.00	1.00
220	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00

Sequence: 121018
Operator: alshs.nouser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 220

Created: 12/11/2018 1:33:52 PM by alshs.nouser
(Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
211	HS18111083-12	112918	Finished	12/12/2018 1:23:33 PM	Anions Gradient Program
212	HS18111083-13	112918	Finished	12/12/2018 1:38:05 PM	Anions Gradient Program
213	HS18111083-14DF5	112918	Finished	12/12/2018 1:52:38 PM	Anions Gradient Program
214	HS18111083-15DF5	112918	Finished	12/12/2018 2:07:11 PM	Anions Gradient Program
215	HS18101385-03	112918	Finished	12/12/2018 2:21:44 PM	Anions Gradient Program
216	HS18101384-03	112918	Finished	12/12/2018 2:36:17 PM	Anions Gradient Program
217	STD CHK	112918	Finished	12/12/2018 2:50:50 PM	Anions Gradient Program
218	CCV	112918	Finished	12/12/2018 3:08:57 PM	Anions Gradient Program
219	CCB	112918	Finished	12/12/2018 3:23:30 PM	Anions Gradient Program
220	DI H2O	112918	Finished	12/12/2018 3:38:03 PM	Anions Gradient Program

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Sequence:	121018		Page 18 of 18
Operator:	alshs.nouser		Printed: 12/26/2018 10:43:10 AM
Title:			
Datasource:	DB7CGHK1_local		
Location:	ICS2100\Sequences and Data\01-2018		
Timebase:	ICS2100	Created:	12/11/2018 1:33:52 PM by alshs.nouser
#Samples:	220		(Modified, not saved)

No.	Name	GUID
211	HS18111083-12	48923ac8-fe43-11e8-b6da-a24899608423
212	HS18111083-13	50ccf861-fe45-11e8-b6da-a24899608423
213	HS18111083-14DF5	58fe2ca6-fe47-11e8-b6da-a24899608423
214	HS18111083-15DF5	61499a92-fe49-11e8-b6da-a24899608423
215	HS18101385-03	69976ad3-fe4b-11e8-b6da-a24899608423
216	HS18101384-03	71de1415-fe4d-11e8-b6da-a24899608423
217	STD CHK	7a1ff8ad-fe4f-11e8-b6da-a24899608423
218	CCV	a2d41a11-fe51-11e8-b6da-a24899608423
219	CCB	0a485caf-fe54-11e8-b6da-a24899608423
220	DI H2O	128f05f1-fe56-11e8-b6da-a24899608423

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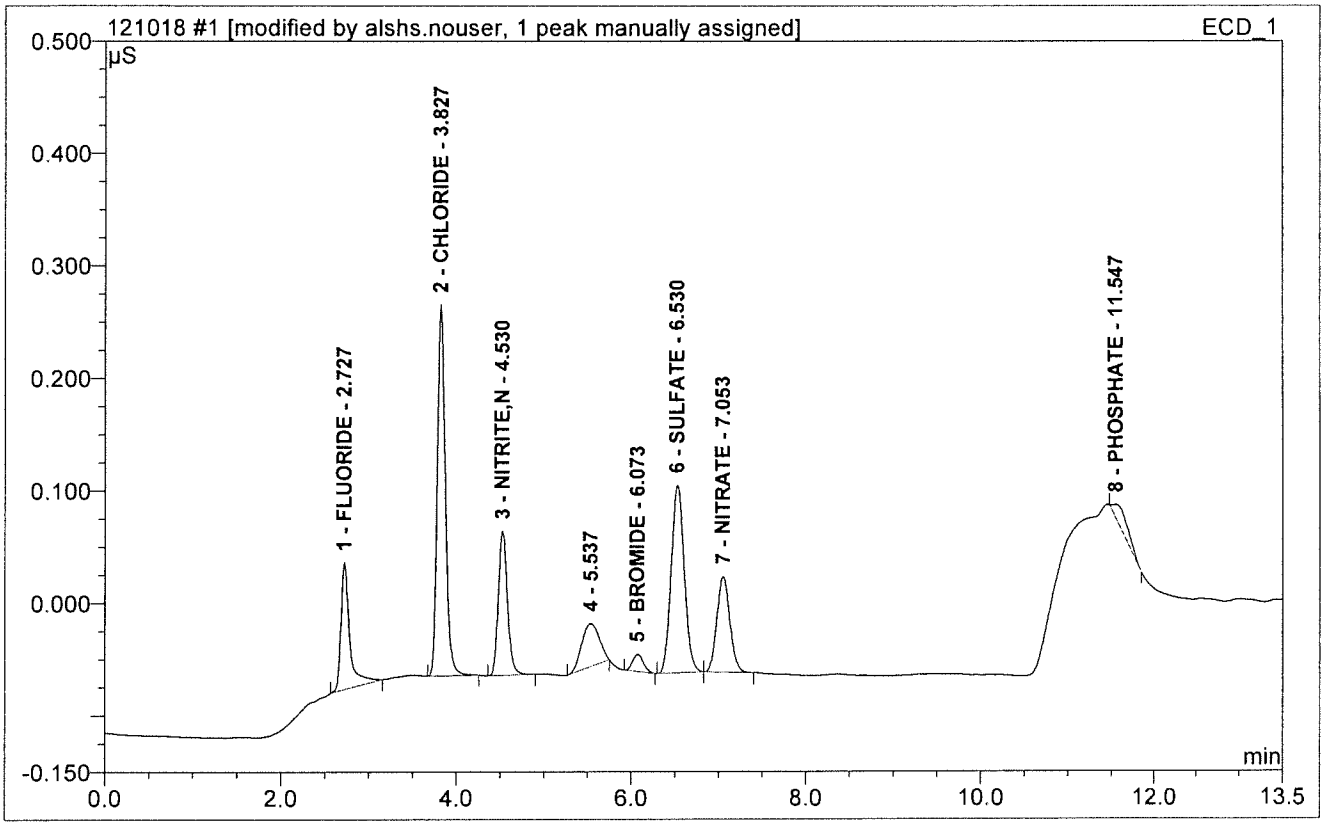
1 STD1

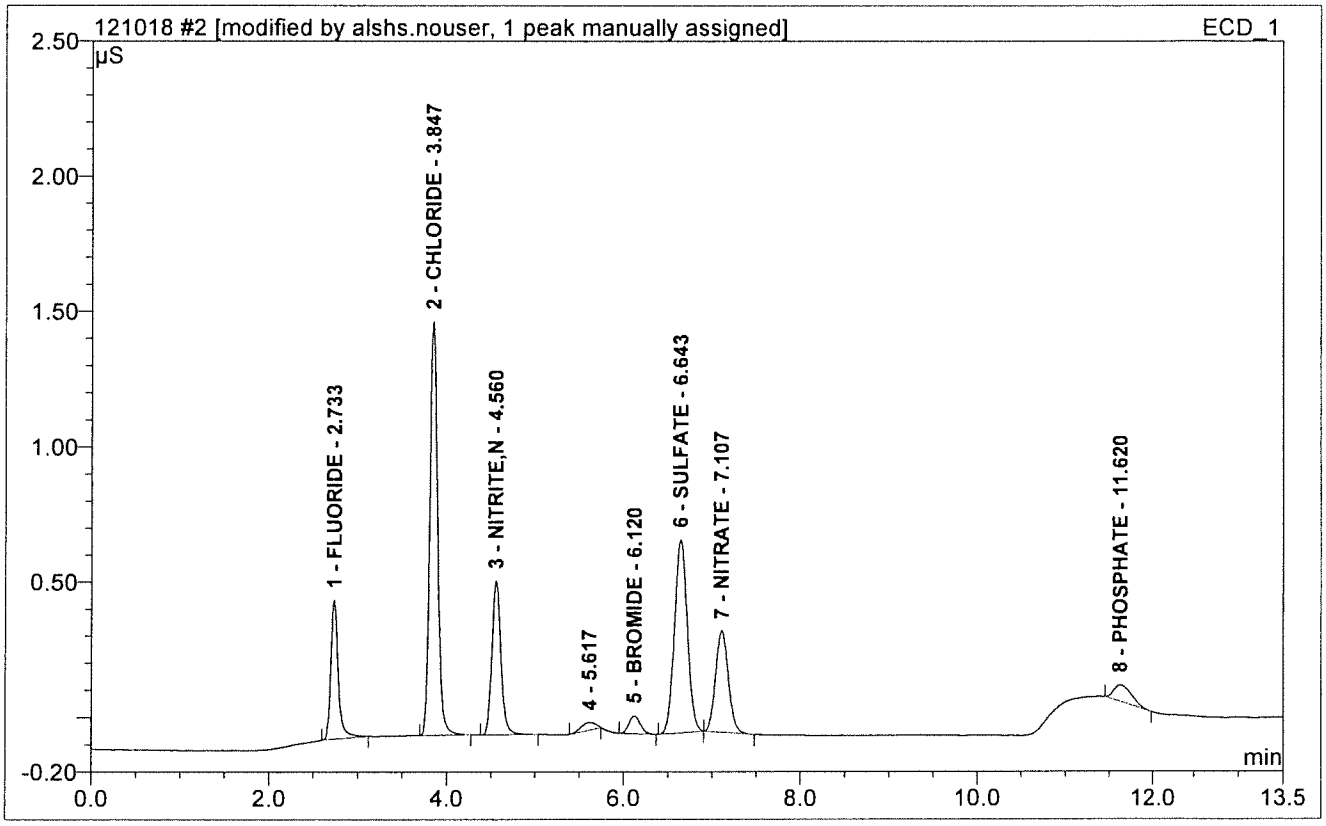
Sample Name:	**STD1**	*Injection Volume:*	**10.0**
Vial Number:	**91**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 0:30**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.113	0.013	10.61	0.103	1.
2	3.83	CHLORIDE	0.330	0.035	28.86	0.527	1.
3	4.53	NITRITE,N	0.128	0.016	12.77	0.094	1.
5	6.07	BROMIDE	0.015	0.002	1.81	0.137	1.
6	6.53	SULFATE	0.167	0.029	23.73	0.511	1.
7	7.05	NITRATE	0.085	0.015	12.09	0.122	1.
8	11.55	PHOSPHATE	0.012	0.003	2.81	0.153	1.
Total:			0.850	0.113	92.68	1.646	

2 STD2

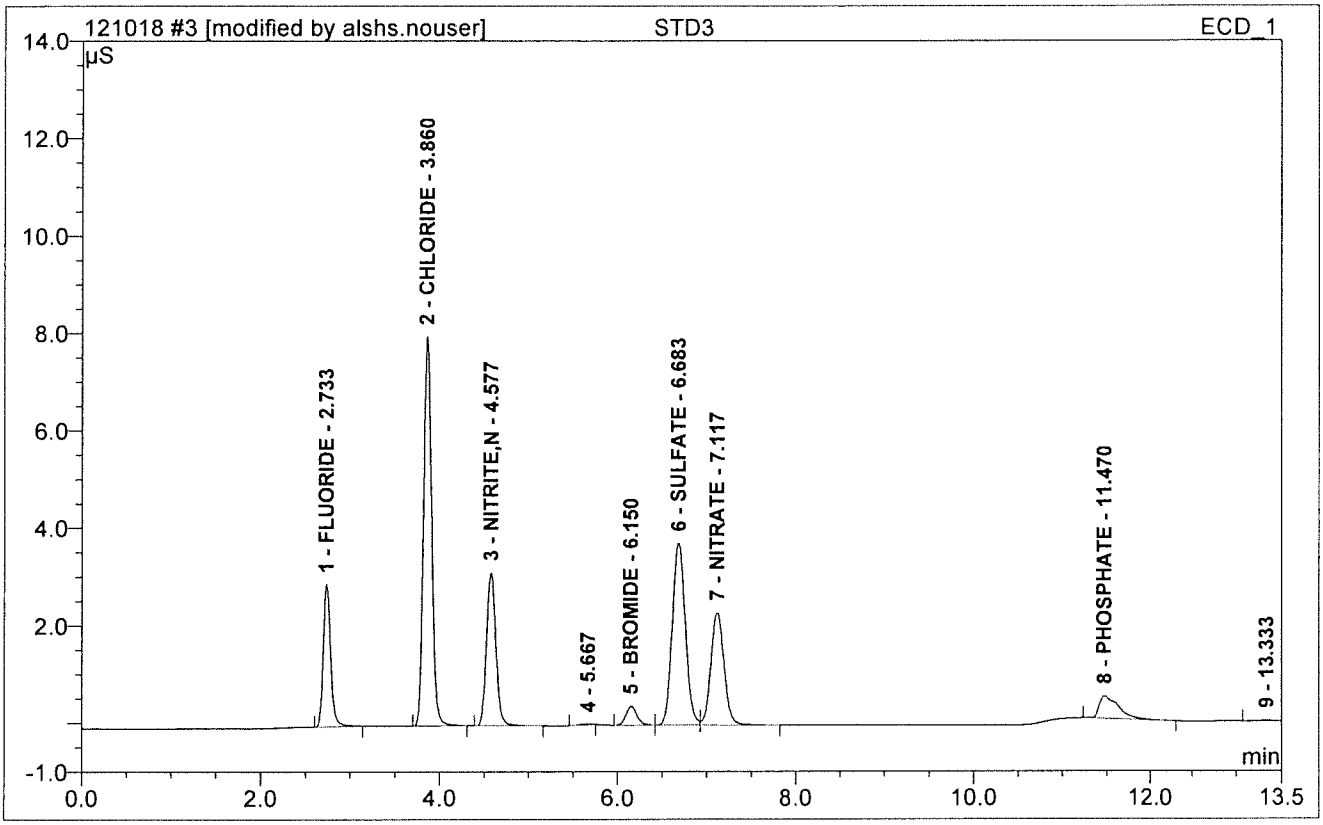
Sample Name:	**STD2**	*Injection Volume:*	**10.0**
Vial Number:	**92**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 0:45**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.511	0.050	10.23	0.372	1.
2	3.85	CHLORIDE	1.527	0.157	32.29	1.939	1.
3	4.56	NITRITE,N	0.567	0.067	13.79	0.380	1.
5	6.12	BROMIDE	0.066	0.010	1.99	0.356	1.
6	6.64	SULFATE	0.712	0.120	24.70	1.977	1.
7	7.11	NITRATE	0.374	0.063	12.92	0.346	1.
8	11.62	PHOSPHATE	0.060	0.014	2.94	0.304	1.
Total:			3.816	0.482	98.85	5.675	

3 STD3

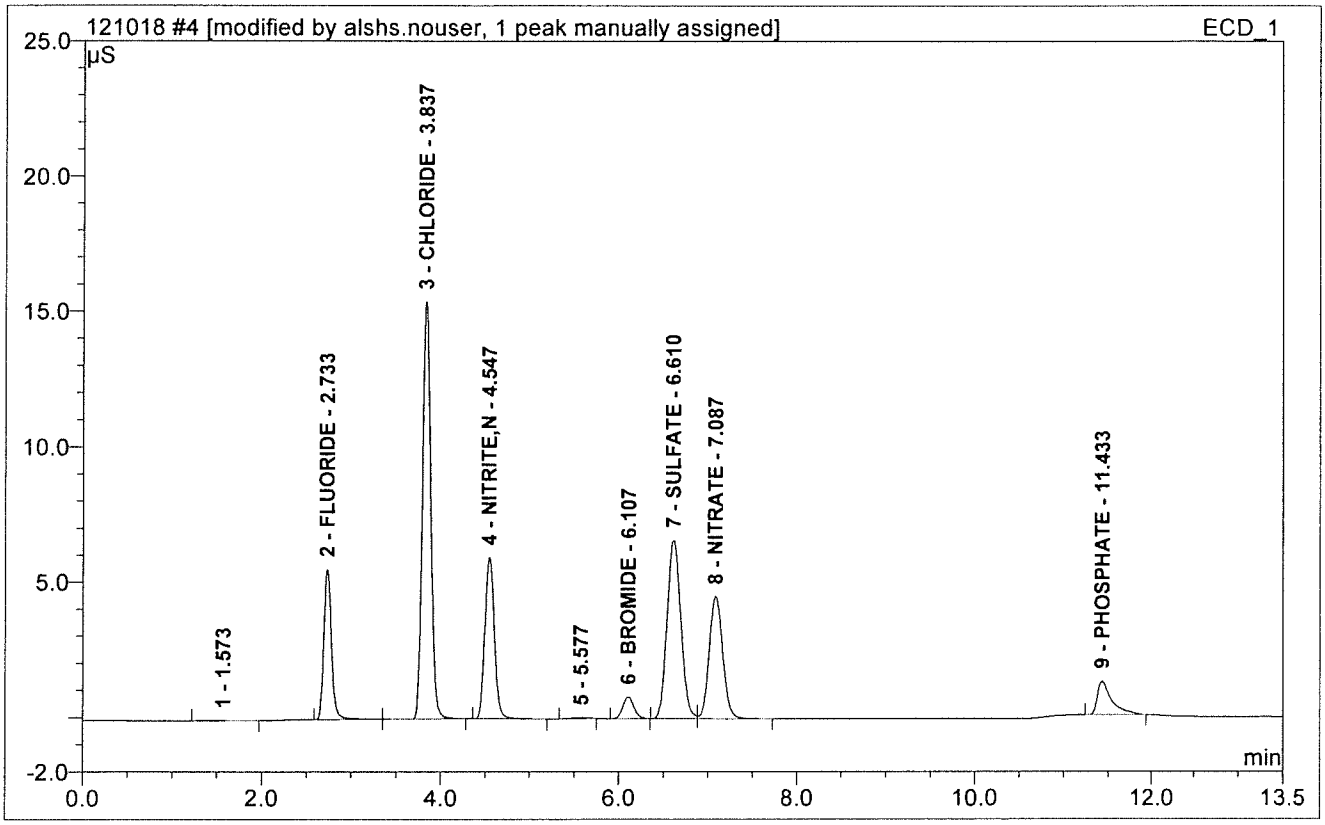
Sample Name:	**STD3**	*Injection Volume:*	**10.0**
Vial Number:	**93**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 1:00**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	2.919	0.281	10.29	2.060	1.
2	3.86	CHLORIDE	7.994	0.856	31.29	10.001	1.
3	4.58	NITRITE,N	3.141	0.386	14.10	2.145	1.
5	6.15	BROMIDE	0.386	0.055	2.01	1.681	1.
6	6.68	SULFATE	3.729	0.638	23.33	10.269	1.
7	7.12	NITRATE	2.320	0.399	14.59	1.909	1.
8	11.47	PHOSPHATE	0.463	0.115	4.21	1.701	1.
Total:			20.953	2.730	99.83	29.767	

4 STD4

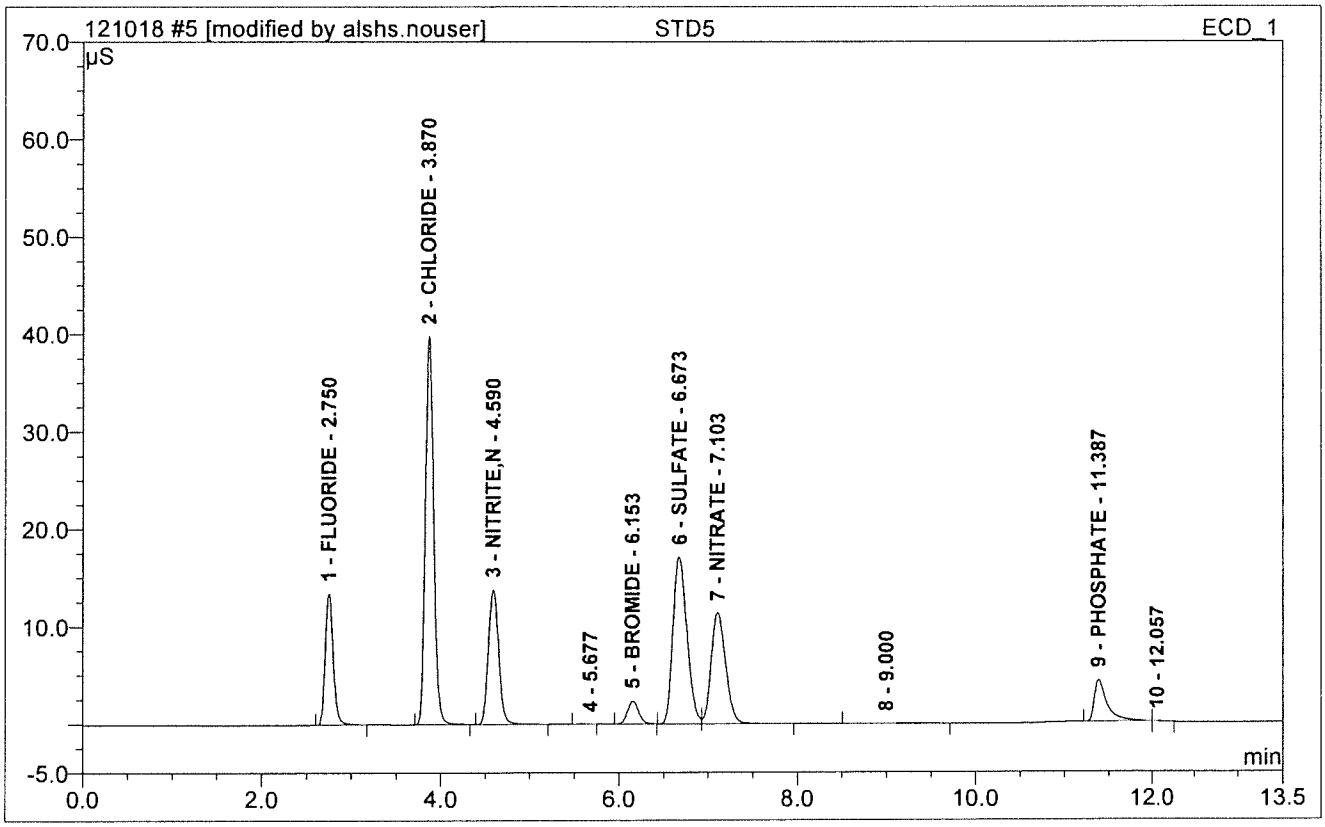
Sample Name:	**STD4**	*Injection Volume:*	**10.0**
Vial Number:	**94**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 1:14**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
2	2.73	FLUORIDE	5.555	0.551	10.40	4.024	1.
3	3.84	CHLORIDE	15.400	1.661	31.38	19.294	1.
4	4.55	NITRITE,N	5.971	0.745	14.08	4.139	1.
6	6.11	BROMIDE	0.804	0.115	2.17	3.434	1.
7	6.61	SULFATE	6.583	1.187	22.43	19.076	1.
8	7.09	NITRATE	4.511	0.797	15.06	3.760	1.
9	11.43	PHOSPHATE	1.231	0.227	4.28	3.245	1.
Total:			40.055	5.282	99.81	56.973	

5 STD5

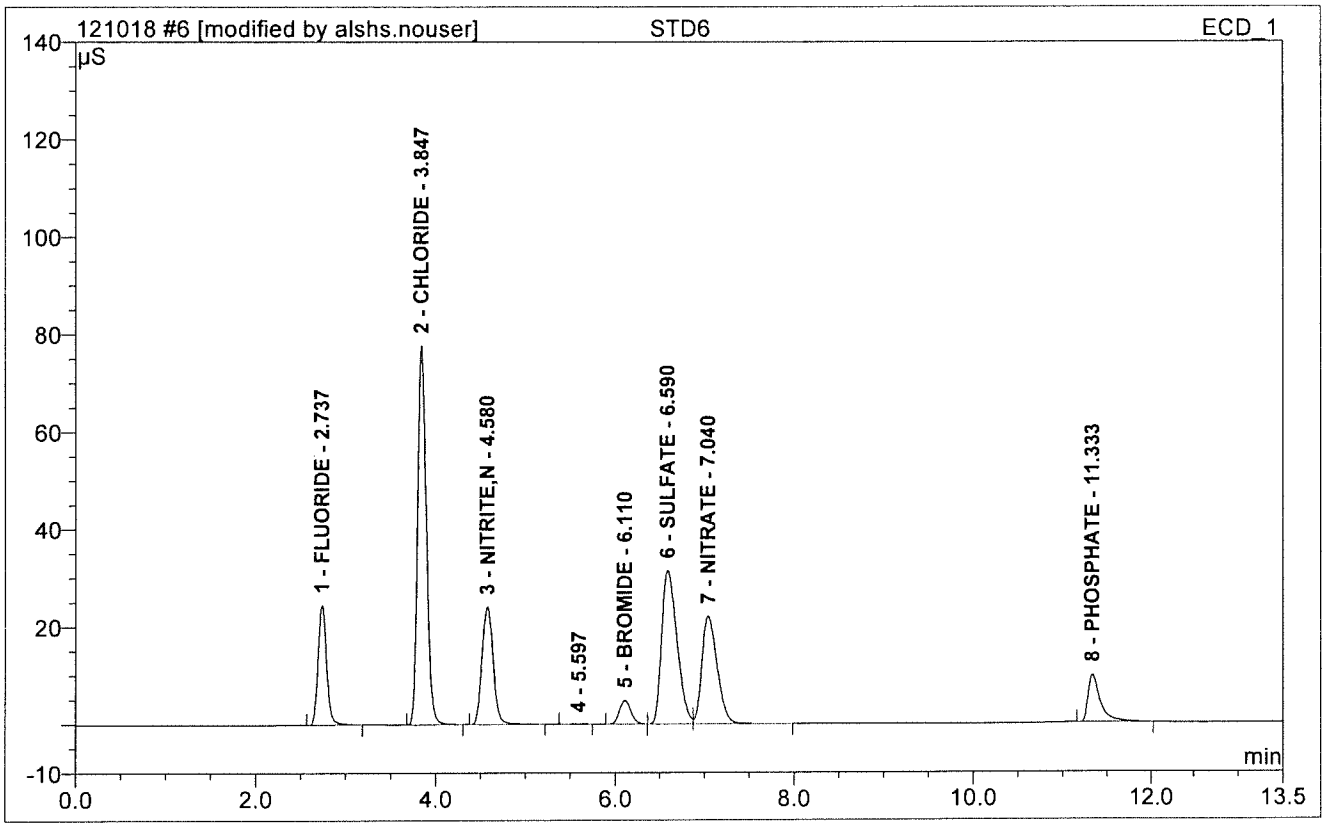
Sample Name:	**STD5**	*Injection Volume:*	**10.0**
Vial Number:	**95**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 1:29**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	13.504	1.402	10.04	10.233	1.
2	3.87	CHLORIDE	39.822	4.351	31.16	50.359	1.
3	4.59	NITRITE,N	13.840	1.870	13.39	10.376	1.
5	6.15	BROMIDE	2.349	0.339	2.43	9.983	1.
6	6.67	SULFATE	17.177	3.130	22.42	50.213	1.
7	7.10	NITRATE	11.440	2.156	15.44	10.082	1.
9	11.39	PHOSPHATE	4.268	0.702	5.03	9.827	1.
Total:			102.400	13.951	99.92	151.072	

6 STD6

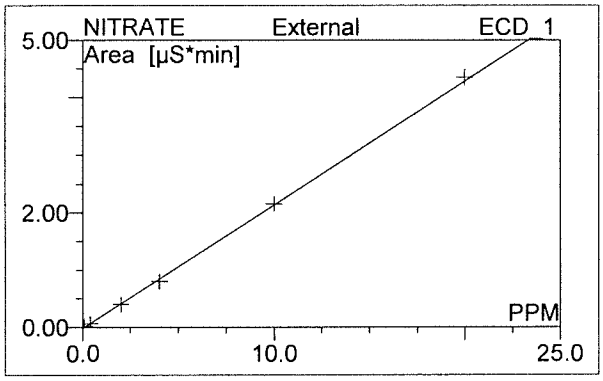
Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 1:43**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**

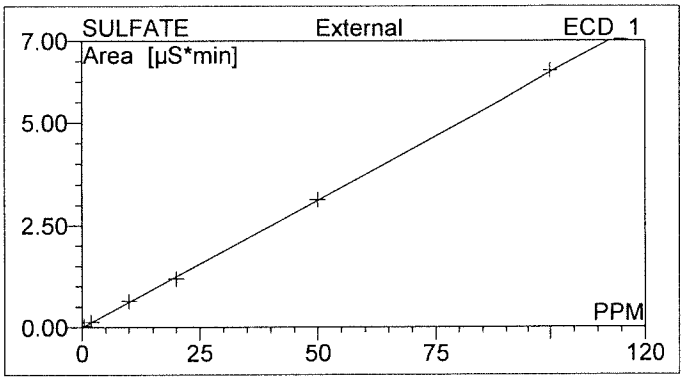


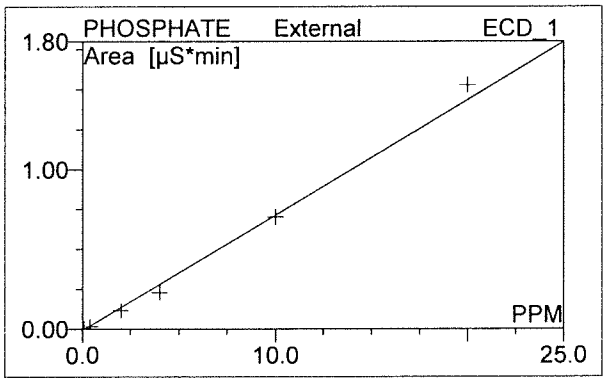
No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	24.575	2.701	9.74	19.708	1.
2	3.85	CHLORIDE	77.742	8.684	31.30	100.380	1.
3	4.58	NITRITE,N	24.093	3.492	12.59	19.366	1.
5	6.11	BROMIDE	4.849	0.713	2.57	20.909	1.
6	6.59	SULFATE	31.447	6.265	22.59	100.454	1.
7	7.04	NITRATE	22.139	4.350	15.68	20.282	1.
8	11.33	PHOSPHATE	9.718	1.528	5.51	21.269	1.
Total:			194.562	27.732	99.97	302.368	

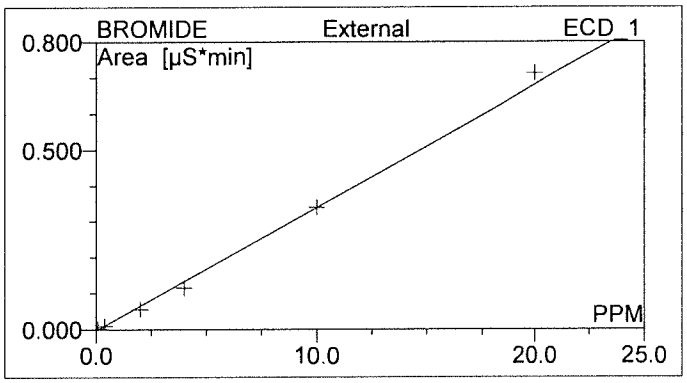
6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 1:43**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**









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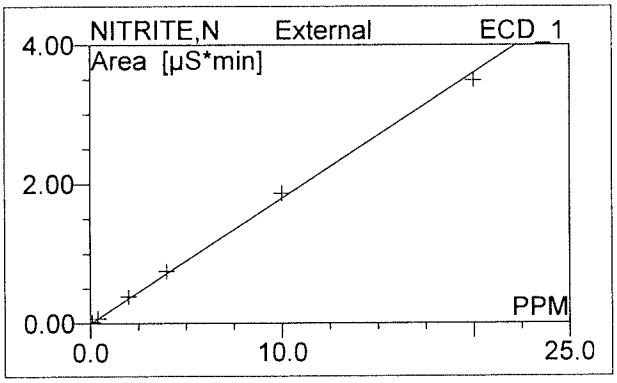
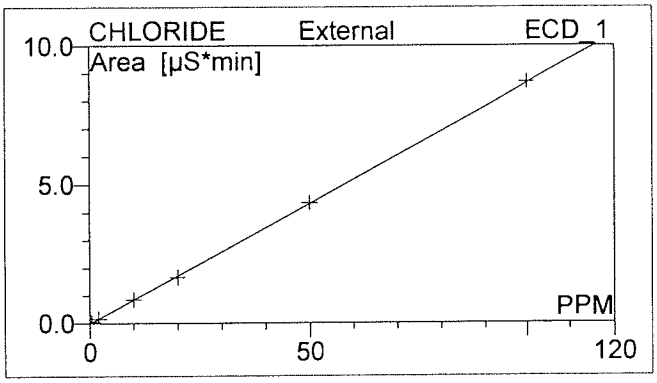
No.	Ret.Time min	Peak Name	Cal.Type	Points	Coeff.Det. %	Offset	Slope	Curve
1	2.74	FLUORIDE	XLOff	6	99.959	-0.0011	0.1371	0.000
2	3.85	CHLORIDE	XLOff	6	99.981	-0.0105	0.0866	0.000
3	4.58	NITRITE,N	XLOff	6	99.849	-0.0013	0.1804	0.000
5	6.11	BROMIDE	XLOff	6	99.439	-0.0025	0.0342	0.000
6	6.59	SULFATE	XLOff	6	99.968	-0.0030	0.0624	0.000
7	7.04	NITRATE	XLOff	6	99.896	-0.0115	0.2150	0.000
8	11.33	PHOSPHATE	XLOff	6	99.058	-0.0076	0.0722	0.000
Average:					99.7359	-0.0054	0.1126	0.0000

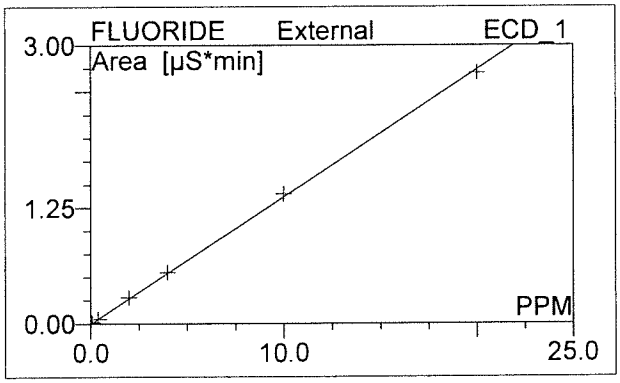
No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	RF-Value	Std.Dev.	RSD %
1	2.74	FLUORIDE	XLOff	6	99.980	7.294	0.005	8.913
2	3.85	CHLORIDE	XLOff	6	99.990	11.546	0.012	6.346
3	4.58	NITRITE,N	XLOff	6	99.925	5.544	0.014	17.158
5	6.11	BROMIDE	XLOff	6	99.719	29.222	0.005	38.898
6	6.59	SULFATE	XLOff	6	99.984	16.026	0.011	7.890
7	7.04	NITRATE	XLOff	6	99.948	4.651	0.014	15.919
8	11.33	PHOSPHATE	XLOff	6	99.528	13.853	0.014	55.458
Average:					99.8678	12.5908	0.0105	21.5119

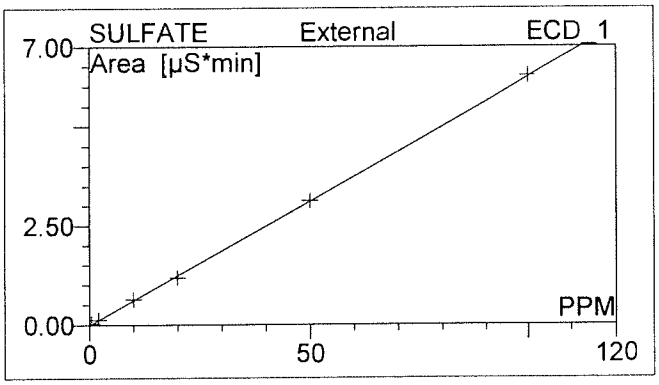
6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.000**
Recording Time:	**11/30/2018 1:43**	*Sample Weight/Volume:*	**1.000**
Run Time (min):	**13.50**	*Final Volume:*	**1.000**









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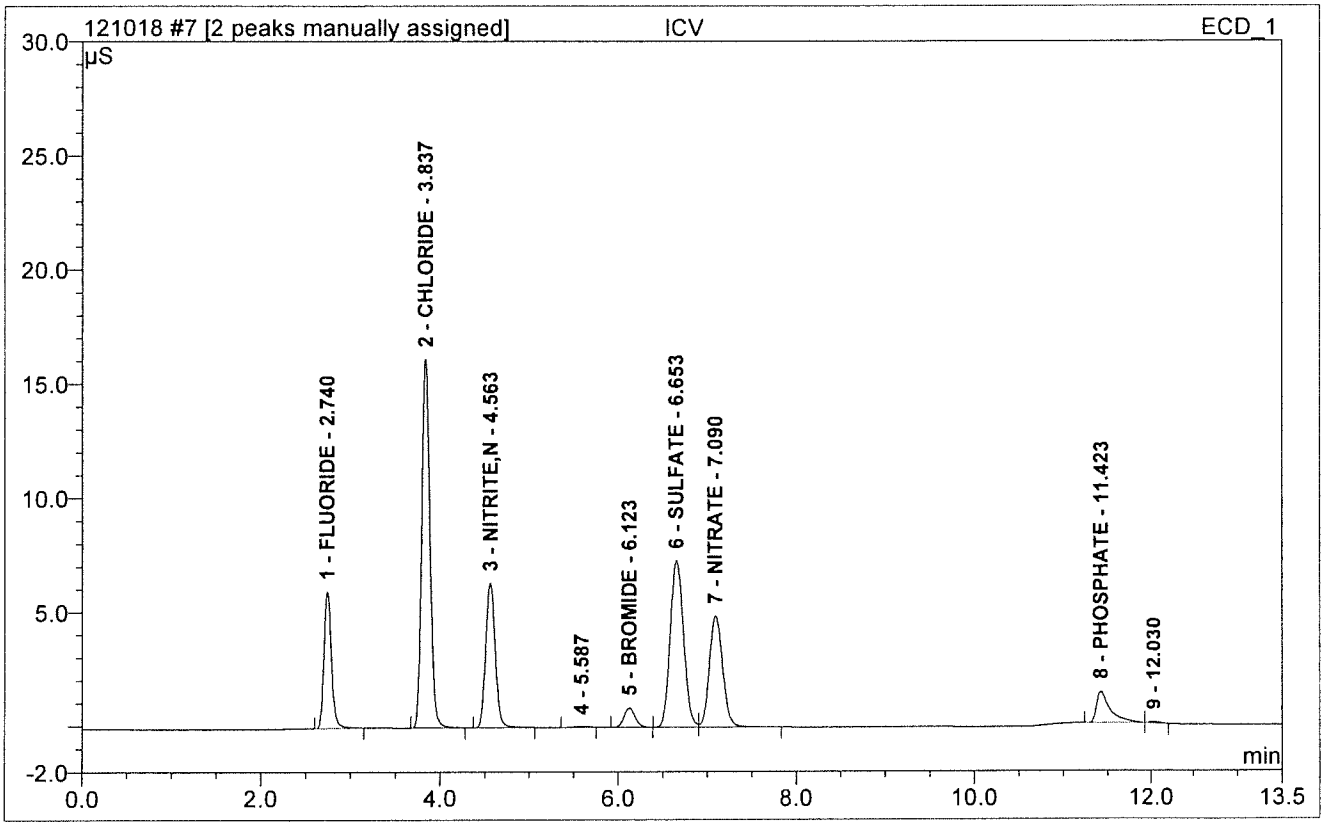
No.	Ret.Time min	Peak Name	Cal.Type	Points	Coeff.Det. %	Offset	Slope	Curve
1	2.74	FLUORIDE	XLOff	6	99.9595	-0.0011	0.1371	0.000
2	3.85	CHLORIDE	XLOff	6	99.9809	-0.0105	0.0866	0.000
3	4.58	NITRITE,N	XLOff	6	99.8494	-0.0013	0.1804	0.000
5	6.11	BROMIDE	XLOff	6	99.4394	-0.0025	0.0342	0.000
6	6.59	SULFATE	XLOff	6	99.9684	-0.0030	0.0624	0.000
7	7.04	NITRATE	XLOff	6	99.8959	-0.0115	0.2150	0.000
8	11.33	PHOSPHATE	XLOff	6	99.0581	-0.0076	0.0722	0.000
Average:					99.7359	-0.0054	0.1126	0.000

No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	RF-Value	Std.Dev.	RSD %
1	2.74	FLUORIDE	XLOff	6	99.980	7.294	0.005	8.913
2	3.85	CHLORIDE	XLOff	6	99.990	11.546	0.012	6.346
3	4.58	NITRITE,N	XLOff	6	99.925	5.544	0.014	17.158
5	6.11	BROMIDE	XLOff	6	99.719	29.222	0.005	38.898
6	6.59	SULFATE	XLOff	6	99.984	16.026	0.011	7.890
7	7.04	NITRATE	XLOff	6	99.948	4.651	0.014	15.919
8	11.33	PHOSPHATE	XLOff	6	99.528	13.853	0.014	55.458
Average:					99.8678	12.591	0.011	21.512

7 ICV

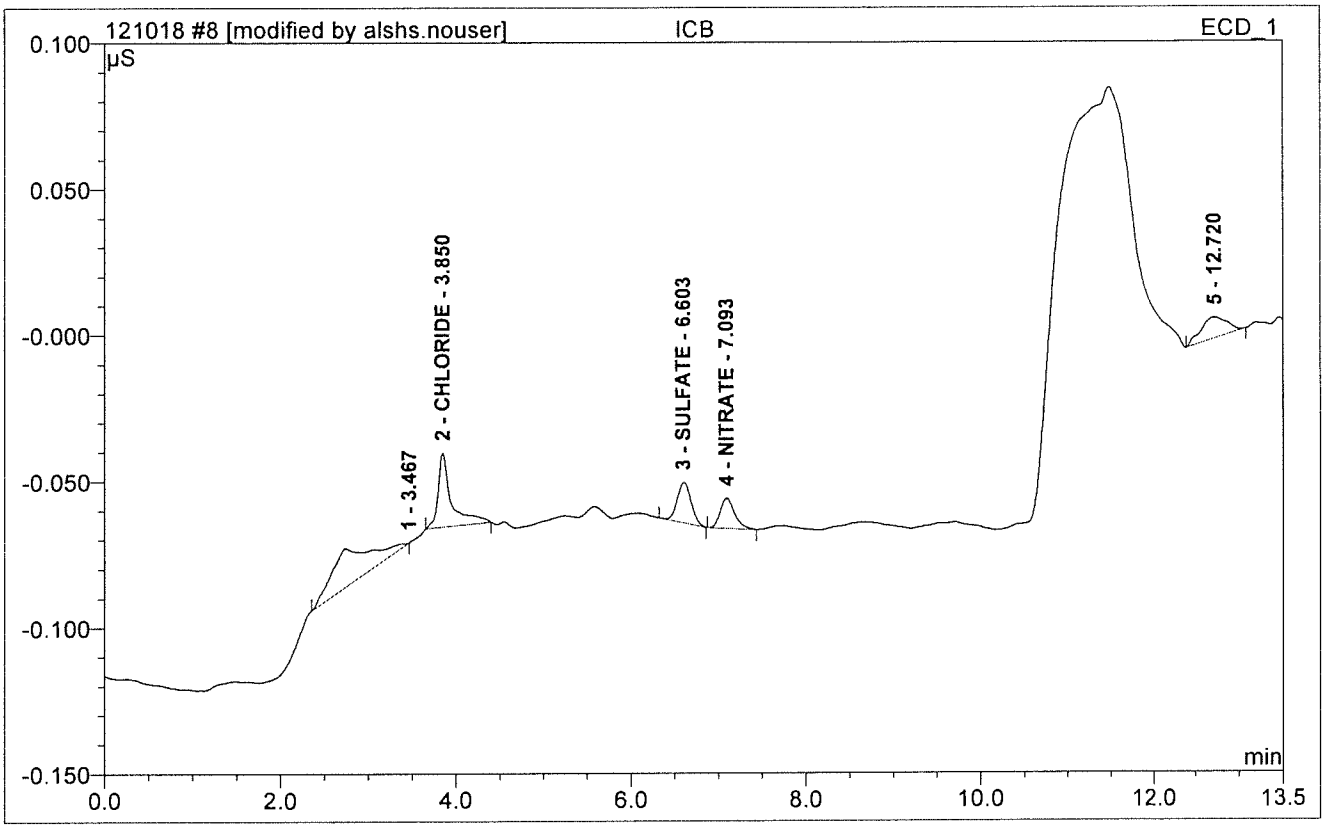
Sample Name:	**ICV**	*Injection Volume:*	**10.0**
Vial Number:	**97**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 1:58**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.989	0.586	10.41	4.279	1.
2	3.84	CHLORIDE	16.148	1.743	30.98	20.239	1.
3	4.56	NITRITE,N	6.333	0.791	14.07	4.395	1.
5	6.12	BROMIDE	0.855	0.123	2.19	3.673	1.
6	6.65	SULFATE	7.305	1.276	22.69	20.501	1.
7	7.09	NITRATE	4.880	0.850	15.11	4.006	1.
8	11.42	PHOSPHATE	1.372	0.242	4.30	3.458	1.
Total:			42.881	5.611	99.76	60.551	

8 ICB

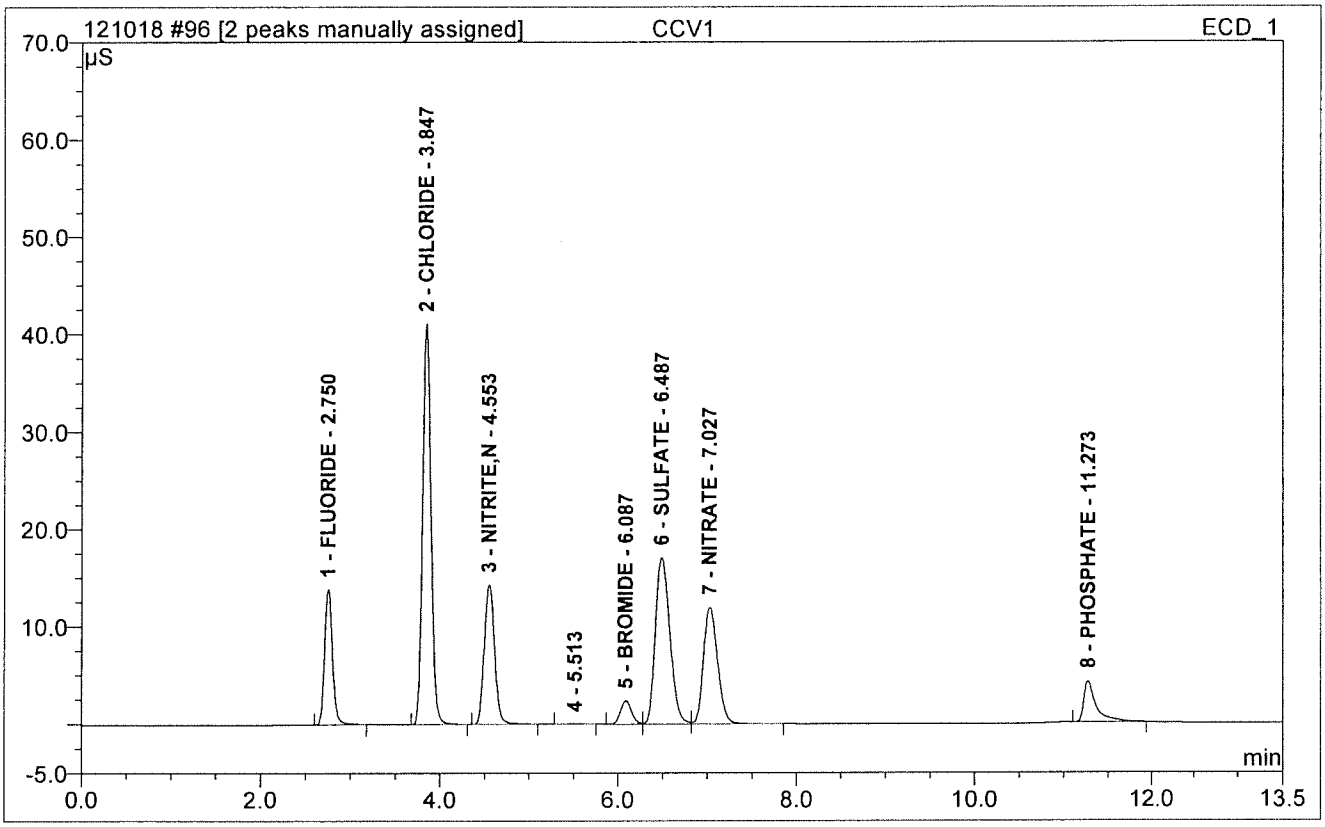
Sample Name:	**ICB**	*Injection Volume:*	**10.0**
Vial Number:	**98**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**11/30/2018 2:12**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
2	3.85	CHLORIDE	0.025	0.005	24.96	0.173	1.
3	6.60	SULFATE	0.014	0.003	14.12	0.088	1.
4	7.09	NITRATE	0.010	0.002	10.89	0.062	1.
Total:			0.050	0.009	49.97	0.324	

96 CCV1

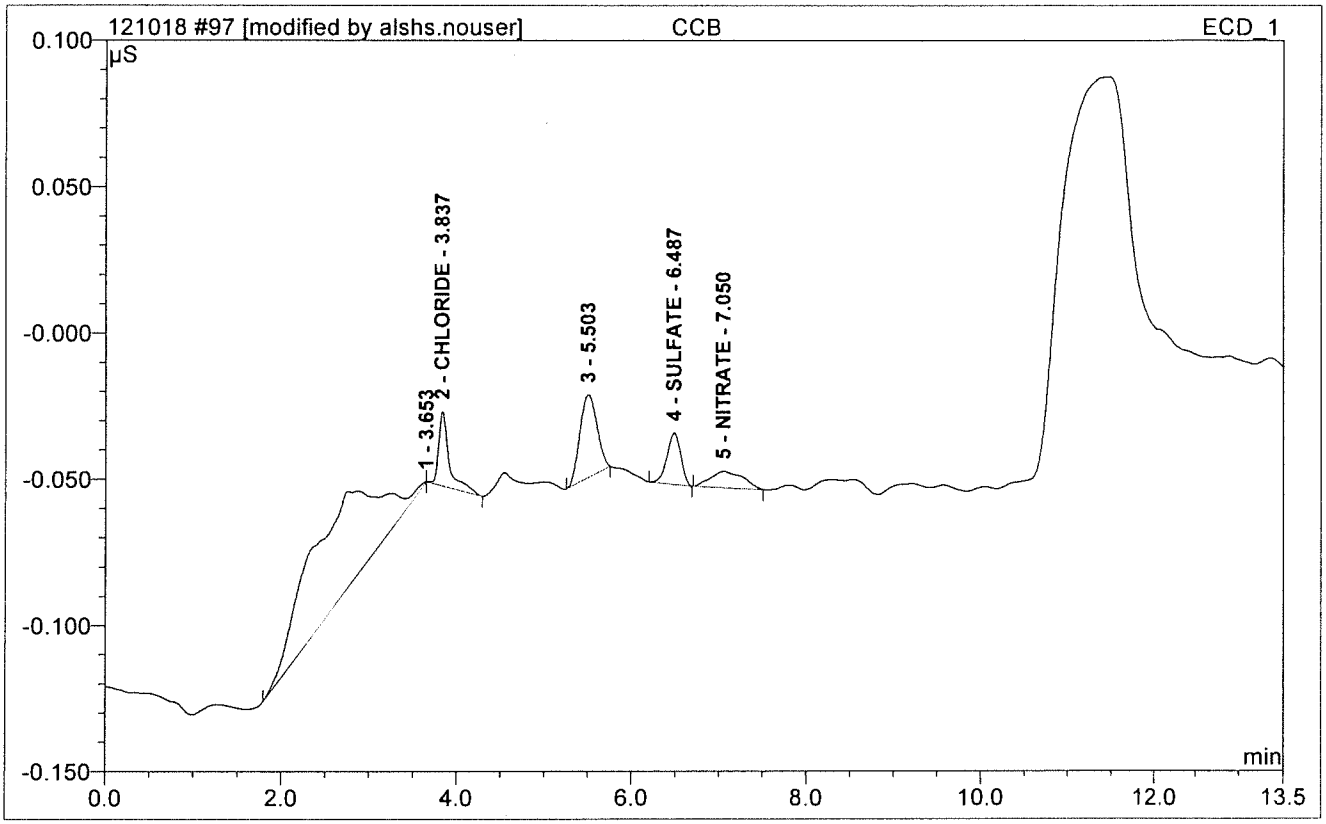
Sample Name:	**CCV1**	*Injection Volume:*	**10.0**
Vial Number:	**3**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 9:04**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	13.883	1.435	10.04	10.476	1.
2	3.85	CHLORIDE	41.110	4.476	31.32	51.795	1.
3	4.55	NITRITE,N	14.321	1.937	13.56	10.748	1.
5	6.09	BROMIDE	2.384	0.341	2.39	10.050	1.
6	6.49	SULFATE	17.137	3.219	22.52	51.629	1.
7	7.03	NITRATE	12.004	2.201	15.40	10.289	1.
8	11.27	PHOSPHATE	4.207	0.674	4.71	9.436	1.
Total:			105.047	14.282	99.95	154.423	

97 CCB

Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**4**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 9:18**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**

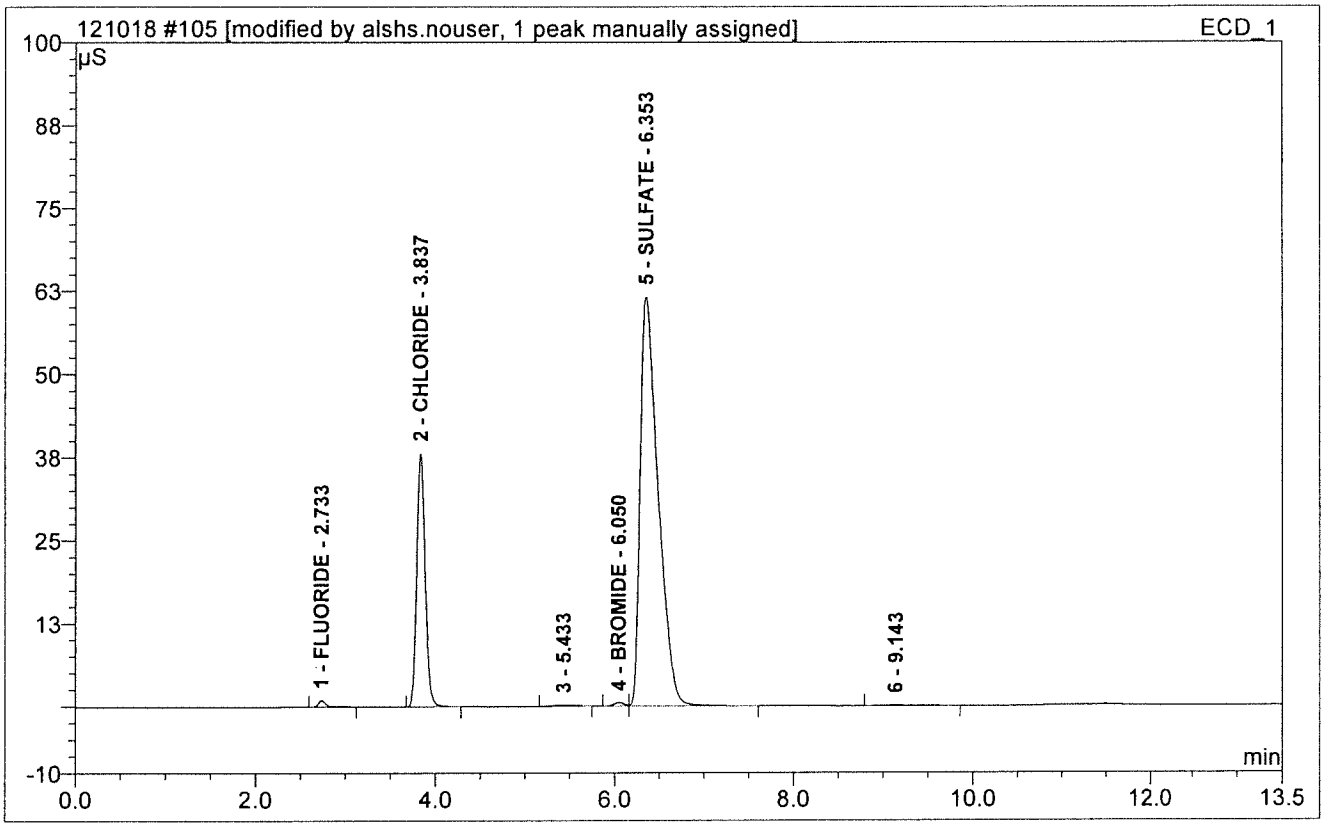


No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
2	3.84	CHLORIDE	0.025	0.004	7.52	0.162	1.
4	6.49	SULFATE	0.018	0.003	6.78	0.099	1.
5	7.05	NITRATE	0.006	0.002	5.15	0.065	1.
Total:			0.049	0.009	19.45	0.326	

105 HS18120545-04

MS/MSD below

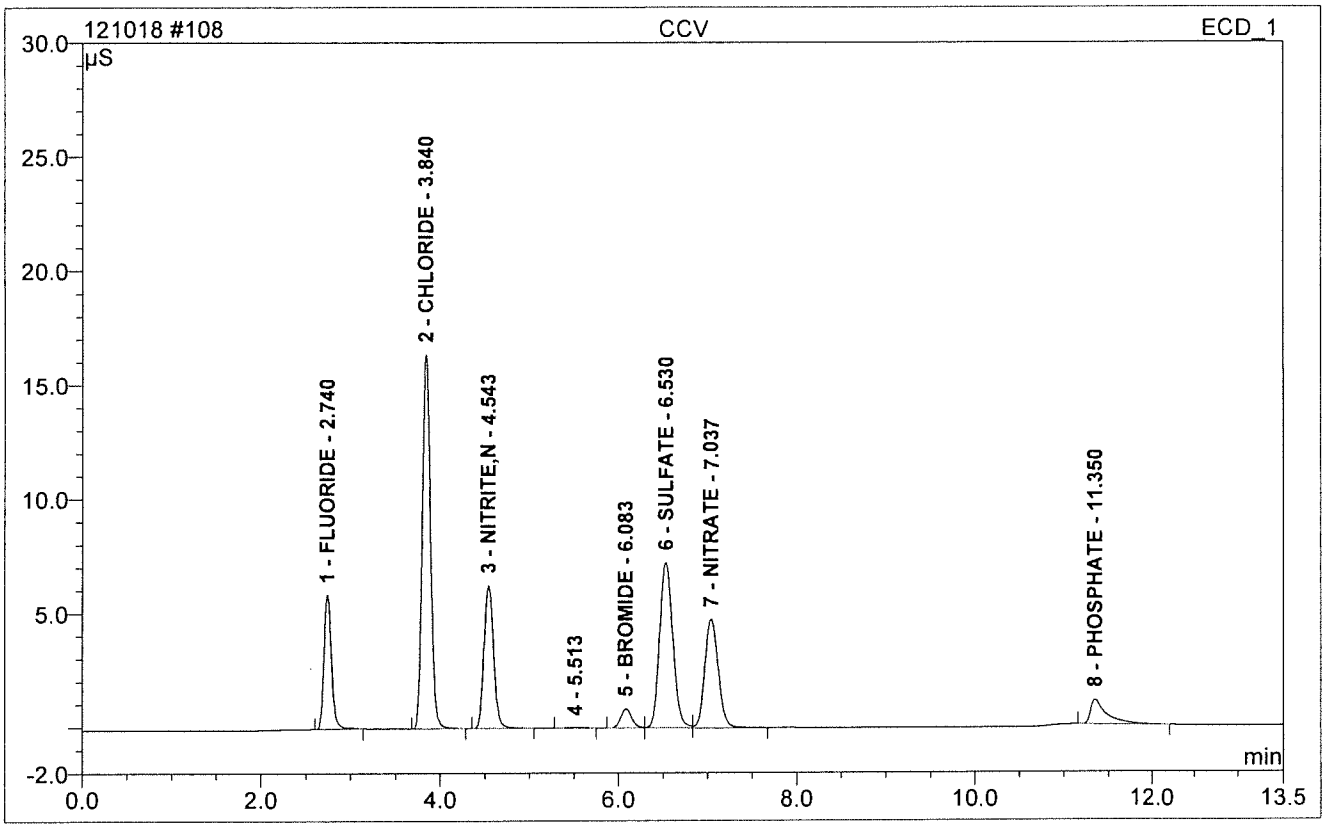
Sample Name:	**HS18120545-04**	*Injection Volume:*	**10.0**
Vial Number:	**14**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 11:14**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.941	0.093	0.50	0.685	1.
2	3.84	CHLORIDE	38.094	4.158	22.34	48.128	1.
4	6.05	BROMIDE	0.502	0.068	0.36	2.046	1.
5	6.35	SULFATE	61.535	14.222	76.41	227.972	1.
Total:			101.073	18.540	99.62	278.831	

108 CCV

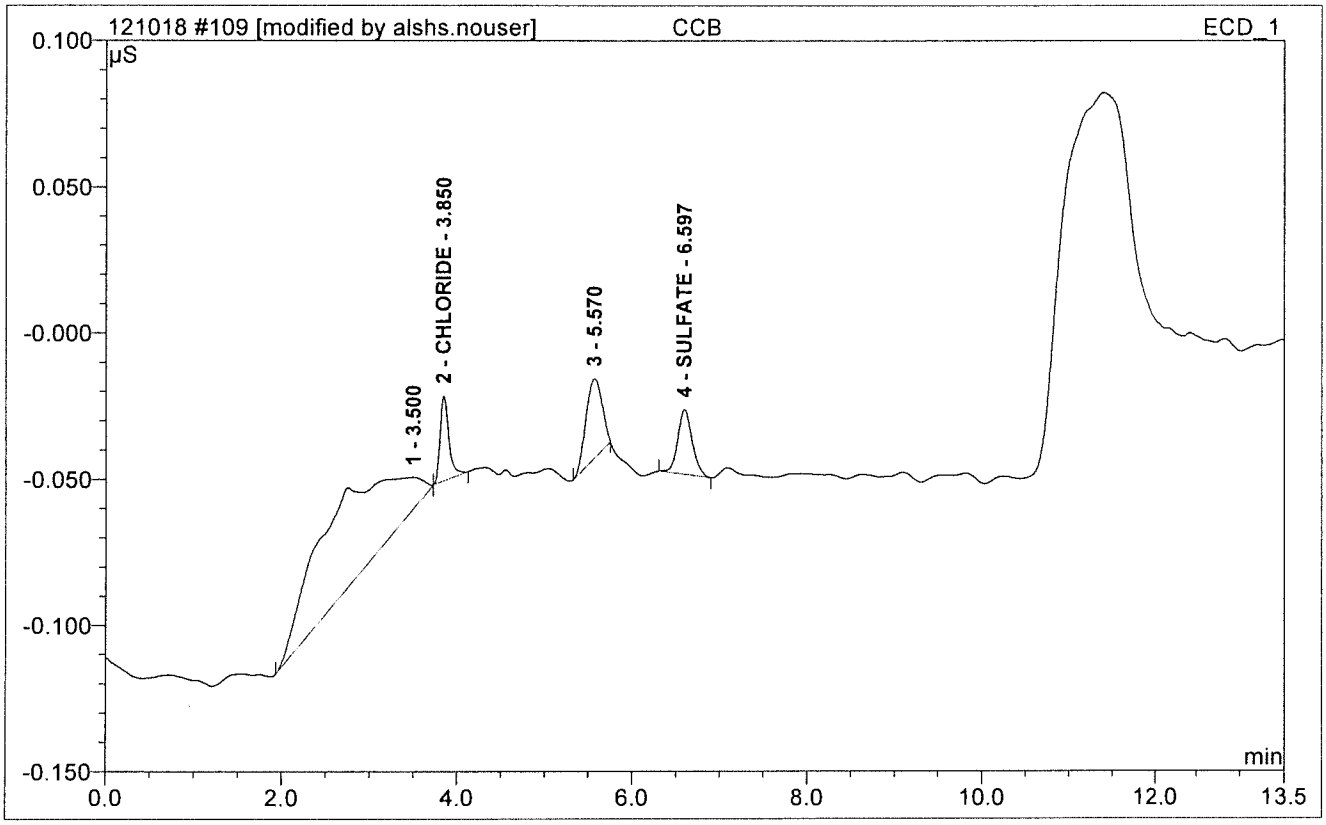
Sample Name:	**CCV**	*Injection Volume:*	**10.0**
Vial Number:	**1**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 11:58**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.891	0.572	10.31	4.179	1.
2	3.84	CHLORIDE	16.379	1.752	31.60	20.349	1.
3	4.54	NITRITE,N	6.269	0.787	14.19	4.371	1.
5	6.08	BROMIDE	0.832	0.119	2.15	3.549	1.
6	6.53	SULFATE	7.257	1.253	22.60	20.131	1.
7	7.04	NITRATE	4.778	0.835	15.07	3.938	1.
8	11.35	PHOSPHATE	1.067	0.219	3.95	3.141	1.
Total:			42.473	5.537	99.88	59.658	

109 CCB

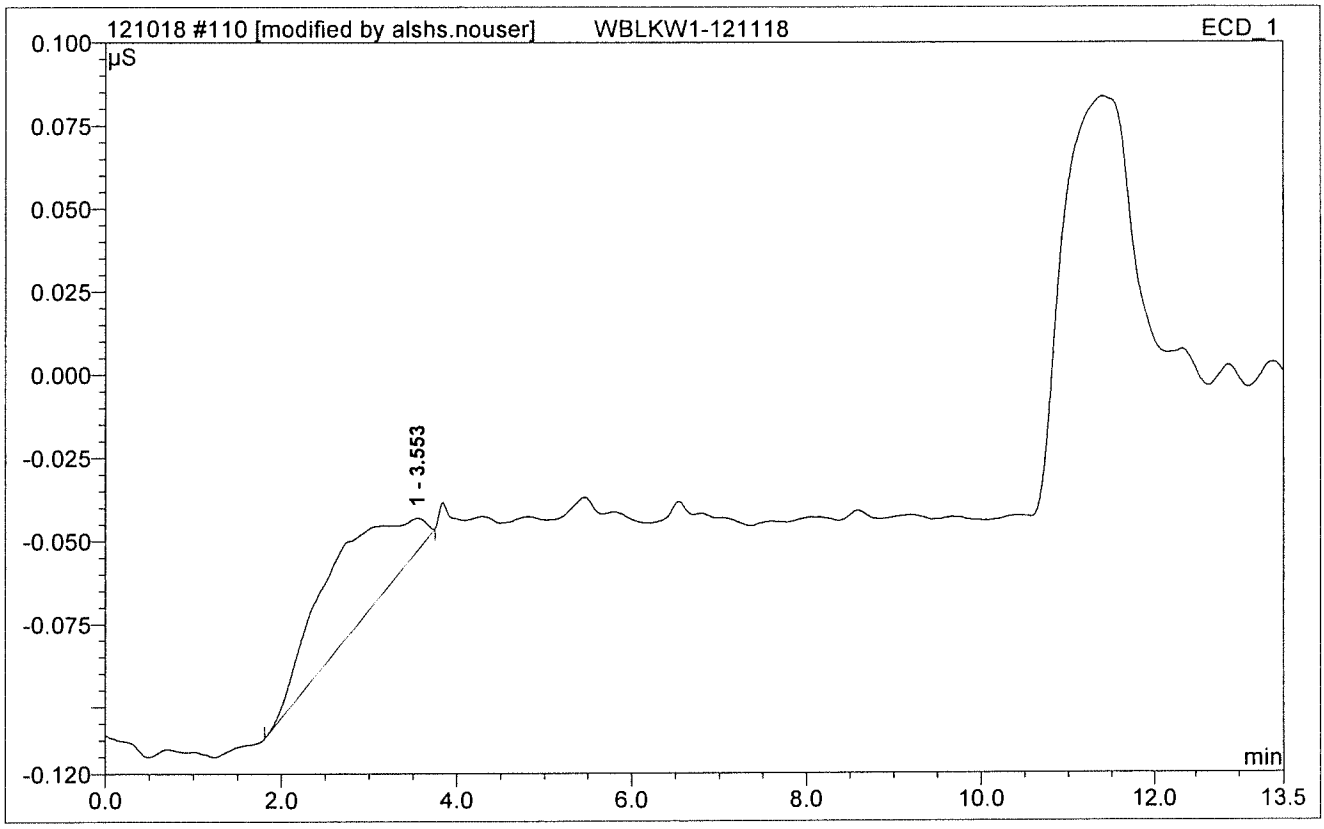
Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**2**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 12:13**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
2	3.85	CHLORIDE	0.029	0.003	6.97	0.160	1.
4	6.60	SULFATE	0.022	0.004	8.85	0.115	1.
Total:			0.051	0.008	15.83	0.275	

110 WBLKW1-121118

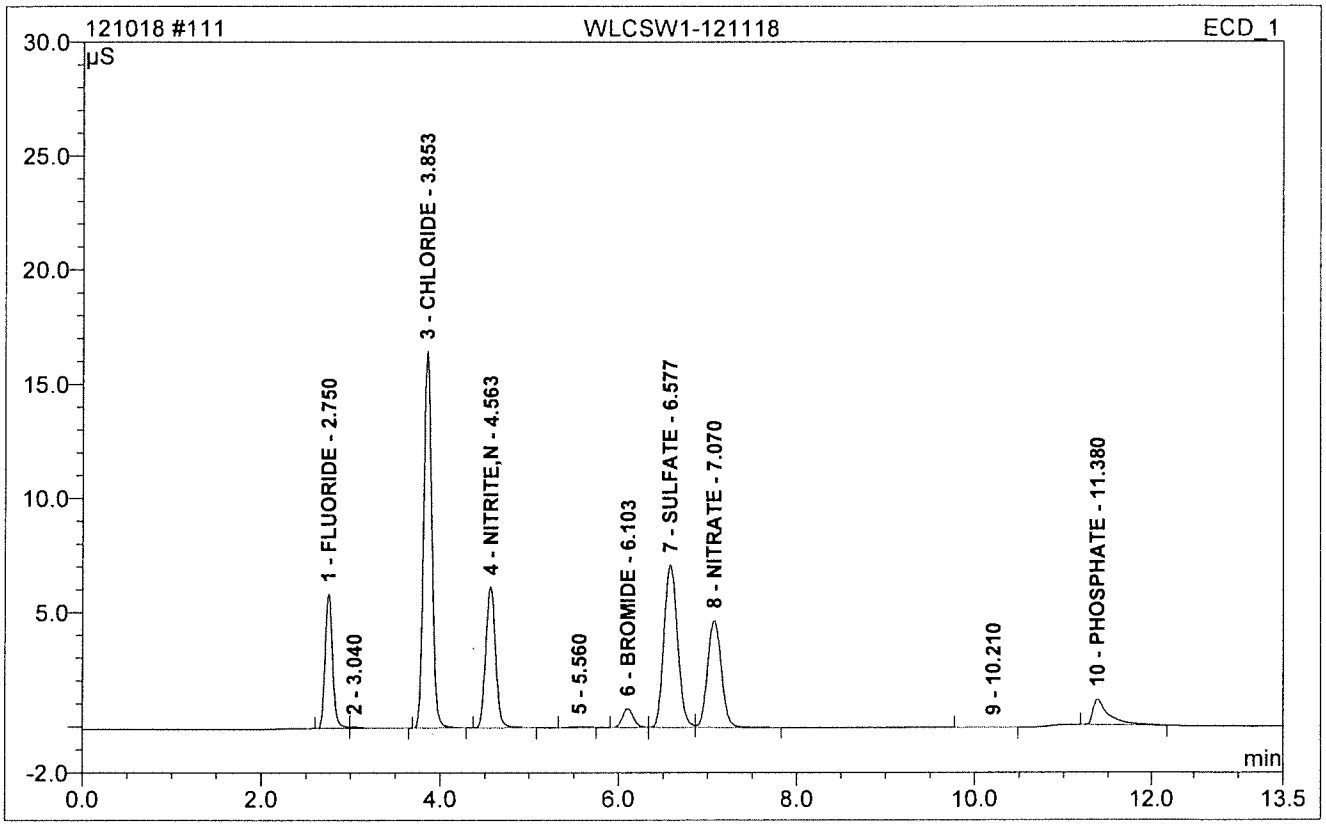
Sample Name:	**WBLKW1-121118**	*Injection Volume:*	**10.0**
Vial Number:	**5**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 12:27**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

111 WLCSW1-121118

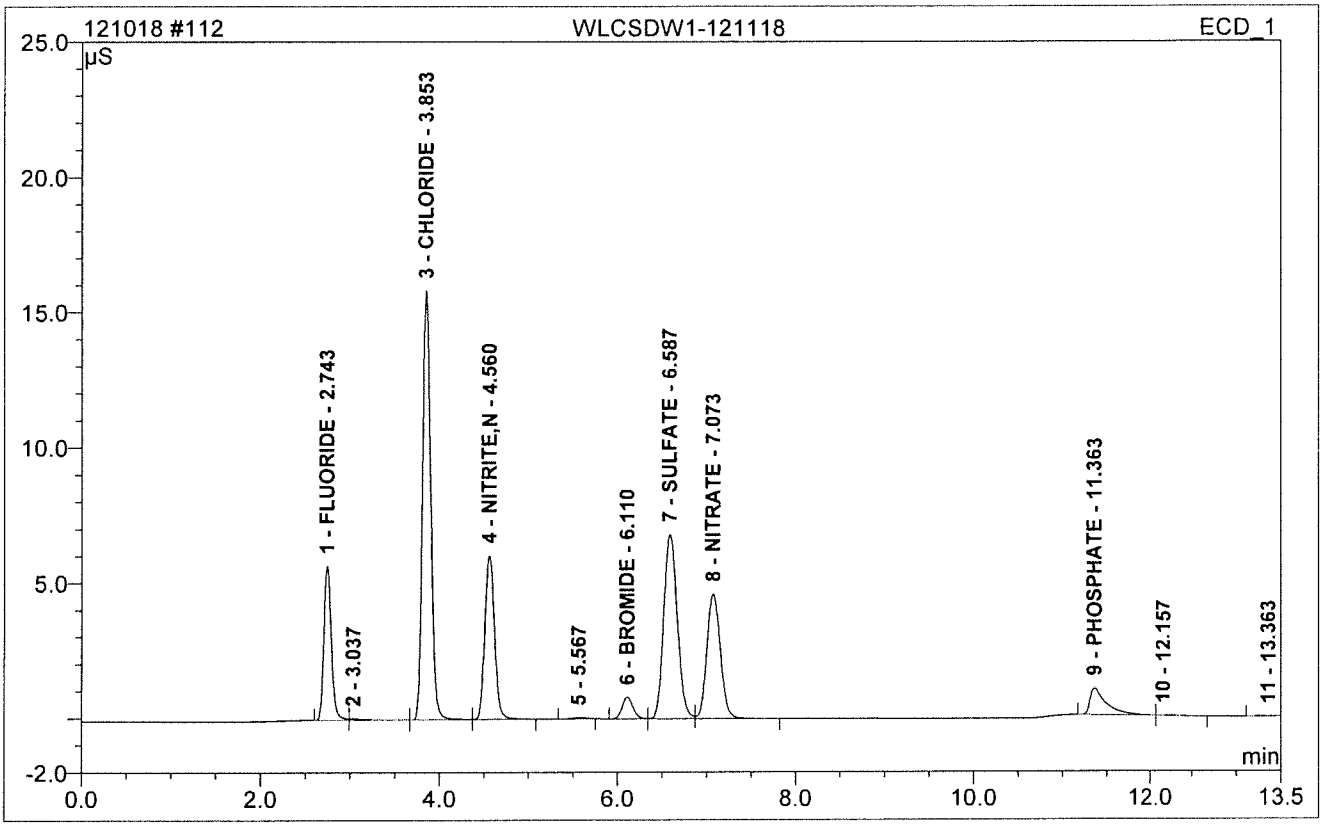
Sample Name:	**WLCSW1-121118**	*Injection Volume:*	**10.0**
Vial Number:	**6**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 12:42**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	5.856	0.574	10.27	4.192	1.
3	3.85	CHLORIDE	16.475	1.762	31.56	20.463	1.
4	4.56	NITRITE,N	6.148	0.791	14.17	4.395	1.
6	6.10	BROMIDE	0.829	0.117	2.10	3.496	1.
7	6.58	SULFATE	7.100	1.258	22.53	20.207	1.
8	7.07	NITRATE	4.670	0.840	15.04	3.958	1.
10	11.38	PHOSPHATE	1.117	0.223	4.00	3.202	1.
Total:			42.195	5.565	99.67	59.914	

112 WLCSDW1-121118

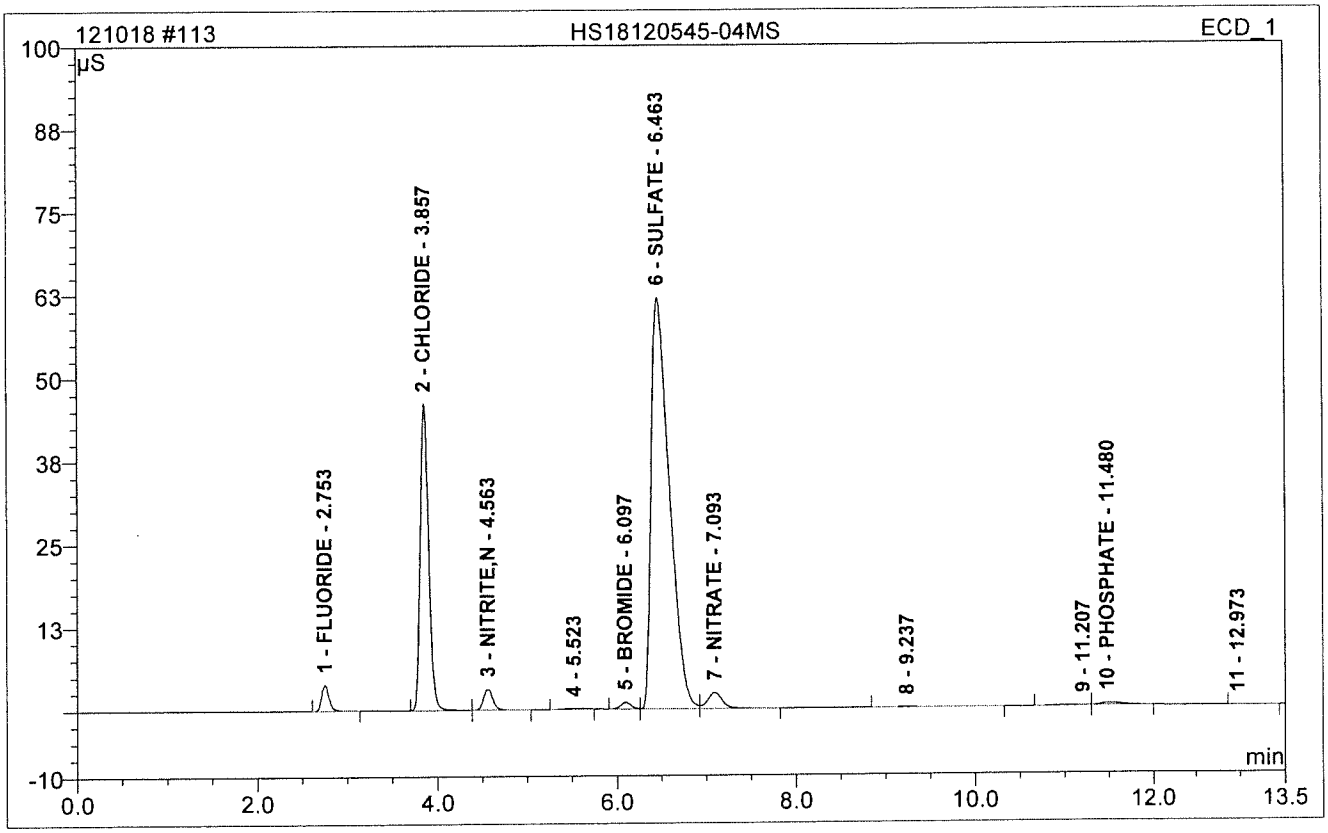
Sample Name:	**WLCSDW1-121118**	*Injection Volume:*	**10.0**
Vial Number:	**7**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 12:56**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.703	0.556	10.28	4.065	1.
3	3.85	CHLORIDE	15.845	1.710	31.58	19.858	1.
4	4.56	NITRITE,N	6.066	0.770	14.22	4.275	1.
6	6.11	BROMIDE	0.805	0.115	2.12	3.429	1.
7	6.59	SULFATE	6.831	1.220	22.54	19.599	1.
8	7.07	NITRATE	4.632	0.817	15.09	3.852	1.
9	11.36	PHOSPHATE	0.985	0.203	3.74	2.912	1.
Total:			40.867	5.390	99.57	57.991	

113 HS18120545-04MS

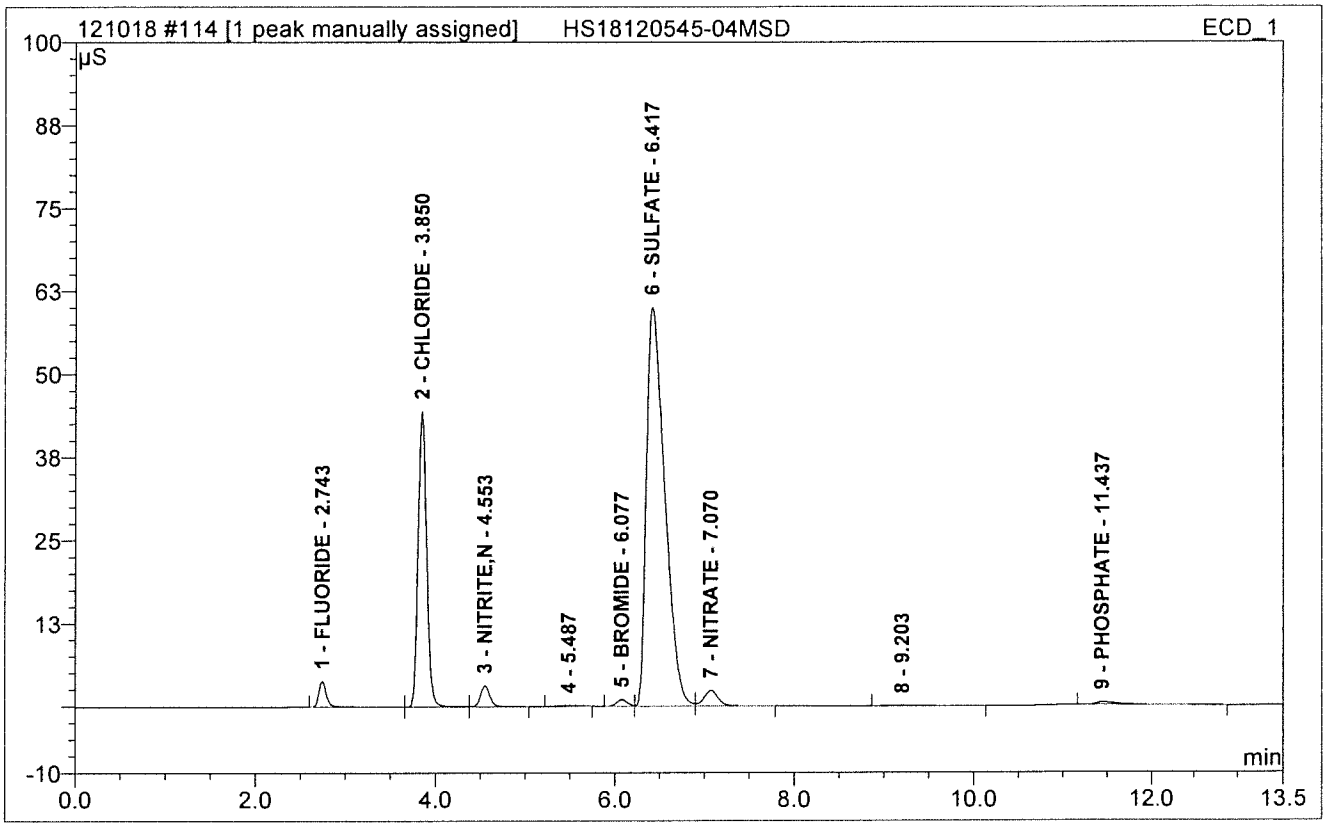
Sample Name:	**HS18120545-04MS**	*Injection Volume:*	**10.0**
Vial Number:	**15**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 13:37**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	3.938	0.382	1.81	2.794	1.
2	3.86	CHLORIDE	46.110	5.004	23.74	57.894	1.
3	4.56	NITRITE,N	3.189	0.387	1.84	2.155	1.
5	6.10	BROMIDE	0.986	0.133	0.63	3.950	1.
6	6.46	SULFATE	61.809	14.562	69.07	233.421	1.
7	7.09	NITRATE	2.402	0.449	2.13	2.143	1.
10	11.48	PHOSPHATE	0.294	0.085	0.40	1.283	1.
Total:			118.730	21.002	99.62	303.639	

114 HS18120545-04MSD

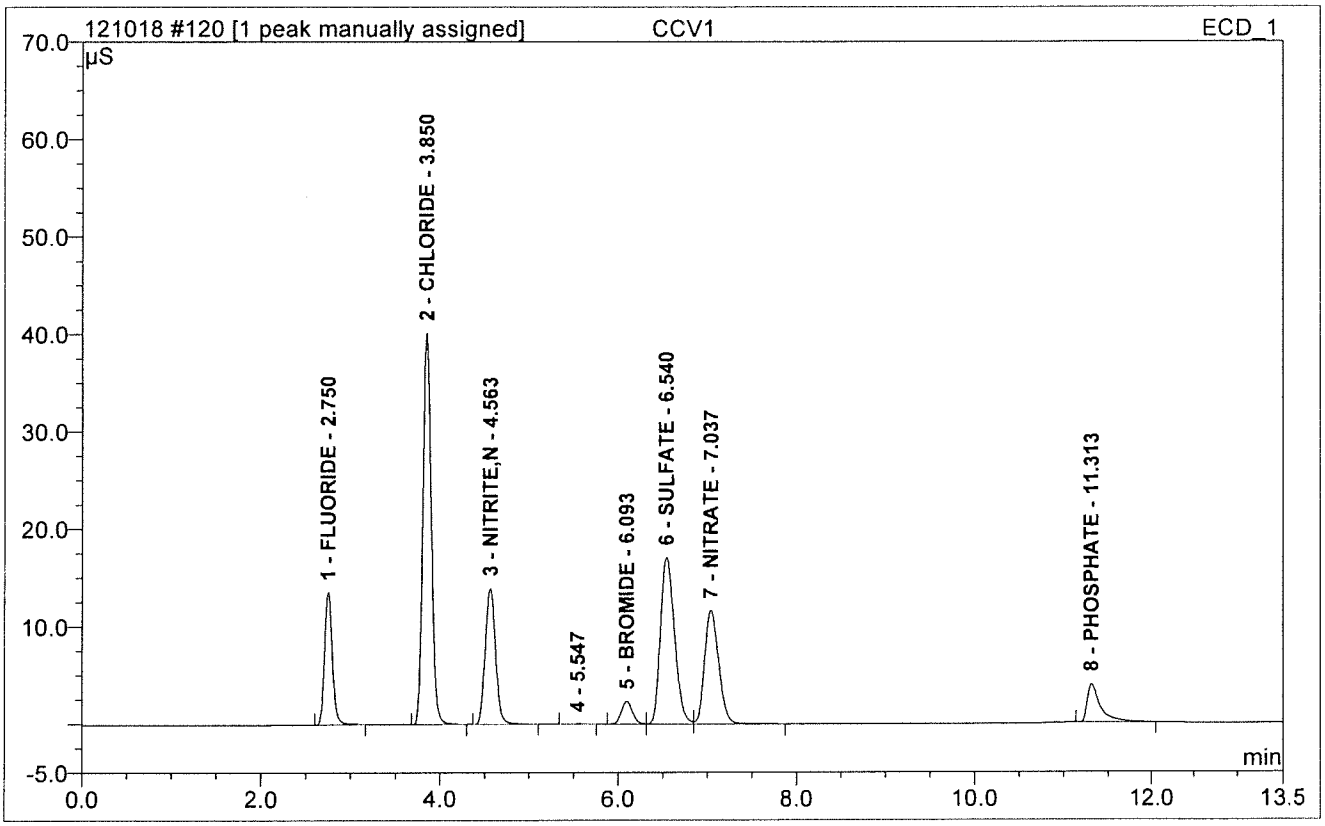
Sample Name:	**HS18120545-04MSD**	*Injection Volume:*	**10.0**
Vial Number:	**16**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 13:52**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	3.880	0.385	1.88	2.816	1.
2	3.85	CHLORIDE	44.424	4.857	23.68	56.196	1.
3	4.55	NITRITE,N	3.131	0.381	1.86	2.122	1.
5	6.08	BROMIDE	0.976	0.134	0.65	3.979	1.
6	6.42	SULFATE	60.058	14.168	69.08	227.108	1.
7	7.07	NITRATE	2.352	0.432	2.11	2.065	1.
9	11.44	PHOSPHATE	0.356	0.091	0.44	1.368	1.
Total:			115.176	20.449	99.70	295.655	

120 CCV1

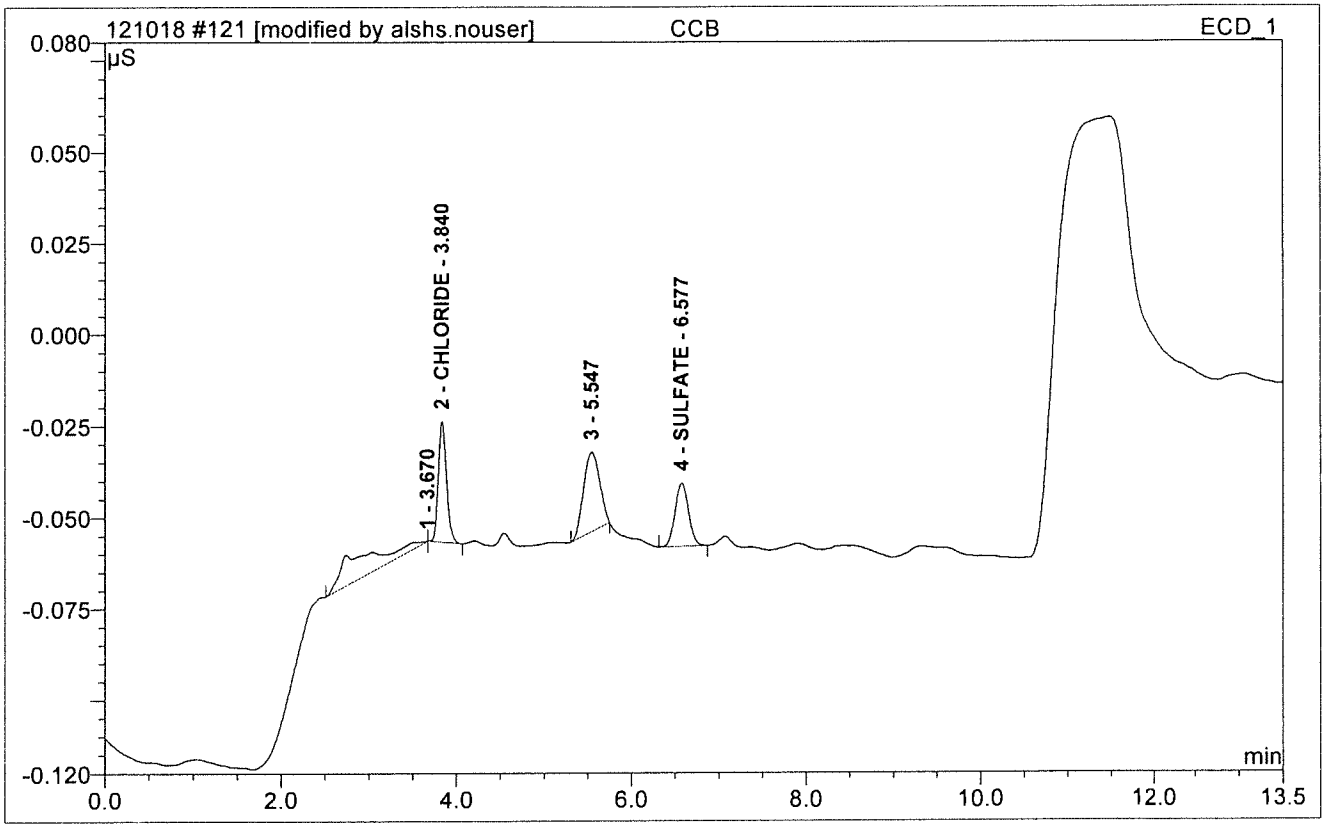
Sample Name:	**CCV1**	*Injection Volume:*	**10.0**
Vial Number:	**3**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 15:19**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	13.594	1.402	10.04	10.233	1.
2	3.85	CHLORIDE	40.183	4.371	31.30	50.592	1.
3	4.56	NITRITE,N	13.925	1.885	13.50	10.460	1.
5	6.09	BROMIDE	2.328	0.336	2.40	9.879	1.
6	6.54	SULFATE	17.089	3.137	22.47	50.329	1.
7	7.04	NITRATE	11.677	2.154	15.42	10.070	1.
8	11.31	PHOSPHATE	3.946	0.673	4.82	9.433	1.
Total:			102.743	13.959	99.96	150.996	

121 CCB

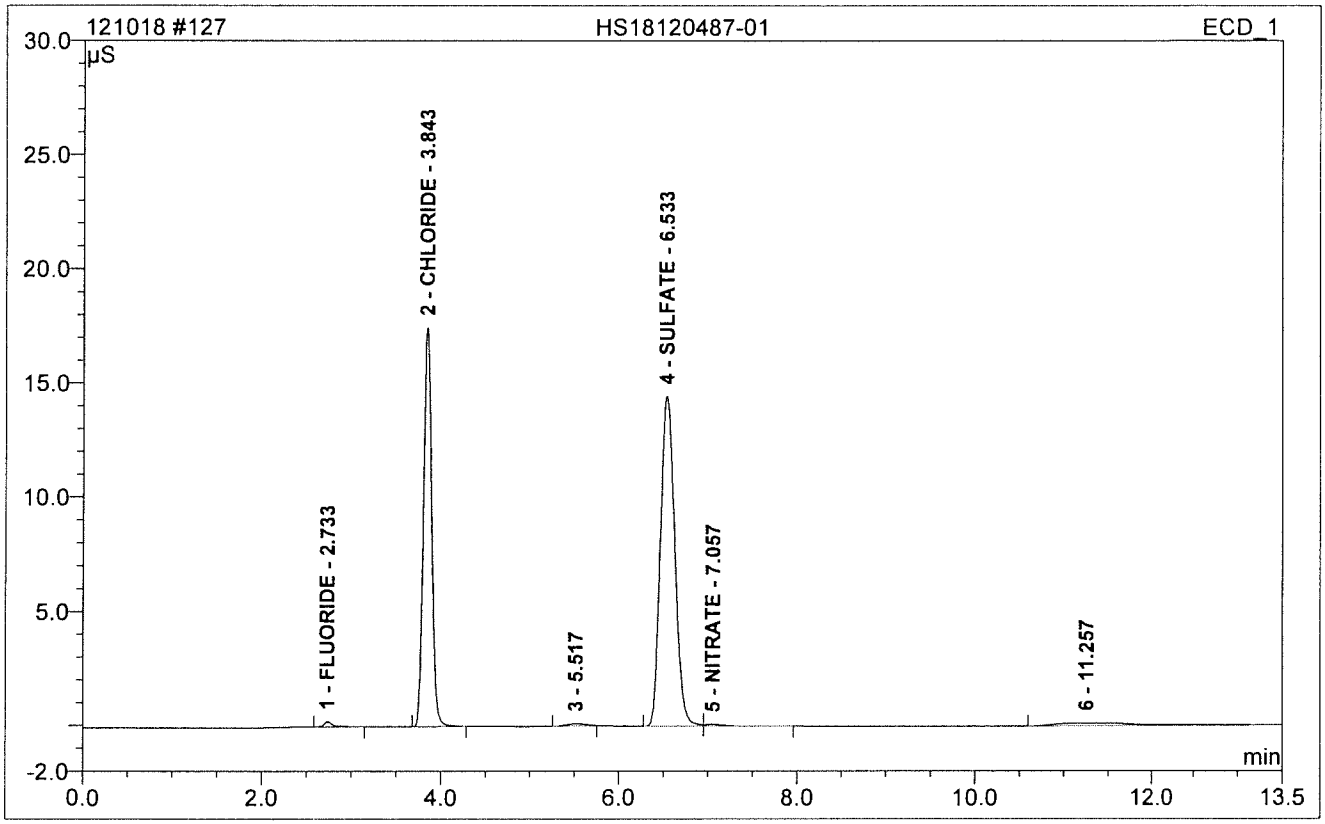
Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**4**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 15:34**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
2	3.84	CHLORIDE	0.033	0.004	23.57	0.163	1.
4	6.58	SULFATE	0.017	0.003	20.34	0.097	1.
Total:			0.050	0.007	43.90	0.260	

127 HS18120487-01

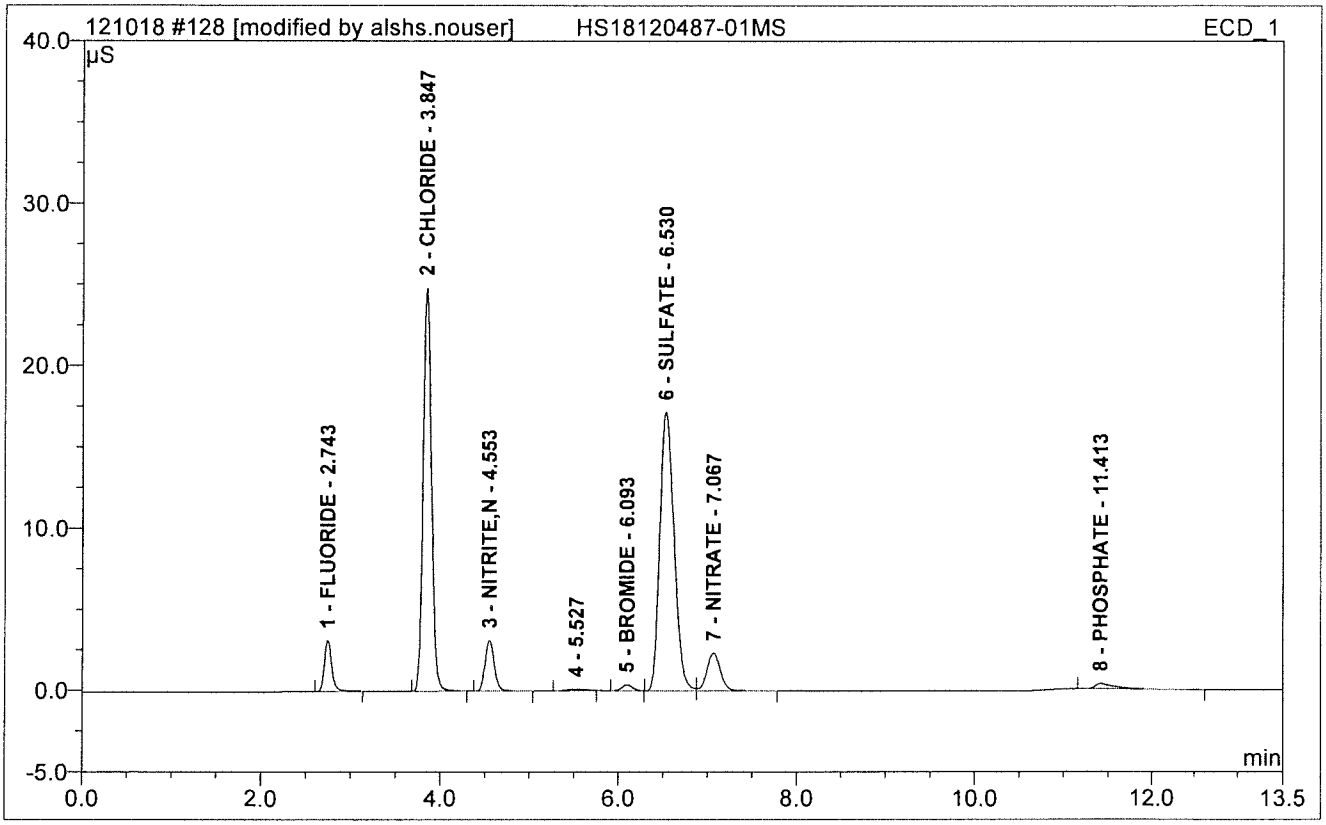
Sample Name:	**HS18120487-01**	*Injection Volume:*	**10.0**
Vial Number:	**21**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 17:01**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.223	0.025	0.53	0.191	1.
2	3.84	CHLORIDE	17.471	1.874	39.34	21.755	1.
4	6.53	SULFATE	14.449	2.693	56.54	43.206	1.
5	7.06	NITRATE	0.086	0.021	0.44	0.150	1.
Total:			32.229	4.613	96.85	65.303	

128 HS18120487-01MS

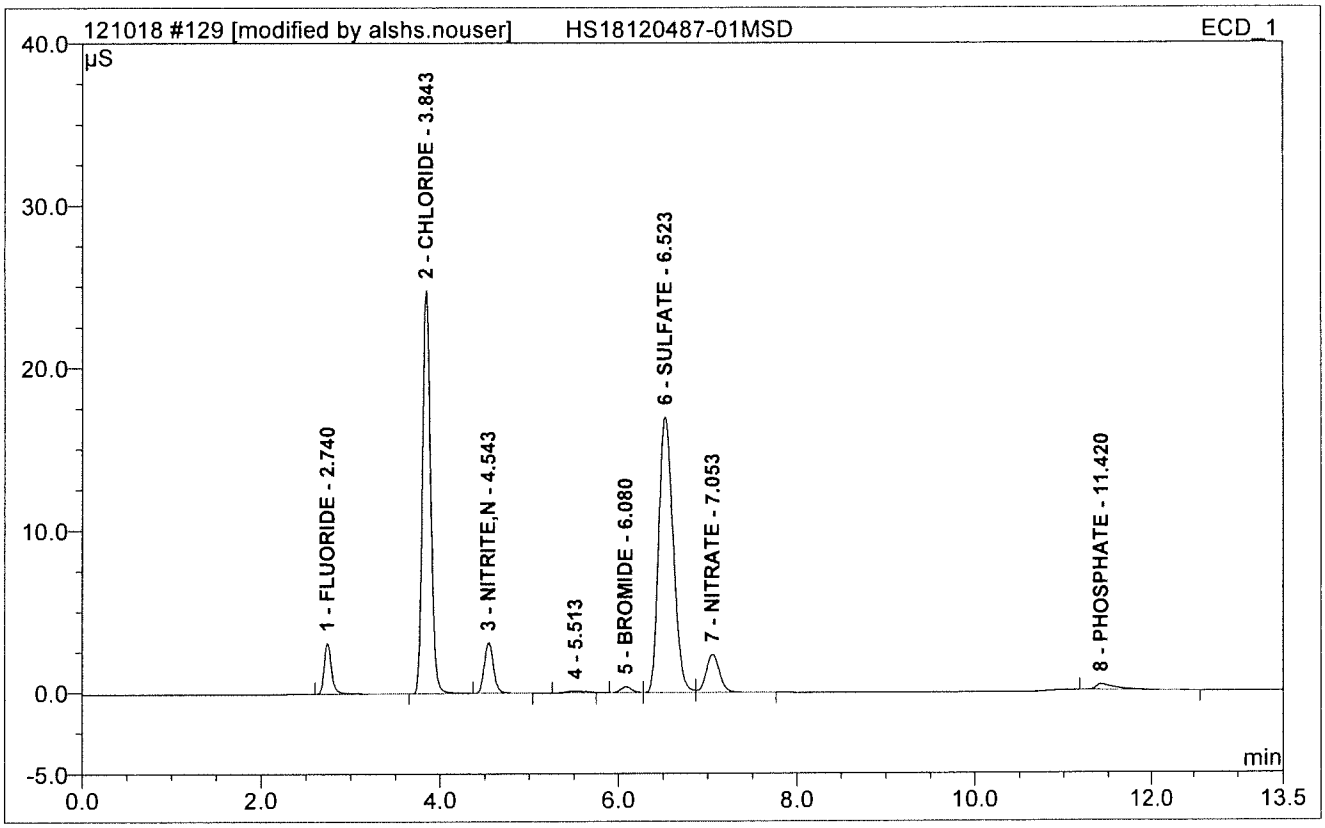
Sample Name:	**HS18120487-01MS**	*Injection Volume:*	**10.0**
Vial Number:	**22**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 17:16**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	3.132	0.301	4.22	2.200	1.
2	3.85	CHLORIDE	24.815	2.670	37.50	30.947	1.
3	4.55	NITRITE,N	3.109	0.376	5.29	2.095	1.
5	6.09	BROMIDE	0.371	0.051	0.72	1.573	1.
6	6.53	SULFATE	17.155	3.208	45.04	51.451	1.
7	7.07	NITRATE	2.331	0.411	5.78	1.967	1.
8	11.41	PHOSPHATE	0.324	0.080	1.12	1.210	1.
Total:			51.236	7.097	99.67	91.444	

129 HS18120487-01MSD

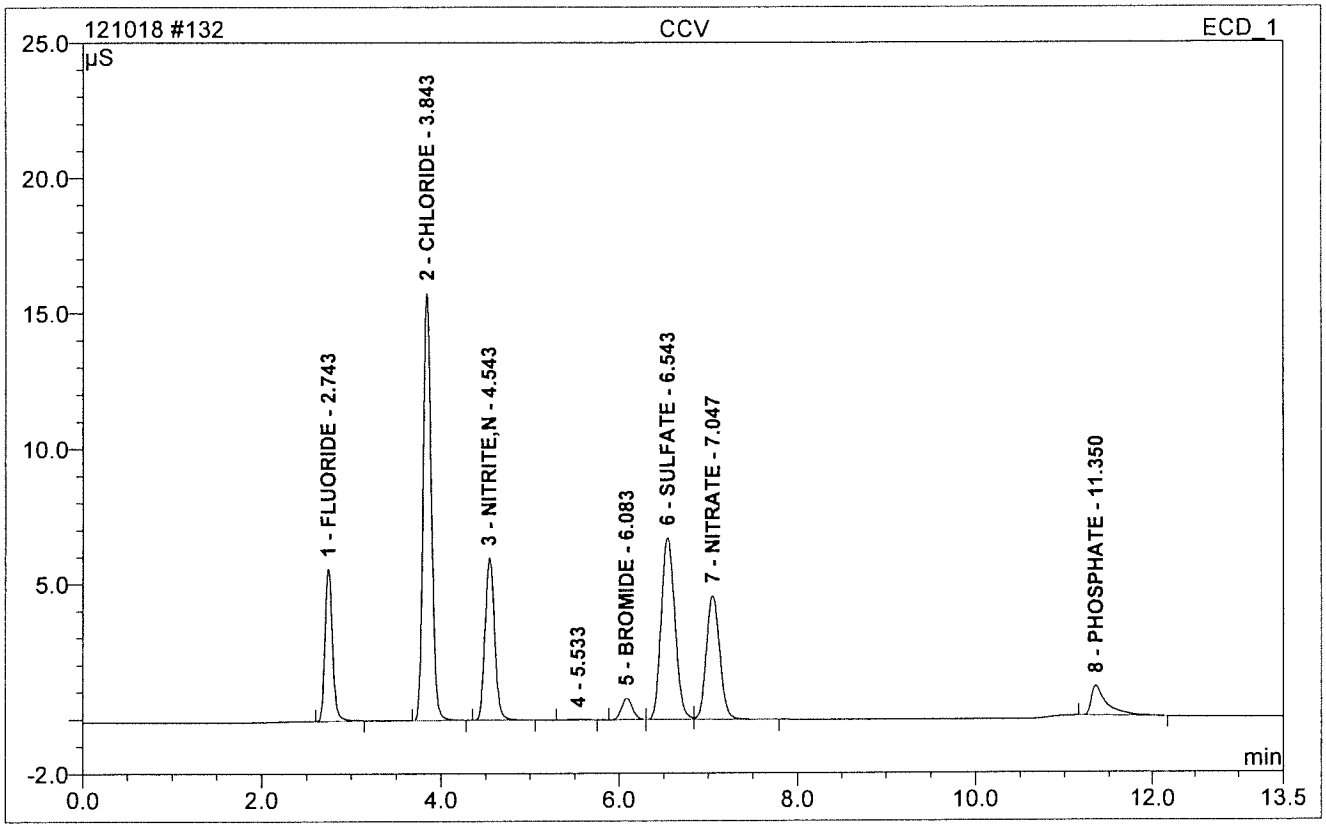
Sample Name:	**HS18120487-01MSD**	*Injection Volume:*	**10.0**
Vial Number:	**23**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 17:30**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	3.127	0.306	4.29	2.238	1.
2	3.84	CHLORIDE	24.812	2.675	37.52	31.011	1.
3	4.54	NITRITE,N	3.118	0.376	5.28	2.094	1.
5	6.08	BROMIDE	0.367	0.052	0.73	1.586	1.
6	6.52	SULFATE	16.969	3.198	44.85	51.306	1.
7	7.05	NITRATE	2.364	0.413	5.79	1.975	1.
8	11.42	PHOSPHATE	0.354	0.086	1.20	1.291	1.
Total:			51.112	7.106	99.66	91.500	

132 CCV

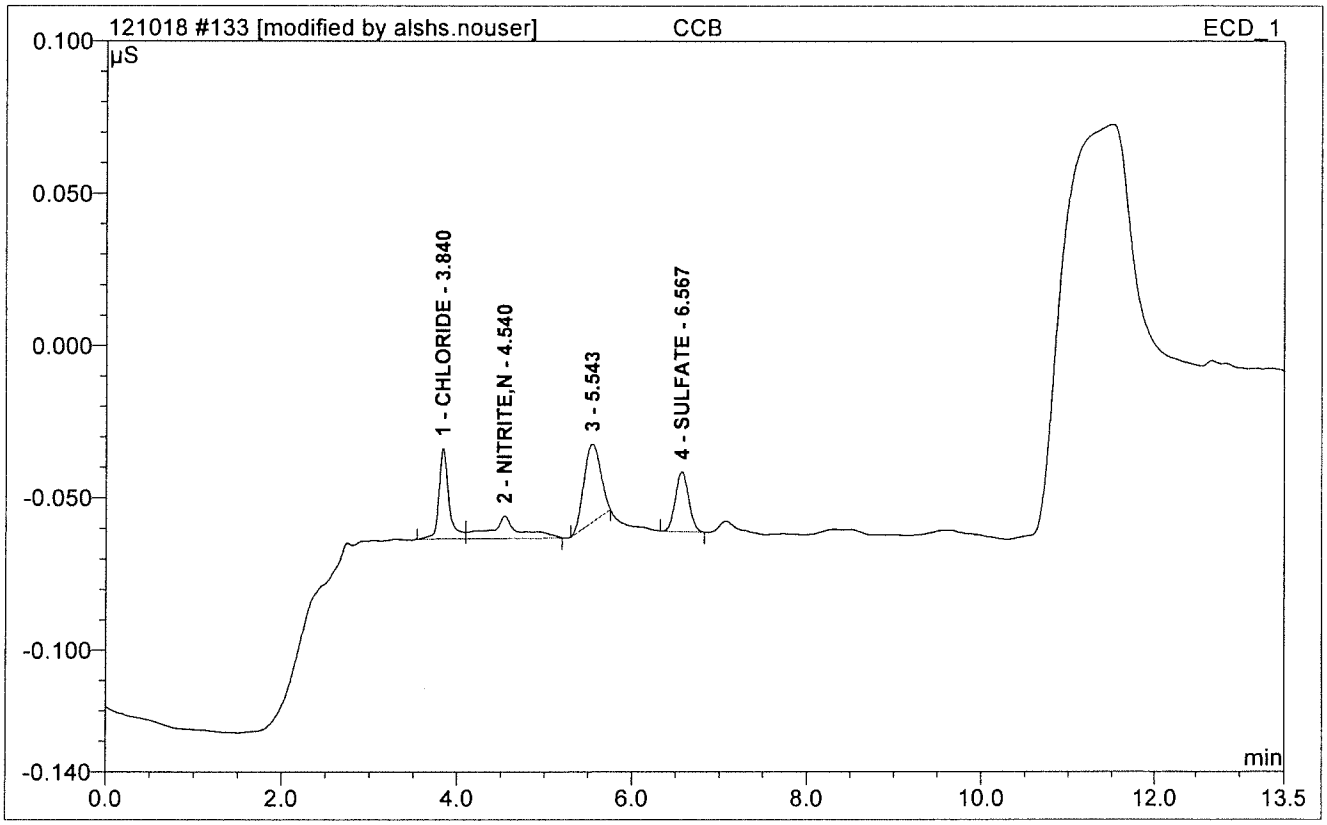
Sample Name:	**CCV**	*Injection Volume:*	**10.0**
Vial Number:	**1**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 18:14**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.628	0.549	10.30	4.016	1.
2	3.84	CHLORIDE	15.789	1.686	31.61	19.583	1.
3	4.54	NITRITE,N	5.999	0.758	14.21	4.209	1.
5	6.08	BROMIDE	0.798	0.112	2.10	3.344	1.
6	6.54	SULFATE	6.719	1.201	22.53	19.302	1.
7	7.05	NITRATE	4.576	0.801	15.02	3.780	1.
8	11.35	PHOSPHATE	1.098	0.219	4.11	3.145	1.
Total:			40.607	5.327	99.88	57.379	

133 CCB

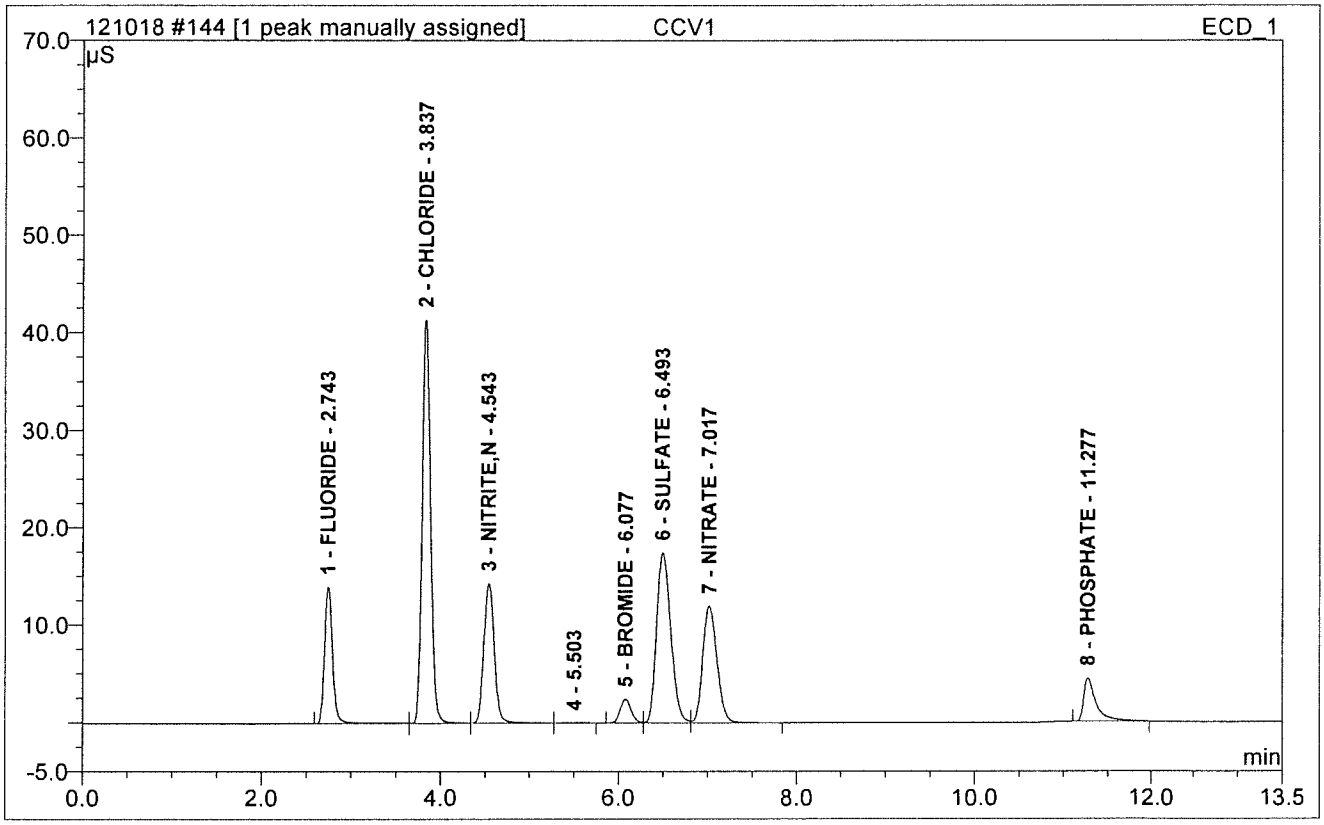
Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**2**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 18:28**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	3.84	CHLORIDE	0.030	0.004	24.73	0.167	1.
2	4.54	NITRITE,N	0.007	0.003	17.75	0.023	1.
4	6.57	SULFATE	0.020	0.003	21.88	0.103	1.
Total:			0.057	0.010	64.35	0.293	

144 CCV1

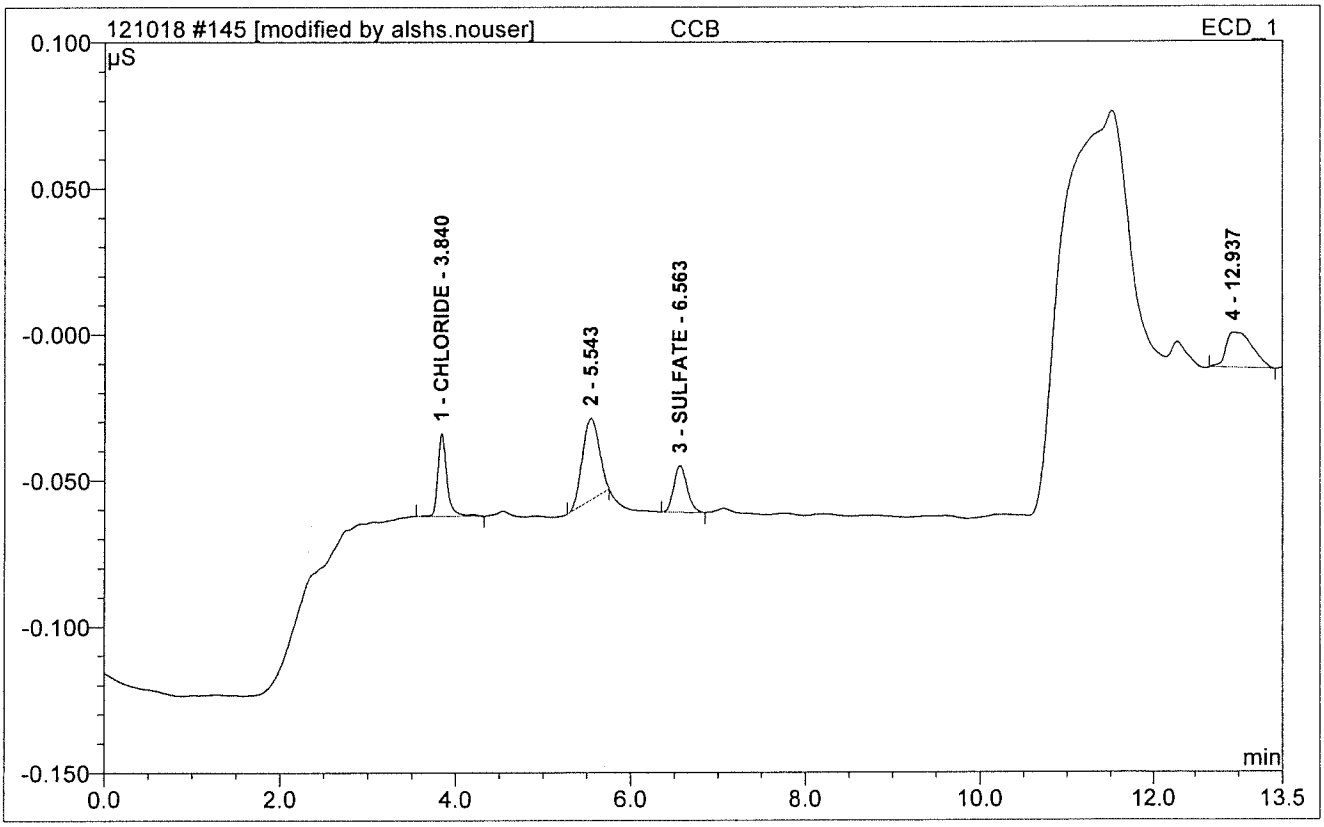
Sample Name:	**CCV1**	*Injection Volume:*	**10.0**
Vial Number:	**3**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 21:08**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	13.989	1.453	10.07	10.608	1.
2	3.84	CHLORIDE	41.373	4.502	31.20	52.095	1.
3	4.54	NITRITE,N	14.341	1.957	13.56	10.859	1.
5	6.08	BROMIDE	2.428	0.347	2.40	10.205	1.
6	6.49	SULFATE	17.414	3.235	22.42	51.885	1.
7	7.02	NITRATE	11.961	2.213	15.34	10.345	1.
8	11.28	PHOSPHATE	4.400	0.711	4.93	9.962	1.
Total:			105.907	14.418	99.93	155.959	

145 CCB

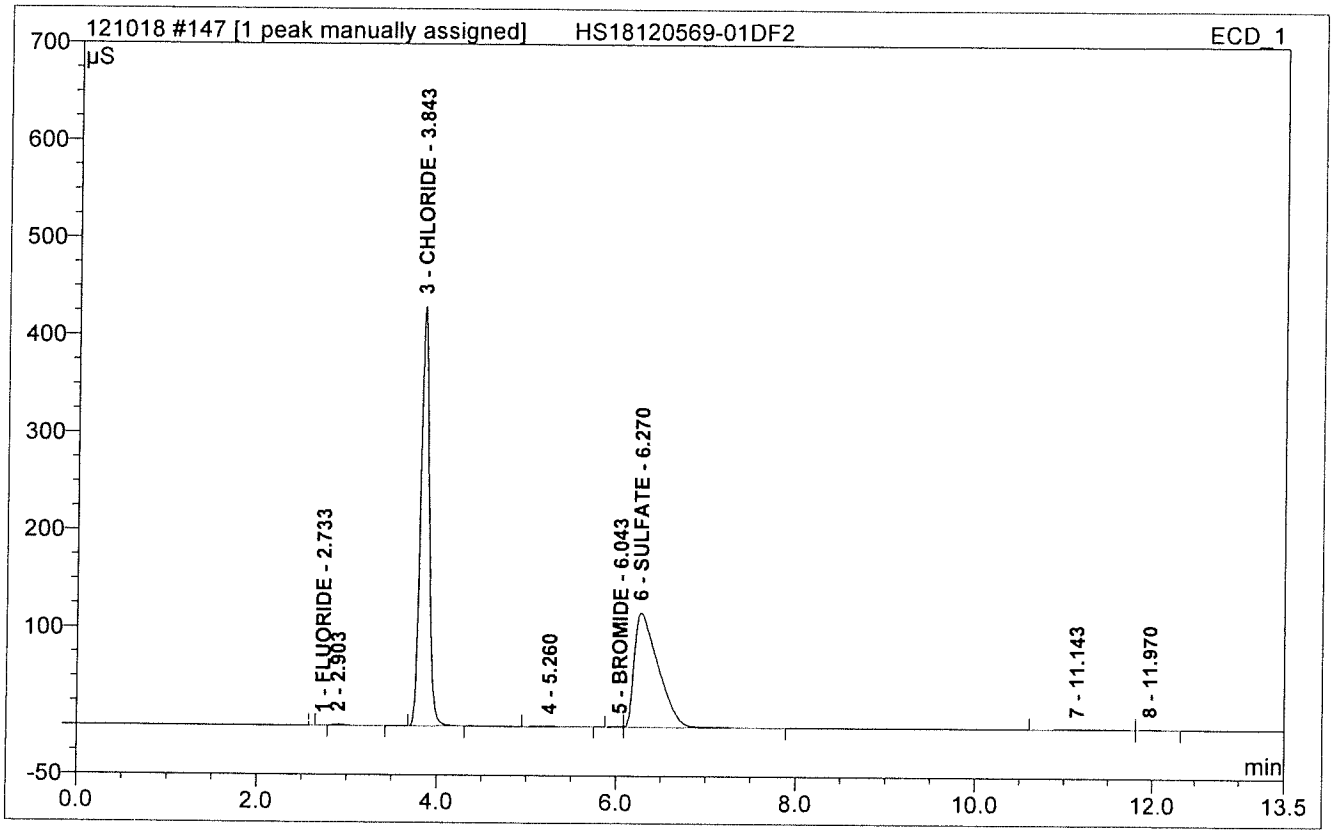
Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**4**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 21:23**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	3.84	CHLORIDE	0.028	0.003	20.56	0.161	1.
3	6.56	SULFATE	0.016	0.003	17.11	0.093	1.
Total:			0.044	0.006	37.67	0.253	

147 HS18120569-01DF2

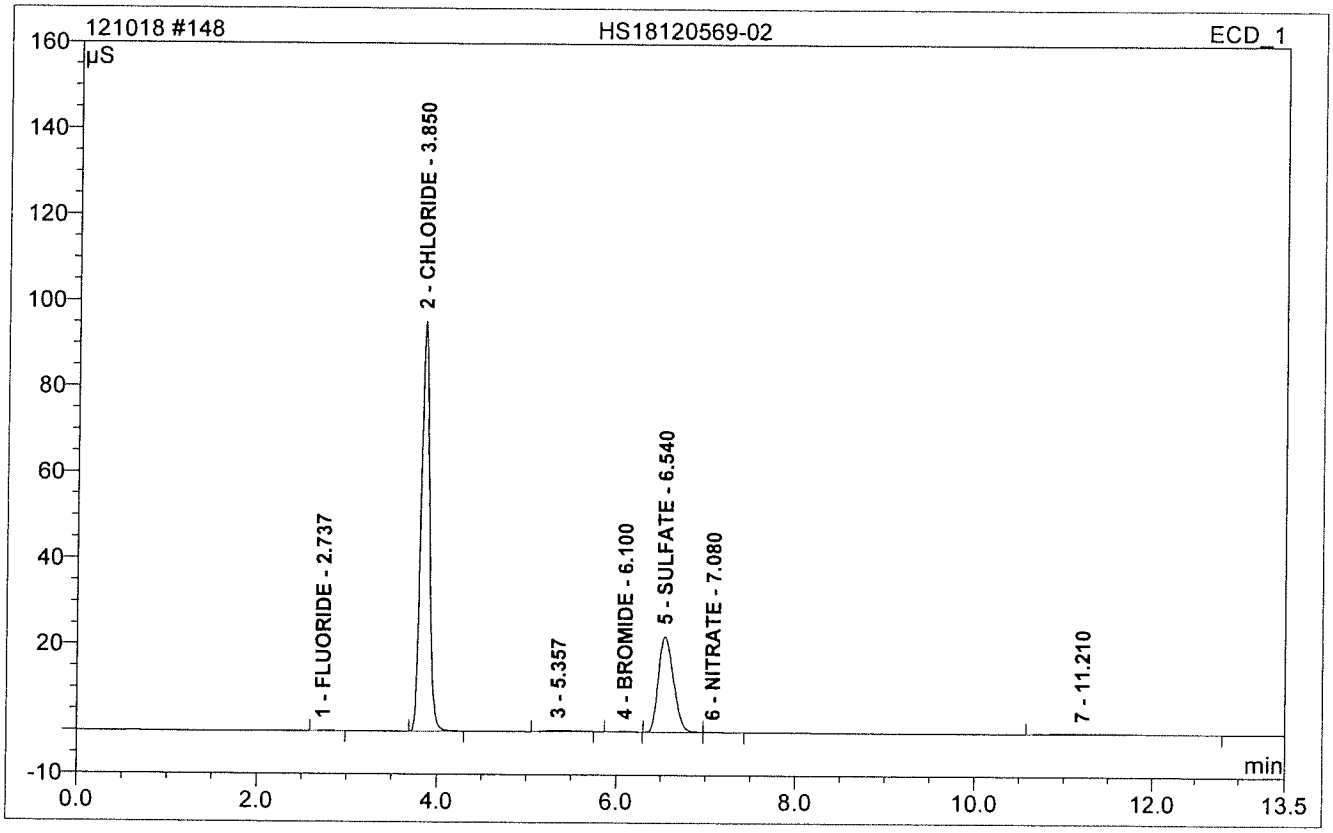
Sample Name:	**HS18120569-01DF2**	*Injection Volume:*	**10.0**
Vial Number:	**34**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**2.**
Recording Time:	**12/11/2018 21:52**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.134	0.009	0.01	0.148	2.
3	3.84	CHLORIDE	429.977	48.114	56.94	1111.249	2.
5	6.04	BROMIDE	0.675	0.068	0.08	4.121	2.
6	6.27	SULFATE	117.224	35.848	42.42	1149.090	2.
Total:			548.011	84.039	99.45	2264.608	

148 HS18120569-02

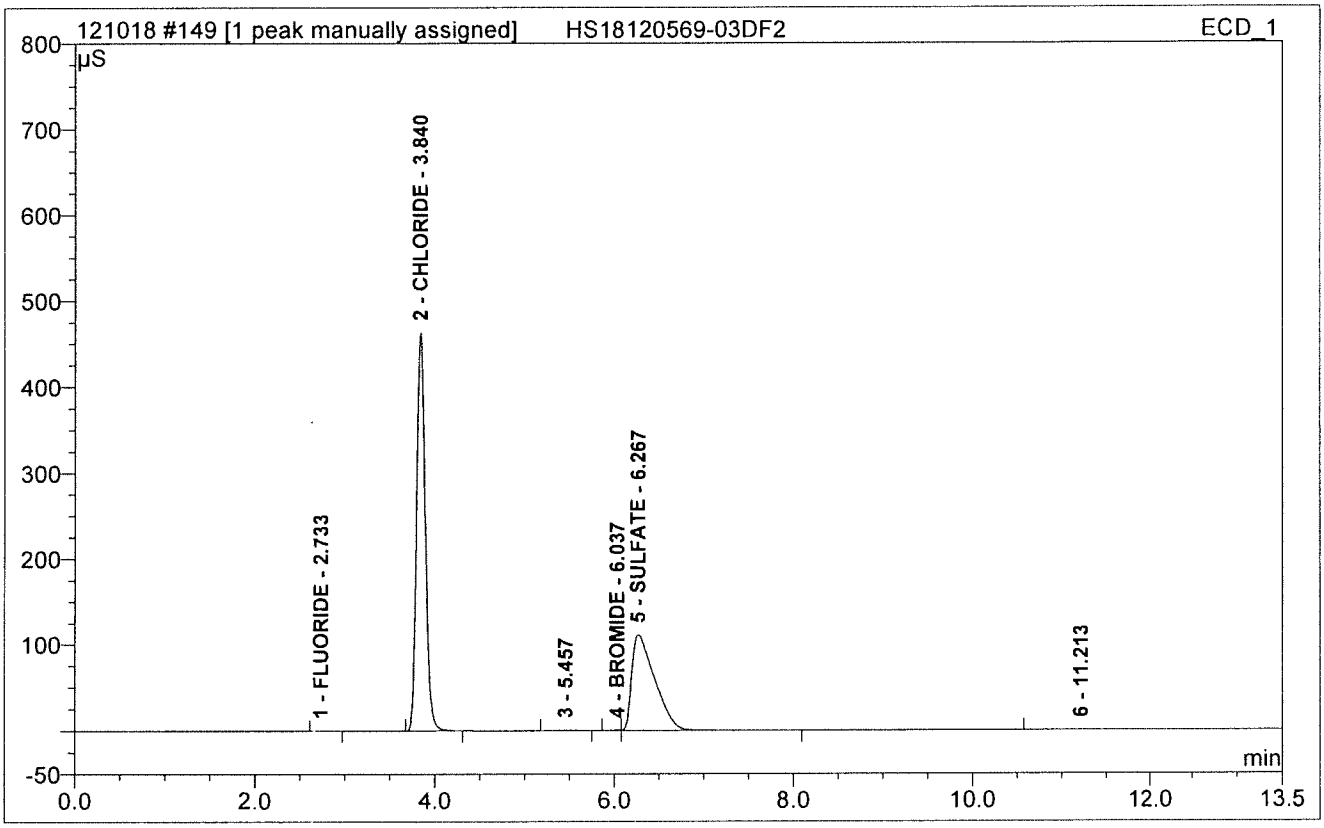
Sample Name:	**HS18120569-02**	*Injection Volume:*	**10.0**
Vial Number:	**35**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/11/2018 22:07**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.086	0.010	0.06	0.078	1.
2	3.85	CHLORIDE	95.414	10.373	69.09	119.888	1.
4	6.10	BROMIDE	0.120	0.018	0.12	0.606	1.
5	6.54	SULFATE	22.320	4.360	29.04	69.924	1.
6	7.08	NITRATE	0.116	0.022	0.15	0.157	1.
Total:			118.057	14.784	98.47	190.653	

149 HS18120569-03DF2

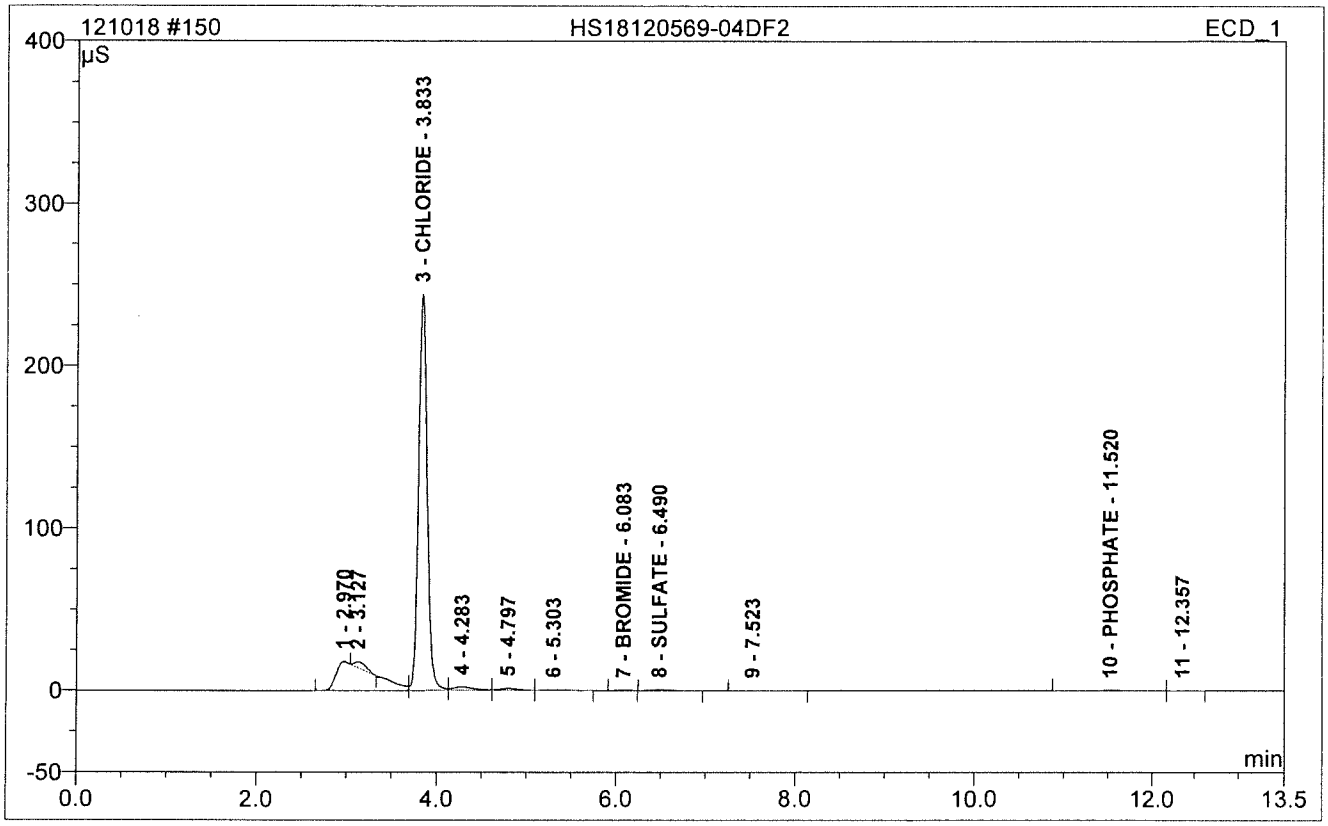
Sample Name:	**HS18120569-03DF2**	*Injection Volume:*	**10.0**
Vial Number:	**36**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**2.**
Recording Time:	**12/11/2018 22:21**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.067	0.008	0.01	0.127	2.
2	3.84	CHLORIDE	462.670	52.110	61.27	1203.506	2.
4	6.04	BROMIDE	0.602	0.064	0.08	3.873	2.
5	6.27	SULFATE	111.036	32.670	38.41	1047.244	2.
Total:			574.374	84.851	99.76	2254.750	

150 HS18120569-04DF2

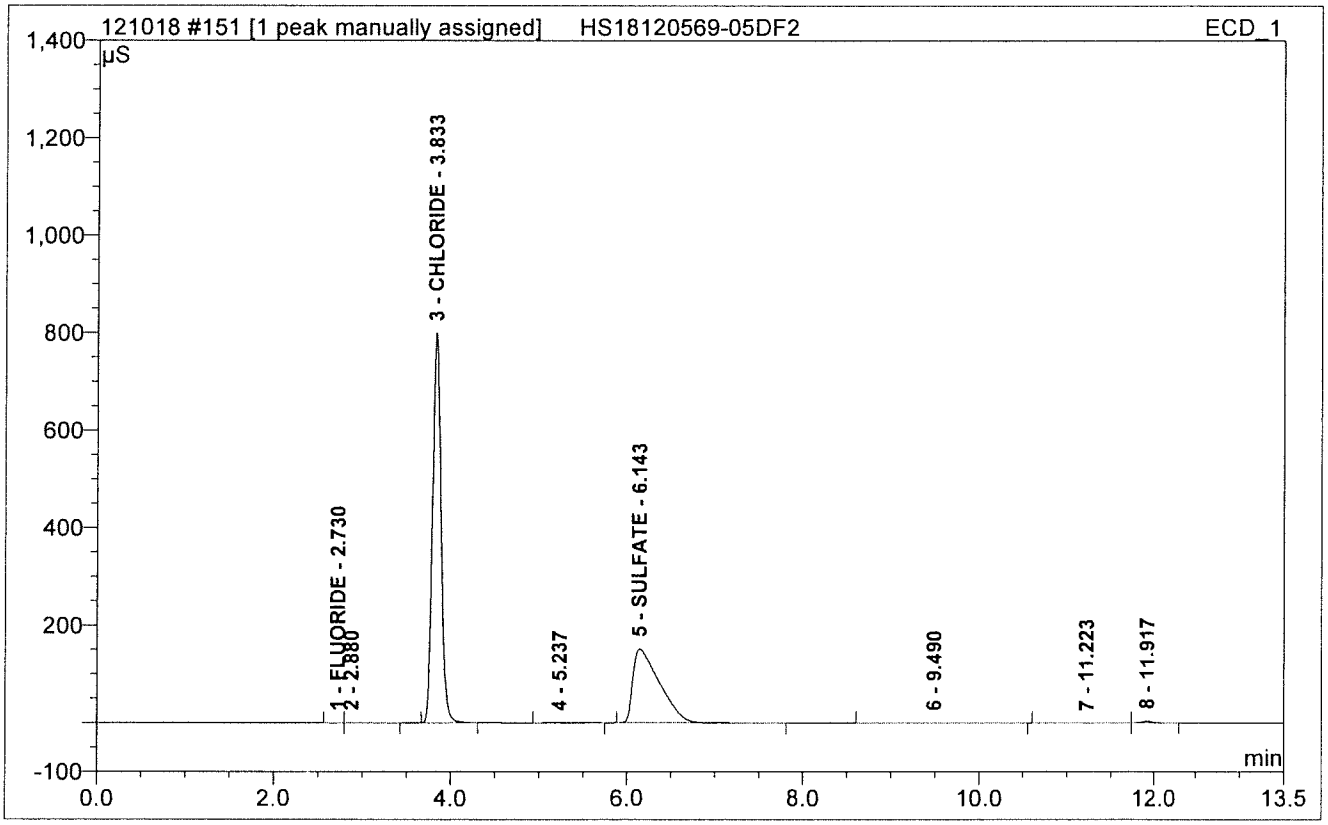
Sample Name:	**HS18120569-04DF2**	*Injection Volume:*	**10.0**
Vial Number:	**37**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**2.**
Recording Time:	**12/11/2018 22:36**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
3	3.83	CHLORIDE	243.872	27.101	72.47	626.035	2.
7	6.08	BROMIDE	0.324	0.044	0.12	2.725	2.
8	6.49	SULFATE	0.547	0.128	0.34	4.194	2.
10	11.52	PHOSPHATE	0.118	0.062	0.17	1.931	2.
Total:			244.861	27.335	73.10	634.884	

151 HS18120569-05DF2

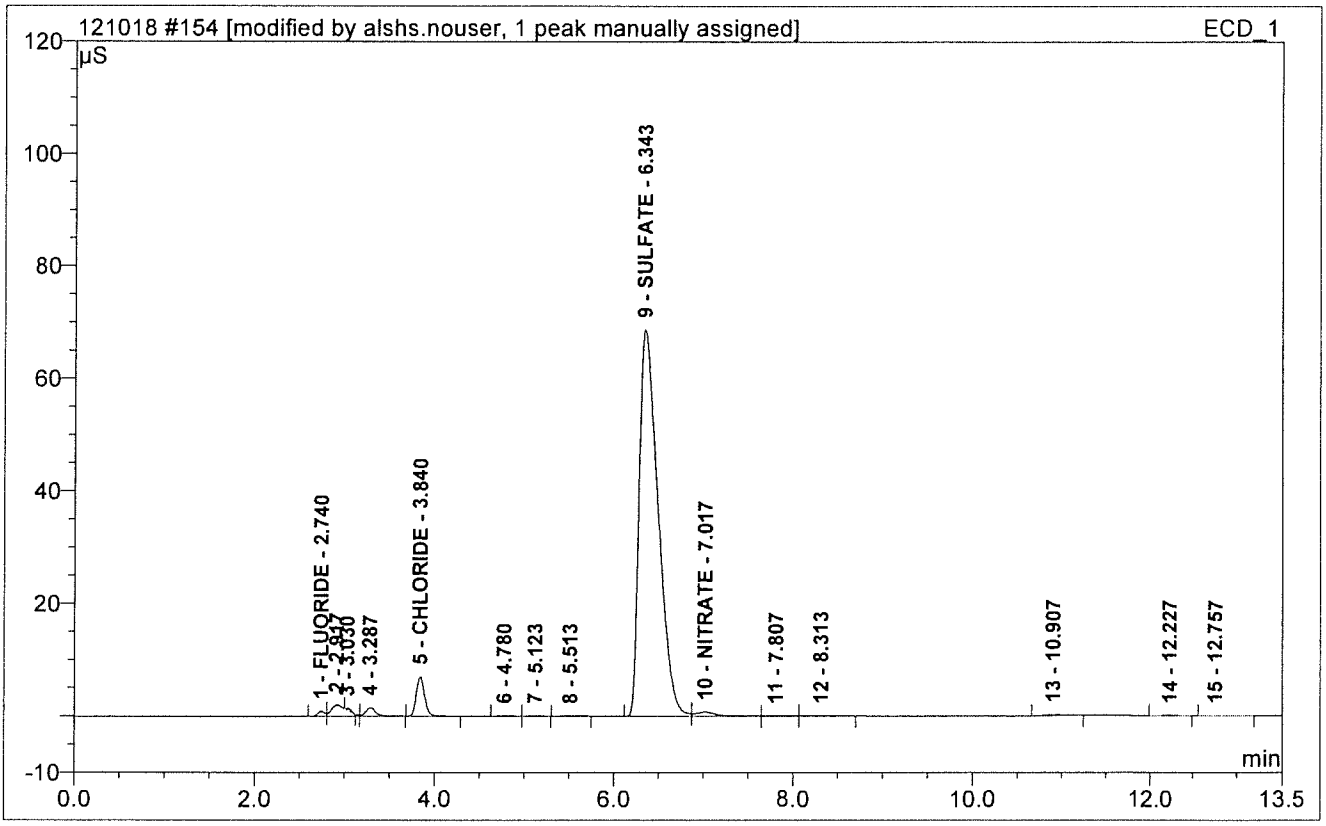
Sample Name:	**HS18120569-05DF2**	*Injection Volume:*	**10.0**
Vial Number:	**38**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**2.**
Recording Time:	**12/11/2018 22:50**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.134	0.013	0.01	0.206	2.
3	3.83	CHLORIDE	800.002	90.629	62.92	2092.961	2.
5	6.14	SULFATE	151.446	52.687	36.58	1688.822	2.
Total:			951.582	143.329	99.51	3781.988	

154 HS18111517-01DF100

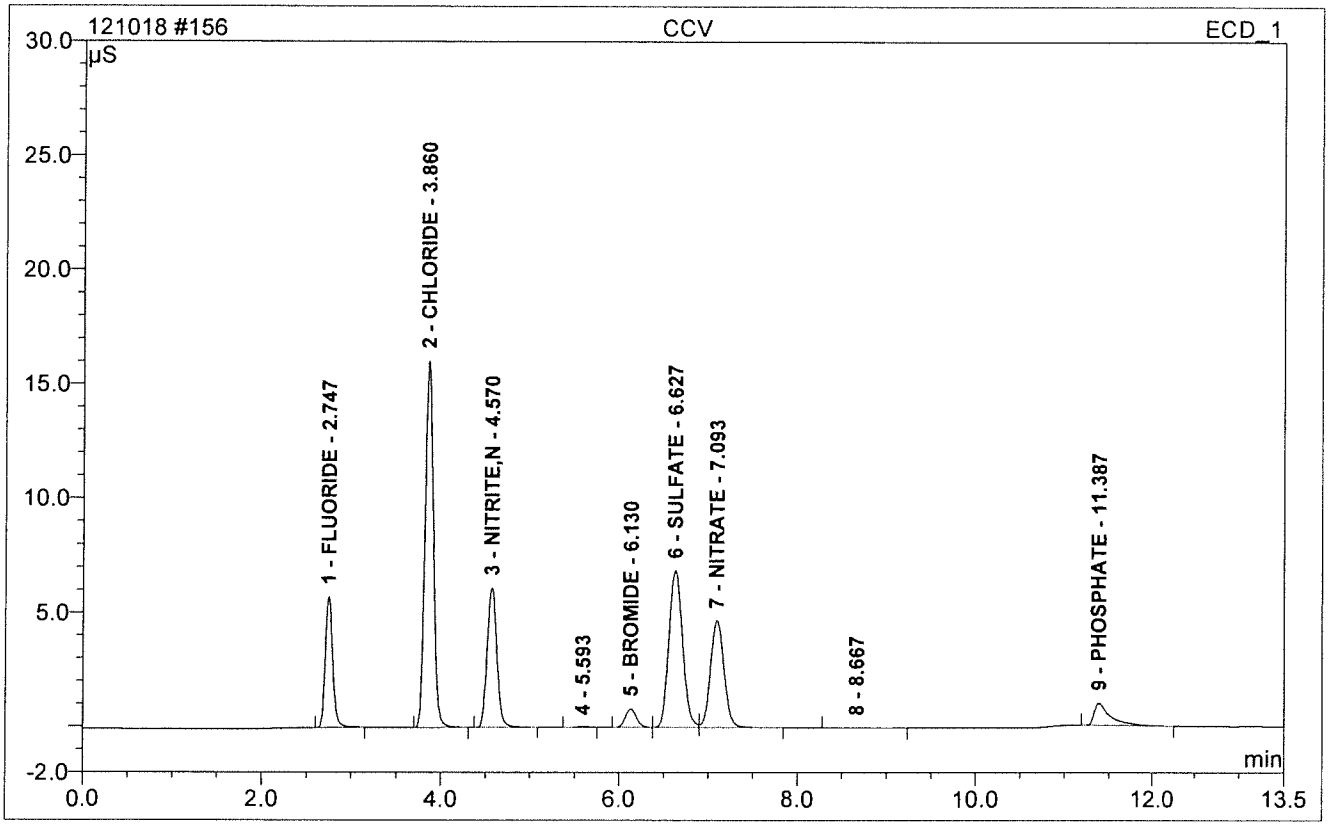
Sample Name:	**HS18111517-01DF100**	*Injection Volume:*	**10.0**
Vial Number:	**31**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**100.**
Recording Time:	**12/11/2018 23:34**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.881	0.081	0.44	59.562	100.
5	3.84	CHLORIDE	6.992	0.745	4.04	872.364	100.
9	6.34	SULFATE	68.725	16.724	90.68	26806.588	100.
10	7.02	NITRATE	0.703	0.183	0.99	90.221	100.
Total:			77.301	17.732	96.15	27828.736	

156 CCV

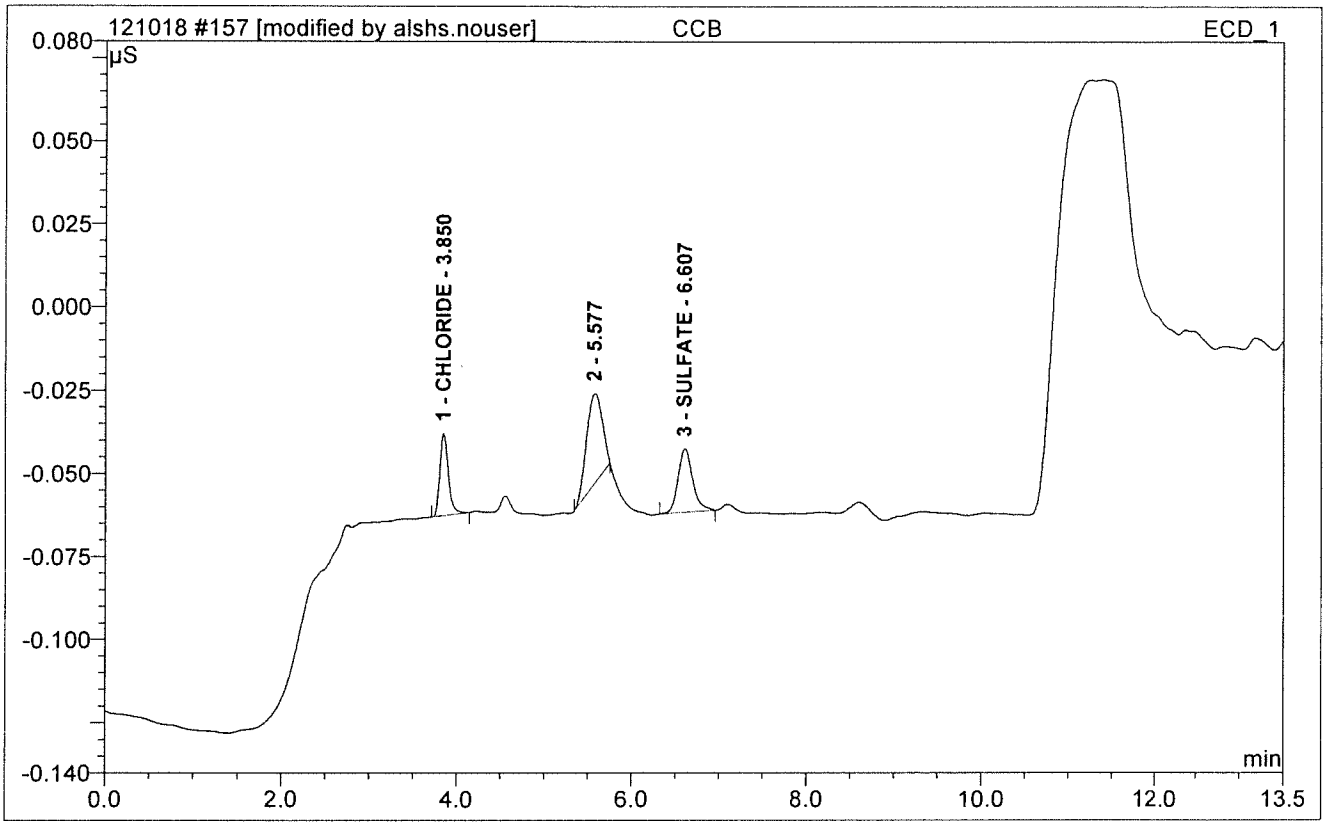
Sample Name:	**CCV**	*Injection Volume:*	**10.0**
Vial Number:	**1**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 0:03**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	5.751	0.568	10.33	4.148	1.
2	3.86	CHLORIDE	16.061	1.745	31.77	20.273	1.
3	4.57	NITRITE,N	6.138	0.785	14.28	4.358	1.
5	6.13	BROMIDE	0.819	0.117	2.13	3.493	1.
6	6.63	SULFATE	6.888	1.235	22.47	19.835	1.
7	7.09	NITRATE	4.720	0.835	15.20	3.937	1.
9	11.39	PHOSPHATE	0.979	0.202	3.68	2.906	1.
Total:			41.358	5.487	99.85	58.949	

157 CCB

Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**2**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**112918**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 0:17**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	3.85	CHLORIDE	0.025	0.003	22.89	0.153	1.
3	6.61	SULFATE	0.019	0.004	30.59	0.107	1.
Total:			0.044	0.006	53.47	0.260	

Sequence: 122418 HS18120569
Operator: alshs.nouser

Printed: 12/26/2018 10:15:31 AM

Title: Temporary sequence for manual data acquisition
Datasource: HP0307B_local
Location: ICS3000_2\2_Data\02-2018
Timebase: ICS3000_2
#Samples: 73

Created: 12/24/2018 5:39:09 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Pos.	Type	Dil. Factor	Program
1	STD1	297.020.7208	91	Standard	1.0000	anions3
2	STD2		92	Standard	1.0000	anions3
3	STD3		93	Standard	1.0000	anions3
4	STD4		94	Standard	1.0000	anions3
5	STD5		95	Standard	1.0000	anions3
6	STD6		96	Standard	1.0000	anions3
7	ICV		97	Unknown	1.0000	anions3
8	ICB		98	Unknown	1.0000	anions3
9	CCV		1	Unknown	1.0000	anions3
10	CCB		2	Unknown	1.0000	anions3
11	MBLK-135923		11	Unknown	1.0000	anions3
12	LCS-135923		12	Unknown	1.0000	anions3
13	LCSD-135923		13	Unknown	1.0000	anions3
14	HS18121242-10DF5		14	Unknown	5.0000	anions3
15	HS18120964-01DF10		15	Unknown	10.0000	anions3
16	HS18120486-01		16	Unknown	1.0000	anions3
17	HS18120486-12		17	Unknown	1.0000	anions3
18	HS18120846-17DF75		18	Unknown	75.0000	anions3
19	HS18120846-17MSDF50		19	Unknown	50.0000	anions3
20	HS18120846-17MSDDF50		20	Unknown	50.0000	anions3
21	CCV1		3	Unknown	1.0000	anions3
22	CCB		4	Unknown	1.0000	anions3
23	HS18120846-18DF20		21	Unknown	20.0000	anions3
24	HS18120846-17DF50		22	Unknown	50.0000	anions3
25	CCV		1	Unknown	1.0000	anions3
26	CCB		2	Unknown	1.0000	anions3
27	WBLKW1-122418		5	Unknown	1.0000	anions3
28	WLCSW1-122418		6	Unknown	1.0000	anions3
29	WLCSDW1-122418		7	Unknown	1.0000	anions3
30	HS18120569-01DF50		23	Unknown	50.0000	anions3
31	HS18120569-02DF10		24	Unknown	10.0000	anions3
32	HS18120569-03DF50		25	Unknown	50.0000	anions3
33	HS18120569-04DF20		26	Unknown	20.0000	anions3
34	HS18120569-04MSDF20		27	Unknown	20.0000	anions3
35	HS18120569-04MSDDF20		28	Unknown	20.0000	anions3
36	HS18120569-05DF100		29	Unknown	100.0000	anions3
37	CCV1		3	Unknown	1.0000	anions3
38	CCB		4	Unknown	1.0000	anions3

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Sequence: 122418
Operator: alshs.nouser

Printed: 12/26/2018 10:15:31 AM

Title: Temporary sequence for manual data acquisition
Datasource: HP0307B_local
Location: ICS3000_2\2_Data\02-2018
Timebase: ICS3000_2
#Samples: 73

Created: 12/24/2018 5:39:09 PM by alshs.nouser
(Modified, not saved)

No.	Name	Method	Inj. Vol.	Status	Inj. Date/Time	Weight
1	STD1	121218	20.0	Finished	12/12/2018 5:31:31 PM	1.0000
2	STD2	121218	20.0	Finished	12/12/2018 5:53:06 PM	1.0000
3	STD3	121218	20.0	Finished	12/12/2018 6:14:40 PM	1.0000
4	STD4	121218	20.0	Finished	12/12/2018 6:36:14 PM	1.0000
5	STD5	121218	20.0	Finished	12/12/2018 6:57:48 PM	1.0000
6	STD6	121218	20.0	Finished	12/12/2018 7:19:22 PM	1.0000
7	ICV	121218	20.0	Finished	12/12/2018 7:40:56 PM	1.0000
8	ICB	121218	20.0	Finished	12/12/2018 8:02:31 PM	1.0000
9	CCV	121218	20.0	Finished	12/24/2018 11:24:55 AM	1.0000
10	CCB	121218	20.0	Finished	12/24/2018 11:46:30 AM	1.0000
11	MBLK-135923	121218	20.0	Finished	12/24/2018 12:08:04 PM	1.0000
12	LCS-135923	121218	20.0	Finished	12/24/2018 12:29:39 PM	1.0000
13	LCSD-135923	121218	20.0	Finished	12/24/2018 12:51:12 PM	1.0000
14	HS18121242-10DF5	121218	20.0	Finished	12/24/2018 1:38:11 PM	1.0000
15	HS18120964-01DF10	121218	20.0	Finished	12/24/2018 1:59:46 PM	1.0000
16	HS18120486-01	121218	20.0	Finished	12/24/2018 2:21:20 PM	1.0000
17	HS18120486-12	121218	20.0	Finished	12/24/2018 2:42:54 PM	1.0000
18	HS18120846-17DF75	121218	20.0	Finished	12/24/2018 3:04:28 PM	1.0000
19	HS18120846-17MSDF50	121218	20.0	Finished	12/24/2018 3:26:02 PM	1.0000
20	HS18120846-17MSDDF50	121218	20.0	Finished	12/24/2018 3:47:37 PM	1.0000
21	CCV1	121218	20.0	Finished	12/24/2018 4:09:11 PM	1.0000
22	CCB	121218	20.0	Finished	12/24/2018 4:30:45 PM	1.0000
23	HS18120846-18DF20	121218	20.0	Finished	12/24/2018 4:52:19 PM	1.0000
24	HS18120846-17DF50	121218	20.0	Finished	12/24/2018 5:13:53 PM	1.0000
25	CCV	121218	20.0	Finished	12/24/2018 5:46:53 PM	1.0000
26	CCB	121218	20.0	Finished	12/24/2018 6:08:28 PM	1.0000
27	WBLKW1-122418	121218	20.0	Finished	12/24/2018 6:30:02 PM	1.0000
28	WLCSW1-122418	121218	20.0	Finished	12/24/2018 6:51:36 PM	1.0000
29	WLCSDW1-122418	121218	20.0	Finished	12/24/2018 7:13:10 PM	1.0000
30	HS18120569-01DF50	121218	20.0	Finished	12/24/2018 7:34:44 PM	1.0000
31	HS18120569-02DF10	121218	20.0	Finished	12/24/2018 7:56:19 PM	1.0000
32	HS18120569-03DF50	121218	20.0	Finished	12/24/2018 8:17:52 PM	1.0000
33	HS18120569-04DF20	121218	20.0	Finished	12/24/2018 8:39:26 PM	1.0000
34	HS18120569-04MSDF20	121218	20.0	Finished	12/24/2018 9:01:00 PM	1.0000
35	HS18120569-04MSDDF20	121218	20.0	Finished	12/24/2018 9:22:34 PM	1.0000
36	HS18120569-05DF100	121218	20.0	Finished	12/24/2018 9:44:09 PM	1.0000
37	CCV1	121218	20.0	Finished	12/24/2018 10:05:43 PM	1.0000
38	CCB	121218	20.0	Finished	12/24/2018 10:27:17 PM	1.0000

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Sequence: 122418
Operator: alshs.nouser

Printed: 12/26/2018 10:15:31 AM

Title: Temporary sequence for manual data acquisition
Datasource: HP0307B_local
Location: ICS3000_2\2_Data\02-2018
Timebase: ICS3000_2
#Samples: 73

Created: 12/24/2018 5:39:09 PM by alshs.nouser
(Modified, not saved)

No.	Name	ISTD Amount	Sample ID	Replicate ID
1	STD1	1.0000		01
2	STD2	1.0000		01
3	STD3	1.0000		01
4	STD4	1.0000		01
5	STD5	1.0000		01
6	STD6	1.0000		01
7	ICV	1.0000		01
8	ICB	1.0000		01
9	CCV	1.0000		01
10	CCB	1.0000		01
11	MBLK-135923	1.0000		01
12	LCS-135923	1.0000		01
13	LCSD-135923	1.0000		01
14	HS18121242-10DF5	1.0000		01
15	HS18120964-01DF10	1.0000		01
16	HS18120486-01	1.0000		01
17	HS18120486-12	1.0000		01
18	HS18120846-17DF75	1.0000		01
19	HS18120846-17MSDF50	1.0000		01
20	HS18120846-17MSDDF50	1.0000		01
21	CCV1	1.0000		01
22	CCB	1.0000		01
23	HS18120846-18DF20	1.0000		01
24	HS18120846-17DF50	1.0000		01
25	CCV	1.0000		01
26	CCB	1.0000		01
27	WBLKW1-122418	1.0000		01
28	WLCSW1-122418	1.0000		01
29	WLCSDW1-122418	1.0000		01
30	HS18120569-01DF50	1.0000		01
31	HS18120569-02DF10	1.0000		01
32	HS18120569-03DF50	1.0000		01
33	HS18120569-04DF20	1.0000		01
34	HS18120569-04MSDF20	1.0000		01
35	HS18120569-04MSDDF20	1.0000		01
36	HS18120569-05DF100	1.0000		01
37	CCV1	1.0000		01
38	CCB	1.0000		01

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Sequence: 122418
Operator: alshs.nouser

Printed: 12/26/2018 10:15:31 AM

Title: Temporary sequence for manual data acquisition
Datasource: HP0307B_local
Location: ICS3000_2\2_Data\02-2018
Timebase: ICS3000_2
#Samples: 73

Created: 12/24/2018 5:39:09 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Pos.	Type	Dil. Factor	Program
39	HS18121041-01DF10		30	Unknown	10.0000	anions3
40	HS18121029-01DF2		31	Unknown	2.0000	anions3
41	HS18121029-01DF20		32	Unknown	20.0000	anions3
42	HS18120486-02DF100		33	Unknown	100.0000	anions3
43	HS18120486-02DF1000		34	Unknown	1000.0000	anions3
44	HS18120486-02MSDF1000		35	Unknown	1000.0000	anions3
45	HS18120486-02MSDDF1000		36	Unknown	1000.0000	anions3
46	HS18120486-03DF100		37	Unknown	100.0000	anions3
47	HS18120486-03DF1000		38	Unknown	1000.0000	anions3
48	DI H2O		10	Unknown	1.0000	anions3
49	CCV		1	Unknown	1.0000	anions3
50	CCB		2	Unknown	1.0000	anions3
51	HS18120486-04DF100		39	Unknown	100.0000	anions3
52	HS18120486-04DF1000		40	Unknown	1000.0000	anions3
53	HS18120486-05DF100		41	Unknown	100.0000	anions3
54	HS18120486-05DF1000		42	Unknown	1000.0000	anions3
55	HS18120486-06DF100		43	Unknown	100.0000	anions3
56	HS18120486-06DF1000		44	Unknown	1000.0000	anions3
57	HS18120486-07DF100		45	Unknown	100.0000	anions3
58	HS18120486-07DF1000		46	Unknown	1000.0000	anions3
59	HS18120486-08DF100		47	Unknown	100.0000	anions3
60	HS18120486-08DF1000		48	Unknown	1000.0000	anions3
61	CCV1		3	Unknown	1.0000	anions3
62	CCB		4	Unknown	1.0000	anions3
63	HS18120486-09DF100		49	Unknown	100.0000	anions3
64	HS18120486-09DF1000		50	Unknown	1000.0000	anions3
65	HS18120486-10DF100		51	Unknown	100.0000	anions3
66	HS18120486-10DF1000		52	Unknown	1000.0000	anions3
67	HS18120486-11DF100		53	Unknown	100.0000	anions3
68	HS18120486-11DF1000		54	Unknown	1000.0000	anions3
69	CCV		1	Unknown	1.0000	anions3
70	CCB		2	Unknown	1.0000	anions3
71	DI H2O		10	Unknown	1.0000	anions3
▶	DI H2O		10	Unknown	1.0000	anions3
73	DI H2O		10	Unknown	1.0000	anions3

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Sequence: 122418
Operator: alshs.nouser

Title: Temporary sequence for manual data acquisition
Datasource: HP0307B_local
Location: ICS3000_2\2_Data\02-2018
Timebase: ICS3000_2
#Samples: 73

Created: 12/24/2018 5:39:09 PM by alshs.nouser
(Modified, not saved)

No.	Name	Method	Inj. Vol.	Status	Inj. Date/Time	Weight
39	HS18121041-01DF10	121218	20.0	Finished	12/24/2018 10:48:51 PM	1.0000
40	HS18121029-01DF2	121218	20.0	Finished	12/24/2018 11:10:25 PM	1.0000
41	HS18121029-01DF20	121218	20.0	Finished	12/24/2018 11:32:00 PM	1.0000
42	HS18120486-02DF100	121218	20.0	Finished	12/24/2018 11:53:34 PM	1.0000
43	HS18120486-02DF1000	121218	20.0	Finished	12/25/2018 12:15:09 AM	1.0000
44	HS18120486-02MSDF1000	121218	20.0	Finished	12/25/2018 12:36:43 AM	1.0000
45	HS18120486-02MSDDF1000	121218	20.0	Finished	12/25/2018 12:58:17 AM	1.0000
46	HS18120486-03DF100	121218	20.0	Finished	12/25/2018 1:19:52 AM	1.0000
47	HS18120486-03DF1000	121218	20.0	Finished	12/25/2018 1:41:26 AM	1.0000
48	DI H2O	121218	20.0	Finished	12/25/2018 2:03:00 AM	1.0000
49	CCV	121218	20.0	Finished	12/25/2018 2:24:34 AM	1.0000
50	CCB	121218	20.0	Finished	12/25/2018 2:46:08 AM	1.0000
51	HS18120486-04DF100	121218	20.0	Finished	12/25/2018 3:07:43 AM	1.0000
52	HS18120486-04DF1000	121218	20.0	Finished	12/25/2018 3:29:17 AM	1.0000
53	HS18120486-05DF100	121218	20.0	Finished	12/25/2018 3:50:52 AM	1.0000
54	HS18120486-05DF1000	121218	20.0	Finished	12/25/2018 4:12:26 AM	1.0000
55	HS18120486-06DF100	121218	20.0	Finished	12/25/2018 4:34:00 AM	1.0000
56	HS18120486-06DF1000	121218	20.0	Finished	12/25/2018 4:55:34 AM	1.0000
57	HS18120486-07DF100	121218	20.0	Finished	12/25/2018 5:17:09 AM	1.0000
58	HS18120486-07DF1000	121218	20.0	Finished	12/25/2018 5:38:42 AM	1.0000
59	HS18120486-08DF100	121218	20.0	Finished	12/25/2018 6:00:16 AM	1.0000
60	HS18120486-08DF1000	121218	20.0	Finished	12/25/2018 6:21:50 AM	1.0000
61	CCV1	121218	20.0	Finished	12/25/2018 6:43:25 AM	1.0000
62	CCB	121218	20.0	Finished	12/25/2018 7:04:59 AM	1.0000
63	HS18120486-09DF100	121218	20.0	Finished	12/25/2018 7:26:33 AM	1.0000
64	HS18120486-09DF1000	121218	20.0	Finished	12/25/2018 7:48:07 AM	1.0000
65	HS18120486-10DF100	121218	20.0	Finished	12/25/2018 8:09:41 AM	1.0000
66	HS18120486-10DF1000	121218	20.0	Finished	12/25/2018 8:31:16 AM	1.0000
67	HS18120486-11DF100	121218	20.0	Finished	12/25/2018 8:52:50 AM	1.0000
68	HS18120486-11DF1000	121218	20.0	Finished	12/25/2018 9:14:24 AM	1.0000
69	CCV	121218	20.0	Finished	12/25/2018 9:35:58 AM	1.0000
70	CCB	121218	20.0	Finished	12/25/2018 9:57:33 AM	1.0000
71	DI H2O	121218	20.0	Finished	12/25/2018 10:19:07 AM	1.0000
▶	DI H2O	121218	20.0	Running	12/26/2018 9:59:01 AM	1.0000
73	DI H2O	121218	20.0	Preparing	12/25/2018 11:02:15 AM	1.0000

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Sequence: 122418
Operator: alshs.nouser

Printed: 12/26/2018 10:15:31 AM

Title: Temporary sequence for manual data acquisition
Datasource: HP0307B_local
Location: ICS3000_2\2_Data\02-2018
Timebase: ICS3000_2
#Samples: 73

Created: 12/24/2018 5:39:09 PM by alshs.nouser
(Modified, not saved)

No.	Name	ISTD Amount	Sample ID	Replicate ID
39	HS18121041-01DF10	1.0000		01
40	HS18121029-01DF2	1.0000		01
41	HS18121029-01DF20	1.0000		01
42	HS18120486-02DF100	1.0000		01
43	HS18120486-02DF1000	1.0000		01
44	HS18120486-02MSDF1000	1.0000		01
45	HS18120486-02MSDDF1000	1.0000		01
46	HS18120486-03DF100	1.0000		01
47	HS18120486-03DF1000	1.0000		01
48	DI H2O	1.0000		01
49	CCV	1.0000		01
50	CCB	1.0000		01
51	HS18120486-04DF100	1.0000		01
52	HS18120486-04DF1000	1.0000		01
53	HS18120486-05DF100	1.0000		01
54	HS18120486-05DF1000	1.0000		01
55	HS18120486-06DF100	1.0000		01
56	HS18120486-06DF1000	1.0000		01
57	HS18120486-07DF100	1.0000		01
58	HS18120486-07DF1000	1.0000		01
59	HS18120486-08DF100	1.0000		01
60	HS18120486-08DF1000	1.0000		01
61	CCV1	1.0000		01
62	CCB	1.0000		01
63	HS18120486-09DF100	1.0000		01
64	HS18120486-09DF1000	1.0000		01
65	HS18120486-10DF100	1.0000		01
66	HS18120486-10DF1000	1.0000		01
67	HS18120486-11DF100	1.0000		01
68	HS18120486-11DF1000	1.0000		01
69	CCV	1.0000		01
70	CCB	1.0000		01
71	DI H2O	1.0000		01
▶	DI H2O	1.0000		01
73	DI H2O	1.0000		01

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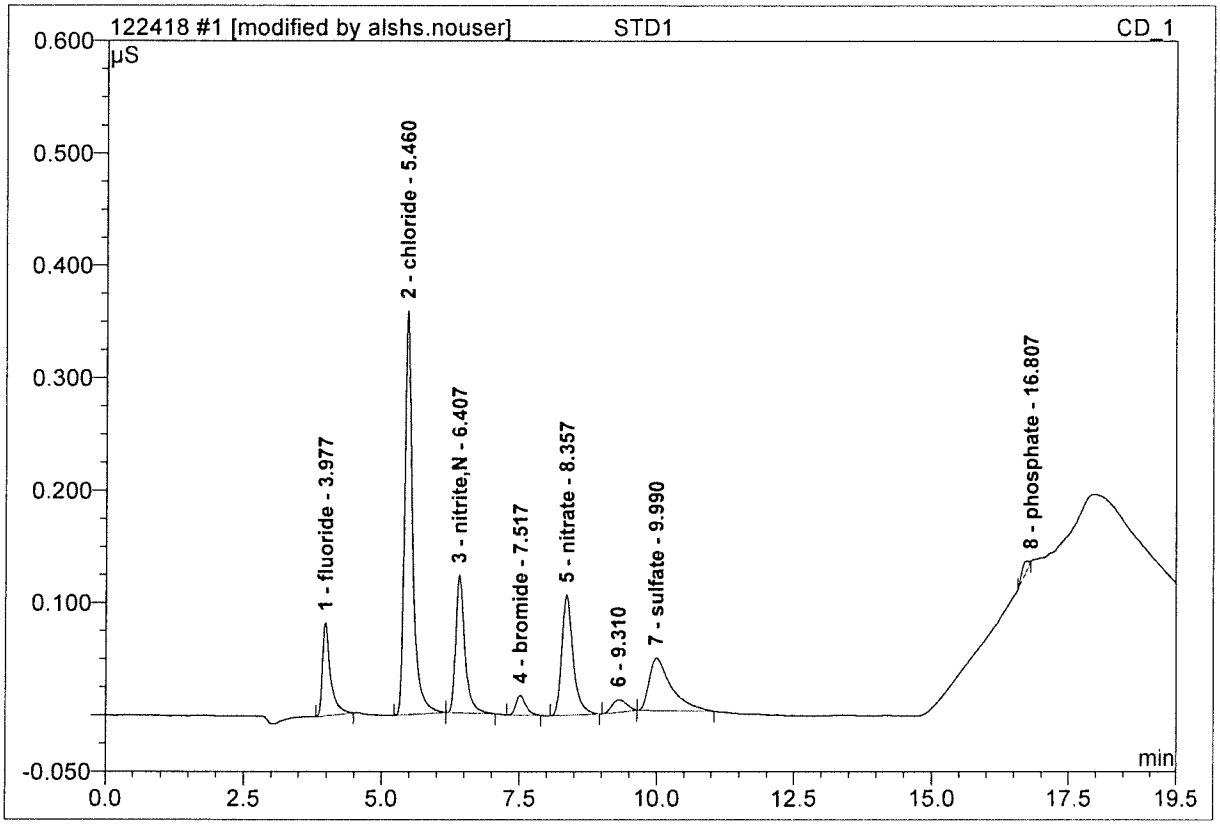
1 STD1

297.020.7208

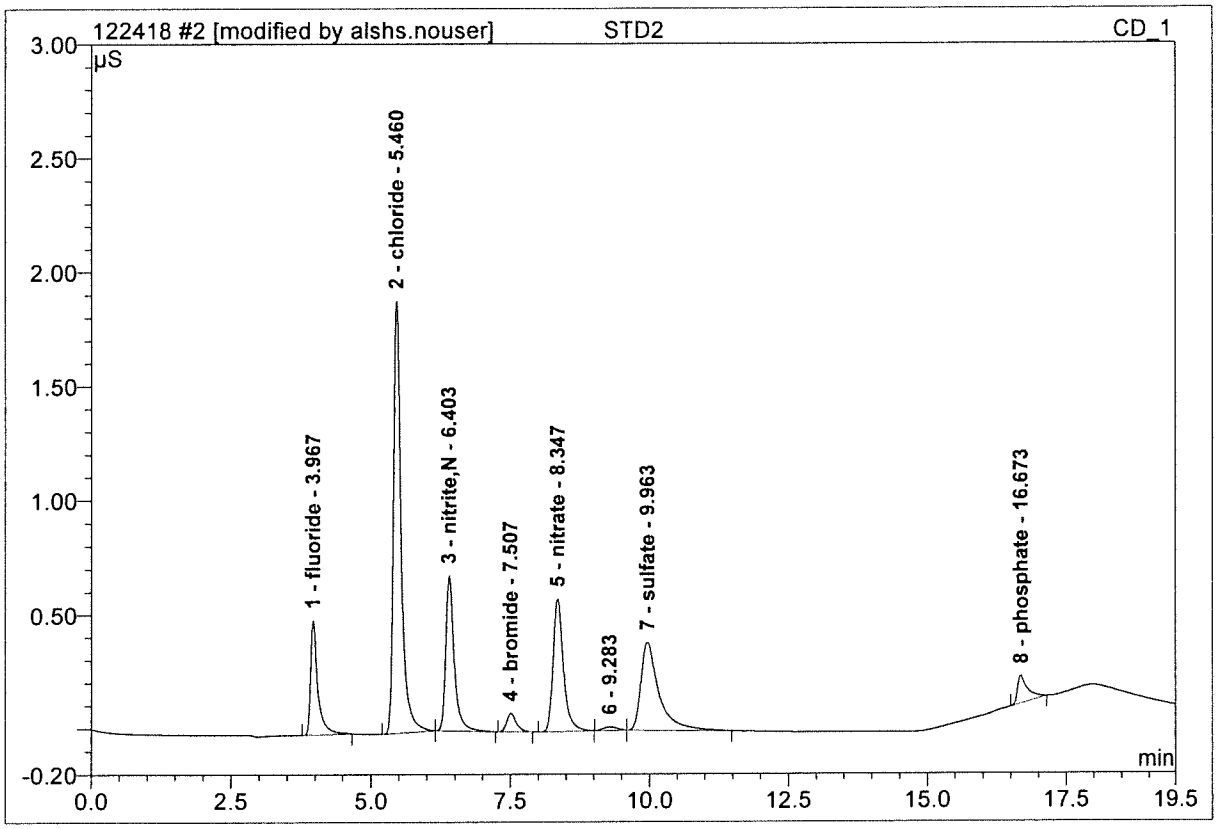
Sample Name:	**STD1**	*Injection Volume:*	**20.0**
Vial Number:	**91**	*Channel:*	**CD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:31**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.98	fluoride	0.083	0.014	9.04	0.120	1.
2	5.46	chloride	0.359	0.060	39.24	0.572	1.
3	6.41	nitrite,N	0.123	0.024	15.35	0.098	1.
4	7.52	bromide	0.018	0.004	2.40	0.135	1.
5	8.36	nitrate	0.107	0.026	16.63	0.127	1.
7	9.99	sulfate	0.047	0.022	14.13	0.696	1.
8	16.81	phosphate	0.000	0.001	0.95	0.162	1.
Total:			0.736	0.150	97.73	1.911	

2 STD2

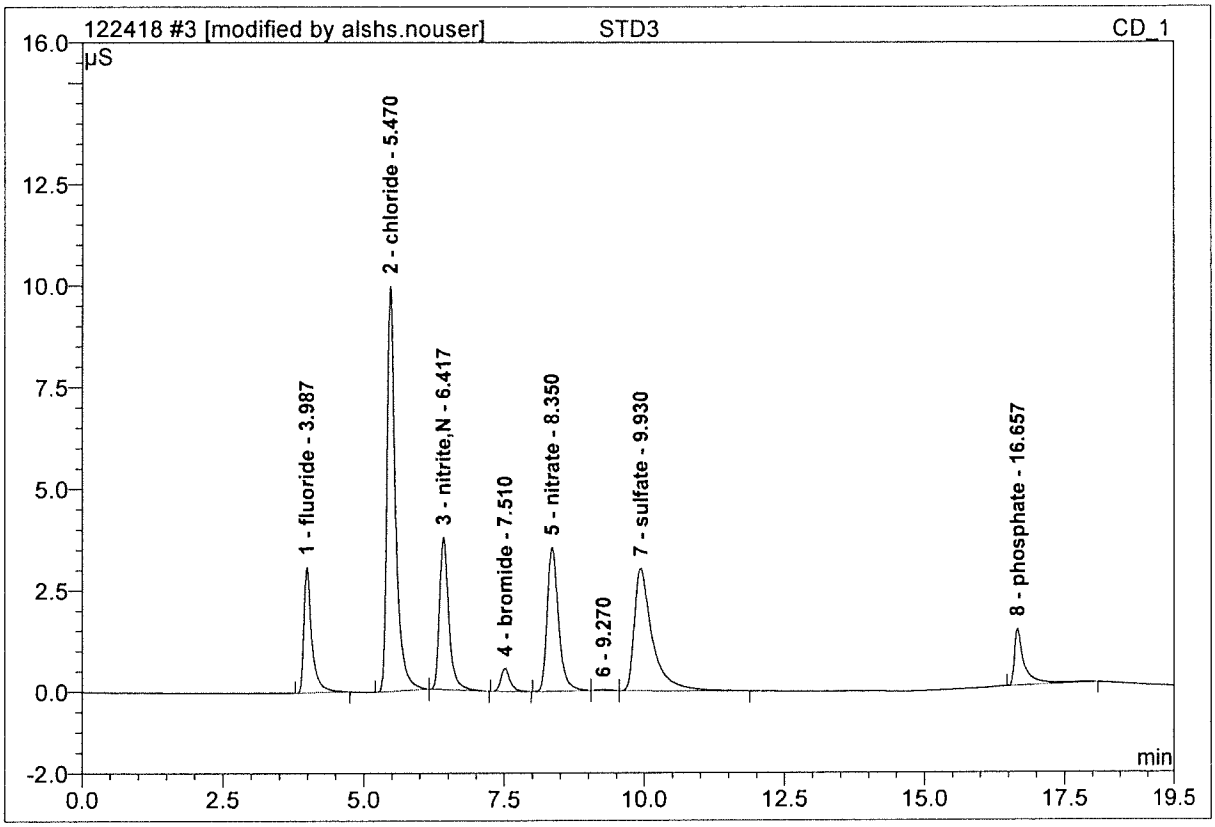
Sample Name:	**STD2**	*Injection Volume:*	**20.0**
Vial Number:	**92**	*Channel:*	**CD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:53**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.97	fluoride	0.503	0.075	9.14	0.340	1.
2	5.46	chloride	1.895	0.305	37.27	1.859	1.
3	6.40	nitrite,N	0.680	0.120	14.71	0.370	1.
4	7.51	bromide	0.081	0.016	1.97	0.322	1.
5	8.35	nitrate	0.583	0.127	15.54	0.340	1.
7	9.96	sulfate	0.387	0.145	17.69	1.584	1.
8	16.67	phosphate	0.121	0.026	3.12	0.275	1.
Total:			4.251	0.814	99.44	5.090	

3 STD3

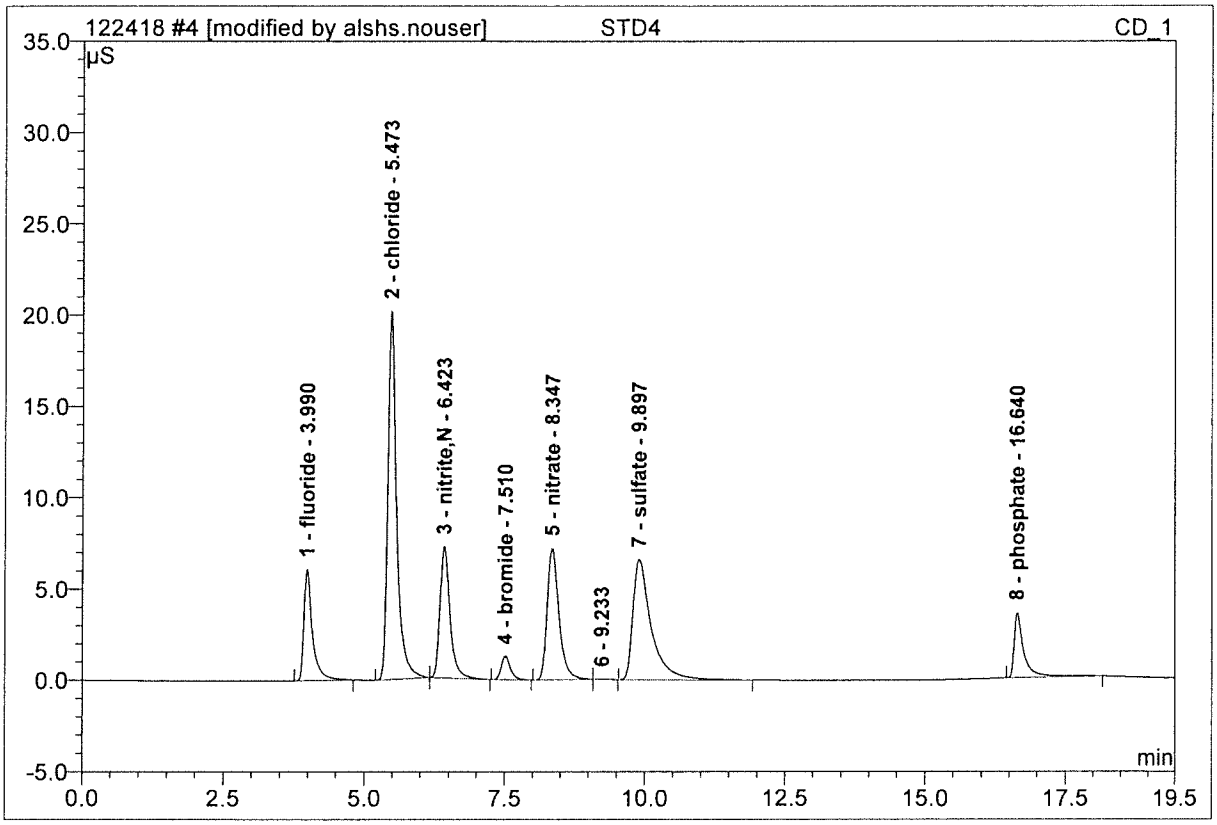
Sample Name:	**STD3**	*Injection Volume:*	**20.0**
Vial Number:	**93**	*Channel:*	**CD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 18:14**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.99	fluoride	3.105	0.508	9.49	1.904	1.
2	5.47	chloride	9.975	1.754	32.77	9.470	1.
3	6.42	nitrite,N	3.761	0.731	13.67	2.085	1.
4	7.51	bromide	0.566	0.107	2.00	1.686	1.
5	8.35	nitrate	3.545	0.834	15.58	1.824	1.
7	9.93	sulfate	3.016	1.119	20.92	8.608	1.
8	16.66	phosphate	1.396	0.292	5.45	1.526	1.
Total:			25.364	5.345	99.88	27.104	

4 STD4

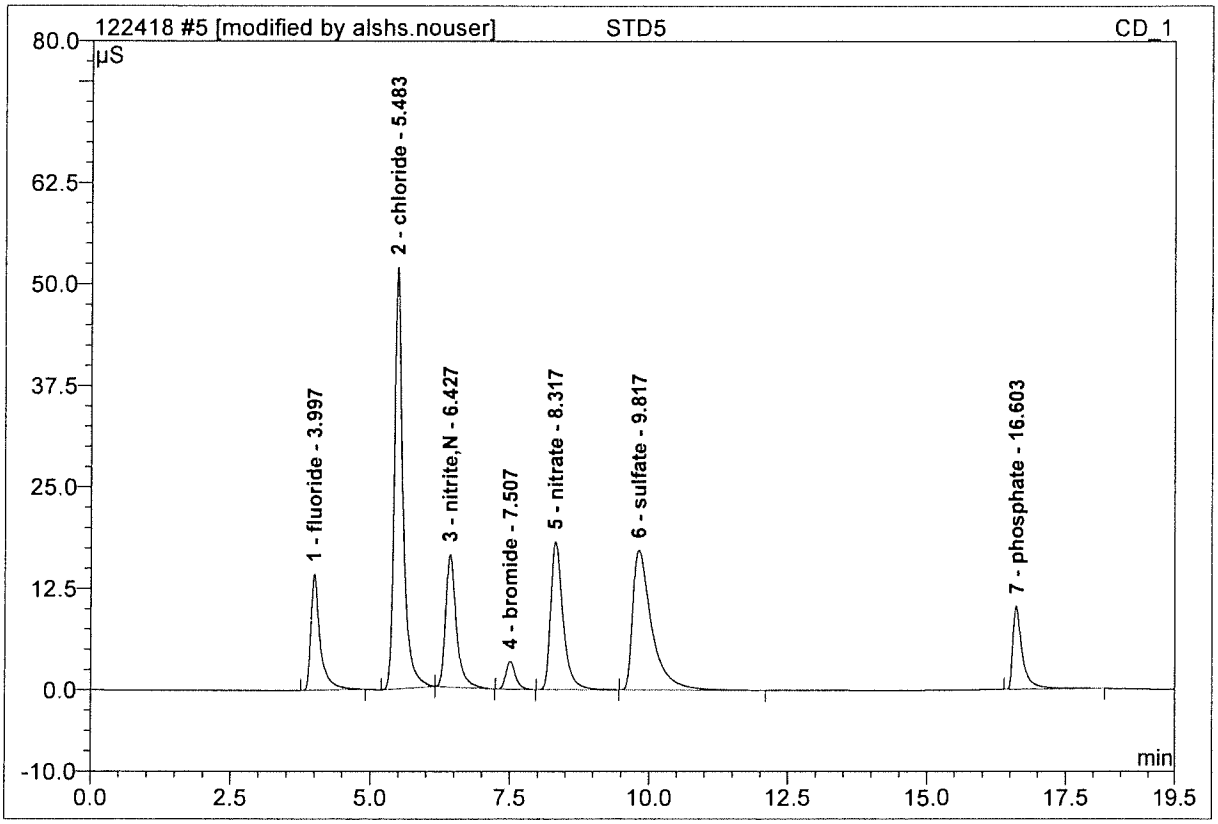
Sample Name:	**STD4**	*Injection Volume:*	**20.0**
Vial Number:	**94**	*Channel:*	**CD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 18:36**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.99	fluoride	6.121	1.072	9.36	3.941	1.
2	5.47	chloride	20.190	3.647	31.83	19.417	1.
3	6.42	nitrite,N	7.216	1.495	13.05	4.229	1.
4	7.51	bromide	1.290	0.247	2.16	3.782	1.
5	8.35	nitrate	7.232	1.772	15.47	3.793	1.
7	9.90	sulfate	6.630	2.501	21.83	18.569	1.
8	16.64	phosphate	3.590	0.719	6.28	3.535	1.
Total:			52.269	11.453	99.96	57.267	

5 STD5

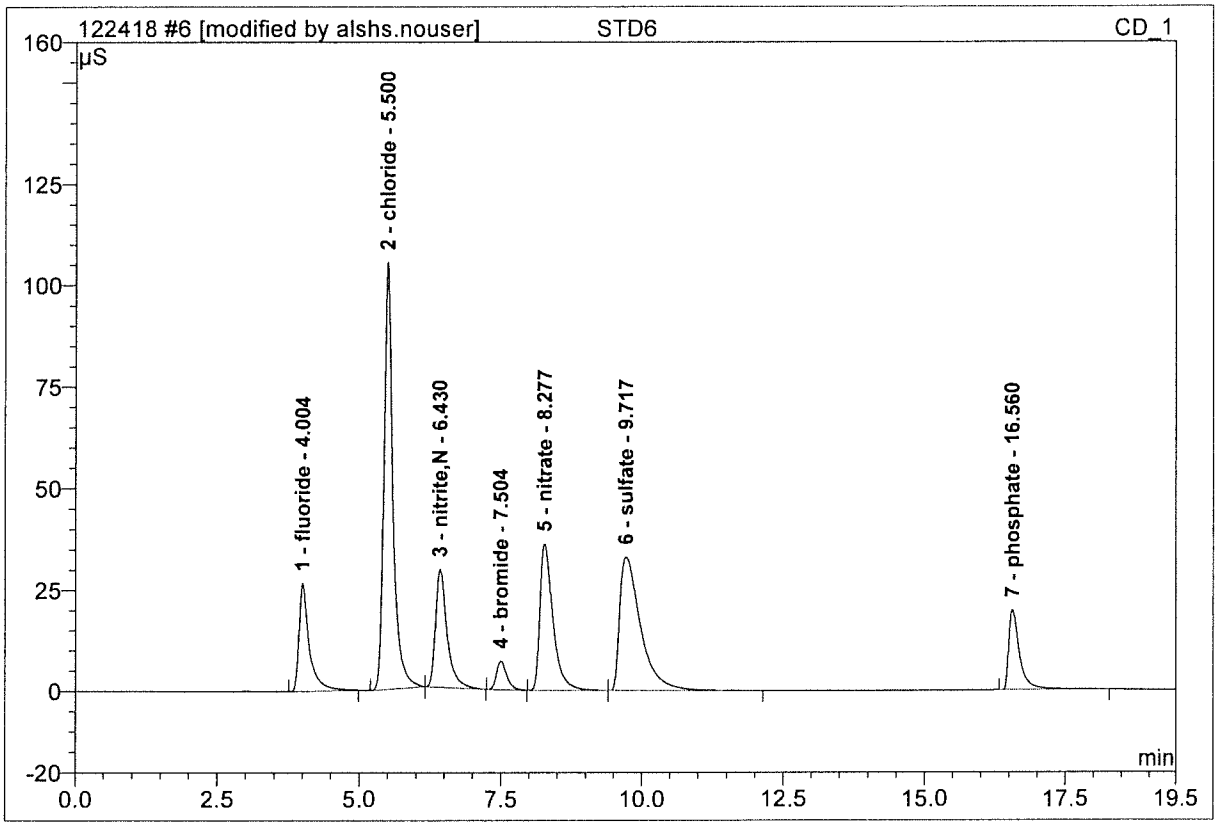
Sample Name:	**STD5**	*Injection Volume:*	**20.0**
Vial Number:	**95**	*Channel:*	**CD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 18:57**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	4.00	fluoride	14.293	2.754	9.16	10.018	1.
2	5.48	chloride	51.905	9.390	31.23	49.599	1.
3	6.43	nitrite,N	16.341	3.641	12.11	10.254	1.
4	7.51	bromide	3.458	0.701	2.33	10.575	1.
5	8.32	nitrate	18.213	4.709	15.66	9.957	1.
6	9.82	sulfate	17.178	6.809	22.65	49.627	1.
7	16.60	phosphate	10.249	2.065	6.87	9.858	1.
Total:			131.637	30.069	100.00	149.888	

6 STD6

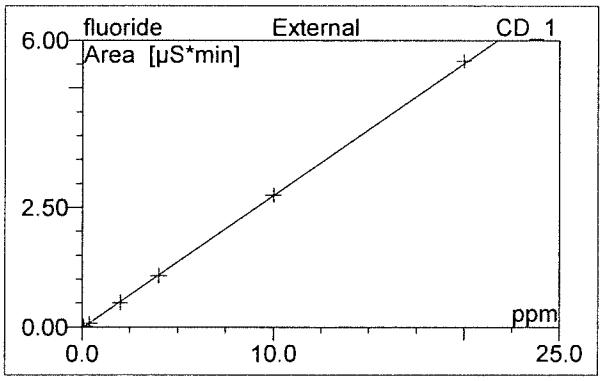
Sample Name:	**STD6**	*Injection Volume:*	**20.0**
Vial Number:	**96**	*Channel:*	**CD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 19:19**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**

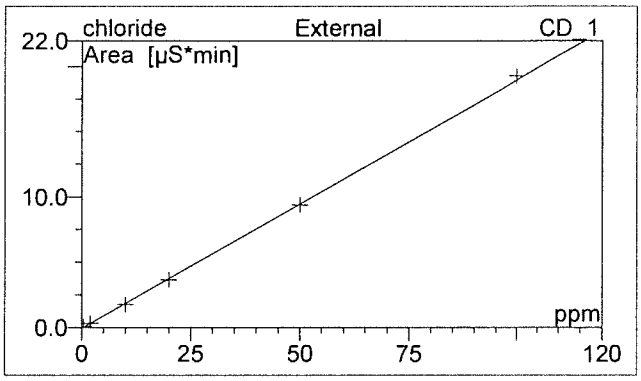


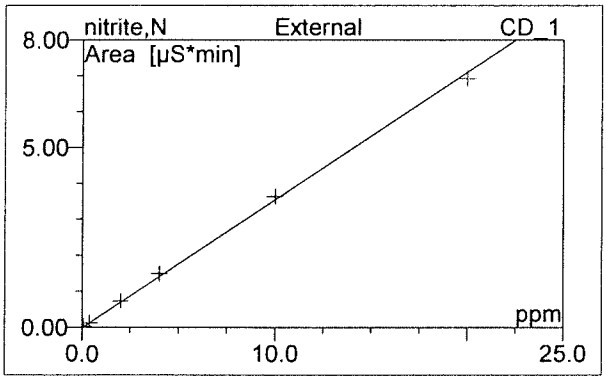
No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	4.00	fluoride	26.757	5.567	9.02	20.177	1.
2	5.50	chloride	105.320	19.283	31.25	101.582	1.
3	6.43	nitrite,N	29.269	6.921	11.22	19.464	1.
4	7.50	bromide	7.113	1.488	2.41	22.358	1.
5	8.28	nitrate	36.289	9.712	15.74	20.459	1.
6	9.72	sulfate	33.122	14.271	23.13	103.416	1.
7	16.56	phosphate	19.850	4.466	7.24	21.144	1.
Total:			257.719	61.708	100.00	308.599	

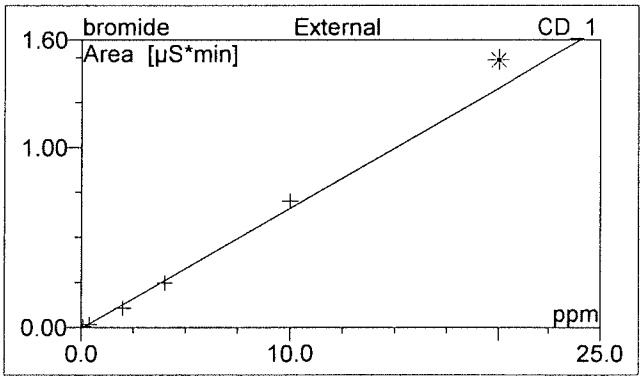
6 STD6

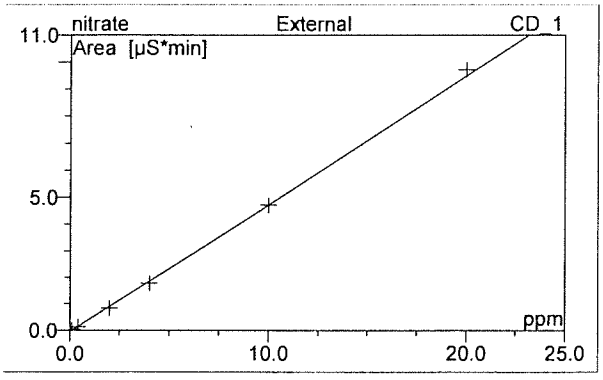
Sample Name:	**STD6**	*Injection Volume:*	**20.0**
Vial Number:	**96**	*Channel:*	**CD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.0000**
Recording Time:	**###############**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**

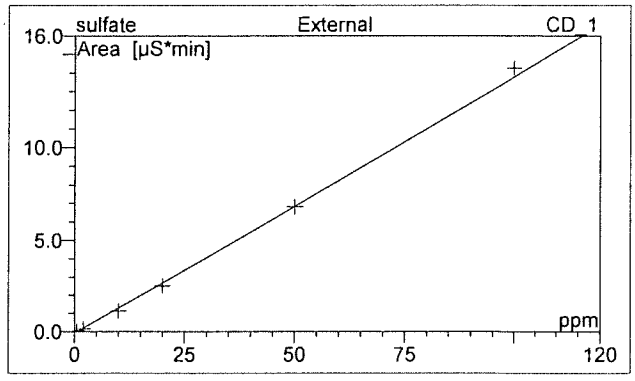


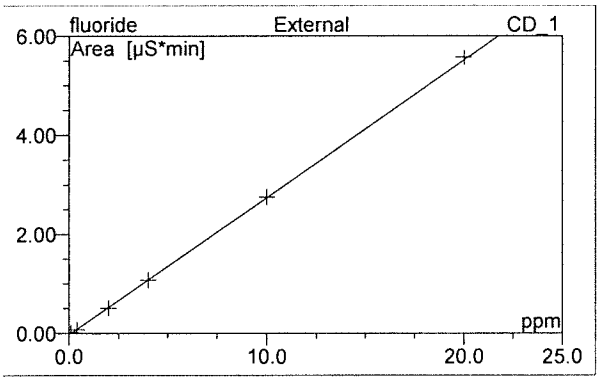


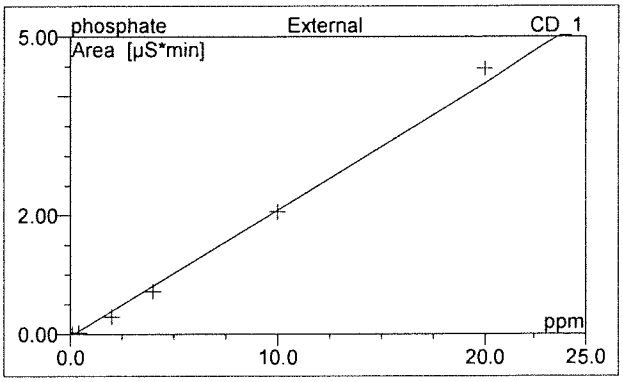










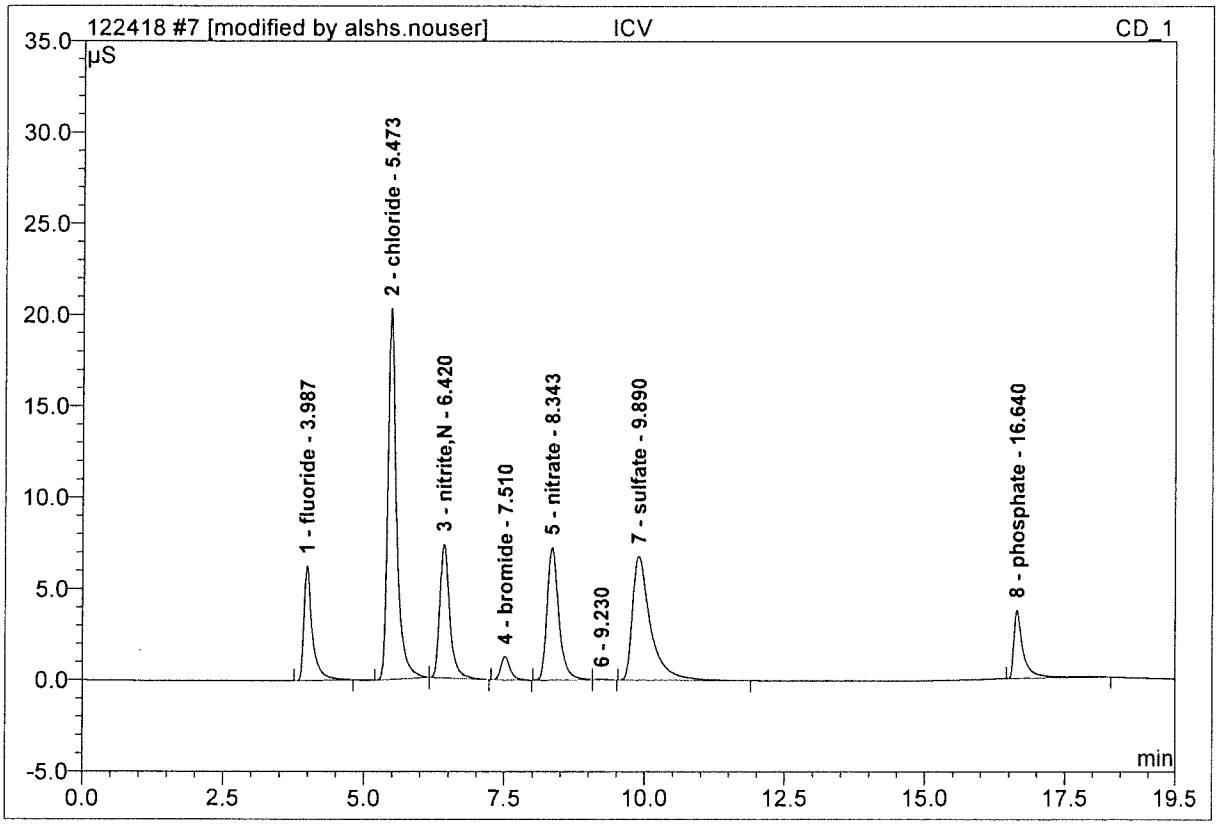


No.	Ret.Time min	Peak Name	Cal.Type	Points	Coeff.Det. %	Offset	Slope	Curve
1	4.00	fluoride	XLOff	6	99.9404	-0.0194	0.2769	0.000
2	5.50	chloride	XLOff	6	99.9446	-0.0487	0.1903	0.000
3	6.43	nitrite,N	XLOff	6	99.8820	-0.0113	0.3562	0.000
4	7.50	bromide	XLOff	5	99.1756	-0.0053	0.0668	0.000
5	8.28	nitrate	XLOff	6	99.8432	-0.0350	0.4764	0.000
6	9.72	sulfate	XLOff	6	99.6586	-0.0749	0.1387	0.000
7	16.56	phosphate	XLOff	6	99.0875	-0.0331	0.2128	0.000
Average:					99.6474	-0.0325	0.2454	0.0000

No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	RF-Value	Std.Dev.	RSD %
1	4.00	fluoride	XLOff	6	99.970	3.612	0.013	12.576
2	5.50	chloride	XLOff	6	99.972	5.255	0.044	11.554
3	6.43	nitrite,N	XLOff	6	99.941	2.808	0.024	16.071
4	7.50	bromide	XLOff	5	99.587	14.974	0.008	41.816
5	8.28	nitrate	XLOff	6	99.922	2.099	0.037	20.598
6	9.72	sulfate	XLOff	6	99.829	7.209	0.079	33.514
7	16.56	phosphate	XLOff	6	99.543	4.700	0.040	63.846
Average:					99.8234	5.8079	0.0349	28.5679

7 ICV

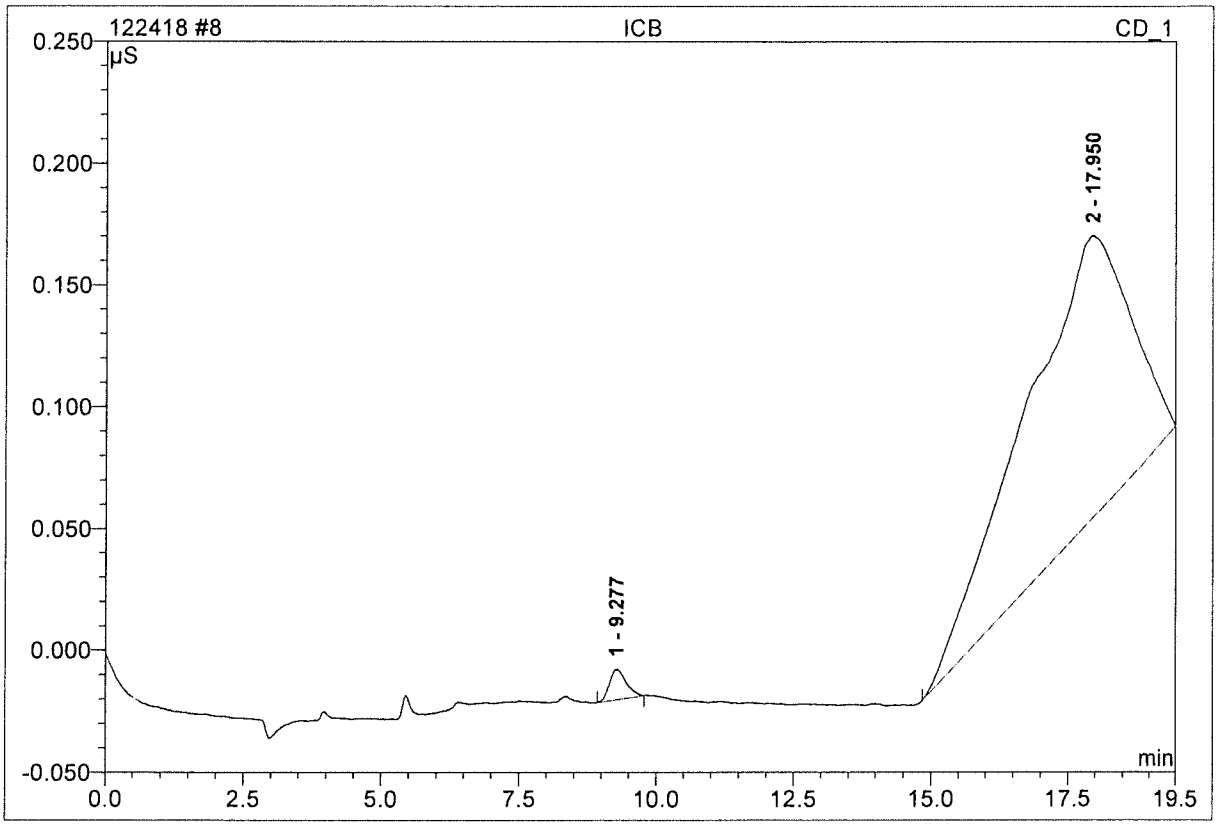
Sample Name:	**ICV**	*Injection Volume:*	**20.0**
Vial Number:	**97**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 19:40**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.99	fluoride	6.264	1.082	9.39	3.979	1.
2	5.47	chloride	20.324	3.635	31.54	19.356	1.
3	6.42	nitrite,N	7.358	1.511	13.11	4.274	1.
4	7.51	bromide	1.290	0.247	2.15	3.785	1.
5	8.34	nitrate	7.268	1.763	15.30	3.775	1.
7	9.89	sulfate	6.805	2.522	21.89	18.723	1.
8	16.64	phosphate	3.745	0.758	6.58	3.717	1.
Total:			53.054	11.519	99.96	57.610	

8 ICB

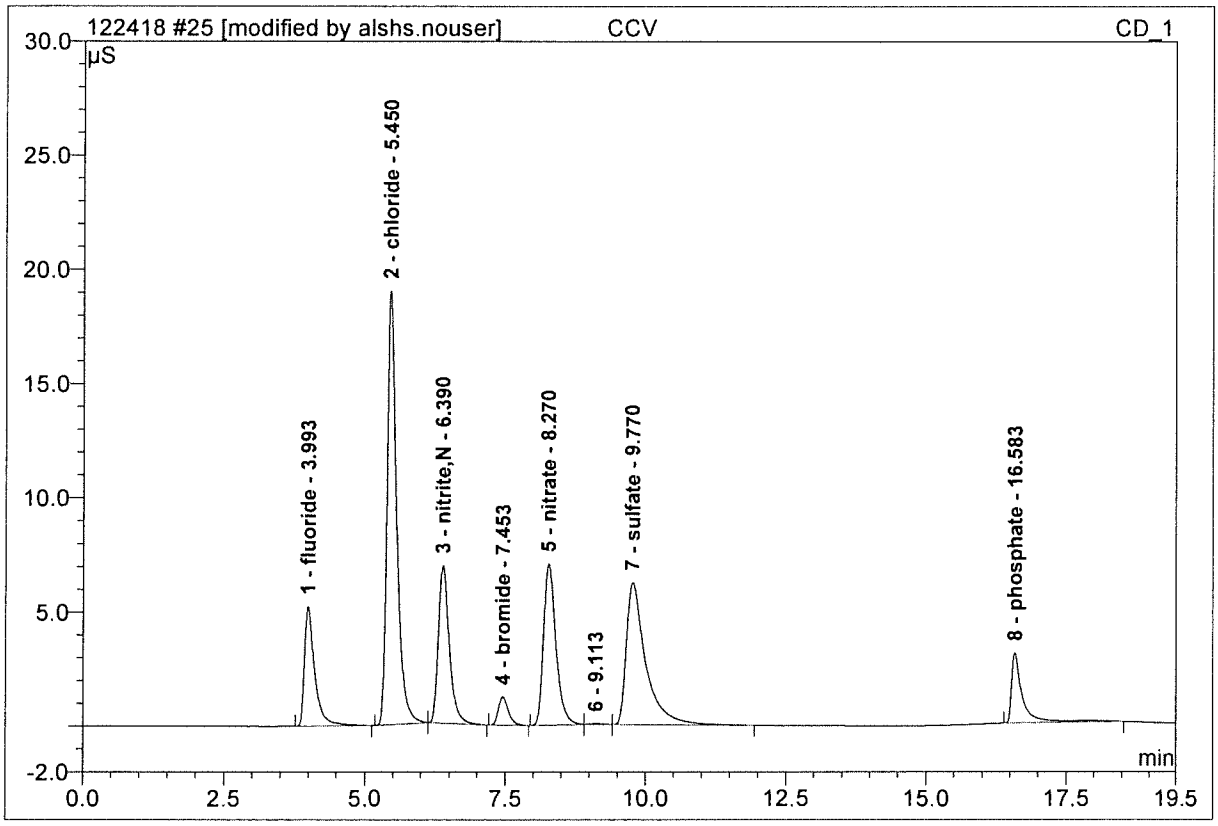
Sample Name:	**ICB**	*Injection Volume:*	**20.0**
Vial Number:	**98**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 20:02**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

25 CCV

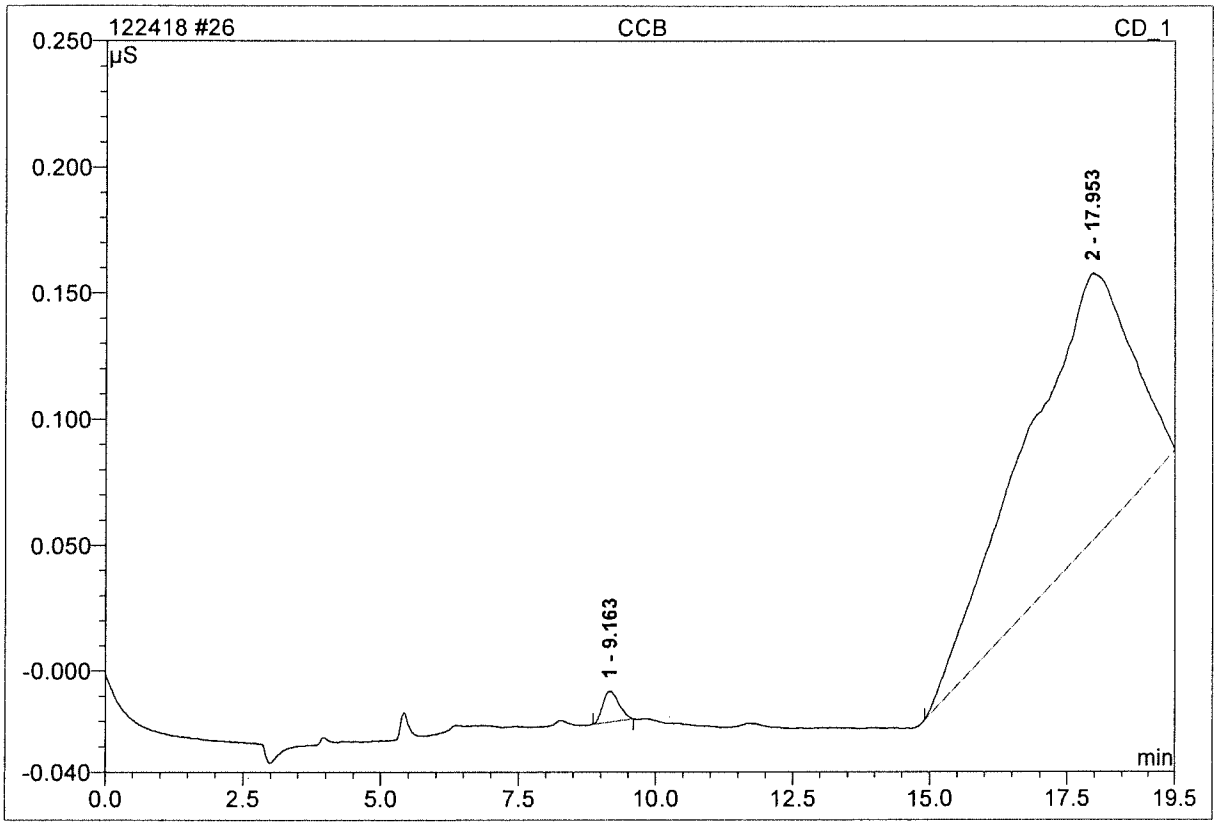
Sample Name:	**CCV**	*Injection Volume:*	**20.0**
Vial Number:	**1**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/24/2018 17:46**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.99	fluoride	5.256	1.114	9.50	4.094	1.
2	5.45	chloride	19.006	3.740	31.88	19.906	1.
3	6.39	nitrite,N	6.913	1.560	13.30	4.412	1.
4	7.45	bromide	1.252	0.259	2.21	3.958	1.
5	8.27	nitrate	7.068	1.816	15.48	3.884	1.
7	9.77	sulfate	6.247	2.509	21.39	18.627	1.
8	16.58	phosphate	3.083	0.721	6.15	3.546	1.
Total:			48.825	11.719	99.92	58.428	

26 CCB

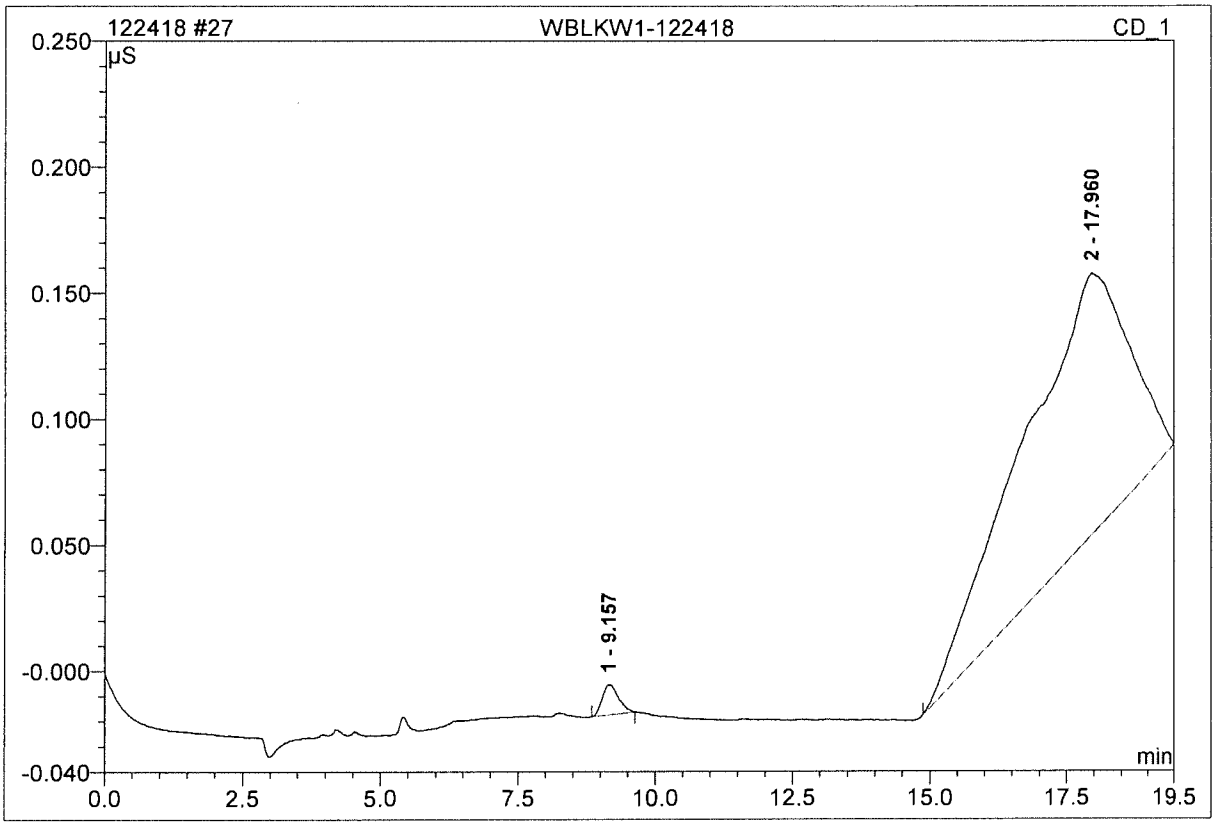
Sample Name:	**CCB**	*Injection Volume:*	**20.0**
Vial Number:	**2**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/24/2018 18:08**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

27 WBLKW1-122418

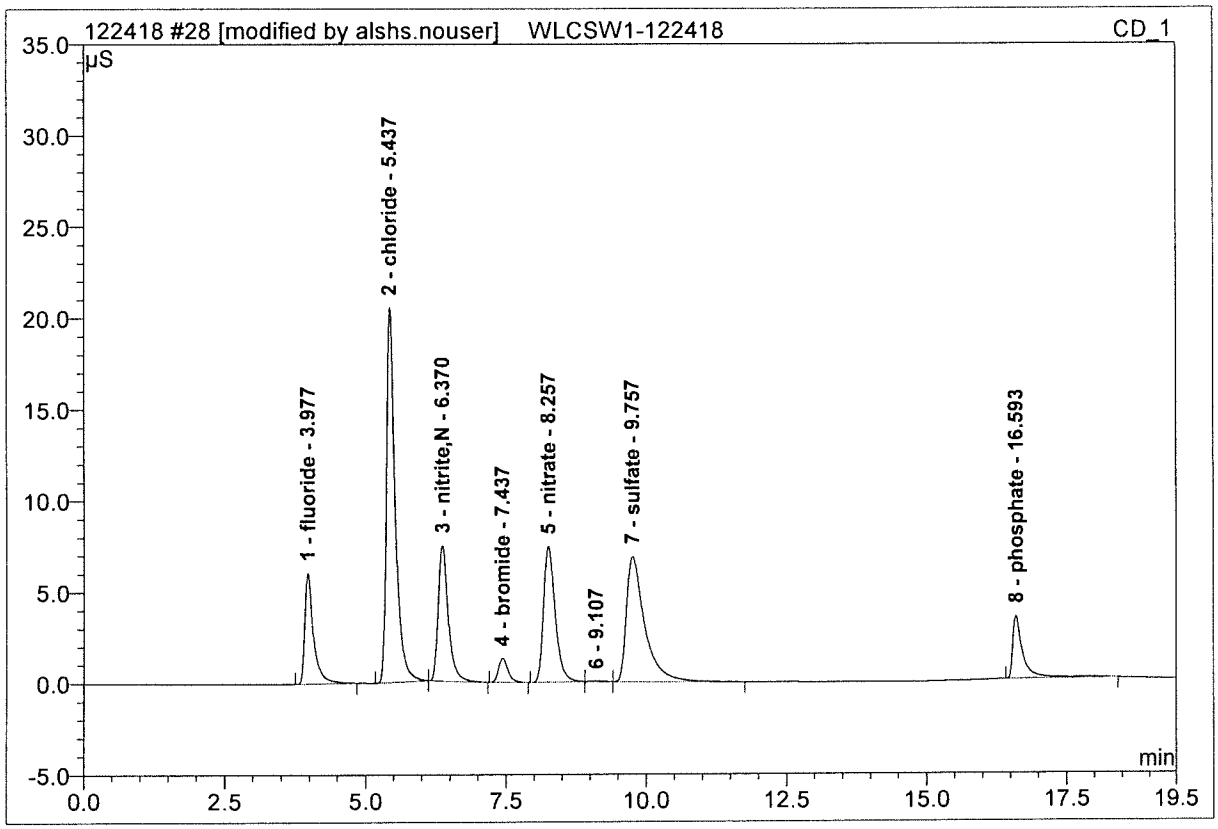
Sample Name:	**WBLKW1-122418**	*Injection Volume:*	**20.0**
Vial Number:	**5**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/24/2018 18:30**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

28 WLCSW1-122418

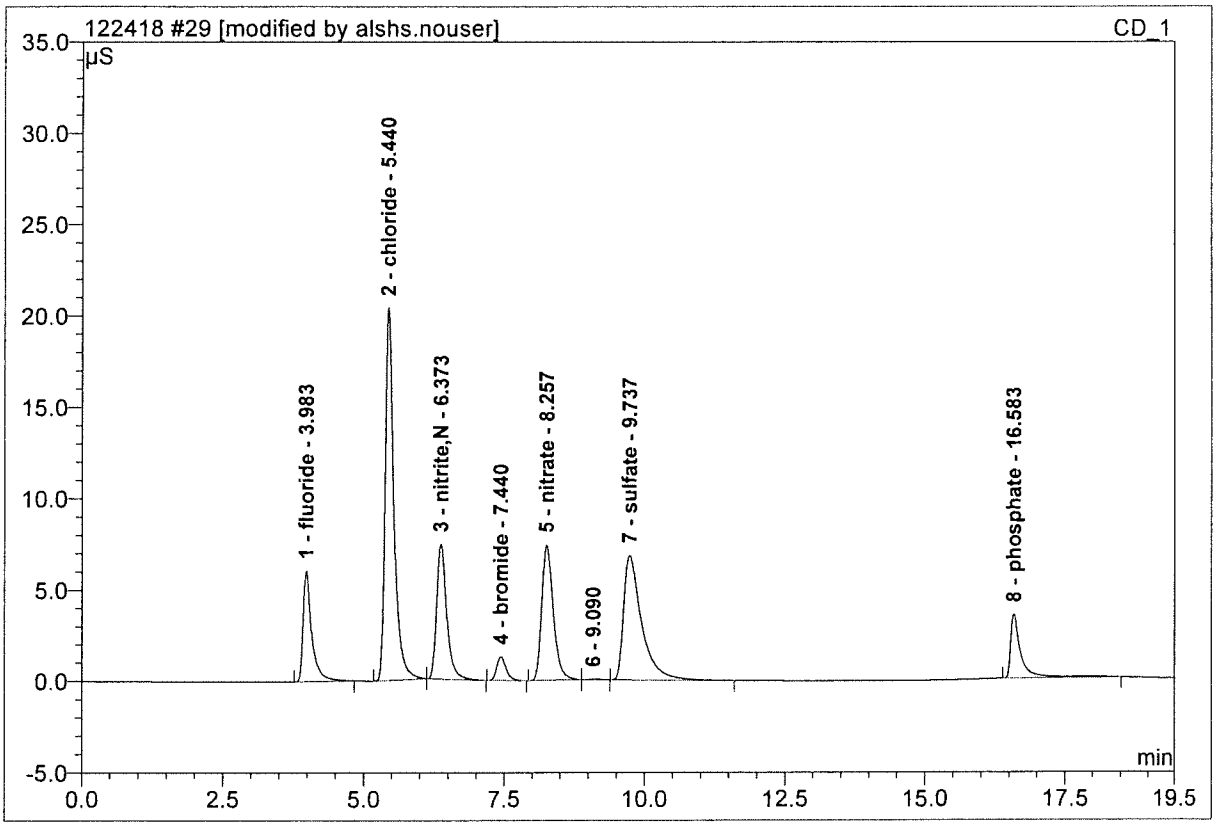
Sample Name:	**WLCSW1-122418**	*Injection Volume:*	**20.0**
Vial Number:	**6**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/24/2018 18:51**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.98	fluoride	6.077	1.090	9.31	4.006	1.
2	5.44	chloride	20.515	3.691	31.54	19.649	1.
3	6.37	nitrite,N	7.409	1.533	13.10	4.336	1.
4	7.44	bromide	1.328	0.258	2.20	3.939	1.
5	8.26	nitrate	7.440	1.798	15.37	3.847	1.
7	9.76	sulfate	6.862	2.586	22.10	19.178	1.
8	16.59	phosphate	3.450	0.739	6.31	3.626	1.
Total:			53.080	11.693	99.93	58.582	

29 WLCSDW1-122418

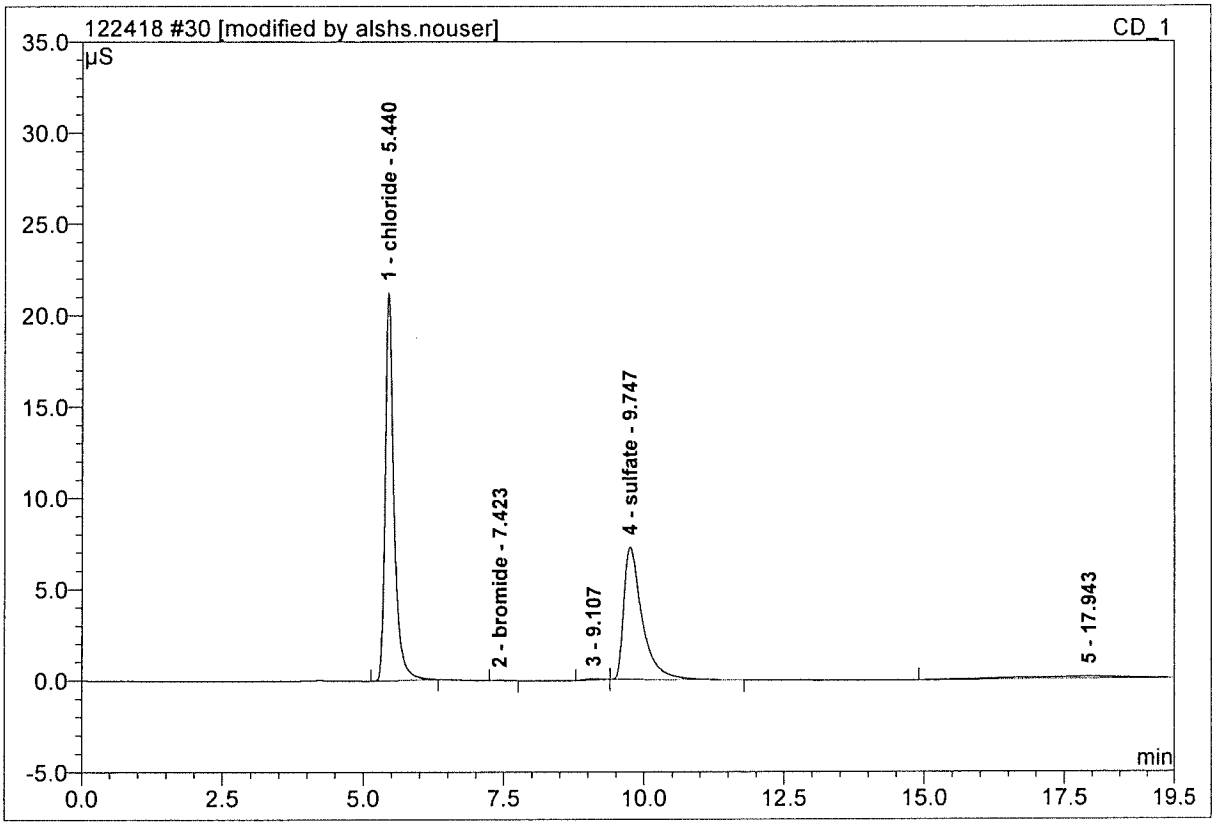
Sample Name:	**WLCSDW1-122418**	*Injection Volume:*	**20.0**
Vial Number:	**7**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/24/2018 19:13**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.98	fluoride	6.081	1.082	9.28	3.979	1.
2	5.44	chloride	20.379	3.669	31.47	19.533	1.
3	6.37	nitrite,N	7.395	1.538	13.19	4.349	1.
4	7.44	bromide	1.321	0.255	2.19	3.896	1.
5	8.26	nitrate	7.433	1.783	15.30	3.816	1.
7	9.74	sulfate	6.864	2.557	21.94	18.972	1.
8	16.58	phosphate	3.528	0.763	6.55	3.742	1.
Total:			53.001	11.646	99.91	58.287	

30 HS18120569-01DF50

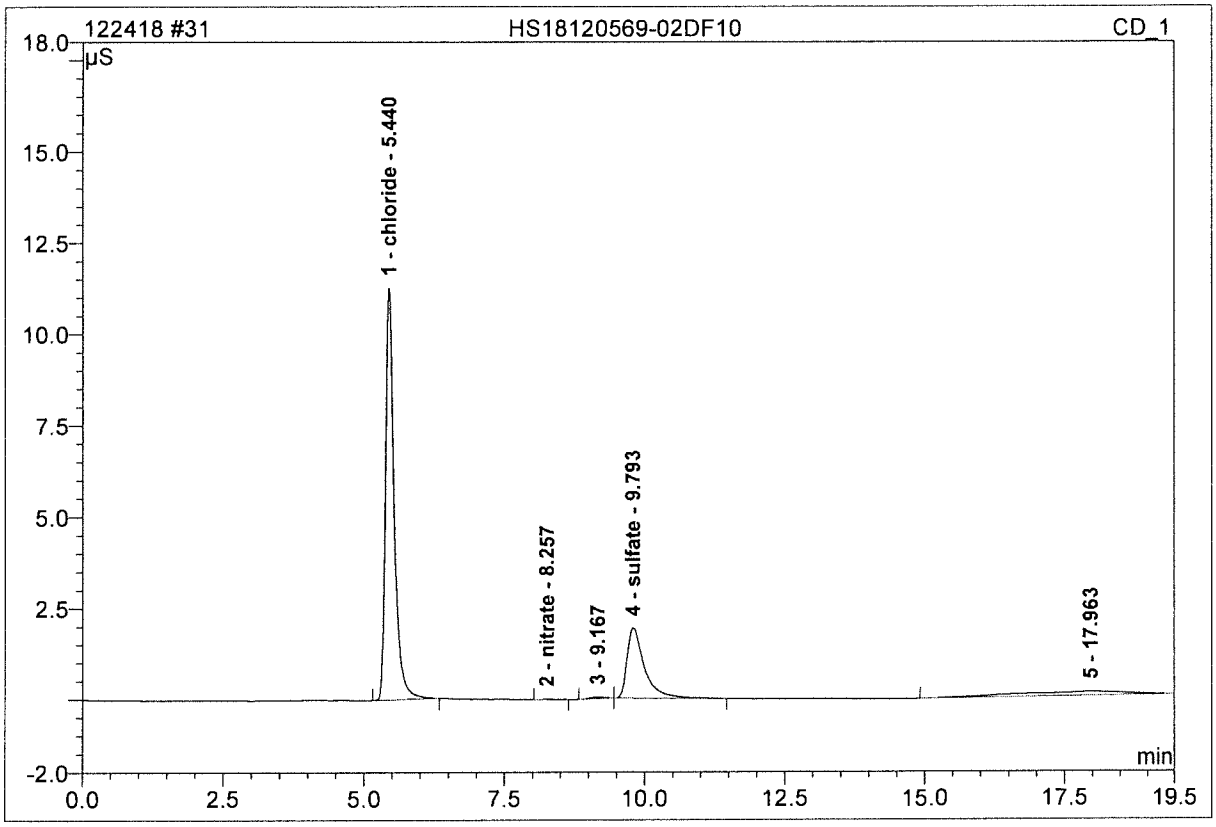
Sample Name:	**HS18120569-01DF50**	*Injection Volume:*	**20.0**
Vial Number:	**23**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**50.**
Recording Time:	**12/24/2018 19:34**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	5.44	chloride	21.235	3.813	55.51	1014.730	50.
2	7.42	bromide	0.026	0.005	0.07	7.743	50.
4	9.75	sulfate	7.245	2.737	39.84	1013.409	50.
Total:			28.506	6.555	95.42	2035.882	

31 HS18120569-02DF10

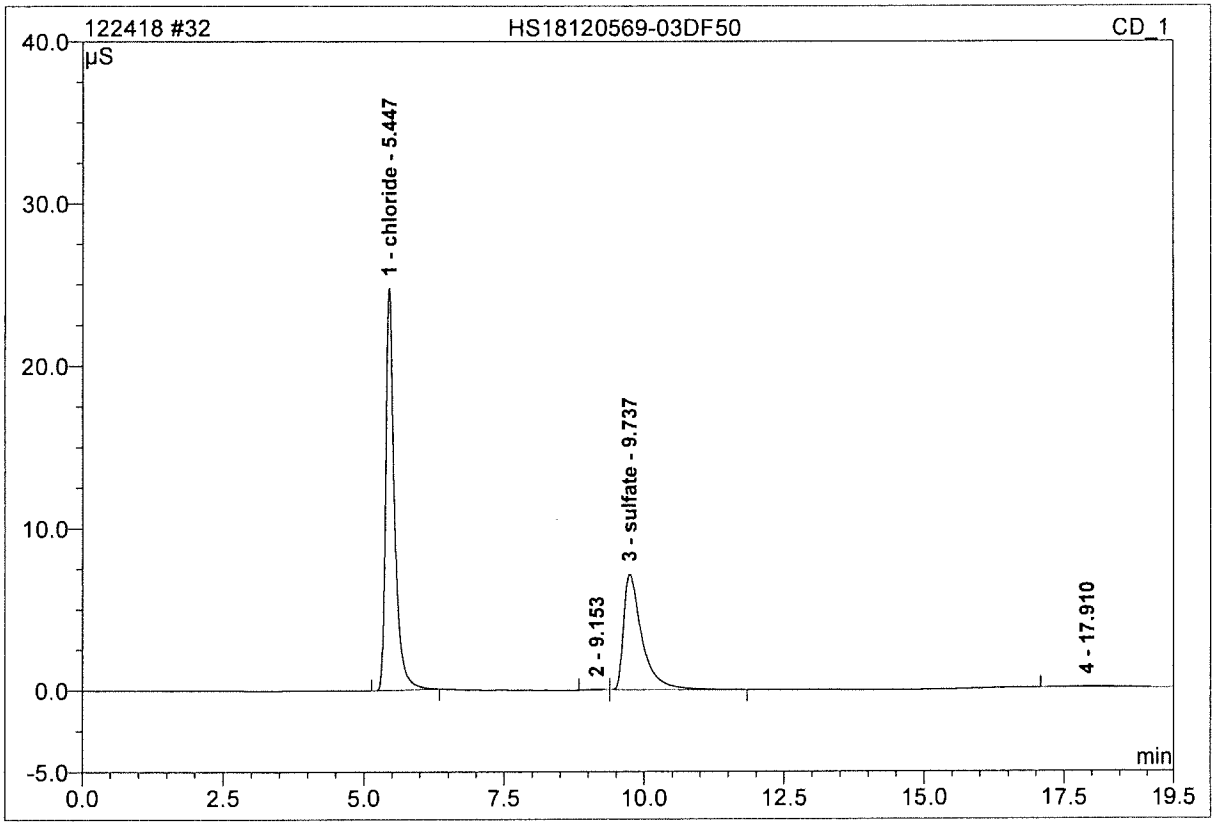
Sample Name:	**HS18120569-02DF10**	*Injection Volume:*	**20.0**
Vial Number:	**24**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**10.**
Recording Time:	**12/24/2018 19:56**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	5.44	chloride	11.282	2.028	67.61	109.146	10.
2	8.26	nitrate	0.014	0.003	0.10	0.798	10.
4	9.79	sulfate	1.938	0.692	23.05	55.248	10.
Total:			13.233	2.723	90.76	165.193	

32 HS18120569-03DF50

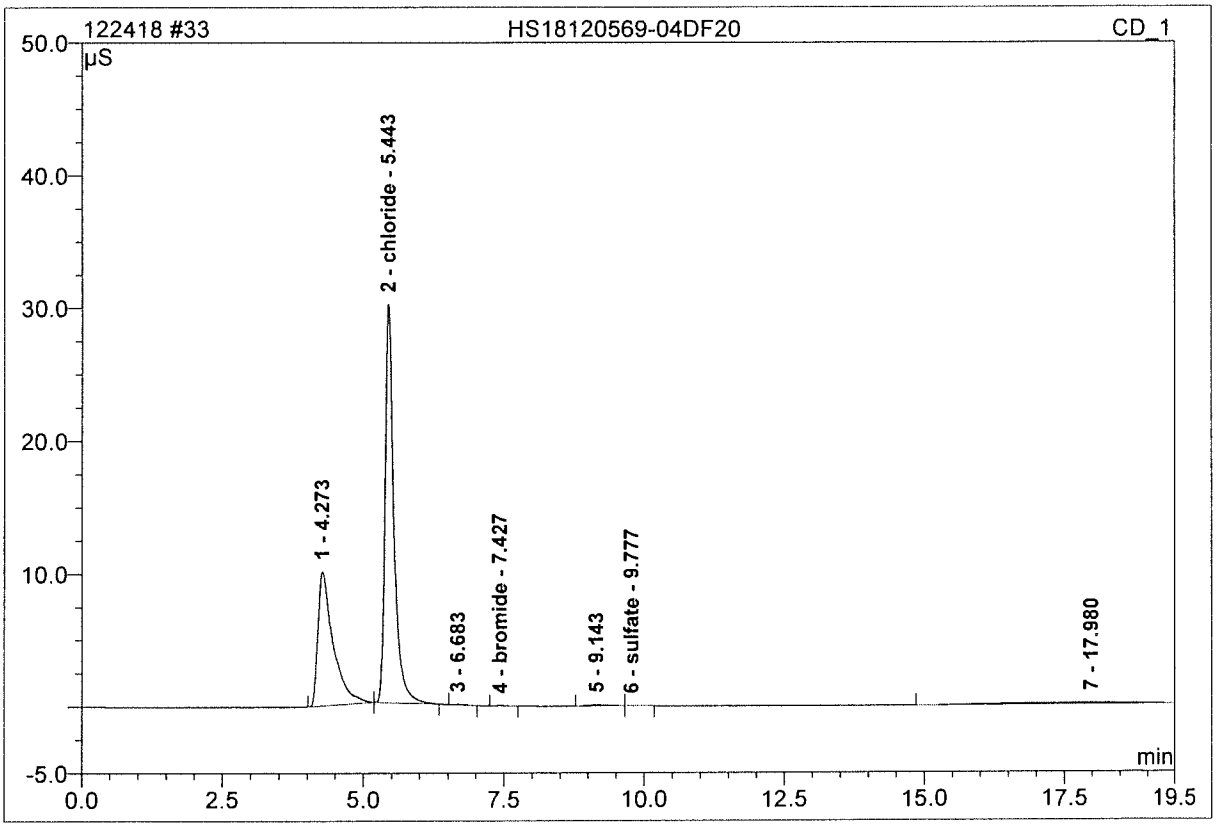
Sample Name:	**HS18120569-03DF50**	*Injection Volume:*	**20.0**
Vial Number:	**25**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**50.**
Recording Time:	**12/24/2018 20:17**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	5.45	chloride	24.764	4.494	61.86	1193.611	50.
3	9.74	sulfate	7.135	2.695	37.09	998.256	50.
Total:			31.899	7.189	98.95	2191.867	

33 HS18120569-04DF20

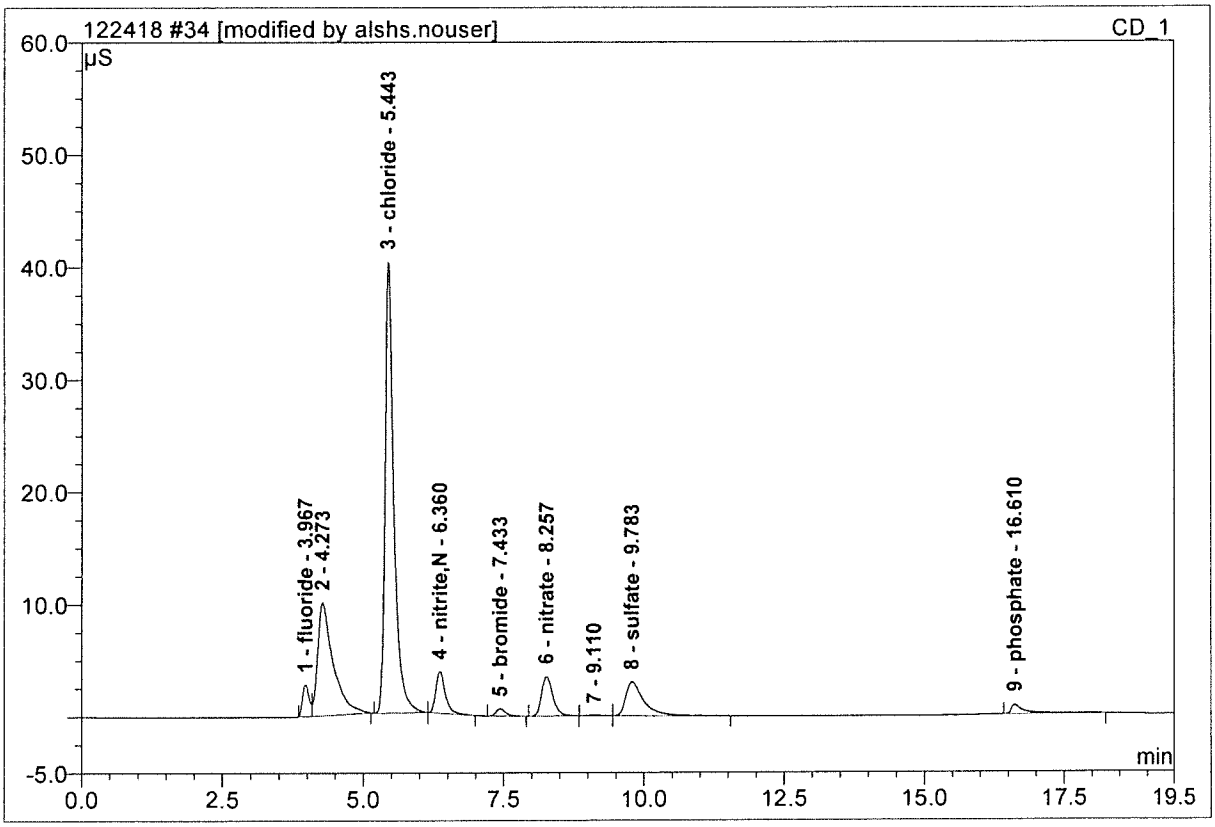
Sample Name:	**HS18120569-04DF20**	*Injection Volume:*	**20.0**
Vial Number:	**26**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**20.**
Recording Time:	**12/24/2018 20:39**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
2	5.44	chloride	29.978	5.452	60.56	578.053	20.
4	7.43	bromide	0.038	0.007	0.08	3.711	20.
6	9.78	sulfate	0.005	0.002	0.02	11.046	20.
Total:			30.021	5.460	60.66	592.810	

34 HS18120569-04MSDF20

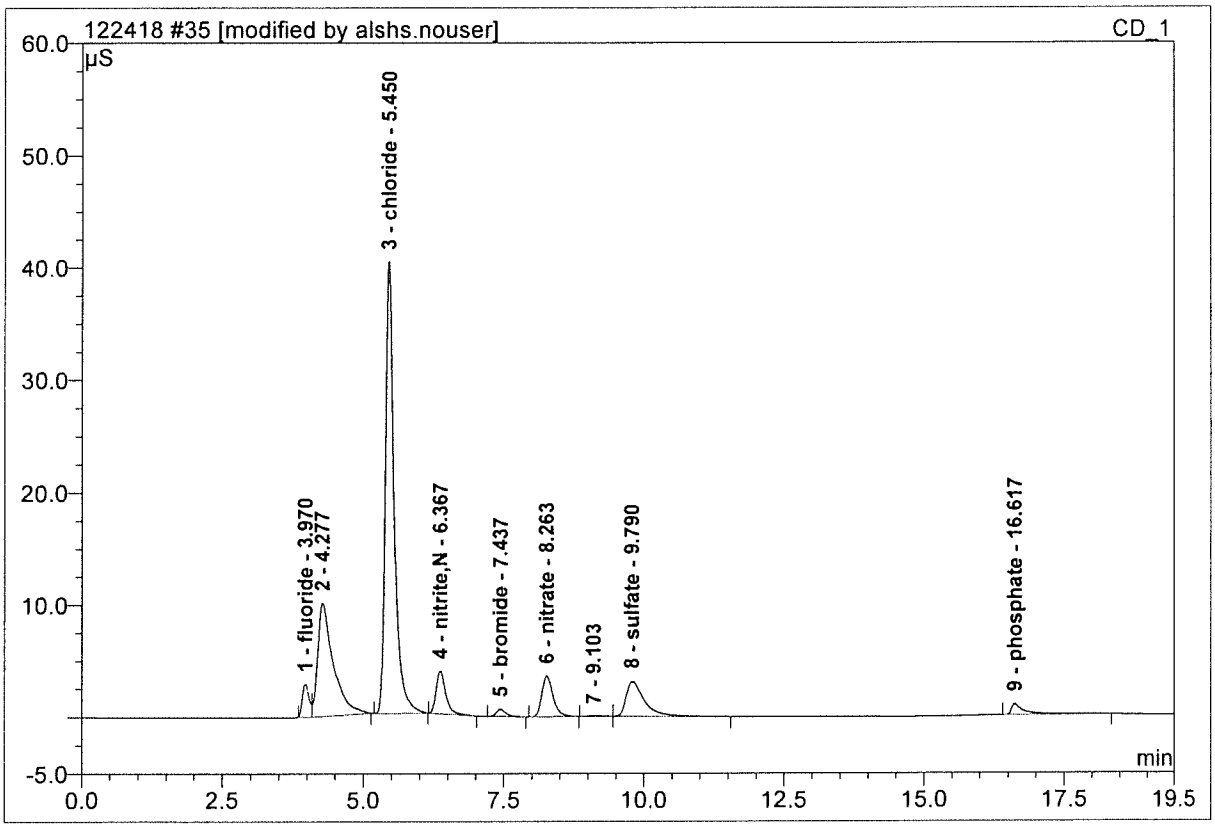
Sample Name:	**HS18120569-04MSDF20**	*Injection Volume:*	**20.0**
Vial Number:	**27**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**20.**
Recording Time:	**12/24/2018 21:01**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.97	fluoride	2.847	0.387	2.79	29.376	20.
3	5.44	chloride	40.117	7.191	51.73	760.887	20.
4	6.36	nitrite,N	3.727	0.734	5.28	41.834	20.
5	7.43	bromide	0.649	0.126	0.91	39.332	20.
6	8.26	nitrate	3.560	0.828	5.95	36.211	20.
8	9.78	sulfate	3.022	1.125	8.09	172.957	20.
9	16.61	phosphate	0.856	0.243	1.75	25.908	20.
Total:			54.780	10.633	76.50	1106.504	

35 HS18120569-04MSDDF20

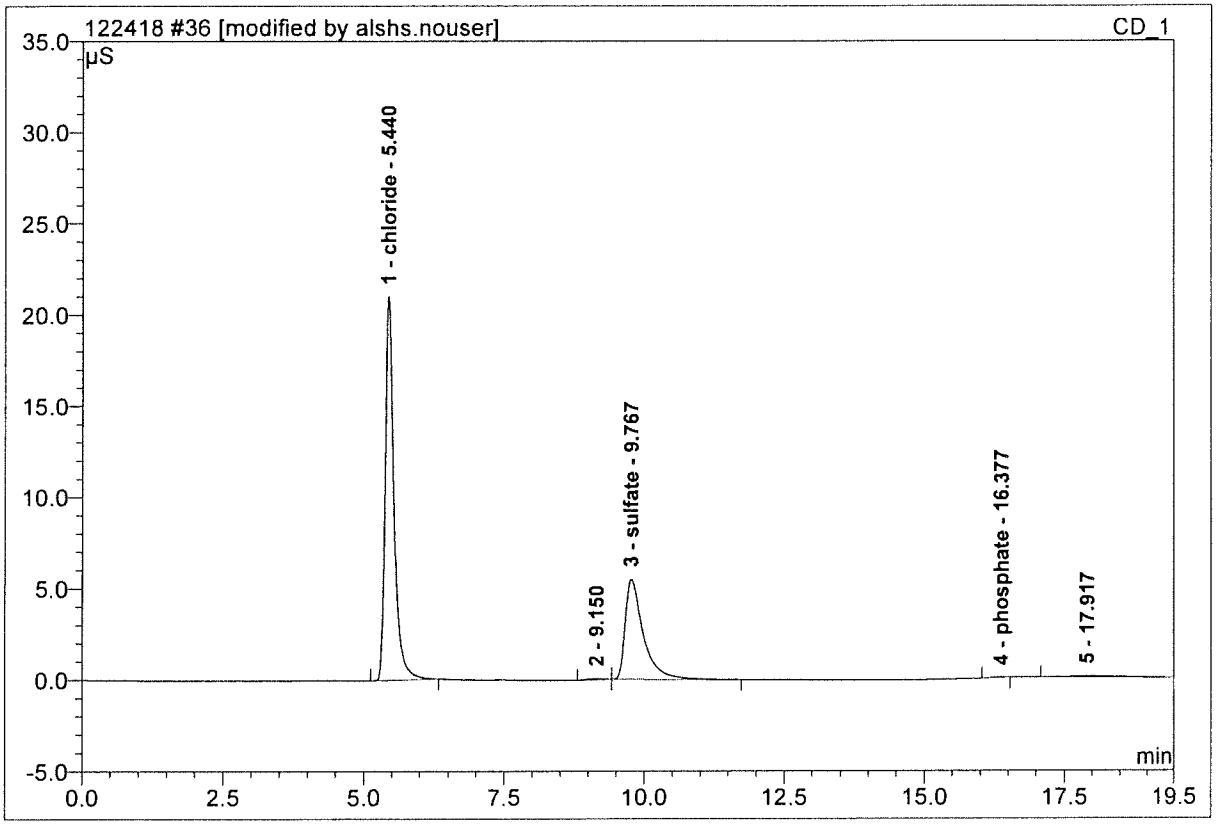
Sample Name:	**HS18120569-04MSDDF20**	*Injection Volume:*	**20.0**
Vial Number:	**28**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**20.**
Recording Time:	**12/24/2018 21:22**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.97	fluoride	2.932	0.403	2.87	30.525	20.
3	5.45	chloride	40.188	7.228	51.47	764.766	20.
4	6.37	nitrite,N	3.799	0.754	5.37	42.970	20.
5	7.44	bromide	0.661	0.128	0.91	39.849	20.
6	8.26	nitrate	3.616	0.841	5.99	36.757	20.
8	9.79	sulfate	3.105	1.152	8.20	176.933	20.
9	16.62	phosphate	0.974	0.277	1.97	29.106	20.
Total:			55.277	10.783	76.77	1120.907	

36 HS18120569-05DF100

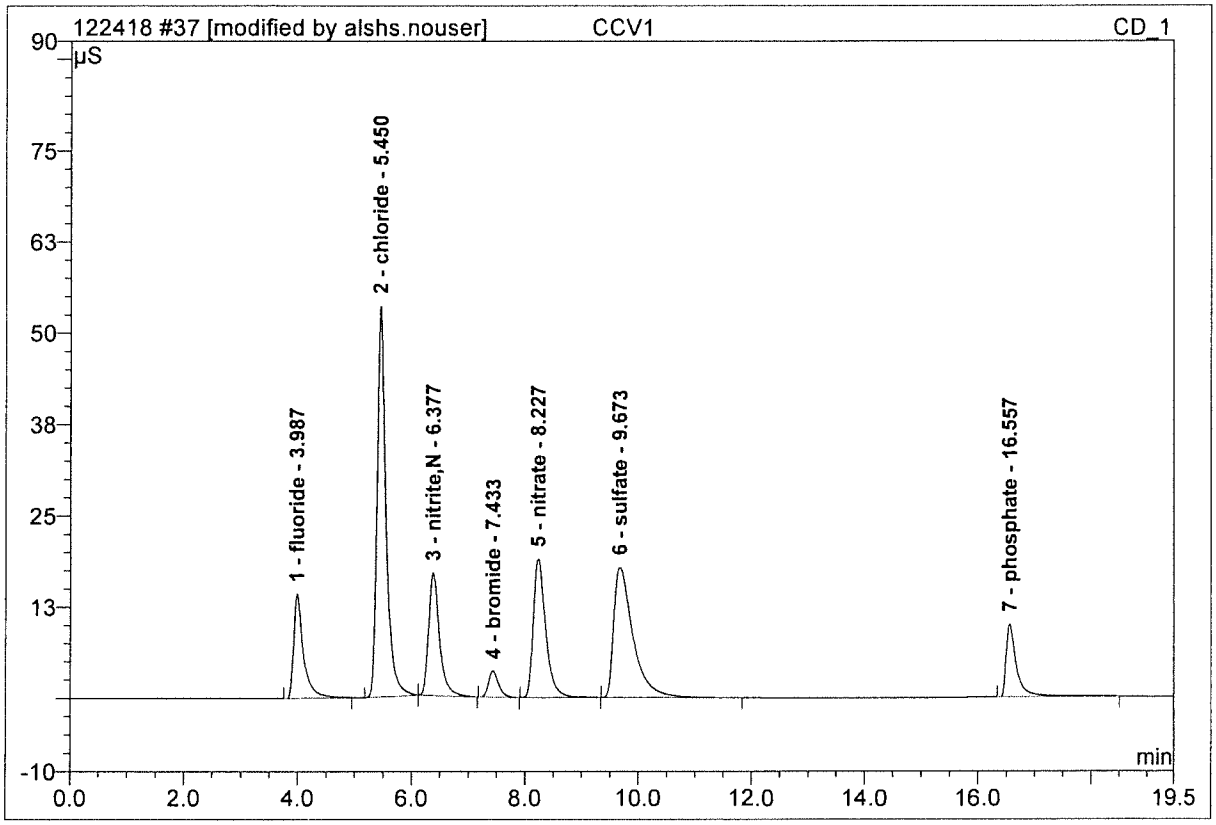
Sample Name:	**HS18120569-05DF100**	*Injection Volume:*	**20.0**
Vial Number:	**29**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**100.**
Recording Time:	**12/24/2018 21:44**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	5.44	chloride	21.011	3.820	64.08	2032.738	100.
3	9.77	sulfate	5.473	2.054	34.45	1534.456	100.
4	16.38	phosphate	0.021	0.008	0.13	19.214	100.
Total:			26.505	5.881	98.66	3586.408	

37 CCV1

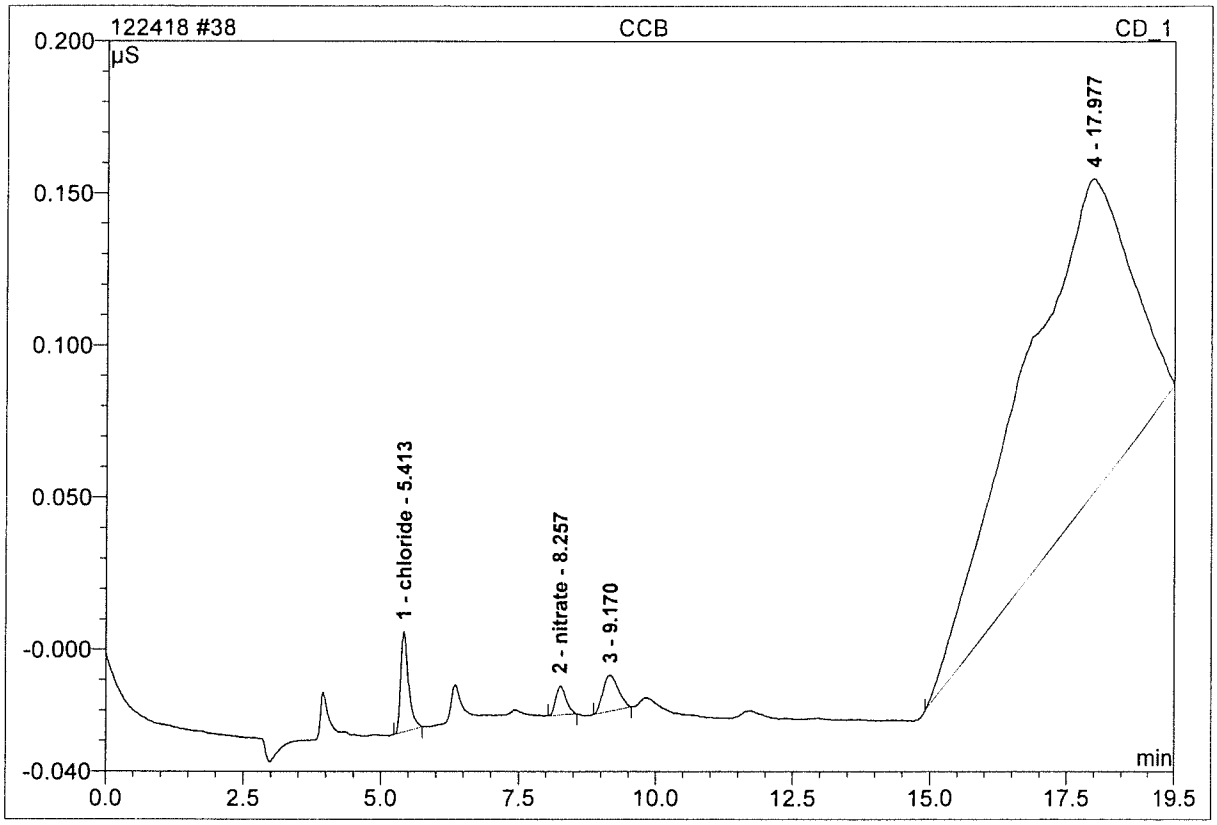
Sample Name:	**CCV1**	*Injection Volume:*	**20.0**
Vial Number:	**3**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/24/2018 22:05**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	3.99	fluoride	14.337	2.851	9.17	10.367	1.
2	5.45	chloride	53.524	9.690	31.17	51.176	1.
3	6.38	nitrite,N	16.839	3.771	12.13	10.619	1.
4	7.43	bromide	3.603	0.738	2.37	11.127	1.
5	8.23	nitrate	19.029	4.857	15.62	10.269	1.
6	9.67	sulfate	17.857	7.053	22.69	51.387	1.
7	16.56	phosphate	9.989	2.132	6.86	10.173	1.
Total:			135.178	31.093	100.00	155.119	

38 CCB

Sample Name:	**CCB**	*Injection Volume:*	**20.0**
Vial Number:	**4**	*Channel:*	**CD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**anions3**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/24/2018 22:27**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Dil.Fac.
1	5.41	chloride	0.033	0.005	2.09	0.285	1.
2	8.26	nitrate	0.010	0.002	0.80	0.078	1.
Total:			0.043	0.007	2.89	0.362	

HS18120642 Cover Page

ALS WO# HS18120642

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HS18120642 Wet Chem Raw Data

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WorkOrder: HS18120642

LHAAP-58

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

28-Jan-2019

HS18120642 LHAAP58 Final

ALS WO# HS18120642

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January 04, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS18120642**

Laboratory Results for: **LHAAP-58**

Dear Marcia,

ALS Environmental received 5 sample(s) on Dec 12, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18120642

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18120642-01	35AWW06_121118	Groundwater		11-Dec-2018 08:55	12-Dec-2018 09:05	☐
HS18120642-02	35AWW11_121118	Groundwater		11-Dec-2018 10:25	12-Dec-2018 09:05	☐
HS18120642-03	35AWW09_121118	Groundwater		11-Dec-2018 11:30	12-Dec-2018 09:05	☐
HS18120642-04	35AWW13_121118	Groundwater		11-Dec-2018 13:00	12-Dec-2018 09:05	☐
HS18120642-05	Trip Blank	Water	CG 101618 -292	11-Dec-2018 00:00	12-Dec-2018 09:05	☐

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP-58
Work Order: HS18120642

Work Order Comments

- The analyses for RSK-175 Dissolved Gases and CO2 were subcontracted to ALS Environmental in Simi Valley, CA. Final Report attached.

  The analyses for Ferrous Iron and Volatile Fatty Acids were subcontracted to ALS Environmental in Rochester, NY. Final Report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

  The analyses for DHC/DHB were subcontracted to Microbial Insights in Knoxville, TN. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R329822

Sample ID: HS18120927-05MS

- MS and MSD are for an unrelated sample.

Metals by Method SW6020

Batch ID: 135804

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: 135805

Sample ID: HS18120927-08MS

- MS and MSD are for an unrelated sample.

Wet Chemistry by Method E376.1

Batch ID: R329956

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R329695

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R329207

Sample ID: HS18120459-01MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate).

Batch ID: R329941

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: 135598

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_121118
Collection Date: 11-Dec-2018 08:55

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,1-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 13:07
1,1-Dichloroethene	**3.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 13:07
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
2-Butanone	**120**		**0.50**	**1.0**	**2.0**	**UG/L**	1	22-Dec-2018 13:07
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
2-Hexanone	**18**		**1.0**	**1.0**	**2.0**	**UG/L**	1	22-Dec-2018 13:07
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	22-Dec-2018 13:07
Acetone	**420**		**2.0**	**10**	**10**	**UG/L**	5	22-Dec-2018 21:23
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	22-Dec-2018 13:07
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_121118
Collection Date: 11-Dec-2018 08:55

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	22-Dec-2018 13:07
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 13:07
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	22-Dec-2018 13:07
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:07
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Naphthalene	**1.1**		**0.30**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 13:07
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:07
Surr: 1,2-Dichloroethane-d4	*90.8*			**0**	*81-118*	*%REC*	*1*	*22-Dec-2018 13:07*
Surr: 1,2-Dichloroethane-d4	*94.6*			**0**	*81-118*	*%REC*	*5*	*22-Dec-2018 21:23*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*22-Dec-2018 13:07*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*5*	*22-Dec-2018 21:23*
Surr: Dibromofluoromethane	*88.6*			**0**	*80-119*	*%REC*	*1*	*22-Dec-2018 13:07*
Surr: Dibromofluoromethane	*90.8*			**0**	*80-119*	*%REC*	*5*	*22-Dec-2018 21:23*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*22-Dec-2018 13:07*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*22-Dec-2018 21:23*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**91.0**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:23
Manganese	**8.52**		**0.0700**	**0.100**	**0.500**	**mg/L**	100	24-Dec-2018 13:34
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**85.8**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:39
Manganese	**9.29**		**0.0700**	**0.100**	**0.500**	**mg/L**	100	24-Dec-2018 13:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_121118
Collection Date: 11-Dec-2018 08:55

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.467**		**0.0200**	**0.0400**	**0.0500**	**mg/L**	1	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	17-Dec-2018 16:30
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,210**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 21:55
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**858**		**4.00**	**10.0**	**10.0**	**mg/L**	20	12-Dec-2018 23:03
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	12-Dec-2018 22:49
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	12-Dec-2018 22:49
Sulfate	**13.4**		**0.400**	**1.00**	**1.00**	**mg/L**	2	12-Dec-2018 22:49
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Dec-2018 16:00
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	28-Dec-2018 10:25
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_121118
Collection Date: 11-Dec-2018 10:25

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,1-Dichloroethene	**1.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 18:54
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
2-Butanone	**200**		**0.50**	**1.0**	**2.0**	**UG/L**	1	22-Dec-2018 18:54
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	22-Dec-2018 18:54
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	22-Dec-2018 18:54
Acetone	**190**		**0.40**	**2.0**	**2.0**	**UG/L**	1	22-Dec-2018 18:54
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	22-Dec-2018 18:54
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_121118
Collection Date: 11-Dec-2018 10:25

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	22-Dec-2018 18:54
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 18:54
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	22-Dec-2018 18:54
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 18:54
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Naphthalene	**0.87**	J	**0.30**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 18:54
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 18:54
Surr: 1,2-Dichloroethane-d4	*93.2*			**0**	*81-118*	*%REC*	*1*	*22-Dec-2018 18:54*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*22-Dec-2018 18:54*
Surr: Dibromofluoromethane	*90.1*			**0**	*80-119*	*%REC*	*1*	*22-Dec-2018 18:54*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*22-Dec-2018 18:54*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**59.0**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:32
Manganese	**8.00**		**0.0350**	**0.0500**	**0.250**	**mg/L**	50	24-Dec-2018 13:36
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**55.3**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:46
Manganese	**7.91**		**0.0350**	**0.0500**	**0.250**	**mg/L**	50	24-Dec-2018 14:00
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.169**		**0.0200**	**0.0400**	**0.0500**	**mg/L**	1	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	**7.84**		**1.00**	**1.00**	**1.00**	**mg/L**	1	17-Dec-2018 16:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_121118
Collection Date: 11-Dec-2018 10:25

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**1,430**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 22:22
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**2,120**		**10.0**	**25.0**	**25.0**	**mg/L**	50	13-Dec-2018 21:50
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	12-Dec-2018 23:18
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	12-Dec-2018 23:18
Sulfate	**127**		**0.400**	**1.00**	**1.00**	**mg/L**	2	12-Dec-2018 23:18
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Dec-2018 16:00
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	28-Dec-2018 10:25
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW09_121118
Collection Date: 11-Dec-2018 11:30

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,1-Dichloroethane	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 13:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 13:32
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	22-Dec-2018 13:32
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	22-Dec-2018 13:32
Acetone	**2.1**		**0.40**	**2.0**	**2.0**	**UG/L**	1	22-Dec-2018 13:32
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	22-Dec-2018 13:32
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW09_121118
Collection Date: 11-Dec-2018 11:30

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
cis-1,2-Dichloroethene	**0.94**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 13:32
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	22-Dec-2018 13:32
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 13:32
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	22-Dec-2018 13:32
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 13:32
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Tetrachloroethene	**450**		**3.0**	**5.0**	**10**	**UG/L**	10	22-Dec-2018 14:46
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Trichloroethene	**150**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Dec-2018 13:32
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 13:32
Surr: 1,2-Dichloroethane-d4	*94.0*			**0**	*81-118*	*%REC*	*1*	*22-Dec-2018 13:32*
Surr: 1,2-Dichloroethane-d4	*92.6*			**0**	*81-118*	*%REC*	*10*	*22-Dec-2018 14:46*
Surr: 4-Bromofluorobenzene	*99.2*			**0**	*85-114*	*%REC*	*1*	*22-Dec-2018 13:32*
Surr: 4-Bromofluorobenzene	*99.2*			**0**	*85-114*	*%REC*	*10*	*22-Dec-2018 14:46*
Surr: Dibromofluoromethane	*89.1*			**0**	*80-119*	*%REC*	*1*	*22-Dec-2018 13:32*
Surr: Dibromofluoromethane	*89.6*			**0**	*80-119*	*%REC*	*10*	*22-Dec-2018 14:46*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*22-Dec-2018 13:32*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*10*	*22-Dec-2018 14:46*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**0.553**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 21:34
Manganese	**0.128**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	21-Dec-2018 21:34
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 19-Dec-2018		Analyst: JCJ
Iron	**0.437**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	21-Dec-2018 23:49
Manganese	**0.140**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	21-Dec-2018 23:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW09_121118
Collection Date: 11-Dec-2018 11:30

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 13-Dec-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.112**		**0.0200**	**0.0400**	**0.0500**	**mg/L**	1	13-Dec-2018 15:15
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	17-Dec-2018 16:30
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**282**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Dec-2018 22:27
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,320**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Dec-2018 00:16
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	12-Dec-2018 23:47
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	12-Dec-2018 23:47
Sulfate	**903**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Dec-2018 00:16
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Dec-2018 16:00
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Dec-2018 09:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	28-Dec-2018 10:25
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Jan-2019 10:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW13_121118
Collection Date: 11-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 19:19
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	22-Dec-2018 19:19
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	22-Dec-2018 19:19
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	22-Dec-2018 19:19
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	22-Dec-2018 19:19
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW13_121118
Collection Date: 11-Dec-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	22-Dec-2018 19:19
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 19:19
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	22-Dec-2018 19:19
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 19:19
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 19:19
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*22-Dec-2018 19:19*
Surr: 4-Bromofluorobenzene	*97.8*			**0**	*85-114*	*%REC*	*1*	*22-Dec-2018 19:19*
Surr: Dibromofluoromethane	*90.4*			**0**	*80-119*	*%REC*	*1*	*22-Dec-2018 19:19*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*22-Dec-2018 19:19*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 11-Dec-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 16:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	22-Dec-2018 16:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	22-Dec-2018 16:01
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	22-Dec-2018 16:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	22-Dec-2018 16:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 11-Dec-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18120642
Lab ID:HS18120642-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	22-Dec-2018 16:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	22-Dec-2018 16:01
Methylene chloride	0.50	U	0.40	0.50	2.0	UG/L	1	22-Dec-2018 16:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	22-Dec-2018 16:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Dec-2018 16:01
Surr: 1,2-Dichloroethane-d4	*94.2*			**0**	*81-118*	*%REC*	*1*	*22-Dec-2018 16:01*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*22-Dec-2018 16:01*
Surr: Dibromofluoromethane	*89.3*			**0**	*80-119*	*%REC*	*1*	*22-Dec-2018 16:01*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*22-Dec-2018 16:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Batch ID: 135598 **Method:** PHOSPHORUS BY E365.3 **Prep:** P_TW_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120642-01	1	50	50 (mL)	1
HS18120642-02	1	50	50 (mL)	1
HS18120642-03	1	50	50 (mL)	1

Batch ID: 135804 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120642-01	1	10	10 (mL)	1
HS18120642-02	1	10	10 (mL)	1
HS18120642-03	1	10	10 (mL)	1

Batch ID: 135805 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18120642-01	1	10	10 (mL)	1
HS18120642-02	1	10	10 (mL)	1
HS18120642-03	1	10	10 (mL)	1

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 135598	**Test Name :** PHOSPHORUS BY E365.3			**Matrix:** Groundwater		
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55		13 Dec 2018 11:00	13 Dec 2018 15:15	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25		13 Dec 2018 11:00	13 Dec 2018 15:15	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30		13 Dec 2018 11:00	13 Dec 2018 15:15	1
Batch ID 135804	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55		19 Dec 2018 13:00	24 Dec 2018 13:34	100
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55		19 Dec 2018 13:00	21 Dec 2018 21:23	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25		19 Dec 2018 13:00	24 Dec 2018 13:36	50
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25		19 Dec 2018 13:00	21 Dec 2018 21:32	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30		19 Dec 2018 13:00	21 Dec 2018 21:34	1
Batch ID 135805	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55		19 Dec 2018 13:00	24 Dec 2018 13:58	100
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55		19 Dec 2018 13:00	21 Dec 2018 23:39	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25		19 Dec 2018 13:00	24 Dec 2018 14:00	50
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25		19 Dec 2018 13:00	21 Dec 2018 23:46	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30		19 Dec 2018 13:00	21 Dec 2018 23:49	1
Batch ID R329207	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			12 Dec 2018 23:03	20
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			12 Dec 2018 22:49	2
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			12 Dec 2018 23:18	2
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			13 Dec 2018 00:16	20
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			12 Dec 2018 23:47	1
Batch ID R329393	**Test Name :** SUBCONTRACT ANALYSIS - DHC/DHB			**Matrix:** Groundwater		
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			17 Dec 2018 16:00	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			17 Dec 2018 16:00	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			17 Dec 2018 16:00	1
Batch ID R329695	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			20 Dec 2018 21:55	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			20 Dec 2018 22:22	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			20 Dec 2018 22:27	1
Batch ID R329822	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS18120642-05	Trip Blank	11 Dec 2018 00:00			22 Dec 2018 16:01	1

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R329822	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			22 Dec 2018 21:23	5
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			22 Dec 2018 13:07	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			22 Dec 2018 18:54	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			22 Dec 2018 14:46	10
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			22 Dec 2018 13:32	1
HS18120642-04	35AWW13_121118	11 Dec 2018 13:00			22 Dec 2018 19:19	1
Batch ID R329884	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			26 Dec 2018 09:04	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			26 Dec 2018 09:04	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			26 Dec 2018 09:04	1
Batch ID R329941	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			13 Dec 2018 21:50	50
Batch ID R329956	**Test Name :** SULFIDE BY E376.1				**Matrix:** Groundwater	
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			17 Dec 2018 16:30	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			17 Dec 2018 16:30	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			17 Dec 2018 16:30	1
Batch ID R330084	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			28 Dec 2018 10:25	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			28 Dec 2018 10:25	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			28 Dec 2018 10:25	1
Batch ID R330453	**Test Name :** SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS				**Matrix:** Groundwater	
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			04 Jan 2019 10:12	1
HS18120642-01	35AWW06_121118	11 Dec 2018 08:55			04 Jan 2019 10:12	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			04 Jan 2019 10:12	1
HS18120642-02	35AWW11_121118	11 Dec 2018 10:25			04 Jan 2019 10:12	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			04 Jan 2019 10:12	1
HS18120642-03	35AWW09_121118	11 Dec 2018 11:30			04 Jan 2019 10:12	1

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: 135804 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-135804** Units: **mg/L** Analysis Date: **21-Dec-2018 21:07**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879116** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-135804** Units: **mg/L** Analysis Date: **21-Dec-2018 21:10**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879117** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.811	0.200	5	0	96.2	80 - 120				
Manganese	0.04729	0.00500	0.05	0	94.6	80 - 120				

MS Sample ID: **HS18120913-04MS** Units: **mg/L** Analysis Date: **21-Dec-2018 22:12**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879142** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	15.56	0.200	5	10.76	96.0	80 - 120				
Manganese	0.1135	0.00500	0.05	0.06587	95.3	80 - 120				

MSD Sample ID: **HS18120913-04MSD** Units: **mg/L** Analysis Date: **21-Dec-2018 22:14**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879143** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	15.34	0.200	5	10.76	91.6	80 - 120	15.56	1.43	20	
Manganese	0.1084	0.00500	0.05	0.06587	85.0	80 - 120	0.1135	4.65	20	

PDS Sample ID: **HS18120913-04PDS** Units: **mg/L** Analysis Date: **21-Dec-2018 22:17**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879144** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	22.17	0.200	10	10.76	114	75 - 125				
Manganese	0.1632	0.00500	0.1	0.06587	97.3	75 - 125				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: 135804 **Instrument: ICPMS04** **Method: SW6020**

SD Sample ID: **HS18120913-04SD** Units: **mg/L** Analysis Date: **21-Dec-2018 22:10**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879141** PrepDate: **19-Dec-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	11.5	1.00					10.76	6.85	10	
Manganese	0.06612	0.0250					0.06587	0.376	10	

The following samples were analyzed in this batch: HS18120642-01 HS18120642-02 HS18120642-03

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: 135805 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-135805** Units: **mg/L** Analysis Date: **21-Dec-2018 23:24**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879287** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-135805** Units: **mg/L** Analysis Date: **21-Dec-2018 23:26**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879288** PrepDate: **19-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.612	0.200	5	0	92.2	80 - 120				
Manganese	0.04744	0.00500	0.05	0	94.9	80 - 120				

MS Sample ID: **HS18120927-08MS** Units: **mg/L** Analysis Date: **22-Dec-2018 00:45**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879323** PrepDate: **19-Dec-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.965	2.00	5	0.101	97.3	75 - 125				
Manganese	0.04104	0.0500	0.05	0.004999	72.1	75 - 125				JS

MSD Sample ID: **HS18120927-08MSD** Units: **mg/L** Analysis Date: **22-Dec-2018 00:47**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879324** PrepDate: **19-Dec-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.346	2.00	5	0.101	84.9	75 - 125	4.965	13.3	20	
Manganese	0.03526	0.0500	0.05	0.004999	60.5	75 - 125	0.04104	0	20	JS

PDS Sample ID: **HS18120927-08PDS** Units: **mg/L** Analysis Date: **22-Dec-2018 00:50**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879325** PrepDate: **19-Dec-2018** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	99.19	2.00	100	0	99.2	75 - 125				
Manganese	1.104	0.0500	1	0	110	75 - 125				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: 135805 **Instrument: ICPMS04** **Method: SW6020 (dissolved) (DISSOLVED)**

SD Sample ID: **HS18120927-08SD** Units: **mg/L** Analysis Date: **22-Dec-2018 00:43**
Client ID: Run ID: **ICPMS04_329719** SeqNo: **4879322** PrepDate: **19-Dec-2018** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	0.6201	10.0					0.101	0	10	J
Manganese	0.0500	0.250					0.004999	0	10	U

The following samples were analyzed in this batch: HS18120642-01 HS18120642-02 HS18120642-03

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181222** Units: **UG/L** Analysis Date: **22-Dec-2018 12:18**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879626** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

MBLK Sample ID: **VBLKW-181222** Units: **UG/L** Analysis Date: **22-Dec-2018 12:18**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879626** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	0.50	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.45*	*1.0*	*50*	*0*	*92.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.25*	*1.0*	*50*	*0*	*98.5*	*85 - 114*				
Surr: Dibromofluoromethane	*43.49*	*1.0*	*50*	*0*	*87.0*	*80 - 119*				
Surr: Toluene-d8	*52.33*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-1812022** Units: **UG/L** Analysis Date: **22-Dec-2018 11:28**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879625** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.87	1.0	20	0	99.3	78 - 124				
1,1,1-Trichloroethane	20.02	1.0	20	0	100	74 - 131				
1,1,2,2-Tetrachloroethane	20	1.0	20	0	100	71 - 121				
1,1,2-Trichloroethane	20.26	1.0	20	0	101	80 - 119				
1,1-Dichloroethane	20.14	1.0	20	0	101	77 - 125				
1,1-Dichloroethene	19.53	1.0	20	0	97.6	71 - 131				
1,1-Dichloropropene	19.53	1.0	20	0	97.7	78 - 125				
1,2,3-Trichlorobenzene	19.73	1.0	20	0	98.6	69 - 129				
1,2,3-Trichloropropane	20.19	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	19.84	1.0	20	0	99.2	69 - 130				
1,2,4-Trimethylbenzene	20.42	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	19.13	1.0	20	0	95.7	62 - 128				
1,2-Dibromoethane	21.02	1.0	20	0	105	77 - 121				
1,2-Dichlorobenzene	19.5	1.0	20	0	97.5	80 - 119				
1,2-Dichloroethane	20.5	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	20.11	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	20.15	1.0	20	0	101	75 - 124				
1,3-Dichlorobenzene	19.53	1.0	20	0	97.6	80 - 119				
1,3-Dichloropropane	20.44	1.0	20	0	102	80 - 119				
1,4-Dichlorobenzene	19.13	1.0	20	0	95.6	79 - 118				
2,2-Dichloropropane	20.92	1.0	20	0	105	60 - 139				
2-Butanone	41.9	2.0	40	0	105	56 - 143				
2-Chlorotoluene	19.88	1.0	20	0	99.4	79 - 122				
2-Hexanone	43.82	2.0	40	0	110	57 - 139				
4-Chlorotoluene	20.23	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	19.72	1.0	20	0	98.6	77 - 127				
4-Methyl-2-pentanone	42.54	2.0	40	0	106	67 - 130				
Acetone	43.87	2.0	40	0	110	39 - 160				
Benzene	20.07	1.0	20	0	100	79 - 120				
Bromobenzene	19.97	1.0	20	0	99.9	80 - 120				
Bromochloromethane	21.98	1.0	20	0	110	78 - 123				
Bromodichloromethane	20.39	1.0	20	0	102	79 - 125				
Bromoform	18.95	1.0	20	0	94.7	66 - 130				
Bromomethane	22.74	1.0	20	0	114	53 - 141				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

LCS Sample ID: **VLCSW-1812022** Units: **UG/L** Analysis Date: **22-Dec-2018 11:28**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879625** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.56	2.0	40	0	98.9	64 - 133				
Carbon tetrachloride	18.79	1.0	20	0	94.0	72 - 136				
Chlorobenzene	19.95	1.0	20	0	99.7	82 - 118				
Chloroethane	20.2	1.0	20	0	101	60 - 138				
Chloroform	20.18	1.0	20	0	101	79 - 124				
Chloromethane	23.38	1.0	20	0	117	50 - 139				
cis-1,2-Dichloroethene	20.59	1.0	20	0	103	78 - 123				
cis-1,3-Dichloropropene	19.44	1.0	20	0	97.2	75 - 124				
Dibromochloromethane	19.36	1.0	20	0	96.8	74 - 126				
Dibromomethane	20.44	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	19.68	1.0	20	0	98.4	32 - 152				
Ethylbenzene	20.1	1.0	20	0	100	79 - 121				
Hexachlorobutadiene	17.05	1.0	20	0	85.3	66 - 134				
Isopropylbenzene	20.34	1.0	20	0	102	72 - 131				
m,p-Xylene	40.53	2.0	40	0	101	80 - 121				
Methylene chloride	20.32	2.0	20	0	102	74 - 124				
Naphthalene	19.84	1.0	20	0	99.2	61 - 128				
n-Butylbenzene	18.85	1.0	20	0	94.3	75 - 128				
n-Propylbenzene	19.99	1.0	20	0	99.9	76 - 126				
o-Xylene	20.62	1.0	20	0	103	78 - 122				
sec-Butylbenzene	19.13	1.0	20	0	95.7	77 - 126				
Styrene	21.44	1.0	20	0	107	78 - 123				
tert-Butylbenzene	19.61	1.0	20	0	98.0	78 - 124				
Tetrachloroethene	18.88	1.0	20	0	94.4	74 - 129				
Toluene	20.38	1.0	20	0	102	80 - 121				
trans-1,2-Dichloroethene	20.25	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	19.15	1.0	20	0	95.8	73 - 127				
Trichloroethene	19.86	1.0	20	0	99.3	79 - 123				
Trichlorofluoromethane	20.19	1.0	20	0	101	65 - 141				
Vinyl chloride	20.43	1.0	20	0	102	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.97*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.27*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.52*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*51.18*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18120927-05MS** Units: **UG/L** Analysis Date: **22-Dec-2018 13:57**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	24.94	1.0	20	0	125	78 - 124				S
1,1,1-Trichloroethane	24.67	1.0	20	0	123	74 - 131				
1,1,2,2-Tetrachloroethane	25.5	1.0	20	0	128	71 - 121				S
1,1,2-Trichloroethane	25.56	1.0	20	0	128	80 - 119				S
1,1-Dichloroethane	23.44	1.0	20	0	117	77 - 125				
1,1-Dichloroethene	23.44	1.0	20	0	117	71 - 131				
1,1-Dichloropropene	26.44	1.0	20	0	132	78 - 125				S
1,2,3-Trichlorobenzene	24.93	1.0	20	0	125	69 - 129				
1,2,3-Trichloropropane	24.99	1.0	20	0	125	73 - 122				S
1,2,4-Trichlorobenzene	25.55	1.0	20	0	128	69 - 130				
1,2,4-Trimethylbenzene	27.34	1.0	20	0	137	76 - 124				S
1,2-Dibromo-3-chloropropane	23.87	1.0	20	0	119	62 - 128				
1,2-Dibromoethane	26.09	1.0	20	0	130	77 - 121				S
1,2-Dichlorobenzene	25.3	1.0	20	0	126	80 - 119				S
1,2-Dichloroethane	25.88	1.0	20	0	129	73 - 128				S
1,2-Dichloropropane	25.49	1.0	20	0	127	78 - 122				S
1,3,5-Trimethylbenzene	27.67	1.0	20	0	138	75 - 124				S
1,3-Dichlorobenzene	25.27	1.0	20	0	126	80 - 119				S
1,3-Dichloropropane	25.9	1.0	20	0	130	80 - 119				S
1,4-Dichlorobenzene	24.68	1.0	20	0	123	79 - 118				S
2,2-Dichloropropane	24.7	1.0	20	0	124	60 - 139				
2-Butanone	45.06	2.0	40	0	113	56 - 143				
2-Chlorotoluene	26.48	1.0	20	0	132	79 - 122				S
2-Hexanone	54.57	2.0	40	0	136	57 - 139				
4-Chlorotoluene	26.53	1.0	20	0	133	78 - 122				S
4-Isopropyltoluene	27.81	1.0	20	0	139	77 - 127				S
4-Methyl-2-pentanone	53.91	2.0	40	0	135	67 - 130				S
Acetone	52.06	2.0	40	6.812	113	39 - 160				
Benzene	25.77	1.0	20	0	129	79 - 120				S
Bromobenzene	25.72	1.0	20	0	129	80 - 120				S
Bromochloromethane	24.92	1.0	20	0	125	78 - 123				S
Bromodichloromethane	25.52	1.0	20	0	128	79 - 125				S
Bromoform	23.45	1.0	20	0	117	66 - 130				
Bromomethane	16.37	1.0	20	0	81.9	53 - 141				

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

MS Sample ID: **HS18120927-05MS** Units: **UG/L** Analysis Date: **22-Dec-2018 13:57**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Carbon disulfide	45.7	2.0	40	0	114	64 - 133			
Carbon tetrachloride	25.64	1.0	20	0	128	72 - 136			
Chlorobenzene	25.89	1.0	20	0	129	82 - 118			S
Chloroethane	22.14	1.0	20	0	111	60 - 138			
Chloroform	23.42	1.0	20	0	117	79 - 124			
Chloromethane	20.56	1.0	20	0	103	50 - 139			
cis-1,2-Dichloroethene	23.51	1.0	20	0	118	78 - 123			
cis-1,3-Dichloropropene	23.36	1.0	20	0	117	75 - 124			
Dibromochloromethane	23.95	1.0	20	0	120	74 - 126			
Dibromomethane	25.5	1.0	20	0	128	79 - 123			S
Dichlorodifluoromethane	16.85	1.0	20	0	84.2	32 - 152			
Ethylbenzene	27.26	1.0	20	0	136	79 - 121			S
Hexachlorobutadiene	24.09	1.0	20	0	120	66 - 134			
Isopropylbenzene	27.98	1.0	20	0	140	72 - 131			S
m,p-Xylene	53.93	2.0	40	0	135	80 - 121			S
Methylene chloride	23.1	2.0	20	0	116	74 - 124			
Naphthalene	25.12	1.0	20	0	126	61 - 128			
n-Butylbenzene	27.37	1.0	20	0	137	75 - 128			S
n-Propylbenzene	27.85	1.0	20	0	139	76 - 126			S
o-Xylene	26.88	1.0	20	0	134	78 - 122			S
sec-Butylbenzene	28.04	1.0	20	0	140	77 - 126			S
Styrene	27.63	1.0	20	0	138	78 - 123			S
tert-Butylbenzene	27.8	1.0	20	0	139	78 - 124			S
Tetrachloroethene	28.12	1.0	20	0	141	74 - 129			S
Toluene	26.71	1.0	20	0	134	80 - 121			S
trans-1,2-Dichloroethene	23.68	1.0	20	0	118	75 - 124			
trans-1,3-Dichloropropene	23.44	1.0	20	0	117	73 - 127			
Trichloroethene	26.02	1.0	20	0	130	79 - 123			S
Trichlorofluoromethane	24.22	1.0	20	0	121	65 - 141			
Vinyl chloride	20.68	1.0	20	0	103	58 - 137			
Surr: 1,2-Dichloroethane-d4	*45.51*	*1.0*	*50*	*0*	*91.0*	*81 - 118*			
Surr: 4-Bromofluorobenzene	*51.18*	*1.0*	*50*	*0*	*102*	*85 - 114*			
Surr: Dibromofluoromethane	*45.09*	*1.0*	*50*	*0*	*90.2*	*80 - 119*			
Surr: Toluene-d8	*52.7*	*1.0*	*50*	*0*	*105*	*89 - 112*			

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18120927-05MSD** Units: **UG/L** Analysis Date: **22-Dec-2018 14:22**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	24.81	1.0	20	0	124	78 - 124	24.94	0.537	20	S
1,1,1-Trichloroethane	24.22	1.0	20	0	121	74 - 131	24.67	1.83	20	
1,1,2,2-Tetrachloroethane	25.11	1.0	20	0	126	71 - 121	25.5	1.53	20	S
1,1,2-Trichloroethane	25.73	1.0	20	0	129	80 - 119	25.56	0.693	20	S
1,1-Dichloroethane	22.92	1.0	20	0	115	77 - 125	23.44	2.23	20	
1,1-Dichloroethene	23.05	1.0	20	0	115	71 - 131	23.44	1.65	20	
1,1-Dichloropropene	26.07	1.0	20	0	130	78 - 125	26.44	1.41	20	S
1,2,3-Trichlorobenzene	24.88	1.0	20	0	124	69 - 129	24.93	0.208	20	
1,2,3-Trichloropropane	25.58	1.0	20	0	128	73 - 122	24.99	2.31	20	S
1,2,4-Trichlorobenzene	25.4	1.0	20	0	127	69 - 130	25.55	0.618	20	
1,2,4-Trimethylbenzene	26.9	1.0	20	0	134	76 - 124	27.34	1.63	20	S
1,2-Dibromo-3-chloropropane	24.32	1.0	20	0	122	62 - 128	23.87	1.85	20	
1,2-Dibromoethane	26.14	1.0	20	0	131	77 - 121	26.09	0.214	20	S
1,2-Dichlorobenzene	24.94	1.0	20	0	125	80 - 119	25.3	1.43	20	S
1,2-Dichloroethane	25.87	1.0	20	0	129	73 - 128	25.88	0.0205	20	S
1,2-Dichloropropane	25.02	1.0	20	0	125	78 - 122	25.49	1.88	20	S
1,3,5-Trimethylbenzene	26.82	1.0	20	0	134	75 - 124	27.67	3.09	20	S
1,3-Dichlorobenzene	25.3	1.0	20	0	127	80 - 119	25.27	0.137	20	S
1,3-Dichloropropane	26.06	1.0	20	0	130	80 - 119	25.9	0.606	20	S
1,4-Dichlorobenzene	24.32	1.0	20	0	122	79 - 118	24.68	1.46	20	S
2,2-Dichloropropane	23.83	1.0	20	0	119	60 - 139	24.7	3.59	20	
2-Butanone	46.98	2.0	40	0	117	56 - 143	45.06	4.16	20	
2-Chlorotoluene	25.84	1.0	20	0	129	79 - 122	26.48	2.46	20	S
2-Hexanone	56.56	2.0	40	0	141	57 - 139	54.57	3.58	20	S
4-Chlorotoluene	26.05	1.0	20	0	130	78 - 122	26.53	1.82	20	S
4-Isopropyltoluene	27.31	1.0	20	0	137	77 - 127	27.81	1.81	20	S
4-Methyl-2-pentanone	55.54	2.0	40	0	139	67 - 130	53.91	2.99	20	S
Acetone	52.78	2.0	40	6.812	115	39 - 160	52.06	1.37	20	
Benzene	25.56	1.0	20	0	128	79 - 120	25.77	0.822	20	S
Bromobenzene	25.33	1.0	20	0	127	80 - 120	25.72	1.53	20	S
Bromochloromethane	24.65	1.0	20	0	123	78 - 123	24.92	1.07	20	S
Bromodichloromethane	25.17	1.0	20	0	126	79 - 125	25.52	1.37	20	S
Bromoform	23.77	1.0	20	0	119	66 - 130	23.45	1.36	20	
Bromomethane	18.44	1.0	20	0	92.2	53 - 141	16.37	11.9	20	

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329822 **Instrument: VOA9** **Method: SW8260**

MSD Sample ID: **HS18120927-05MSD** Units: **UG/L** Analysis Date: **22-Dec-2018 14:22**
Client ID: Run ID: **VOA9_329822** SeqNo: **4879631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	44.61	2.0	40	0	112	64 - 133	45.7	2.42	20	
Carbon tetrachloride	25.1	1.0	20	0	125	72 - 136	25.64	2.16	20	
Chlorobenzene	25.62	1.0	20	0	128	82 - 118	25.89	1.05	20	S
Chloroethane	22	1.0	20	0	110	60 - 138	22.14	0.629	20	
Chloroform	23.15	1.0	20	0	116	79 - 124	23.42	1.16	20	
Chloromethane	19.72	1.0	20	0	98.6	50 - 139	20.56	4.16	20	
cis-1,2-Dichloroethene	23.07	1.0	20	0	115	78 - 123	23.51	1.89	20	
cis-1,3-Dichloropropene	23.25	1.0	20	0	116	75 - 124	23.36	0.462	20	
Dibromochloromethane	24.41	1.0	20	0	122	74 - 126	23.95	1.89	20	
Dibromomethane	25.3	1.0	20	0	127	79 - 123	25.5	0.79	20	S
Dichlorodifluoromethane	16.44	1.0	20	0	82.2	32 - 152	16.85	2.48	20	
Ethylbenzene	26.44	1.0	20	0	132	79 - 121	27.26	3.02	20	S
Hexachlorobutadiene	23.96	1.0	20	0	120	66 - 134	24.09	0.547	20	
Isopropylbenzene	27.49	1.0	20	0	137	72 - 131	27.98	1.77	20	S
m,p-Xylene	53.51	2.0	40	0	134	80 - 121	53.93	0.773	20	S
Methylene chloride	22.8	2.0	20	0	114	74 - 124	23.1	1.33	20	
Naphthalene	25.31	1.0	20	0	127	61 - 128	25.12	0.763	20	
n-Butylbenzene	26.56	1.0	20	0	133	75 - 128	27.37	2.98	20	S
n-Propylbenzene	27.1	1.0	20	0	135	76 - 126	27.85	2.72	20	S
o-Xylene	26.52	1.0	20	0	133	78 - 122	26.88	1.37	20	S
sec-Butylbenzene	27.23	1.0	20	0	136	77 - 126	28.04	2.91	20	S
Styrene	27.22	1.0	20	0	136	78 - 123	27.63	1.5	20	S
tert-Butylbenzene	27.28	1.0	20	0	136	78 - 124	27.8	1.89	20	S
Tetrachloroethene	26.71	1.0	20	0	134	74 - 129	28.12	5.15	20	S
Toluene	26.58	1.0	20	0	133	80 - 121	26.71	0.494	20	S
trans-1,2-Dichloroethene	23.03	1.0	20	0	115	75 - 124	23.68	2.76	20	
trans-1,3-Dichloropropene	23.2	1.0	20	0	116	73 - 127	23.44	1.01	20	
Trichloroethene	25.49	1.0	20	0	127	79 - 123	26.02	2.05	20	S
Trichlorofluoromethane	22.99	1.0	20	0	115	65 - 141	24.22	5.19	20	
Vinyl chloride	20.82	1.0	20	0	104	58 - 137	20.68	0.689	20	
Surr: 1,2-Dichloroethane-d4	*45.77*	*1.0*	*50*	*0*	*91.5*	*81 - 118*	*45.51*	*0.576*	*20*	
Surr: 4-Bromofluorobenzene	*51.8*	*1.0*	*50*	*0*	*104*	*85 - 114*	*51.18*	*1.21*	*20*	
Surr: Dibromofluoromethane	*44.56*	*1.0*	*50*	*0*	*89.1*	*80 - 119*	*45.09*	*1.2*	*20*	
Surr: Toluene-d8	*52.97*	*1.0*	*50*	*0*	*106*	*89 - 112*	*52.7*	*0.504*	*20*	

ALS Houston, US Date: 04-Jan-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP-58
WorkOrder:	HS18120642

QC BATCH REPORT

Batch ID: R329822	**Instrument:** VOA9	**Method:** SW8260

The following samples were analyzed in this batch:

HS18120642-01	HS18120642-02	HS18120642-03	HS18120642-04
HS18120642-05			

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: 135598 **Instrument: UV-2450** **Method: E365.3**

MBLK Sample ID: **MBLK-135598** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863283** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.0400	0.0500								U

LCS Sample ID: **LCS-135598** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863282** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.241	0.0500	0.25	0	96.4	80 - 120				

MS Sample ID: **HS18120487-01MS** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863280** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.339	0.0500	0.25	0.113	90.4	80 - 120				

MSD Sample ID: **HS18120487-01MSD** Units: **mg/L** Analysis Date: **13-Dec-2018 15:15**
Client ID: Run ID: **UV-2450_329185** SeqNo: **4863281** PrepDate: **13-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.338	0.0500	0.25	0.113	90.0	80 - 120	0.339	0.295	20	

The following samples were analyzed in this batch: HS18120642-01 HS18120642-02 HS18120642-03

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329207 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW1-121218** Units: **mg/L** Analysis Date: **12-Dec-2018 22:05**
Client ID: Run ID: **ICS2100_329207** SeqNo: **4863820** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-121218** Units: **mg/L** Analysis Date: **12-Dec-2018 22:19**
Client ID: Run ID: **ICS2100_329207** SeqNo: **4863821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.92	0.500	20	0	99.6	80 - 120				
Nitrogen, Nitrate (As N)	3.883	0.100	4	0	97.1	80 - 120				
Nitrogen, Nitrite (As N)	4.266	0.100	4	0	107	80 - 120				
Sulfate	19.97	0.500	20	0	99.8	80 - 120				

LCSD Sample ID: **WLCSDW1-121218** Units: **mg/L** Analysis Date: **12-Dec-2018 22:34**
Client ID: Run ID: **ICS2100_329207** SeqNo: **4863822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.51	0.500	20	0	97.6	80 - 120	19.92	2.07	20	
Nitrogen, Nitrate (As N)	3.782	0.100	4	0	94.6	80 - 120	3.883	2.64	20	
Nitrogen, Nitrite (As N)	4.154	0.100	4	0	104	80 - 120	4.266	2.66	20	
Sulfate	19.54	0.500	20	0	97.7	80 - 120	19.97	2.13	20	

MS Sample ID: **HS18120459-01MS** Units: **mg/L** Analysis Date: **13-Dec-2018 01:14**
Client ID: Run ID: **ICS2100_329207** SeqNo: **4863833** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	42.73	0.500	10	34.82	79.2	80 - 120				S
Nitrogen, Nitrate (As N)	1.906	0.100	2	0.135	88.6	80 - 120				
Nitrogen, Nitrite (As N)	2.035	0.100	2	0.041	99.7	80 - 120				
Sulfate	75.7	0.500	10	69.69	60.0	80 - 120				SO

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329207 **Instrument: ICS2100** **Method: SW9056**

MSD Sample ID: **HS18120459-01MSD** Units: **mg/L** Analysis Date: **13-Dec-2018 01:29**
Client ID: Run ID: **ICS2100_329207** SeqNo: **4863834** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	43.3	0.500	10	34.82	84.8	80 - 120	42.73	1.32	20	
Nitrogen, Nitrate (As N)	1.973	0.100	2	0.135	91.9	80 - 120	1.906	3.45	20	
Nitrogen, Nitrite (As N)	2.103	0.100	2	0.041	103	80 - 120	2.035	3.29	20	
Sulfate	76.33	0.500	10	69.69	66.4	80 - 120	75.7	0.83	20	SO

The following samples were analyzed in this batch: HS18120642-01 HS18120642-02 HS18120642-03

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329695 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 20:45**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876171** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 20:54**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876172** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1061	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **LCSD1-181220** Units: **mg/L** Analysis Date: **20-Dec-2018 21:04**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876173** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1057	5.00	1000	0	106	85 - 115	1061	0.378	20	

DUP Sample ID: **HS18120927-05DUP** Units: **mg/L** Analysis Date: **20-Dec-2018 23:05**
Client ID: Run ID: **ManTech01_329695** SeqNo: **4876188** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	650.2	5.00					647.6	0.402	20	

The following samples were analyzed in this batch: HS18120642-01 HS18120642-02 HS18120642-03

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329941 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW1-121318** Units: **mg/L** Analysis Date: **13-Dec-2018 16:12**
Client ID: Run ID: **ICS2100_329941** SeqNo: **4882213** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U

LCS Sample ID: **WLCSW1-121318** Units: **mg/L** Analysis Date: **13-Dec-2018 16:26**
Client ID: Run ID: **ICS2100_329941** SeqNo: **4882214** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.85	0.500	20	0	99.3	80 - 120				

LCSD Sample ID: **WLCSDW1-121318** Units: **mg/L** Analysis Date: **13-Dec-2018 16:41**
Client ID: Run ID: **ICS2100_329941** SeqNo: **4882215** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.71	0.500	20	0	98.5	80 - 120	19.85	0.733	20	

MS Sample ID: **HS18120757-02MS** Units: **mg/L** Analysis Date: **13-Dec-2018 21:21**
Client ID: Run ID: **ICS2100_329941** SeqNo: **4882229** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	12.25	0.500	10	2.107	101	80 - 120				

MS Sample ID: **HS18120736-04MS** Units: **mg/L** Analysis Date: **13-Dec-2018 17:39**
Client ID: Run ID: **ICS2100_329941** SeqNo: **4882219** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	14.57	0.500	10	5.166	94.0	80 - 120				

MSD Sample ID: **HS18120757-02MSD** Units: **mg/L** Analysis Date: **13-Dec-2018 21:35**
Client ID: Run ID: **ICS2100_329941** SeqNo: **4882230** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	12.31	0.500	10	2.107	102	80 - 120	12.25	0.448	20	

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329941 **Instrument: ICS2100** **Method: SW9056**

MSD Sample ID: **HS18120736-04MSD** Units: **mg/L** Analysis Date: **13-Dec-2018 17:54**
Client ID: Run ID: **ICS2100_329941** SeqNo: **4882220** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	14.97	0.500	10	5.166	98.0	80 - 120	14.57	2.68	20	

The following samples were analyzed in this batch: HS18120642-02

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

QC BATCH REPORT

Batch ID: R329956 **Instrument: WetChem_HS** **Method: E376.1**

MBLK Sample ID: **MBLK-R329956** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: Run ID: **WetChem_HS_329956** SeqNo: **4882426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	1.00	1.00								U

LCS Sample ID: **LCS-R329956** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: Run ID: **WetChem_HS_329956** SeqNo: **4882425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.24	1.00	25	0	89.0	80 - 120				

LCSD Sample ID: **LCSD-R329956** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: Run ID: **WetChem_HS_329956** SeqNo: **4882424** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.44	1.00	25	0	89.8	80 - 120	22.24	0.895	20	

MS Sample ID: **HS18120569-04MS** Units: **mg/L** Analysis Date: **17-Dec-2018 16:30**
Client ID: Run ID: **WetChem_HS_329956** SeqNo: **4882427** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	24.64	1.00	25	0.04	98.4	80 - 120				

The following samples were analyzed in this batch: HS18120642-01 HS18120642-02 HS18120642-03

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS18120642**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

ALS Houston, US Date: 04-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18120642

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	WET303
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	VOA015
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-01	35AWW06_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	WET303
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	VOA015
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-02	35AWW11_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	WET303
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-03	35AWW09_121118	Login	12/12/2018 10:40:01 AM	JRM	VOA015
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	WET301
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	WET303
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	MET098
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	VOA015
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-04	35AWW13_121118	Login	12/12/2018 10:40:01 AM	JRM	Sub
HS18120642-05	Trip Blank	Login	12/12/2018 10:40:01 AM	JRM	VOA015

ALS Houston, US Date: 04-Jan-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS18120642
Date/Time Received: **12-Dec-2018 09:05**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 12-Dec-2018 Date
Reviewed by: *RJ Modashia* eSignature 12-Dec-2018 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.3c/1.6c UC/C	IR25	
Cooler(s)/Kit(s):	44340		
Date/Time sample(s) sent to storage:	12/12/2018 10:50		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☑	N/A ☐
pH adjusted?	Yes ☑	No ☐	N/A ☐
pH adjusted by:	Jared R. Makan		

Login Notes: Sample pH>2 (4) for 35AWW06 & 35AWW11. Metals preserved with 0.25ml HNO3 (Acid lot # 308055508). Total Phosphorous preserved with 0.5ml H2SO4 (Acid lot # 300107019-10) Samples preserved 12/12/18 at 10:43am. Sample pH=1 after preservation.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate ENVIRONMENTAL CONSTRUCTION CONSULTANTS

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Sample Analysis Requested[5] | Quality Assurance Samples[6]

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code [2]	Sample Number [3]	Sample Matrix [4]	Number of containers	VOC	MEE	TOC	Carbon Dioxide	Total Phosphorous	Total Manganese & Iron	Dissolved Manganese & Iron	Sulfide	Arsenic	Anions	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW06_121118		11 DEC 2018	0855	-	N		WG	14	X	X	X	X	X	X	X	X	(X)	X				
35AWW11_121118		11 DEC 2018	1025	-	N		WG	14	X	X	X	X	X	X	X	X		X				
35AWW09_121118		11 DEC 2018	1130	-	N		WG	14	X	X	X	X	X	X	X	X		X				
35AWW13_121118		11 DEC 2018	1300		N		WG	3	X													
TRIP BLANK		11 DEC 2018			TB		W	2	X													
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		

HS18120642
Bhate Environmental Associates, Inc.
LHAAP-58

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beesinger	12/4/18	1400		12/12/18	0935
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

Method of Shipment: _____

Fed Ex _____ Airbill Number:

Analytical Lab: ALS, 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number [e.g. 09-02-1999-01]

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

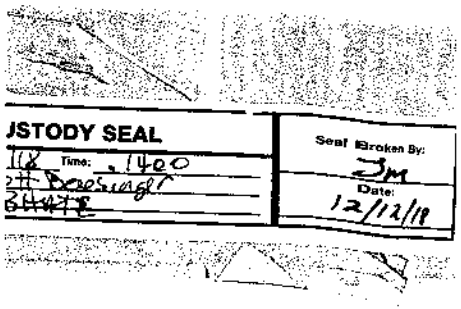
6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

44340

VIC. 1.3 425 cl- 0.30

00945597

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Date:
Name:
Company:


JSTODY SEAL
Time:
Seal Broken By:
Date:
12/12/19

FedEx.
TRK#
0221 4380 9535 2765
WED - 12 DEC 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
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www.alsglobal.com

December 27, 2018 **Analytical Report for Service Request No:** K1812278

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS18120642 / HS18120642

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory December 14, 2018
For your reference, these analyses have been assigned our service request number **K1812278.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
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www.alsglobal.com

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: HS18120642
Sample Matrix: Ground Water

Service Request: K1812278
Date Received: 12/14/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Three ground water samples were received for analysis at ALS Environmental on 12/14/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Diaz Date 12/27/2018

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

K1812278

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 10419

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18120642
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18120642-01**	**35AWW06_121118**	**Groundwater**	**11 Dec 2018 08:55**
	TOC Analysis for DOD Level IV			27 Dec 2018
2.	**HS18120642-02**	**35AWW11_121118**	**Groundwater**	**11 Dec 2018 10:25**
	TOC Analysis for DOD Level IV			27 Dec 2018
3.	**HS18120642-03**	**35AWW09_121118**	**Groundwater**	**11 Dec 2018 11:30**
	TOC Analysis for DOD Level IV			27 Dec 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: R Gugg Date/Time: 12/13/18 1800

Received By: Date/Time: 12/14/18 0950

Cooler ID(s): Temperature(s):

00945608

(ALS)

PC AJ

Cooler Receipt and Preservation Form

Client ALS/Houston Service Request K18 12278

Received: 12/14/18 Opened: 12/14/18 By: Unloaded: 12/14/18 By:

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 front + back
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.2	0.1	1.8	1.7	-0.1	381	10432	438095356370	
						10419		
						10429		

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1812278
Project:	HS18120642/HS18120642	**Date Collected:**	12/11/18
Sample Matrix:	Ground Water	**Date Received:**	12/14/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
35AWW06_121118	K1812278-001	**685**	25	10	4	50	12/21/18 18:19	
35AWW11_121118	K1812278-002	**701**	25	10	4	50	12/21/18 22:19	
35AWW09_121118	K1812278-003	**4.5**	2.0	0.8	0.3	4	12/21/18 20:41	
Method Blank	K1812278-MB	ND U	0.50	0.20	0.07	1	12/21/18 11:06	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1812278
Project:	HS18120642/HS18120642	**Date Analyzed:**	12/21/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	619810

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1812278-LCS	20.3	21.9	93	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1812278
Project: HS18120642/HS18120642

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	619810	KQ1818709-28	12/21/18 05:13	25.0	24.3	97	90-110
CCV2	619810	KQ1818709-29	12/21/18 10:33	25.0	24.0	96	90-110
CCV3	619810	KQ1818709-30	12/21/18 15:37	25.0	23.7	95	90-110
CCV4	619810	KQ1818709-31	12/21/18 21:13	25.0	23.6	94	90-110
CCV5	619810	KQ1818709-32	12/22/18 02:33	25.0	23.6	95	90-110
CCV6	619810	KQ1818709-33	12/22/18 07:36	25.0	23.9	95	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1812278
Project: HS18120642/HS18120642

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	619810	KQ1818709-34	12/21/18 05:30	0.50	0.20	0.07	ND	U
CCB2	619810	KQ1818709-35	12/21/18 10:49	0.50	0.20	0.07	ND	U
CCB3	619810	KQ1818709-36	12/21/18 15:54	0.50	0.20	0.07	ND	U
CCB4	619810	KQ1818709-37	12/21/18 21:29	0.50	0.20	0.07	ND	U
CCB5	619810	KQ1818709-38	12/22/18 02:49	0.50	0.20	0.07	ND	U
CCB6	619810	KQ1818709-39	12/22/18 07:53	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
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General Chemistry

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Work Request # Original ( ) K18/1658, 1888, 2001, 1625, 1728, 1789, 1849, 1831, 2101, 2154, 1928, 2278, 2279, 2272, 1745, 1747, 2416

Tier: II IV IV I I IV II II IV IV II IV IV IV IV IV II

Date Analyzed: 12/20/18

Analyst: CLS

Run # TOC 619808, 619810 DOC 620105

Analysis: TOC/DOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

1789-2, 3, 4, 5, 8, 1849-4, 2416-35 RPD not within acceptance limits. The sample results are less than 5x the MRL.
RA 2154-1, 2154-5 - over diluted.
1831-2, 1745-1 RPD not within acceptance limits - samples contain sediment - non homogeneous.

Final Approved by: _____ Date: 12/26/18

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619808 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811625-001	Carbon, Total Organic	N/A		Ground Water	4.25 mg/L	10 ml	8.5 mg/L	2	0.2	1.0			12/20/18 16:31	N	I
K1811625-003	Carbon, Total Organic	N/A		Ground Water	4.47 mg/L	10 ml	4.47 mg/L	1	0.07	0.50			12/20/18 17:51	N	I
K1811658-004	Carbon, Total Organic	N/A		Water	3.83 mg/L	10 ml	3.83 mg/L	1	0.07	0.50			12/20/18 13:18	N	II
K1811728-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 18:54	N	I
K1811728-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 19:26	N	I
K1811789-002	Carbon, Total Organic	N/A		Ground Water	0.51 mg/L	10 ml	0.51 mg/L	1	0.07	0.50			12/20/18 19:58	N	IV
K1811789-003	Carbon, Total Organic	N/A		Ground Water	0.74 mg/L	10 ml	0.74 mg/L	1	0.07	0.50			12/20/18 22:39	N	IV
K1811789-004	Carbon, Total Organic	N/A		Ground Water	0.16 mg/L	10 ml	0.16 mg/L J	1	0.07	0.50			12/20/18 23:42	N	IV
K1811789-005	Carbon, Total Organic	N/A		Ground Water	0.77 mg/L	10 ml	0.77 mg/L	1	0.07	0.50			12/21/18 00:45	N	IV
K1811789-006	Carbon, Total Organic	N/A		Ground Water	0.55 mg/L	10 ml	0.55 mg/L	1	0.07	0.50			12/21/18 01:48	N	IV
K1811789-008	Carbon, Total Organic	N/A		Ground Water	0.39 mg/L	10 ml	0.39 mg/L J	1	0.07	0.50			12/21/18 02:51	N	IV
K1811831-002	Carbon, Total Organic	N/A		Water	6.74 mg/L	10 ml	6.74 mg/L	1	0.07	0.50			12/21/18 08:25	N	II
K1811849-001	Carbon, Total Organic	N/A		Water	1.24 mg/L	10 ml	1.24 mg/L	1	0.07	0.50			12/21/18 04:25	N	II
K1811849-002	Carbon, Total Organic	N/A		Water	8.22 mg/L	10 ml	32.9 mg/L	4	0.3	2.0			12/21/18 05:46	N	II
K1811849-003	Carbon, Total Organic	N/A		Water	7.74 mg/L	10 ml	31.0 mg/L	4	0.3	2.0			12/21/18 06:18	N	II
K1811849-004	Carbon, Total Organic	N/A		Water	1.09 mg/L	10 ml	1.09 mg/L	1	0.07	0.50			12/21/18 06:50	N	II
K1811849-005	Carbon, Total Organic	N/A		Water	5.34 mg/L	10 ml	5.34 mg/L	1	0.07	0.50			12/21/18 07:22	N	II
K1811888-002	Carbon, Total Organic	N/A		Water	2.74 mg/L	10 ml	2.74 mg/L	1	0.07	0.50			12/20/18 14:22	N	IV
K1812001-001	Carbon, Total Organic	N/A		Water	6.94 mg/L	10 ml	69.4 mg/L	10	0.7	5.0			12/20/18 14:54	N	IV
KQ1818705-01	Carbon, Total Organic	DUP	K1811658-004	Water	3.91 mg/L	10 ml	3.91 mg/L	1	0.07	0.50		2	12/20/18 13:18	N	II
KQ1818705-02	Carbon, Total Organic	DUP	K1811888-002	Water	2.73 mg/L	10 ml	2.73 mg/L	1	0.07	0.50		<1	12/20/18 14:22	N	IV
KQ1818705-03	Carbon, Total Organic	MS	K1812001-001	Water	31.62 mg/L	10 ml	316 mg/L	10	0.7	5.0	99		12/20/18 15:25	N	IV
KQ1818705-04	Carbon, Total Organic	DUP	K1812001-001	Water	6.88 mg/L	10 ml	68.8 mg/L	10	0.7	5.0		<1	12/20/18 14:54	N	IV
KQ1818705-05	Carbon, Total Organic	MS	K1811625-001	Ground Water	29.15 mg/L	10 ml	58.3 mg/L	2	0.2	1.0	100		12/20/18 17:03	N	I
KQ1818705-06	Carbon, Total Organic	DUP	K1811625-001	Ground Water	3.84 mg/L	10 ml	7.7 mg/L	2	0.2	1.0		10	12/20/18 16:31	N	I
KQ1818705-07	Carbon, Total Organic	DUP	K1811625-003	Ground Water	4.23 mg/L	10 ml	4.23 mg/L	1	0.07	0.50		6	12/20/18 17:51	N	I
KQ1818705-08	Carbon, Total Organic	DUP	K1811728-001	Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/20/18 18:54	N	I
KQ1818705-09	Carbon, Total Organic	DUP	K1811728-002	Reagent Water	0.80 mg/L	10 ml	0.80 mg/L	1	0.07	0.50		NC	12/20/18 19:26	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619808 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818705-10	Carbon, Total Organic	MS	K1811789-002	Ground Water	25.21 mg/L	10 ml	25.2 mg/L	1	0.07	0.50	99		12/20/18 21:01	N	IV
KQ1818705-11	Carbon, Total Organic	DUP	K1811789-002	Ground Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		66*	12/20/18 19:58	N	IV
KQ1818705-12	Carbon, Total Organic	TRP	K1811789-002	Ground Water	0.22 mg/L	10 ml	0.22 mg/L J	1	0.07	0.50		48*	12/20/18 19:58	N	IV
KQ1818705-13	Carbon, Total Organic	QUAD	K1811789-002	Ground Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50		45*	12/20/18 19:58	N	IV
KQ1818705-14	Carbon, Total Organic	DUP	K1811789-003	Ground Water	0.60 mg/L	10 ml	0.60 mg/L	1	0.07	0.50		21*	12/20/18 22:39	N	IV
KQ1818705-15	Carbon, Total Organic	TRP	K1811789-003	Ground Water	0.58 mg/L	10 ml	0.58 mg/L	1	0.07	0.50		14	12/20/18 22:39	N	IV
KQ1818705-16	Carbon, Total Organic	QUAD	K1811789-003	Ground Water	0.52 mg/L	10 ml	0.52 mg/L	1	0.07	0.50		16	12/20/18 22:39	N	IV
KQ1818705-17	Carbon, Total Organic	DUP	K1811789-004	Ground Water	1.01 mg/L	10 ml	1.01 mg/L	1	0.07	0.50		146*	12/20/18 23:42	N	IV
KQ1818705-18	Carbon, Total Organic	TRP	K1811789-004	Ground Water	0.19 mg/L	10 ml	0.19 mg/L J	1	0.07	0.50		106*	12/20/18 23:42	N	IV
KQ1818705-19	Carbon, Total Organic	QUAD	K1811789-004	Ground Water	0.07 mg/L	10 ml	0.07 mg/L J	1	0.07	0.50		122*	12/20/18 23:42	N	IV
KQ1818705-20	Carbon, Total Organic	DUP	K1811789-005	Ground Water	0.58 mg/L	10 ml	0.58 mg/L	1	0.07	0.50		27*	12/21/18 00:45	N	IV
KQ1818705-21	Carbon, Total Organic	TRP	K1811789-005	Ground Water	0.57 mg/L	10 ml	0.57 mg/L	1	0.07	0.50		17	12/21/18 00:45	N	IV
KQ1818705-22	Carbon, Total Organic	QUAD	K1811789-005	Ground Water	0.61 mg/L	10 ml	0.61 mg/L	1	0.07	0.50		14	12/21/18 00:45	N	IV
KQ1818705-23	Carbon, Total Organic	DUP	K1811789-006	Ground Water	0.53 mg/L	10 ml	0.53 mg/L	1	0.07	0.50		3	12/21/18 01:48	N	IV
KQ1818705-24	Carbon, Total Organic	TRP	K1811789-006	Ground Water	0.50 mg/L	10 ml	0.50 mg/L	1	0.07	0.50		5	12/21/18 01:48	N	IV
KQ1818705-25	Carbon, Total Organic	QUAD	K1811789-006	Ground Water	0.54 mg/L	10 ml	0.54 mg/L	1	0.07	0.50		4	12/21/18 01:48	N	IV
KQ1818705-26	Carbon, Total Organic	DUP	K1811789-008	Ground Water	0.34 mg/L	10 ml	0.34 mg/L J	1	0.07	0.50		16	12/21/18 02:51	N	IV
KQ1818705-27	Carbon, Total Organic	TRP	K1811789-008	Ground Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50		31*	12/21/18 02:51	N	IV
KQ1818705-28	Carbon, Total Organic	QUAD	K1811789-008	Ground Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		28*	12/21/18 02:51	N	IV
KQ1818705-29	Carbon, Total Organic	MS	K1811849-001	Water	25.43 mg/L	10 ml	25.4 mg/L	1	0.07	0.50	97		12/21/18 04:57	N	II
KQ1818705-30	Carbon, Total Organic	DUP	K1811849-001	Water	1.25 mg/L	10 ml	1.25 mg/L	1	0.07	0.50		1	12/21/18 04:25	N	II
KQ1818705-31	Carbon, Total Organic	DUP	K1811849-002	Water	8.05 mg/L	10 ml	32.2 mg/L	4	0.3	2.0		2	12/21/18 05:46	N	II
KQ1818705-32	Carbon, Total Organic	DUP	K1811849-003	Water	7.59 mg/L	10 ml	30.3 mg/L	4	0.3	2.0		2	12/21/18 06:18	N	II
KQ1818705-33	Carbon, Total Organic	DUP	K1811849-004	Water	0.86 mg/L	10 ml	0.86 mg/L	1	0.07	0.50		24*	12/21/18 06:50	N	II
KQ1818705-34	Carbon, Total Organic	DUP	K1811849-005	Water	5.16 mg/L	10 ml	5.16 mg/L	1	0.07	0.50		3	12/21/18 07:22	N	II
KQ1818705-35	Carbon, Total Organic	MS	K1811831-002	Water	31.00 mg/L	10 ml	31.0 mg/L	1	0.07	0.50	97		12/21/18 08:57	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619808 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818705-36	Carbon, Total Organic	DUP	K1811831-002	Water	6.02 mg/L	10 ml	6.02 mg/L	1	0.07	0.50		11*	12/21/18 08:25	N	II
KQ1818705-37	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:29	N	II
KQ1818705-37	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:29	N	II
KQ1818705-38	Carbon, Total Organic	LCS		Water	20.64 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 12:46	N	II
KQ1818705-38	Carbon, Total Organic	LCS		Water	20.64 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 12:46	N	II
KQ1818705-39	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 22:06	N	II
KQ1818705-39	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 22:06	N	II
KQ1818705-40	Carbon, Total Organic	LCS		Water	20.62 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 22:23	N	II
KQ1818705-40	Carbon, Total Organic	LCS		Water	20.62 mg/L	10 ml	20.6 mg/L	1	0.07	0.50	94		12/20/18 22:23	N	II
KQ1818705-41	Carbon, Total Organic	CCV		Water	24.08 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 11:56	N	II
KQ1818705-41	Carbon, Total Organic	CCV		Water	24.08 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 11:56	N	II
KQ1818705-42	Carbon, Total Organic	CCV		Water	24.01 mg/L	10 ml	24.0 mg/L	1			96		12/20/18 15:58	N	II
KQ1818705-42	Carbon, Total Organic	CCV		Water	24.01 mg/L	10 ml	24.0 mg/L	1			96		12/20/18 15:58	N	II
KQ1818705-43	Carbon, Total Organic	CCV		Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 21:33	N	II
KQ1818705-43	Carbon, Total Organic	CCV		Water	24.07 mg/L	10 ml	24.1 mg/L	1			96		12/20/18 21:33	N	II
KQ1818705-44	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	II
KQ1818705-44	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	II
KQ1818705-45	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	II
KQ1818705-45	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	II
KQ1818705-46	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:13	N	II
KQ1818705-46	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 12:13	N	II
KQ1818705-47	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 16:14	N	II
KQ1818705-47	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 16:14	N	II
KQ1818705-48	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 21:50	N	II
KQ1818705-48	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/20/18 21:50	N	II
KQ1818705-49	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	II
KQ1818705-49	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	II
KQ1818705-50	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	II
KQ1818705-50	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619810 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1811745-001	Carbon, Total Organic	N/A		Water	1.55 mg/L	10 ml	1.55 mg/L	1	0.07	0.50			12/22/18 05:13	N	IV
K1811747-001	Carbon, Total Organic	N/A		Water	4.71 mg/L	10 ml	4.71 mg/L	1	0.07	0.50			12/22/18 06:48	N	IV
K1811928-001	Carbon, Total Organic	N/A		Drinking Water	0.10 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 17:14	N	II
K1812101-001	Carbon, Total Organic	N/A		Water	16.05 mg/L	10 ml	16.0 mg/L	1	0.07	0.50			12/21/18 09:45	N	IV
K1812154-001	Carbon, Total Organic	N/A		Ground Water	0.19 mg/L	10 ml	10 mg/L J	50	4	25			12/21/18 11:39	N	IV
K1812154-002	Carbon, Total Organic	N/A		Ground Water	1.67 mg/L	10 ml	1.67 mg/L	1	0.07	0.50			12/21/18 12:59	N	IV
K1812154-003	Carbon, Total Organic	N/A		Ground Water	2.17 mg/L	10 ml	2.17 mg/L	1	0.07	0.50			12/21/18 14:02	N	IV
K1812154-004	Carbon, Total Organic	N/A		Ground Water	17.57 mg/L	10 ml	879 mg/L	50	4	25			12/21/18 14:34	N	IV
K1812154-005	Carbon, Total Organic	N/A		Ground Water	0.16 mg/L	10 ml	3 mg/L J	20	2	10			12/21/18 16:10	N	IV
K1812272-001	Carbon, Total Organic	N/A		Ground Water	10.54 mg/L	10 ml	42.2 mg/L	4	0.3	2.0			12/22/18 00:42	N	IV
K1812272-002	Carbon, Total Organic	N/A		Ground Water	3.92 mg/L	10 ml	392 mg/L	100	7	50			12/22/18 03:06	N	IV
K1812272-003	Carbon, Total Organic	N/A		Ground Water	3.97 mg/L	10 ml	3.97 mg/L	1	0.07	0.50			12/22/18 03:38	N	IV
K1812272-004	Carbon, Total Organic	N/A		Ground Water	4.03 mg/L	10 ml	4.03 mg/L	1	0.07	0.50			12/22/18 04:09	N	IV
K1812278-001	Carbon, Total Organic	N/A		Ground Water	13.71 mg/L	10 ml	685 mg/L	50	4	25			12/21/18 18:19	N	IV
K1812278-002	Carbon, Total Organic	N/A		Ground Water	14.02 mg/L	10 ml	701 mg/L	50	4	25			12/21/18 22:19	N	IV
K1812278-003	Carbon, Total Organic	N/A		Ground Water	1.13 mg/L	10 ml	4.5 mg/L	4	0.3	2.0			12/21/18 20:41	N	IV
K1812279-001	Carbon, Total Organic	N/A		Water	24.72 mg/L	10 ml	24.7 mg/L	1	0.07	0.50			12/21/18 23:22	N	IV
KQ1818709-01	Carbon, Total Organic	MS	K1812101-001	Water	40.70 mg/L	10 ml	40.7 mg/L	1	0.07	0.50	99		12/21/18 10:16	N	IV
KQ1818709-02	Carbon, Total Organic	DUP	K1812101-001	Water	16.03 mg/L	10 ml	16.0 mg/L	1	0.07	0.50		<1	12/21/18 09:45	N	IV
KQ1818709-03	Carbon, Total Organic	MS	K1812154-001	Ground Water	24.33 mg/L	10 ml	1220 mg/L	50	4	25	97		12/21/18 12:11	N	IV
KQ1818709-04	Carbon, Total Organic	DUP	K1812154-001	Ground Water	0.00 mg/L	10 ml	25 mg/L U	50	4	25		NC	12/21/18 11:39	N	IV
KQ1818709-05	Carbon, Total Organic	DUP	K1812154-002	Ground Water	1.52 mg/L	10 ml	1.52 mg/L	1	0.07	0.50		9	12/21/18 12:59	N	IV
KQ1818709-06	Carbon, Total Organic	DUP	K1812154-003	Ground Water	2.18 mg/L	10 ml	2.18 mg/L	1	0.07	0.50		<1	12/21/18 14:02	N	IV
KQ1818709-07	Carbon, Total Organic	DUP	K1812154-004	Ground Water	17.56 mg/L	10 ml	878 mg/L	50	4	25		<1	12/21/18 14:34	N	IV
KQ1818709-08	Carbon, Total Organic	DUP	K1812154-005	Ground Water	0.00 mg/L	10 ml	10 mg/L U	20	2	10		NC	12/21/18 16:10	N	IV
KQ1818709-09	Carbon, Total Organic	MS	K1811928-001	Drinking Water	24.48 mg/L	10 ml	24.5 mg/L	1	0.07	0.50	98		12/21/18 17:46	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

CLS 12/26/18

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619810 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818709-10	Carbon, Total Organic	DUP	K1811928-001	Drinking Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/21/18 17:14	N	II
KQ1818709-11	Carbon, Total Organic	MS	K1812278-001	Ground Water	38.12 mg/L	10 ml	1910 mg/L	50	4	25	98		12/21/18 19:22	N	IV
KQ1818709-12	Carbon, Total Organic	DUP	K1812278-001	Ground Water	13.53 mg/L	10 ml	677 mg/L	50	4	25		1	12/21/18 18:19	N	IV
KQ1818709-13	Carbon, Total Organic	DUP	K1812278-002	Ground Water	13.66 mg/L	10 ml	683 mg/L	50	4	25		3	12/21/18 22:19	N	IV
KQ1818709-14	Carbon, Total Organic	DUP	K1812278-003	Ground Water	1.15 mg/L	10 ml	4.6 mg/L	4	0.3	2.0		1	12/21/18 20:41	N	IV
KQ1818709-15	Carbon, Total Organic	MS	K1812279-001	Water	48.60 mg/L	10 ml	48.6 mg/L	1	0.07	0.50	96		12/21/18 23:54	N	IV
KQ1818709-16	Carbon, Total Organic	DUP	K1812279-001	Water	24.96 mg/L	10 ml	25.0 mg/L	1	0.07	0.50		<1	12/21/18 23:22	N	IV
KQ1818709-17	Carbon, Total Organic	MS	K1812272-001	Ground Water	36.01 mg/L	10 ml	144 mg/L	4	0.3	2.0	102		12/22/18 01:14	N	IV
KQ1818709-18	Carbon, Total Organic	DUP	K1812272-001	Ground Water	10.47 mg/L	10 ml	41.9 mg/L	4	0.3	2.0		<1	12/22/18 00:42	N	IV
KQ1818709-19	Carbon, Total Organic	DUP	K1812272-002	Ground Water	3.78 mg/L	10 ml	378 mg/L	100	7	50		4	12/22/18 03:06	N	IV
KQ1818709-20	Carbon, Total Organic	DUP	K1812272-003	Ground Water	3.95 mg/L	10 ml	3.95 mg/L	1	0.07	0.50		<1	12/22/18 03:38	N	IV
KQ1818709-21	Carbon, Total Organic	DUP	K1812272-004	Ground Water	3.99 mg/L	10 ml	3.99 mg/L	1	0.07	0.50		1	12/22/18 04:09	N	IV
KQ1818709-23	Carbon, Total Organic	DUP	K1811745-001	Water	2.34 mg/L	10 ml	2.34 mg/L	1	0.07	0.50		41*	12/22/18 05:13	N	IV
KQ1818709-24	Carbon, Total Organic	MS	K1811747-001	Water	29.30 mg/L	10 ml	29.3 mg/L	1	0.07	0.50	98		12/22/18 07:20	N	IV
KQ1818709-25	Carbon, Total Organic	DUP	K1811747-001	Water	4.71 mg/L	10 ml	4.71 mg/L	1	0.07	0.50		<1	12/22/18 06:48	N	IV
KQ1818709-26	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 11:06	N	IV
KQ1818709-26	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 11:06	N	IV
KQ1818709-27	Carbon, Total Organic	LCS		Water	20.26 mg/L	10 ml	20.3 mg/L	1	0.07	0.50	93		12/21/18 11:22	N	IV
KQ1818709-27	Carbon, Total Organic	LCS		Water	20.26 mg/L	10 ml	20.3 mg/L	1	0.07	0.50	93		12/21/18 11:22	N	IV
KQ1818709-28	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	IV
KQ1818709-28	Carbon, Total Organic	CCV		Water	24.26 mg/L	10 ml	24.3 mg/L	1			97		12/21/18 05:13	N	IV
KQ1818709-29	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	IV
KQ1818709-29	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 ml	24.0 mg/L	1			96		12/21/18 10:33	N	IV
KQ1818709-30	Carbon, Total Organic	CCV		Water	23.72 mg/L	10 ml	23.7 mg/L	1			95		12/21/18 15:37	N	IV
KQ1818709-30	Carbon, Total Organic	CCV		Water	23.72 mg/L	10 ml	23.7 mg/L	1			95		12/21/18 15:37	N	IV
KQ1818709-31	Carbon, Total Organic	CCV		Water	23.55 mg/L	10 ml	23.6 mg/L	1			94		12/21/18 21:13	N	IV
KQ1818709-31	Carbon, Total Organic	CCV		Water	23.55 mg/L	10 ml	23.6 mg/L	1			94		12/21/18 21:13	N	IV
KQ1818709-32	Carbon, Total Organic	CCV		Water	23.63 mg/L	10 ml	23.6 mg/L	1			94		12/22/18 02:33	N	IV
KQ1818709-32	Carbon, Total Organic	CCV		Water	23.63 mg/L	10 ml	23.6 mg/L	1			94		12/22/18 02:33	N	IV
KQ1818709-33	Carbon, Total Organic	CCV		Water	23.86 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 07:36	N	IV
KQ1818709-33	Carbon, Total Organic	CCV		Water	23.86 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 07:36	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 619810 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1818709-34	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	IV
KQ1818709-34	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 05:30	N	IV
KQ1818709-35	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	IV
KQ1818709-35	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 10:49	N	IV
KQ1818709-36	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 15:54	N	IV
KQ1818709-36	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 15:54	N	IV
KQ1818709-37	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:29	N	IV
KQ1818709-37	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:29	N	IV
KQ1818709-38	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 02:49	N	IV
KQ1818709-38	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 02:49	N	IV
KQ1818709-39	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 07:53	N	IV
KQ1818709-39	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 07:53	N	IV
KQ1818709-40	Carbon, Total Organic	MS	K1811745-001	Water	26.18 mg/L	10 ml	26.2 mg/L	1	0.07	0.50	99		12/22/18 05:45	N	IV
KQ1818709-41	Carbon, Total Organic	DMS	K1811745-001	Water	25.64 mg/L	10 ml	25.6 mg/L	1	0.07	0.50	96		12/22/18 05:45	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** CSETHE **Analysis Lot:** 620105 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1812416-035	Carbon, Dissolved Organic (DOC)	N/A		Water	1.24 mg/L	10 ml	1.24 mg/L	1	0.07	0.50			12/22/18 08:10	N	II
KQ1818712-01	Carbon, Dissolved Organic (DOC)	MS	K1812416-035	Water	24.33 mg/L	10 ml	24.3 mg/L	1	0.07	0.50	92		12/22/18 08:41	N	II
KQ1818712-02	Carbon, Dissolved Organic (DOC)	DUP	K1812416-035	Water	1.48 mg/L	10 ml	1.48 mg/L	1	0.07	0.50		18*	12/22/18 08:10	N	II
KQ1818712-03	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:46	N	II
KQ1818712-04	Carbon, Dissolved Organic (DOC)	LCS		Water	19.23 mg/L	10 ml	19.2 mg/L	1	0.07	0.50	88		12/21/18 22:02	N	II
KQ1818712-05	Carbon, Dissolved Organic (DOC)	CCV		Water	23.55 mg/L	10 ml	23.6 mg/L	1			94		12/21/18 21:13	N	II
KQ1818712-06	Carbon, Dissolved Organic (DOC)	CCV		Water	23.63 mg/L	10 ml	23.6 mg/L	1			94		12/22/18 02:33	N	II
KQ1818712-07	Carbon, Dissolved Organic (DOC)	CCV		Water	23.86 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 07:36	N	II
KQ1818712-08	Carbon, Dissolved Organic (DOC)	CCV		Water	23.93 mg/L	10 ml	23.9 mg/L	1			96		12/22/18 08:58	N	II
KQ1818712-09	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/21/18 21:29	N	II
KQ1818712-10	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 02:49	N	II
KQ1818712-11	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 07:53	N	II
KQ1818712-12	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/22/18 09:14	N	II

CES 12/26/18

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

ALS Environmental

StarLIMS Run: 619808, 619810, 620105

Analysis: TOC

Method: SM 5310 C, 9060, 415.1

CCV: 11-GEN-05-73F 50 ppm LCS: 11-GEN-05-73C 21.9 ppm

ICAL Date: 11/26/18

ICAL ID: 11-GEN-05-72J

ICS ID: 11-GEN-05-73B

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-70O 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-73J

21 % H3PO4: 11-GEN-05-73I

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, Marge, 129001F, N11314F

FILTER ID: NA

Analyzed By: CES	Date Analyzed: 12/20/18
Reviewed By:	Date Reviewed: 12/26/18

TOC: 619808, 619810
DOC: 620105

Schedule: 12202018

Version: 9
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2018/12/21 10:33 - Friday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Clean)	Clean	Clean		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	K1811658-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1811888-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	K1812001-001.01 10x	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K1812001-001.01 ms 10x	Extended Reaction 021711 (Extended Reaction 021711)	1
9	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1811625-001.03 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1811625-001.03 ms 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
12	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1811625-003.03	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1811728-001	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1811728-002	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1811789-002.08	Extended Reaction 021711 (Extended Reaction 021711)	4
18	Sample	K1811789-002.08 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
19	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1811789-003.08	Extended Reaction 021711 (Extended Reaction 021711)	4
22	Sample	K1811789-004.08	Extended Reaction 021711 (Extended Reaction 021711)	4
23	Sample	K1811789-005.08	Extended Reaction 021711 (Extended Reaction 021711)	4
24	Sample	K1811789-006.08	Extended Reaction 021711 (Extended Reaction 021711)	4
25	Sample	K1811789-008.08	Extended Reaction 021711 (Extended Reaction 021711)	4
26	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1811849-001.04	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1811849-001.04 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1811849-002.04 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1811849-003.04 4x	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1811849-004.04	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1811849-005.04	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1811831-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	K1811831-002.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
36	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	K1812101-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2

Schedule: 12202018

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Page
38	Sample	K1812101-001.02 mre	Extended Reaction 021711 (Extended Reaction 021711)	11
39	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
40	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
41	Sample	K1812154-001.01 mre 50x	Extended Reaction 021711 (Extended Reaction 021711)	11
42	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
43	Sample	K1812154-002.01	Extended Reaction 021711 (Extended Reaction 021711)	12
44	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
45	Sample	K1812154-003.01	Extended Reaction 021711 (Extended Reaction 021711)	12
46	Sample	K1812154-004.01 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
47	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
48	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
49	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
50	Sample	K1812154-005.01 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
51	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
52	Sample	K1811825-001.01 mre	Extended Reaction 021711 (Extended Reaction 021711)	11
53	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	11
54	Sample	K1812276-001.01 50x	Extended Reaction 021711 (Extended Reaction 021711)	12
55	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
56	Sample	K1812276-001.01 mre 50x	Extended Reaction 021711 (Extended Reaction 021711)	11
57	Sample	K1812276-002.02 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
58	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
59	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
60	Sample	K1812276-003.01 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
61	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
62	Sample	K1812276-004.01	Extended Reaction 021711 (Extended Reaction 021711)	12
63	Sample	K1812276-001.02 mre	Extended Reaction 021711 (Extended Reaction 021711)	11
64	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
65	Sample	K1812276-001.01 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
66	Sample	K1812276-001.01 mre dre	Extended Reaction 021711 (Extended Reaction 021711)	11
67	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	14
68	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
69	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
70	Sample	K1812276-005.01 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
71	Sample	K1812276-006.01	Extended Reaction 021711 (Extended Reaction 021711)	12
72	Sample	K1812276-001.01	Extended Reaction 021711 (Extended Reaction 021711)	12
73	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
74	Sample	K1811745-001.01 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
75	Sample	K1811745-001.01 mre	Extended Reaction 021711 (Extended Reaction 021711)	12
76	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	12
77	Sample	K1811747-001.01	Extended Reaction 021711 (Extended Reaction 021711)	12
78	Sample	K1811747-001.01 mre	Extended Reaction 021711 (Extended Reaction 021711)	11
79	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
80	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
81	Sample	K1812415-001.01 dre	Extended Reaction 021711 (Extended Reaction 021711)	12
82	Sample	K1812415-001.01 mre dre	Extended Reaction 021711 (Extended Reaction 021711)	11
83	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11
84	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	11

00945627

Fusion Report - 12202018
Thursday, December 20, 2018 08:21 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2018/12/26 11:38 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	12202018	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v9)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/12/20 08:21

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.04	16.47	4.43	49.47	05:34
2	TC Clean	8.60	11.29	2.69	49.71	07:15
3	TC Clean	2.48	5.22	2.74	49.77	07:01
4	TC Clean	1.83	4.57	2.75	49.73	07:03

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 08:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.50	16.00	2.50	49.87	12:34

Dilution **Blank Contribution** **Method** **Calibration**

1:10	(TC) 17.0445 (IC) (v1201)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/12/20 09:09

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.06	13.45	3.39	49.37	07:59
2	TC Clean	5.19	7.86	2.67	49.71	07:17
3	TC Clean	3.04	5.66	2.63	49.76	07:01
4	TC Clean	1.91	4.53	2.62	49.76	07:03

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 09:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.36	15.83	2.47	49.86	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0445 (IC) (v1201)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2018/12/20 10:00

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.15	13.24	3.09	49.44	08:00
2	TC Clean	4.75	7.44	2.69	49.80	07:17
3	TC Clean	1.82	4.43	2.62	49.83	07:02
4	TC Clean	1.43	4.08	2.65	49.84	07:02

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 10:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.13	15.68	2.54	49.91	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 17.0445 (IC) (v1201)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Blank (Creating v1202) From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2018/12/20 10:50

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.18	13.18	3.00	49.42	07:58
2	TC Clean	4.60	7.15	2.55	49.76	07:16
3	TC Clean	1.96	4.47	2.51	49.84	07:03
4	TC Clean	1.49	4.08	2.59	49.85	07:01
5	Reagent Blank	5.37	8.01	2.63	49.80	08:12
6	Acid Blank	1.31	3.85	2.54	49.49	05:40

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.7100 ppm	0.0000 ppm	0.0000%	2018/12/20 11:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7100	7.1003	22.39	25.22	2.83	49.95	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0779 ppm (PASS)	0.0000 ppm	0%	2018/12/20 11:56

	Base

Pos	Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0779	240.7790	202.52	205.21	2.70	49.94	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/20 12:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	17.20	19.92	2.72	49.96	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 12:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.53	19.20	2.67	49.98	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.6415 ppm (PASS)	0.0000 ppm	0%	2018/12/20 12:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.6415	206.4151	176.24	178.89	2.65	49.99	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	ICS	0.2428 ppm	0.0000 ppm	0.0000%	2018/12/20 13:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2428	2.4278	18.82	21.60	2.78	50.00	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1811658-004.01	3.8703 ppm	0.0531 ppm	1.3700%	2018/12/20 13:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8327	38.3274	46.26	49.03	2.77	49.98	12:27
2	TOC	3.9078	39.0782	46.84	49.59	2.76	50.00	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0004 ppm	0.0006 ppm	141.4200%	2018/12/20 13:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0008	0.0078	16.97	19.66	2.69	50.05	12:27
2	TOC	0.0000	0.0000	15.66	18.25	2.59	50.03	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1811888-002.01	2.7312 ppm	0.0057 ppm	0.2100%	2018/12/20 14:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7352	27.3524	37.87	40.73	2.86	50.02	12:28
2	TOC	2.7271	27.2713	37.81	40.62	2.81	50.08	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1812001-001.01 10x	6.9117 ppm	0.0401 ppm	0.5800%	2018/12/20 14:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	6.9401	69.4013	70.02	72.80	2.79	50.07	12:25
2	TOC	6.8834	68.8336	69.58	72.19	2.61	50.09	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1812001-001.01 ms 10x	31.6218 ppm	0.0000 ppm	0.0000%	2018/12/20 15:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.6218	316.2181	258.70	261.23	2.53	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	RB	0.1048 ppm	0.0000 ppm	0.0000%	2018/12/20 15:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1048	1.0477	17.76	20.50	2.74	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0103 ppm (PASS)	0.0000 ppm	0%	2018/12/20 15:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0103	240.1027	202.00	204.73	2.73	50.11	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

~~**Sample Type**: Check Standard --> CCB 021711 From Schedule Version~~

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/20 16:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	17.00	19.74	2.75	50.14	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1811625-001.03 2x	4.0447 ppm	0.2857 ppm	7.0600%	2018/12/20 16:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2468	42.4675	49.43	52.16	2.73	50.15	12:28
2	TOC	3.8427	38.4268	46.34	48.97	2.63	50.14	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1811625-001.03 ms 2x	29.1500 ppm	0.0000 ppm	0.0000%	2018/12/20 17:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.1500	291.5002	239.80	242.66	2.86	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 17:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.64	17.28	2.63	50.16	12:29
2	TOC	0.0000	0.0000	14.52	17.37	2.85	50.16	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K1811625-003.03	4.3494 ppm	0.1702 ppm	3.9100%	2018/12/20 17:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4698	44.6978	51.13	53.85	2.72	50.20	12:30
2	TOC	4.2291	42.2909	49.29	51.80	2.51	50.15	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 18:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.47	16.22	2.75	50.18	12:22
2	TOC	0.0000	0.0000	14.66	17.23	2.57	50.14	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1811728-001	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 18:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.67	17.32	2.65	50.14	12:26
2	TOC	0.0000	0.0000	14.89	17.48	2.58	50.12	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1811728-002	0.3981 ppm	0.5629 ppm	141.4200%	2018/12/20 19:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.71	17.40	2.68	50.14	12:27
2	TOC	0.7961	7.9611	23.05	25.78	2.73	50.12	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1811789-002.08	0.3032 ppm	0.1364 ppm	44.9900%	2018/12/20 19:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5064	5.0636	20.83	23.42	2.59	50.08	12:28
2	TOC	0.2565	2.5651	18.92	21.63	2.71	50.14	12:25
3	TOC	0.2160	2.1596	18.61	21.36	2.75	50.13	12:2
4	TOC	0.2341	2.3415	18.75	21.38	2.63	50.14	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	18	TOC	K1811789-002.08 ms	25.2126 ppm	0.0000 ppm	0.0000%	2018/12/20 21:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.2126	252.1263	209.70	212.25	2.55	50.12	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 21:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.94	19.63	2.68	50.10	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0674 ppm (PASS)	0.0000 ppm	0%	2018/12/20 21:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0674	240.6743	202.44	205.01	2.58	50.10	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/20 21:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.32	19.03	2.72	50.15	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/20 22:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.21	17.97	2.76	50.11	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.6186 ppm (PASS)	0.0000 ppm	0%	2018/12/20 22:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.6186	206.1862	176.07	178.69	2.62	50.07	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1811789-003.08	0.6115 ppm	0.0957 ppm	15.6500%	2018/12/20 22:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7447	7.4470	22.65	25.41	2.75	50.03	12:29
2	TOC	0.6046	6.0460	21.58	24.25	2.67	49.99	12:26
3	TOC	0.5775	5.7752	21.38	23.89	2.51	49.91	12:24
4	TOC	0.5192	5.1918	20.93	23.51	2.58	49.93	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1811789-004.08	0.3582 ppm	0.4373 ppm	122.0700%	2018/12/20 23:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1593	1.5932	18.18	20.90	2.72	49.89	12:24

2	TOC	1.0099	10.0985	24.68	27.32	2.64	49.87	12:26
3	TOC	0.1908	1.9085	18.42	21.15	2.73	49.87	12:26
4	TOC	0.0729	0.7286	17.52	20.19	2.67	49.84	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1811789-005.08	0.6339 ppm	0.0893 ppm	14.0800%	2018/12/21 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7650	7.6497	22.81	25.45	2.65	49.83	12:24
2	TOC	0.5847	5.8472	21.43	24.13	2.70	49.81	12:25
3	TOC	0.5711	5.7111	21.33	24.07	2.74	49.79	12:24
4	TOC	0.6149	6.1493	21.66	24.35	2.68	49.78	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1811789-006.08	0.5329 ppm	0.0218 ppm	4.1000%	2018/12/21 01:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5515	5.5149	21.18	23.88	2.70	49.78	12:27
2	TOC	0.5332	5.3318	21.04	23.57	2.54	49.78	12:26
3	TOC	0.5022	5.0218	20.80	23.44	2.64	49.72	12:25
4	TOC	0.5447	5.4469	21.12	23.86	2.73	49.78	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1811789-008.08	0.2970 ppm	0.0830 ppm	27.9500%	2018/12/21 02:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3918	3.9177	19.96	22.52	2.56	49.74	12:28
2	TOC	0.3350	3.3500	19.52	22.21	2.69	49.74	12:24
3	TOC	0.2038	2.0380	18.52	21.29	2.77	49.72	12:27
4	TOC	0.2574	2.5743	18.93	21.62	2.69	49.72	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 03:54

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	15.47	17.90	2.42	49.72	12:24
2	TOC	0.0000	0.0000	14.64	17.20	2.56	49.73	12:23

Dilution 1:10
Blank Contribution (TC) 16.9610 (IC) (v1202)
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1811849-001.04	1.2435 ppm	0.0105 ppm	0.8400%	2018/12/21 04:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2362	12.3615	26.41	29.06	2.65	49.71	12:22
2	TOC	1.2509	12.5093	26.52	29.16	2.63	49.71	12:26

Dilution 1:10
Blank Contribution (TC) 16.9610 (IC) (v1202)
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1811849-001.04 ms	25.4293 ppm	0.0000 ppm	0.0000%	2018/12/21 04:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.4293	254.2925	211.36	213.95	2.59	49.70	12:30

Dilution 1:10
Blank Contribution (TC) 16.9610 (IC) (v1202)
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2565 ppm (PASS)	0.0000 ppm	0%	2018/12/21 05:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2565	242.5645	203.88	206.62	2.74	49.66	12:31

Completion State Success - Criteria met.
Success Action Do Nothing
Method Extended Reaction 021711 (v3)
Calibration Extended Reaction 021711 (v24)
STD Conc - Pos B 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 05:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.31	19.10	2.80	49.66	12:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1811849-002.04 4x	8.1359 ppm	0.1209 ppm	1.4900%	2018/12/21 05:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.2214	82.2142	79.81	82.70	2.89	49.69	12:23
2	TOC	8.0505	80.5045	78.50	81.19	2.69	49.68	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1811849-003.04 4x	7.6636 ppm	0.1108 ppm	1.4500%	2018/12/21 06:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.7420	77.4200	76.15	78.89	2.75	49.68	12:26
2	TOC	7.5853	75.8529	74.95	77.63	2.68	49.71	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1811849-004.04	0.9762 ppm	0.1639 ppm	16.7900%	2018/12/21 06:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0921	10.9213	25.31	27.99	2.68	49.67	12:28
2	TOC	0.8603	8.6033	23.54	26.17	2.64	49.67	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1811849-005.04	5.2512 ppm	0.1272 ppm	2.4200%	2018/12/21 07:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3411	53.4111	57.79	60.40	2.61	49.69	12:24
2	TOC	5.1612	51.6125	56.42	59.23	2.82	49.71	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	RB	0.3241 ppm	0.4583 ppm	141.4200%	2018/12/21 07:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	16.09	18.66	2.57	49.67	12:29
2	TOC	0.6482	6.4816	21.92	24.59	2.67	49.61	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1811831-002.01	6.3814 ppm	0.5082 ppm	7.9600%	2018/12/21 08:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7408	67.4078	68.49	71.00	2.51	49.71	12:27
2	TOC	6.0221	60.2211	63.00	65.39	2.40	49.90	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1811831-002.01 ms	31.0037 ppm	0.0000 ppm	0.0000%	2018/12/21 08:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.0037	310.0373	253.97	256.56	2.59	49.92	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 09:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	13.45	16.02	2.57	49.95	12:24
2	TOC	0.0000	0.0000	13.80	16.48	2.67	49.92	12:23

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1812101-001.02	16.0372 ppm	0.0155 ppm	0.1000%	2018/12/21 09:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.0482	160.4819	139.64	142.30	2.66	49.93	12:27
2	TOC	16.0262	160.2622	139.48	142.17	2.69	49.89	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1812101-001.02 ms	40.7000 ppm	0.0000 ppm	0.0000%	2018/12/21 10:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	40.7000	407.0004	328.10	330.64	2.54	49.86	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0495 ppm (PASS)	0.0000 ppm	0%	2018/12/21 10:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0495	240.4951	202.30	204.97	2.67	49.86	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 — From Schedule Version

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 10:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	15.93	18.55	2.62	49.84	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 11:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.88	17.48	2.60	50.04	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	20.2644 ppm (PASS)	0.0000 ppm	0%	2018/12/21 11:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	20.2644	202.6439	173.36	175.92	2.56	49.99	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1812154-001.01 50x	0.0965 ppm	0.1365 ppm	141.4200%	2018/12/21 11:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1931	1.9307	18.44	21.05	2.61	49.95	12:28
2	TOC	0.0000	0.0000	16.89	19.63	2.74	49.95	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K1812154-001.01 ms 50x	24.3267 ppm	0.0000 ppm	0.0000%	2018/12/21 12:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.3267	243.2665	202.93	205.49	2.56	49.93	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 12:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.90	17.47	2.57	49.92	12:27
2	TOC	0.0000	0.0000	13.95	16.42	2.47	49.95	12:21

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	K1812154-002.01	1.5973 ppm	0.1048 ppm	6.5600%	2018/12/21 12:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6714	16.7136	29.74	32.52	2.78	49.93	12:27
2	TOC	1.5232	15.2315	28.60	31.41	2.81	49.97	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 13:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.83	17.44	2.61	49.98	12:26
2	TOC	0.0000	0.0000	13.52	16.27	2.75	49.99	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K1812154-003.01	2.1735 ppm	0.0087 ppm	0.4000%	2018/12/21 14:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1674	21.6739	33.53	36.21	2.68	49.99	12:27

2	TOC	2.1797	21.7969	33.62	36.23	2.60	49.96	12:25

Dilution 1:10 | **Blank Contribution** (TC) 16.9610 (IC) (v1202) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1812154-004.01 50x	17.5683 ppm	0.0074 ppm	0.0400%	2018/12/21 14:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.5736	175.7357	151.30	154.08	2.77	50.00	12:27
2	TOC	17.5631	175.6311	151.22	153.86	2.64	49.96	12:28

Dilution 1:10 | **Blank Contribution** (TC) 16.9610 (IC) (v1202) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 15:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.33	17.92	2.59	49.96	12:28
2	TOC	0.0000	0.0000	13.94	16.74	2.80	49.99	12:26

Dilution 1:10 | **Blank Contribution** (TC) 16.9610 (IC) (v1202) | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7161 ppm (PASS)	0.0000 ppm	0%	2018/12/21 15:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7161	237.1608	199.75	202.36	2.62	50.01	12:29

Completion State Success - Criteria met. | **Success Action** Do Nothing | **Method** Extended Reaction 021711 (v3) | **Calibration** Extended Reaction 021711 (v24) | **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 15:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	15.45	17.92	2.47	50.01	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1812154-005.01 20x	0.0816 ppm	0.1112 ppm	136.2200%	2018/12/21 16:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1602	1.6024	18.19	20.63	2.44	50.06	12:26
2	TOC	0.0030	0.0300	16.98	19.62	2.63	50.02	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 16:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.08	16.76	2.68	50.06	12:24
2	TOC	0.0000	0.0000	13.43	15.97	2.54	50.07	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1811928-001.01	0.0564 ppm	0.0642 ppm	113.8700%	2018/12/21 17:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1018	1.0177	17.74	20.38	2.64	50.07	12:24
2	TOC	0.0110	0.1098	17.05	19.66	2.62	50.06	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1811928-001.01 ms	24.4826 ppm	0.0000 ppm	0.0000%	2018/12/21 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.4826	244.8258	204.12	206.67	2.55	50.07	12:34

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 18:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.50	18.26	2.75	50.01	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1812278-001.01 50x	13.6190 ppm	0.1234 ppm	0.9100%	2018/12/21 18:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.7063	137.0630	121.74	124.53	2.79	49.97	12:26
2	TOC	13.5318	135.3180	120.41	123.06	2.65	49.99	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 18:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.98	17.57	2.59	50.00	12:29
2	TOC	0.0000	0.0000	14.14	16.73	2.59	49.98	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1812278-001.01 ms 50x	38.1173 ppm	0.0000 ppm	0.0000%	2018/12/21 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	38.1173	381.1732	308.36	311.11	2.76	50.03	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reactio 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 19:38

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	15.38	18.03	2.65	50.12	12:21
2	TOC	0.0000	0.0000	13.18	15.90	2.72	50.12	12:29
3	TOC	0.0000	0.0000	13.10	15.85	2.75	50.11	12:25
4	TOC	0.0000	0.0000	13.37	15.90	2.53	50.14	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	57	TOC	K1812278-003.02 4x	1.1389 ppm	0.0119 ppm	1.0500%	2018/12/21 20:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1305	11.3046	25.60	28.30	2.69	50.14	12:28
2	TOC	1.1473	11.4733	25.73	28.49	2.76	50.17	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.5524 ppm (PASS)	0.0000 ppm	0%	2018/12/21 21:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5524	235.5243	198.50	201.17	2.67	50.15	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/21 21:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.23	18.82	2.59	50.15	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 21:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.51	17.24	2.74	50.15	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> LCS ER — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	19.2260 ppm (PASS)	0.0000 ppm	0%	2018/12/21 22:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	19.2260	192.2601	165.42	168.09	2.66	50.13	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	21.9 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	K1812278-002.01 50x	13.8400 ppm	0.2571 ppm	1.8600%	2018/12/21 22:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.0218	140.2181	124.15	126.95	2.79	50.10	12:23
2	TOC	13.6582	136.5816	121.37	124.17	2.79	50.13	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/21 22:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	14.44	17.22	2.77	50.12	12:27
2	TOC	0.0000	0.0000	13.12	15.76	2.64	50.12	12:27

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	K1812279-001.02	24.8410 ppm	0.1722 ppm	0.6900%	2018/12/21 23:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.7192	247.1921	205.93	208.61	2.68	50.12	12:24
2	TOC	24.9628	249.6278	207.79	210.56	2.77	50.10	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K1812279-001.02 ms	48.6019 ppm	0.0000 ppm	0.0000%	2018/12/21 23:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	48.6019	486.0190	388.51	391.29	2.78	50.13	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	RB	0.3638 ppm	0.5145 ppm	141.4200%	2018/12/22 00:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7276	7.2756	22.52	25.36	2.84	50.13	12:25
2	TOC	0.0000	0.0000	16.69	19.45	2.76	50.14	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1812272-001.01 4x	10.5041 ppm	0.0528 ppm	0.5000%	2018/12/22 00:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.5415	105.4147	97.55	100.17	2.62	50.14	12:27
2	TOC	10.4668	104.6678	96.98	99.78	2.81	50.13	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1812272-001.01 ms 4x	36.0064 ppm	0.0000 ppm	0.0000%	2018/12/22 01:14

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	36.0064	360.0644	292.22	294.86	2.64	50.13	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	RB	0.0221 ppm	0.0441 ppm	200.0000%	2018/12/22 01:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0883	0.8829	17.64	20.45	2.81	50.10	12:26
2	TOC	0.0000	0.0000	15.76	18.39	2.63	50.11	12:26
3	TOC	0.0000	0.0000	14.56	17.38	2.82	50.12	12:26
4	TOC	0.0000	0.0000	14.00	16.68	2.68	50.13	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6288 ppm (PASS)	0.0000 ppm	0%	2018/12/22 02:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6288	236.2883	199.08	201.57	2.49	50.12	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/22 02:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	15.09	17.75	2.66	50.13	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1812272-002.01 100x	3.8476 ppm	0.0975 ppm	2.5300%	2018/12/22 03:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9166	39.1659	46.90	49.50	2.60	50.12	12:28
2	TOC	3.7787	37.7871	45.85	48.70	2.85	50.12	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1812272-003.01	3.9636 ppm	0.0156 ppm	0.3900%	2018/12/22 03:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9747	39.7467	47.35	50.10	2.76	50.12	12:26
2	TOC	3.9526	39.5256	47.18	49.88	2.70	50.11	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K1812272-004.01	4.0087 ppm	0.0333 ppm	0.8300%	2018/12/22 04:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0322	40.3222	47.79	50.48	2.69	50.10	12:29
2	TOC	3.9851	39.8513	47.43	50.17	2.74	50.12	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/22 04:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.38	18.09	2.72	50.15	12:28
2	TOC	0.0000	0.0000	14.56	17.22	2.66	50.14	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1811745-001.09	1.9426 ppm	0.5604 ppm	28.8500%	2018/12/22 05:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	1.5463	15.4630	28.78	31.48	2.70	50.17	12:27
2	TOC	2.3389	23.3888	34.84	37.63	2.79	50.13	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	72	TOC	K1811745-001.09 ms	25.9104 ppm	0.3760 ppm	1.4500%	2018/12/22 05:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1763	261.7631	217.07	219.81	2.74	50.12	12:24
2	TOC	25.6446	256.4457	213.00	215.81	2.81	50.13	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	73	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2018/12/22 06:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	15.93	18.61	2.68	50.12	12:23
2	TOC	0.0000	0.0000	14.21	17.02	2.81	50.10	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	74	TOC	K1811747-001.09	4.7084 ppm	0.0027 ppm	0.0600%	2018/12/22 06:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7103	47.1034	52.97	55.91	2.94	50.11	12:24
2	TOC	4.7065	47.0655	52.94	55.63	2.69	50.12	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	75	TOC	K1811747-001.09 ms	29.2991 ppm	0.0000 ppm	0.0000%	2018/12/22 07:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.2991	292.9914	240.94	243.69	2.75	50.09	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

00945653

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8618 ppm (PASS)	0.0000 ppm	0%	2018/12/22 07:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8618	238.6180	200.86	203.53	2.67	50.09	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/22 07:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	14.88	17.69	2.81	50.09	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	K1812416-035.01 doc	1.3602 ppm	0.1716 ppm	12.6100%	2018/12/22 08:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2389	12.3890	26.43	29.31	2.88	50.08	12:27
2	TOC	1.4816	14.8155	28.29	31.38	3.09	50.10	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1812416-035.01 ms doc	24.3251 ppm	0.0000 ppm	0.0000%	2018/12/22 08:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.3251	243.2508	202.92	205.83	2.92	50.10	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 16.9610 (IC) (v1202)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9324 ppm (PASS)	0.0000 ppm	0%	2018/12/22 08:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9324	239.3244	201.40	204.23	2.82	50.11	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2018/12/22 09:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	16.24	18.97	2.73	50.12	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v24)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1201	2.2080	1.6200	0.0000	0.0000	0.0000	2018/12/17 20:18	Fusion1 (Fusion1)
v1202	1.7907	1.3090	0.0000	0.0000	0.0000	2018/12/20 11:40	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v24	Calibration curve formula:	TOC: y = 7.645x + 18.448
Ver Creation:	2018/11/26 18:53	r^2 value:	TOC: r^2 = 0.99984
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	19.1720	0.0000		2018/11/26 17:15
0.50 ppm	23.8410	0.5000		2018/11/26 17:31
1.00 ppm	25.1300	1.0000		2018/11/26 17:47
5.00 ppm	53.5500	5.0000		2018/11/26 18:03
10.0 ppm	95.3860	10.0000		2018/11/26 18:20
25.0 ppm	211.7220	25.0000		2018/11/26 18:36
50.0 ppm	399.8190	50.0000		2018/11/26 18:52

Methods

Name: Extended Reaction 021711 (TOC)

Version:	v3	Operator:	Gen Chem Lab (Fusion1)
Ver Creation:	2013/02/04 11:44		
Comment:			

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	7
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	7
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1

00945656

SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2018/12/22 09:34

LABORATORY REPORT

December 24, 2018

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS18120642

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on December 14, 2018. For your reference, these analyses have been assigned our service request number P1806863.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko

By Kate Kaneko at 4:08 pm, 12/24/18

Kate Kaneko
Laboratory Director

Client: ALS Laboratory Group Service Request No: P1806863
Project: HS18120642

CASE NARRATIVE

The samples were received intact under chain of custody on December 14, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Service Request: P1806863
Project ID: HS18120642

Date Received: 12/14/2018
Time Received: 13:57

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
35AWW06_121118	P1806863-001	Water	12/11/2018	08:55	X	X
35AWW11_121118	P1806863-002	Water	12/11/2018	10:25	X	X
35AWW09_121118	P1806863-003	Water	12/11/2018	11:30	X	X

P1806863

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 10420

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18120642
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18120642-01**	**35AWW06_121118**	**Groundwater**	**11 Dec 2018 08:55**
	MEE plus CO2 Sub to ALS SimiValley			27 Dec 2018
2.	**HS18120642-02**	**35AWW11_121118**	**Groundwater**	**11 Dec 2018 10:25**
	MEE plus CO2 Sub to ALS SimiValley			27 Dec 2018
3.	**HS18120642-03**	**35AWW09_121118**	**Groundwater**	**11 Dec 2018 11:30**
	MEE plus CO2 Sub to ALS SimiValley			27 Dec 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: R Ciga Date/Time: 12/13/18 1800

Received By: Date/Time: 12/14/18 0910

Cooler ID(s): Temperature(s): 1°C wet 1C

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1806863

Project: HS18120642

Sample(s) received on: 12/14/18 Date opened: 12/14/18 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 1° C Thermometer ID CO907034581 Wet Ice			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1806863-001.01	40mL VOA NP		7		A	MR 12/20/18
P1806863-001.02	40mL VOA NP				A	
P1806863-001.04	40ml VOA HCL		1		A	MR 12/19/18
P1806863-001.05	40ml VOA HCL				A	
P1806863-002.01	40mL VOA NP		7		A	MR 12/20/18
P1806863-002.02	40mL VOA NP				A	
P1806863-002.04	40ml VOA HCL		1		A	MR 12/19/18
P1806863-002.05	40ml VOA HCL				A	
P1806863-003.01	40mL VOA NP		7		A	MR 12/20/18
P1806863-003.02	40mL VOA NP				A	
P1806863-003.04	40ml VOA HCL		1		A	MR 12/19/18
P1806863-003.05	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS18120642** ALS Project ID: P1806863

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date(s) Collected: 12/11/18
Date Received: 12/14/18
Date Analyzed: 12/20/18

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
35AWW06_121118	P1806863-001	0.10	**790,000**	1,000	860	370	
35AWW11_121118	P1806863-002	0.10	**820,000**	1,000	860	370	
35AWW09_121118	P1806863-003	0.10	**420,000**	1,000	860	370	
Method Control Sample	P181220-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18120642**

ALS Project ID: P1806863
ALS Sample ID: P181220-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 12/20/18
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	18,700	20,500	**82**	**90**	80-122	9	12	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW06_121118**
Client Project ID: **HS18120642**

ALS Project ID: P1806863
ALS Sample ID: P1806863-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/11/18
Date Received: 12/14/18
Date Analyzed: 12/19/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**890**	1.3	1.0	0.51	
74-85-1	Ethene	**0.44**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW11_121118**
Client Project ID: **HS18120642**

ALS Project ID: P1806863
ALS Sample ID: P1806863-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/11/18
Date Received: 12/14/18
Date Analyzed: 12/19/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**5.5**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW09_121118**
Client Project ID: **HS18120642**

ALS Project ID: P1806863
ALS Sample ID: P1806863-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: 12/11/18
Date Received: 12/14/18
Date Analyzed: 12/19/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1,000**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS18120642**

ALS Project ID: P1806863
ALS Sample ID: P181219-MB

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 12/19/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18120642**

ALS Project ID: P1806863
ALS Sample ID: P181219-LCS
P181219-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Magaly Rodriguez
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 12/19/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.50	2.43	2.40	**97**	**96**	73-125	1	26	
74-85-1	Ethene	4.37	4.49	4.43	**103**	**101**	72-133	2	11	
74-84-0	Ethane	4.69	4.67	4.65	**100**	**99**	74-131	1	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201806.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 13:19:14
Operator : MR
Sample : P1806863-001 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:34:11 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.997f	101351	0.021	ppm
2)	Carbon monoxide	1.997f	101351	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	6.041	4229469	18018.503	ppm
6)	Methane (FID)	1.121	2295863	243.005	ppm
7)	Ethylene	1.685	1044	0.062	ppm
8)	Ethane	1.685f	1044	0.061	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
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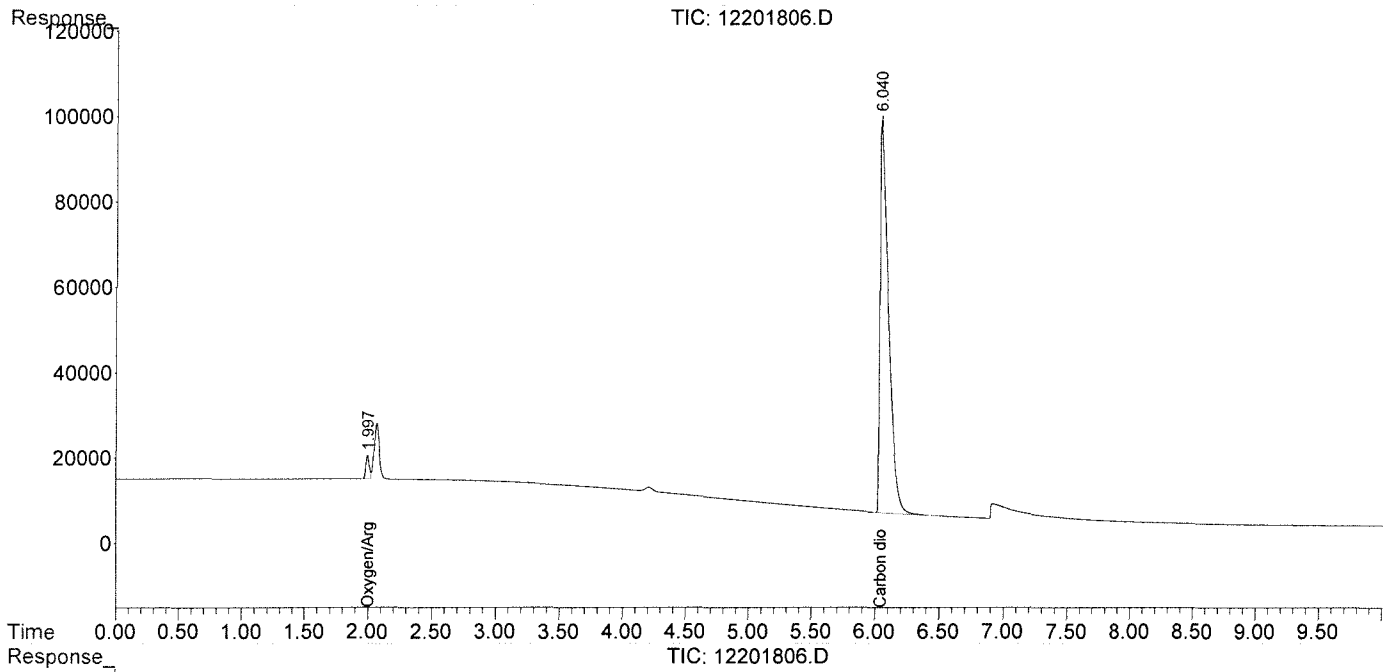
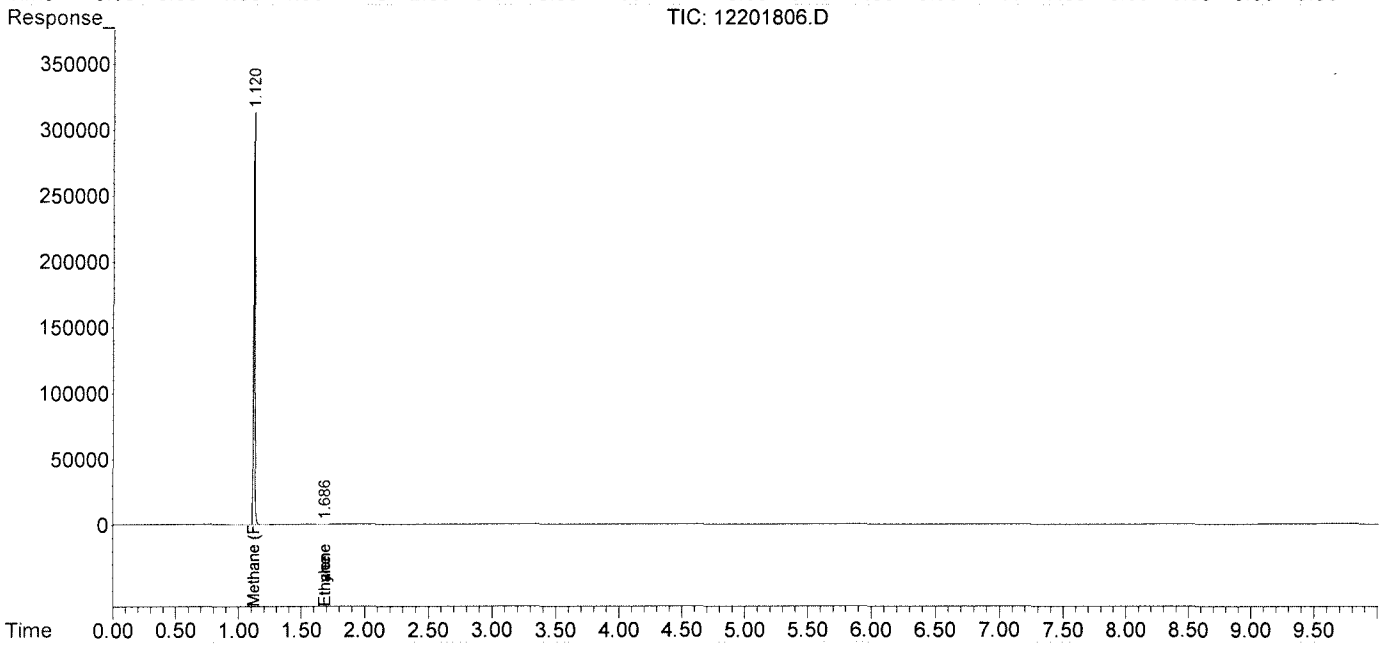
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201807.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 13:35:16
Operator : MR
Sample : P1806863-002 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:53:23 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
	Target Compounds				
1)	Oxygen/Argon	1.999f	93515	0.020	ppm
2)	Carbon monoxide	1.999f	93515	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	6.039	4414392	18806.318	ppm
6)	Methane (FID)	1.121	3156241	334.071	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

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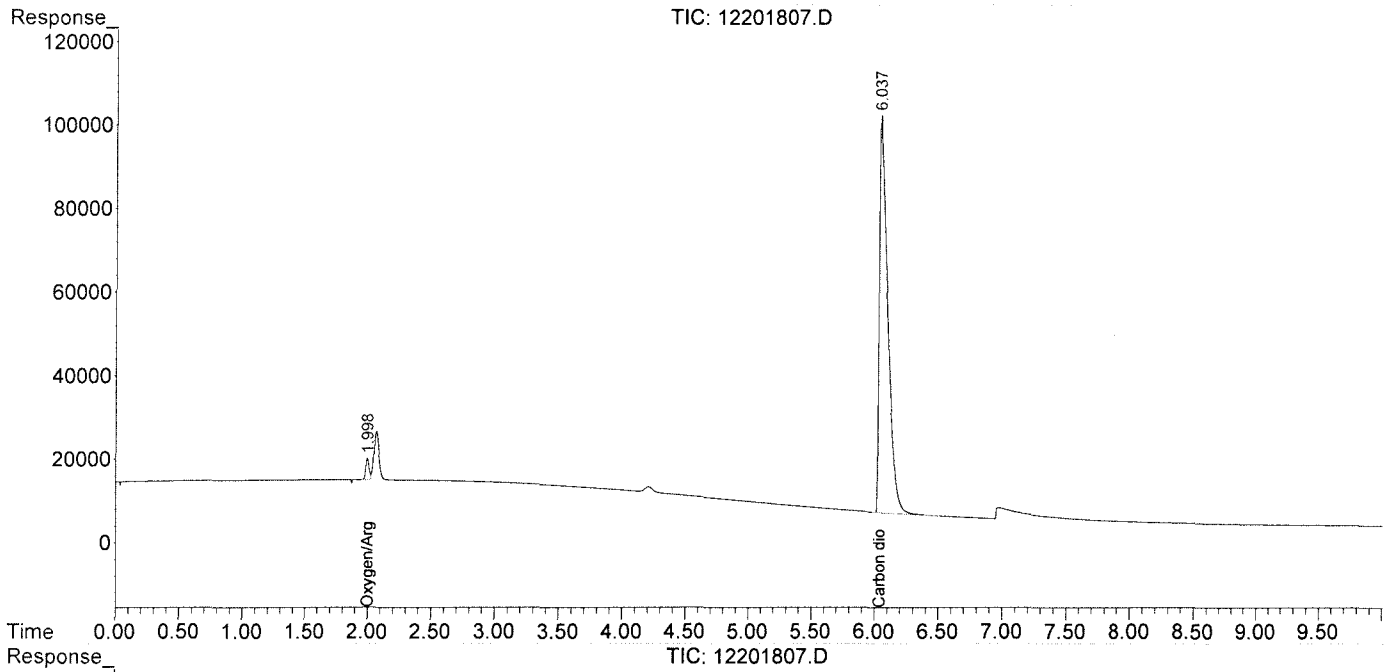
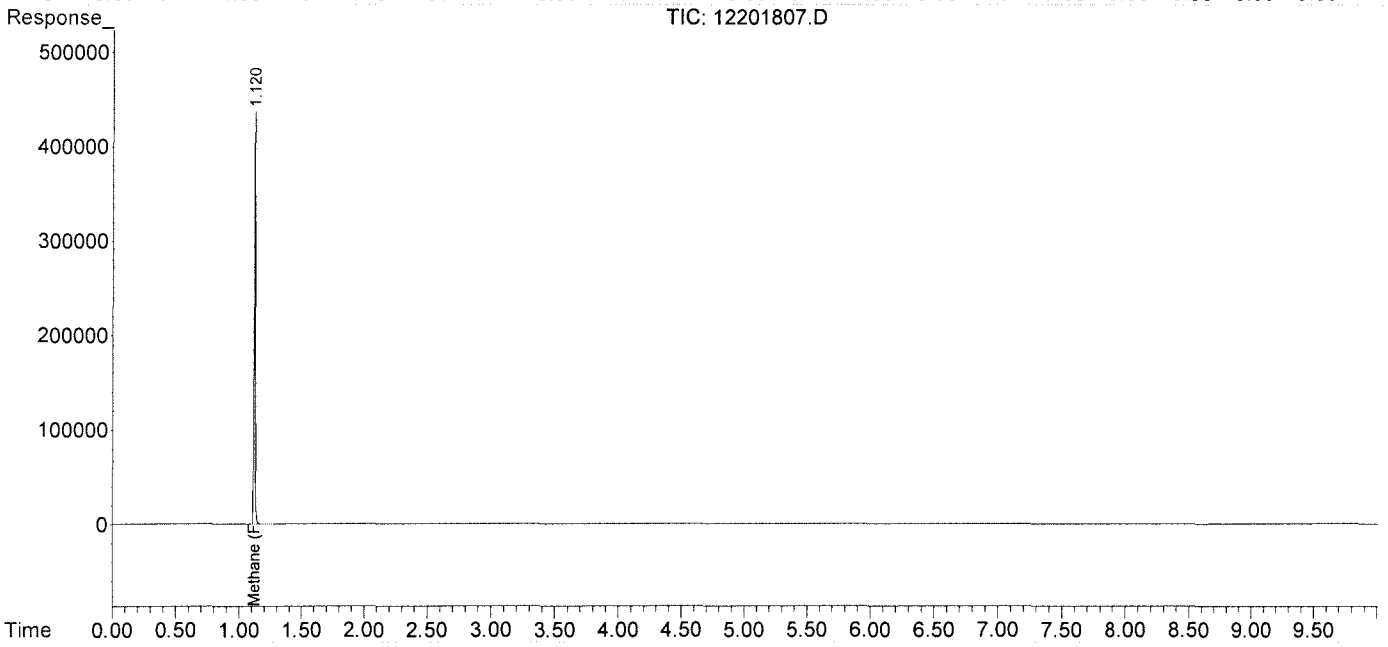
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201808.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 13:49:24
Operator : MR
Sample : P1806863-003 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 14:18:06 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.991f	197538	0.042	ppm
2)	Carbon monoxide	1.991f	197538	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	6.059	2234434	9519.199	ppm
6)	Methane (FID)	1.119	11574	1.225	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201808.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
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Operator : MR
Sample : P1806863-003 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
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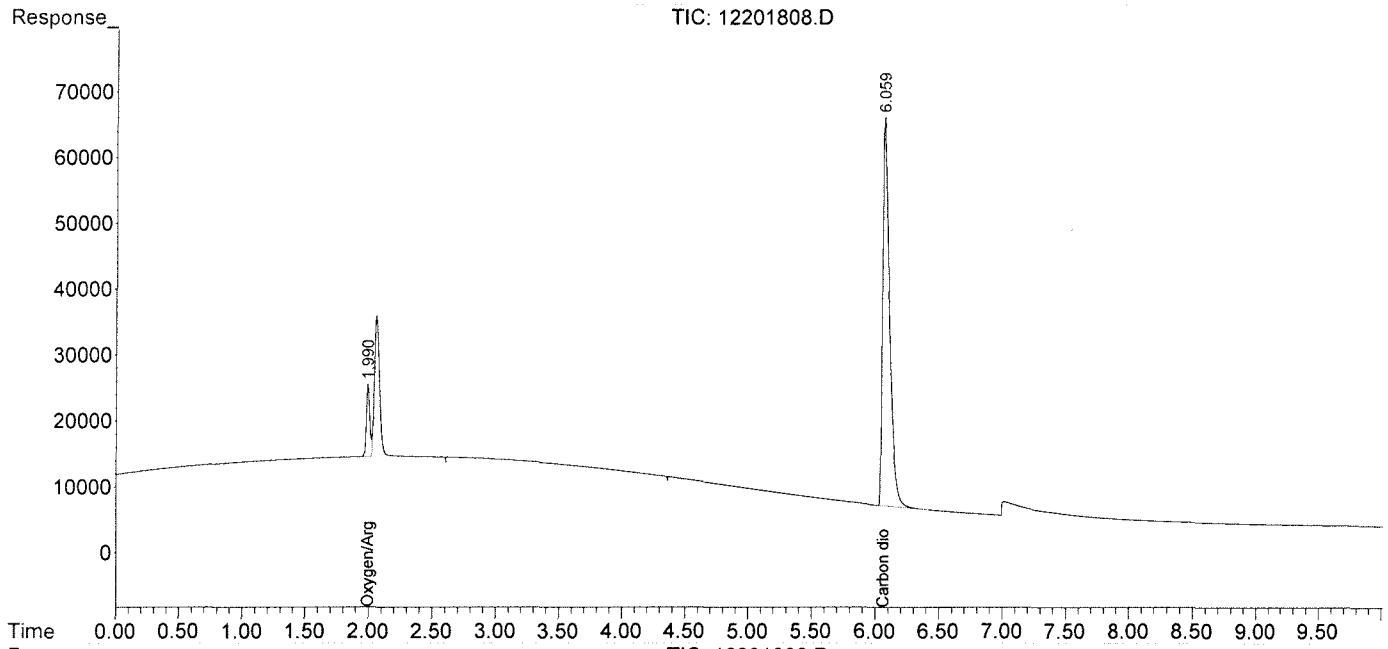
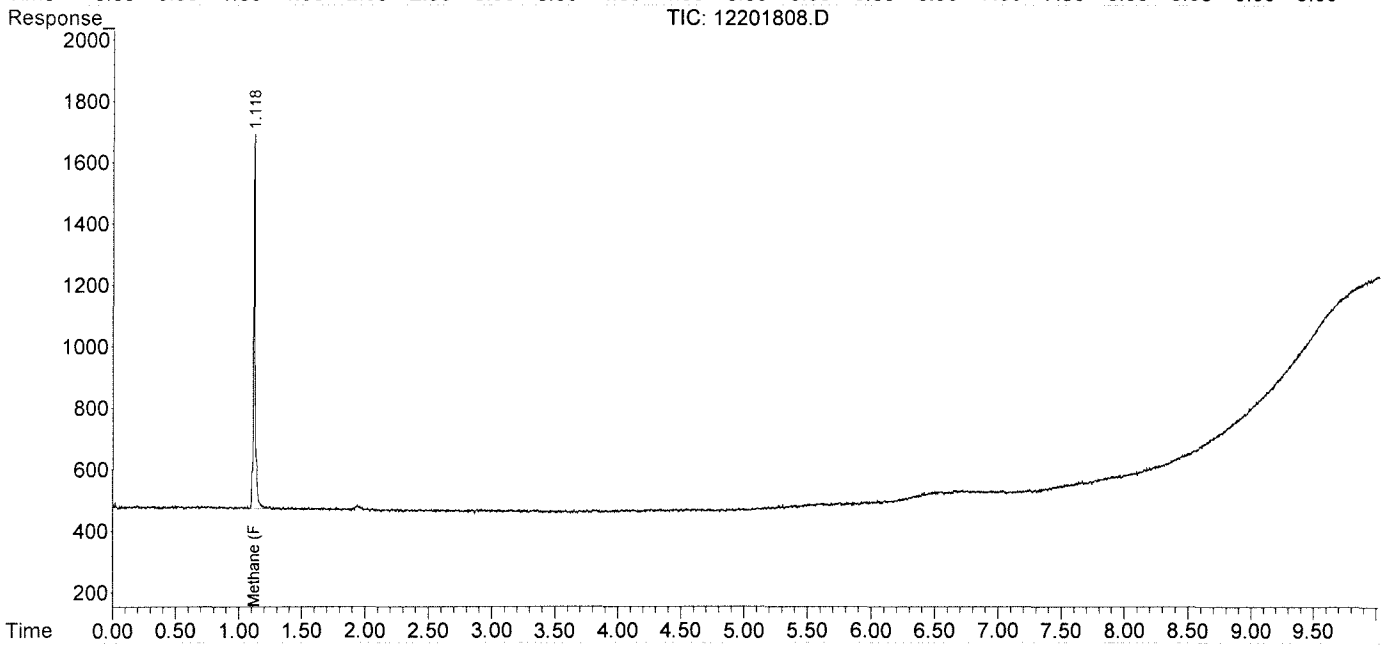
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 12:01:09
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 12:49:36 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.985f	524802	0.110	ppm
2)	Carbon monoxide	1.985f	524802	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	1505	0.159	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 12:01:09
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
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Quant Time: Dec 20 12:49:36 2018
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Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
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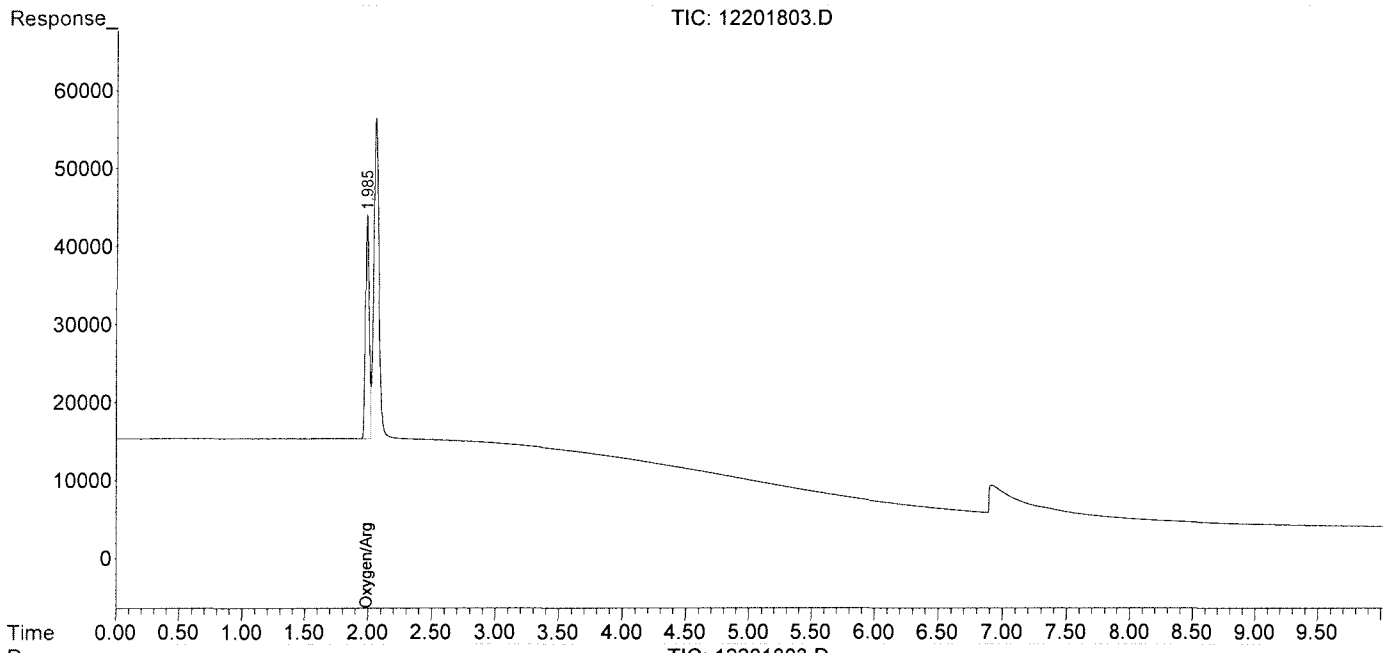

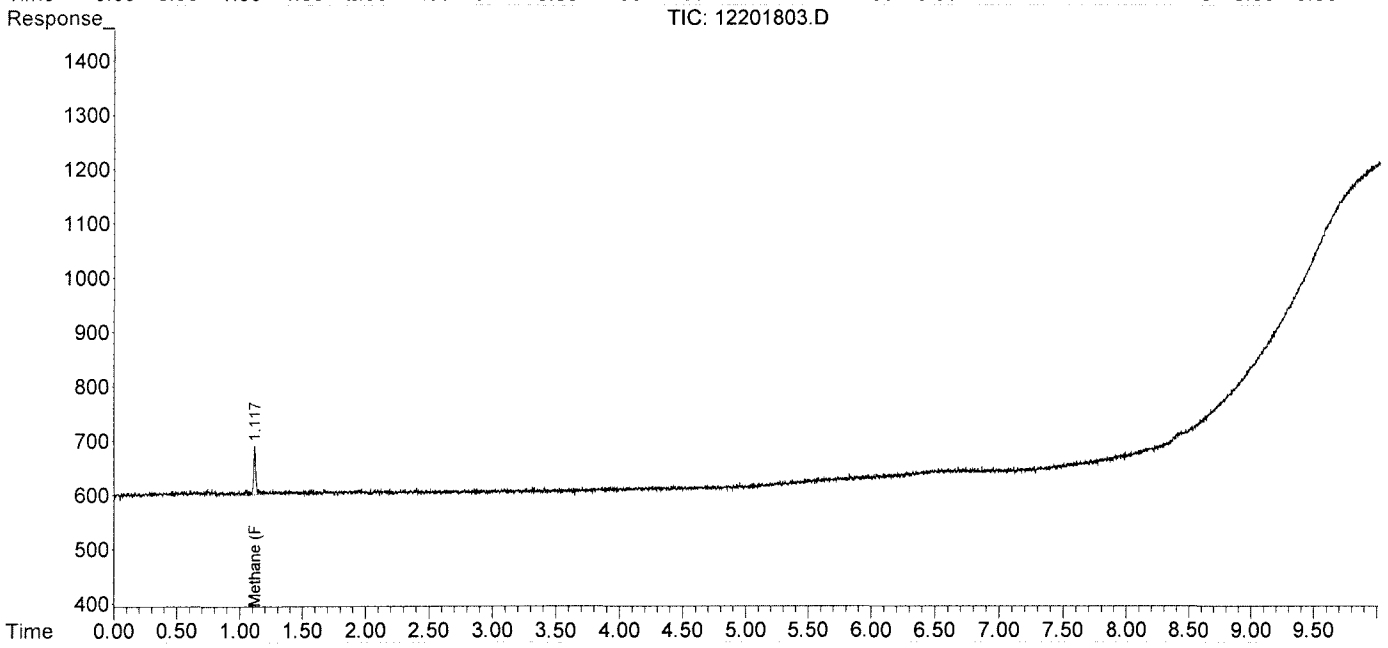

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201804.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 12:38:52
Operator : MR
Sample : tcd lcs s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:38:03 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.973f	1286380	0.270	ppm	
2)	Carbon monoxide	1.973f	1286380	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.109	201115	856.794	ppm	m
6)	Methane (FID)	1.116	30694128	3248.807	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201804.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 12:38:52
Operator : MR
Sample : tcd lcs s32-10081801
Misc :
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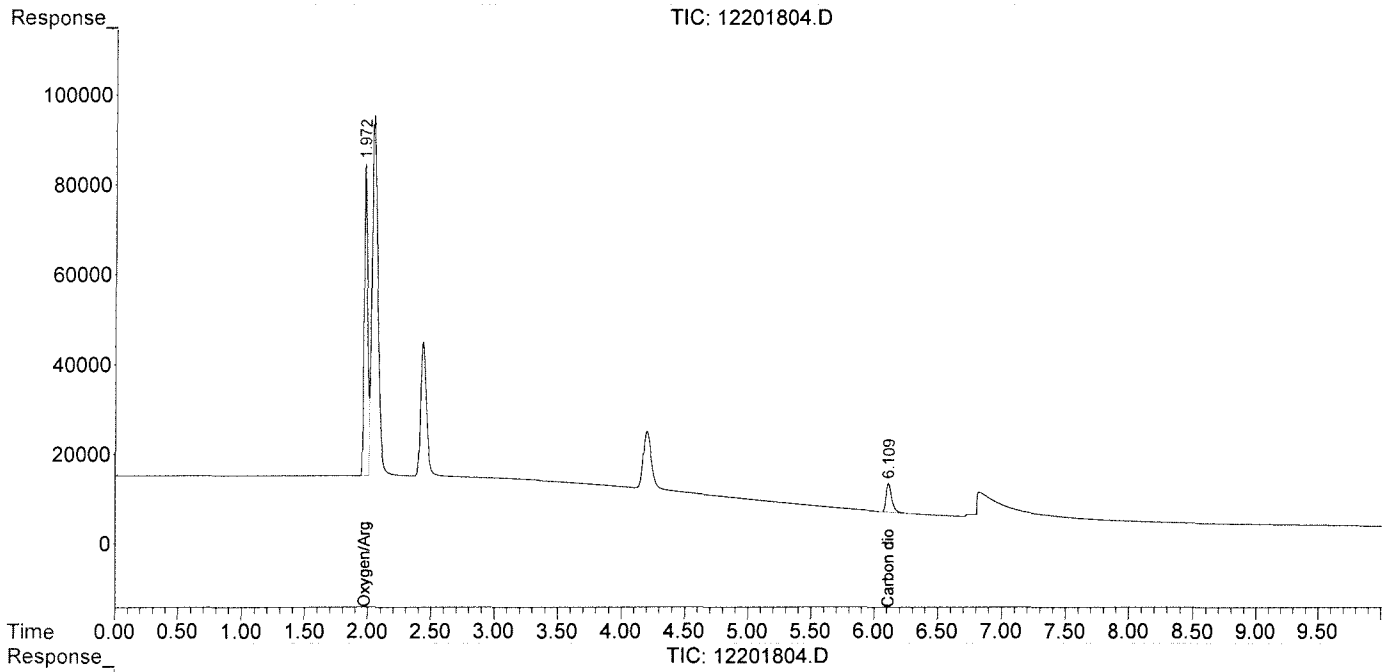
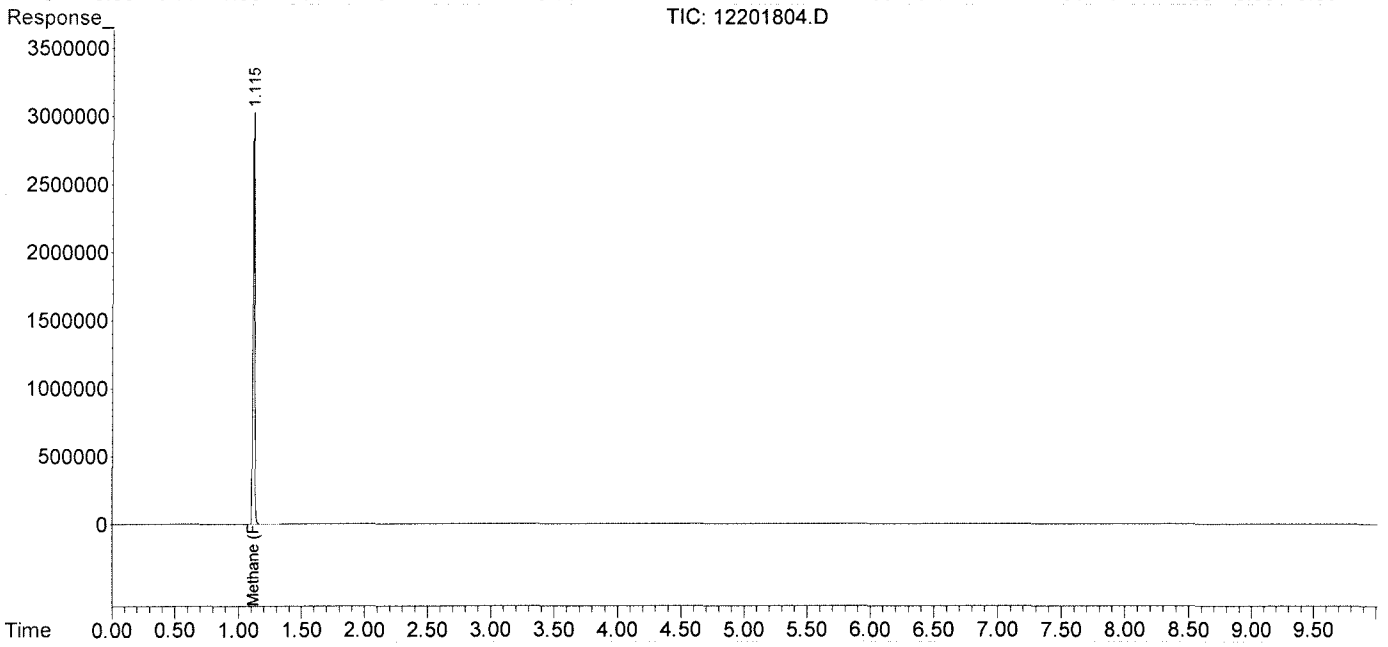
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201804.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 12:38:52
Operator : MR
Sample : tcd lcs s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
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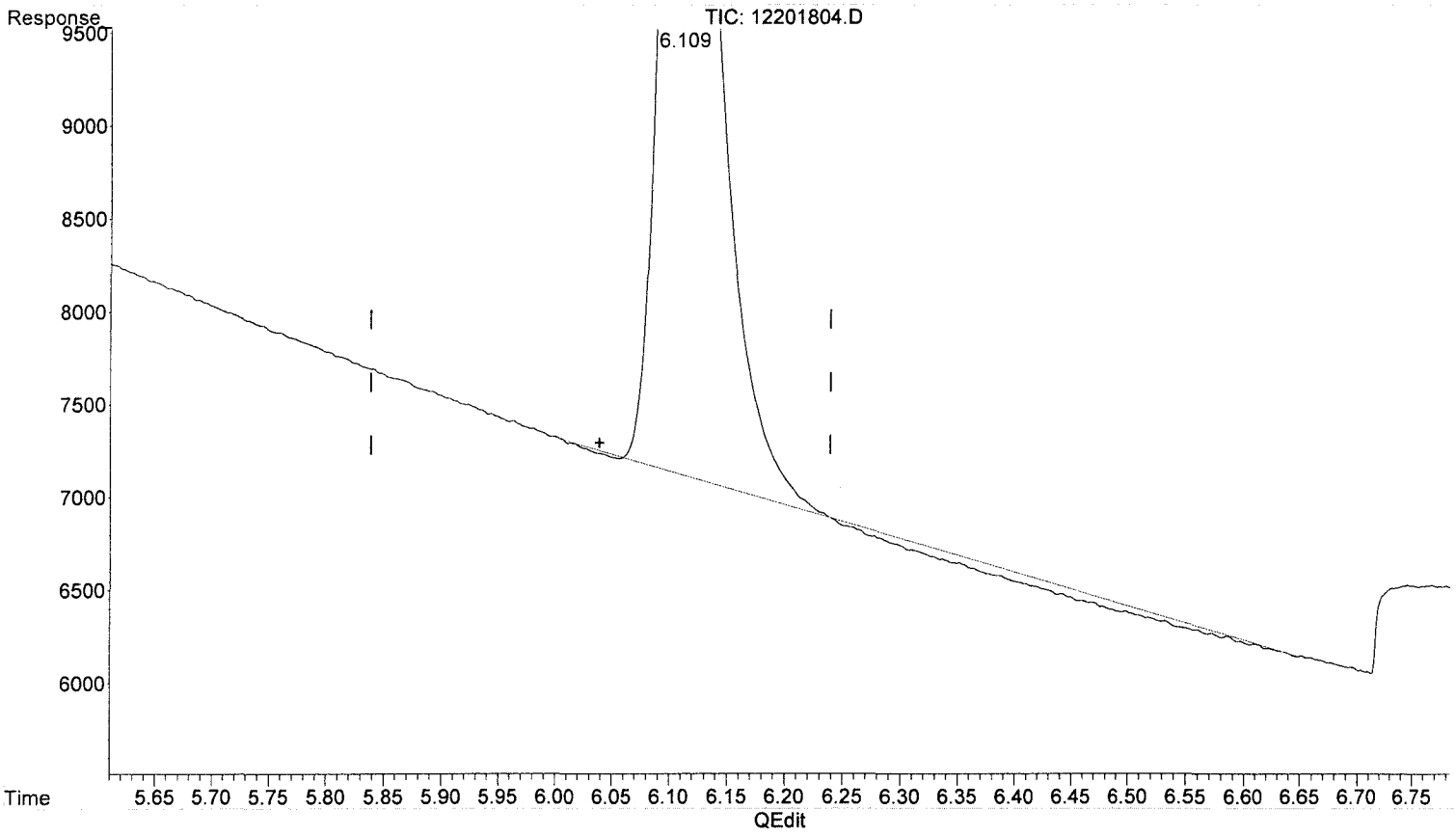
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.111min 803.961 ppm

response 188713

(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201804.D
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Acq On : 20-Dec-2018, 12:38:52
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Sample : tcd lcs s32-10081801
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Integration File signal 1: autoint1.e
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Volume Inj. :
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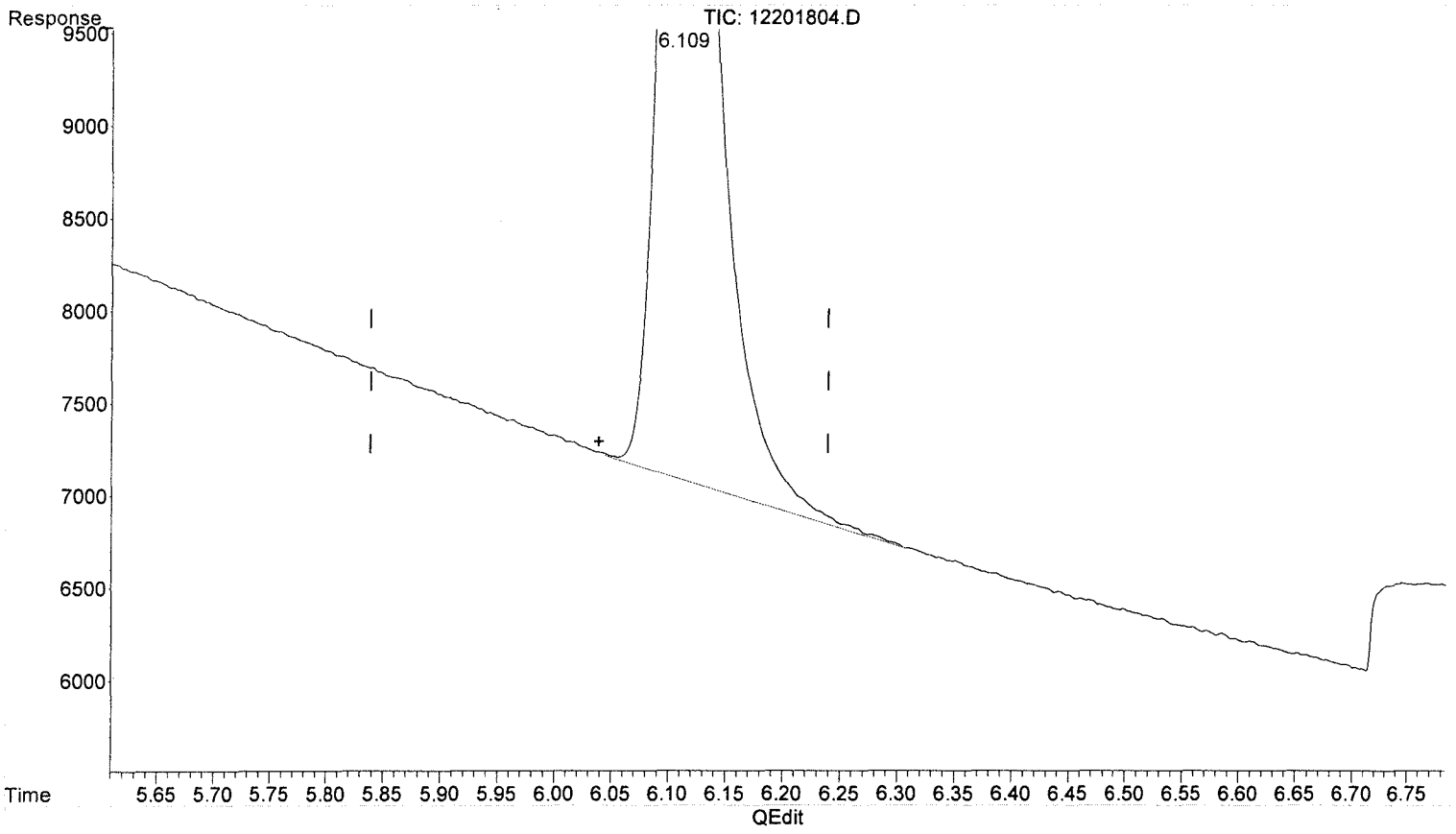
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.109min 856.794 ppm m

response 201115

MK 12/21/18 BLC

12/21/18

(+) = Expected Retention Time

RS082817_CO2.M Thu Dec 20 16:38:57 2018 Page 128 of 409 Page: 1

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201805.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 12:52:24
Operator : MR
Sample : tcd lcsd s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:39:22 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.950f	1418439	0.298	ppm	
2)	Carbon monoxide	1.950f	1418439	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.101	220359	938.778	ppm	m
6)	Methane (FID)	1.097	33961665	3594.658	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
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Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
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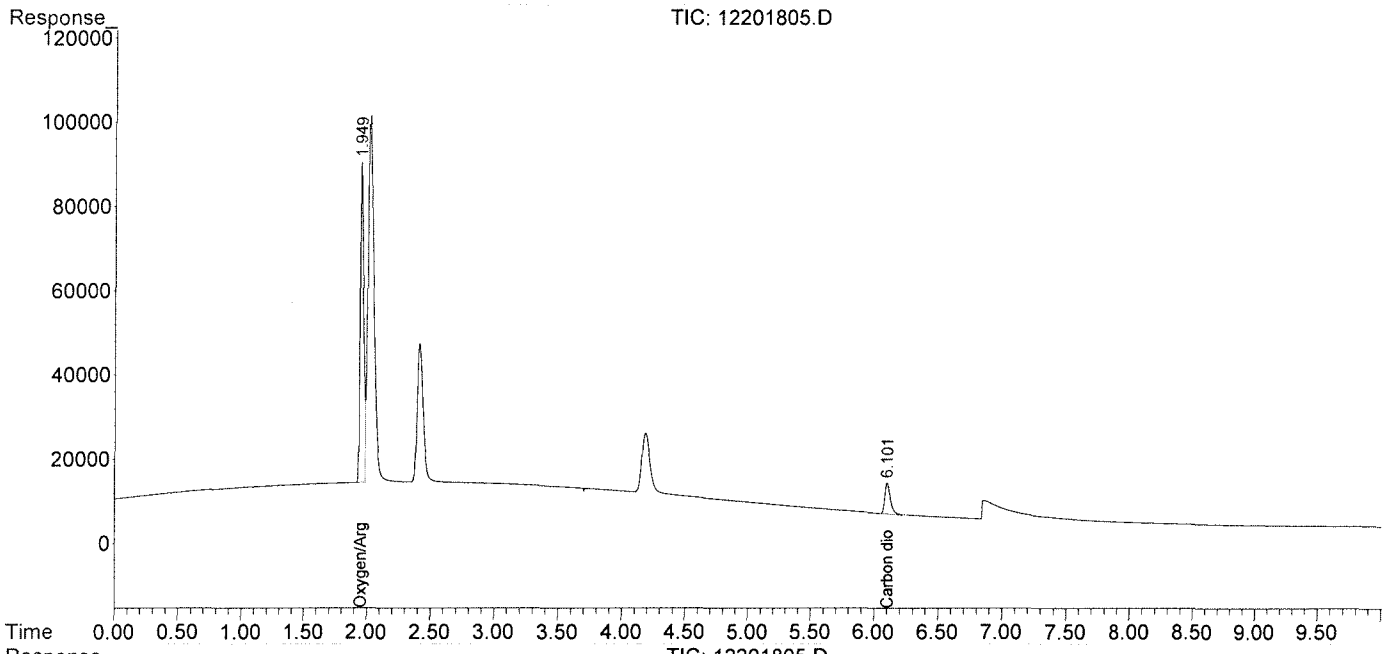

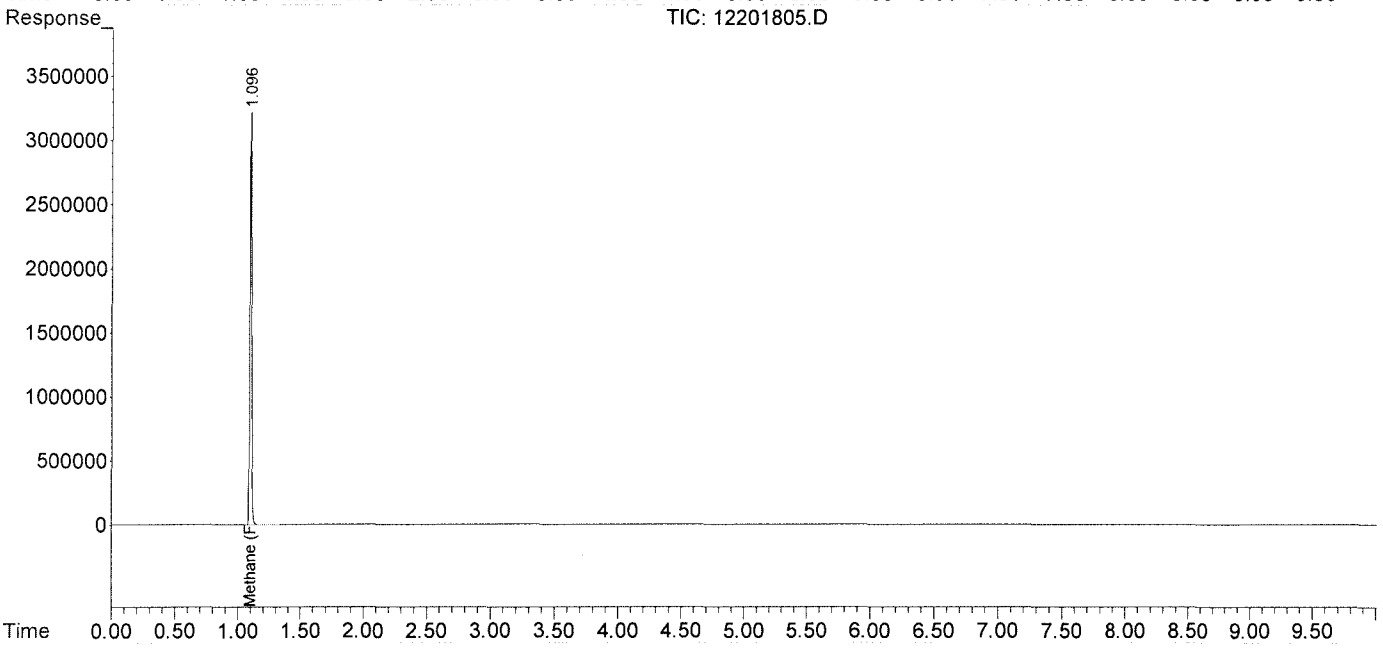

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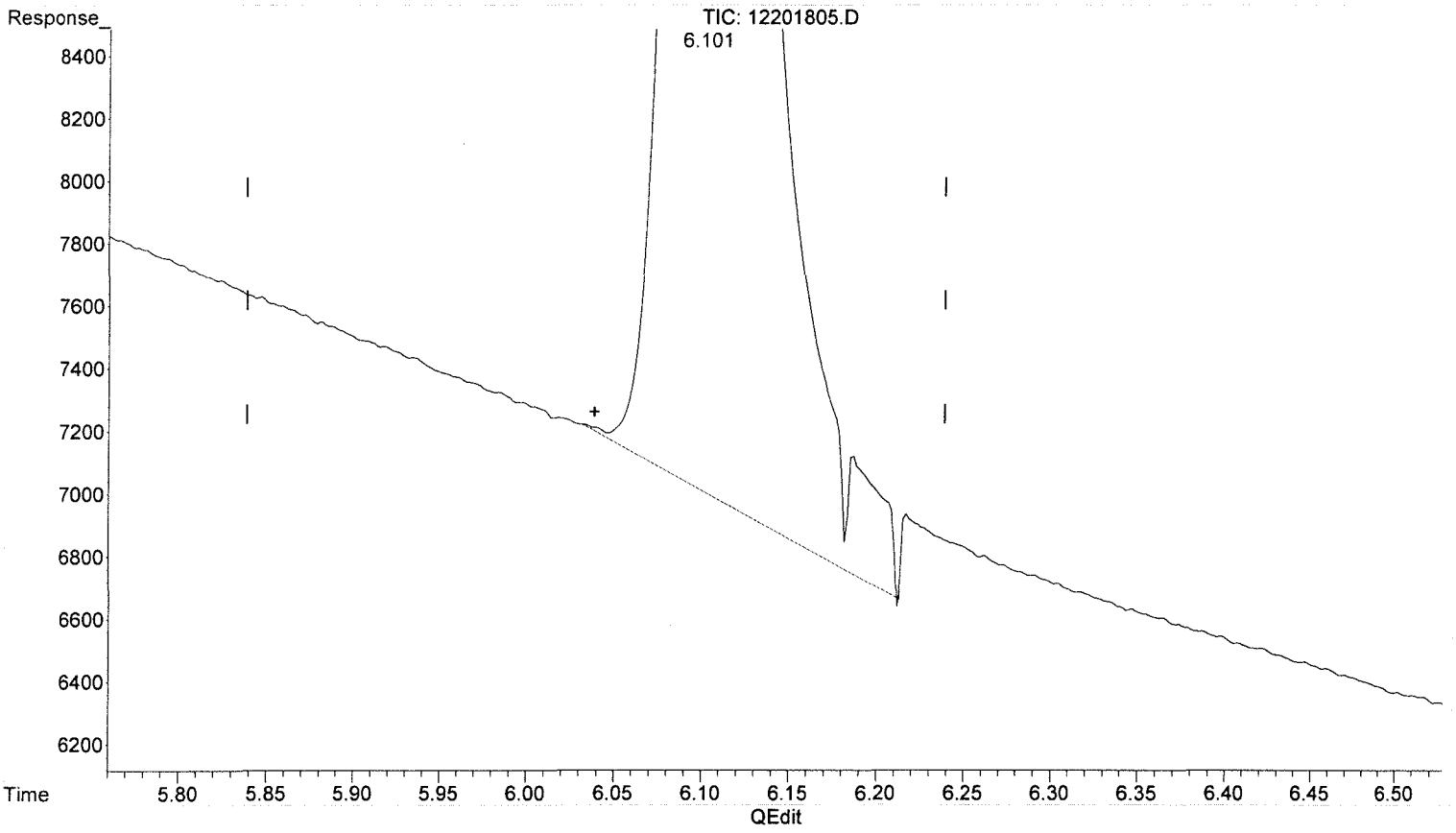
Acq On : 20-Dec-2018, 12:52:24
Operator : MR
Sample : tcd lcsd s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:39:22 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.102min 989.017 ppm

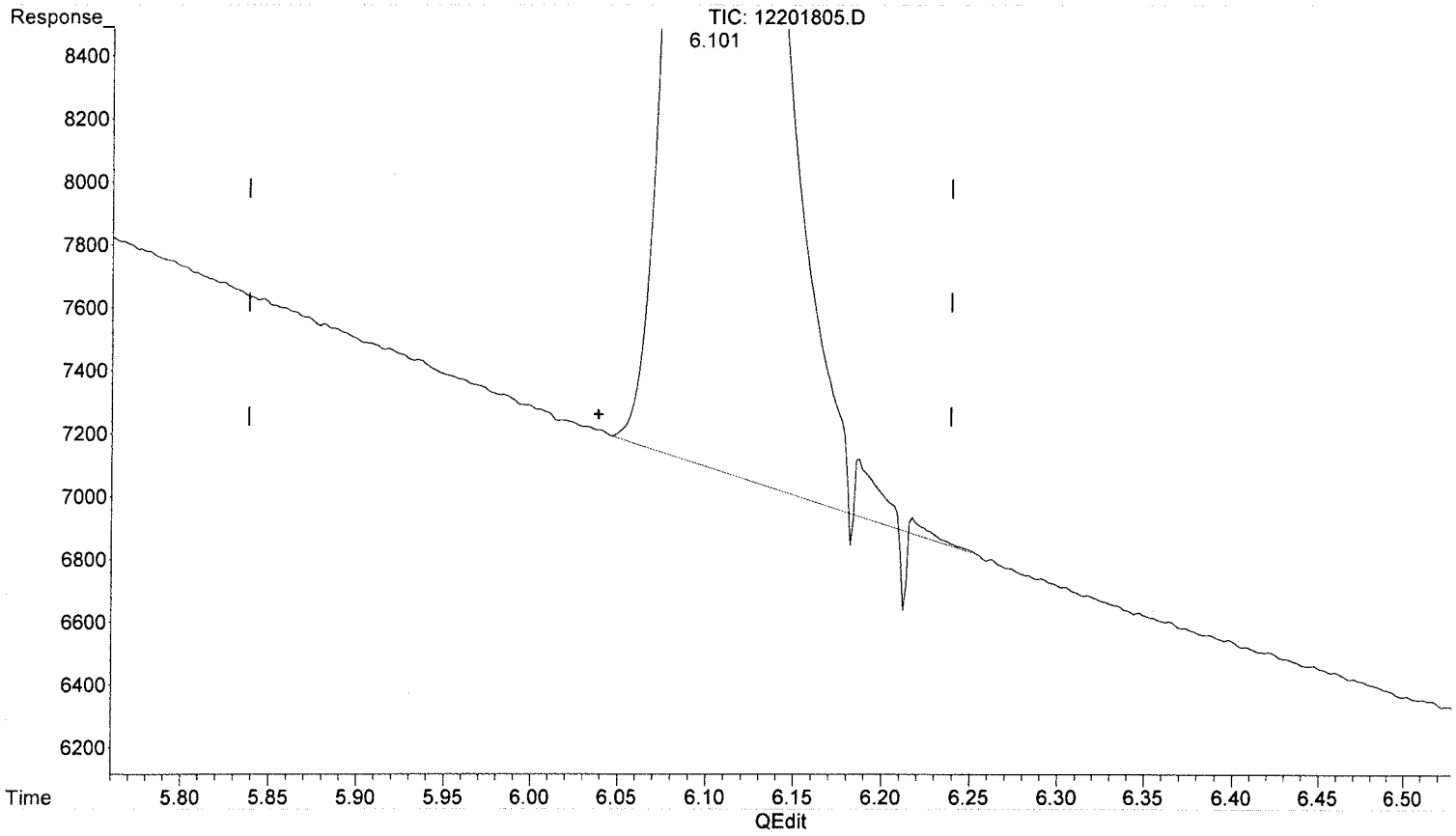
response 232151

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201805.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 12:52:24
Operator : MR
Sample : tcd lcsd s32-10081801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:39:22 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.101min 938.778 ppm m

response 220359

MK 12/21/18
BLC

12/21/18

(+) = Expected Retention Time

RS082817_CO2.M Thu Dec 20 16:39:44 2018 Page: 1

Response Factor Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	4.760						4.760	E6	0.00
2)	Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657	E6	170.12
3)	Methane (TCD)							9.457		0.00
4)	Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347	E2	7.99

Signal #2 Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945	E4	15.85
7)	Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684	E4	7.30
8)	Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723	E4	5.40
9)	Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449	E4	7.32
10)	Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655	E4	7.75
11)	Isobutylene							0.000		-1.00
12)	Isobutane							0.000		-1.00
13)	n-Butane							0.000		-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

Compounds -- Compound #4 -- Carbon dioxide

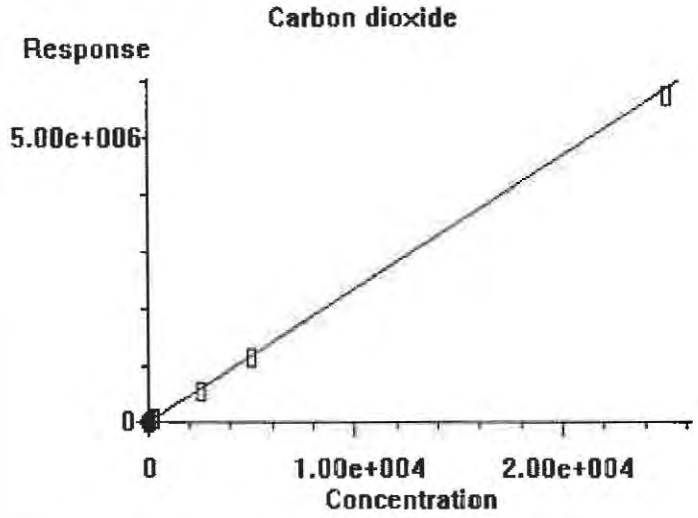
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	25.000000	6793.665186
2	100.000000	21932.418000
3	250.000000	58460.642510
4	2500.000000	568043.388750
5	5000.000000	1132363.215937
6	25000.000000	5744294.891563
7	25000.000000	
8	25000.000000	
9	2000.000000	
10	30000.000000	

Lvl ID	Concentration	Response



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.776	277465	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	6794	27.870	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

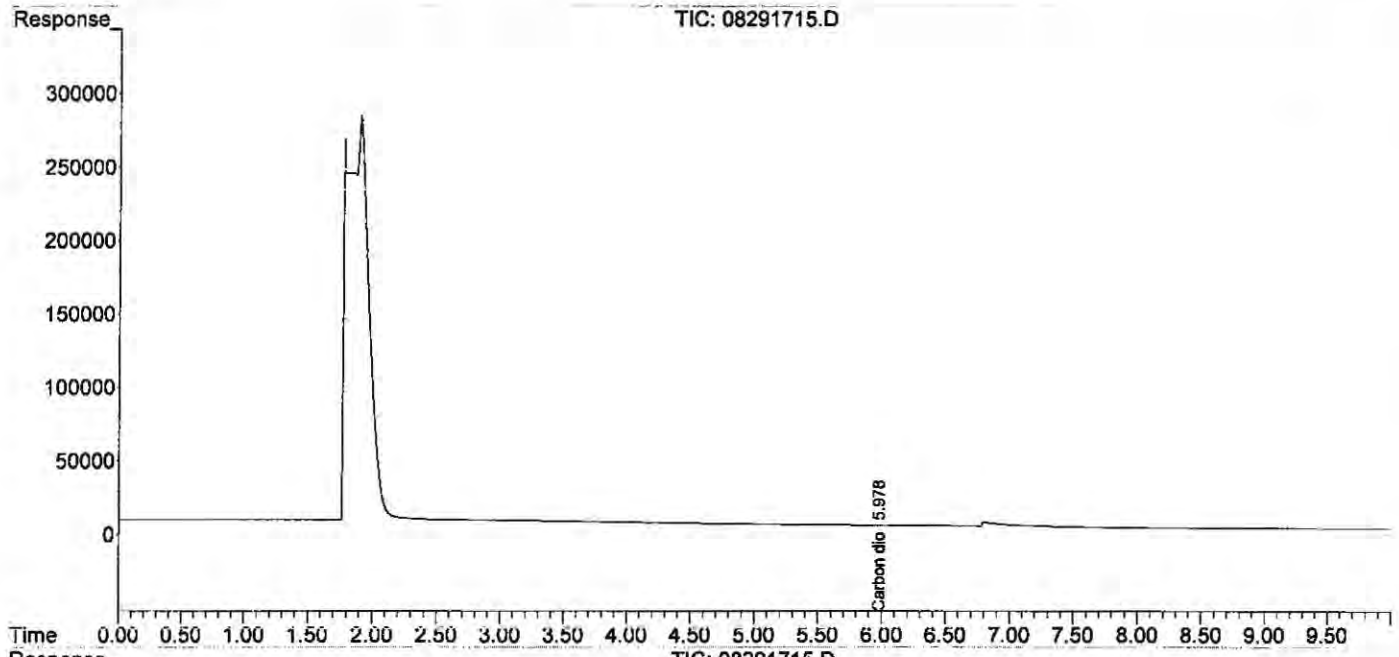
(f)=RT Delta > 1/2 Window (m)=manual int.

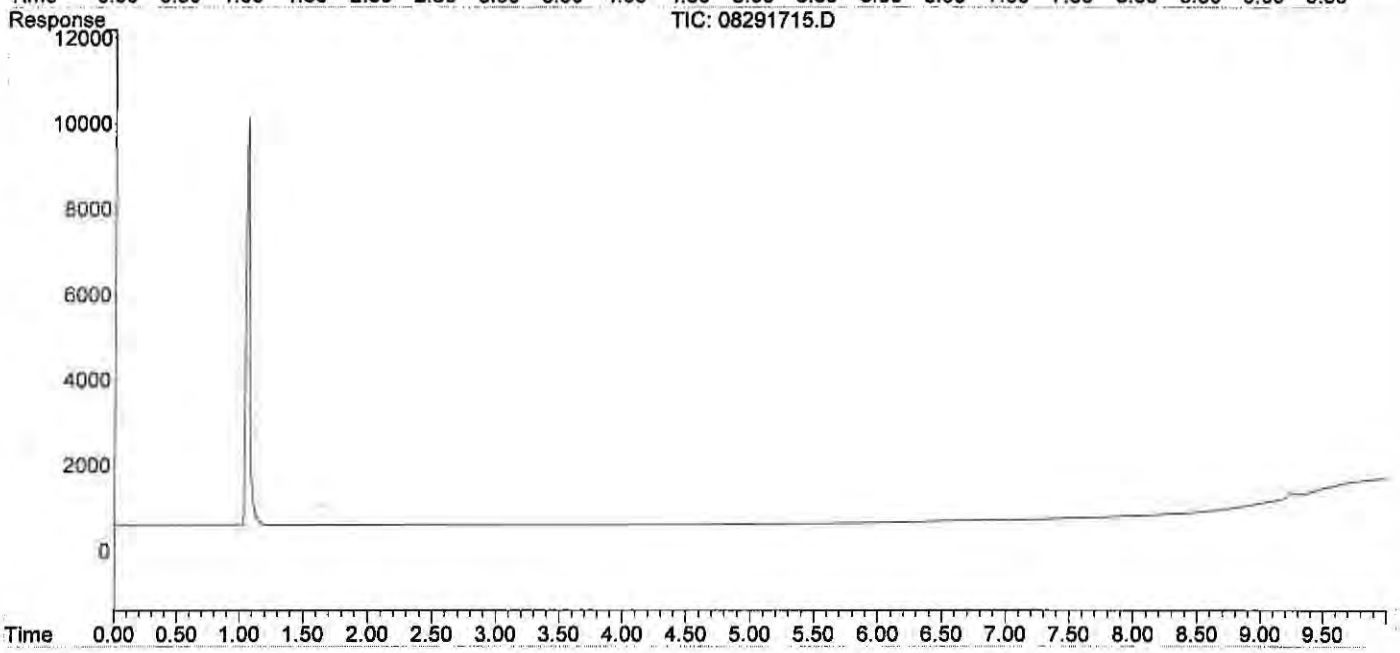
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



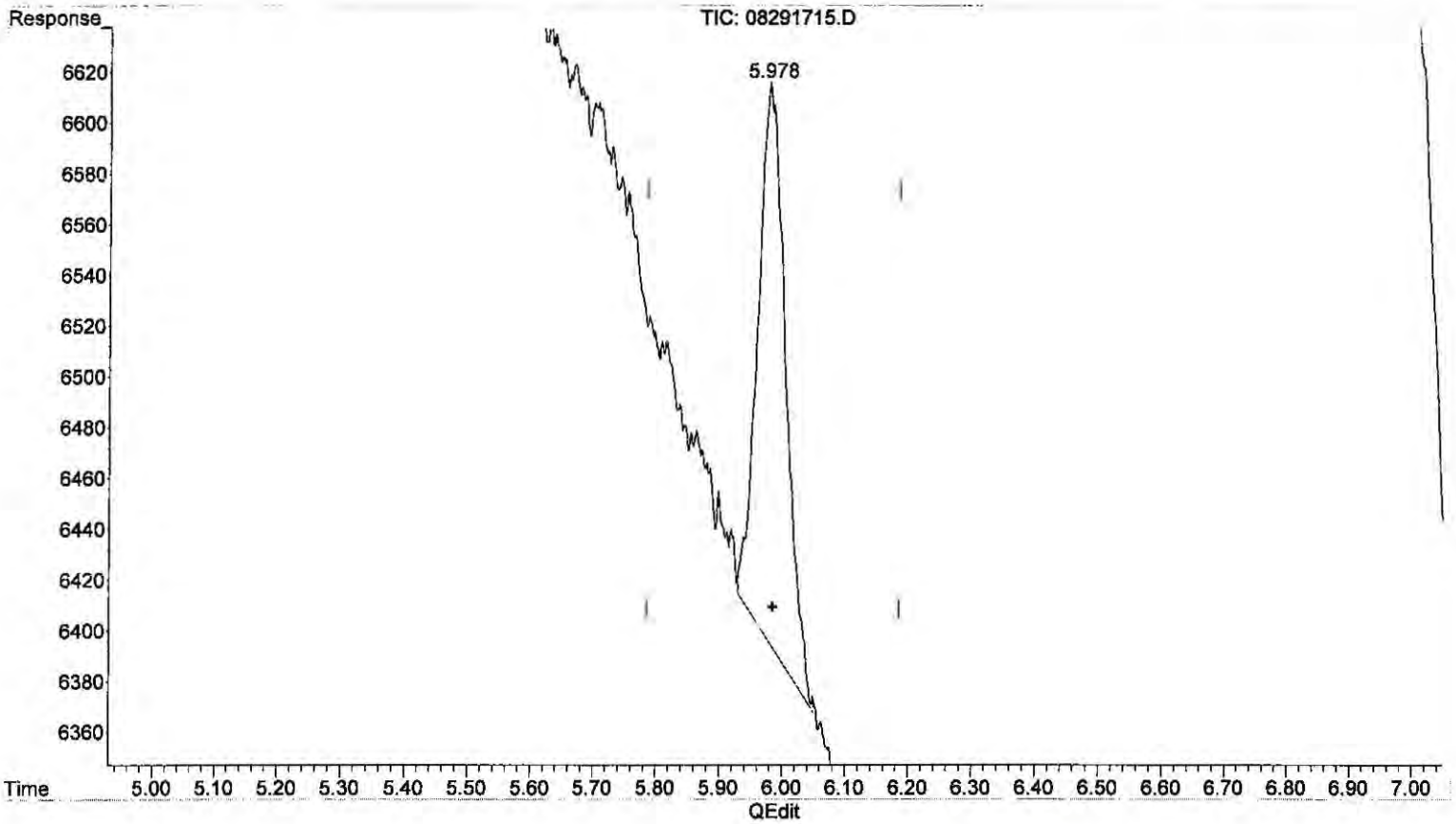


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.978min 27.870 ppm m

response 6794

8/30/17
BW
M.
prelim

8/4/17

(+) = Expected Retention Time

RS082817_CO2.M Wed Aug 30 13:17:47 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.790	-598962	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	21932	87.858	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

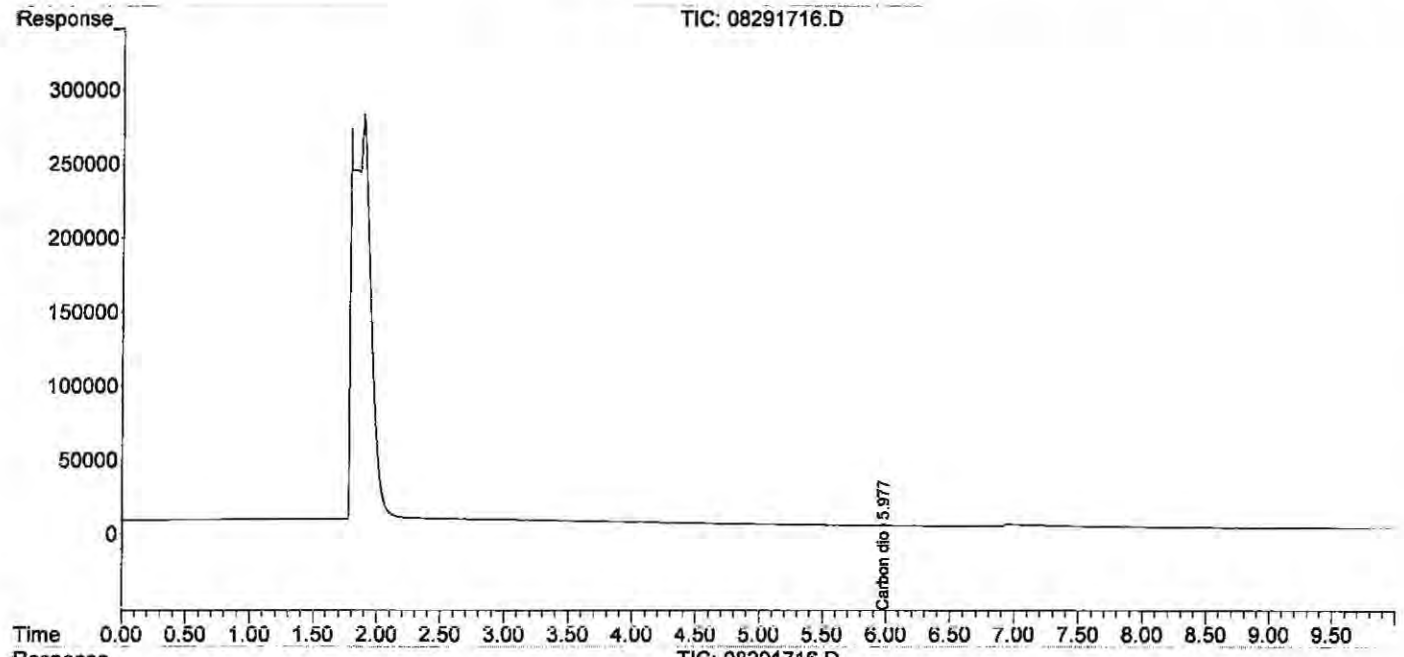
(f)=RT Delta > 1/2 Window (m)=manual int.

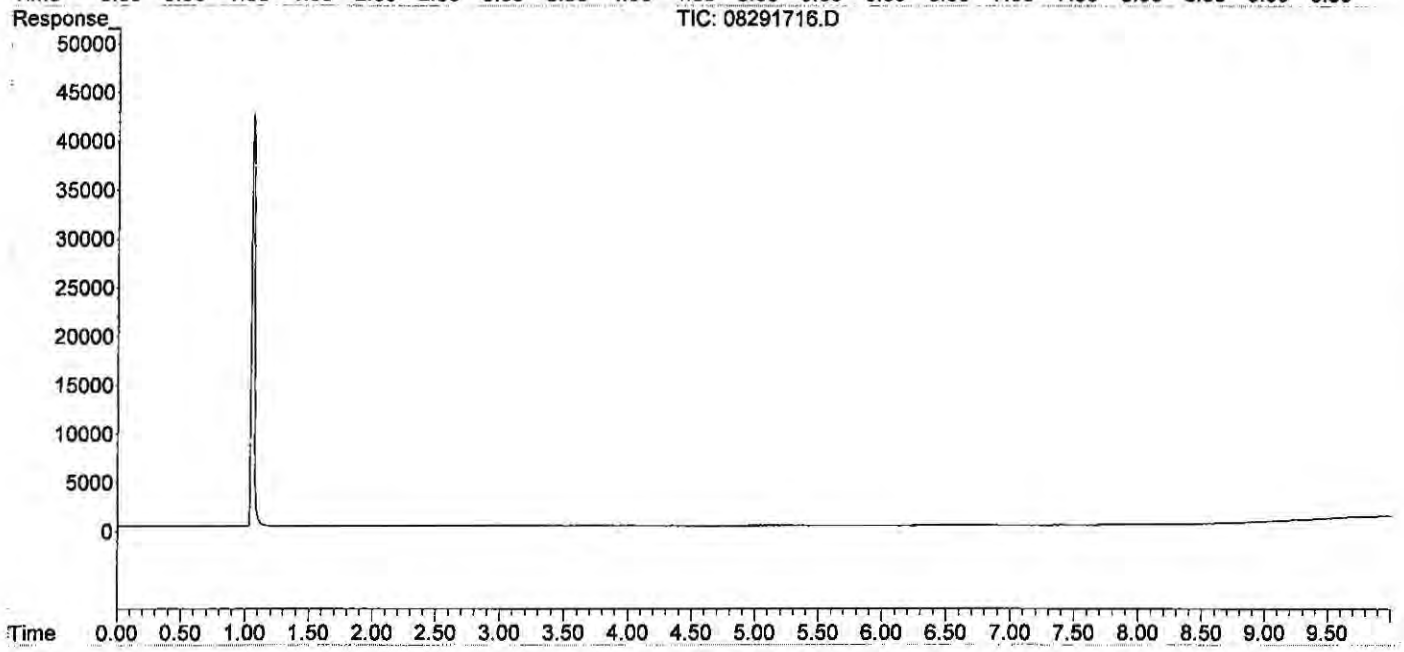
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.920f	-30716454	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.970	58461	240.204	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

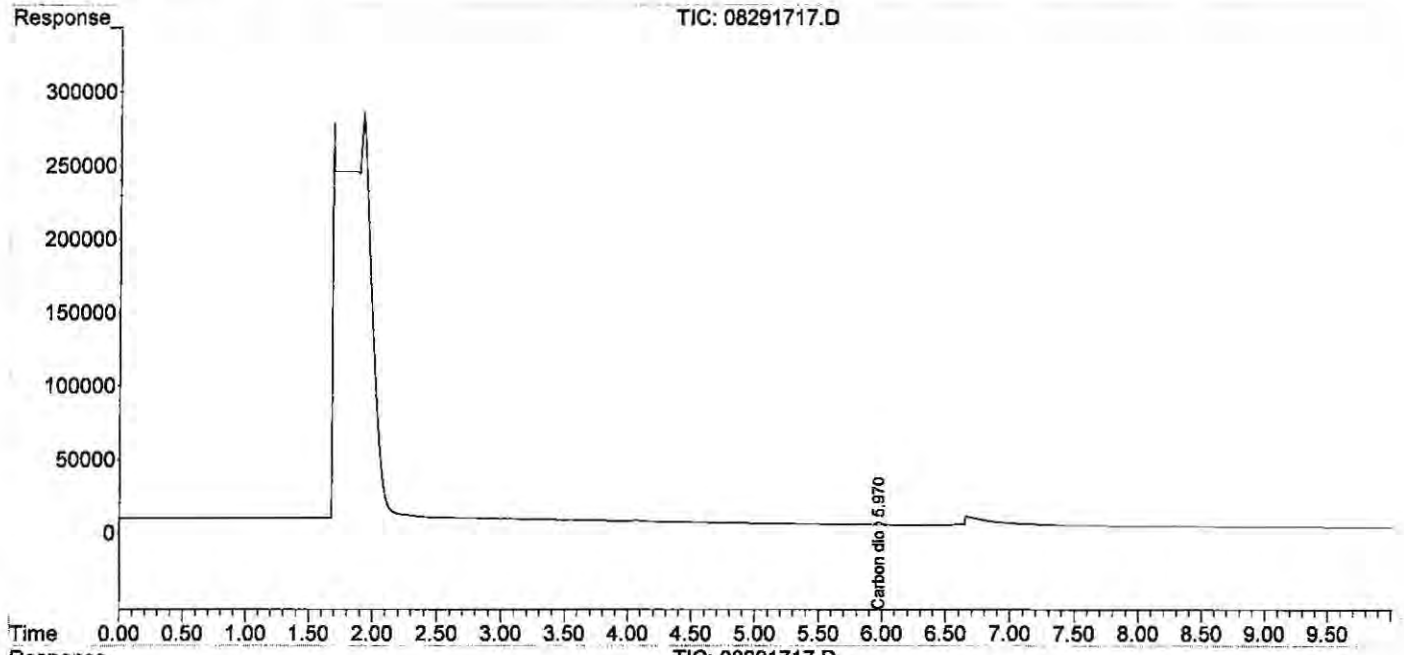
(f)=RT Delta > 1/2 Window (m)=manual int.

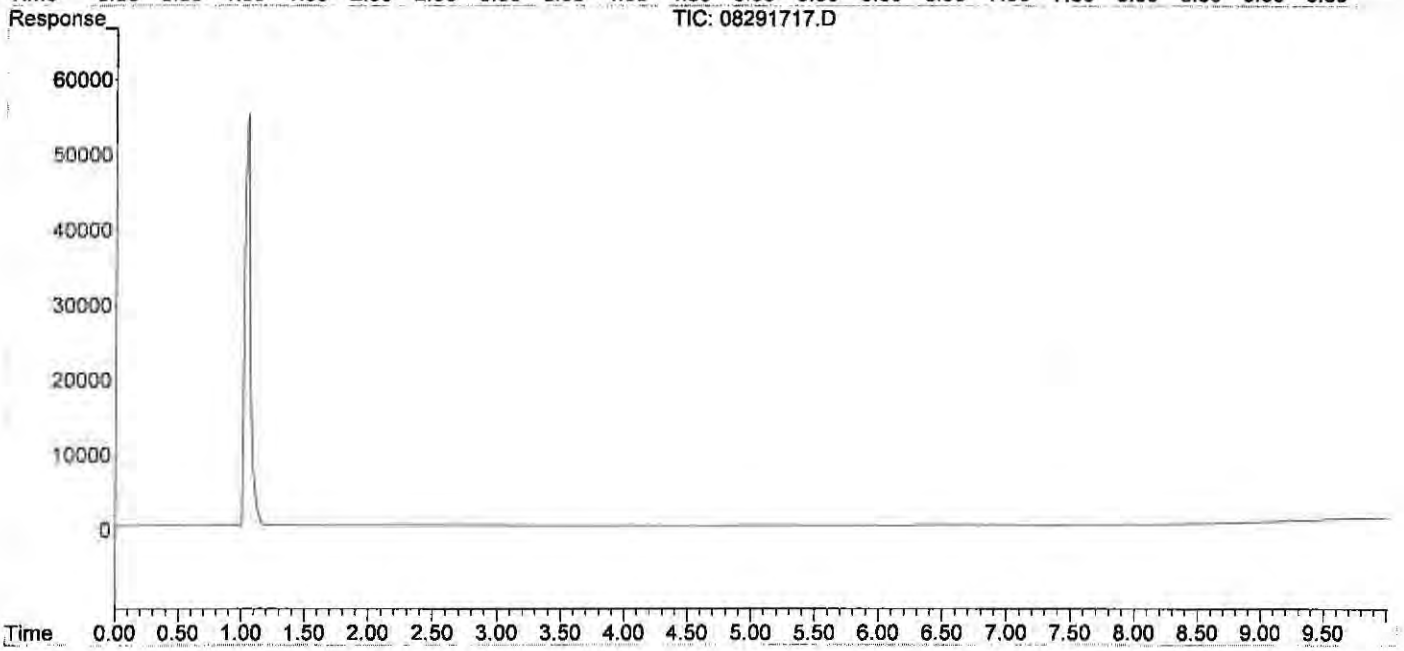
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



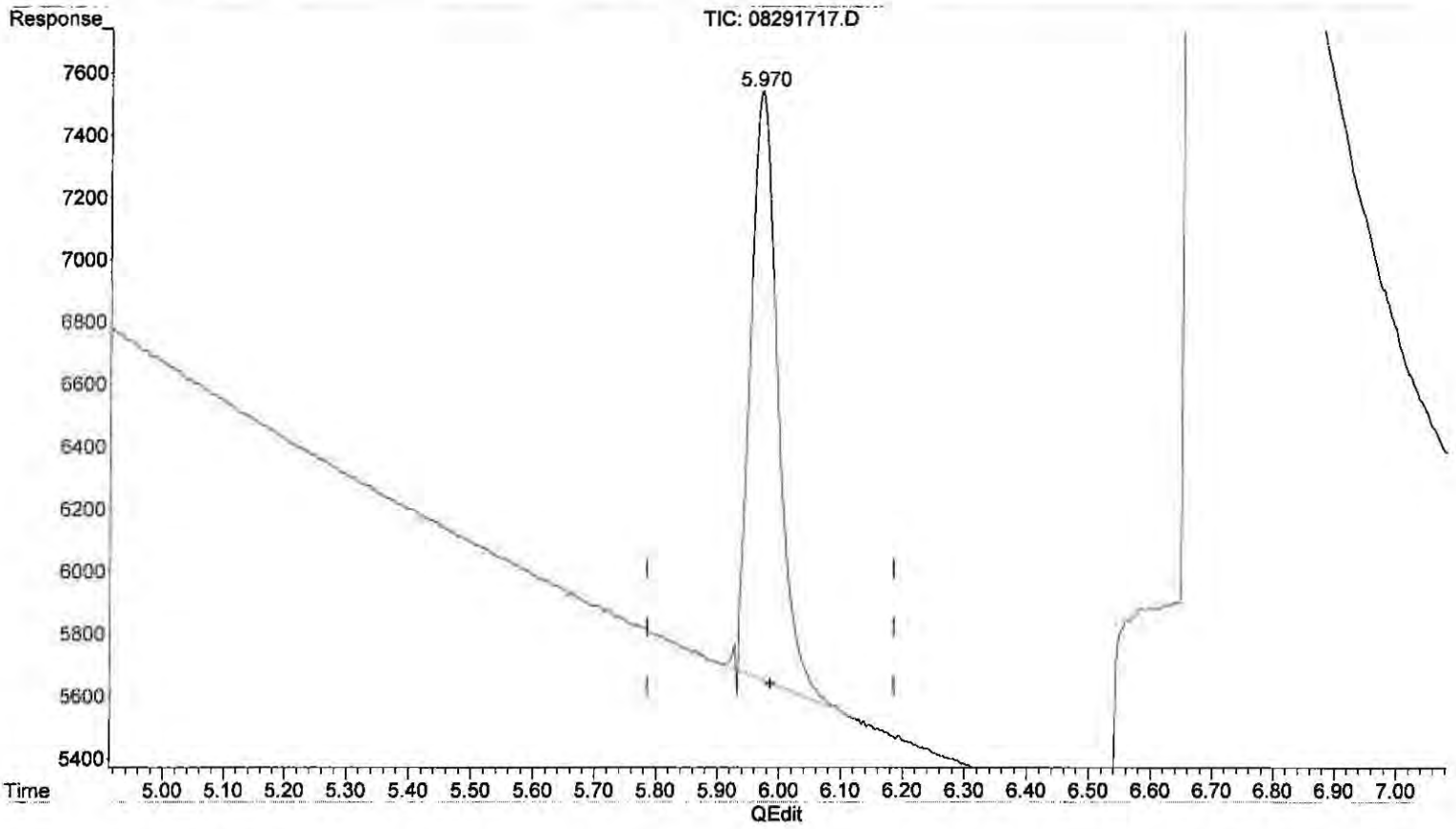


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.970min 240.204 ppm m

response 58461

(+) = Expected Retention Time

RS082817_CO2.M Wed Aug 30 13:19:20 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

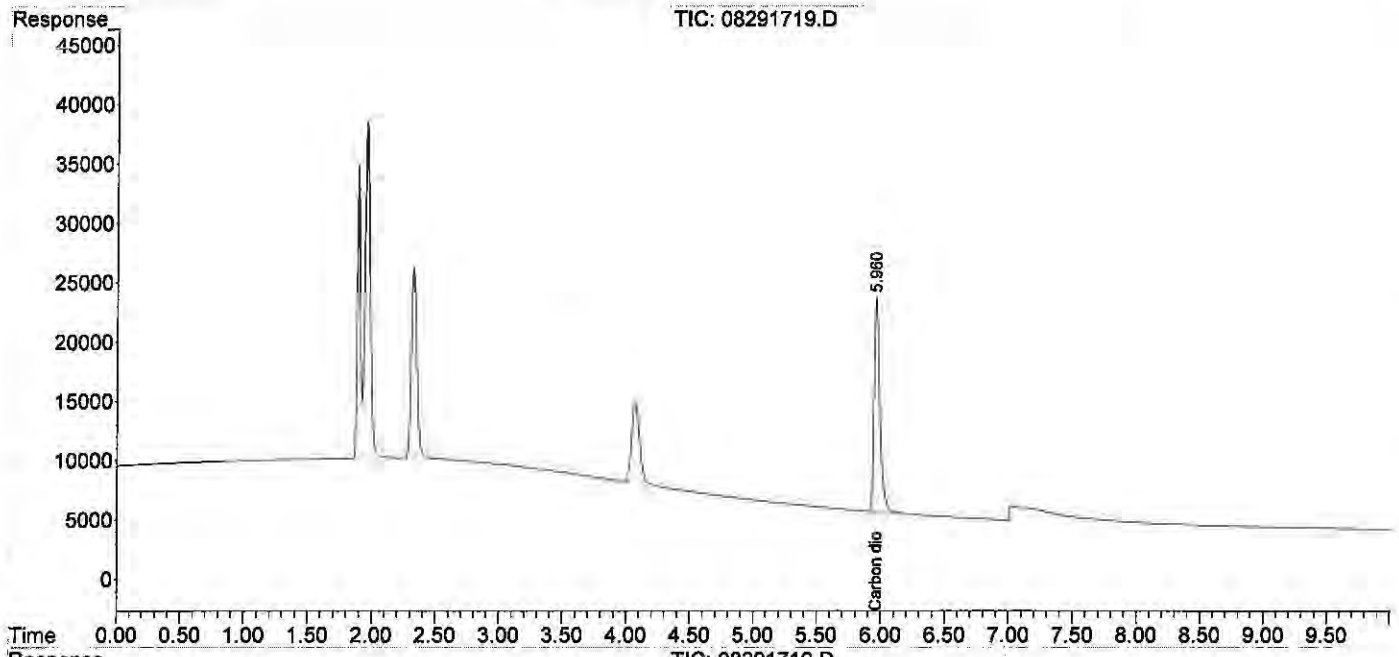
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.891	425113	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.962	568043	2369.673	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

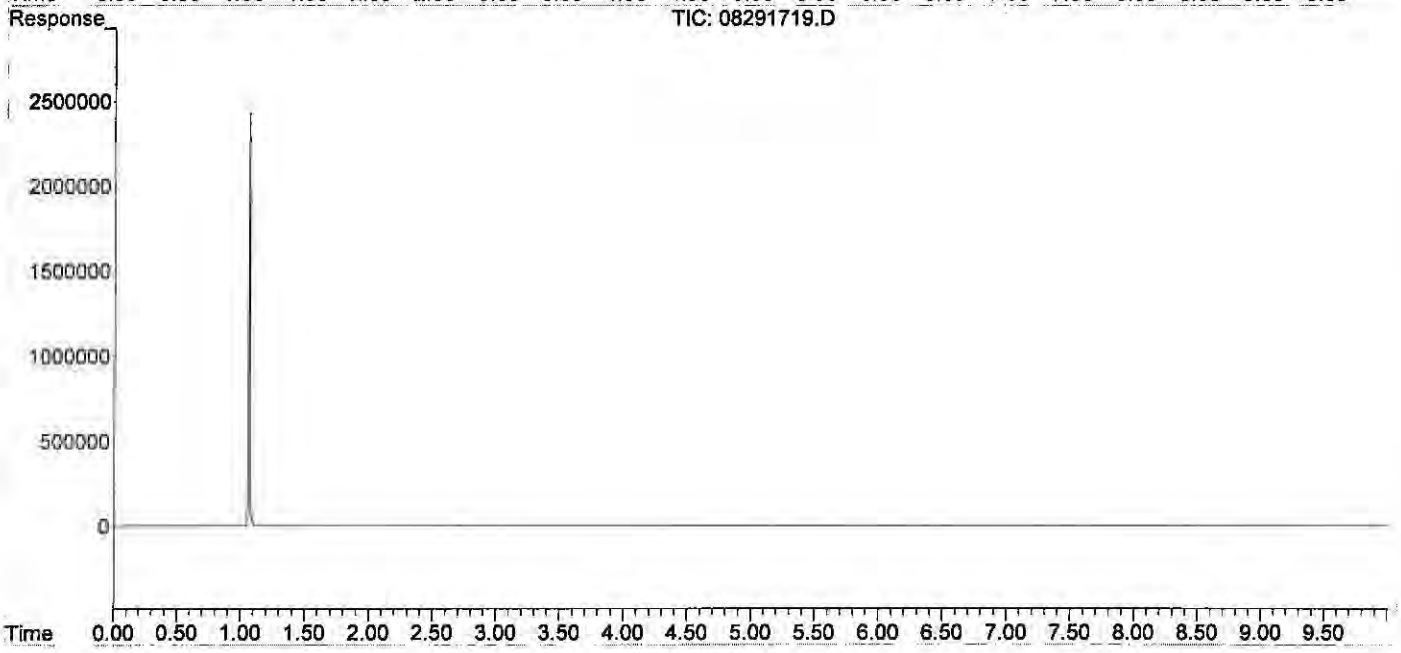
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.880	819221	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.948	1132363	4753.126	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

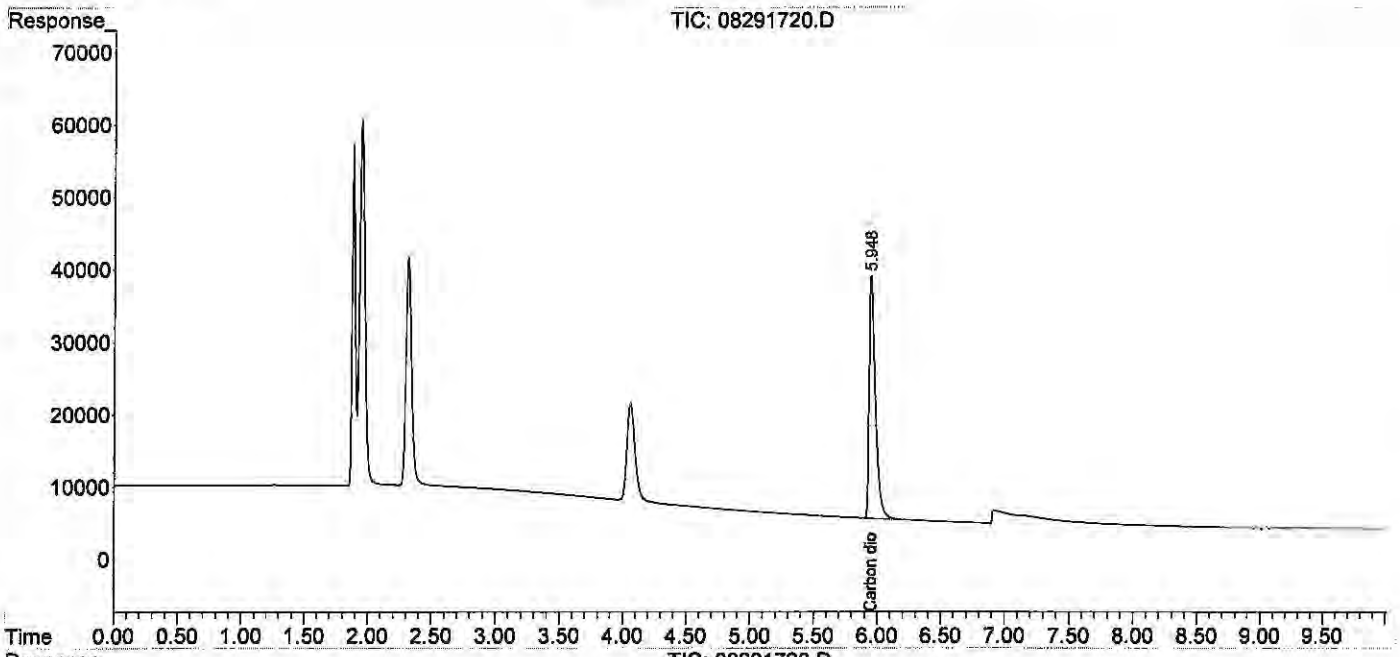
(f)=RT Delta > 1/2 Window (m)=manual int.

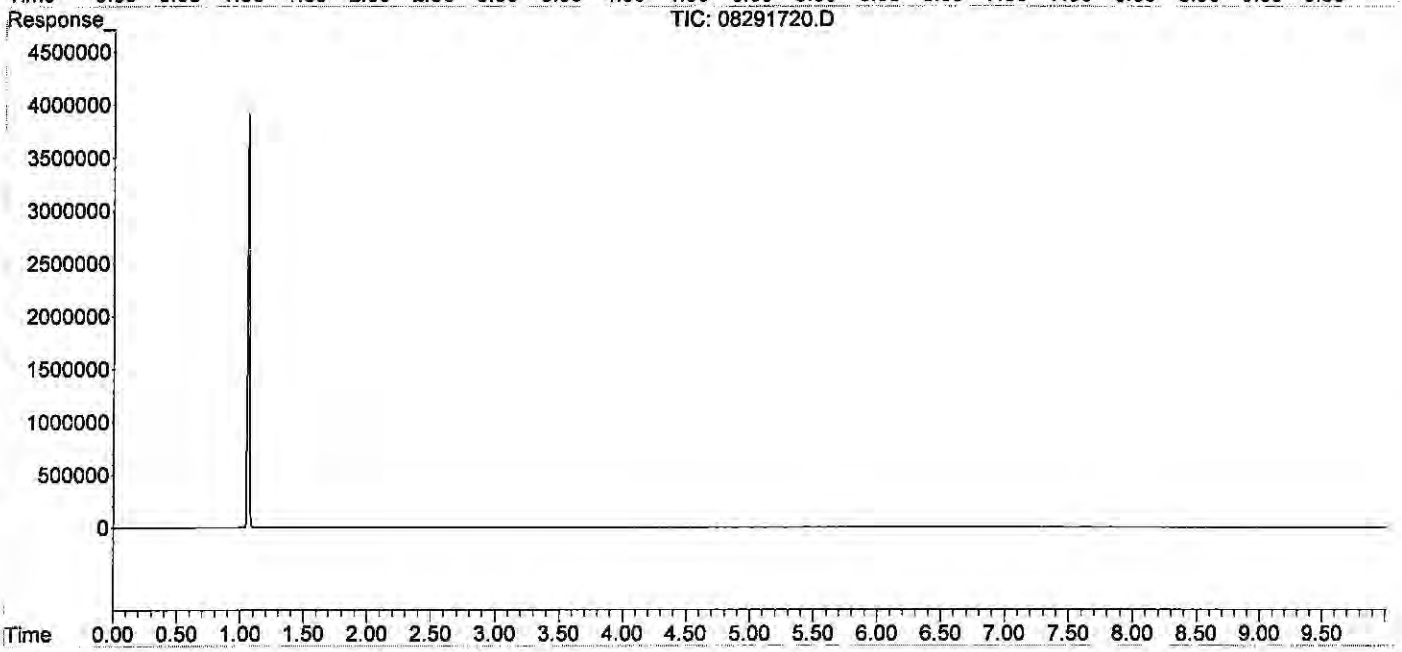
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.827	3325463	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.879f	5744295	24443.288	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

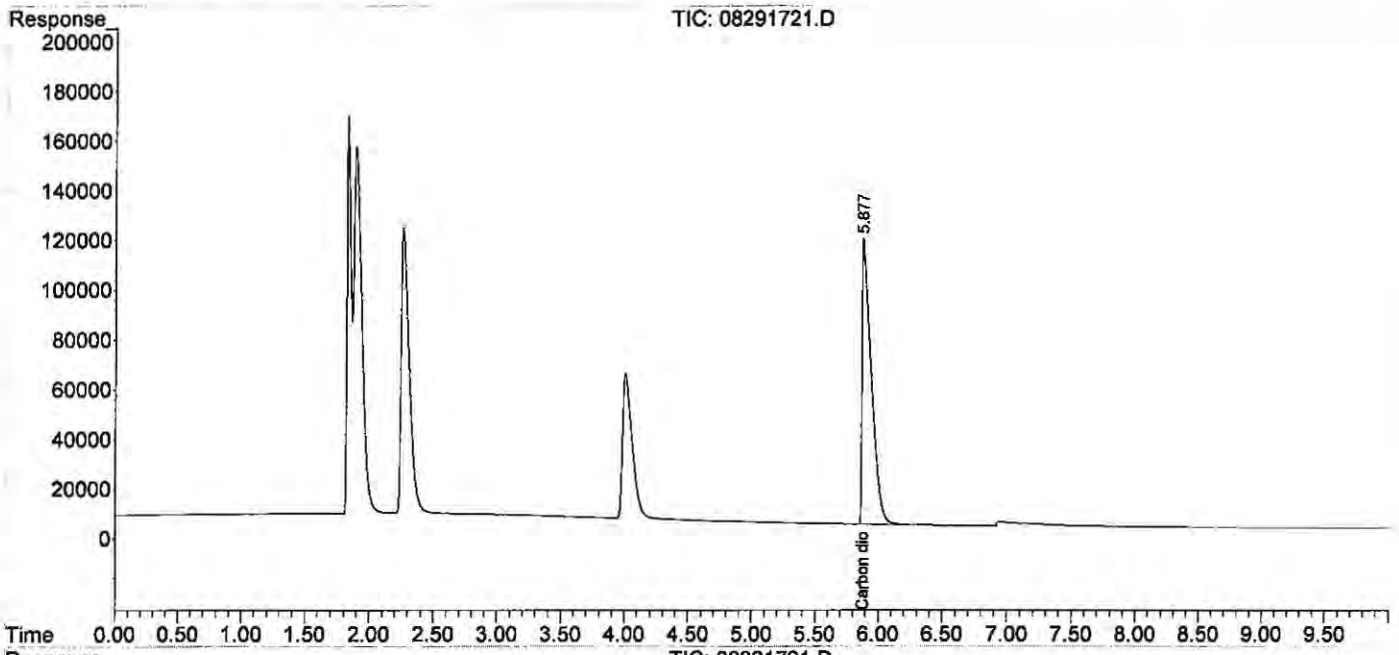
(f)=RT Delta > 1/2 Window (m)=manual int.

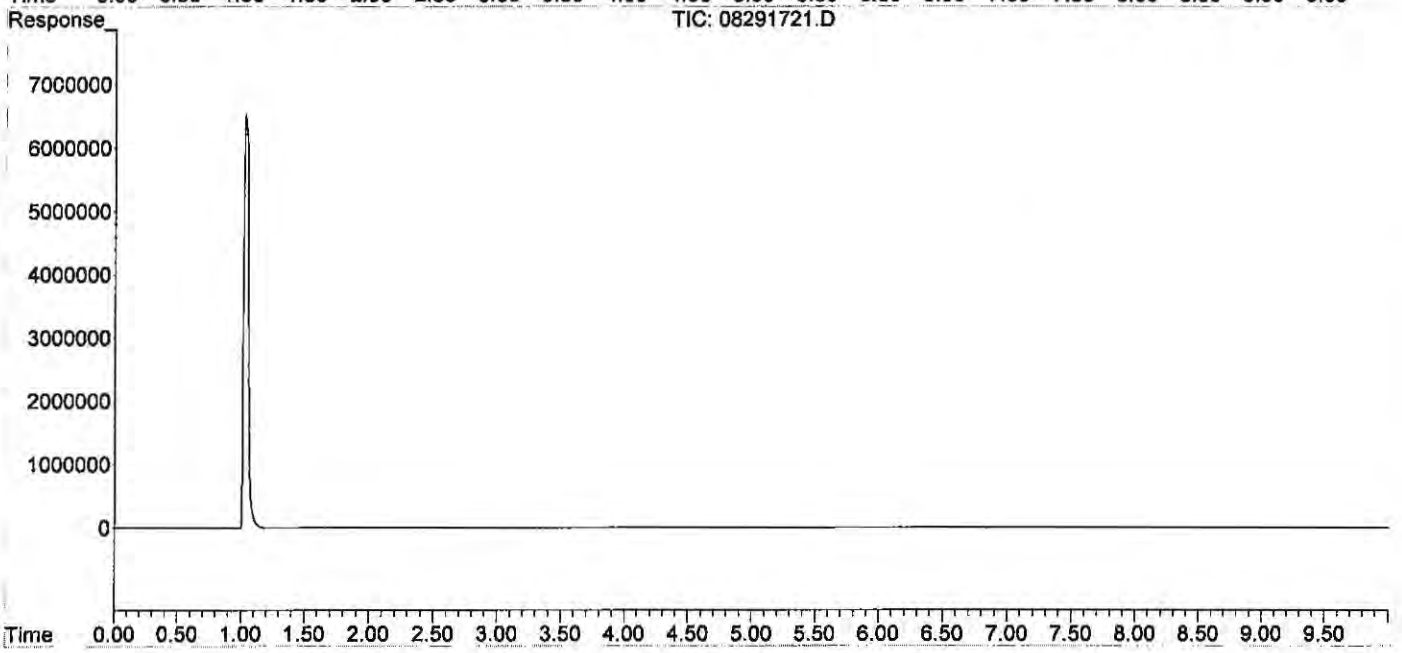
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.886	536422	0.113	ppm
2)	Carbon monoxide	1.886	536422	N.D.	ppm
3)	Methane (TCD)	4.059f	626500	66244.710	ppm
4)	Carbon dioxide	5.947	1163775	4957.948	ppm
6)	Methane (FID)	1.062	37290742	3947.023	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

Actual %D
5000 99.16

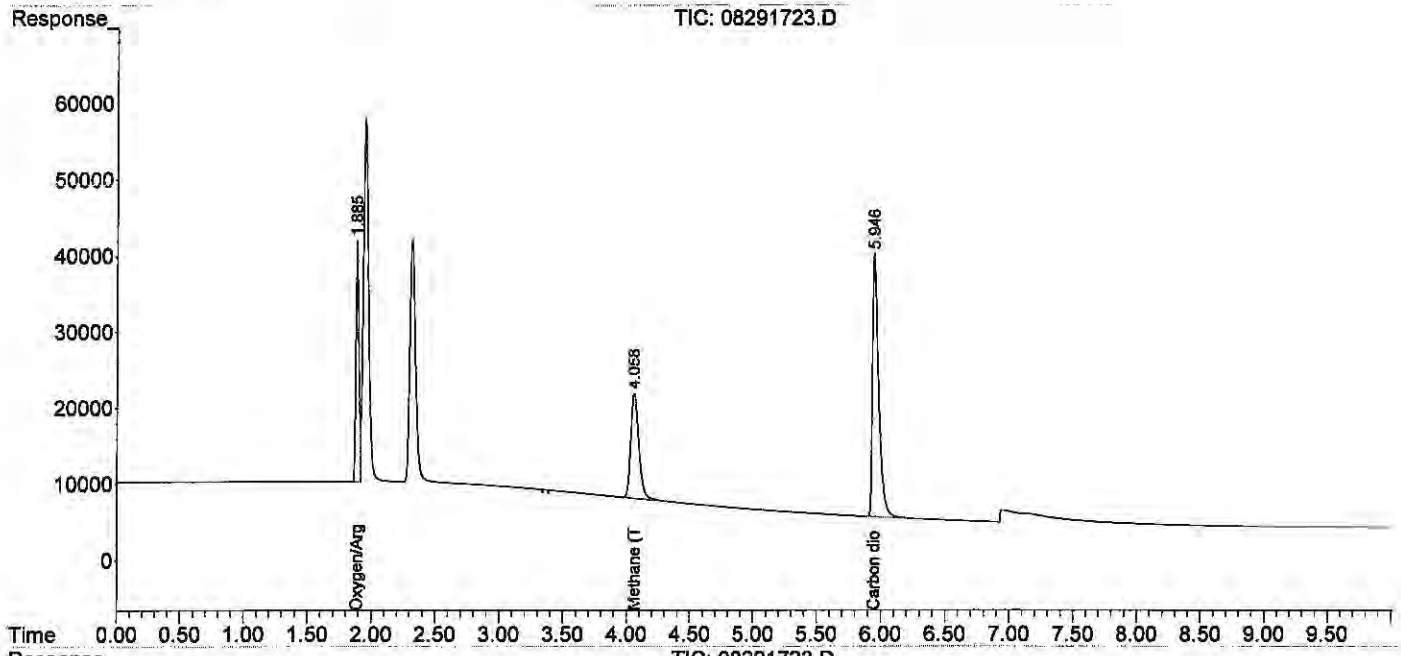
(f)=RT Delta > 1/2 Window (m)=manual int.

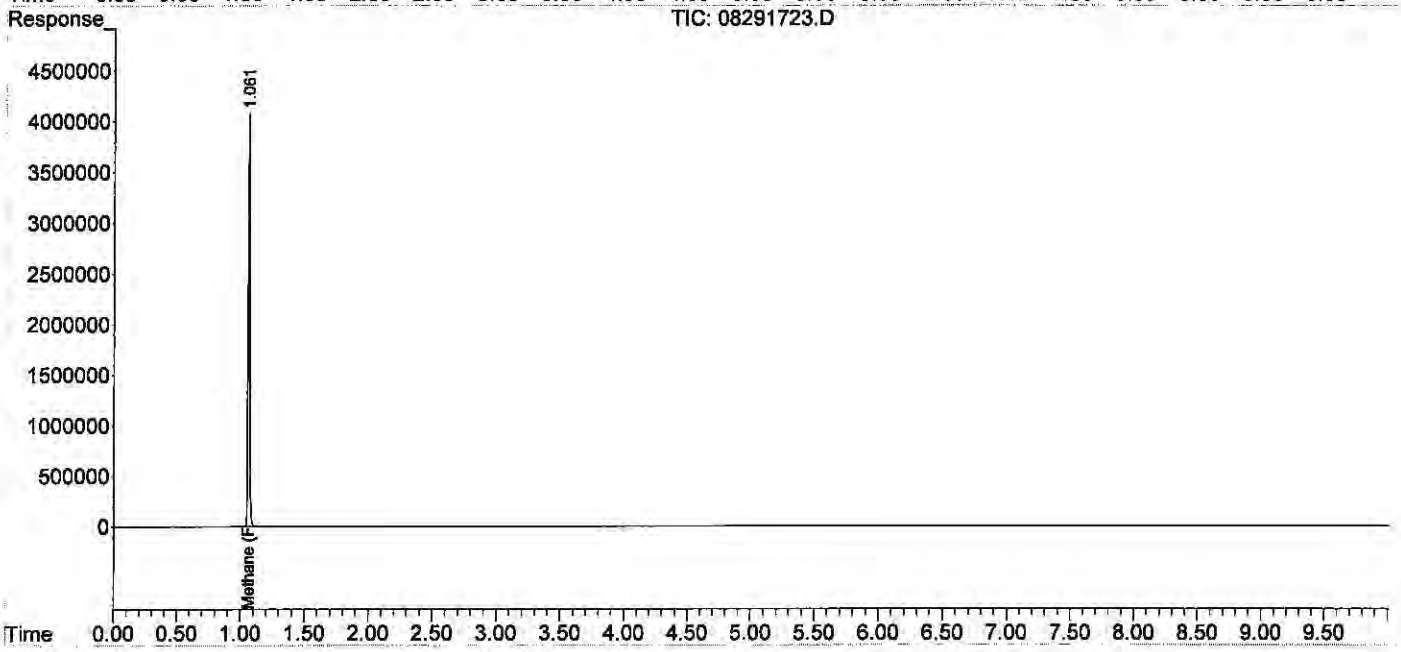
W 9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD

Client : ALS Laboratory Group | Analyst : MR | Instrument : GC#10

Service Request: P1806863 | Date Analysis : 12/20/18 | Detector : FID#10, TCD#10

Sample Vol. (ml) : 32.00 ml | Head Space Vol.(ml) : 8.00 ml | Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Carbon Dioxide
std s32-11091801	0.100	4891.803
ACTUAL		5000.00
%Difference		2.2%
mcs 0.1ml	0.100	0.000
rb 0.1ml	0.100	0.000
tcd lcs s32-10081801	0.100	856.794
tcd lcsd s32-10081801	0.100	938.778
P1806863-001 50ul	0.050	18018.50
P1806863-002 50ul	0.050	18806.32
P1806863-003 50ul	0.050	9519.199

FINAL HEAD SPACE RESULT (ppm)

	Carbon Dioxide
WWt.	44.10
HENRY'S CONSTANT	1.42E+03
RL	100.00
mcs 0.1ml	0.000
tcd lcs s32-10081801	8567.940
tcd lcsd s32-10081801	9387.780
P1806863-001 50ul	360370.06
P1806863-002 50ul	376126.36
P1806863-003 50ul	190383.98

std s32-11091801	4915.636
ACTUAL	5000.00
%Difference	1.7%

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 11:26:02
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:36:46 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.979f	566505	0.119	ppm	
2)	Carbon monoxide	1.979f	566505	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.076	1148249	4891.803	ppm	m
6)	Methane (FID)	1.113	32620061	3452.657	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

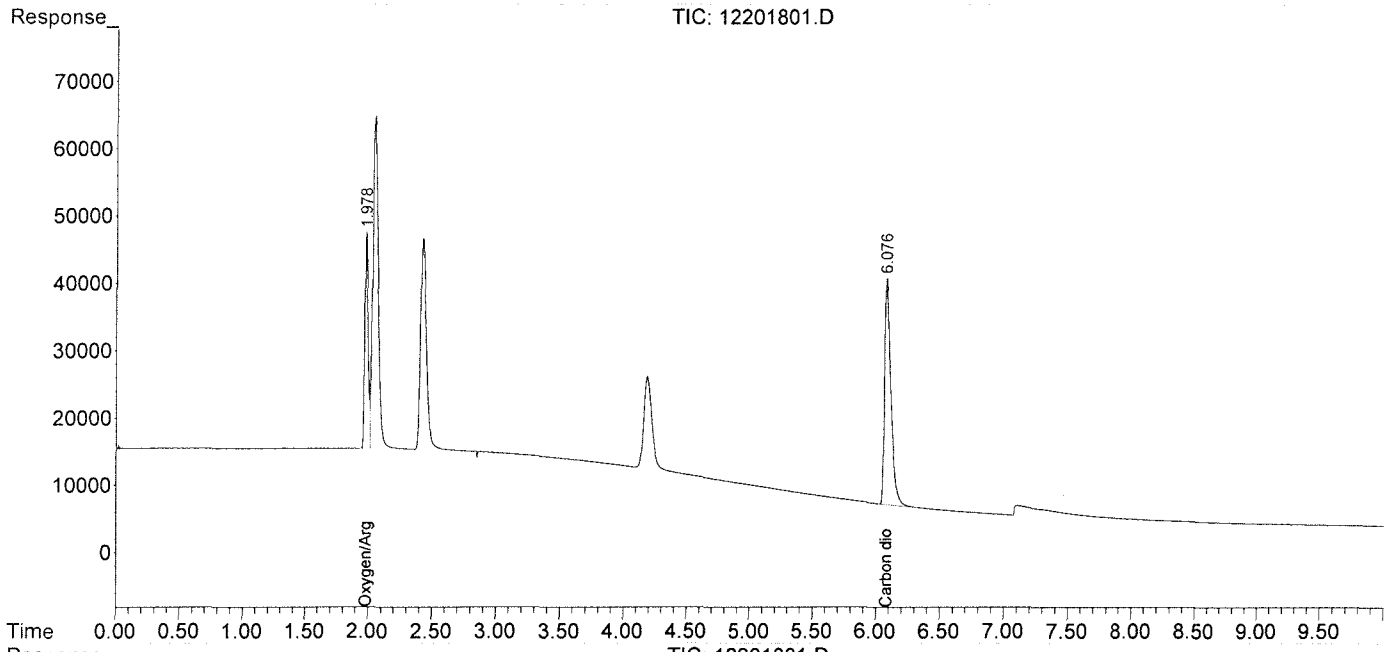
(f)=RT Delta > 1/2 Window (m)=manual int.

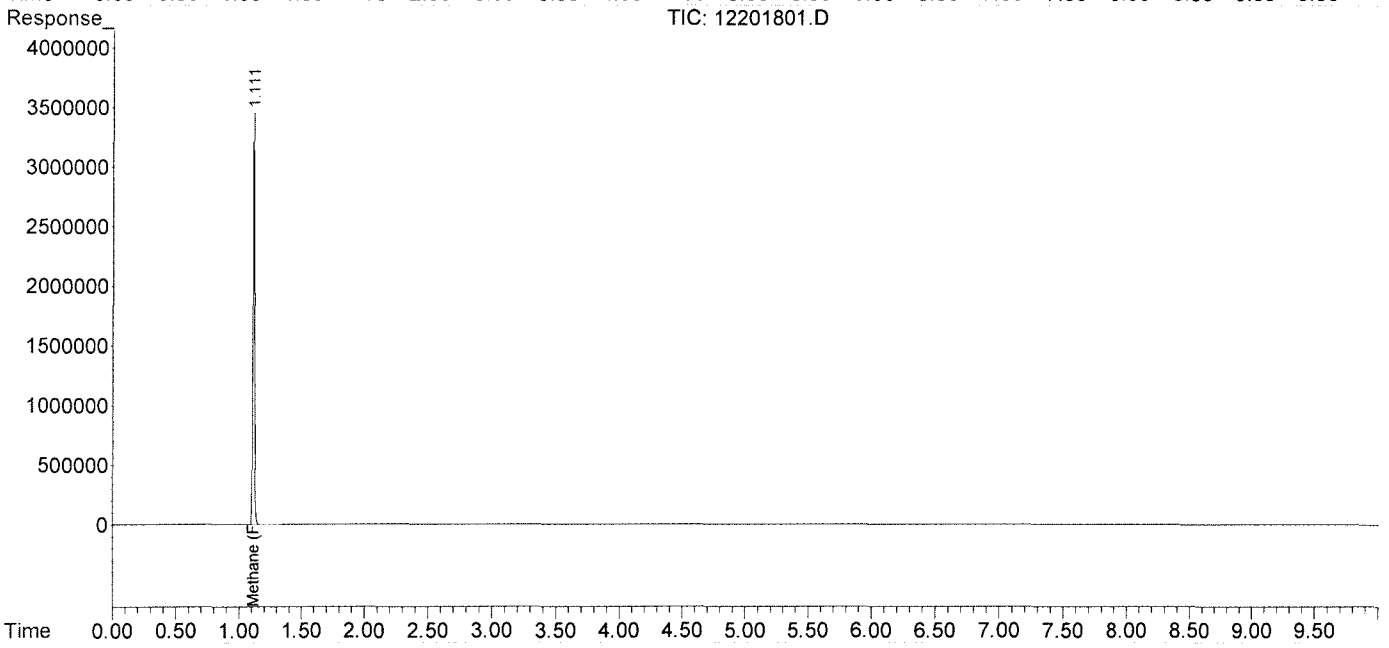
MR 12/21/18

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 11:26:02
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:36:46 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

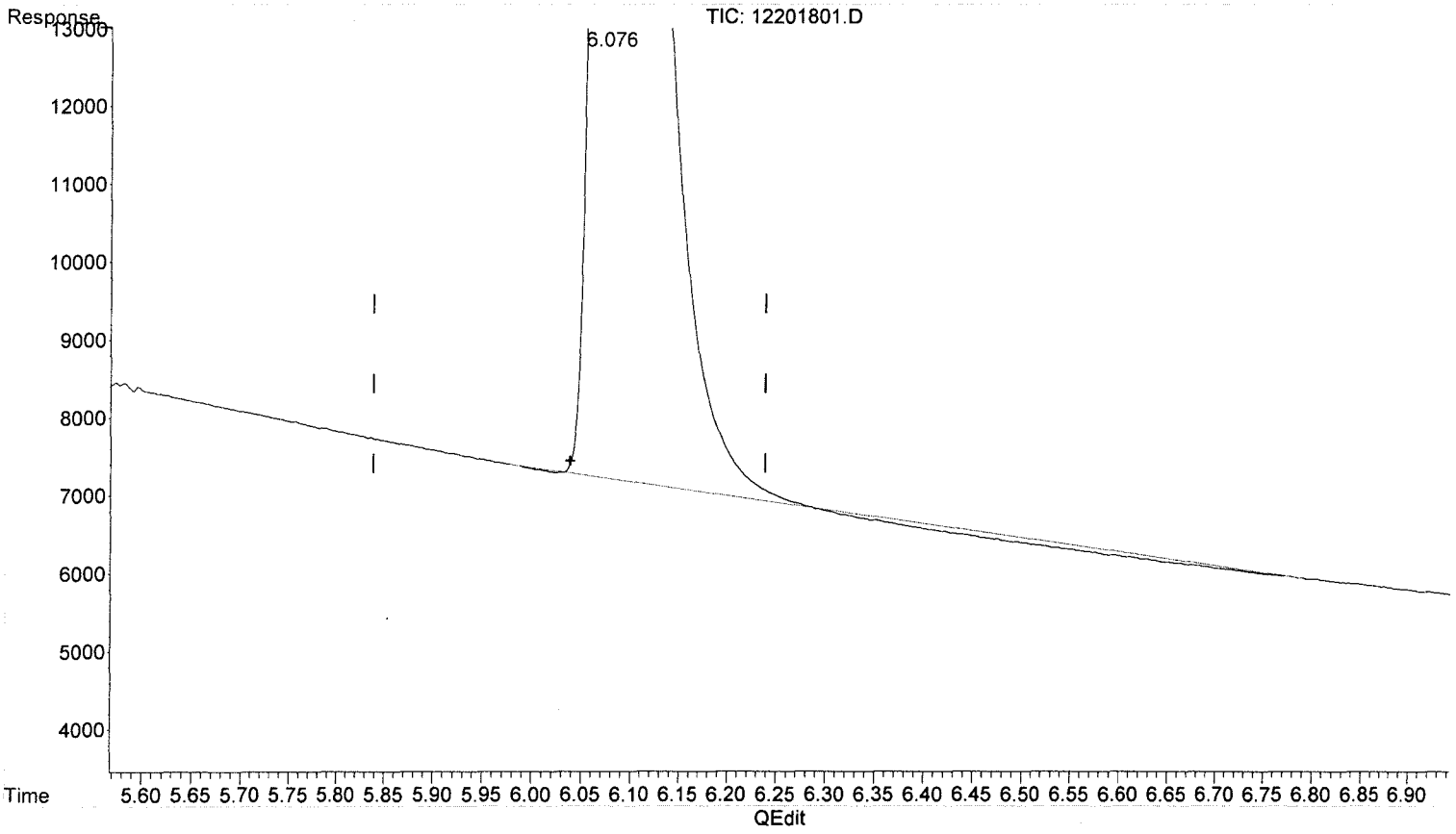




Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 11:26:02
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:36:46 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.078min 4810.455 ppm

response 1129154

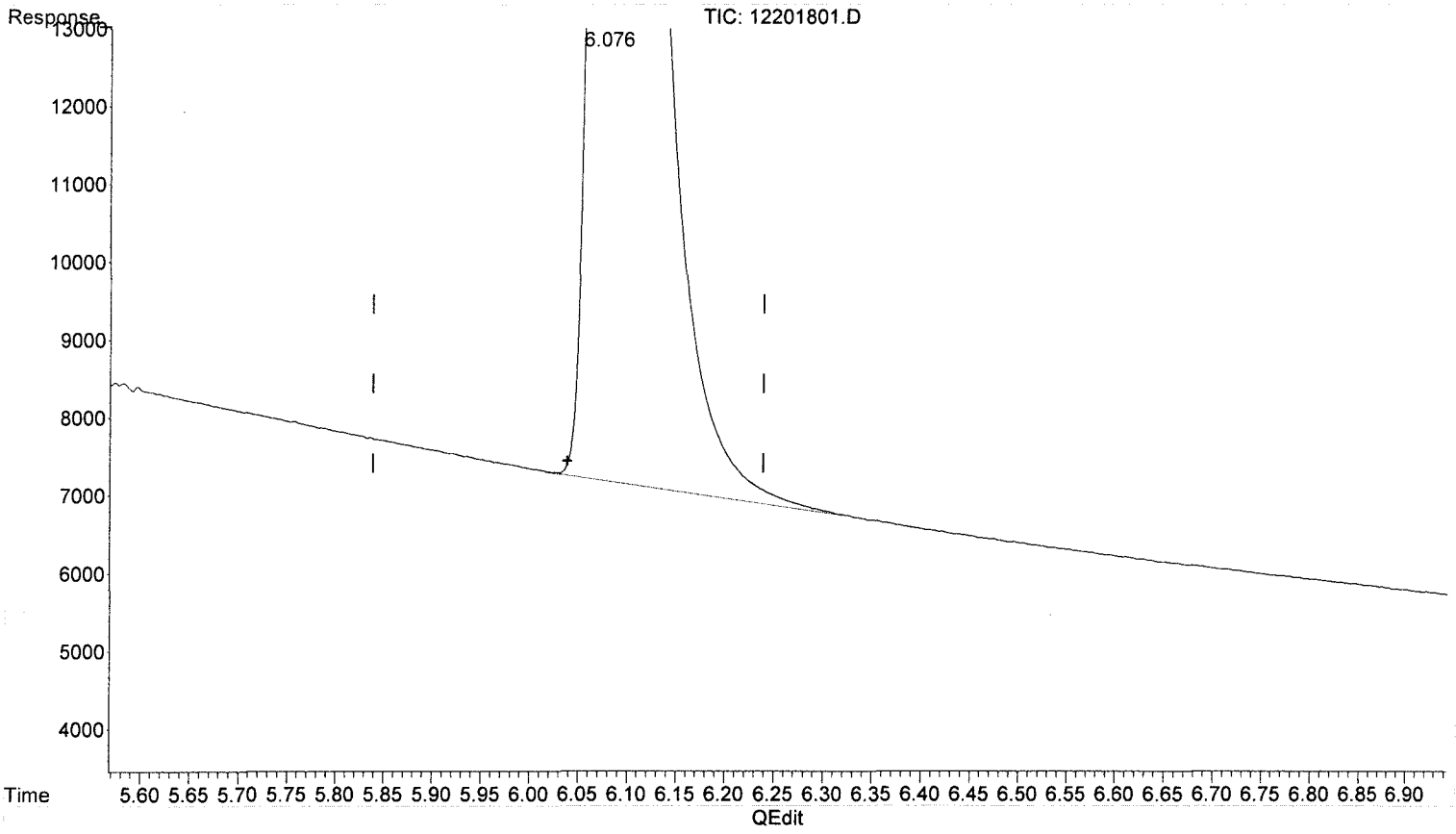
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 11:26:02
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:36:46 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.076min 4891.803 ppm m

response 1148249

MR 12/21/18
BLC

12/21/18

(+) = Expected Retention Time

RS082817_CO2.M Thu Dec 20 16:37:14 2018

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 15:30:51
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:42:17 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

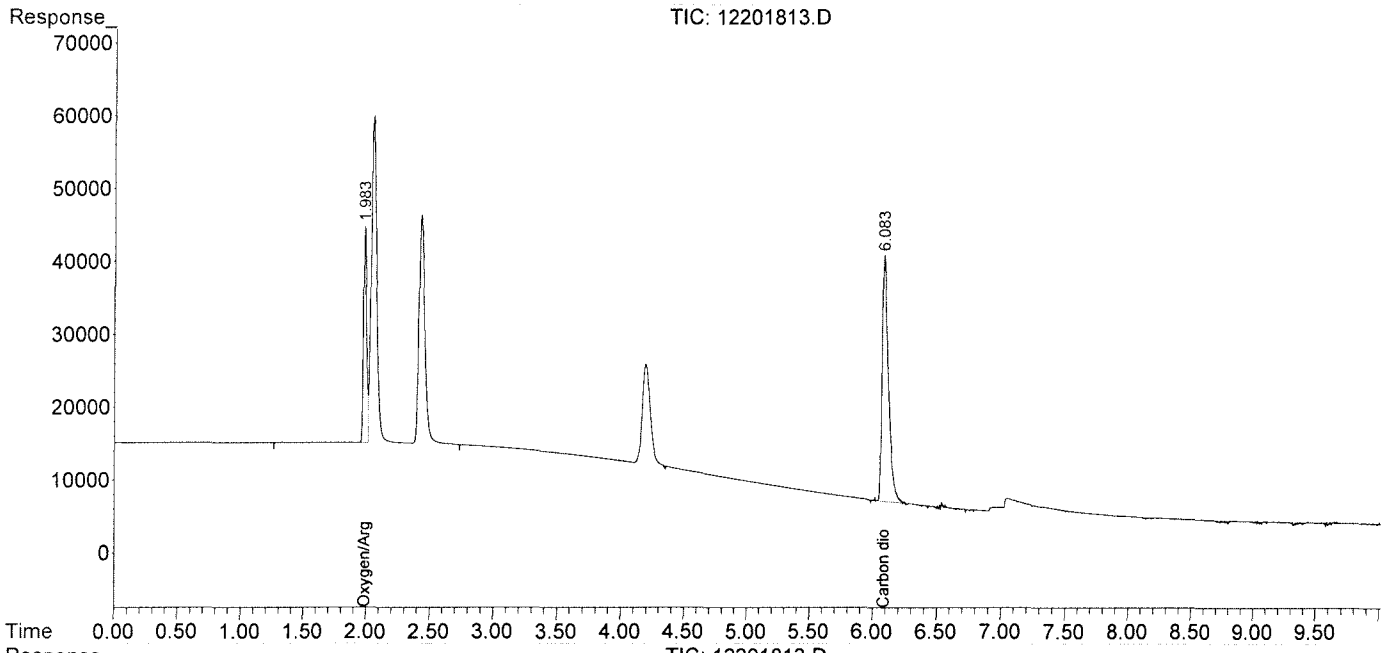
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.983f	529088	0.111	ppm	
2)	Carbon monoxide	1.983f	529088	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	6.083	1153843	4915.636	ppm	m
6)	Methane (FID)	1.114	33106517	3504.145	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

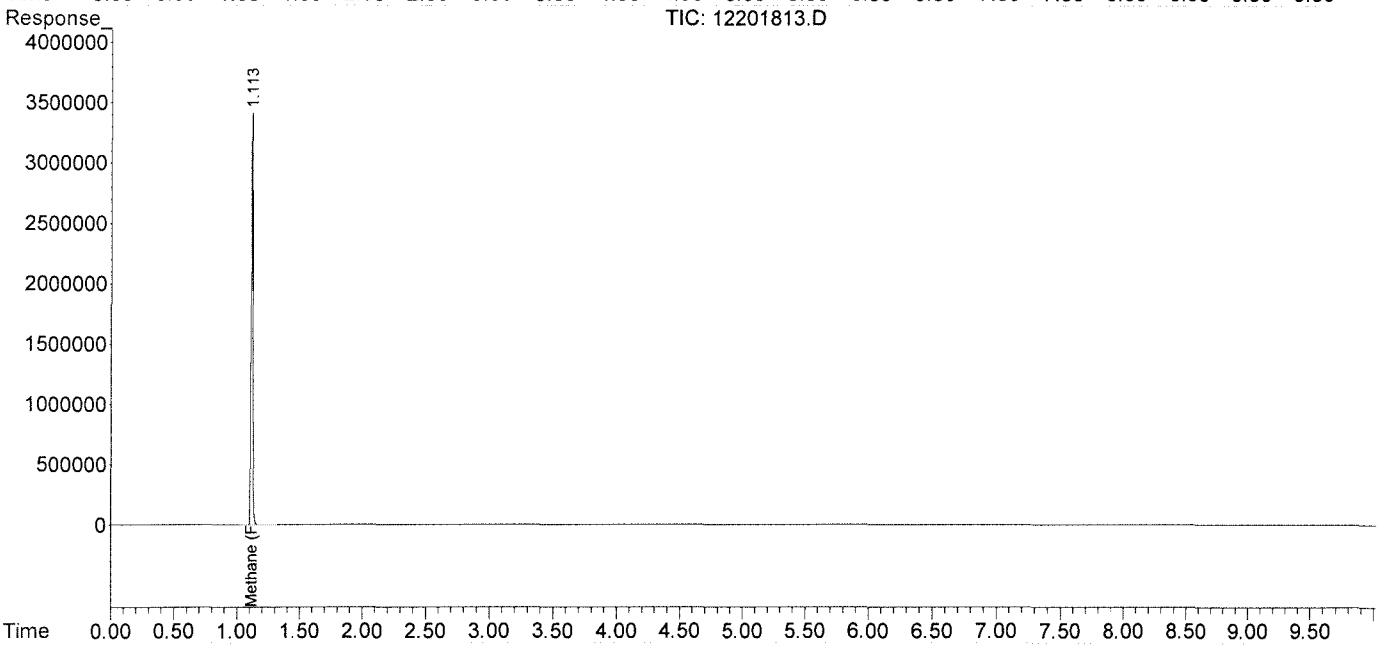
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 15:30:51
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:42:17 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



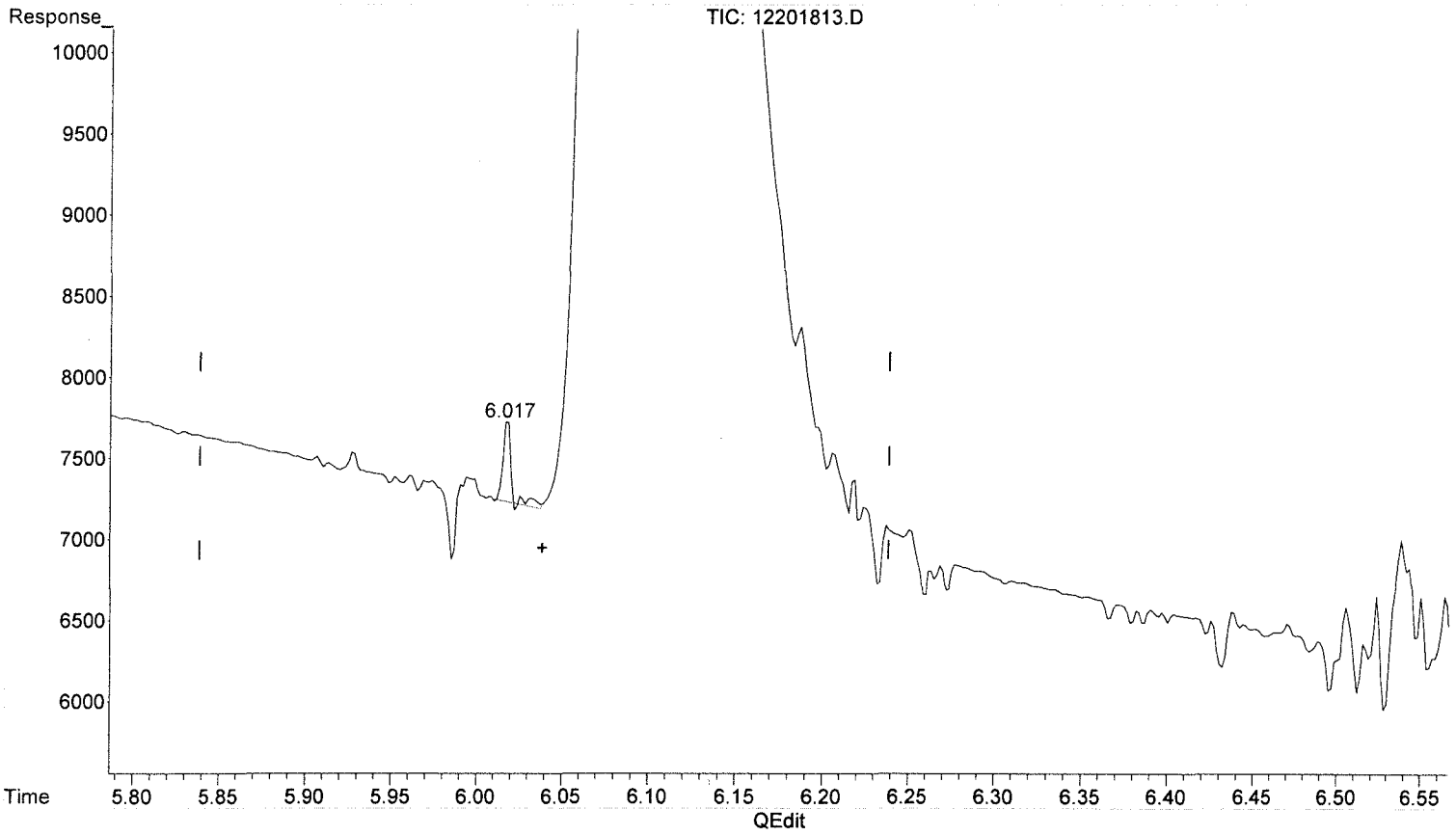


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 15:30:51
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:42:17 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.018min 7.400 ppm

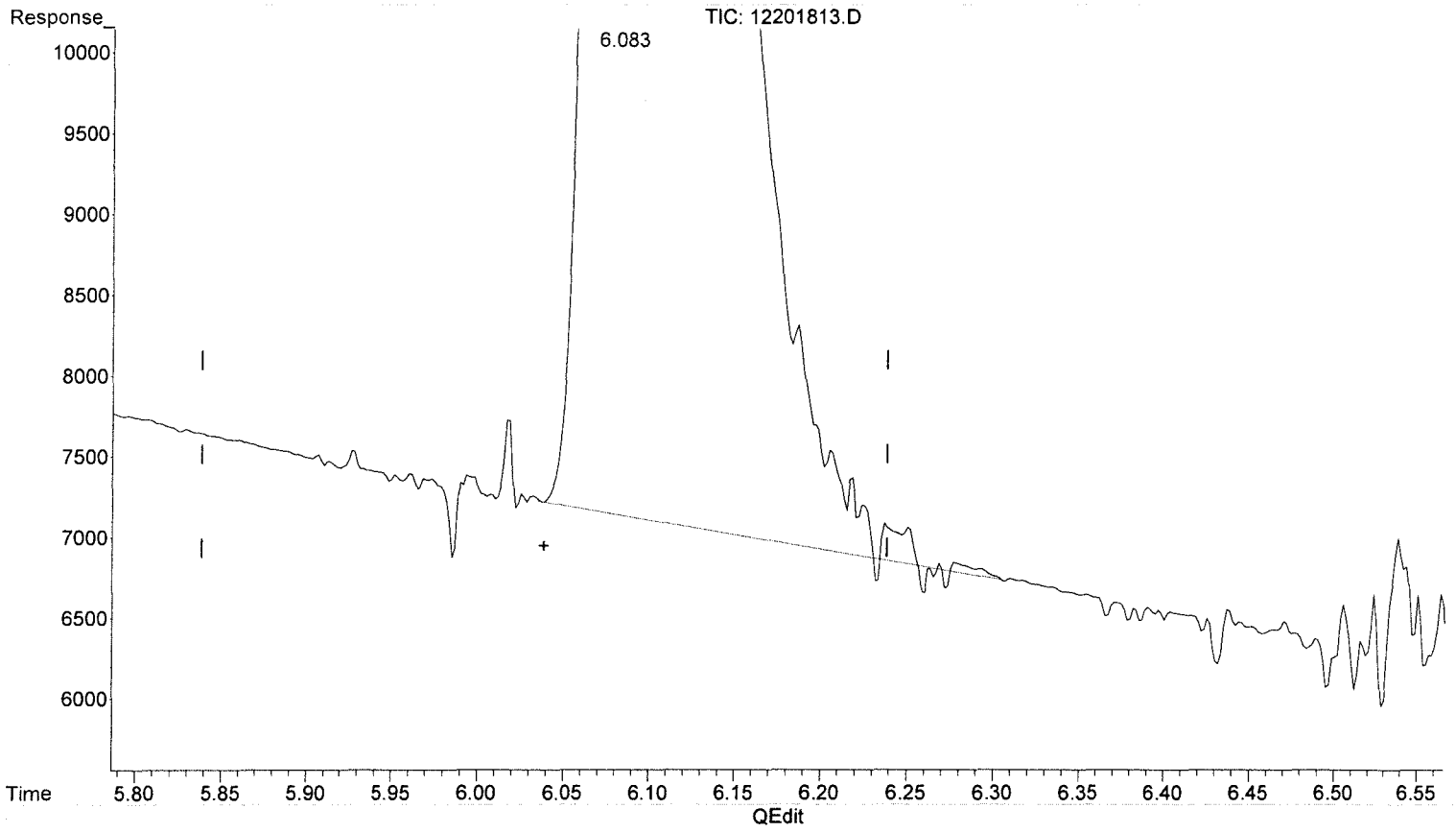
response 1737

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2018_12\20\
Data File : 12201813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 20-Dec-2018, 15:30:51
Operator : MR
Sample : std s32-11091801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 16:42:17 2018
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

6.083min 4915.636 ppm m

response 1153843

ML 12/21/18
MP

12/21/18

(+) = Expected Retention Time

RS082817_CO2.M Thu Dec 20 16:42:41 2018 Page 160 of 409 Page: 1

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mls inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	lcv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2018_12\20\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	20-Dec-18, 11:26:02	12201801.D	std s32-11091801		MR	RSKBOTH.M	pass
2	20-Dec-18, 11:39:49	12201802.D	rb 0.1ml		MR	RSKBOTH.M	pass
3	20-Dec-18, 12:01:09	12201803.D	mcs 0.1ml		MR	RSKBOTH.M	pass
4	20-Dec-18, 12:38:52	12201804.D	tcd lcs s32-10081801		MR	RSKBOTH.M	pass
5	20-Dec-18, 12:52:24	12201805.D	tcd lcsd s32-10081801		MR	RSKBOTH.M	
6	20-Dec-18, 13:19:14	12201806.D	P1806863-001 50ul		MR	RSKBOTH.M	
7	20-Dec-18, 13:35:16	12201807.D	P1806863-002 50ul		MR	RSKBOTH.M	
8	20-Dec-18, 13:49:24	12201808.D	P1806863-003 50ul		MR	RSKBOTH.M	
9	20-Dec-18, 14:04:40	12201809.D	P1806865-001 50u		MR	RSKBOTH.M	
10	20-Dec-18, 14:19:57	12201810.D	P1806865-002 50u		MR	RSKBOTH.M	
11	20-Dec-18, 14:38:24	12201811.D	P1806865-003 50u		MR	RSKBOTH.M	
12	20-Dec-18, 14:56:31	12201812.D	P1806865-004 50u		MR	RSKBOTH.M	
13	20-Dec-18, 15:30:51	12201813.D	std s32-11091801		MR	RSKBOTH.M	pass

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191806.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 12:02:09
Operator : MR
Sample : P1806863-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:59:15 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

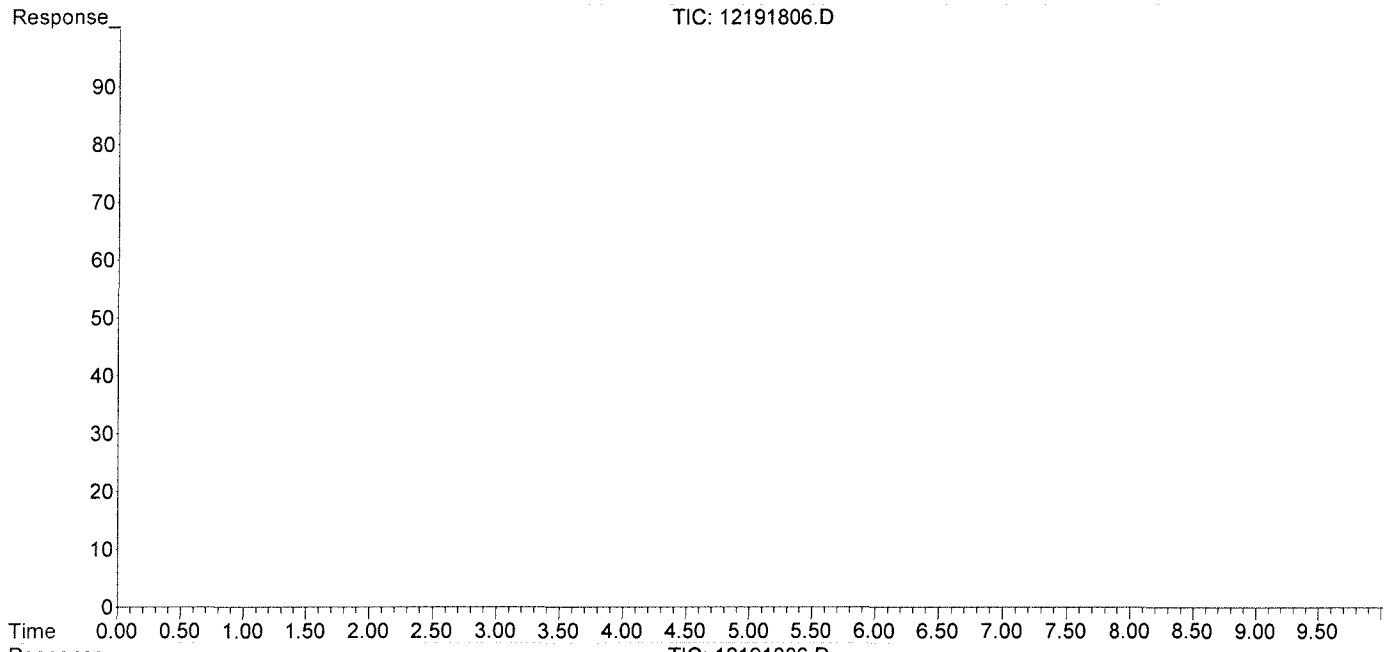
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	4221271	465.377	ppm
7)	Ethylene	1.682	1642	0.098	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

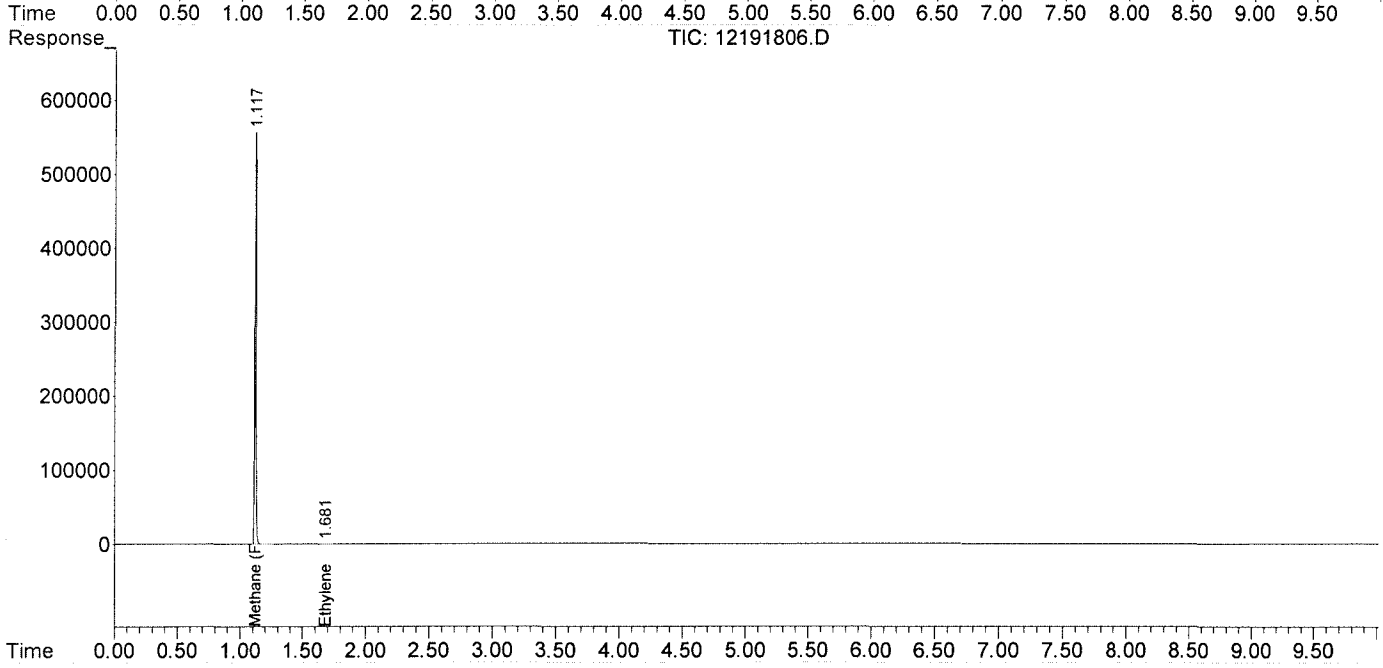
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191806.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 12:02:09
Operator : MR
Sample : P1806863-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:59:15 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191807.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 12:51:33
Operator : MR
Sample : P1806863-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:59:39 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

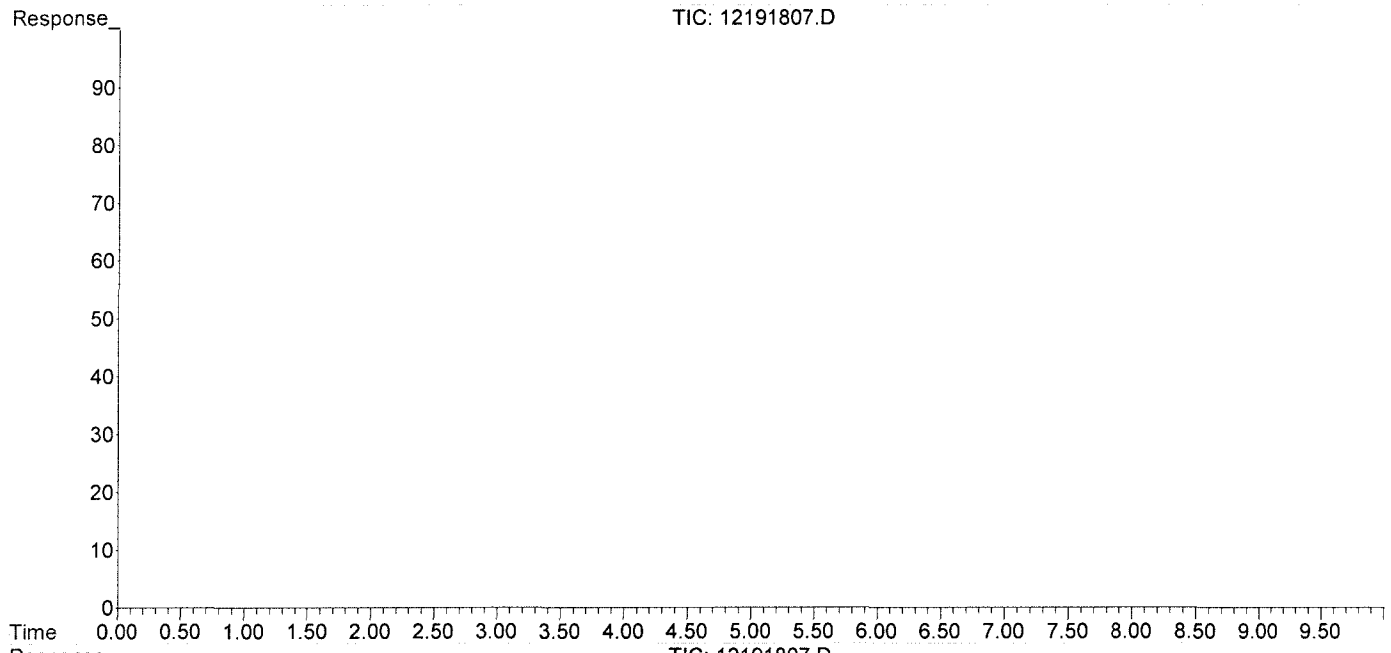
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	26327	2.902	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

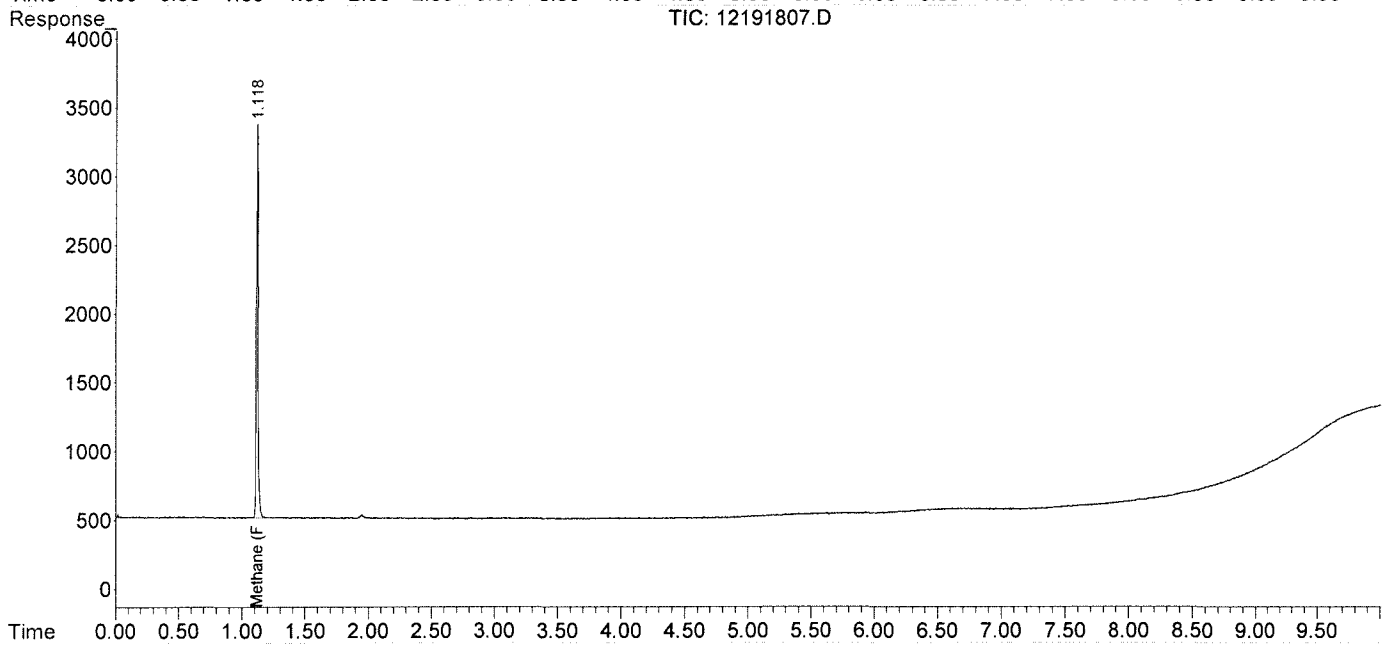
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191807.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 12:51:33
Operator : MR
Sample : P1806863-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:59:39 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191808.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 13:05:45
Operator : MR
Sample : P1806863-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:59:59 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

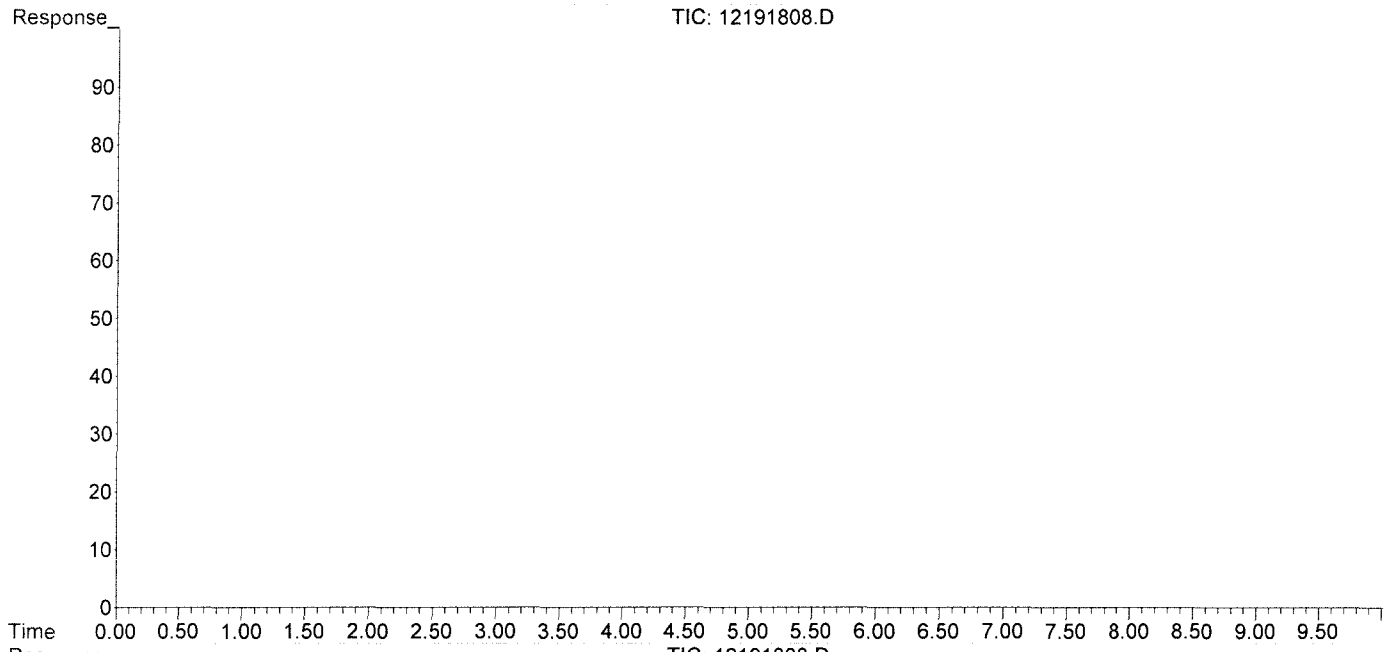
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.117	4880577	538.063	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

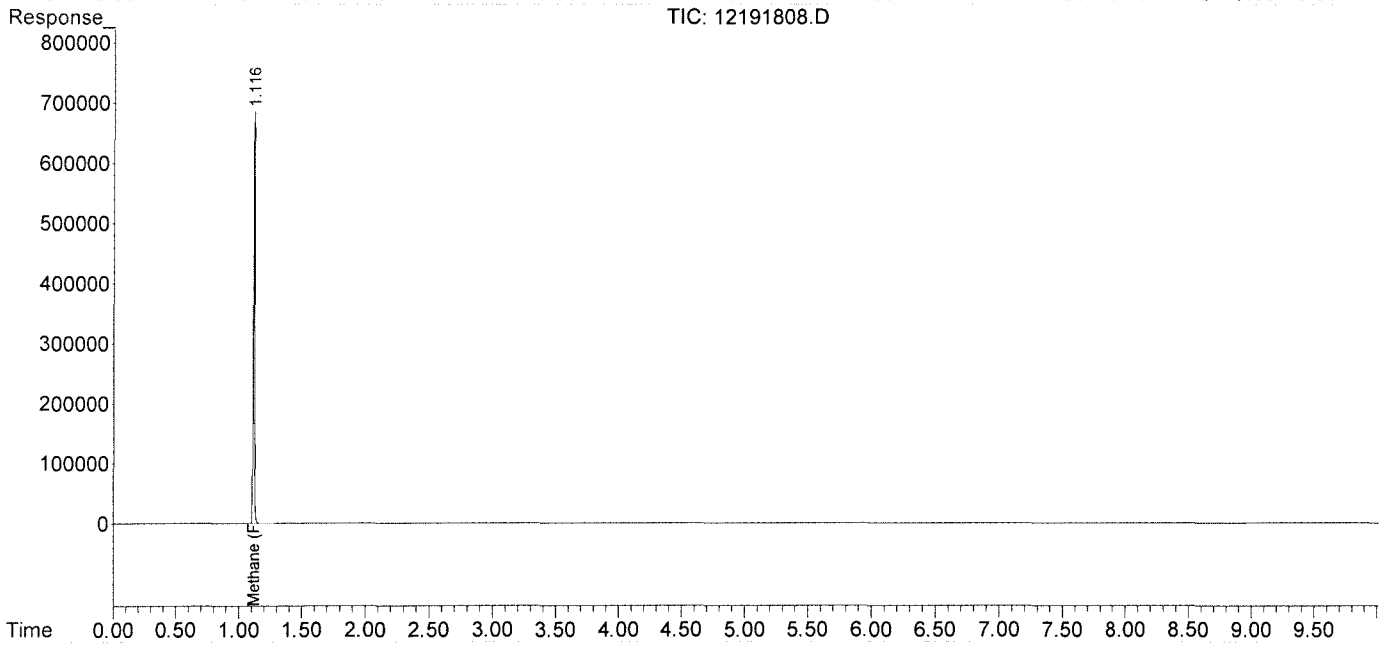
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191808.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 13:05:45
Operator : MR
Sample : P1806863-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 20 13:59:59 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:13:15
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:46:40 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

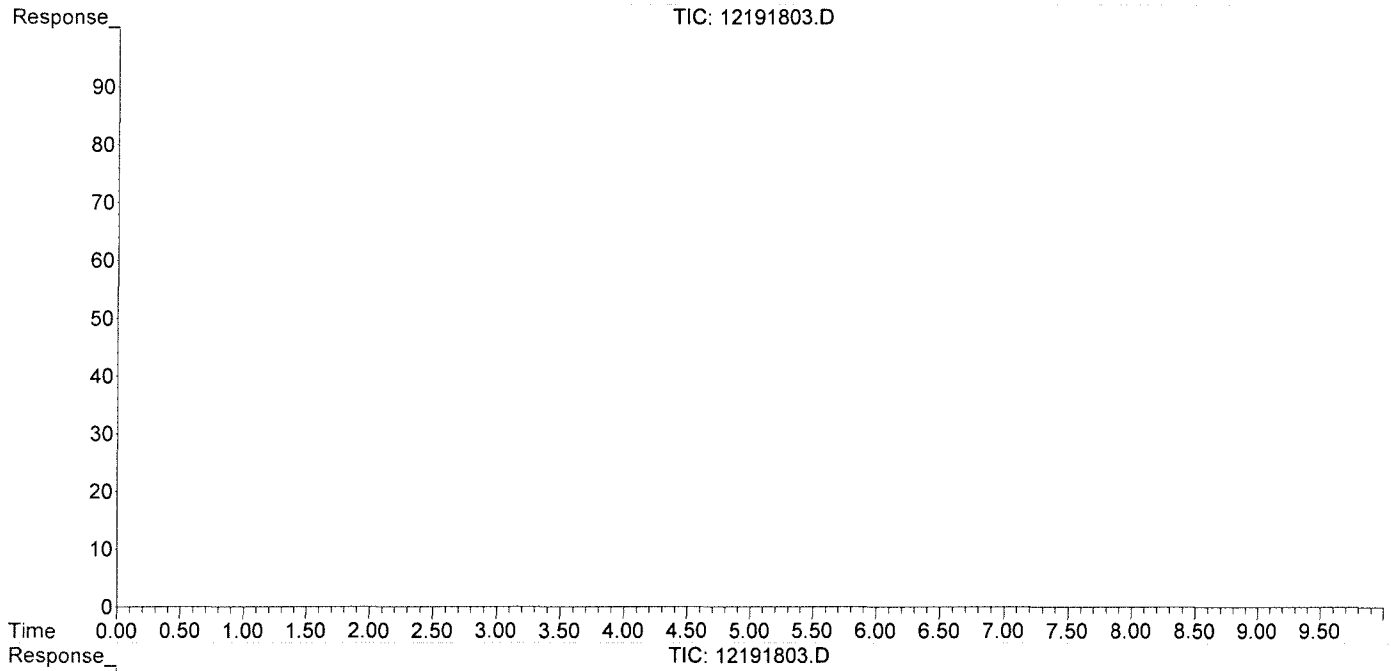
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.120	1664	0.183	ppm	m
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

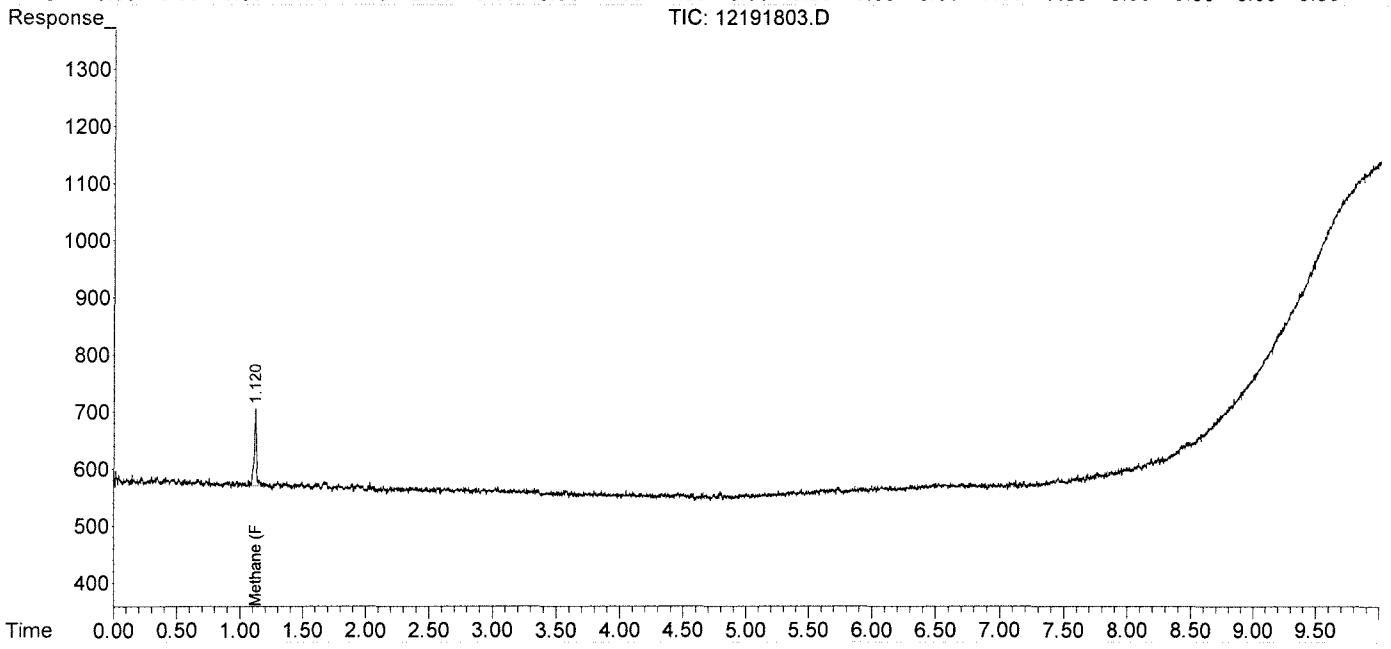
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:13:15
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:46:40 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

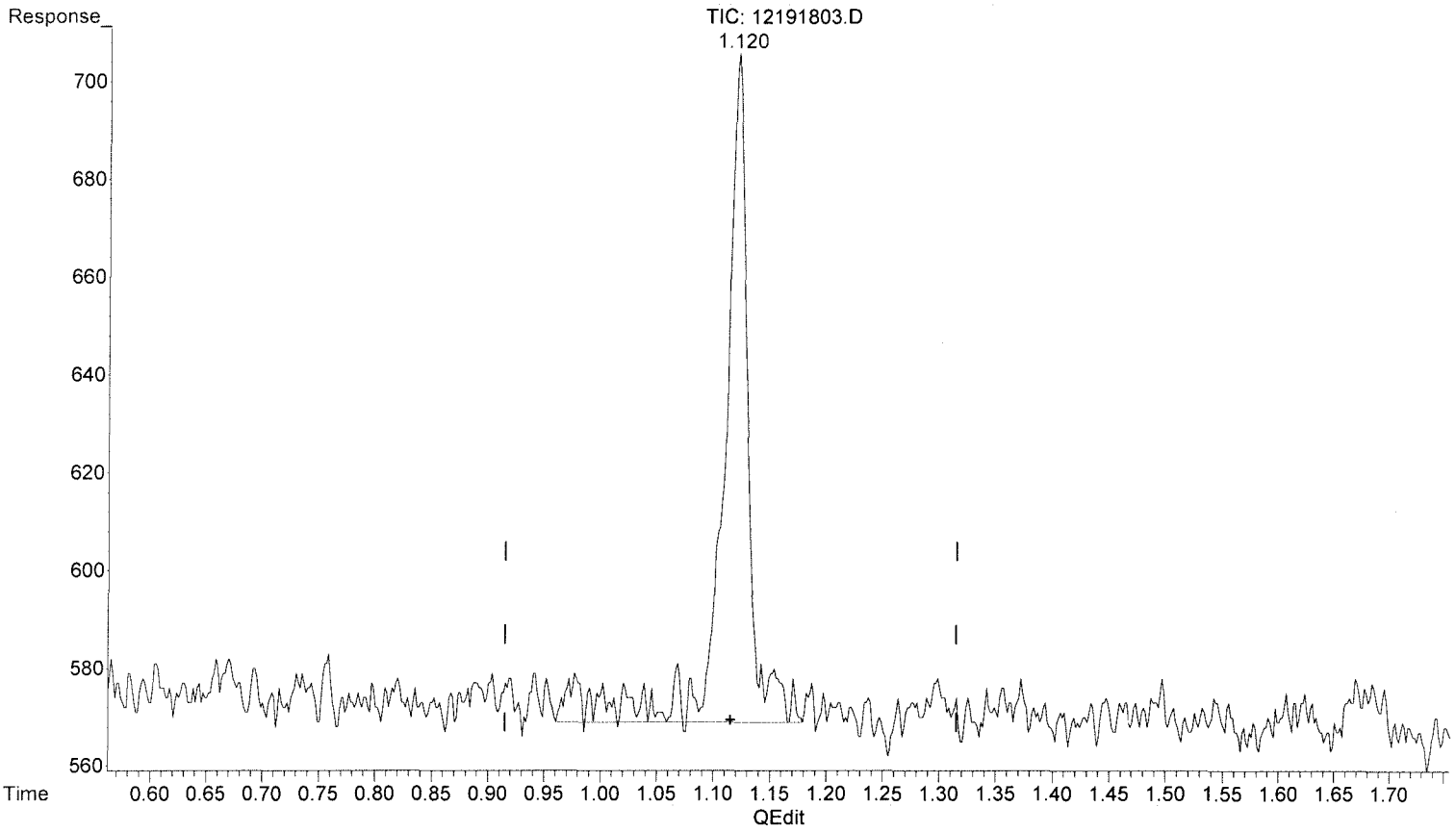




Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:13:15
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:46:40 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.121min 0.230 ppm

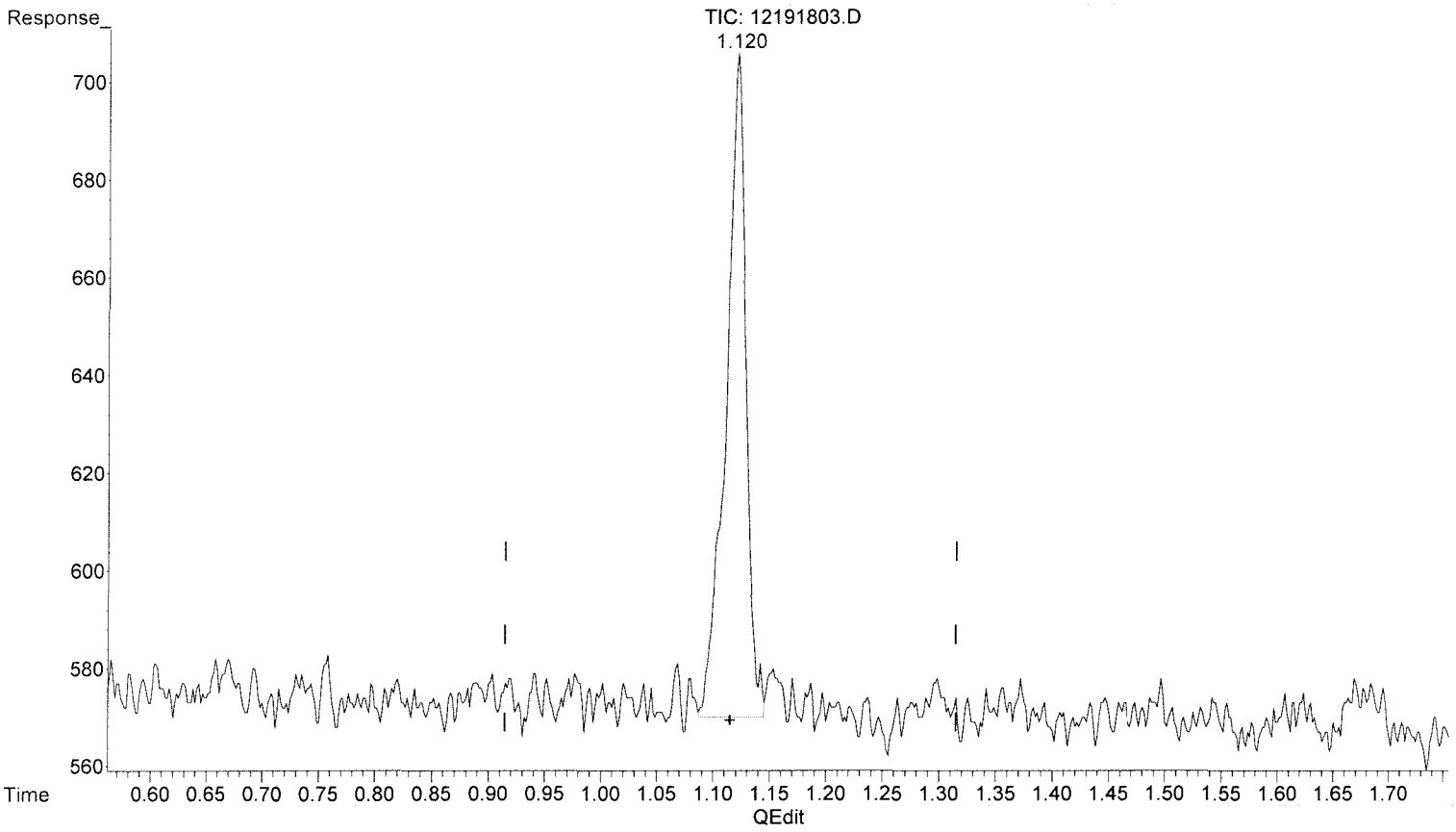
response 2085

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191803.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:13:15
Operator : MR
Sample : mcs 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:46:40 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.120min 0.183 ppm m

response 1664

MR 12/20/18
BLC

(+) = Expected Retention Time

RS091217_R.M Wed Dec 19 14:14:15 2018 Page: 1

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191804.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:29:51
Operator : MR
Sample : fid lcs s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:47:01 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

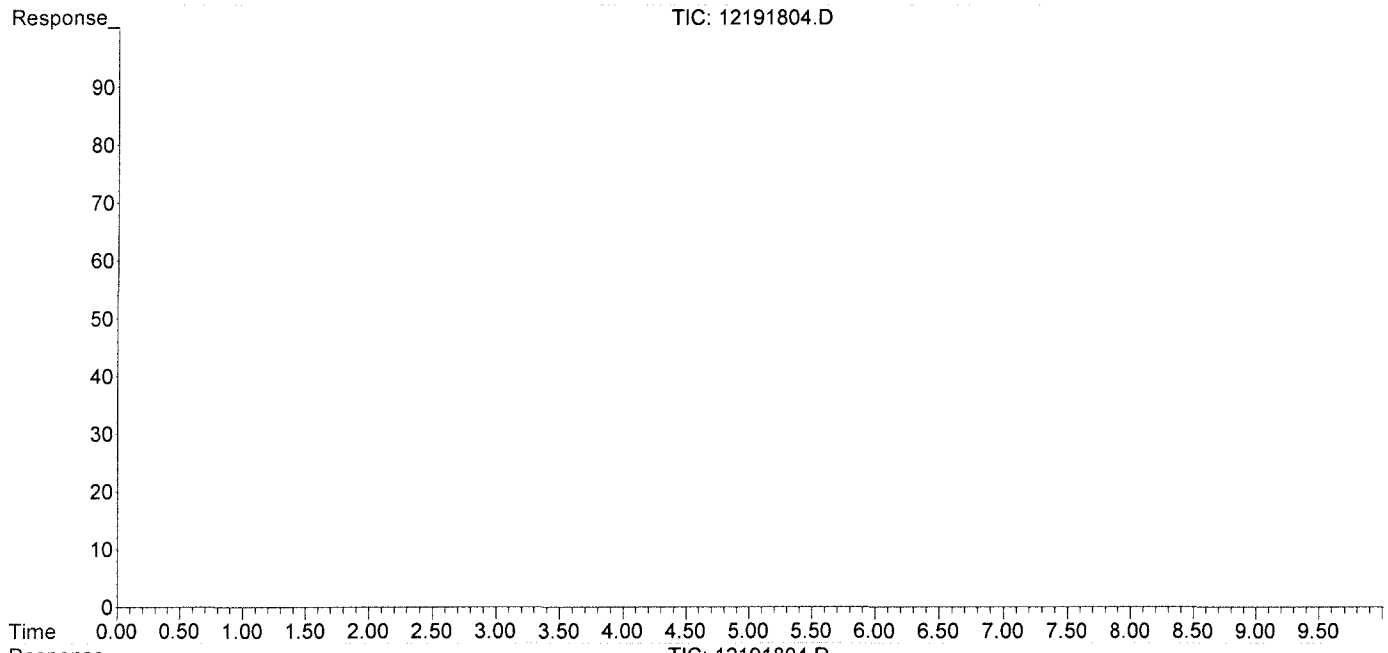
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	13215	1.457	ppm
7)	Ethylene	1.682	16932	1.012	ppm
8)	Ethane	1.946	21056	1.242	ppm
9)	Propylene	4.322	23272	0.993	ppm
10)	Propane	4.443	32697	1.314	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.657	43027	1.616	ppm
13)	n-Butane	6.657	43027	1.616	ppm

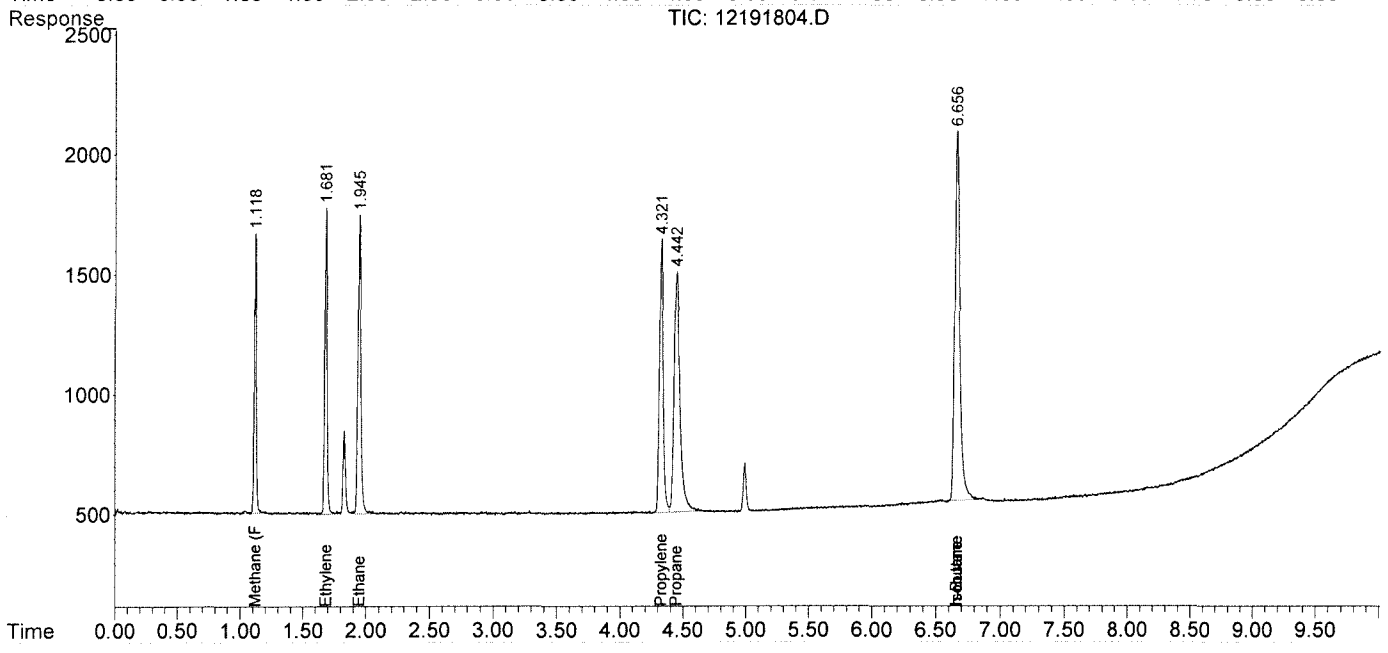
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191804.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:29:51
Operator : MR
Sample : fid lcs s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:47:01 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191805.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:45:28
Operator : MR
Sample : fid lcsd s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 12:54:06 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

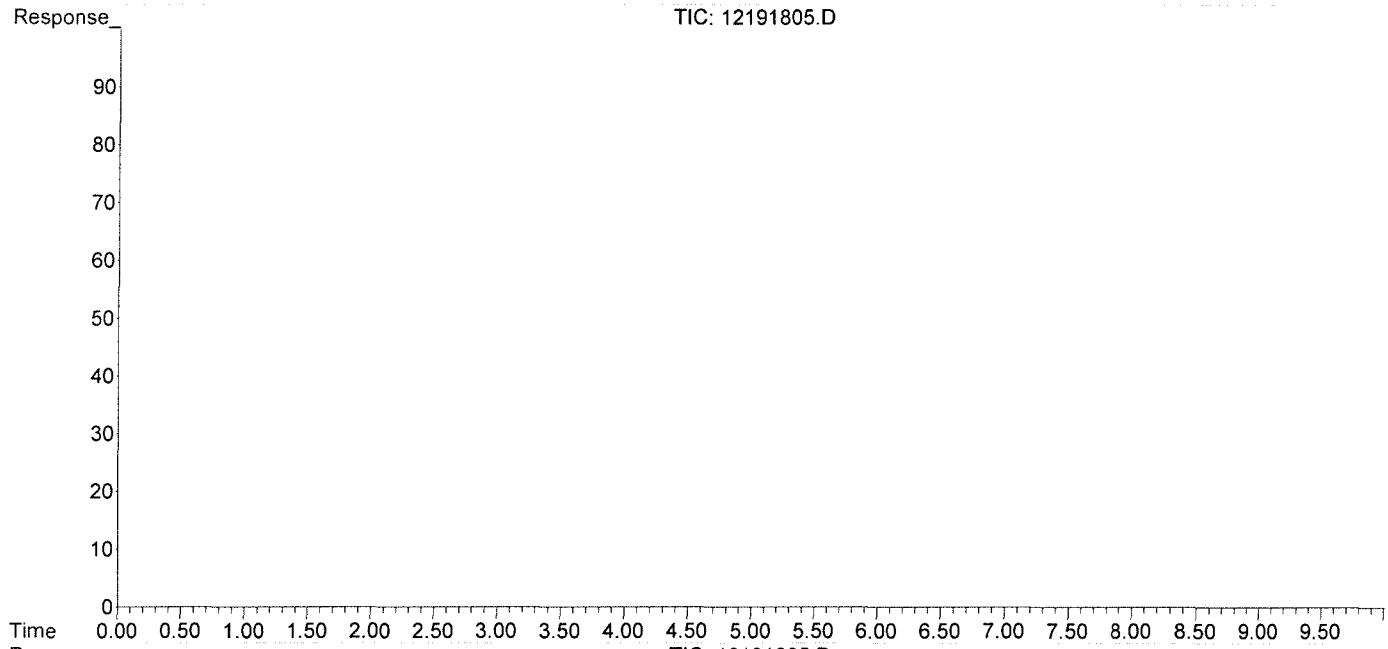
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	13106	1.445	ppm
7)	Ethylene	1.683	16707	0.998	ppm
8)	Ethane	1.946	20957	1.236	ppm
9)	Propylene	4.322	23610	1.008	ppm
10)	Propane	4.443	33371	1.341	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.656	44089	1.656	ppm
13)	n-Butane	6.656	44089	1.656	ppm

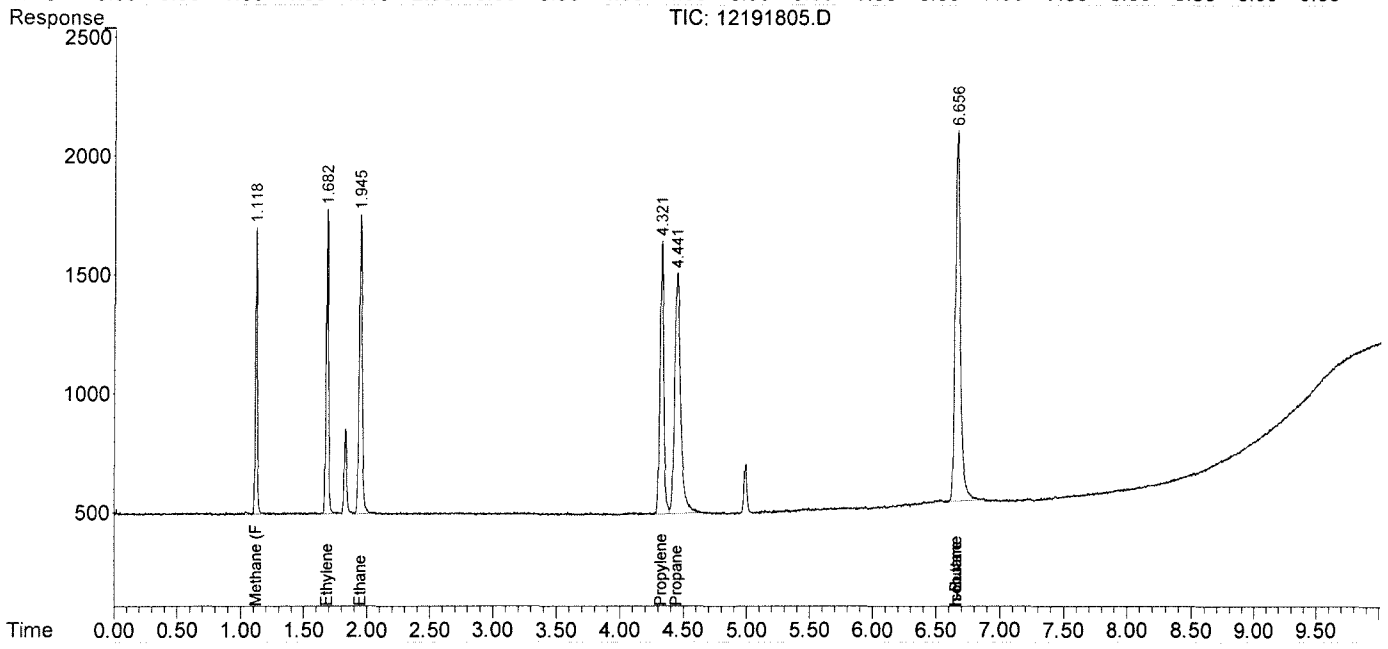
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191805.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 11:45:28
Operator : MR
Sample : fid lcsd s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 12:54:06 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Response Factor Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	3.739		1.014			0.001	0.793	E6	189.17
2)	Carbon monoxide	3.739		1.014			0.001	0.594	E6	221.92
3)	Methane (TCD)						2.161	0.951	E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438	E2	4.44

Signal #2 Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907	E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673	E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695	E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343	E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488	E4	4.20
11)	Isobutylene							0.652	E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017

Edit Compounds -- Compound #6 -- Methane (FID)

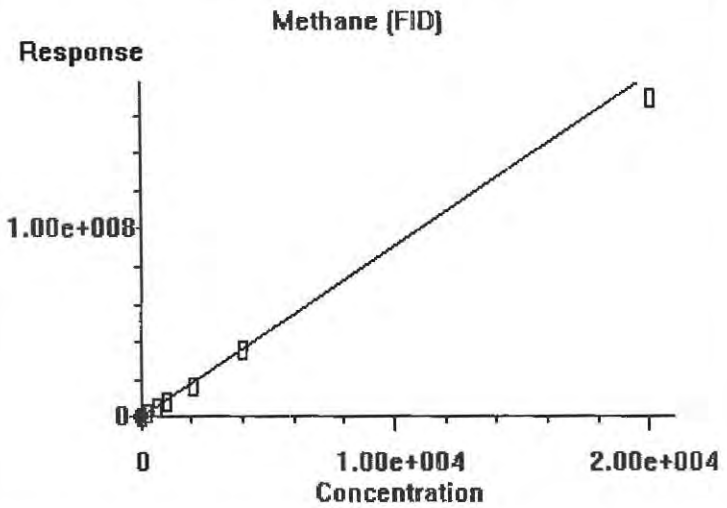
Search by: Ret Time | Name | Index | Find Compound

Compound Database
External Standard Compoun
- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	
2	0.302000	3564.400000
3	1.510000	14725.268625
4	4.530000	41128.575000
5	10.570000	91966.784531
6	200.000000	1735997.497500
7	600.000000	5189848.900000
8	1000.000000	8598533.570000
9	2000.000000	16098209.390000
10	4000.000000	35776839.311362

Lvl ID	Concentration	Response
11	20000.000000	169009160.49199



0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #7 -- Ethylene

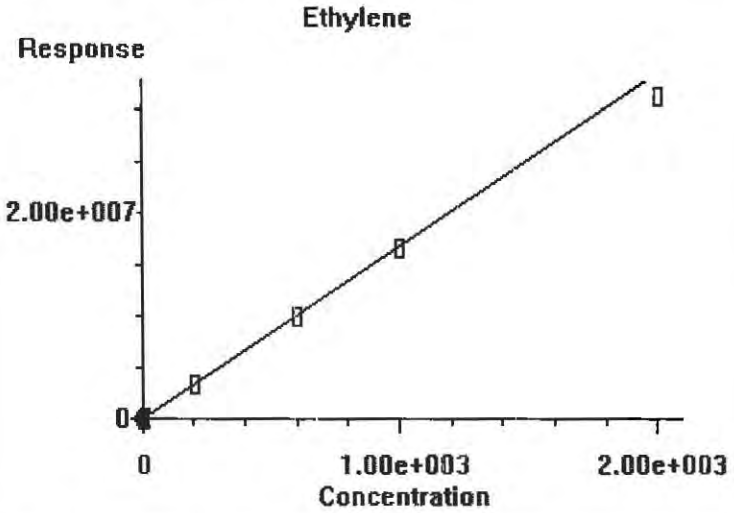
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16608503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.673e+004	Linear term
0.000e+000	Constant term
3.897%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #8 -- Ethane

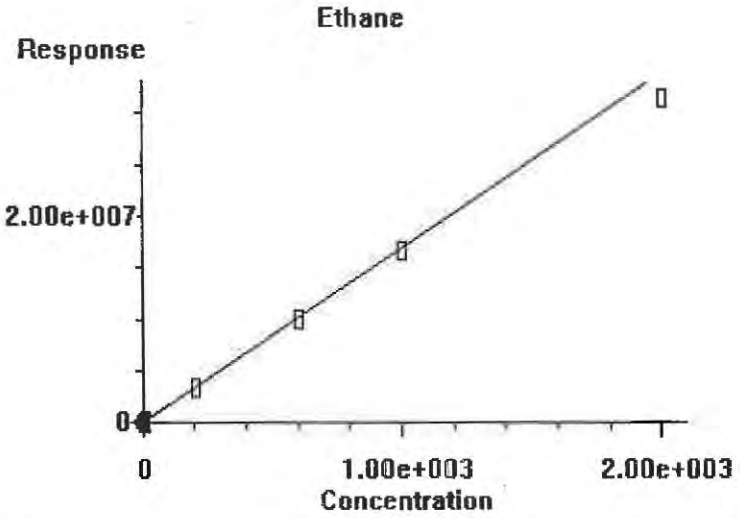
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2689.928008
2	0.302000	5060.331943
3	1.510000	26943.667500
4	4.530000	78353.525045
5	10.570000	178840.731148
6	200.000000	3350442.319129
7	600.000000	10048964.218029
8	1000.000000	16703164.879012
9	2000.000000	31424217.938900
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #9 -- Propylene

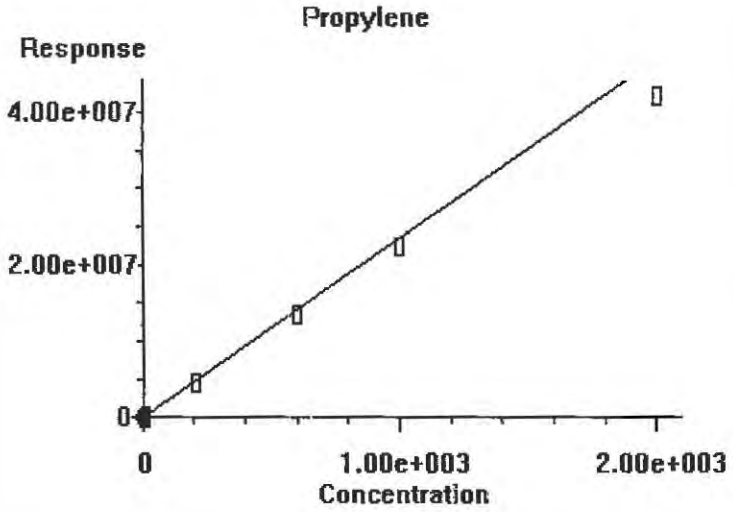
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3782.537646
2	0.302000	6933.285530
3	1.510000	39139.518208
4	4.530000	112341.896872
5	10.570000	248003.903623
6	200.000000	4504060.086084
7	600.000000	13569342.761419
8	1000.000000	22494887.720990
9	2000.000000	42124689.656800
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

00945734

Edit Compounds -- Compound #10 -- Propane

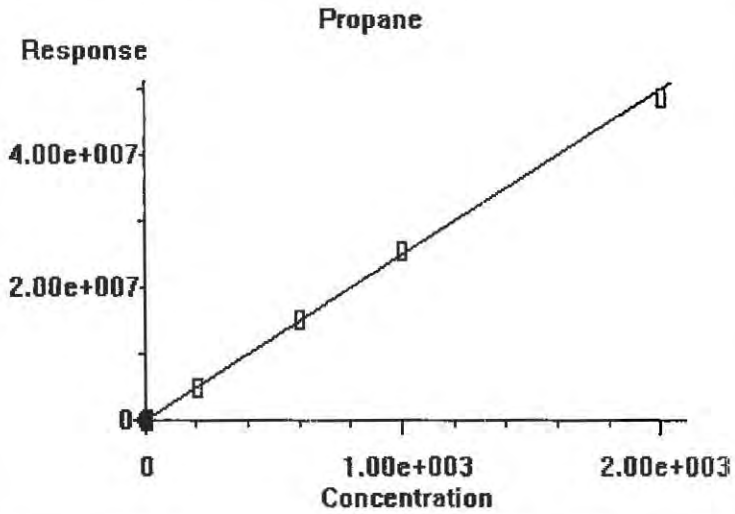
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3682.897354
2	0.302000	6894.237803
3	1.510000	39934.166792
4	4.530000	115723.428128
5	10.570000	257124.432806
6	200.000000	5043035.663916
7	600.000000	15251325.797404
8	1000.000000	25459410.657938
9	2000.000000	48583085.287451
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

00945735

Calibration Status Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.767	373920	0.128	ppm	
2)	Carbon monoxide	1.767	373920	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	1.595	2622	0.156	ppm	
8)	Ethane	1.848	2690	0.156	ppm	
9)	Propylene	4.222	3783	0.154	ppm	
10)	Propane	4.348	3683	0.139	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.582f	6058	NoCal	ppm	
13)	n-Butane	6.582f	6058	NoCal	ppm	

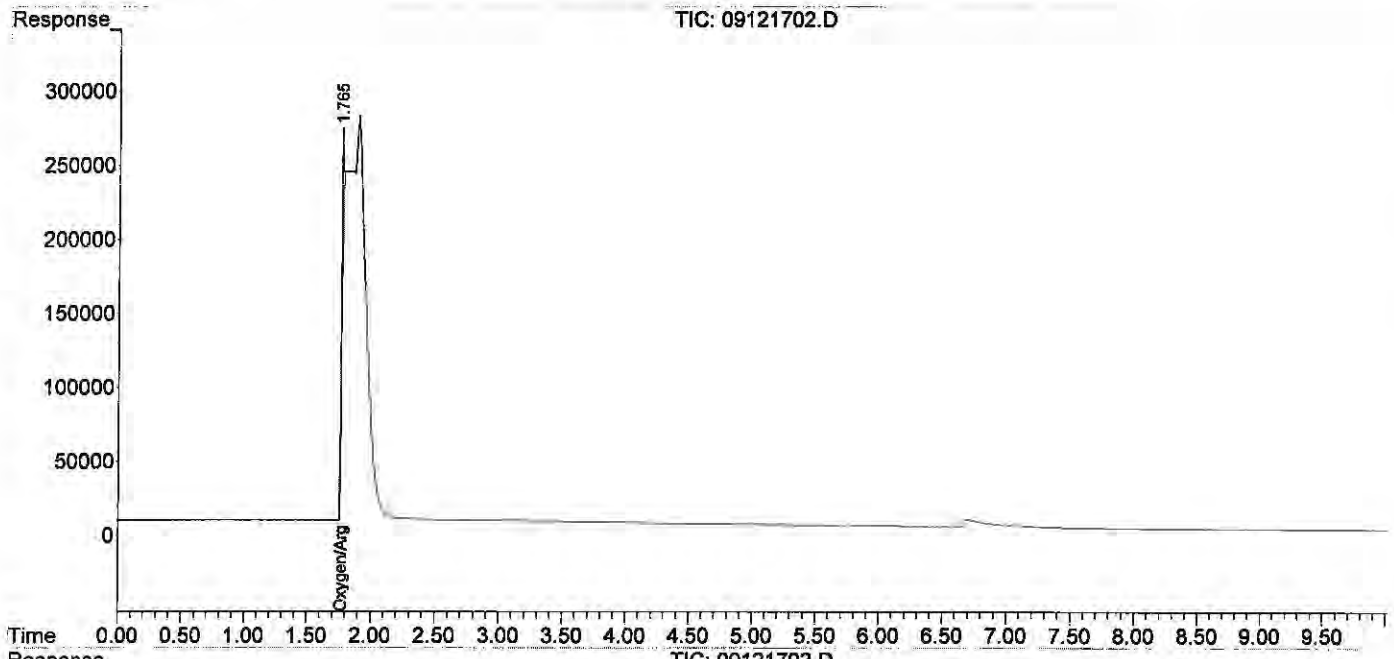
(f)=RT Delta > 1/2 Window (m)=manual int.

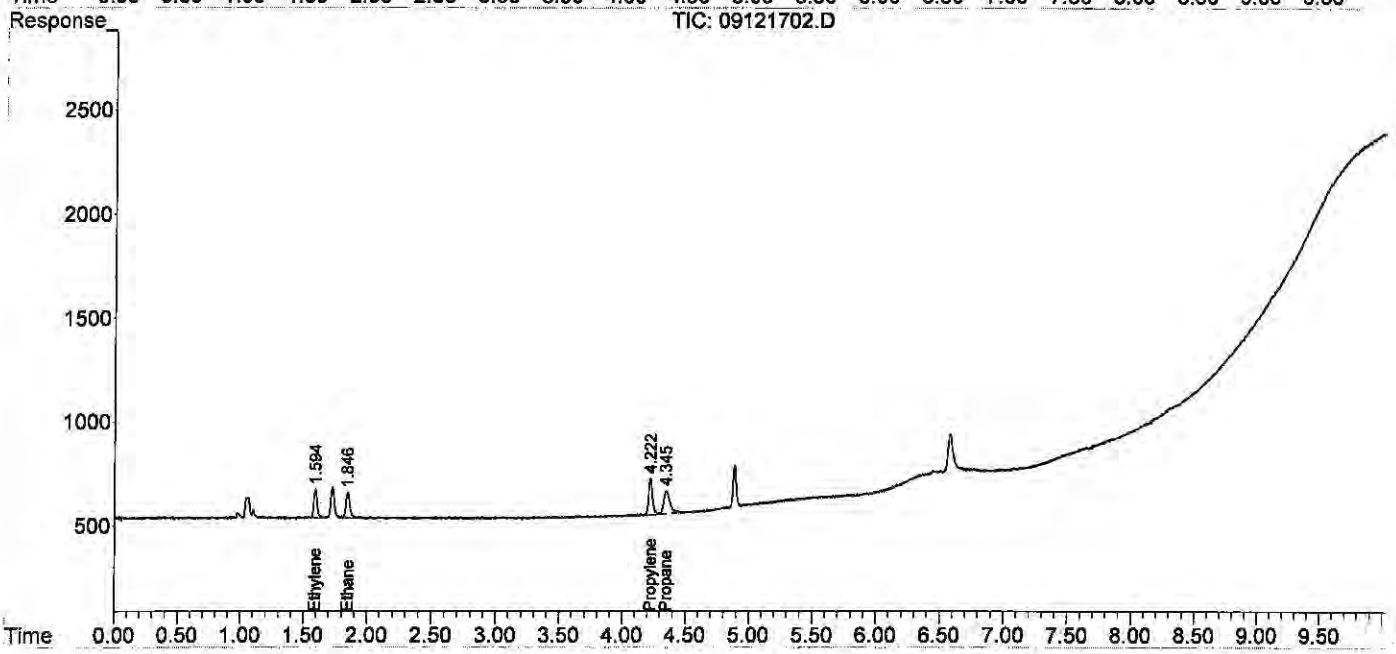
9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





RS091217_R.M Wed Sep 13 14:58:18 2017 Page: 2

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.913f	-25181981	N.D.	ppm	
2)	Carbon monoxide	1.913f	-25181981	1.089	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.049	3564	0.391	ppm	m
7)	Ethylene	1.577	4947	0.292	ppm	
8)	Ethane	1.828	5060	0.293	ppm	
9)	Propylene	4.207	6933	0.281	ppm	
10)	Propane	4.337	6894	0.268	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	9587	0.158	ppm	
13)	n-Butane	6.579f	9587	0.158	ppm	

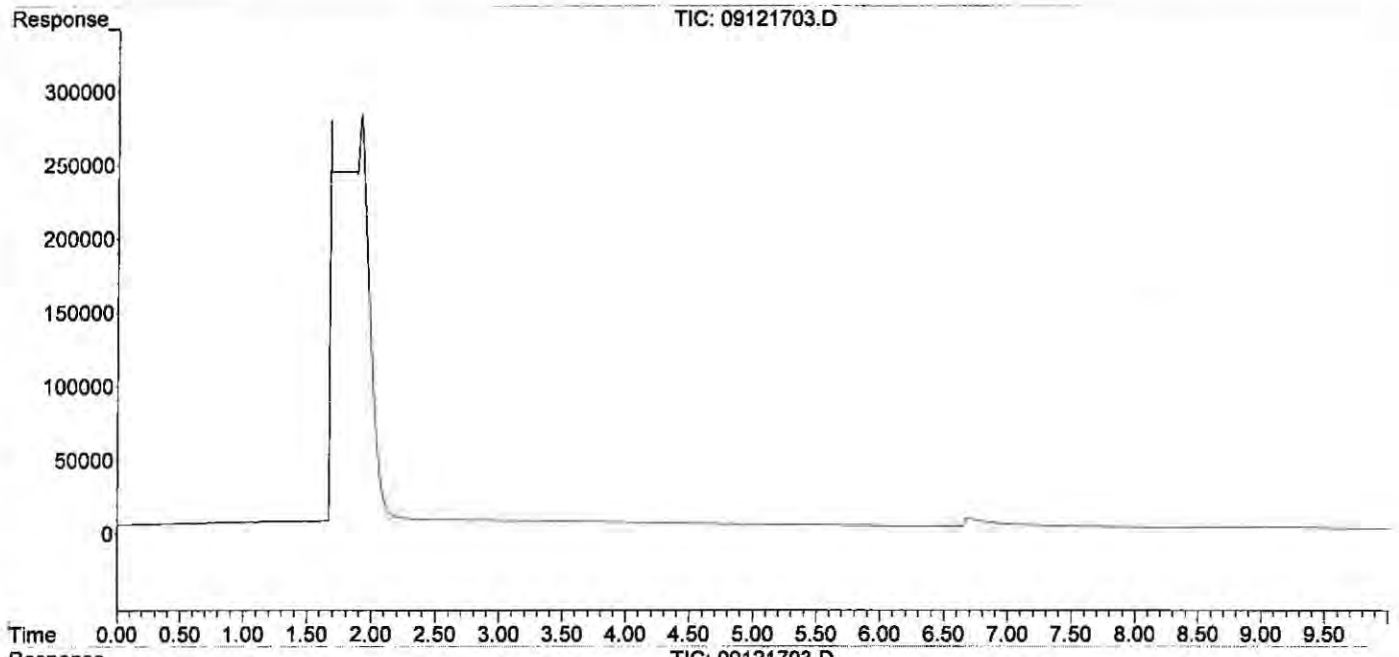
(f)=RT Delta > 1/2 Window (m)=manual int.

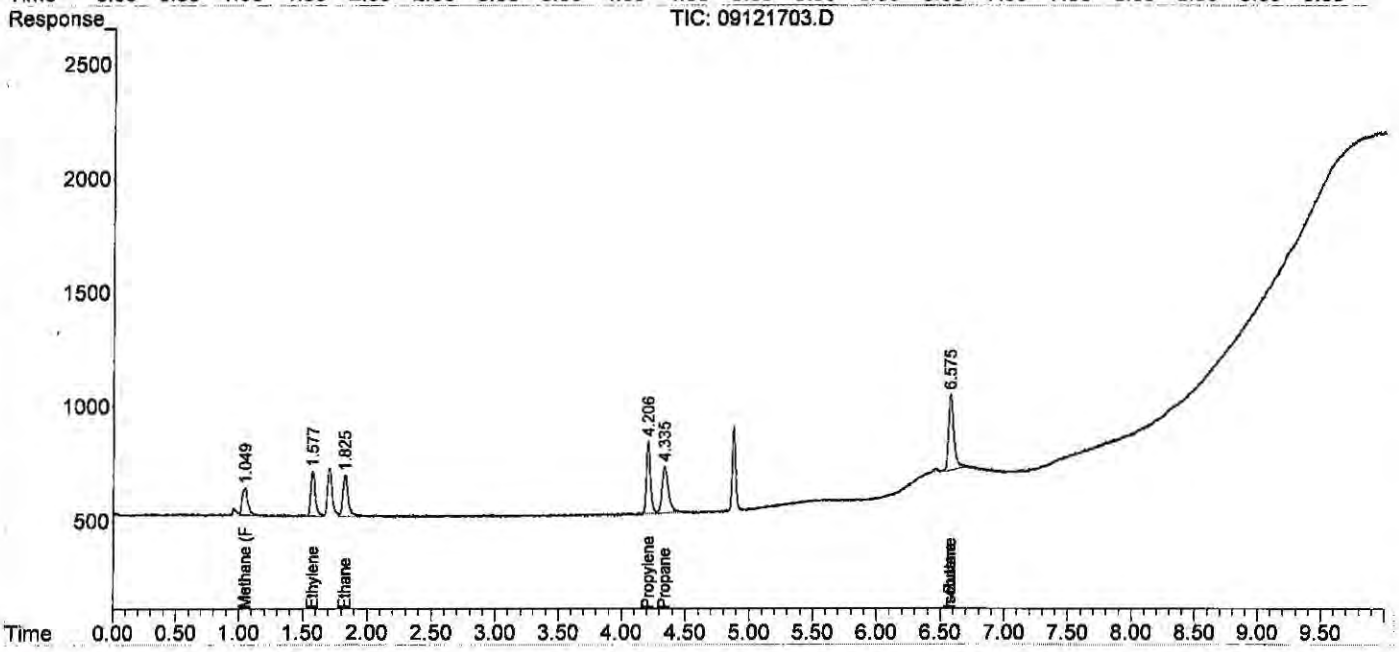
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



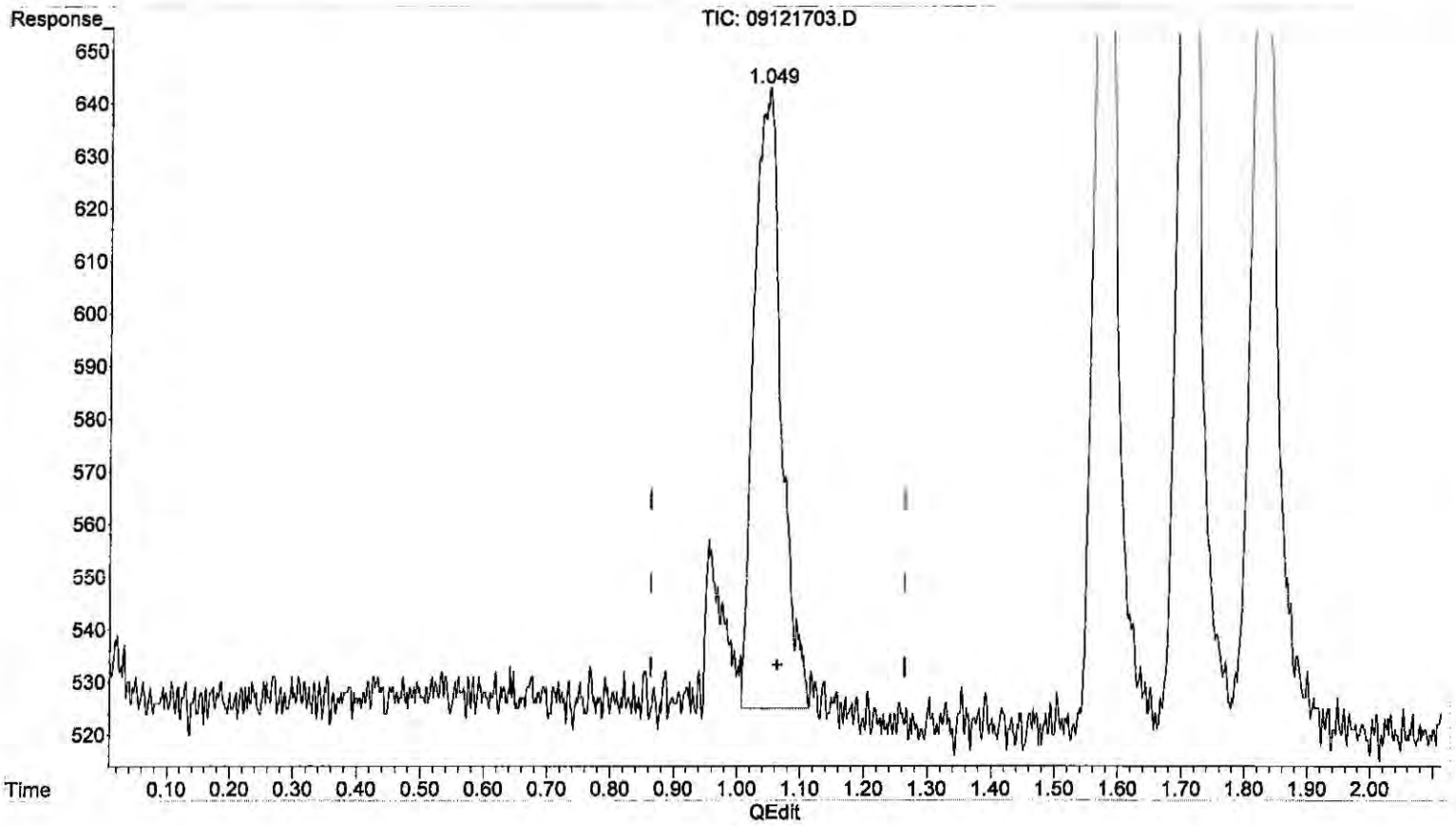


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.049min 0.391 ppm m

response 3564

(+) = Expected Retention Time

RS091217_R.M Wed Sep 13 15:00:03 2017 Page: 1

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

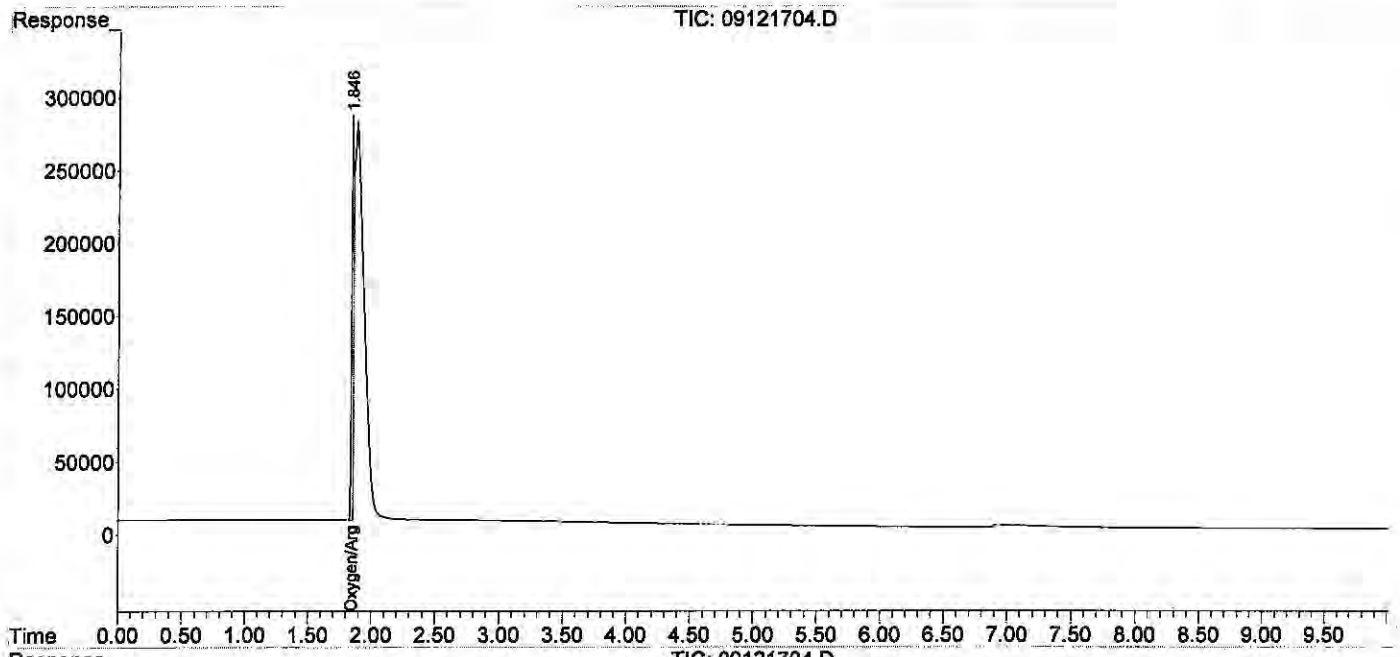
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.847	2536230	1.056	ppm
2)	Carbon monoxide	1.847	2536230	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.064	14725	1.613	ppm
7)	Ethylene	1.598	26885	1.582	ppm
8)	Ethane	1.851	26944	1.555	ppm
9)	Propylene	4.220	39140	1.589	ppm
10)	Propane	4.349	39934	1.596	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	55348	1.020	ppm
13)	n-Butane	6.578f	55348	1.020	ppm

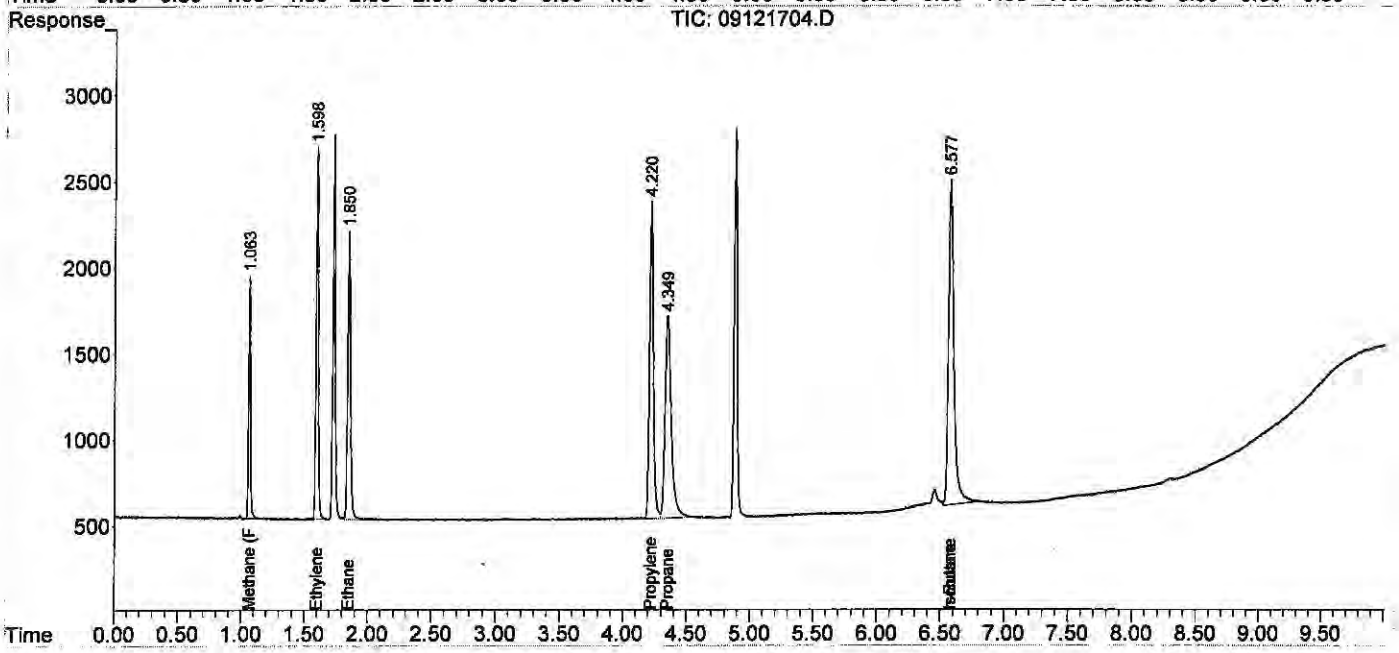
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.738	-331216	N.D.	ppm
2)	Carbon monoxide	1.738	-331216	0.019	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.052	41129	4.522	ppm
7)	Ethylene	1.586	77903	4.637	ppm
8)	Ethane	1.838	78354	4.558	ppm
9)	Propylene	4.218	112342	4.614	ppm
10)	Propane	4.347	115723	4.680	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.580f	155256	3.565	ppm
13)	n-Butane	6.580f	155256	3.565	ppm

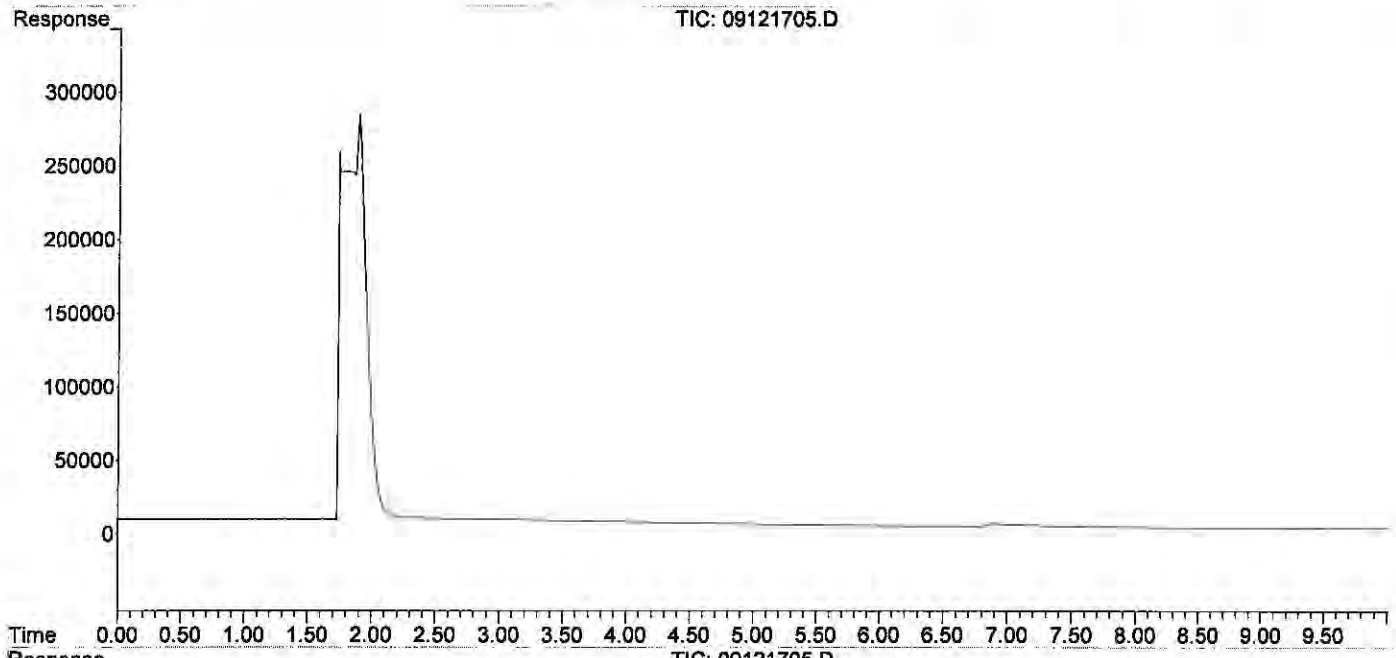
(f)=RT Delta > 1/2 Window (m)=manual int.

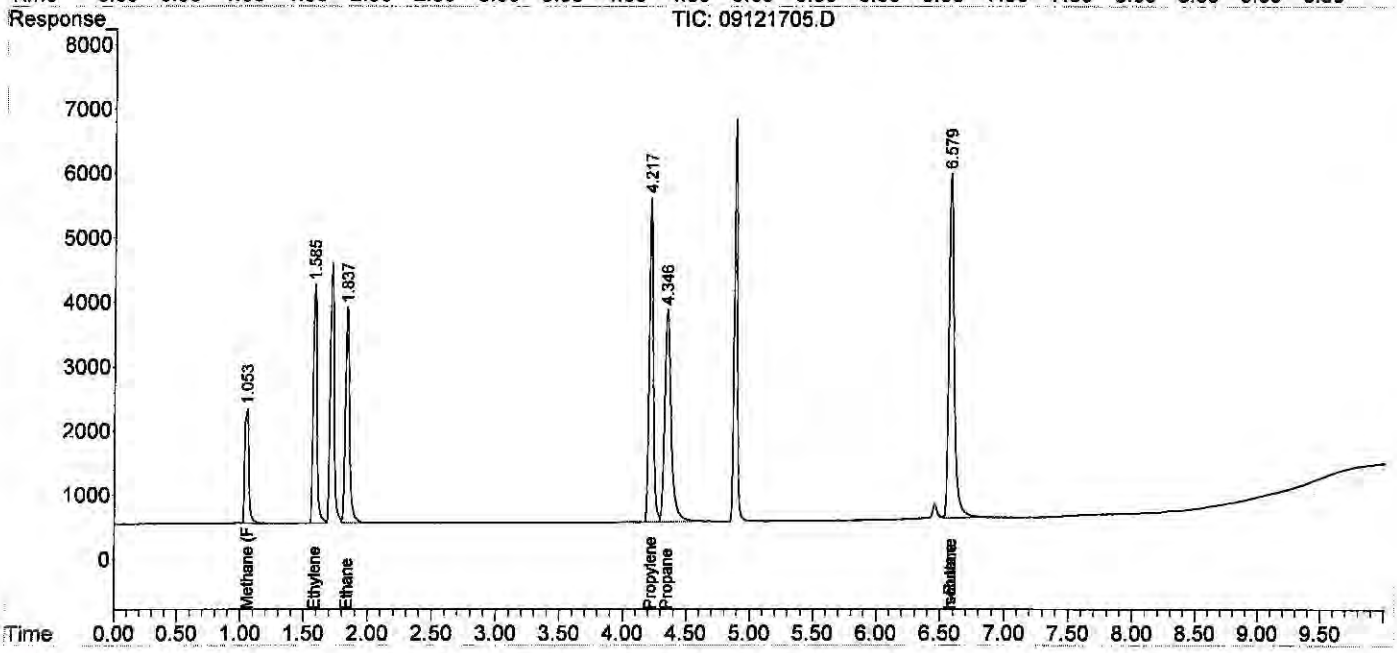
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2)	Carbon monoxide	1.929f	-31871242	1.818	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.025	91967	10.135	ppm
7)	Ethylene	1.568	172086	10.273	ppm
8)	Ethane	1.822	178841	10.441	ppm
9)	Propylene	4.214	248004	10.236	ppm
10)	Propane	4.344	257124	10.458	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	338181	9.254	ppm
13)	n-Butane	6.578f	338181	9.254	ppm

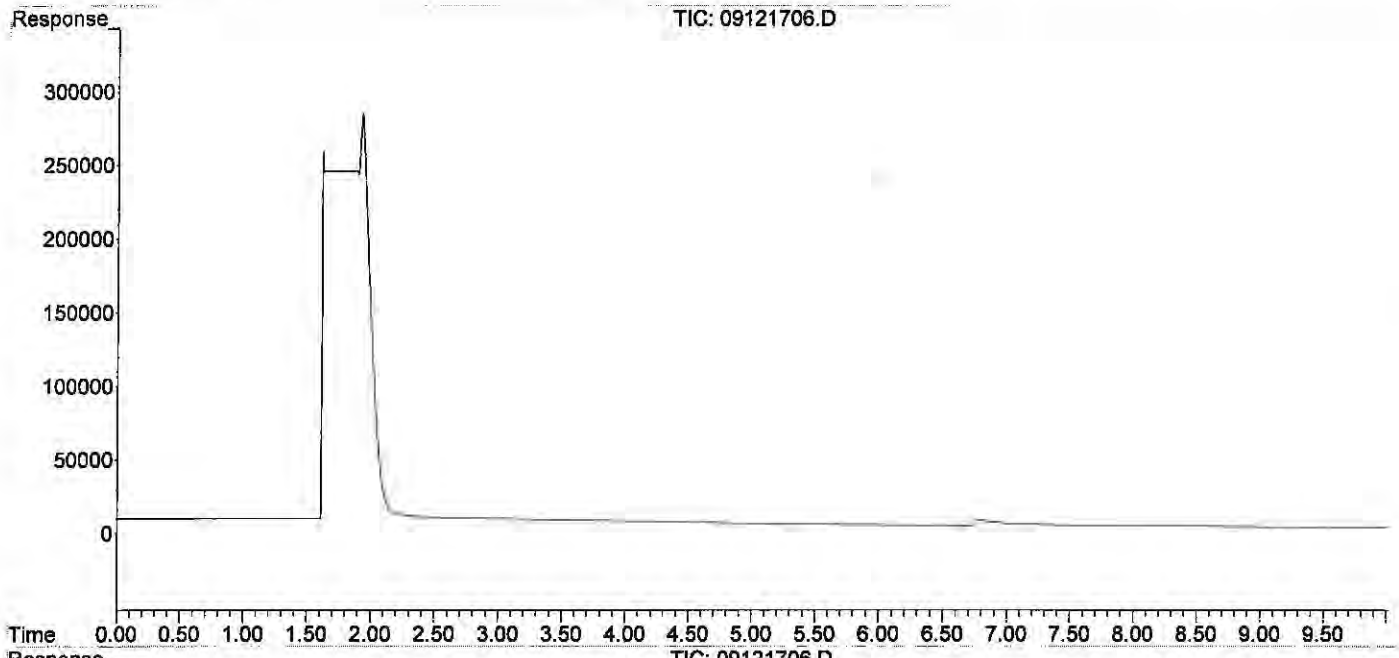
(f)=RT Delta > 1/2 Window (m)=manual int.

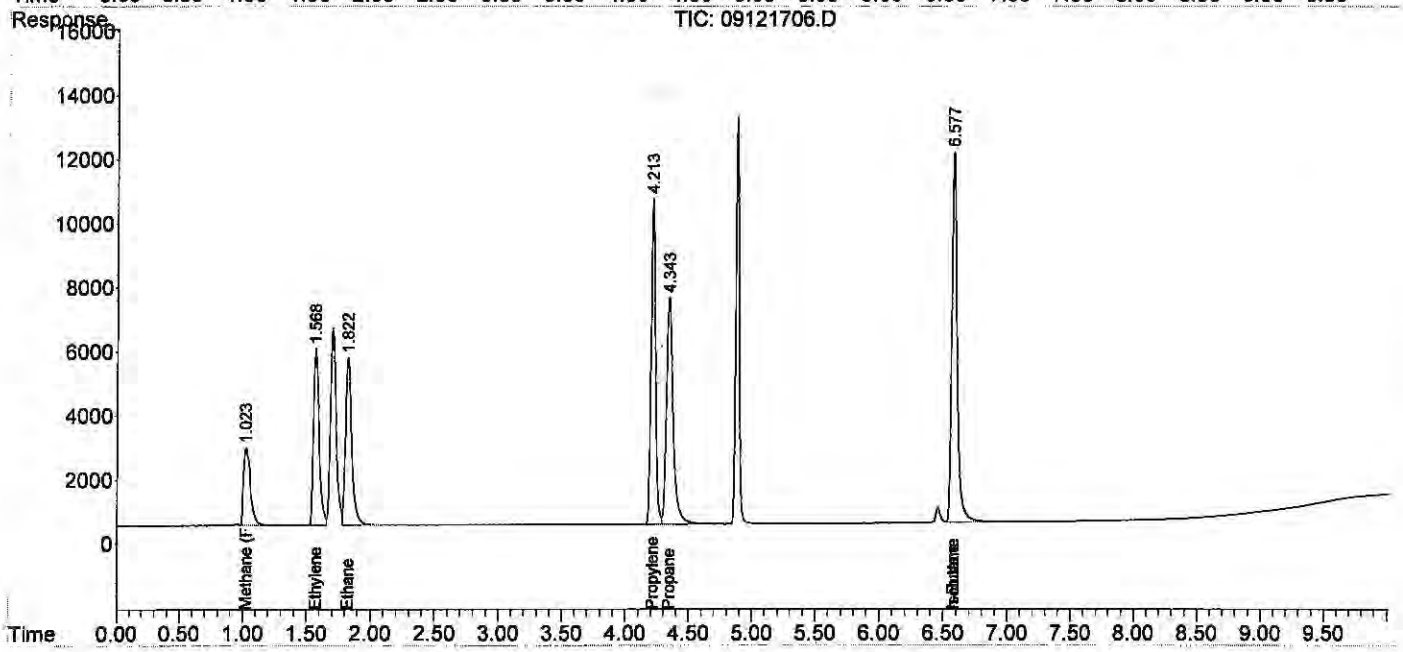
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.897	155286	0.065	ppm
2)	Carbon monoxide	1.897	155286	N.D.	ppm
3)	Methane (TCD)	4.079f	27015	2856.472	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.063	1735997	190.792	ppm
7)	Ethylene	1.597	3339702	198.758	ppm
8)	Ethane	1.849	3350442	194.597	ppm
9)	Propylene	4.201	4504060	185.706	ppm
10)	Propane	4.333	5043036	204.809	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

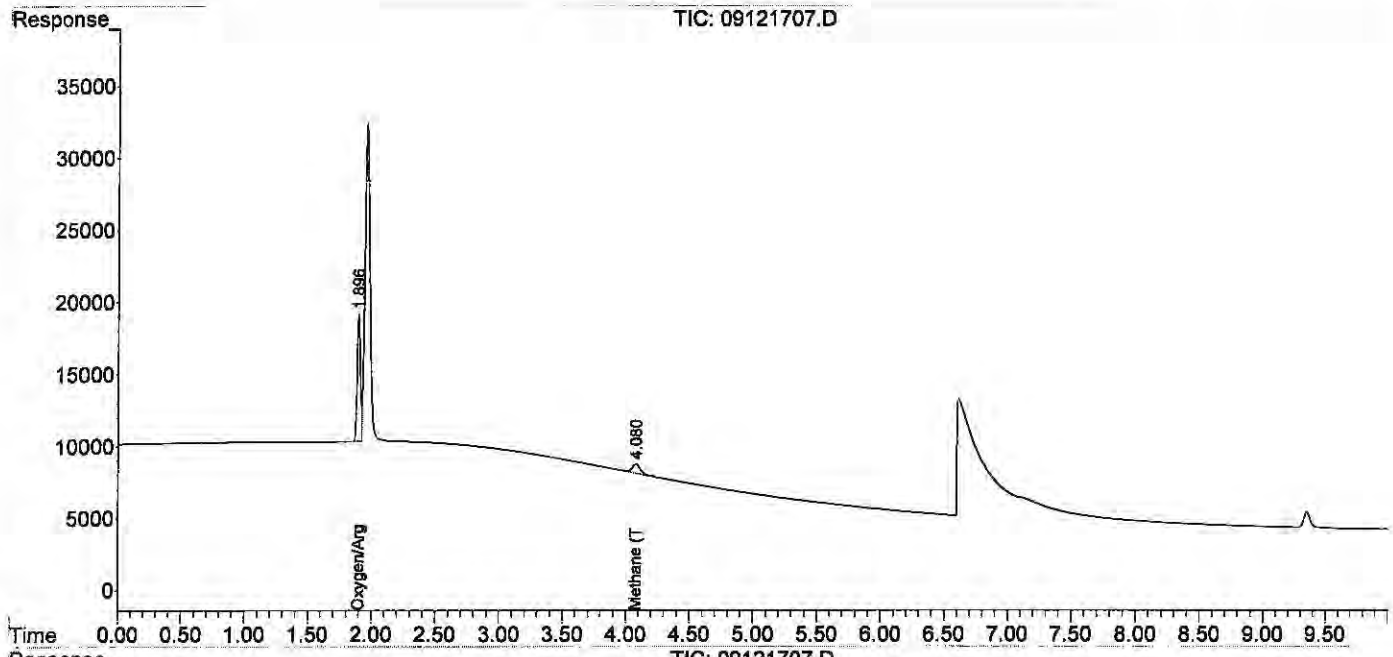
(f)=RT Delta > 1/2 Window (m)=manual int.

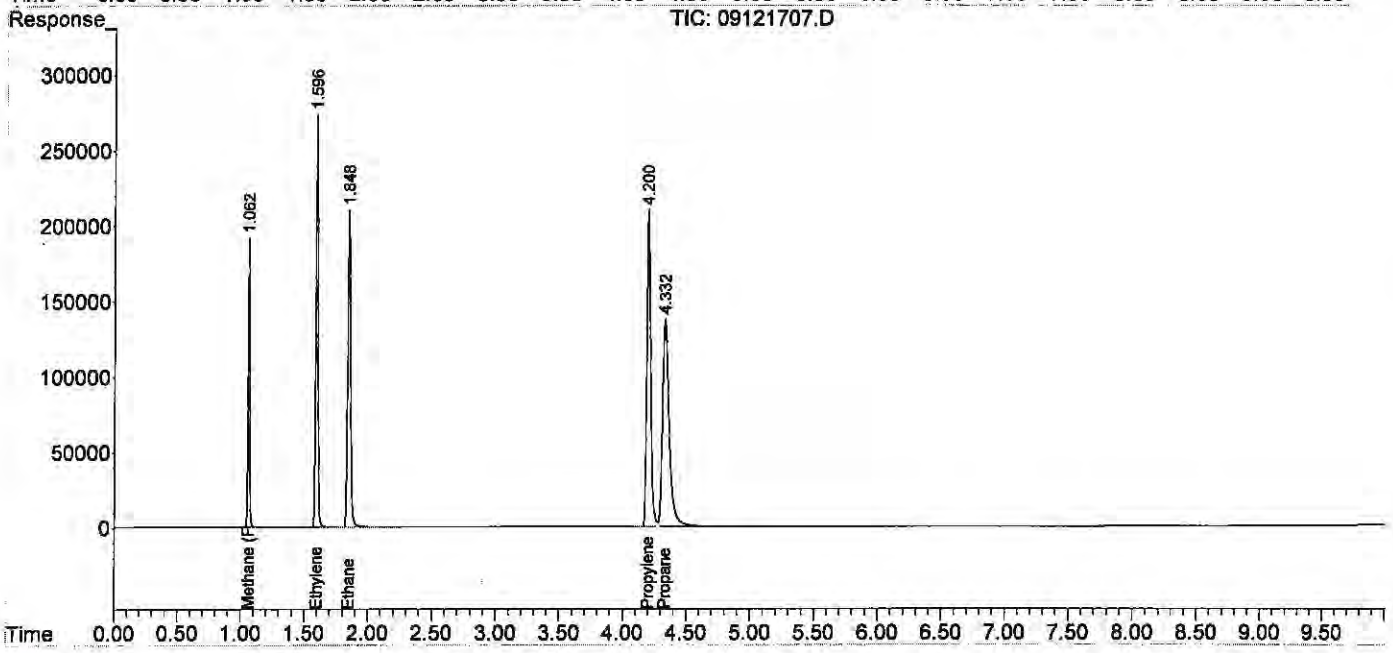
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	196022	0.124	ppm
2)	Carbon monoxide	1.884	196022	N.D.	ppm
3)	Methane (TCD)	4.070f	88282	782.730	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.044	5189849	539.759	ppm
7)	Ethylene	1.573	10007759	590.286	ppm
8)	Ethane	1.822	10048964	583.213	ppm
9)	Propylene	4.160	13569343	562.612	ppm
10)	Propane	4.300	15251326	615.171	ppm
11)	Isobutylene	6.143	9815	NoCal	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

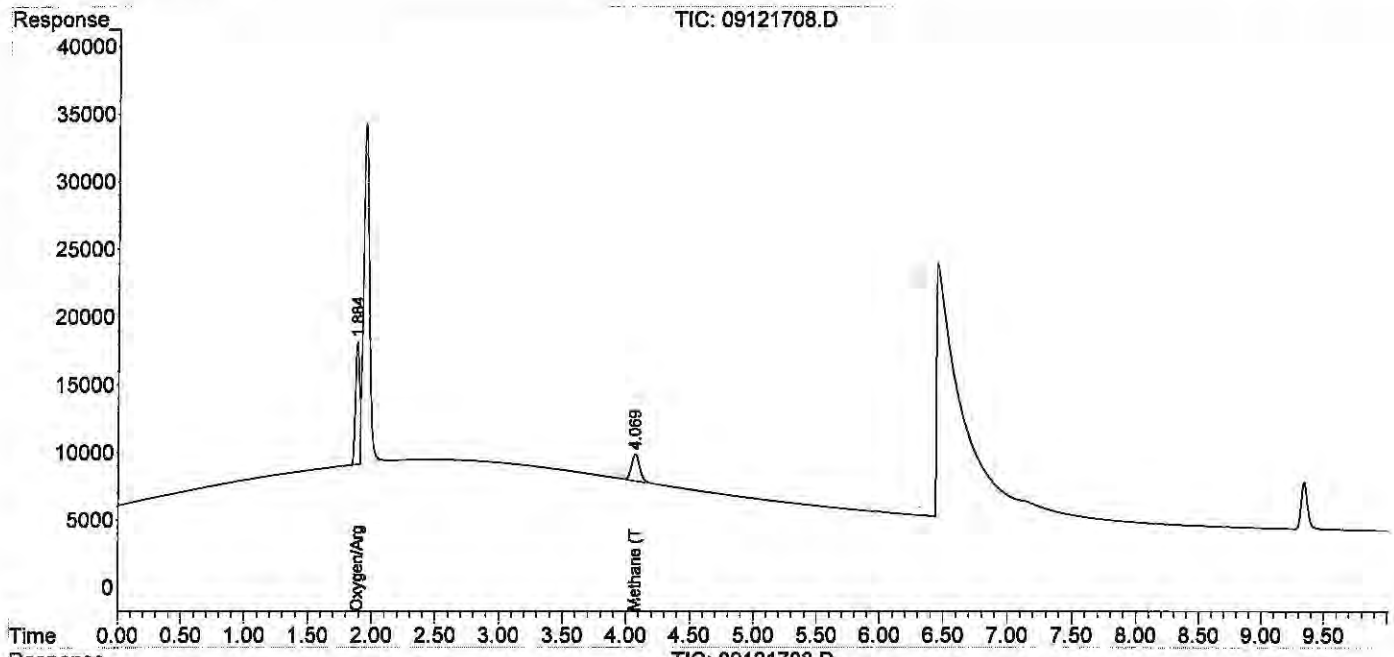
(f)=RT Delta > 1/2 Window (m)=manual int.

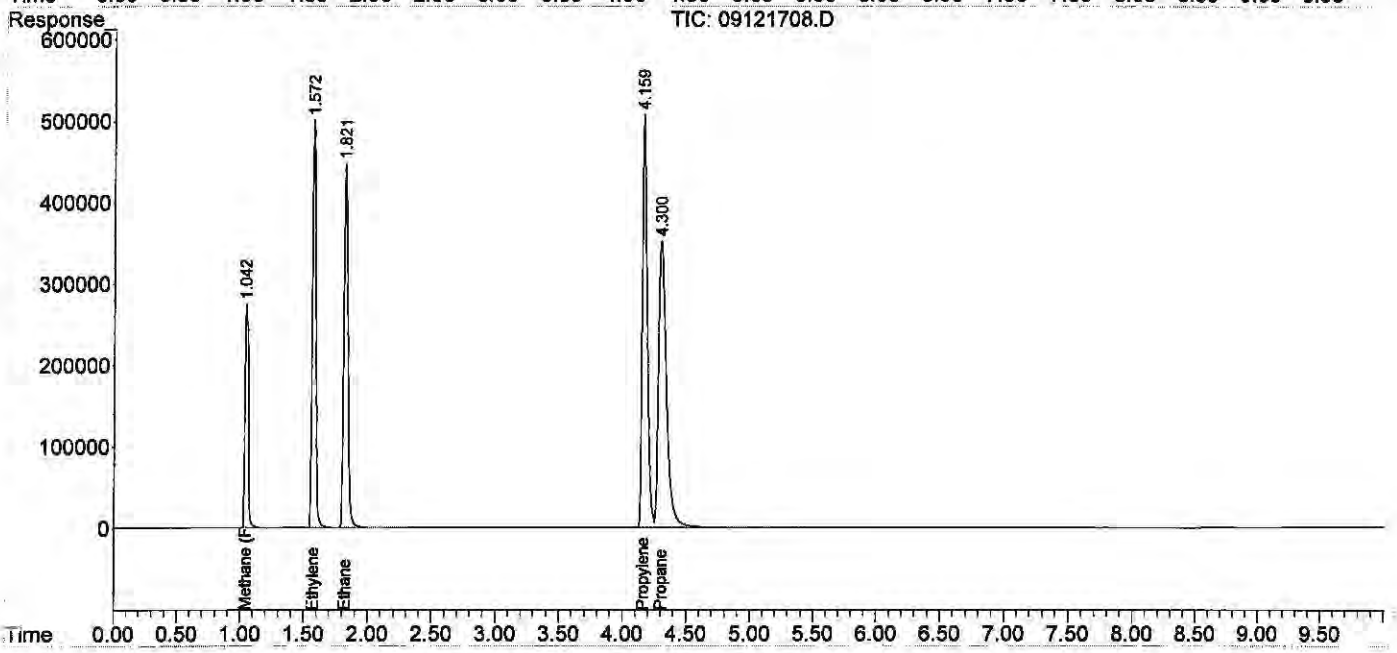
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

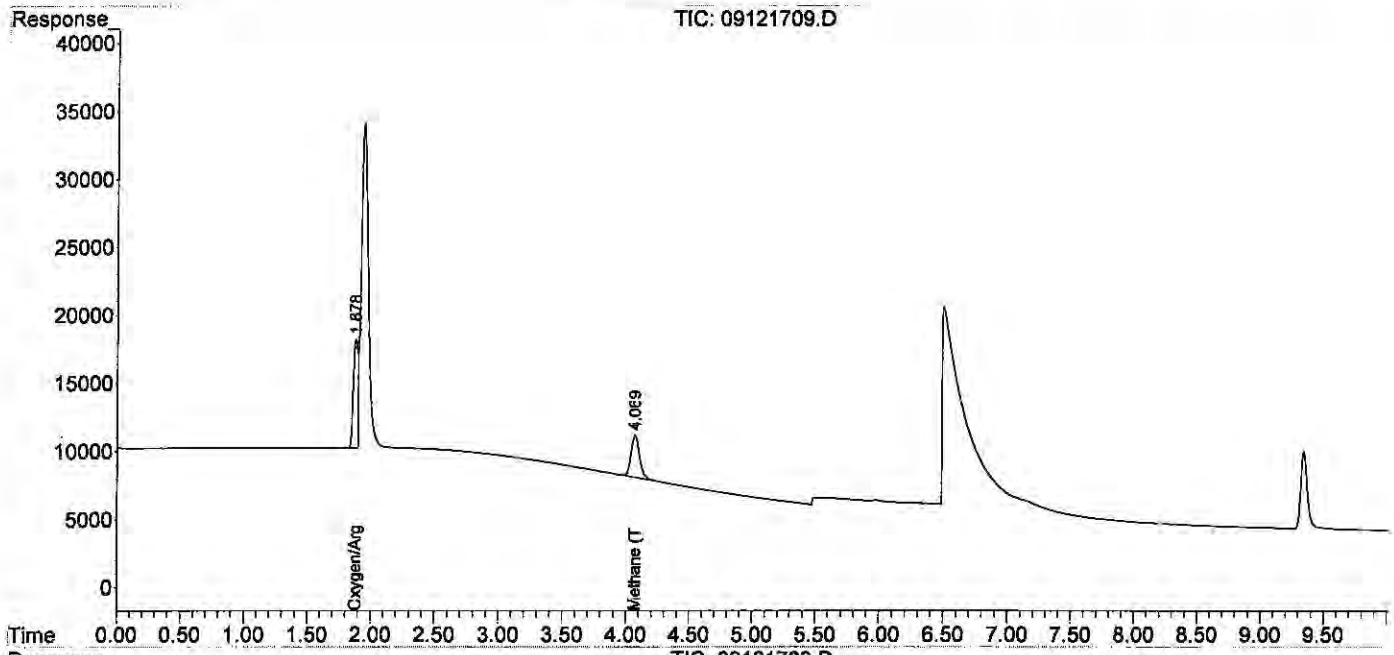
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.879	192611	0.162	ppm
2)	Carbon monoxide	1.879	192611	N.D.	ppm
3)	Methane (TCD)	4.070f	145492	1244.729	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.039	8598534	945.644	ppm
7)	Ethylene	1.576	16608504	981.887	ppm
8)	Ethane	1.827	16709165	973.644	ppm
9)	Propylene	4.161	22494888	941.060	ppm
10)	Propane	4.298	25459411	1023.223	ppm
11)	Isobutylene	6.138	16970	8645.243	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

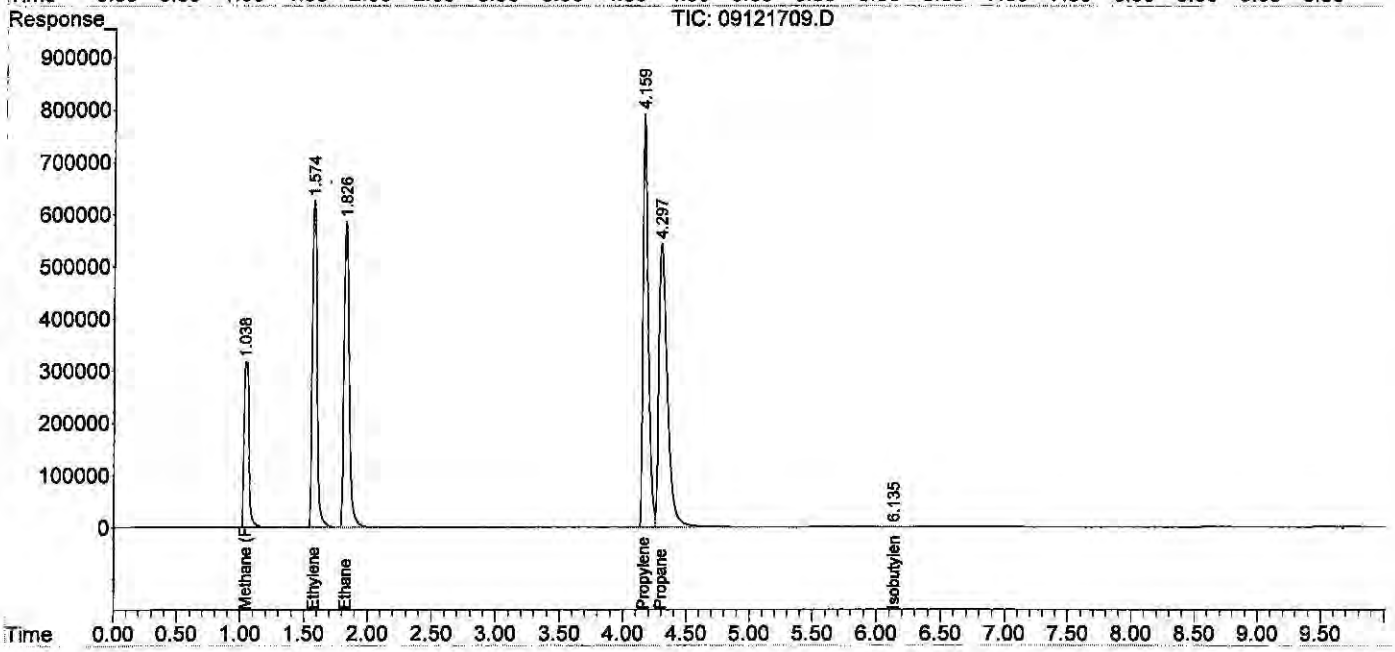
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.922f	1578147	1.659	ppm	
2)	Carbon monoxide	1.922f	1578147	N.D.	ppm	
3)	Methane (TCD)	4.057f	281651	3526.607	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.016	16098209	1763.622	ppm	
7)	Ethylene	1.552	31192444	1848.268	ppm	
8)	Ethane	1.801	31424218	1837.143	ppm	
9)	Propylene	4.129	42124690	1775.341	ppm	m
10)	Propane	4.269	48583085	1946.921	ppm	
11)	Isobutylene	6.136	33832	25613.603	ppm	
12)	Isobutane	6.576f	3845	0.120	ppm	
13)	n-Butane	6.576f	3845	0.120	ppm	

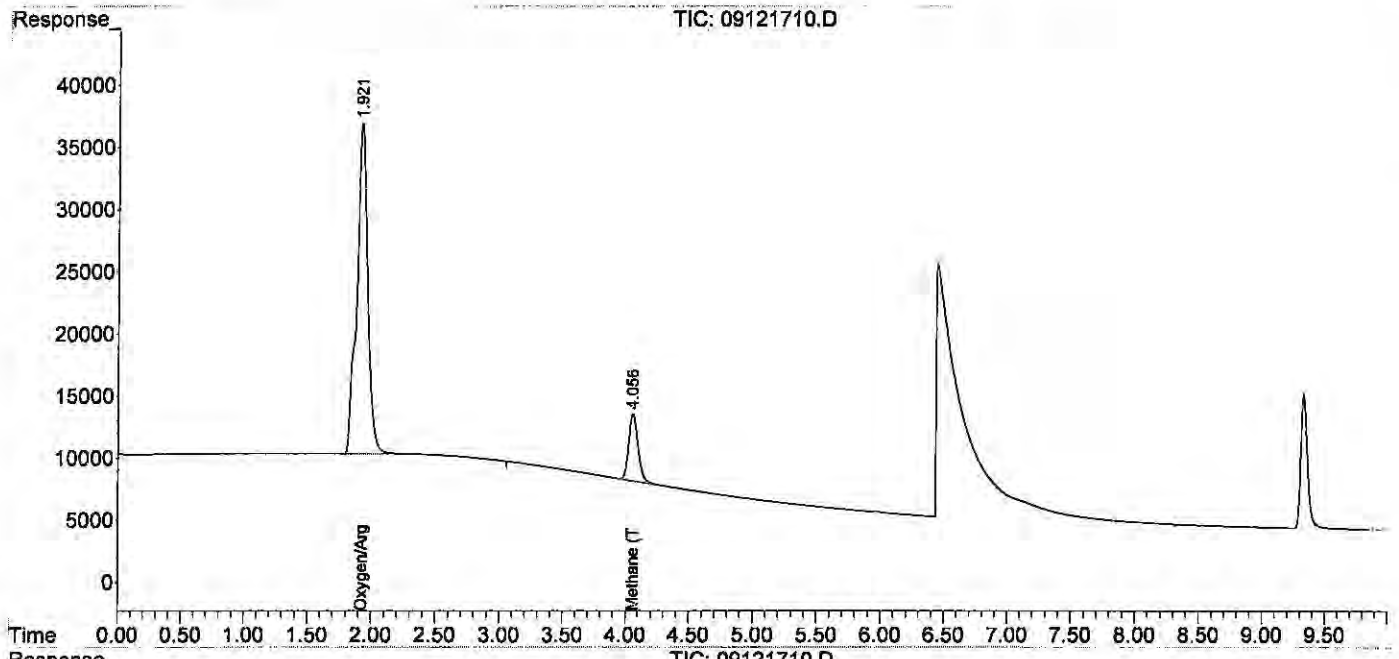
(f)=RT Delta > 1/2 Window (m)=manual int.

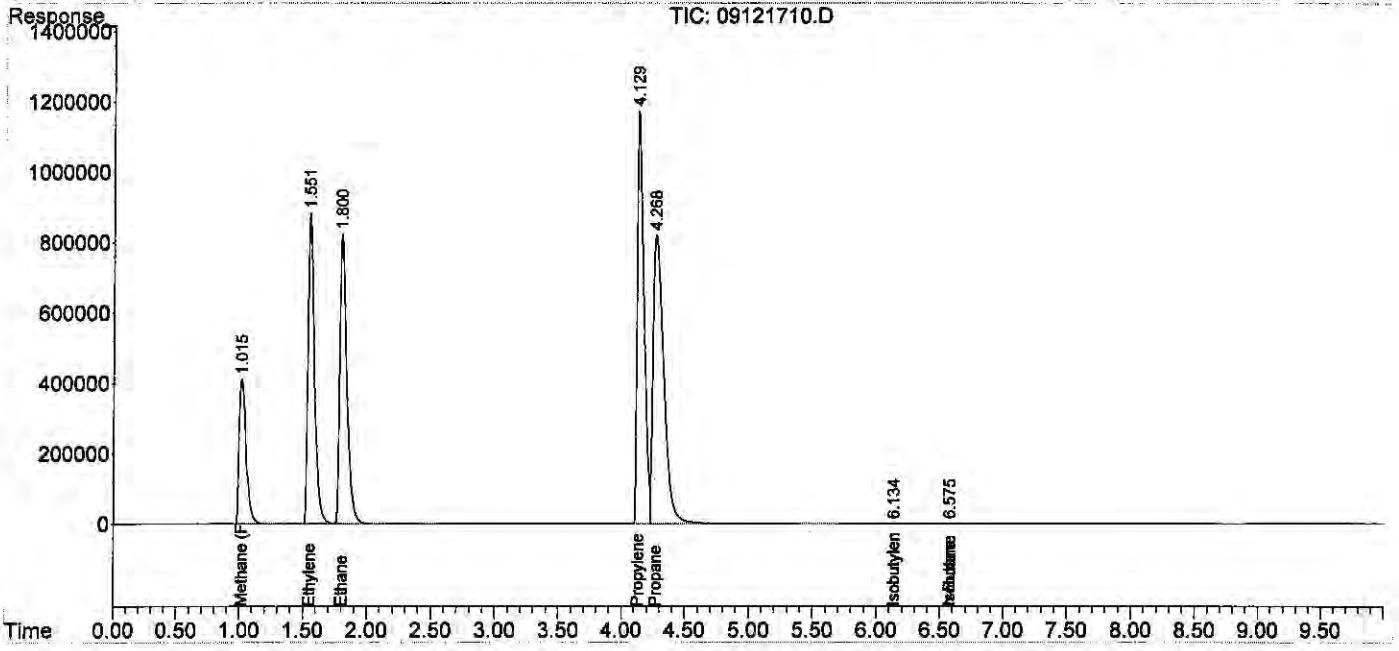
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



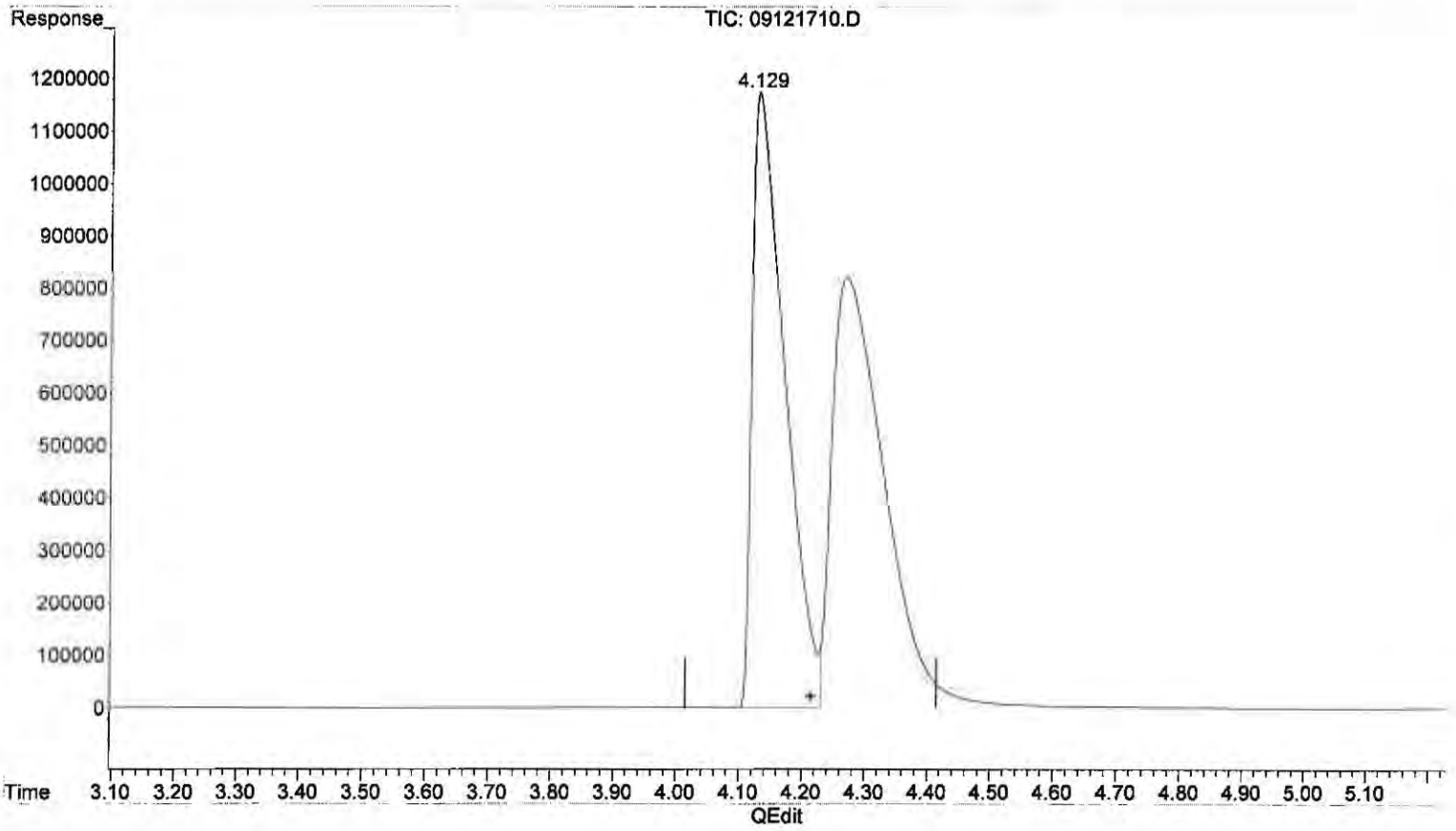


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(9) Propylene
4.129min 1775.341 ppm m
response 42124690

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

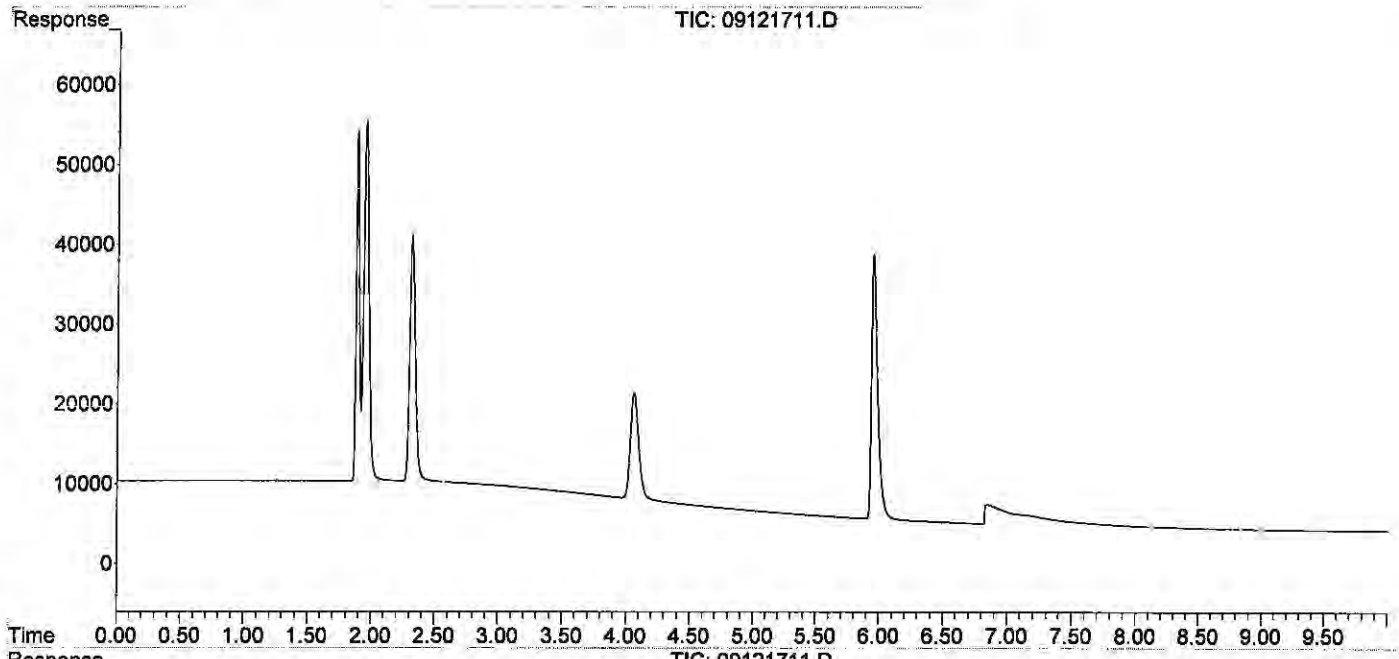
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.059	35776839	3925.122	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

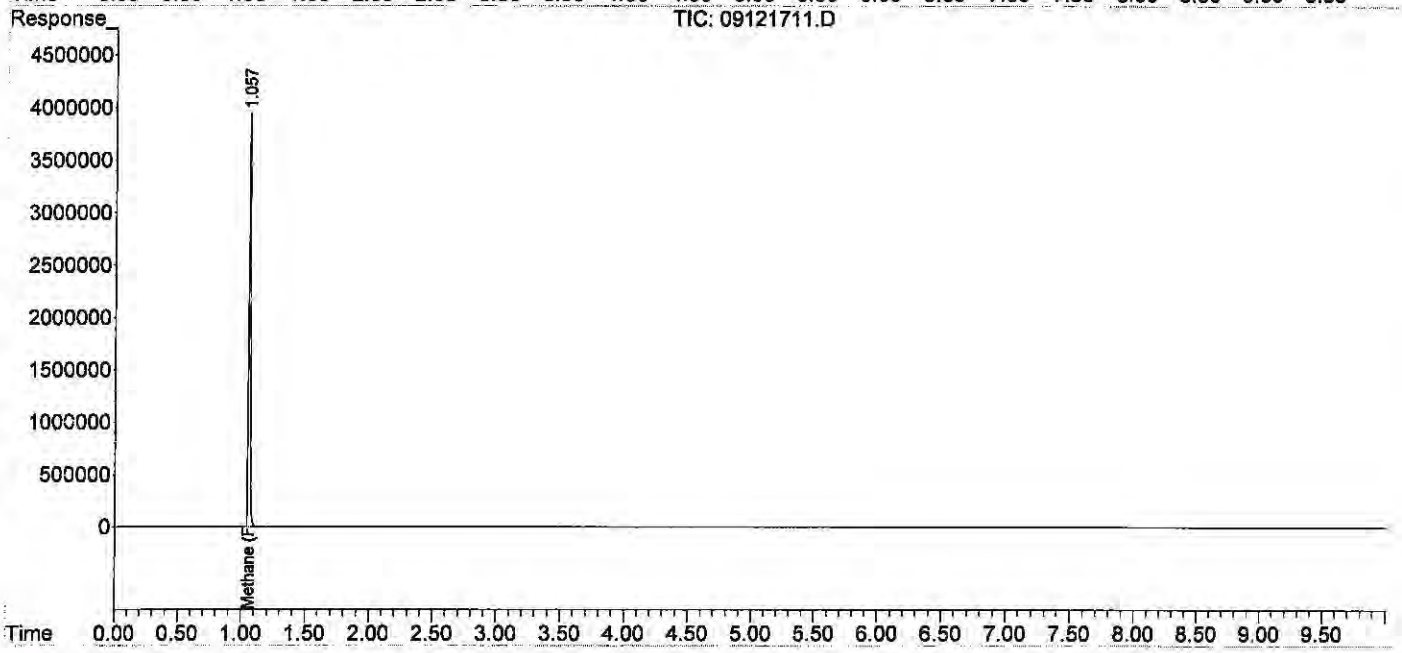
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

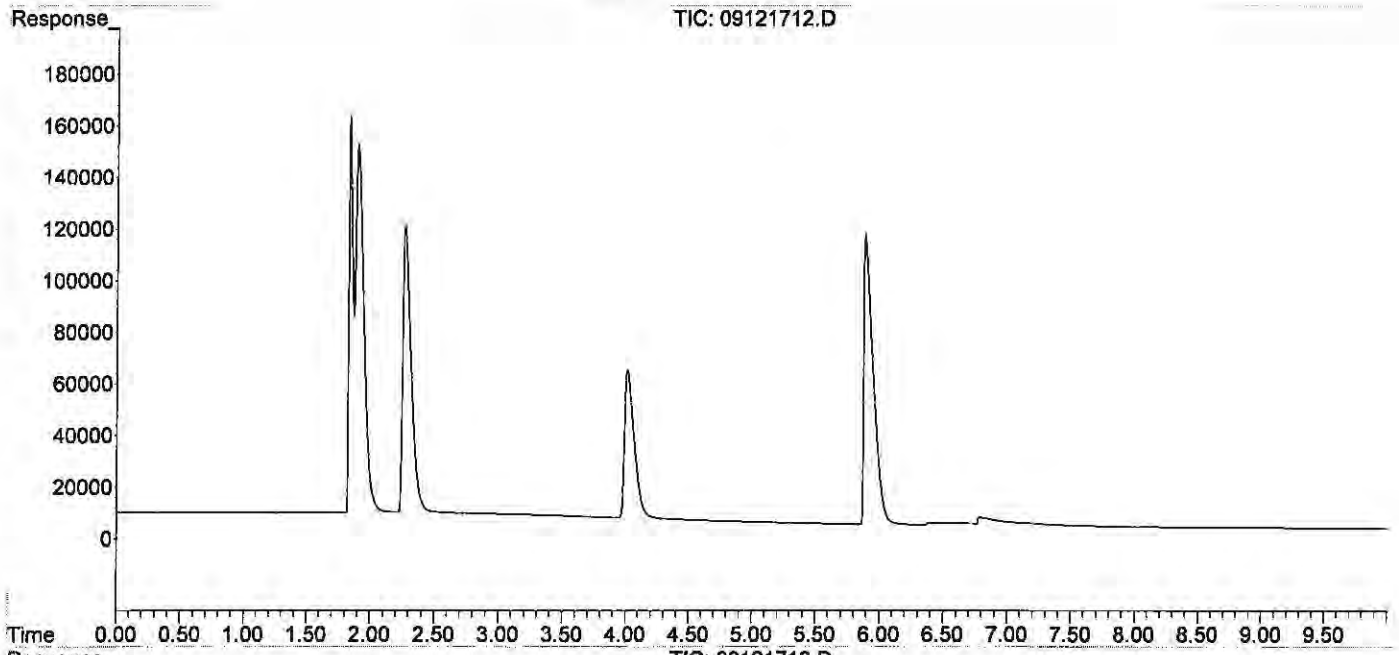
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.836	3190788	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.034	169009160	18492.064	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

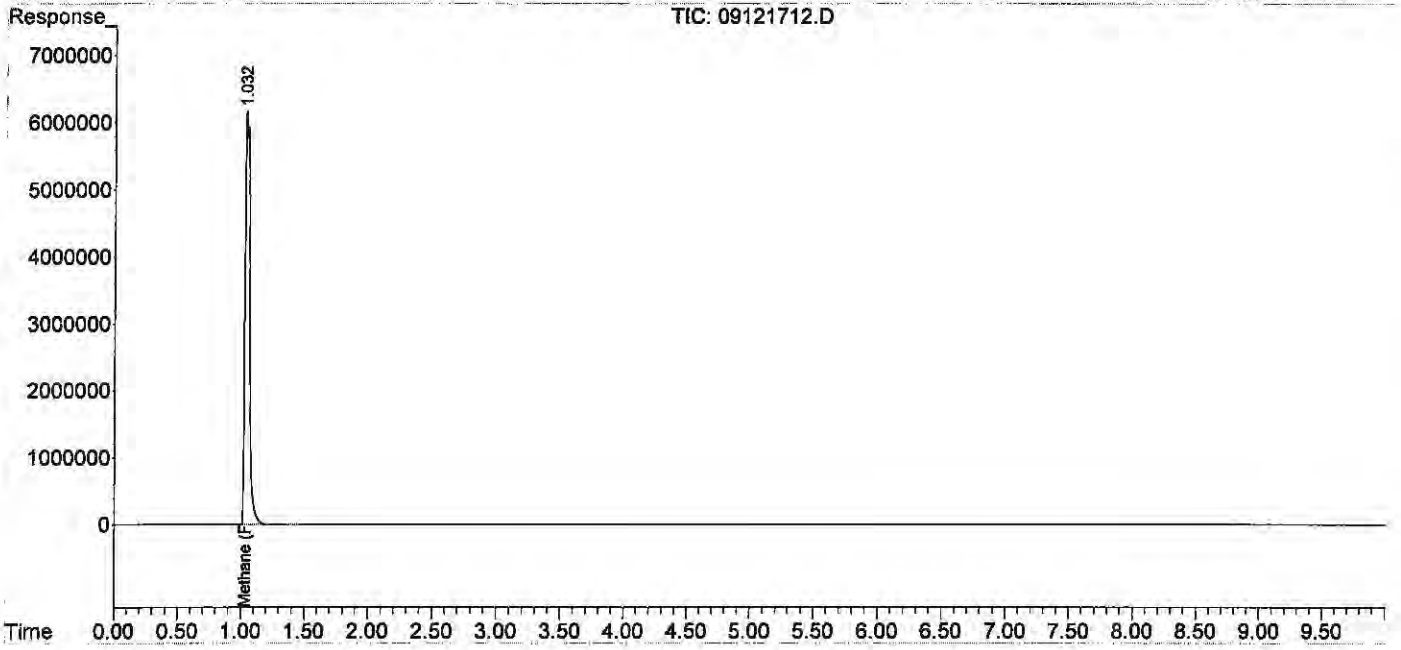
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.843	2922459	3.687	ppm	
2)	Carbon monoxide	1.843	2922459	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	actual %D
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.063	13748	1.516	ppm	1.50 101.1
7)	Ethylene	1.598	24153	1.443	ppm	1.50 96.2
8)	Ethane	1.850	24488	1.445	ppm	1.50 96.3
9)	Propylene	4.221	36004	1.537	ppm	1.50 102.5
10)	Propane	4.350	37738	1.517	ppm	1.51 100.5
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	48019	1.804	ppm	9/14/2
13)	n-Butane	6.579f	48019	1.804	ppm	

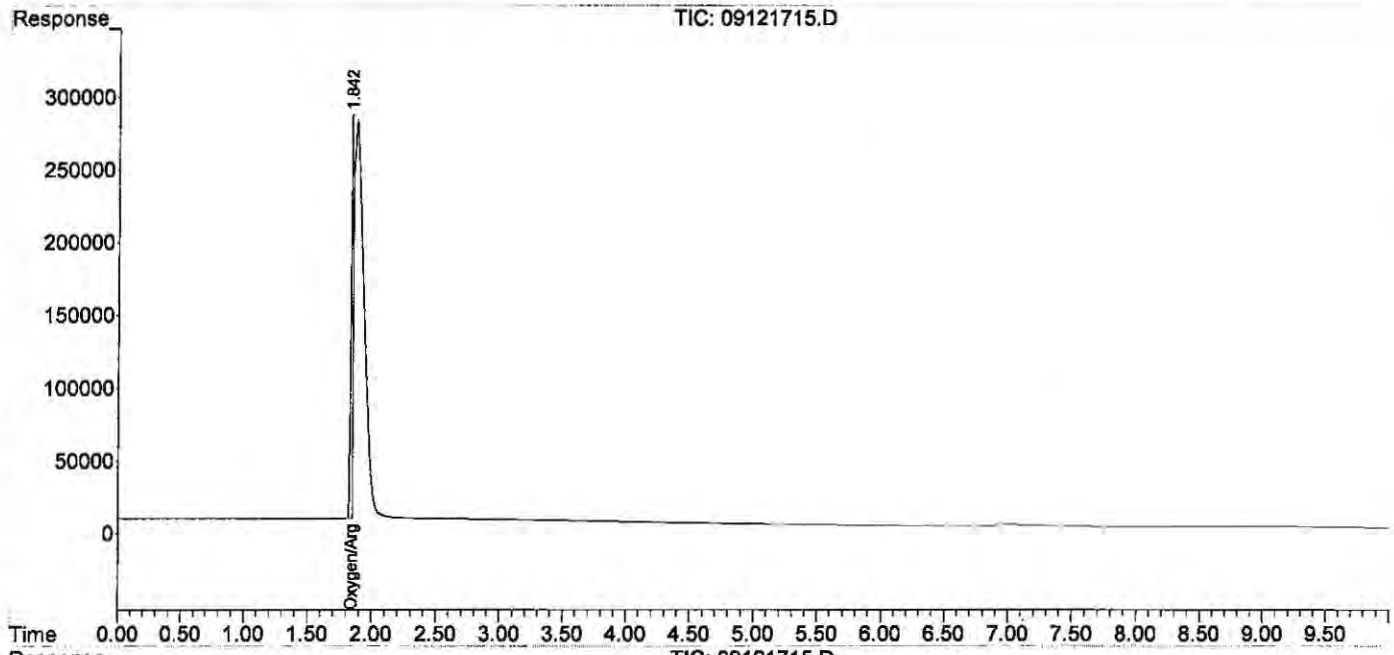
(f)=RT Delta > 1/2 Window (m)=manual int.

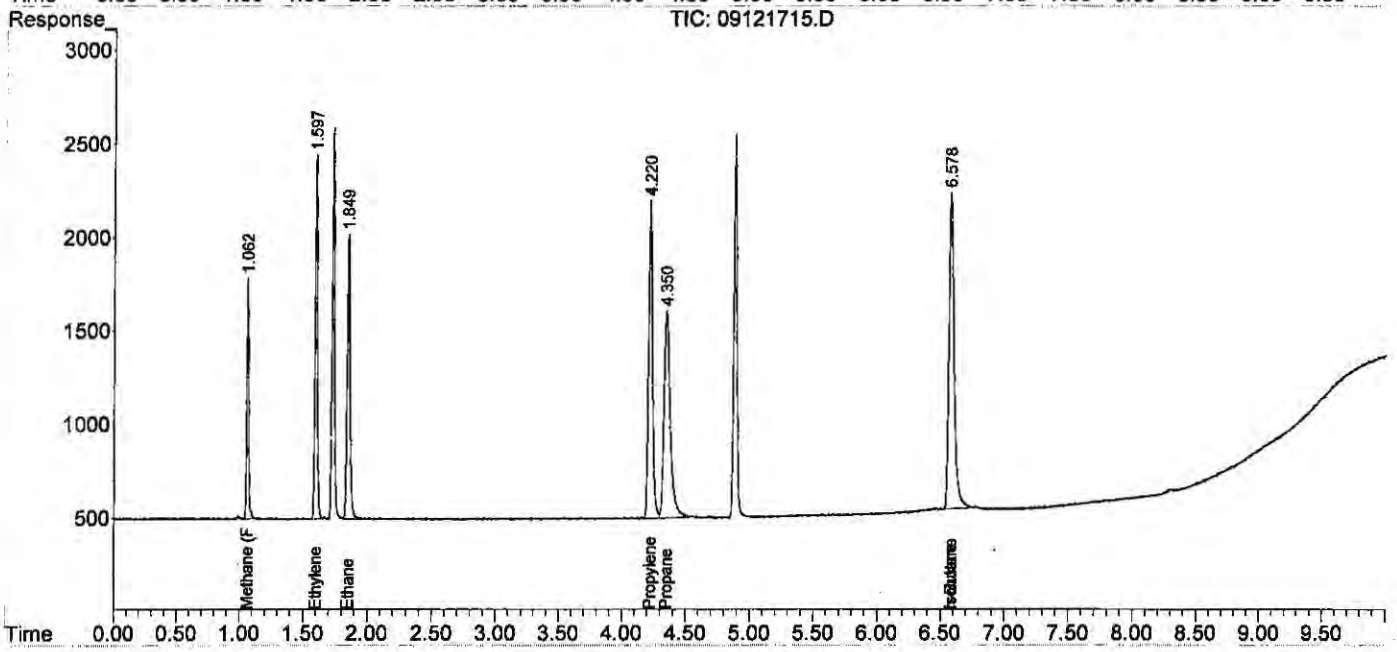
9/14/2017

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P1806863
Sample Vol. (ml) : 32.00 ml
Analyst : MR
Date Analysis : 12/19/18
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Methane	Ethylene	Ethane
std s32-07231801	0.100	1.508	1.430	1.398
ACTUAL		1.51	1.51	1.51
%Difference		0.1%	5.3%	7.4%
mcs 0.1ml	0.100	0.183	0.000	0.000
rb 0.1ml	0.100	0.000	0.000	0.000
fid lcs s30-05241604	0.100	1.457	1.012	1.242
fid lcsd s30-05241604	0.100	1.445	0.998	1.236
P1806863-001 0.1ml	0.100	465.377	0.098	0.000
P1806863-002 0.1ml	0.100	2.902	0.000	0.000
P1806863-003 0.1ml	0.100	538.063	0.000	0.000

FINAL HEAD SPACE RESULT (ppm)

	Methane	Ethylene	Ethane
WWt.	16.04	28.05	30.07
HENRY'S CONSTANT	3.76E+04	1.02E+04	2.63E+04
RL	1.30	1.00	0.60
mcs 0.1ml	1.830	0.000	0.000
fid lcs s30-05241604	14.570	10.120	12.420
fid lcsd s30-05241604	14.450	9.980	12.360
P1806863-001 0.1ml	4653.770	0.980	0.000
P1806863-002 0.1ml	29.020	0.000	0.000
P1806863-003 0.1ml	5380.630	0.000	0.000

std s32-07231801	1.507	1.463	1.442
ACTUAL	1.51	1.51	1.51
%Difference	0.2%	3.1%	4.5%

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 10:38:40
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:45:57 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.116	13675	1.508	ppm
7)	Ethylene	1.679	23933	1.430	ppm
8)	Ethane	1.942	23704	1.398	ppm
9)	Propylene	4.319	33295	1.421	ppm
10)	Propane	4.443	35022	1.408	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.652	44527	1.673	ppm
13)	n-Butane	6.652	44527	1.673	ppm

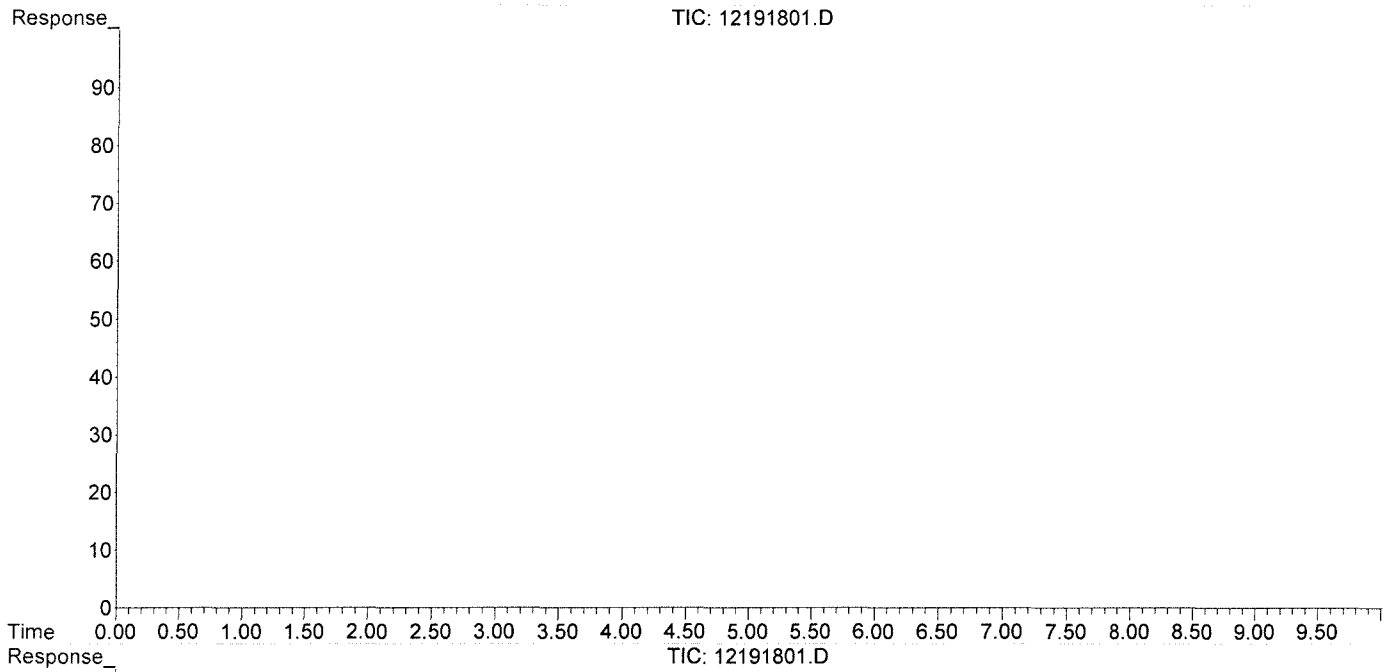
(f)=RT Delta > 1/2 Window (m)=manual int.

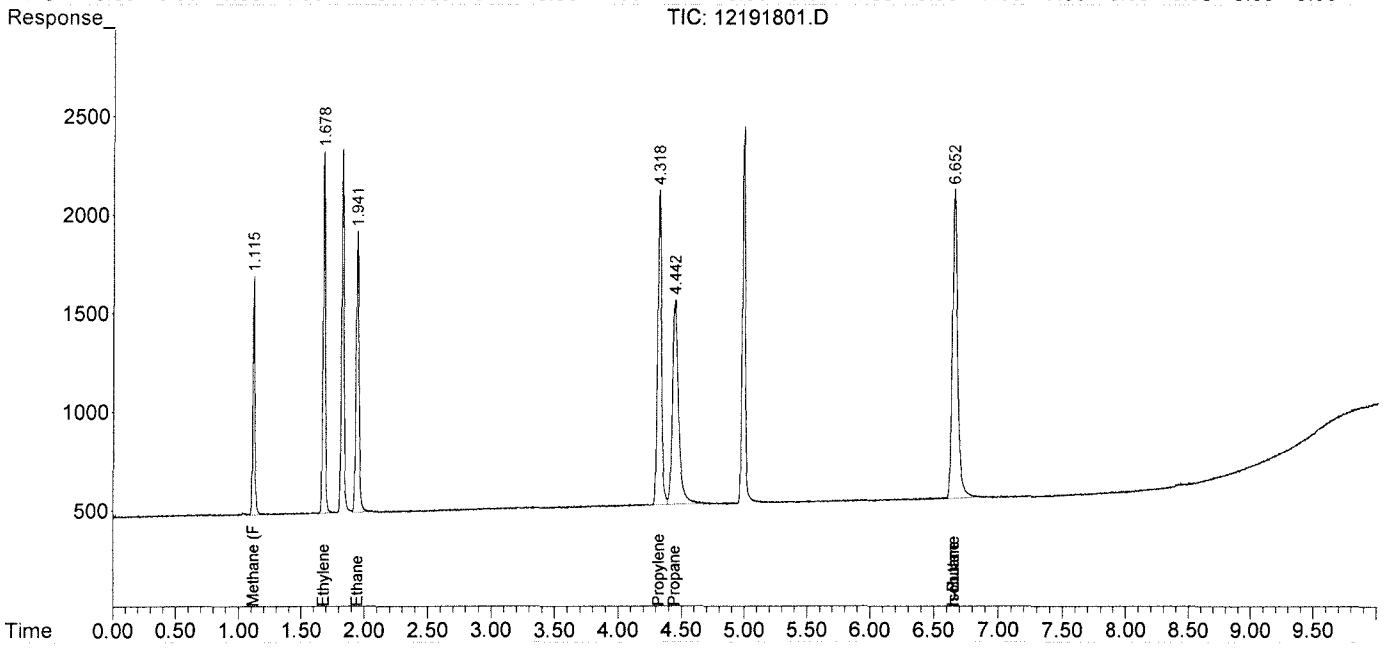
MR 12/20/18

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191801.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 10:38:40
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 11:45:57 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 14:22:31
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 14:35:00 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

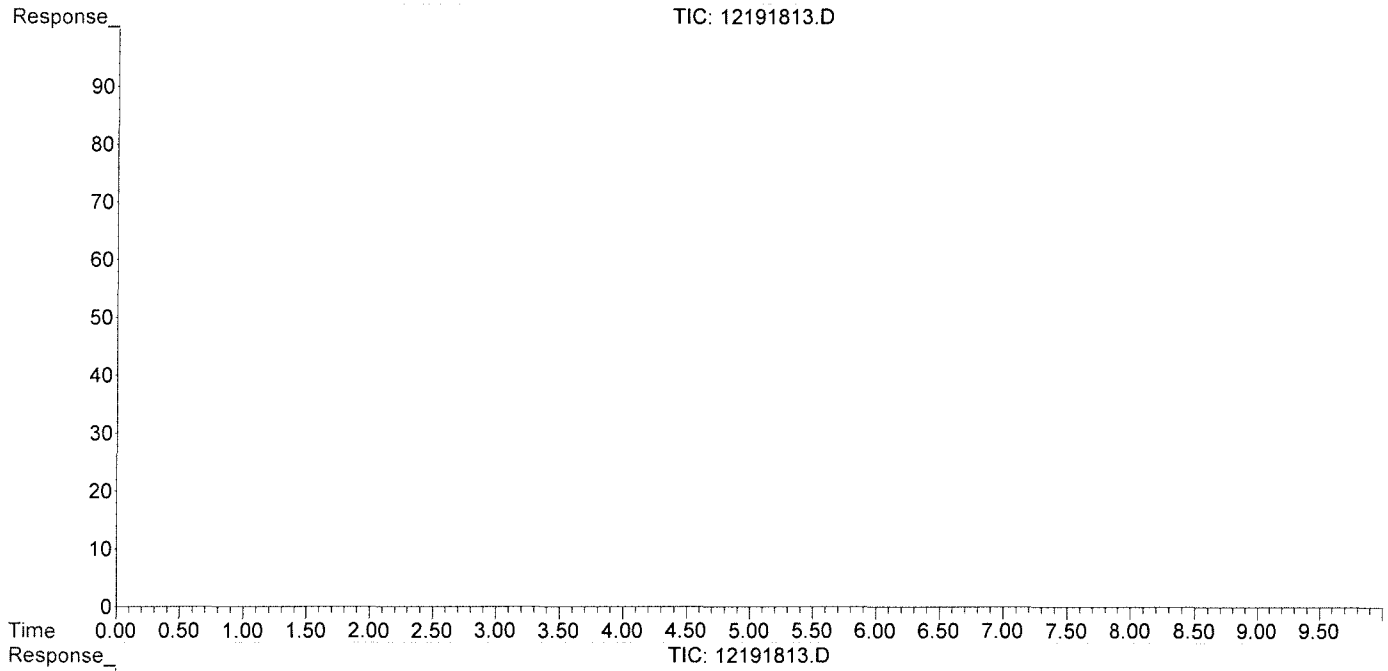
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.115	13669	1.507	ppm
7)	Ethylene	1.673	24477	1.463	ppm
8)	Ethane	1.935	24440	1.442	ppm
9)	Propylene	4.315	34381	1.467	ppm
10)	Propane	4.439	35574	1.430	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.654	44719	1.680	ppm
13)	n-Butane	6.654	44719	1.680	ppm

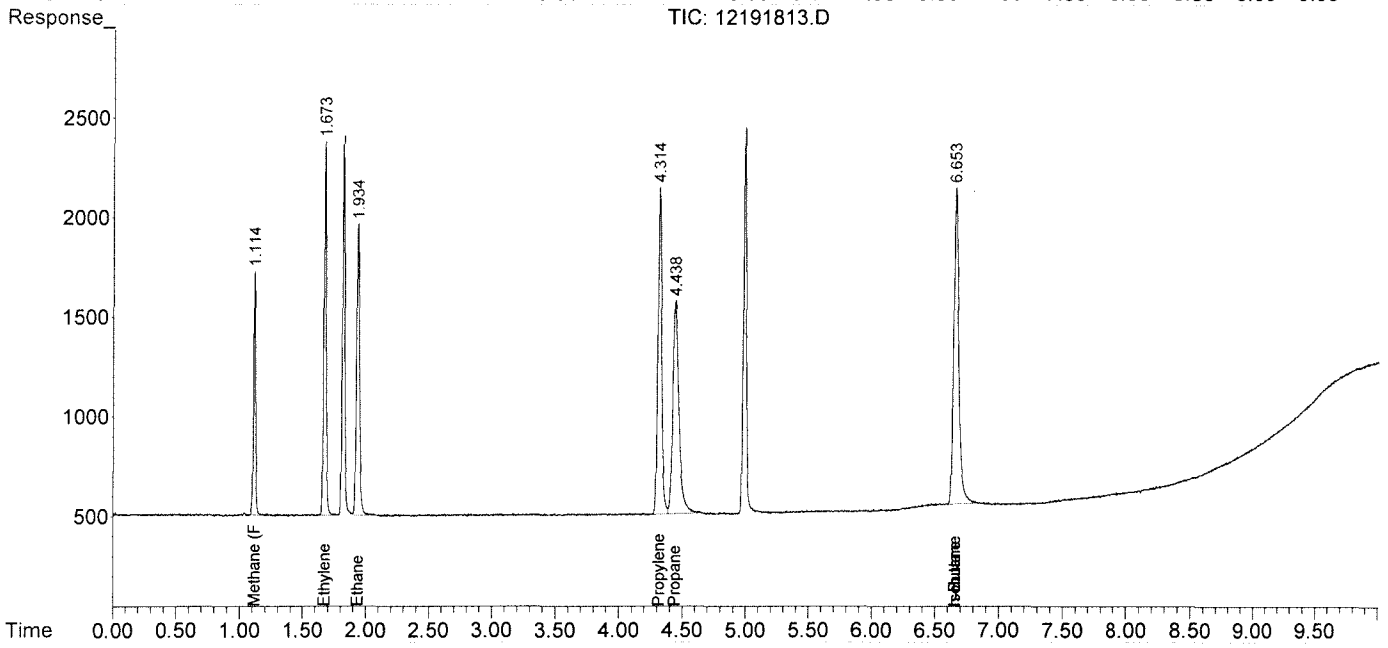
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2018_12\19\
Data File : 12191813.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Dec-2018, 14:22:31
Operator : MR
Sample : std s32-07231801
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Dec 19 14:35:00 2018
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2018_12\19\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	19-Dec-18, 10:38:40	12191801.D	std s32-07231801		MR	RSKBOTH.M	pass
2	19-Dec-18, 10:54:48	12191802.D	rb 0.1ml		MR	RSKBOTH.M	pass
3	19-Dec-18, 11:13:15	12191803.D	mcs 0.1ml		MR	RSKBOTH.M	pass
4	19-Dec-18, 11:29:51	12191804.D	fid lcs s30-05241604		MR	RSKBOTH.M	pass
5	19-Dec-18, 11:45:28	12191805.D	fid lcsd s30-05241604		MR	RSKBOTH.M	pass
6	19-Dec-18, 12:02:09	12191806.D	P1806863-001 0.1ml		MR	RSKBOTH.M	
7	19-Dec-18, 12:51:33	12191807.D	P1806863-002 0.1ml		MR	RSKBOTH.M	
8	19-Dec-18, 13:05:45	12191808.D	P1806863-003 0.1ml		MR	RSKBOTH.M	
9	19-Dec-18, 13:23:14	12191809.D	P1806865-001 0.1		MR	RSKBOTH.M	
10	19-Dec-18, 13:38:42	12191810.D	P1806865-002 0.1		MR	RSKBOTH.M	
11	19-Dec-18, 13:52:18	12191811.D	P1806865-003 0.1		MR	RSKBOTH.M	
12	19-Dec-18, 14:09:10	12191812.D	P1806865-004 0.1		MR	RSKBOTH.M	
13	19-Dec-18, 14:22:31	12191813.D	std s32-07231801		MR	RSKBOTH.M	pass

December 27, 2018 Service Request No:R1811991

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: LHAAP / Site 58

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory December 12, 2018
For your reference, these analyses have been assigned our service request number **R1811991.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger
Project Manager

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ALS Group USA, Corp.
dba ALS Environmental

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Narrative Documents

ALS Environmental—Rochester Laboratory
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1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

Client: ALS Environmental - US
Project: LHAAP / Site 58
Sample Matrix: Water

Service Request: R1811991
Date Received: 12/12/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 12/12/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 0 to 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature. If any samples were received for the analysis of pH, chlorine residual, sulfite, dissolved oxygen, or ferrous iron, the samples were analyzed past their holding time expiration since these analyses are required to be analyzed within 15 minutes of sampling.

Semivoa GC:

No significant anomalies were noted with this analysis.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 12/27/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: 35AWW06_121118			Lab ID: R1811991-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	88.1		1.1	5.0	mg/L	SM 3500-Fe B.4.c
Acetic Acid	920		10	40	mg/L	Organic Acids
Butanoic Acid (Butyric Acid)	97		3.2	20	mg/L	Organic Acids
Propionic Acid	390		1.9	20	mg/L	Organic Acids

CLIENT ID: 35AWW11_121118			Lab ID: R1811991-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	20.6		0.3	1.0	mg/L	SM 3500-Fe B.4.c
Acetic Acid	540		5.0	20	mg/L	Organic Acids
Propionic Acid	420		0.94	10	mg/L	Organic Acids

CLIENT ID: 35AWW09_121118			Lab ID: R1811991-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.13		0.03	0.10	mg/L	SM 3500-Fe B.4.c

Sample Receipt Information

ALS Environmental—Rochester Laboratory
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Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: ALS Environmental - US **Service Request:**R1811991
Project: LHAAP / Site 58/NWO1312.0150

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1811991-001	35AWW06_121118	12/11/2018	0855
R1811991-002	35AWW11_121118	12/11/2018	1025
R1811991-003	35AWW09_121118	12/11/2018	1130

bhate ENVIRONMENTAL CONSTRUCTION EXPERT

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Sample Analysis Requested (5): Number of containers	VFA	Ferrous Iron										Quality Assurance Samples (6): Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW06-121118		11 DEC 2018	0855	-	N		WG	2	X	X												
35AWW11-121118		11 DEC 2018	1025	-	N		WG	2	X	X												
35AWW09-121118		11 DEC 2018	1130	-	N		WG	2	X	X												
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	12/11/18	1400	1. [signature]	12/14/18	0945
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment

R1811991 5
ALS Group USA, Corp.
LHAAP / Site 58

00945779

R1811991 5
ALS Group USA, Corp.
LHAAP / Site 60

Cooler Receipt and Preservation Check Form

Project/Client ALS- Jacksonville Folder Number

Cooler received on 12/12/18 by: @

COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	Y (N)	5a	**Perchlorate** samples have required headspace?	Y N (NA)
2	**Custody papers** properly completed (ink, signed)?	(Y) N	5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y N (NA)
3	Did all bottles arrive in good **condition** (unbroken)?	(Y) N	6	Where did the bottles originate?	ALS/ROC (CLIENT)
4	Circle: (Wet Ice) **Dry Ice, Gel packs** present?	(Y) N	7	Soil VOA received as: Bulk Encore 5035set	(NA)

8. Temperature Readings Date: 12/12/18 Time: 1015 ID: IR#7 (IR#10) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	1.6						
Correction Factor (°C)	—						
Corrected Temp (°C)	1.6						
Temp from:Type of bottle	—						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-002 by @ on 12/12/18 at 1020
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown/Preservation Check**: Date: 12/12/18 Time: 1530 by: @

9.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
10.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
11.	Were correct containers used for the tests indicated?	(YES)	(NO)
12.	Were 5035 vials acceptable (no extra labels, not leaking)?	YES	NO (N/A)
13.	Air Samples: Cassettes / Tubes Intact with MS? Canisters Pressurized	Tedlar® Bags Inflated	(N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)	e	For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-						
		HCl	**	**	Client					

**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).

Bottle lot numbers: 09248-18MC

Explain all Discrepancies/ Other Comments:

Fe 2+ → HCl preserved.

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: @
PC Secondary Review: MMS 12/18/18 *significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1811991
Project: LHAAP / Site 58/NWO1312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1811991-001.01					
	SM 3500-Fe B.4.c				
		12/12/2018	1532	SMO / GESMERIAN	
		12/12/2018	1709	RT000566 / GESMERIAN	
		12/12/2018	1709	R-015 / GESMERIAN	
R1811991-001.02					
	Organic Acids				
		12/12/2018	1532	SMO / GESMERIAN	
		12/12/2018	1532	R-002 / GESMERIAN	
		12/17/2018	0812	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	
R1811991-002.01					
	SM 3500-Fe B.4.c				
		12/12/2018	1532	SMO / GESMERIAN	
		12/12/2018	1709	RT000566 / GESMERIAN	
		12/12/2018	1709	R-015 / GESMERIAN	
R1811991-002.02					
	Organic Acids				
		12/12/2018	1532	SMO / GESMERIAN	
		12/12/2018	1532	R-002 / GESMERIAN	
		12/17/2018	0812	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	
R1811991-003.01					
	SM 3500-Fe B.4.c				
		12/12/2018	1532	SMO / GESMERIAN	
		12/12/2018	1709	RT000566 / GESMERIAN	
		12/12/2018	1709	R-015 / GESMERIAN	
R1811991-003.02					
	Organic Acids				
		12/12/2018	1532	SMO / GESMERIAN	
		12/12/2018	1532	R-002 / GESMERIAN	
		12/17/2018	0812	In Lab / BALLGEIER	
		12/17/2018	1520	R-002 / BALLGEIER	

Miscellaneous Forms

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ALS Environmental

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.

Spike was diluted out.

\+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratoryôs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Service Request: R1811991

Sample Name: 35AWW06_121118
Lab Code: R1811991-001
Sample Matrix: Water
Date Collected: 12/11/18
Date Received: 12/12/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW11_121118
Lab Code: R1811991-002
Sample Matrix: Water
Date Collected: 12/11/18
Date Received: 12/12/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW09_121118
Lab Code: R1811991-003
Sample Matrix: Water
Date Collected: 12/11/18
Date Received: 12/12/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

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Semivolatile Organic Compounds by GC

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 08:55
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW06_121118	**Units:**	mg/L
Lab Code:	R1811991-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	2.0	1.0	0.16	10	12/21/18 14:45	
Acetic Acid	**920**		40	20	10	10	12/21/18 14:45	
Butanoic Acid (Butyric Acid)	**97**		20	10	3.2	10	12/21/18 14:45	
Lactic Acid	ND	U	20	10	1.4	10	12/21/18 14:45	
Propionic Acid	**390**		20	10	1.9	10	12/21/18 14:45	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 10:25
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW11_121118	**Units:**	mg/L
Lab Code:	R1811991-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	1.0	0.50	0.077	5	12/21/18 15:40	
Acetic Acid	**540**		20	10	5.0	5	12/21/18 15:40	
Butanoic Acid (Butyric Acid)	ND	U	10	5.0	1.6	5	12/21/18 15:40	
Lactic Acid	ND	U	10	5.0	0.67	5	12/21/18 15:40	
Propionic Acid	**420**		10	5.0	0.94	5	12/21/18 15:40	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 11:30
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW09_121118	**Units:**	mg/L
Lab Code:	R1811991-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	12/21/18 07:42	
Acetic Acid	ND U	4.0	2.0	1.0	1	12/21/18 07:42	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	12/21/18 07:42	
Lactic Acid	ND U	2.0	1.0	0.14	1	12/21/18 07:42	
Propionic Acid	ND U	2.0	1.0	0.19	1	12/21/18 07:42	

General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 08:55
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW06_121118	**Basis:**	NA
Lab Code:	R1811991-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**88.1**	mg/L	5.0	4.0	1.1	50	12/12/18 21:24	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 10:25
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW11_121118	**Basis:**	NA
Lab Code:	R1811991-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**20.6**	mg/L	1.0	0.8	0.3	10	12/12/18 21:24	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 11:30
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW09_121118	**Basis:**	NA
Lab Code:	R1811991-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.13**	mg/L	0.10	0.08	0.03	1	12/12/18 21:24	*

QC Summary Forms

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811991
Date Analyzed: 12/18/18 16:38

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Method Blank
Lab Code: RQ1814001-01

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\121718\A0002588.D\

Analysis Method: Organic Acids

Analysis Lot:619495

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1814001-02	I:\ACQUDATA\hplc05\data\121718\A0002589.D\	12/18/18 17:35
Duplicate Lab Control Sample	RQ1814001-03	I:\ACQUDATA\hplc05\data\121718\A0002590.D\	12/18/18 18:28
35AWW09_121118	R1811991-003	I:\ACQUDATA\hplc05\data\121918\A0002654.D\	12/21/18 07:42
35AWW06_121118	R1811991-001	I:\ACQUDATA\hplc05\data\121918\A0002662.D\	12/21/18 14:45
35AWW11_121118	R1811991-002	I:\ACQUDATA\hplc05\data\121918\A0002663.D\	12/21/18 15:40

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1814001-01	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	12/18/18 16:38	
Acetic Acid	ND U	4.0	2.0	1.0	1	12/18/18 16:38	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	12/18/18 16:38	
Lactic Acid	ND U	2.0	1.0	0.14	1	12/18/18 16:38	
Propionic Acid	ND U	2.0	1.0	0.19	1	12/18/18 16:38	

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811991
Date Analyzed: 12/18/18 17:35

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Lab Control Sample
Lab Code: RQ1814001-02

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\121718\A0002589.D\

Analysis Method: Organic Acids

Analysis Lot:619495

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1814001-01	I:\ACQUDATA\hplc05\data\121718\A0002588.D\	12/18/18 16:38
Duplicate Lab Control Sample	RQ1814001-03	I:\ACQUDATA\hplc05\data\121718\A0002590.D\	12/18/18 18:28
35AWW09_121118	R1811991-003	I:\ACQUDATA\hplc05\data\121918\A0002654.D\	12/21/18 07:42
35AWW06_121118	R1811991-001	I:\ACQUDATA\hplc05\data\121918\A0002662.D\	12/21/18 14:45
35AWW11_121118	R1811991-002	I:\ACQUDATA\hplc05\data\121918\A0002663.D\	12/21/18 15:40

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811991
Date Analyzed: 12/18/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample RQ1814001-02			Duplicate Lab Control Sample RQ1814001-03					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	2.97	2.02	147 *	2.97	2.02	147 *	73-122	<1	30
Acetic Acid	Organic Acids	19.8	19.9	99	20.1	19.9	101	80-130	1	30
Butanoic Acid (Butyric Acid)	Organic Acids	18.0	20.3	89	18.0	20.3	88	86-128	<1	30
Lactic Acid	Organic Acids	21.3	20.6	103	21.4	20.6	104	81-114	<1	30
Propionic Acid	Organic Acids	19.2	20.0	96	18.6	20.0	93	63-153	3	30

General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1811991-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	ND U	mg/L	0.10	0.08	0.03	1	12/12/18 21:24	

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18
Sample Matrix:	Water	**Date Received:**	12/12/18
		Date Analyzed:	12/12/18

Duplicate Matrix Spike Summary
Iron, Divalent (Ferrous Iron)

Sample Name:	35AWW09_121118	**Units:**	mg/L
Lab Code:	R1811991-003	**Basis:**	NA
Analysis Method:	SM 3500-Fe B.4.c		

		Matrix Spike R1811991-003MS			Duplicate Matrix Spike R1811991-003DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Iron, Divalent (Ferrous Iron)	0.13	0.71	0.40	146 *	0.71	0.40	146 *	67-129	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R1811991
Date Analyzed: 12/12/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1811991-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	0.38	0.40	95	67-129

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811991
Project: LHAAP / Site 58/NWO1312.0150

Continuing Calibration Blank (CCB) Summary
Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	619163	RQ1813872-02	12/12/18 21:24	0.10	0.08	0.03	ND	U
CCB2	619163	RQ1813872-05	12/12/18 21:24	0.10	0.08	0.03	ND	U

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QA/QC Report

Client: ALS Environmental - US **Service Request:** R1811991
Project: LHAAP / Site 58/NWO1312.0150

Continuing Calibration Verification (CCV) Summary

Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	619163	RQ1813872-01	12/12/18 21:24	2.00	2.03	101	90-110
CCV2	619163	RQ1813872-06	12/12/18 21:24	2.00	2.02	101	90-110

Raw Data

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 08:55
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW06_121118	**Units:**	mg/L
Lab Code:	R1811991-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	2.0	1.0	0.16	10	12/21/18 14:45	
Acetic Acid	**920**		40	20	10	10	12/21/18 14:45	
Butanoic Acid (Butyric Acid)	**97**		20	10	3.2	10	12/21/18 14:45	
Lactic Acid	ND	U	20	10	1.4	10	12/21/18 14:45	
Propionic Acid	**390**		20	10	1.9	10	12/21/18 14:45	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 10:25
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW11_121118	**Units:**	mg/L
Lab Code:	R1811991-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	1.0	0.50	0.077	5	12/21/18 15:40	
Acetic Acid	**540**		20	10	5.0	5	12/21/18 15:40	
Butanoic Acid (Butyric Acid)	ND	U	10	5.0	1.6	5	12/21/18 15:40	
Lactic Acid	ND	U	10	5.0	0.67	5	12/21/18 15:40	
Propionic Acid	**420**		10	5.0	0.94	5	12/21/18 15:40	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 11:30
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW09_121118	**Units:**	mg/L
Lab Code:	R1811991-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

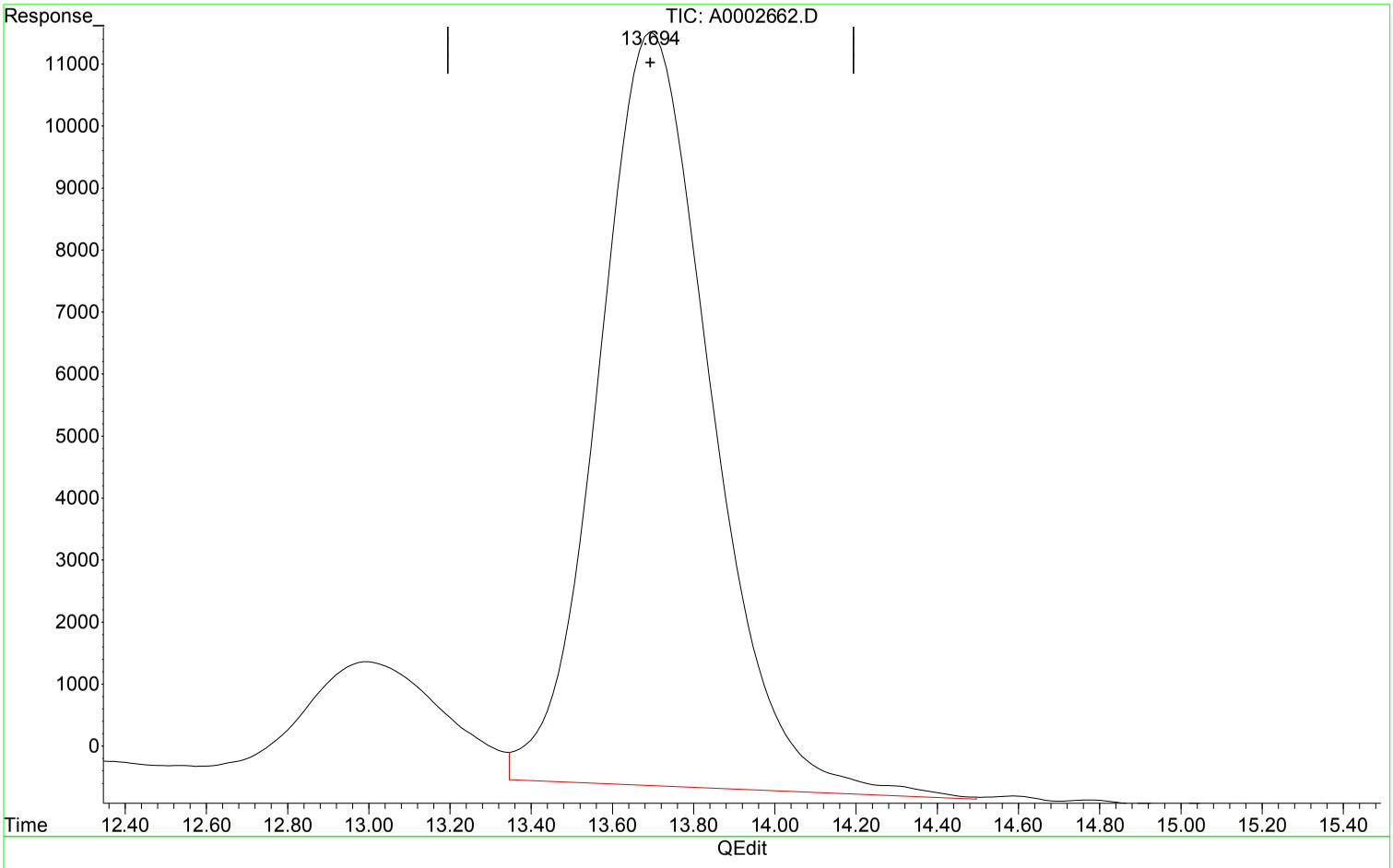
Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	12/21/18 07:42	
Acetic Acid	ND U	4.0	2.0	1.0	1	12/21/18 07:42	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	12/21/18 07:42	
Lactic Acid	ND U	2.0	1.0	0.14	1	12/21/18 07:42	
Propionic Acid	ND U	2.0	1.0	0.19	1	12/21/18 07:42	

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002662.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 14:45:51
Operator : b.allgeier
Sample : r1811991-001|10
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:49:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.694min 39.395 ppm m

response 2347583

Manual Integration:

After

Poor integration.

12/24/18

(+) = Expected Retention Time

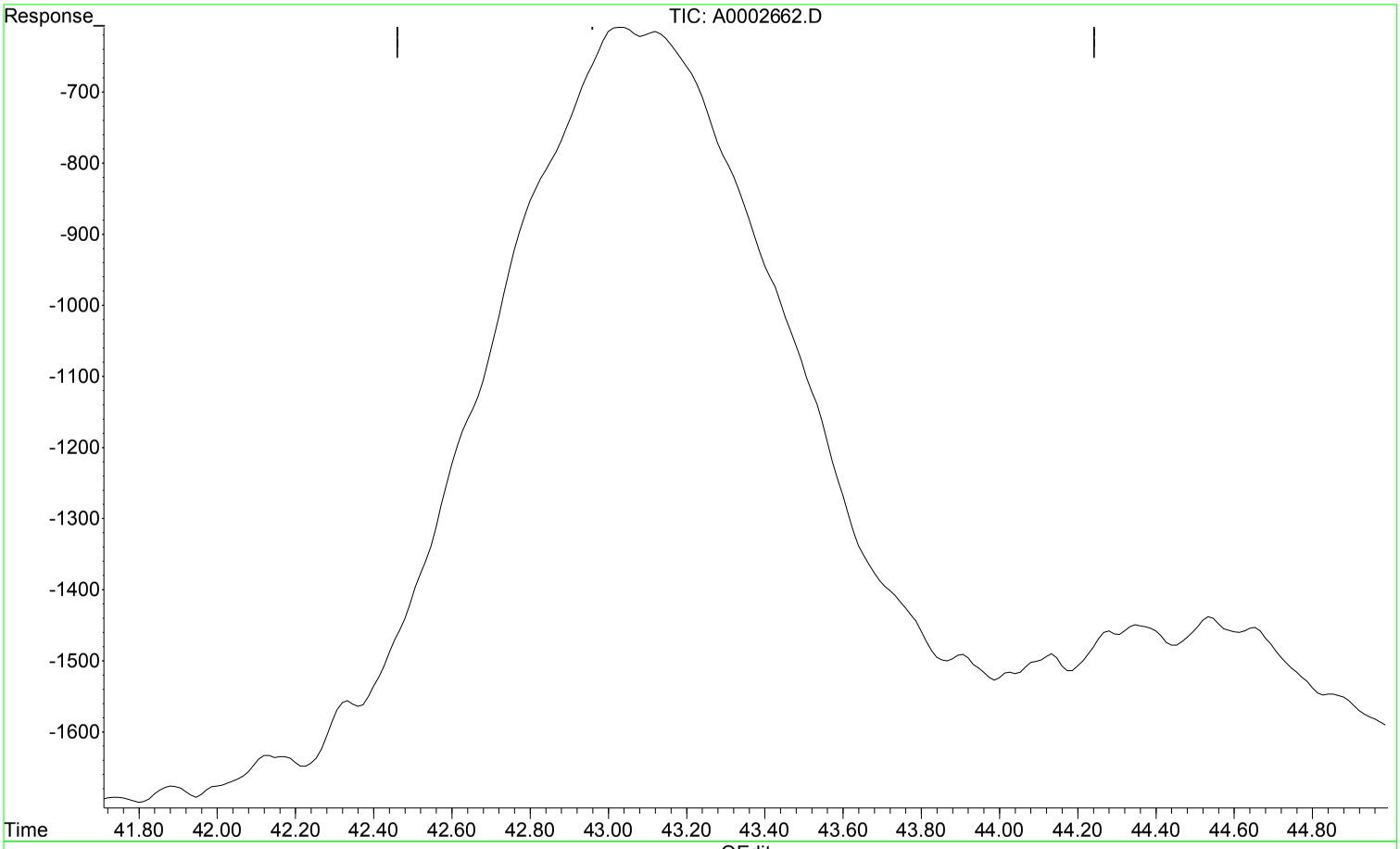
00945813

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002662.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 14:45:51
Operator : b.allgeier
Sample : r1811991-001|10
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:49:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

43.064min 9.853 ppm

response 619721

Manual Integration:

Before

12/24/18

(+) = Expected Retention Time

00945814

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002662.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 14:45:51
Operator : b.allgeier
Sample : r1811991-001|10
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:49:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	0.000	0	N.D.	ppm	
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	5.419	5427430	91.727	ppm	
5) T	Propionic Acid	13.694	2347583	39.395	ppm	m
6) T	Butyric Acid	43.033	608585	9.676	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

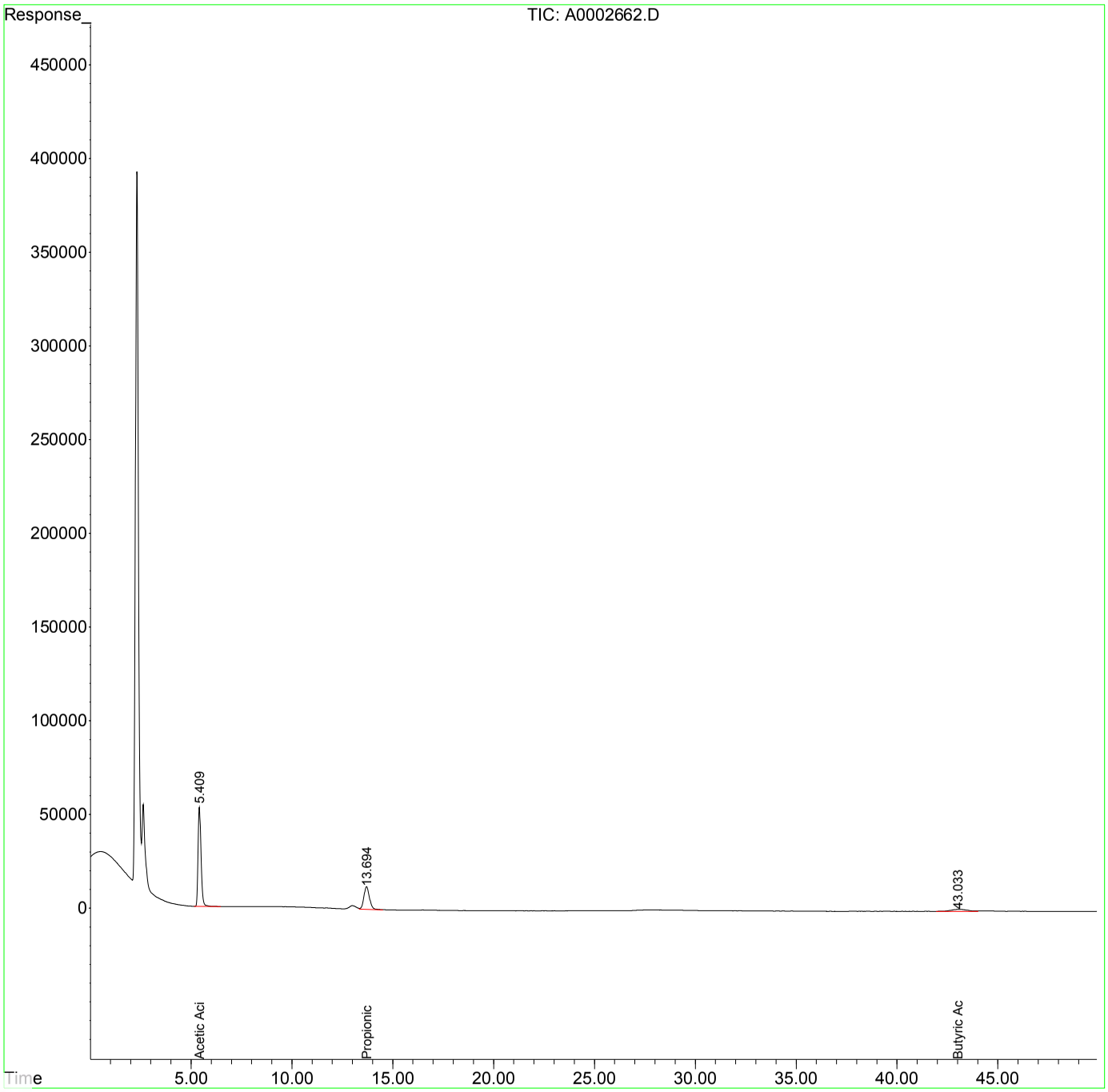
00945815

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002662.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 14:45:51
Operator : b.allgeier
Sample : r1811991-001|10
Misc :
ALS Vial : 12 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:49:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00945816

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002663.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 00:10:08~~ 21-Dec-2018, 15:40:00
Operator : b.allgeier
Sample : r1811991-002|5
Misc :
ALS Vial : 13 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:49:58 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	5.415	6356161	107.423	ppm
5) T	Propionic Acid	13.678	5042639	84.620	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

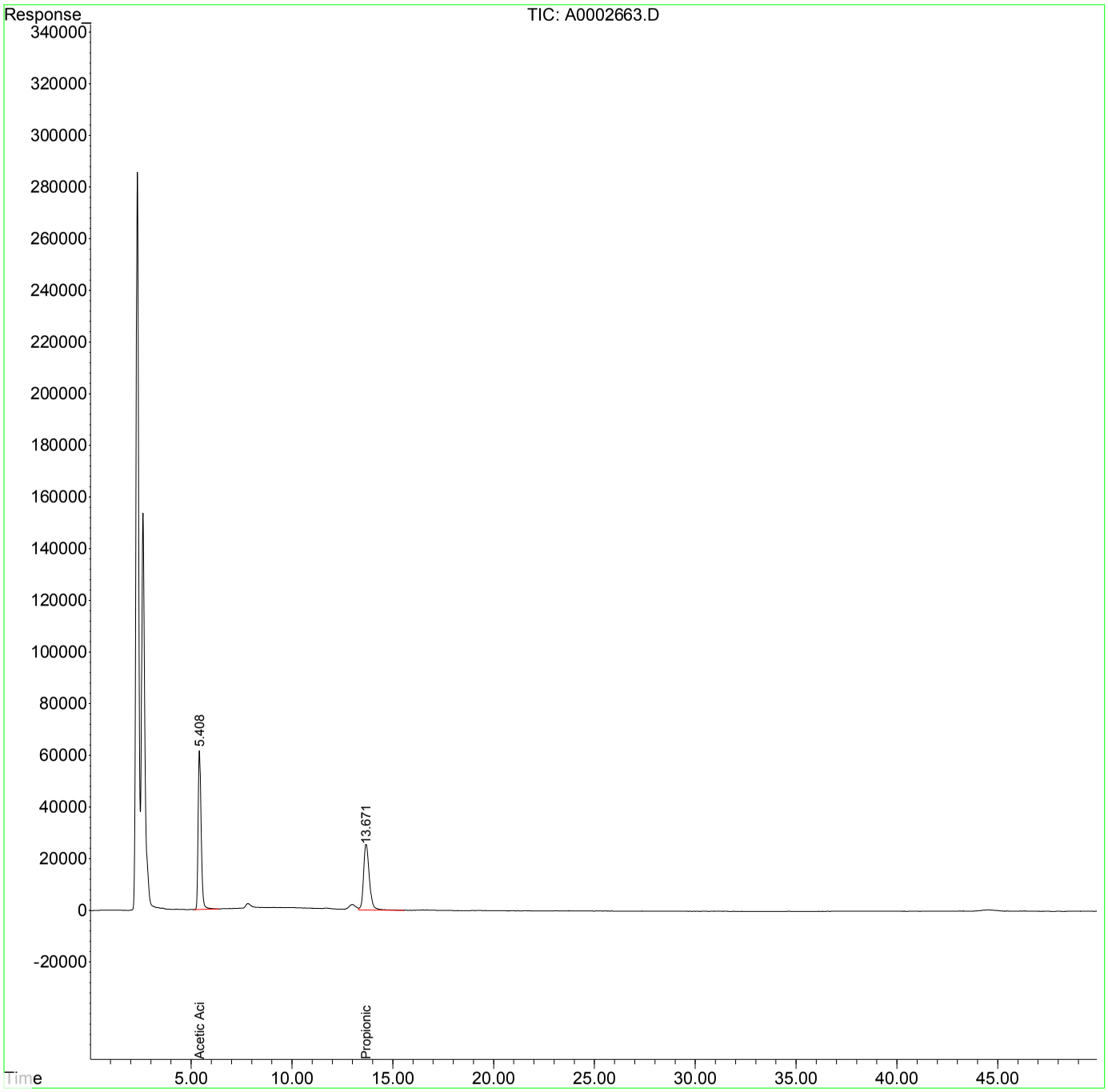
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002663.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 00:10:08
Operator : b.allgeier
Sample : r1811991-002|5
Misc :
ALS Vial : 13 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:49:58 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00945818

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002654.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 07:42:15
Operator : b.allgeier
Sample : r1811991-003
Misc :
ALS Vial : 14 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 10:16:42 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 10:14:14 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1) t	Formic acid	0.000	0	N.D.	ppm
2) T	Pyruvic acid	0.000	0	N.D.	ppm
3) T	Lactic Acid	0.000	0	N.D.	ppm
4) T	Acetic Acid	0.000	0	N.D.	ppm
5) T	Propionic Acid	0.000	0	N.D.	ppm
6) T	Butyric Acid	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

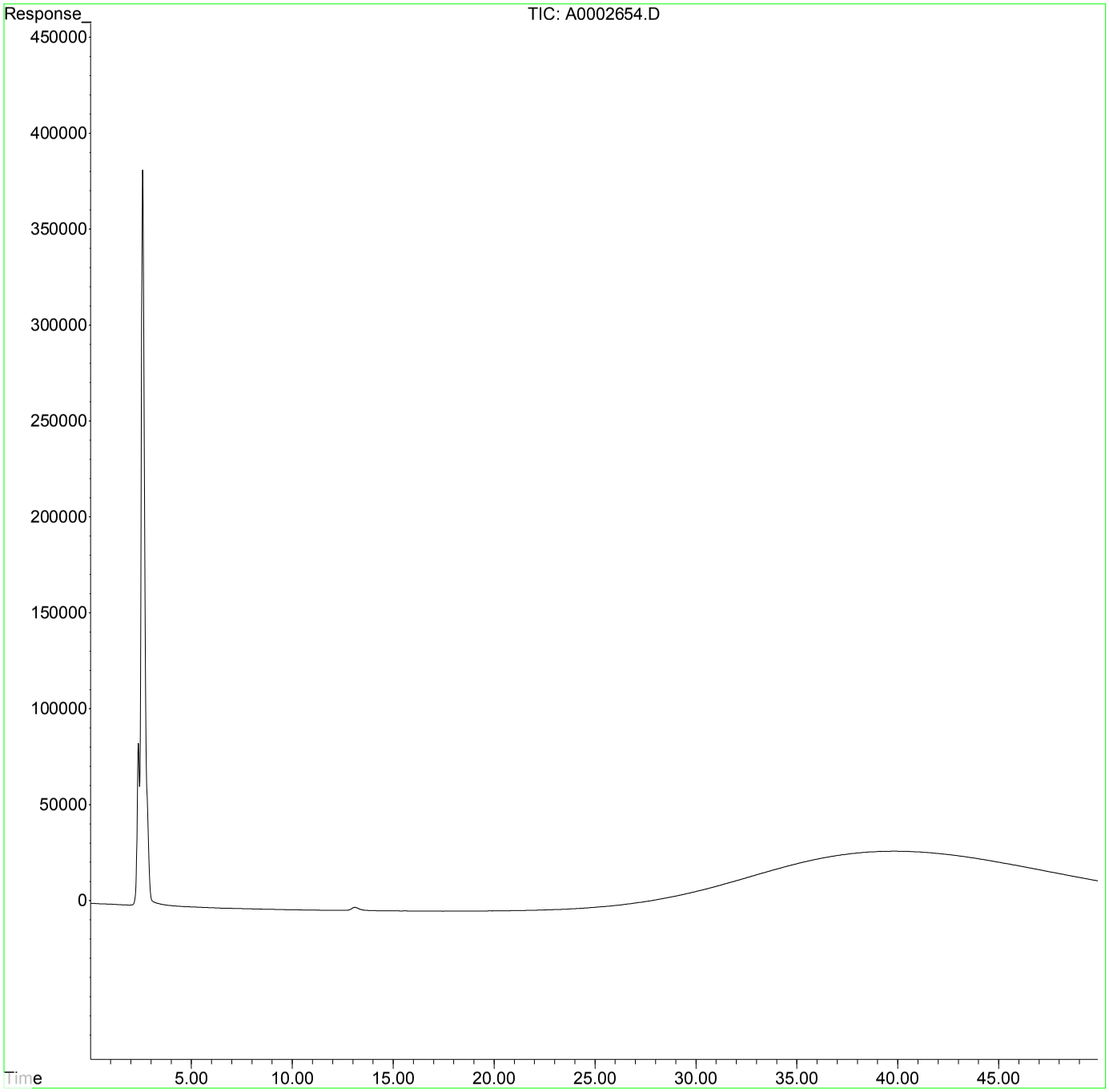
00945819

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002654.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 07:42:15
Operator : b.allgeier
Sample : r1811991-003
Misc :
ALS Vial : 14 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 10:16:42 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 10:14:14 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002588.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 16:38:32
Operator : b.allgeier
Sample : MB
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:55 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	d
2) T	Pyruvic acid	0.000	0	N.D.	ppm	
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	0.000	0	N.D.	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

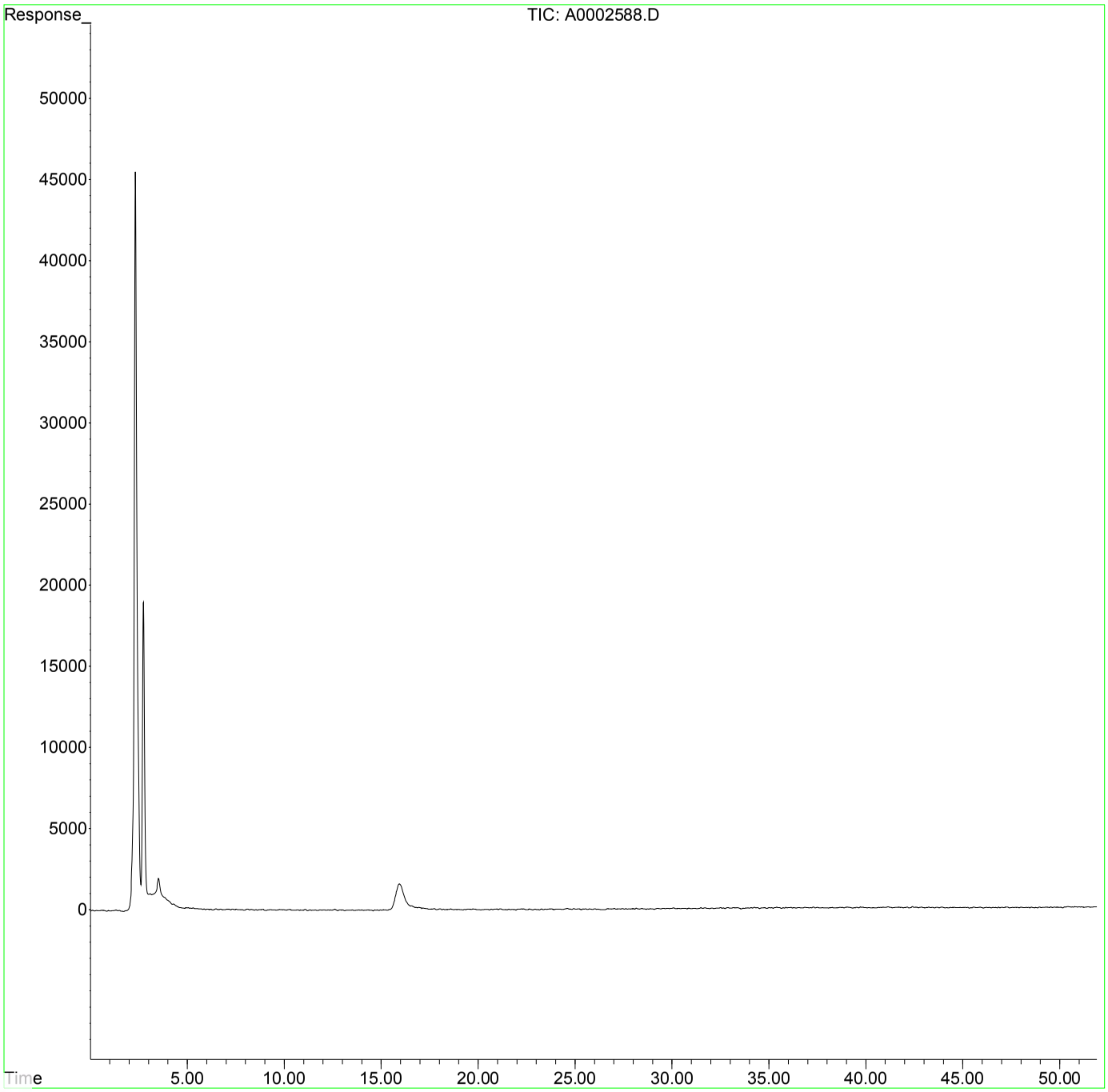
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002588.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 16:38:32
Operator : b.allgeier
Sample : MB
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:55 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



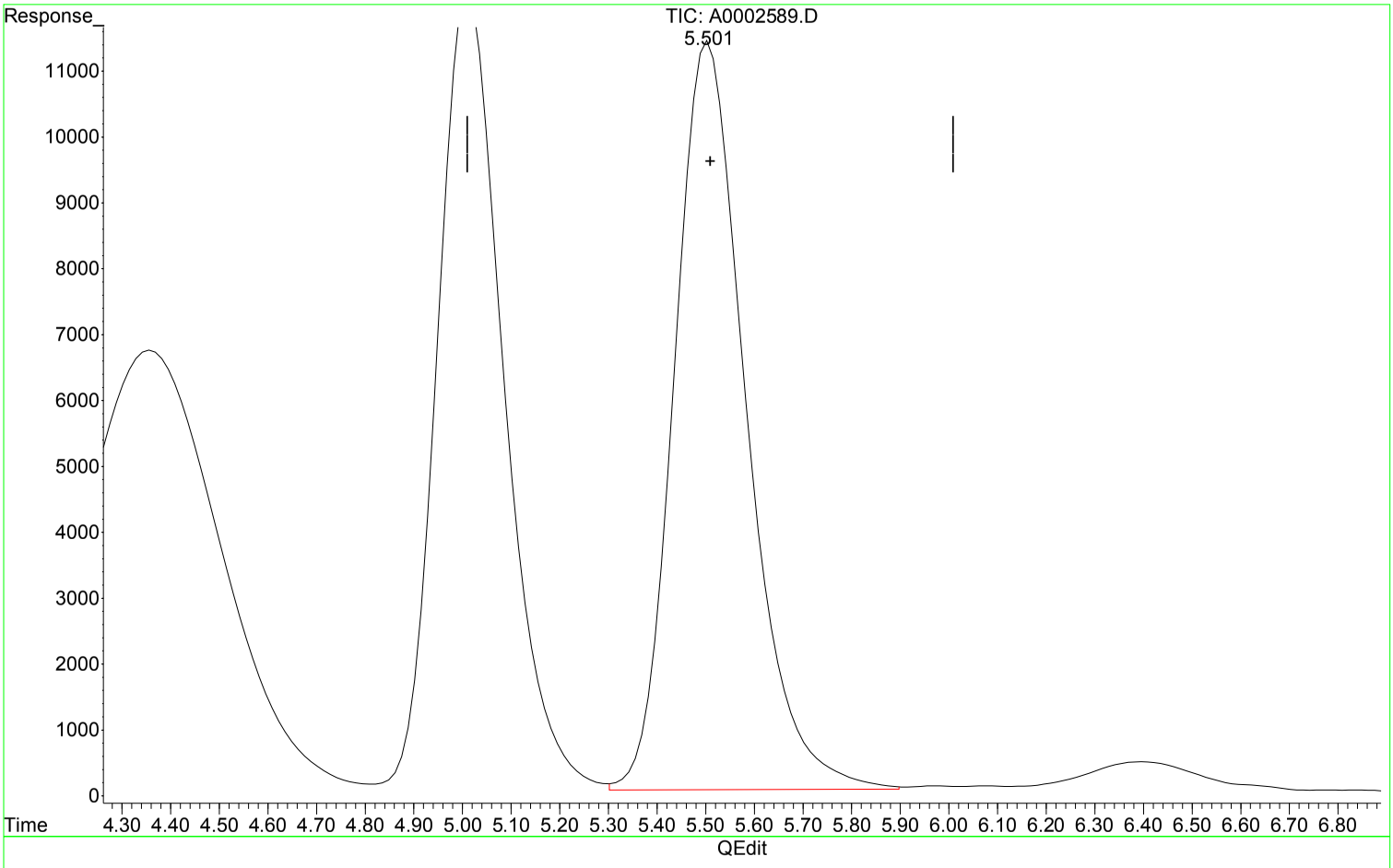
00945822

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.501min 19.770 ppm m

response 1169791

Manual Integration:

After

Poor integration.

12/19/18

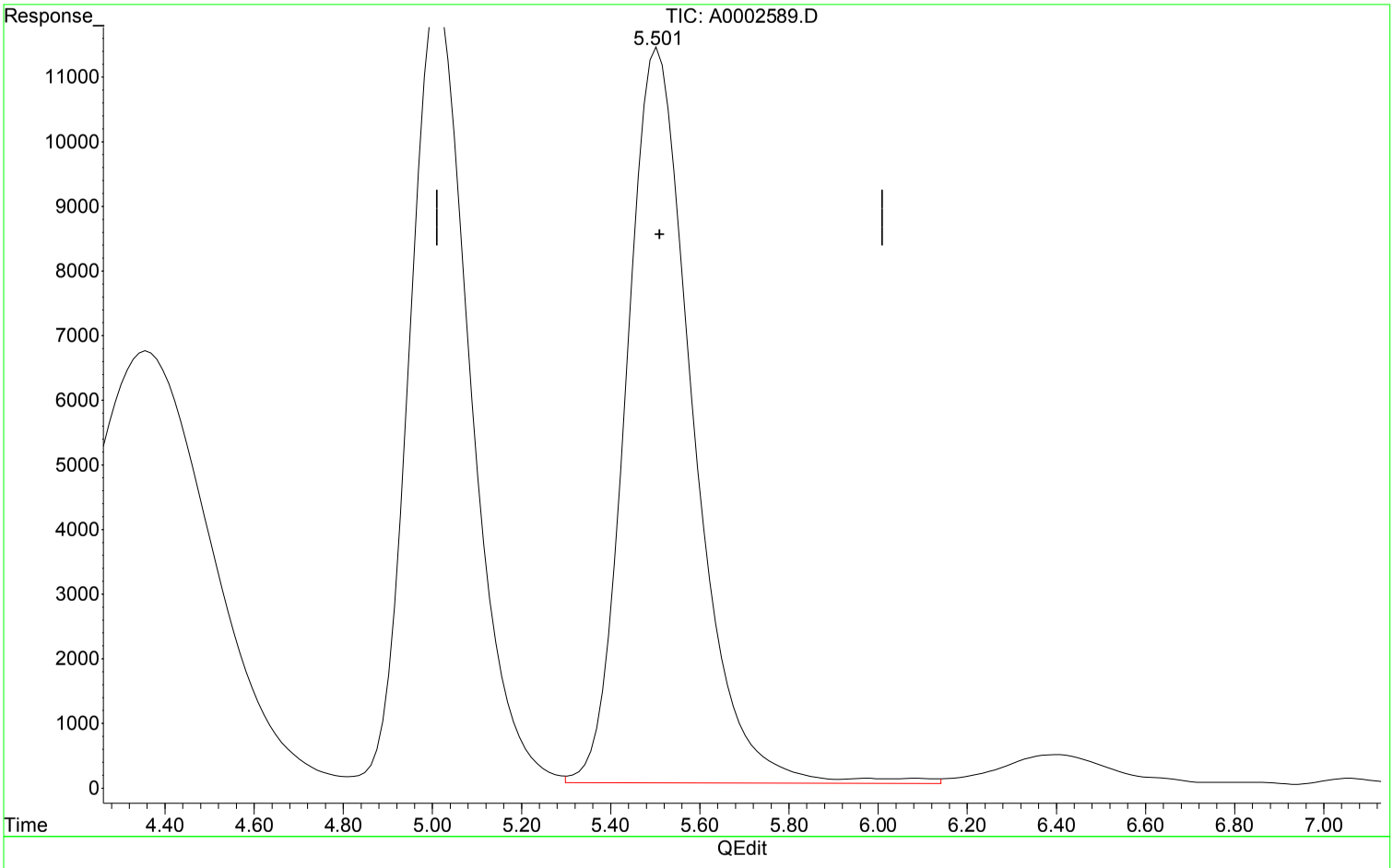
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.507min 20.052 ppm

response 1186474

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:15:19 2018

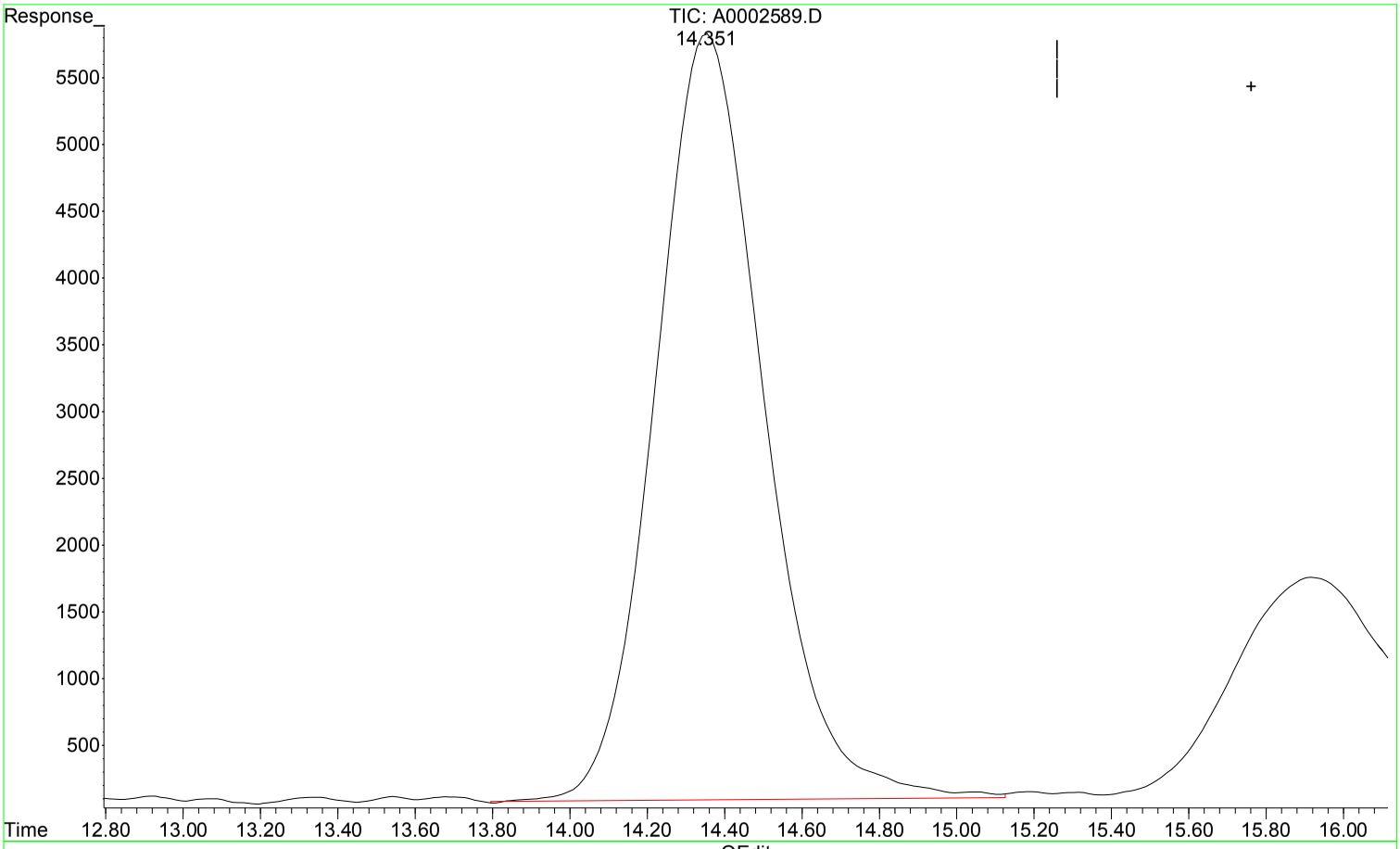
00945824

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:01:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:01:05 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.351min 18.786 ppm m

response 1119471

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:12:31 2018

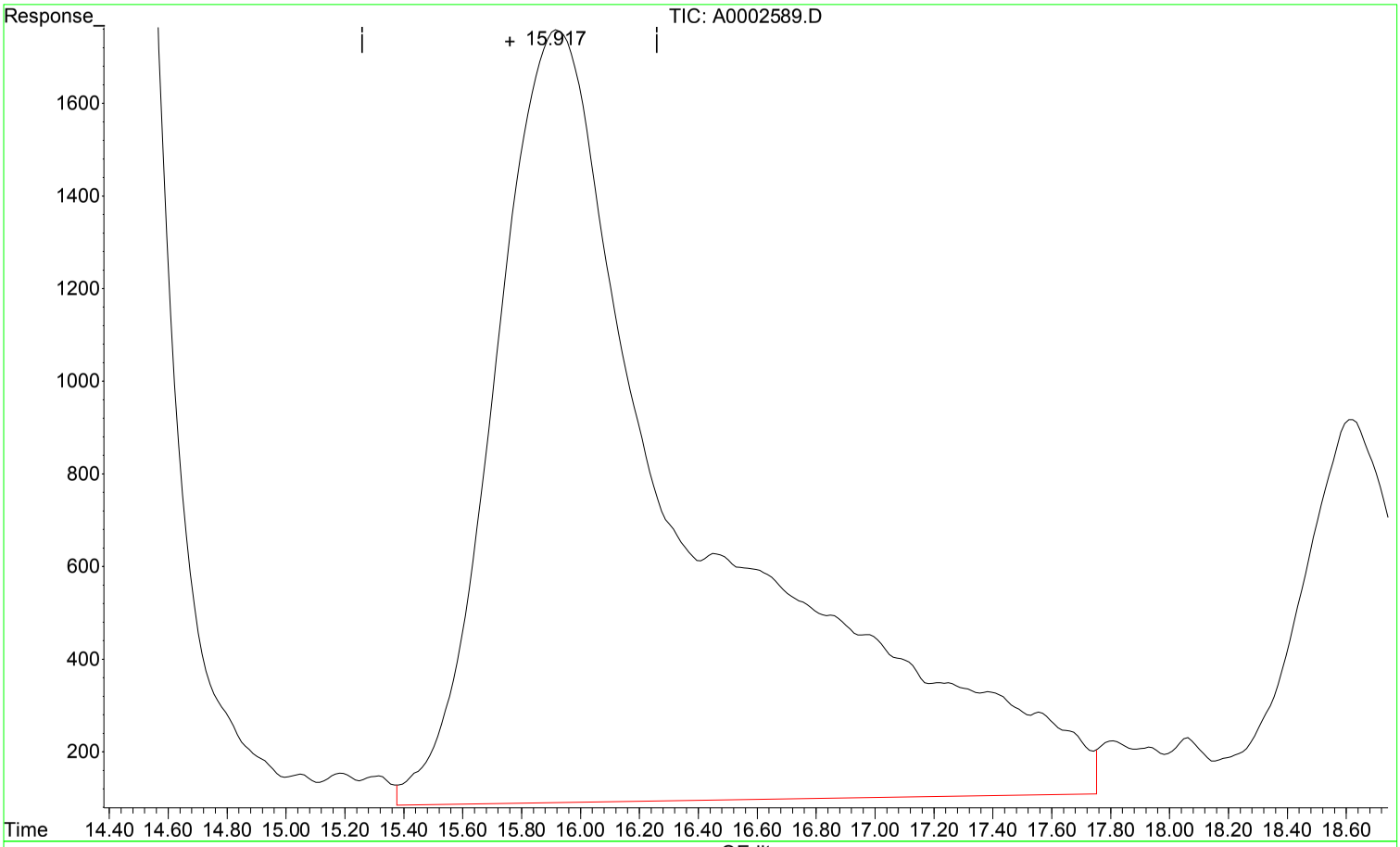
00945825

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:01:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:01:05 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

15.925min 13.163 ppm

response 784404

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:12:25 2018

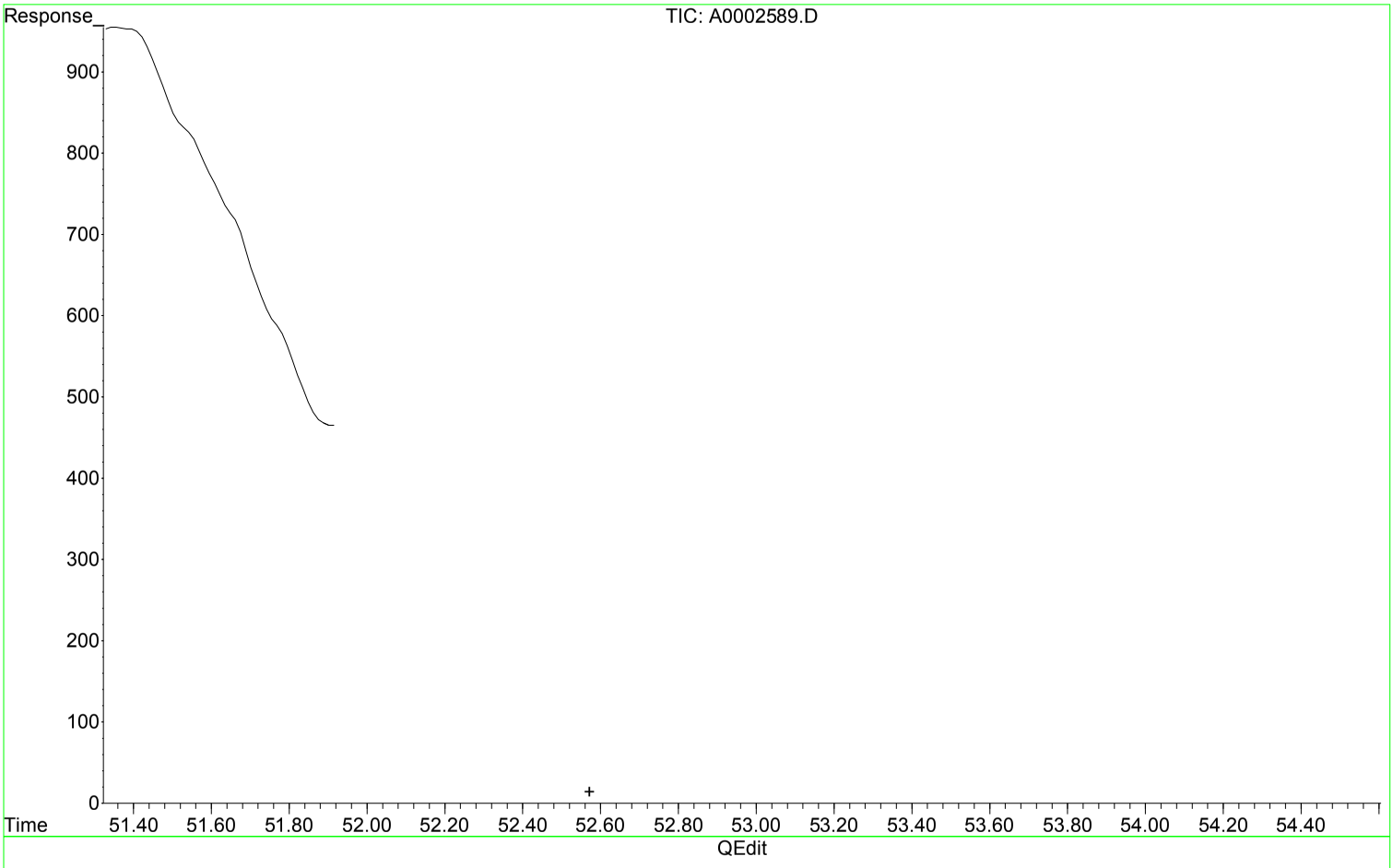
00945826

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:01:23 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:01:05 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

52.572min 0.000 ppm

response 0

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:12:42 2018

00945827

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 02:47:47~~ 18-Dec-2018, 17:35:00
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.398	1948872	20.228	ppm	
2) T	Pyruvic acid	4.361	1343905	2.967	ppm	
3) T	Lactic Acid	5.016	1147308	21.339	ppm	
4) T	Acetic Acid	5.501	1169791	19.770	ppm	m
5) T	Propionic Acid	14.358	1142782	19.177	ppm	
6) T	Butyric Acid	46.164	1132410	18.004	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

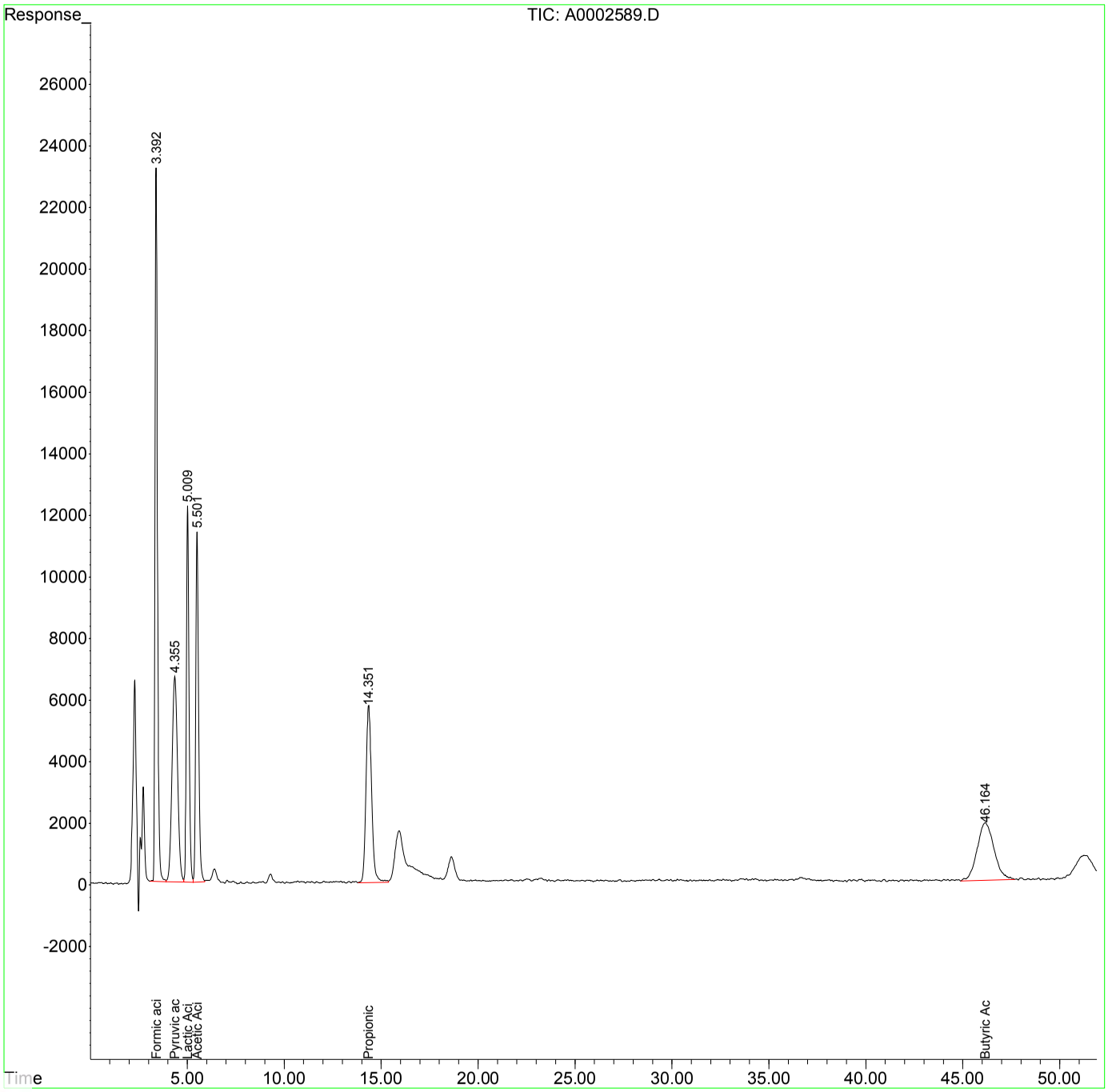
00945828

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002589.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:47
Operator : b.allgeier
Sample : lcs
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:57 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

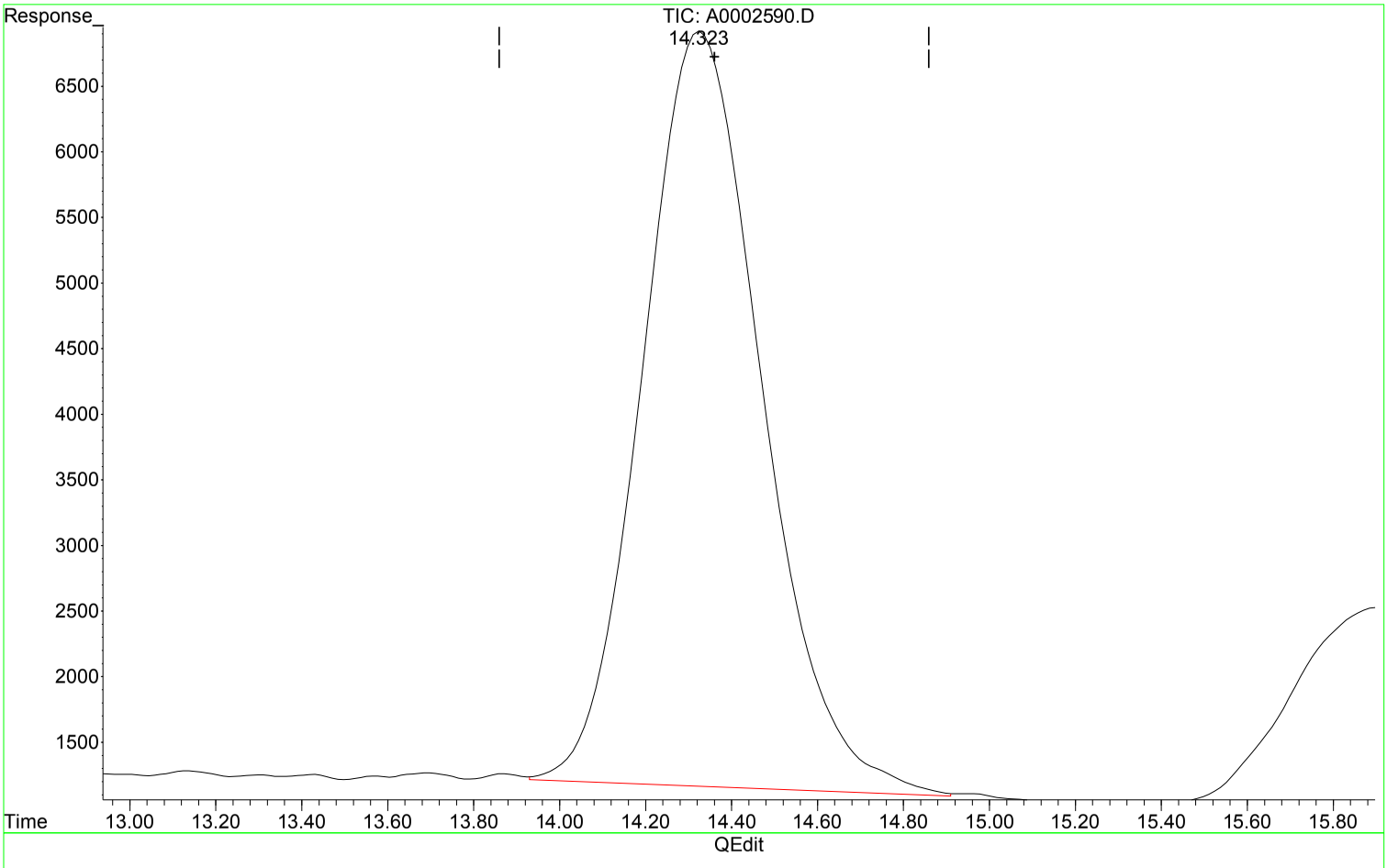


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.323min 18.639 ppm m

response 1110701

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:16:01 2018

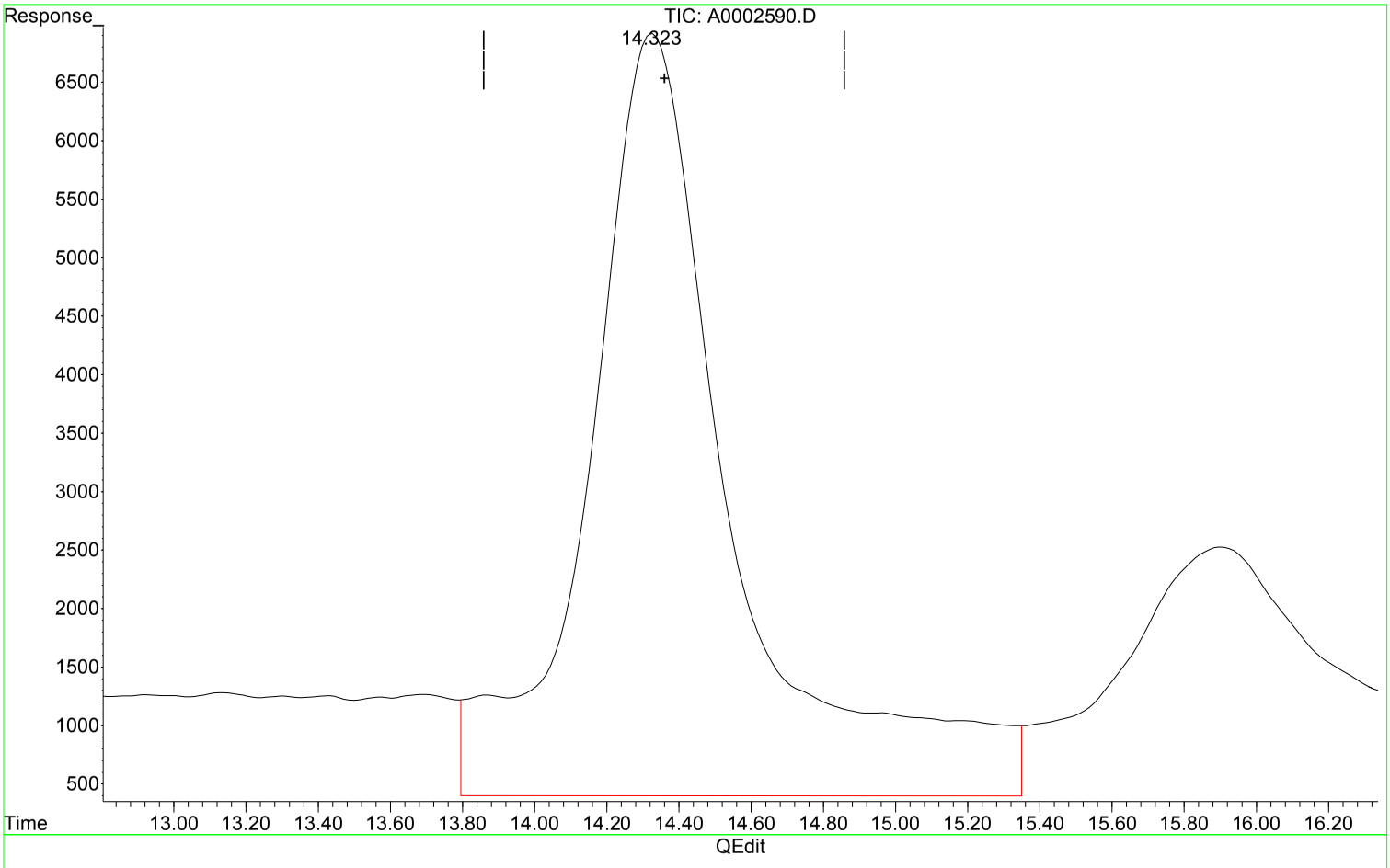
00945830

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.329min 30.117 ppm

response 1794742

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:15:55 2018

00945831

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.398	1956662	20.309	ppm	
2) T	Pyruvic acid	4.359	1346166	2.972	ppm	
3) T	Lactic Acid	5.014	1149193	21.374	ppm	
4) T	Acetic Acid	5.505	1186924	20.060	ppm	
5) T	Propionic Acid	14.323	1110701	18.639	ppm	m
6) T	Butyric Acid	46.044	1131013	17.982	ppm	

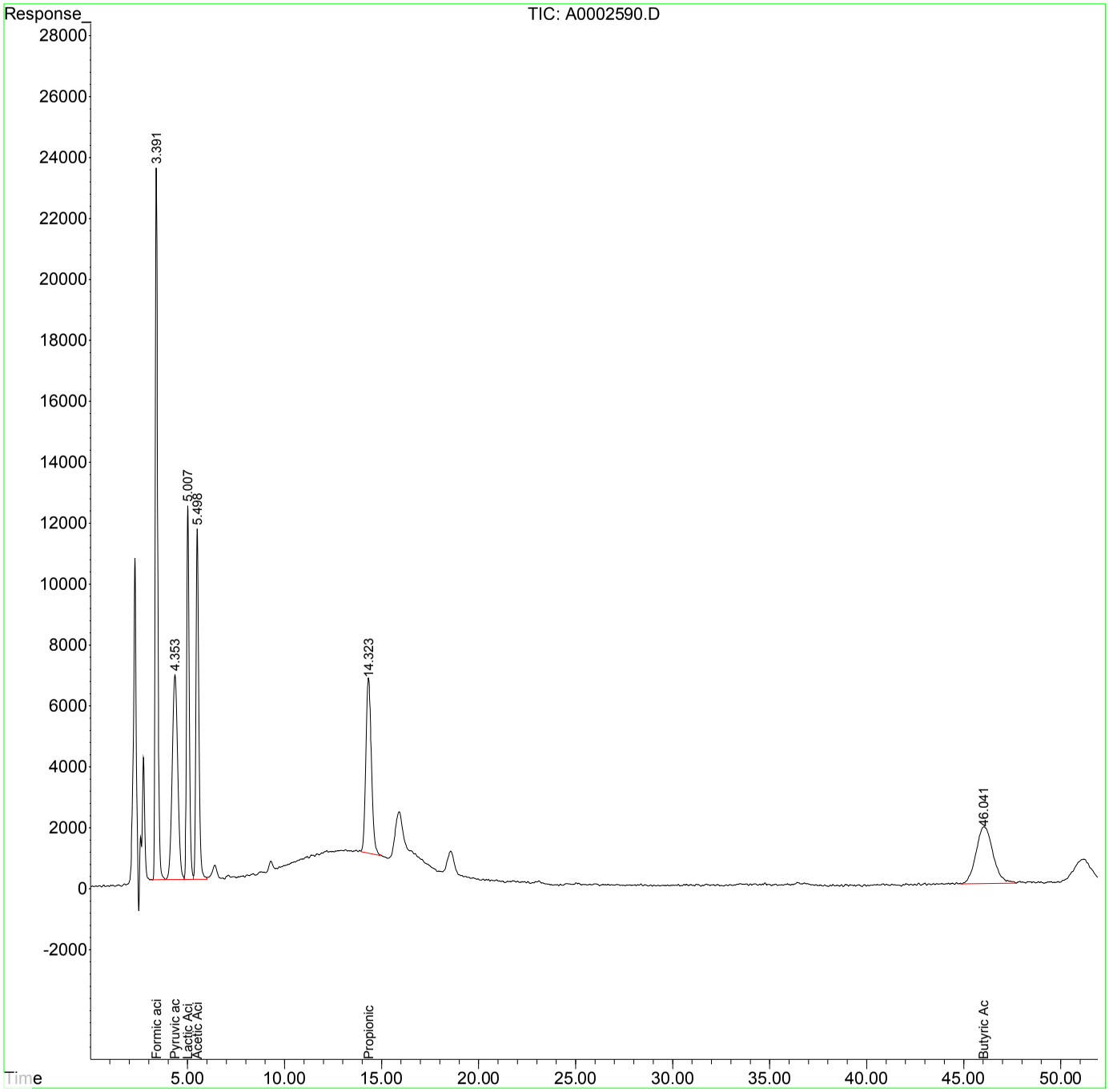
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002590.D
Signal(s) : dad1A.ch
Acq On : 18-Dec-2018, 18:28:31
Operator : b.allgeier
Sample : lcsd
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:59 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00945833

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002587.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 02:47:53~~ 18-Dec-2018, 15:45:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.545 E3	-1.2	101	0.00
2 T	Pyruvic acid	452.935	451.371 E3	0.3	98	0.00
3 T	Lactic Acid	53.765	58.152 E3	-8.2	107	0.00
4 T	Acetic Acid	59.169	60.054 E3	-1.5	99	0.00
5 T	Propionic Acid	59.592	58.025 E3	2.6	98	0.00
6 T	Butyric Acid	62.897	55.870 E3	11.2	95	0.00

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002587.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 02:47:53~~ 18-Dec-2018, 15:45:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.398	4877269	50.624 ppm
2) T	Pyruvic acid	4.365	2256853	4.983 ppm
3) T	Lactic Acid	5.018	2907596	54.080 ppm
4) T	Acetic Acid	5.509	3002708	50.748 ppm
5) T	Propionic Acid	14.360	2901256	48.686 ppm
6) T	Butyric Acid	46.228	2793510	44.414 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

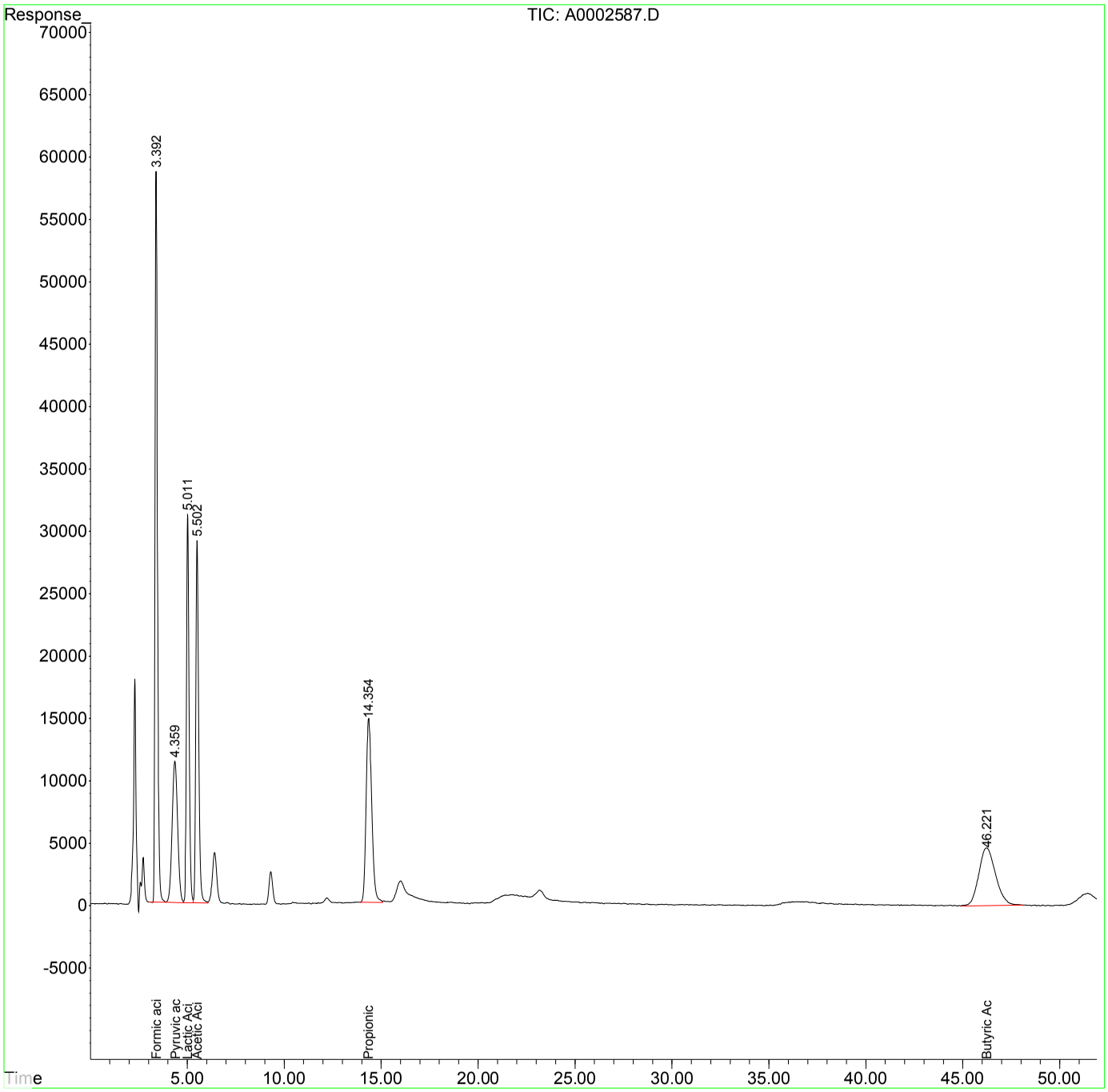
00945835

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002587.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 02:47:53
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:13:53 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



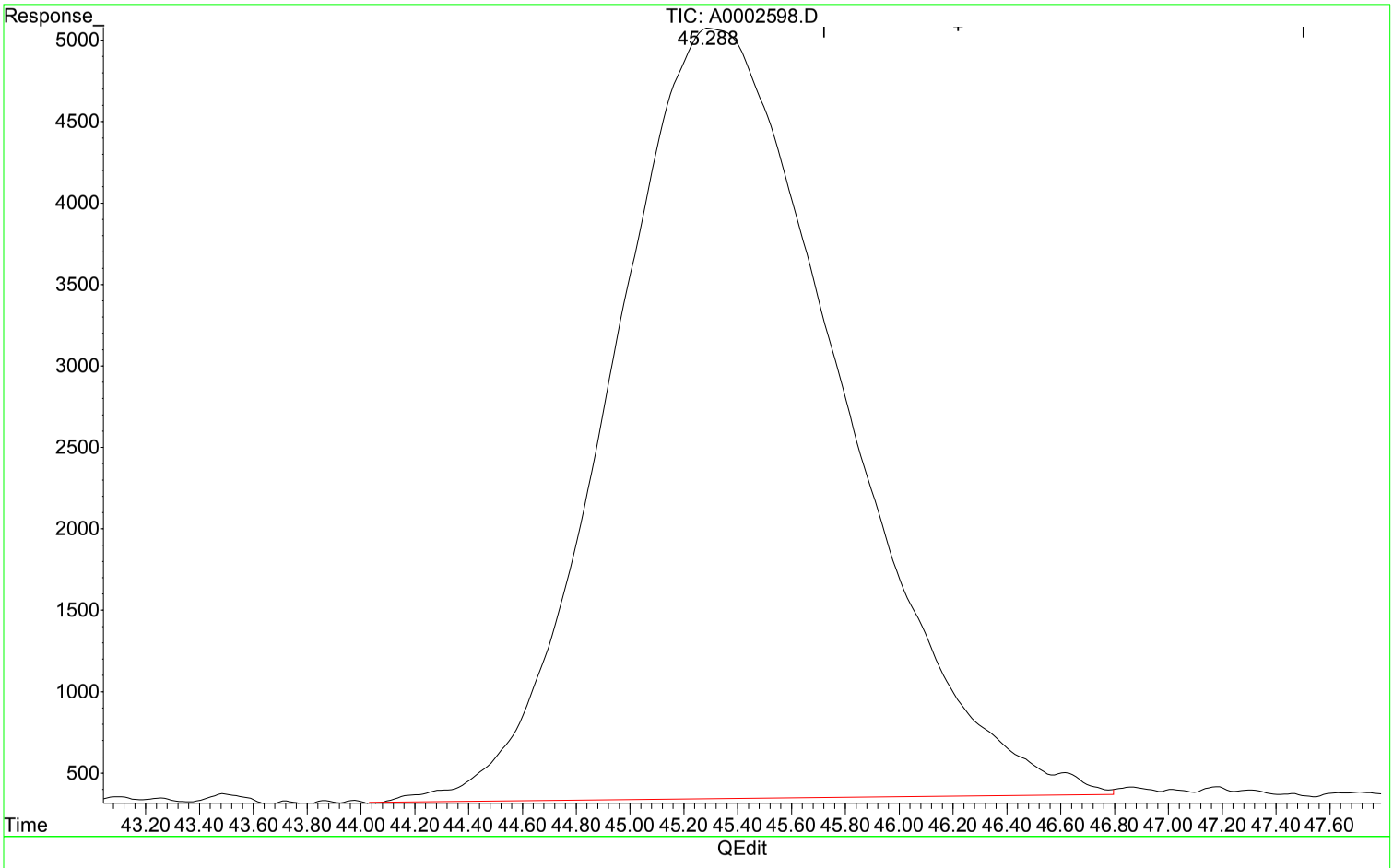
00945836

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

45.288min 44.291 ppm m

response 2785759

Manual Integration:

After

Poor integration.

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:20:31 2018

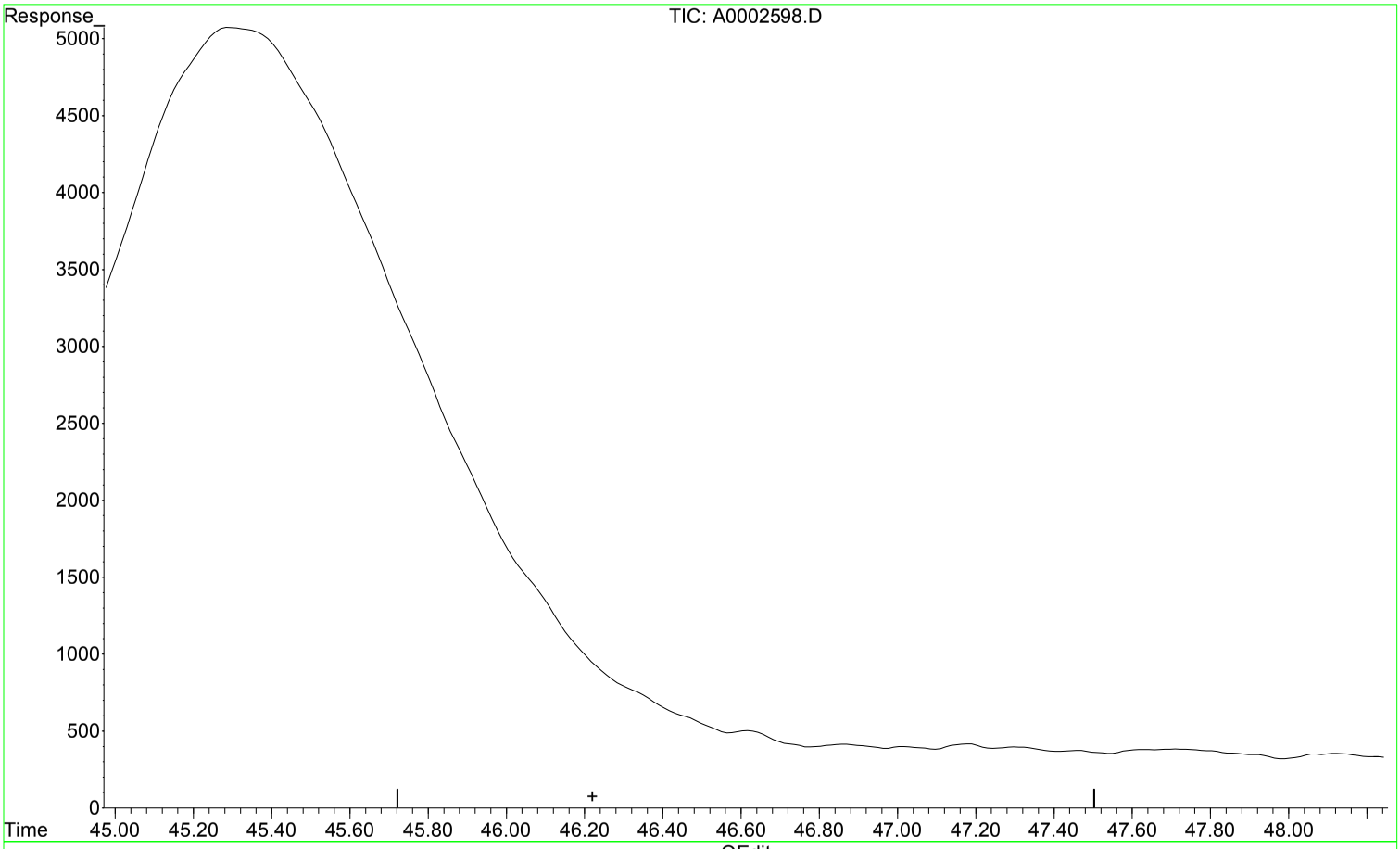
00945837

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

46.221min 0.000 ppm

response 0

Manual Integration:

Before

12/19/18

(+) = Expected Retention Time

MA100418.M Wed Dec 19 10:20:23 2018

00945838

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.724 E3	-0.4	100	0.00
2 T	Pyruvic acid	452.935	445.920 E3	1.5	97	-0.03
3 T	Lactic Acid	53.765	58.468 E3	-8.7	108	-0.03
4 T	Acetic Acid	59.169	59.478 E3	-0.5	98	-0.03
5 T	Propionic Acid	59.592	58.220 E3	2.3	99	-0.17
6 T	Butyric Acid	62.897	55.715 E3	11.4	95	-0.94#

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.392	4836188	50.198	ppm	
2) T	Pyruvic acid	4.334	2229601	4.923	ppm	
3) T	Lactic Acid	4.992	2923402	54.374	ppm	
4) T	Acetic Acid	5.480	2973916	50.261	ppm	
5) T	Propionic Acid	14.188	2911015	48.849	ppm	
6) T	Butyric Acid	45.288f	2785759	44.291	ppm	m

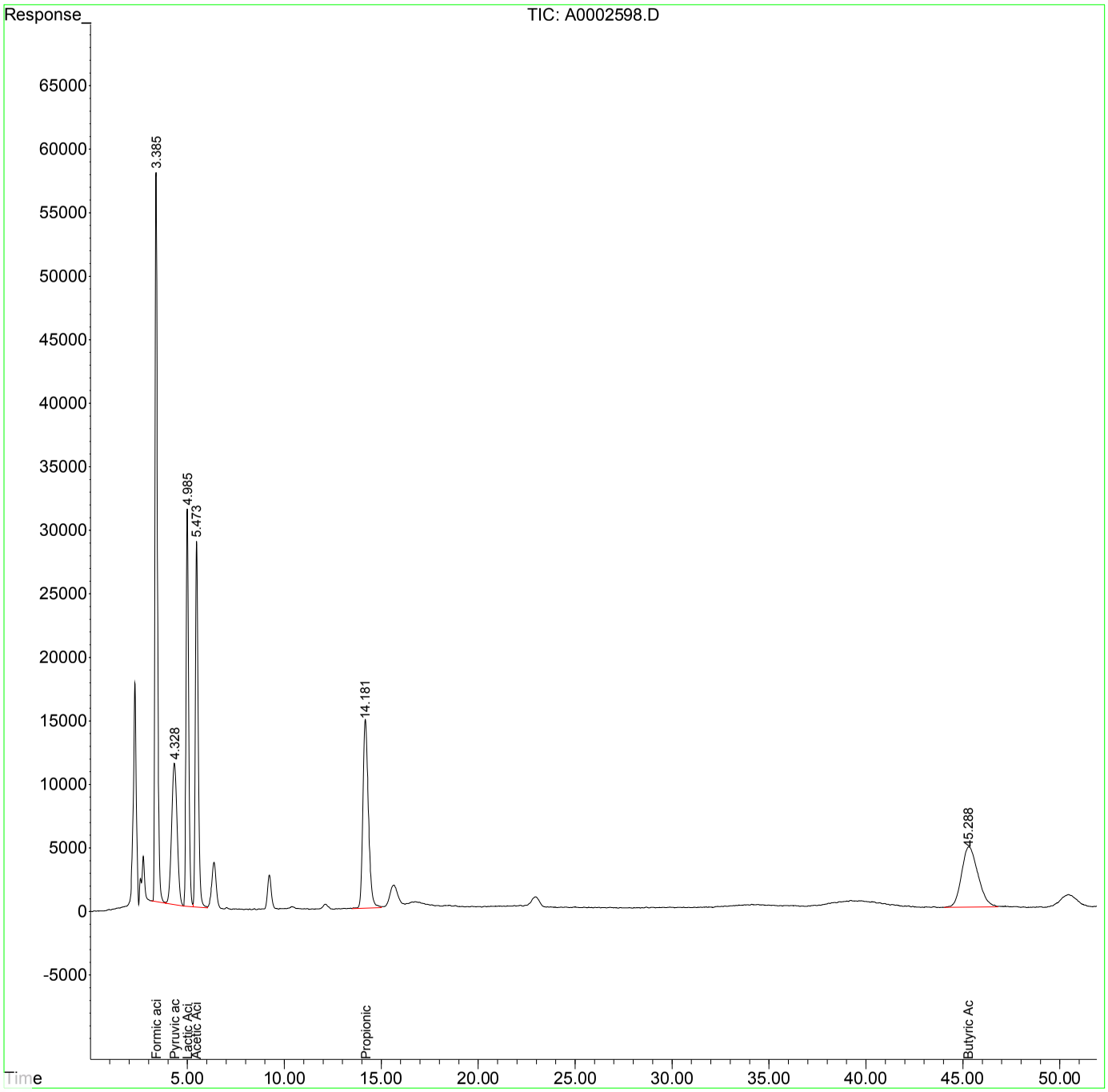
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121718\
Data File : A0002598.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 01:48:07
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 19 10:14:15 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Wed Dec 19 10:13:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00945841

1st BA 12/21/18
2nd DM 12/26/18

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002621.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 01:28:24~~ 20-Dec-2018, 02:35:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:29:50 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:29:23 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.744 E3	-0.4	100	0.00
2 T	Pyruvic acid	452.935	453.830 E3	-0.2	99	0.00
3 T	Lactic Acid	53.765	58.697 E3	-9.2	108	0.00
4 T	Acetic Acid	59.169	59.940 E3	-1.3	99	0.00
5 T	Propionic Acid	59.592	58.984 E3	1.0	100	0.03
6 T	Butyric Acid	62.897	56.296 E3	10.5	96	0.16

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002621.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 01:28:24~~ 20-Dec-2018, 02:35:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:29:50 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:29:23 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.436	4837191	50.208 ppm
2) T	Pyruvic acid	4.398	2269150	5.010 ppm
3) T	Lactic Acid	5.065	2934854	54.587 ppm
4) T	Acetic Acid	5.547	2997009	50.651 ppm
5) T	Propionic Acid	14.326	2949206	49.490 ppm
6) T	Butyric Acid	45.642	2814809	44.752 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

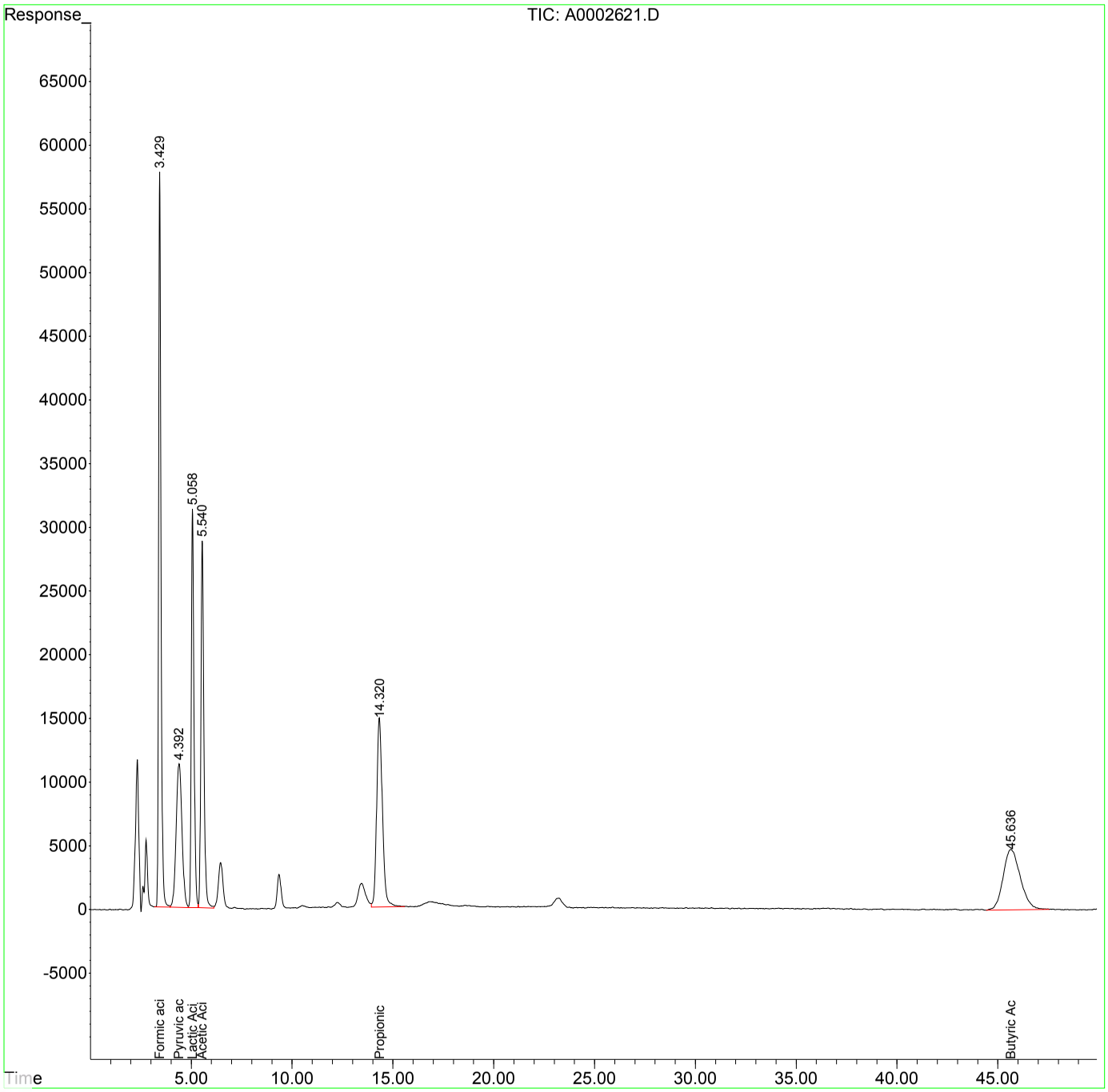
00945843

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002621.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:28:24
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:29:50 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:29:23 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002623.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 04:21:02
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:51 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.194 E3	0.2	100	0.00
2 T	Pyruvic acid	452.935	443.729 E3	2.0	97	0.00
3 T	Lactic Acid	53.765	58.140 E3	-8.1	107	0.00
4 T	Acetic Acid	59.169	59.231 E3	-0.1	98	0.00
5 T	Propionic Acid	59.592	58.485 E3	1.9	99	0.00
6 T	Butyric Acid	62.897	55.287 E3	12.1	94	0.00

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00945845

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002623.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 04:21:02
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:51 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.435	4809684	49.922 ppm
2) T	Pyruvic acid	4.393	2218644	4.898 ppm
3) T	Lactic Acid	5.060	2906976	54.068 ppm
4) T	Acetic Acid	5.541	2961574	50.052 ppm
5) T	Propionic Acid	14.292	2924251	49.072 ppm
6) T	Butyric Acid	45.483	2764365	43.950 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

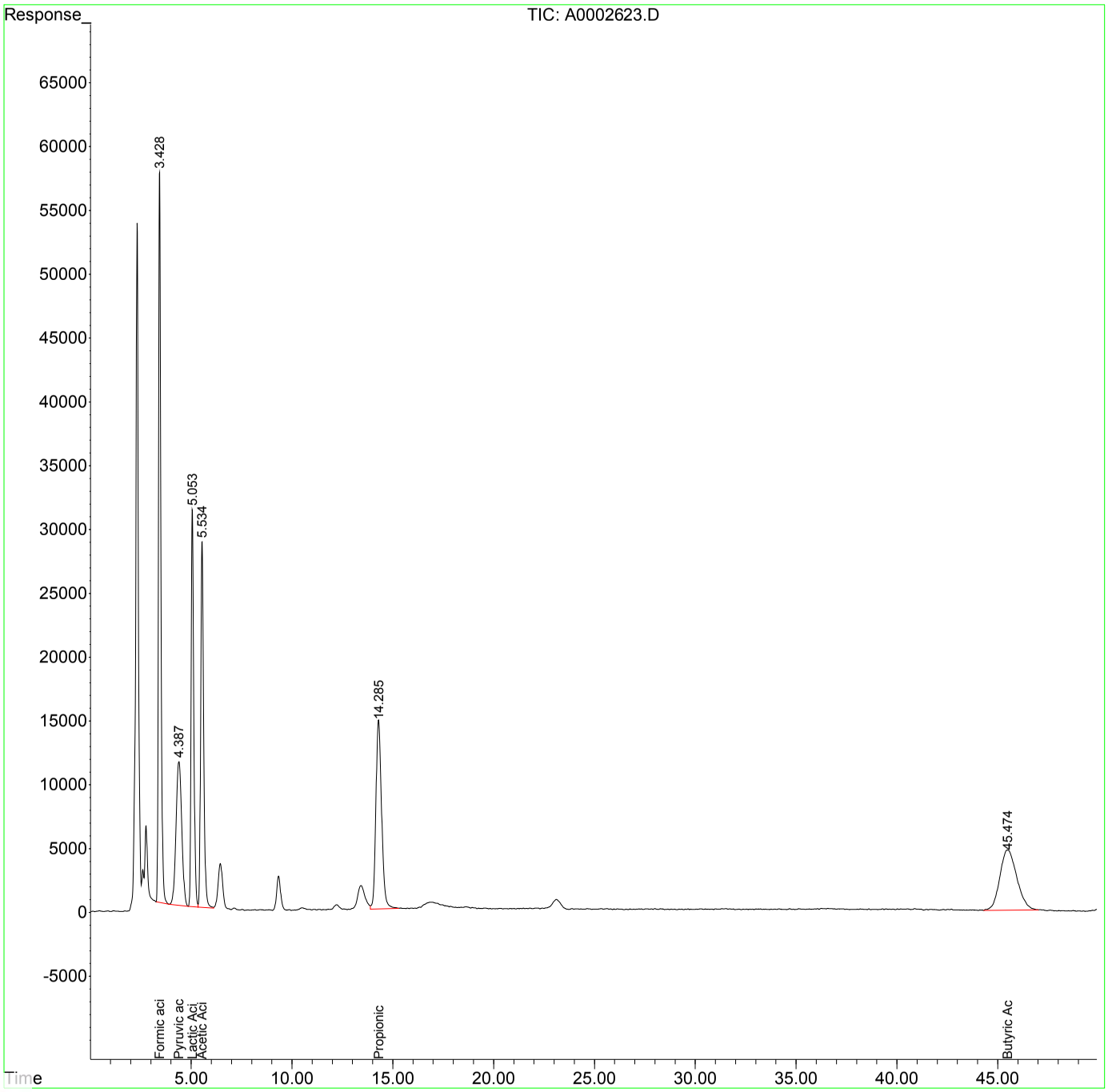
00945846

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002623.D
Signal(s) : dad1A.ch
Acq On : 20-Dec-2018, 04:21:02
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:30:51 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:30:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002651.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 05:03:39
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 09:51:28 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 09:51:11 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.212 E3	0.1	100	0.00
2 T	Pyruvic acid	452.935	451.409 E3	0.3	98	0.00
3 T	Lactic Acid	53.765	60.234 E3	-12.0	111	-0.01
4 T	Acetic Acid	59.169	59.299 E3	-0.2	98	0.00
5 T	Propionic Acid	59.592	60.176 E3	-1.0	102	-0.07
6 T	Butyric Acid	62.897	55.921 E3	11.1	95	-0.32

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002651.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 05:03:39
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 09:51:28 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 09:51:11 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.413	4810618	49.932 ppm
2) T	Pyruvic acid	4.334	2257047	4.983 ppm
3) T	Lactic Acid	4.979	3011701	56.016 ppm
4) T	Acetic Acid	5.447	2964931	50.109 ppm
5) T	Propionic Acid	13.850	3008788	50.490 ppm
6) T	Butyric Acid	43.641	2796063	44.454 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

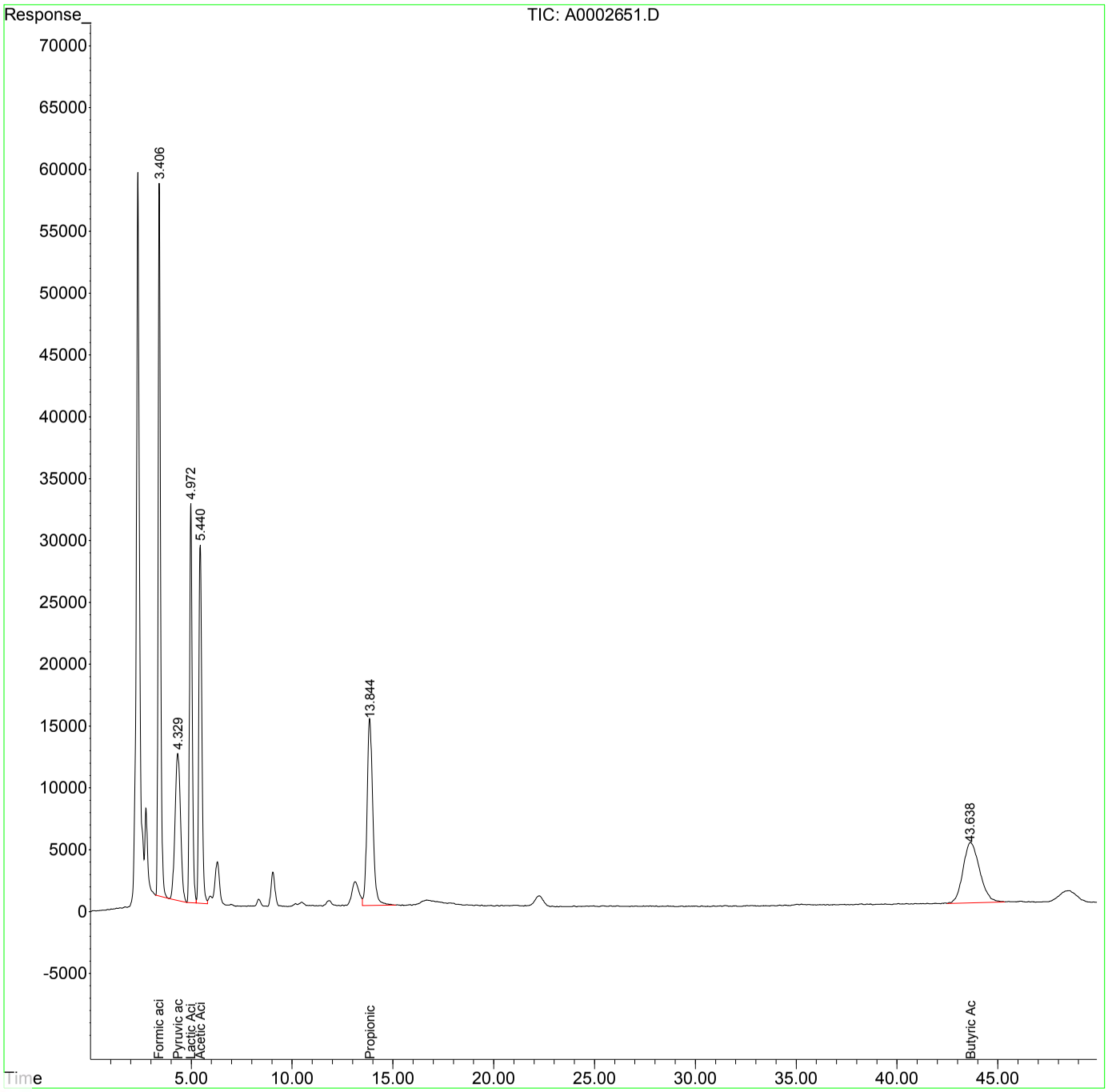
00945849

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002651.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 05:03:39
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 09:51:28 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 09:51:11 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



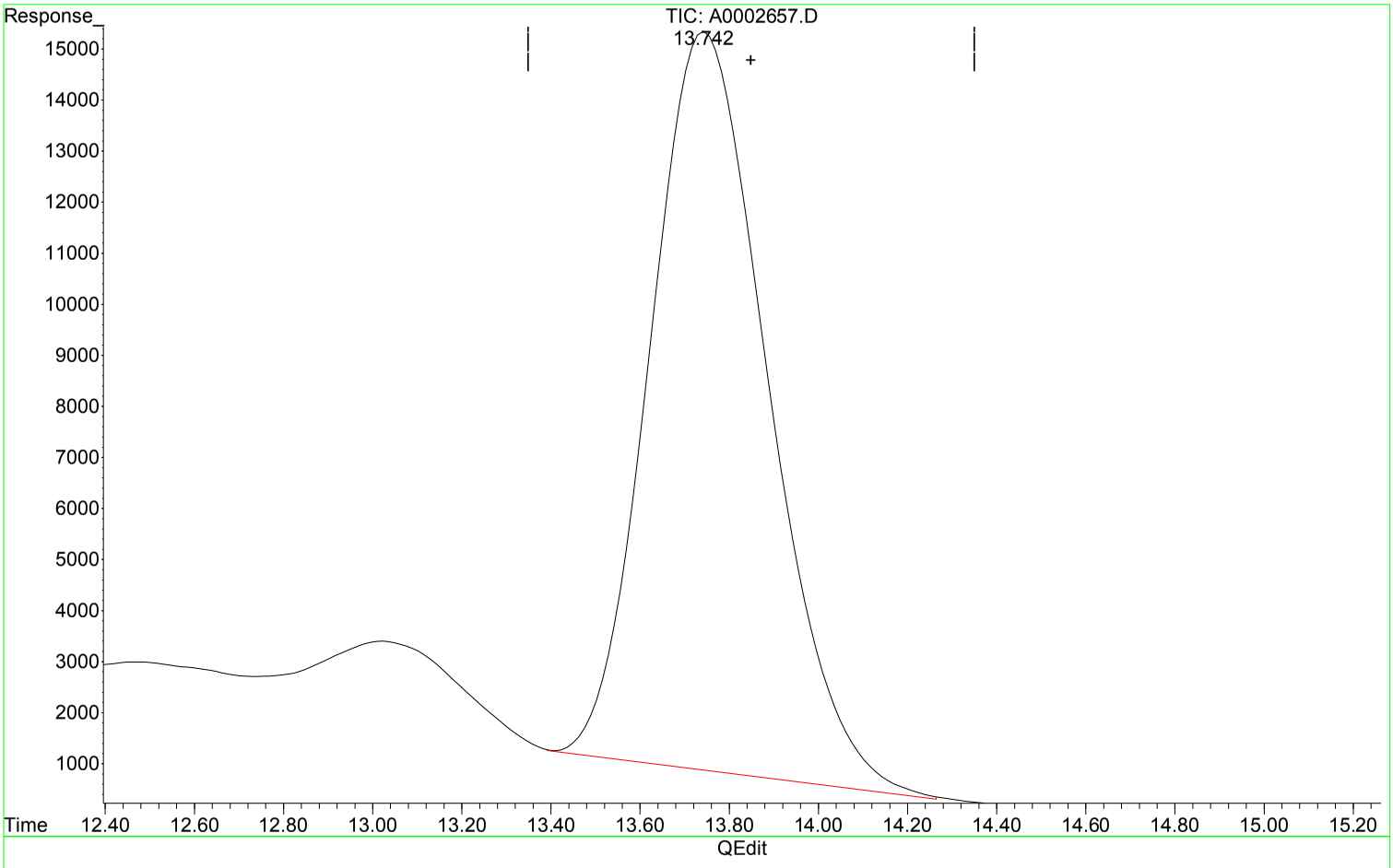
00945850

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 00:10:32
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:25:44 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 10:14:14 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.742min 44.551 ppm m

response 2654877

Manual Integration:

After

Poor integration.

12/21/18

(+) = Expected Retention Time

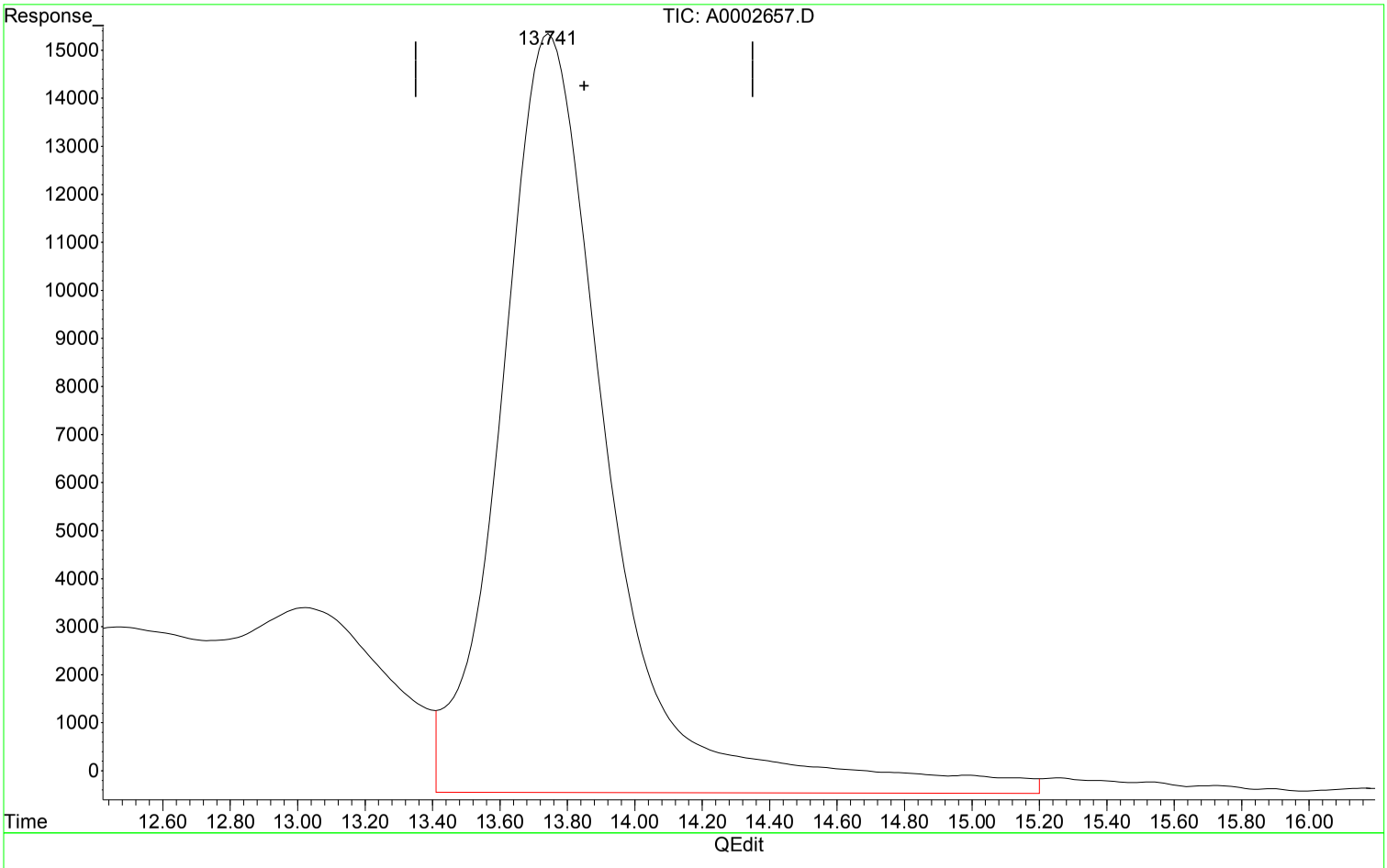
00945851

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 00:10:32
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:25:44 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 10:14:14 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.747min 59.660 ppm

response 3555234

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

00945852

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 00:10:32~~ 21-Dec-2018, 09:00:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:26:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 11:26:29 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.608 E3	-1.3	101	0.00
2 T	Pyruvic acid	452.935	458.020 E3	-1.1	100	0.00
3 T	Lactic Acid	53.765	60.544 E3	-12.6	112	-0.01
4 T	Acetic Acid	59.169	59.707 E3	-0.9	99	-0.02
5 T	Propionic Acid	59.592	53.194 E3	10.7	90	-0.11
6 T	Butyric Acid	62.897	55.389 E3	11.9	94	-0.46

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00945853

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 00:10:32~~ 21-Dec-2018, 09:00:00
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:26:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 11:26:29 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.411	4880415	50.657	ppm	
2) T	Pyruvic acid	4.326	2290098	5.056	ppm	
3) T	Lactic Acid	4.965	3027179	56.304	ppm	
4) T	Acetic Acid	5.430	2985327	50.454	ppm	
5) T	Propionic Acid	13.742	2659702	44.632	ppm	m
6) T	Butyric Acid	43.180f	2769435	44.031	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

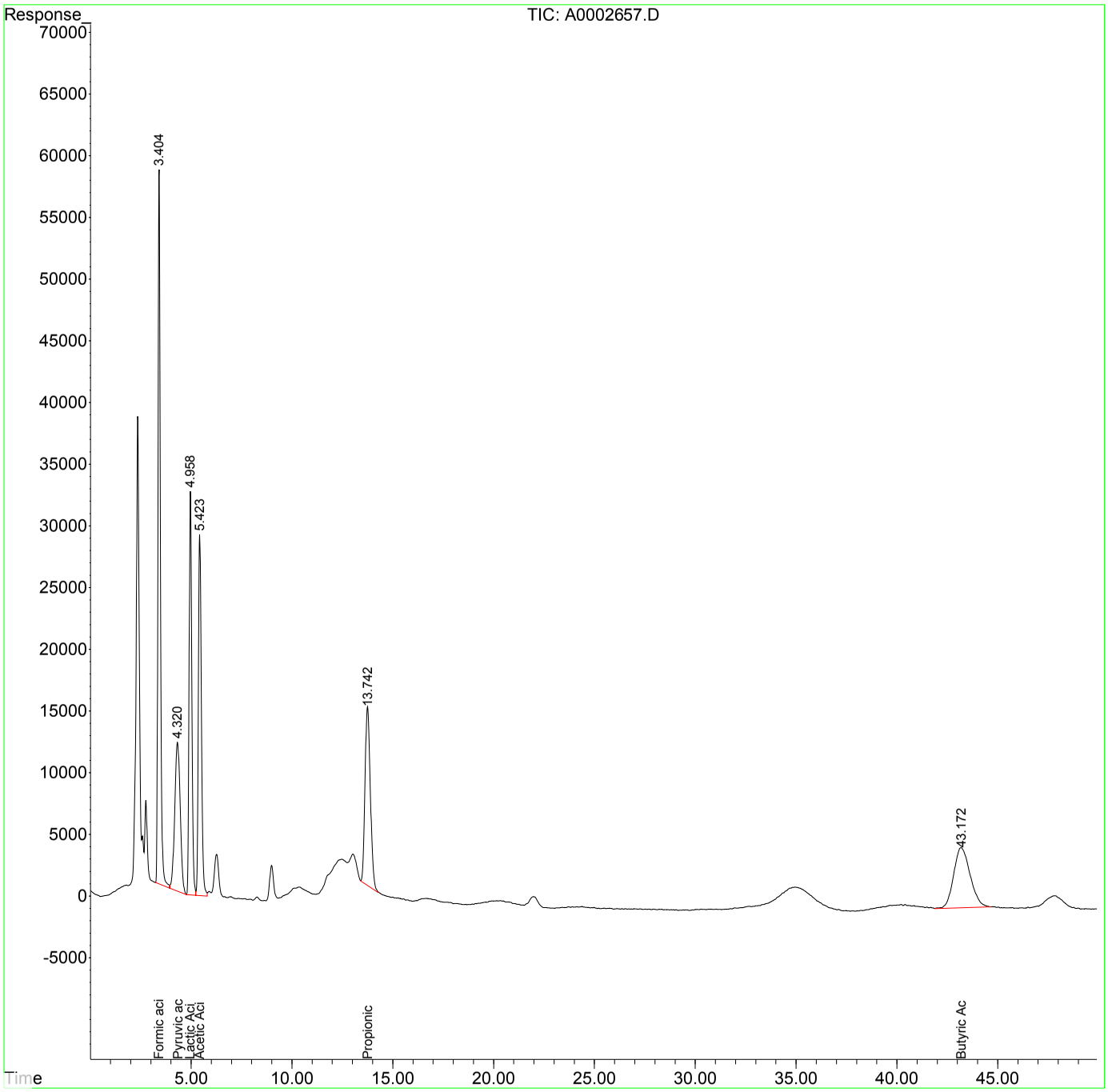
00945854

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002657.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 00:10:32
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 11:26:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 11:26:29 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



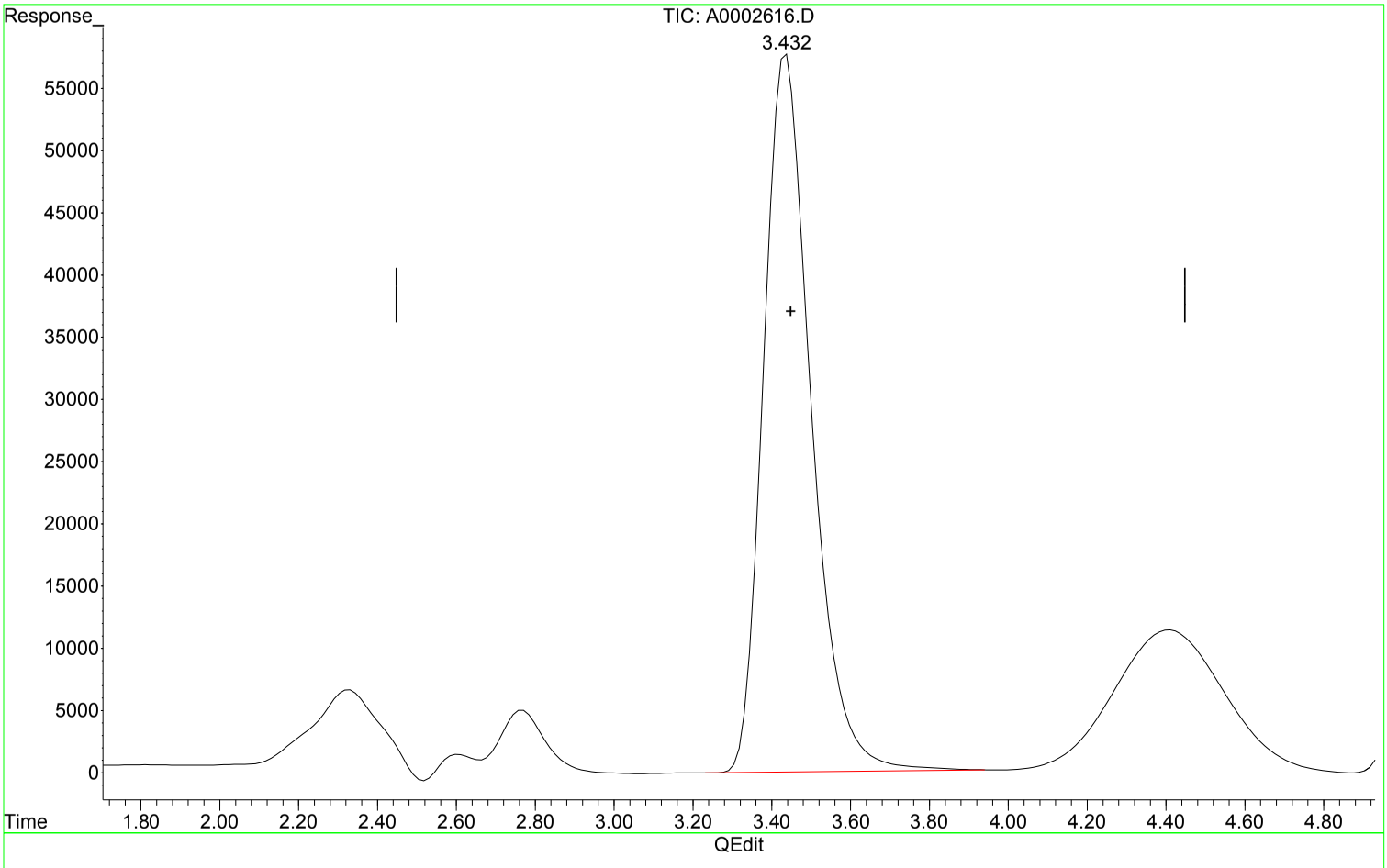
00945855

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(1) Formic acid (t)

3.432min 50.416 ppm m

response 4857207

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:10 2018

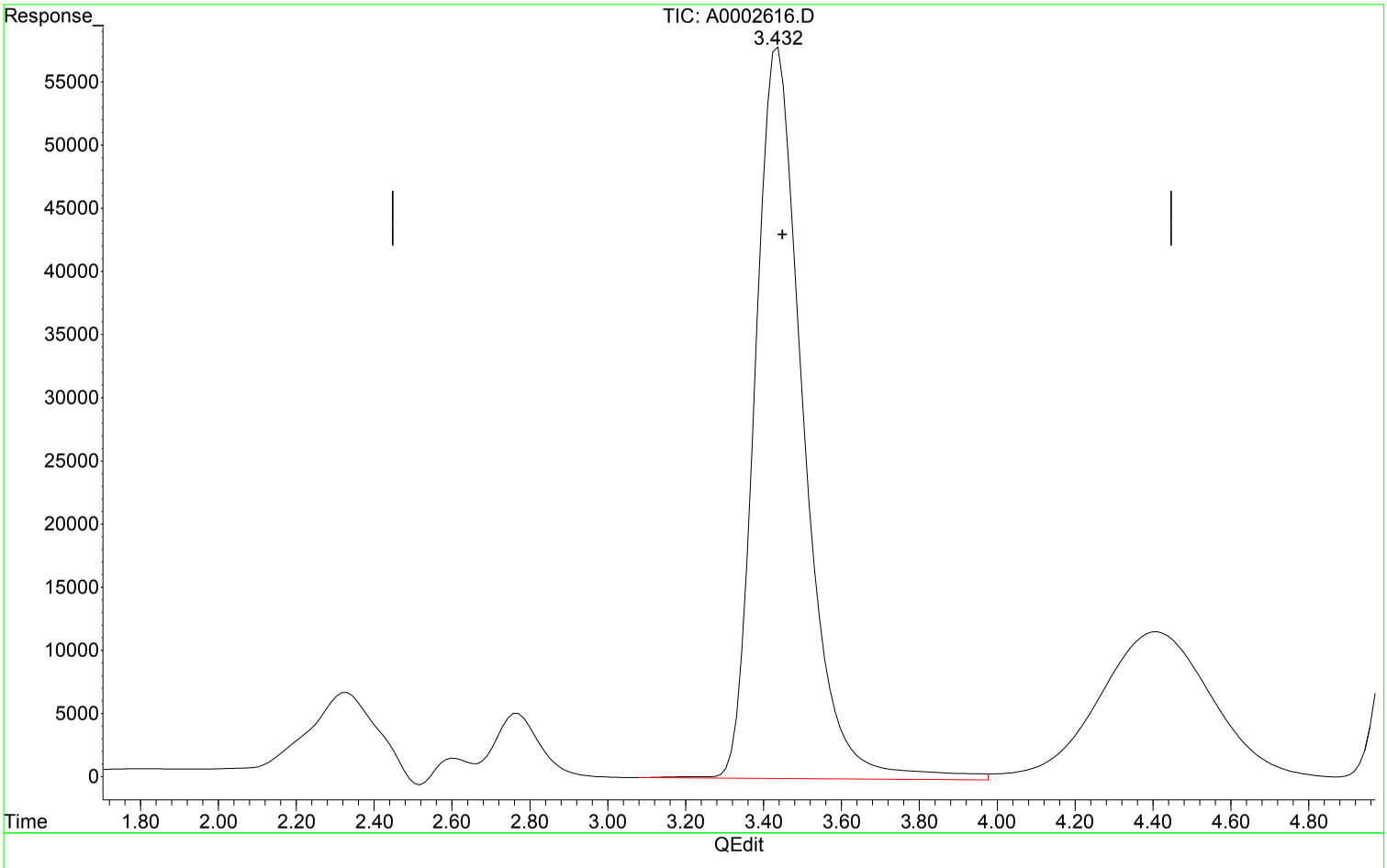
00945856

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(1) Formic acid (t)

3.439min 51.810 ppm

response 4991581

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:04 2018

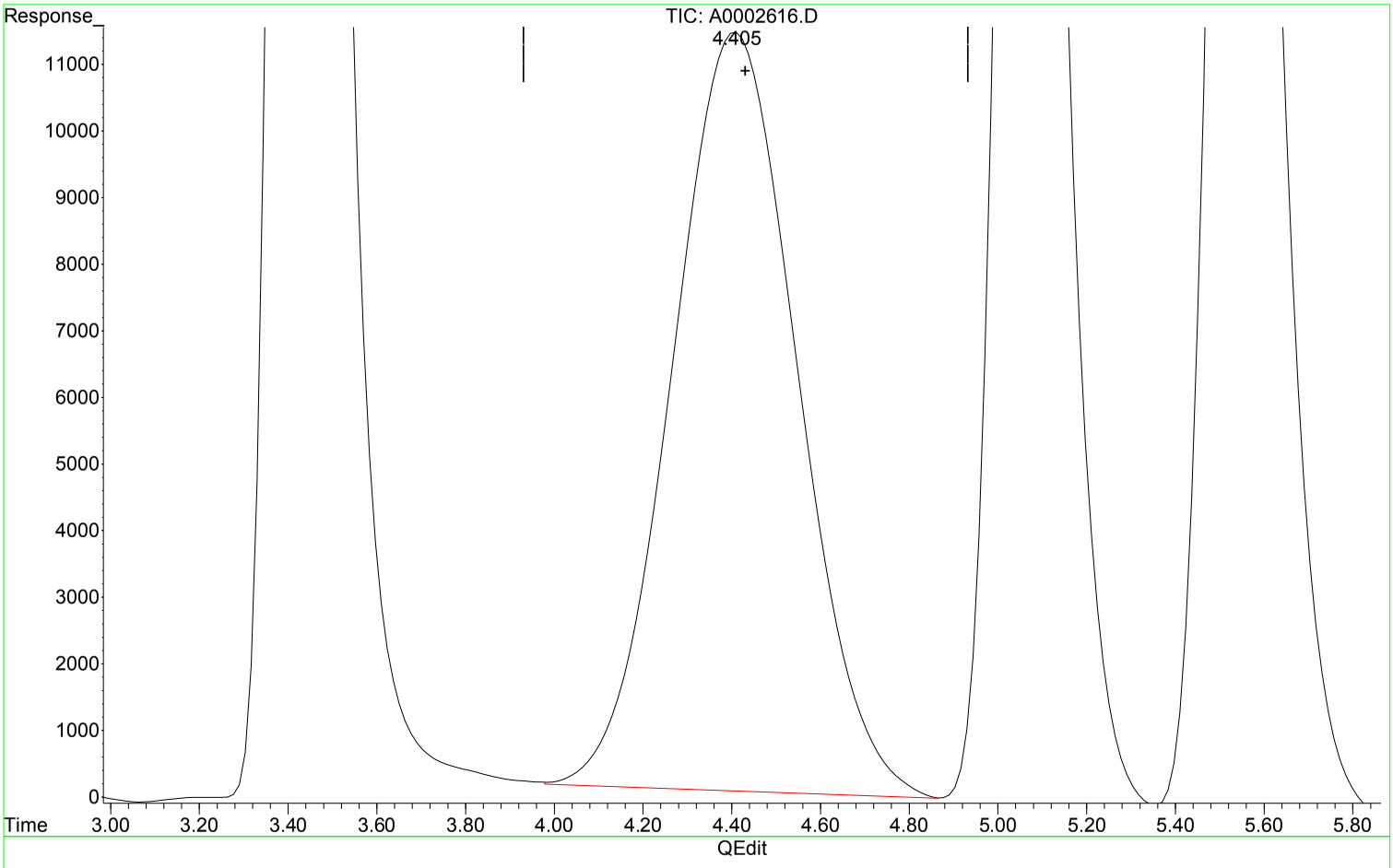
00945857

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(2) Pyruvic acid (T)

4.405min 4.933 ppm m

response 2234360

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:22 2018

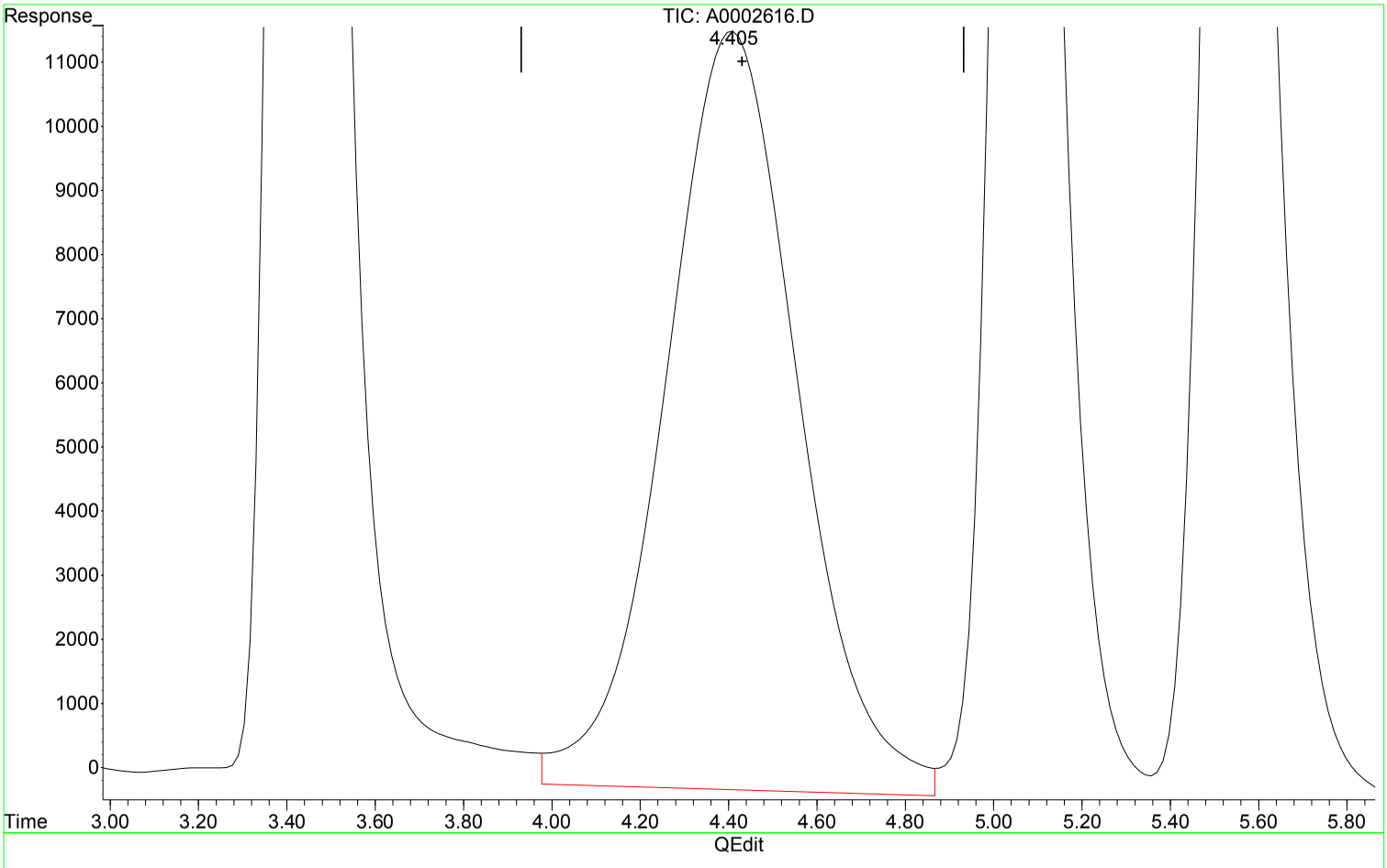
00945858

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(2) Pyruvic acid (T)

4.411min 5.448 ppm

response 2467745

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:15 2018

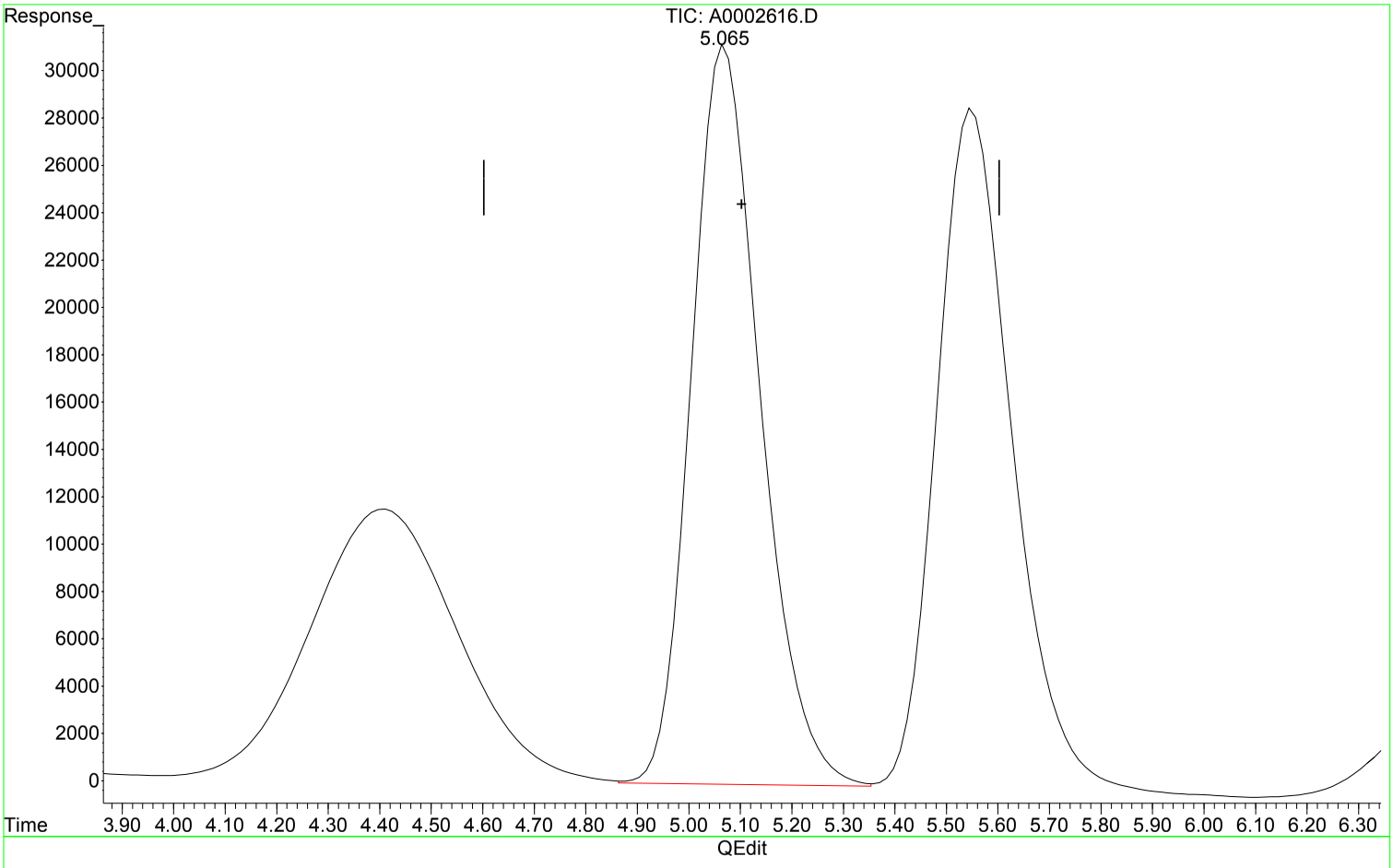
00945859

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

5.065min 54.023 ppm m

response 2904540

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

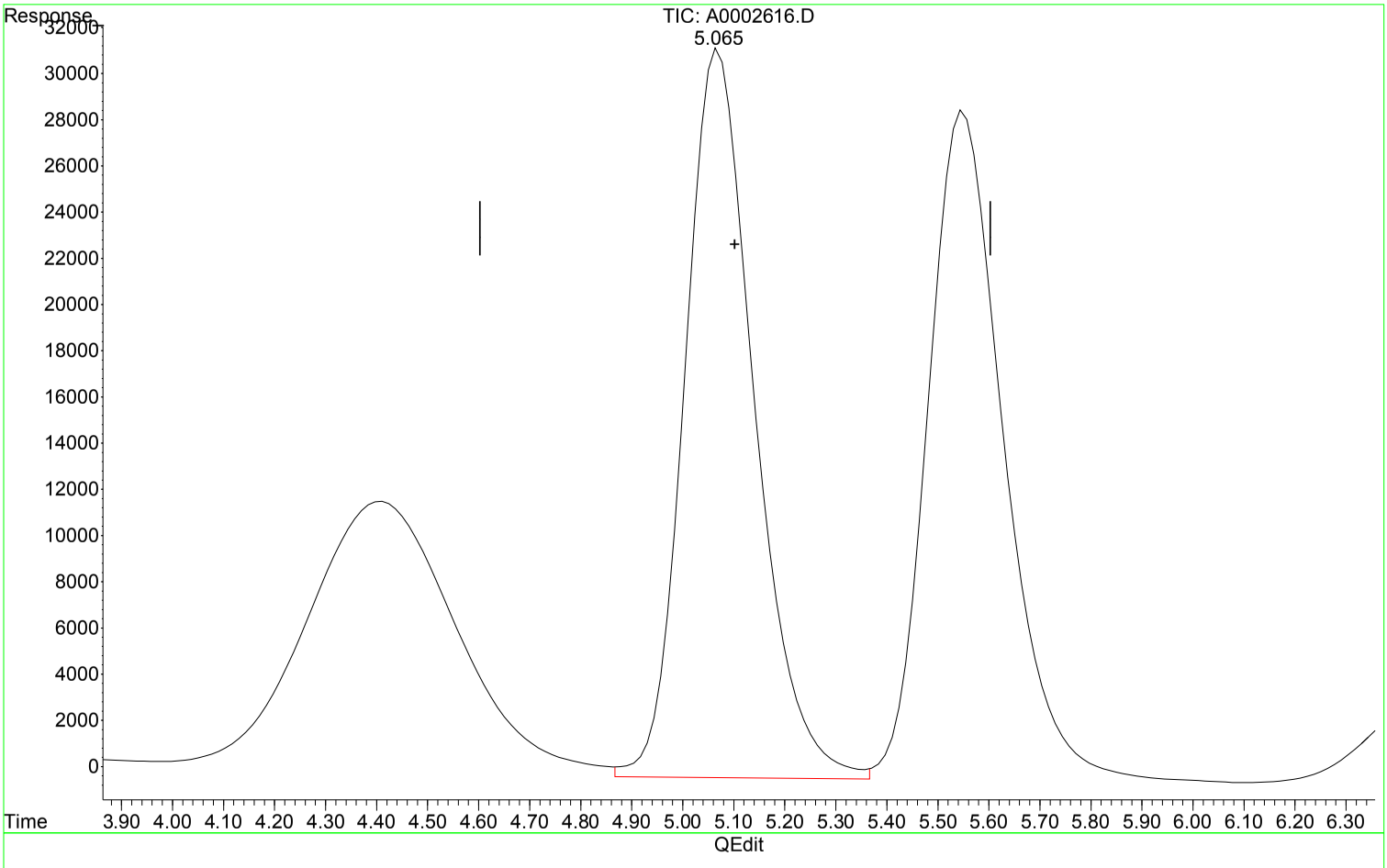
00945860

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

5.072min 55.891 ppm

response 3004993

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

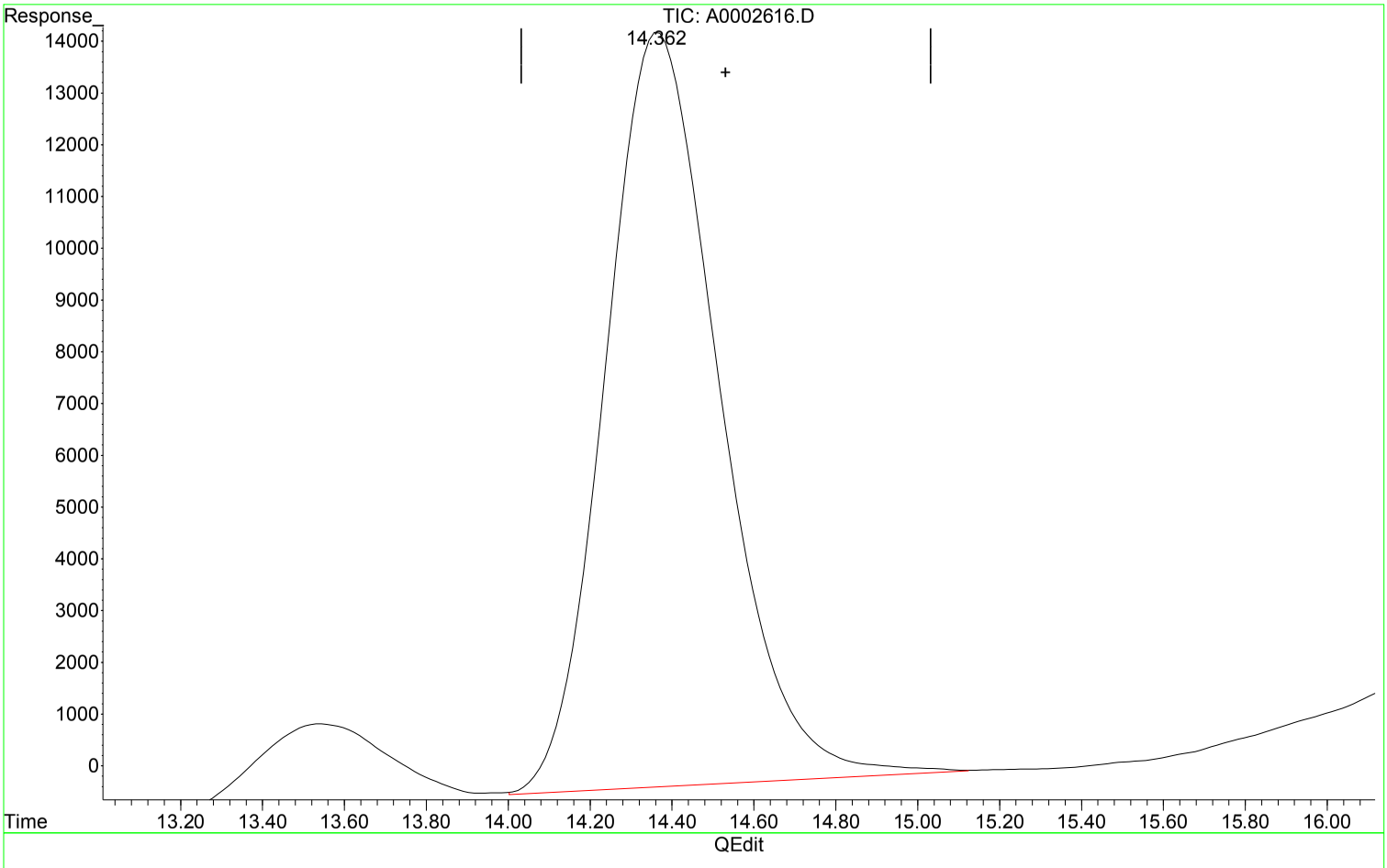
00945861

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.362min 47.411 ppm m

response 2825301

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:46 2018

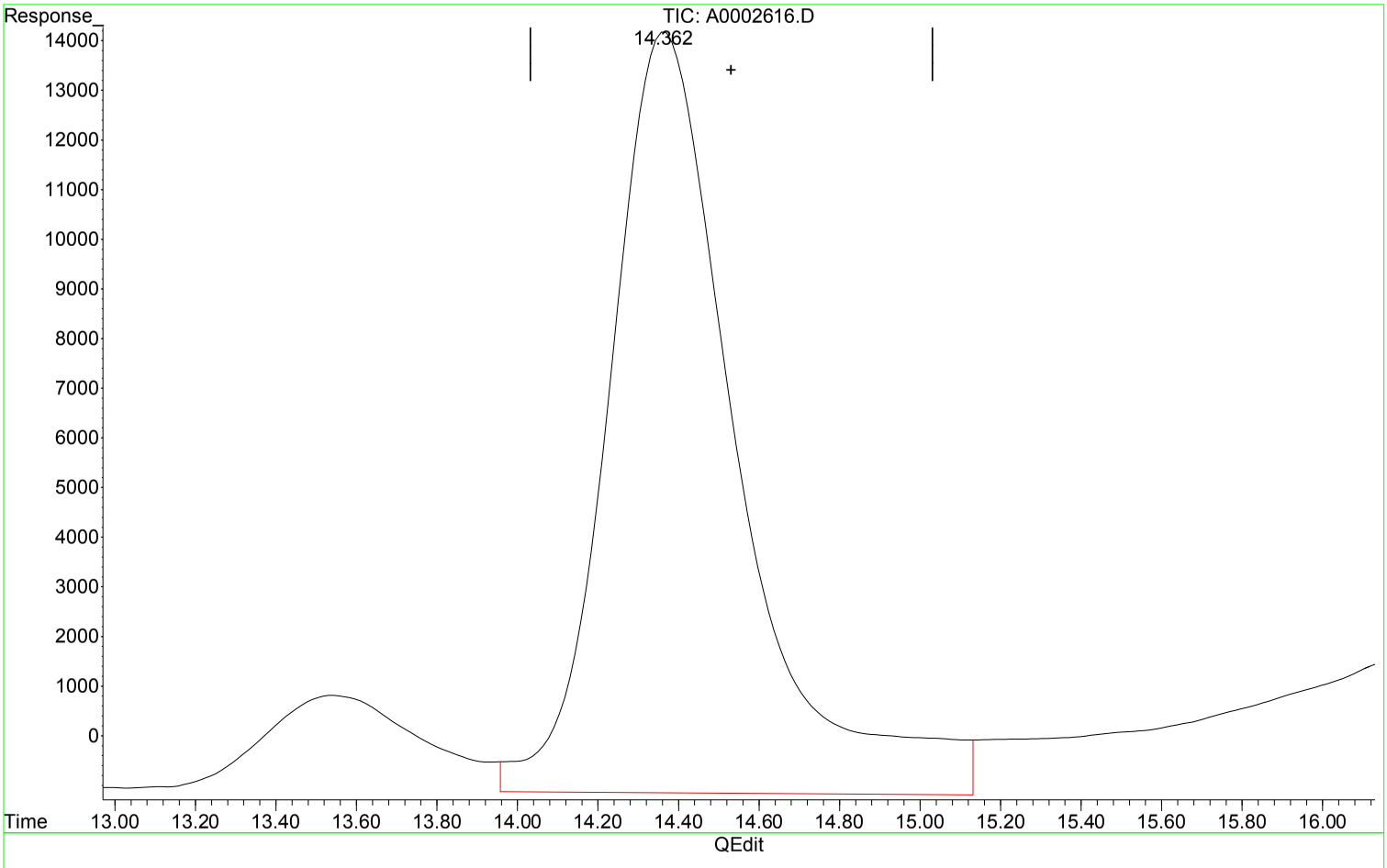
00945862

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

14.368min 57.152 ppm

response 3405796

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:40 2018

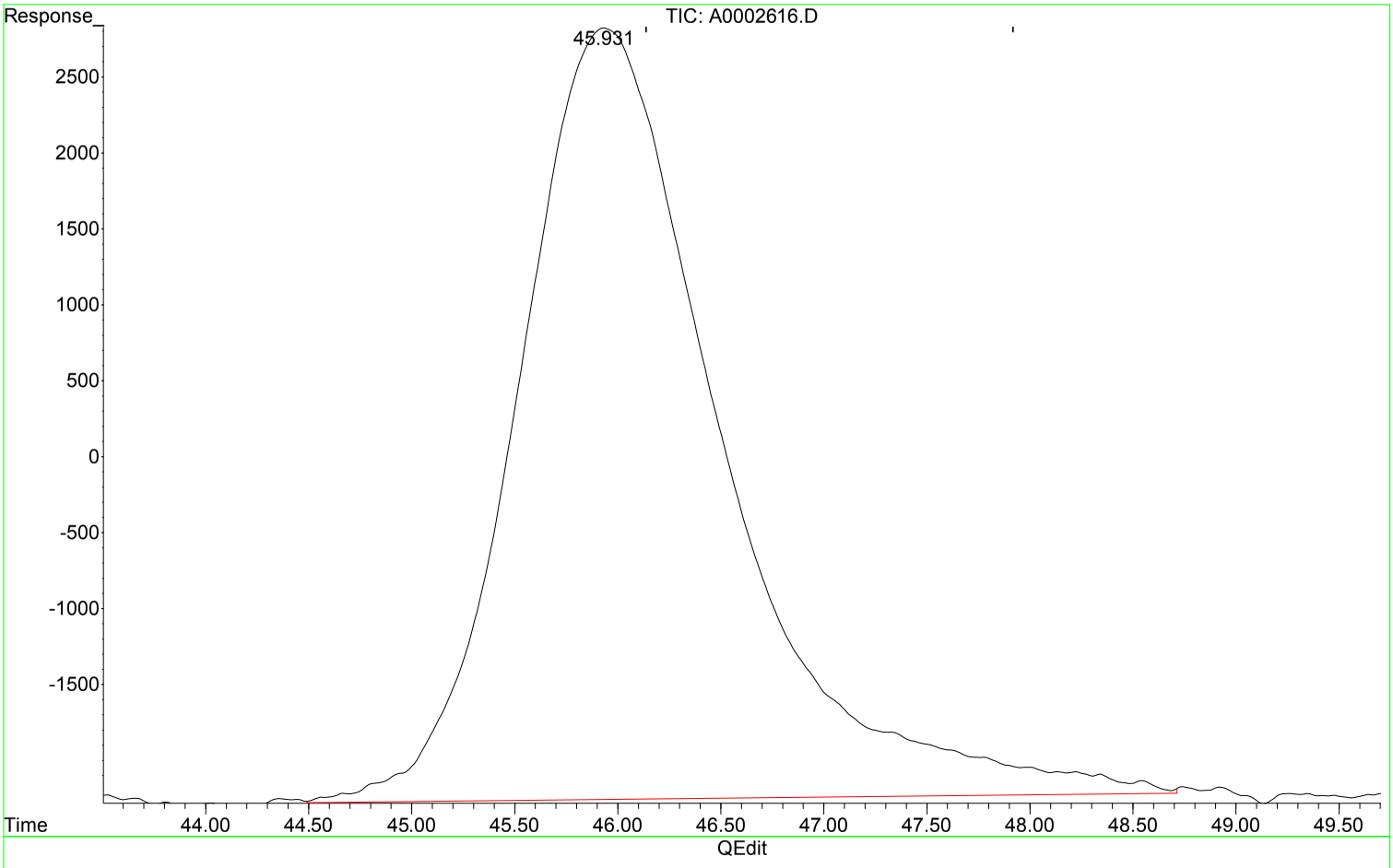
00945863

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

45.931min 55.051 ppm m

response 3462535

Manual Integration:

After

Poor integration.

12/20/18

(+) = Expected Retention Time

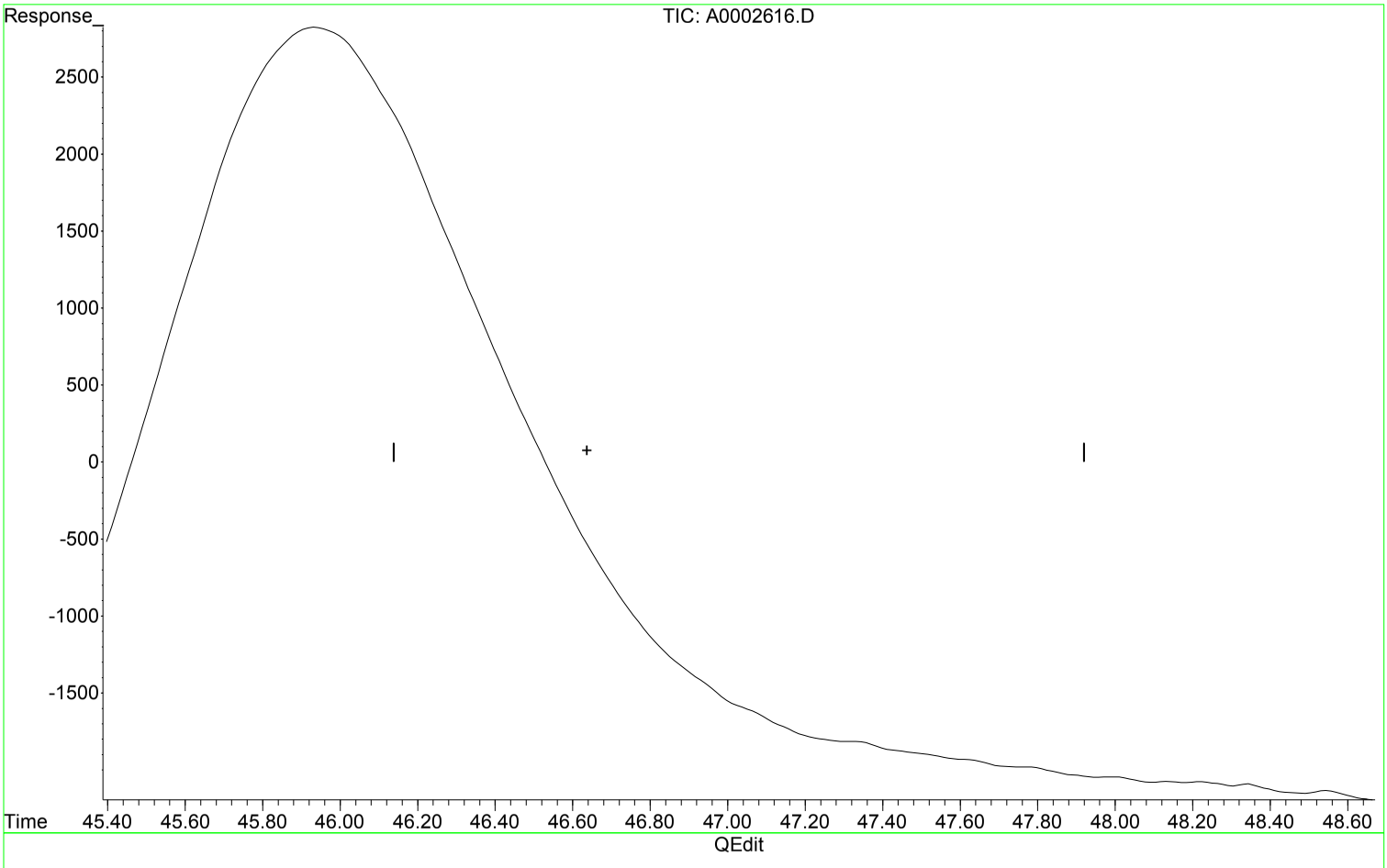
00945864

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

46.638min 0.000 ppm

response 0

Manual Integration:

Before

12/20/18

(+) = Expected Retention Time

MA100418.M Thu Dec 20 09:28:53 2018

00945865

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	97.144 E3	-0.8	101	-0.02
2 T	Pyruvic acid	452.935	446.872 E3	1.3	97	-0.03
3 T	Lactic Acid	53.765	58.091 E3	-8.0	107	-0.04
4 T	Acetic Acid	59.169	59.782 E3	-1.0	99	-0.04
5 T	Propionic Acid	59.592	56.506 E3	5.2	96	-0.17
6 T	Butyric Acid	62.897	69.251 E3	-10.1	118	-0.71#

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00945866

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.432	4857207	50.416	ppm	m
2) T	Pyruvic acid	4.405	2234360	4.933	ppm	m
3) T	Lactic Acid	5.065	2904540	54.023	ppm	m
4) T	Acetic Acid	5.552	2989104	50.518	ppm	
5) T	Propionic Acid	14.362	2825301	47.411	ppm	m
6) T	Butyric Acid	45.931f	3462535	55.051	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

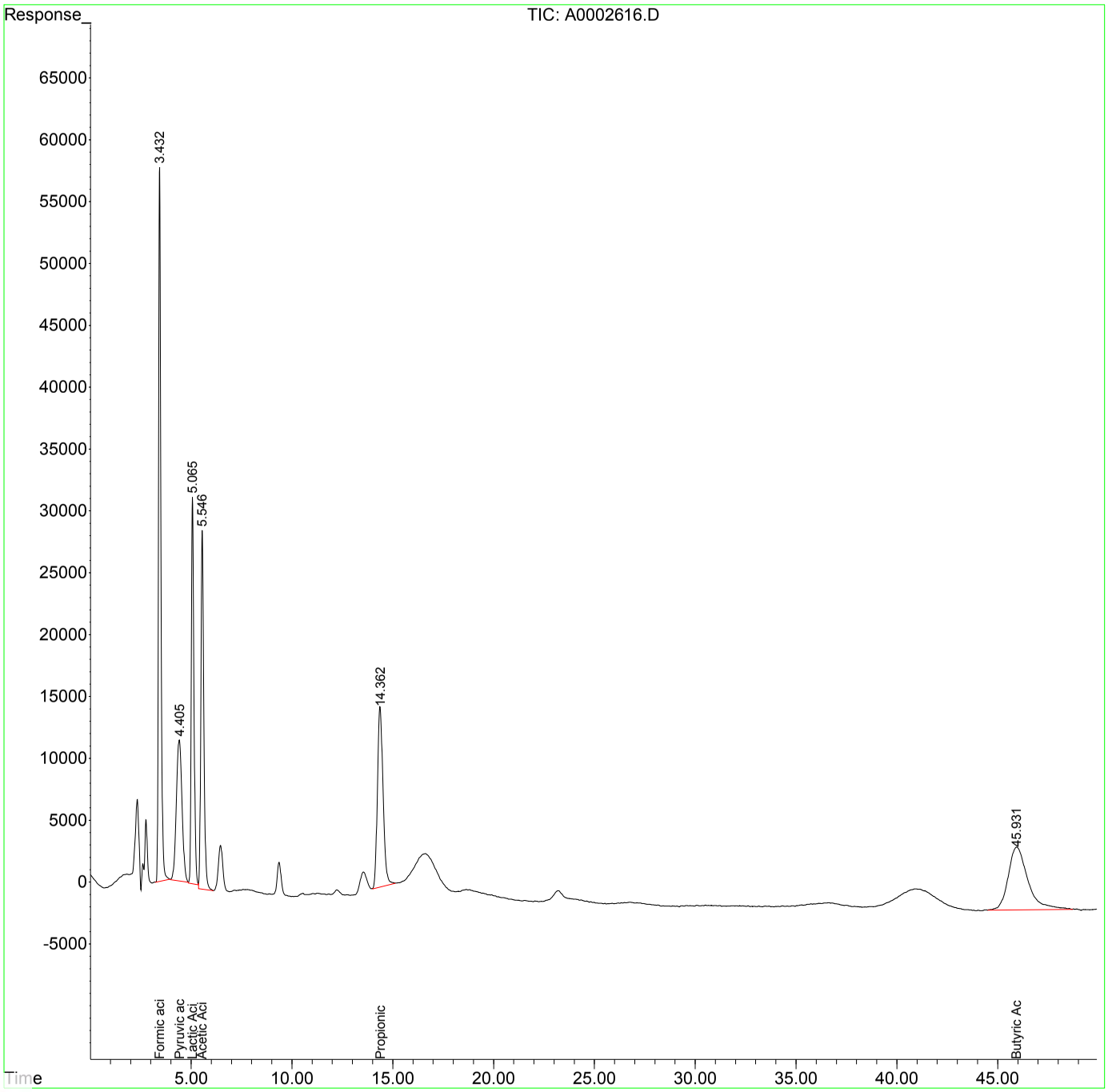
00945867

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002616.D
Signal(s) : dad1A.ch
Acq On : 19-Dec-2018, 22:10:28
Operator : b.allgeier
Sample : CCV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 20 09:27:48 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Dec 20 09:27:08 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

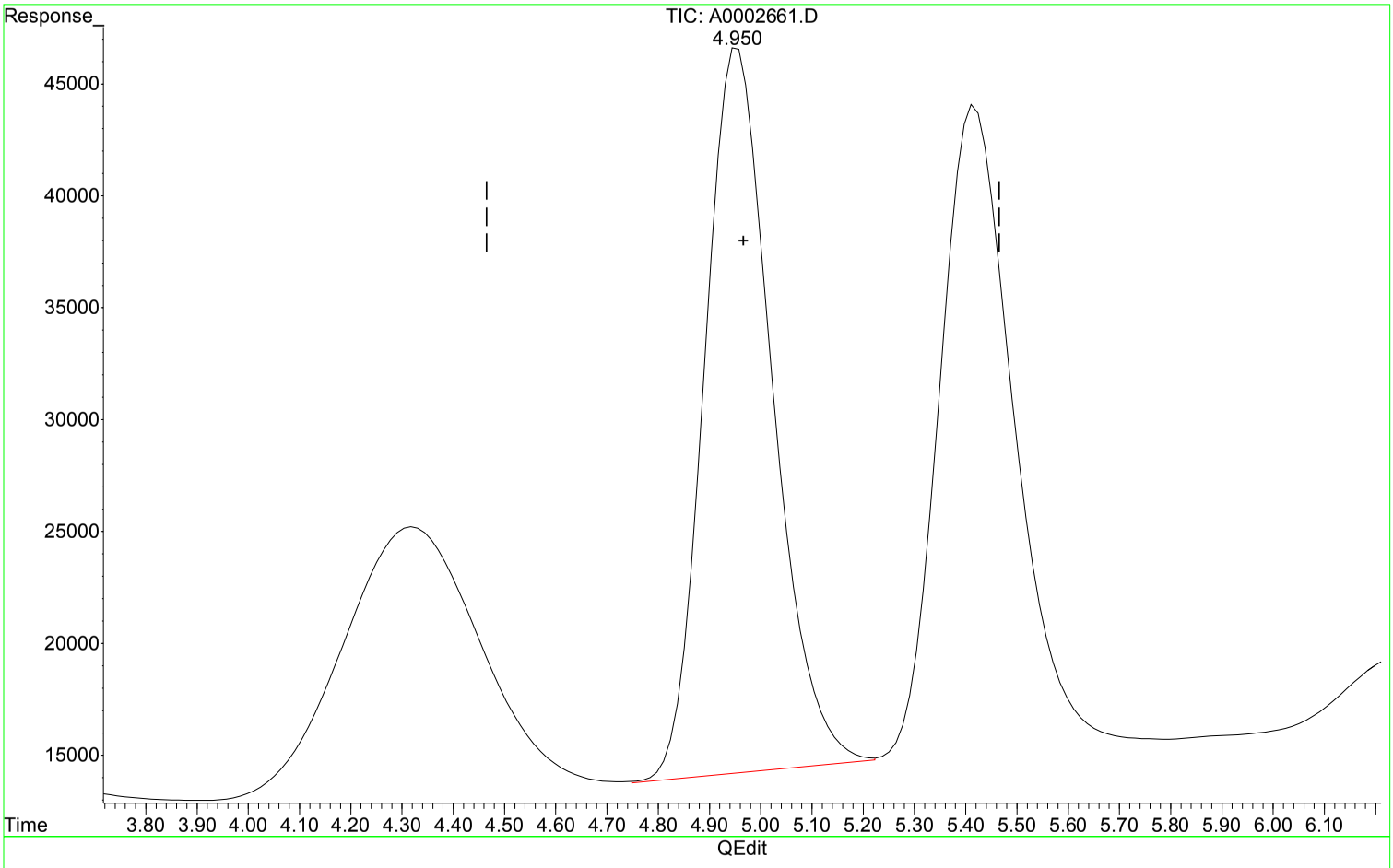


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.950min 55.665 ppm m

response 2992819

Manual Integration:

After

Poor integration.

12/21/18

(+) = Expected Retention Time

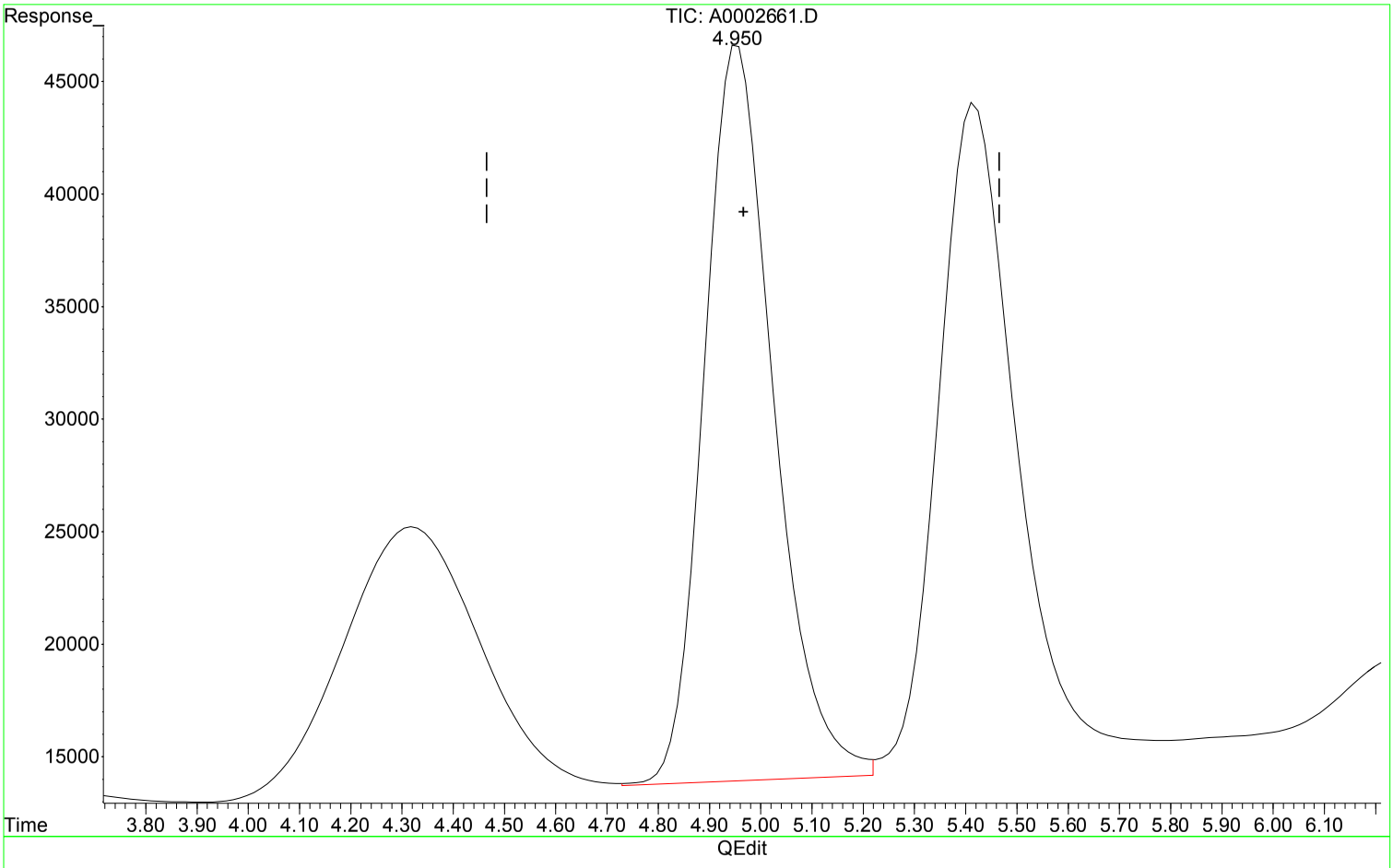
00945869

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(3) Lactic Acid (T)

4.957min 57.280 ppm

response 3079640

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

MA100418.M Fri Dec 21 14:46:43 2018

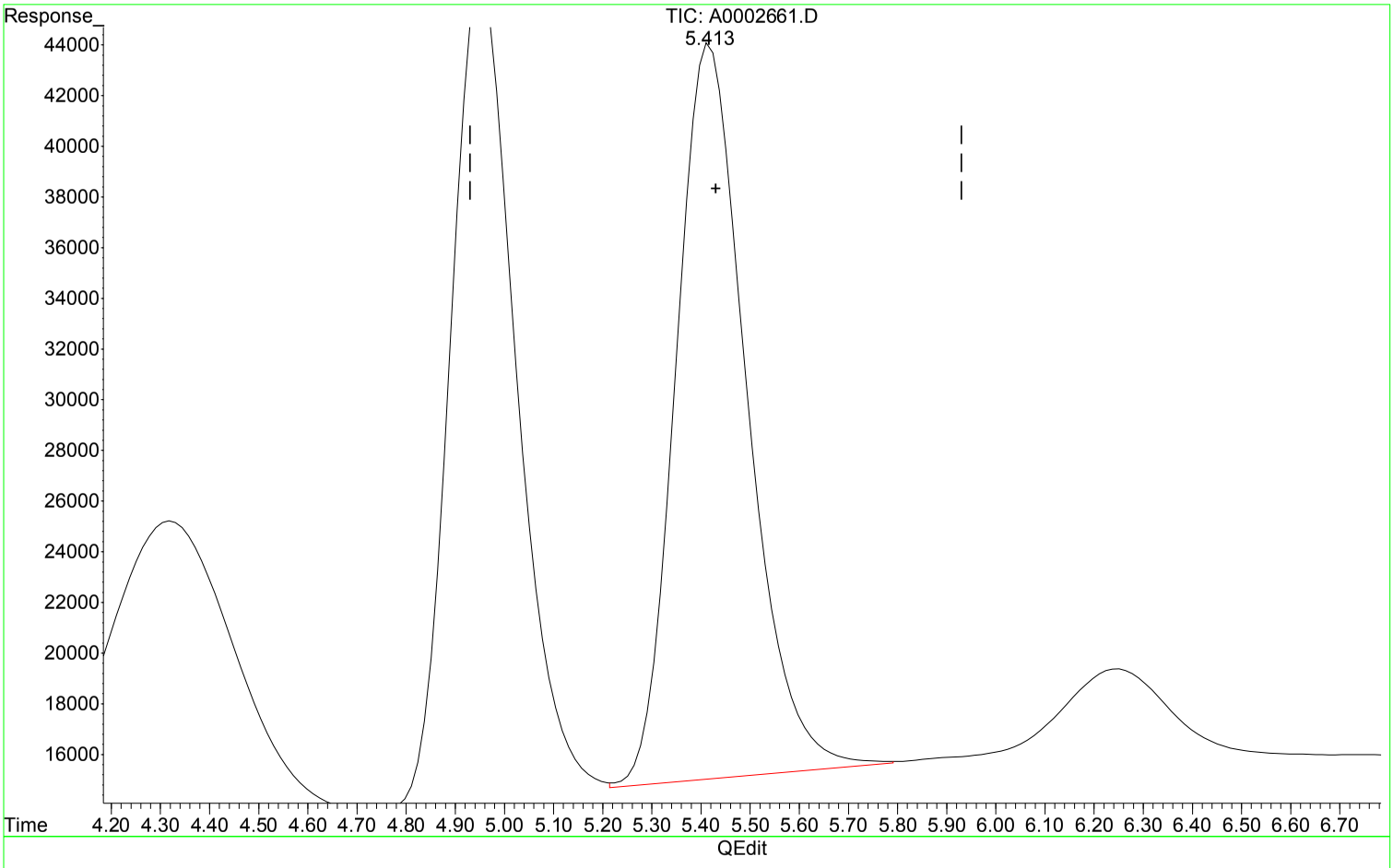
00945870

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.413min 49.499 ppm m

response 2928823

Manual Integration:

After

Poor integration.

12/21/18

(+) = Expected Retention Time

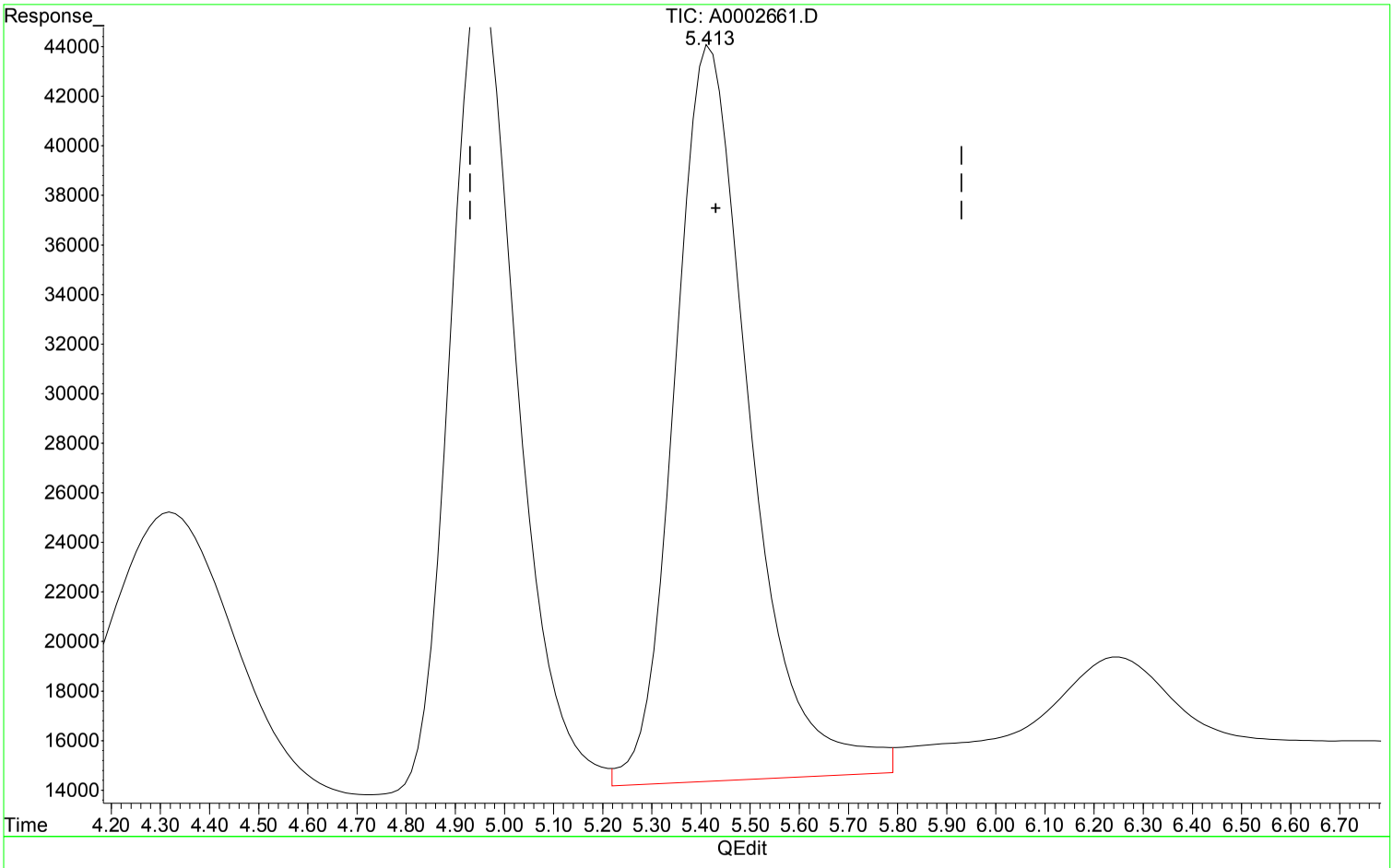
00945871

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

5.420min 53.746 ppm

response 3180137

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

MA100418.M Fri Dec 21 14:46:53 2018

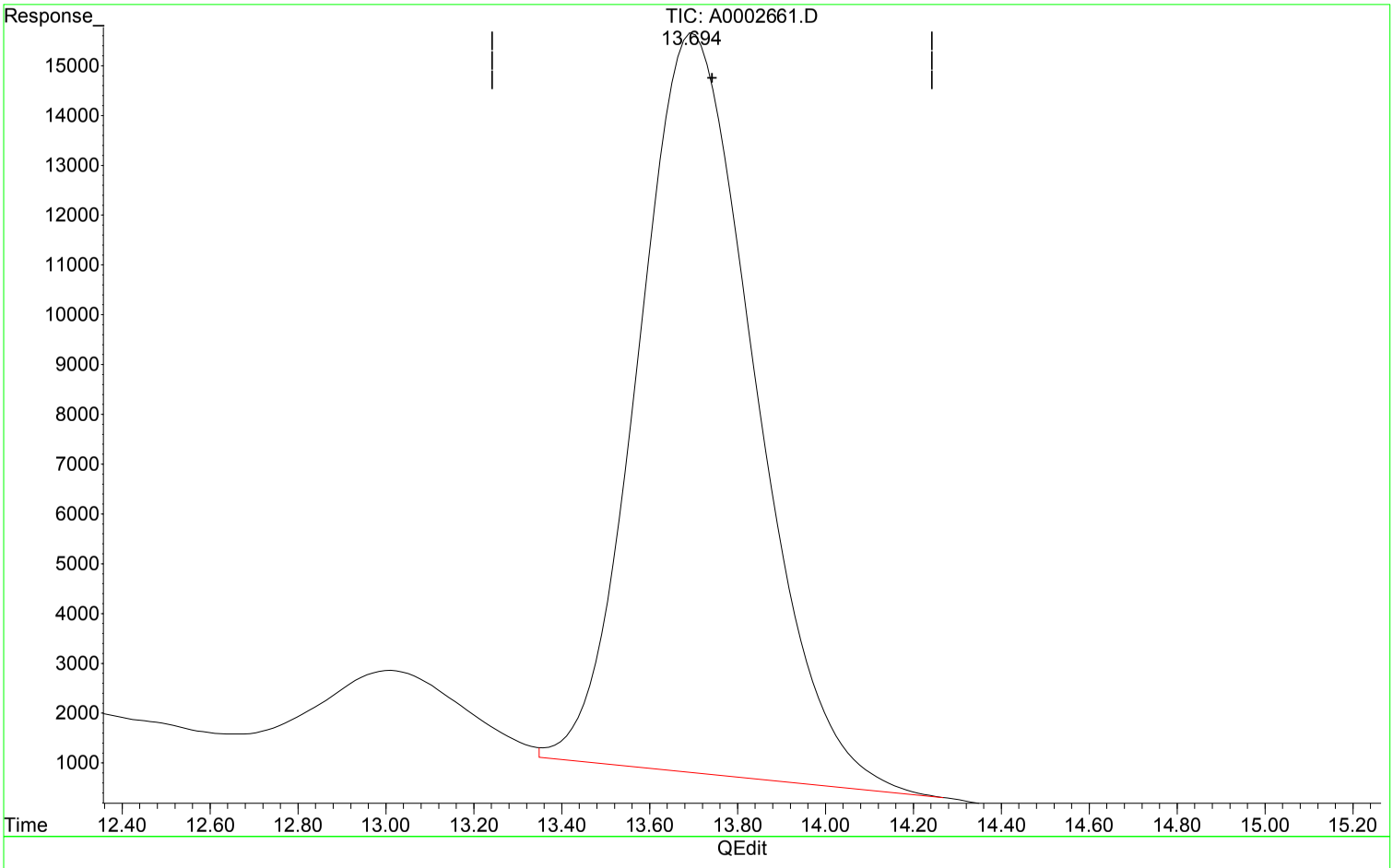
00945872

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.694min 46.178 ppm m

response 2751846

Manual Integration:

After

Poor integration.

12/21/18

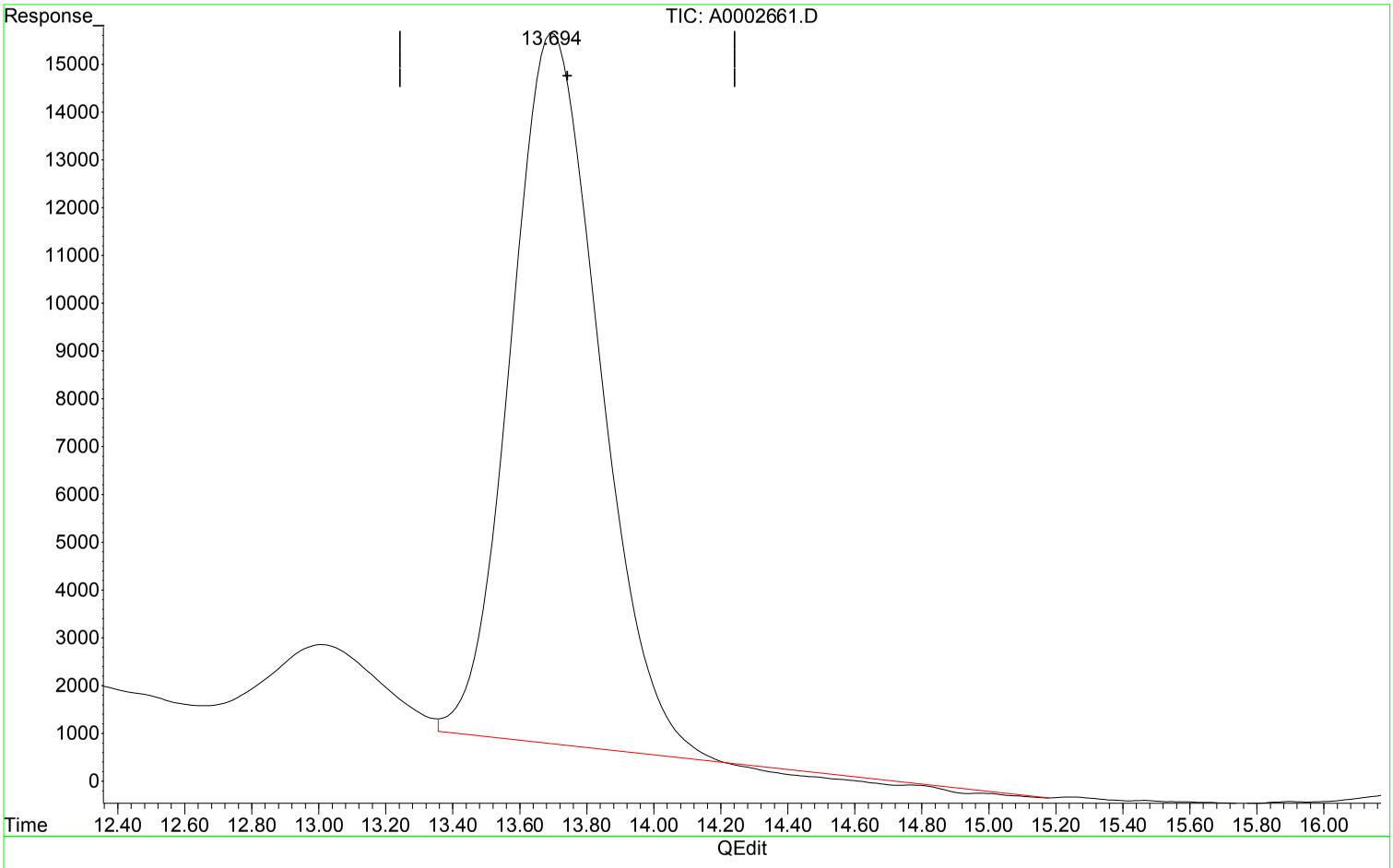
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

13.701min 45.674 ppm

response 2721779

Manual Integration:

Before

12/21/18

(+) = Expected Retention Time

00945874

Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 17:48:15~~ 21-Dec-2018, 13:50:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	94.769 E3	1.6	98	0.00
2 T	Pyruvic acid	452.935	439.778 E3	2.9	96	0.00
3 T	Lactic Acid	53.765	59.856 E3	-11.3	110	-0.02
4 T	Acetic Acid	59.169	58.576 E3	1.0	97	-0.02
5 T	Propionic Acid	59.592	55.037 E3	7.6	93	-0.05
6 T	Butyric Acid	62.897	54.523 E3	13.3	93	-0.22

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : ~~30-Dec-2000, 17:48:15~~ 21-Dec-2018, 13:50:00
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.409	4738427	49.183	ppm	
2) T	Pyruvic acid	4.323	2198889	4.855	ppm	
3) T	Lactic Acid	4.950	2992819	55.665	ppm	m
4) T	Acetic Acid	5.413	2928823	49.499	ppm	m
5) T	Propionic Acid	13.694	2751846	46.178	ppm	m
6) T	Butyric Acid	42.960	2726132	43.343	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

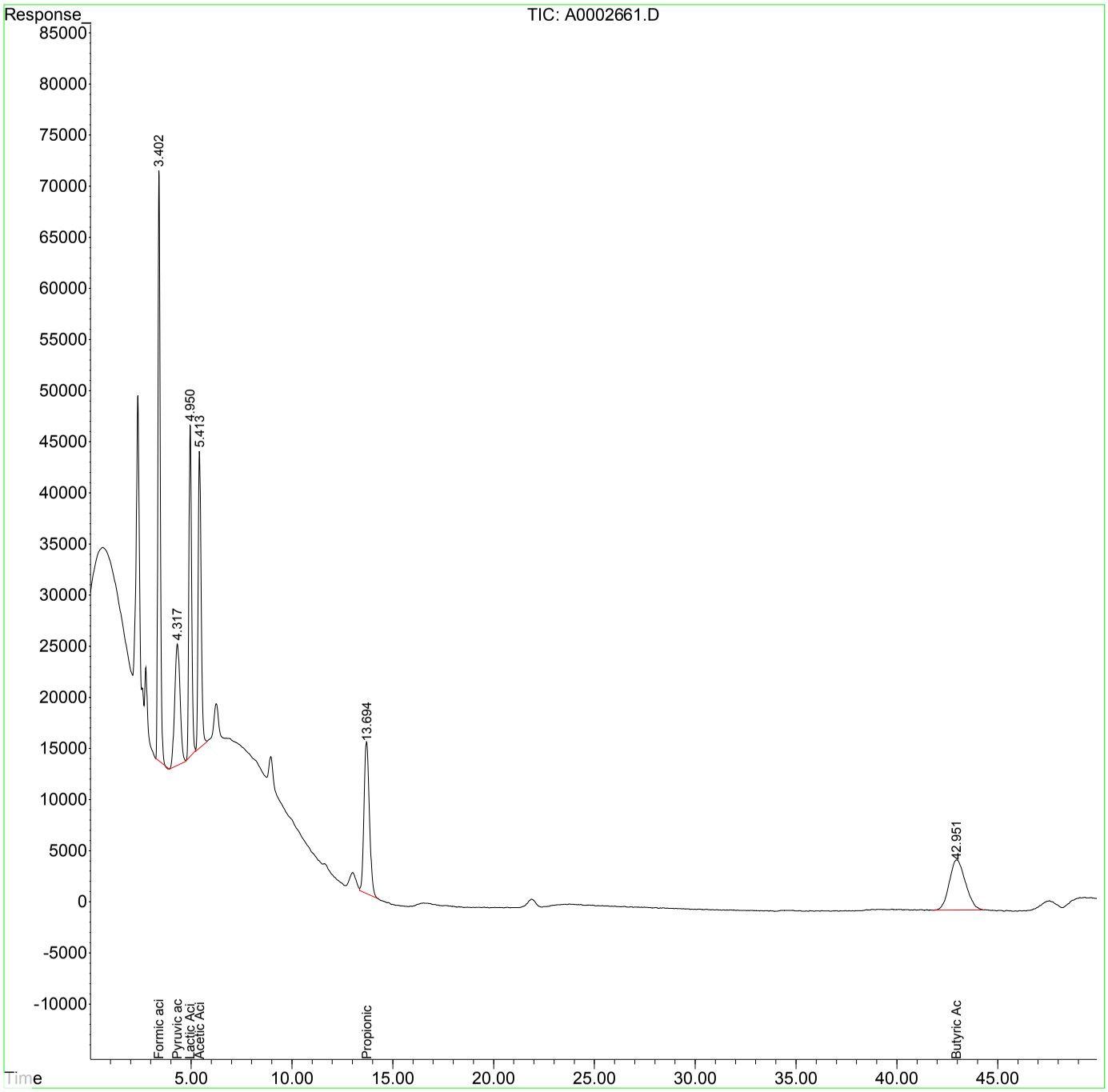
00945876

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002661.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 17:48:15
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 21 14:46:27 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Fri Dec 21 14:46:13 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002664.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 16:31:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:50:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	96.917 E3	-0.6	101	0.00
2 T	Pyruvic acid	452.935	455.683 E3	-0.6	99	0.00
3 T	Lactic Acid	53.765	60.657 E3	-12.8	112	0.00
4 T	Acetic Acid	59.169	59.543 E3	-0.6	98	0.00
5 T	Propionic Acid	59.592	59.498 E3	0.2	101	0.00
6 T	Butyric Acid	62.897	56.871 E3	9.6	97	-0.02

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00945878

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002664.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 16:31:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:50:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.410	4845835	50.298 ppm
2) T	Pyruvic acid	4.318	2278413	5.030 ppm
3) T	Lactic Acid	4.957	3032840	56.409 ppm
4) T	Acetic Acid	5.420	2977131	50.315 ppm
5) T	Propionic Acid	13.692	2974878	49.921 ppm
6) T	Butyric Acid	42.935	2843527	45.209 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

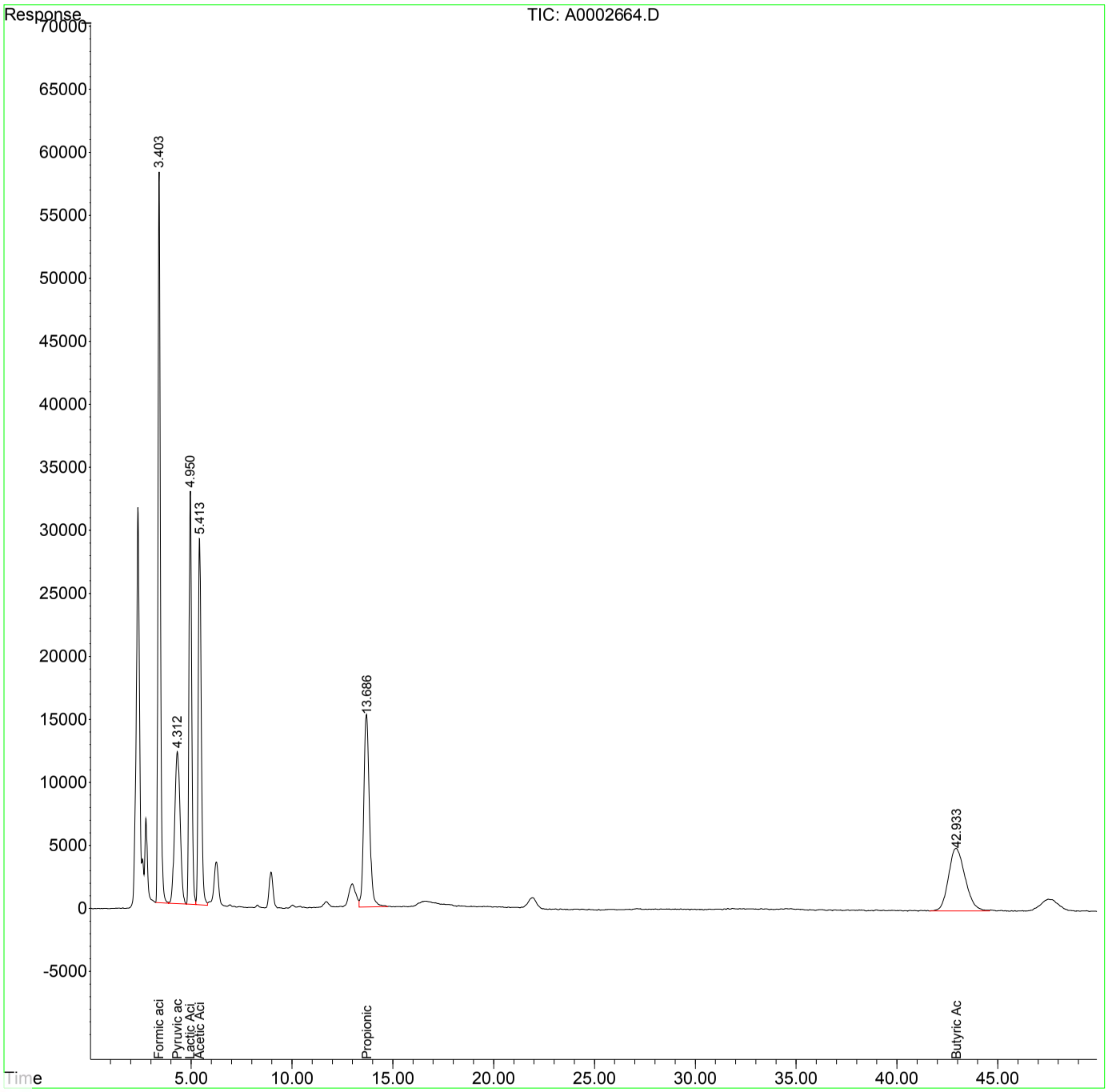
00945879

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\121918\
Data File : A0002664.D
Signal(s) : dad1A.ch
Acq On : 21-Dec-2018, 16:31:46
Operator : b.allgeier
Sample : ccv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Dec 24 09:50:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Mon Dec 24 09:49:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00945880

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc Units
Target Compounds				
1) t	Formic acid	3.131	1896636	19.686 ppm
2) T	Pyruvic acid	3.628	1357394	2.997 ppm
3) T	Lactic Acid	4.052	1086883	20.215 ppm
4) T	Acetic Acid	4.405	1218452	20.593 ppm
5) T	Propionic Acid	9.222	1146657	19.242 ppm
6) T	Butyric Acid	25.002	1138865	18.107 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

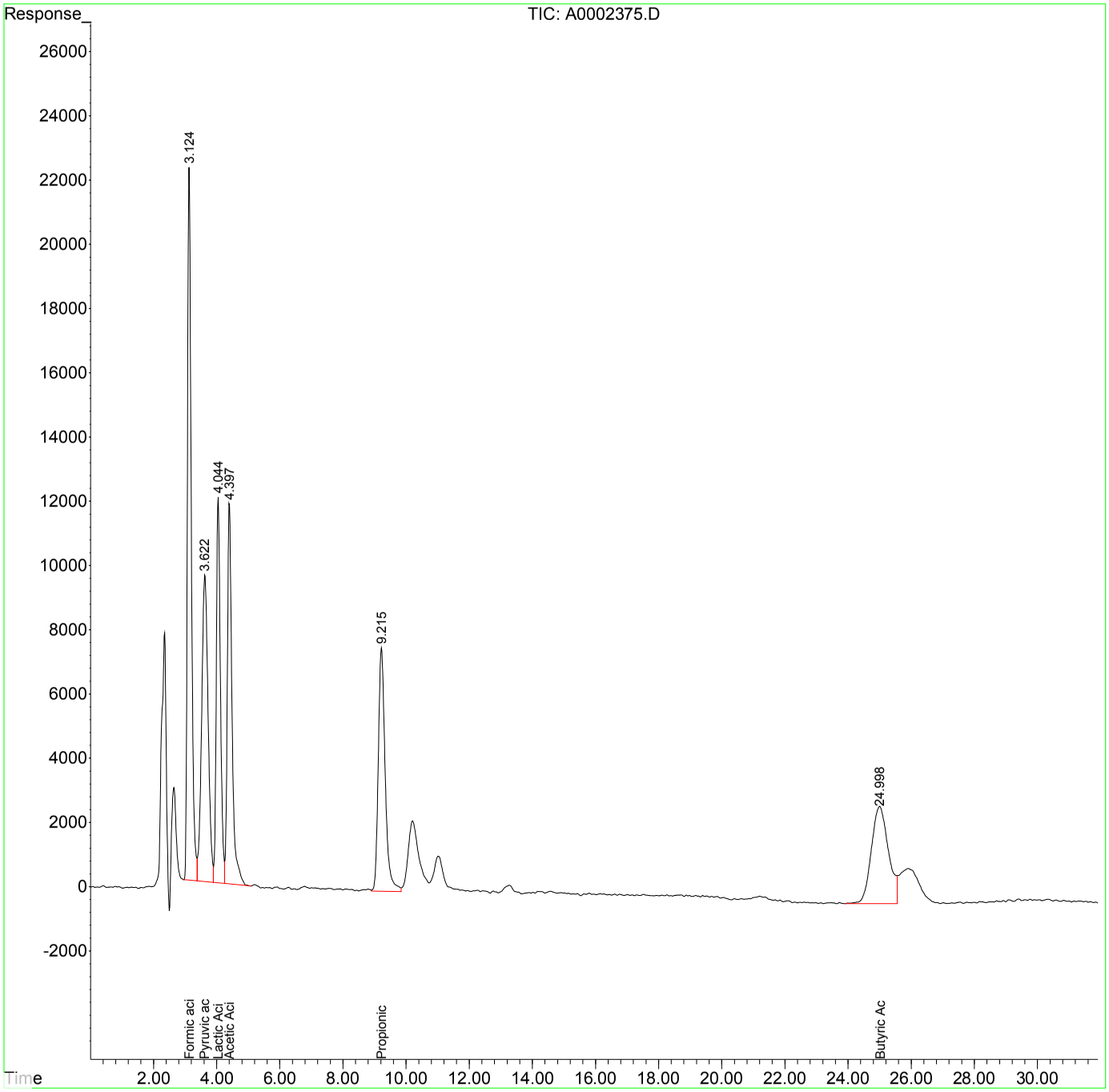
00945881

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



Evaluate Continuing Calibration Report

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002375.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : icv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 05 08:21:24 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(Min)
1 t	Formic acid	96.343	94.832 E3	1.6	100	0.00
2 T	Pyruvic acid	452.935	678.697 E3	-49.8#	160#	0.00
3 T	Lactic Acid	53.765	54.344 E3	-1.1	108	0.00
4 T	Acetic Acid	59.169	60.923 E3	-3.0	111	0.00
5 T	Propionic Acid	59.592	57.333 E3	3.8	101	0.03
6 T	Butyric Acid	62.897	56.943 E3	9.5	94	0.16

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

00945883

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.129	18870917	195.296	ppm	
2) T	Pyruvic acid	3.625	9170882	20.284	ppm	
3) T	Lactic Acid	4.045	10741636	199.759	ppm	
4) T	Acetic Acid	4.387	11865318	200.607	ppm	m
5) T	Propionic Acid	9.141	11451173	191.091	ppm	
6) T	Butyric Acid	24.580	12106071	191.444	ppm	m

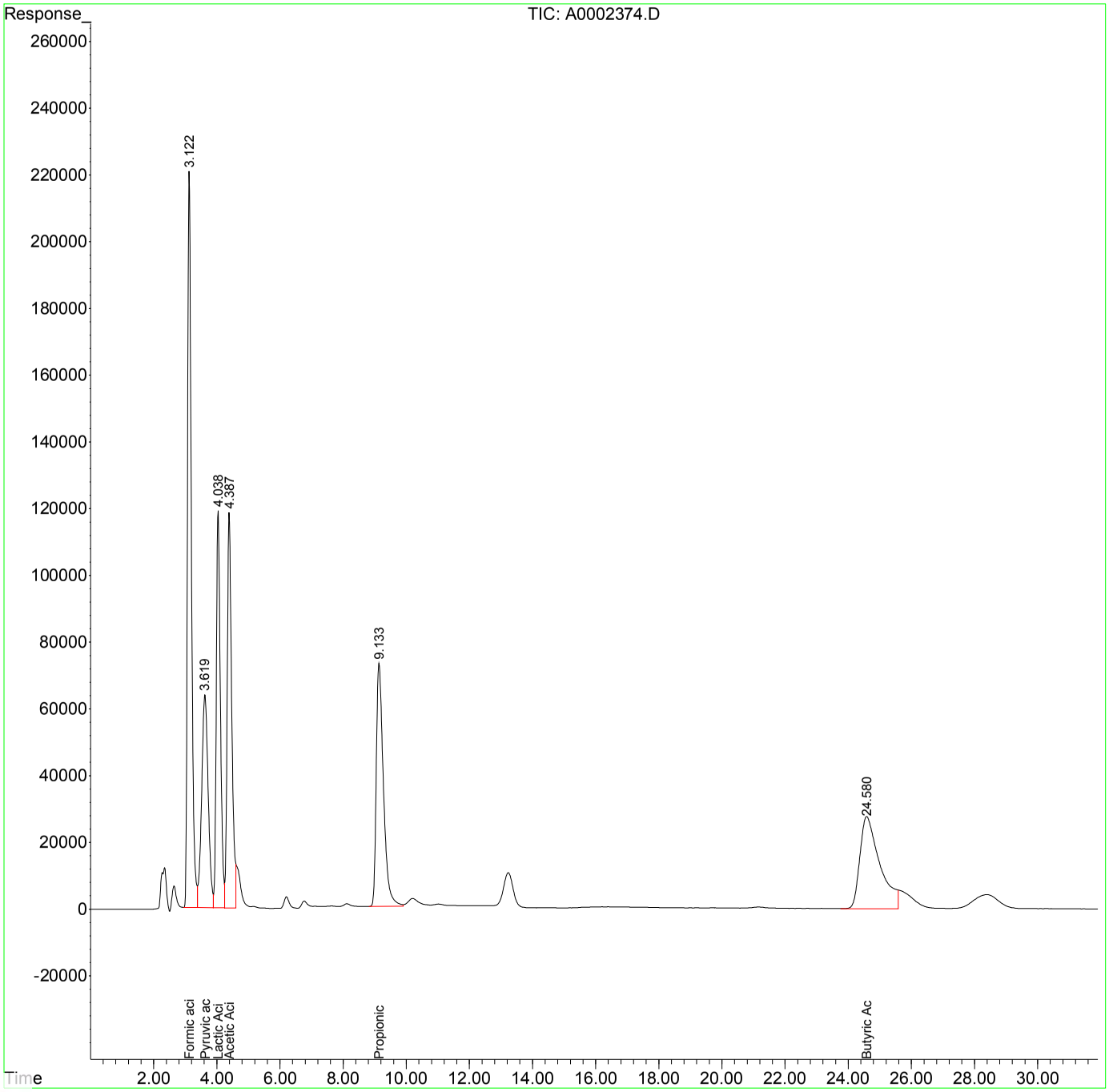
(f)=RT Delta > 1/2 Window (m)=manual int.

1st BA 10/05/18
2nd MP 10/09/18

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



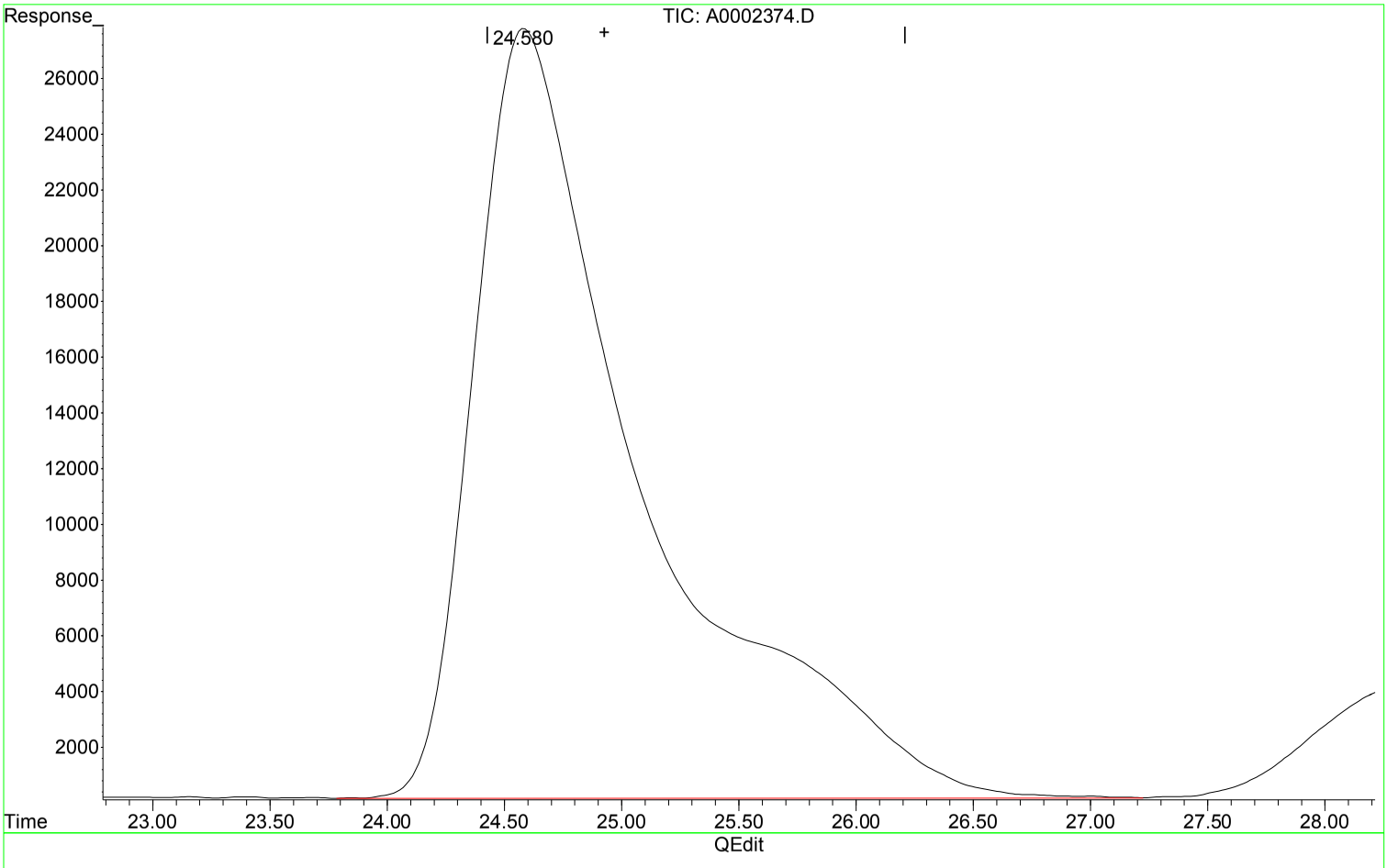
00945885

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.587min 217.586 ppm

response 13759140

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:42:19 2018

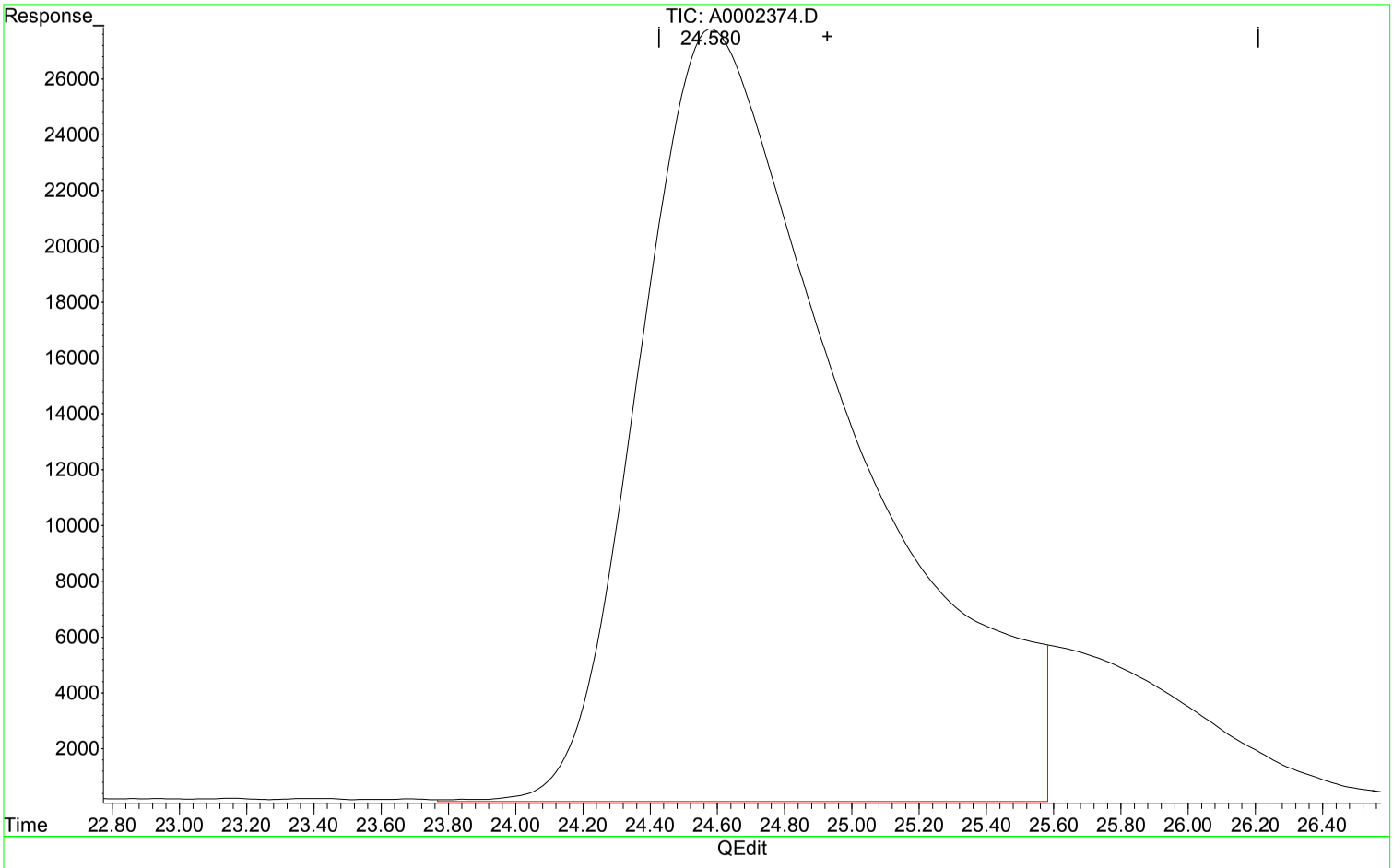
00945886

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.580min 191.444 ppm m

response 12106071

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:42:27 2018

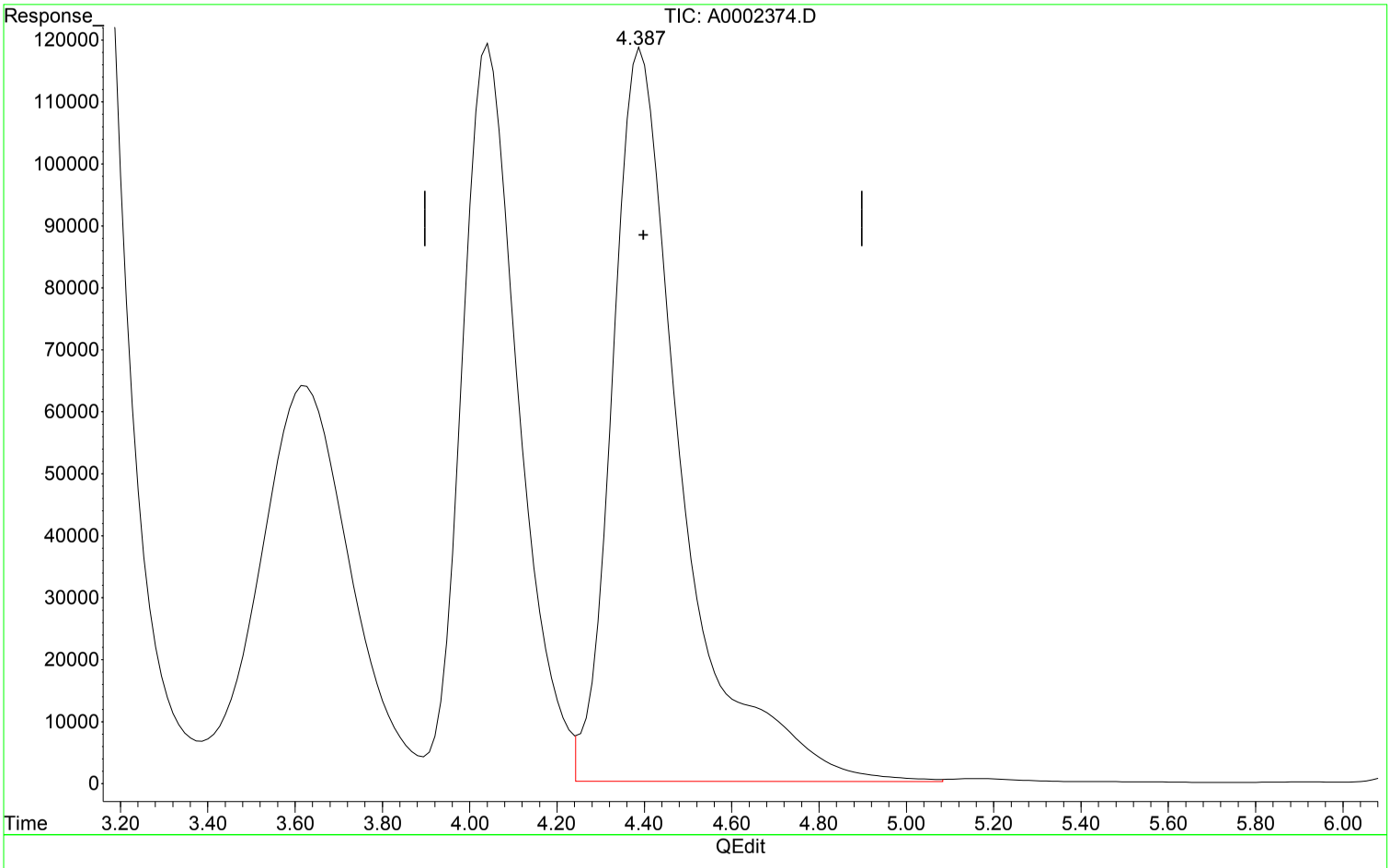
00945887

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.394min 222.004 ppm

response 13130885

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:42:06 2018

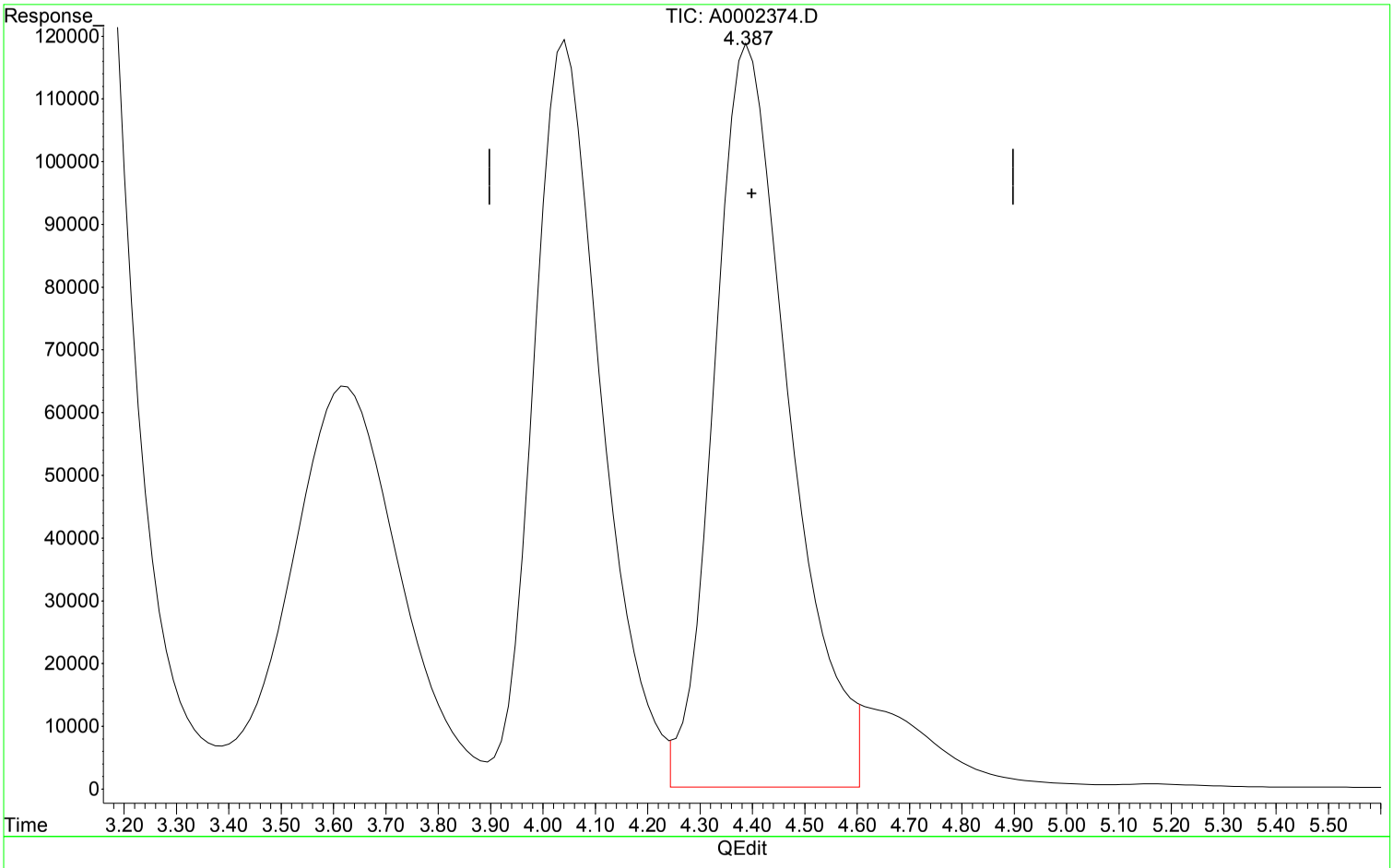
00945888

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002374.D
Signal(s) : dad1A.ch
Acq On : 31-Dec-2000, 02:48:10
Operator : b.allgeier
Sample : 20.0-200.0ppm
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:41:56 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:11:30 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.387min 200.607 ppm m

response 11865318

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00945889

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.132	9131569	96.958	ppm	
2) T	Pyruvic acid	3.629	4430352	9.849	ppm	
3) T	Lactic Acid	4.052	5216101	98.587	ppm	
4) T	Acetic Acid	4.397	5725459	96.715	ppm	m
5) T	Propionic Acid	9.203	5508012	93.403	ppm	
6) T	Butyric Acid	24.847	5510917	91.221	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

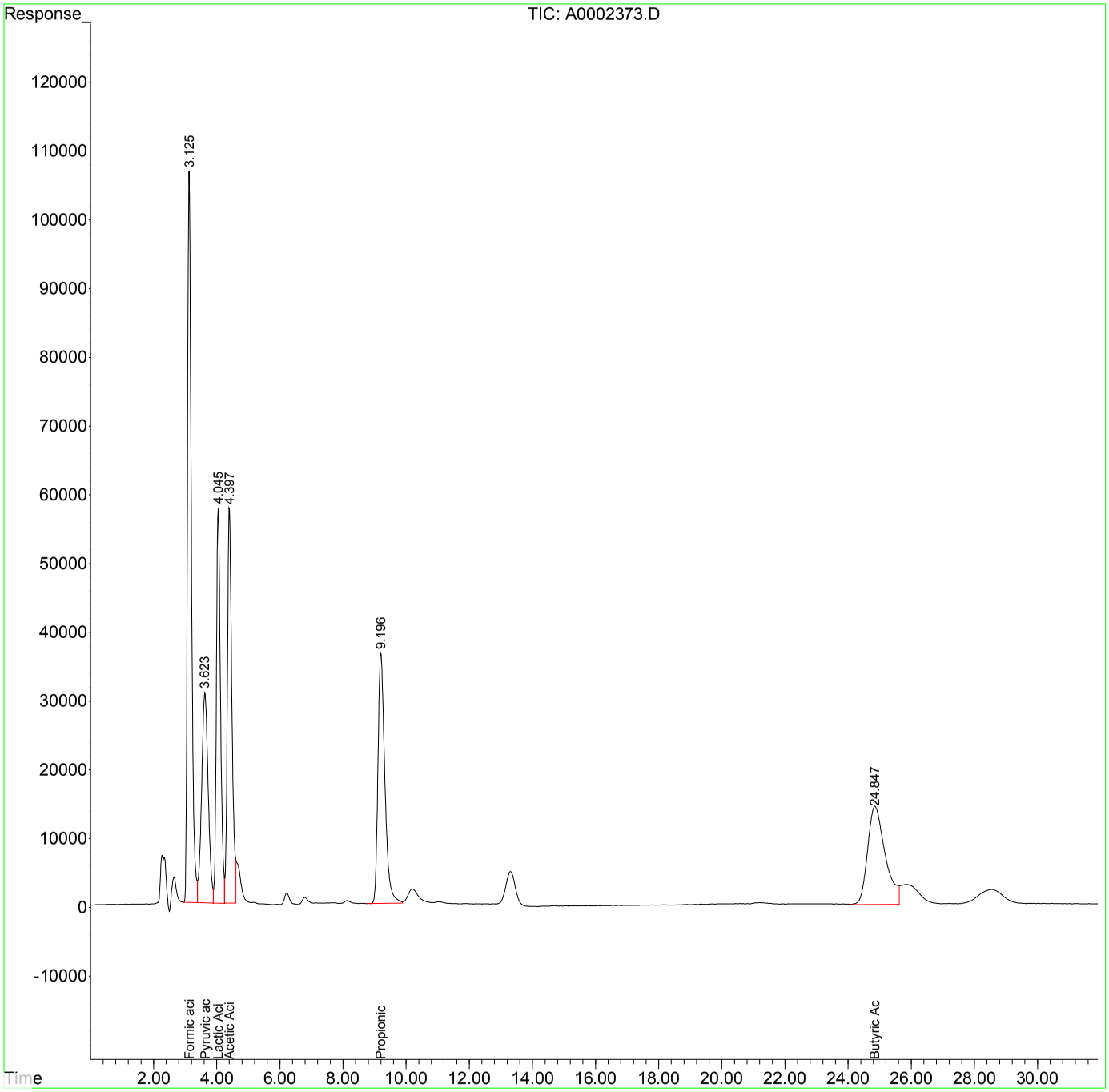
00945890

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

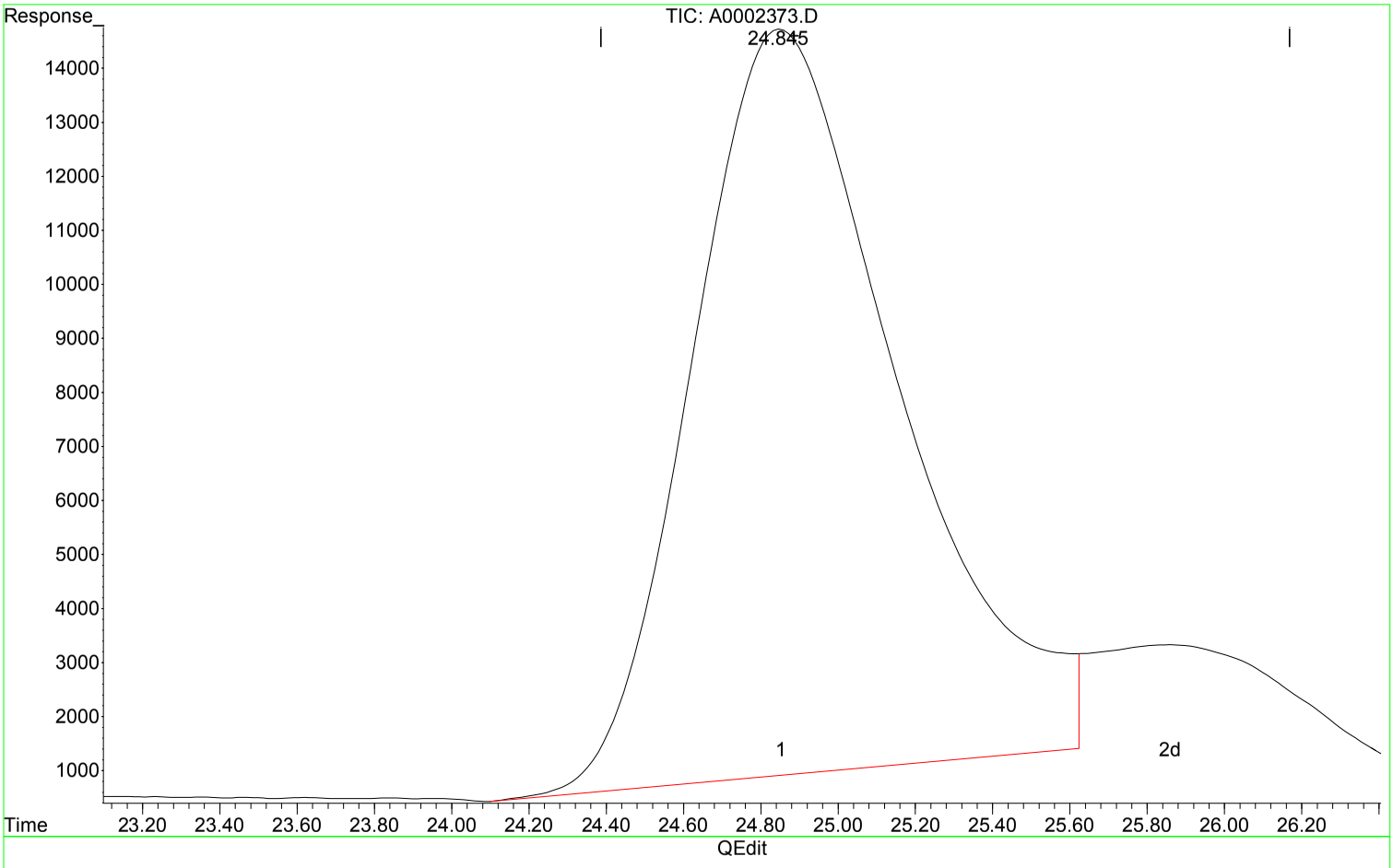


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.853min 84.188 ppm

response 5086048

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:11:08 2018

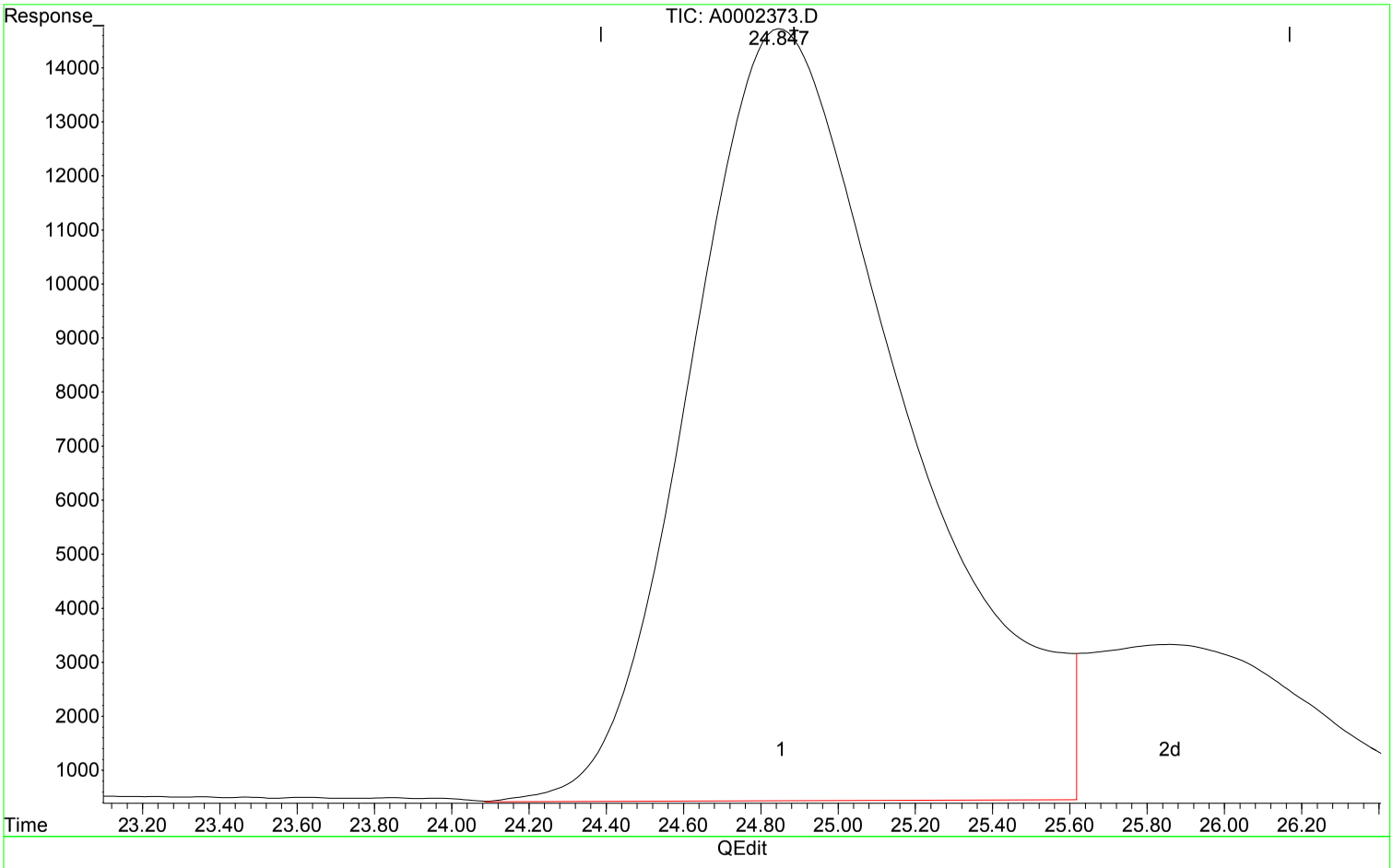
00945892

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.847min 91.221 ppm m

response 5510917

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:11:21 2018

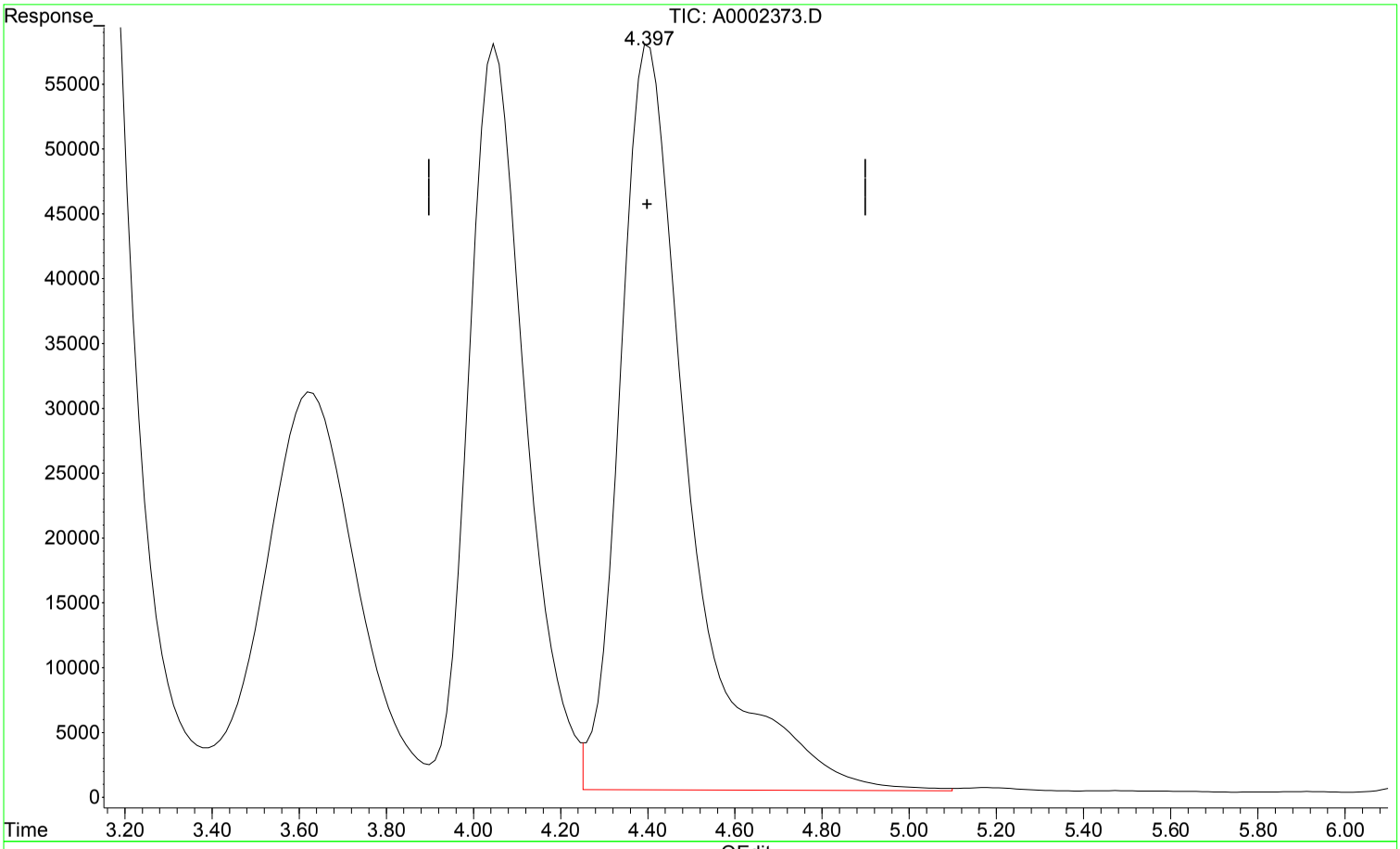
00945893

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.405min 107.446 ppm

response 6360712

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:10:56 2018

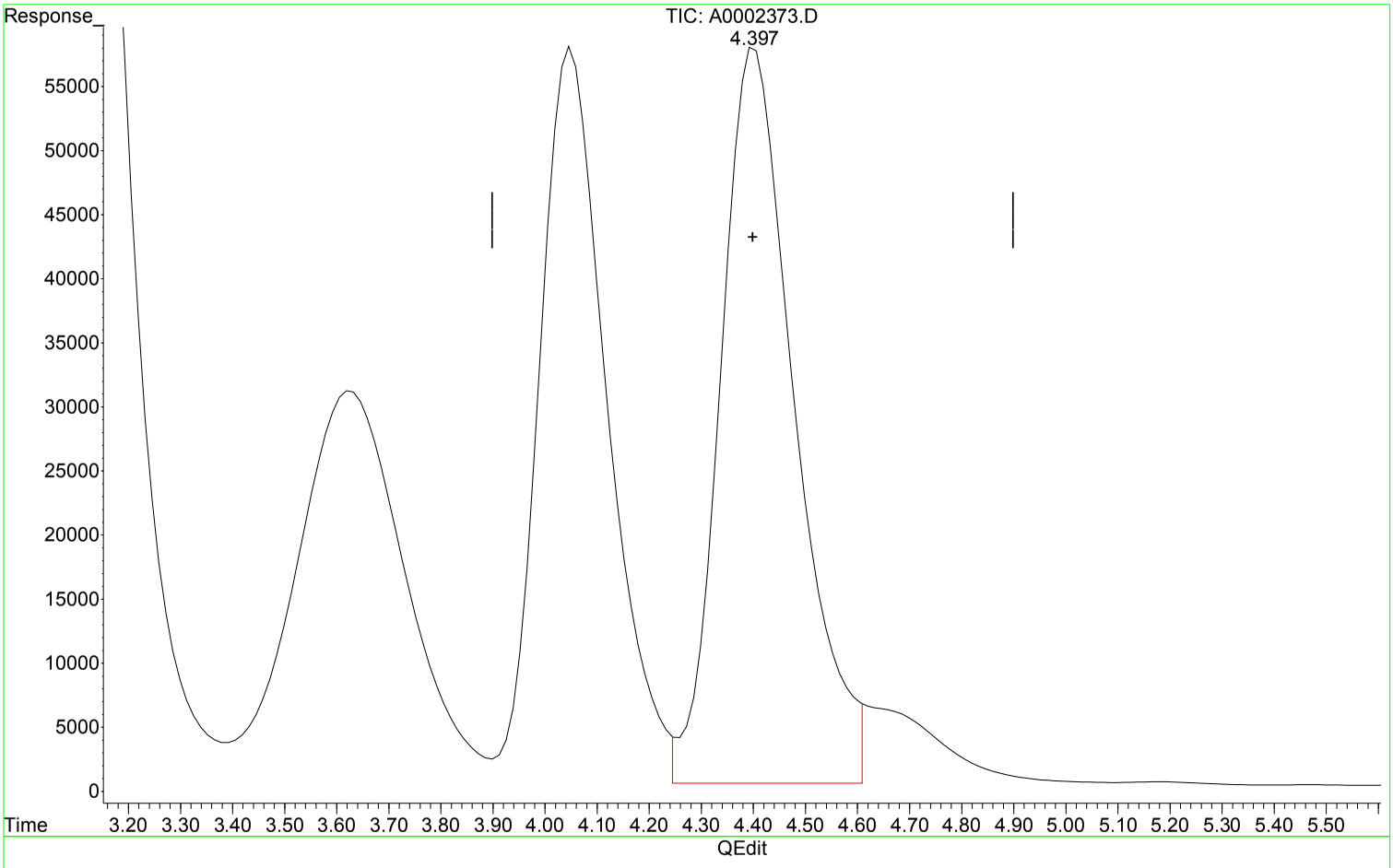
00945894

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002373.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 15:31:47
Operator : b.allgeier
Sample : 10.0-100.0ppm
Misc :
ALS Vial : 8 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:46 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 96.715 ppm m

response 5725459

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00945895

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	4817586	51.153	ppm	
2) T	Pyruvic acid	3.630	2294161	5.100	ppm	
3) T	Lactic Acid	4.053	2711599	51.251	ppm	
4) T	Acetic Acid	4.398	3026497	51.124	ppm	m
5) T	Propionic Acid	9.212	2949938	50.024	ppm	
6) T	Butyric Acid	24.928	2932273	48.537	ppm	

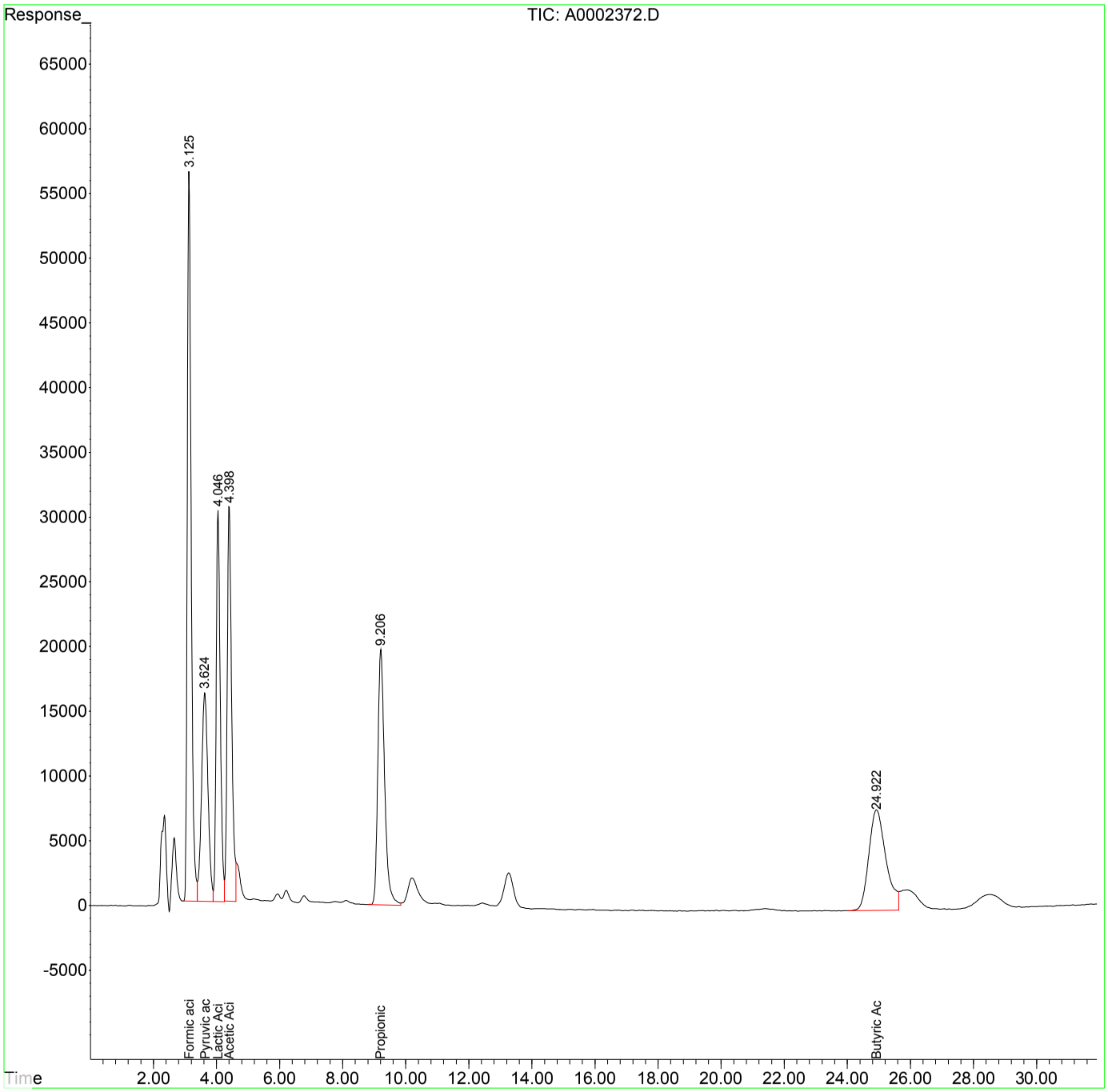
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

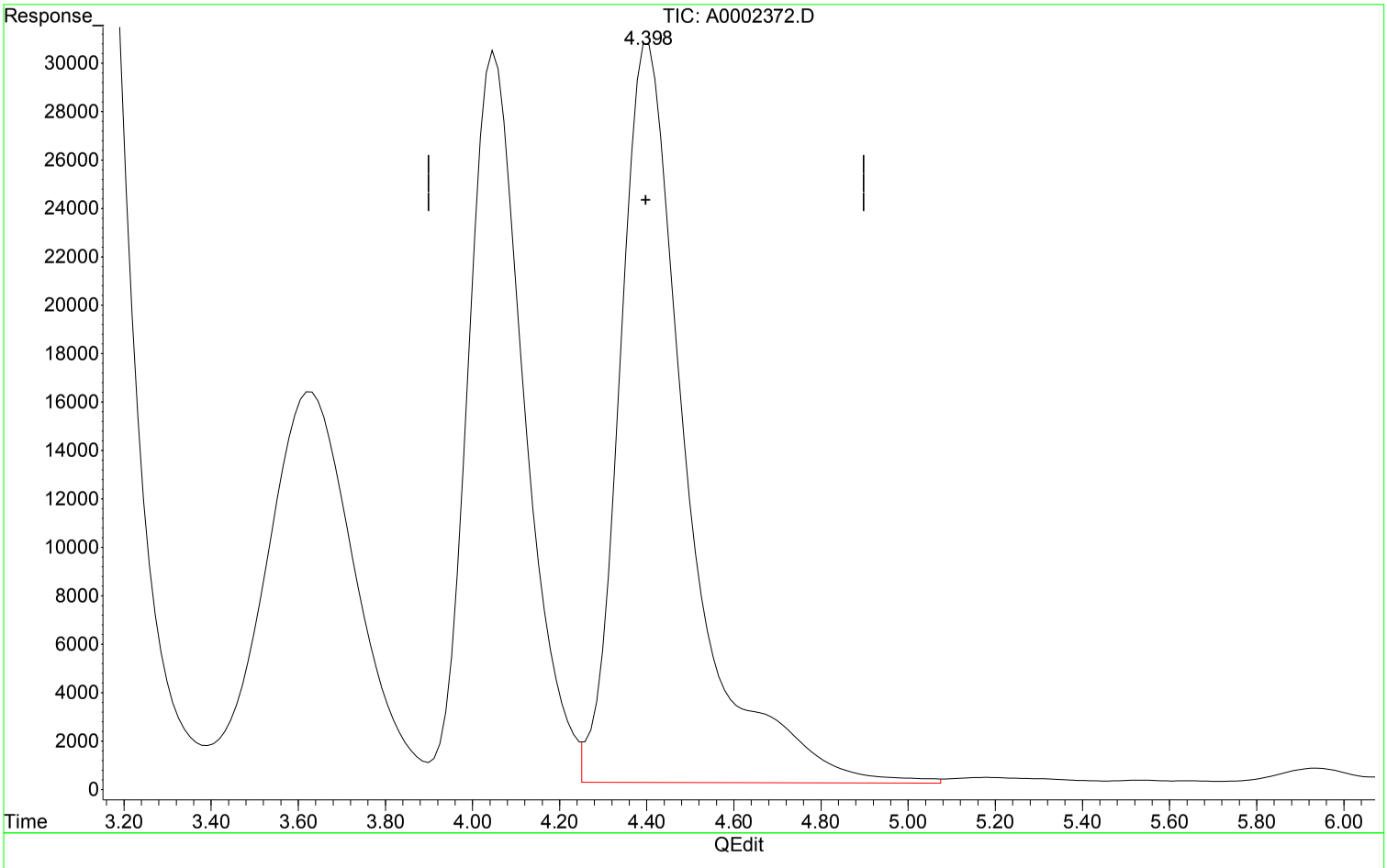


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 56.131 ppm

response 3322912

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

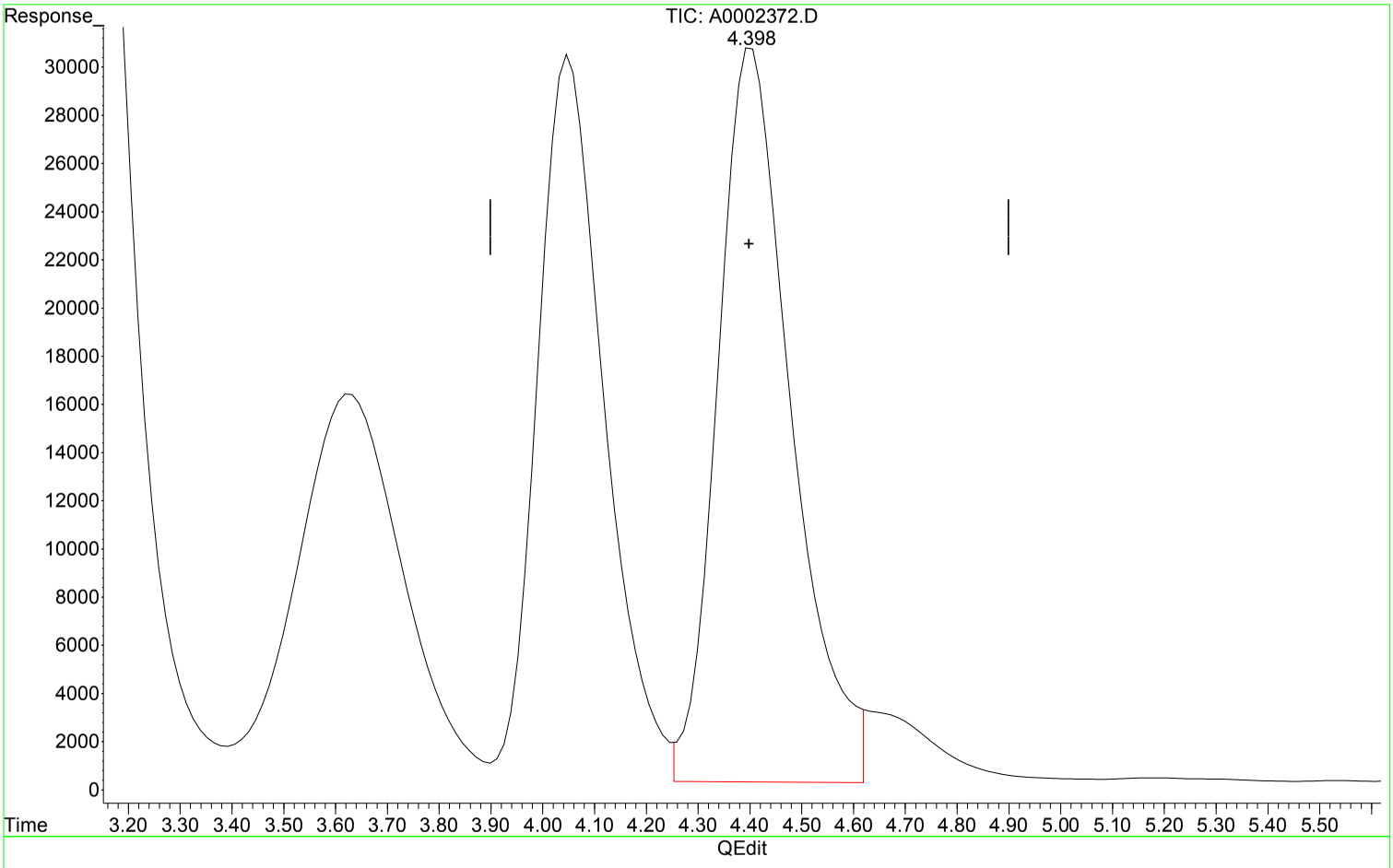
00945898

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002372.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:56:43
Operator : b.allgeier
Sample : 5.0-50.0ppm
Misc :
ALS Vial : 7 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:10:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.398min 51.124 ppm m

response 3026497

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:10:25 2018

00945899

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.131	1890077	20.069	ppm	
2) T	Pyruvic acid	3.629	850051	1.890	ppm	
3) T	Lactic Acid	4.051	1003444	18.966	ppm	
4) T	Acetic Acid	4.397	1096677	18.525	ppm	m
5) T	Propionic Acid	9.206	1140510	19.340	ppm	m
6) T	Butyric Acid	24.960	1207082	19.981	ppm	

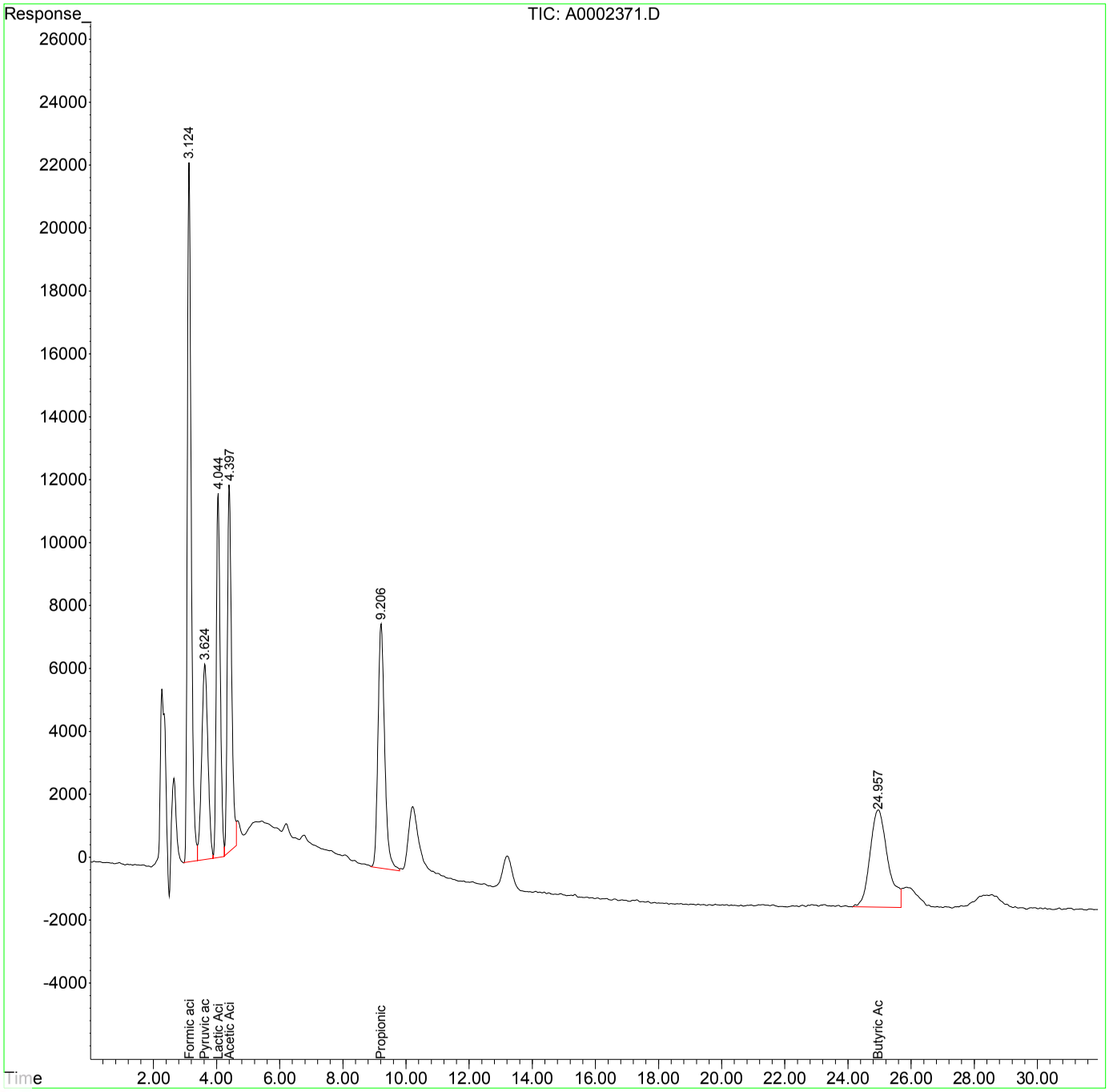
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

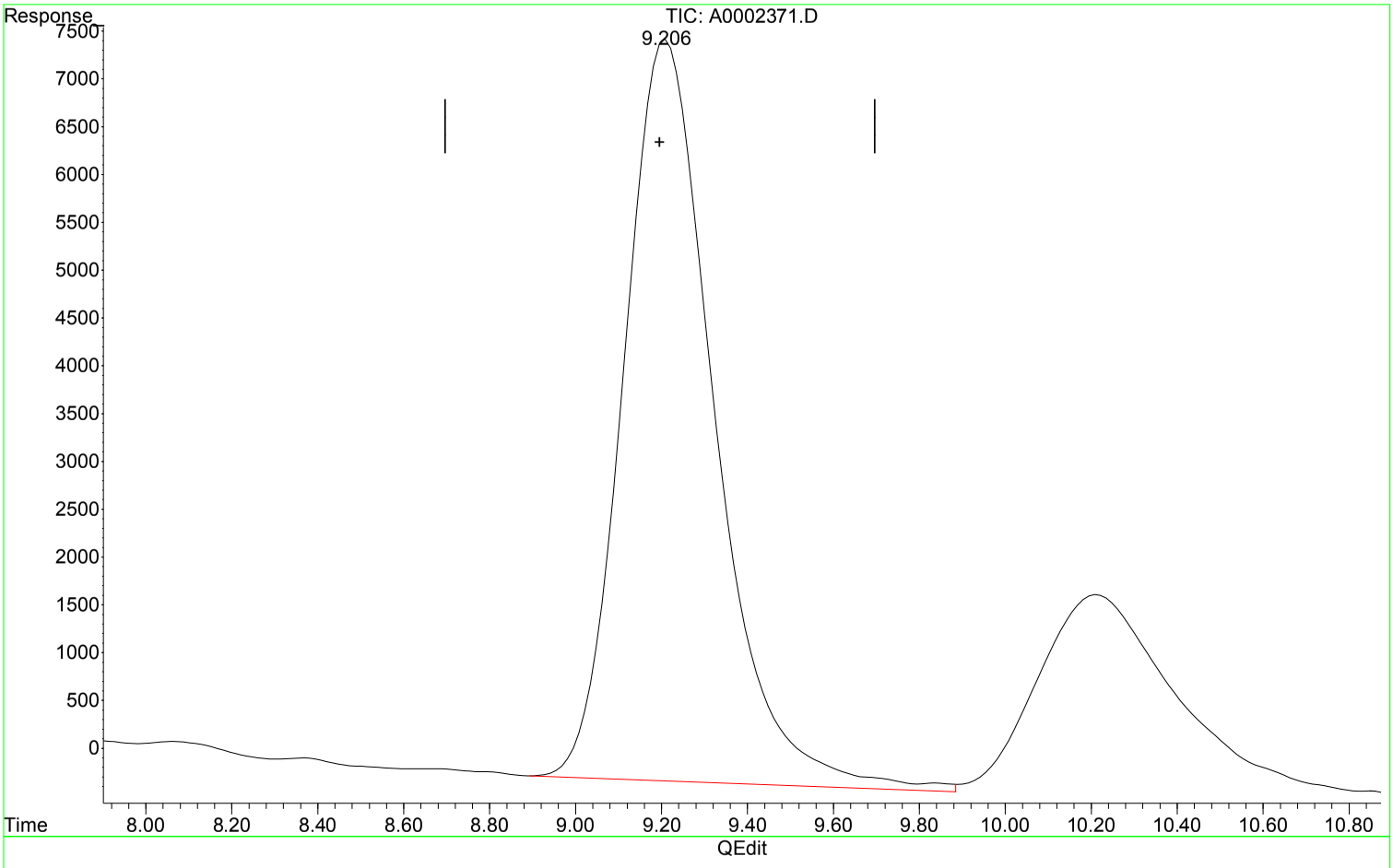


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.212min 19.380 ppm

response 1142822

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:09:40 2018

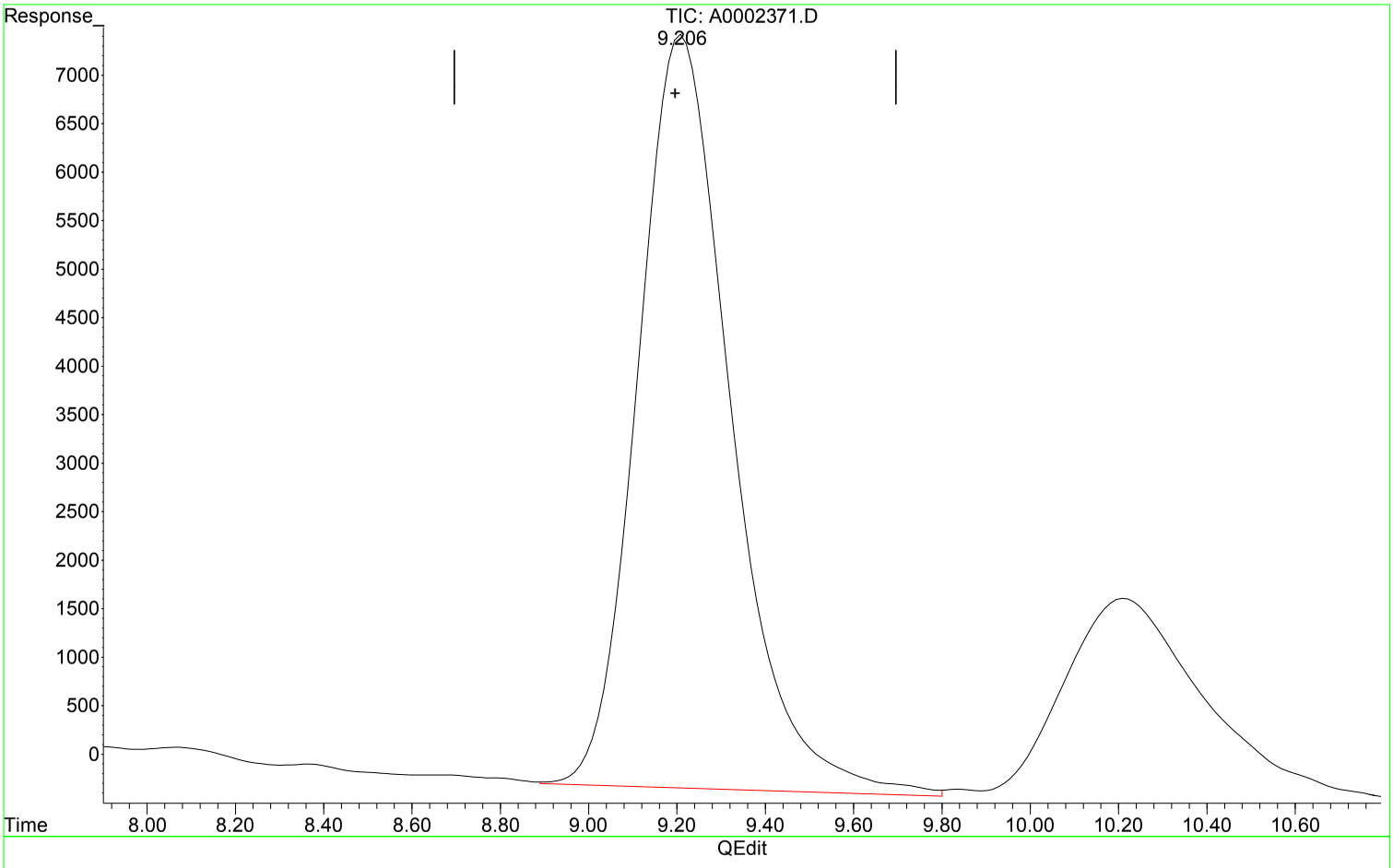
00945902

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.206min 19.340 ppm m

response 1140510

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:09:47 2018

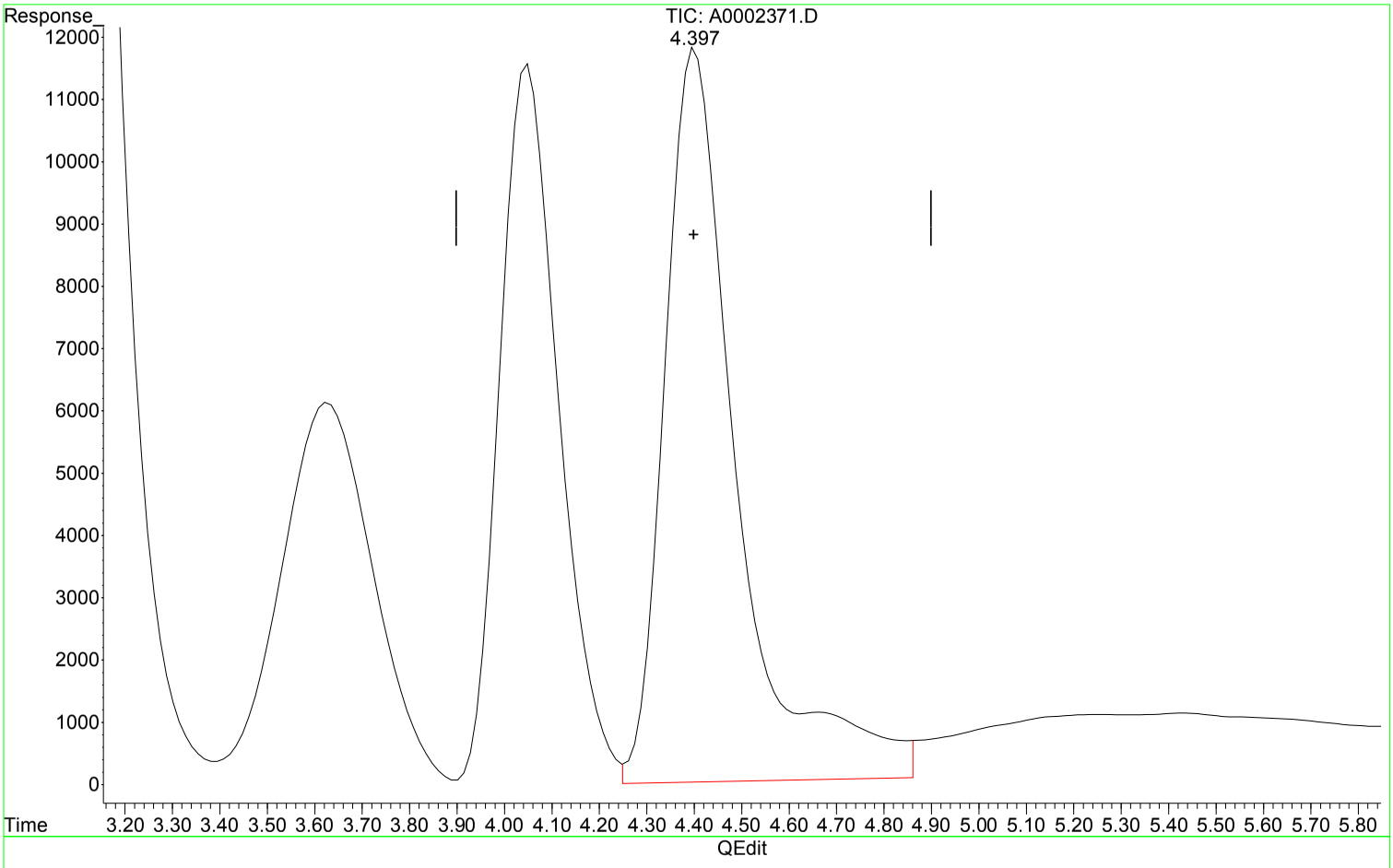
00945903

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.404min 21.093 ppm

response 1248683

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

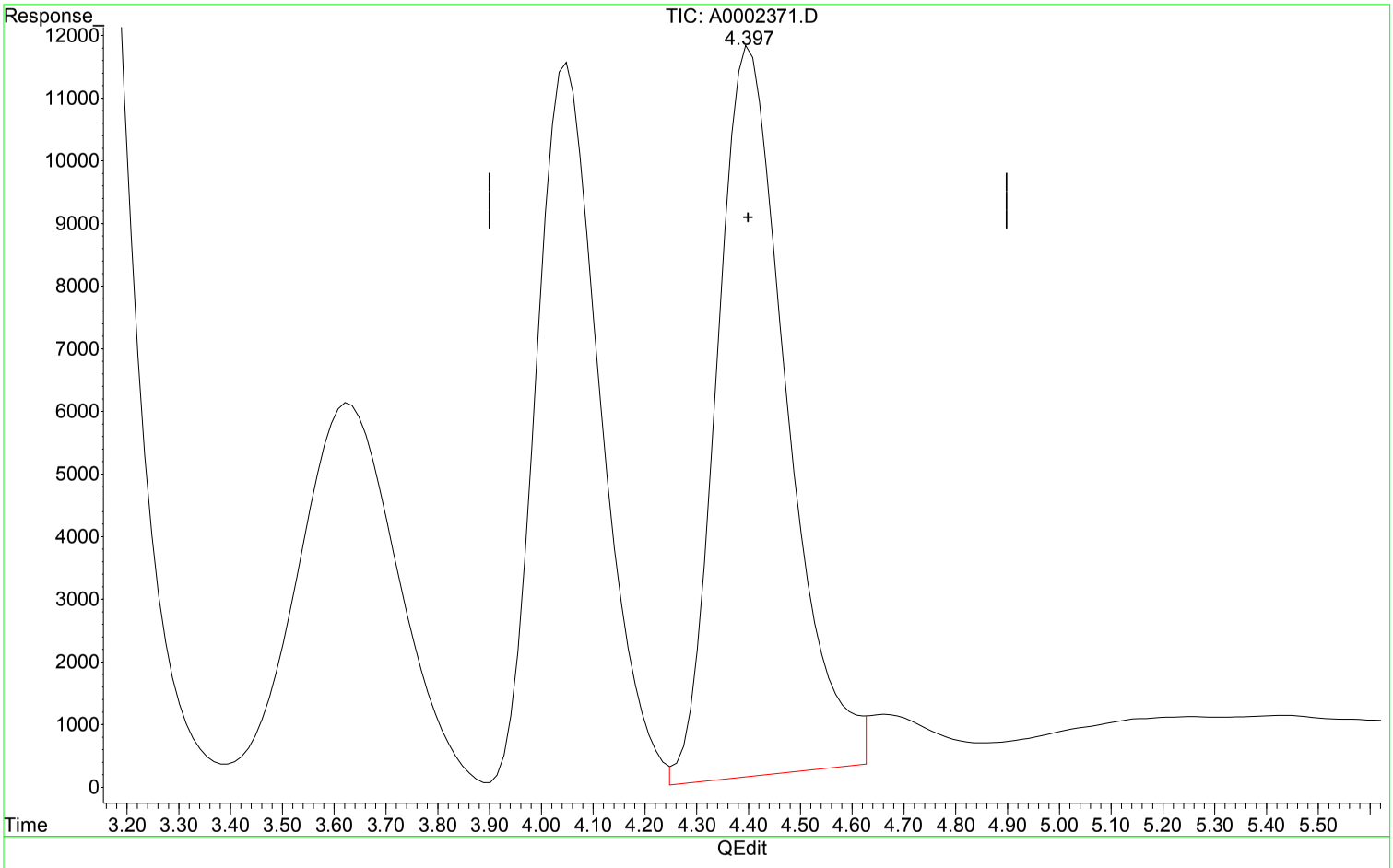
00945904

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002371.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 14:21:46
Operator : b.allgeier
Sample : 2.0-20.0ppm
Misc :
ALS Vial : 6 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:09:14 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.397min 18.525 ppm m

response 1096677

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00945905

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	942238	10.005	ppm	
2) T	Pyruvic acid	3.631	448113	0.996	ppm	
3) T	Lactic Acid	4.053	528635	9.991	ppm	
4) T	Acetic Acid	4.399	585881	9.897	ppm	m
5) T	Propionic Acid	9.226	585985	9.937	ppm	
6) T	Butyric Acid	25.010	602088	9.966	ppm	

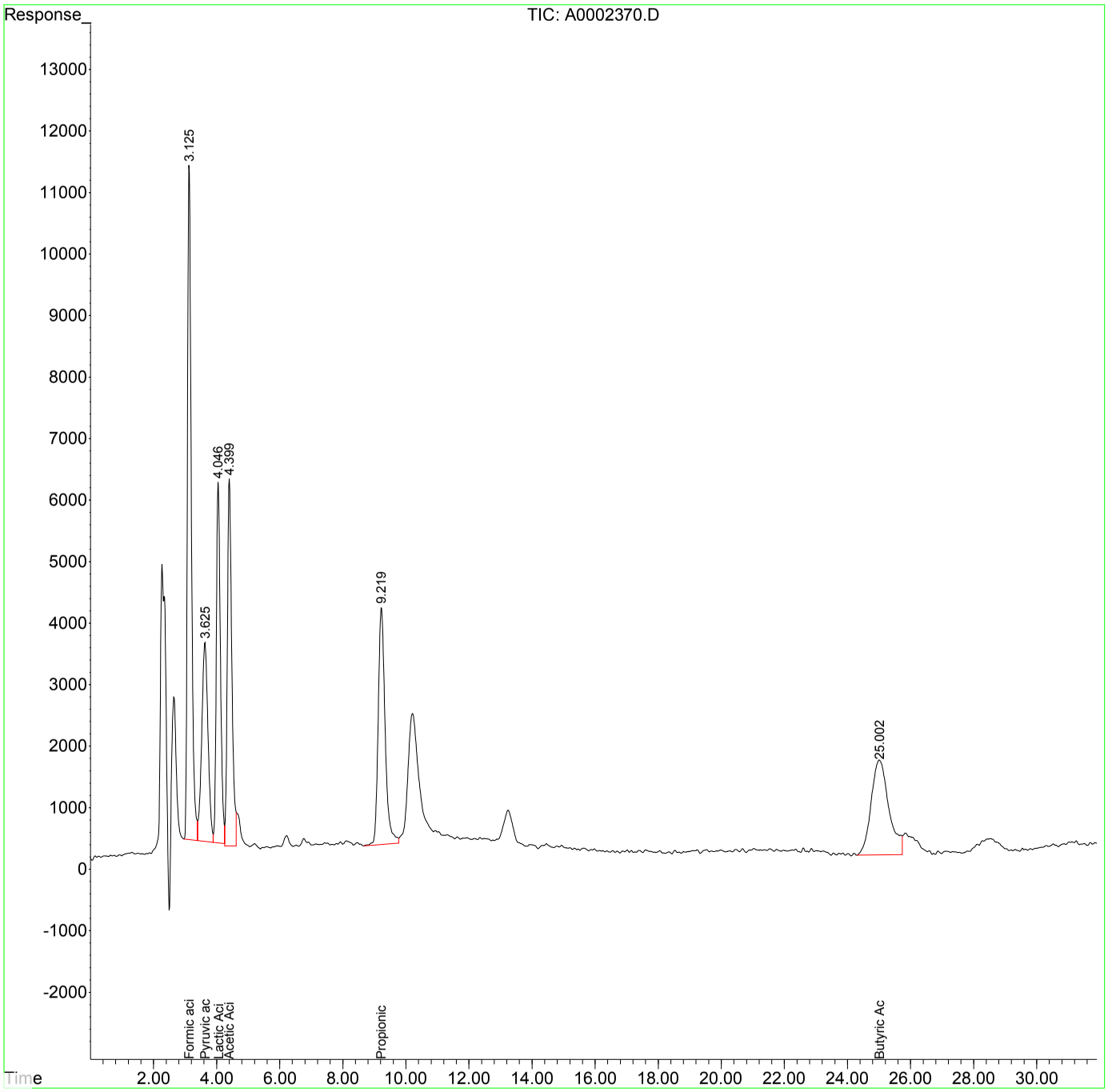
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

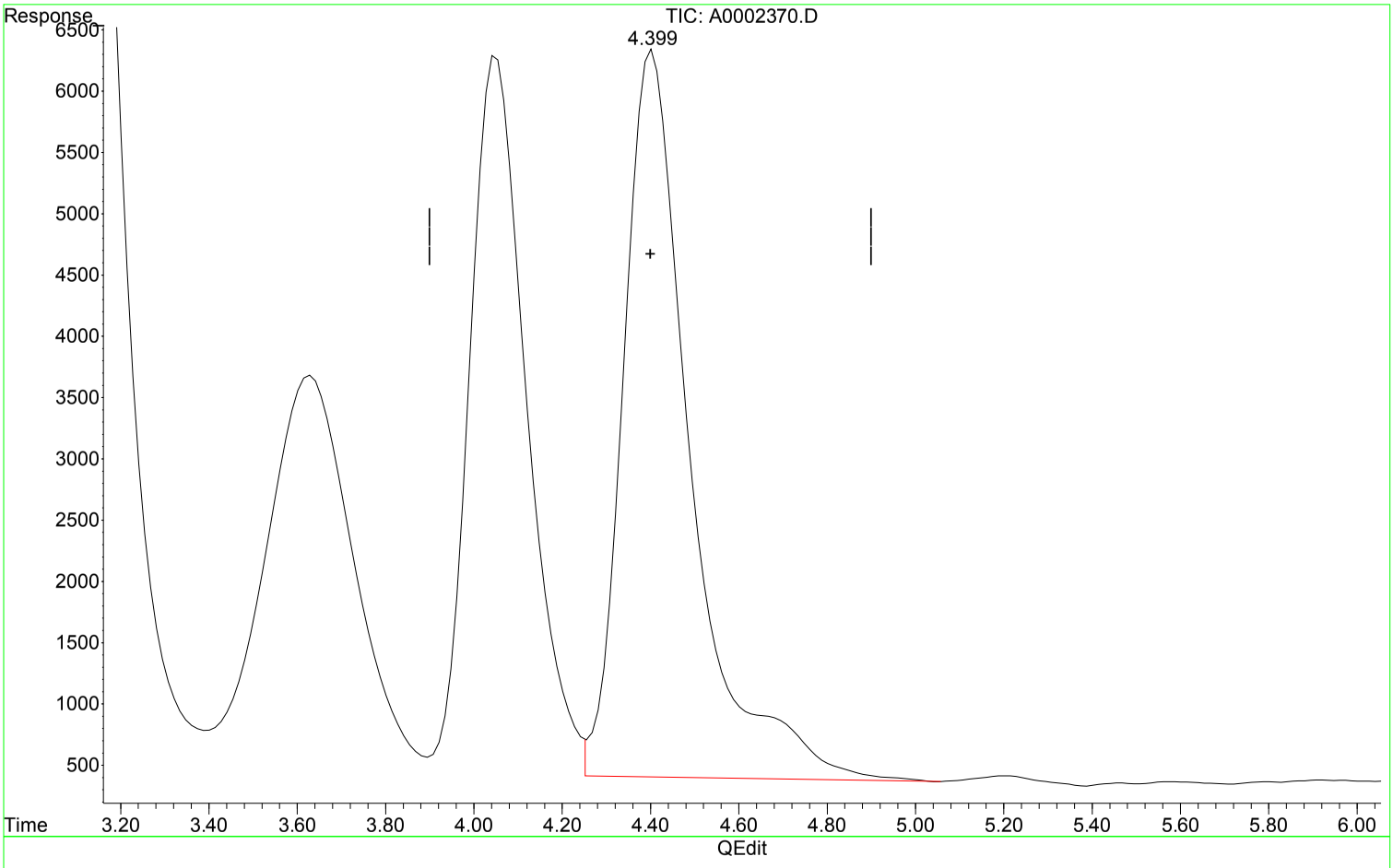


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 10.646 ppm

response 630261

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 16:08:50 2018

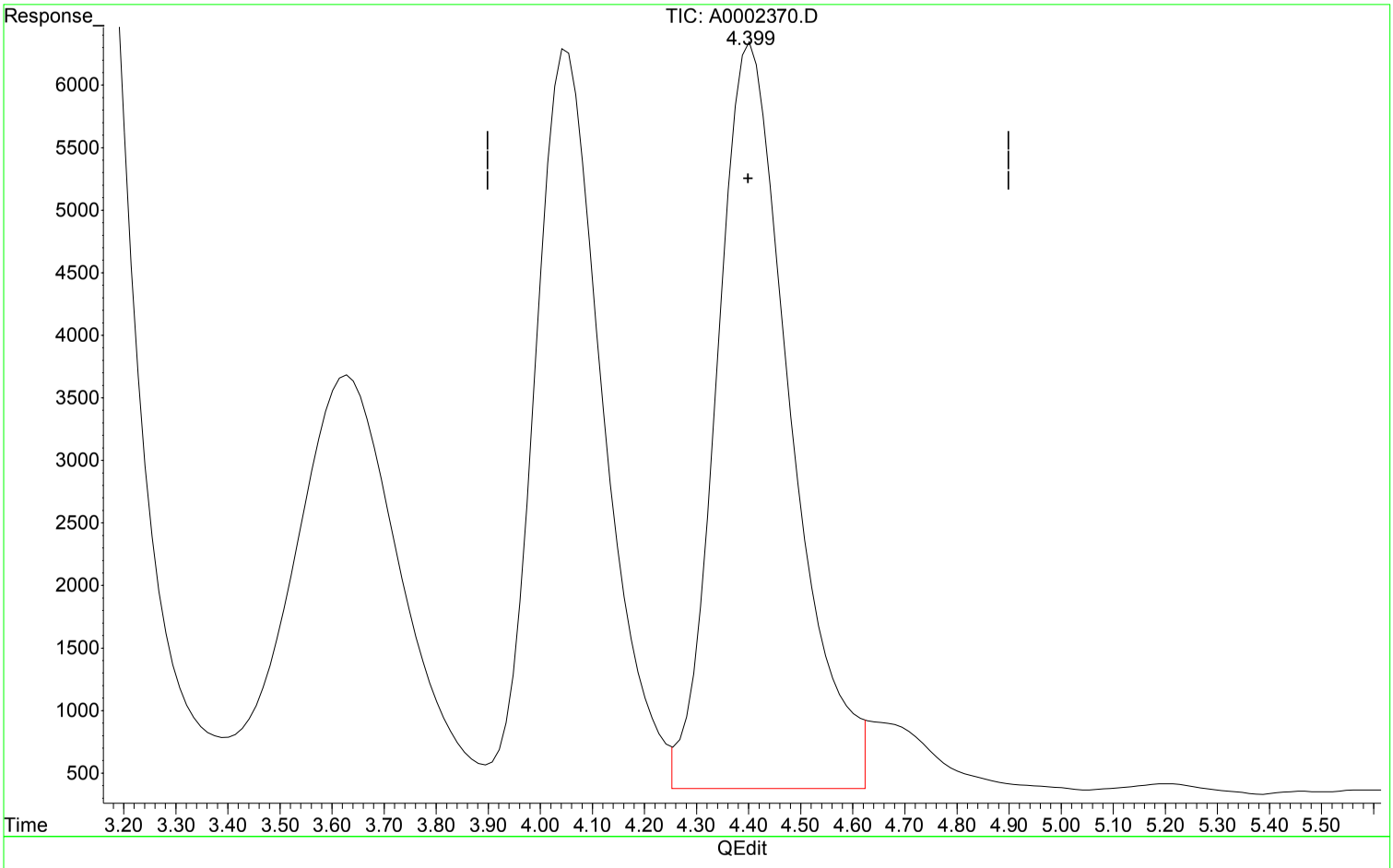
00945908

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002370.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:19
Operator : b.allgeier
Sample : 1.0-10.0ppm
Misc :
ALS Vial : 5 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:08:41 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 9.897 ppm m

response 585881

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00945909

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	497049	5.278	ppm	
2) T	Pyruvic acid	3.631	227620	0.506	ppm	
3) T	Lactic Acid	4.053	269401	5.092	ppm	
4) T	Acetic Acid	4.399	309471	5.228	ppm	m
5) T	Propionic Acid	9.220	306395	5.196	ppm	m
6) T	Butyric Acid	25.001	310758	5.144	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

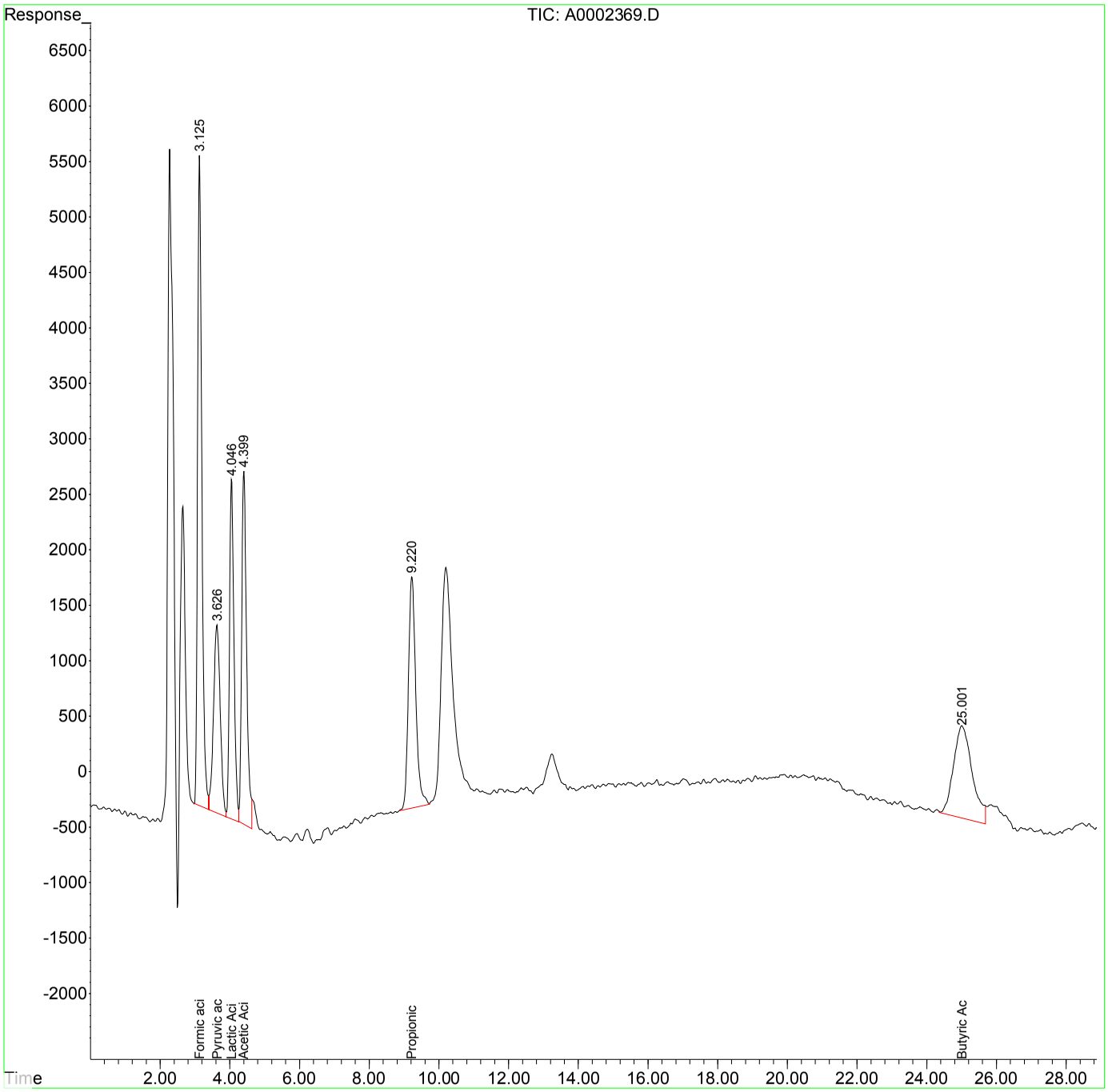
00945910

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

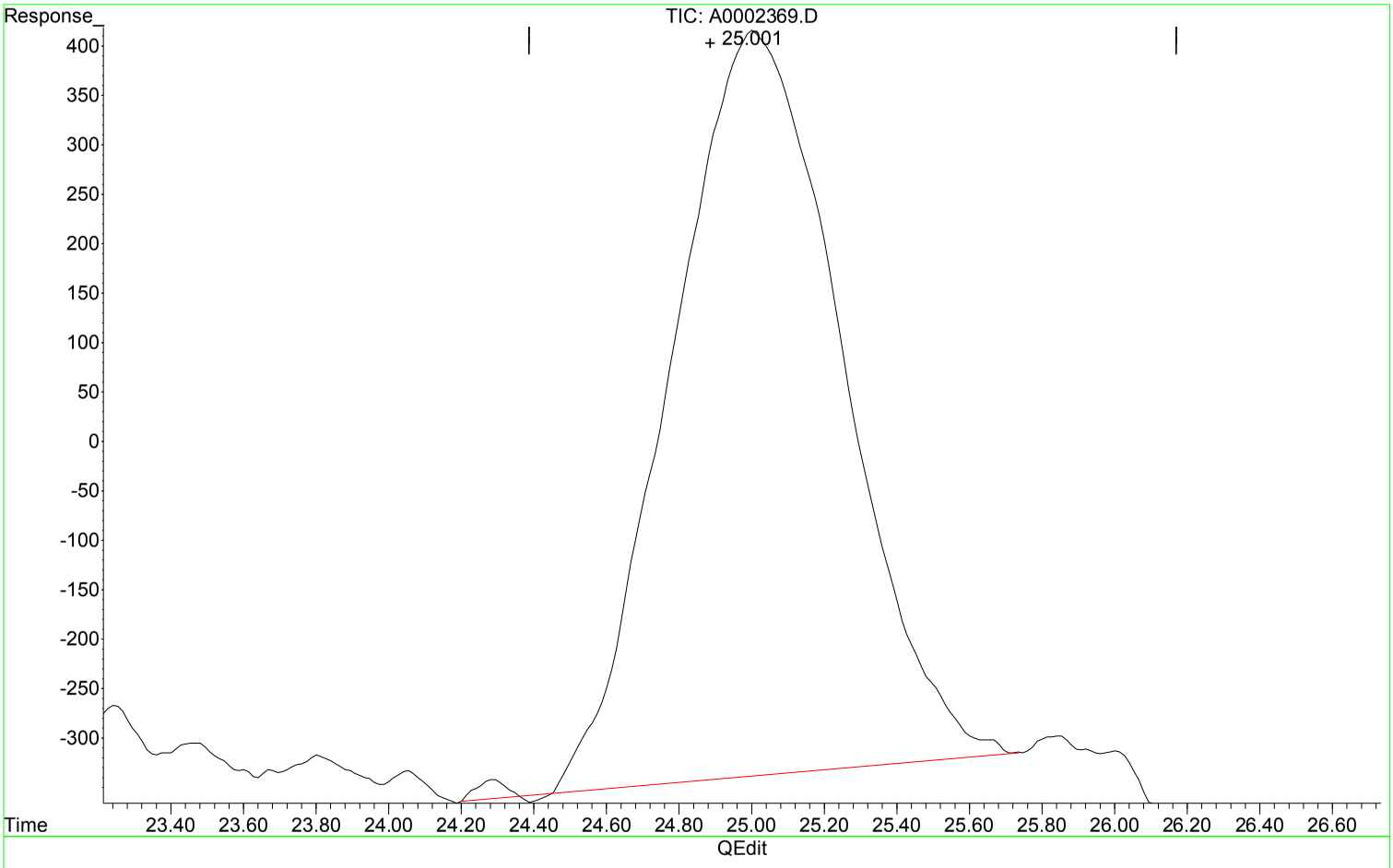


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.009min 4.071 ppm

response 245954

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:45:08 2018

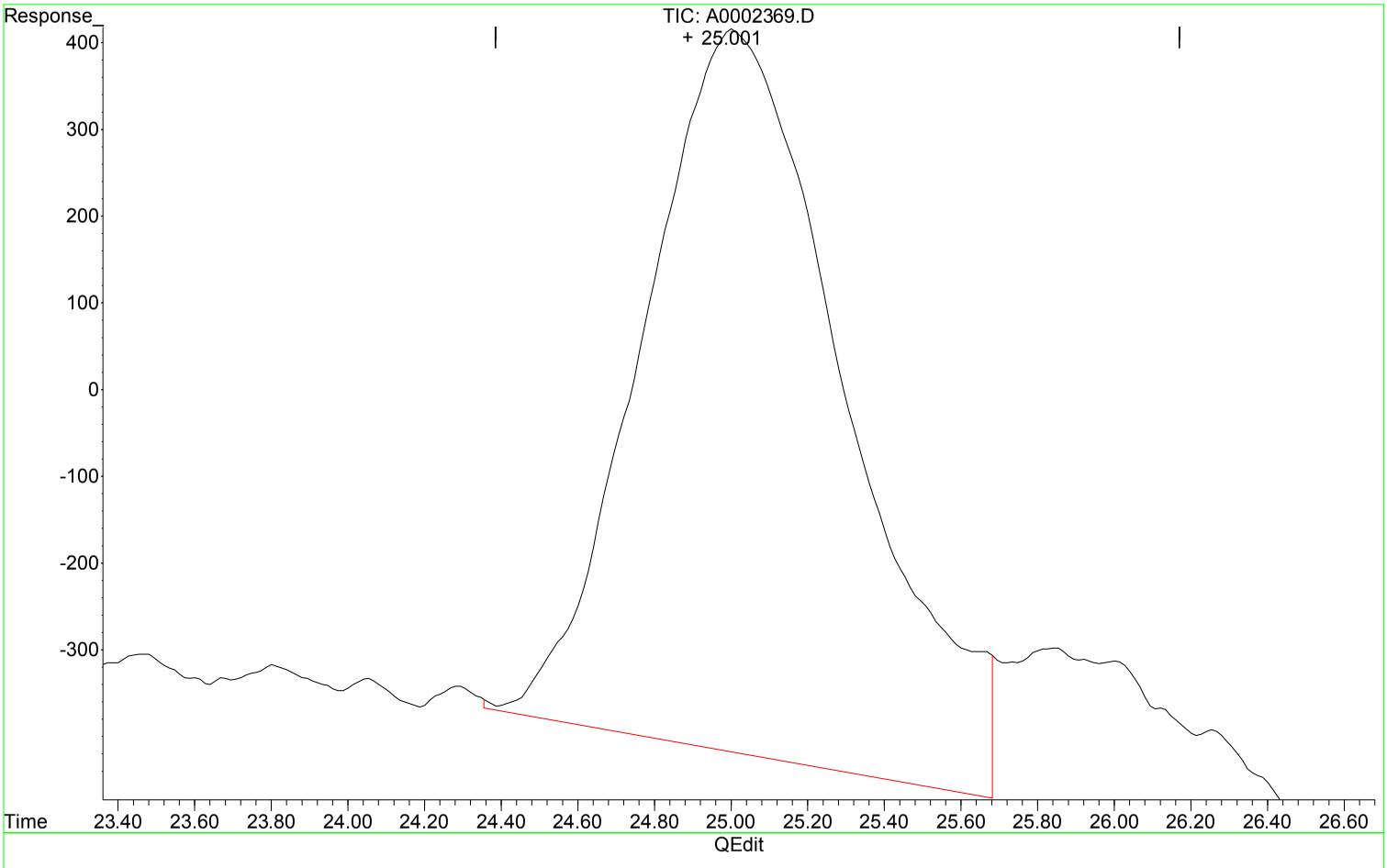
00945912

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

25.001min 5.144 ppm m

response 310758

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:45:19 2018

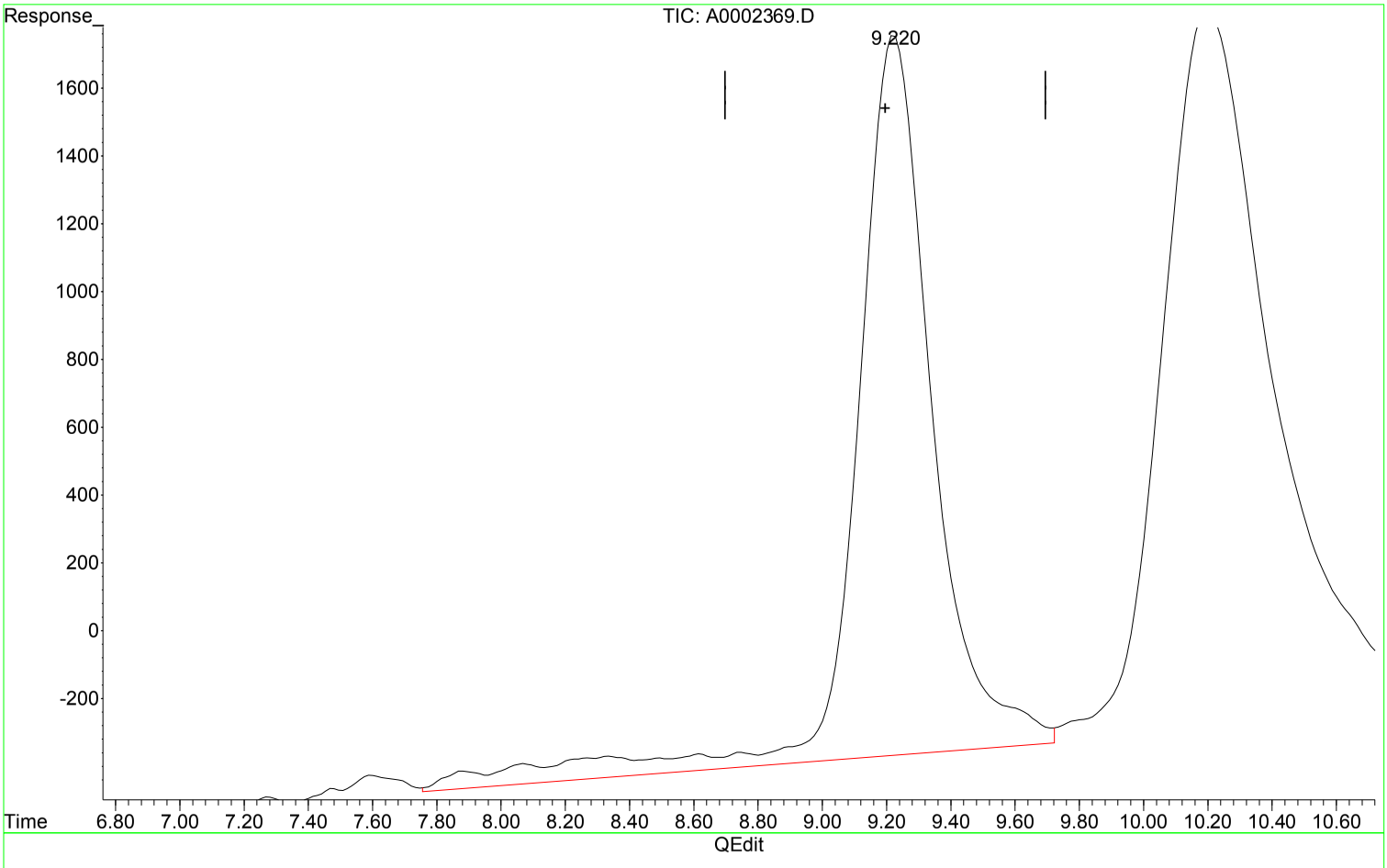
00945913

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 6.027 ppm

response 355419

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

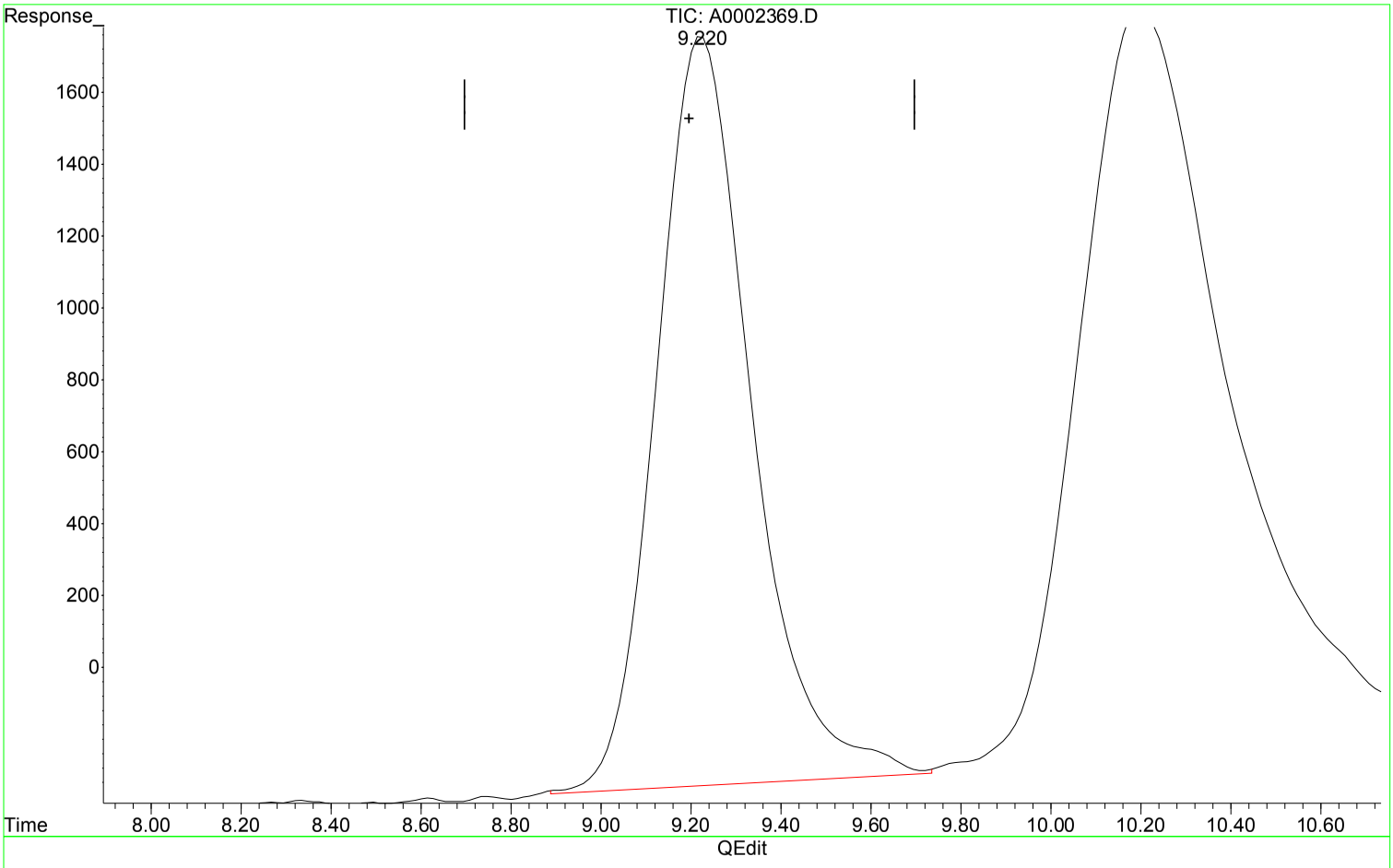
00945914

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.220min 5.196 ppm m

response 306395

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

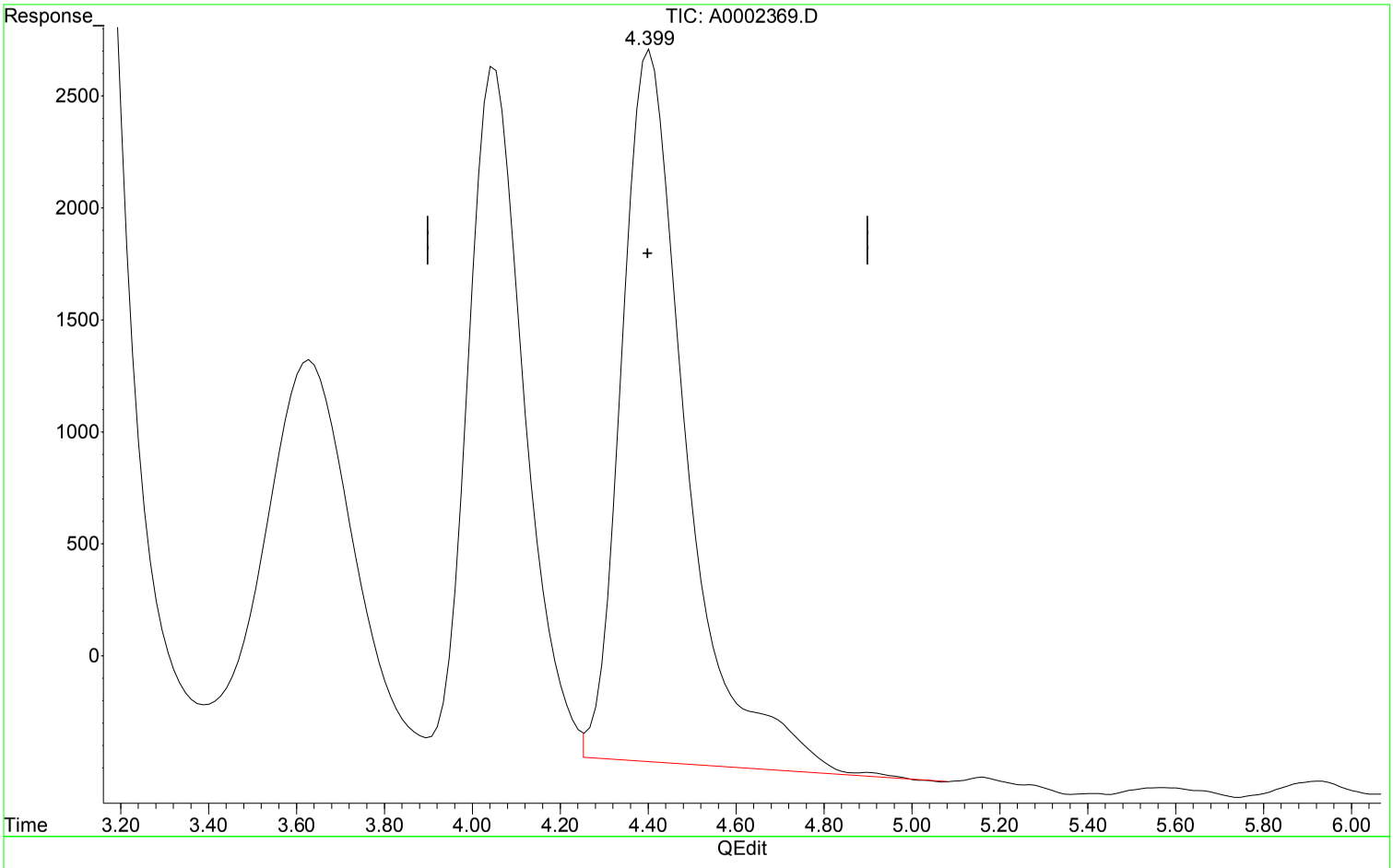
00945915

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 5.542 ppm

response 328094

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:46 2018

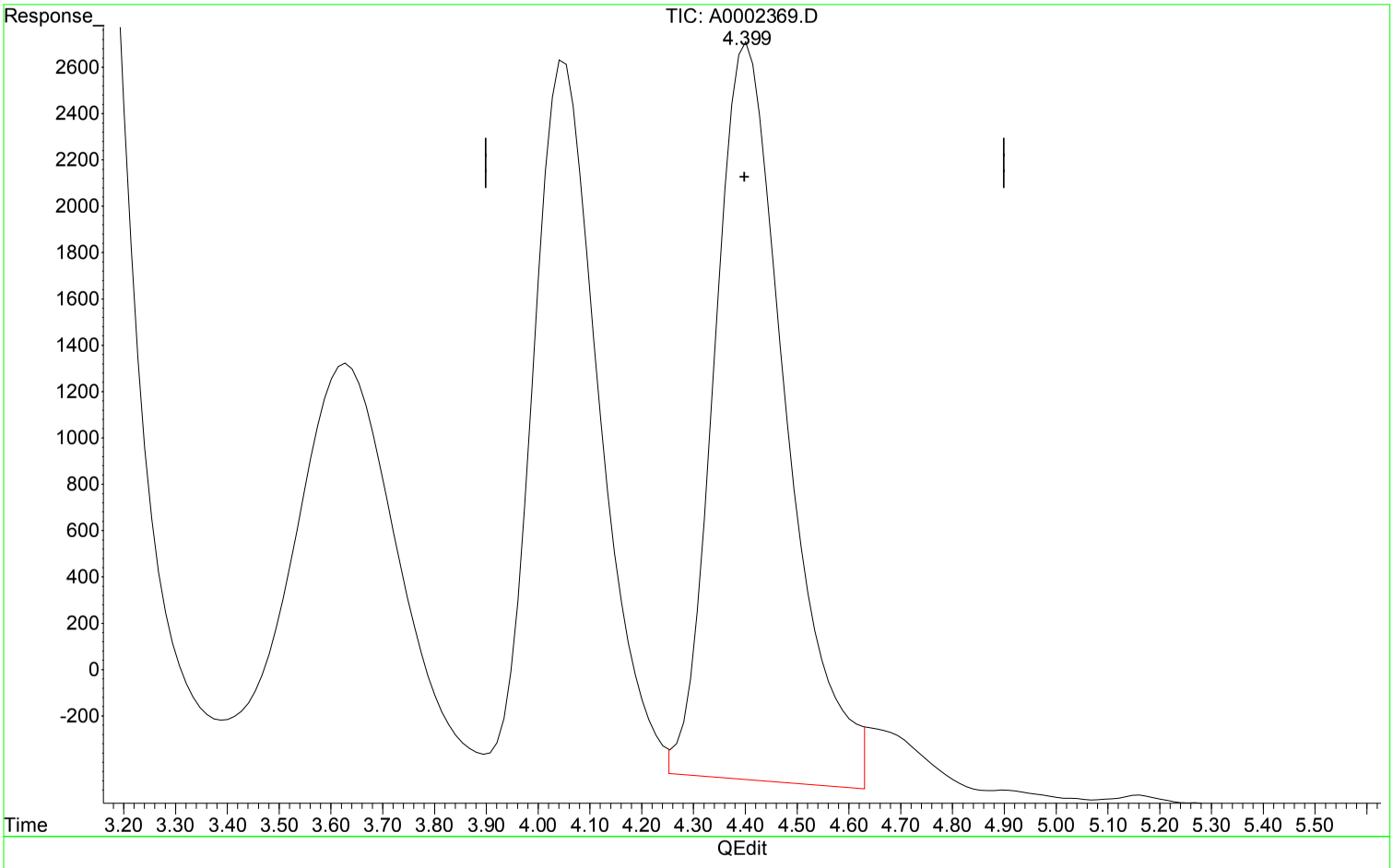
00945916

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002369.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 01:48:26
Operator : b.allgeier
Sample : 0.5-5.0ppm
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:43:00 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 5.228 ppm m

response 309471

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00945917

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	197324	2.095	ppm	
2) T	Pyruvic acid	3.628	94203	0.209	ppm	
3) T	Lactic Acid	4.053	108314	2.047	ppm	
4) T	Acetic Acid	4.399	121343	2.050	ppm	m
5) T	Propionic Acid	9.219	118189	2.004	ppm	m
6) T	Butyric Acid	24.985	143852	2.381	ppm	m

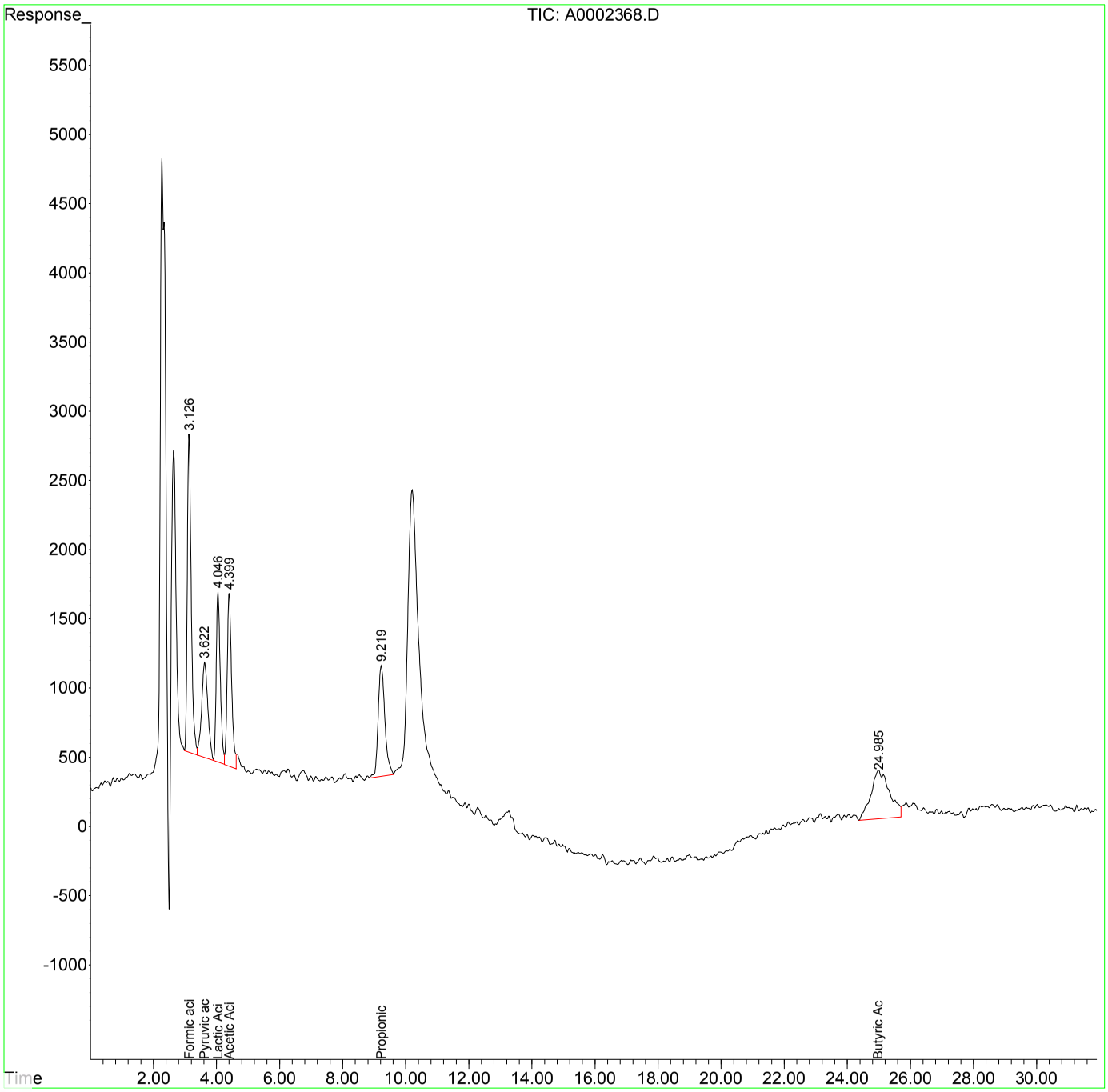
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

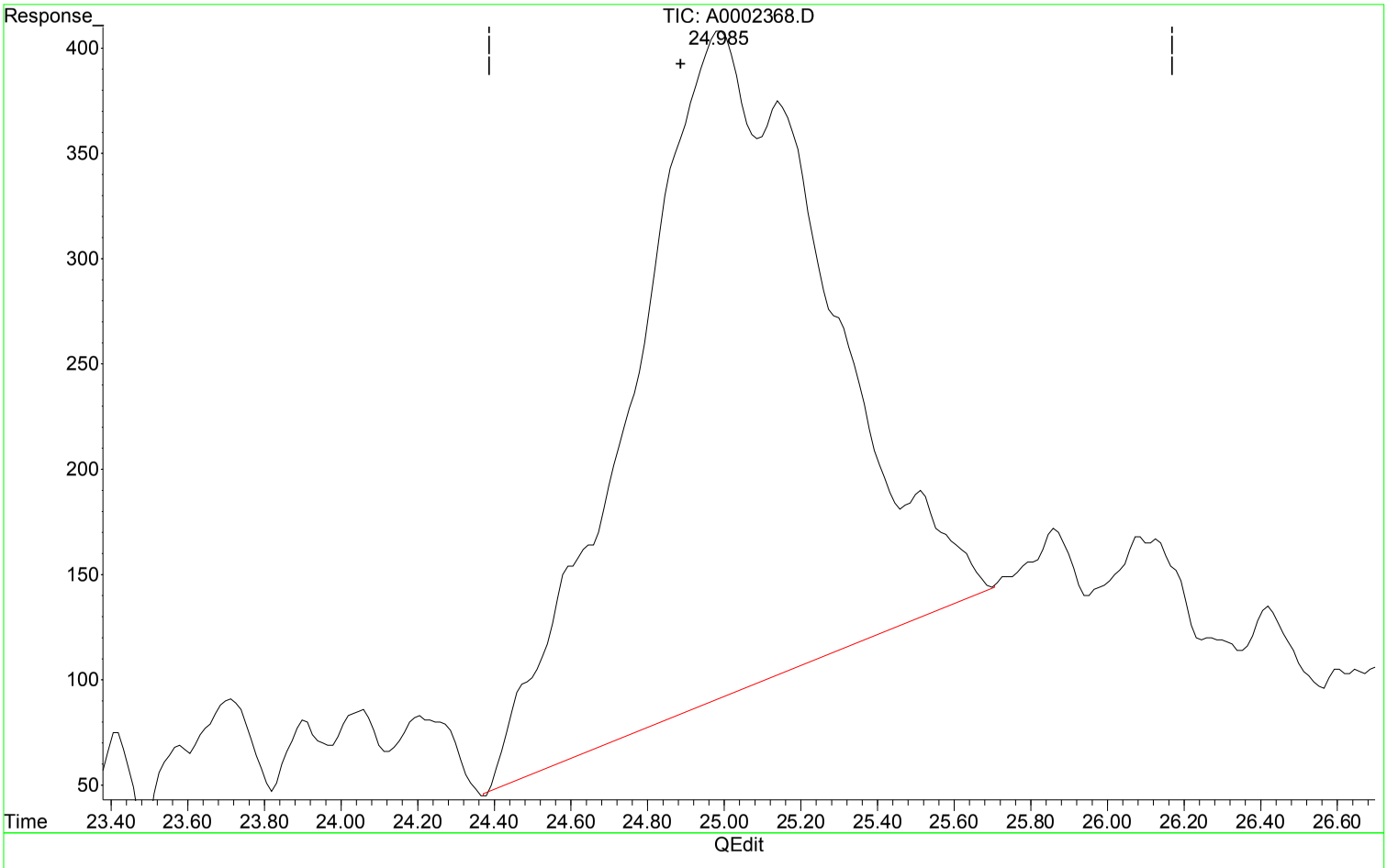


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.991min 1.857 ppm

response 112205

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:20 2018

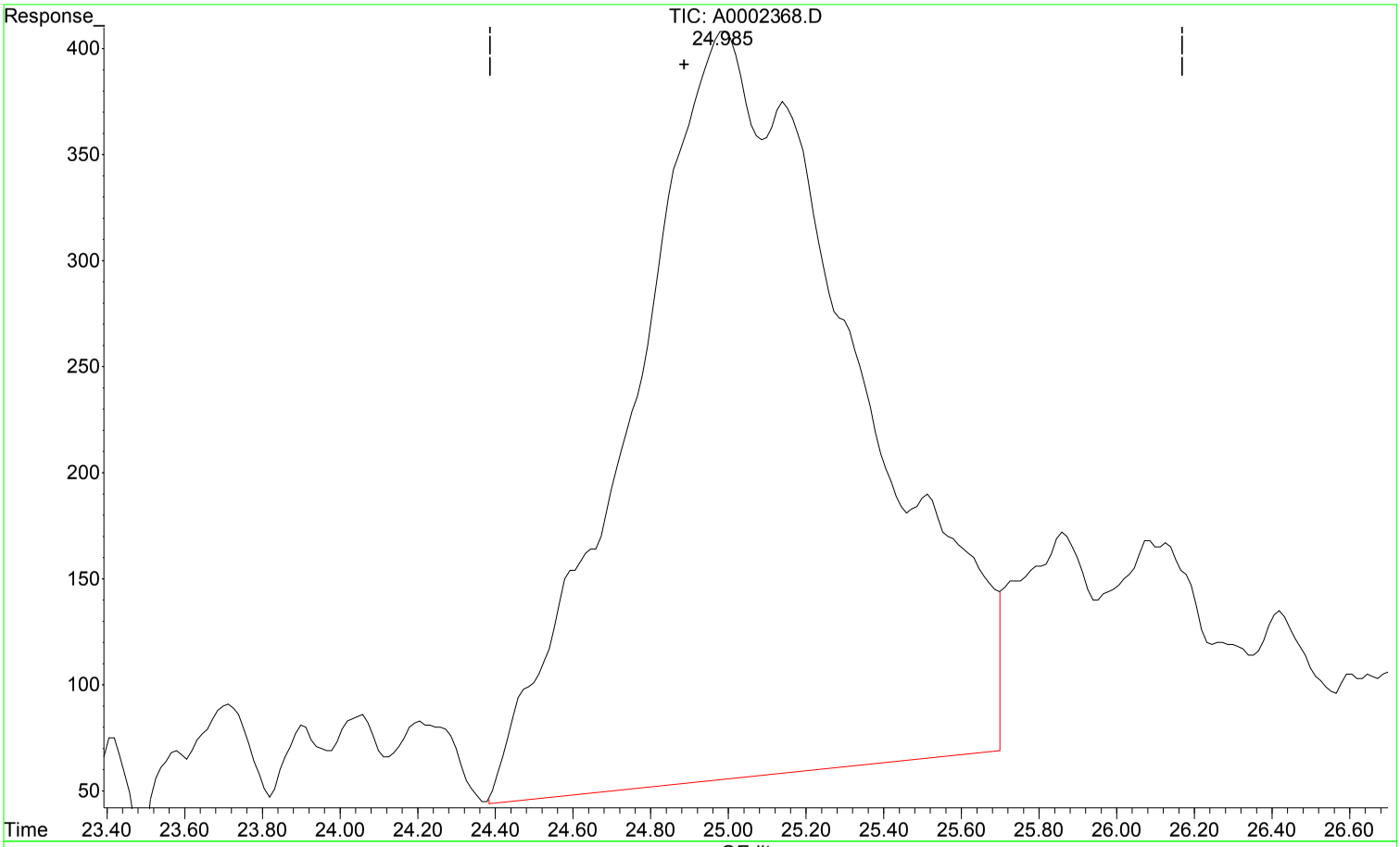
00945920

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.985min 2.381 ppm m

response 143852

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:27 2018

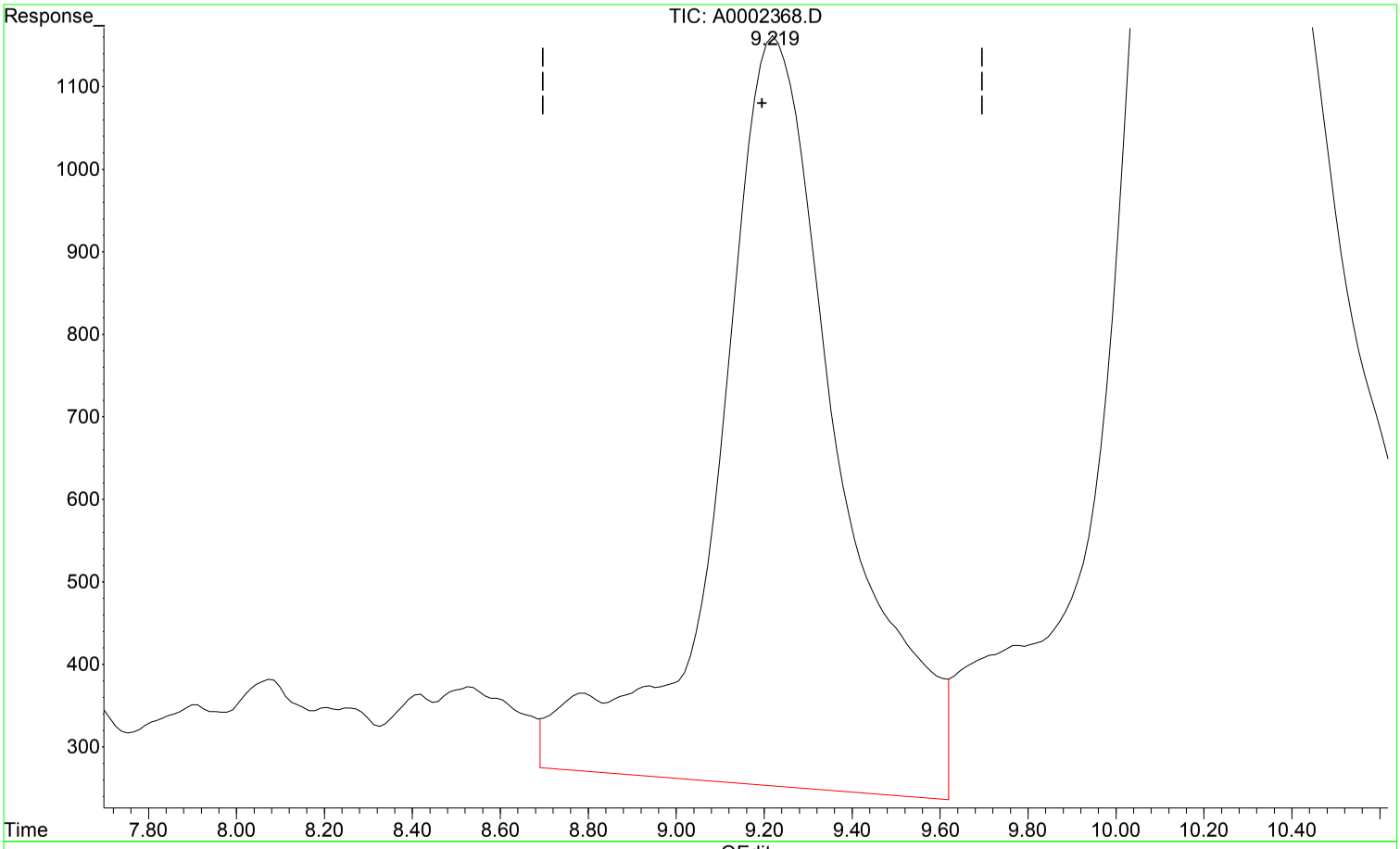
00945921

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.226min 3.005 ppm

response 177221

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:44:07 2018

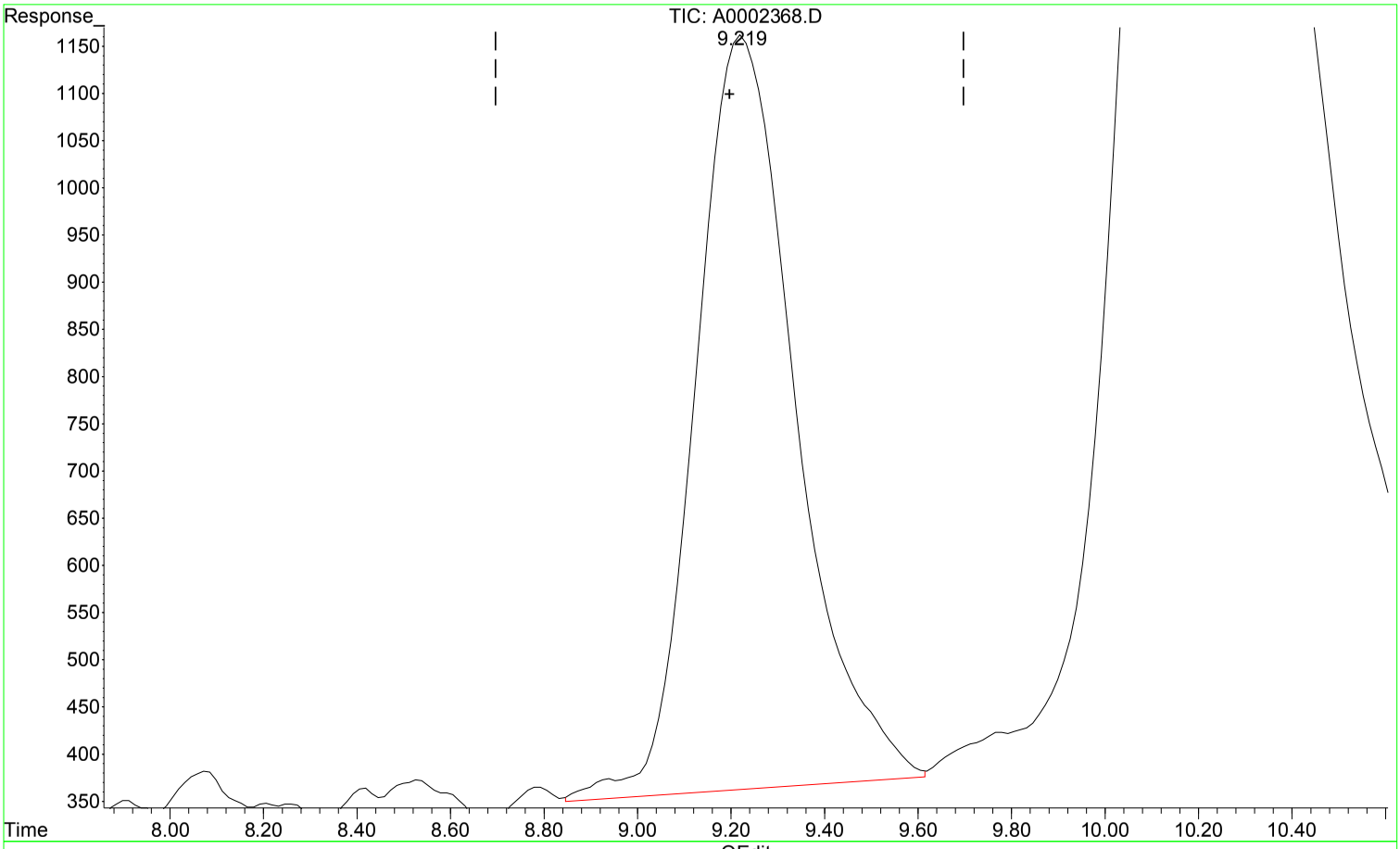
00945922

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.219min 2.004 ppm m

response 118189

Manual Integration:

After

Poor integration.

10/04/18

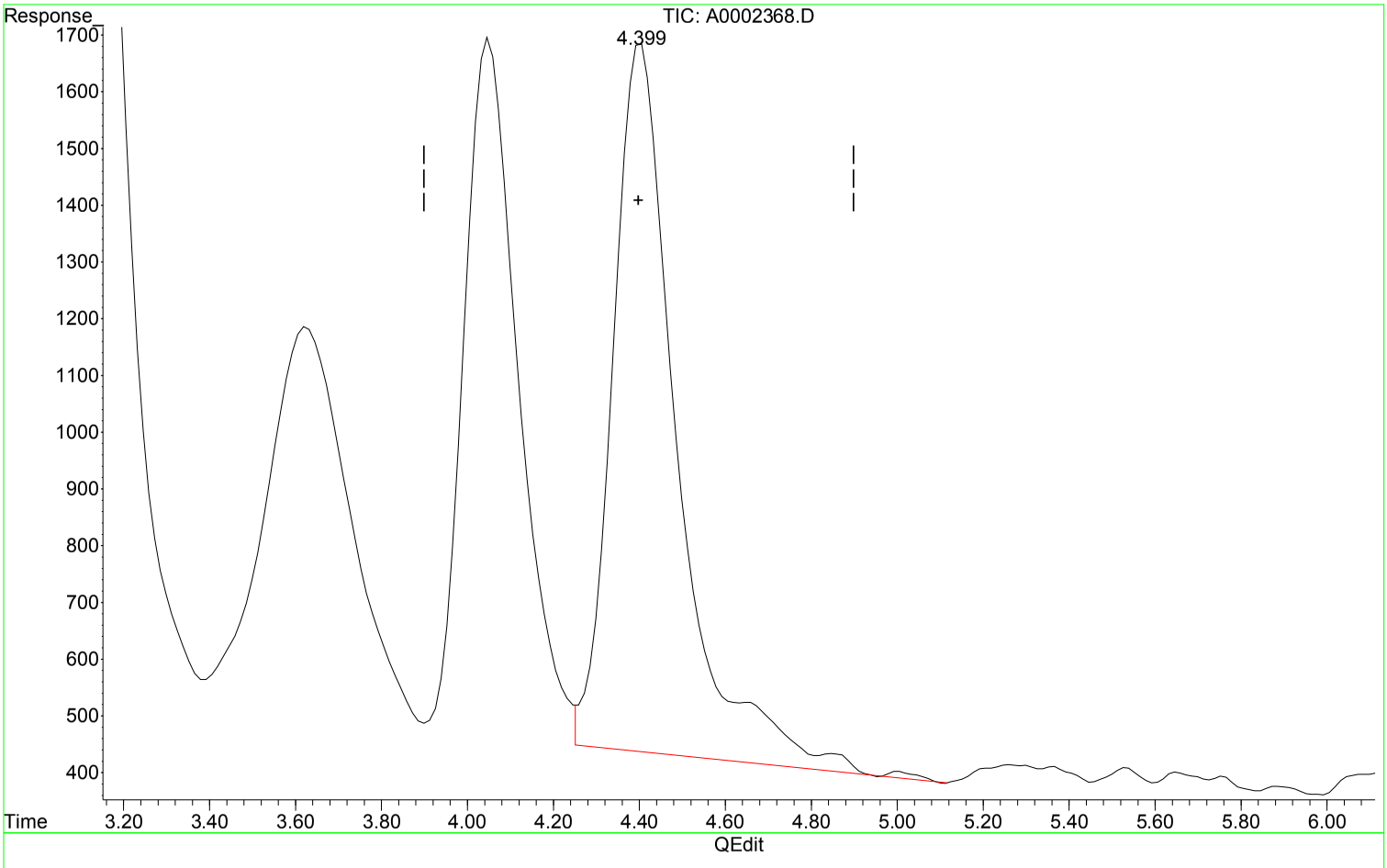
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.406min 2.212 ppm

response 130945

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:43:56 2018

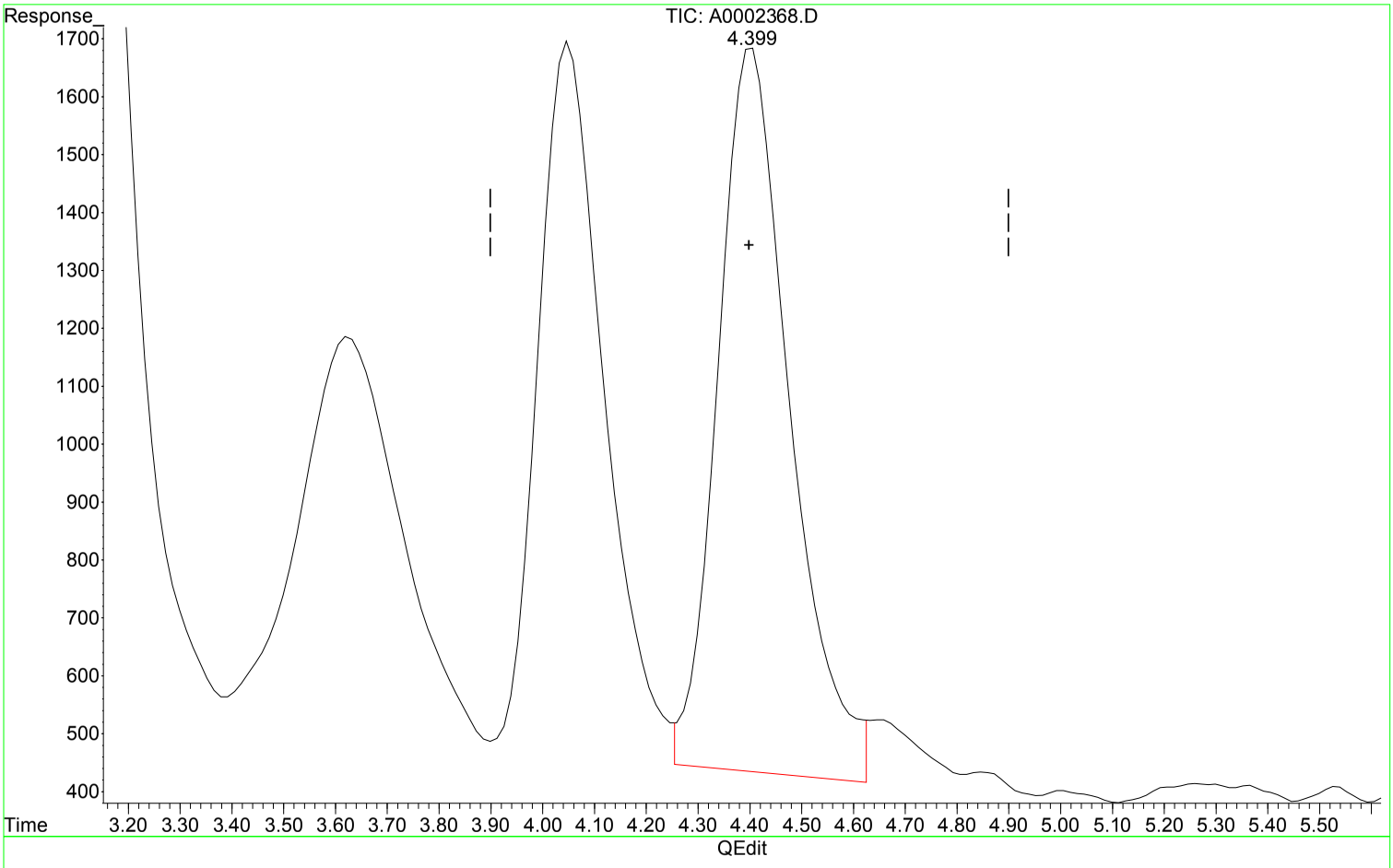
00945924

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002368.D
Signal(s) : dad1A.ch
Acq On : 30-Dec-2000, 16:48:22
Operator : b.allgeier
Sample : 0.2-2.0ppm
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:49 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(4) Acetic Acid (T)

4.399min 2.050 ppm m

response 121343

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

00945925

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	3.133	101923	1.082	ppm	
2) T	Pyruvic acid	3.631	46367	0.103	ppm	
3) T	Lactic Acid	4.052	58945	1.114	ppm	
4) T	Acetic Acid	4.404	60257	1.018	ppm	
5) T	Propionic Acid	9.215	69400	1.177	ppm	m
6) T	Butyric Acid	24.964	74253	1.229	ppm	m

(f)=RT Delta > 1/2 Window (m)=manual int.

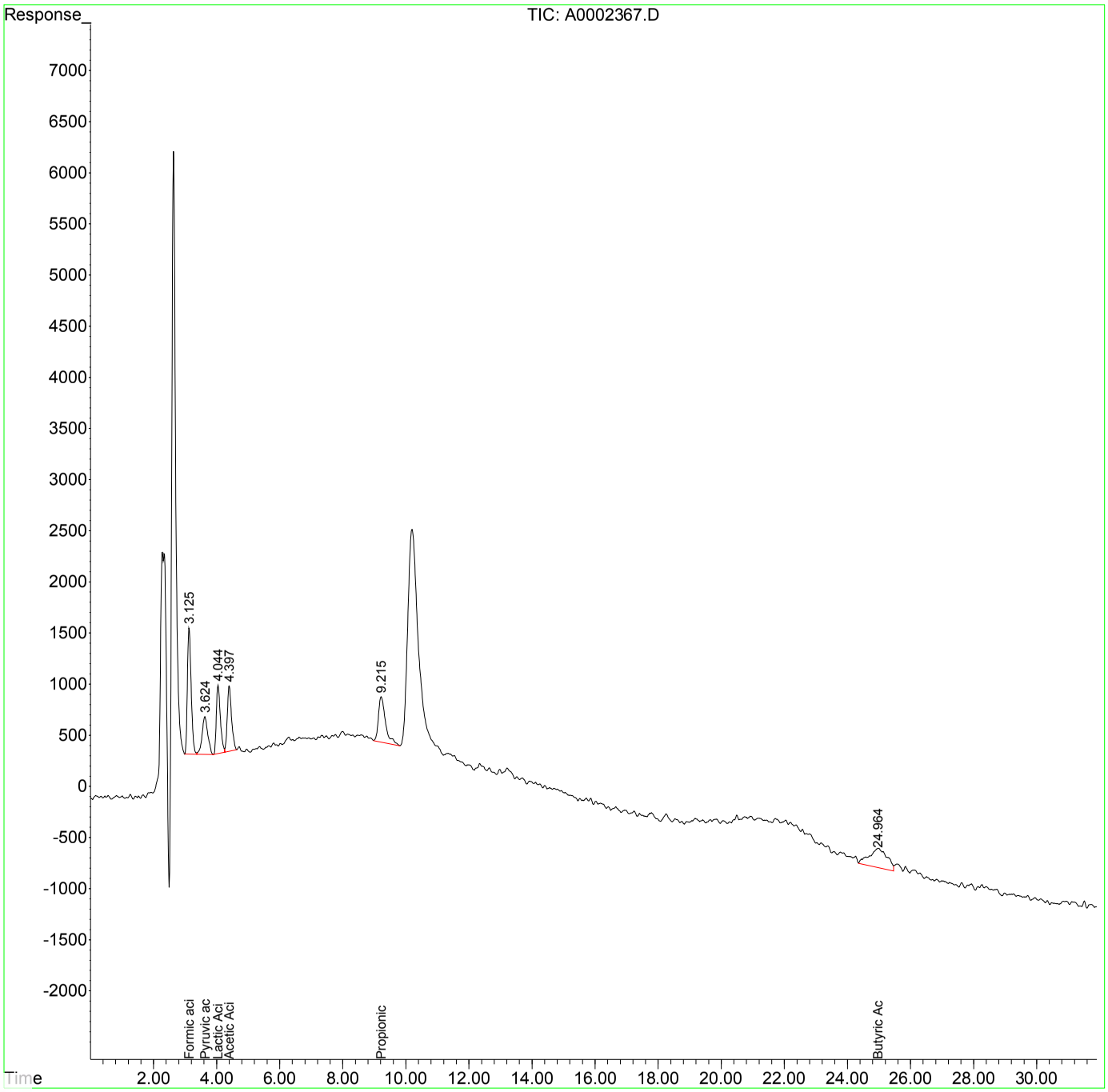
00945926

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

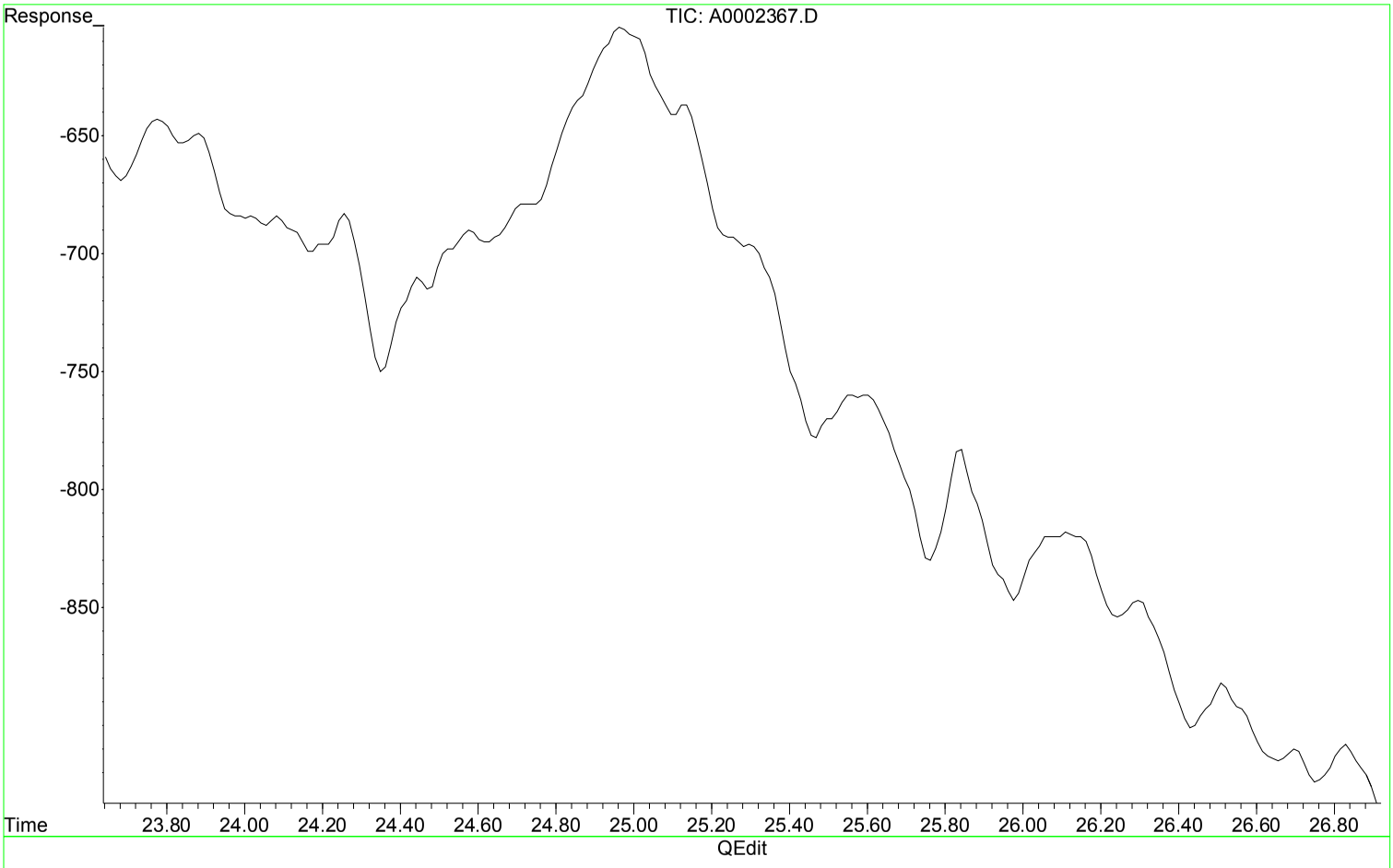


Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(6) Butyric Acid (T)

24.887min 0.000 ppm

response 0

Manual Integration:

Before

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:43:19 2018

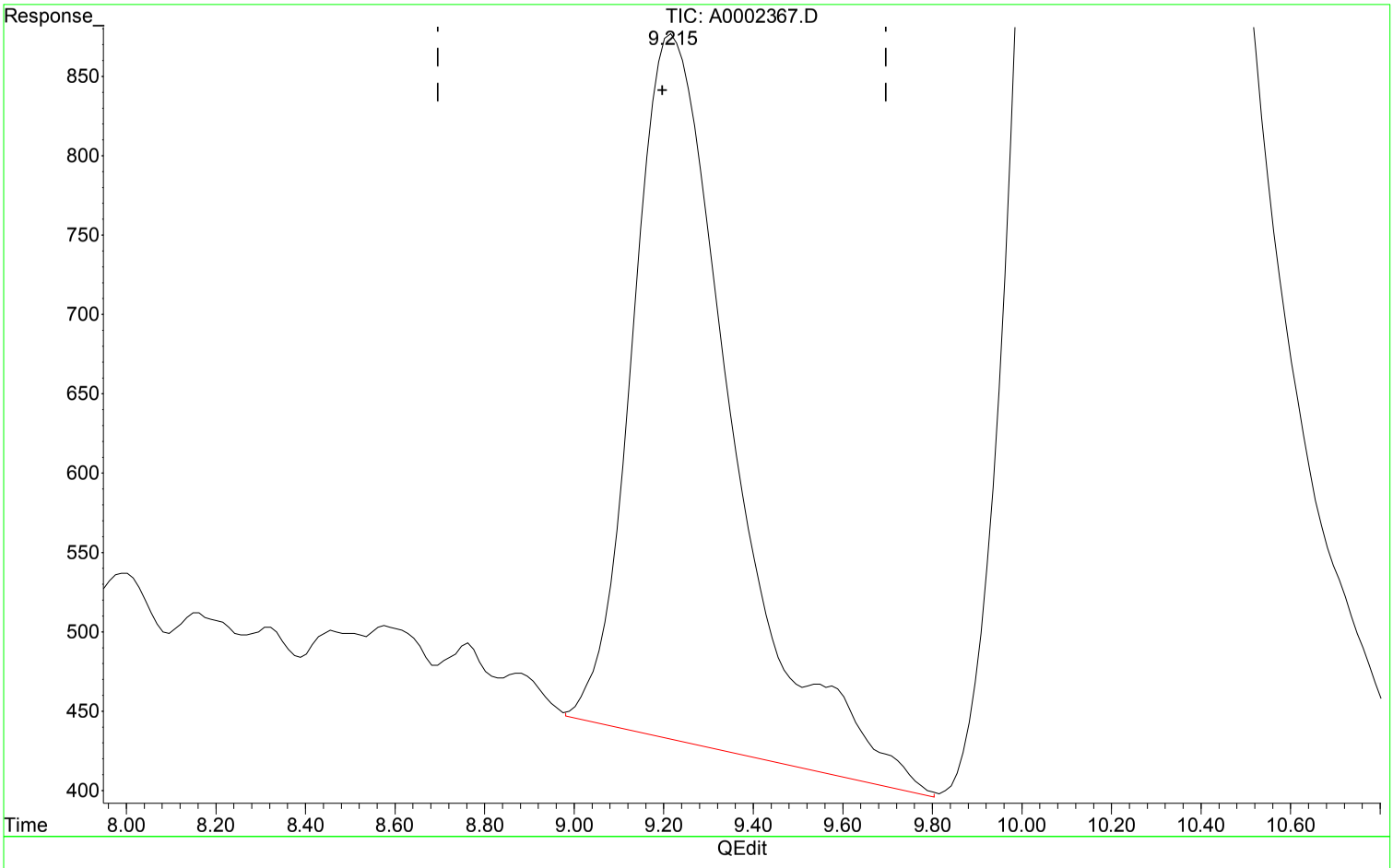
00945928

Quantitation Report (Qedit)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002367.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 12:01:56
Operator : b.allgeier
Sample : 0.1-1.0ppm
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 13:42:47 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 08:47:26 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



(5) Propionic Acid (T)

9.215min 1.177 ppm m

response 69400

Manual Integration:

After

Poor integration.

10/04/18

(+) = Expected Retention Time

MA100418.M Thu Oct 04 13:43:33 2018

00945929

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1) t	Formic acid	0.000	0	N.D.	ppm	
2) T	Pyruvic acid	3.655	25630	0.057	ppm	m
3) T	Lactic Acid	0.000	0	N.D.	ppm	
4) T	Acetic Acid	0.000	0	N.D.	ppm	
5) T	Propionic Acid	0.000	0	N.D.	ppm	
6) T	Butyric Acid	0.000	0	N.D.	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

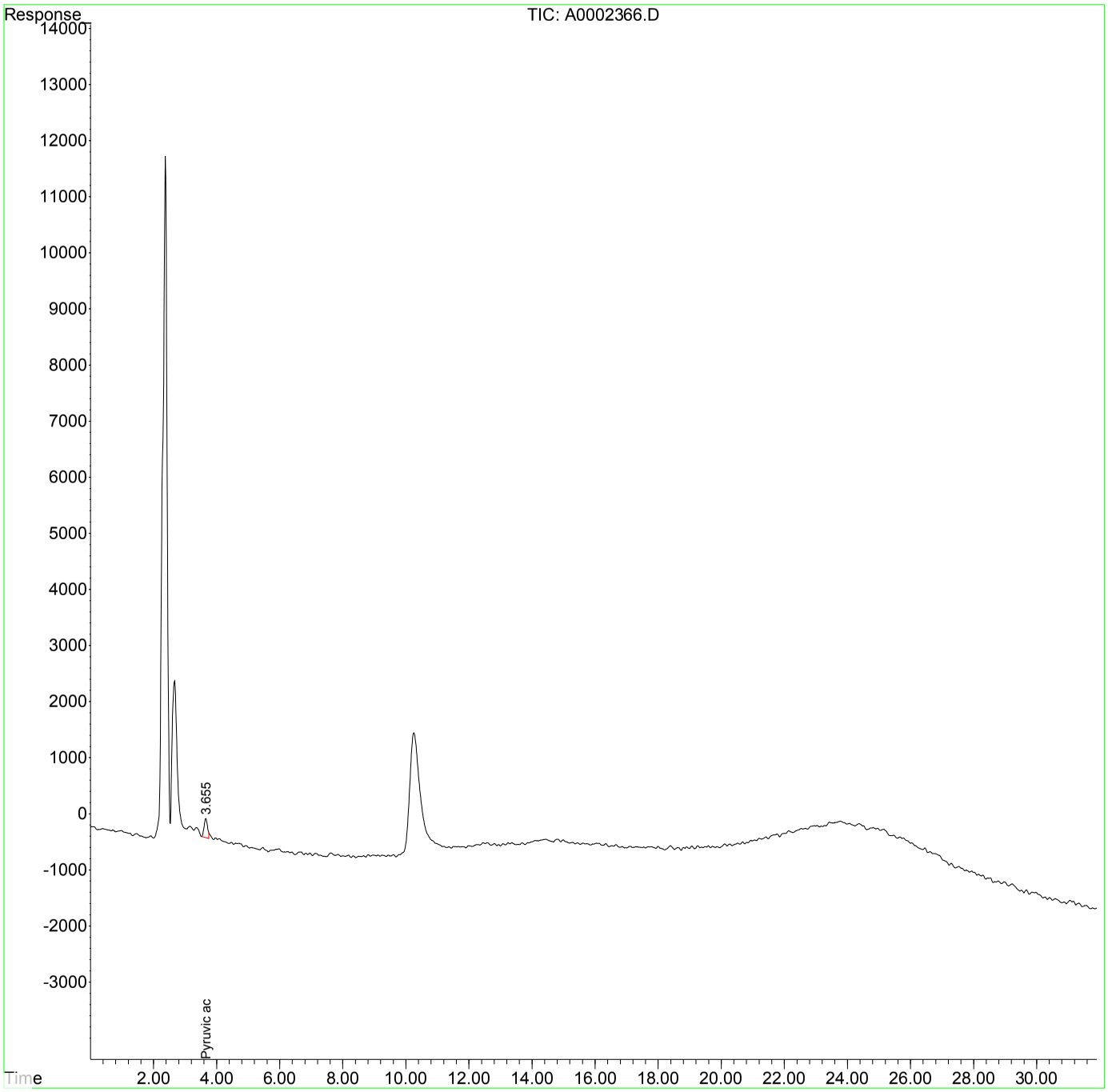
00945930

Quantitation Report (QT Reviewed)

Data Path : I:\ACQUDATA\hplc05\data\100418\
Data File : A0002366.D
Signal(s) : dad1A.ch
Acq On : 04-Oct-2018, 11:26:57
Operator : b.allgeier
Sample : inst blk
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: MA1.E
Quant Time: Oct 04 16:43:03 2018
Quant Method : I:\ACQUDATA\hplc05\Methods\MA100418.M
Quant Title : organic acids
QLast Update : Thu Oct 04 16:42:39 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 50.0ul
Signal Phase : synergi hydro rp
Signal Info : UV wave 210



00945931

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1811991
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

#	Lab Code	Sample Name	File Location	Acquisition Date
01	RC1800114-01	0.1-1.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002367.D	10/04/2018 12:01
02	RC1800114-02	0.2-2.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002368.D	10/04/2018 12:32
03	RC1800114-03	0.5-5.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002369.D	10/04/2018 13:04
04	RC1800114-04	1.0-10.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002370.D	10/04/2018 13:36
05	RC1800114-05	2.0-20.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002371.D	10/04/2018 14:21
06	RC1800114-06	5.0-50.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002372.D	10/04/2018 14:56
07	RC1800114-07	10.0-100.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002373.D	10/04/2018 15:31
08	RC1800114-08	20.0-200.0ppm	I:\ACQUDATA\hplc05\data\100418\A0002374.D	10/04/2018 16:03

Analyte

Acetic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.026E4	02	2.000	6.067E4	03	5.000	6.189E4	04	10.000	5.859E4
05	20.000	5.483E4	06	50.000	6.053E4	07	100.000	5.725E4	08	200.000	5.933E4

Butanoic Acid (Butyric Acid)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	7.425E4	02	2.000	7.193E4	03	5.000	6.215E4	04	10.000	6.021E4
05	20.000	6.035E4	06	50.000	5.865E4	07	100.000	5.511E4	08	200.000	6.053E4

Lactic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	5.895E4	02	2.000	5.416E4	03	5.000	5.388E4	04	10.000	5.286E4
05	20.000	5.017E4	06	50.000	5.423E4	07	100.000	5.216E4	08	200.000	5.371E4

Propionic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.000	6.94E4	02	2.000	5.909E4	03	5.000	6.128E4	04	10.000	5.86E4
05	20.000	5.703E4	06	50.000	5.9E4	07	100.000	5.508E4	08	200.000	5.726E4

Pyruvic Acid

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.100	4.637E5	02	0.200	4.71E5	03	0.500	4.552E5	04	1.000	4.481E5
05	2.000	4.25E5	06	5.000	4.588E5	07	10.000	4.43E5	08	20.000	4.585E5

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1811991
Calibration Date: 10/4/2018

Initial Calibration Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

		Calibration Evaluation				Calibration Evaluation	
Analyte Name	Compound Type	Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
Acetic Acid	TRG	Average RF	% RSD	3.8	≤	5.917E4	
Butanoic Acid (Butyric Acid)	TRG	Average RF	% RSD	10.6	≤	6.29E4	
Lactic Acid	TRG	Average RF	% RSD	4.6	≤	5.376E4	
Propionic Acid	TRG	Average RF	% RSD	7.3	≤	5.959E4	
Pyruvic Acid	TRG	Average RF	% RSD	3.1	≤	4.529E5	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58

Service Request: R1811991
Calibration Date: 10/4/2018

Initial Calibration Verification Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Calibration ID: RC1800114
Instrument ID: R-HPLC-05

Signal ID: synergi hydro rp

#	Lab Code	Sample Name	File Location	Acquisition Date
09	RC1800114-09	icv	I:\ACQUDATA\hplc05\data\100418\A0002375.D	10/04/2018 16:35

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
Pyruvic Acid	2.00	3.00	4.529E5	6.787E5	150*	85-115	Average RF
Acetic Acid	20.0	20.6	5.917E4	6.092E4	103	85-115	Average RF
Butanoic Acid (Butyric Acid)	20.0	18.1	6.29E4	5.694E4	90.5	85-115	Average RF
Lactic Acid	20.0	20.2	5.376E4	5.434E4	101	85-115	Average RF
Propionic Acid	20.0	19.2	5.959E4	5.733E4	96.0	85-115	Average RF

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/18/18 15:45

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121718\A0002587.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.98	4.529E5	4.489E5	-0.9	NA	±15	Average RF
Acetic Acid	50.1	50.8	5.917E4	5.993E4	1.3	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.4	6.29E4	5.496E4	-12.6	NA	±15	Average RF
Lactic Acid	49.8	54.1	5.376E4	5.844E4	8.7	NA	±15	Average RF
Propionic Acid	50.3	48.7	5.959E4	5.763E4	-3.3	NA	±15	Average RF

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/19/18 01:48

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121718\A0002598.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.92	4.529E5	4.435E5	-2.1	NA	±15	Average RF
Acetic Acid	50.1	50.3	5.917E4	5.936E4	0.3	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.3	6.29E4	5.481E4	-12.9	NA	±15	Average RF
Lactic Acid	49.8	54.4	5.376E4	5.876E4	9.3	NA	±15	Average RF
Propionic Acid	50.3	48.9	5.959E4	5.783E4	-3.0	NA	±15	Average RF

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/20/18 02:35

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002621.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.01	4.529E5	4.514E5	-0.3	NA	±15	Average RF
Acetic Acid	50.1	50.7	5.917E4	5.982E4	1.1	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.8	6.29E4	5.538E4	-12.0	NA	±15	Average RF
Lactic Acid	49.8	54.6	5.376E4	5.899E4	9.7	NA	±15	Average RF
Propionic Acid	50.3	49.5	5.959E4	5.859E4	-1.7	NA	±15	Average RF

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/20/18 04:21

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002623.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.90	4.529E5	4.413E5	-2.6	NA	±15	Average RF
Acetic Acid	50.1	50.1	5.917E4	5.911E4	-0.1	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.0	6.29E4	5.438E4	-13.5	NA	±15	Average RF
Lactic Acid	49.8	54.1	5.376E4	5.843E4	8.7	NA	±15	Average RF
Propionic Acid	50.3	49.1	5.959E4	5.809E4	-2.5	NA	±15	Average RF

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/21/18 05:03

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002651.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.98	4.529E5	4.49E5	-0.9	NA	±15	Average RF
Acetic Acid	50.1	50.1	5.917E4	5.918E4	0.0	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.5	6.29E4	5.501E4	-12.5	NA	±15	Average RF
Lactic Acid	49.8	56.0	5.376E4	6.053E4	12.6	NA	±15	Average RF
Propionic Acid	50.3	50.5	5.959E4	5.977E4	0.3	NA	±15	Average RF

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/21/18 09:00

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002657.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.06	4.529E5	4.556E5	0.6	NA	±15	Average RF
Acetic Acid	50.1	50.5	5.917E4	5.959E4	0.7	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	44.0	6.29E4	5.448E4	-13.4	NA	±15	Average RF
Lactic Acid	49.8	56.3	5.376E4	6.084E4	13.2	NA	±15	Average RF
Propionic Acid	50.3	44.6	5.959E4	5.283E4	-11.3	NA	±15	Average RF

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/19/18 22:10

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002616.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.93	4.529E5	4.445E5	-1.9	NA	±15	Average RF
Acetic Acid	50.1	50.5	5.917E4	5.966E4	0.8	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	55.1	6.29E4	6.812E4	8.3	NA	±15	Average RF
Lactic Acid	49.8	54.0	5.376E4	5.838E4	8.6	NA	±15	Average RF
Propionic Acid	50.3	47.4	5.959E4	5.612E4	-5.8	NA	±15	Average RF

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/21/18 13:50

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002661.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	4.85	4.529E5	4.374E5	-3.4	NA	±15	Average RF
Acetic Acid	50.1	49.5	5.917E4	5.846E4	-1.2	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	43.3	6.29E4	5.363E4	-14.7	NA	±15	Average RF
Lactic Acid	49.8	55.7	5.376E4	6.015E4	11.9	NA	±15	Average RF
Propionic Acid	50.3	46.2	5.959E4	5.467E4	-8.3	NA	±15	Average RF

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150

Service Request: R1811991
Date Analyzed: 12/21/18 16:31

Continuing Calibration Verification (CCV) Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids
File ID: I:\ACQUDATA\hplc05\data\121918\A0002664.D\
Signal ID: synergi hydro rp

Calibration Date: 10/4/2018
Calibration ID: RC1800114
Analysis Lot: 619495
Units: mg/L

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Pyruvic Acid	5.03	5.03	4.529E5	4.532E5	0.1	NA	±15	Average RF
Acetic Acid	50.1	50.3	5.917E4	5.942E4	0.4	NA	±15	Average RF
Butanoic Acid (Butyric Acid)	50.8	45.2	6.29E4	5.594E4	-11.1	NA	±15	Average RF
Lactic Acid	49.8	56.4	5.376E4	6.096E4	13.4	NA	±15	Average RF
Propionic Acid	50.3	49.9	5.959E4	5.91E4	-0.8	NA	±15	Average RF

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811991
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: **Analysis Lot:**619495
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\121918 \A0002627.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	00:06:10	
I:\ACQUDATA\hplc05\data\121918 \A0002663.D\	35AWW11_121118	R1811991-002	12/30/2000	00:10:08	
I:\ACQUDATA\hplc05\data\121918 \A0002638.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	00:10:31	
I:\ACQUDATA\hplc05\data\121918 \A0002657.D\	Continuing Calibration Verification	RQ1814001-18	12/30/2000	00:10:32	
I:\ACQUDATA\hplc05\data\121918 \A0002619.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	00:18:26	
I:\ACQUDATA\hplc05\data\121918 \A0002621.D\	Continuing Calibration Verification	RQ1814001-10	12/30/2000	01:28:24	
I:\ACQUDATA\hplc05\data\121718 \A0002595.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	01:28:29	
I:\ACQUDATA\hplc05\data\121718 \A0002589.D\	Lab Control Sample	RQ1814001-02	12/30/2000	02:47:47	
I:\ACQUDATA\hplc05\data\121718 \A0002587.D\	Continuing Calibration Verification	RQ1814001-06	12/30/2000	02:47:53	
I:\ACQUDATA\hplc05\data\121918 \A0002660.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	02:48:16	
I:\ACQUDATA\hplc05\data\121718 \A0002593.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	02:48:30	
I:\ACQUDATA\hplc05\data\121918 \A0002655.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	02:48:38	
I:\ACQUDATA\hplc05\data\121918 \A0002636.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	02:48:42	
I:\ACQUDATA\hplc05\data\121918 \A0002625.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	03:48:16	
I:\ACQUDATA\hplc05\data\121918 \A0002624.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	05:48:22	
I:\ACQUDATA\hplc05\data\121918 \A0002628.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	17:48:05	
I:\ACQUDATA\hplc05\data\121918 \A0002661.D\	Continuing Calibration Verification	RQ1814001-23	12/30/2000	17:48:15	
I:\ACQUDATA\hplc05\data\121718 \A0002591.D\	ZZZZZZZ	ZZZZZZZ	12/30/2000	17:48:42	
I:\ACQUDATA\hplc05\data\121918 \A0002634.D\	ZZZZZZZ	ZZZZZZZ	12/31/2000	03:47:56	
I:\ACQUDATA\hplc05\data\121718 \A0002587.D\	Continuing Calibration Verification	RQ1814001-06	12/18/2018	15:45:00	
I:\ACQUDATA\hplc05\data\121718 \A0002588.D\	Method Blank	RQ1814001-01	12/18/2018	16:38:32	
I:\ACQUDATA\hplc05\data\121718 \A0002589.D\	Lab Control Sample	RQ1814001-02	12/18/2018	17:35:00	
I:\ACQUDATA\hplc05\data\121718 \A0002590.D\	Duplicate Lab Control Sample	RQ1814001-03	12/18/2018	18:28:31	

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811991
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: **Analysis Lot:**619495
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\121718\A0002591.D\	ZZZZZZZ	ZZZZZZZ	12/18/2018	19:25:00	
I:\ACQUDATA\hplc05\data\121718\A0002592.D\	ZZZZZZZ	ZZZZZZZ	12/18/2018	20:18:17	
I:\ACQUDATA\hplc05\data\121718\A0002593.D\	ZZZZZZZ	ZZZZZZZ	12/18/2018	21:15:00	
I:\ACQUDATA\hplc05\data\121718\A0002594.D\	ZZZZZZZ	ZZZZZZZ	12/18/2018	22:08:14	
I:\ACQUDATA\hplc05\data\121718\A0002595.D\	ZZZZZZZ	ZZZZZZZ	12/18/2018	23:05:00	
I:\ACQUDATA\hplc05\data\121718\A0002597.D\	ZZZZZZZ	ZZZZZZZ	12/19/2018	00:53:09	
I:\ACQUDATA\hplc05\data\121718\A0002598.D\	Continuing Calibration Verification	RQ1814001-07	12/19/2018	01:48:07	
I:\ACQUDATA\hplc05\data\121918\A0002616.D\	Continuing Calibration Verification	RQ1814001-22	12/19/2018	22:10:28	
I:\ACQUDATA\hplc05\data\121918\A0002617.D\	ZZZZZZZ	ZZZZZZZ	12/19/2018	23:03:21	
I:\ACQUDATA\hplc05\data\121918\A0002618.D\	ZZZZZZZ	ZZZZZZZ	12/19/2018	23:56:12	
I:\ACQUDATA\hplc05\data\121918\A0002619.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	00:50:00	
I:\ACQUDATA\hplc05\data\121918\A0002620.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	01:42:07	
I:\ACQUDATA\hplc05\data\121918\A0002621.D\	Continuing Calibration Verification	RQ1814001-10	12/20/2018	02:35:00	
I:\ACQUDATA\hplc05\data\121918\A0002622.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	03:28:04	
I:\ACQUDATA\hplc05\data\121918\A0002623.D\	Continuing Calibration Verification	RQ1814001-11	12/20/2018	04:21:02	
I:\ACQUDATA\hplc05\data\121918\A0002624.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	05:15:00	
I:\ACQUDATA\hplc05\data\121918\A0002625.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	06:10:00	
I:\ACQUDATA\hplc05\data\121918\A0002626.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	06:59:53	
I:\ACQUDATA\hplc05\data\121918\A0002627.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	07:52:00	
I:\ACQUDATA\hplc05\data\121918\A0002628.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	08:49:00	
I:\ACQUDATA\hplc05\data\121918\A0002634.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	13:00:00	
I:\ACQUDATA\hplc05\data\121918\A0002635.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	14:56:30	
I:\ACQUDATA\hplc05\data\121918\A0002636.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	15:50:00	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**R1811991
Project: LHAAP / Site 58/NWO1312.0150

Analysis Run Log

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: **Analysis Lot:**619495
Instrument ID:R-HPLC-05

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
I:\ACQUDATA\hplc05\data\121918\A0002637.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	16:42:18	
I:\ACQUDATA\hplc05\data\121918\A0002638.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	17:20:00	
I:\ACQUDATA\hplc05\data\121918\A0002639.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	18:28:13	
I:\ACQUDATA\hplc05\data\121918\A0002640.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	19:21:16	
I:\ACQUDATA\hplc05\data\121918\A0002641.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	20:14:08	
I:\ACQUDATA\hplc05\data\121918\A0002645.D\	ZZZZZZZ	ZZZZZZZ	12/20/2018	23:45:50	
I:\ACQUDATA\hplc05\data\121918\A0002646.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	00:38:42	
I:\ACQUDATA\hplc05\data\121918\A0002647.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	01:31:38	
I:\ACQUDATA\hplc05\data\121918\A0002648.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	02:24:42	
I:\ACQUDATA\hplc05\data\121918\A0002649.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	03:17:35	
I:\ACQUDATA\hplc05\data\121918\A0002650.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	04:10:42	
I:\ACQUDATA\hplc05\data\121918\A0002651.D\	Continuing Calibration Verification	RQ1814001-17	12/21/2018	05:03:39	
I:\ACQUDATA\hplc05\data\121918\A0002654.D\	35AWW09_121118	R1811991-003	12/21/2018	07:42:15	
I:\ACQUDATA\hplc05\data\121918\A0002655.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	08:20:00	
I:\ACQUDATA\hplc05\data\121918\A0002657.D\	Continuing Calibration Verification	RQ1814001-18	12/21/2018	09:00:00	
I:\ACQUDATA\hplc05\data\121918\A0002658.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	11:14:02	
I:\ACQUDATA\hplc05\data\121918\A0002659.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	12:06:57	
I:\ACQUDATA\hplc05\data\121918\A0002660.D\	ZZZZZZZ	ZZZZZZZ	12/21/2018	13:00:00	
I:\ACQUDATA\hplc05\data\121918\A0002661.D\	Continuing Calibration Verification	RQ1814001-23	12/21/2018	13:50:00	
I:\ACQUDATA\hplc05\data\121918\A0002662.D\	35AWW06_121118	R1811991-001	12/21/2018	14:45:51	
I:\ACQUDATA\hplc05\data\121918\A0002663.D\	35AWW11_121118	R1811991-002	12/21/2018	15:40:00	
I:\ACQUDATA\hplc05\data\121918\A0002664.D\	Continuing Calibration Verification	RQ1814001-24	12/21/2018	16:31:46	

Analysis: Organic Acids Analyst: BA Run Method: ~~OXIO~~ NEW METH
Date: 12/17/18 Instr. _HPLC-05_ Quant Method: MAI00418
LIMS Run#: 619495
Setup: Column: Synergi Hydro RP 150x4.6 Col.Temp: 35 Flow: 0.60 ml/min
Mobile Phase: 0.02 KH2 prep 0.1PO4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	CCV	1000/1ml	193753	A0087	YC	
	MBT BLK			88 87	Y	
	LCS	100/1ml	193754	89 88	Y	> PYRUVIC OUT
	DLCS	↓	↓	90 89	Y	
	R1812142-001			91 90	Y	
	↓ -002			92 91	Y	
	R1811942-001			93 92	Y	
	-002			94 93	Y	
	-003			95 94	Y	
	-004			96 95	N	RPT 1/10
	↓ -005			97 96	Y	
	CCV			98 97	YC	RT SHIFT prep and BOTTLE
	R1811991-001			99 98	N	RPT 1/10
	-002			100 99		1/5
	-003			01 00		
	R1812085-004			02 01		
	-002			03 02		
	-003			04 03		
	-004			05 04		
	-004MS	100/1ml	193754	06 05		
	-004MSD	↓	↓	07 06	↓	JUST SHUTDOWN NOCLOC
	~~CCV~~	1000/1ml	~~193753~~	~~08 07~~		WHY MISSED 12 HR CLOCK
	R1811991-001			09 08		RESTART
	-002		12/20	10 09		
	-003			11 10		
	R1812085-001	BA		12 11		
	-002			13 12		
	-003			14 13		
	-004			15 14		
	-004MS	100/1ml	193754	16 15		
	-004MSD	↓	↓	17 16		
	~~CCV~~	↓	193753	18 17		

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:
Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

Analysis: Organic Acids Analyst: BA Run Method: NEWMETA
Date: 12/19/18 Instr. _HPLC-05_ Quant Method: MA100418
LIMS Run#: _____
Setup: Column: Synergi Hydro RP150x4.6 Col.Temp: 35 Flow: 0.6 mL/min
Mobile Phase: 0.02 KH2 prep 0.1 PO4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	CCV	1000ul/1mL	193753	A0002608	—	
	R1811991-001	10.0		09	—	
	CCV			10	YC	
	R1811991-001	10.0		11	N	RPT RT SHIFT
	-002	5.0		12		
	-003			13		
	R181 2085-001			14		
	-002			15	↓	
	CCV	1000ul/1mL	193753	16	YC	
	R1812085-003			17	Y	
	-004			18	Y	
	-004MS	1000ul/1mL	193754	19	Y	
	-004MSD	↓	↓	20	Y	
	CCV			21	YC	
	R1811942-004	10.0		22	Y	
	CCV	1000ul/1mL	193753	23	YC	
	MET BLK			24	Y	
	LCS	1000ul/1mL	193754	25	Y	
	LCSD	↓	↓	26	Y	
	R1812089-006			27	Y	
	-007			28	Y	
	-008			29	N	
	-009			30		
	-015			31		
	-016			32		
	-017			33	↓	
	-018			34	Y	
	-019			35	Y	
	R181 2120-005			36	Y	
	CCV	1000ul/1mL	193753	37	YC	RT PROP + BUTYRIC NO HET
	R1812120-006			38	Y	
	-007			39	Y	
	-009			40	Y	
	-010			41	Y	

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:
Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

Analysis: Organic Acids Analyst: BA Run Method: NEW META
Date: 12/20/18 Instr. _HPLC-05 Quant Method: MA100418
LIMS Run#:
Setup: Column: Synergi Hydro RP 150x4.6 Col.Temp: 35 Flow: 0.6 ml/min
Mobile Phase: 0.02% H_2 prep 0.1% H_3PO_4 ul Inj.: 50

Pos.	Sample	Diln.	Stds. ID	File#	OK?	Comments
	R182120-011			4000242	N	RPT 1/2.5
	-011ms			43		
	-011msD			44		
	CCV	1000/1mL	193753	45	YC	
	R1812089-008			46	Y	
	-009			47	Y	
	-015			48	Y	
	-016			49	Y	
	-017			50	Y	
	CCV	1000/1mL	193753	51	YC	
	R1811991-001	10.0		52	N	
	-002	5.0		53	N	
	-003			54	N Y	
	R1812085 -001			55	Y Y	
	-002			56	Y N	
	CCV	1000/1mL	193753	57	YC	RT SHIFT PROP + Butyr.
	R1812120-011			58	Y	
	-011ms			59	Y	
	-011msD			60	Y	
	CCV	1000/1mL	193753	61	YC	
	R181199-001	10.0		62	Y	
	-002	5.0		63	Y	
	CCV	1000/1mL	193753	64	YC	

All samples = _____mL + _____uL Combined IS/Surr.;

Primary :_____ exp: Secondary :_____ exp:
Primary:_____ exp: Secondary :_____ exp:

Runlog HPLC05r1
1/10/13

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 08:55
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW06_121118	**Basis:**	NA
Lab Code:	R1811991-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**88.1**	mg/L	5.0	4.0	1.1	50	12/12/18 21:24	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 10:25
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW11_121118	**Basis:**	NA
Lab Code:	R1811991-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**20.6**	mg/L	1.0	0.8	0.3	10	12/12/18 21:24	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1811991
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/11/18 11:30
Sample Matrix:	Water	**Date Received:**	12/12/18 09:45
Sample Name:	35AWW09_121118	**Basis:**	NA
Lab Code:	R1811991-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.13**	mg/L	0.10	0.08	0.03	1	12/12/18 21:24	*

Analytical Results Summary

Instrument Name: R-UV-VIS-05 **Analyst:** MROGERSON **Analysis Lot:** 619163 **Method/Testcode:** SM 3500-Fe B.4.c/Ferrous DOD

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1813872-01	Iron, Divalent (Ferrous Iron)	CCV		Water	2.03 mg/L	5 mL	2.03 mg/L	1					12/12/18 21:24	N	IV
RQ1813872-02	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			12/12/18 21:24	N	IV
RQ1813872-03	Iron, Divalent (Ferrous Iron)	LCS		Water	0.38 mg/L	5 mL	0.379 mg/L	1	0.03	0.10	95		12/12/18 21:24	N	IV
RQ1813872-04	Iron, Divalent (Ferrous Iron)	MB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.08	0.10			12/12/18 21:24:00	N	IV
R1811991-001	Iron, Divalent (Ferrous Iron)	N/A		Water	88.13 mg/L	5 mL	88.1 mg/L	50	1.1	5.0			12/12/18 21:24	N	IV
R1811991-002	Iron, Divalent (Ferrous Iron)	N/A		Water	20.65 mg/L	5 mL	20.6 mg/L	10	0.3	1.0			12/12/18 21:24	N	IV
R1811991-003	Iron, Divalent (Ferrous Iron)	N/A		Water	0.13 mg/L	5 mL	0.13 mg/L	1	0.03	0.10			12/12/18 21:24	N	IV
RQ1813872-07	Iron, Divalent (Ferrous Iron)	MS	R1811991-003	Water	0.71 mg/L	5 mL	0.71 mg/L	1	0.03	0.10	146*		12/12/18 21:24	N	IV
RQ1813872-08	Iron, Divalent (Ferrous Iron)	DMS	R1811991-003	Water	0.71 mg/L	5 mL	0.71 mg/L	1	0.03	0.10	146*	<1	12/12/18 21:24	N	IV
RQ1813872-06	Iron, Divalent (Ferrous Iron)	CCV		Water	2.02 mg/L	5 mL	2.02 mg/L	1					12/12/18 21:24	N	IV
RQ1813872-05	Iron, Divalent (Ferrous Iron)	CCB		Water	0.00 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10			12/12/18 21:24	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: R-UV-VIS-05 **Analyst:** MROGERSON **Analysis Lot:** 619165 **Method/Testcode:** SM 3500-Fe B.4.c/Ferrous DOD

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
R1811638-003	Iron, Divalent (Ferrous Iron)	N/A		Water	0.08 mg/L	5 mL	0.10 mg/L U	1	0.08	0.10			12/12/18 21:24:00	N	III
RQ1813870-01	Iron, Divalent (Ferrous Iron)	LCS		Water	0.08 mg/L	5 mL	0.0771 mg/L J	1	0.03	0.10	77		12/12/18 21:24	N	III
RQ1813870-02	Iron, Divalent (Ferrous Iron)	LODV		Water	0.03 mg/L	5 mL	0.10 mg/L U	1	0.03	0.10	57		12/12/18 21:24	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Pippetor Calibration

ALS Environmental

Frequency:

Pipettes: 3 trials for both bias and precision	**Calculations:**
DOD Projects - Daily before use at each volume of use, or if more than 3 volumes of use, a high, medium, and low.	%Recovery = Mean/Nominal Volume*100
Non-DOD: Monthly at high, medium, and low.	%RSD = Stdev/Volume*100
Repeaters, Dispensers, and Repipettors: 3 trials for both bias and precision	**Limits:** % Rec: 98-102 for Pipettes and others for dilutions
If used for dilutions - Daily before use and each time the volume is changed.	% Recovery: 90-110 (Repeaters, Dispensers, Repipettors not for dilutions)
If not used for dilutions - monthly	%RSD: ≤1 (Pipets); ≤3 (Repeaters, Dispensers, and Repipettors)

Use a balance and DI for all except Dispensers and Repipettors which contain reagents. For these, dispense into a To Contain Class A grad cylinder and document the Max Volume of the cylinder instead of the Balance ID. Record to 1/10 the graduation of the cylinder.

Date	Init.	Equipment ID	Volume (mL)	Trial #1 (g/mL)	Trial #2 (g/mL)	Trial #3 (g/mL)	Bias %Recovery	Pass/ Fail	Precision %RSD	Pass/ Fail	Recal? Y/N	Balance ID or Class A (TC)	Comments/ Corrective Action
12/6/18	GN	HULIC	2.00	1.9688	1.9640	1.9680	98.3467	P	0.12858	P	N	R-10	
↓	↓	↓	5.00	4.9225	4.9516	4.9338	98.7193	P	0.29341	P	N	↓	
		Donald	0.5000	0.5052	0.5054	0.5051	101.0467	P	0.03955	P	N		
		↓	1.0000	1.0021	1.0010	1.0002	100.1100	P	0.09534	P	N		
↓	↓	↓	0.2000	0.2021	0.2024	02025	101.1667	P	0.10408	P	N	↓	
12/12/18	MAR	Hank	1.00	0.9998	0.9983	0.9993	99.91	P	0.07	P	N	R-10	DOD/Monthly
		↓	3.00	2.9999	3.0003	3.0009	100.03	P	0.05	P			
		↓	5.00	5.0134	5.0096	5.0055	100.19	P	0.12	P			
		Thor	0.200	0.1994	0.2000	0.2011	100.08	P	0.43	P			
		↓	0.500	0.4967	0.4956	0.4957	99.20	P	0.12	P			
		↓	1.000	0.9974	0.9970	0.9964	99.76	P	0.16	P			
		Daisy	0.200	0.1991	0.1988	0.1990	99.49	P	0.09	P			
		↓	0.100	0.0999	0.0998	0.0999	99.87	P	0.06	P			
↓	↓	↓	0.0200	0.0101	0.0101	0.0101	101	P	0	P	↓	↓	↓
12/13/18	MAR	Thor	0.5000	0.4954	0.4952	0.4960	99.11	P	0.05	P	N	R-10	DOD
↓	↓	Hank	2.500	2.4983	2.5027	2.4903	99.88	P	0.85	P	↓	↓	↓
								MAR					
								12/17/18					

Sample Dilutions

00945957

Analyst: MAR
Instrument: UV-05

Date 12/12/18
Analysis Fe^{2+}

Sample ID	Matrix of Diluent	1st Dilution			2nd Dilution			3rd Dilution			4th Dilution			5th Dilution		
		mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor	mL's of Sample	mL's of Diluent	Dilution Factor
R1811991-001	DI	1	4	1/5	1	9	1/50									
R1811991-002	DI	1	9	1/10												

MAR 12/17/18

C:\Users\chris.woods\Downloads\Sample Dilution Sheets R2Original

9/18/15

ALS ENVIRONMENTAL

Analyte: Ferrous Iron By Standard Methods Analyst: MAR Date: 12/12/18

Method: 3500-Fe,D Pipette: THOR, HANK, DAISY Time: 21:24

Instrument: UV-1600PC (R-UVVIS-05) DOD Pipet Check: WC194 P. 3 Balance: NA

Calibration:

Phenanthroline (0.1%w/v): 190443

Ammonium Acetate: 194232

Std	Conc.	Absorb.	Result	% Rec
1	0.00	0.000	-0.001	
2	0.10	0.010	0.097	96.6%
3	0.20	0.021	0.204	101.9%
4	0.30	0.031	0.301	100.4%
5	0.40	0.041	0.399	99.7%
6	0.80	0.081	0.788	98.5%
7	1.00	0.103	1.003	100.3%
8	2.00	0.207	2.016	100.8%
9	3.00	0.308	3.000	100.0%
10	4.00	0.410	3.994	99.8%

Curve Date: 7/16/2018

C.C = 0.999986

y-int. = 0.000084

Slope: 0.102641

Wavelength: 510nm

	Misc.	Order #	Absorb.	Color Blk, if nec.	Abs. Difference Sample - Color	mg/L	Dilution	Final Result (mg/L)/(mg/Kg	Check if Soil
1	TV=2.0	ICV	0.202		0.202	1.9672	1.0	1.967	
2		ICB	0.000		0.000	-0.0008	1.0	-0.001	
3	TV=0.4	LCS	0.038		0.038	0.3694	1.0	0.369	
4		CCV	0.208		0.208	2.0257	1.0	2.026	
5		CCB	0.000		0.000	-0.0008	1.0	-0.001	
6		LCS	0.039		0.039	0.3792	1.0	0.379	
7		R1811991-001	0.181	0.000	0.181	1.7626	50.0	88.131	
8		R1811991-002	0.212	0.001	0.212	2.0646	10.0	20.646	
9		R1811991-003	0.013	0.002	0.013	0.1258	1.0	0.126	
10		R1811991-003 MS	0.073	0.002	0.073	0.7104	1.0	0.710	
11		R1811991-003 DMS	0.073	0.002	0.073	0.7104	1.0	0.710	
12	TV=0.1	LOQ	0.008		0.008	0.0771	1.0	0.077	
13	TV=0.05	LODV	0.003		0.003	0.0284	1.0	0.028	
14		CCV	0.207		0.207	2.0159	1.0	2.016	
15		CCB	0.000		0.000	-0.0008	1.0	-0.001	

ALS Environmental
1565 Jefferson Rd., Rochester, NY 14623

General Chemistry Analytical Run Cover Sheet

Analyst: MAR Date: 12/12/18

Analysis: Ferrous Iron by Method 3500-Fe, D. Instrument: R-UV-VIS-05

Quality Control:

	Same as Log#, Date,	Stocks Prep. Log#, Date,	Stock Sol (mLs)	Stock Sol (mg/L)	Final Vol (mLs)	True Value (mg/L)
a) Standards Prep.:	WC126121A,11/25/13	WC149110A, 10/13/15				
b) ICV Preparation:	WC126121B,11/25/13	191837, 7/16/18	2.5	4.0	5	2.00
b2) CCV Preparation:	WC126121B, 11/25/14	191837, 7/16/18				
c) LCS Preparation:	WC126121C, 11/25/14	191836, 7/16/18	0.5	4.0	5	0.40
d) Matrix Spike Prep.:	WC126121C, 11/25/13	191836, 7/16/18	0.5	4.0	5	0.40

Instrument log filled in? (Y) (N)

Packages: Copy and attach Standards Preparation

Comments:

All standards, QC (CCV's, LCS's, Matrix Spikes) and samples are based on the Standard Methods 3500-Fe D. Phenanthroline Method being scaled down by a factor of 10. Hence, 1.0 mL of Ammonium acetate buffer and 2.0 mL of Phenanthroline solution are added to 5.0 mL of sample, standards, or QC and brought to 10.0 mL with DI water. True values are based on sample volumes of 5.0 mLs.

Color blank absorbance is not measured where the sample itself is clear or the sample absorbance is less than the PQL. Samples above the PQL do not have their color blank absorbance subtracted if it is less than the absorbance of the low standard (PQL).

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Fax: (865) 573-8133

Client: RJ Modashia
ALS Laboratory Group
10450 Stancliff Rd
Suite 210
Houston, TX 77040

Phone: 281-575-2279

Fax:

Identifier: 040PL **Date Rec:** 12/12/2018 **Report Date:** 12/17/2018

Client Project #: NW01312.0150 **Client Project Name:** LHAAP-58

Purchase Order #:

Analysis Requested: CENSUS

Reviewed By:

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CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP-58

MI Project Number: **040PL**
Date Received: 12/12/2018

Sample Information

Client Sample ID:		**35AWW06_121118**	**35AWW11_121118**	**35AWW09_121118**
Sample Date:		12/11/2018	12/11/2018	12/11/2018
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS

Dechlorinating Bacteria

Dehalococcoides	*DHC*	**2.50E+00**	**1.06E+01**	<9.00E-01
tceA Reductase	TCE	**1.30E+00**	**2.00E-01 (J)**	<9.00E-01
BAV1 Vinyl Chloride Reductase	BVC	<9.00E-01	<5.00E-01	<9.00E-01
Vinyl Chloride Reductase	VCR	<9.00E-01	<5.00E-01	<9.00E-01
Dehalobacter spp.	*DHBt*	**1.44E+05**	**2.20E+05**	<8.60E+00

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **12/12/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	12/12/2018	12/17/2018	0 °C	104%	non-detect	non-detect
BVC	12/12/2018	12/17/2018	0 °C	105%	non-detect	non-detect
DHBt	12/12/2018	12/17/2018	0 °C	101%	non-detect	non-detect
TCE	12/12/2018	12/17/2018	0 °C	107%	non-detect	non-detect
VCR	12/12/2018	12/17/2018	0 °C	104%	non-detect	non-detect

HS18120642 8260 Raw Data

ALS WO# HS18120642

MSVOA09 -Logbook

Batch: 34002
Date: 12-21-2018
Method: 8260
Comments:

Analyst: Presenta Cabascango
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	12-21-2018 01:25 pm	1.00	50 mL	50 mL	U122101.D	Liquid	Y	NA
	Auto find/purged									
2	VSTD00.25	ICAL1	12-21-2018 01:49 pm	1.00	50 mL	50 mL	U122102.D	Liquid	Y	NA
	0.25 uL cal std/250 mL DI									
3	VSTD00.5	ICAL2	12-21-2018 02:14 pm	1.00	50 mL	50 mL	U122103.D	Liquid	Y	NA
	0.5 uL cal std/250 mL DI									
4	VSTD001	ICAL3	12-21-2018 03:03 pm	1.00	50 mL	50 mL	U122104.D	Liquid	Y	NA
	1 uL cal std/250 mL DI									
5	VSTD002	ICAL4	12-21-2018 03:28 pm	1.00	50 mL	50 mL	U122105.D	Liquid	Y	NA
	2 uL cal std/250 mL DI									
6	VSTD005	ICAL5	12-21-2018 03:52 pm	1.00	50 mL	50 mL	U122106.D	Liquid	Y	NA
	5 uL cal std/250 mL DI									
7	VSTD020	ICAL6	12-21-2018 04:17 pm	1.00	50 mL	50 mL	U122107.D	Liquid	Y	NA
	4 uL cal std/50 mL DI									
8	VSTD050	ICAL7	12-21-2018 04:41 pm	1.00	50 mL	50 mL	U122108.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
9	VSTD100	ICAL8	12-21-2018 05:06 pm	1.00	50 mL	50 mL	U122109.D	Liquid	Y	NA
	20 uL cal std/50 mL DI									
10	VSTD150	ICAL9	12-21-2018 05:31 pm	1.00	50 mL	50 mL	U122110.D	Liquid	Y	NA
	30 uL cal std/50 mL DI									
11	VSTD200	ICAL	12-21-2018 05:55 pm	1.00	50 mL	50 mL	U122111.D	Liquid	Y	NA
	40 uL cal std/50 mL DI									
12	BLANK	SAMP	12-21-2018 06:20 pm	1.00	50 mL	50 mL	U122112.D	Liquid	Y	NA
	Cleanup blk									
13	VSTD050	ICV	12-21-2018 06:45 pm	1.00	50 mL	50 mL	U122113.D	Liquid	Y	NA
	10 uL ICV std/50 mL DI									
14	BLANK	SAMP	12-21-2018 07:09 pm	1.00	50 mL	50 mL	U122114.D	Liquid	Y	NA
15	VLCSW-1812021	LCS	12-21-2018 07:34 pm	1.00	50 mL	50 mL	U122115.D	Liquid	Y	NA
	4 uL ICV std/50 mL DI									
16	BLANK	SAMP	12-21-2018 07:59 pm	1.00	50 mL	50 mL	U122116.D	Liquid	Y	NA
17	VBLKW-181221	MBLK	12-21-2018 08:24 pm	1.00	50 mL	50 mL	U122117.D	Liquid	Y	NA
18	HS18120782-01	SAMP	12-21-2018 08:48 pm	1.00	50 mL	50 mL	U122118.D	Liquid	Y	<2
19	HS18121172-01	SAMP	12-21-2018 09:13 pm	1.00	50 mL	50 mL	U122119.D	Liquid	Y	<2
20	HS18120947-01	SAMP	12-21-2018 09:38 pm	10.00	5 mL	50 mL	U122120.D	Liquid	Y	<2
21	HS18121172-01MS	MS	12-21-2018 10:03 pm	1.00	50 mL	50 mL	U122121.D	Liquid	Y	<2
	3.5 uL cal std/40 mL Sample									
22	HS18121172-01MSD	MSD	12-21-2018 10:27 pm	1.00	50 mL	50 mL	U122122.D	Liquid	Y	<2
	3.5 uL cal std/40 mL Sample									
23	HS18121172-02	SAMP	12-21-2018 10:52 pm	1.00	50 mL	50 mL	U122123.D	Liquid	Y	<2
24	HS18121172-03	SAMP	12-21-2018 11:17 pm	1.00	50 mL	50 mL	U122124.D	Liquid	Y	<2
25	HS18121172-04	SAMP	12-21-2018 11:42 pm	1.00	50 mL	50 mL	U122125.D	Liquid	Y	<2
26	HS18121172-05	SAMP	12-22-2018 12:06 am	1.00	50 mL	50 mL	U122126.D	Liquid	Y	<2
27	HS18121172-06	SAMP	12-22-2018 12:31 am	1.00	50 mL	50 mL	U122127.D	Liquid	Y	<2

MSVOA09 -Logbook

Chemical	Value
SURR SPK ID	30502-52-03
IS ID	30502-52-04
ICV STD ID	30603-46-01
LCS/MS ID	30603-46-01
CAL STD ID	30502-56-01/02
BFB ID	30502-52-03

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Matrix Spike - Sample No.: VSTD050

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	50.00	48.91	98	80-120
trans-1,3-Dichloroprope	50.00	48.93	98	80-120
1,3-Dichlorobenzene	50.00	48.27	96	80-120
2,2-Dichloropropane	50.00	53.09	106	80-120
1,1-Dichloropropene	50.00	47.46	95	80-120
Dibromomethane	50.00	50.89	102	80-120
1,2-Dibromoethane	50.00	51.16	102	80-120
trans-1,2-Dichloroethen	50.00	48.02	96	80-120
1,1,1,2-Tetrachloroetha	50.00	48.43	97	80-120
1,1,1-Trichloroethane	50.00	49.36	99	80-120
1,1,2,2-Tetrachloroetha	50.00	49.55	99	80-120
Freon TF	50.00	45.07	90	80-120
1,1,2-Trichloroethane	50.00	49.30	99	80-120
1,1-Dichloroethane	50.00	47.96	96	80-120
1,1-Dichloroethene	50.00	45.82	92	80-120
Trichlorofluoromethane	50.00	45.85	92	80-120
1,2,3-Trichlorobenzene	50.00	47.80	96	80-120
Toluene	50.00	49.27	98	80-120
1,2,4-Trichlorobenzene	50.00	50.37	101	80-120
1,2,4-Trimethylbenzene	50.00	50.13	100	80-120
Tetrachloroethene	50.00	45.93	92	80-120
Trichloroethene	50.00	48.84	98	80-120
1,2-Dichlorobenzene	50.00	48.36	97	80-120
1,2-Dichloroethane	50.00	50.35	101	80-120
1,2-Dichloropropane	50.00	49.19	98	80-120
1,3,5-Trimethylbenzene	50.00	50.06	100	80-120
1,3-Dichloropropane	50.00	49.40	99	80-120
1,4-Dichlorobenzene	50.00	47.08	94	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Matrix Spike - Sample No.: VSTD050

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
2-Butanone	100.00	104.35	104	80-120
2-Chlorotoluene	50.00	49.32	99	80-120
2-Hexanone	100.00	109.16	109	80-120
4-Chlorotoluene	50.00	49.71	99	80-120
tert-Butylbenzene	50.00	47.93	96	80-120
4-Methyl-2-Pentanone	100.00	106.57	106	80-120
Acetone	100.00	114.45	114	80-120
Benzene	50.00	48.82	98	80-120
Bromobenzene	50.00	49.77	100	80-120
Bromochloromethane	50.00	56.76	114	80-120
Bromodichloromethane	50.00	52.06	104	80-120
Bromoform	50.00	47.92	96	80-120
Bromomethane	50.00	54.05	108	80-120
Carbon Disulfide	100.00	96.00	96	80-120
Carbon Tetrachloride	50.00	44.88	90	80-120
Chlorobenzene	50.00	48.25	96	80-120
Chloroethane	50.00	46.15	92	80-120
Chloroform	50.00	48.45	97	80-120
Chloromethane	50.00	48.96	98	80-120
cis-1,2-Dichloroethene	50.00	48.93	98	80-120
Dibromochloromethane	50.00	48.57	97	80-120
Dichlorodifluoromethane	50.00	46.21	92	80-120
Ethylbenzene	50.00	49.30	99	80-120
Hexachlorobutadiene	50.00	46.17	92	80-120
Isopropylbenzene	50.00	49.07	98	80-120
m,p-Xylenes	100.00	99.88	100	80-120
Methylene Chloride	50.00	49.75	100	80-120
n-Butylbenzene	50.00	46.94	94	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Matrix Spike - Sample No.: VSTD050

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
n-Propylbenzene	50.00	49.11	98	80-120
Naphthalene	50.00	49.46	99	80-120
o-Xylene	50.00	49.89	100	80-120
sec-Butylbenzene	50.00	47.69	95	80-120
Styrene	50.00	52.73	105	80-120
Vinyl Chloride	50.00	46.02	92	80-120
1,2,3-Trichloropropane	50.00	53.26	106	80-120
p-Isopropyltoluene	50.00	49.19	98	80-120
1,2-Dibromo-3-Chloropro	50.00	49.92	100	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Lab File ID: U122101 BFB Injection Date: 12/21/18

Instrument ID: VOA9 BFB Injection Time: 1325

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.6
75	30.0 - 60.0% of mass 95	50.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.5 (0.8)1
174	Greater than 50.0% of mass 95	66.8
175	5.0 - 9.0% of mass 174	5.1 (7.7)1
176	95.0 - 101.0% of mass 174	63.8 (95.6)1
177	5.0 - 9.0% of mass 176	4.5 (7.0)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD00.25	VSTD00.25	U122102	12/21/18	1349
02	VSTD00.5	VSTD00.5	U122103	12/21/18	1414
03	VSTD001	VSTD001	U122104	12/21/18	1503
04	VSTD002	VSTD002	U122105	12/21/18	1528
05	VSTD005	VSTD005	U122106	12/21/18	1552
06	VSTD020	VSTD020	U122107	12/21/18	1617
07	VSTD050	VSTD050	U122108	12/21/18	1641
08	VSTD100	VSTD100	U122109	12/21/18	1706
09	VSTD150	VSTD150	U122110	12/21/18	1731
10	VSTD200	VSTD200	U122111	12/21/18	1755
11	VSTD050	VSTD050	U122113	12/21/18	1845
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Instrument ID: VOA9 Calibration Date(s): 12/21/18 12/21/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1349 1755

LAB FILE ID: RF0.25: U122102 RF0.5: U122103 RF1: U122104
RF2: U122105 RF5: U122106 RF20: U122107

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
cis-1,3-Dichloropropene		2152	7273	13732	38403	162454
trans-1,3-Dichloropropene		1633	5668	10646	30725	135347
1,3-Dichlorobenzene		1.191	1.700	1.605	1.568	1.456
2,2-Dichloropropane		0.485	0.763	0.625	0.645	0.634
1,1-Dichloropropene		0.322	0.521	0.477	0.458	0.439
Dibromomethane		0.143	0.229	0.212	0.217	0.208
1,2-Dibromoethane		0.251	0.393	0.345	0.364	0.358
trans-1,2-Dichloroethene		0.432	0.724	0.620	0.614	0.598
1,1,1,2-Tetrachloroethane		1272	4208	8522	21878	89389
1,1,1-Trichloroethane		0.521	0.866	0.775	0.824	0.806
1,1,2,2-Tetrachloroethane		0.818	1.359	1.245	1.216	1.139
Freon TF		0.306	0.503	0.450	0.439	0.408
1,1,2-Trichloroethane		0.224	0.351	0.317	0.320	0.302
1,1-Dichloroethane		0.726	1.305	1.174	1.154	1.100
1,1-Dichloroethene		0.403	0.563	0.526	0.486	0.447
Trichlorofluoromethane		1919	7922	14026	37144	130957
1,2,3-Trichlorobenzene		1324	6631	12385	31113	126752
Toluene		1.131	1.662	1.581	1.624	1.525
1,2,4-Trichlorobenzene		0.721	1.015	0.905	0.905	0.901
1,2,4-Trimethylbenzene		1.826	2.823	2.656	2.819	2.701
Tetrachloroethene		0.219	0.326	0.277	0.272	0.254
Trichloroethene		0.245	0.382	0.322	0.344	0.317
1,2-Dichlorobenzene		1.166	1.777	1.606	1.586	1.444
1,2-Dichloroethane		2385	8970	15708	41415	149131
1,2-Dichloropropane		0.265	0.415	0.367	0.371	0.353
1,3,5-Trimethylbenzene		1.672	2.689	2.445	2.682	2.616
1,3-Dichloropropane		0.478	0.748	0.679	0.708	0.655
1,4-Dichlorobenzene		1.357	1.906	1.683	1.662	1.508
2-Butanone		2109	6369	11299	29605	119433
2-Chlorotoluene		1.700	2.636	2.392	2.490	2.333
2-Hexanone		0.182	0.278	0.270	0.285	0.300
4-Chlorotoluene		1.938	2.990	2.793	2.876	2.698
tert-Butylbenzene		1.429	2.338	2.197	2.340	2.218
4-Methyl-2-Pentanone		0.264	0.428	0.396	0.407	0.423
Acetone		3366	5582	8219	19230	73380
Benzene		0.975	1.562	1.399	1.435	1.337
Bromobenzene		0.564	0.890	0.814	0.813	0.765
Bromochloromethane		773	2865	5148	13786	51515
Bromodichloromethane		0.250	0.393	0.362	0.383	0.380
Bromoform		762	2343	4574	12962	53922
Bromomethane		822	2293	4588	12245	47148
Carbon Disulfide		1.468	2.043	1.806	1.808	1.714
Carbon Tetrachloride		1510	5463	10077	26439	104210
Chlorobenzene		0.762	1.142	1.012	1.020	0.962

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812064

Instrument ID: VOA9 Calibration Date(s): 12/21/18 12/21/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1349 1755

LAB FILE ID: RF0.25: U122102 RF0.5: U122103 RF1: U122104
RF2: U122105 RF5: U122106 RF20: U122107

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Chloroethane		2753	3213	8179	22172	73150
Chloroform		0.705	1.253	1.110	1.148	1.060
Chloromethane		1695	4689	8693	20682	79075
cis-1,2-Dichloroethene		0.459	0.806	0.684	0.699	0.678
Dibromochloromethane		1194	4051	7740	20846	89836
Dichlorodifluoromethane		2033	6583	11371	26580	98486
Ethylbenzene		0.353	0.556	0.512	0.523	0.497
Hexachlorobutadiene		0.453	0.398	0.322	0.324	0.310
Isopropylbenzene		0.918	1.542	1.455	1.530	1.485
m,p-Xylenes		0.432	0.668	0.621	0.648	0.629
Methylene Chloride		3346	8113	13726	31487	109403
n-Butylbenzene		1.993	2.818	2.596	2.666	2.520
n-Propylbenzene		2.596	4.144	3.755	4.032	3.835
Naphthalene		5535	16505	32897	91300	413229
o-Xylene		0.413	0.703	0.613	0.642	0.637
sec-Butylbenzene		2.047	3.385	3.201	3.334	3.199
Styrene		0.640	1.035	0.996	1.084	1.092
Vinyl Chloride		1815	6308	12656	29272	111713
1,2,3-Trichloropropane		0.777	1.295	1.203	1.184	1.156
p-Isopropyltoluene		1.912	2.733	2.516	2.786	2.704
1,2-Dibromo-3-Chloropropane		272	861	1910	4931	22196
1,2-Dichloroethane-d4		8601	10907	17881	38943	131494
Dibromofluoromethane		6036	8005	12720	28568	98984
Toluene-d8		27052	32175	54444	117010	408521
4-Bromofluorobenzene		9627	12547	20092	42900	153183

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812064

Instrument ID: VOA9 Calibration Date(s): 12/21/18 12/21/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1349 1755

LAB FILE ID: RF50: U122108 RF100: U122109 RF150: U122110
RF200: U122111

COMPOUND	RF50	RF100	RF150	RF200
cis-1,3-Dichloropropene	449225	944095	1468956	1986544
trans-1,3-Dichloropropene	381258	811224	1271771	1721394
1,3-Dichlorobenzene	1.440	1.476	1.485	1.441
2,2-Dichloropropane	0.635	0.683	0.695	0.673
1,1-Dichloropropene	0.427	0.455	0.457	0.448
Dibromomethane	0.207	0.207	0.205	0.205
1,2-Dibromoethane	0.349	0.345	0.342	0.340
trans-1,2-Dichloroethene	0.564	0.579	0.576	0.559
1,1,1,2-Tetrachloroethane	235446	493177	766622	1032567
1,1,1-Trichloroethane	0.788	0.846	0.852	0.826
1,1,2,2-Tetrachloroethane	1.127	1.090	1.080	1.060
Freon TF	0.397	0.445	0.445	0.434
1,1,2-Trichloroethane	0.296	0.295	0.290	0.286
1,1-Dichloroethane	1.058	1.079	1.066	1.028
1,1-Dichloroethene	0.441	0.480	0.472	0.461
Trichlorofluoromethane	330010	753769	1146930	1561606
1,2,3-Trichlorobenzene	334600	694931	1085027	1453309
Toluene	1.488	1.490	1.464	1.421
1,2,4-Trichlorobenzene	0.926	0.982	1.001	0.974
1,2,4-Trimethylbenzene	2.661	2.738	2.712	2.610
Tetrachloroethene	0.243	0.257	0.257	0.251
Trichloroethene	0.311	0.321	0.328	0.321
1,2-Dichlorobenzene	1.442	1.463	1.459	1.417
1,2-Dichloroethane	376591	747337	1129116	1504782
1,2-Dichloropropane	0.350	0.357	0.353	0.348
1,3,5-Trimethylbenzene	2.579	2.685	2.665	2.582
1,3-Dichloropropane	0.642	0.630	0.620	0.613
1,4-Dichlorobenzene	1.482	1.511	1.509	1.472
2-Butanone	304044	587152	880878	1199902
2-Chlorotoluene	2.295	2.323	2.315	2.248
2-Hexanone	0.302	0.295	0.297	0.293
4-Chlorotoluene	2.665	2.704	2.694	2.601
tert-Butylbenzene	2.197	2.301	2.300	2.225
4-Methyl-2-Pentanone	0.427	0.421	0.419	0.415
Acetone	187964	331678	520533	723113
Benzene	1.319	1.335	1.317	1.294
Bromobenzene	0.765	0.778	0.792	0.773
Bromochloromethane	129496	244429	348533	453685
Bromodichloromethane	0.388	0.406	0.411	0.408
Bromoform	154855	331336	522892	718878
Bromomethane	117780	281859	444174	585856
Carbon Disulfide	1.656	1.742	1.730	1.622
Carbon Tetrachloride	274507	601960	939611	1268610
Chlorobenzene	0.940	0.949	0.943	0.916

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812064

Instrument ID: VOA9 Calibration Date(s): 12/21/18 12/21/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1349 1755

LAB FILE ID: RF50: U122108 RF100: U122109 RF150: U122110
RF200: U122111

COMPOUND	RF50	RF100	RF150	RF200
Chloroethane	179707	384958	684109	859472
Chloroform	1.027	1.035	1.016	0.978
Chloromethane	197328	441603	746873	1095269
cis-1,2-Dichloroethene	0.650	0.655	0.653	0.630
Dibromochloromethane	242061	512845	791728	1081017
Dichlorodifluoromethane	248322	553841	873891	1151588
Ethylbenzene	0.490	0.504	0.504	0.495
Hexachlorobutadiene	0.324	0.352	0.356	
Isopropylbenzene	1.450	1.506	1.482	1.428
m,p-Xylenes	0.612	0.626	0.616	0.600
Methylene Chloride	274258	554902	841220	1131189
n-Butylbenzene	2.535	2.661	2.637	
n-Propylbenzene	3.794	3.919	3.867	3.682
Naphthalene	1107938	2231968	3430934	4589381
o-Xylene	0.622	0.631	0.627	0.612
sec-Butylbenzene	3.182	3.378	3.341	3.190
Styrene	1.084	1.087	1.074	1.044
Vinyl Chloride	283791	629175	1000865	1348117
1,2,3-Trichloropropane	1.210	1.222	1.246	1.245
p-Isopropyltoluene	2.733	2.856	2.837	2.735
1,2-Dibromo-3-Chloropropane	61793	125814	200384	274280
1,2-Dichloroethane-d4	320796	635081	949266	1274051
Dibromofluoromethane	245007	495628	745399	1006329
Toluene-d8	1010127	2029223	3016887	4010125
4-Bromofluorobenzene	382581	764798	1153874	1540801

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812064

Instrument ID: VOA9 Calibration Date(s): 12/21/18 12/21/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1349 1755

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
cis-1,3-Dichloropropene	LINR	2.529e-002	1.70725996		0.9997580	0.9900000
trans-1,3-Dichloropropene	LINR	3.3e-002	1.96902158		0.9995927	0.9900000
1,3-Dichlorobenzene	AVRG		1.48472992		9.494	20.000
2,2-Dichloropropane	AVRG		0.64891526		11.509	20.000
1,1-Dichloropropene	AVRG		0.44488137		11.968	20.000
Dibromomethane	AVRG		0.20390294		11.744	20.000
1,2-Dibromoethane	AVRG		0.34310644		11.102	20.000
trans-1,2-Dichloroethene	AVRG		0.58526565		12.993	20.000
1,1,1,2-Tetrachloroethane	LINR	1.17e-002	3.11489679		0.9998991	0.9900000
1,1,1-Trichloroethane	AVRG		0.78949465		13.294	20.000
1,1,2,2-Tetrachloroethane	AVRG		1.12601556		13.302	20.000
Freon TF	AVRG		0.42507305		12.611	20.000
1,1,2-Trichloroethane	AVRG		0.29788801		11.475	20.000
1,1-Dichloroethane	AVRG		1.07678494		14.456	20.000
1,1-Dichloroethene	AVRG		0.47540572		9.911	20.000
Trichlorofluoromethane	LINR	1.25e-002	1.19826122		0.9992799	0.9900000
1,2,3-Trichlorobenzene	LINR	1.266e-002	1.04791842		0.9997493	0.9900000
Toluene	AVRG		1.48733738		10.393	20.000
1,2,4-Trichlorobenzene	AVRG		0.92571167		9.562	20.000
1,2,4-Trimethylbenzene	AVRG		2.61651384		11.645	20.000
Tetrachloroethene	AVRG		0.26176272		11.269	20.000
Trichloroethene	AVRG		0.32119921		11.118	20.000
1,2-Dichlorobenzene	AVRG		1.48461871		11.211	20.000
1,2-Dichloroethane	LINR	-1.47e-002	2.25247271		0.9997943	0.9900000
1,2-Dichloropropane	AVRG		0.35329723		11.023	20.000
1,3,5-Trimethylbenzene	AVRG		2.51283681		12.919	20.000
1,3-Dichloropropane	AVRG		0.64163858		11.739	20.000
1,4-Dichlorobenzene	AVRG		1.56545234		10.298	20.000
2-Butanone	LINR	-4.87e-002	3.13274512		0.9994657	0.9900000
2-Chlorotoluene	AVRG		2.30373097		11.091	20.000
2-Hexanone	AVRG		0.27803053		13.505	20.000
4-Chlorotoluene	AVRG		2.66220268		11.134	20.000
tert-Butylbenzene	AVRG		2.17187412		13.092	20.000
4-Methyl-2-Pentanone	AVRG		0.40004668		13.000	20.000
Acetone	LINR	-6.05e-002	5.27806885		0.9991782	0.9900000
Benzene	AVRG		1.33049482		11.804	20.000
Bromobenzene	AVRG		0.77253354		11.330	20.000
Bromochloromethane	LINR	-6.22e-002	4.05290698		0.9951390	0.9900000
Bromodichloromethane	AVRG		0.37570006		13.249	20.000
Bromoform	LINR	3.523e-002	4.49538839		0.9994690	0.9900000
Bromomethane	LINR	2.677e-002	3.15194291		0.9981331	0.9900000
Carbon Disulfide	AVRG		1.73224763		9.031	20.000
Carbon Tetrachloride	LINR	2.798e-002	2.67309140		0.9994430	0.9900000
Chlorobenzene	AVRG		0.96069061		10.497	20.000

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812064

Instrument ID: VOA9 Calibration Date(s): 12/21/18 12/21/18

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1349 1755

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Chloroethane	2ORDR	9.363e-003	2.27118996	-8.34e-002	0.9953360	0.9900000
Chloroform	AVRG		1.03699562		14.439	20.000
Chloromethane	LINR	6.638e-002	1.75757606		0.9946541	0.9900000
cis-1,2-Dichloroethene	AVRG		0.65721728		13.730	20.000
Dibromochloromethane	LINR	1.95e-002	2.98429229		0.9998675	0.9900000
Dichlorodifluoromethane	LINR	9.706e-003	1.60963706		0.9988360	0.9900000
Ethylbenzene	AVRG		0.49273054		11.389	20.000
Hexachlorobutadiene	AVRG		0.35465839		13.679	20.000
Isopropylbenzene	AVRG		1.42182513		13.532	20.000
m,p-Xylenes	AVRG		0.60575037		11.285	20.000
Methylene Chloride	LINR	-2.41e-002	1.65721813		0.9996145	0.9900000
n-Butylbenzene	AVRG		2.55335964		9.575	20.000
n-Propylbenzene	AVRG		3.73602785		12.044	20.000
Naphthalene	2ORDR	1.313e-002	0.32140252	9.017e-004	0.9999007	0.9900000
o-Xylene	AVRG		0.61109521		12.917	20.000
sec-Butylbenzene	AVRG		3.13985879		13.327	20.000
Styrene	AVRG		1.01526757		14.203	20.000
Vinyl Chloride	LINR	1.938e-002	1.38661185		0.9992348	0.9900000
1,2,3-Trichloropropane	AVRG		1.17088717		13.058	20.000
p-Isopropyltoluene	AVRG		2.64580193		11.042	20.000
1,2-Dibromo-3-Chloropropane	LINR	2.904e-002	5.59224209		0.9995363	0.9900000
1,2-Dichloroethane-d4	LINR	-4.34e-002	1.47435424		0.9993295	0.9900000
Dibromofluoromethane	LINR	-3.06e-002	1.86777807		0.9996249	0.9900000
Toluene-d8	LINR	-3.57e-002	0.80216996		0.9994439	0.9900000
4-Bromofluorobenzene	LINR	-2.86e-002	2.09274699		0.9997553	0.9900000

FORM VI VOA

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122101.D

Date : 21-DEC-2018 13:25

Client ID: BFB

Instrument: VOA9.i

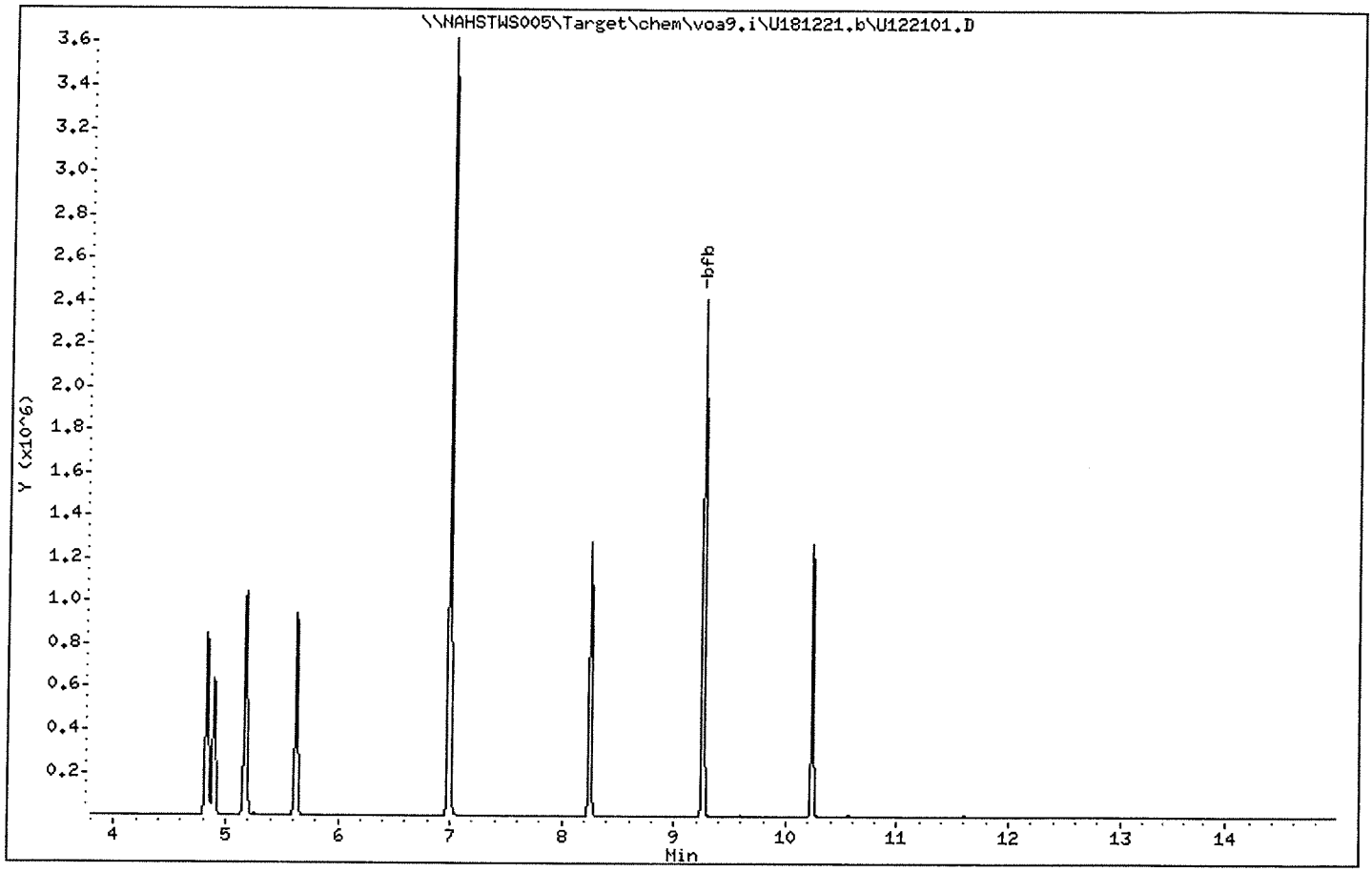
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122101.D

Date : 21-DEC-2018 13:25

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

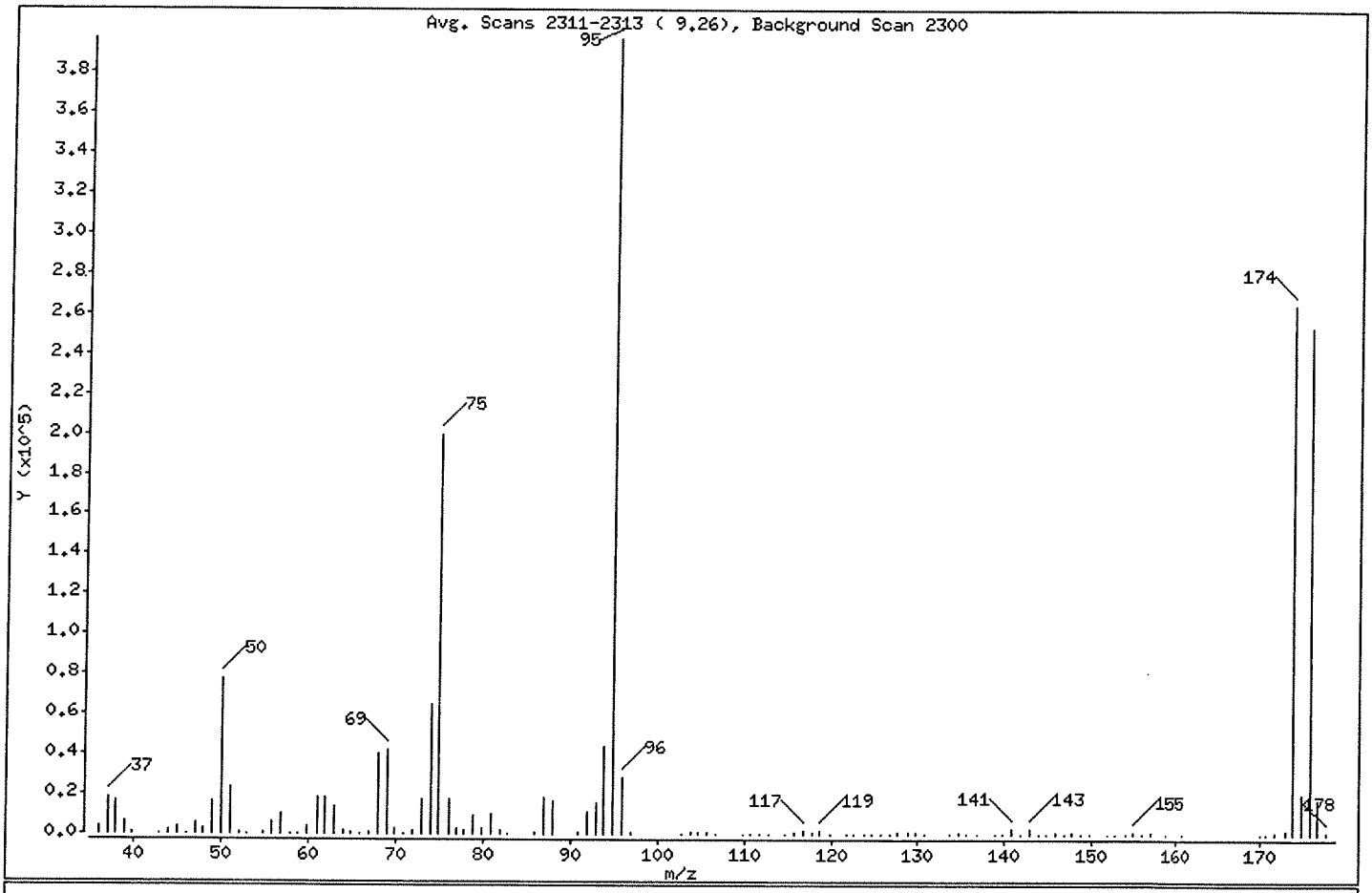
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	19.64
75	30.00 - 60.00% of mass 95	50.36
96	5.00 - 9.00% of mass 95	7.02
173	Less than 2.00% of mass 174	0.53 (0.79)
174	Greater than 50.00% of mass 95	66.76
175	5.00 - 9.00% of mass 174	5.12 (7.67)
176	95.00 - 101.00% of mass 174	63.79 (95.55)
177	5.00 - 9.00% of mass 176	4.47 (7.01)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122101.D

Date : 21-DEC-2018 13:25

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: U122101.D

Spectrum: Avg. Scans 2311-2313 (9.26), Background Scan 2300

Location of Maximum: 94.95

Number of points: 113

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	3522	67.90	40024	105.80	1268	141.70	302
37.00	18528	68.90	41568	106.80	285	142.80	2909
38.00	16159	69.90	3074	109.80	127	143.80	180
39.00	6598	70.90	134	110.70	307	144.70	380
39.90	601	71.90	2102	111.70	156	145.70	457
42.90	115	73.00	17344	112.80	260	146.70	229
43.90	2066	73.90	64968	114.70	321	147.70	676
45.00	3408	74.90	199680	115.70	1039	148.60	185
46.10	284	76.00	17352	116.80	1890	149.70	381
47.00	5059	76.90	2402	117.70	1164	151.70	195
47.90	2352	77.80	1696	118.70	1600	152.70	221
49.00	16317	78.90	8933	119.80	55	153.80	245
50.00	77856	79.90	2552	121.70	99	154.70	869
51.00	23912	80.90	9833	122.70	71	155.70	141
52.00	1198	81.90	1903	123.80	148	156.70	599
52.90	102	82.80	214	124.70	101	158.60	297
54.90	806	85.90	533	125.70	152	160.70	273
55.90	6021	86.90	18088	126.70	123	169.90	51
56.90	10148	87.90	16848	127.70	1127	170.60	105
57.90	434	90.80	1233	128.80	534	171.70	1051
58.70	68	91.90	10521	129.70	1152	172.80	2098
59.90	3925	92.90	15269	130.70	419	173.70	264704
61.00	18160	93.90	43328	133.70	53	174.70	20304
61.90	18216	94.90	396480	134.70	496	175.70	252928
63.00	13327	95.90	27824	135.60	96	176.70	17720
64.00	1507	96.90	709	136.70	369	177.70	520
64.90	816	102.80	137	138.90	62		
65.80	130	103.80	1364	139.70	200		
67.00	910	104.70	463	140.80	2707		

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122102.D
Lab Smp Id: VSTD00.25 Client Smp ID: VSTD00.25
Inj Date : 21-DEC-2018 13:49
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD00.25;VSTD00.25;1;1;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 13:49 Cal File: U122102.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

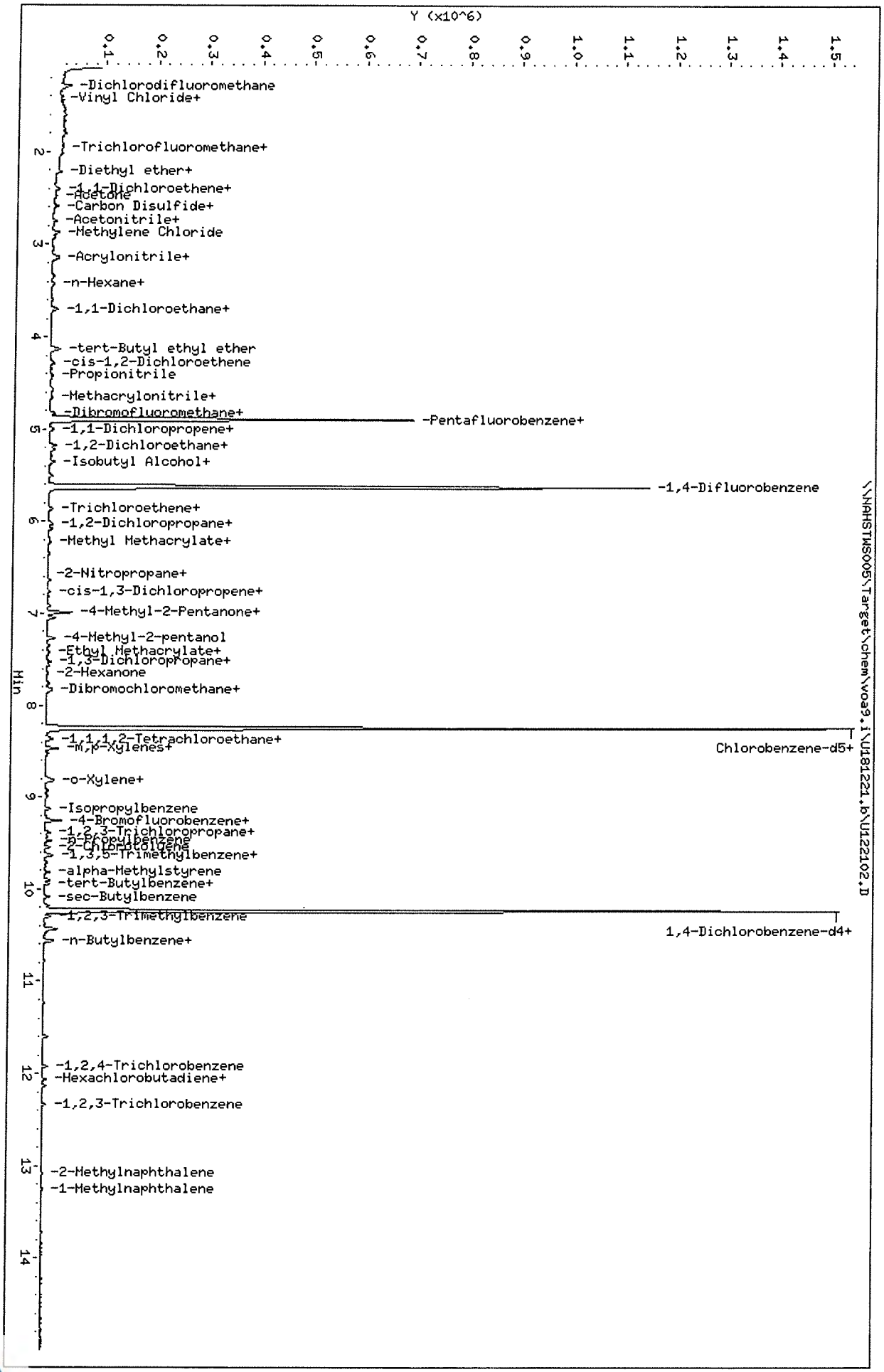
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	428138	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	818709	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	747851	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	340535	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	4885	0.25000	(a)
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	7874	0.25000	(a)
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	25629	0.25000	(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	9480	0.25000	(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	1214	0.25000	0.83(a)
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	2037	0.25000	0.30(a)
138 Freon TF	101	2.401	2.394	(0.491)	1292	0.25000	0.35(a)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	1492	0.25000	0.33(a)
22 1,1-Dichloroethane	63	3.601	3.597	(0.736)	2808	0.25000	0.30(Ta)
11 1,1-Dichloroethene	96	2.397	2.394	(0.490)	1606	0.25000	0.39(a)
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	2559	0.25000	0.35(a)
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	2119	0.25000	0.95(a)
71 1,2,3-Trichloropropane	75	9.426	9.430	(0.921)	2311	0.25000	0.28(a)
90 1,2,4-Trichlorobenzene	180	11.923	11.926	(1.165)	1867	0.25000	0.29(a)
79 1,2,4-Trimethylbenzene	105	9.940	9.943	(0.971)	5702	0.25000	0.31(a)
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	1463	0.25000	0.28(a)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	3604	0.25000	0.35(a)
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	2468	0.25000	(a)
42 1,2-Dichloropropane	63	6.079	6.078	(1.081)	1752	0.25000	0.30(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
75 1,3,5-Trimethylbenzene	105	9.625	9.628	(0.940)	5173	0.25000	0.30(a)
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	3530	0.25000	0.34(a)
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	3033	0.25000	0.31(a)
84 1,4-Dichlorobenzene	146	10.255	10.258	(1.002)	4184	0.25000	0.39(a)
76 2-Chlorotoluene	91	9.546	9.550	(0.933)	5370	0.25000	0.34(a)
52 2-Hexanone	43	7.649	7.653	(0.927)	2221	0.50000	0.53(a)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	6065	0.25000	0.33(a)
82 p-Isopropyltoluene	119	10.210	10.213	(0.997)	5637	0.25000	0.31(a)
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	3388	0.50000	0.56(a)
10 Acetone	43	2.480	2.476	(0.507)	3620	0.50000	(a)
37 Benzene	78	5.216	5.216	(0.927)	7659	0.25000	0.35(a)
74 Bromobenzene	156	9.381	9.385	(0.917)	1549	0.25000	0.29(a)
19 Carbon Disulfide	76	2.588	2.585	(0.529)	12805	0.50000	0.86(a)
34 Carbon Tetrachloride	117	4.988	4.991	(0.887)	1501	0.25000	1.64(a)
59 Chlorobenzene	112	8.272	8.275	(1.003)	5314	0.25000	0.36(a)
28 Chloroform	83	4.654	4.654	(0.951)	3005	0.25000	0.33(a)
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	1960	0.25000	0.34(a)
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	2017	0.25000	1.47(a)
55 Dibromochloromethane	129	7.758	7.758	(0.940)	1084	0.25000	1.19(a)
2 Dichlorodifluoromethane	85	1.201	1.198	(0.246)	2264	0.25000	0.91(a)
61 Ethylbenzene	106	8.369	8.373	(1.015)	2474	0.25000	0.33(a)
91 Hexachlorobutadiene	225	12.061	12.065	(1.178)	1019	0.25000	0.42(a)
67 Isopropylbenzene	105	9.126	9.126	(1.106)	6811	0.25000	0.32(a)
62 m,p-Xylenes	106	8.474	8.474	(1.027)	5829	0.50000	0.64(a)
17 Methylene Chloride	84	2.870	2.866	(0.586)	3269	0.25000	(a)
87 n-Butylbenzene	91	10.554	10.558	(1.031)	6526	0.25000	0.37(a)
73 n-Propylbenzene	91	9.475	9.479	(0.926)	8427	0.25000	0.33(a)
92 Naphthalene	128	12.133	12.133	(1.185)	4657	0.25000	0.87(a)
63 o-Xylene	106	8.811	8.811	(1.068)	2975	0.25000	0.32(a)
81 sec-Butylbenzene	105	10.086	10.090	(0.985)	6928	0.25000	0.32(a)
64 Styrene	104	8.823	8.826	(1.070)	4467	0.25000	0.29(a)
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	4611	0.25000	0.31(a)
56 Tetrachloroethene	164	7.522	7.525	(0.912)	1622	0.25000	0.41(a)
50 Toluene	91	7.046	7.046	(0.854)	7336	0.25000	0.32(a)
20 trans-1,2-Dichloroethene	96	3.136	3.136	(0.641)	1833	0.25000	0.36(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	2028	0.25000	0.38(a)
8 Trichlorofluoromethane	101	1.955	1.944	(0.400)	2465	0.25000	0.97(a)
5 Vinyl Chloride	62	1.419	1.415	(0.290)	2098	0.25000	1.30(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122102.D
Date : 21-DEC-2018 13:49
Client ID: VSTD00.25
Sample Info: VSTD00.25;VSTD00.25;1;1;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122103.D
Lab Smp Id: VSTD00.5 Client Smp ID: VSTD00.5
Inj Date : 21-DEC-2018 14:14
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD00.5;VSTD00.5;1;2;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 13:49 Cal File: U122102.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

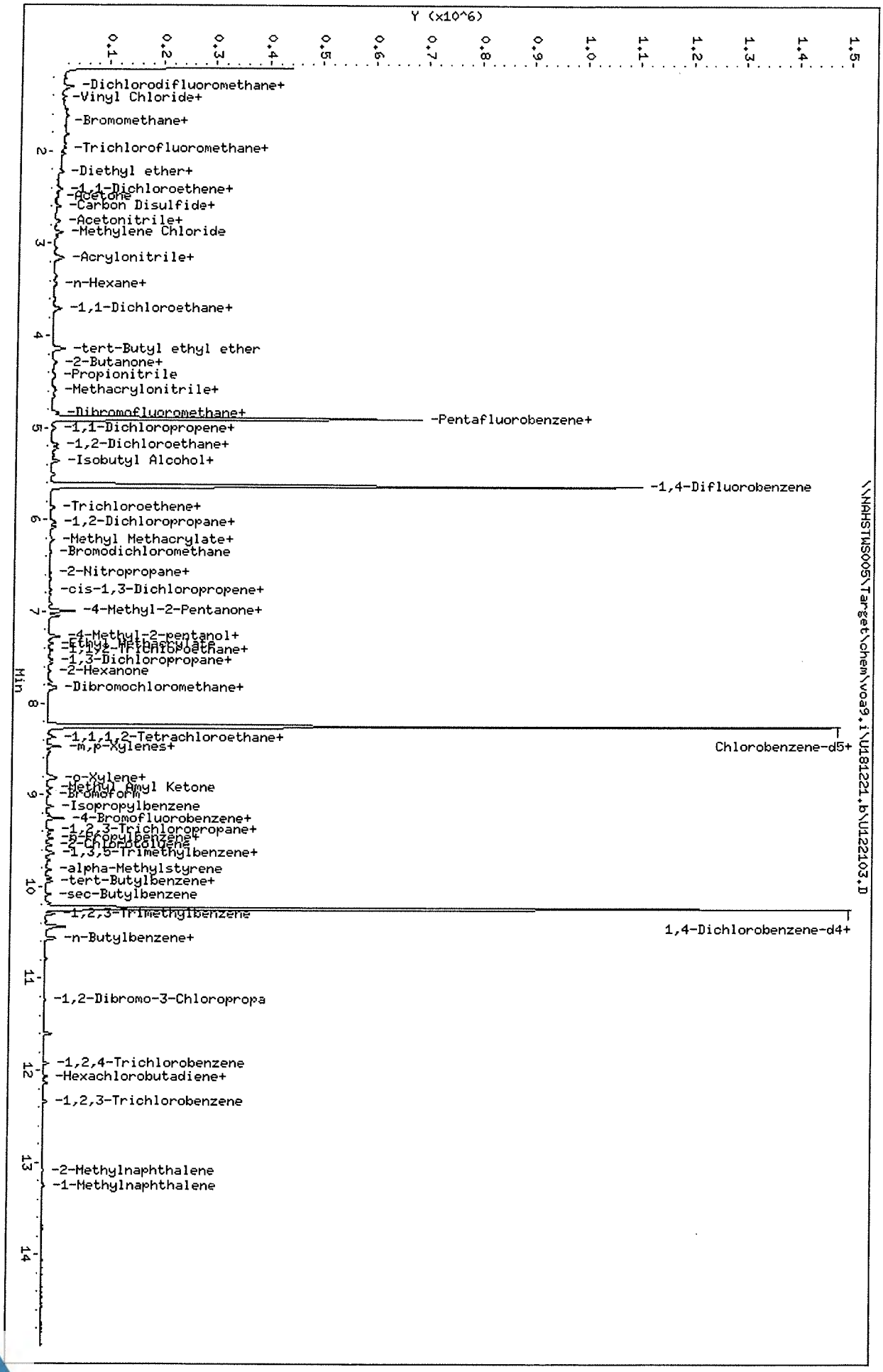
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.898	(1.000)	422356	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.629	(1.000)	796827	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	725774	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	333300	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	6036	0.50000	(a)
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	8601	0.50000	(a)
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	27052	0.50000	(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	9627	0.50000	(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	1272	0.50000	0.85(a)
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	2201	0.50000	0.33(a)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	2725	0.50000	0.36(aM)
138 Freon TF	101	2.412	2.412	(0.493)	1292	0.50000	0.35(a)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	1629	0.50000	0.37(a)
22 1,1-Dichloroethane	63	3.612	3.612	(0.737)	3066	0.50000	0.33(Ta)
11 1,1-Dichloroethene	96	2.409	2.409	(0.492)	1703	0.50000	0.42(a)
32 1,1-Dichloropropene	75	5.010	5.010	(0.890)	2565	0.50000	0.36(a)
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	1324	0.50000	0.84(a)
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	2591	0.50000	0.33(a)
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	2402	0.50000	0.38(a)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	6088	0.50000	0.34(a)
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	272	0.50000	1.68(aM)
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	1825	0.50000	0.36(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122103.D Page 2
Report Date: 28-Jan-2019 11:25

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	3885	0.50000	0.39(a)
33 1,2-Dichloroethane	62	5.258	5.258	(0.934)	2385	0.50000	(a)
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	2114	0.50000	0.37(a)
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	5574	0.50000	0.33(a)
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	3970	0.50000	0.40(a)
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	3471	0.50000	0.37(a)
84 1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	4522	0.50000	0.43(a)
26 2,2-Dichloropropane	77	4.279	4.279	(0.874)	2050	0.50000	0.37(aM)
24 2-Butanone	43	4.354	4.354	(0.889)	2109	1.00000	(a)
76 2-Chlorotoluene	91	9.550	9.550	(0.933)	5666	0.50000	0.36(a)
52 2-Hexanone	43	7.649	7.649	(0.927)	2639	1.00000	0.65(a)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	6459	0.50000	0.36(a)
82 p-Isopropyltoluene	119	10.210	10.210	(0.997)	6372	0.50000	0.36(a)
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	3831	1.00000	0.65(a)
10 Acetone	43	2.491	2.491	(0.509)	3366	1.00000	(a)
37 Benzene	78	5.220	5.220	(0.927)	7772	0.50000	0.36(a)
74 Bromobenzene	156	9.381	9.381	(0.917)	1879	0.50000	0.36(a)
29 Bromochloromethane	128	4.553	4.553	(0.930)	773	0.50000	(a)
39 Bromodichloromethane	83	6.348	6.348	(1.128)	1990	0.50000	0.33(aM)
66 Bromoform	173	8.984	8.984	(1.089)	762	0.50000	1.99(aM)
6 Bromomethane	94	1.681	1.681	(0.343)	822	0.50000	1.64(a)
19 Carbon Disulfide	76	2.596	2.596	(0.530)	12403	1.00000	0.84(a)
34 Carbon Tetrachloride	117	4.999	4.999	(0.888)	1510	0.50000	1.65(a)
59 Chlorobenzene	112	8.275	8.275	(1.003)	5533	0.50000	0.39(a)
7 Chloroethane	64	1.764	1.764	(0.360)	2753	0.50000	1.20(aM)
28 Chloroform	83	4.662	4.662	(0.952)	2977	0.50000	0.33(a)
3 Chloromethane	50	1.348	1.348	(0.275)	1695	0.50000	3.67(aM)
27 cis-1,2-Dichloroethene	96	4.294	4.294	(0.877)	1939	0.50000	0.34(a)
46 cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	2152	0.50000	1.49(a)
55 Dibromochloromethane	129	7.758	7.758	(0.940)	1194	0.50000	1.22(a)
44 Dibromomethane	93	6.195	6.195	(1.101)	1143	0.50000	0.35(aM)
2 Dichlorodifluoromethane	85	1.213	1.213	(0.248)	2033	0.50000	0.87(aM)
61 Ethylbenzene	106	8.369	8.369	(1.015)	2560	0.50000	0.35(a)
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	1509	0.50000	0.63(a)
67 Isopropylbenzene	105	9.126	9.126	(1.106)	6665	0.50000	0.32(a)
62 m,p-Xylenes	106	8.474	8.474	(1.027)	6264	1.00000	0.71(a)
17 Methylene Chloride	84	2.877	2.877	(0.587)	3346	0.50000	(a)
87 n-Butylbenzene	91	10.558	10.558	(1.031)	6644	0.50000	0.39(a)
73 n-Propylbenzene	91	9.475	9.475	(0.926)	8654	0.50000	0.34(a)
92 Naphthalene	128	12.136	12.136	(1.186)	5535	0.50000	0.92(a)
63 o-Xylene	106	8.811	8.811	(1.068)	3001	0.50000	0.33(a)
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	6823	0.50000	0.32(a)
64 Styrene	104	8.826	8.826	(1.070)	4646	0.50000	0.31(a)
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	4764	0.50000	0.32(a)
56 Tetrachloroethene	164	7.526	7.526	(0.912)	1587	0.50000	0.41(a)
50 Toluene	91	7.049	7.049	(0.855)	8207	0.50000	0.38(a)
20 trans-1,2-Dichloroethene	96	3.151	3.151	(0.643)	1825	0.50000	0.36(a)
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	1633	0.50000	1.85(aM)
38 Trichloroethene	130	5.865	5.865	(1.042)	1953	0.50000	0.38(a)
8 Trichlorofluoromethane	101	1.966	1.966	(0.402)	1919	0.50000	0.89(a)
5 Vinyl Chloride	62	1.430	1.430	(0.292)	1815	0.50000	1.26(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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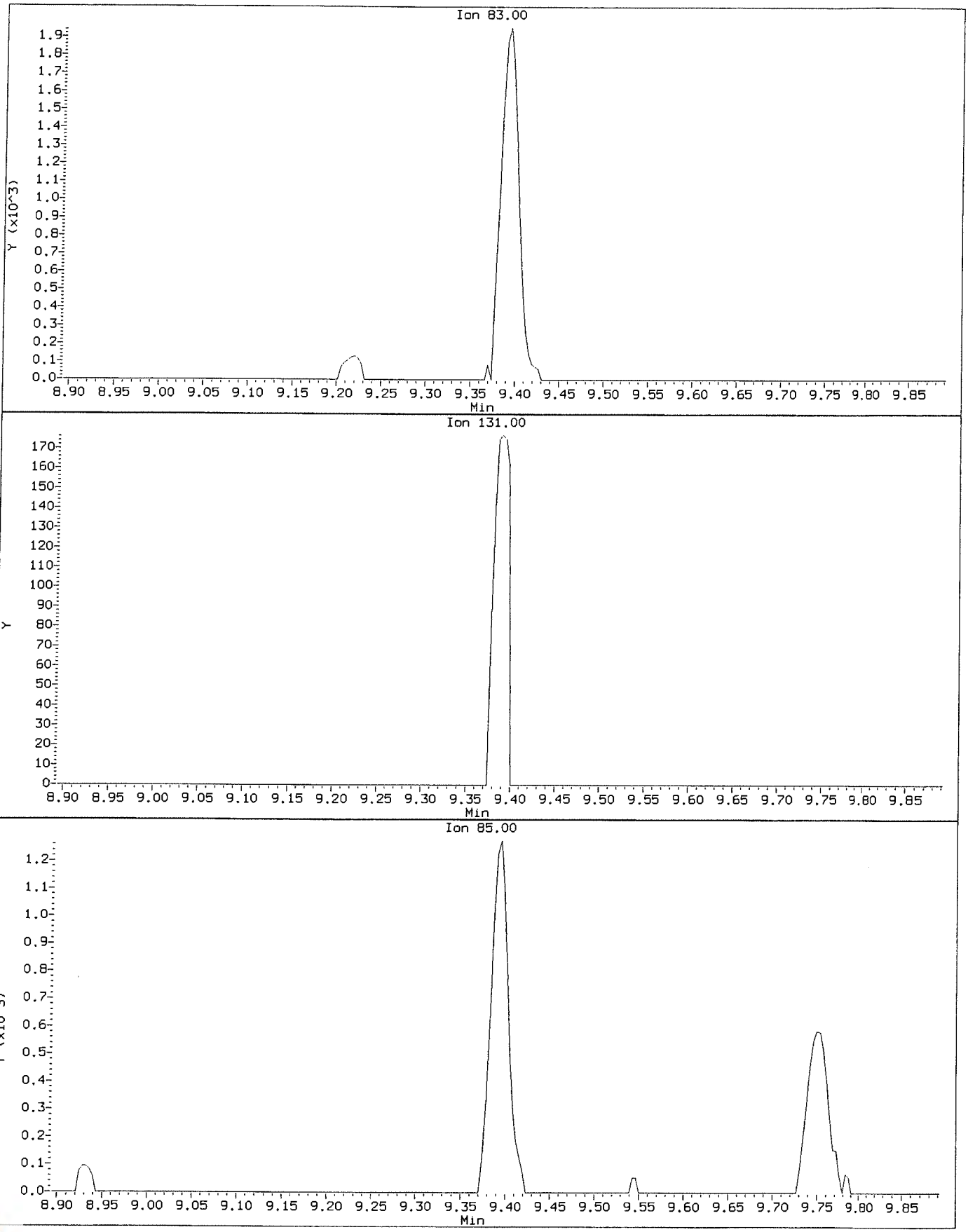
Client ID: VSTD00.5
Sample Info: VSTD00.5;VSTD00.5;1;2;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

\\NAHSTWS005\Target\chem\voa9,i\U181221.b\U122103.D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122103.D
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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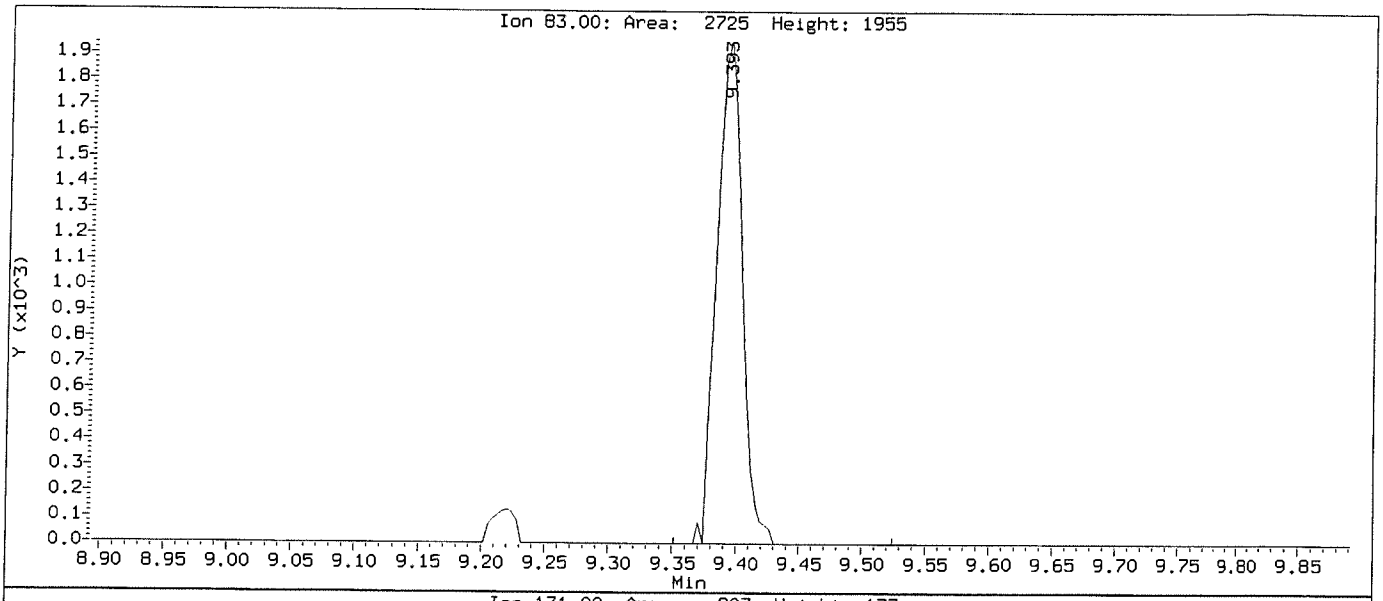
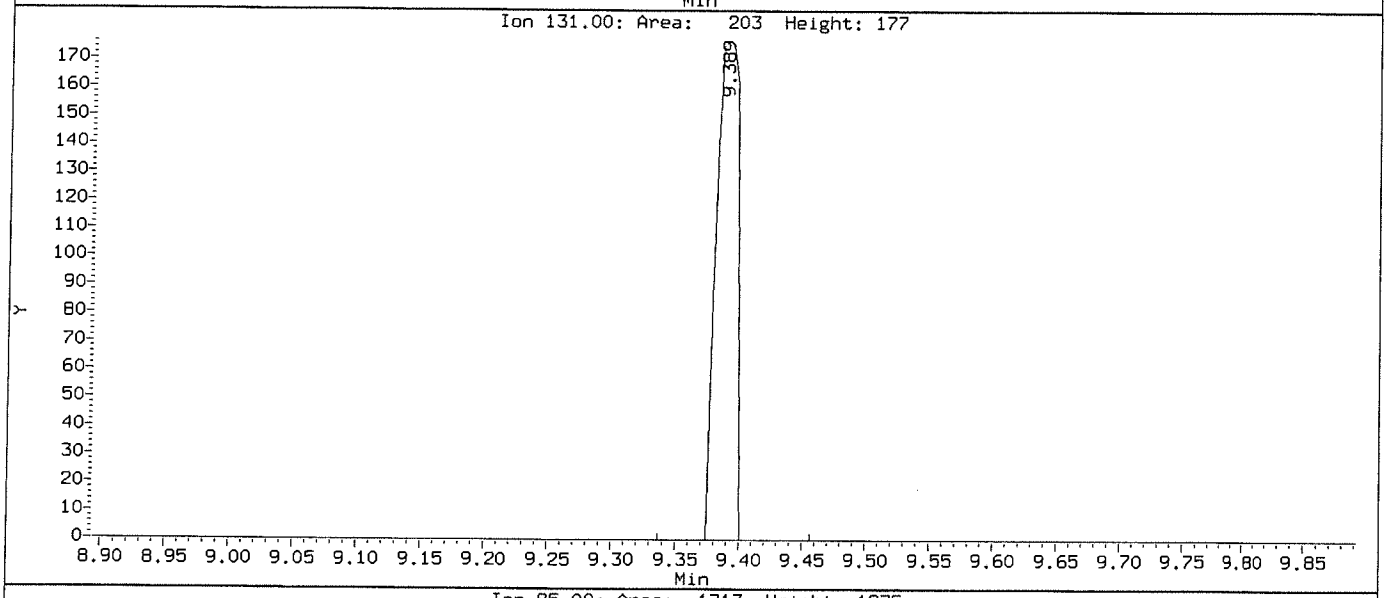
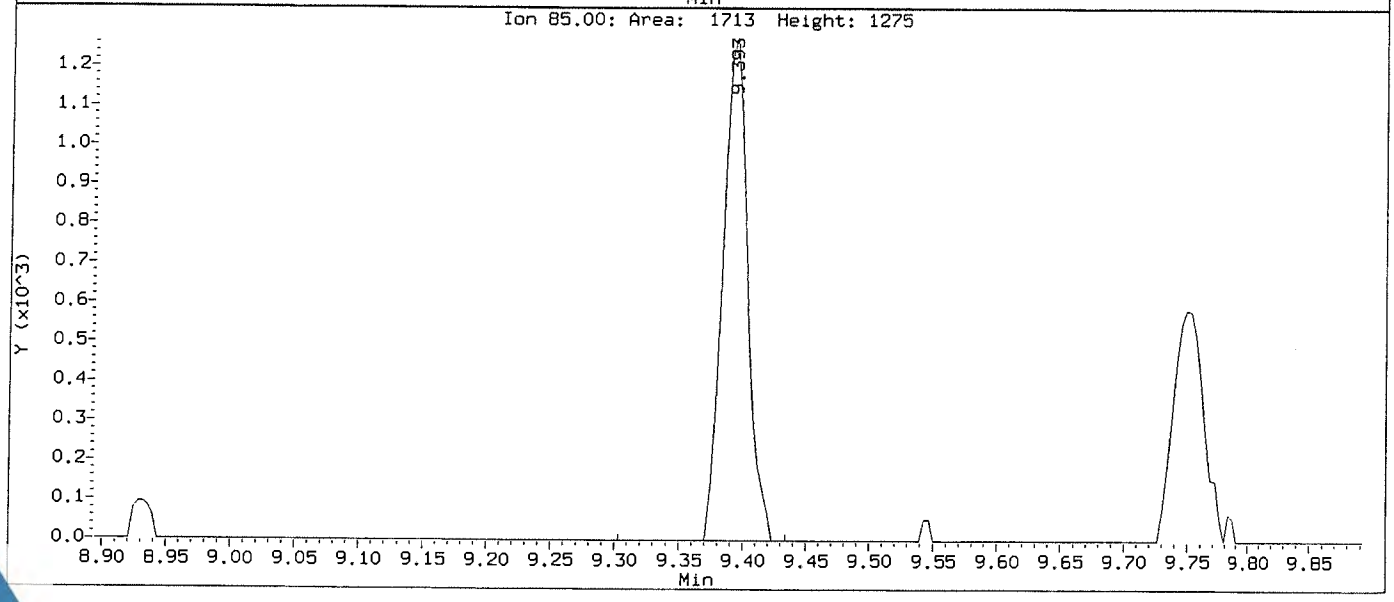
Client Sample ID: VSTD00.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5







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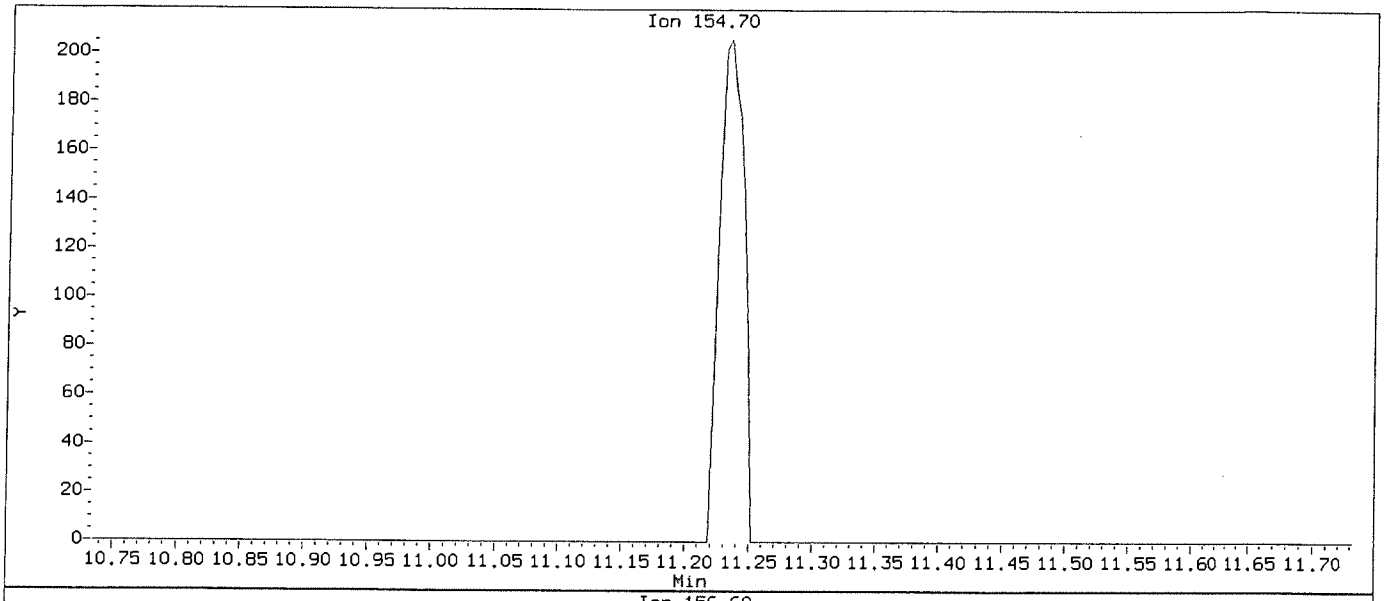
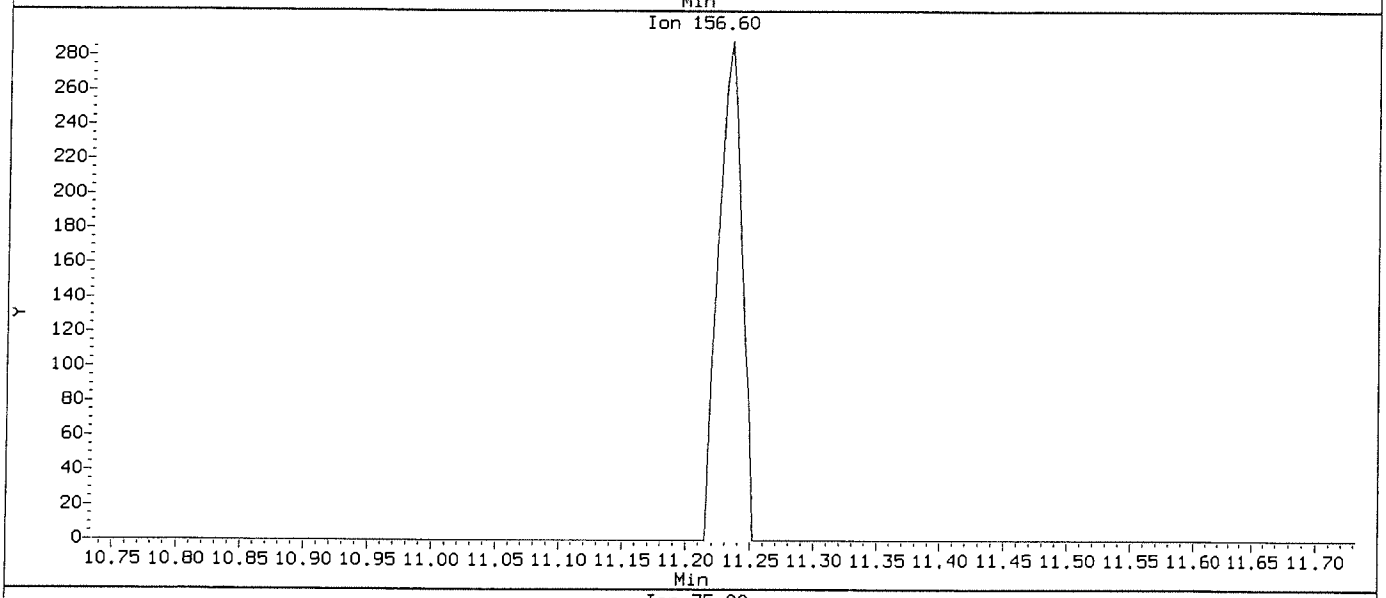
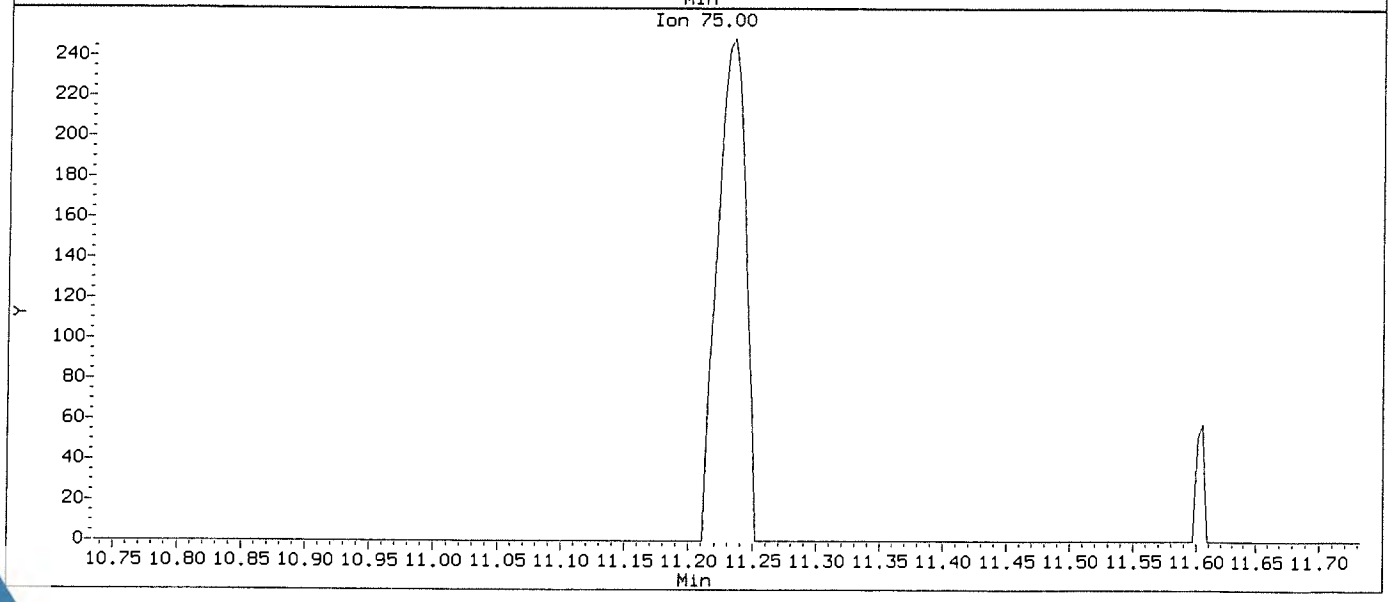
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8







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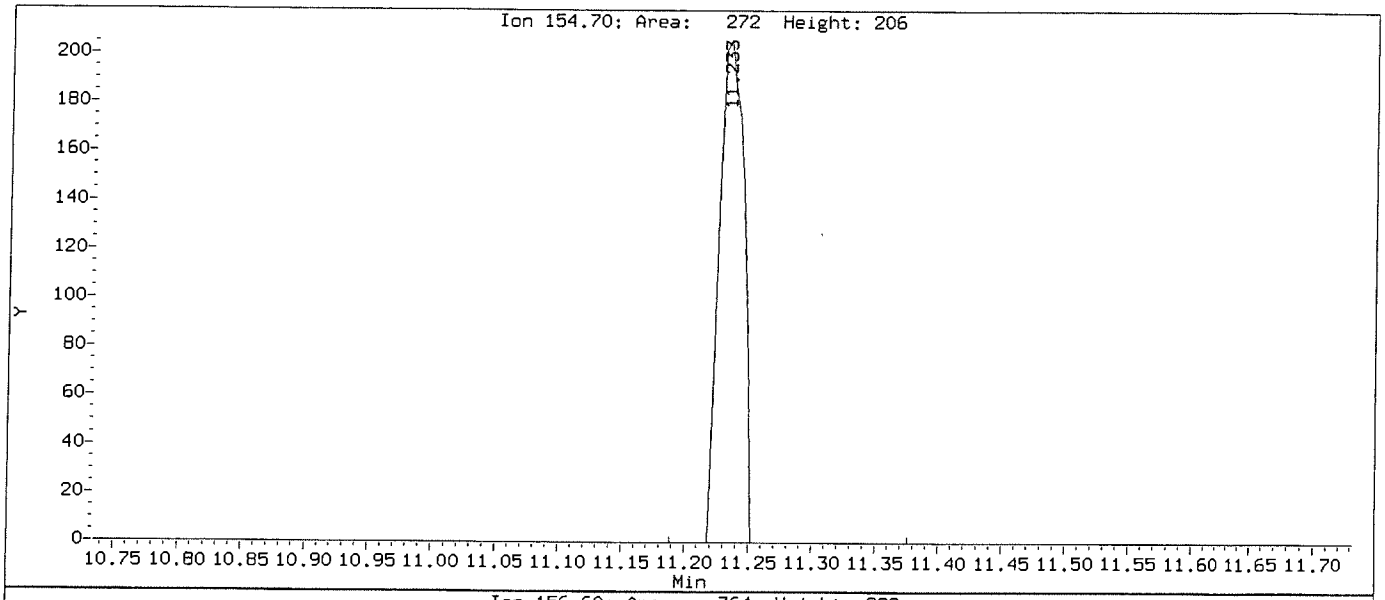
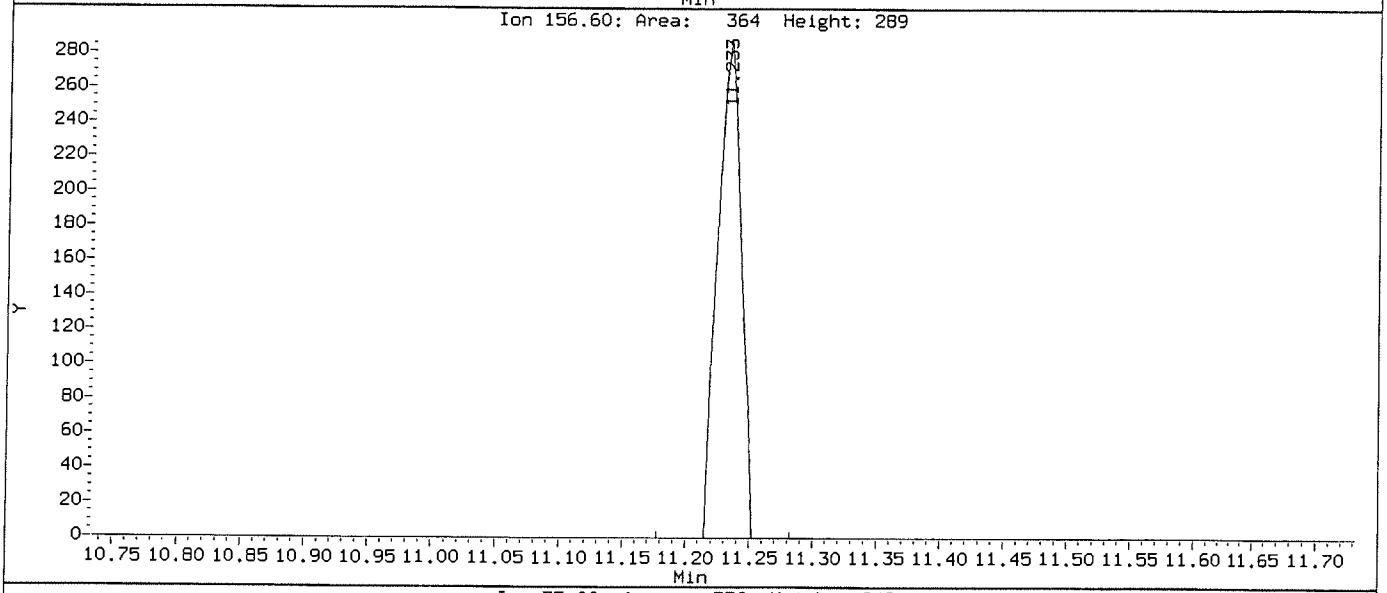
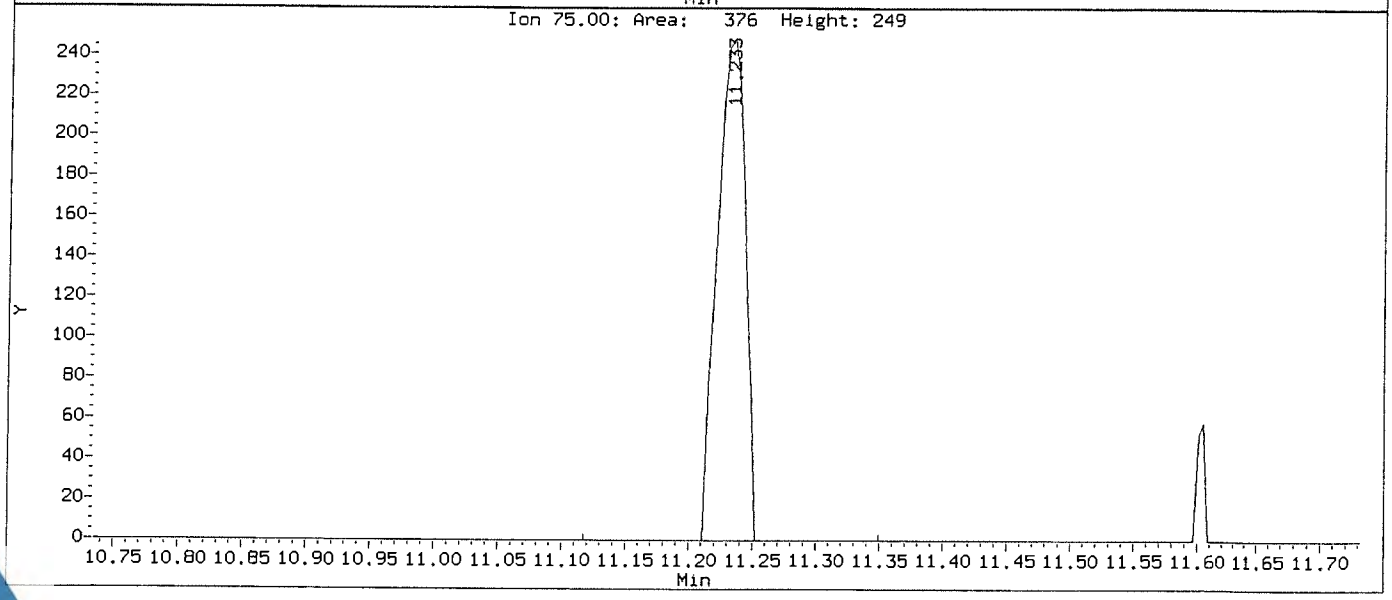
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8







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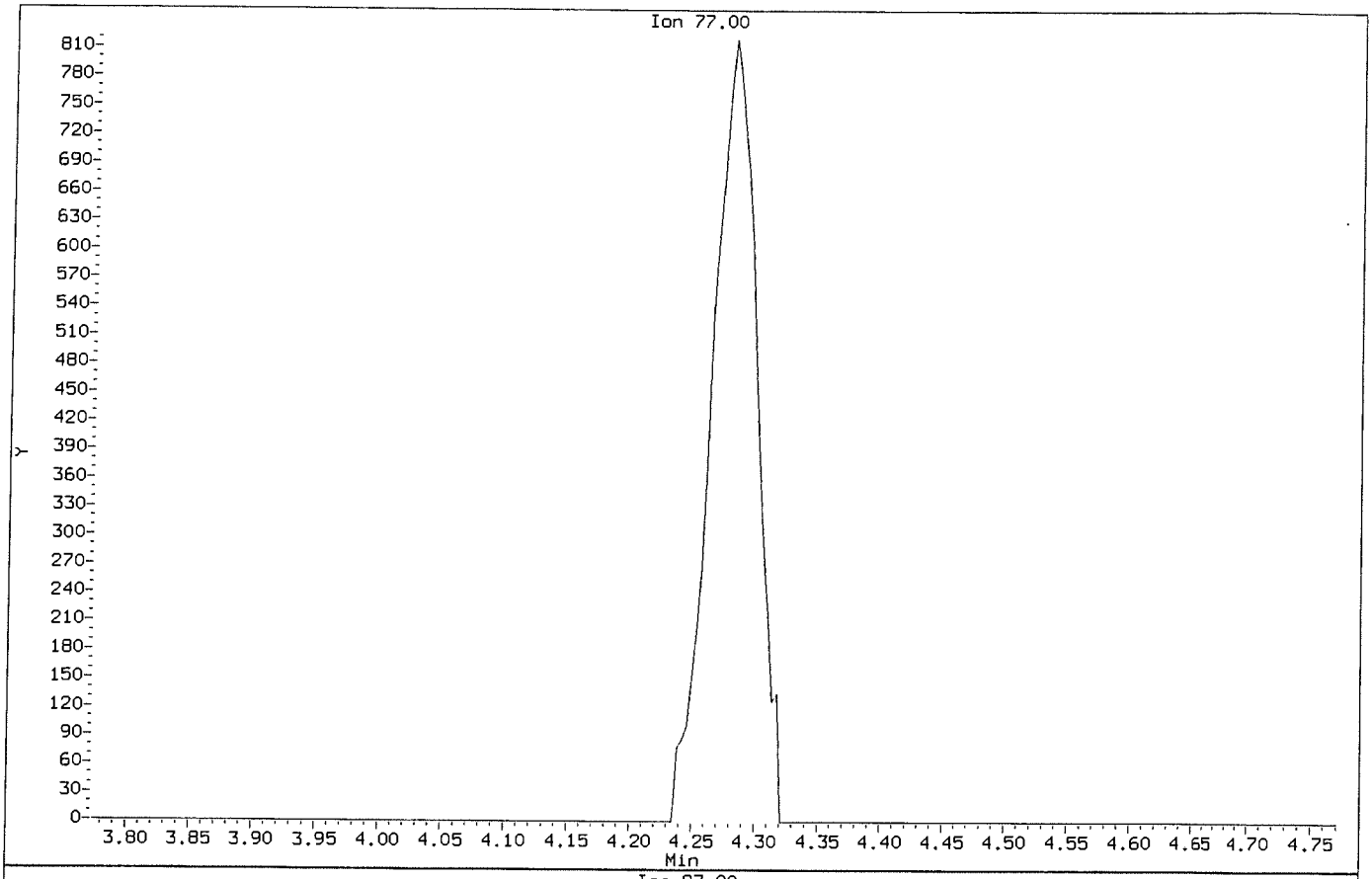
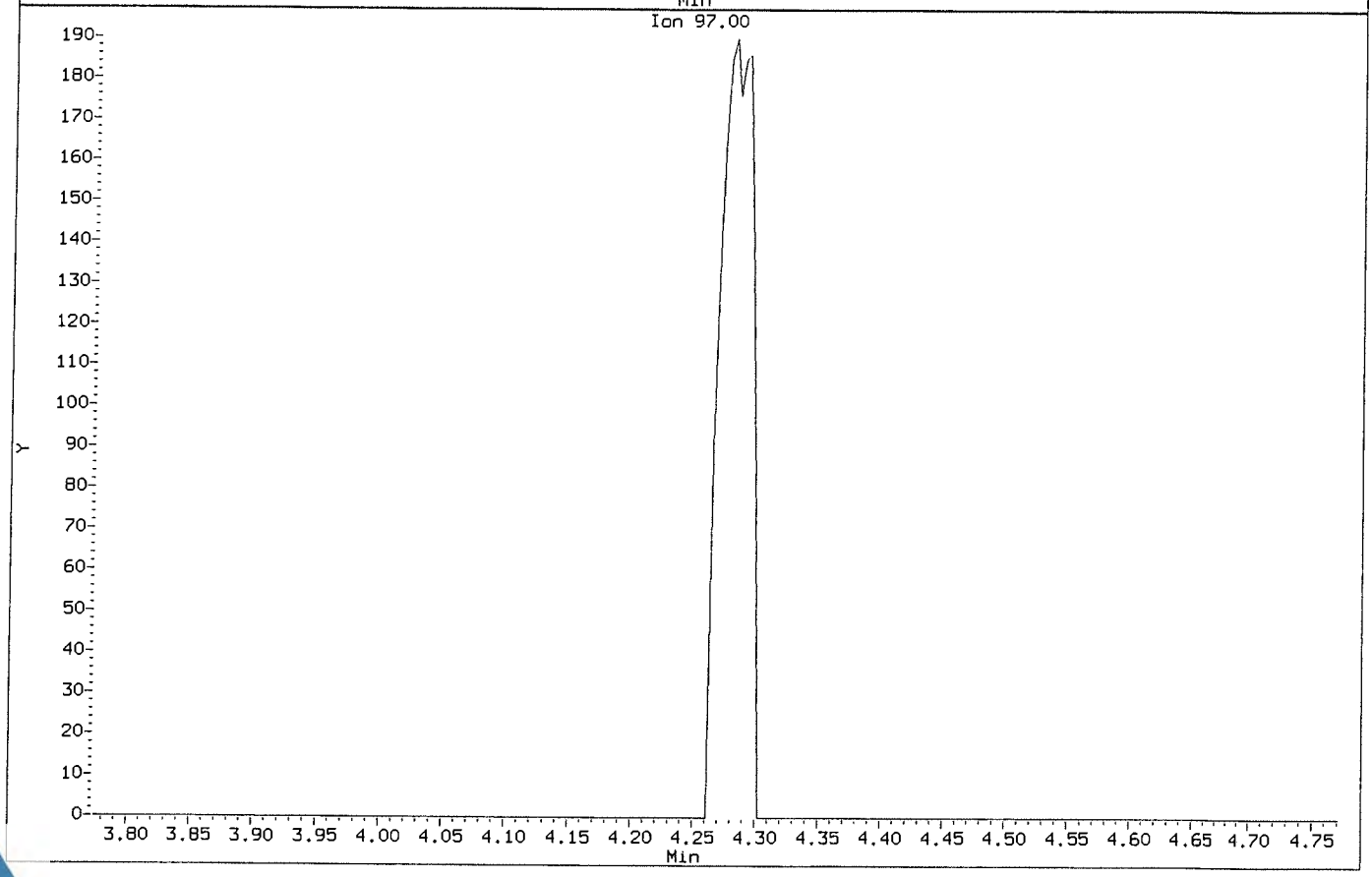
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





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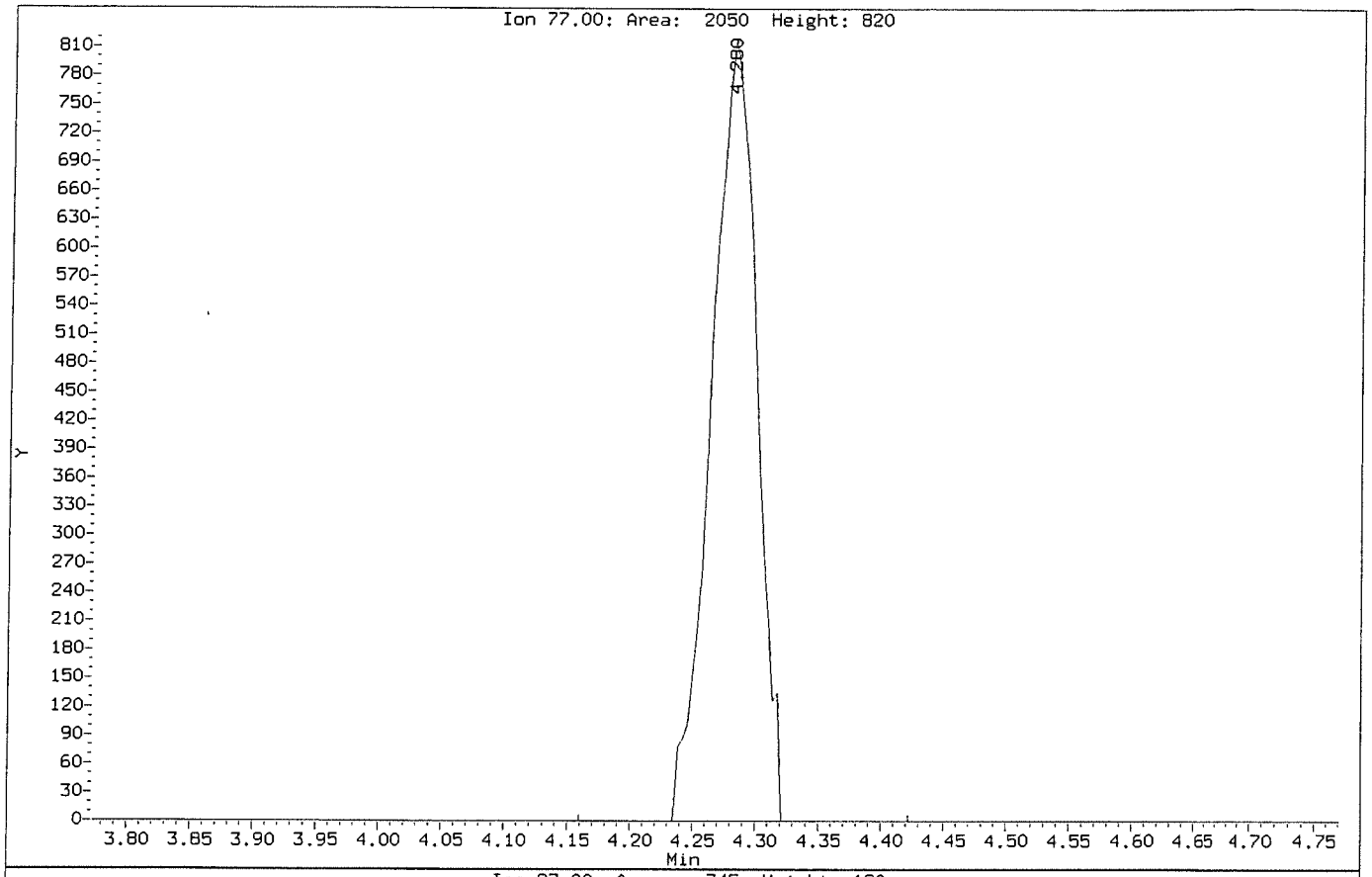
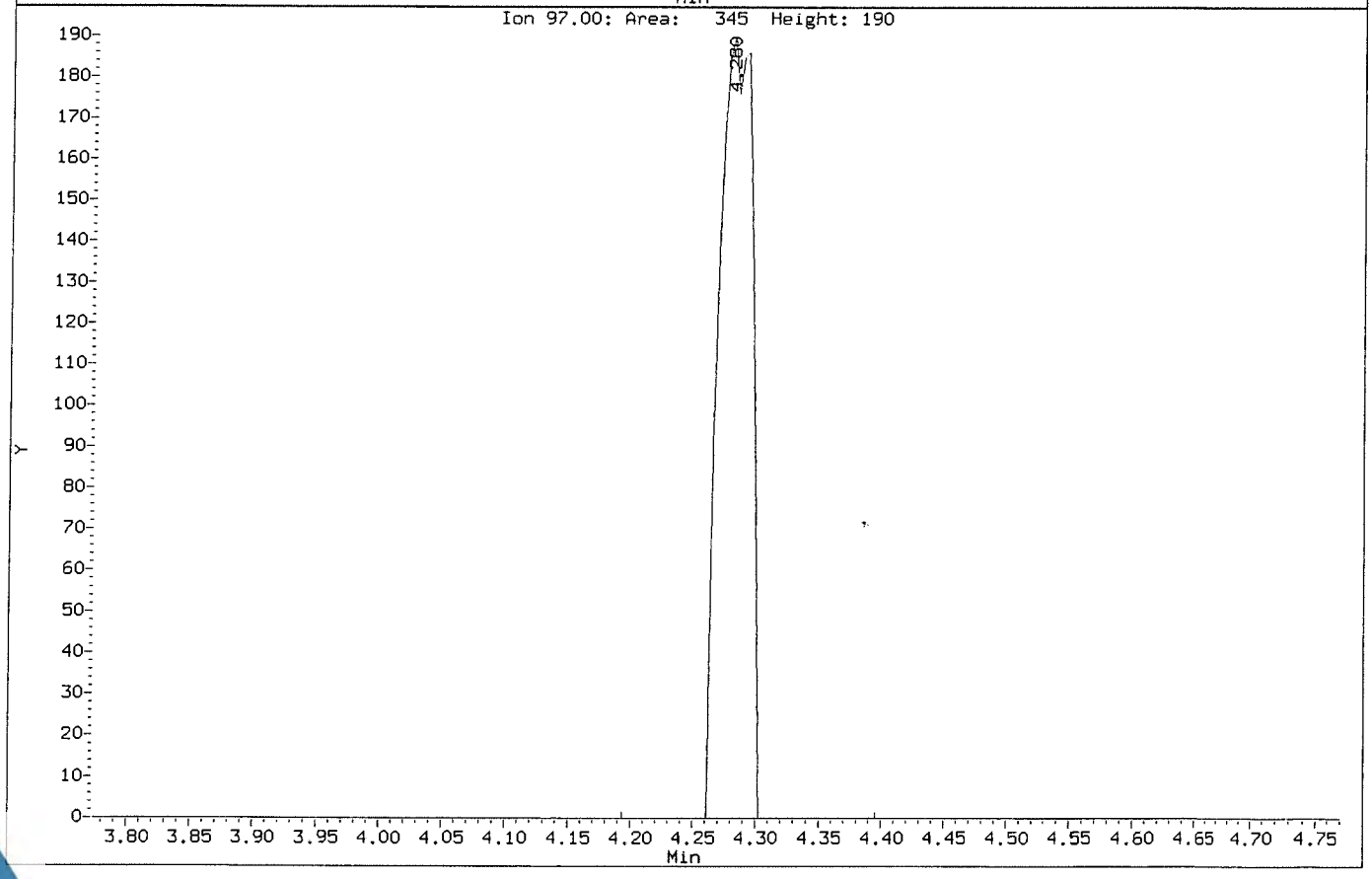
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





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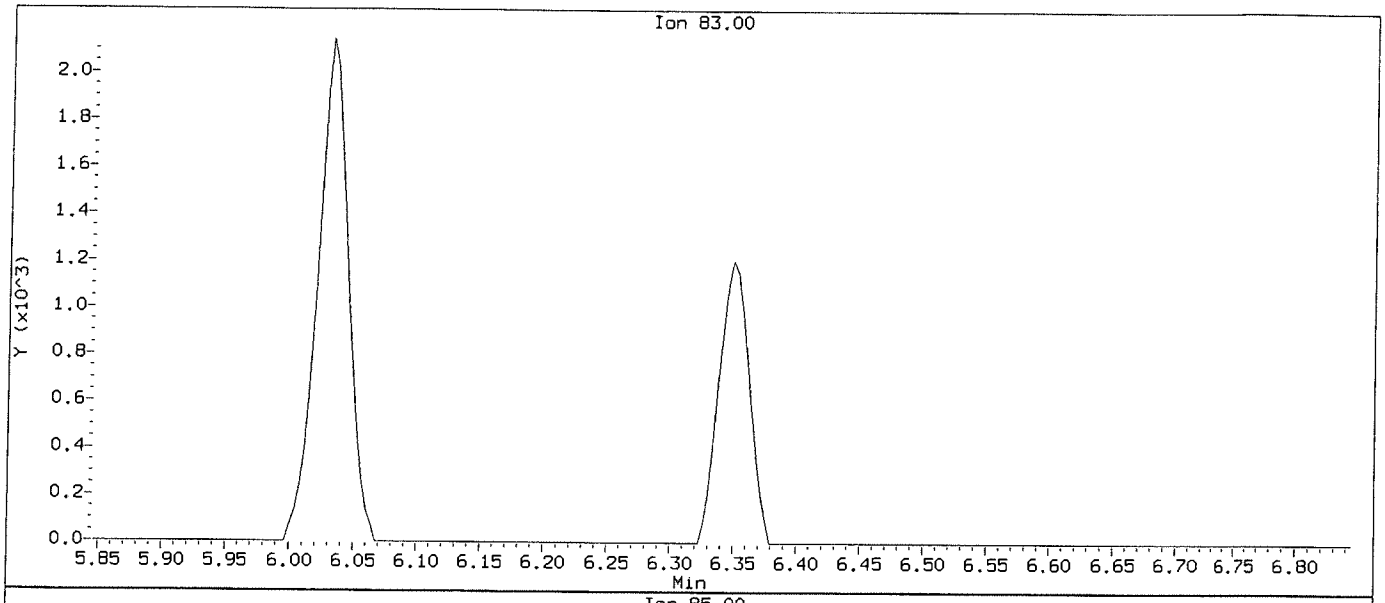
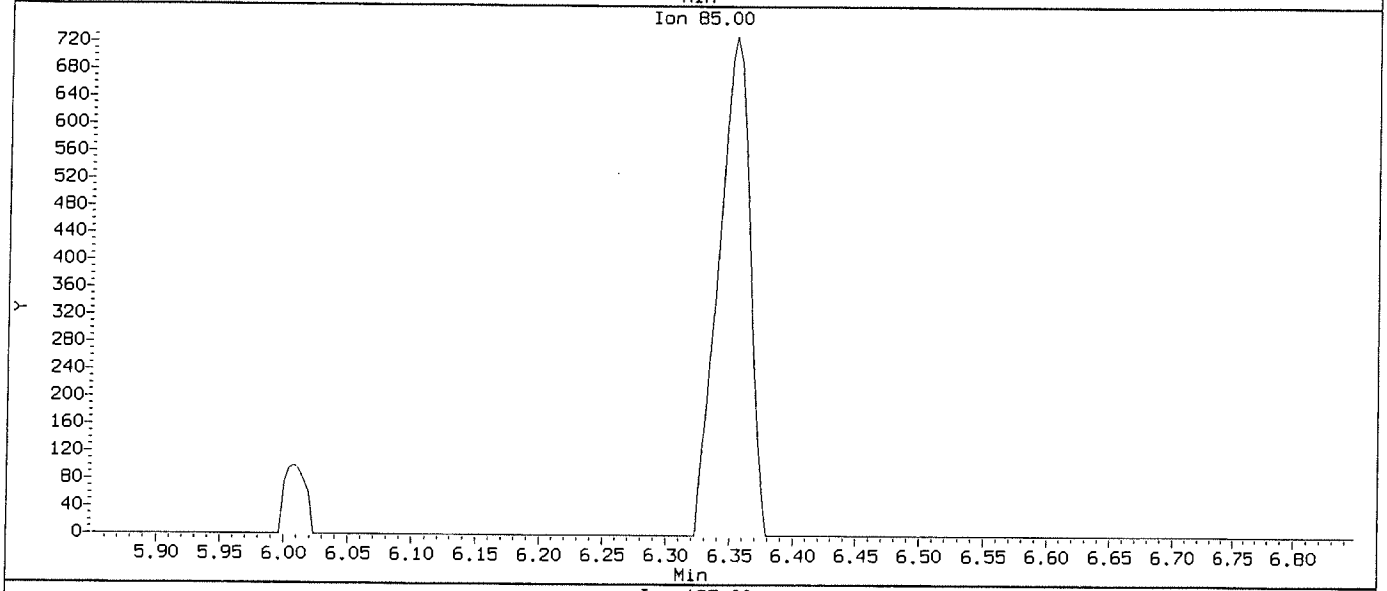
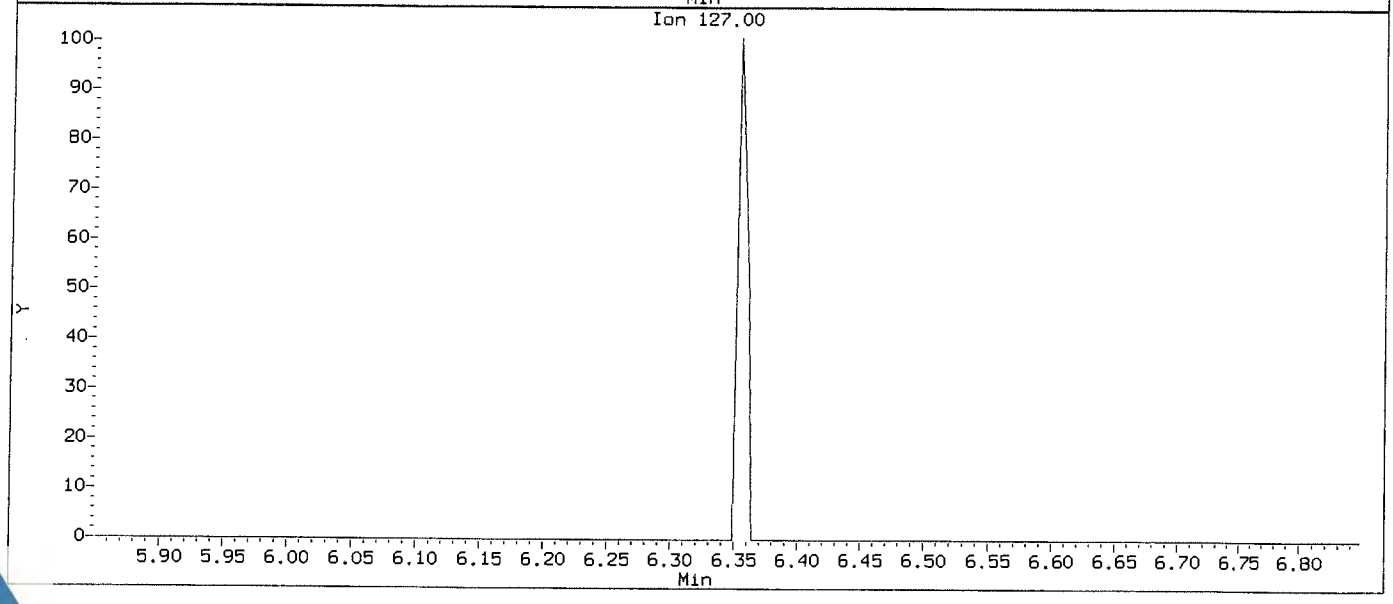
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Bromodichloromethane
CAS Number: 75-27-4







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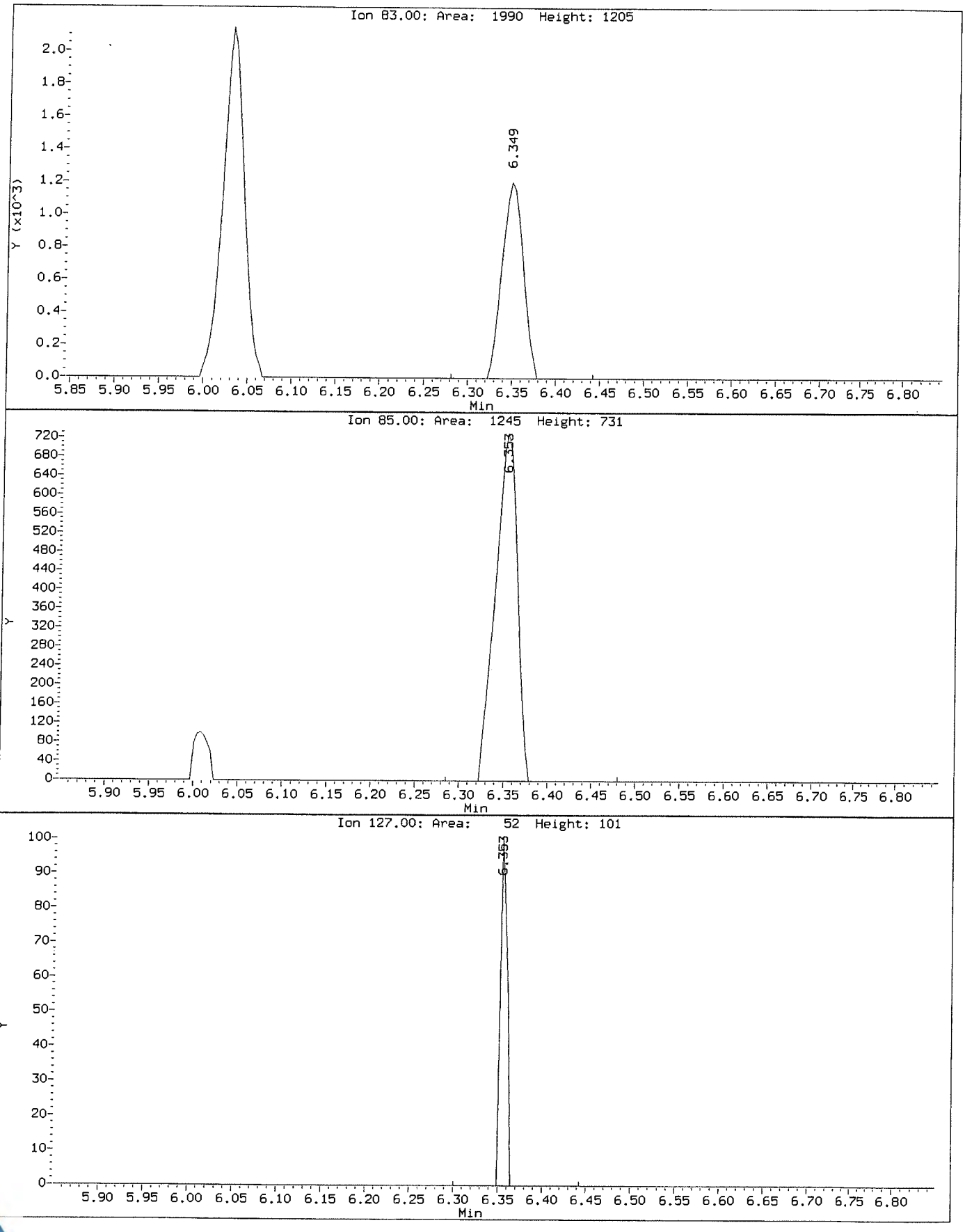
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



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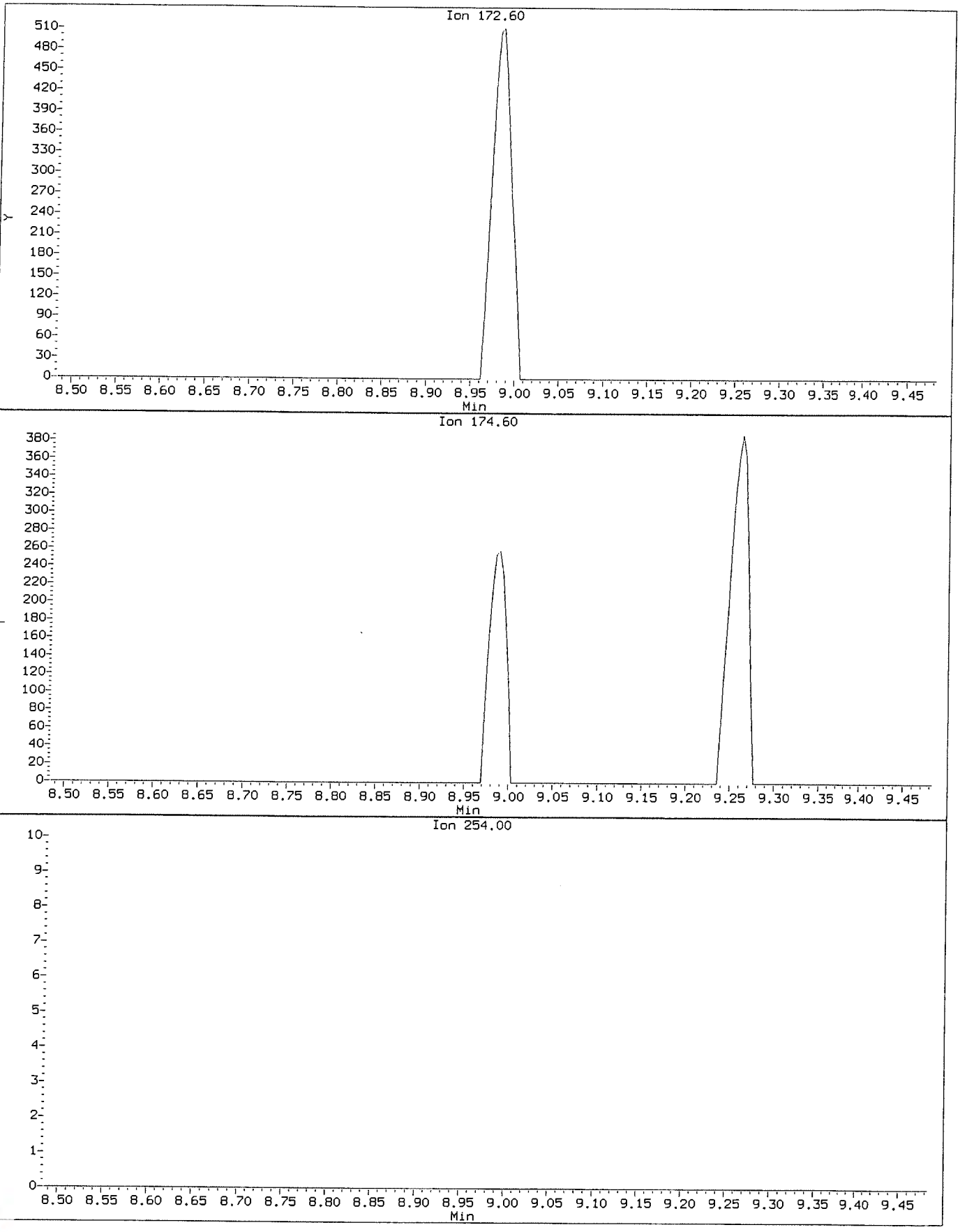
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Bromoform
CAS Number: 75-25-2



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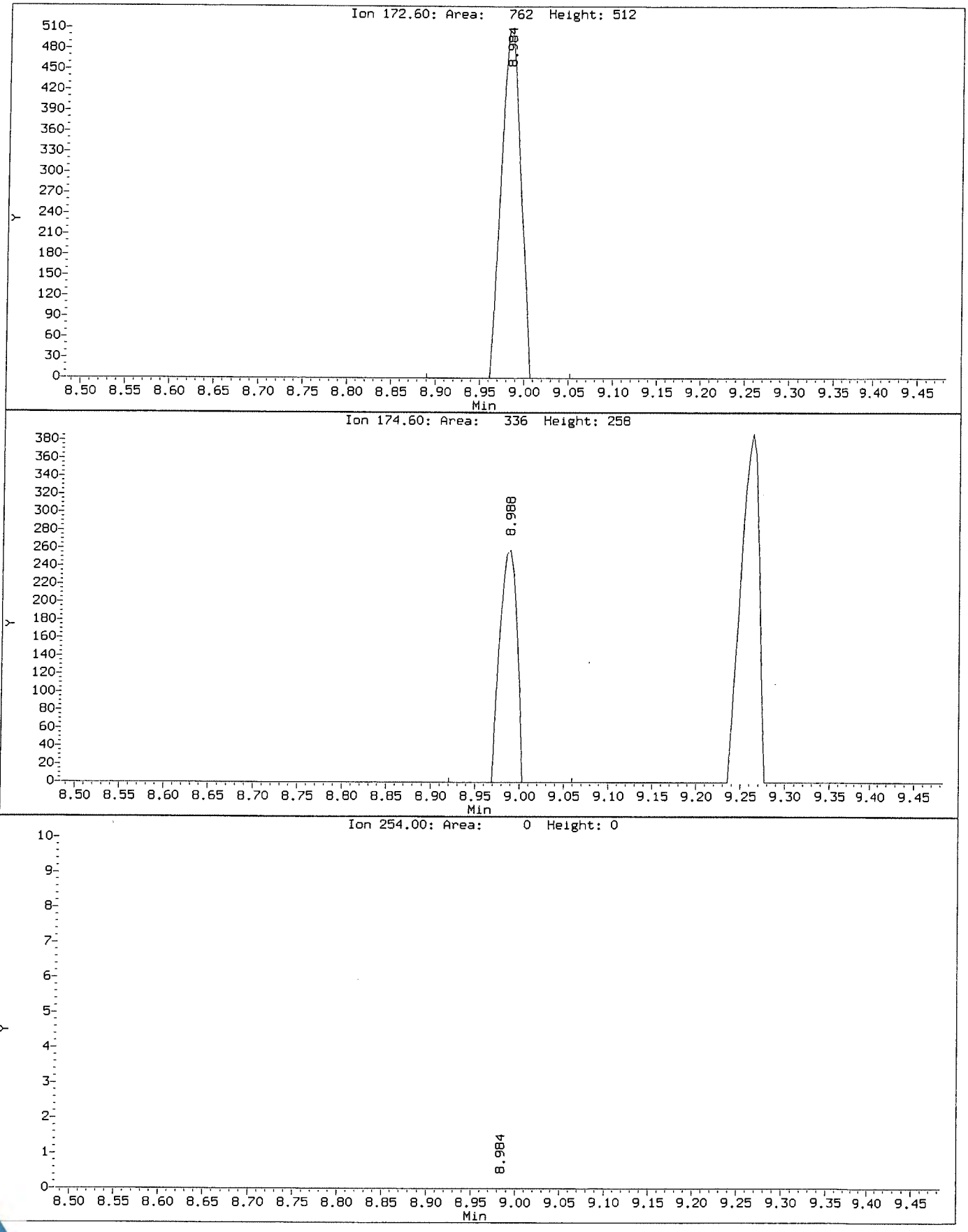
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Bromoform
CAS Number: 75-25-2



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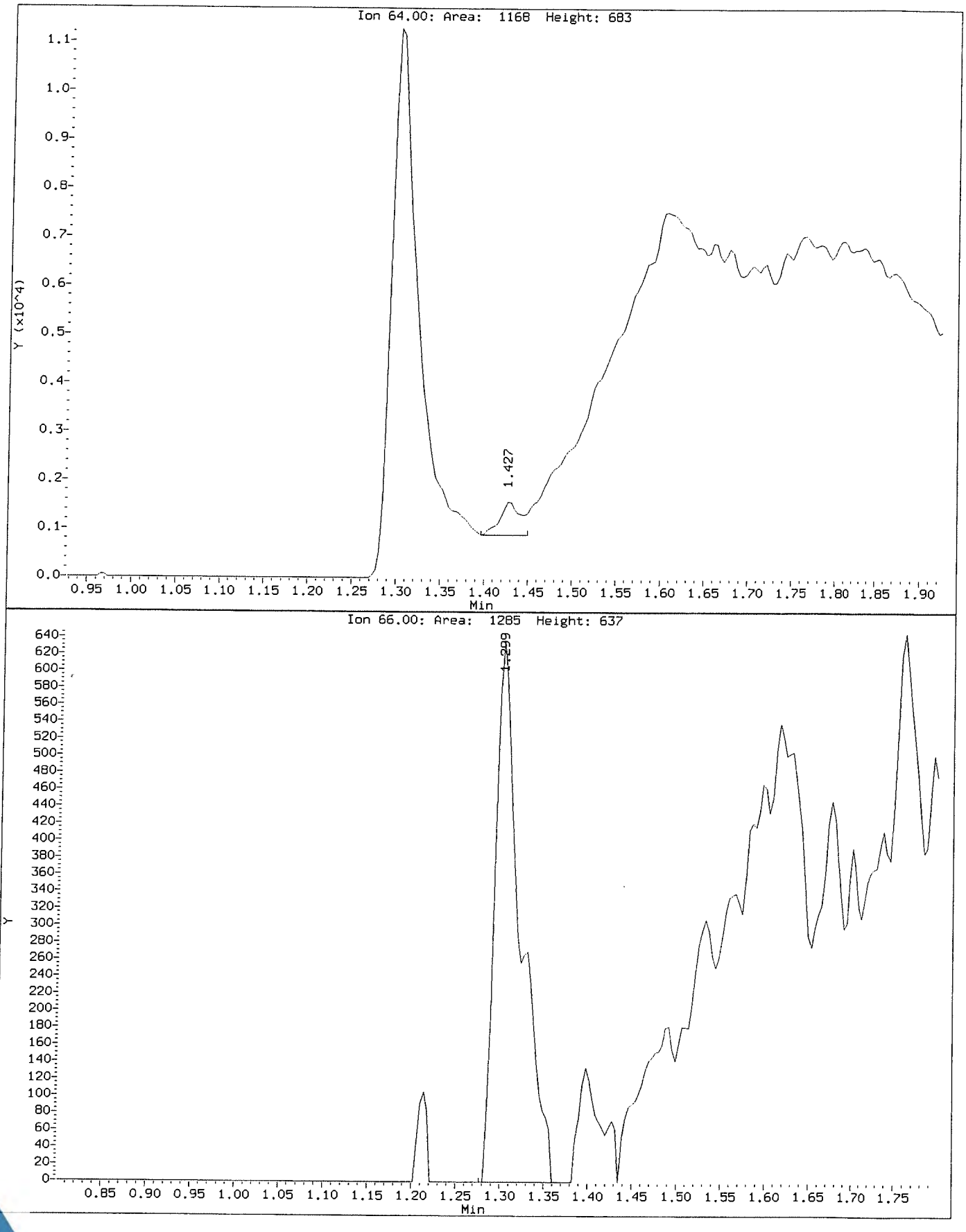
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Chloroethane
CAS Number: 75-00-3



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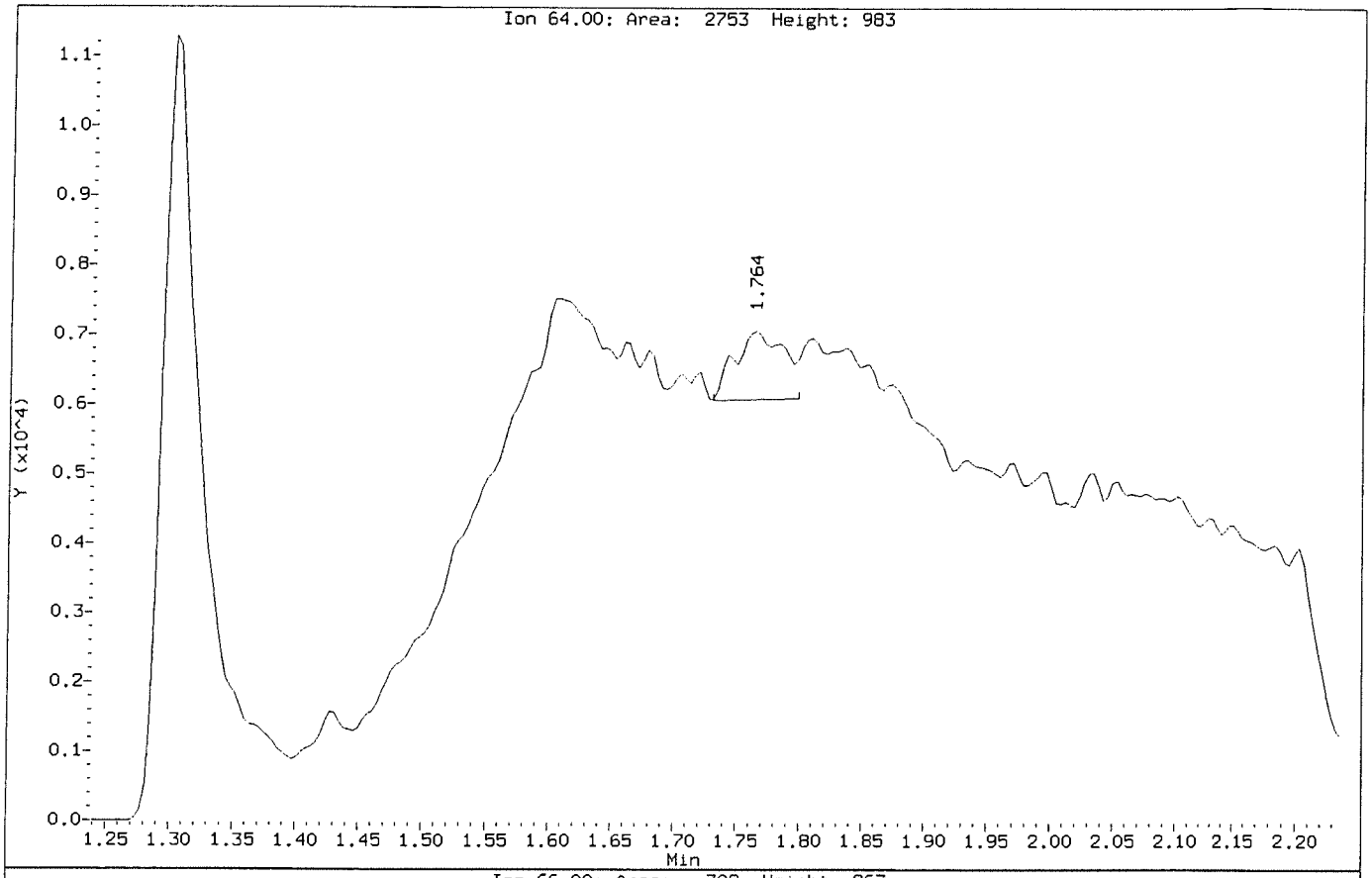
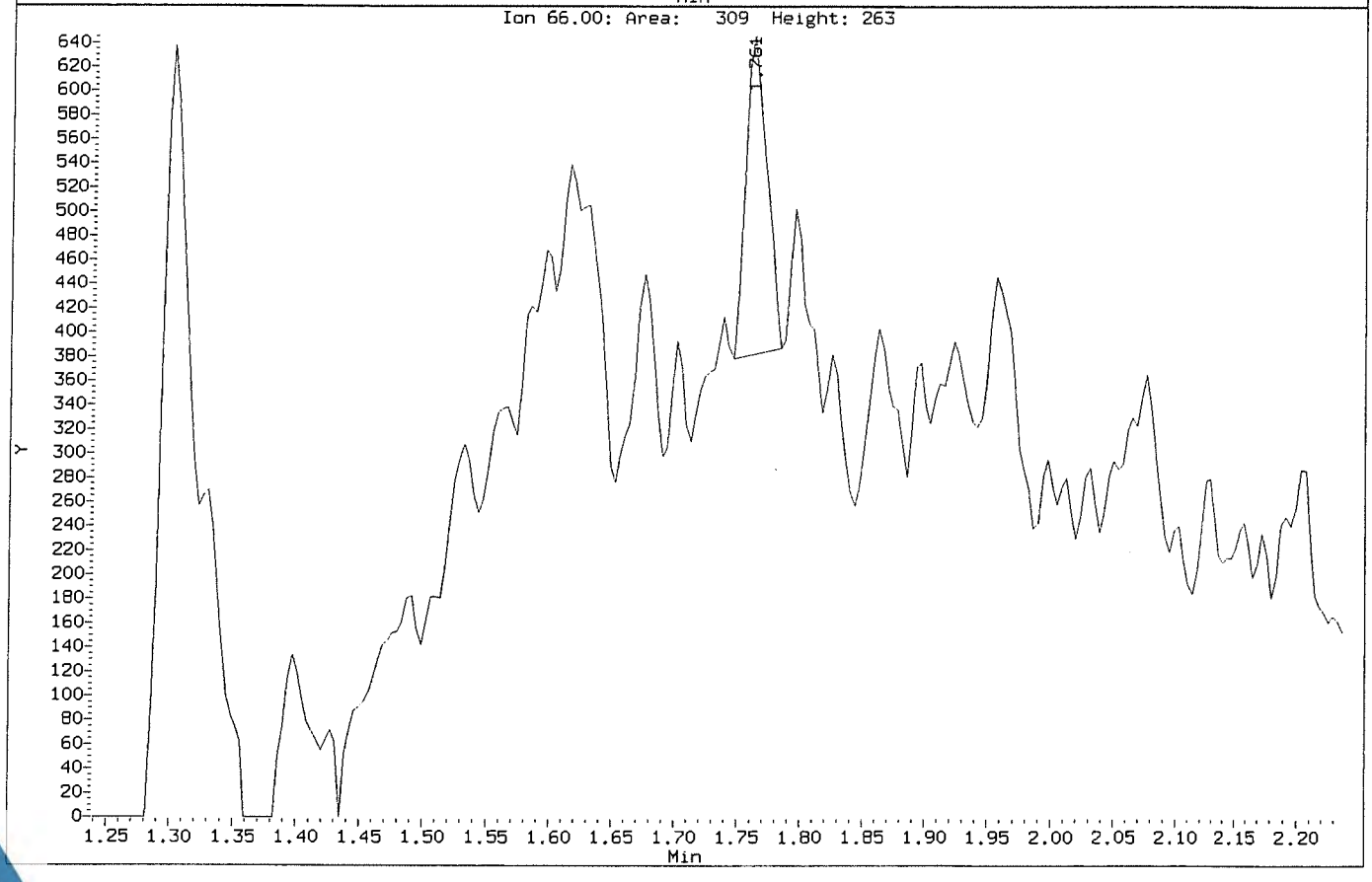
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Chloroethane
CAS Number: 75-00-3





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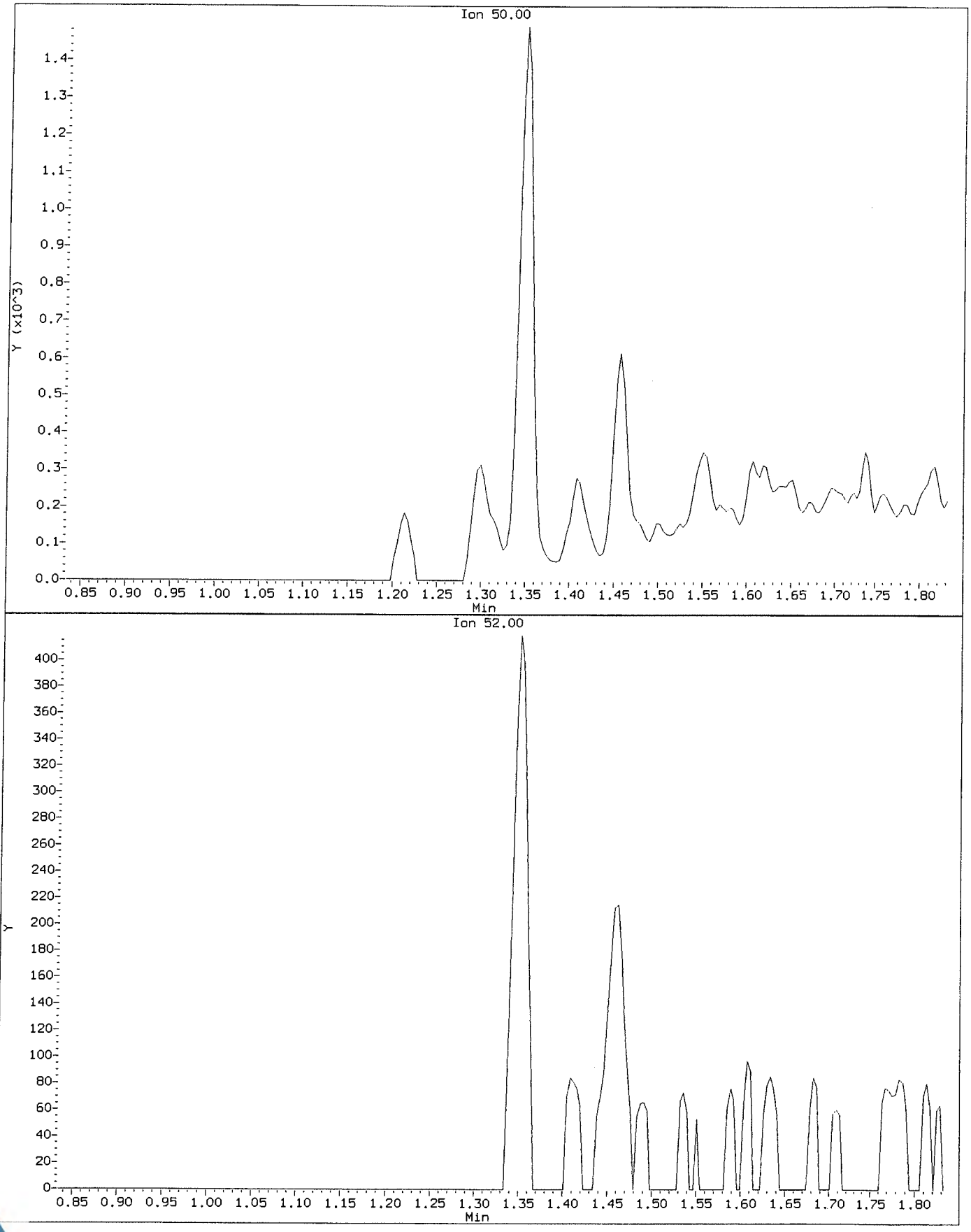
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Chloromethane
CAS Number: 74-87-3



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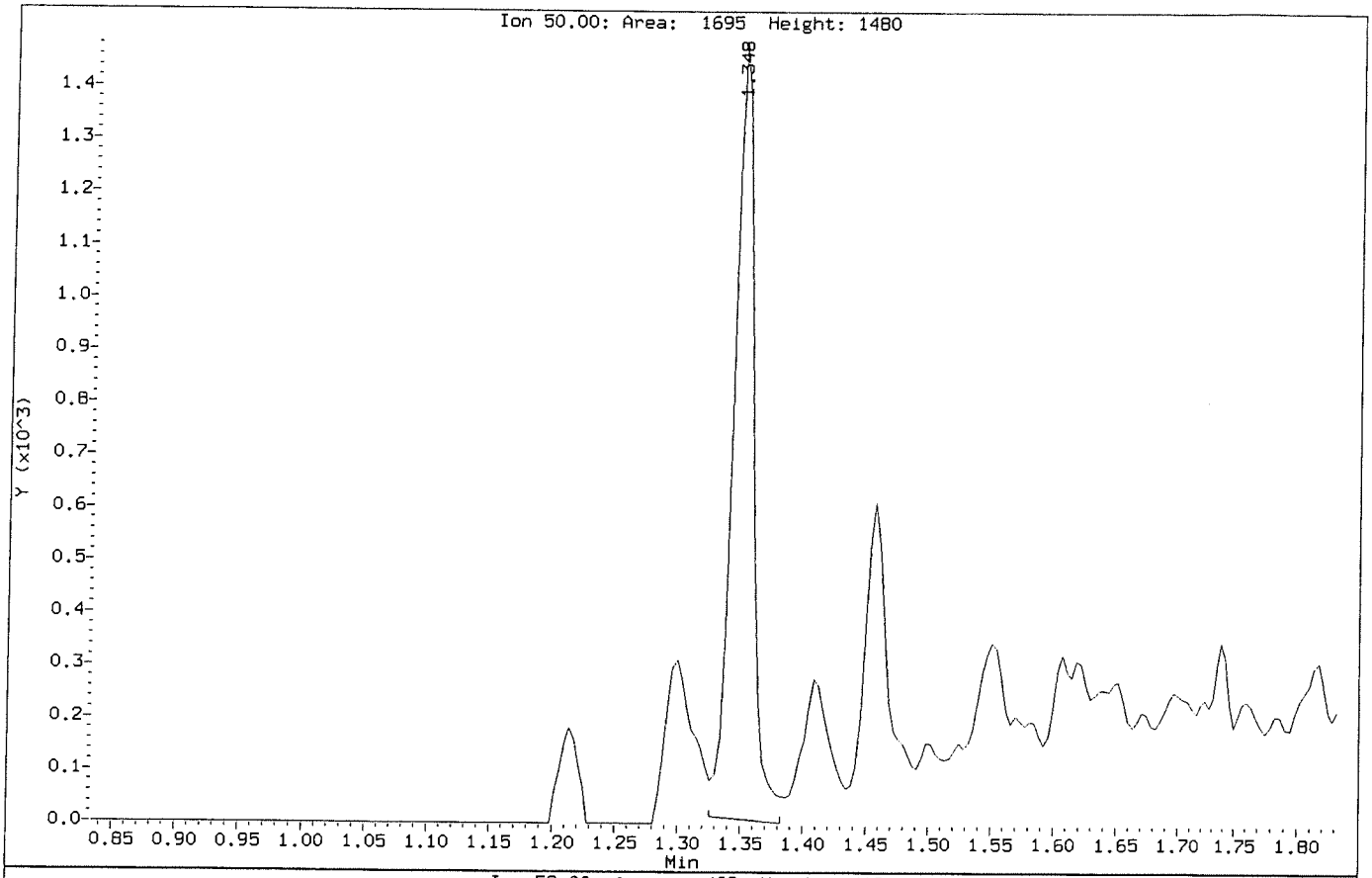
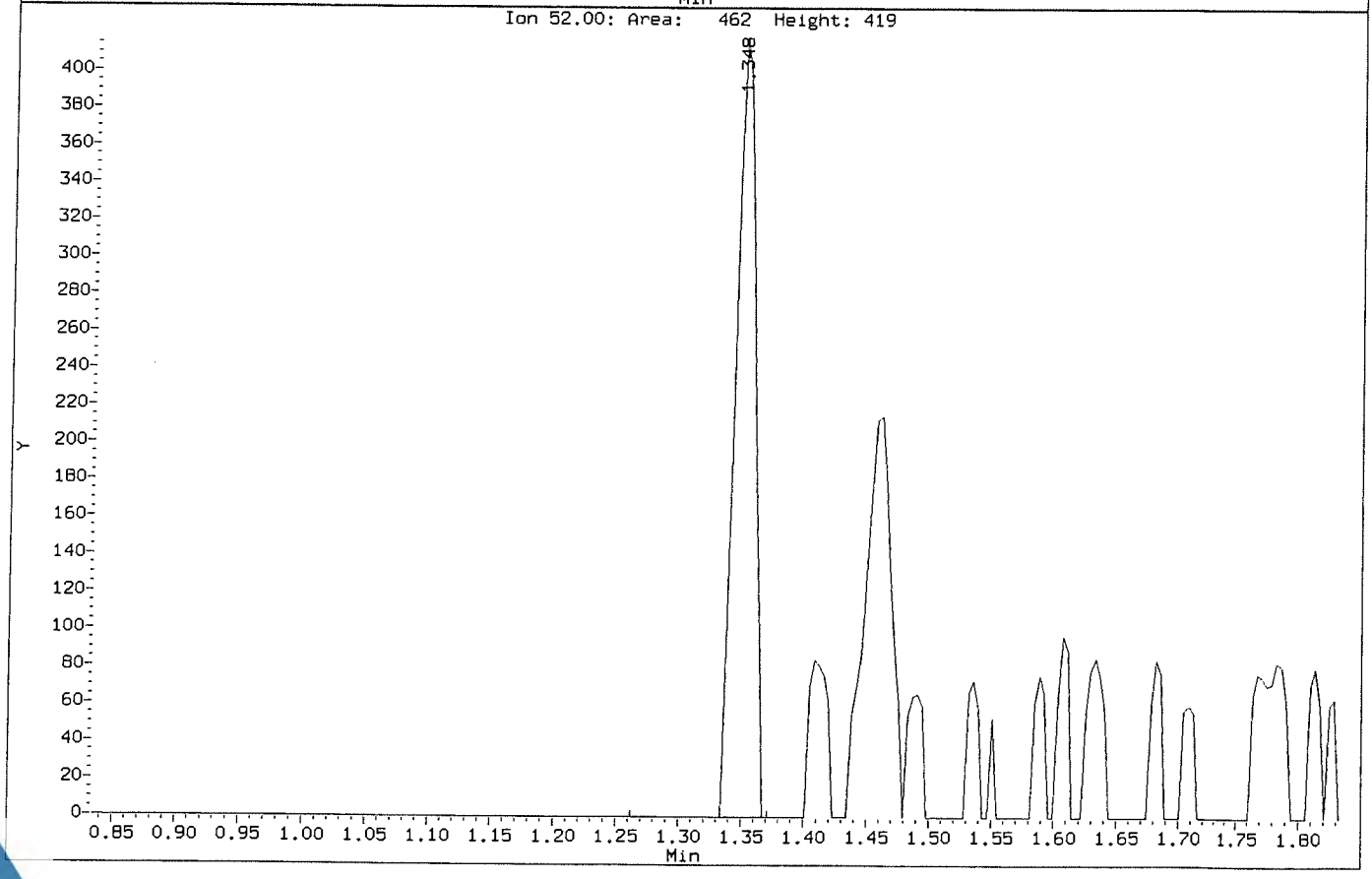
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Chloromethane
CAS Number: 74-87-3





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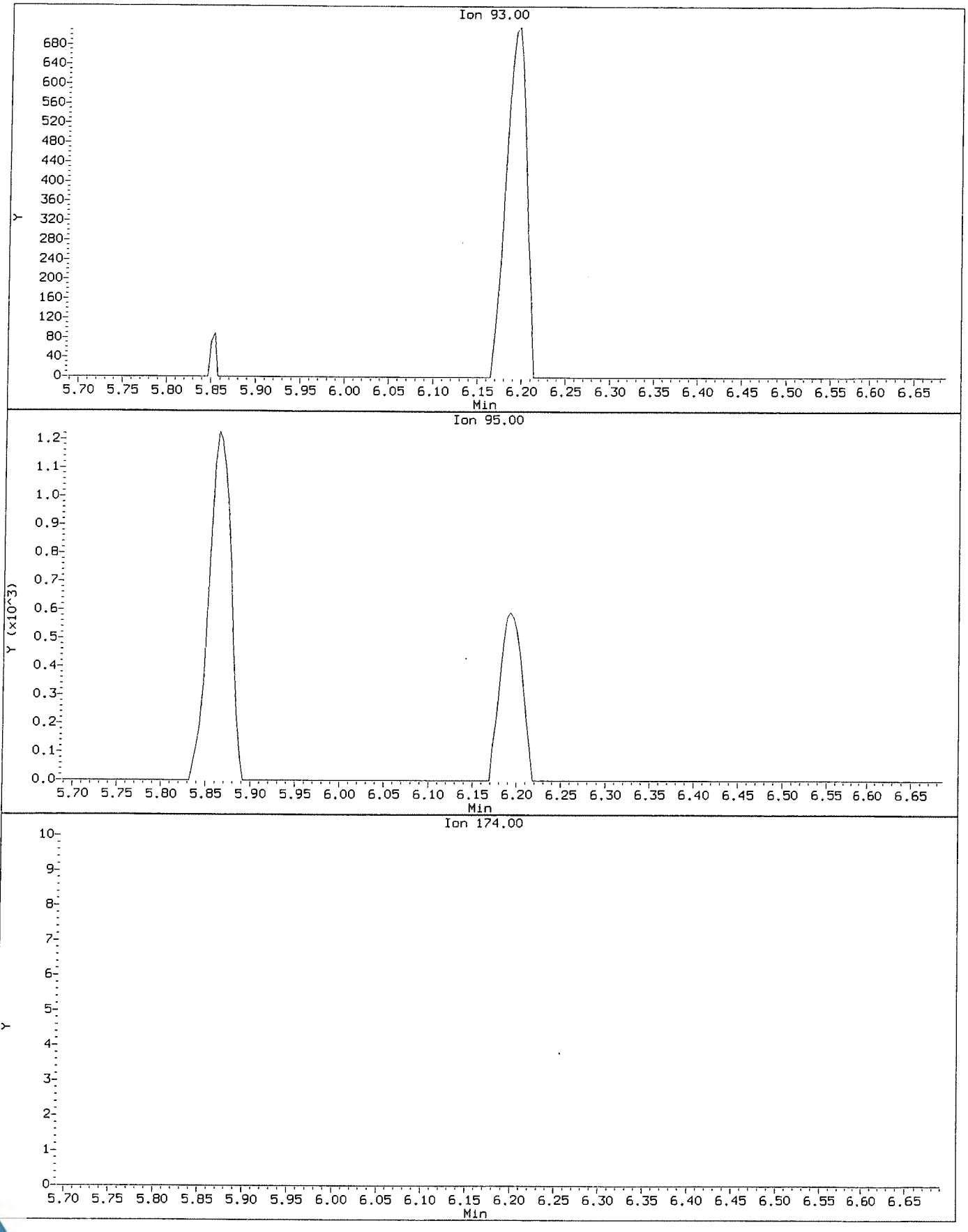
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Dibromomethane
CAS Number: 74-95-3



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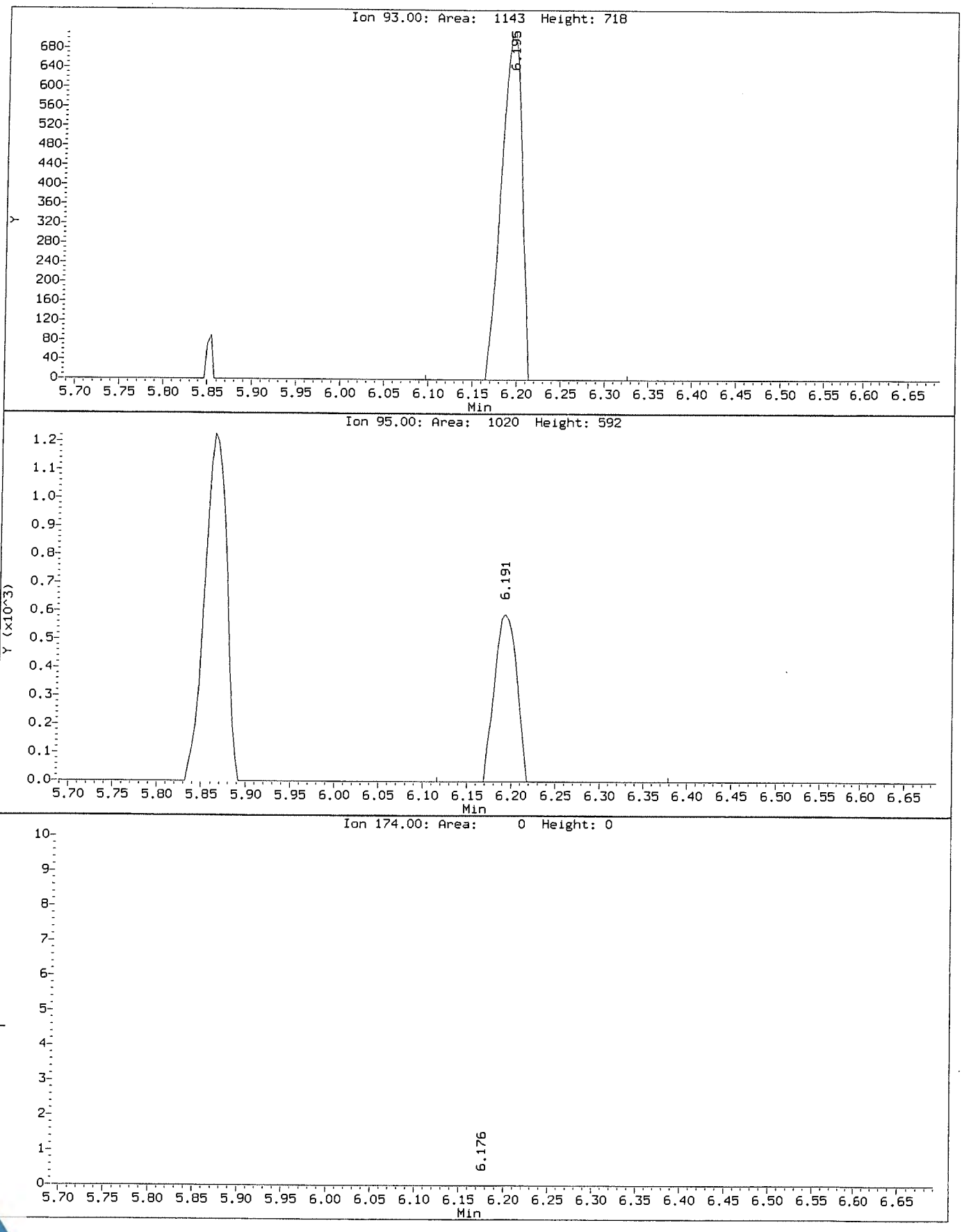
Compound: Dibromomethane
CAS Number: 74-95-3



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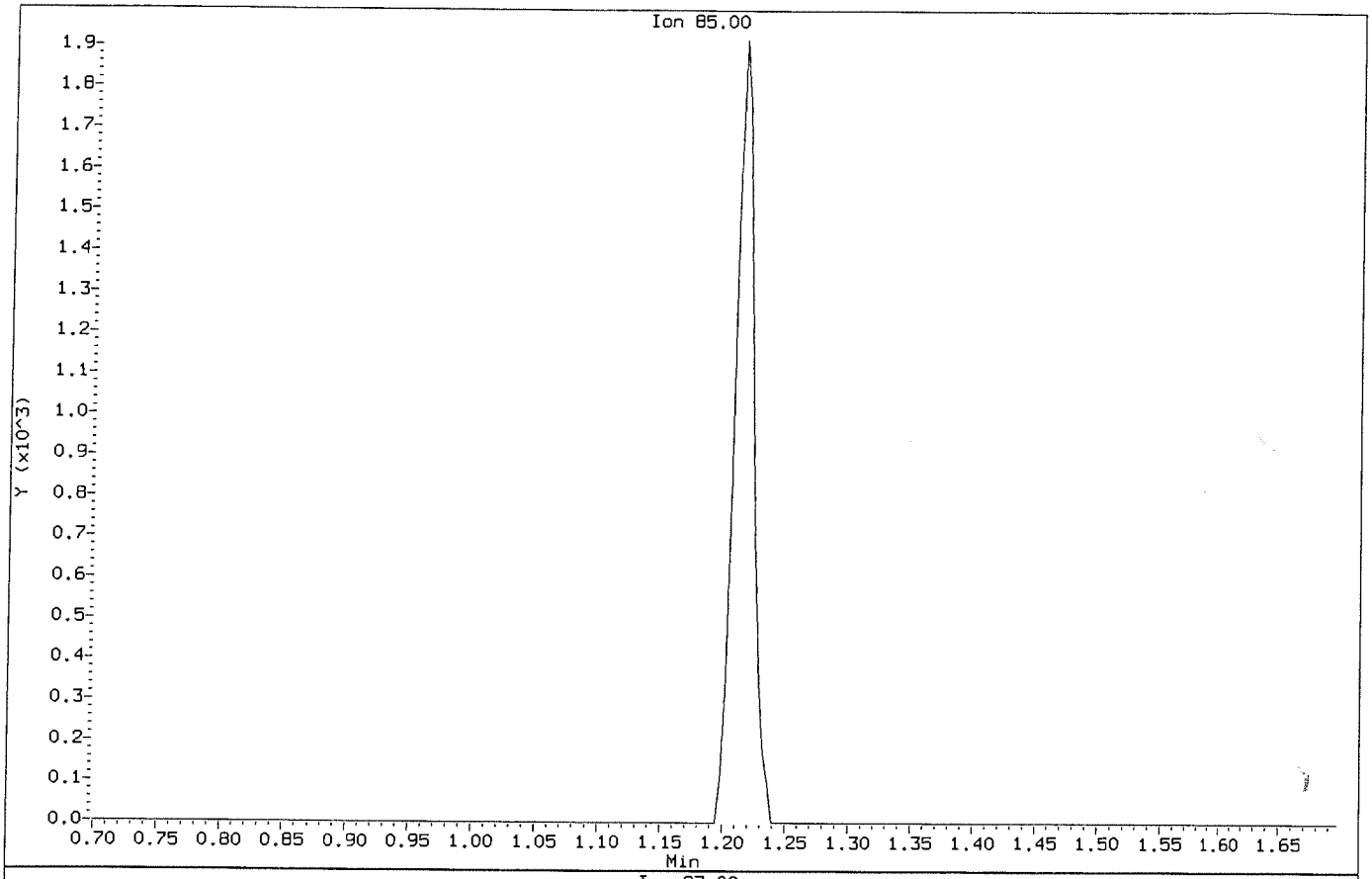
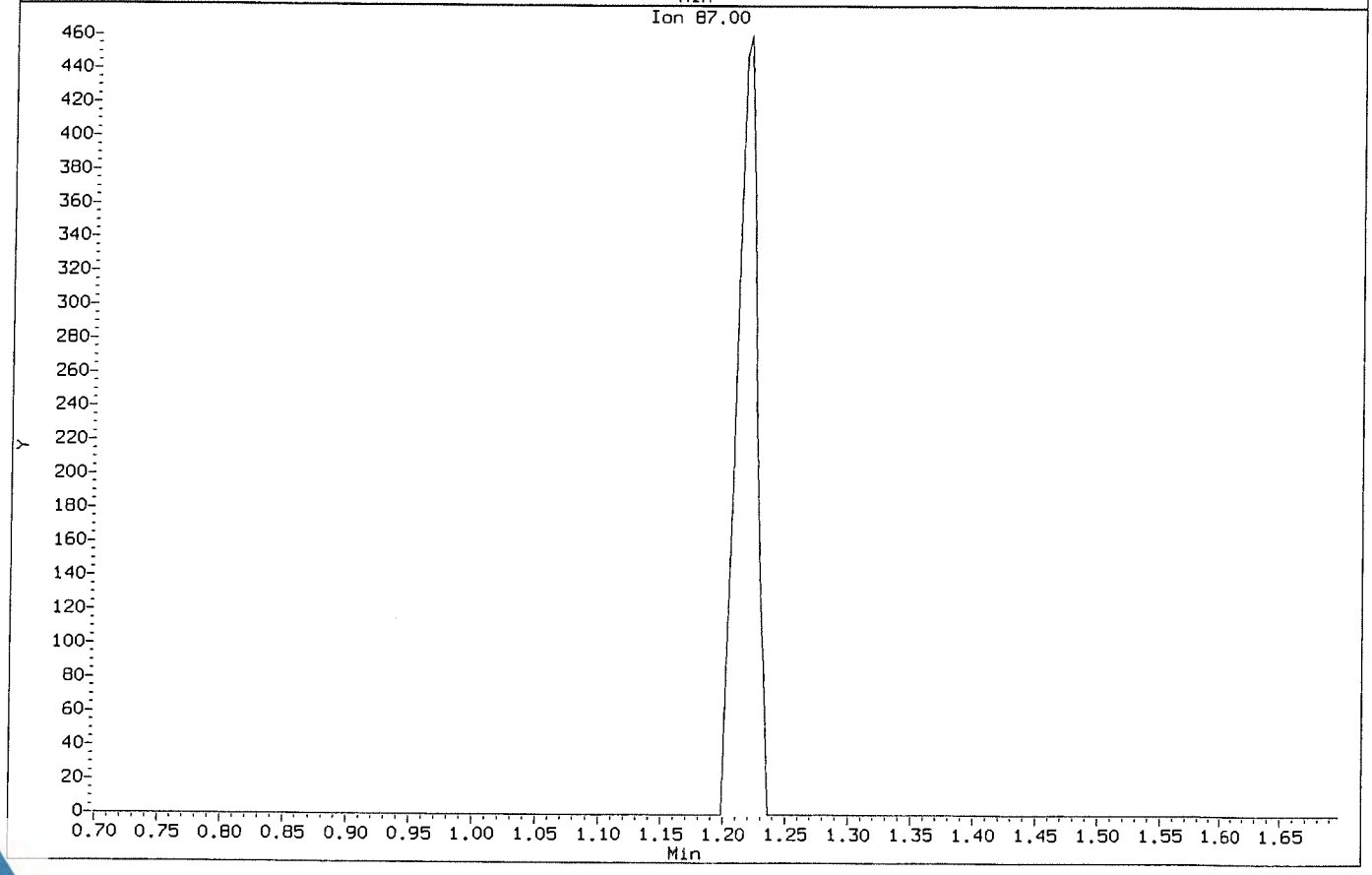
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





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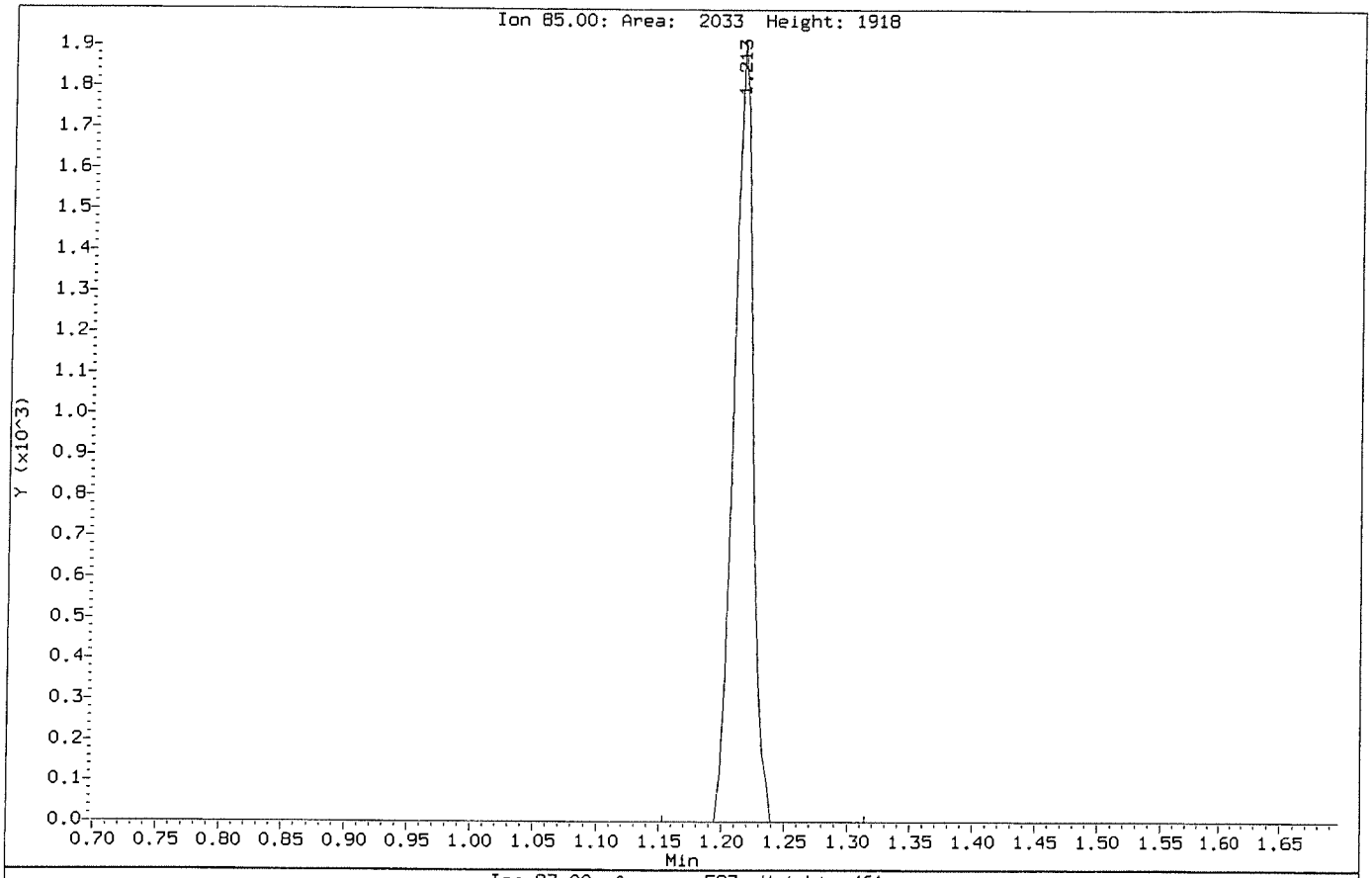
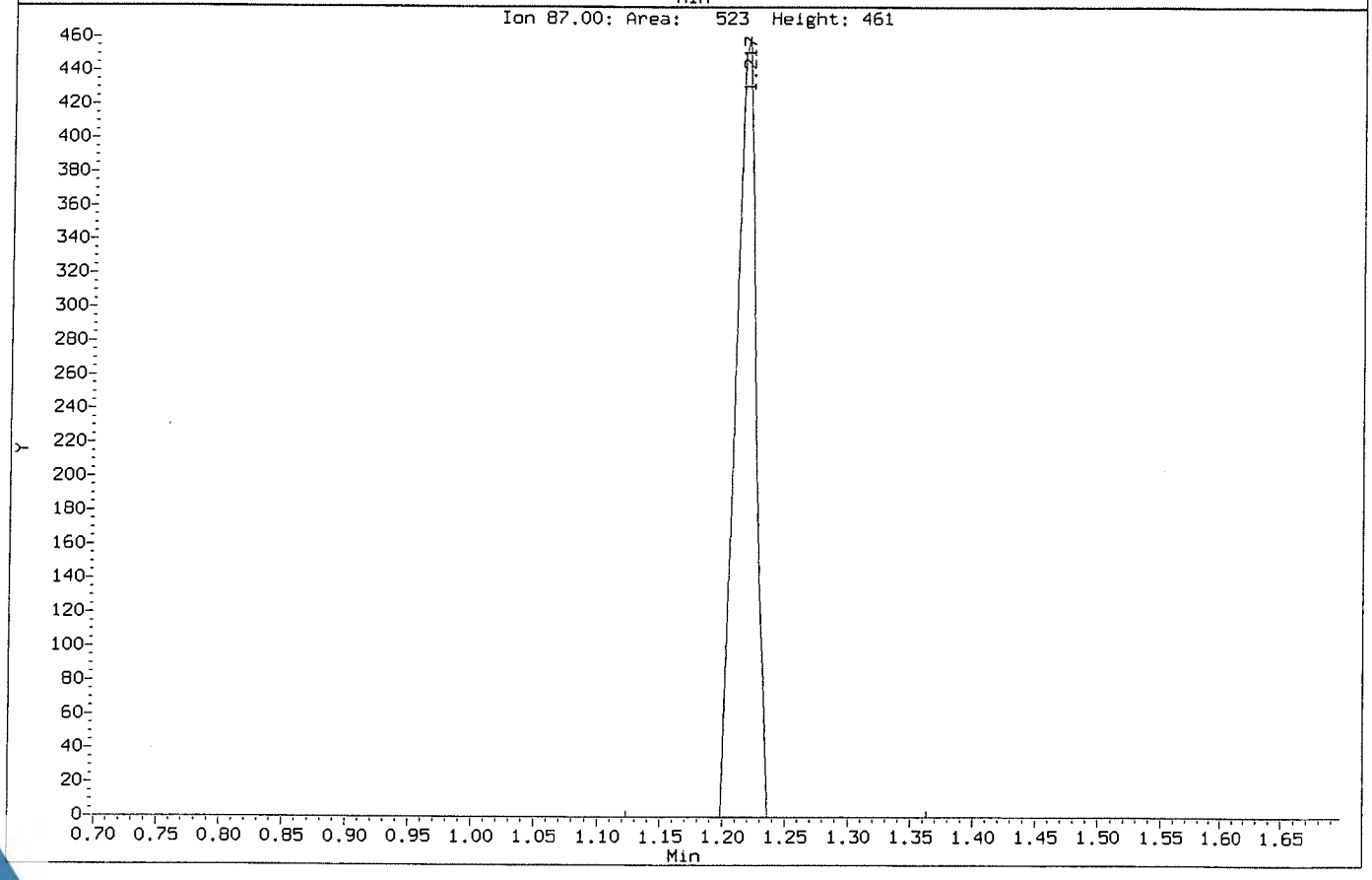
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





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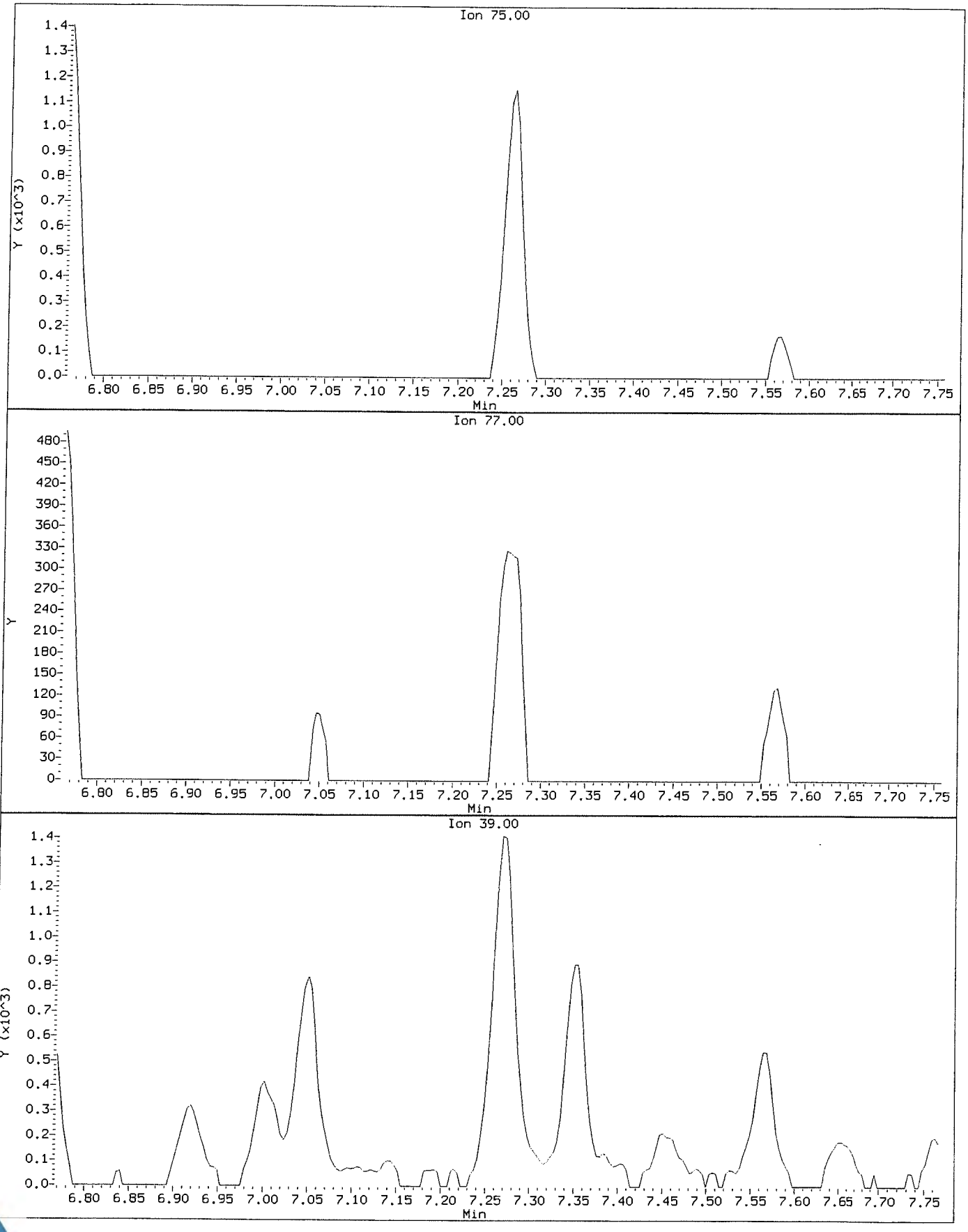
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



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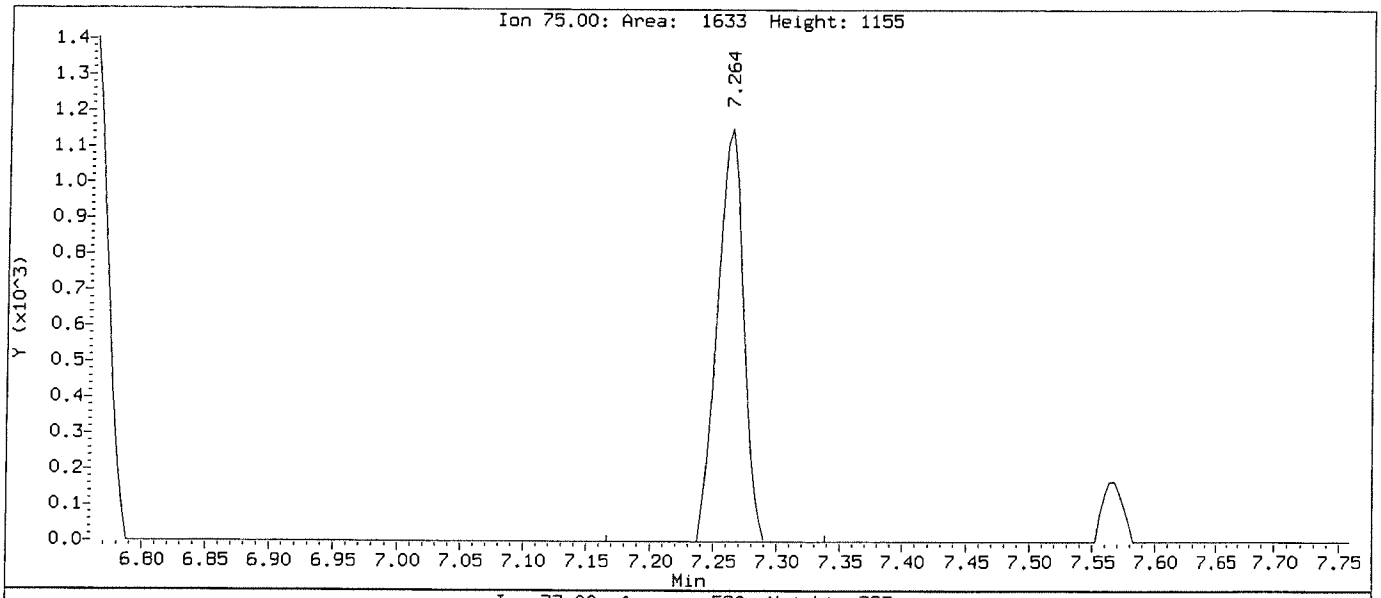
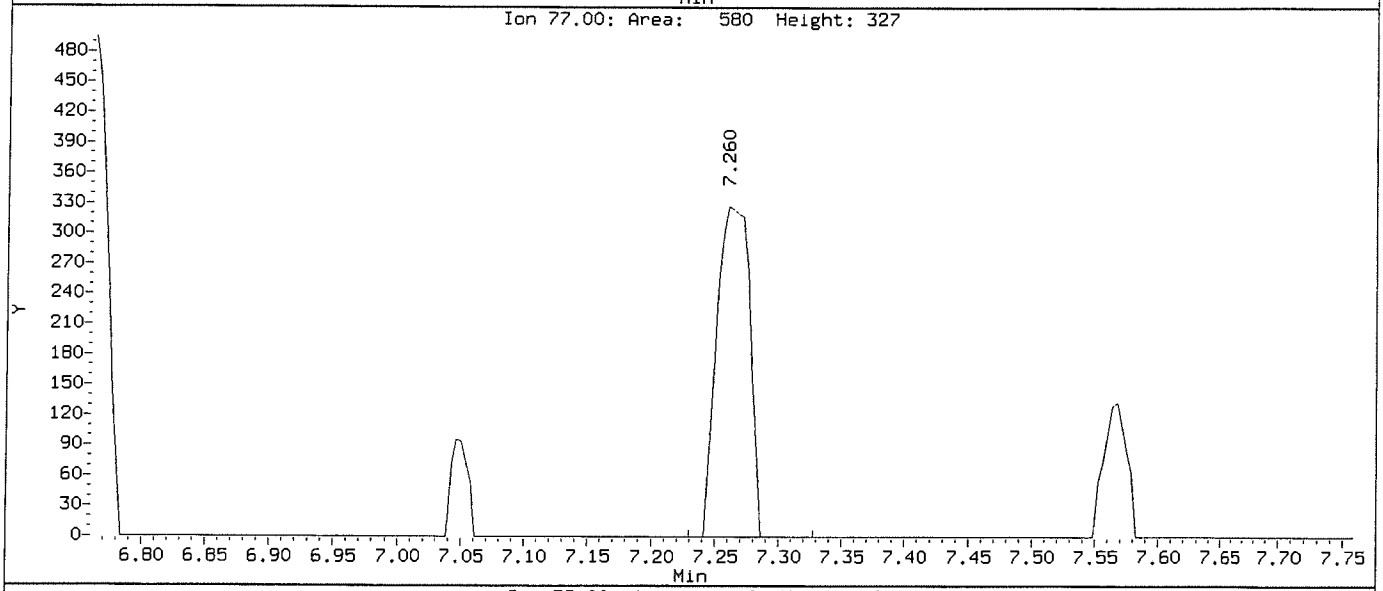
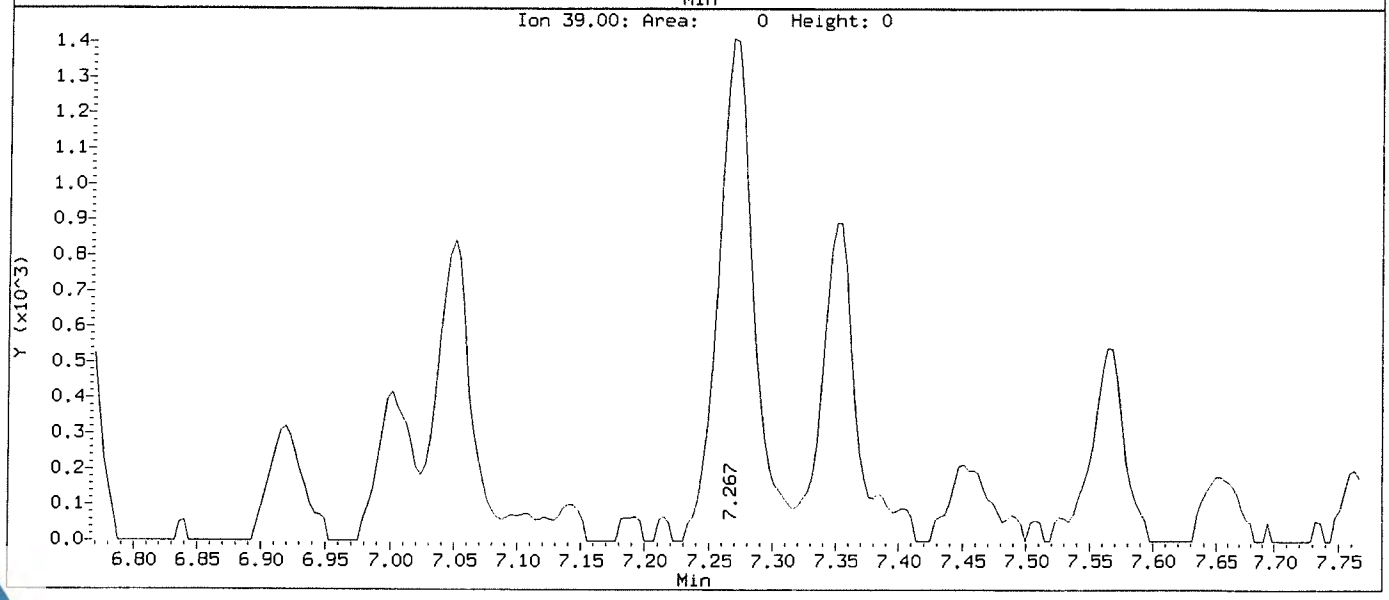
Injection Date: 21-DEC-2018 14:14
Instrument: VOA9.i
Client Sample ID: VSTD00.5

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6







Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122104.D Page 1
Report Date: 28-Jan-2019 11:25

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122104.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 21-DEC-2018 15:03
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 14:14 Cal File: U122103.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

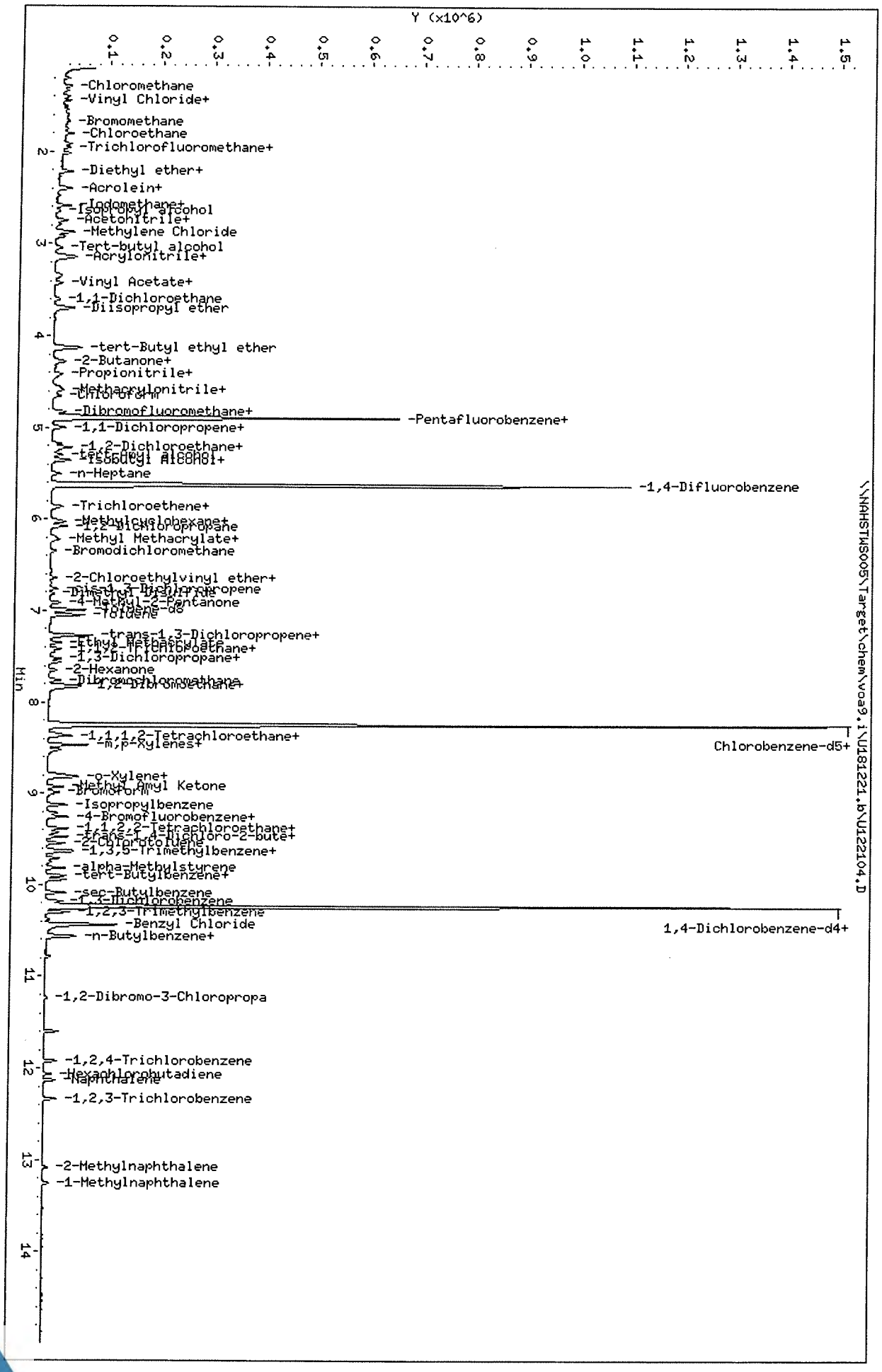
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	408613	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	790484	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	731112	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	336061	50.0000	
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.986)	8005	1.00000	0.30(a)
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	10907	1.00000	(a)
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	32175	1.00000	(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	12547	1.00000	0.36(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	4208	1.00000	1.48(a)
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	7082	1.00000	1.09(a)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	9134	1.00000	1.20(a)
138 Freon TF	101	2.401	2.401	(0.491)	4108	1.00000	1.18(a)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	5137	1.00000	1.17(a)
22 1,1-Dichloroethane	63	3.604	3.604	(0.737)	10662	1.00000	1.21(a)
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	4598	1.00000	1.18(a)
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	8232	1.00000	1.17(a)
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	6631	1.00000	1.66(a)
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	8706	1.00000	1.10(a)
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	6820	1.00000	1.09(a)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	18977	1.00000	1.07(a)
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	861	1.00000	2.16(a)
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	5748	1.00000	1.14(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122104.D Page 2
Report Date: 28-Jan-2019 11:25

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	11945	1.00000	1.19(a)
33	1,2-Dichloroethane	62	5.250	5.250	(0.933)	8970	1.00000	0.54(a)
42	1,2-Dichloropropane	63	6.078	6.078	(1.081)	6565	1.00000	1.17(a)
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	18075	1.00000	1.07(a)
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	11430	1.00000	1.14(a)
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	10939	1.00000	1.16(a)
84	1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	12811	1.00000	1.21(a)
26	2,2-Dichloropropane	77	4.272	4.272	(0.873)	6236	1.00000	1.17(a)
24	2-Butanone	43	4.343	4.343	(0.887)	6369	2.00000	0.00(a)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	17719	1.00000	1.14(a)
52	2-Hexanone	43	7.649	7.649	(0.927)	8136	2.00000	2.00(a)
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	20099	1.00000	1.12(a)
82	p-Isopropyltoluene	119	10.210	10.210	(0.997)	18371	1.00000	1.03(a)
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	12526	2.00000	2.14(a)
10	Acetone	43	2.480	2.480	(0.507)	5582	2.00000	0.58(a)
37	Benzene	78	5.216	5.216	(0.927)	24701	1.00000	1.17(a)
74	Bromobenzene	156	9.381	9.381	(0.917)	5982	1.00000	1.15(a)
29	Bromochloromethane	128	4.553	4.553	(0.930)	2865	1.00000	(a)
39	Bromodichloromethane	83	6.348	6.348	(1.129)	6221	1.00000	1.04(aM)
66	Bromoform	173	8.984	8.984	(1.089)	2343	1.00000	2.48(Ta)
6	Bromomethane	94	1.670	1.670	(0.341)	2293	1.00000	2.22(a)
19	Carbon Disulfide	76	2.585	2.585	(0.528)	33391	2.00000	2.35(a)
34	Carbon Tetrachloride	117	4.991	4.991	(0.887)	5463	1.00000	2.32(a)
59	Chlorobenzene	112	8.275	8.275	(1.003)	16703	1.00000	1.18(a)
7	Chloroethane	64	1.749	1.749	(0.357)	3213	1.00000	1.36(aM)
28	Chloroform	83	4.654	4.654	(0.951)	10242	1.00000	1.20(a)
3	Chloromethane	50	1.336	1.336	(0.273)	4689	1.00000	4.32(a)
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	6586	1.00000	1.22(a)
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	7273	1.00000	2.04(a)
55	Dibromochloromethane	129	7.758	7.758	(0.940)	4051	1.00000	1.80(a)
44	Dibromomethane	93	6.187	6.187	(1.100)	3627	1.00000	1.12(aM)
2	Dichlorodifluoromethane	85	1.201	1.201	(0.246)	6583	1.00000	1.78(a)
61	Ethylbenzene	106	8.369	8.369	(1.015)	8132	1.00000	1.12(a)
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	2672	1.00000	1.12(a)
67	Isopropylbenzene	105	9.126	9.126	(1.106)	22547	1.00000	1.08(a)
62	m,p-Xylenes	106	8.470	8.470	(1.027)	19538	2.00000	2.20(a)
17	Methylene Chloride	84	2.866	2.866	(0.586)	8113	1.00000	0.44(a)
87	n-Butylbenzene	91	10.554	10.554	(1.031)	18944	1.00000	1.10(a)
73	n-Propylbenzene	91	9.475	9.475	(0.926)	27852	1.00000	1.10(a)
92	Naphthalene	128	12.133	12.133	(1.185)	16505	1.00000	1.44(a)
63	o-Xylene	106	8.811	8.811	(1.068)	10277	1.00000	1.15(a)
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	22753	1.00000	1.07(a)
64	Styrene	104	8.826	8.826	(1.070)	15133	1.00000	1.01(a)
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	15715	1.00000	1.07(a)
56	Tetrachloroethene	164	7.522	7.522	(0.912)	4775	1.00000	1.24(a)
50	Toluene	91	7.046	7.046	(0.854)	24298	1.00000	1.11(a)
20	trans-1,2-Dichloroethene	96	3.140	3.140	(0.642)	5920	1.00000	1.23(a)
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	5668	1.00000	2.35(a)
38	Trichloroethene	130	5.861	5.861	(1.042)	6040	1.00000	1.18(a)
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	7922	1.00000	1.78(a)
5	Vinyl Chloride	62	1.415	1.415	(0.289)	6308	1.00000	2.03(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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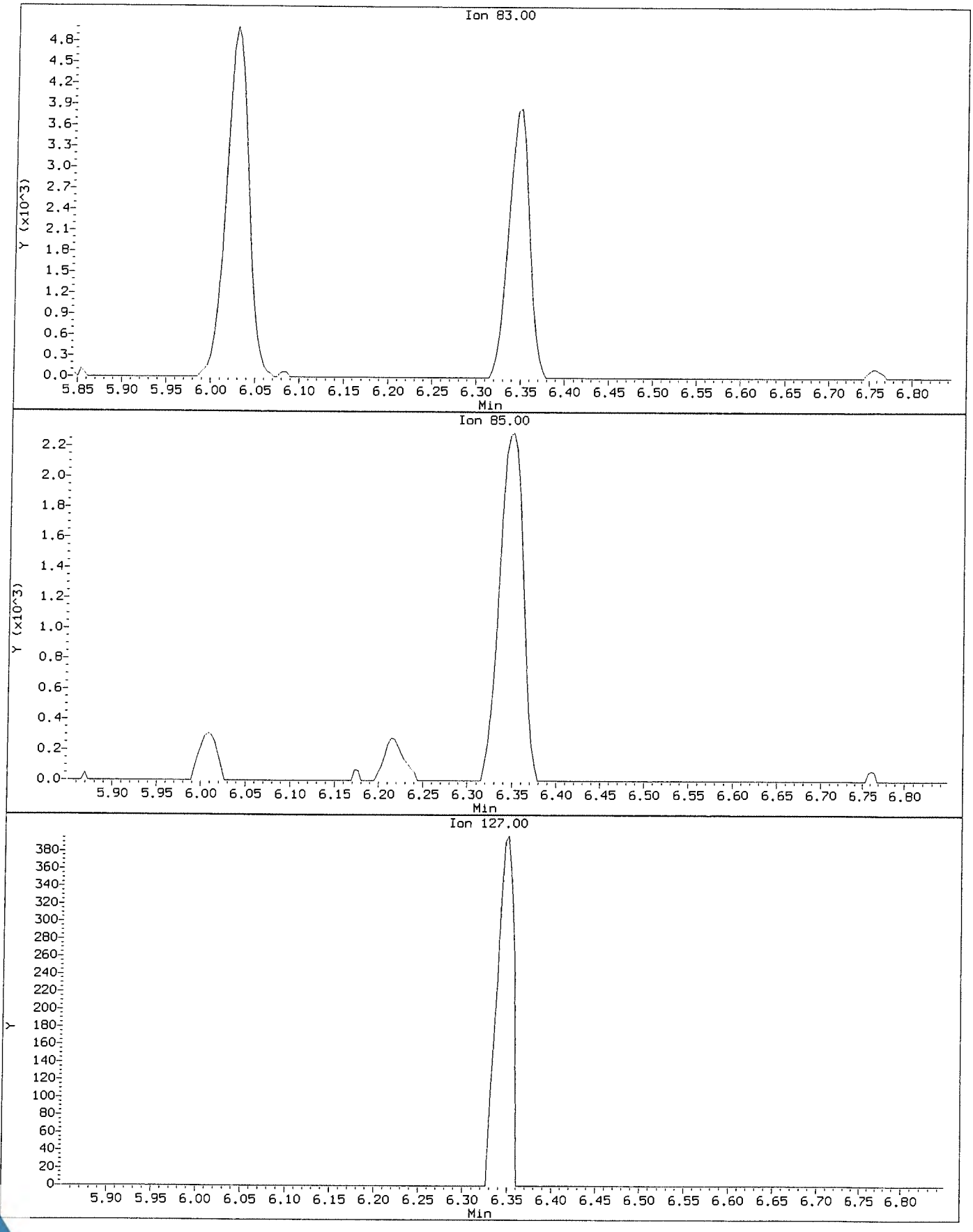
Date : 21-DEC-2018 15:03
Client ID: VSTD001
Sample Info: VSTD001;VSTD001;1;3;
Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122104.D

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122104.D
Injection Date: 21-DEC-2018 15:03
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4



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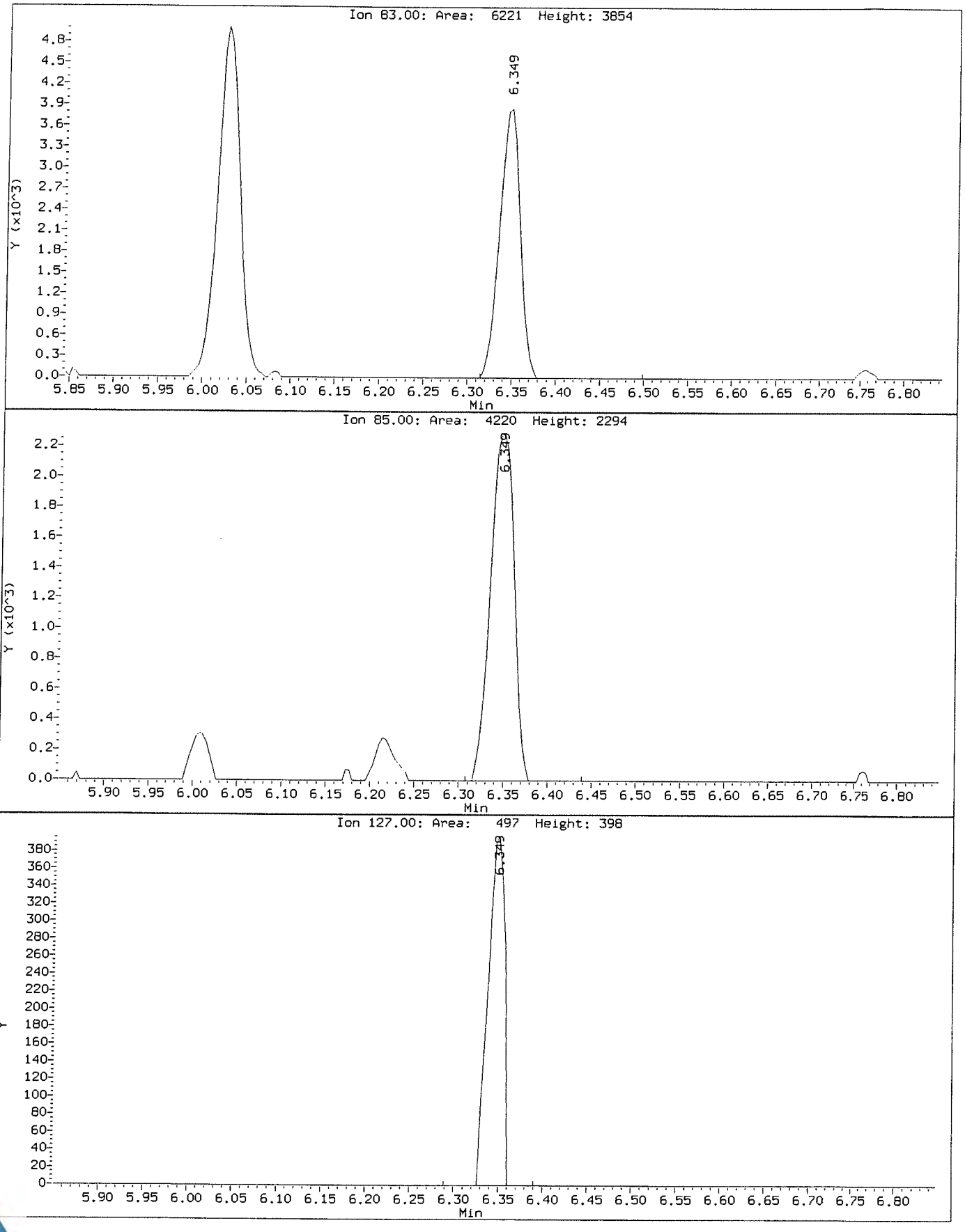
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4



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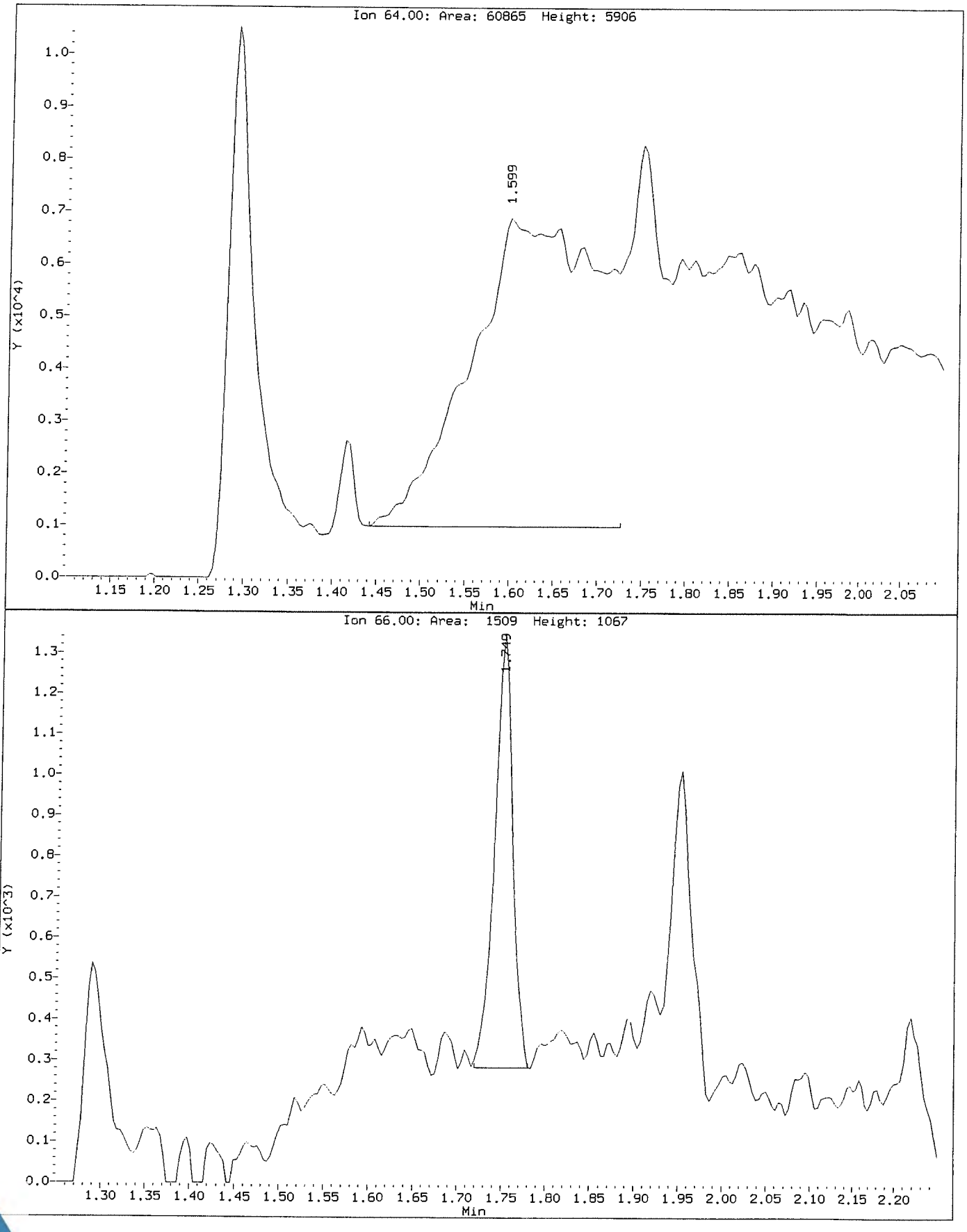
Injection Date: 21-DEC-2018 15:03
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3



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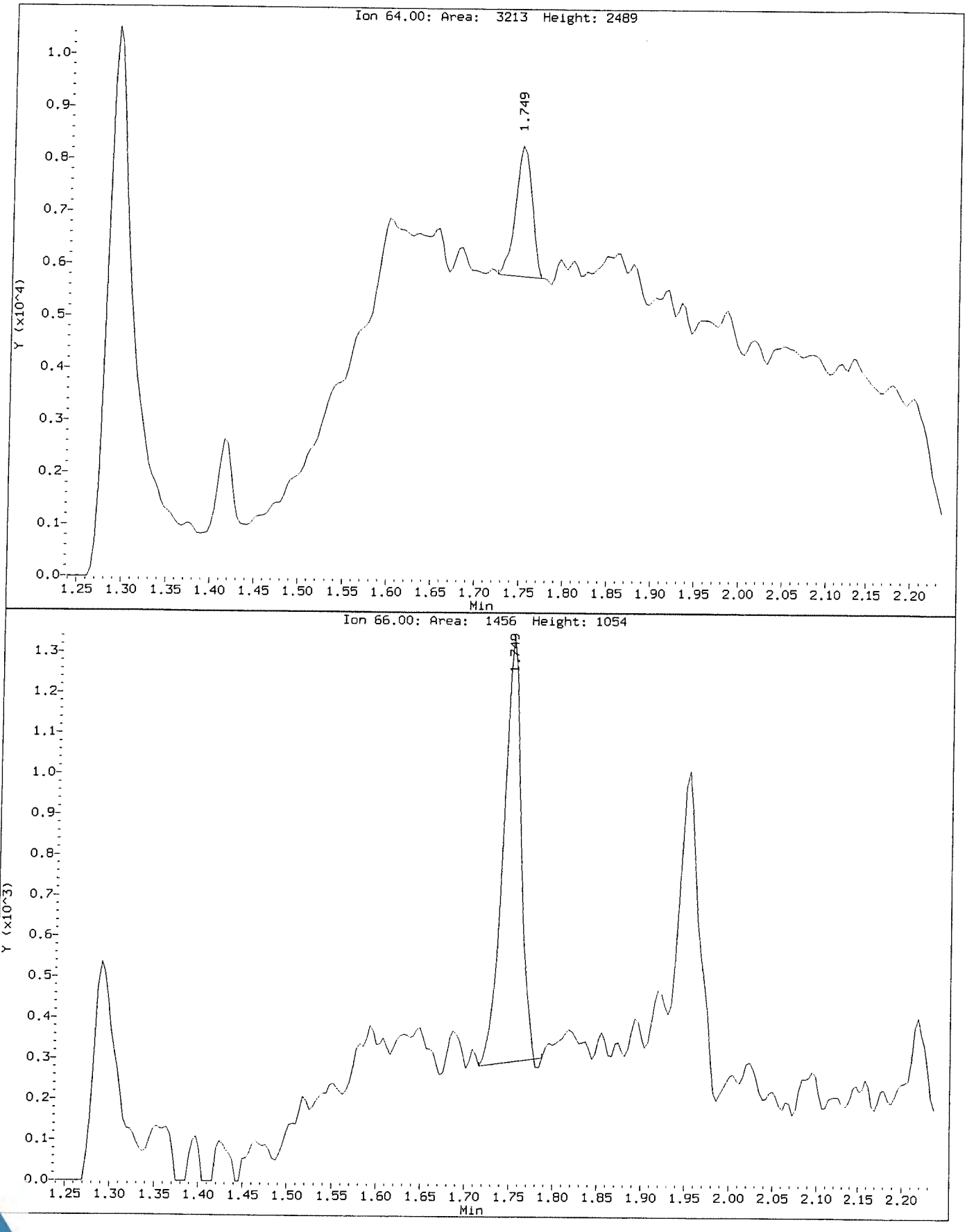
Injection Date: 21-DEC-2018 15:03
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3



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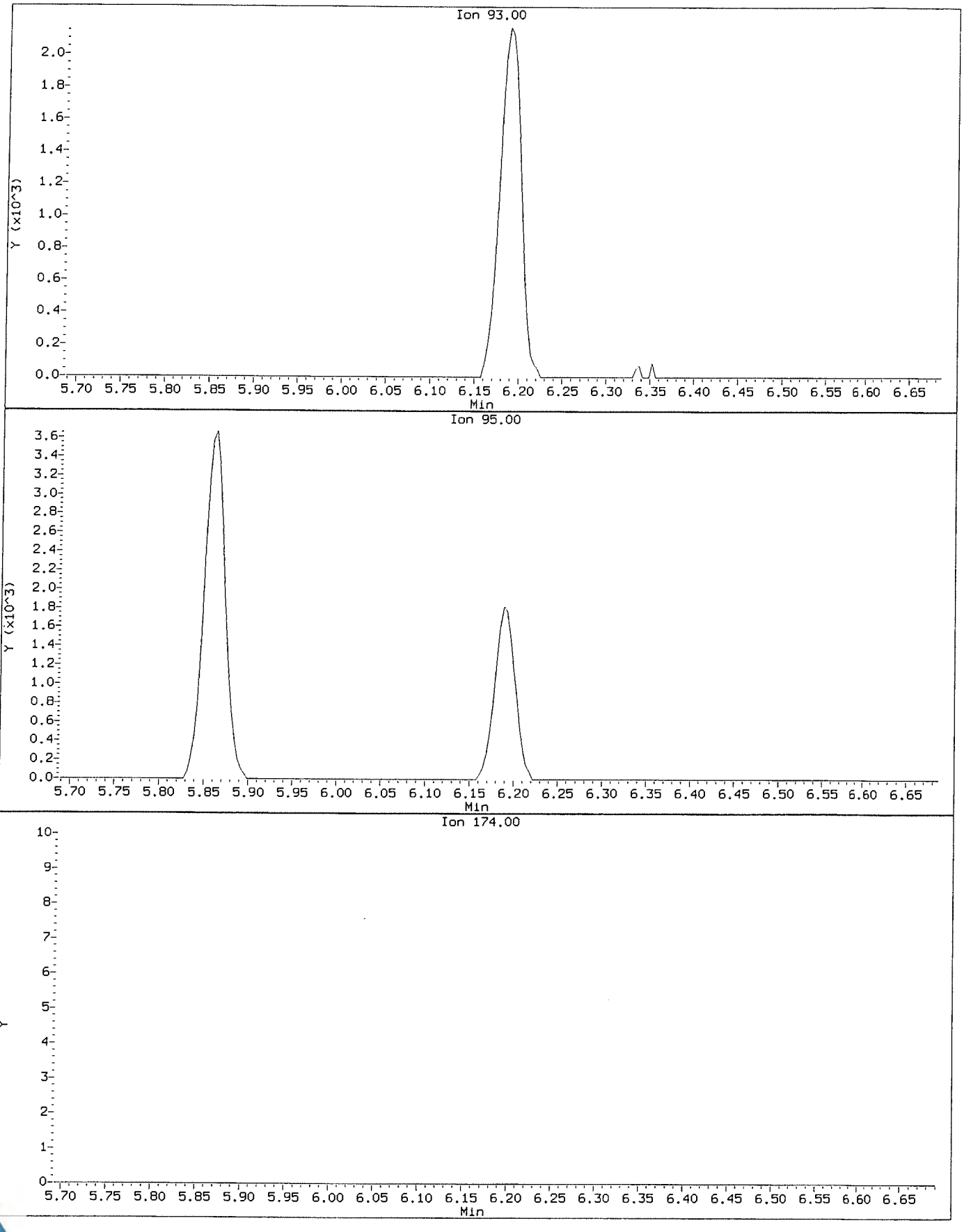
Injection Date: 21-DEC-2018 15:03
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Dibromomethane
CAS Number: 74-95-3



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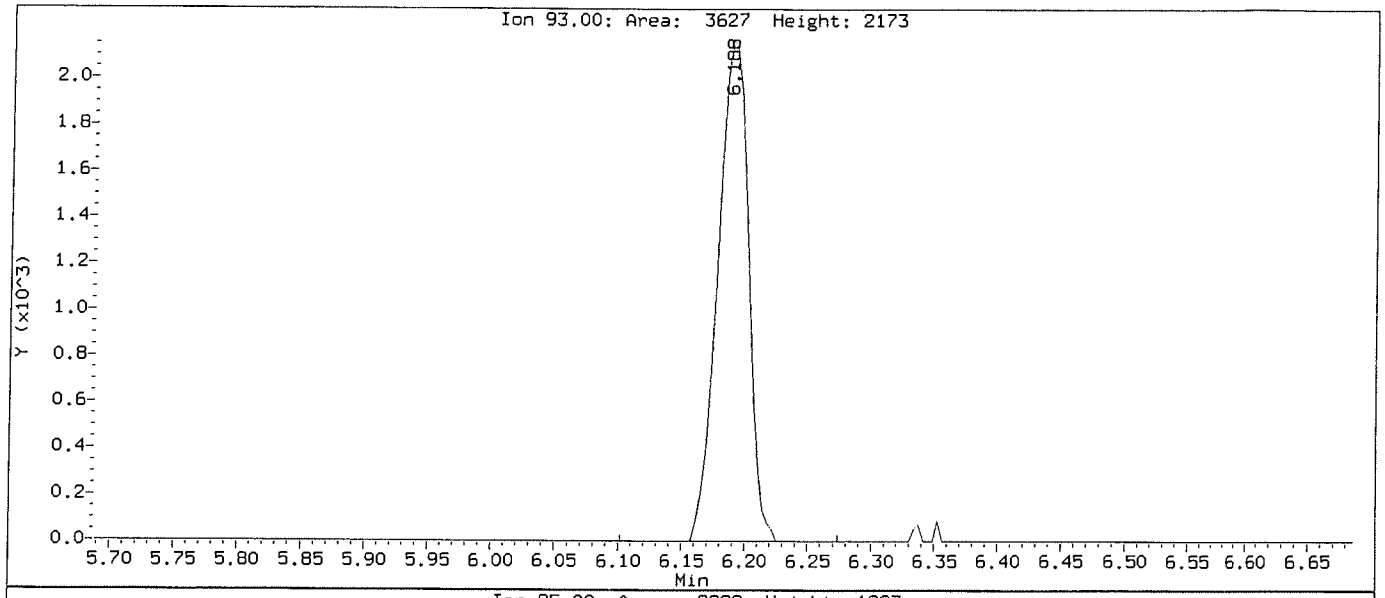
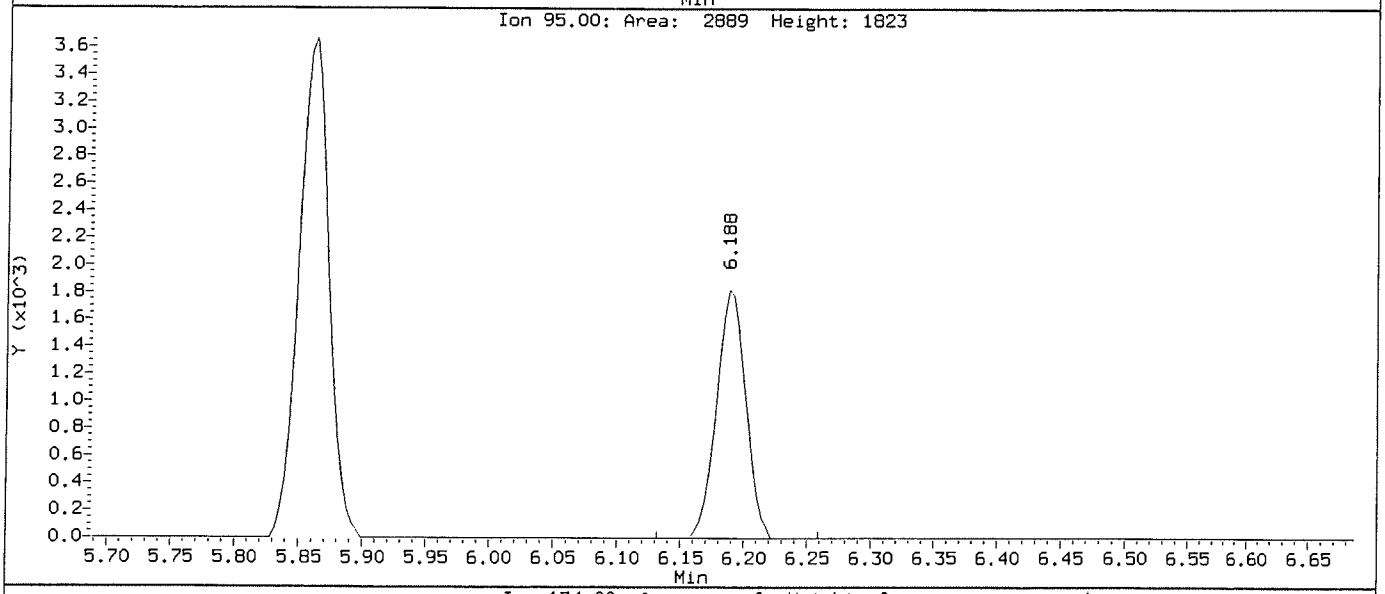
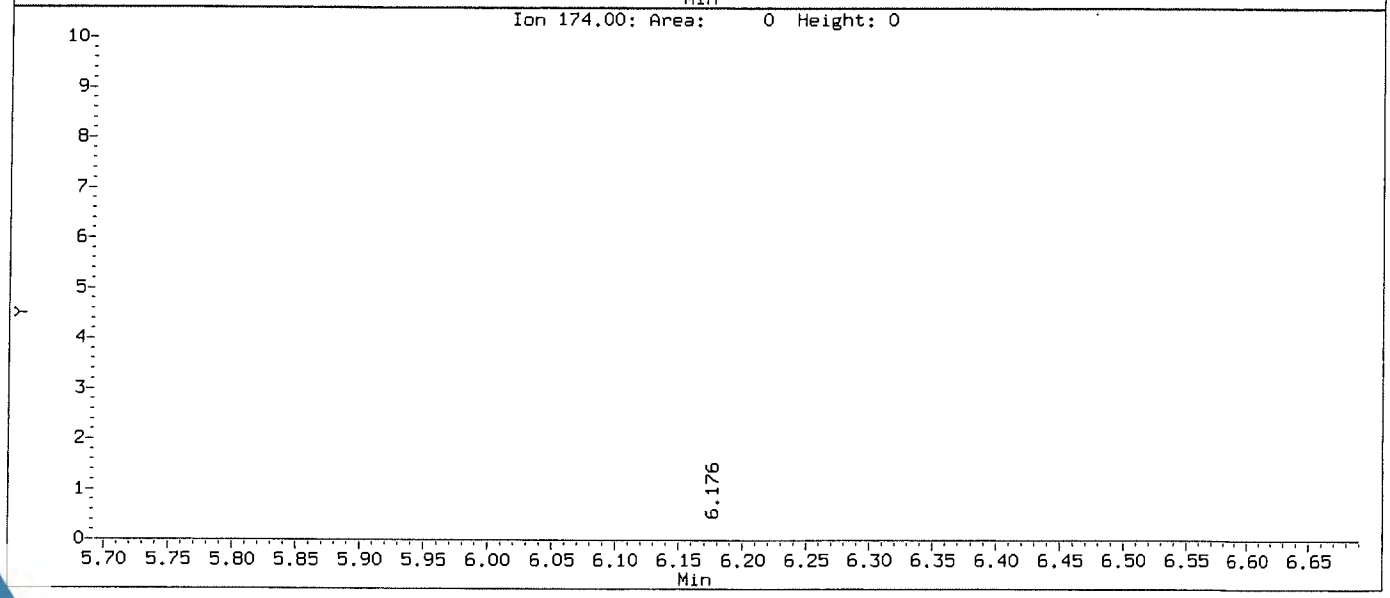
Injection Date: 21-DEC-2018 15:03
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Dibromomethane
CAS Number: 74-95-3







Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122105.D Page 1
Report Date: 28-Jan-2019 11:25

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122105.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 21-DEC-2018 15:28
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD002;VSTD002;1;4;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 15:03 Cal File: U122104.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

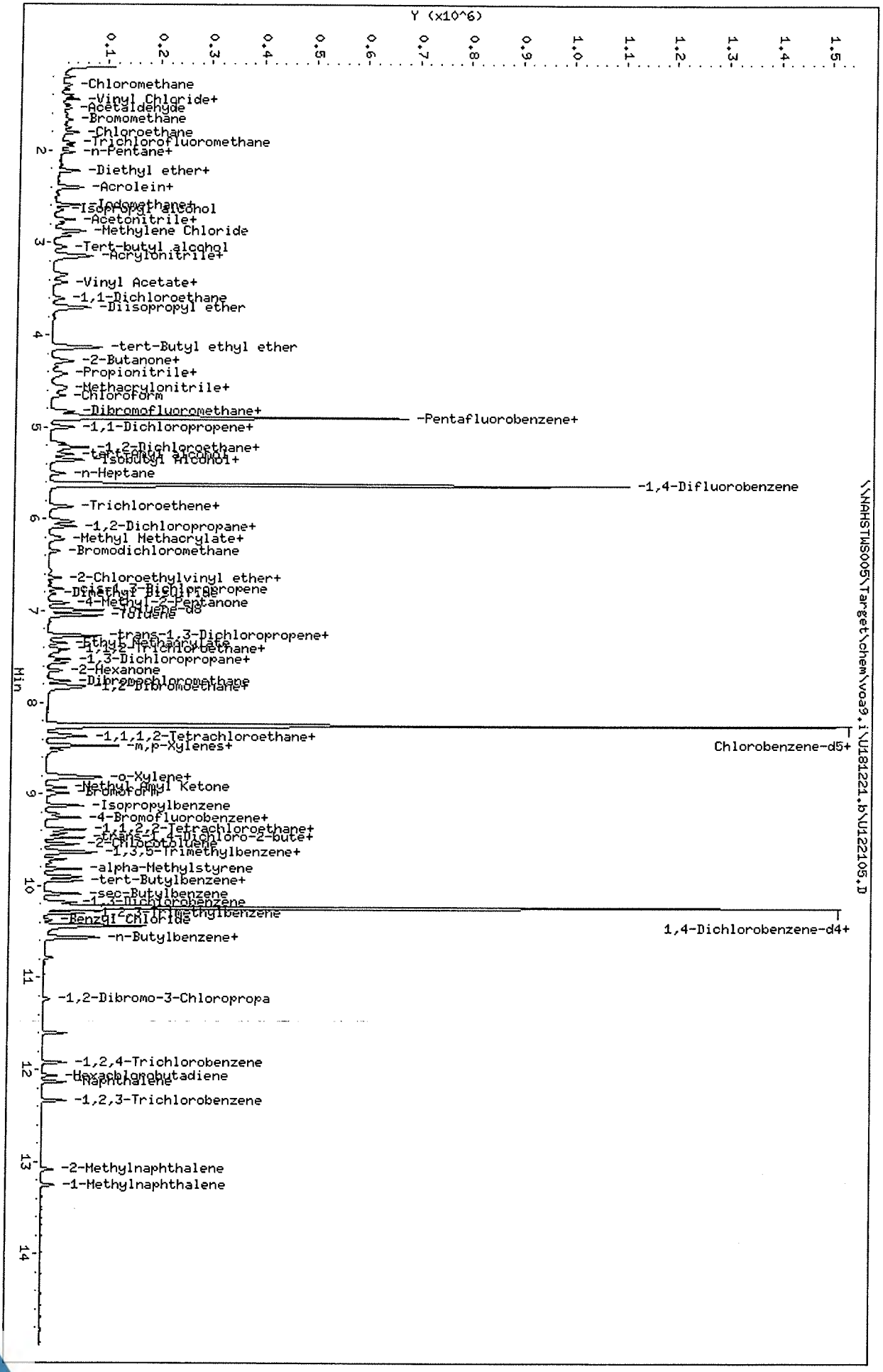
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.894	4.894	(1.000)	416245	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	790380	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	728875	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	340088	50.0000	
$	30 Dibromofluoromethane	113	4.830	4.830	(0.987)	12720	2.00000	1.32(a)
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	17881	2.00000	0.99(a)
$	48 Toluene-d8	98	6.989	6.989	(0.847)	54444	2.00000	1.21(a)
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	20092	2.00000	1.45(a)
	60 1,1,1,2-Tetrachloroethane	131	8.347	8.347	(1.012)	8522	2.00000	2.40(a)
	31 1,1,1-Trichloroethane	97	4.827	4.827	(0.986)	12904	2.00000	1.96(a)
	68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	16933	2.00000	2.21(a)
	138 Freon TF	101	2.401	2.401	(0.491)	7489	2.00000	2.11(a)
	53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	9254	2.00000	2.13(a)
	22 1,1-Dichloroethane	63	3.604	3.604	(0.737)	19553	2.00000	2.18(a)
	11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	8761	2.00000	2.21(a)
	32 1,1-Dichloropropene	75	5.006	5.006	(0.890)	15087	2.00000	2.14(a)
	93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	12385	2.00000	2.54(a)
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	16368	2.00000	2.05(a)
	90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	12313	2.00000	1.95(a)
	79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	36129	2.00000	2.03(a)
	89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	1910	2.00000	3.02(a)
	57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	10069	2.00000	2.01(a)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122105.D Page 2
Report Date: 28-Jan-2019 11:25

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	21852	2.00000	2.16(a)
33	1,2-Dichloroethane	62	5.254	5.254	(0.934)	15708	2.00000	1.50(a)
42	1,2-Dichloropropane	63	6.079	6.079	(1.081)	11593	2.00000	2.07(a)
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	33264	2.00000	1.94(a)
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	21833	2.00000	2.16(a)
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	19804	2.00000	2.11(a)
84	1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	22897	2.00000	2.15(a)
26	2,2-Dichloropropane	77	4.275	4.275	(0.874)	10414	2.00000	1.92(a)
24	2-Butanone	43	4.343	4.343	(0.887)	11299	4.00000	1.81(a)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	32538	2.00000	2.07(a)
52	2-Hexanone	43	7.653	7.653	(0.928)	15773	4.00000	3.89(a)
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	38000	2.00000	2.09(a)
82	p-Isopropyltoluene	119	10.210	10.210	(0.997)	34224	2.00000	1.90(a)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.838)	23124	4.00000	3.96(a)
10	Acetone	43	2.484	2.484	(0.508)	8219	4.00000	2.18(a)
37	Benzene	78	5.220	5.220	(0.928)	44238	2.00000	2.10(a)
74	Bromobenzene	156	9.381	9.381	(0.917)	11074	2.00000	2.10(a)
29	Bromochloromethane	128	4.557	4.557	(0.931)	5148	2.00000	(a)
39	Bromodichloromethane	83	6.348	6.348	(1.129)	11433	2.00000	1.92(a)
66	Bromoform	173	8.984	8.984	(1.089)	4574	2.00000	3.17(Ta)
6	Bromomethane	94	1.674	1.674	(0.342)	4588	2.00000	3.07(a)
19	Carbon Disulfide	76	2.589	2.589	(0.529)	60138	4.00000	4.17(a)
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	10077	2.00000	3.10(a)
59	Chlorobenzene	112	8.275	8.275	(1.003)	29501	2.00000	2.10(a)
7	Chloroethane	64	1.753	1.753	(0.358)	8179	2.00000	2.69(aM)
28	Chloroform	83	4.658	4.658	(0.952)	18482	2.00000	2.14(a)
3	Chloromethane	50	1.340	1.340	(0.274)	8693	2.00000	5.15
27	cis-1,2-Dichloroethene	96	4.287	4.287	(0.876)	11391	2.00000	2.08(a)
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	13732	2.00000	2.74(a)
55	Dibromochloromethane	129	7.758	7.758	(0.940)	7740	2.00000	2.55(a)
44	Dibromomethane	93	6.191	6.191	(1.101)	6690	2.00000	2.07(aM)
2	Dichlorodifluoromethane	85	1.205	1.205	(0.246)	11371	2.00000	2.68(a)
61	Ethylbenzene	106	8.373	8.373	(1.015)	14915	2.00000	2.07(a)
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	4376	2.00000	1.81(a)
67	Isopropylbenzene	105	9.126	9.126	(1.106)	42416	2.00000	2.04(a)
62	m,p-Xylenes	106	8.474	8.474	(1.027)	36211	4.00000	4.10(a)
17	Methylene Chloride	84	2.873	2.873	(0.587)	13726	2.00000	1.52(a)
87	n-Butylbenzene	91	10.558	10.558	(1.031)	35309	2.00000	2.03(a)
73	n-Propylbenzene	91	9.475	9.475	(0.926)	51078	2.00000	2.01(a)
92	Naphthalene	128	12.133	12.133	(1.185)	32897	2.00000	2.21(a)
63	o-Xylene	106	8.811	8.811	(1.068)	17863	2.00000	2.00(a)
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	43551	2.00000	2.03(a)
64	Styrene	104	8.826	8.826	(1.070)	29048	2.00000	1.96(a)
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	29889	2.00000	2.02(a)
56	Tetrachloroethene	164	7.526	7.526	(0.912)	8071	2.00000	2.11(a)
50	Toluene	91	7.049	7.049	(0.855)	46092	2.00000	2.12(a)
20	trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	10325	2.00000	2.11(a)
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	10646	2.00000	2.97(a)
38	Trichloroethene	130	5.861	5.861	(1.042)	10169	2.00000	2.00(a)
8	Trichlorofluoromethane	101	1.955	1.955	(0.400)	14026	2.00000	2.64(a)
5	Vinyl Chloride	62	1.419	1.419	(0.290)	12656	2.00000	3.07(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122105.D

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Page 4

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122105.D
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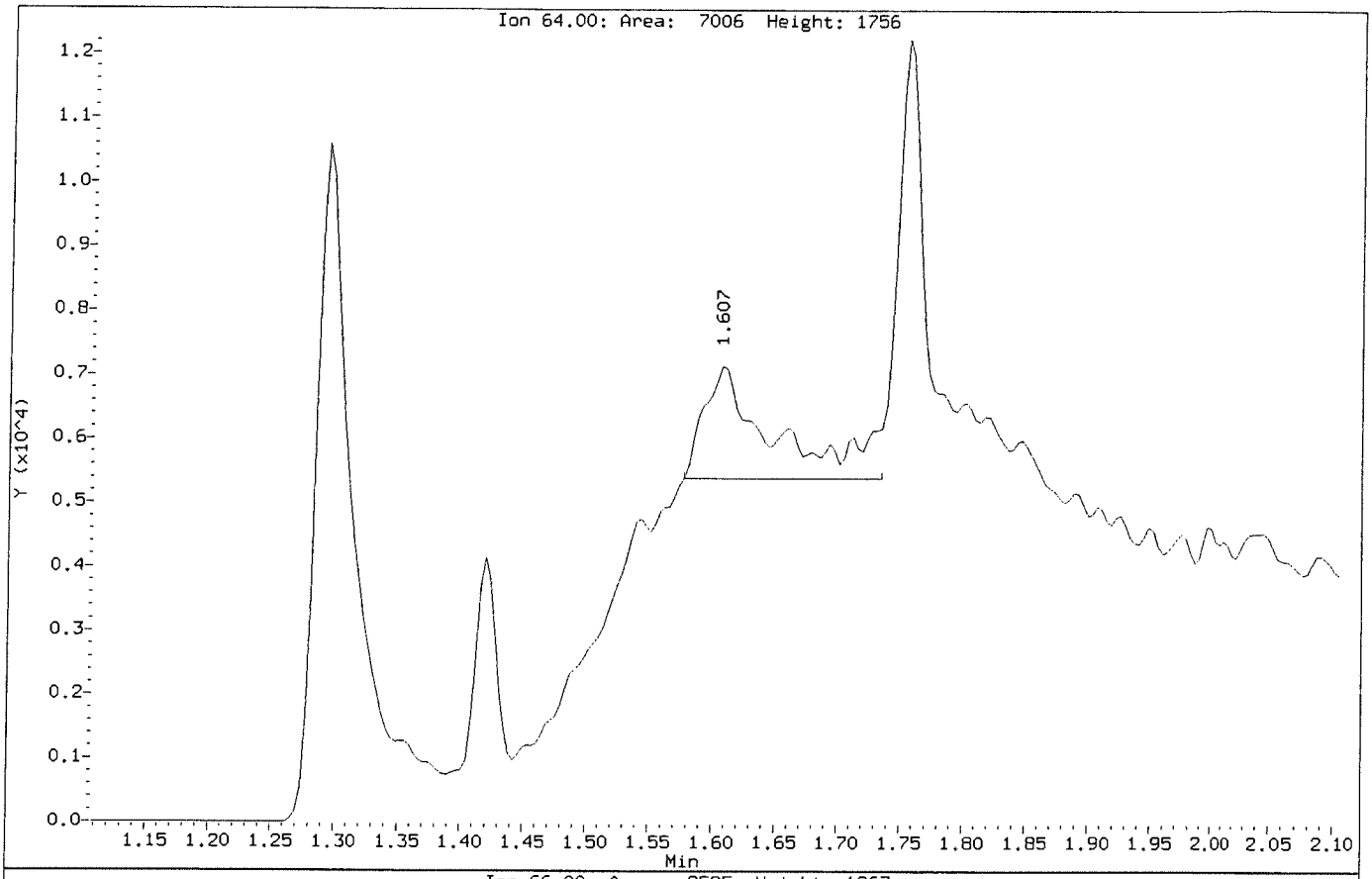
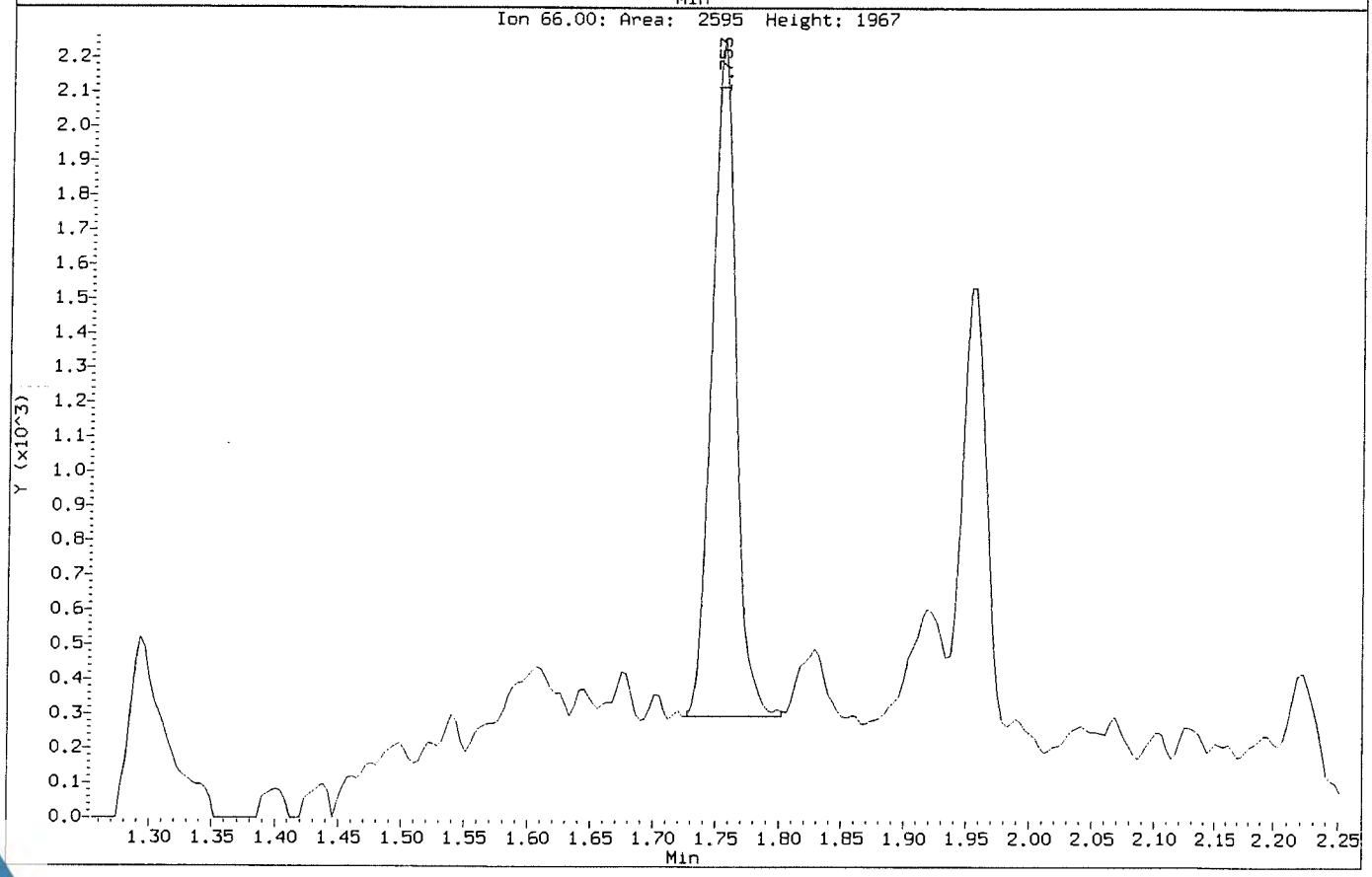
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Chloroethane
CAS Number: 75-00-3





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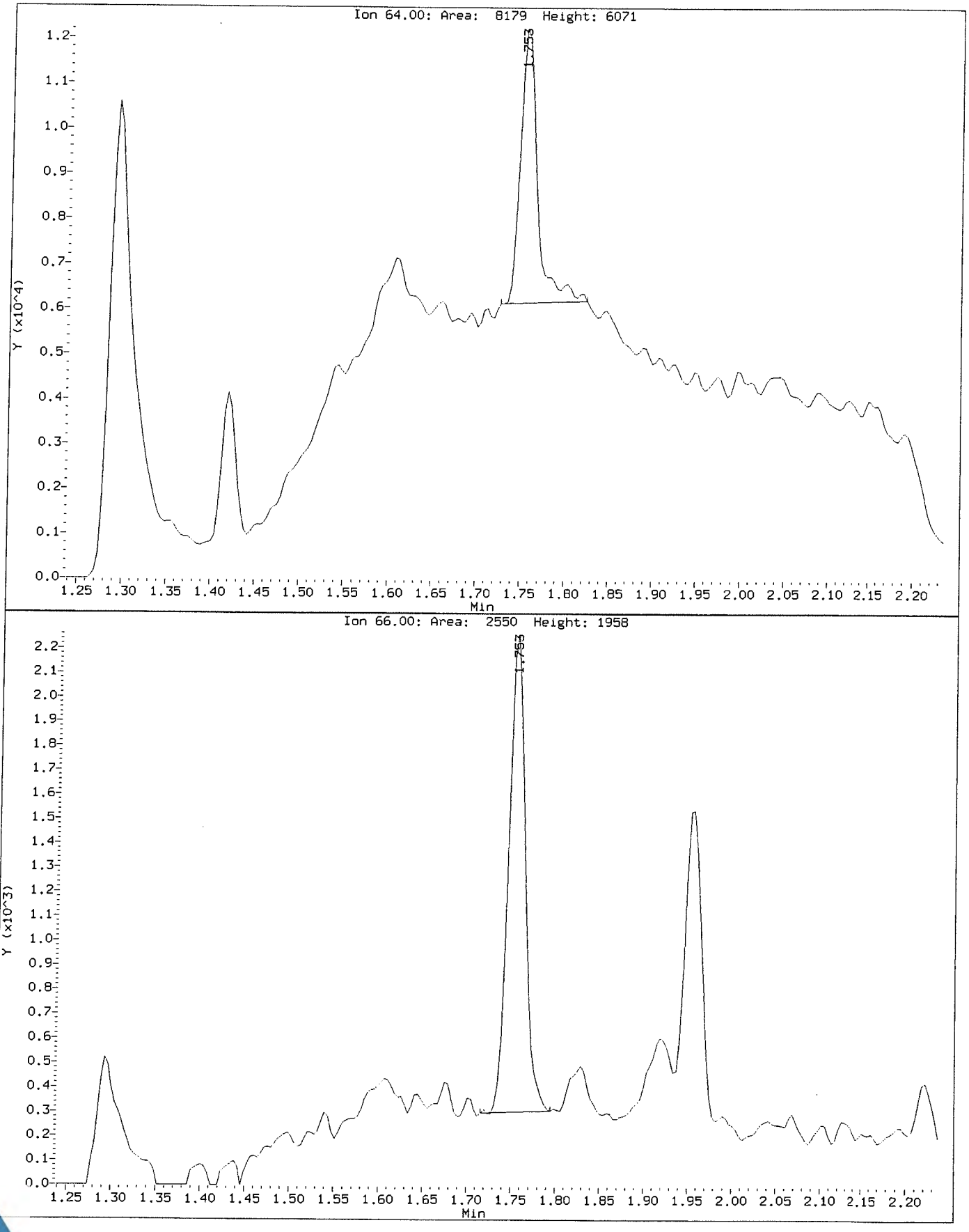
Client Sample ID: VSTD002

Compound: Chloroethane
CAS Number: 75-00-3



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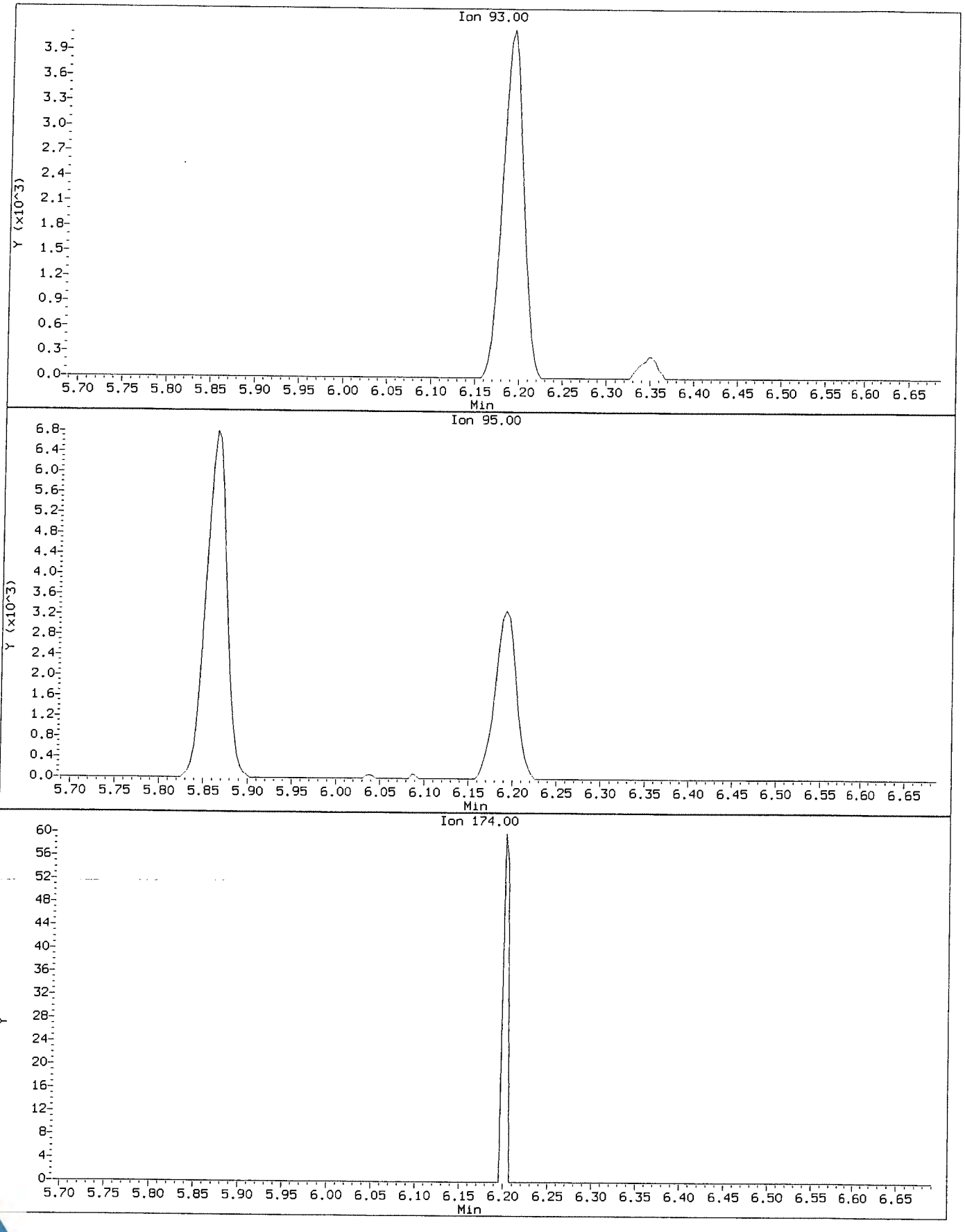
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3



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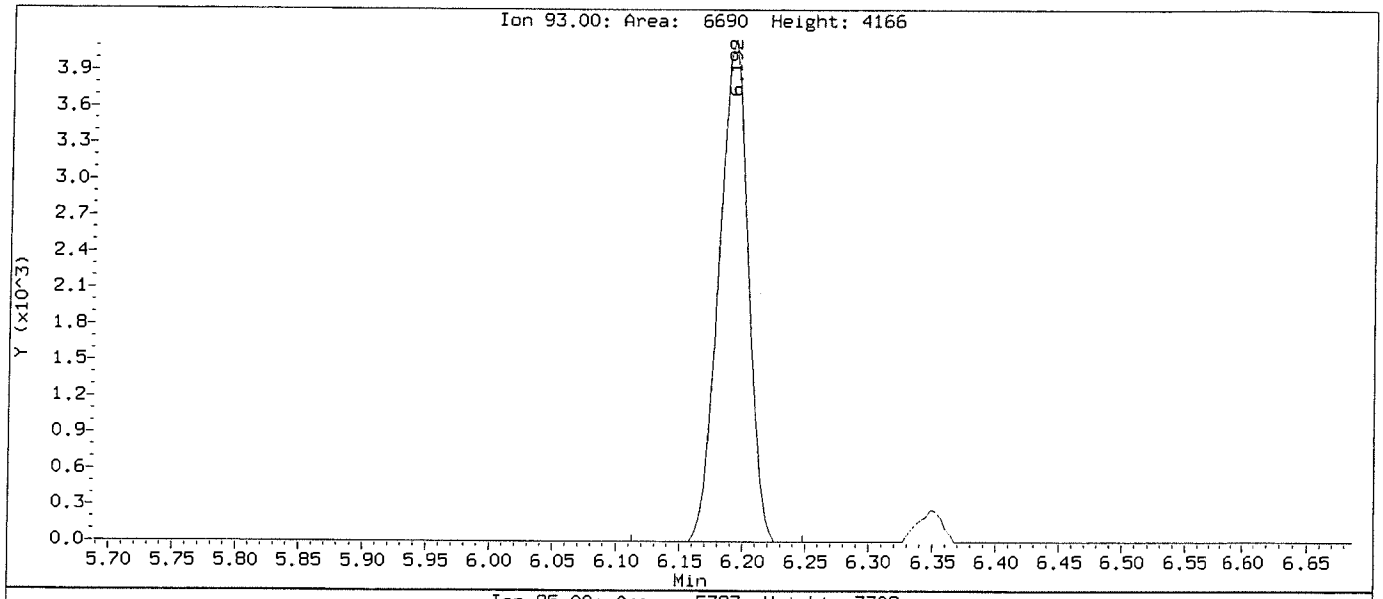
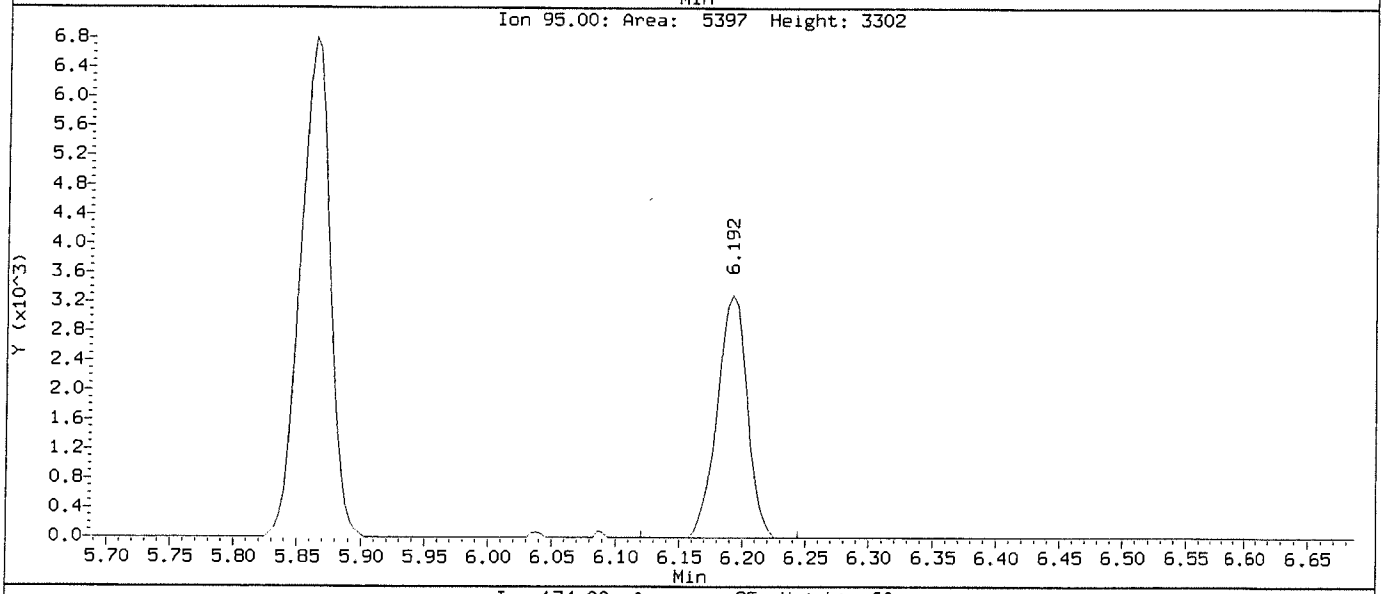
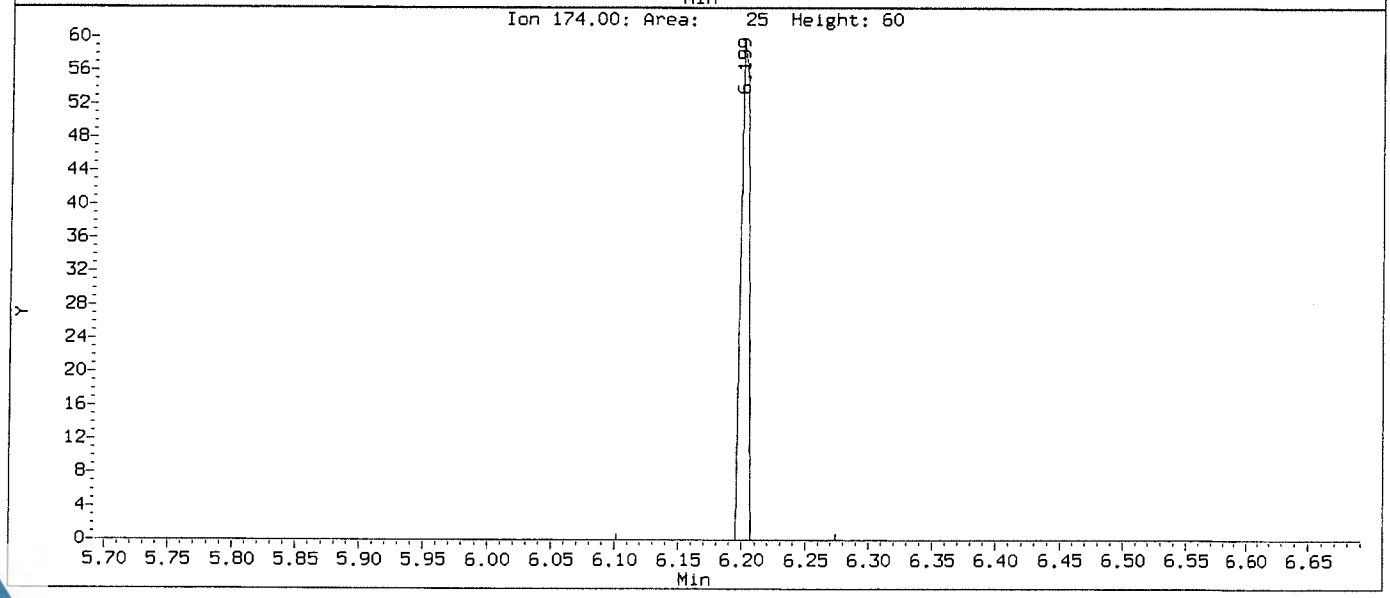
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3







Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122106.D Page 1
Report Date: 28-Jan-2019 11:25

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122106.D
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Inj Date : 21-DEC-2018 15:52
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD005;VSTD005;1;5;
Misc Info : 180315V9;WATER;0;1;
Comment :
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Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 15:28 Cal File: U122105.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

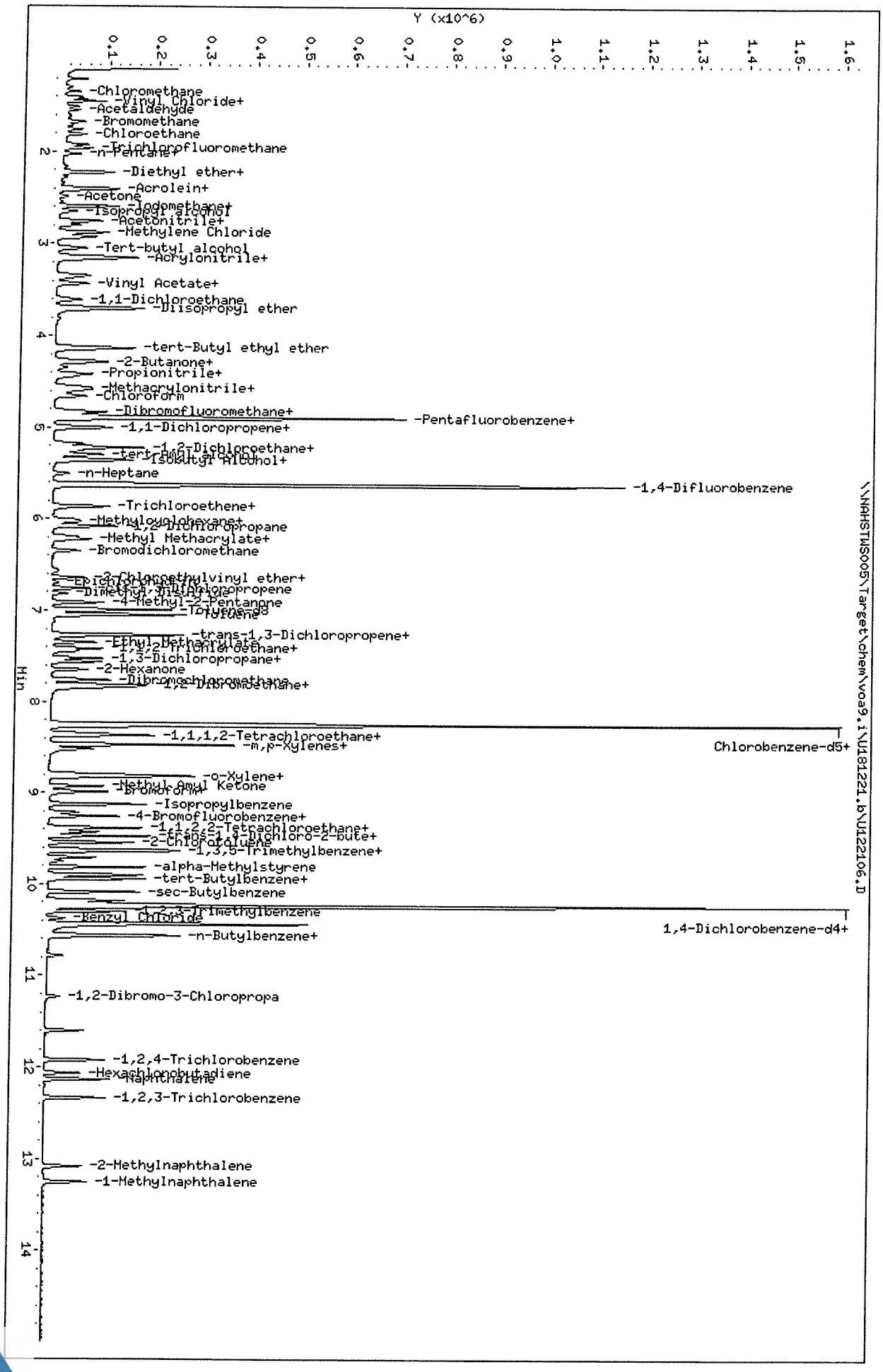
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.897	(1.000)	423551	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	811321	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	744062	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	348718	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.986)	28568	5.00000	4.77(a)
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	38943	5.00000	4.60(a)
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	117010	5.00000	4.52(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	42900	5.00000	4.60(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	21878	5.00000	5.16
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	34906	5.00000	5.21
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	42397	5.00000	5.39
138 Freon TF	101	2.408	2.408	(0.492)	18593	5.00000	5.16
53 1,1,2-Trichloroethane	83	7.420	7.420	(0.900)	23788	5.00000	5.36
22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	48869	5.00000	5.35
11 1,1-Dichloroethene	96	2.405	2.405	(0.491)	20607	5.00000	5.11
32 1,1-Dichloropropene	75	5.006	5.006	(0.890)	37139	5.00000	5.14
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	31113	5.00000	5.30
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	41282	5.00000	5.05
90 1,2,4-Trichlorobenzene	180	11.922	11.922	(1.165)	31564	5.00000	4.88(a)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	98307	5.00000	5.38
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	4931	5.00000	5.40
57 1,2-Dibromoethane	107	7.851	7.851	(0.952)	27067	5.00000	5.30

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122106.D Page 2
Report Date: 28-Jan-2019 11:25

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	55324	5.00000	5.34
33	1,2-Dichloroethane	62	5.254	5.254	(0.934)	41415	5.00000	5.01
42	1,2-Dichloropropane	63	6.082	6.082	(1.081)	30107	5.00000	5.25
75	1,3,5-Trimethylbenzene	105	9.624	9.624	(0.940)	93516	5.00000	5.33
83	1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	54677	5.00000	5.28
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	52651	5.00000	5.51
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	57942	5.00000	5.30
26	2,2-Dichloropropane	77	4.275	4.275	(0.873)	27335	5.00000	4.97(a)
24	2-Butanone	43	4.343	4.343	(0.887)	29605	10.0000	8.51
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	86842	5.00000	5.40
52	2-Hexanone	43	7.649	7.649	(0.927)	42401	10.0000	10.24
77	4-Chlorotoluene	91	9.639	9.639	(0.942)	100274	5.00000	5.40
82	p-Isopropyltoluene	119	10.209	10.209	(0.997)	97160	5.00000	5.26
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	60636	10.0000	10.18
10	Acetone	43	2.487	2.487	(0.508)	19230	10.0000	8.95
37	Benzene	78	5.220	5.220	(0.928)	116462	5.00000	5.39
74	Bromobenzene	156	9.381	9.381	(0.917)	28350	5.00000	5.26
29	Bromochloromethane	128	4.556	4.556	(0.930)	13786	5.00000	3.48(a)
39	Bromodichloromethane	83	6.348	6.348	(1.129)	31104	5.00000	5.10
66	Bromoform	173	8.983	8.983	(1.089)	12962	5.00000	5.67(T)
6	Bromomethane	94	1.674	1.674	(0.342)	12245	5.00000	5.89
19	Carbon Disulfide	76	2.592	2.592	(0.529)	153199	10.0000	10.44
34	Carbon Tetrachloride	117	4.999	4.999	(0.889)	26439	5.00000	5.75
59	Chlorobenzene	112	8.275	8.275	(1.003)	75901	5.00000	5.30
7	Chloroethane	64	1.756	1.756	(0.359)	22172	5.00000	6.40(M)
28	Chloroform	83	4.657	4.657	(0.951)	48639	5.00000	5.53
3	Chloromethane	50	1.344	1.344	(0.274)	20682	5.00000	7.61
27	cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	29626	5.00000	5.32
46	cis-1,3-Dichloropropene	75	6.760	6.760	(1.202)	38403	5.00000	5.30
55	Dibromochloromethane	129	7.758	7.758	(0.940)	20846	5.00000	5.15
44	Dibromomethane	93	6.191	6.191	(1.101)	17610	5.00000	5.32(M)
2	Dichlorodifluoromethane	85	1.209	1.209	(0.247)	26580	5.00000	5.53
61	Ethylbenzene	106	8.372	8.372	(1.015)	38926	5.00000	5.30
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	11286	5.00000	4.56(a)
67	Isopropylbenzene	105	9.126	9.126	(1.106)	113805	5.00000	5.37
62	m,p-Xylenes	106	8.474	8.474	(1.027)	96419	10.0000	10.69
17	Methylene Chloride	84	2.877	2.877	(0.587)	31487	5.00000	4.95(a)
87	n-Butylbenzene	91	10.554	10.554	(1.031)	92969	5.00000	5.22
73	n-Propylbenzene	91	9.475	9.475	(0.926)	140607	5.00000	5.39
92	Naphthalene	128	12.132	12.132	(1.185)	91300	5.00000	4.86(a)
63	o-Xylene	106	8.811	8.811	(1.068)	47745	5.00000	5.25
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	116270	5.00000	5.30
64	Styrene	104	8.826	8.826	(1.070)	80690	5.00000	5.34
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	81608	5.00000	5.38
56	Tetrachloroethene	164	7.525	7.525	(0.912)	20249	5.00000	5.19
50	Toluene	91	7.049	7.049	(0.855)	120808	5.00000	5.45
20	trans-1,2-Dichloroethene	96	3.147	3.147	(0.643)	25998	5.00000	5.24
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	30725	5.00000	5.37
38	Trichloroethene	130	5.865	5.865	(1.043)	27950	5.00000	5.36
8	Trichlorofluoromethane	101	1.958	1.958	(0.400)	37144	5.00000	5.87
5	Vinyl Chloride	62	1.422	1.422	(0.291)	29272	5.00000	5.76

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

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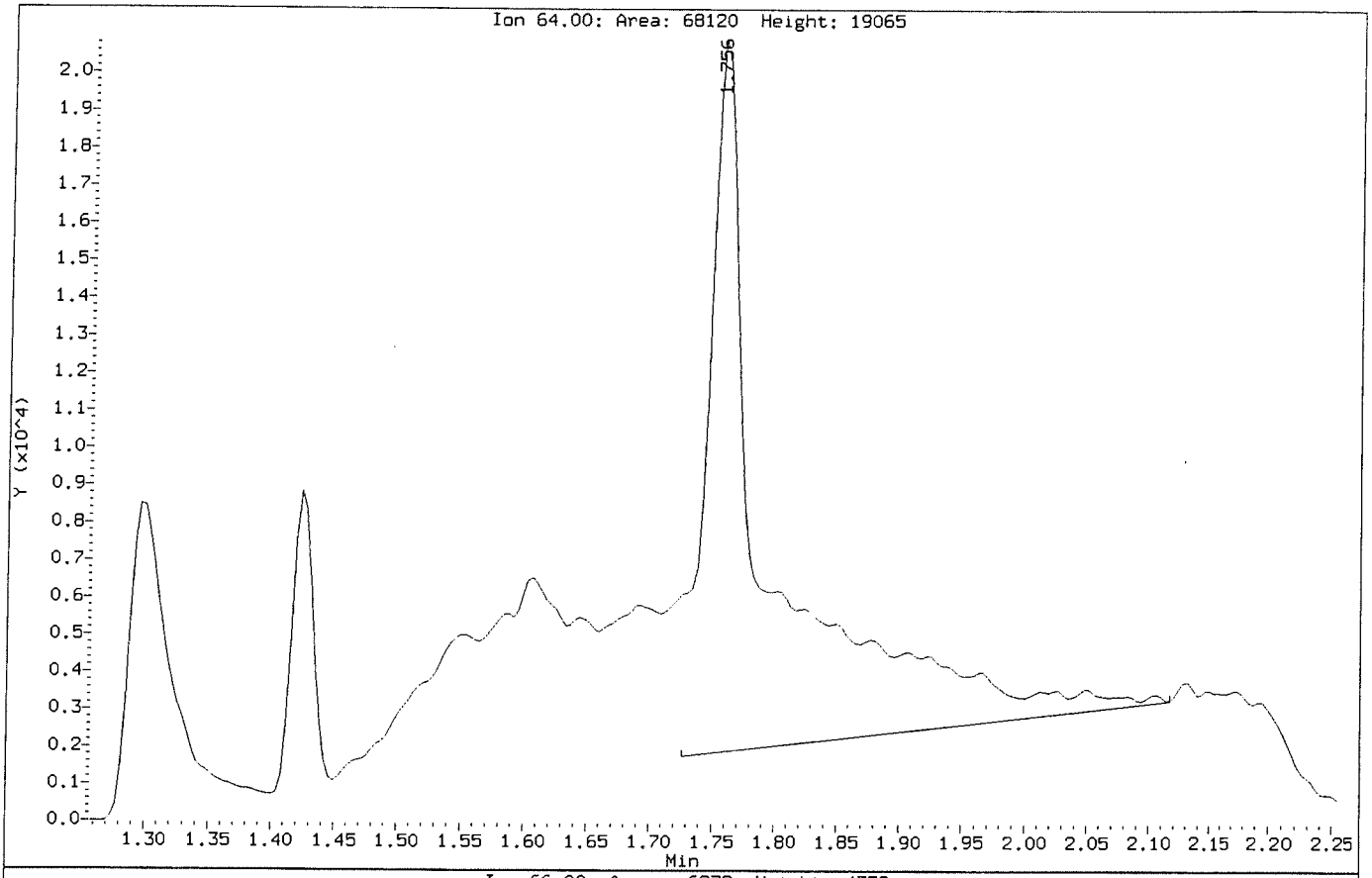
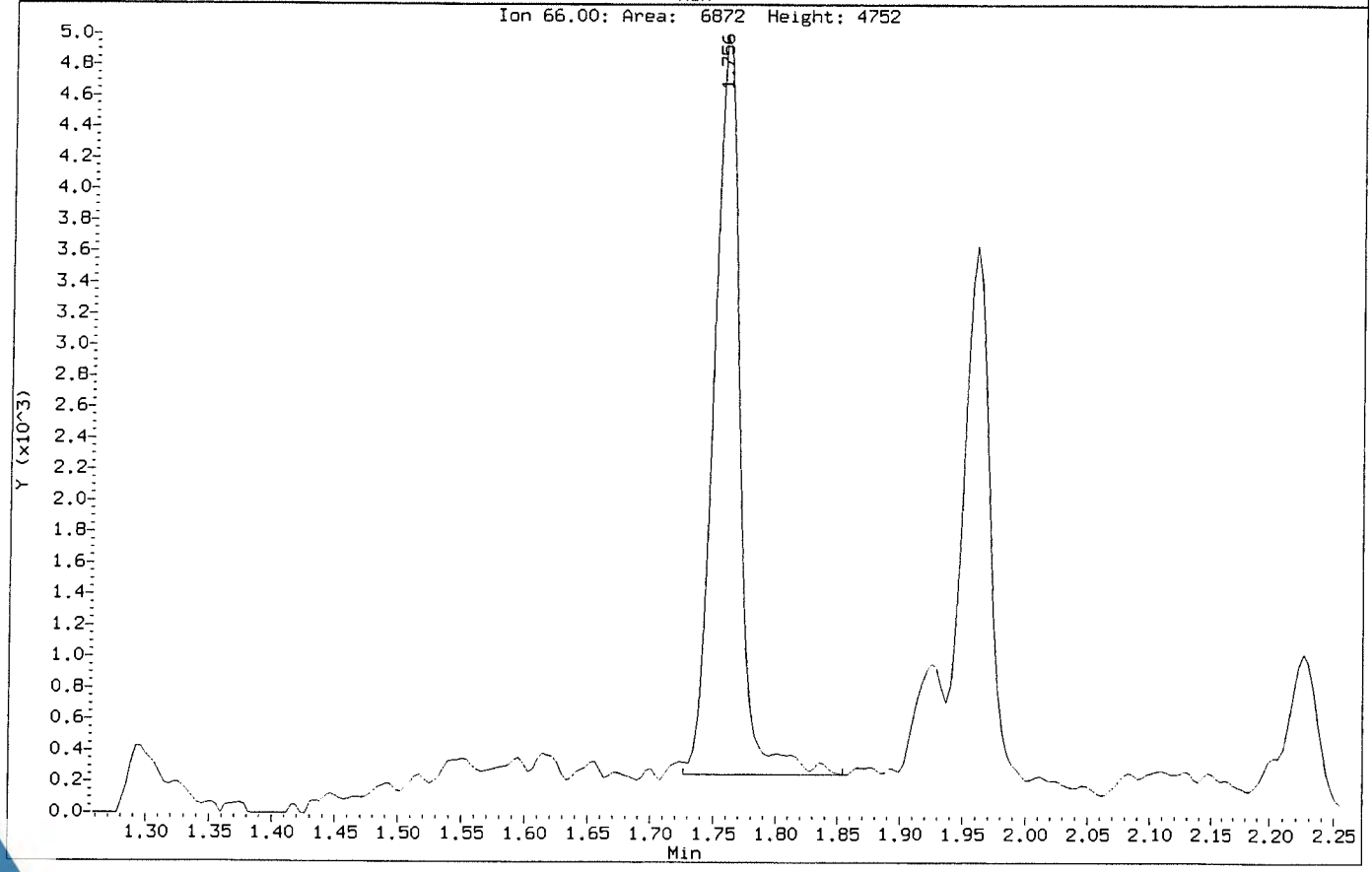
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Chloroethane
CAS Number: 75-00-3





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Instrument: VOA9.i
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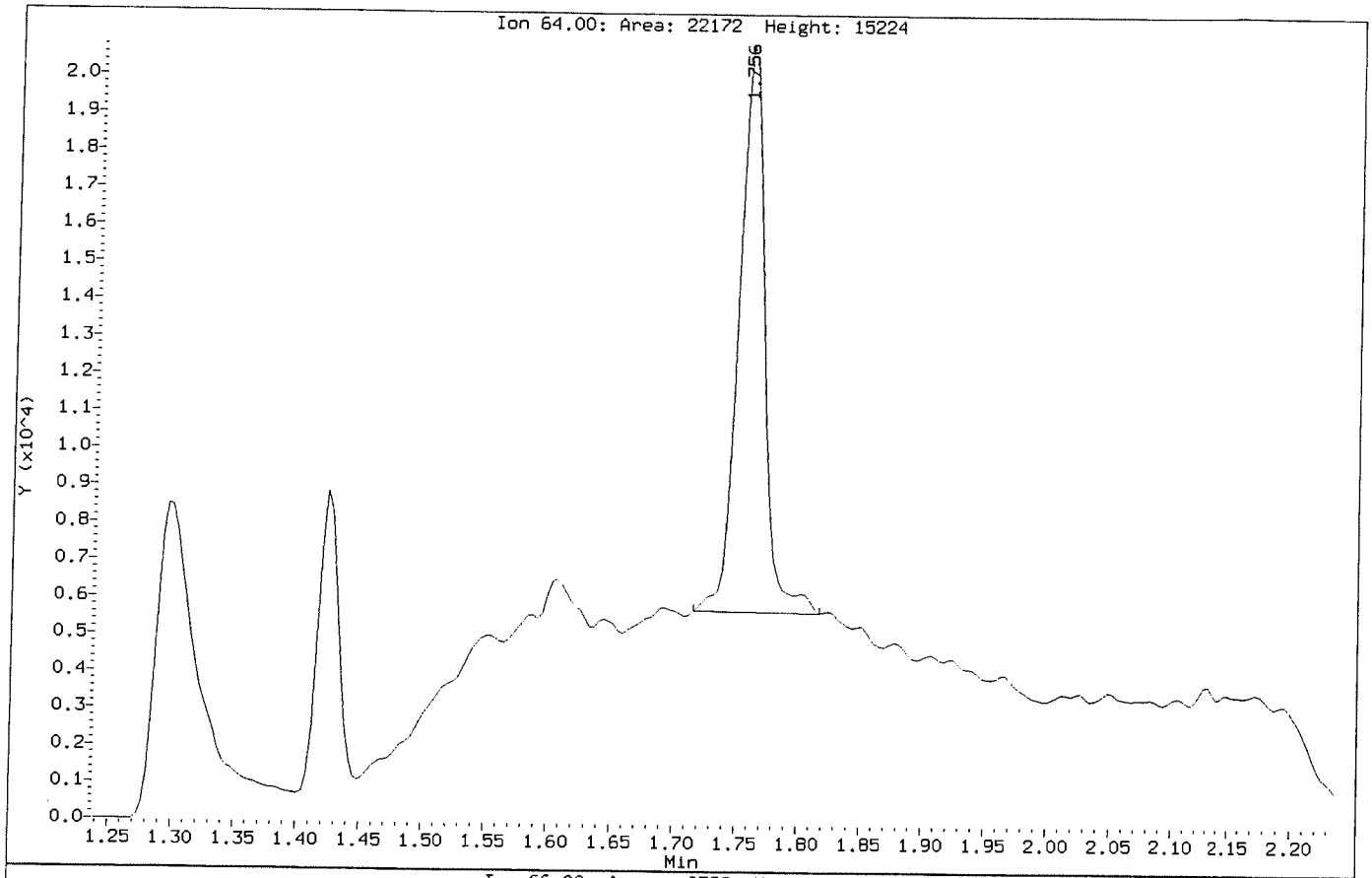
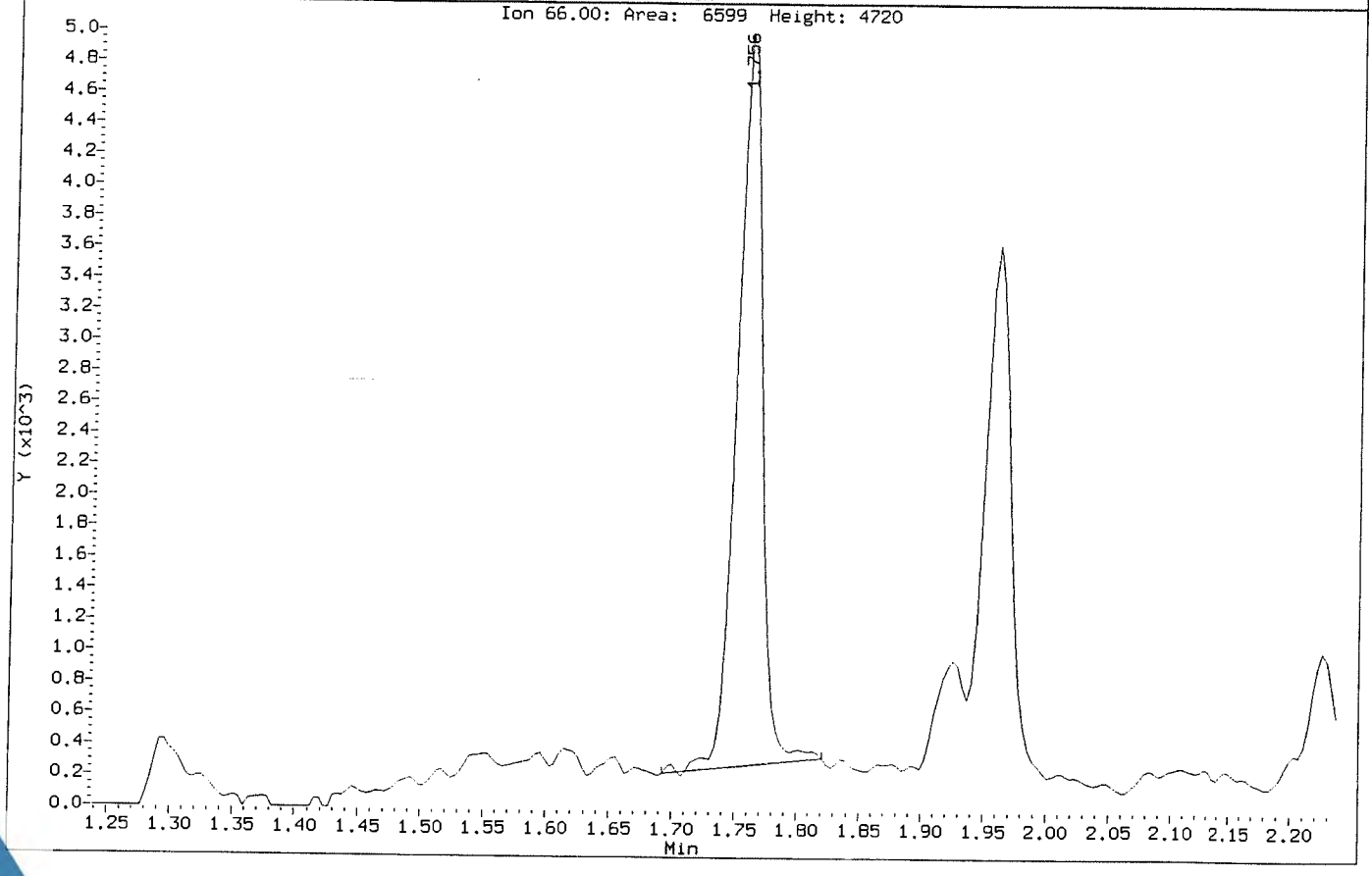
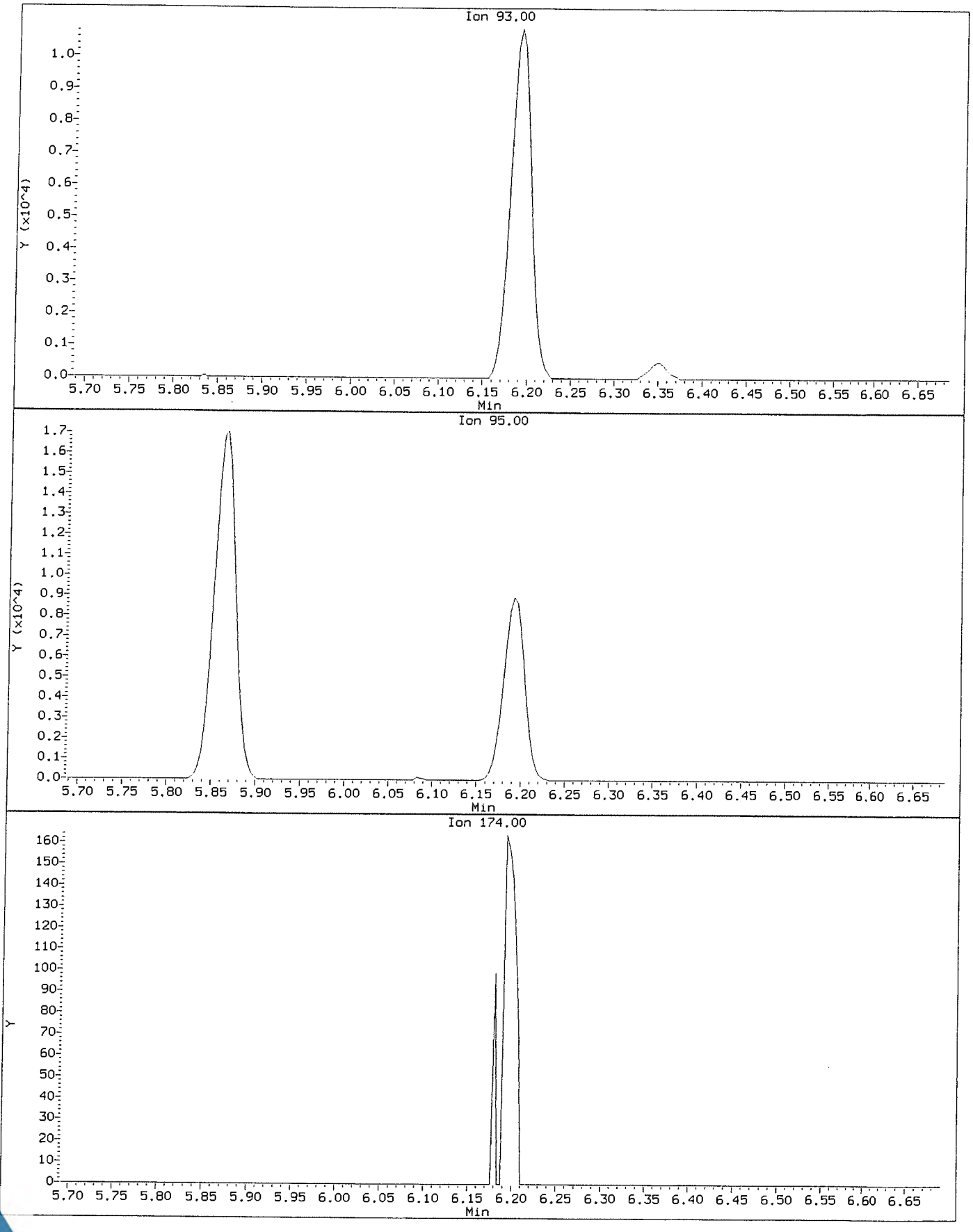
Compound: Chloroethane
CAS Number: 75-00-3





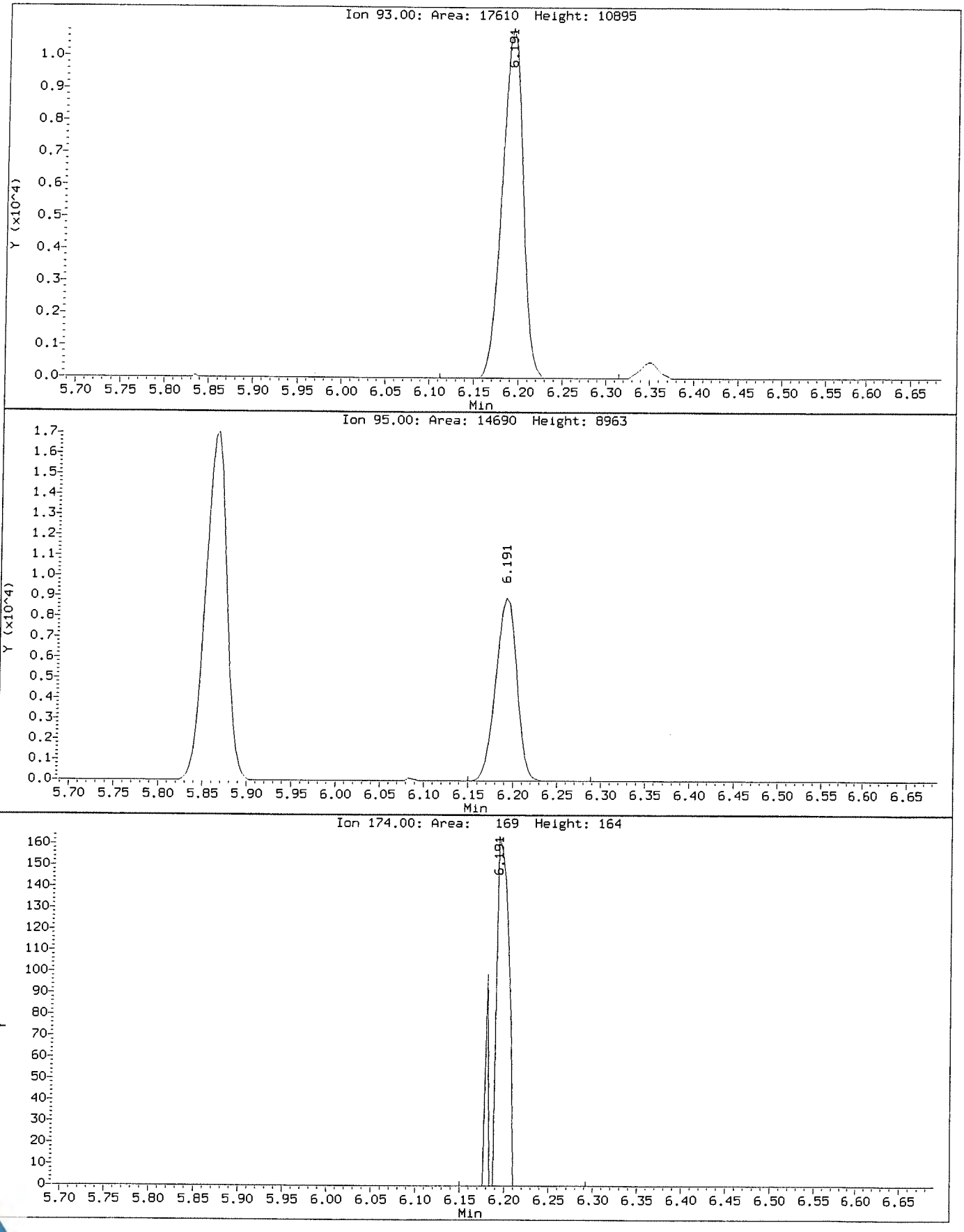
Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122106.D
Injection Date: 21-DEC-2018 15:52
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Dibromomethane
CAS Number: 74-95-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122106.D
Injection Date: 21-DEC-2018 15:52
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Dibromomethane
CAS Number: 74-95-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122107.D Page 1
Report Date: 28-Jan-2019 11:25

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122107.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 21-DEC-2018 16:17
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD020;VSTD020;1;6;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 15:52 Cal File: U122106.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

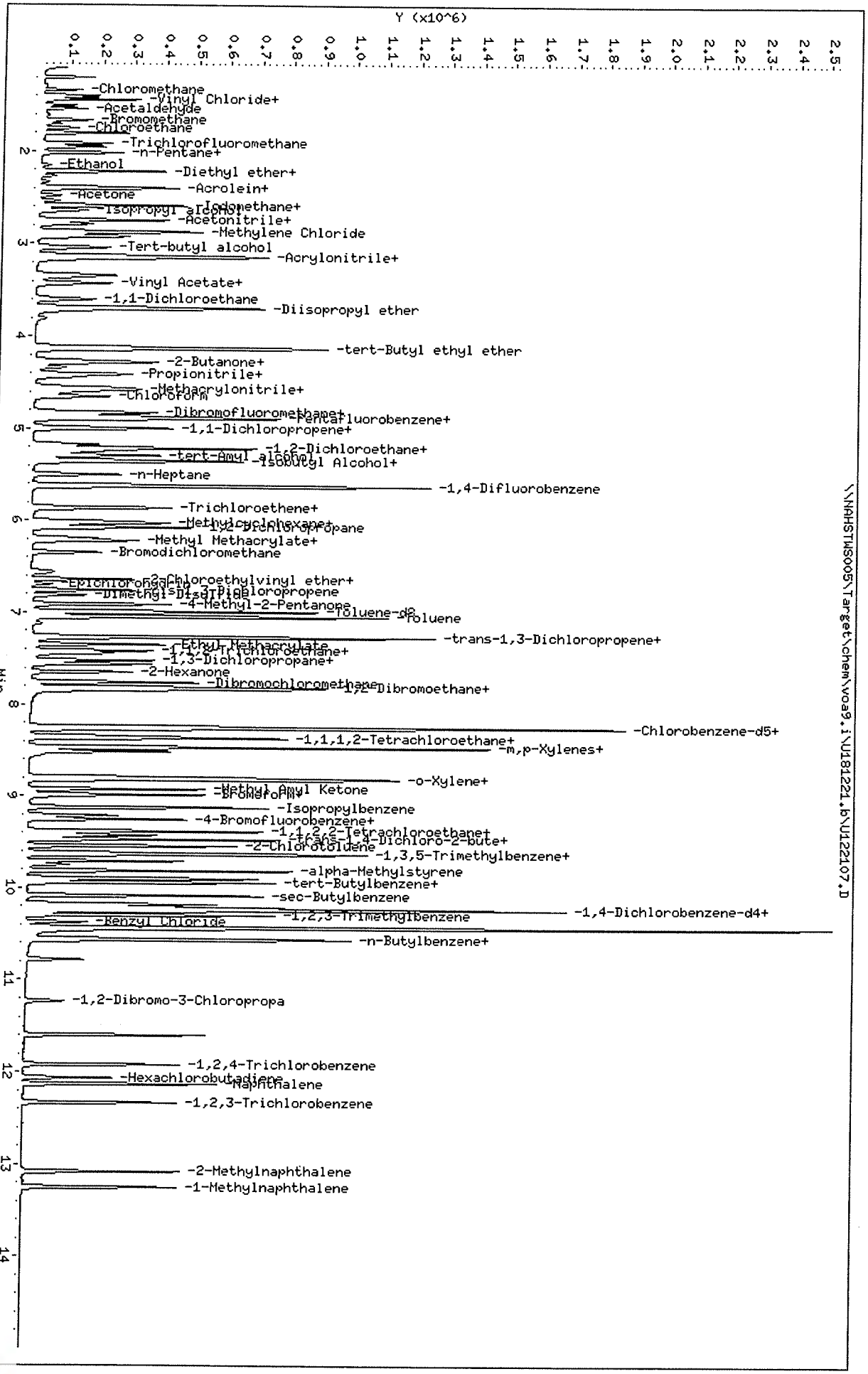
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	420221	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	802033	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	739775	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	359235	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.987)	98984	20.0000	20.47
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	131494	20.0000	20.89
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	408521	20.0000	20.36
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	153183	20.0000	20.23
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	89389	20.0000	19.40
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	135496	20.0000	20.42
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	163701	20.0000	20.23
138 Freon TF	101	2.401	2.401	(0.491)	68573	20.0000	19.19
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	89267	20.0000	20.25
22 1,1-Dichloroethane	63	3.604	3.604	(0.737)	184998	20.0000	20.44
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	75169	20.0000	18.81
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	140960	20.0000	19.75
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	126752	20.0000	19.12
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	166045	20.0000	19.73
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	129526	20.0000	19.47
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	388189	20.0000	20.64
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	22196	20.0000	18.72
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	105981	20.0000	20.87

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122107.D Page 2
Report Date: 28-Jan-2019 11:25

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	207507	20.0000	19.45
33	1,2-Dichloroethane	62	5.250	5.250	(0.933)	149131	20.0000	20.20
42	1,2-Dichloropropane	63	6.079	6.079	(1.081)	113309	20.0000	19.99
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	375852	20.0000	20.81
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	209196	20.0000	19.61
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	193920	20.0000	20.42
84	1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	216649	20.0000	19.26
26	2,2-Dichloropropane	77	4.275	4.275	(0.874)	106667	20.0000	19.55
24	2-Butanone	43	4.339	4.339	(0.887)	119433	40.0000	42.08
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	335289	20.0000	20.25
52	2-Hexanone	43	7.649	7.649	(0.927)	177404	40.0000	43.12
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	387760	20.0000	20.27
82	p-Isopropyltoluene	119	10.210	10.210	(0.997)	388512	20.0000	20.43
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	250121	40.0000	42.25
10	Acetone	43	2.480	2.480	(0.507)	73380	40.0000	43.05
37	Benzene	78	5.216	5.216	(0.927)	428833	20.0000	20.09
74	Bromobenzene	156	9.381	9.381	(0.917)	109892	20.0000	19.79
29	Bromochloromethane	128	4.553	4.553	(0.930)	51515	20.0000	21.73
39	Bromodichloromethane	83	6.348	6.348	(1.129)	121760	20.0000	20.20
66	Bromoform	173	8.984	8.984	(1.089)	53922	20.0000	18.14(T)
6	Bromomethane	94	1.666	1.666	(0.341)	47148	20.0000	19.02
19	Carbon Disulfide	76	2.588	2.588	(0.529)	576362	40.0000	39.58
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	104210	20.0000	18.76
59	Chlorobenzene	112	8.275	8.275	(1.003)	284621	20.0000	20.02
7	Chloroethane	64	1.749	1.749	(0.357)	73150	20.0000	20.10(M)
28	Chloroform	83	4.654	4.654	(0.951)	178122	20.0000	20.43
3	Chloromethane	50	1.336	1.336	(0.273)	79075	20.0000	19.85
27	cis-1,2-Dichloroethene	96	4.287	4.287	(0.876)	114056	20.0000	20.64
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	162454	20.0000	18.55
55	Dibromochloromethane	129	7.758	7.758	(0.940)	89836	20.0000	19.09
44	Dibromomethane	93	6.187	6.187	(1.100)	66878	20.0000	20.44
2	Dichlorodifluoromethane	85	1.201	1.201	(0.246)	98486	20.0000	19.34
61	Ethylbenzene	106	8.369	8.369	(1.015)	147187	20.0000	20.18
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	44482	20.0000	17.45
67	Isopropylbenzene	105	9.126	9.126	(1.106)	439477	20.0000	20.89
62	m,p-Xylenes	106	8.474	8.474	(1.027)	372108	40.0000	41.51
17	Methylene Chloride	84	2.870	2.870	(0.586)	109403	20.0000	20.36
87	n-Butylbenzene	91	10.554	10.554	(1.031)	362066	20.0000	19.73
73	n-Propylbenzene	91	9.475	9.475	(0.926)	551133	20.0000	20.53
92	Naphthalene	128	12.133	12.133	(1.185)	413229	20.0000	19.20
63	o-Xylene	106	8.811	8.811	(1.068)	188442	20.0000	20.84
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	459645	20.0000	20.37
64	Styrene	104	8.823	8.823	(1.070)	323232	20.0000	21.51
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	318726	20.0000	20.42
56	Tetrachloroethene	164	7.522	7.522	(0.912)	75128	20.0000	19.39
50	Toluene	91	7.046	7.046	(0.854)	451178	20.0000	20.50
20	trans-1,2-Dichloroethene	96	3.140	3.140	(0.642)	100515	20.0000	20.43
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	135347	20.0000	18.26
38	Trichloroethene	130	5.861	5.861	(1.042)	101824	20.0000	19.76
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	130957	20.0000	19.29
5	Vinyl Chloride	62	1.419	1.419	(0.290)	111713	20.0000	19.39

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.



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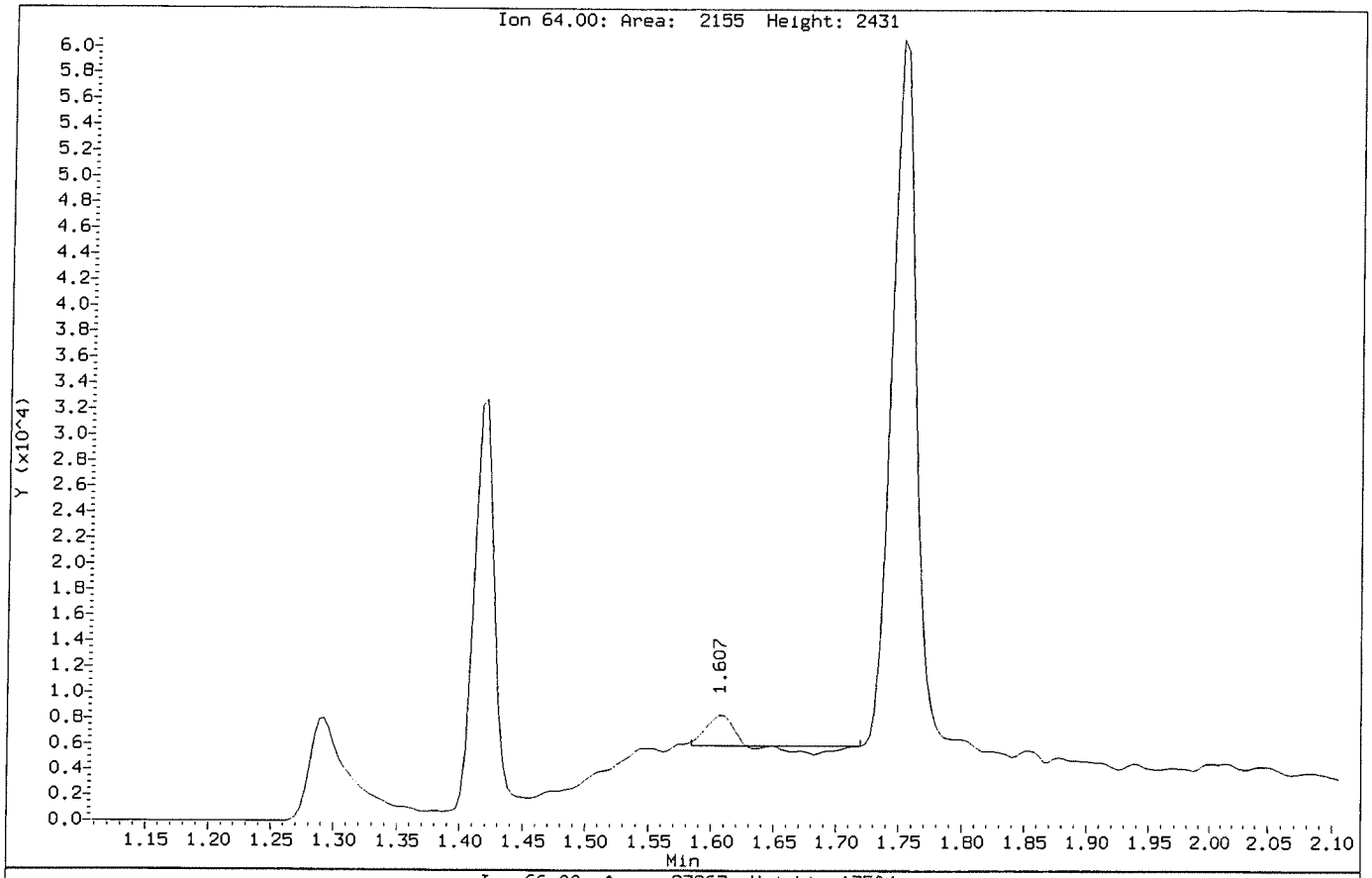
Date : 21-DEC-2018 16:17
Client ID: VSTD020
Sample Info: VSTD020;VSTD020;1;6;
Purge Volume: 5.0
Column phase: DB624

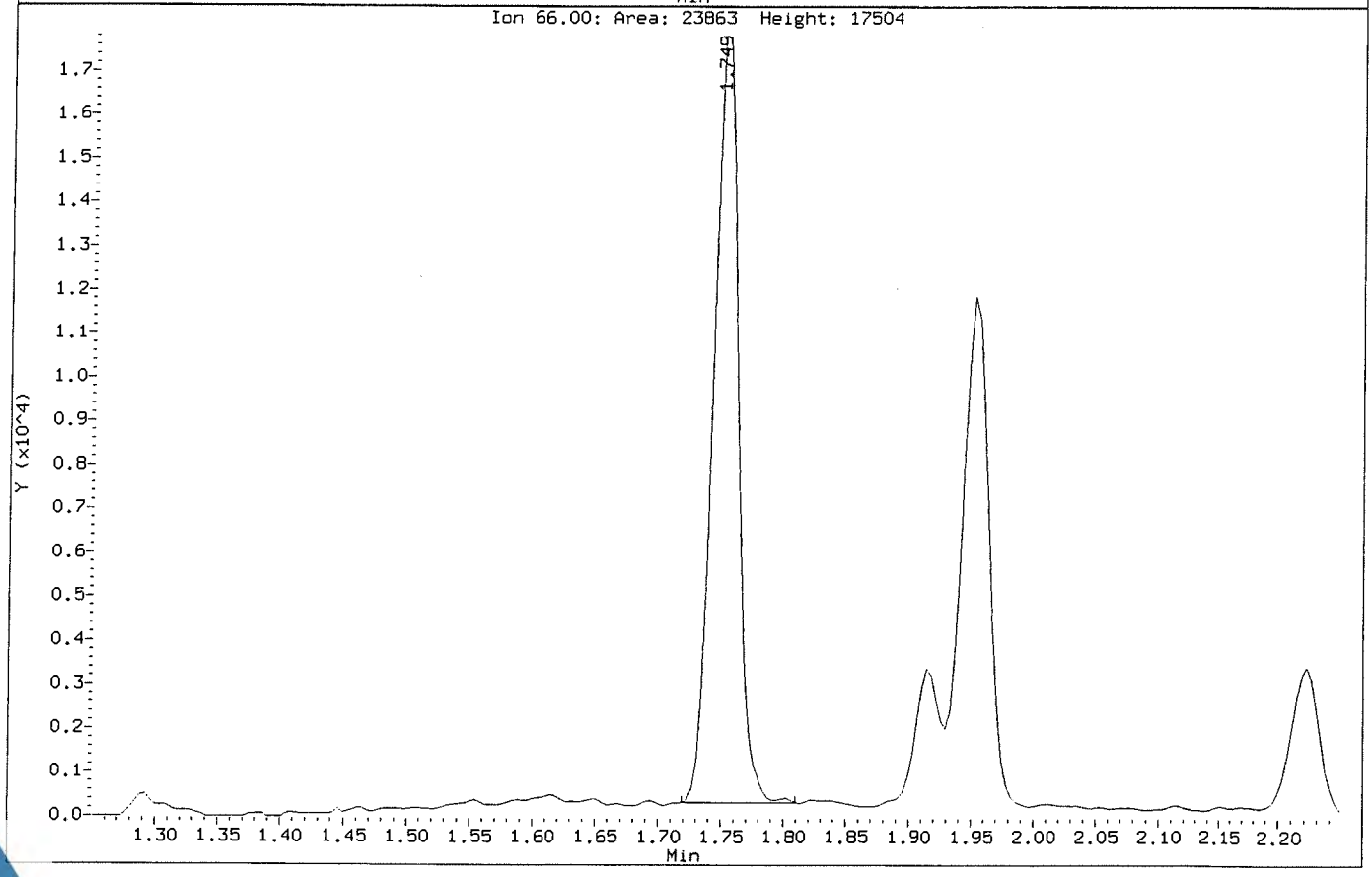
\\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122107.D

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122107.D
Injection Date: 21-DEC-2018 16:17
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Chloroethane
CAS Number: 75-00-3





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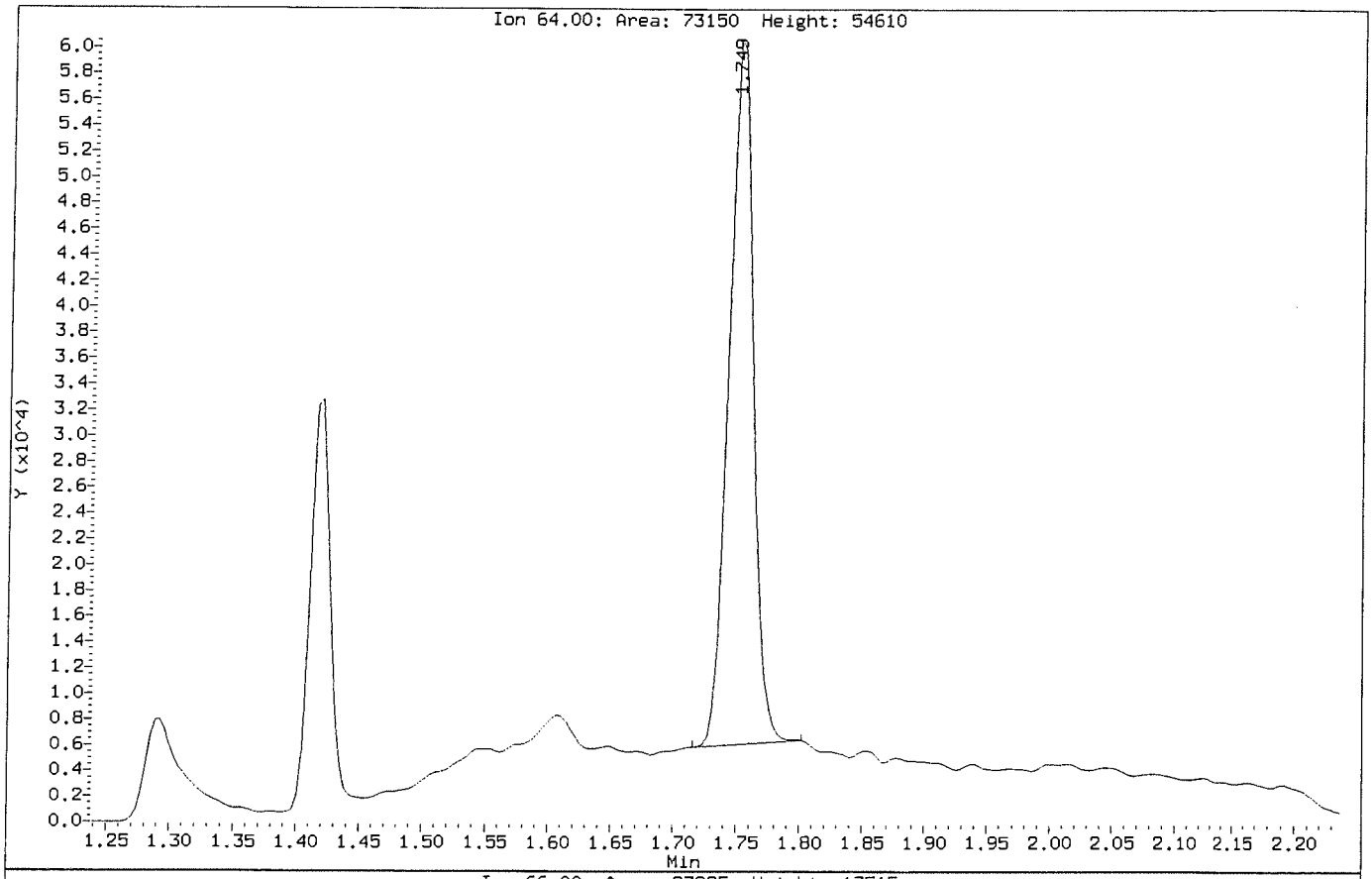
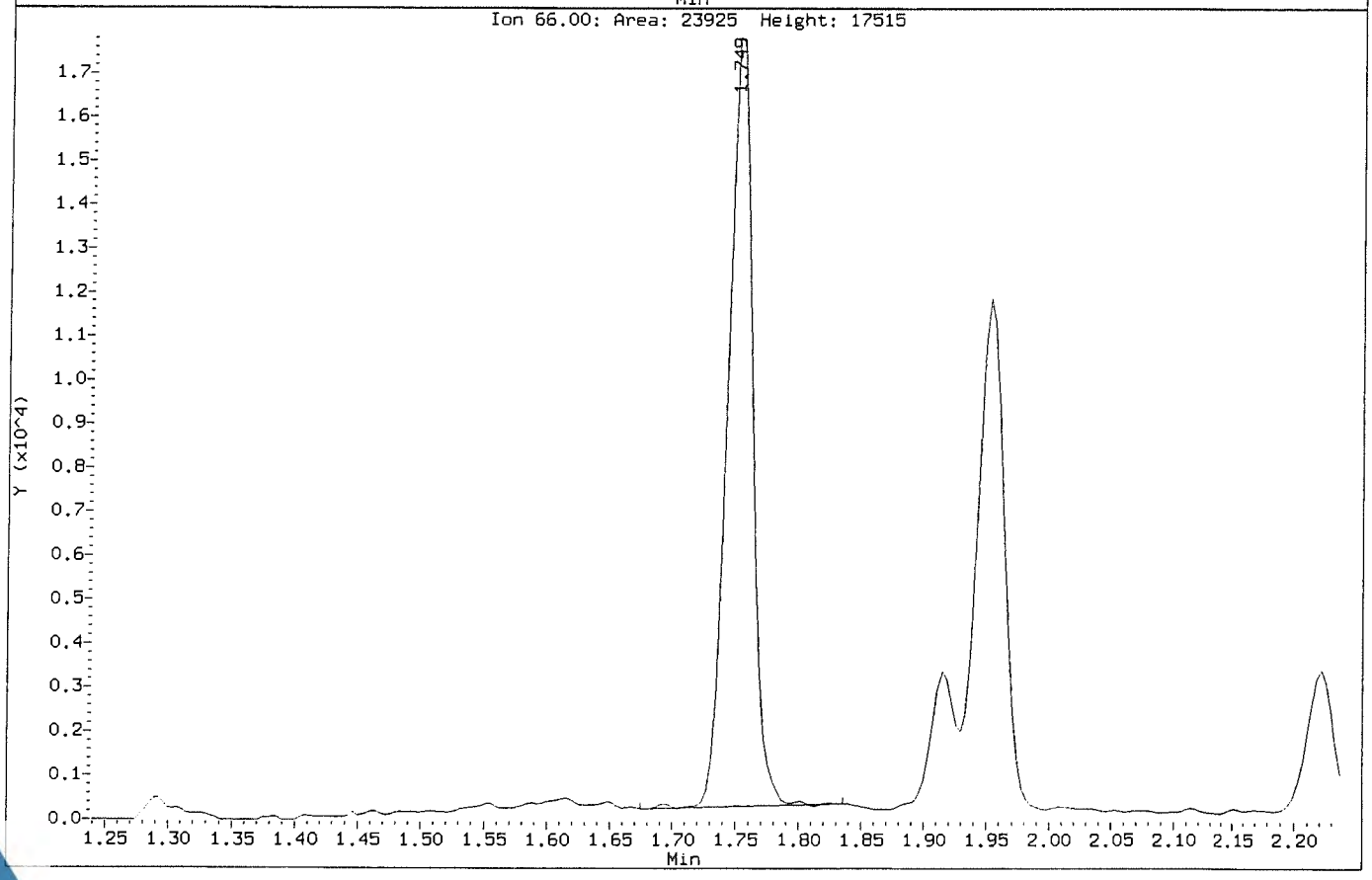
Injection Date: 21-DEC-2018 16:17
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122108.D Page 1
Report Date: 28-Jan-2019 11:25

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122108.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 21-DEC-2018 16:41
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;1;7;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:17 Cal File: U122107.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

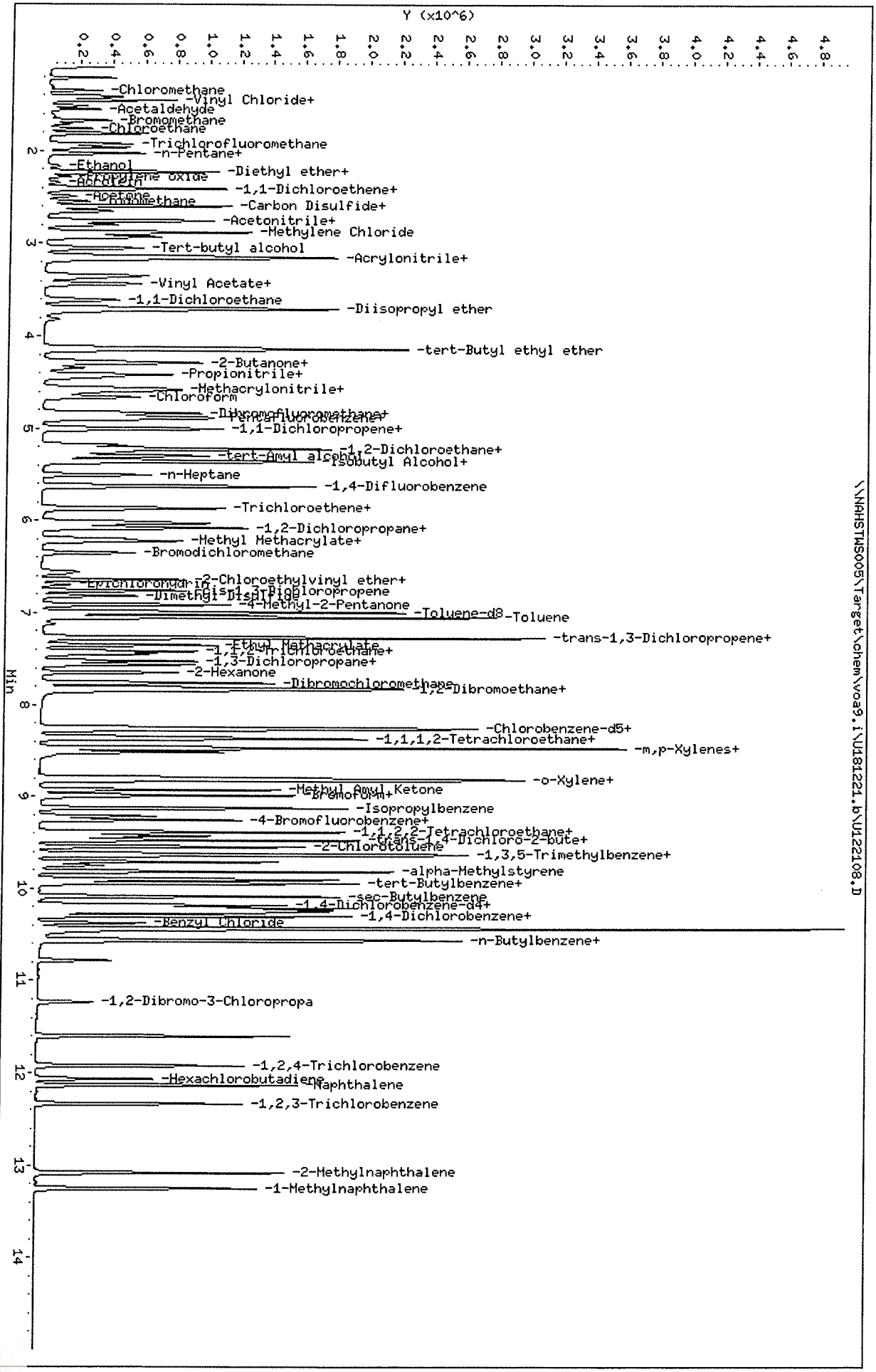
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.898	(1.000)	441118	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.629	(1.000)	822734	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	764792	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	367345	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	245007	50.0000	50.34
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	320796	50.0000	51.44
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	1010127	50.0000	51.19
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	382581	50.0000	50.91
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	235446	50.0000	48.53
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	347757	50.0000	49.92
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	414173	50.0000	50.06
138 Freon TF	101	2.412	2.412	(0.493)	175022	50.0000	46.67
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	226615	50.0000	49.73
22 1,1-Dichloroethane	63	3.612	3.612	(0.737)	466899	50.0000	49.14
11 1,1-Dichloroethene	96	2.409	2.409	(0.492)	194403	50.0000	46.35
32 1,1-Dichloropropene	75	5.010	5.010	(0.890)	351519	50.0000	48.01
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	334600	50.0000	48.35
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	444407	50.0000	51.66
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	340316	50.0000	50.03
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	977610	50.0000	50.85
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	61793	50.0000	48.48
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	266705	50.0000	50.81

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122108.D Page 2
Report Date: 28-Jan-2019 11:25

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	529898	50.0000	48.58
33	1,2-Dichloroethane	62	5.258	5.258	(0.934)	376591	50.0000	50.81
42	1,2-Dichloropropane	63	6.082	6.082	(1.081)	287570	50.0000	49.46
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	947470	50.0000	51.32
83	1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	529098	50.0000	48.50
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	491255	50.0000	50.05
84	1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	544274	50.0000	47.32
26	2,2-Dichloropropane	77	4.279	4.279	(0.874)	280126	50.0000	48.93
24	2-Butanone	43	4.343	4.343	(0.887)	304044	100.000	105.52
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	843166	50.0000	49.81
52	2-Hexanone	43	7.653	7.653	(0.928)	461299	100.000	108.47
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	978873	50.0000	50.04
82	p-Isopropyltoluene	119	10.210	10.210	(0.997)	1003937	50.0000	51.64
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	653234	100.000	106.75
10	Acetone	43	2.487	2.487	(0.508)	187964	100.000	109.42
37	Benzene	78	5.220	5.220	(0.927)	1084861	50.0000	49.55
74	Bromobenzene	156	9.381	9.381	(0.917)	280874	50.0000	49.48
29	Bromochloromethane	128	4.560	4.560	(0.931)	129496	50.0000	56.37
39	Bromodichloromethane	83	6.348	6.348	(1.128)	319701	50.0000	51.71
66	Bromoform	173	8.984	8.984	(1.089)	154855	50.0000	47.27(T)
6	Bromomethane	94	1.674	1.674	(0.342)	117780	50.0000	43.41
19	Carbon Disulfide	76	2.600	2.600	(0.531)	1460668	100.000	95.57
34	Carbon Tetrachloride	117	4.999	4.999	(0.888)	274507	50.0000	45.99
59	Chlorobenzene	112	8.275	8.275	(1.003)	718560	50.0000	48.89
7	Chloroethane	64	1.760	1.760	(0.359)	179707	50.0000	46.03(M)
28	Chloroform	83	4.661	4.661	(0.952)	453061	50.0000	49.52
3	Chloromethane	50	1.348	1.348	(0.275)	197328	50.0000	42.63
27	cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	286659	50.0000	49.43
46	cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	449225	50.0000	47.87
55	Dibromochloromethane	129	7.758	7.758	(0.940)	242061	50.0000	48.20
44	Dibromomethane	93	6.191	6.191	(1.100)	170556	50.0000	50.83
2	Dichlorodifluoromethane	85	1.213	1.213	(0.248)	248322	50.0000	45.79
61	Ethylbenzene	106	8.373	8.373	(1.015)	374921	50.0000	49.74
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	119140	50.0000	45.72
67	Isopropylbenzene	105	9.126	9.126	(1.106)	1109213	50.0000	51.00
62	m,p-Xylenes	106	8.474	8.474	(1.027)	936911	100.000	101.11
17	Methylene Chloride	84	2.877	2.877	(0.587)	274258	50.0000	50.31
87	n-Butylbenzene	91	10.558	10.558	(1.031)	931396	50.0000	49.64
73	n-Propylbenzene	91	9.475	9.475	(0.926)	1393780	50.0000	50.77
92	Naphthalene	128	12.133	12.133	(1.185)	1107938	50.0000	49.53
63	o-Xylene	106	8.811	8.811	(1.068)	475748	50.0000	50.89
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	1169025	50.0000	50.67
64	Styrene	104	8.826	8.826	(1.070)	828798	50.0000	53.36
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	807157	50.0000	50.58
56	Tetrachloroethene	164	7.525	7.525	(0.912)	186057	50.0000	46.46
50	Toluene	91	7.049	7.049	(0.855)	1138194	50.0000	50.03
20	trans-1,2-Dichloroethene	96	3.147	3.147	(0.643)	248845	50.0000	48.19
51	trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	381258	50.0000	47.27
38	Trichloroethene	130	5.865	5.865	(1.042)	255628	50.0000	48.36
8	Trichlorofluoromethane	101	1.962	1.962	(0.401)	330010	50.0000	45.44
5	Vinyl Chloride	62	1.426	1.426	(0.291)	283791	50.0000	45.57

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.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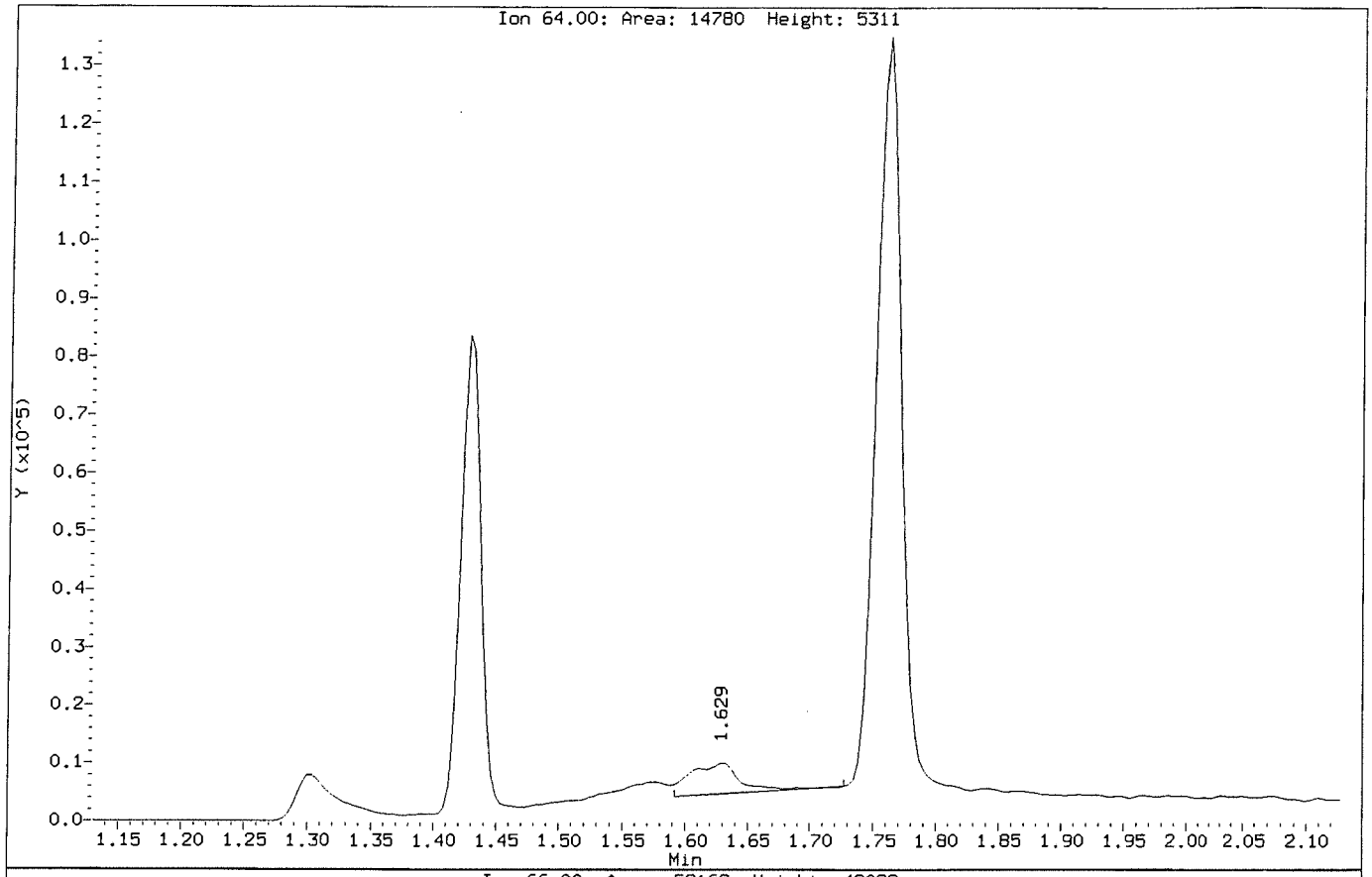
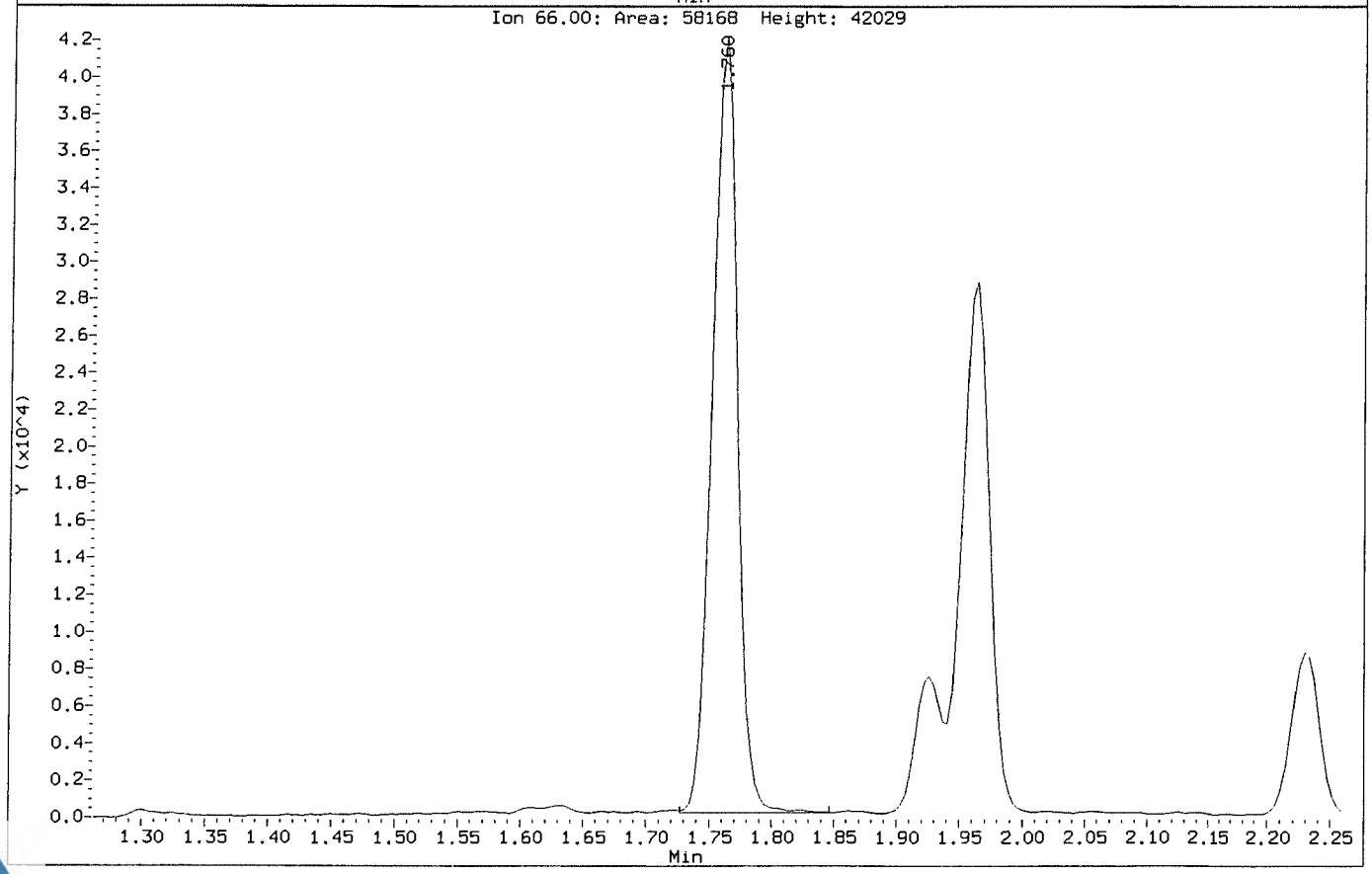
Date : 21-DEC-2018 16:41
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18
\\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122108.D
Y (x10^6)
Min
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-n-Pentane+
-Ethanol
-Diethyl ether+
-1,1-Dichloroethene+
-Carbon Disulfide+
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-Vinyl Acetate+
-1,1-Dichloroethane
-Diisopropyl ether
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile+
-Methacrylonitrile+
-Chloroform
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-Isobutyl Alcohol+
-n-Heptane
-1,4-Difluorobenzene
-Trichloroethene+
-1,2-Dichloropropane+
-Methyl Methacrylate+
-Bromodichloromethane
-2-Chloroethylvinyl ether+
-Dimethyl Disulfide
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-trans-1,3-Dichloropropene+
-1,1,2-Trichloroethane+
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane+
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes+
-o-Xylene+
-Methyl Amyl Ketone
-Bromoform+
-Isopropylbenzene
-4-Bromofluorobenzene+
-1,1,2,2-Tetrachloroethane+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
-1,4-Dichlorobenzene+
-Benzyl Chloride
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
-2-Methylnaphthalene
-1-Methylnaphthalene

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122108.D
Injection Date: 21-DEC-2018 16:41
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





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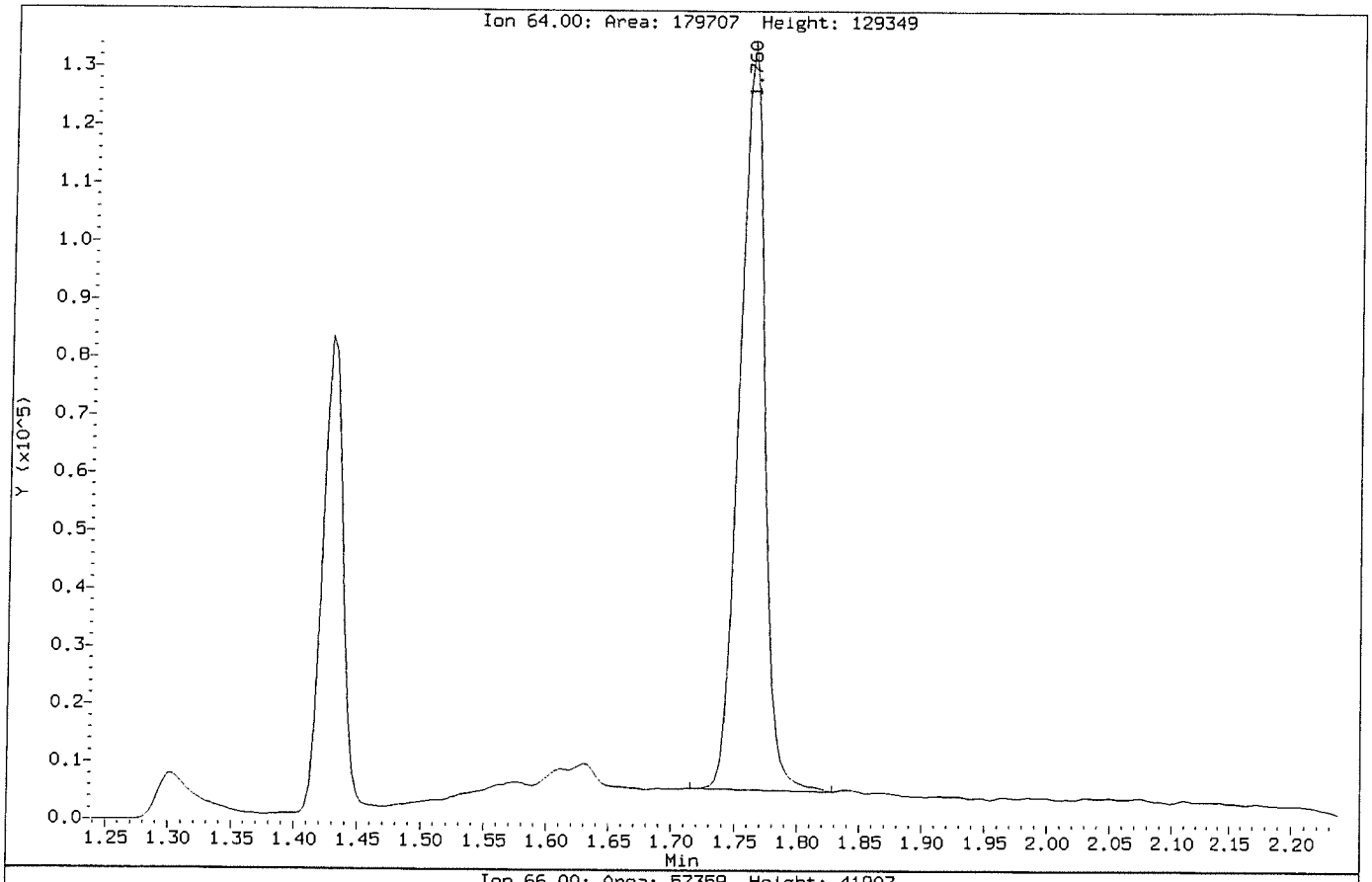
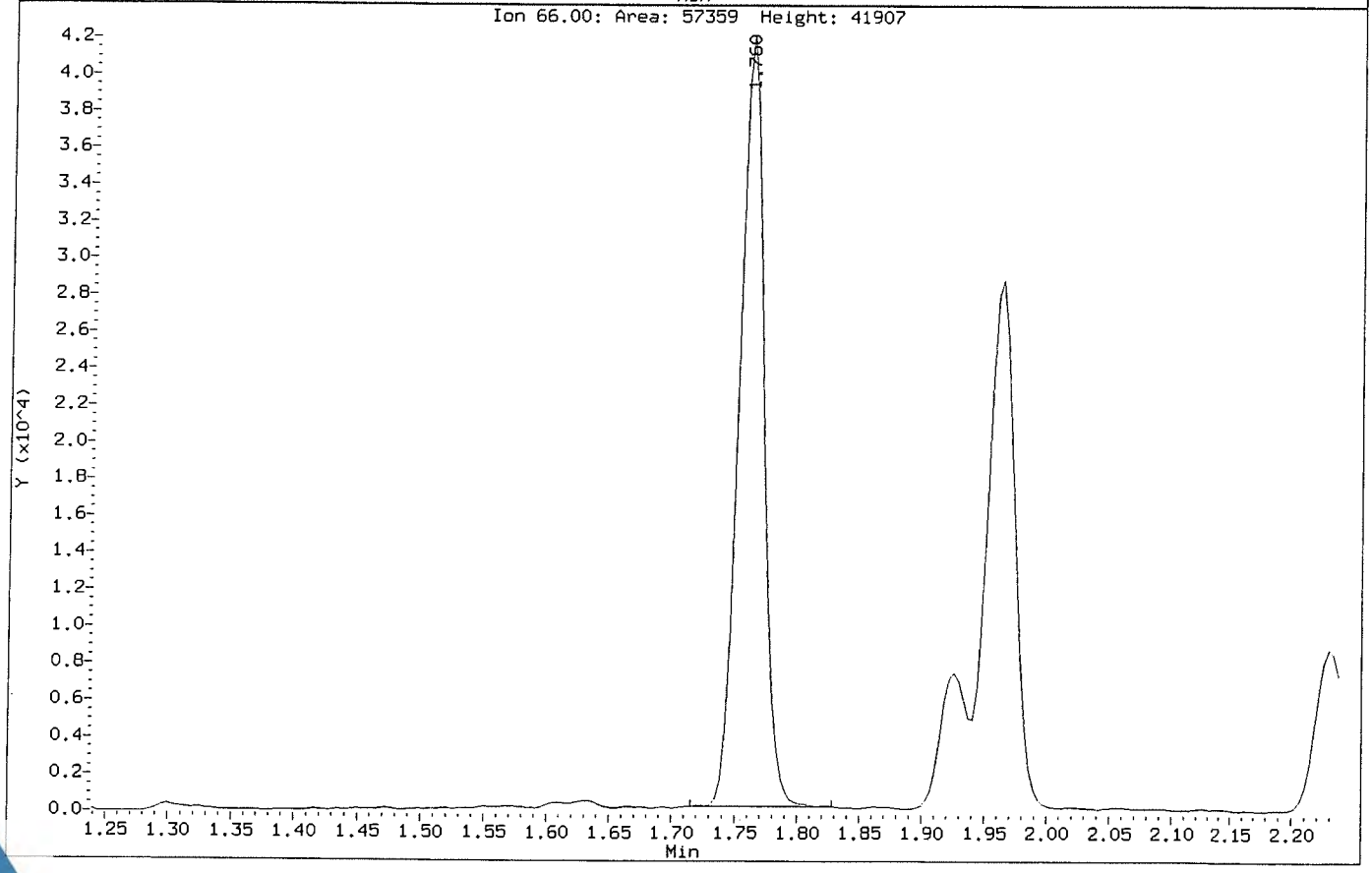
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122109.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 21-DEC-2018 17:06
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD100;VSTD100;1;8;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

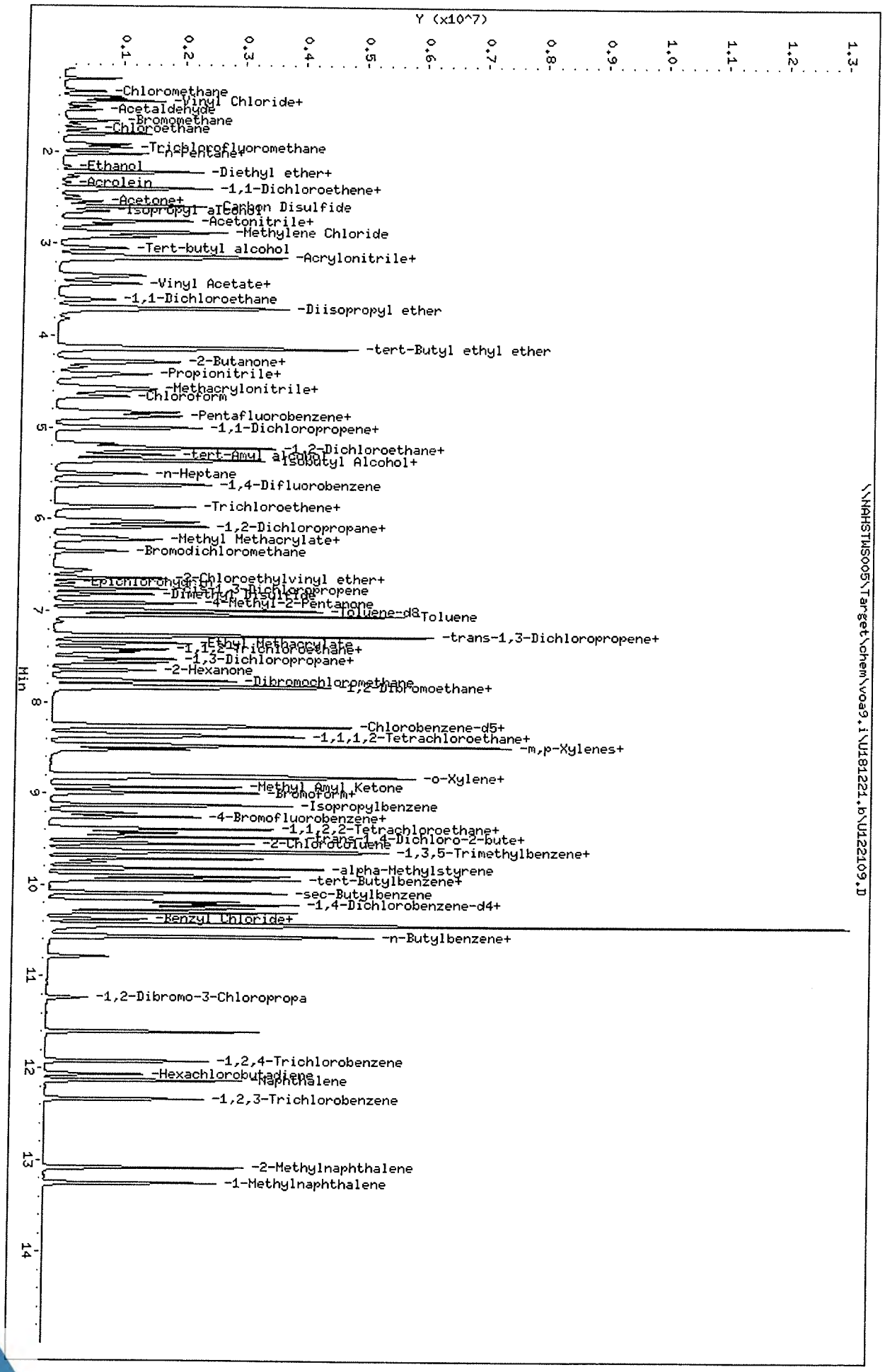
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.897	(1.000)	443466	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	822102	50.0000	
* 47 Chlorobenzene-d5	117	8.252	8.252	(1.000)	772888	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.235	10.235	(1.000)	368944	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.986)	495628	100.000	102.84
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	635081	100.000	103.40
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	2029223	100.000	103.52
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	764798	100.000	102.11
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	493177	100.000	99.96
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	750490	100.000	107.17
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	804056	100.000	96.77
138 Freon TF	101	2.404	2.404	(0.491)	394668	100.000	104.68
53 1,1,2-Trichloroethane	83	7.420	7.420	(0.899)	455612	100.000	98.94
22 1,1-Dichloroethane	63	3.604	3.604	(0.736)	956686	100.000	100.17
11 1,1-Dichloroethene	96	2.401	2.401	(0.490)	425292	100.000	100.86
32 1,1-Dichloropropene	75	5.006	5.006	(0.890)	748488	100.000	102.32
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	694931	100.000	99.32
71 1,2,3-Trichloropropane	75	9.430	9.430	(0.921)	901833	100.000	104.38
90 1,2,4-Trichlorobenzene	180	11.926	11.926	(1.165)	724973	100.000	106.13
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	2020622	100.000	104.65
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	125814	100.000	96.80
57 1,2-Dibromoethane	107	7.851	7.851	(0.951)	533692	100.000	100.62

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122109.D Page 2
Report Date: 28-Jan-2019 11:25

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	1079683	100.000	98.55
33	1,2-Dichloroethane	62	5.253	5.253	(0.934)	747337	100.000	101.64
42	1,2-Dichloropropane	63	6.082	6.082	(1.081)	587293	100.000	101.10
75	1,3,5-Trimethylbenzene	105	9.628	9.628	(0.941)	1981203	100.000	106.84
83	1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	1088889	100.000	99.39
54	1,3-Dichloropropane	76	7.563	7.563	(0.916)	974518	100.000	98.25
84	1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	1115296	100.000	96.55
26	2,2-Dichloropropane	77	4.275	4.275	(0.873)	606051	100.000	105.30
24	2-Butanone	43	4.339	4.339	(0.886)	587152	200.000	204.95(A)
76	2-Chlorotoluene	91	9.549	9.549	(0.933)	1714248	100.000	100.84
52	2-Hexanone	43	7.649	7.649	(0.927)	912444	200.000	212.30(A)
77	4-Chlorotoluene	91	9.639	9.639	(0.942)	1995109	100.000	101.56
82	p-Isopropyltoluene	119	10.209	10.209	(0.997)	2107729	100.000	107.96
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	1301011	200.000	210.38(A)
10	Acetone	43	2.483	2.483	(0.507)	331678	200.000	194.35
37	Benzene	78	5.220	5.220	(0.928)	2195227	100.000	100.34
74	Bromobenzene	156	9.385	9.385	(0.917)	573954	100.000	100.68
29	Bromochloromethane	128	4.556	4.556	(0.930)	244429	100.000	108.58
39	Bromodichloromethane	83	6.348	6.348	(1.129)	667511	100.000	108.05
66	Bromoform	173	8.983	8.983	(1.089)	331336	100.000	98.11(T)
6	Bromomethane	94	1.666	1.666	(0.340)	281859	100.000	101.50
19	Carbon Disulfide	76	2.592	2.592	(0.529)	3090544	200.000	201.15(A)
34	Carbon Tetrachloride	117	4.999	4.999	(0.889)	601960	100.000	99.26
59	Chlorobenzene	112	8.275	8.275	(1.003)	1466929	100.000	98.78
7	Chloroethane	64	1.752	1.752	(0.358)	384958	100.000	95.90(M)
28	Chloroform	83	4.657	4.657	(0.951)	918394	100.000	99.85
3	Chloromethane	50	1.344	1.344	(0.274)	441603	100.000	90.82
27	cis-1,2-Dichloroethene	96	4.286	4.286	(0.875)	580958	100.000	99.66
46	cis-1,3-Dichloropropene	75	6.760	6.760	(1.202)	944095	100.000	99.29
55	Dibromochloromethane	129	7.758	7.758	(0.940)	512845	100.000	99.98
44	Dibromomethane	93	6.191	6.191	(1.101)	341140	100.000	101.75
2	Dichlorodifluoromethane	85	1.209	1.209	(0.247)	553841	100.000	100.99
61	Ethylbenzene	106	8.372	8.372	(1.015)	779796	100.000	102.38
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	259405	100.000	99.12
67	Isopropylbenzene	105	9.126	9.126	(1.106)	2327627	100.000	105.90
62	m,p-Xylenes	106	8.474	8.474	(1.027)	1935465	200.000	206.70(A)
17	Methylene Chloride	84	2.873	2.873	(0.587)	554902	100.000	102.47
87	n-Butylbenzene	91	10.558	10.558	(1.031)	1963594	100.000	104.21
73	n-Propylbenzene	91	9.478	9.478	(0.926)	2891517	100.000	104.88
92	Naphthalene	128	12.132	12.132	(1.185)	2231968	100.000	99.52
63	o-Xylene	106	8.811	8.811	(1.068)	975544	100.000	103.27
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	2492415	100.000	107.57
64	Styrene	104	8.826	8.826	(1.069)	1680613	100.000	107.08
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	1698031	100.000	105.95
56	Tetrachloroethene	164	7.525	7.525	(0.912)	397169	100.000	98.15
50	Toluene	91	7.049	7.049	(0.854)	2304015	100.000	100.21
20	trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	513822	100.000	98.98
51	trans-1,3-Dichloropropene	75	7.263	7.263	(1.291)	811224	100.000	98.79
38	Trichloroethene	130	5.861	5.861	(1.042)	528149	100.000	100.00
8	Trichlorofluoromethane	101	1.955	1.955	(0.399)	753769	100.000	102.46
5	Vinyl Chloride	62	1.422	1.422	(0.290)	629175	100.000	99.33

QC Flag Legend

T - Target compound detected outside RT window.
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.



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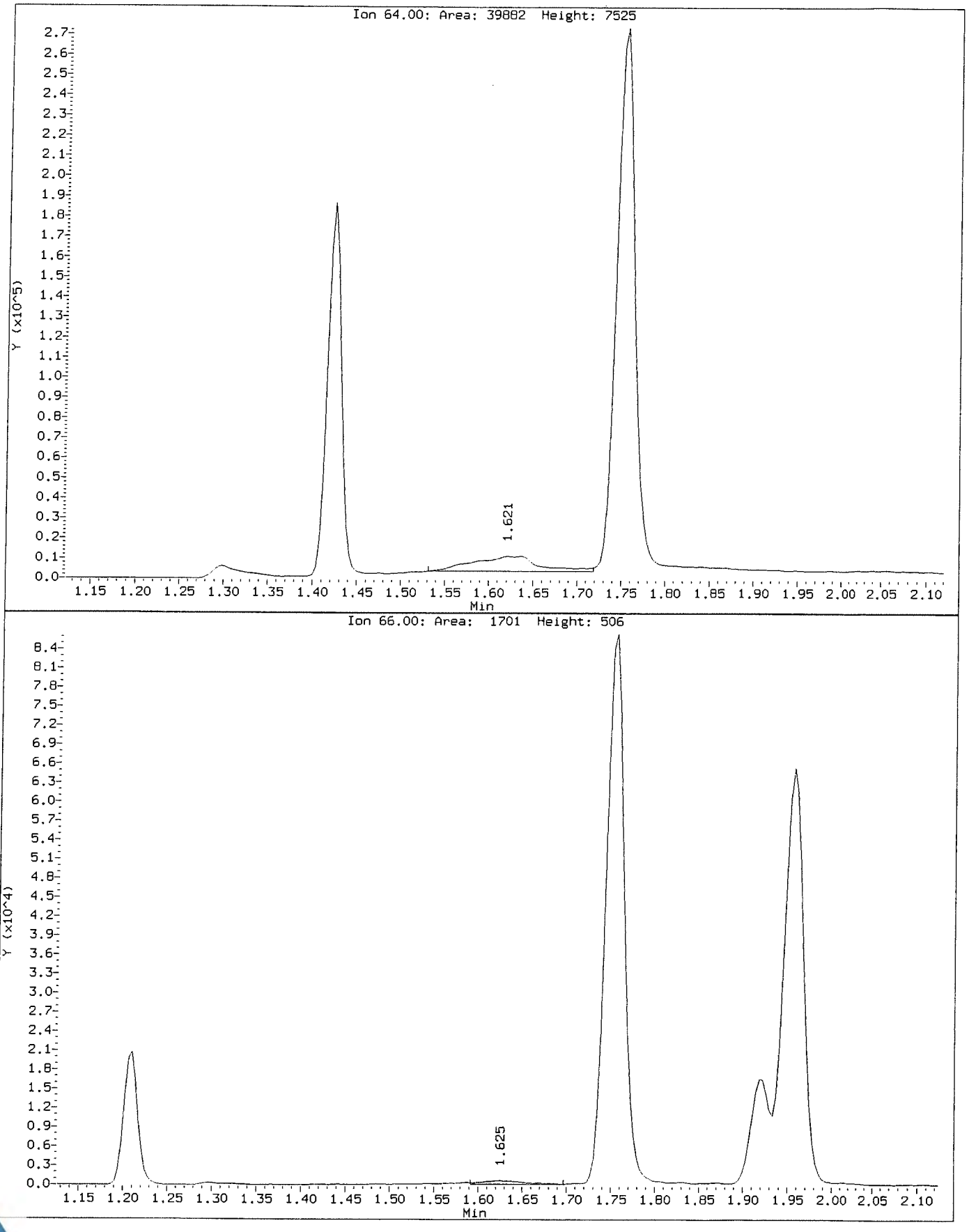
Client ID: VSTD100
Sample Info: VSTD100;VSTD100;1;8;
Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122109.D

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122109.D
Injection Date: 21-DEC-2018 17:06
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: Chloroethane
CAS Number: 75-00-3



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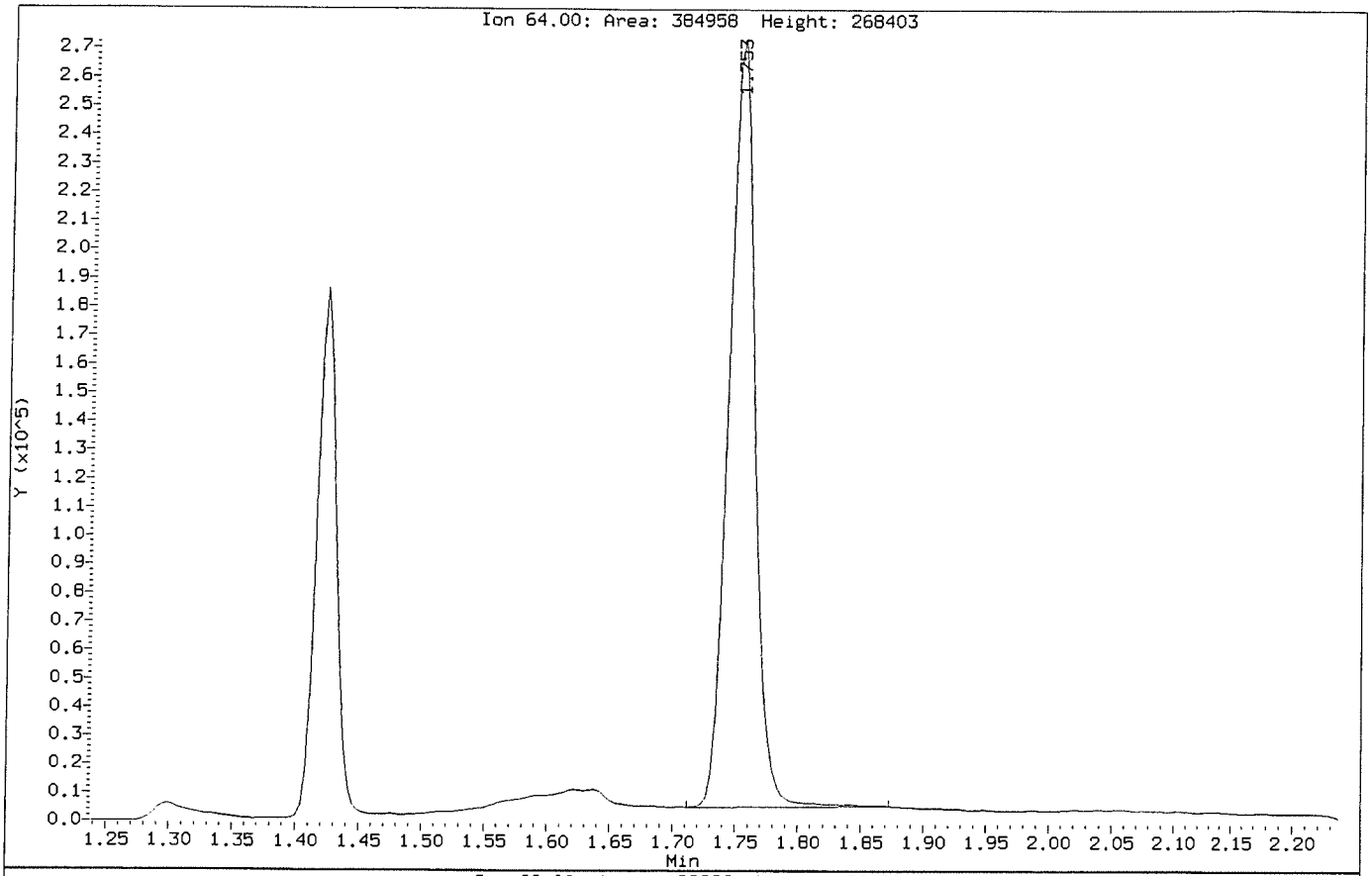
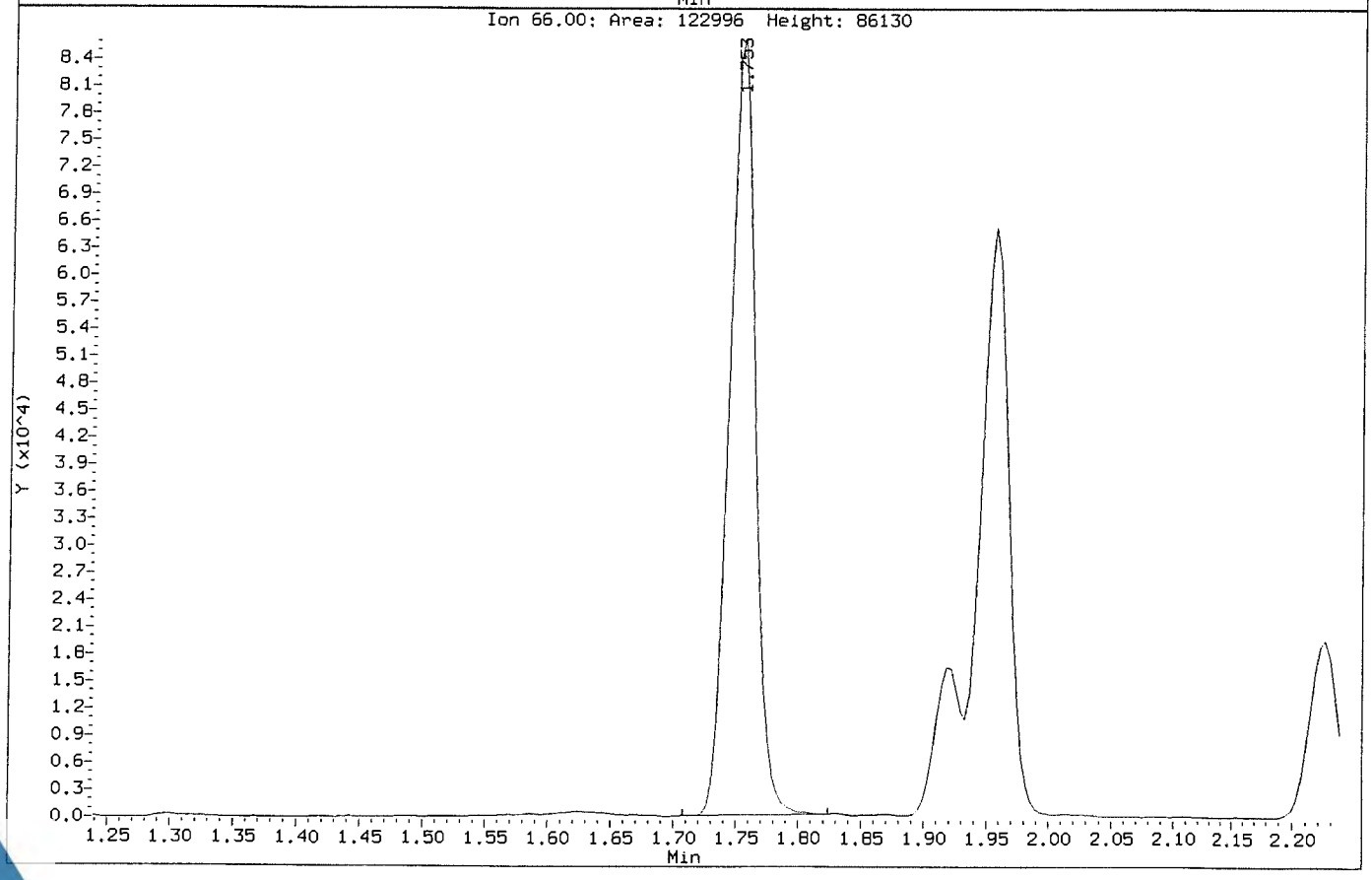
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122110.D
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Inj Date : 21-DEC-2018 17:31
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD150;VSTD150;1;9;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 17:06 Cal File: U122109.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

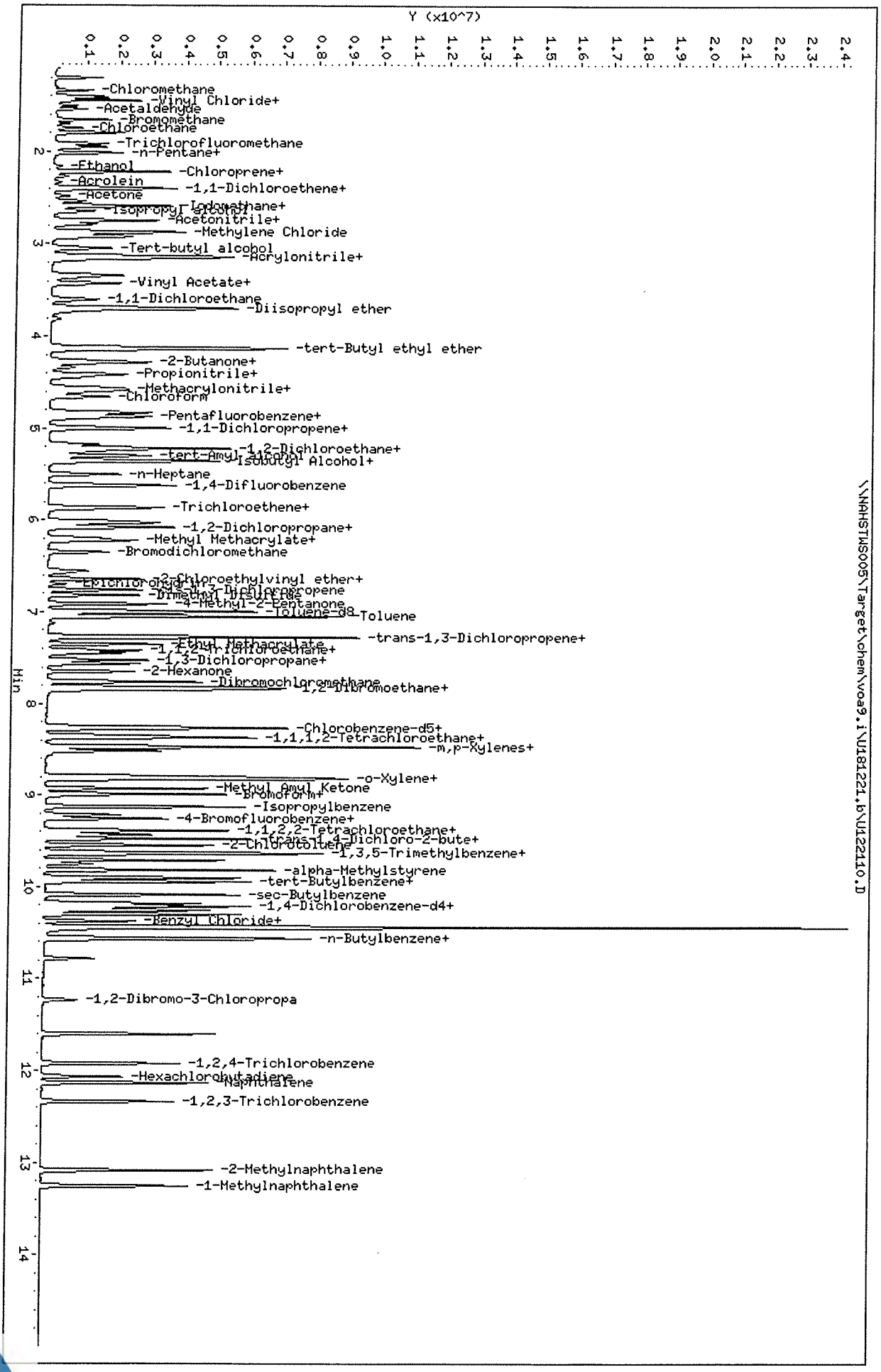
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	456327	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	837974	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	793198	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	374825	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.830	(0.987)	745399	150.000	151.02
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	949266	150.000	151.18
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	3016887	150.000	150.76
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	1153874	150.000	150.78
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	766622	150.000	151.11
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	1166981	150.000	161.96
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	1214939	150.000	143.93
138 Freon TF	101	2.401	2.401	(0.491)	609198	150.000	157.03
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	689788	150.000	145.96
22 1,1-Dichloroethane	63	3.604	3.604	(0.737)	1459691	150.000	148.53
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	645721	150.000	148.82
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	1147997	150.000	153.96
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	1085027	150.000	152.30
71 1,2,3-Trichloropropane	75	9.430	9.430	(0.921)	1401190	150.000	159.63
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	1126029	150.000	162.26
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	3050007	150.000	155.49
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	200384	150.000	150.93
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	815175	150.000	149.76

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122110.D Page 2
Report Date: 28-Jan-2019 11:25

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	1640210	150.000	147.37
33 1,2-Dichloroethane	62	5.254	5.254	(0.934)	1129116	150.000	151.01
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	888346	150.000	150.03
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	2996671	150.000	159.08
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	1669910	150.000	150.03
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	1476732	150.000	145.07
84 1,4-Dichlorobenzene	146	10.255	10.255	(1.002)	1696761	150.000	144.58
26 2,2-Dichloropropane	77	4.275	4.275	(0.874)	951402	150.000	160.64
24 2-Butanone	43	4.335	4.335	(0.886)	880878	300.000	299.93(A)
76 2-Chlorotoluene	91	9.550	9.550	(0.933)	2603345	150.000	150.74
52 2-Hexanone	43	7.653	7.653	(0.928)	1413890	300.000	320.56(A)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	3029757	150.000	151.81
82 p-Isopropyltoluene	119	10.210	10.210	(0.997)	3190047	150.000	160.83
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	1993190	300.000	314.06(A)
10 Acetone	43	2.480	2.480	(0.507)	520533	300.000	298.01(A)
37 Benzene	78	5.216	5.216	(0.927)	3311929	150.000	148.52
74 Bromobenzene	156	9.385	9.385	(0.917)	890701	150.000	153.79
29 Bromochloromethane	128	4.557	4.557	(0.931)	348533	150.000	151.66
39 Bromodichloromethane	83	6.348	6.348	(1.129)	1032680	150.000	164.00
66 Bromoform	173	8.984	8.984	(1.089)	522892	150.000	149.93
6 Bromomethane	94	1.659	1.659	(0.339)	444174	150.000	154.73
19 Carbon Disulfide	76	2.588	2.588	(0.529)	4735575	300.000	299.54(A)
34 Carbon Tetrachloride	117	4.995	4.995	(0.888)	939611	150.000	151.26
59 Chlorobenzene	112	8.275	8.275	(1.003)	2244427	150.000	147.26
7 Chloroethane	64	1.745	1.745	(0.357)	684109	150.000	161.33
28 Chloroform	83	4.658	4.658	(0.952)	1391091	150.000	146.98
3 Chloromethane	50	1.340	1.340	(0.274)	746873	150.000	147.15
27 cis-1,2-Dichloroethene	96	4.287	4.287	(0.876)	893807	150.000	149.01
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	1468956	150.000	150.90
55 Dibromochloromethane	129	7.758	7.758	(0.940)	791728	150.000	149.91
44 Dibromomethane	93	6.191	6.191	(1.101)	516406	150.000	151.11
2 Dichlorodifluoromethane	85	1.205	1.205	(0.246)	873891	150.000	154.61
61 Ethylbenzene	106	8.373	8.373	(1.015)	1198529	150.000	153.33
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	400552	150.000	150.65
67 Isopropylbenzene	105	9.126	9.126	(1.106)	3526393	150.000	156.34
62 m,p-Xylenes	106	8.474	8.474	(1.027)	2933161	300.000	305.23(A)
17 Methylene Chloride	84	2.870	2.870	(0.586)	841220	150.000	151.54
87 n-Butylbenzene	91	10.558	10.558	(1.031)	2965307	150.000	154.91
73 n-Propylbenzene	91	9.479	9.479	(0.926)	4348220	150.000	155.25
92 Naphthalene	128	12.133	12.133	(1.185)	3430934	150.000	151.53
63 o-Xylene	106	8.811	8.811	(1.068)	1492877	150.000	153.99
81 sec-Butylbenzene	105	10.090	10.090	(0.986)	3757107	150.000	159.61
64 Styrene	104	8.826	8.826	(1.070)	2556162	150.000	158.70
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	2586354	150.000	158.85
56 Tetrachloroethene	164	7.526	7.526	(0.912)	610669	150.000	147.05
50 Toluene	91	7.049	7.049	(0.855)	3483930	150.000	147.65
20 trans-1,2-Dichloroethene	96	3.140	3.140	(0.642)	789348	150.000	147.77
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.291)	1271771	150.000	151.06
38 Trichloroethene	130	5.861	5.861	(1.042)	823329	150.000	152.94
8 Trichlorofluoromethane	101	1.951	1.951	(0.399)	1146930	150.000	151.21
5 Vinyl Chloride	62	1.419	1.419	(0.290)	1000865	150.000	153.03

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122110.D
Date : 21-DEC-2018 17:31
Client ID: VSTD150
Sample Info: VSTD150;VSTD150;1;9;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122111.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 21-DEC-2018 17:55
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD200;VSTD200;1;10;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 17:31 Cal File: U122110.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

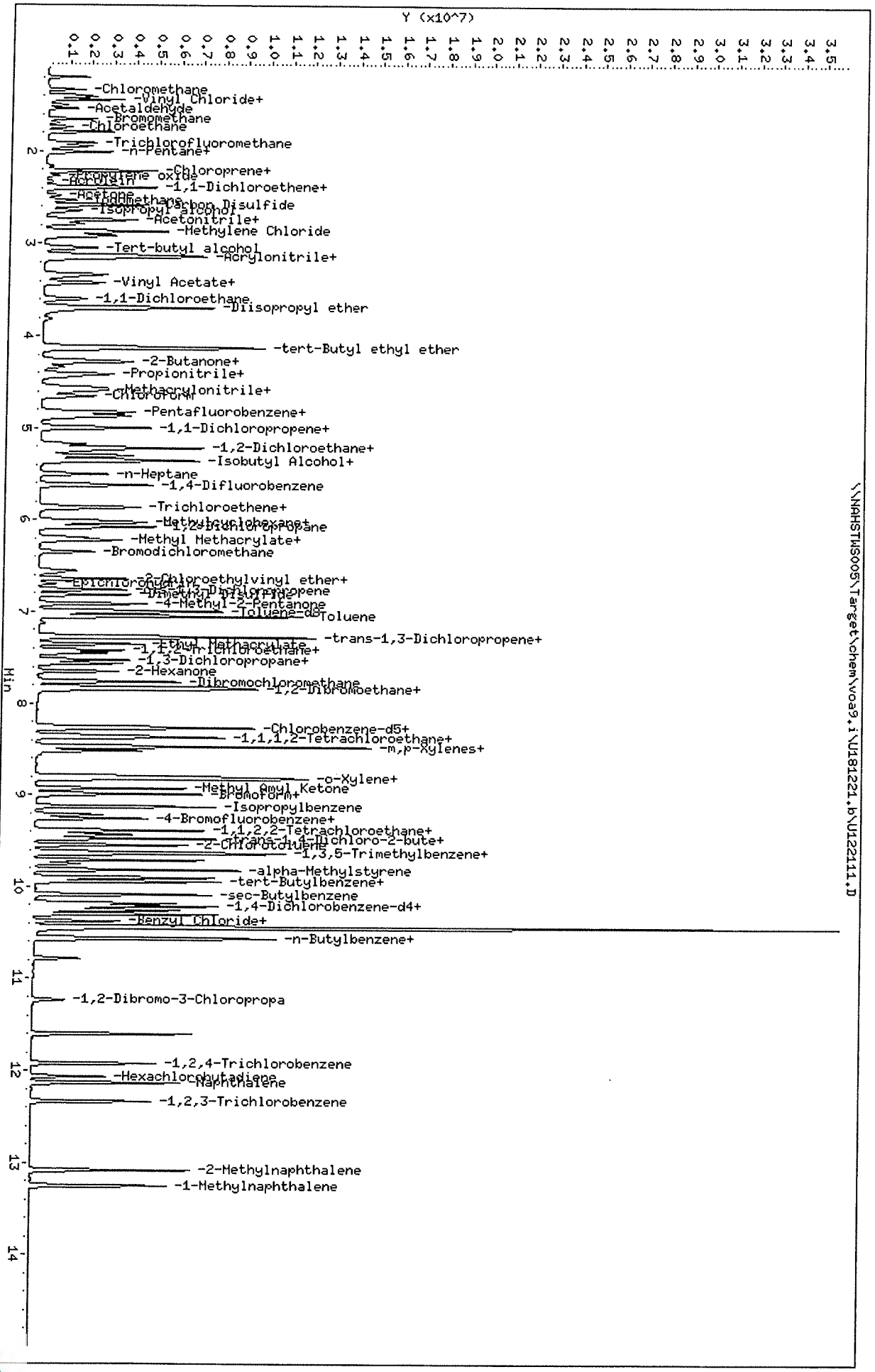
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	471928	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	852109	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	808162	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	383807	50.0000	
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.987)	1006329	200.000	197.61
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	1274051	200.000	196.84
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	4010125	200.000	197.23
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	1540801	200.000	198.06
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	1032567	200.000	199.57
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.987)	1558350	200.000	209.12(A)
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	1627647	200.000	188.30
138 Freon TF	101	2.394	2.394	(0.490)	818502	200.000	204.00(A)
53 1,1,2-Trichloroethane	83	7.421	7.421	(0.900)	922969	200.000	191.69
22 1,1-Dichloroethane	63	3.597	3.597	(0.736)	1941260	200.000	191.00
11 1,1-Dichloroethene	96	2.394	2.394	(0.490)	870210	200.000	193.93
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	1526453	200.000	201.33(A)
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	1453309	200.000	199.03
71 1,2,3-Trichloropropane	75	9.430	9.430	(0.921)	1910859	200.000	212.60(A)
90 1,2,4-Trichlorobenzene	180	11.926	11.926	(1.165)	1495400	200.000	210.44(A)
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	4007083	200.000	199.50
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	274280	200.000	201.27(A)
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	1097675	200.000	197.93

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122111.D Page 2
Report Date: 28-Jan-2019 11:25

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	2176108	200.000	190.95
33 1,2-Dichloroethane	62	5.250	5.250	(0.933)	1504782	200.000	198.15
42 1,2-Dichloropropane	63	6.078	6.078	(1.081)	1186343	200.000	197.03
75 1,3,5-Trimethylbenzene	105	9.628	9.628	(0.941)	3964216	200.000	205.51(A)
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	2212350	200.000	194.11
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	1981022	200.000	191.01
84 1,4-Dichlorobenzene	146	10.258	10.258	(1.002)	2259523	200.000	188.03
26 2,2-Dichloropropane	77	4.272	4.272	(0.874)	1270502	200.000	207.43(A)
24 2-Butanone	43	4.335	4.335	(0.887)	1199902	400.000	395.82(A)
76 2-Chlorotoluene	91	9.550	9.550	(0.933)	3451393	200.000	195.17
52 2-Hexanone	43	7.653	7.653	(0.928)	1896004	400.000	421.90(A)
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	3993483	200.000	195.41
82 p-Isopropyltoluene	119	10.213	10.213	(0.998)	4198944	200.000	206.74(A)
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	2681840	400.000	414.75(A)
10 Acetone	43	2.476	2.476	(0.506)	723113	400.000	401.34(A)
37 Benzene	78	5.216	5.216	(0.927)	4410809	200.000	194.52
74 Bromobenzene	156	9.385	9.385	(0.917)	1186255	200.000	200.04(A)
29 Bromochloromethane	128	4.553	4.553	(0.931)	453685	200.000	191.69
39 Bromodichloromethane	83	6.345	6.345	(1.128)	1391257	200.000	217.29(A)
66 Bromoform	173	8.984	8.984	(1.089)	718878	200.000	201.69(A)
6 Bromomethane	94	1.651	1.651	(0.338)	585856	200.000	196.98
19 Carbon Disulfide	76	2.585	2.585	(0.529)	6125723	400.000	374.66(A)
34 Carbon Tetrachloride	117	4.991	4.991	(0.887)	1268610	200.000	200.38(A)
59 Chlorobenzene	112	8.275	8.275	(1.003)	2961137	200.000	190.69
7 Chloroethane	64	1.737	1.737	(0.355)	859472	200.000	193.44
28 Chloroform	83	4.654	4.654	(0.952)	1846267	200.000	188.63
3 Chloromethane	50	1.333	1.333	(0.273)	1095269	200.000	207.27(A)
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.876)	1189323	200.000	191.72
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	1986544	200.000	200.27(A)
55 Dibromochloromethane	129	7.758	7.758	(0.940)	1081017	200.000	200.56(A)
44 Dibromomethane	93	6.187	6.187	(1.100)	698521	200.000	201.01(A)
2 Dichlorodifluoromethane	85	1.198	1.198	(0.245)	1151588	200.000	196.87
61 Ethylbenzene	106	8.373	8.373	(1.015)	1600834	200.000	201.00(A)
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	534175	200.000	196.21
67 Isopropylbenzene	105	9.126	9.126	(1.106)	4617933	200.000	200.94(A)
62 m,p-Xylenes	106	8.474	8.474	(1.027)	3876248	400.000	395.90(A)
17 Methylene Chloride	84	2.866	2.866	(0.586)	1131189	200.000	197.41
87 n-Butylbenzene	91	10.558	10.558	(1.031)	3856663	200.000	196.76
73 n-Propylbenzene	91	9.479	9.479	(0.926)	5652456	200.000	197.09
92 Naphthalene	128	12.133	12.133	(1.185)	4589381	200.000	199.26
63 o-Xylene	106	8.811	8.811	(1.068)	1977764	200.000	200.23(A)
81 sec-Butylbenzene	105	10.090	10.090	(0.986)	4898290	200.000	203.23(A)
64 Styrene	104	8.826	8.826	(1.070)	3375201	200.000	205.67(A)
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	3416506	200.000	204.92(A)
56 Tetrachloroethene	164	7.525	7.525	(0.912)	811202	200.000	191.73
50 Toluene	91	7.046	7.046	(0.854)	4594912	200.000	191.13
20 trans-1,2-Dichloroethene	96	3.136	3.136	(0.641)	1055077	200.000	190.99
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	1721394	200.000	200.53(A)
38 Trichloroethene	130	5.861	5.861	(1.042)	1093007	200.000	199.67
8 Trichlorofluoromethane	101	1.944	1.944	(0.398)	1561606	200.000	198.87
5 Vinyl Chloride	62	1.415	1.415	(0.289)	1348117	200.000	199.01

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122111.D
Date : 21-DEC-2018 17:55
Client ID: VSTD200
Sample Info: VSTD200;VSTD200;1;10;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122113.D Page 1
Report Date: 28-Jan-2019 11:25

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122113.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 21-DEC-2018 18:45
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;ICV
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181221.b\8260C.m
Meth Date : 28-Jan-2019 11:25 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 17:55 Cal File: U122111.D
Als bottle: 14 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

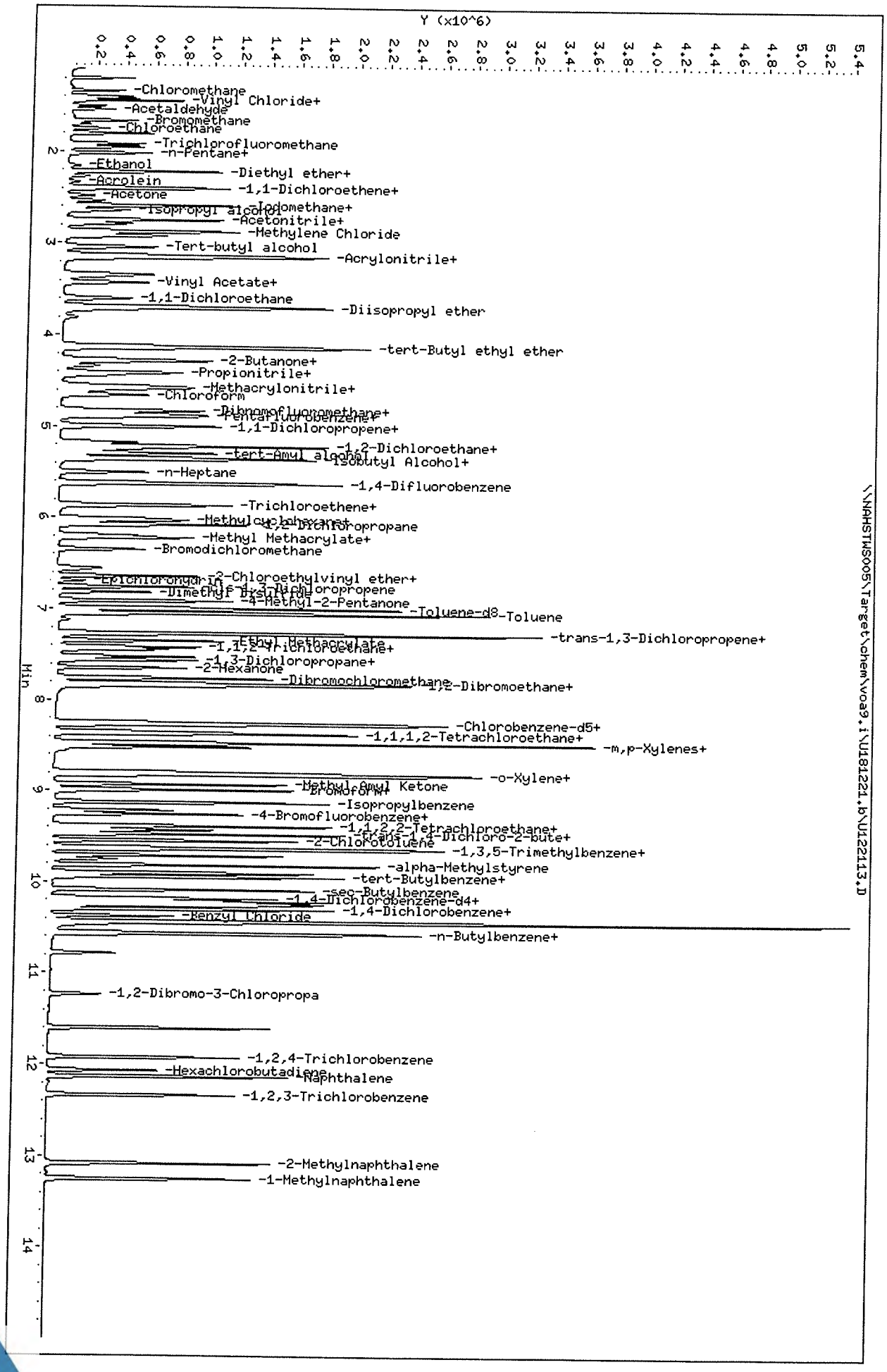
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	454236	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	837452	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	785431	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	375418	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	255609	51.0245	51.02
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	329809	51.3551	51.35
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	1045729	51.6161	51.61
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	396478	51.3902	51.39
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	241293	48.4317	48.43
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	354032	49.3608	49.36
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	418971	49.5558	49.55
138 Freon TF	101	2.401	2.394	(0.491)	174050	45.0712	45.07
53 1,1,2-Trichloroethane	83	7.420	7.421	(0.900)	230741	49.3099	49.30
22 1,1-Dichloroethane	63	3.604	3.597	(0.737)	469167	47.9609	47.96
11 1,1-Dichloroethene	96	2.397	2.394	(0.490)	197920	45.8262	45.82
32 1,1-Dichloropropene	75	5.003	5.003	(0.889)	353683	47.4657	47.46
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	338004	47.8072	47.80
71 1,2,3-Trichloropropane	75	9.426	9.430	(0.921)	468241	53.2610	53.26
90 1,2,4-Trichlorobenzene	180	11.923	11.926	(1.165)	350114	50.3719	50.37
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	985013	50.1388	50.13
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	65081	49.9244	49.92
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	275792	51.1699	51.16

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122113.D Page 2
Report Date: 28-Jan-2019 11:25

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	539129	48.3652	48.36
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	379863	50.3501	50.35
42 1,2-Dichloropropane	63	6.082	6.078	(1.081)	291083	49.1911	49.19
75 1,3,5-Trimethylbenzene	105	9.625	9.628	(0.940)	944583	50.0646	50.06
83 1,3-Dichlorobenzene	146	10.180	10.180	(0.995)	538150	48.2737	48.27
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	498006	49.4090	49.40
84 1,4-Dichlorobenzene	146	10.254	10.258	(1.002)	553425	47.0841	47.08
26 2,2-Dichloropropane	77	4.275	4.272	(0.874)	312995	53.0931	53.09
24 2-Butanone	43	4.335	4.335	(0.886)	309683	104.354	104.35
76 2-Chlorotoluene	91	9.546	9.550	(0.933)	853147	49.3227	49.32
52 2-Hexanone	43	7.649	7.653	(0.927)	476780	109.166	109.16
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	993815	49.7187	49.71
82 p-Isopropyltoluene	119	10.209	10.213	(0.997)	977284	49.1947	49.19
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	669743	106.576	106.57
10 Acetone	43	2.480	2.476	(0.507)	202203	114.452	114.45
37 Benzene	78	5.216	5.216	(0.927)	1087936	48.8203	48.82
74 Bromobenzene	156	9.381	9.385	(0.917)	288693	49.7707	49.77
29 Bromochloromethane	128	4.553	4.553	(0.930)	134219	56.7663	56.76
39 Bromodichloromethane	83	6.348	6.345	(1.129)	327631	52.0660	52.06
66 Bromoform	173	8.984	8.984	(1.089)	161326	47.9288	47.92(T)
6 Bromomethane	94	1.666	1.651	(0.341)	151955	54.0592	54.05
19 Carbon Disulfide	76	2.588	2.585	(0.529)	1510901	96.0096	96.00
34 Carbon Tetrachloride	117	4.995	4.991	(0.888)	272477	44.8853	44.88
59 Chlorobenzene	112	8.275	8.275	(1.003)	728193	48.2531	48.25
7 Chloroethane	64	1.752	1.737	(0.358)	185529	46.1546	46.15(M)
28 Chloroform	83	4.658	4.654	(0.952)	456472	48.4536	48.45
3 Chloromethane	50	1.340	1.333	(0.274)	235959	48.9688	48.96
27 cis-1,2-Dichloroethene	96	4.287	4.283	(0.876)	292150	48.9311	48.93
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	467498	48.9175	48.91
55 Dibromochloromethane	129	7.758	7.758	(0.940)	250542	48.5723	48.57
44 Dibromomethane	93	6.191	6.187	(1.101)	173822	50.8969	50.89
2 Dichlorodifluoromethane	85	1.205	1.198	(0.246)	258081	46.2123	46.21
61 Ethylbenzene	106	8.373	8.373	(1.015)	381593	49.3007	49.30
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	122959	46.1748	46.17
67 Isopropylbenzene	105	9.126	9.126	(1.106)	1096015	49.0718	49.07
62 m,p-Xylenes	106	8.474	8.474	(1.027)	950452	99.8846	99.88
17 Methylene Chloride	84	2.870	2.866	(0.586)	279368	49.7584	49.75
87 n-Butylbenzene	91	10.558	10.558	(1.031)	900081	46.9488	46.94
73 n-Propylbenzene	91	9.475	9.479	(0.926)	1377655	49.1117	49.11
92 Naphthalene	128	12.133	12.133	(1.185)	1130612	49.4621	49.46
63 o-Xylene	106	8.811	8.811	(1.068)	478939	49.8923	49.89
81 sec-Butylbenzene	105	10.086	10.090	(0.985)	1124348	47.6920	47.69
64 Styrene	104	8.826	8.826	(1.070)	841070	52.7368	52.73
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	781669	47.9339	47.93
56 Tetrachloroethene	164	7.525	7.525	(0.912)	188872	45.9327	45.93
50 Toluene	91	7.046	7.046	(0.854)	1151259	49.2749	49.27
20 trans-1,2-Dichloroethene	96	3.139	3.136	(0.642)	255368	48.0288	48.02
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	402226	48.9357	48.93
38 Trichloroethene	130	5.861	5.861	(1.042)	262761	48.8423	48.84
8 Trichlorofluoromethane	101	1.951	1.944	(0.399)	342884	45.8511	45.85
5 Vinyl Chloride	62	1.419	1.415	(0.290)	295169	46.0208	46.02

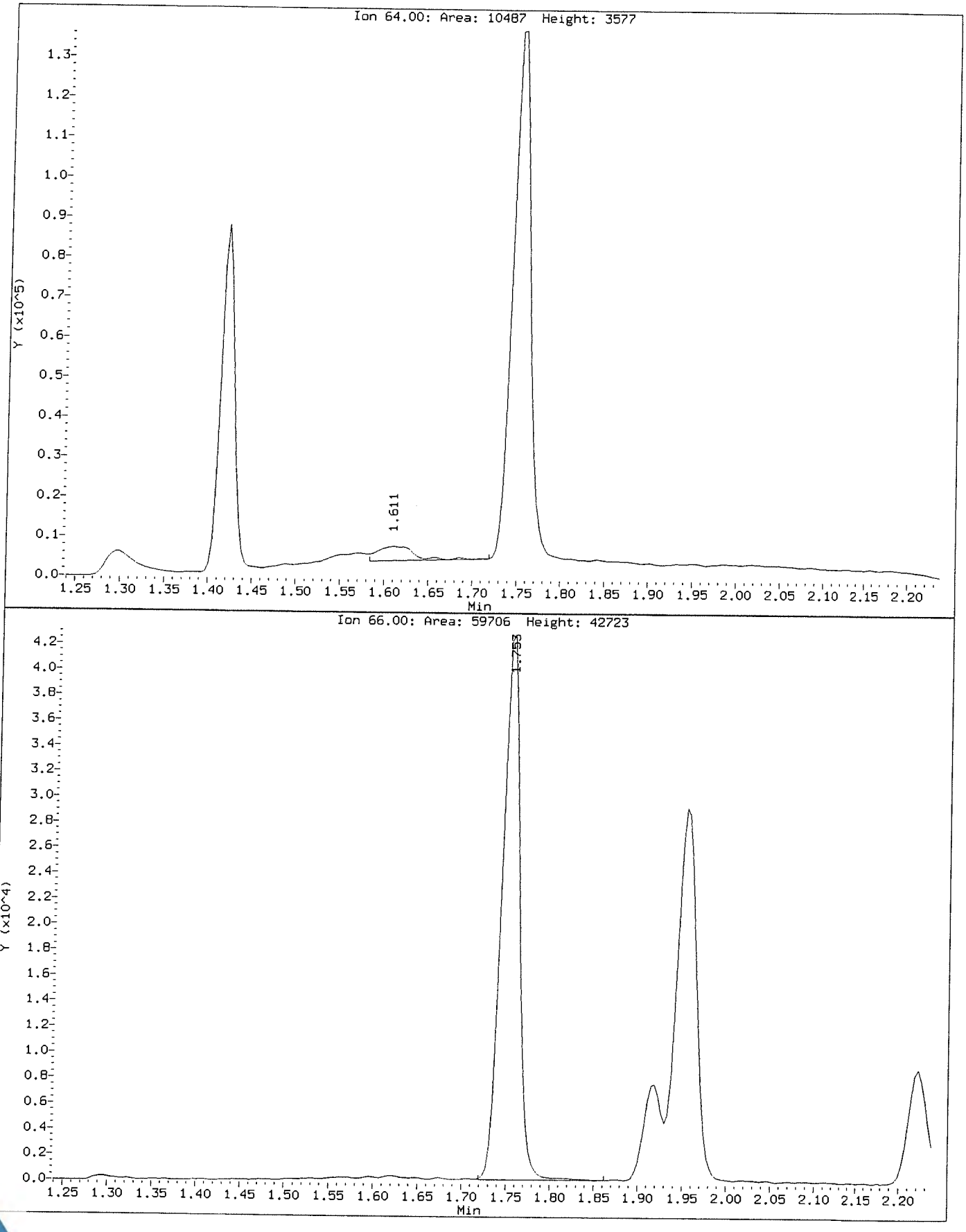
QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.


Y (x10^6)
Min
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-n-Pentane+
-Ethanol
-Diethyl ether+
-Acrolein
-1,1-Dichloroethene+
-Acetone
-Iodomethane+
-Isopropyl alcohol
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-Vinyl Acetate+
-1,1-Dichloroethane
-Diisopropyl ether
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile+
-Methacrylonitrile+
-Chloroform
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-tert-Amyl alcohol
-Isobutyl Alcohol+
-n-Heptane
-1,4-Difluorobenzene
-Trichloroethene+
-Methylcyclohexane+
-1,2-Dichloropropane
-Methyl Methacrylate+
-Bromodichloromethane
-2-Chloroethylvinyl ether+
-Epichlorohydrin
-cis-1,3-Dichloropropene
-Dimethyl disulfide
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-trans-1,3-Dichloropropene+
-Ethyl Methacrylate
-1,1,2-Trichloroethane+
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane+
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes+
-o-Xylene+
-Methyl Amyl Ketone
-Bromoform+
-Isopropylbenzene
-4-Bromofluorobenzene+
-1,1,2,2-Tetrachloroethane+
-trans-1,4-Dichloro-2-bute+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
-1,4-Dichlorobenzene+
-Benzyl Chloride
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
-2-Methylnaphthalene
-1-Methylnaphthalene
\\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122113.D
Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\U122113.D
Date : 21-DEC-2018 18:45
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;2;;ICV
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18
Page 4

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181221.b\Before\U122113.D
Injection Date: 21-DEC-2018 18:45
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3



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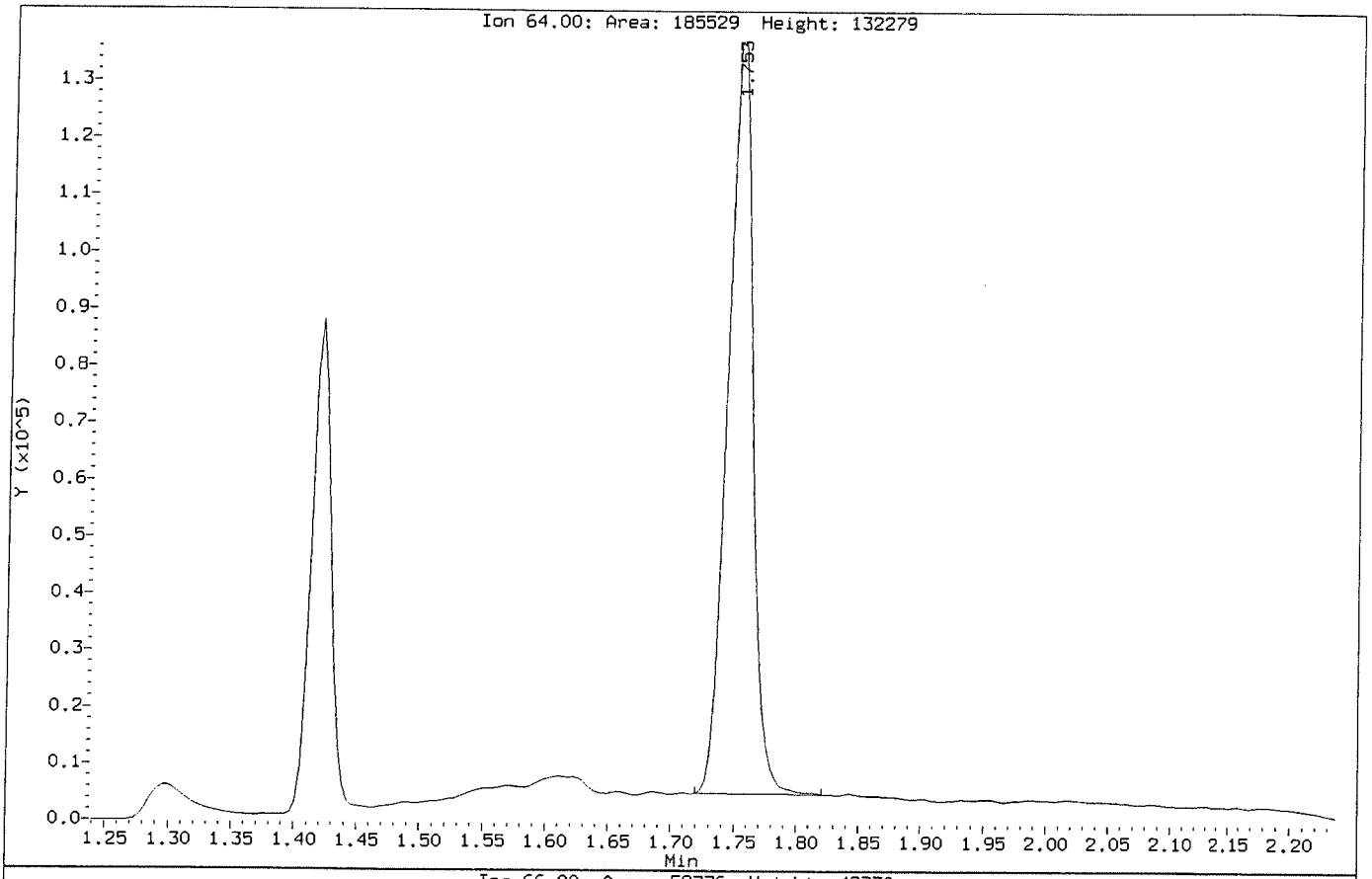
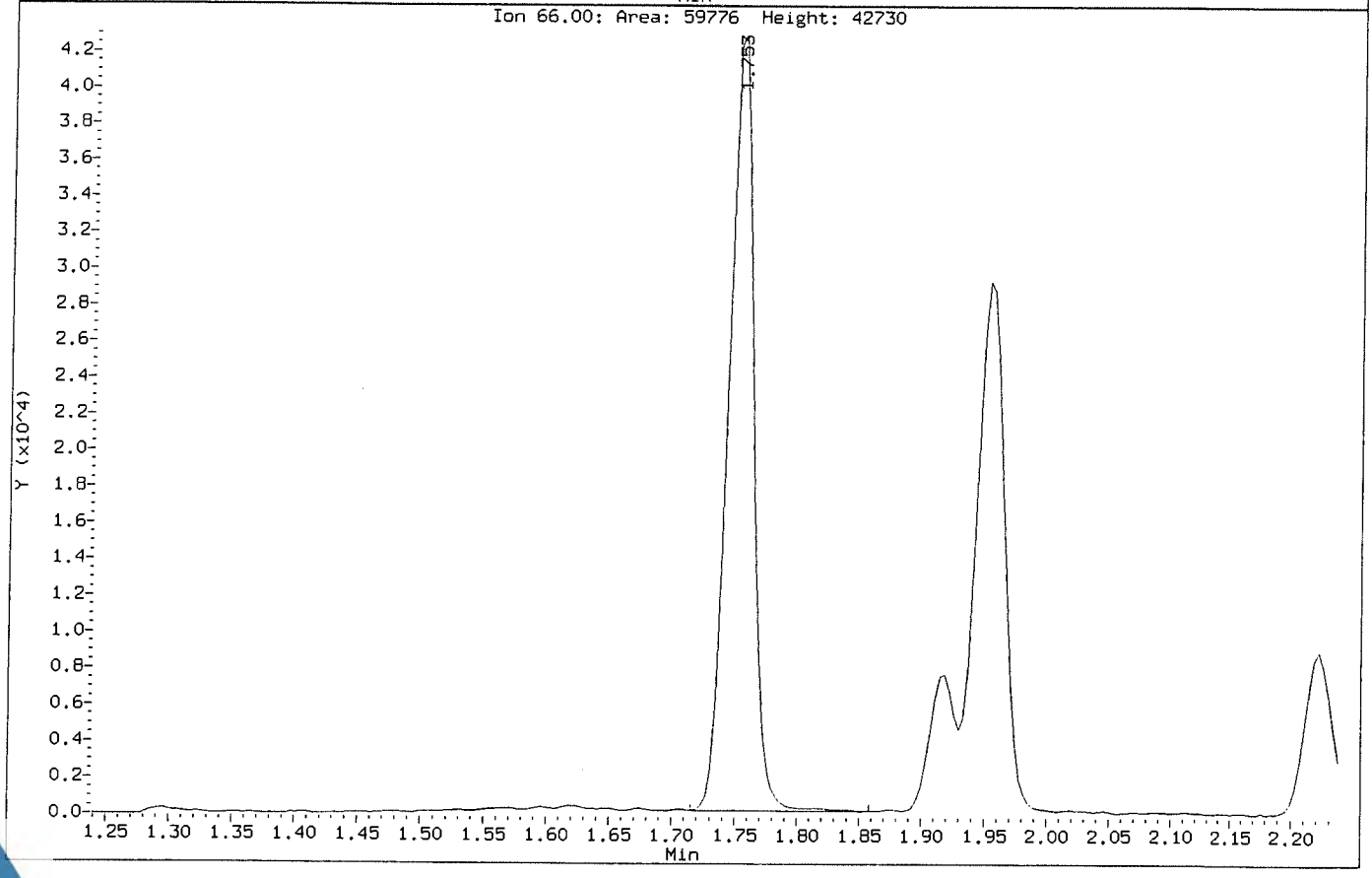
Injection Date: 21-DEC-2018 18:45
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





MSVOA09 -Logbook

Batch: 34003
Date: 12-22-2018
Method: 8260
Comments:

Analyst: Presenta Cabascango
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	12-22-2018 10:39 am	1.00	50 mL	50 mL	U122201.D	Liquid	Y	NA
	Auto find/purged									
2	VSTD050	CCV	12-22-2018 11:03 am	1.00	50 mL	50 mL	U122202.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
3	VLCSW-1812022	LCS	12-22-2018 11:28 am	1.00	50 mL	50 mL	U122203.D	Liquid	Y	NA
	4 uL ICV std/50 mL DI									
4	BLANK	SAMP	12-22-2018 11:53 am	1.00	50 mL	50 mL	U122204.D	Liquid	Y	NA
	Cleanup blk									
5	VBLKW-181222	MBLK	12-22-2018 12:18 pm	1.00	50 mL	50 mL	U122205.D	Liquid	Y	NA
6	HS18120927-05	SAMP	12-22-2018 12:43 pm	1.00	50 mL	50 mL	U122206.D	Liquid	Y	<2
7	HS18120642-01	SAMP	12-22-2018 01:07 pm	1.00	50 mL	50 mL	U122207.D	Liquid	Y	<2
8	HS18120642-03	SAMP	12-22-2018 01:32 pm	1.00	50 mL	50 mL	U122208.D	Liquid	Y	<2
9	HS18120927-05MS	MS	12-22-2018 01:57 pm	1.00	50 mL	50 mL	U122209.D	Liquid	Y	<2
	3.5 uL cal std/43 mL Sample									
10	HS18120927-05MSD	MSD	12-22-2018 02:22 pm	1.00	50 mL	50 mL	U122210.D	Liquid	Y	<2
	3.5 uL cal std/43 mL Sample									
11	HS18120642-03	SAMP	12-22-2018 02:46 pm	10.00	5 mL	50 mL	U122211.D	Liquid	Y	<2
12	HS18120927-02	SAMP	12-22-2018 03:11 pm	1.00	50 mL	50 mL	U122212.D	Liquid	Y	<2
13	HS18120927-09	SAMP	12-22-2018 03:36 pm	1.00	50 mL	50 mL	U122213.D	Liquid	Y	<2
14	HS18120642-05	SAMP	12-22-2018 04:01 pm	1.00	50 mL	50 mL	U122214.D	Liquid	Y	<2
15	HS18120927-01	SAMP	12-22-2018 04:26 pm	1.00	50 mL	50 mL	U122215.D	Liquid	Y	<2
16	HS18120927-03	SAMP	12-22-2018 04:50 pm	1.00	50 mL	50 mL	U122216.D	Liquid	Y	<2
17	HS18120927-04	SAMP	12-22-2018 05:15 pm	1.00	50 mL	50 mL	U122217.D	Liquid	Y	<2
18	HS18120927-06	SAMP	12-22-2018 05:40 pm	1.00	50 mL	50 mL	U122218.D	Liquid	Y	<2
19	HS18120927-07	SAMP	12-22-2018 06:05 pm	1.00	50 mL	50 mL	U122219.D	Liquid	Y	<2
20	HS18120927-08	SAMP	12-22-2018 06:30 pm	1.00	50 mL	50 mL	U122220.D	Liquid	Y	<2
21	HS18120642-02	SAMP	12-22-2018 06:54 pm	1.00	50 mL	50 mL	U122221.D	Liquid	Y	<2
22	HS18120642-04	SAMP	12-22-2018 07:19 pm	1.00	50 mL	50 mL	U122222.D	Liquid	Y	<2
23	HS18120736-02	SAMP	12-22-2018 07:44 pm	10.00	5 mL	50 mL	U122223.D	Liquid	Y	<2
24	HS18120736-01	SAMP	12-22-2018 08:09 pm	1.00	50 mL	50 mL	U122224.D	Liquid	Y	<2
25	HS18120736-03	SAMP	12-22-2018 08:33 pm	1.00	50 mL	50 mL	U122225.D	Liquid	Y	<2
26	HS18120736-04	SAMP	12-22-2018 08:58 pm	1.00	50 mL	50 mL	U122226.D	Liquid	Y	<2
27	HS18120642-01	SAMP	12-22-2018 09:23 pm	5.00	10 mL	50 mL	U122227.D	Liquid	Y	<2
28	VSTD050-END	CCV	12-22-2018 09:47 pm	1.00	50 mL	50 mL	U122228.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
29	BFB	TUNE	12-22-2018 10:12 pm	1.00	50 mL	50 mL	V122201.D	Liquid	Y	NA
	Auto find/purged									
30	VSTD050	CCV	12-22-2018 10:37 pm	1.00	50 mL	50 mL	V122202.D	Liquid	Y	NA
	Auto find/purged									
31	CCB	SAMP	12-22-2018 11:02 pm	1.00	50 mL	50 mL	V122203.D	Liquid	Y	NA
	CCB									
32	VLCSW-1812022	LCS	12-22-2018 11:26 pm	1.00	50 mL	50 mL	V122204.D	Liquid	Y	NA
	4 uL ICV std/50 mL DI									
33	BLANK	SAMP	12-22-2018 11:51 pm	1.00	50 mL	50 mL	V122205.D	Liquid	Y	NA
	Cleanup blk									
34	VBLKW-181222	MBLK	12-23-2018 12:16 am	1.00	50 mL	50 mL	V122206.D	Liquid	Y	NA
35	HS18120646-13	SAMP	12-23-2018 12:41 am	1.00	50 mL	50 mL	V122207.D	Liquid	Y	<2

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
36	HS18120646-03	SAMP	12-23-2018 01:05 am	1.00	50 mL	50 mL	V122208.D	Liquid	Y	<2
37	HS18120646-03MS	MS	12-23-2018 01:30 am	1.00	50 mL	50 mL	V122209.D	Liquid	Y	<2
	3.5 uL cal std/43 mL Sample									
38	HS18120646-03MSD	MSD	12-23-2018 01:55 am	1.00	50 mL	50 mL	V122210.D	Liquid	Y	<2
	3.5 uL cal std/43 mL Sample									
39	HS18120704-05	SAMP	12-23-2018 02:20 am	25.00	2 mL	50 mL	V122211.D	Liquid	Y	<2
40	HS18120704-06	SAMP	12-23-2018 02:45 am	25.00	2 mL	50 mL	V122212.D	Liquid	Y	<2
41	HS18120646-04	SAMP	12-23-2018 03:09 am	1.00	50 mL	50 mL	V122213.D	Liquid	Y	<2
42	HS18120646-07	SAMP	12-23-2018 03:34 am	1.00	50 mL	50 mL	V122214.D	Liquid	Y	<2
43	HS18120646-08	SAMP	12-23-2018 03:59 am	1.00	50 mL	50 mL	V122215.D	Liquid	Y	<2
44	HS18120646-09	SAMP	12-23-2018 04:24 am	1.00	50 mL	50 mL	V122216.D	Liquid	Y	<2
45	HS18120646-11	SAMP	12-23-2018 04:49 am	1.00	50 mL	50 mL	V122217.D	Liquid	Y	<2
46	HS18120646-01	SAMP	12-23-2018 05:14 am	5.00	10 mL	50 mL	V122218.D	Liquid	Y	<2
47	HS18120646-02	SAMP	12-23-2018 05:39 am	10.00	5 mL	50 mL	V122219.D	Liquid	Y	<2
48	HS18120646-05	SAMP	12-23-2018 06:04 am	1.00	50 mL	50 mL	V122220.D	Liquid	Y	<2
49	HS18120646-05	SAMP	12-23-2018 06:29 am	10.00	5 mL	50 mL	V122221.D	Liquid	Y	<2
50	HS18120646-06	SAMP	12-23-2018 06:54 am	10.00	5 mL	50 mL	V122222.D	Liquid	Y	<2
51	HS18120646-10	SAMP	12-23-2018 07:19 am	1.00	50 mL	50 mL	V122223.D	Liquid	Y	<2
52	HS18120646-10	SAMP	12-23-2018 07:45 am	10.00	5 mL	50 mL	V122224.D	Liquid	Y	<2
53	HS18120646-12	SAMP	12-23-2018 08:10 am	10.00	5 mL	50 mL	V122225.D	Liquid	Y	<2
54	HS18120704-01	SAMP	12-23-2018 08:35 am	1.00	50 mL	50 mL	V122226.D	Liquid	Y	<2
55	HS18120704-02	SAMP	12-23-2018 09:00 am	1.00	50 mL	50 mL	V122227.D	Liquid	Y	<2
56	HS18120704-03	SAMP	12-23-2018 09:25 am	1.00	50 mL	50 mL	V122228.D	Liquid	Y	<2

Chemical	Value
SURR SPK ID	30502-52-03
IS ID	30502-52-04
LCS/MS ID	30603-46-01
CAL STD ID	30502-56-01/02
BFB ID	30502-52-03

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

	CLIENT SAMPLE NO.	SMC1 (DCE)#	SMC2 #	SMC3 (TOL)#	OTHER #	TOT OUT
01	VLCSW-181222	106	103	102	102	0
02	VBLKW-181222	93	87	105	98	0
03	HS18120642-0	91	88	103	102	0
04	HS18120642-0	94	89	104	99	0
05	HS18120927-0	91	90	105	102	0
06	HS18120927-0	92	89	106	104	0
07	HS18120642-0	93	90	105	99	0
08	HS18120642-0	94	89	104	98	0
09	HS18120642-0	93	90	104	102	0
10	HS18120642-0	96	90	104	98	0
11	HS18120642-0	95	91	104	101	0
12						
13						
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27						
28						

		QC LIMITS
SMC1 (DCE)	= 1,2-Dichloroethane-d4	(0-130)
SMC2	= Dibromofluoromethane	(0-130)
SMC3 (TOL)	= Toluene-d8	(0-130)
OTHER	= 4-Bromofluorobenzene	(0-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

VBLKW-181222

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Lab File ID: U122205 Lab Sample ID: VBLKW-181222

Date Analyzed: 12/22/18 Time Analyzed: 1218

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA9

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLCSW-181222	VLCSW-1812022	U122203	1128
02	HS18120642-0	HS18120642-01	U122207	1307
03	HS18120642-0	HS18120642-03	U122208	1332
04	HS18120927-0	HS18120927-05M	U122209	1357
05	HS18120927-0	HS18120927-05M	U122210	1422
06	HS18120642-0	HS18120642-03D	U122211	1446
07	HS18120642-0	HS18120642-05	U122214	1601
08	HS18120642-0	HS18120642-02	U122221	1854
09	HS18120642-0	HS18120642-04	U122222	1919
10	HS18120642-0	HS18120642-01D	U122227	2123
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
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29				
30				

COMMENTS:

FORM IV VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Lab File ID: U122201 BFB Injection Date: 12/22/18

Instrument ID: VOA9 BFB Injection Time: 1039

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.2
75	30.0 - 60.0% of mass 95	50.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.6 (0.9)1
174	Greater than 50.0% of mass 95	67.4
175	5.0 - 9.0% of mass 174	5.1 (7.6)1
176	95.0 - 101.0% of mass 174	65.0 (96.4)1
177	5.0 - 9.0% of mass 176	4.3 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	U122202	12/22/18	1103
02	VLCSW-181222	VLCSW-1812022	U122203	12/22/18	1128
03	VBLKW-181222	VBLKW-181222	U122205	12/22/18	1218
04	HS18120642-0	HS18120642-01	U122207	12/22/18	1307
05	HS18120642-0	HS18120642-03	U122208	12/22/18	1332
06	HS18120927-0	HS18120927-05M	U122209	12/22/18	1357
07	HS18120927-0	HS18120927-05M	U122210	12/22/18	1422
08	HS18120642-0	HS18120642-03D	U122211	12/22/18	1446
09	HS18120642-0	HS18120642-05	U122214	12/22/18	1601
10	HS18120642-0	HS18120642-02	U122221	12/22/18	1854
11	HS18120642-0	HS18120642-04	U122222	12/22/18	1919
12	HS18120642-0	HS18120642-01D	U122227	12/22/18	2123
13	VSTD050-END	VSTD050-END	U122228	12/22/18	2147
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Instrument ID: VOA9 Calibration Date: 12/22/18 Time: 1103

Lab File ID: U122202 Init. Calib. Date(s): 12/21/18 12/21/18

Init. Calib. Times: 1349 1755

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
cis-1,3-Dichloropropene	48.764951	50.000000	0.5277837	0.2	2.47	20.00	LINR
trans-1,3-Dichloropropene	48.330215	50.000000	0.4524389	0.1	3.34	20.00	LINR
1,3-Dichlorobenzene	1.4850000	1.4390608	1.4390608	0.6	3.09	20.00	AVRG
2,2-Dichloropropane	0.6490000	0.5274239	0.5274239	0.1	18.73	20.00	AVRG
1,1-Dichloropropene	0.4450000	0.4255397	0.4255397	0.1	4.37	20.00	AVRG
Dibromomethane	0.2040000	0.2102588	0.2102588	0.1	-3.07	20.00	AVRG
1,2-Dibromoethane	0.3430000	0.3596375	0.3596375	0.1	-4.85	20.00	AVRG
trans-1,2-Dichloroethene	0.5850000	0.5756573	0.5756573	0.1	1.60	20.00	AVRG
1,1,1,2-Tetrachloroethane	48.888847	50.000000	0.3074071	0.1	2.22	20.00	LINR
1,1,1-Trichloroethane	0.7890000	0.7953628	0.7953628	0.1	-0.81	20.00	AVRG
1,1,2,2-Tetrachloroethane	1.1260000	1.1459592	1.1459592	0.3	-1.77	20.00	AVRG
Freon TF	0.4250000	0.3885645	0.3885645	0.1	8.57	20.00	AVRG
1,1,2-Trichloroethane	0.2980000	0.3049414	0.3049414	0.1	-2.33	20.00	AVRG
1,1-Dichloroethane	1.0770000	1.0657707	1.0657707	0.2	1.04	20.00	AVRG
1,1-Dichloroethene	0.4750000	0.4572196	0.4572196	0.1	3.74	20.00	AVRG
Trichlorofluoromethane	50.804434	50.000000	0.7968663	0.1	-1.61	20.00	LINR
1,2,3-Trichlorobenzene	47.722858	50.000000	0.9049339	0.1	4.55	20.00	LINR
Toluene	1.4870000	1.4923025	1.4923025	0.4	-0.36	20.00	AVRG
1,2,4-Trichlorobenzene	0.9260000	0.9161280	0.9161280	0.2	1.07	20.00	AVRG
1,2,4-Trimethylbenzene	2.6160000	2.6459268	2.6459268	0.1	-1.14	20.00	AVRG
Tetrachloroethene	0.2620000	0.2355687	0.2355687	0.2	10.09	20.00	AVRG
Trichloroethene	0.3210000	0.3088790	0.3088790	0.2	3.78	20.00	AVRG
1,2-Dichlorobenzene	1.4840000	1.4508495	1.4508495	0.4	2.23	20.00	AVRG
1,2-Dichloroethane	51.153481	50.000000	0.4649868	0.1	-2.31	20.00	LINR
1,2-Dichloropropane	0.3530000	0.3509230	0.3509230	0.1	0.59	20.00	AVRG
1,3,5-Trimethylbenzene	2.5130000	2.5151502	2.5151502	0.1	-0.08	20.00	AVRG
1,3-Dichloropropane	0.6410000	0.6561811	0.6561811	0.1	-2.37	20.00	AVRG
1,4-Dichlorobenzene	1.5660000	1.4842464	1.4842464	0.4	5.22	20.00	AVRG
2-Butanone	100.05221	100.00000	0.3462225	0.1	-0.05	20.00	LINR
2-Chlorotoluene	2.3040000	2.2780427	2.2780427	0.1	1.13	20.00	AVRG
2-Hexanone	0.2780000	0.3092444	0.3092444	0.1	-11.24	20.00	AVRG
4-Chlorotoluene	2.6620000	2.6521022	2.6521022	0.1	0.37	20.00	AVRG
tert-Butylbenzene	2.1720000	2.1285396	2.1285396	0.1	2.00	20.00	AVRG
4-Methyl-2-Pentanone	0.4000000	0.4316568	0.4316568	0.1	-7.91	20.00	AVRG
Acetone	104.18702	100.00000	0.2452801	0.1	-4.19	20.00	LINR
Benzene	1.3300000	1.3215973	1.3215973	0.5	0.63	20.00	AVRG
Bromobenzene	0.7730000	0.7756938	0.7756938	0.1	-0.35	20.00	AVRG
Bromochloromethane	58.115547	50.000000	0.2998792	0.1	-16.23	20.00	LINR
Bromodichloromethane	0.3760000	0.3920147	0.3920147	0.2	-4.26	20.00	AVRG
Bromoform	48.045782	50.000000	0.2040281	0.1	3.91	20.00	LINR
Bromomethane	50.484275	50.000000	0.1972688	0.1	-0.97	20.00	LINR
Carbon Disulfide	1.7320000	1.6858883	1.6858883	0.1	2.66	20.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812064

Instrument ID: VOA9 Calibration Date: 12/22/18 Time: 1103

Lab File ID: U122202 Init. Calib. Date(s): 12/21/18 12/21/18

Init. Calib. Times: 1349 1755

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Carbon Tetrachloride	48.386486	50.000000	0.3302381	0.1	3.23	20.00	LINR
Chlorobenzene	0.9610000	0.9453081	0.9453081	0.5	1.63	20.00	AVRG
Chloroethane	48.626371	50.000000	0.4227912	0.1	2.75	20.00	2RDR
Chloroform	1.0370000	1.0359967	1.0359967	0.2	0.10	20.00	AVRG
Chloromethane	49.758168	50.000000	0.4333563	0.1	0.48	20.00	LINR
cis-1,2-Dichloroethene	0.6570000	0.6580261	0.6580261	0.1	-0.16	20.00	AVRG
Dibromochloromethane	48.766356	50.000000	0.3261819	0.1	2.47	20.00	LINR
Dichlorodifluoromethane	49.534880	50.000000	0.5519381	0.1	0.93	20.00	LINR
Ethylbenzene	0.4930000	0.4828480	0.4828480	0.1	2.06	20.00	AVRG
Hexachlorobutadiene	0.3550000	0.2979790	0.2979790	0.1	16.06	20.00	AVRG
Isopropylbenzene	1.4220000	1.4082826	1.4082826	0.1	0.96	20.00	AVRG
m,p-Xylenes	0.6060000	0.6004248	0.6004248	0.1	0.92	20.00	AVRG
Methylene Chloride	51.585216	50.000000	0.6349337	0.1	-3.17	20.00	LINR
n-Butylbenzene	2.5530000	2.3941048	2.3941048	0.5	6.22	20.00	AVRG
n-Propylbenzene	3.7360000	3.6918689	3.6918689	0.1	1.18	20.00	AVRG
Naphthalene	48.387582	50.000000	3.0564916	0.2	3.22	20.00	2RDR
o-Xylene	0.6110000	0.6136959	0.6136959	0.3	-0.44	20.00	AVRG
sec-Butylbenzene	3.1400000	3.0685275	3.0685275	0.1	2.28	20.00	AVRG
Styrene	1.0150000	1.0735114	1.0735114	0.3	-5.76	20.00	AVRG
Vinyl Chloride	49.231582	50.000000	0.6535542	0.1	1.54	20.00	LINR
1,2,3-Trichloropropane	1.1710000	1.2279091	1.2279091	0.1	-4.86	20.00	AVRG
p-Isopropyltoluene	2.6460000	2.6046501	2.6046501	0.1	1.56	20.00	AVRG
1,2-Dibromo-3-Chloropropane	46.724517	50.000000	0.1676998	0.05	6.55	20.00	LINR
1,2-Dichloroethane-d4	51.432208	50.000000	0.7432890	0.1	-2.86	20.00	LINR
Dibromofluoromethane	51.809400	50.000000	0.5693840	0.1	-3.62	20.00	LINR
Toluene-d8	51.230451	50.000000	1.3489865	0.1	-2.46	20.00	LINR
4-Bromofluorobenzene	51.316453	50.000000	0.5096516	0.1	-2.63	20.00	LINR

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Instrument ID: VOA9 Calibration Date: 12/22/18 Time: 2147

Lab File ID: U122228 Init. Calib. Date(s): 12/21/18 12/21/18

Init. Calib. Times: 1349 1755

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
cis-1,3-Dichloropropene	46.317778	50.000000	0.5277837	0.2	7.36	50.00	LINR
trans-1,3-Dichloropropene	46.193050	50.000000	0.4524389	0.1	7.61	50.00	LINR
1,3-Dichlorobenzene	1.4850000	1.4390608	1.4390608	0.6	3.09	50.00	AVRG
2,2-Dichloropropane	0.6490000	0.5274239	0.5274239	0.1	18.73	50.00	AVRG
1,1-Dichloropropene	0.4450000	0.4255397	0.4255397	0.1	4.37	50.00	AVRG
Dibromomethane	0.2040000	0.2102588	0.2102588	0.1	-3.07	50.00	AVRG
1,2-Dibromoethane	0.3430000	0.3596375	0.3596375	0.1	-4.85	50.00	AVRG
trans-1,2-Dichloroethene	0.5850000	0.5756573	0.5756573	0.1	1.60	50.00	AVRG
1,1,1,2-Tetrachloroethane	48.462204	50.000000	0.3074071	0.1	3.08	50.00	LINR
1,1,1-Trichloroethane	0.7890000	0.7953628	0.7953628	0.1	-0.81	50.00	AVRG
1,1,2,2-Tetrachloroethane	1.1260000	1.1459592	1.1459592	0.3	-1.77	50.00	AVRG
Freon TF	0.4250000	0.3885645	0.3885645	0.1	8.57	50.00	AVRG
1,1,2-Trichloroethane	0.2980000	0.3049414	0.3049414	0.1	-2.33	50.00	AVRG
1,1-Dichloroethane	1.0770000	1.0657707	1.0657707	0.2	1.04	50.00	AVRG
1,1-Dichloroethene	0.4750000	0.4572196	0.4572196	0.1	3.74	50.00	AVRG
Trichlorofluoromethane	48.367931	50.000000	0.7968663	0.1	3.26	50.00	LINR
1,2,3-Trichlorobenzene	48.047881	50.000000	0.9049339	0.1	3.90	50.00	LINR
Toluene	1.4870000	1.4923025	1.4923025	0.4	-0.36	50.00	AVRG
1,2,4-Trichlorobenzene	0.9260000	0.9161280	0.9161280	0.2	1.07	50.00	AVRG
1,2,4-Trimethylbenzene	2.6160000	2.6459268	2.6459268	0.1	-1.14	50.00	AVRG
Tetrachloroethene	0.2620000	0.2355687	0.2355687	0.2	10.09	50.00	AVRG
Trichloroethene	0.3210000	0.3088790	0.3088790	0.2	3.78	50.00	AVRG
1,2-Dichlorobenzene	1.4840000	1.4508495	1.4508495	0.4	2.23	50.00	AVRG
1,2-Dichloroethane	51.633261	50.000000	0.4649868	0.1	-3.27	50.00	LINR
1,2-Dichloropropane	0.3530000	0.3509230	0.3509230	0.1	0.59	50.00	AVRG
1,3,5-Trimethylbenzene	2.5130000	2.5151502	2.5151502	0.1	-0.08	50.00	AVRG
1,3-Dichloropropane	0.6410000	0.6561811	0.6561811	0.1	-2.37	50.00	AVRG
1,4-Dichlorobenzene	1.5660000	1.4842464	1.4842464	0.4	5.22	50.00	AVRG
2-Butanone	106.02705	100.00000	0.3462225	0.1	-6.03	50.00	LINR
2-Chlorotoluene	2.3040000	2.2780427	2.2780427	0.1	1.13	50.00	AVRG
2-Hexanone	0.2780000	0.3092444	0.3092444	0.1	-11.24	50.00	AVRG
4-Chlorotoluene	2.6620000	2.6521022	2.6521022	0.1	0.37	50.00	AVRG
tert-Butylbenzene	2.1720000	2.1285396	2.1285396	0.1	2.00	50.00	AVRG
4-Methyl-2-Pentanone	0.4000000	0.4316568	0.4316568	0.1	-7.91	50.00	AVRG
Acetone	126.43639	100.00000	0.2452801	0.1	-26.44	50.00	LINR
Benzene	1.3300000	1.3215973	1.3215973	0.5	0.63	50.00	AVRG
Bromobenzene	0.7730000	0.7756938	0.7756938	0.1	-0.35	50.00	AVRG
Bromochloromethane	57.657205	50.000000	0.2998792	0.1	-15.31	50.00	LINR
Bromodichloromethane	0.3760000	0.3920147	0.3920147	0.2	-4.26	50.00	AVRG
Bromoform	47.620905	50.000000	0.2040281	0.1	4.76	50.00	LINR
Bromomethane	32.427445	50.000000	0.1972688	0.1	35.14	50.00	LINR
Carbon Disulfide	1.7320000	1.6858883	1.6858883	0.1	2.66	50.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS1812064

Instrument ID: VOA9 Calibration Date: 12/22/18 Time: 2147

Lab File ID: U122228 Init. Calib. Date(s): 12/21/18 12/21/18

Init. Calib. Times: 1349 1755

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
Carbon Tetrachloride	45.536719	50.000000	0.3302381	0.1	8.93	50.00	LINR
Chlorobenzene	0.9610000	0.9453081	0.9453081	0.5	1.63	50.00	AVRG
Chloroethane	47.734383	50.000000	0.4227912	0.1	4.53	50.00	2RDR
Chloroform	1.0370000	1.0359967	1.0359967	0.2	0.10	50.00	AVRG
Chloromethane	41.401789	50.000000	0.4333563	0.1	17.20	50.00	LINR
cis-1,2-Dichloroethene	0.6570000	0.6580261	0.6580261	0.1	-0.16	50.00	AVRG
Dibromochloromethane	49.645964	50.000000	0.3261819	0.1	0.71	50.00	LINR
Dichlorodifluoromethane	44.906322	50.000000	0.5519381	0.1	10.19	50.00	LINR
Ethylbenzene	0.4930000	0.4828480	0.4828480	0.1	2.06	50.00	AVRG
Hexachlorobutadiene	0.3550000	0.2979790	0.2979790	0.1	16.06	50.00	AVRG
Isopropylbenzene	1.4220000	1.4082826	1.4082826	0.1	0.96	50.00	AVRG
m,p-Xylenes	0.6060000	0.6004248	0.6004248	0.1	0.92	50.00	AVRG
Methylene Chloride	51.407764	50.000000	0.6349337	0.1	-2.82	50.00	LINR
n-Butylbenzene	2.5530000	2.3941048	2.3941048	0.5	6.22	50.00	AVRG
n-Propylbenzene	3.7360000	3.6918689	3.6918689	0.1	1.18	50.00	AVRG
Naphthalene	50.195677	50.000000	3.0564916	0.2	-0.39	50.00	2RDR
o-Xylene	0.6110000	0.6136959	0.6136959	0.3	-0.44	50.00	AVRG
sec-Butylbenzene	3.1400000	3.0685275	3.0685275	0.1	2.28	50.00	AVRG
Styrene	1.0150000	1.0735114	1.0735114	0.3	-5.76	50.00	AVRG
Vinyl Chloride	46.280143	50.000000	0.6535542	0.1	7.44	50.00	LINR
1,2,3-Trichloropropane	1.1710000	1.2279091	1.2279091	0.1	-4.86	50.00	AVRG
p-Isopropyltoluene	2.6460000	2.6046501	2.6046501	0.1	1.56	50.00	AVRG
1,2-Dibromo-3-Chloropropane	48.342831	50.000000	0.1676998	0.05	3.31	50.00	LINR
1,2-Dichloroethane-d4	52.624152	50.000000	0.7432890	0.1	-5.25	50.00	LINR
Dibromofluoromethane	51.646605	50.000000	0.5693840	0.1	-3.29	50.00	LINR
Toluene-d8	52.321114	50.000000	1.3489865	0.1	-4.64	50.00	LINR
4-Bromofluorobenzene	51.898862	50.000000	0.5096516	0.1	-3.80	50.00	LINR

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Lab File ID (Standard): U122202 Date Analyzed: 12/22/18

Instrument ID: VOA9 Time Analyzed: 1103

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(DCB) AREA #	IS1(DCB) RT #	IS2(CBZ) AREA #	IS2(CBZ) RT #	IS3(DFB) AREA #	IS3(DFB) RT #
	12 HOUR STD	368700	10.24	765245	8.25	822201	5.63
	UPPER LIMIT	737400	10.74	1530490	8.75	1644402	6.13
	LOWER LIMIT	184350	9.74	382623	7.75	411101	5.13
	CLIENT SAMPLE NO.						
01	VLCSW-181222	366132	10.24	755224	8.25	814375	5.63
02	VBLKW-181222	284398	10.24	615766	8.25	677477	5.63
03	HS18120642-0	305173	10.24	626961	8.25	672965	5.63
04	HS18120642-0	286645	10.24	615089	8.25	677261	5.63
05	HS18120927-0	295823	10.24	616476	8.25	673318	5.63
06	HS18120927-0	298917	10.24	614956	8.25	673270	5.63
07	HS18120642-0	280375	10.24	600892	8.25	666664	5.63
08	HS18120642-0	274529	10.24	595211	8.25	650773	5.63
09	HS18120642-0	288621	10.24	597502	8.25	658742	5.63
10	HS18120642-0	267403	10.24	584082	8.25	644909	5.63
11	HS18120642-0	269640	10.24	567833	8.25	620954	5.63
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DFB) = 1,4-Difluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS LABORATORY GROUP Contract:

Lab Code: ALS-HS Case No.: SAS No.: SDG No.: HS18120642

Lab File ID (Standard): U122202 Date Analyzed: 12/22/18

Instrument ID: VOA9 Time Analyzed: 1103

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	439937	4.90				
	UPPER LIMIT	879874	5.40				
	LOWER LIMIT	219969	4.40				
	CLIENT SAMPLE NO.						
01	VLCSW-181222	431862	4.90				
02	VBLKW-181222	393752	4.89				
03	HS18120642-0	397155	4.89				
04	HS18120642-0	392061	4.90				
05	HS18120927-0	395043	4.89				
06	HS18120927-0	396082	4.90				
07	HS18120642-0	385415	4.90				
08	HS18120642-0	376198	4.90				
09	HS18120642-0	380200	4.90				
10	HS18120642-0	370753	4.89				
11	HS18120642-0	357247	4.89				
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS4 = Pentafluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM VIII VOA

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122201.D

Date : 22-DEC-2018 10:39

Client ID: BFB

Instrument: VOA9.i

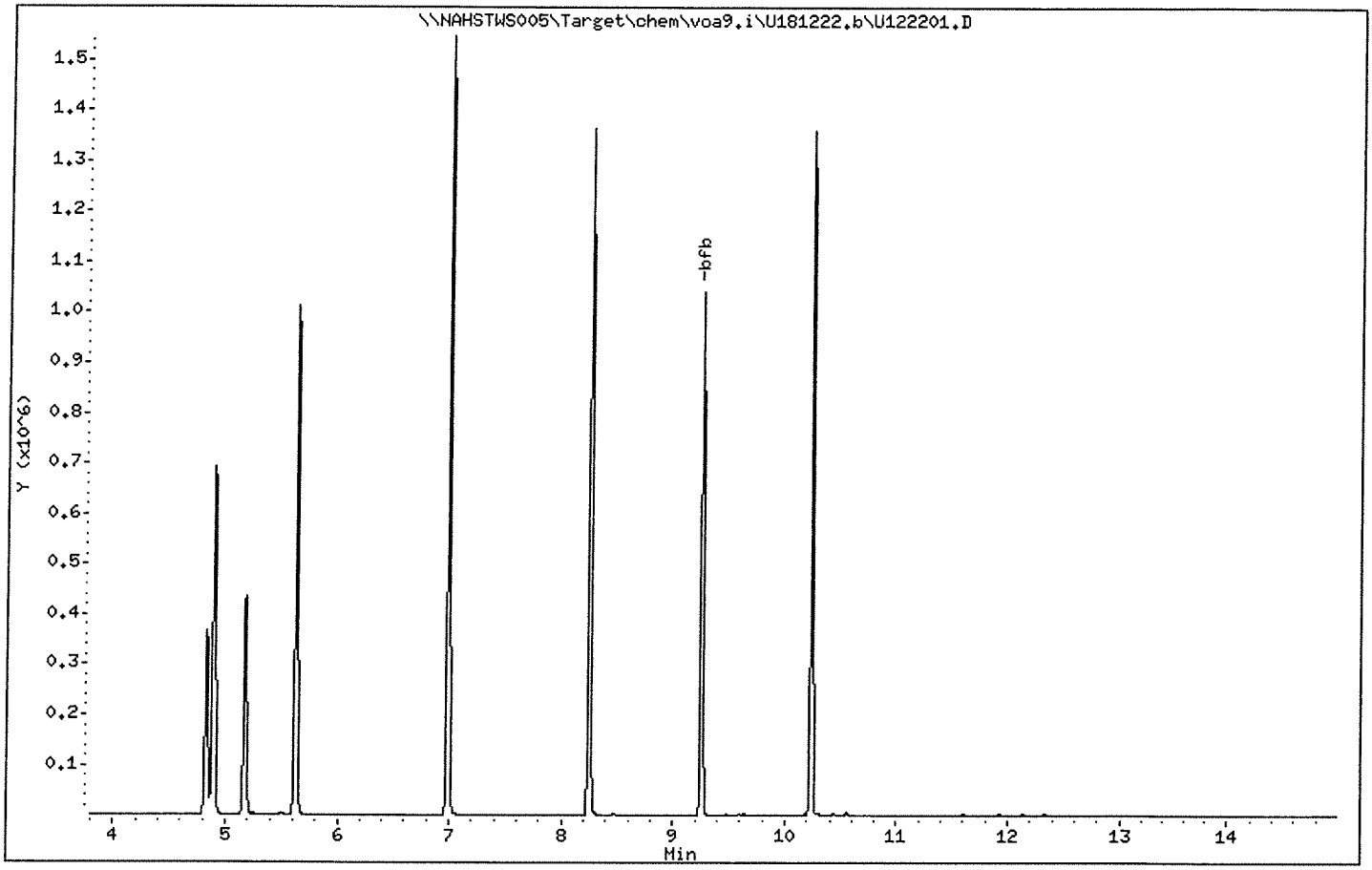
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122201.D

Date : 22-DEC-2018 10:39

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

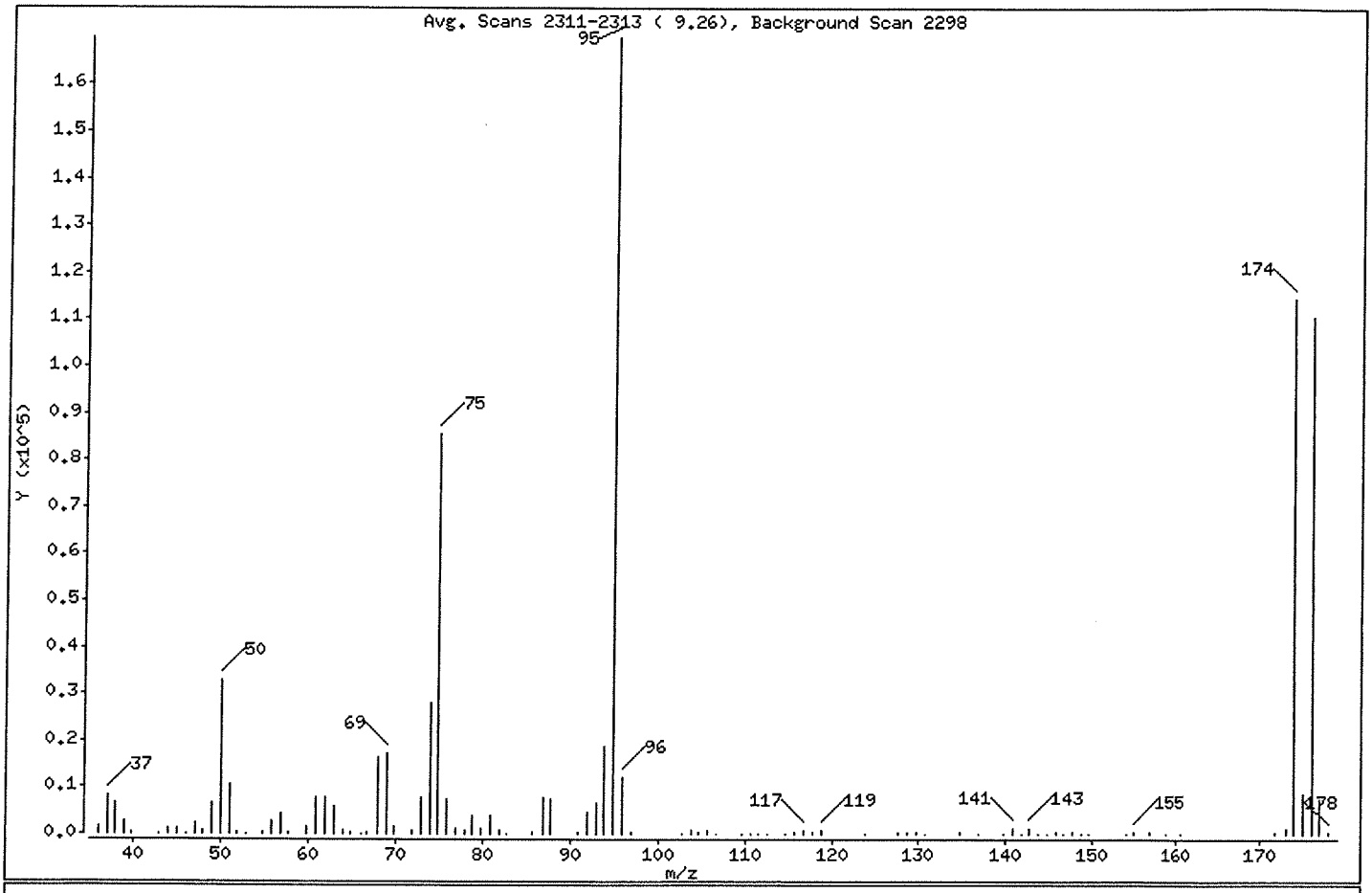
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	19.23
75	30.00 - 60.00% of mass 95	50.31
96	5.00 - 9.00% of mass 95	7.08
173	Less than 2.00% of mass 174	0.60 (0.89)
174	Greater than 50.00% of mass 95	67.35
175	5.00 - 9.00% of mass 174	5.09 (7.56)
176	95.00 - 101.00% of mass 174	64.96 (96.45)
177	5.00 - 9.00% of mass 176	4.26 (6.57)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122201.D

Date : 22-DEC-2018 10:39

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: U122201.D

Spectrum: Avg. Scans 2311-2313 (9.26), Background Scan 2298

Location of Maximum: 94.95

Number of points: 97

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	1436	64.90	473	94.90	169920	140.80	1142
37.00	8335	66.00	65	95.90	12036	141.80	190
38.00	6727	66.80	360	96.90	334	142.70	1124
39.00	2833	67.90	16488	102.70	61	143.60	73
39.90	481	68.90	17088	103.80	640	144.60	132
43.00	60	69.90	1514	104.70	221	145.70	201
44.00	1090	71.90	926	105.70	599	146.60	118
45.00	1308	72.90	7652	106.70	135	147.60	290
46.00	147	73.90	28112	109.70	74	148.70	73
47.00	2212	74.90	85488	110.70	129	149.60	127
47.90	971	75.90	7517	111.60	55	153.80	66
49.00	6786	76.90	1131	112.60	99	154.80	311
50.00	32672	77.90	730	114.70	104	156.60	265
51.00	10467	78.80	3950	115.80	539	158.70	146
51.90	456	79.90	1163	116.80	938	160.60	149
52.90	88	80.80	4033	117.80	500	171.70	501
54.90	440	81.90	901	118.80	628	172.80	1014
55.90	2592	82.80	72	123.90	64	173.70	114448
56.90	4484	85.70	203	127.70	526	174.70	8654
57.80	218	86.90	7752	128.70	236	175.70	110384
59.90	1552	87.80	7334	129.70	465	176.70	7247
60.90	7770	90.80	576	130.80	191	177.70	247
62.00	7739	91.90	4523	134.70	239		
63.00	5671	92.90	6720	136.70	158		
63.90	616	93.90	18800	139.60	57		

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122202.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 22-DEC-2018 11:03
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

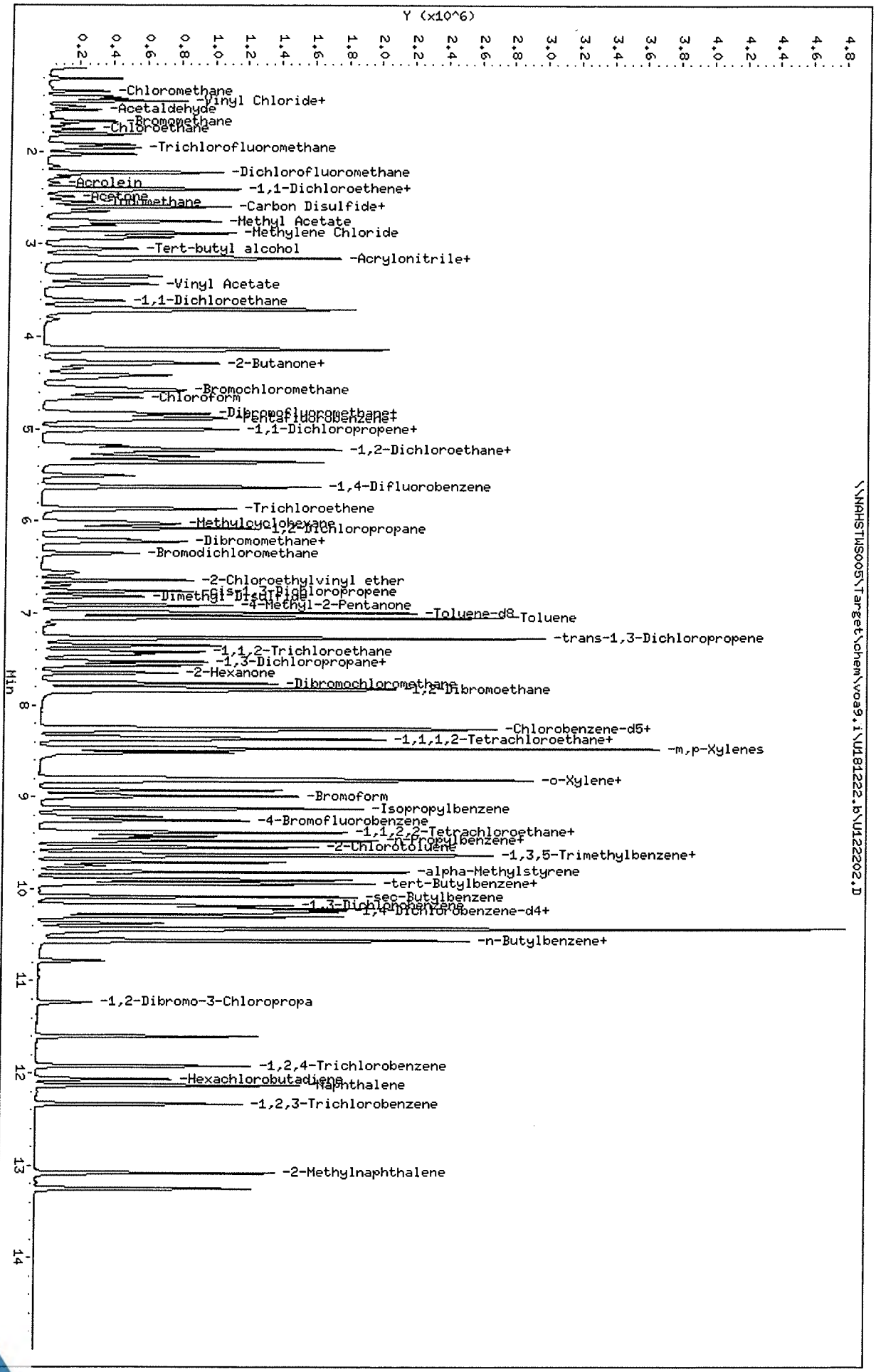
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.897	(1.000)	439937	50.0000	
* 36 1,4-Difluorobenzene	114	5.628	5.628	(1.000)	822201	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	765245	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	368700	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	251260	50.0000	51.80
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	319887	50.0000	51.43
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	1011496	50.0000	51.23
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	385749	50.0000	51.31
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	237338	50.0000	48.88
31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	365717	50.0000	52.64
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	399095	50.0000	48.06
138 Freon TF	101	2.408	2.408	(0.492)	192741	50.0000	51.53
53 1,1,2-Trichloroethane	83	7.420	7.420	(0.900)	226319	50.0000	49.64
22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	473232	50.0000	49.94
11 1,1-Dichloroethene	96	2.405	2.405	(0.491)	206895	50.0000	49.46
32 1,1-Dichloropropene	75	5.006	5.006	(0.889)	368445	50.0000	50.36
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	331362	50.0000	47.72
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	443705	50.0000	51.38
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	339651	50.0000	49.75
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	988374	50.0000	51.22
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	59697	50.0000	46.72
57 1,2-Dibromoethane	107	7.851	7.851	(0.952)	267661	50.0000	50.97

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122202.D Page 2
Report Date: 28-Jan-2019 13:52

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	527850	50.0000	48.21
33	1,2-Dichloroethane	62	5.254	5.254	(0.933)	378810	50.0000	51.15
42	1,2-Dichloropropane	63	6.082	6.082	(1.081)	289116	50.0000	49.76
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	958319	50.0000	51.71
83	1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	533290	50.0000	48.70
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	489297	50.0000	49.82
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	547075	50.0000	47.39
26	2,2-Dichloropropane	77	4.279	4.279	(0.874)	317585	50.0000	55.62
24	2-Butanone	43	4.339	4.339	(0.886)	287851	100.000	100.05
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	850436	50.0000	50.06
52	2-Hexanone	43	7.649	7.649	(0.927)	437511	100.000	102.81
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	987531	50.0000	50.30
82	p-Isopropyltoluene	119	10.209	10.209	(0.997)	1008118	50.0000	51.67
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	624635	100.000	102.01
10	Acetone	43	2.483	2.483	(0.507)	178725	100.000	104.18
37	Benzene	78	5.220	5.220	(0.927)	1095158	50.0000	50.05
74	Bromobenzene	156	9.381	9.381	(0.917)	283071	50.0000	49.69
29	Bromochloromethane	128	4.556	4.556	(0.930)	132923	50.0000	58.11
39	Bromodichloromethane	83	6.348	6.348	(1.128)	328321	50.0000	53.14
66	Bromoform	173	8.984	8.984	(1.089)	157578	50.0000	48.04(T)
6	Bromomethane	94	1.674	1.674	(0.342)	137192	50.0000	50.48
19	Carbon Disulfide	76	2.596	2.596	(0.530)	1379459	100.000	90.50
34	Carbon Tetrachloride	117	4.999	4.999	(0.888)	289053	50.0000	48.38
59	Chlorobenzene	112	8.275	8.275	(1.003)	729755	50.0000	49.63
7	Chloroethane	64	1.756	1.756	(0.359)	189569	50.0000	48.62(M)
28	Chloroform	83	4.661	4.661	(0.952)	458505	50.0000	50.25
3	Chloromethane	50	1.344	1.344	(0.274)	232483	50.0000	49.75
27	cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	293348	50.0000	50.72
46	cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	457515	50.0000	48.76
55	Dibromochloromethane	129	7.758	7.758	(0.940)	245098	50.0000	48.76
44	Dibromomethane	93	6.191	6.191	(1.100)	170275	50.0000	50.78
2	Dichlorodifluoromethane	85	1.209	1.209	(0.247)	268119	50.0000	49.53
61	Ethylbenzene	106	8.373	8.373	(1.015)	381042	50.0000	50.52
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	130497	50.0000	49.89
67	Isopropylbenzene	105	9.126	9.126	(1.106)	1129055	50.0000	51.88
62	m,p-Xylenes	106	8.474	8.474	(1.027)	946477	100.000	102.09
17	Methylene Chloride	84	2.877	2.877	(0.587)	280273	50.0000	51.58
87	n-Butylbenzene	91	10.558	10.558	(1.031)	951357	50.0000	50.52
73	n-Propylbenzene	91	9.475	9.475	(0.926)	1414293	50.0000	51.33
92	Naphthalene	128	12.132	12.132	(1.185)	1086132	50.0000	48.38
63	o-Xylene	106	8.811	8.811	(1.068)	476832	50.0000	50.98
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	1189748	50.0000	51.38
64	Styrene	104	8.826	8.826	(1.070)	832029	50.0000	53.54
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	807069	50.0000	50.39
56	Tetrachloroethene	164	7.525	7.525	(0.912)	192069	50.0000	47.94
50	Toluene	91	7.049	7.049	(0.855)	1153238	50.0000	50.66
20	trans-1,2-Dichloroethene	96	3.147	3.147	(0.643)	258990	50.0000	50.29
51	trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	389844	50.0000	48.33
38	Trichloroethene	130	5.865	5.865	(1.042)	265713	50.0000	50.30
8	Trichlorofluoromethane	101	1.959	1.959	(0.400)	368462	50.0000	50.80
5	Vinyl Chloride	62	1.426	1.426	(0.291)	306251	50.0000	49.23

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.

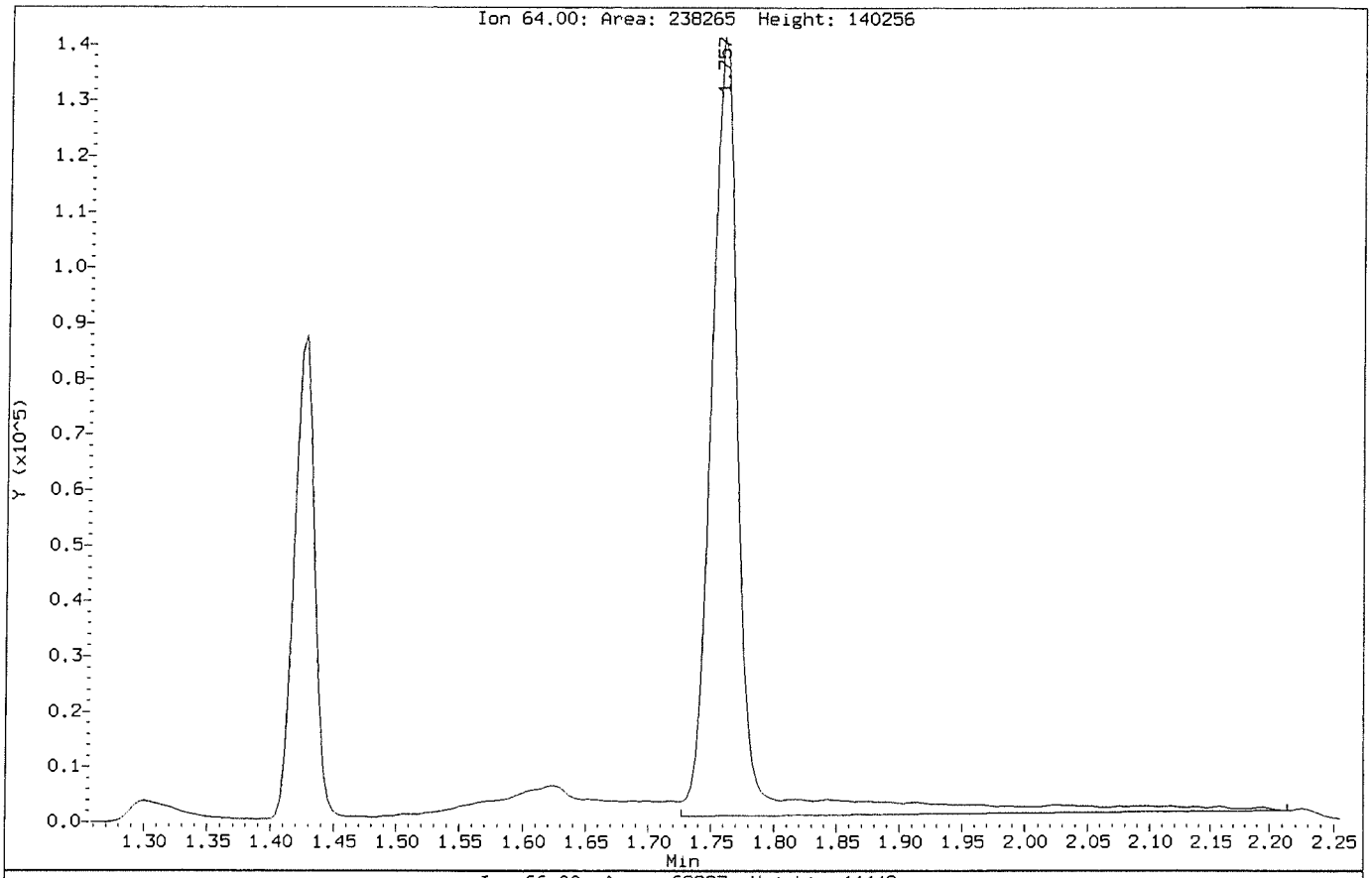


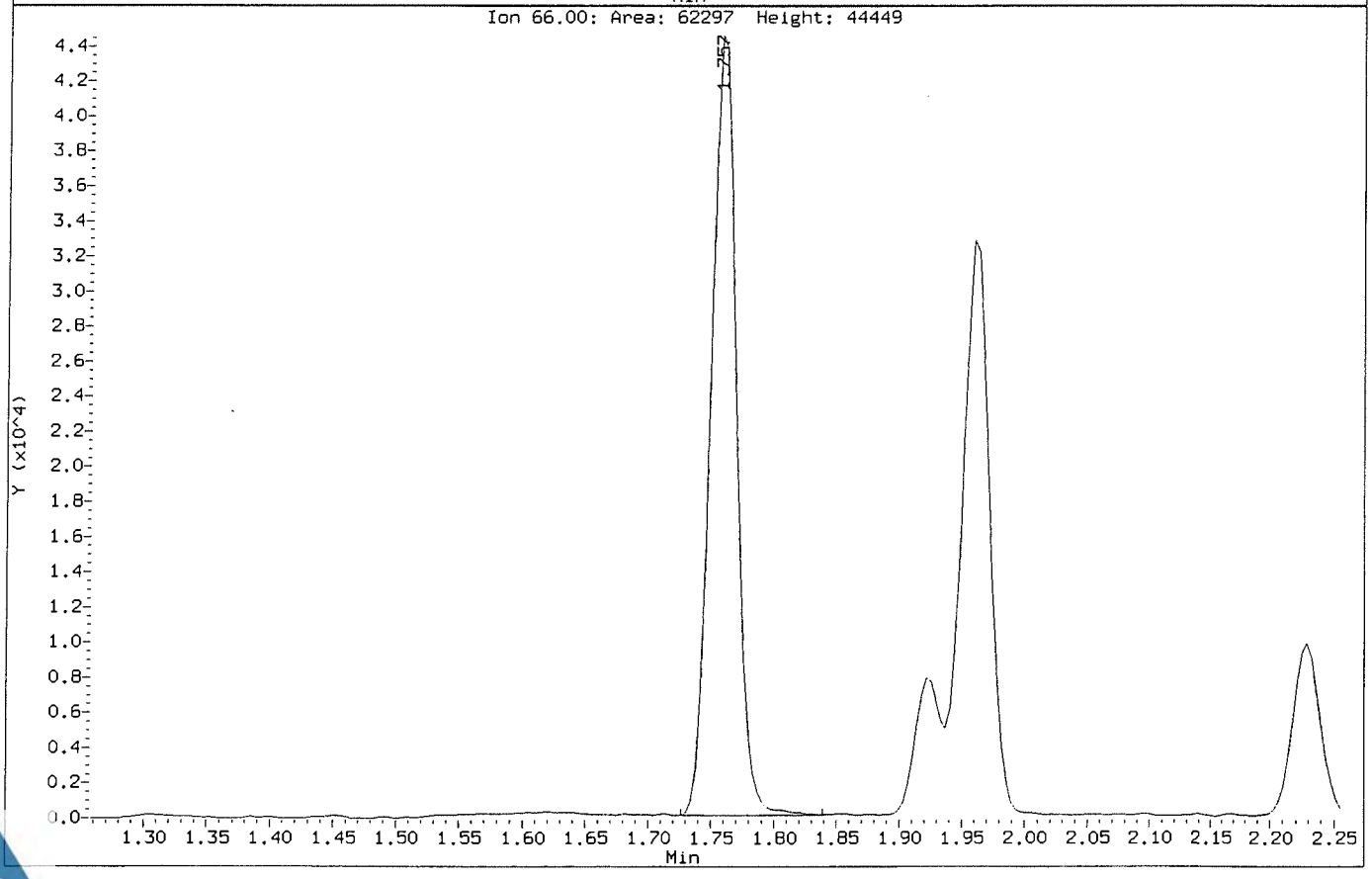
Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122202.D
Date : 22-DEC-2018 11:03
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\Before\U122202.D
Injection Date: 22-DEC-2018 11:03
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





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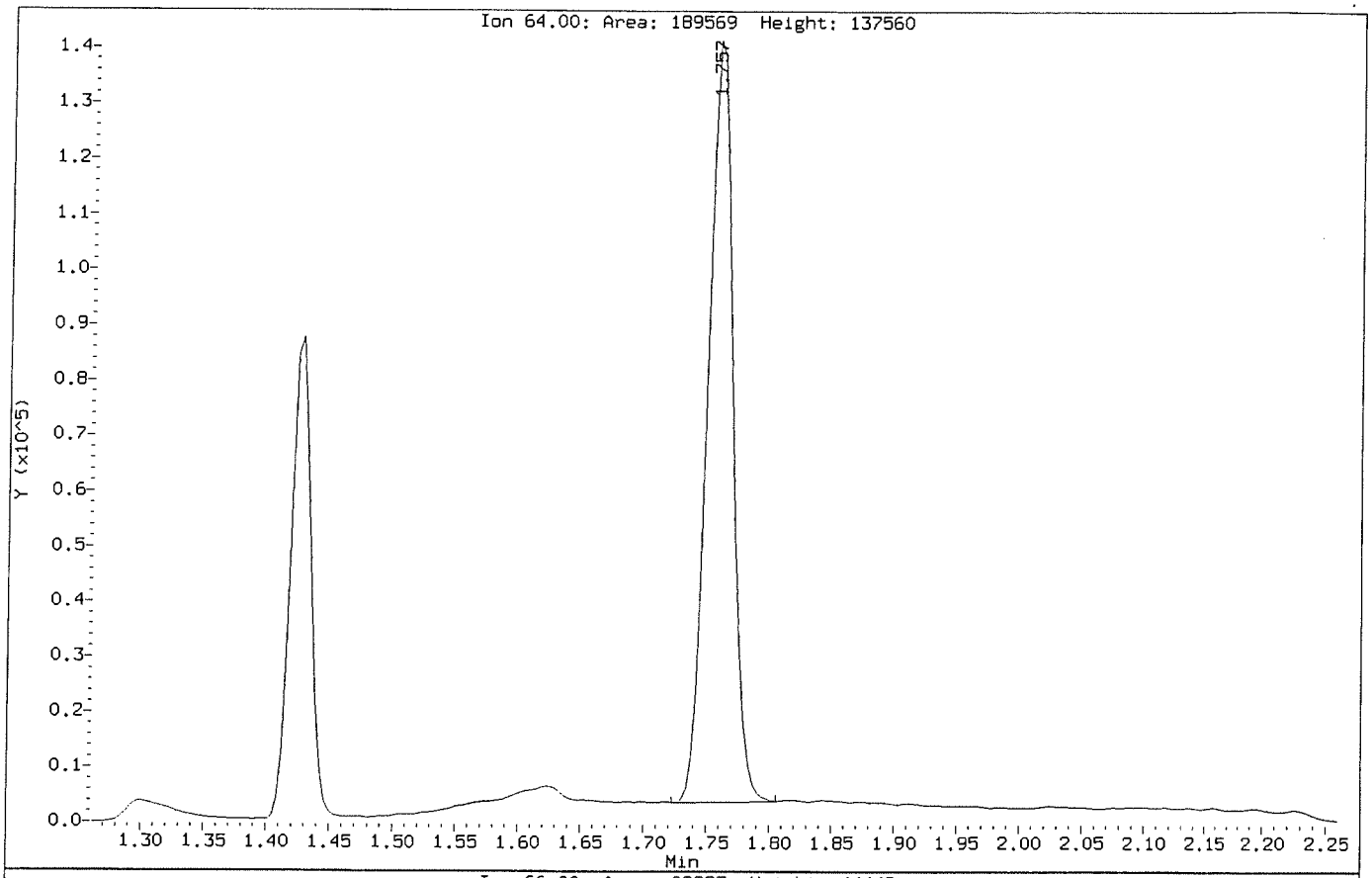
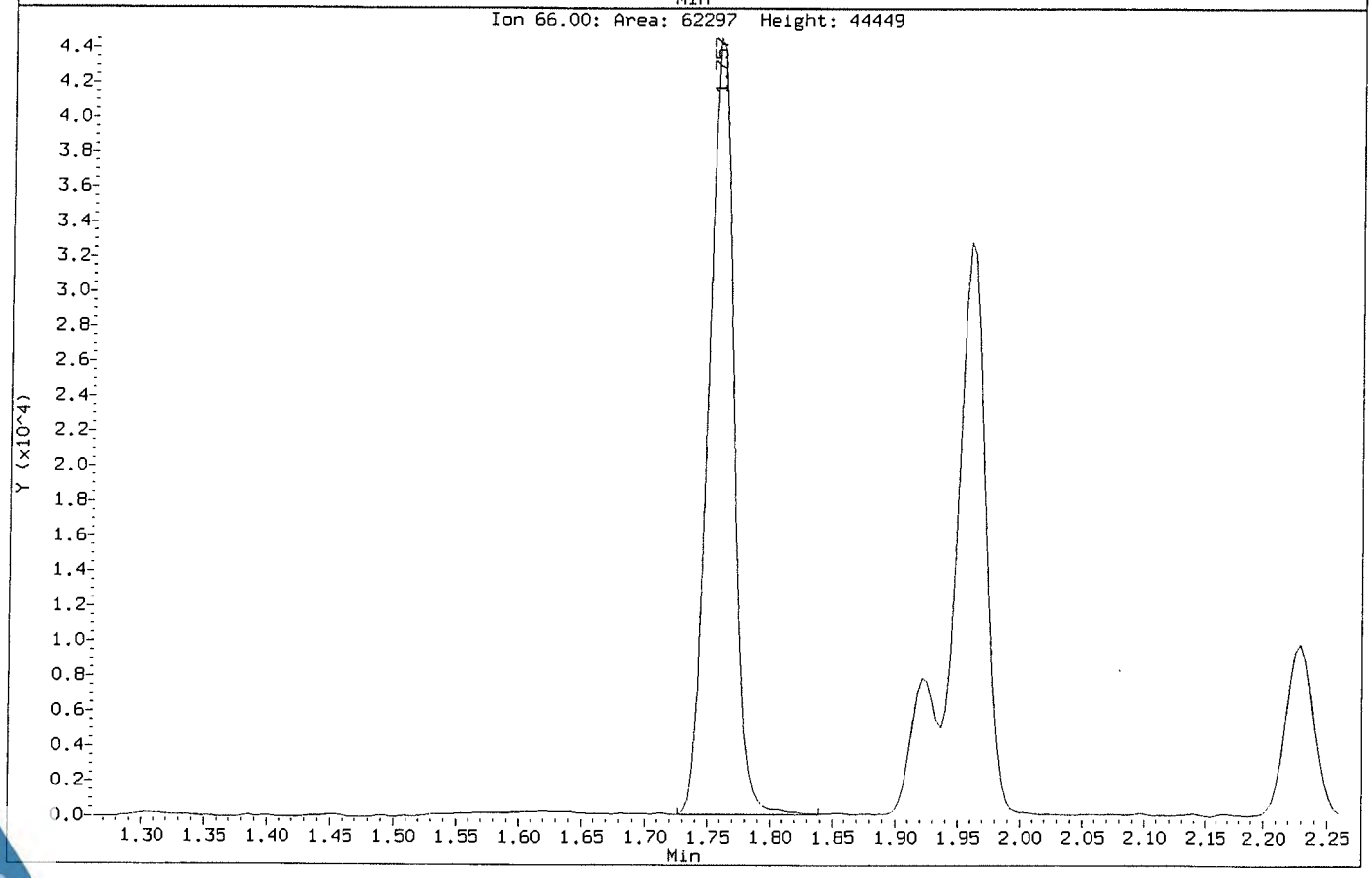
Injection Date: 22-DEC-2018 11:03
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122203.D Page 1
Report Date: 28-Jan-2019 13:52

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122203.D
Lab Smp Id: VLCSW-1812022 Client Smp ID: VLCSW-181222
Inj Date : 22-DEC-2018 11:28
Operator : PC Inst ID: VOA9.i
Smp Info : VLCSW-1812022;VLCSW-181222;3;;LCS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 3 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

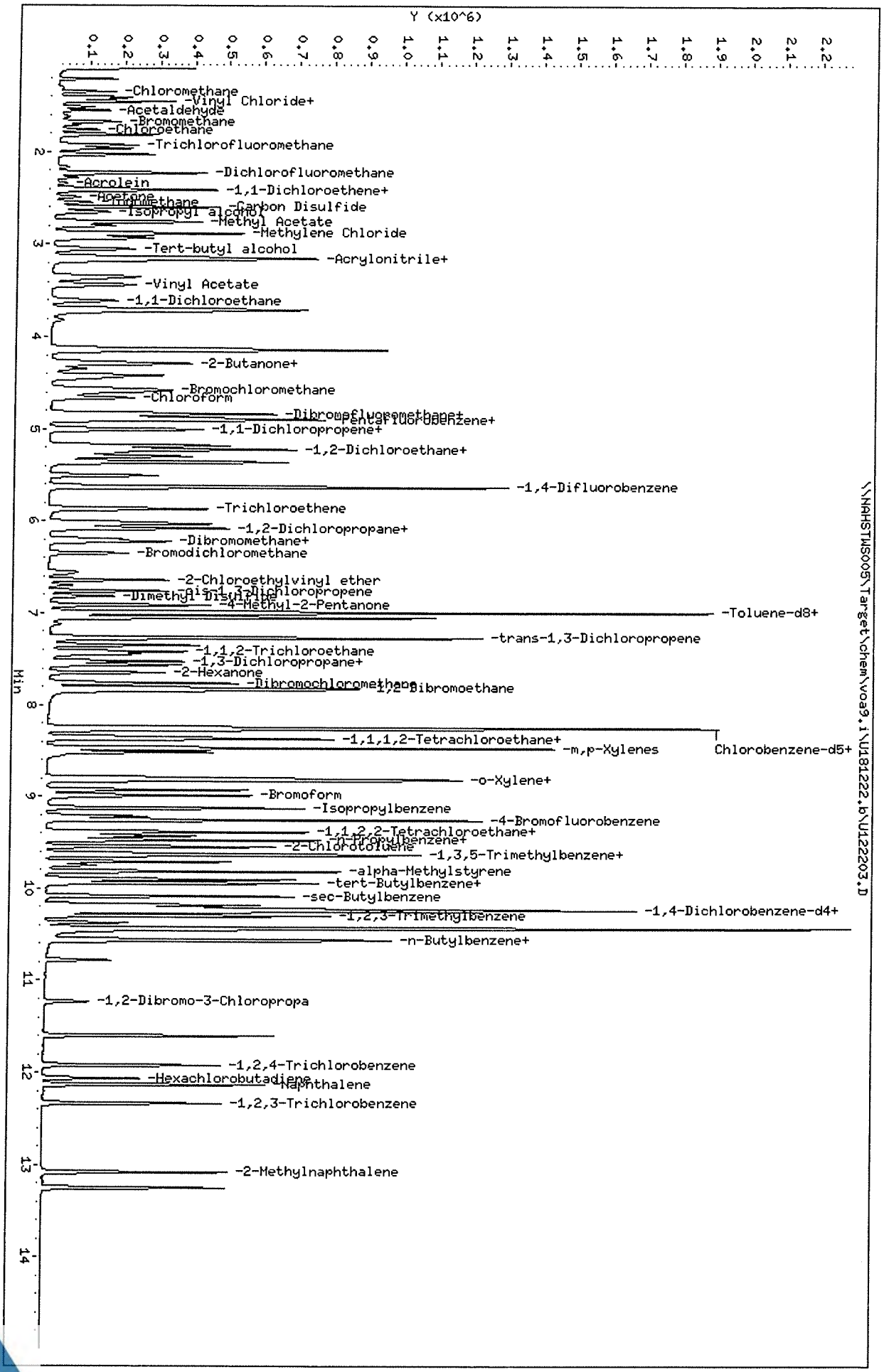
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.897	(1.000)	431862	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.628	(1.000)	814375	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	755224	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	366132	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	245304	51.5187	51.51
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	323042	52.9730	52.97
$ 48 Toluene-d8	98	6.990	6.989	(0.847)	997232	51.1764	51.17
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	380376	51.2719	51.27
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	93491	19.8652	19.86
31 1,1,1-Trichloroethane	97	4.834	4.830	(0.987)	136533	20.0223	20.02
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	164920	20.0014	20.00
138 Freon TF	101	2.412	2.408	(0.493)	71338	19.4304	19.43
53 1,1,2-Trichloroethane	83	7.421	7.420	(0.900)	91176	20.2638	20.26
22 1,1-Dichloroethane	63	3.612	3.608	(0.737)	187326	20.1416	20.14
11 1,1-Dichloroethene	96	2.409	2.405	(0.492)	80193	19.5298	19.52
32 1,1-Dichloropropene	75	5.010	5.006	(0.890)	141547	19.5345	19.53
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	133430	19.7278	19.72
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	173074	20.1859	20.18
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	134480	19.8387	19.83
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	391337	20.4249	20.42
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	23150	19.1314	19.13
57 1,2-Dibromoethane	107	7.852	7.851	(0.952)	108939	21.0208	21.02

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122203.D Page 2
Report Date: 28-Jan-2019 13:52

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
88 1,2-Dichlorobenzene	146	10.573	10.573	(1.033)	212027	19.5033	19.50
33 1,2-Dichloroethane	62	5.258	5.254	(0.934)	153542	20.4988	20.49
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	115717	20.1096	20.10
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	370755	20.1491	20.14
83 1,3-Dichlorobenzene	146	10.180	10.179	(0.995)	212305	19.5274	19.52
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	198073	20.4376	20.43
84 1,4-Dichlorobenzene	146	10.255	10.254	(1.002)	219281	19.1291	19.12
26 2,2-Dichloropropane	77	4.279	4.279	(0.874)	117240	20.9176	20.91
24 2-Butanone	43	4.343	4.339	(0.887)	122250	41.9047	41.90
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	335307	19.8766	19.87
52 2-Hexanone	43	7.649	7.649	(0.927)	184006	43.8161	43.81
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	394300	20.2264	20.22
82 p-Isopropyltoluene	119	10.210	10.209	(0.997)	382155	19.7249	19.72
45 4-Methyl-2-Pentanone	43	6.915	6.914	(0.838)	257059	42.5418	42.54
10 Acetone	43	2.487	2.483	(0.508)	76735	43.8673	43.86
37 Benzene	78	5.220	5.220	(0.927)	435013	20.0740	20.07
74 Bromobenzene	156	9.381	9.381	(0.917)	112974	19.9707	19.97
29 Bromochloromethane	128	4.560	4.556	(0.931)	53467	21.9767	21.97
39 Bromodichloromethane	83	6.348	6.348	(1.128)	124748	20.3863	20.38
66 Bromoform	173	8.984	8.984	(1.089)	57750	18.9492	18.94
6 Bromomethane	94	1.678	1.674	(0.343)	58636	22.7362	22.73
19 Carbon Disulfide	76	2.596	2.596	(0.530)	591894	39.5602	39.56
34 Carbon Tetrachloride	117	4.999	4.999	(0.888)	105981	18.7924	18.79
59 Chlorobenzene	112	8.275	8.275	(1.003)	289484	19.9496	19.94
7 Chloroethane	64	1.760	1.756	(0.359)	75533	20.2022	20.20(M)
28 Chloroform	83	4.662	4.661	(0.952)	180784	20.1840	20.18
3 Chloromethane	50	1.348	1.344	(0.275)	98573	23.3774	23.37
27 cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	116853	20.5852	20.58
46 cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	173404	19.4408	19.44
55 Dibromochloromethane	129	7.758	7.758	(0.940)	93036	19.3566	19.35
44 Dibromomethane	93	6.191	6.191	(1.100)	67867	20.4353	20.43
2 Dichlorodifluoromethane	85	1.213	1.209	(0.248)	102972	19.6752	19.67
61 Ethylbenzene	106	8.373	8.373	(1.015)	149559	20.0954	20.09
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	44289	17.0537	17.05
67 Isopropylbenzene	105	9.126	9.126	(1.106)	436840	20.3409	20.34
62 m,p-Xylenes	106	8.474	8.474	(1.027)	370799	40.5265	40.52
17 Methylene Chloride	84	2.881	2.877	(0.588)	112181	20.3206	20.32
87 n-Butylbenzene	91	10.555	10.558	(1.031)	352487	18.8523	18.85
73 n-Propylbenzene	91	9.475	9.475	(0.926)	546860	19.9893	19.98
92 Naphthalene	128	12.133	12.132	(1.185)	435664	19.8421	19.84
63 o-Xylene	106	8.811	8.811	(1.068)	190318	20.6189	20.61
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	439895	19.1325	19.13
64 Styrene	104	8.826	8.826	(1.070)	328837	21.4434	21.44
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	311840	19.6078	19.60
56 Tetrachloroethene	164	7.526	7.525	(0.912)	74662	18.8837	18.88
50 Toluene	91	7.050	7.049	(0.855)	457817	20.3787	20.37
20 trans-1,2-Dichloroethene	96	3.151	3.147	(0.643)	102347	20.2464	20.24
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	144791	19.1540	19.15
38 Trichloroethene	130	5.865	5.865	(1.042)	103906	19.8615	19.86
8 Trichlorofluoromethane	101	1.963	1.959	(0.401)	141045	20.1927	20.19
5 Vinyl Chloride	62	1.426	1.426	(0.291)	121201	20.4263	20.42

QC Flag Legend

M - Compound response manually integrated.

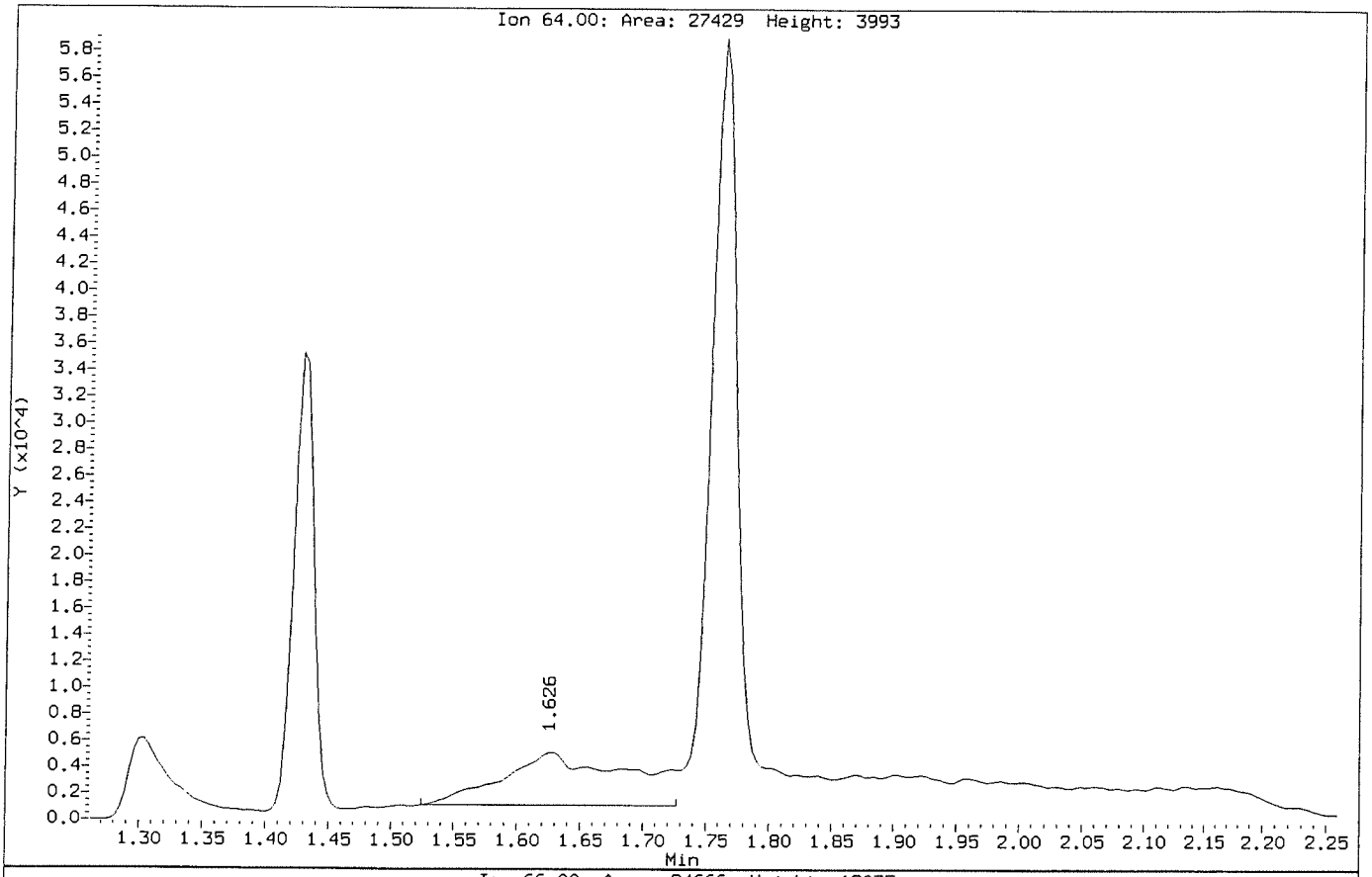


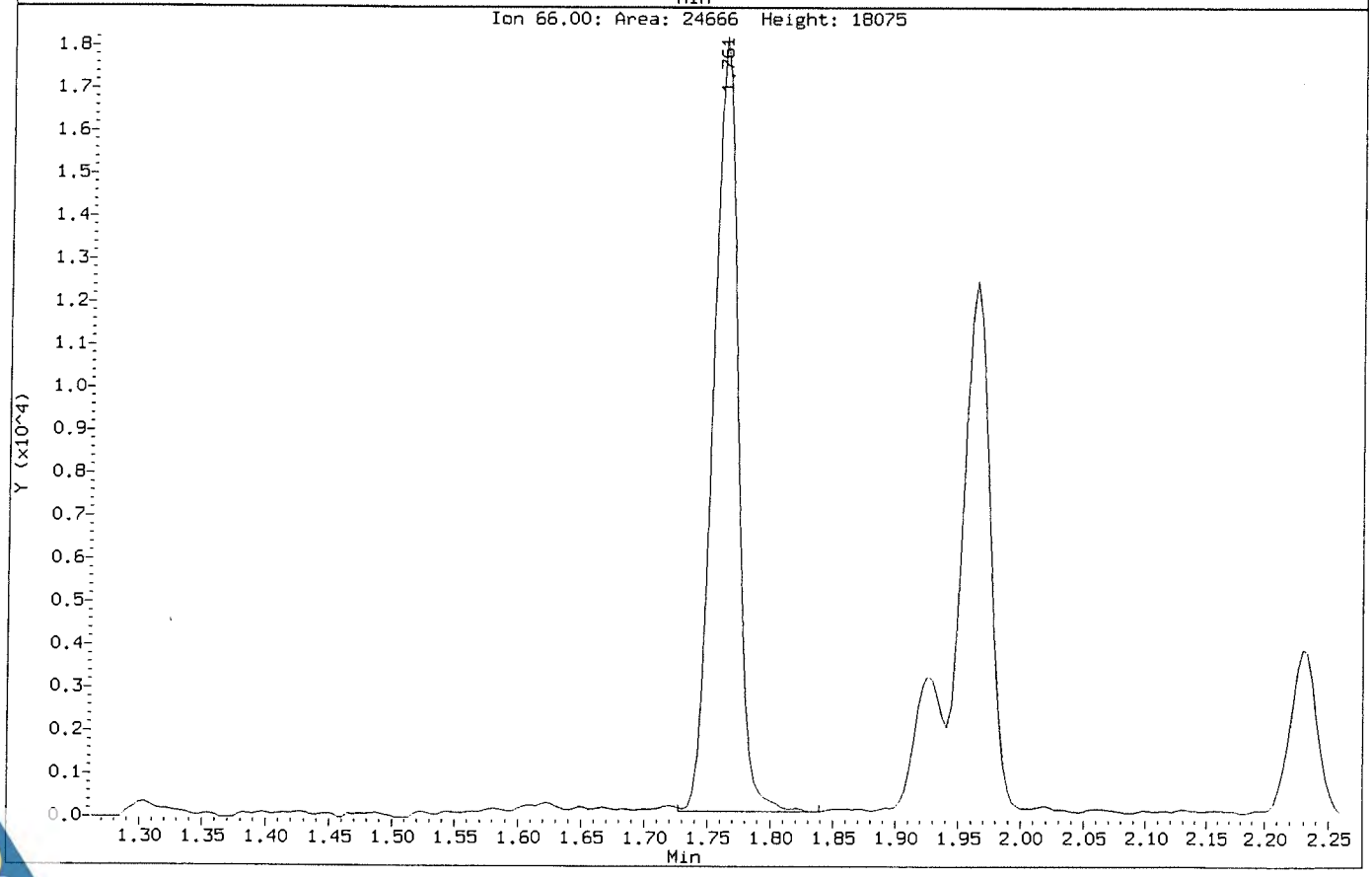
Data File: \\NAHSTWS005\Target\chem\voa9,i\U181222.b\U122203.D
Date : 22-DEC-2018 11:28
Client ID: VLCSW-181222
Sample Info: VLCSW-1812022;VLCSW-181222;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\Before\U122203.D
Injection Date: 22-DEC-2018 11:28
Instrument: VOA9.i
Client Sample ID: VLCSW-181222

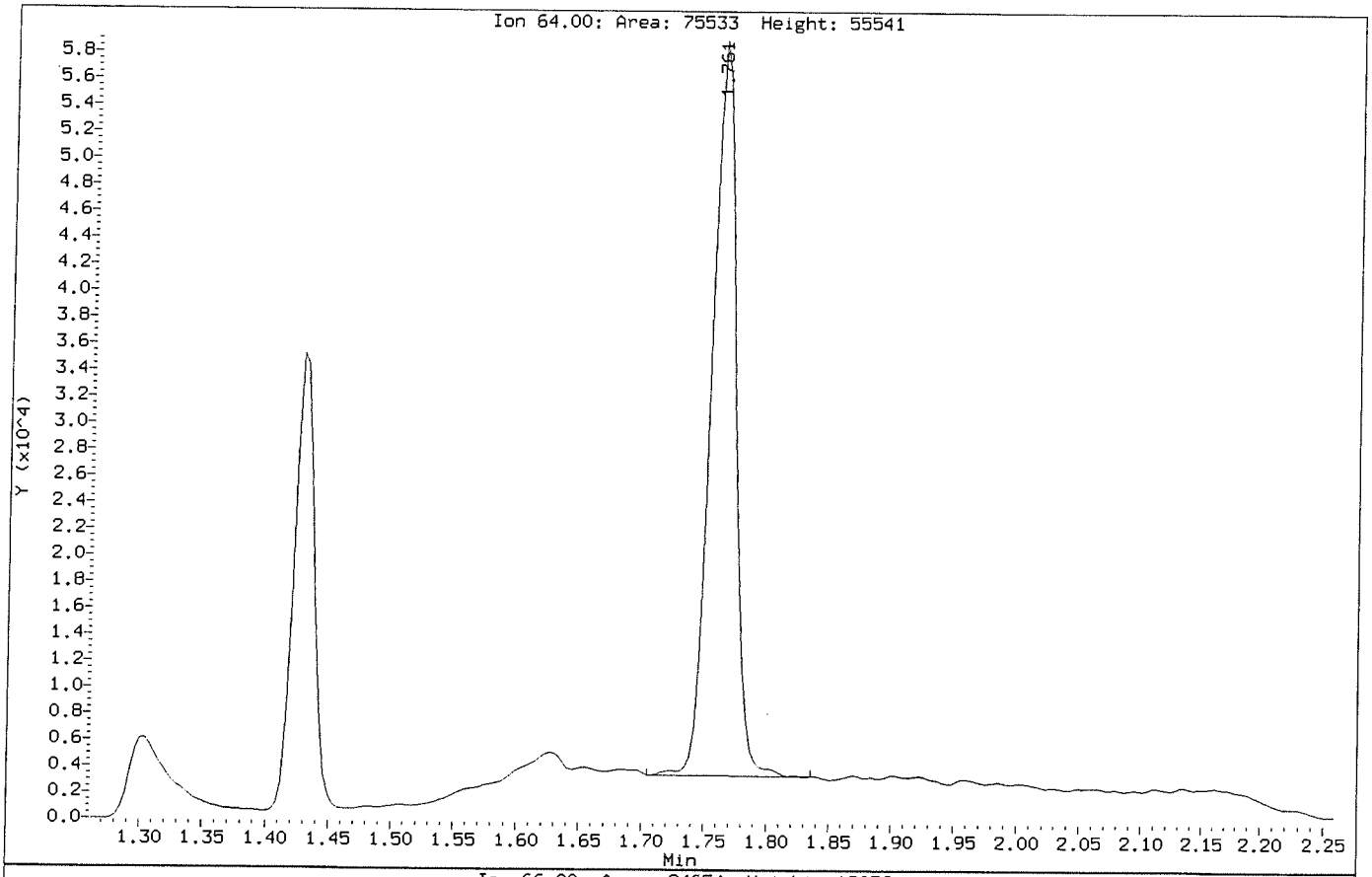
Compound: Chloroethane
CAS Number: 75-00-3

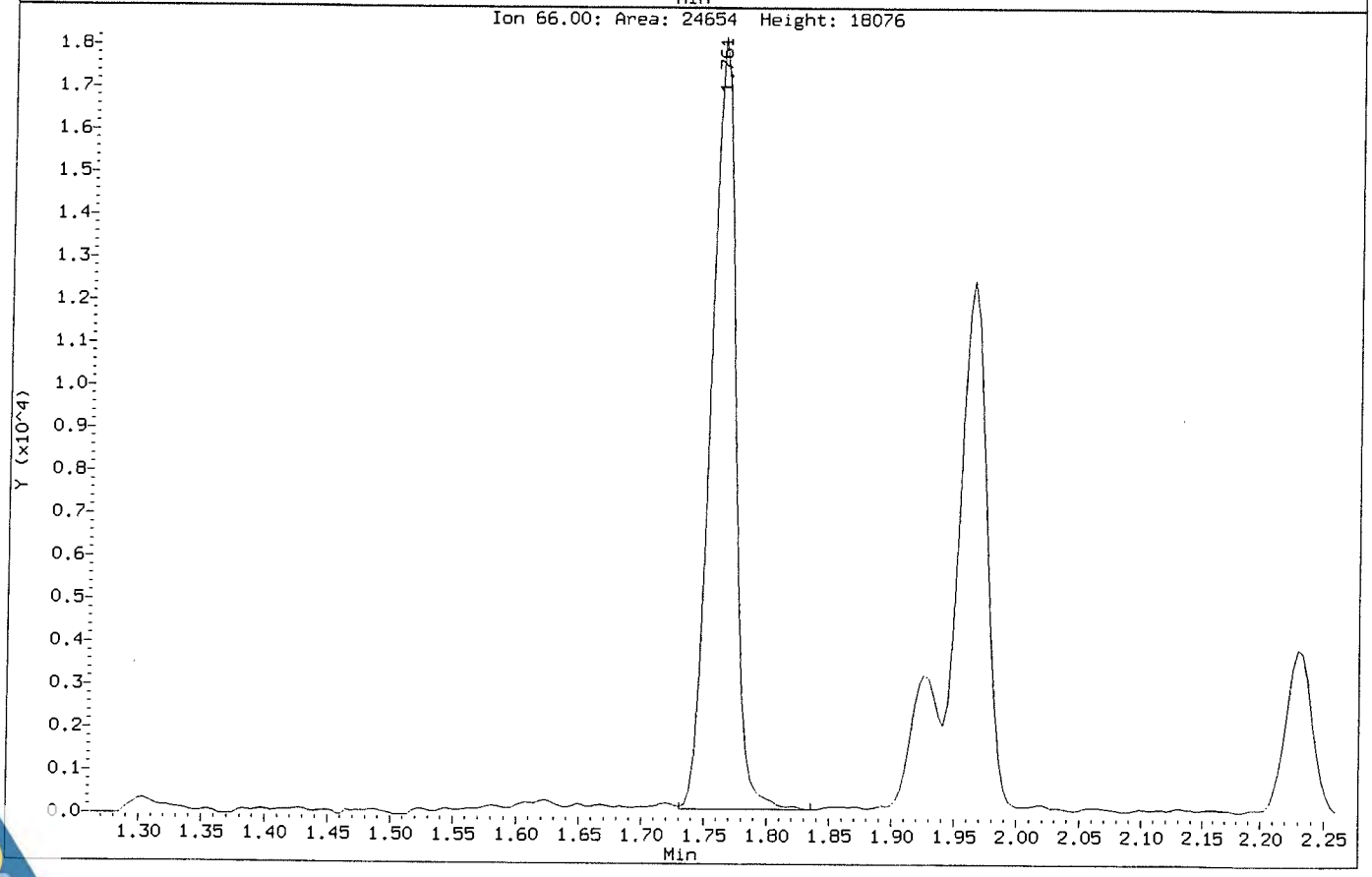




Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122203.D
Injection Date: 22-DEC-2018 11:28
Instrument: VOA9.i
Client Sample ID: VLCSW-181222

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122205.D
Lab Smp Id: VBLKW-181222 Client Smp ID: VBLKW-181222
Inj Date : 22-DEC-2018 12:18
Operator : PC Inst ID: VOA9.i
Smp Info : VBLKW-181222;VBLKW-181222;3;;BLANK
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 5 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

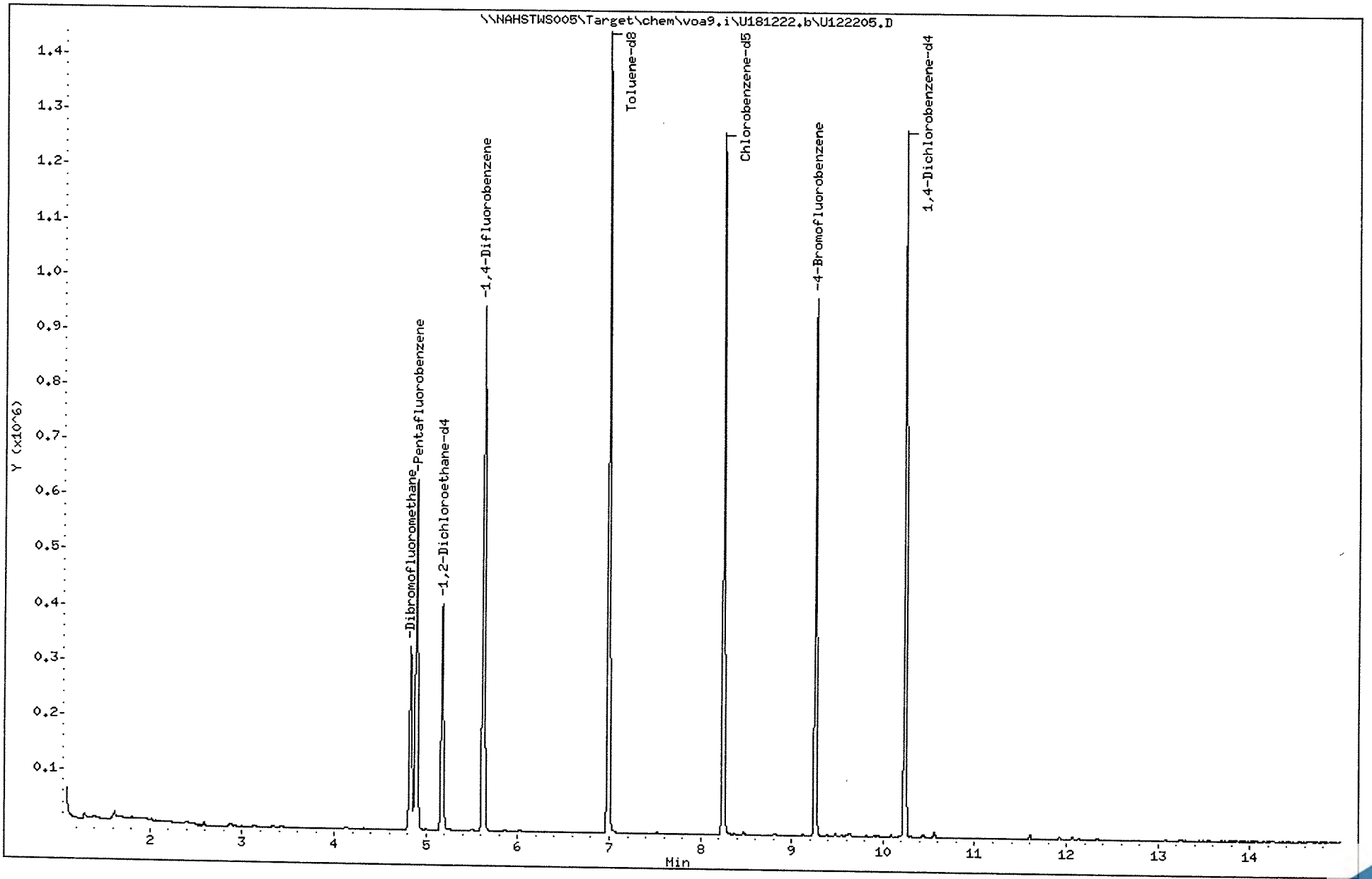
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.897	(1.000)	393752	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.628	(1.000)	677477	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	615766	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	284398	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.834	(0.987)	189791	43.4865	43.48
$ 35 1,2-Dichloroethane-d4	65	5.175	5.179	(1.057)	259716	46.4543	46.45
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	830845	52.3332	52.33
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	298252	49.2523	49.25

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122205.D
Date : 22-DEC-2018 12:18
Client ID: VBLKW-181222
Sample Info: VBLKW-181222;VBLKW-181222;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i

Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D
Lab Smp Id: HS18120642-01 Client Smp ID: HS18120642-01
Inj Date : 22-DEC-2018 13:07
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120642-01;HS18120642-01;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

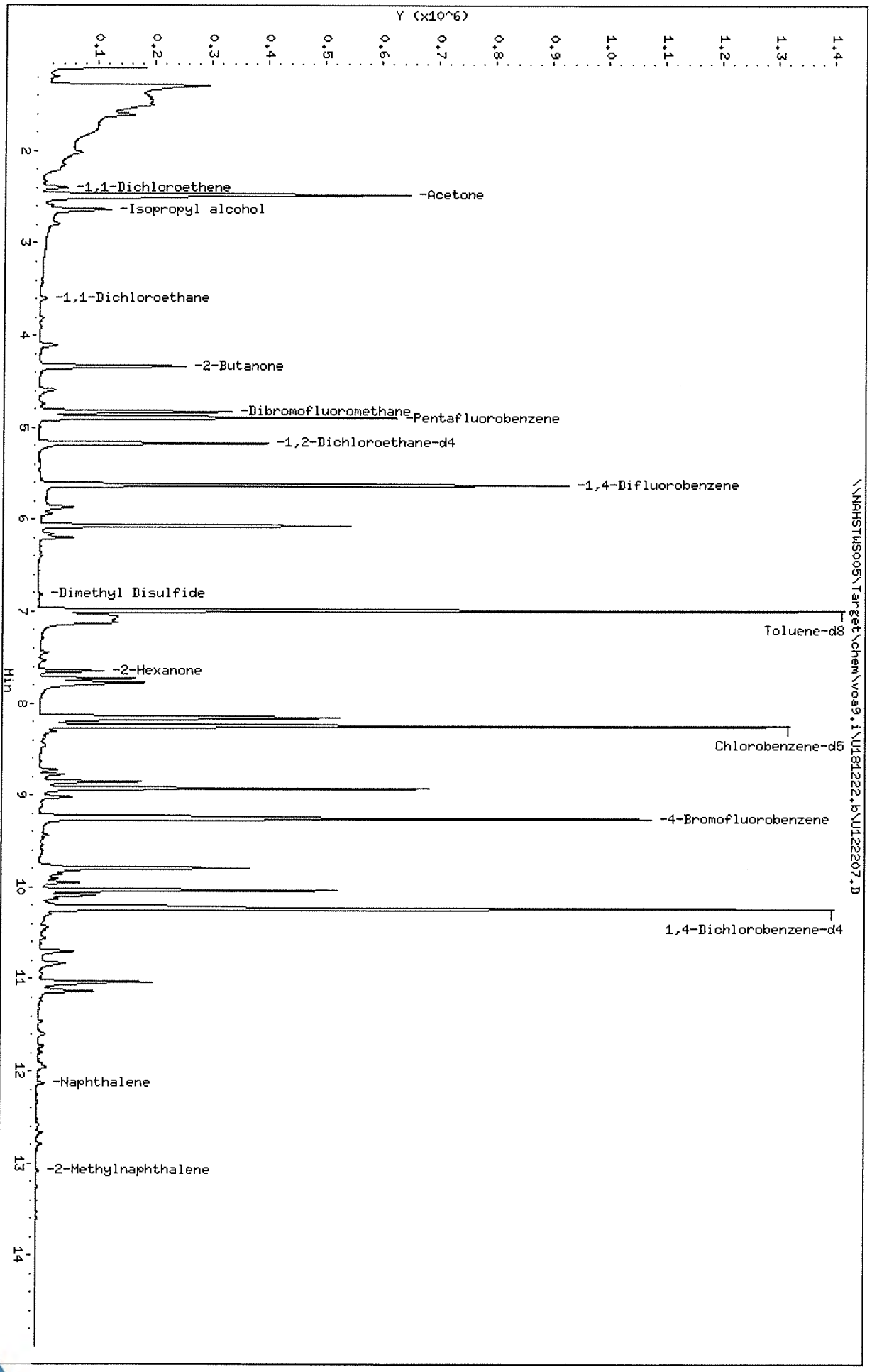
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.897	(1.000)	397155	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.628	(1.000)	672965	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	626961	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	305173	50.0000	
$ 30 Dibromofluoromethane	113	4.827	4.834	(0.986)	194816	44.2824	44.28
$ 35 1,2-Dichloroethane-d4	65	5.171	5.179	(1.057)	256254	45.3950	45.39
$ 48 Toluene-d8	98	6.990	6.989	(0.847)	833027	51.5064	51.50
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	314018	50.9787	50.97
22 1,1-Dichloroethane	63	3.601	3.608	(0.736)	10829	1.26610	1.26(a)
11 1,1-Dichloroethene	96	2.397	2.405	(0.490)	12929	3.42382	3.42(a)
24 2-Butanone	43	4.335	4.339	(0.886)	321193	124.242	124.24
52 2-Hexanone	43	7.649	7.649	(0.927)	62551	17.9420	17.94
10 Acetone	43	2.476	2.483	(0.506)	657332	433.763	433.76(A)
92 Naphthalene	128	12.133	12.132	(1.185)	8636	1.11106	1.11(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount
exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D
Date : 22-DEC-2018 13:07
Client ID: HS18120642-01
Sample Info: HS18120642-01;HS18120642-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D

Date : 22-DEC-2018 13:07

Client ID: HS18120642-01

Instrument: VOA9.i

Sample Info: HS18120642-01;HS18120642-01;;;

Purge Volume: 5.0

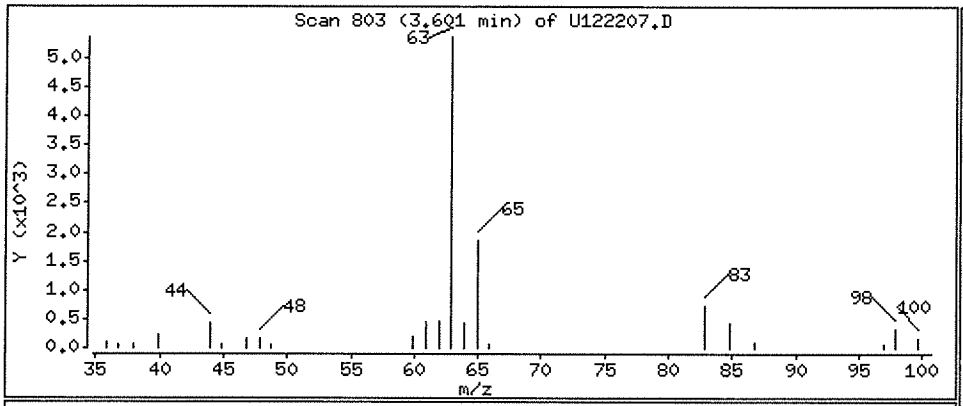
Operator: PC

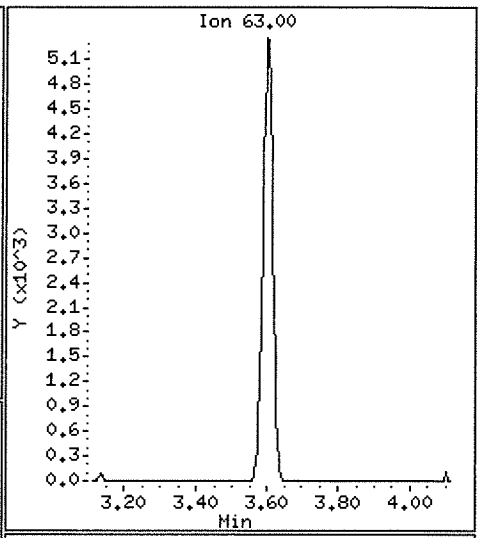
Column phase: DB624

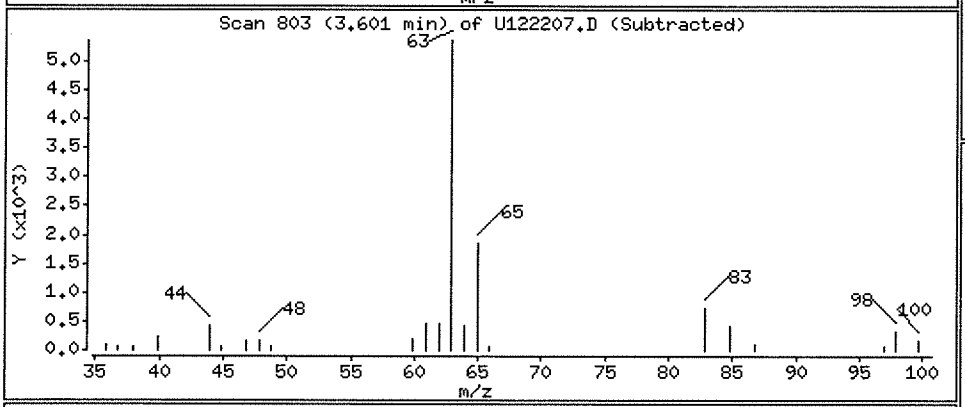
Column diameter: 0.18

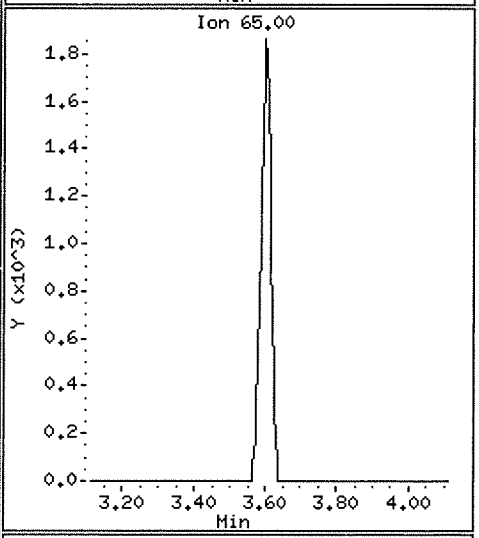
22 1,1-Dichloroethane

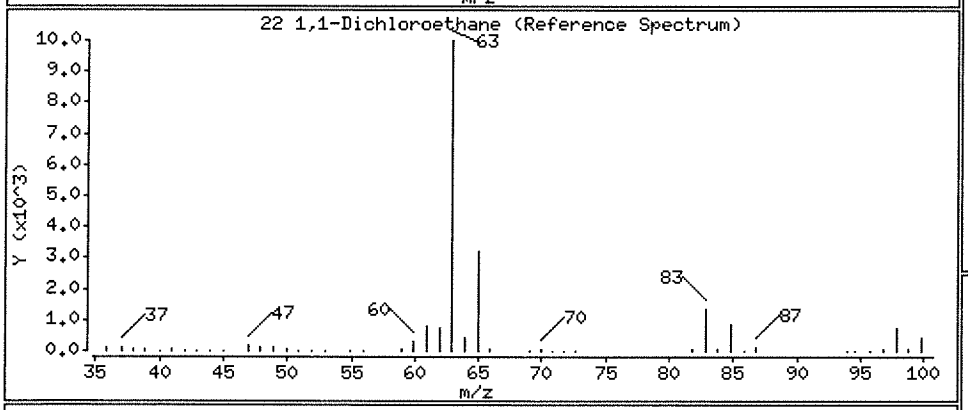
Concentration: 1.26 ug/l

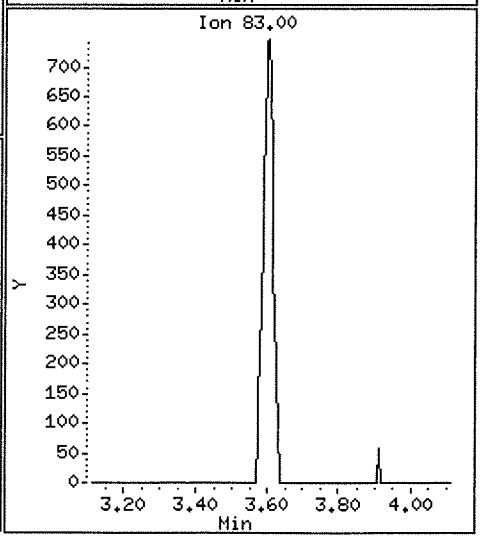


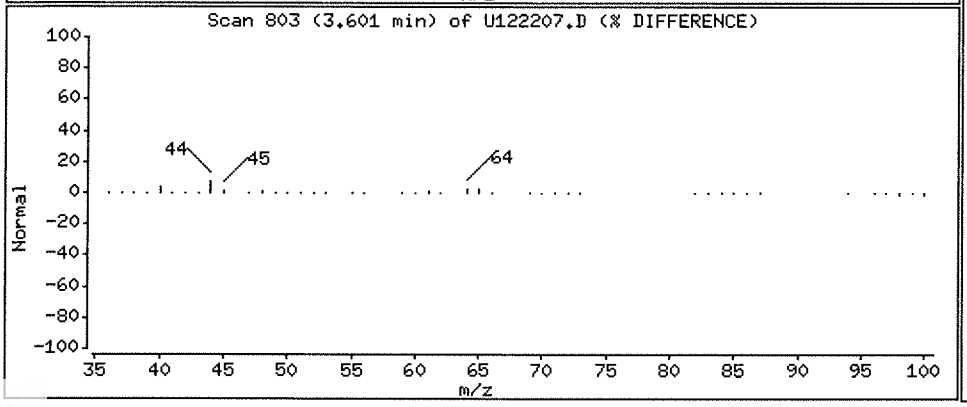












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D Page 4

Date : 22-DEC-2018 13:07

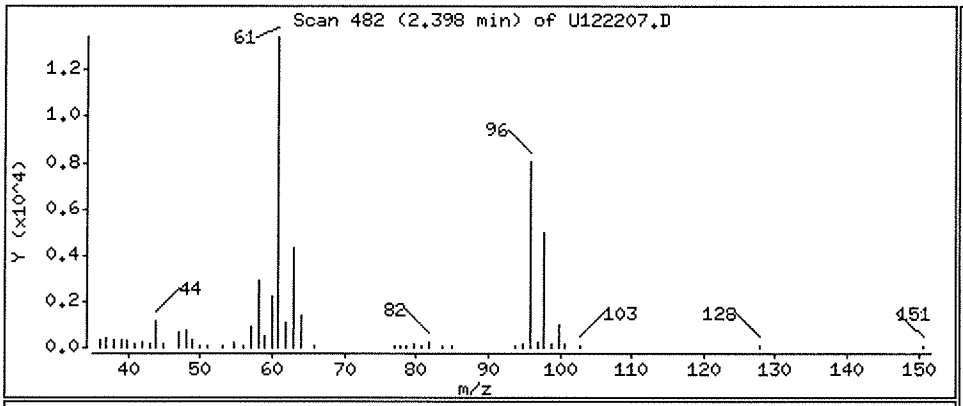
Client ID: HS18120642-01 Instrument: VOA9.i

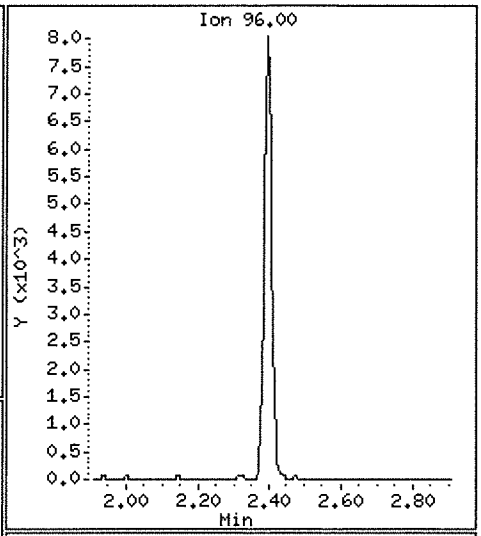
Sample Info: HS18120642-01;HS18120642-01;;;

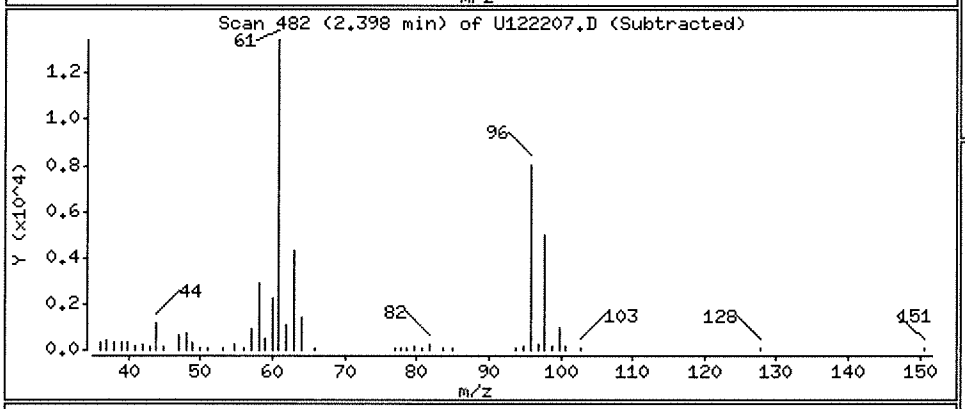
Purge Volume: 5.0 Operator: PC

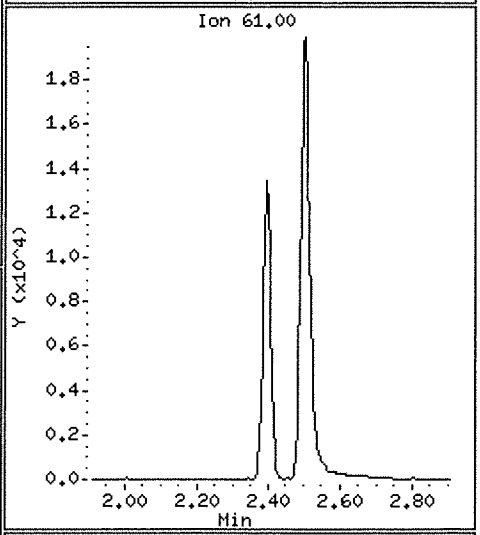
Column phase: DB624 Column diameter: 0.18

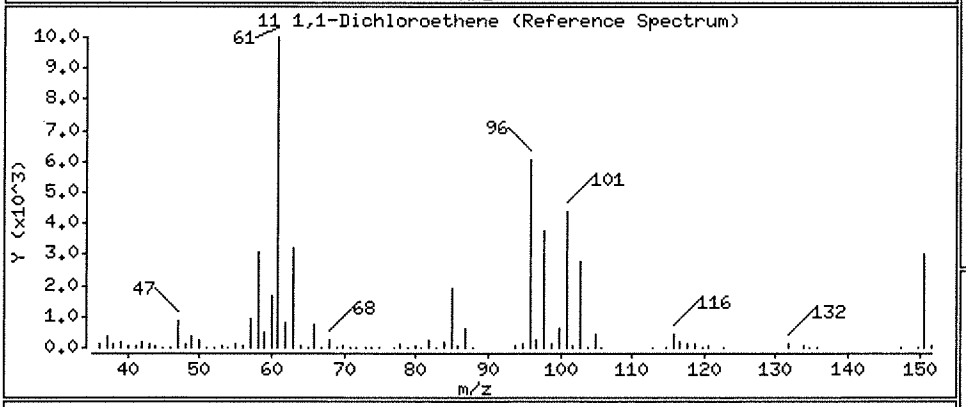
11 1,1-Dichloroethene Concentration: 3.42 ug/l

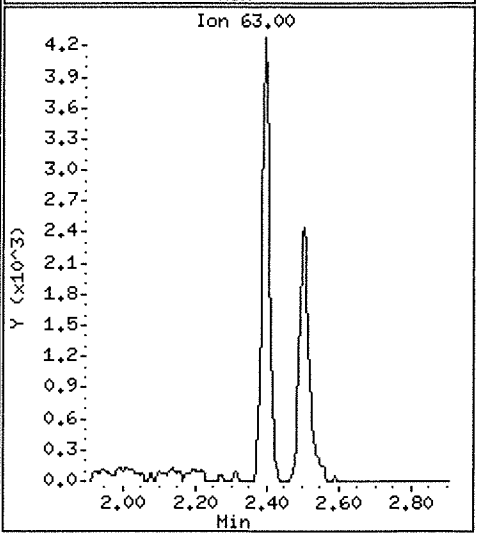


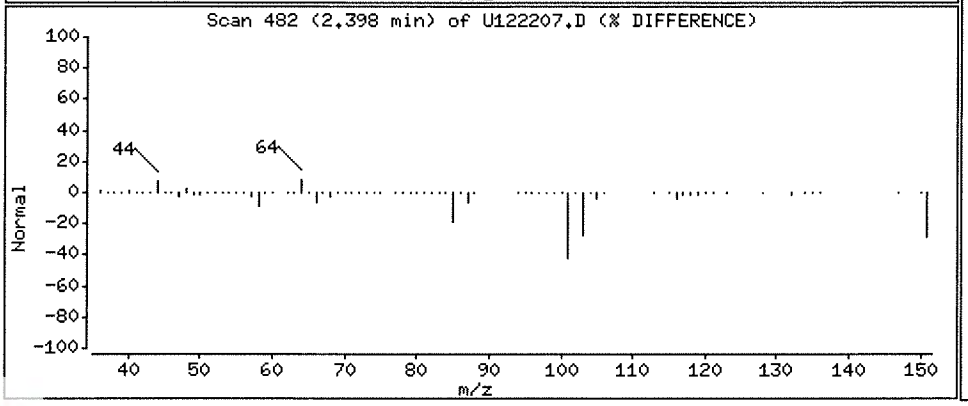












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D

Date : 22-DEC-2018 13:07

Client ID: HS18120642-01

Instrument: VOA9.i

Sample Info: HS18120642-01;HS18120642-01;;;

Purge Volume: 5.0

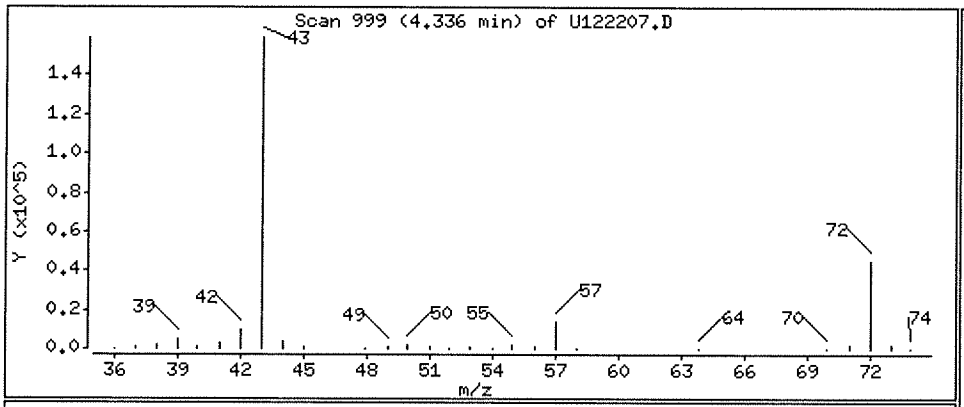
Operator: PC

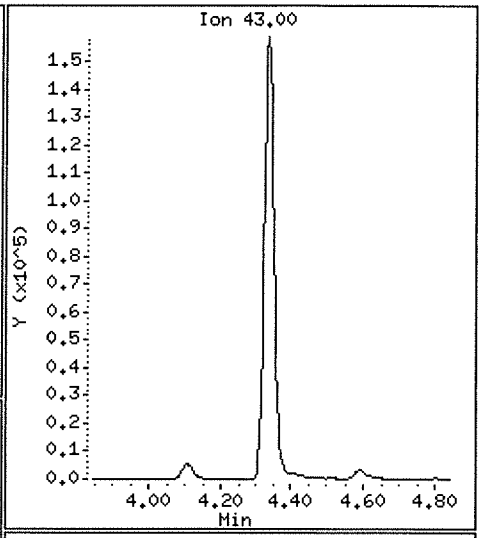
Column phase: DB624

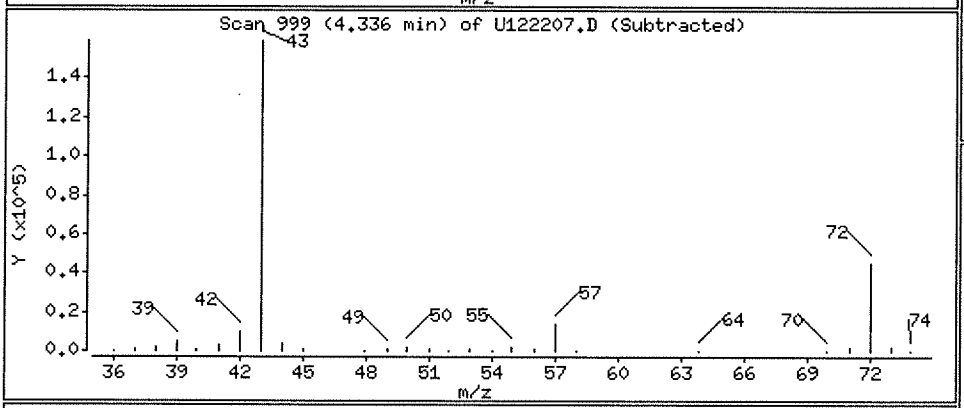
Column diameter: 0.18

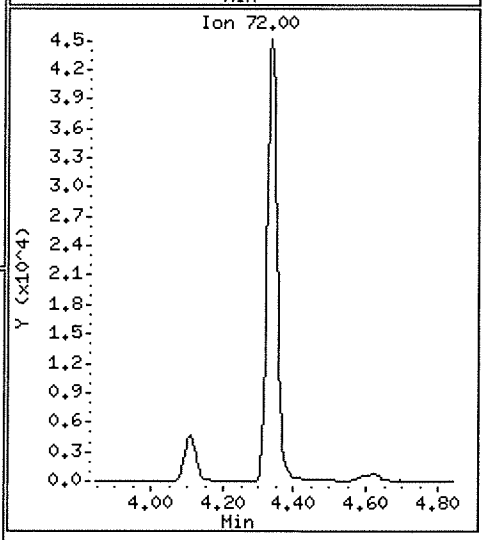
24 2-Butanone

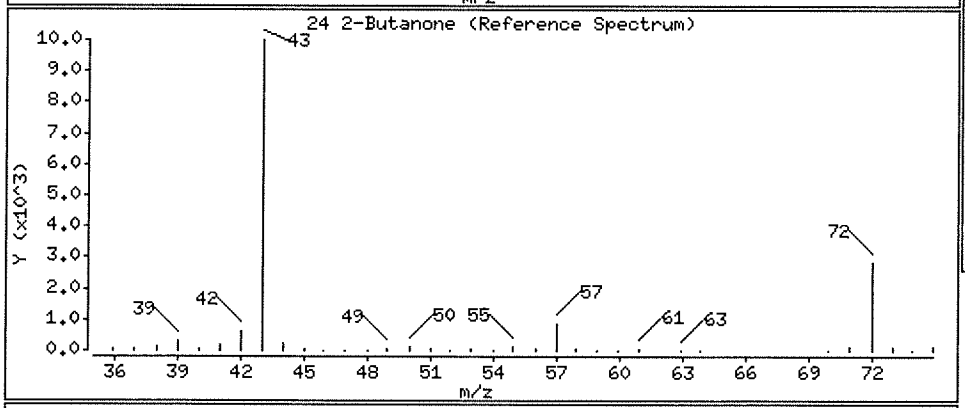
Concentration: 124.24 ug/l

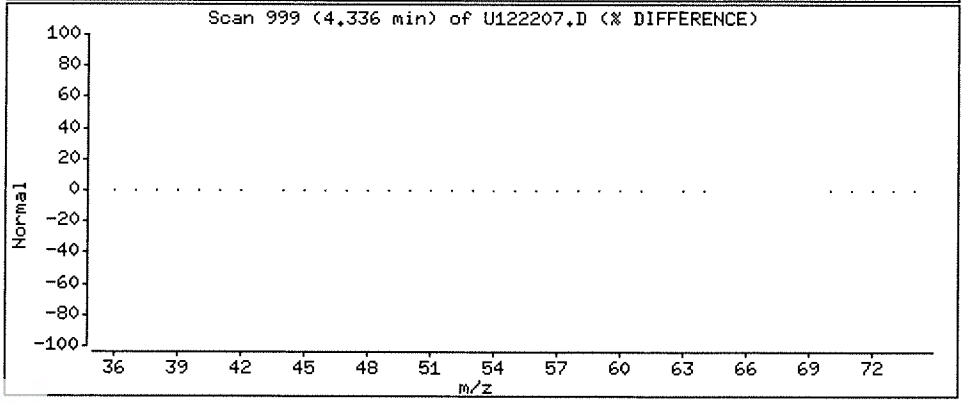












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D Page 6

Date : 22-DEC-2018 13:07

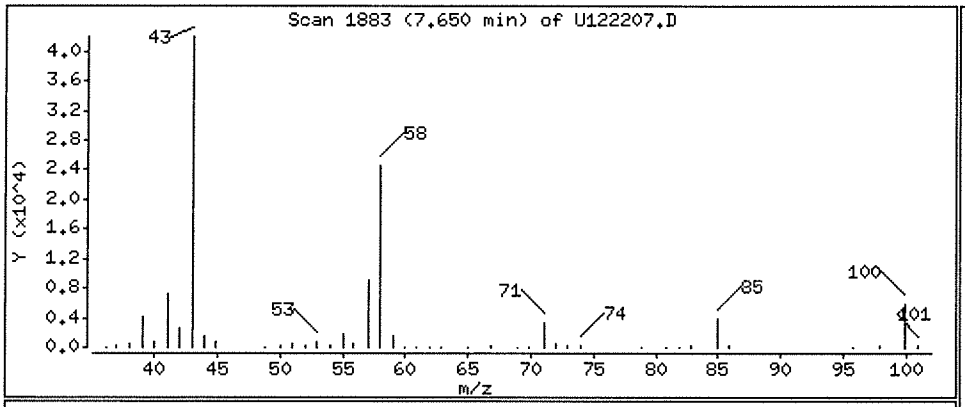
Client ID: HS18120642-01 Instrument: VOA9.i

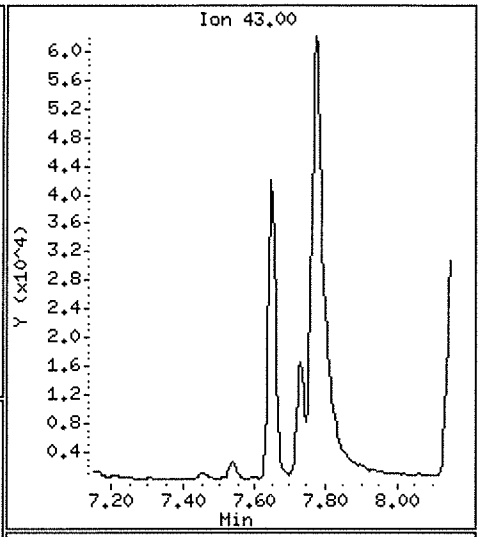
Sample Info: HS18120642-01;HS18120642-01;;;

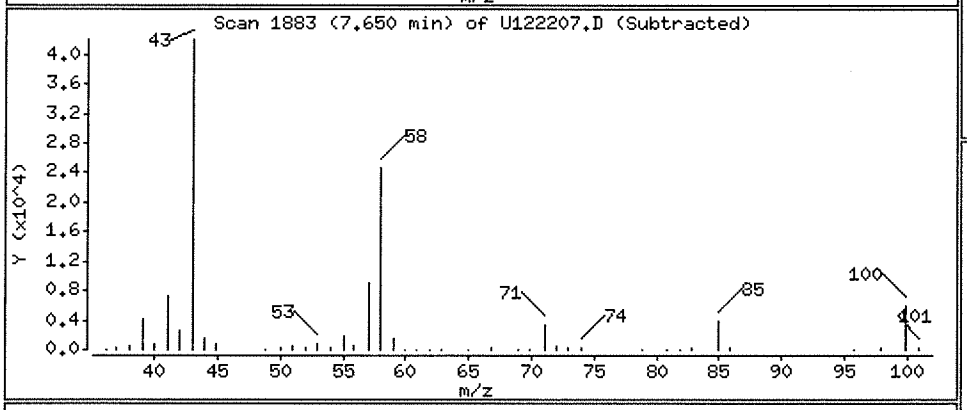
Purge Volume: 5.0 Operator: PC

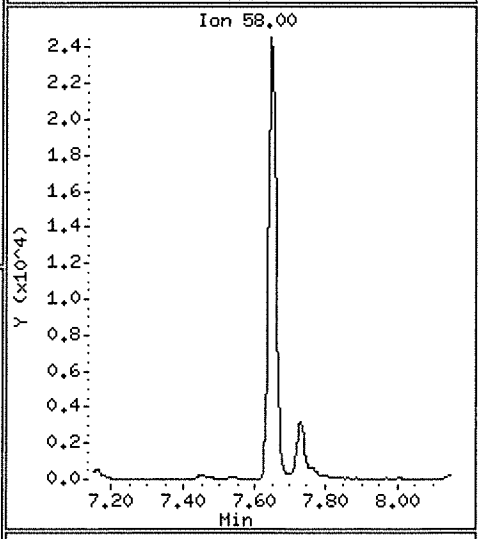
Column phase: DB624 Column diameter: 0.18

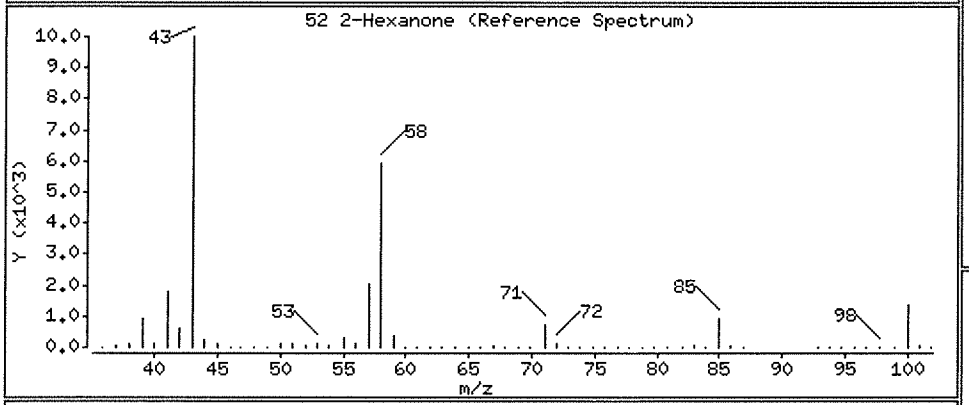
52 2-Hexanone Concentration: 17.94 ug/l

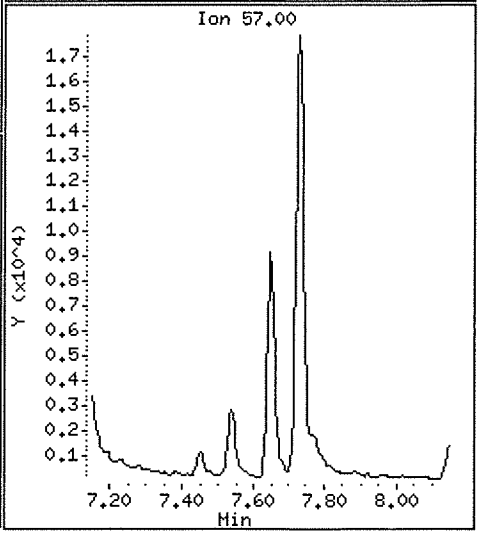


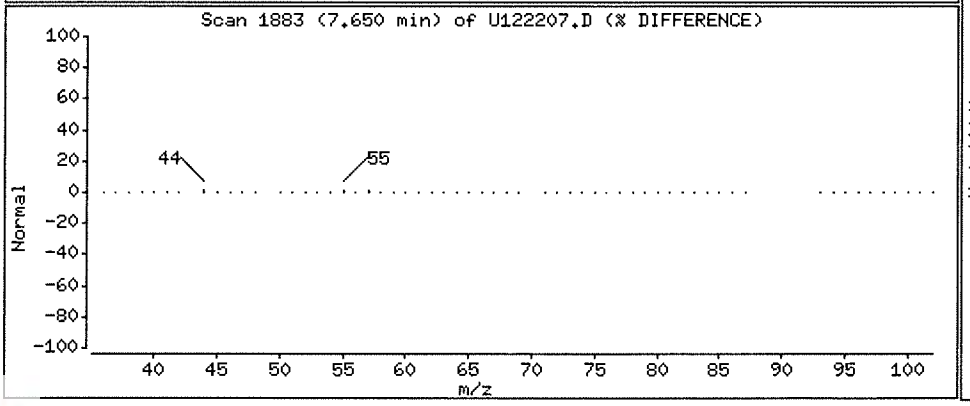












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D

Date : 22-DEC-2018 13:07

Client ID: HS18120642-01

Instrument: VOA9.i

Sample Info: HS18120642-01;HS18120642-01;;;

Purge Volume: 5.0

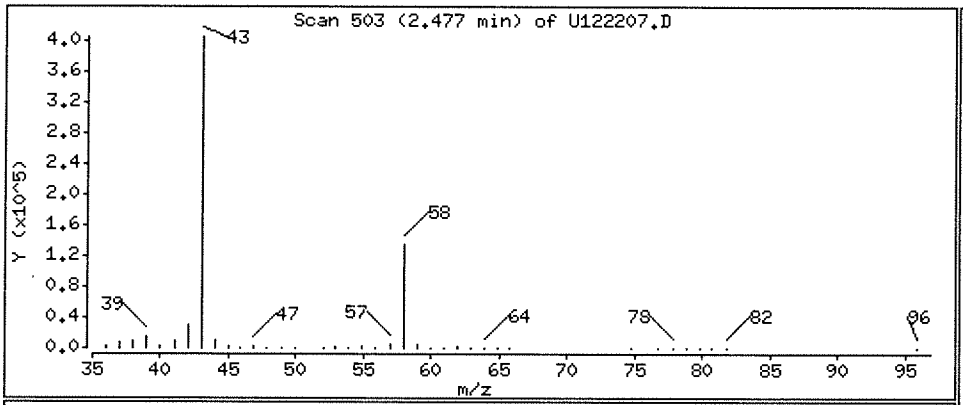
Operator: PC

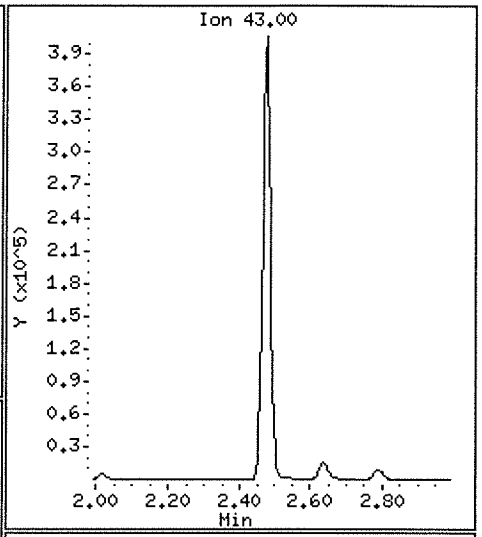
Column phase: DB624

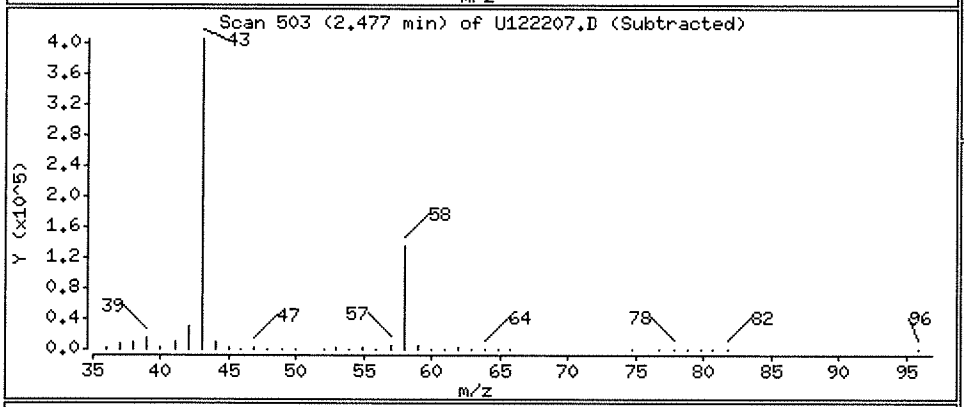
Column diameter: 0.18

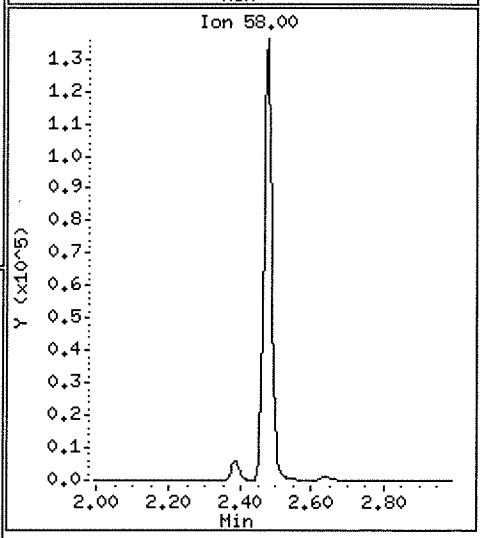
10 Acetone

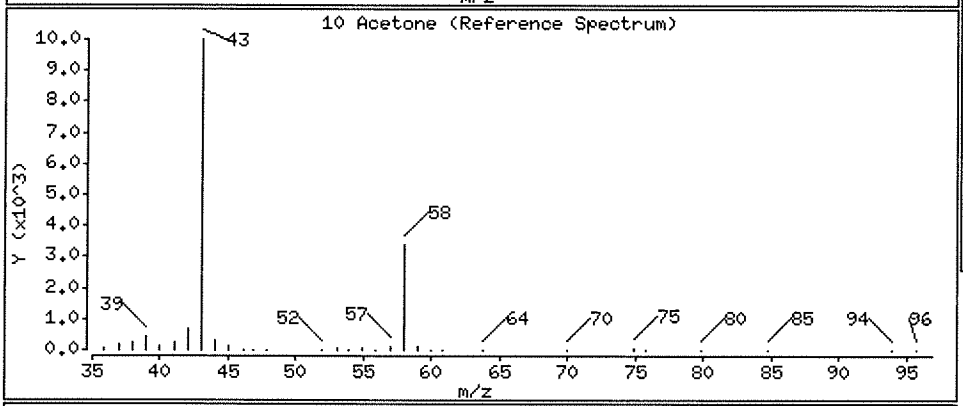
Concentration: 433.76 ug/l

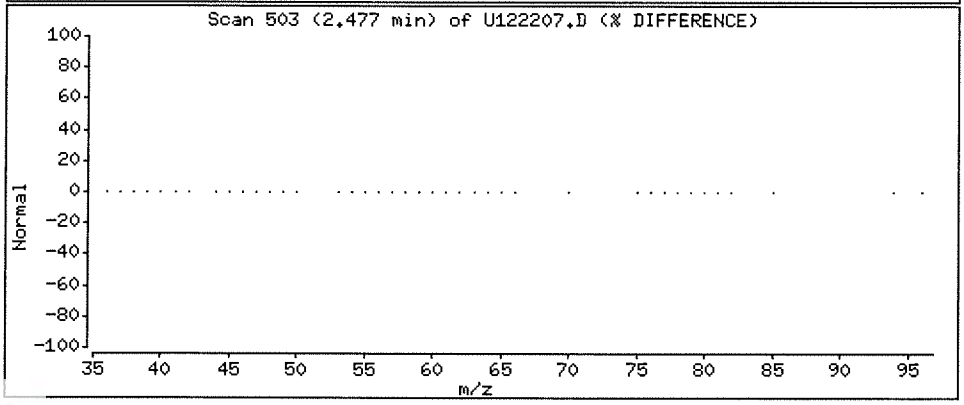












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122207.D Page 8

Date : 22-DEC-2018 13:07

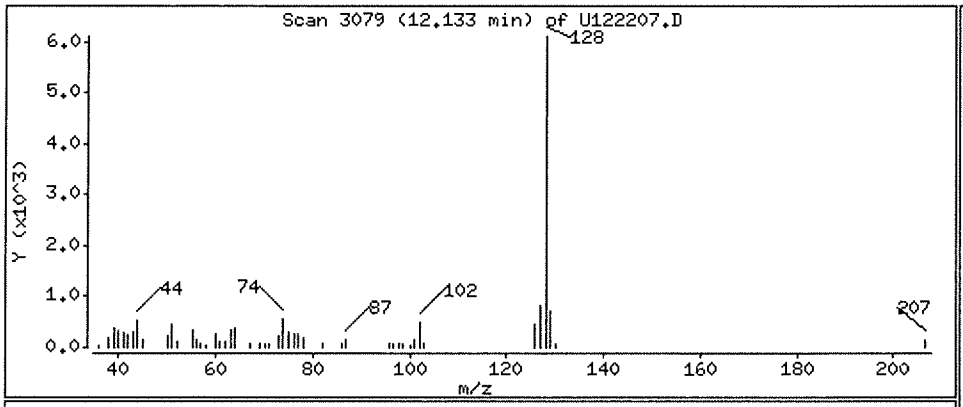
Client ID: HS18120642-01 Instrument: VOA9.i

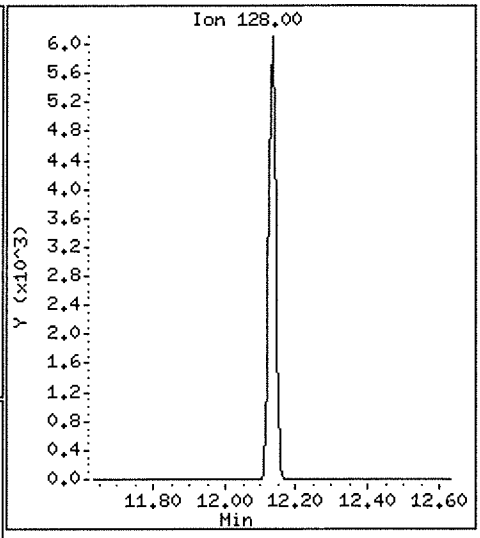
Sample Info: HS18120642-01;HS18120642-01;;;

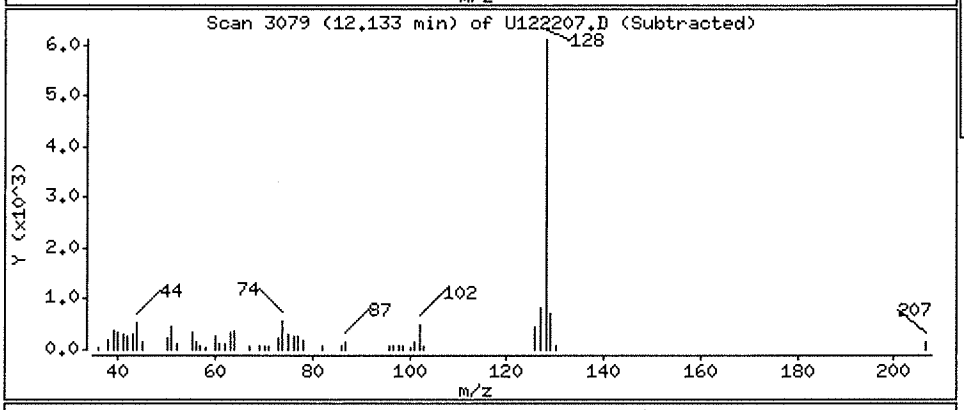
Purge Volume: 5.0 Operator: PC

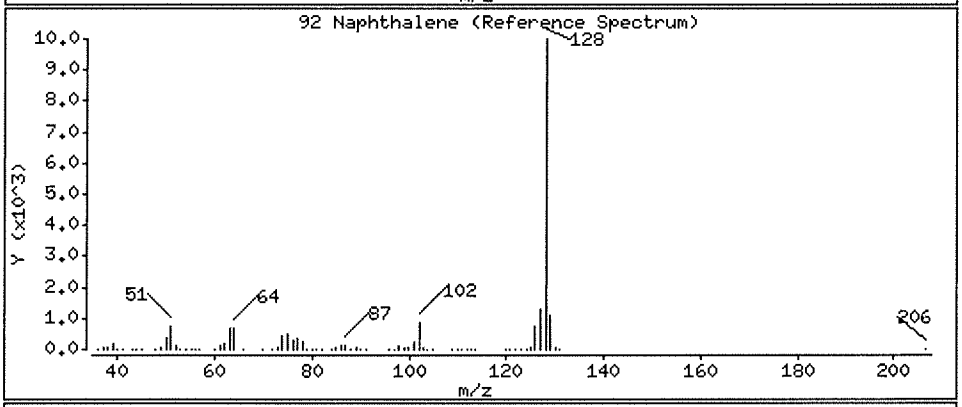
Column phase: DB624 Column diameter: 0.18

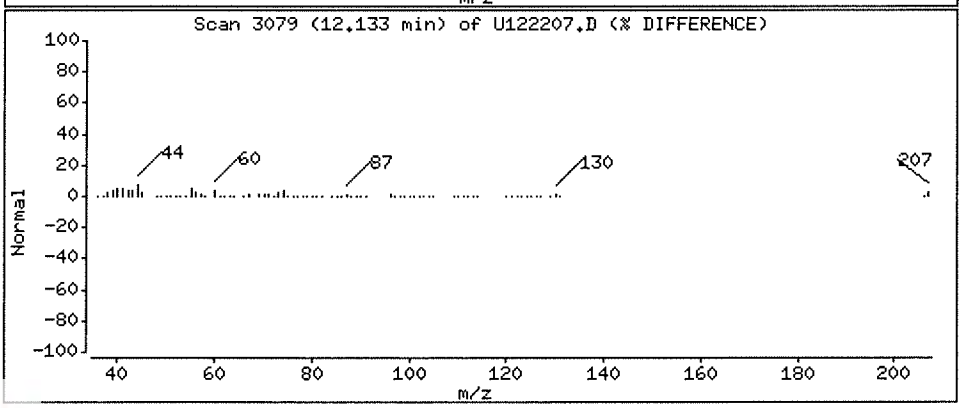
92 Naphthalene Concentration: 1.11 ug/l











Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122208.D Page 1
Report Date: 28-Jan-2019 13:52

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122208.D
Lab Smp Id: HS18120642-03 Client Smp ID: HS18120642-03
Inj Date : 22-DEC-2018 13:32
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120642-03;HS18120642-03;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

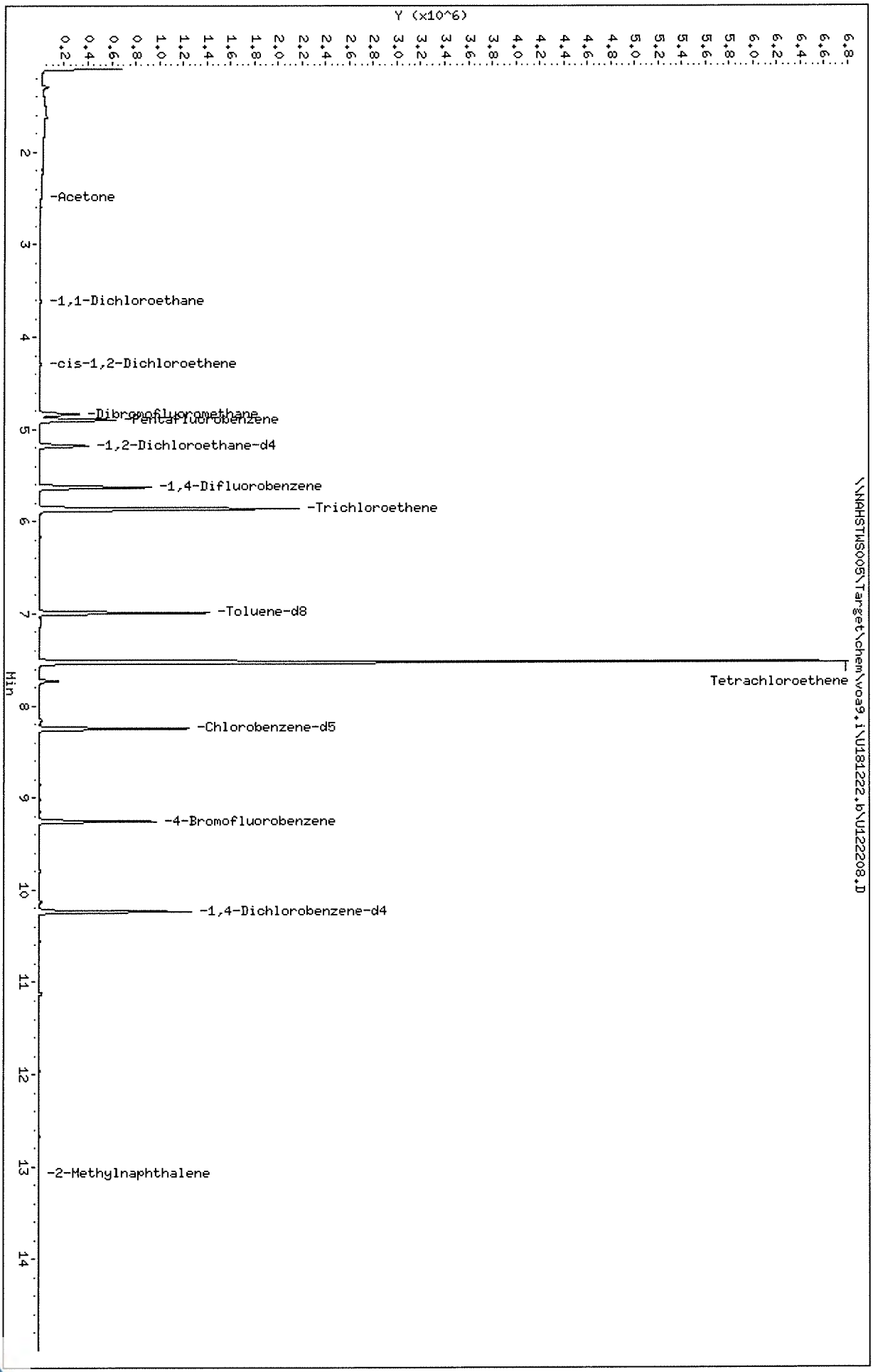
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.898	4.897	(1.000)	392061	50.0000	
*	36 1,4-Difluorobenzene	114	5.629	5.628	(1.000)	677261	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	615089	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	286645	50.0000	
$	30 Dibromofluoromethane	113	4.834	4.834	(0.987)	193401	44.5406	44.54
$	35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	261491	46.9977	46.99
$	48 Toluene-d8	98	6.989	6.989	(0.847)	829325	52.2936	52.29
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	300032	49.6109	49.61
	22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	10408	1.23269	1.23(a)
	10 Acetone	43	2.487	2.483	(0.508)	7621	2.10573	2.10(a)
	27 cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	4850	0.94113	0.94(a)
	56 Tetrachloroethene	164	7.525	7.525	(0.912)	1319826	409.865	409.86(A)
	38 Trichloroethene	130	5.865	5.865	(1.042)	644053	148.034	148.03

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount
exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9,i\U181222,b\U122208,D
Date : 22-DEC-2018 13:32
Client ID: HS18120642-03
Sample Info: HS18120642-03;HS18120642-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122208.D

Date : 22-DEC-2018 13:32

Client ID: HS18120642-03

Instrument: VOA9.i

Sample Info: HS18120642-03;HS18120642-03;;;

Purge Volume: 5.0

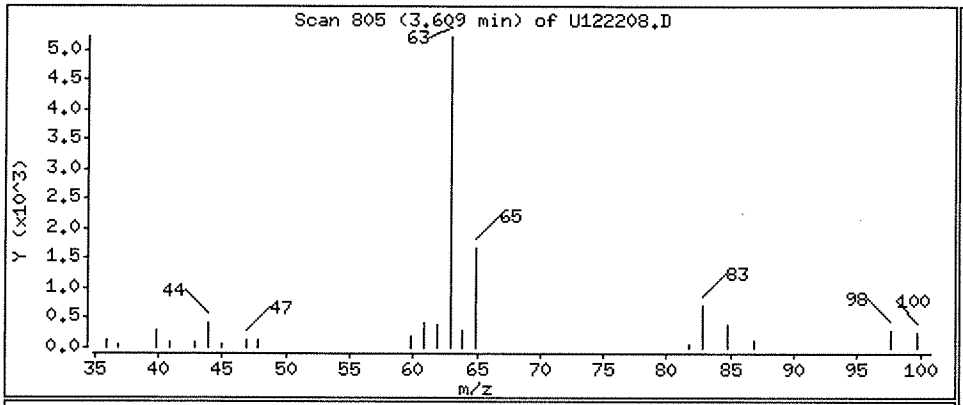
Operator: PC

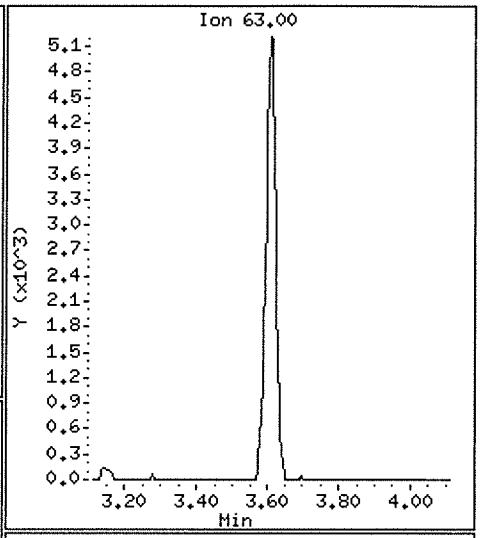
Column phase: DB624

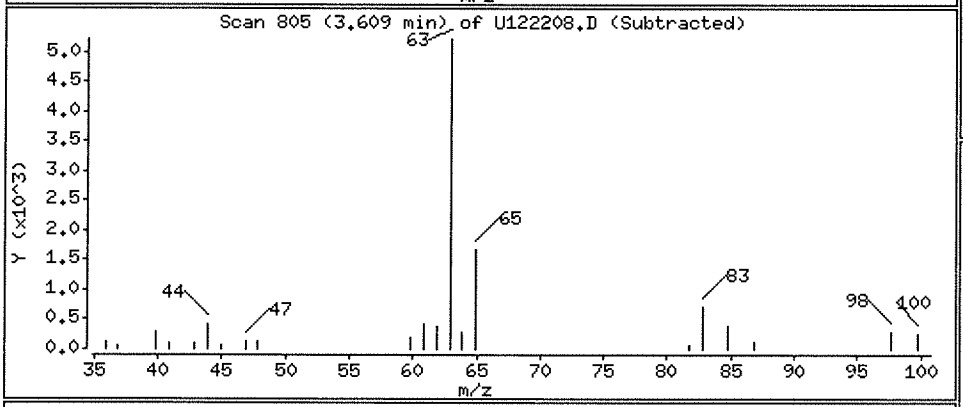
Column diameter: 0.18

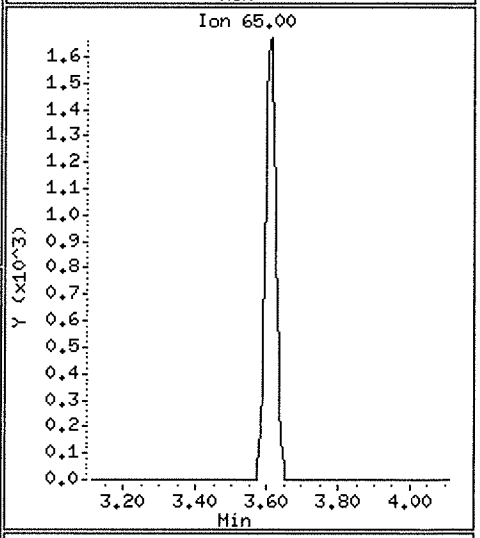
22 1,1-Dichloroethane

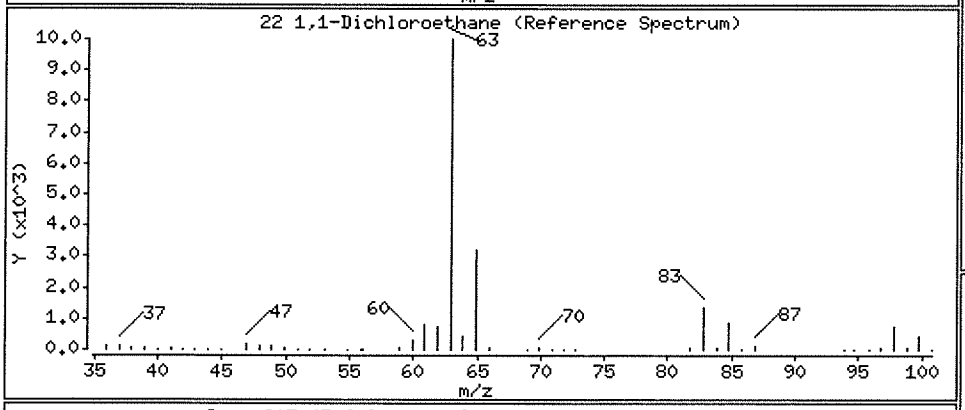
Concentration: 1.23 ug/l

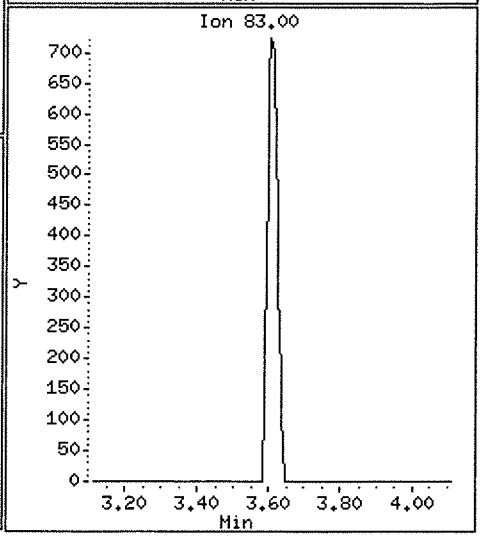


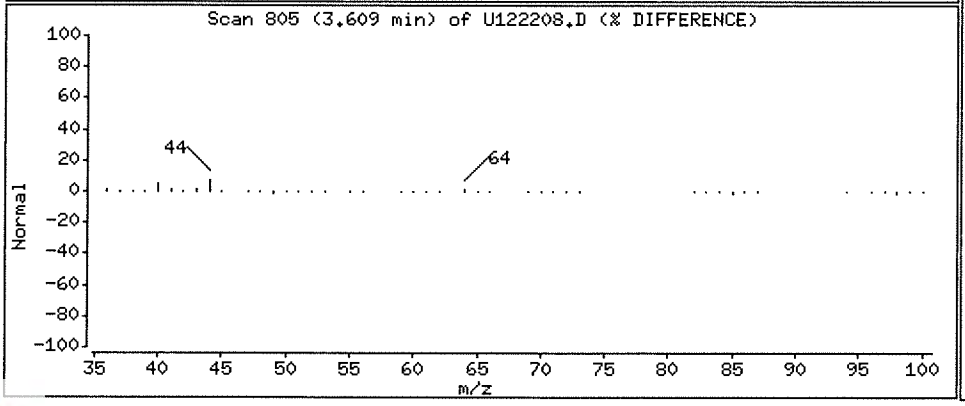












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122208.D

Date : 22-DEC-2018 13:32

Client ID: HS18120642-03

Instrument: VOA9.i

Sample Info: HS18120642-03;HS18120642-03;;;

Purge Volume: 5.0

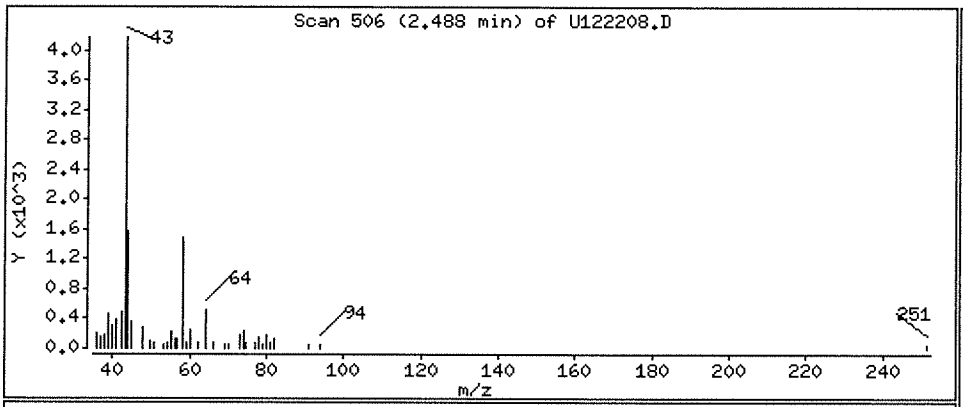
Operator: PC

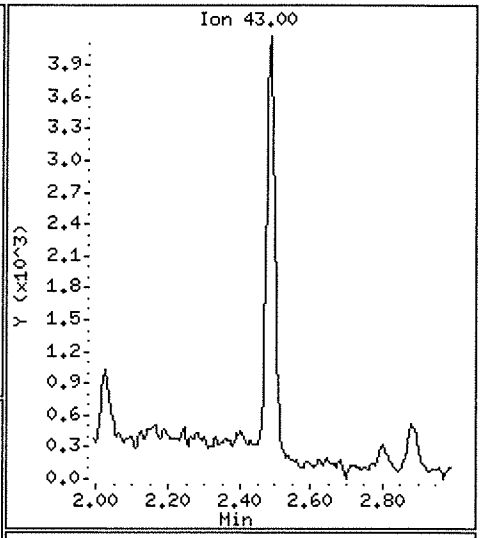
Column phase: DB624

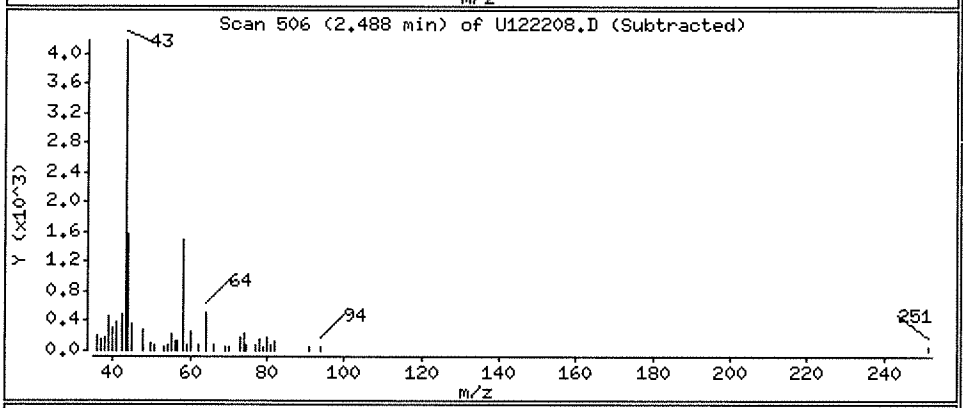
Column diameter: 0.18

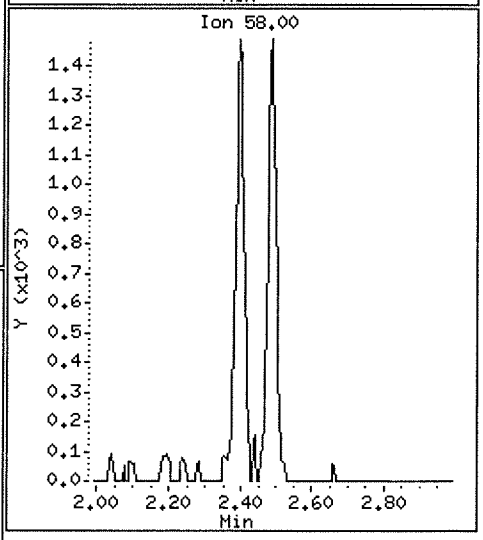
10 Acetone

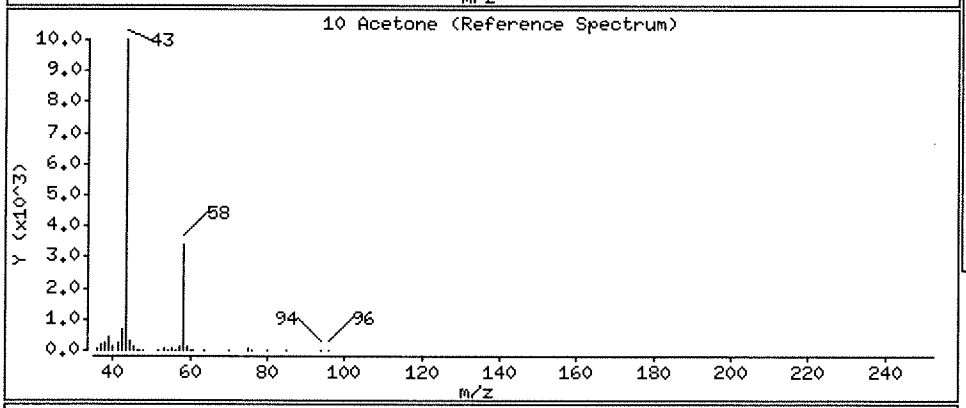
Concentration: 2.10 ug/l

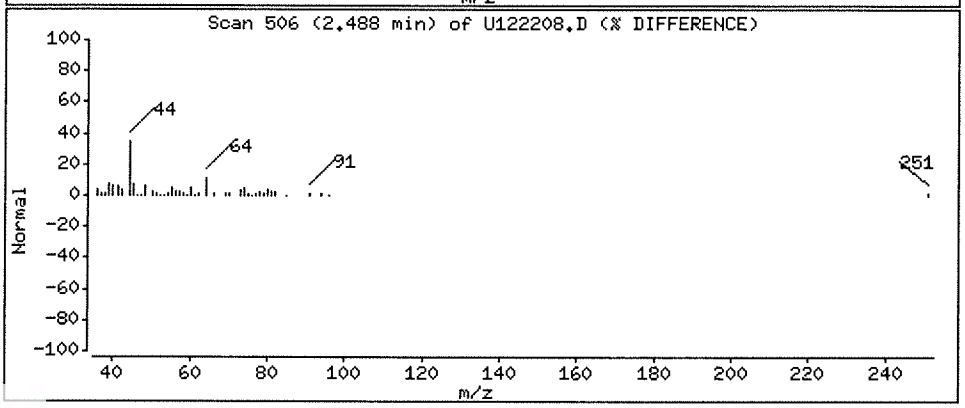












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122208.D Page 5

Date : 22-DEC-2018 13:32

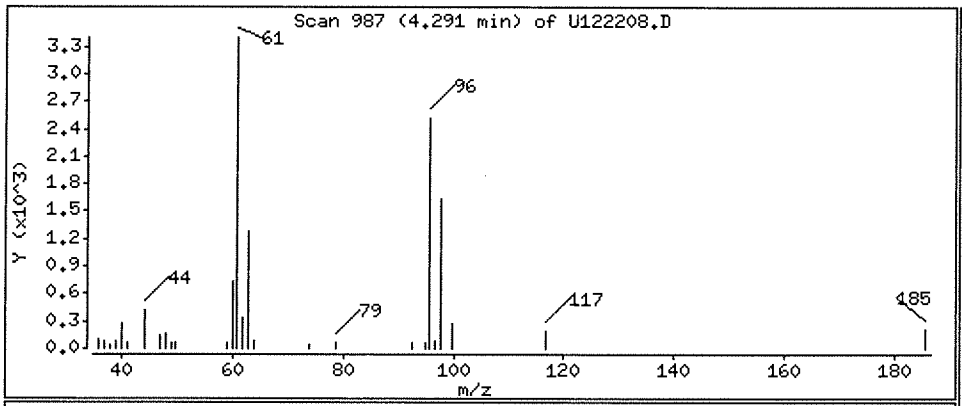
Client ID: HS18120642-03 Instrument: VOA9.i

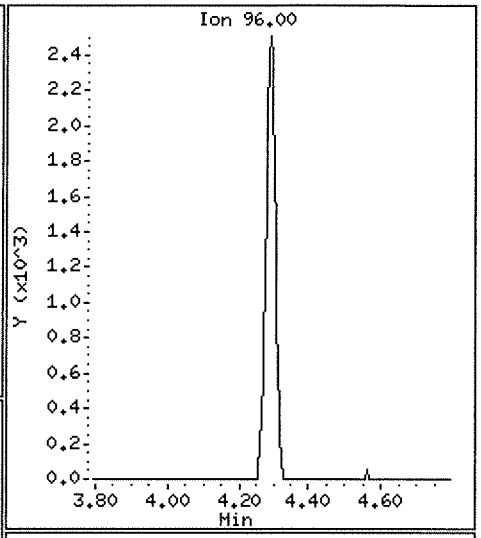
Sample Info: HS18120642-03;HS18120642-03;;;

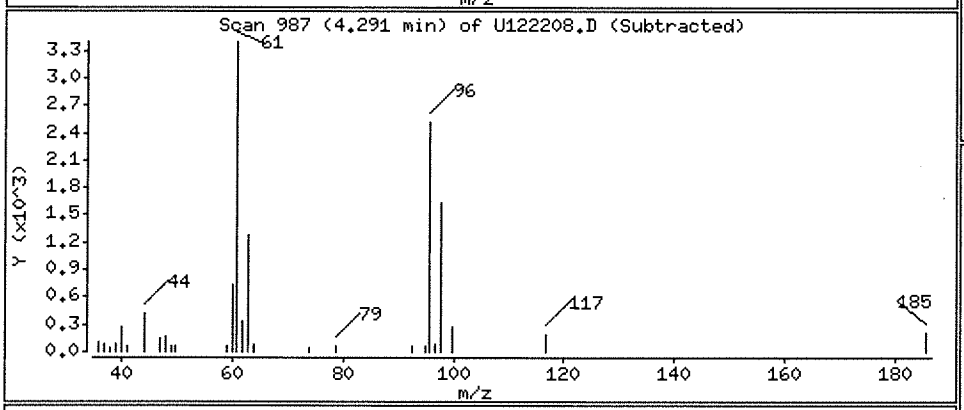
Purge Volume: 5.0 Operator: PC

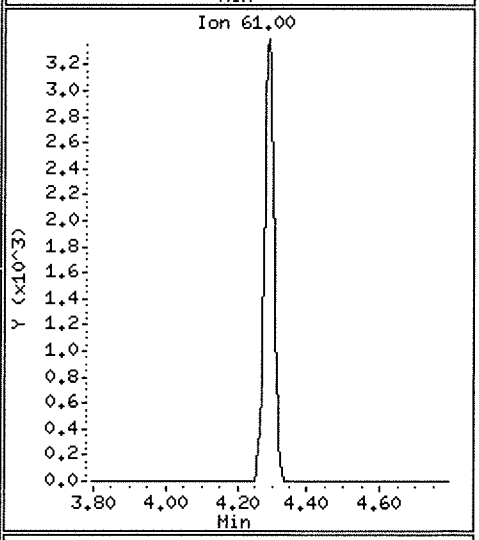
Column phase: DB624 Column diameter: 0.18

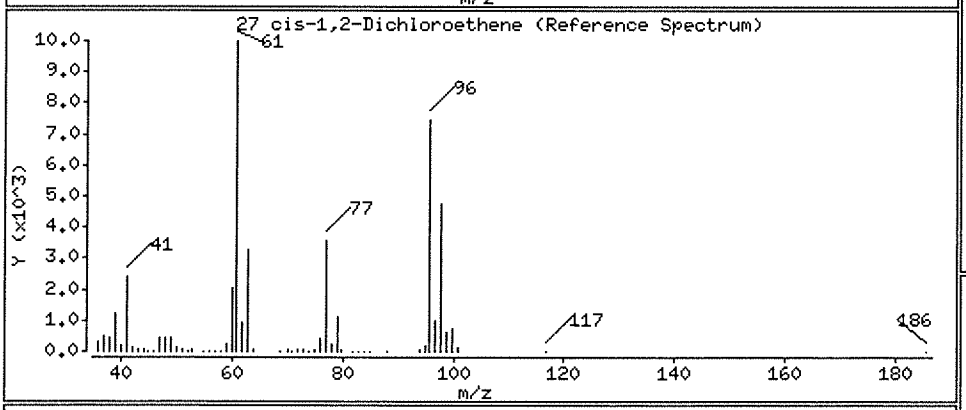
27 cis-1,2-Dichloroethene Concentration: 0.94 ug/l

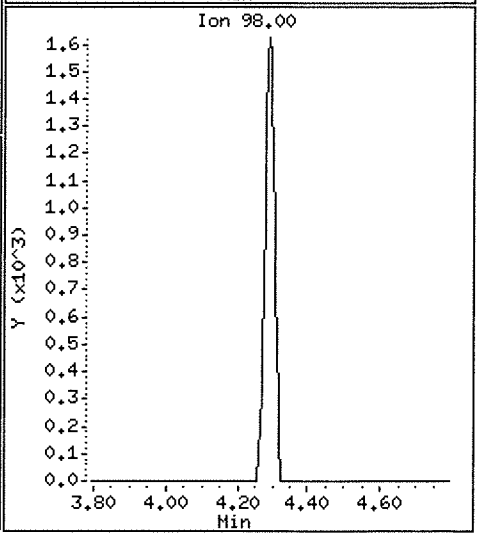


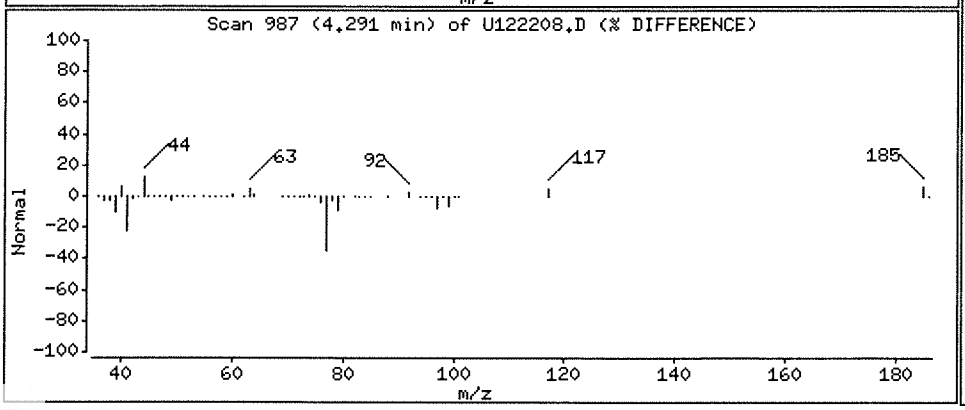












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122208.D

Date : 22-DEC-2018 13:32

Client ID: HS18120642-03

Instrument: VOA9.i

Sample Info: HS18120642-03;HS18120642-03;;;

Purge Volume: 5.0

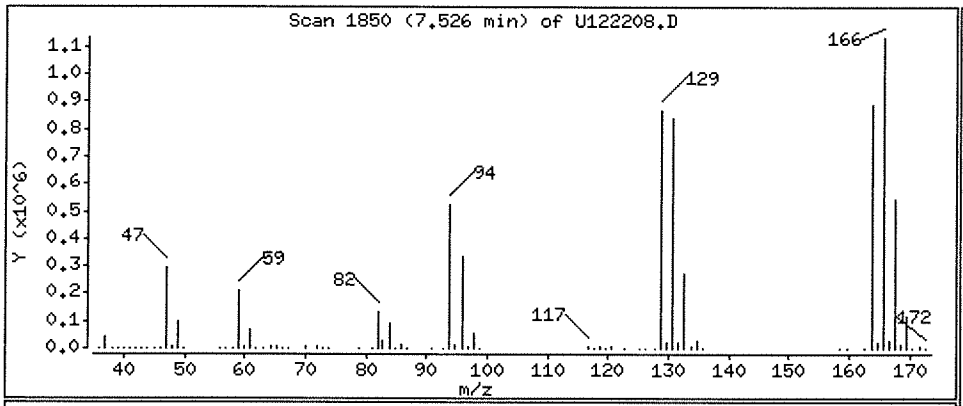
Operator: PC

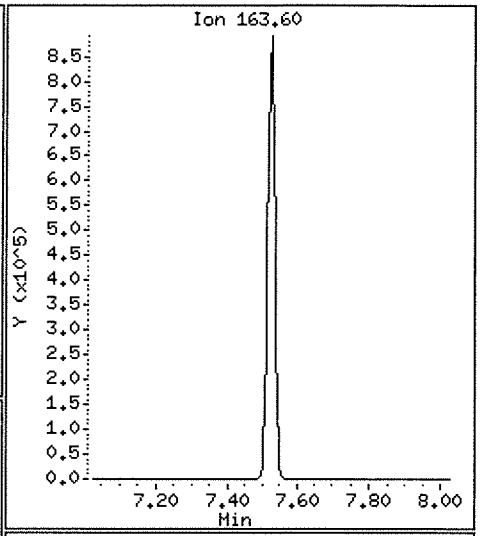
Column phase: DB624

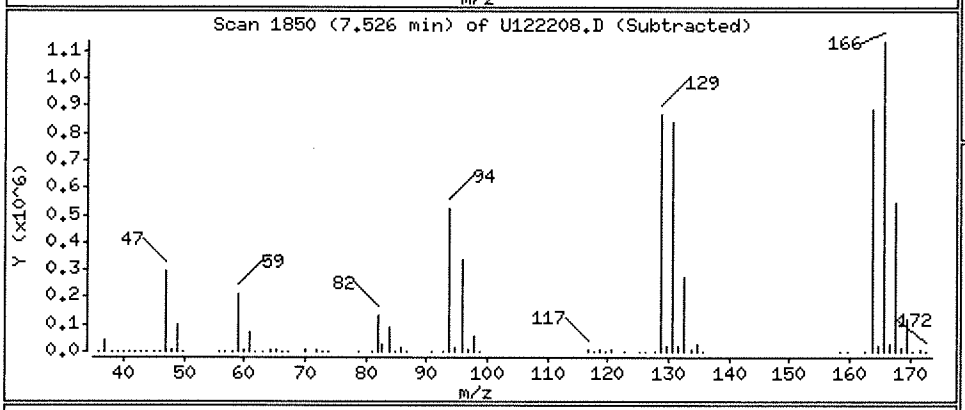
Column diameter: 0.18

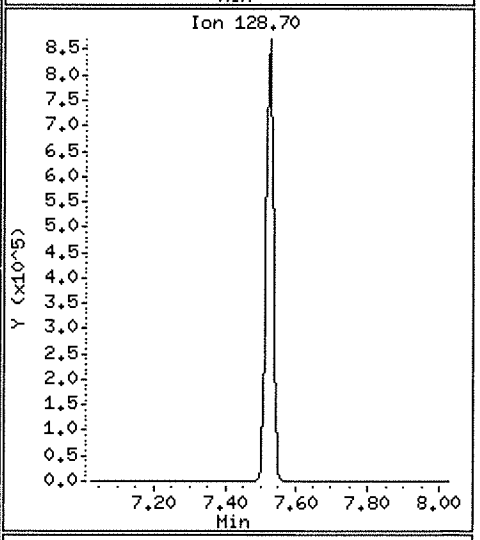
56 Tetrachloroethene

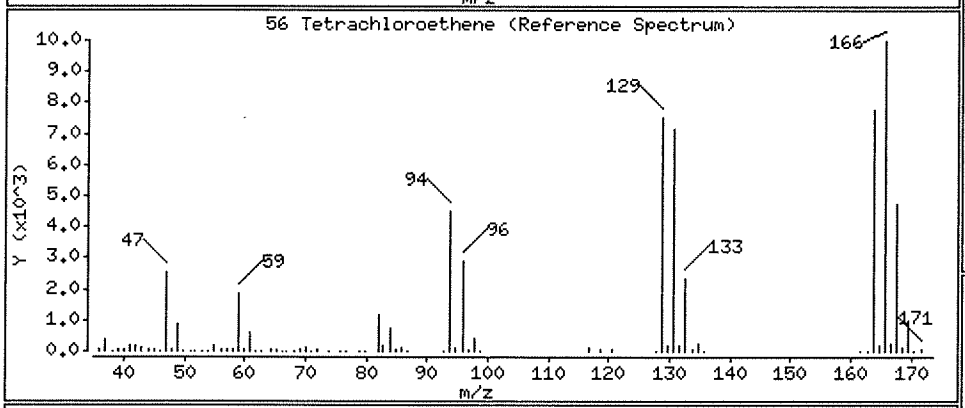
Concentration: 409.86 ug/l

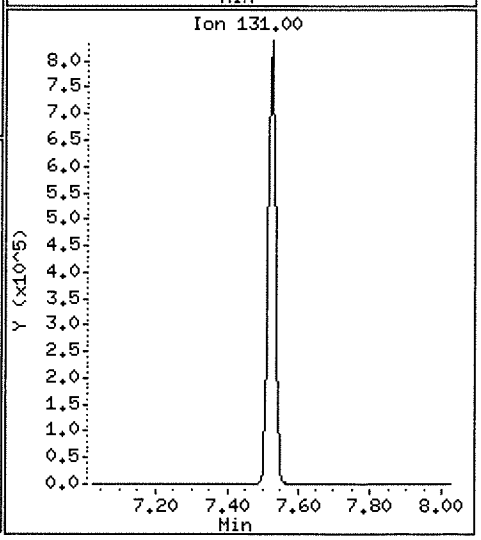


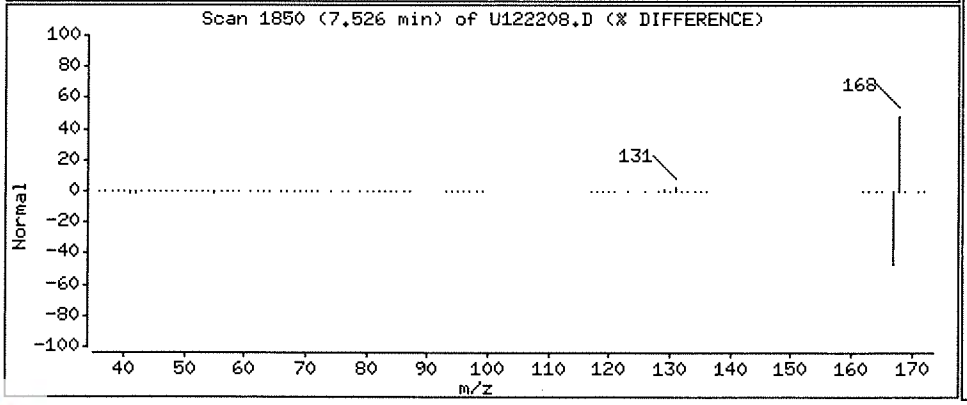












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122208.D Page 7

Date : 22-DEC-2018 13:32

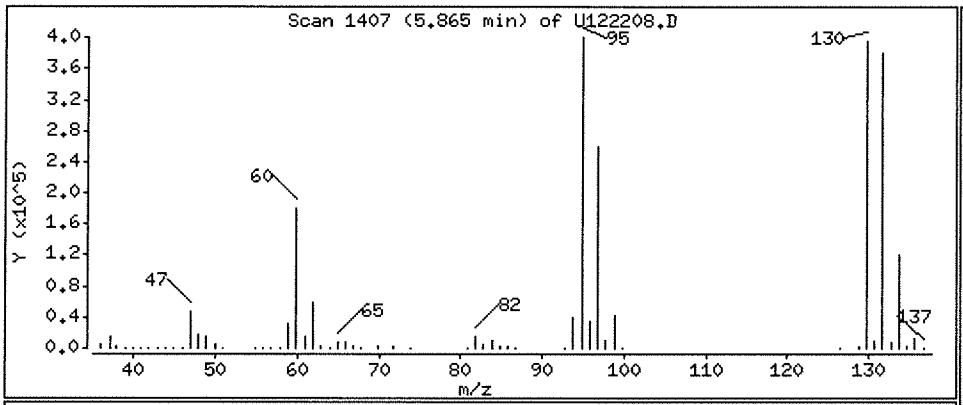
Client ID: HS18120642-03 Instrument: VOA9.i

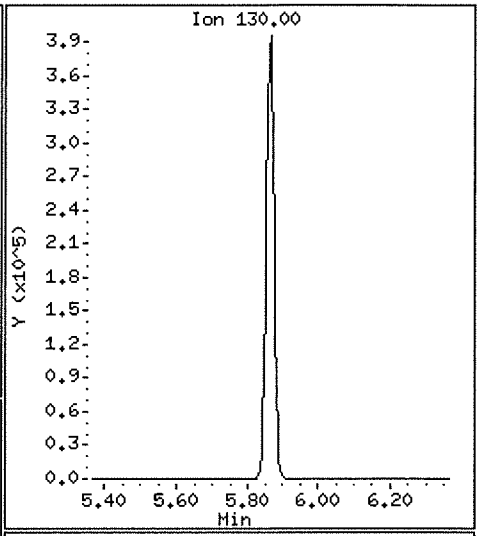
Sample Info: HS18120642-03;HS18120642-03;;;

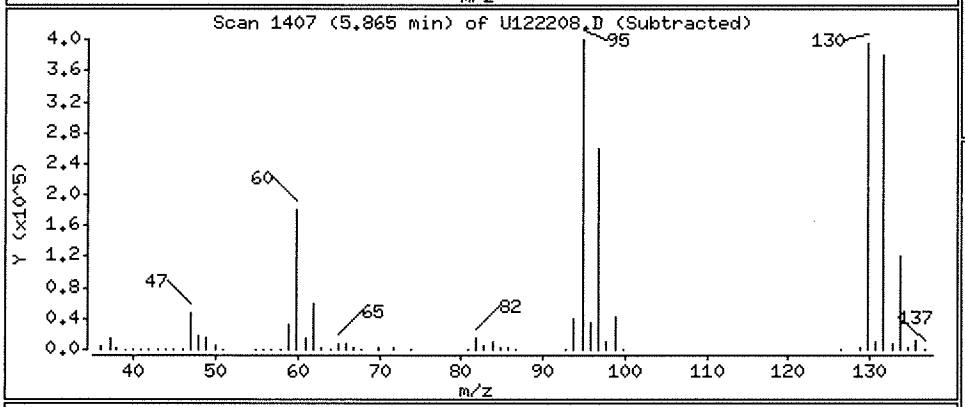
Purge Volume: 5.0 Operator: PC

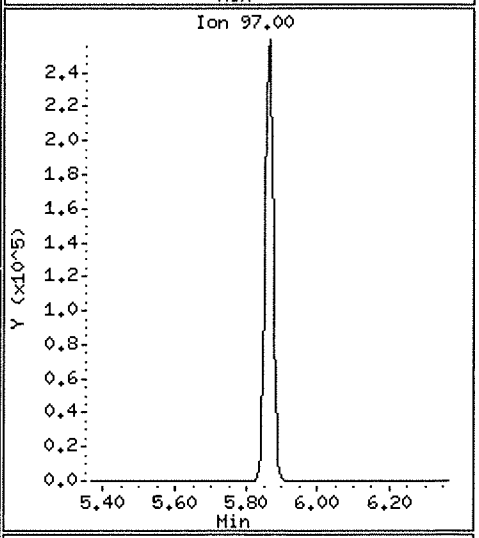
Column phase: DB624 Column diameter: 0.18

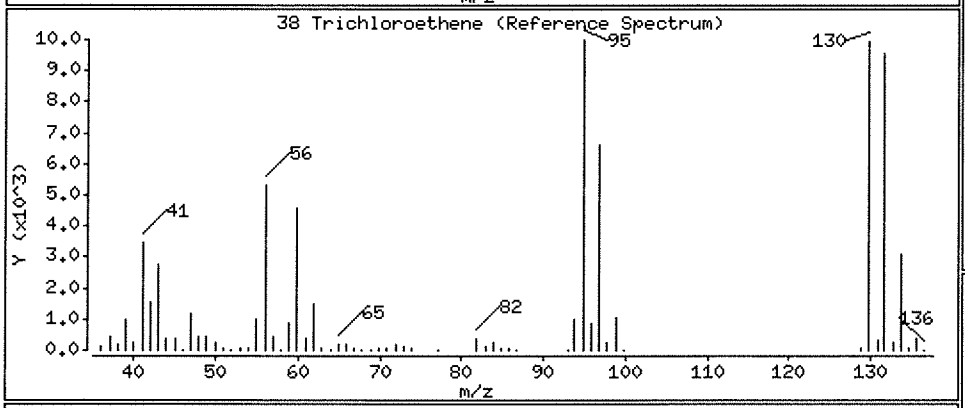
38 Trichloroethene Concentration: 148.03 ug/l

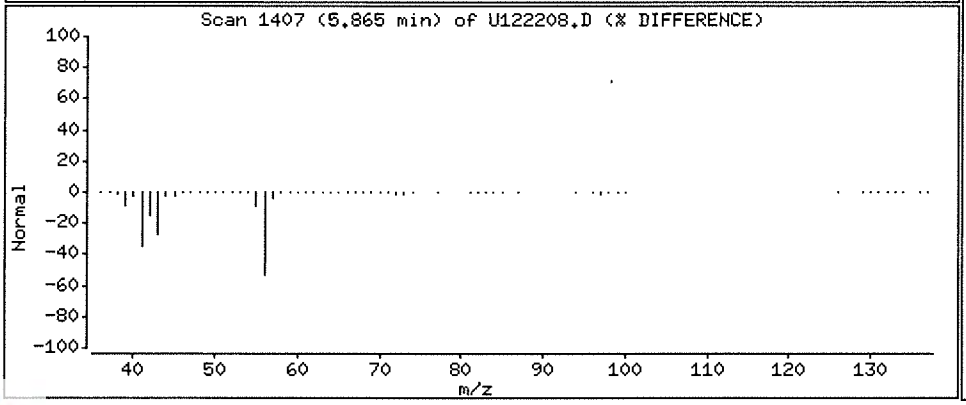


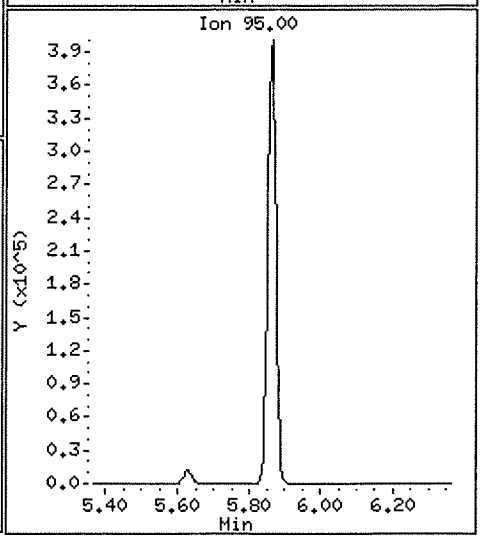












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122209.D Page 1
Report Date: 28-Jan-2019 13:52

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122209.D
Lab Smp Id: HS18120927-05MS Client Smp ID: HS18120927-05MS
Inj Date : 22-DEC-2018 13:57
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120927-05MS;HS18120927-05MS;3;;MS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 9 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

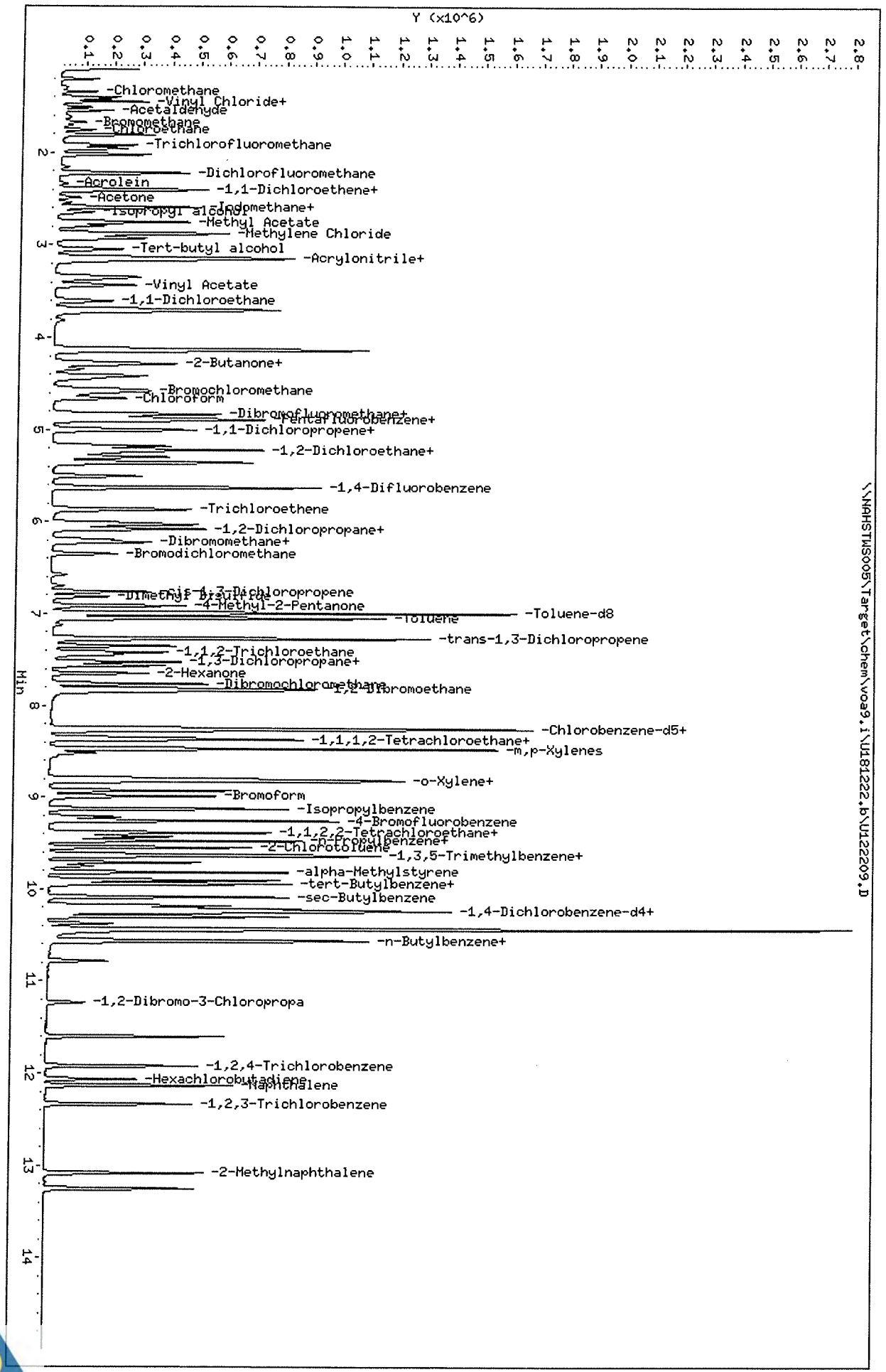
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.894	4.897	(1.000)	395043	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.628	(1.000)	673318	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	616476	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	295823	50.0000	
$	30 Dibromofluoromethane	113	4.830	4.834	(0.987)	197217	45.0949	45.09
$	35 1,2-Dichloroethane-d4	65	5.175	5.179	(1.057)	255507	45.5099	45.50
$	48 Toluene-d8	98	6.990	6.989	(0.847)	837428	52.6991	52.69
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	309963	51.1817	51.18
	60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	96400	24.9394	24.93
	31 1,1,1-Trichloroethane	97	4.830	4.830	(0.987)	153870	24.6678	24.66
	68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	169884	25.5004	25.50
	138 Freon TF	101	2.405	2.408	(0.491)	81914	24.3905	24.39
	53 1,1,2-Trichloroethane	83	7.421	7.420	(0.900)	93860	25.5553	25.55
	22 1,1-Dichloroethane	63	3.604	3.608	(0.737)	199426	23.4411	23.44
	11 1,1-Dichloroethene	96	2.401	2.405	(0.491)	88030	23.4365	23.43
	32 1,1-Dichloropropene	75	5.006	5.006	(0.890)	158413	26.4421	26.44
	93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	137176	24.9295	24.92
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	173142	24.9934	24.99
	90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	139963	25.5550	25.55
	79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	423271	27.3422	27.34
	89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	23723	23.8749	23.87
	57 1,2-Dibromoethane	107	7.852	7.851	(0.952)	110349	26.0852	26.08

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122209.D Page 2
Report Date: 28-Jan-2019 13:52

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
88	1,2-Dichlorobenzene	146	10.570	10.573	(1.033)	222204	25.2973	25.29
33	1,2-Dichloroethane	62	5.254	5.254	(0.934)	159097	25.8764	25.87
42	1,2-Dichloropropane	63	6.082	6.082	(1.081)	121295	25.4948	25.49
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	411319	27.6664	27.66
83	1,3-Dichlorobenzene	146	10.180	10.179	(0.995)	221980	25.2700	25.26
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	204914	25.9021	25.90
84	1,4-Dichlorobenzene	146	10.255	10.254	(1.002)	228594	24.6810	24.68
26	2,2-Dichloropropane	77	4.275	4.279	(0.874)	126637	24.7001	24.70
24	2-Butanone	43	4.339	4.339	(0.887)	119784	45.0595	45.05
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	360986	26.4848	26.48
52	2-Hexanone	43	7.649	7.649	(0.927)	187061	54.5688	54.56
77	4-Chlorotoluene	91	9.640	9.640	(0.942)	417862	26.5295	26.52
82	p-Isopropyltoluene	119	10.210	10.209	(0.997)	435284	27.8070	27.80
45	4-Methyl-2-Pentanone	43	6.915	6.914	(0.838)	265897	53.9084	53.90
10	Acetone	43	2.484	2.483	(0.508)	82459	52.0616	52.06
37	Benzene	78	5.220	5.220	(0.928)	461755	25.7720	25.77
74	Bromobenzene	156	9.381	9.381	(0.917)	117540	25.7162	25.71
29	Bromochloromethane	128	4.557	4.556	(0.931)	54645	24.9193	24.91
39	Bromodichloromethane	83	6.348	6.348	(1.129)	129090	25.5153	25.51
66	Bromoform	173	8.984	8.984	(1.089)	59485	23.4501	23.45
6	Bromomethane	94	1.670	1.674	(0.341)	37684	16.3720	16.37
19	Carbon Disulfide	76	2.592	2.596	(0.530)	625517	45.7041	45.70
34	Carbon Tetrachloride	117	4.995	4.999	(0.888)	122132	25.6423	25.64
59	Chlorobenzene	112	8.275	8.275	(1.003)	306691	25.8923	25.89
7	Chloroethane	64	1.753	1.756	(0.358)	75911	22.1356	22.13(M)
28	Chloroform	83	4.658	4.661	(0.952)	191874	23.4188	23.41
3	Chloromethane	50	1.340	1.344	(0.274)	77519	20.5633	20.56
27	cis-1,2-Dichloroethene	96	4.287	4.290	(0.876)	122082	23.5108	23.51
46	cis-1,3-Dichloropropene	75	6.757	6.761	(1.201)	174282	23.3600	23.35
55	Dibromochloromethane	129	7.758	7.758	(0.940)	94915	23.9485	23.94
44	Dibromomethane	93	6.191	6.191	(1.101)	70026	25.5027	25.50
2	Dichlorodifluoromethane	85	1.205	1.209	(0.246)	80320	16.8489	16.84
61	Ethylbenzene	106	8.373	8.373	(1.015)	165585	27.2562	27.25
91	Hexachlorobutadiene	225	12.065	12.065	(1.179)	50558	24.0945	24.09
67	Isopropylbenzene	105	9.126	9.126	(1.106)	490568	27.9838	27.98
62	m,p-Xylenes	106	8.474	8.474	(1.027)	402773	53.9288	53.92
17	Methylene Chloride	84	2.873	2.877	(0.587)	115889	23.1045	23.10
87	n-Butylbenzene	91	10.558	10.558	(1.031)	413416	27.3661	27.36
73	n-Propylbenzene	91	9.475	9.475	(0.926)	615543	27.8475	27.84
92	Naphthalene	128	12.133	12.132	(1.185)	448465	25.1220	25.12
63	o-Xylene	106	8.811	8.811	(1.068)	202541	26.8818	26.88
81	sec-Butylbenzene	105	10.086	10.086	(0.985)	520848	28.0375	28.03
64	Styrene	104	8.826	8.826	(1.070)	345860	27.6295	27.62
78	tert-Butylbenzene	119	9.902	9.902	(0.967)	357243	27.8014	27.80
56	Tetrachloroethene	164	7.526	7.525	(0.912)	90769	28.1244	28.12
50	Toluene	91	7.049	7.049	(0.855)	489824	26.7106	26.71
20	trans-1,2-Dichloroethene	96	3.143	3.147	(0.642)	109492	23.6785	23.67
51	trans-1,3-Dichloropropene	75	7.259	7.263	(1.291)	149003	23.4368	23.43
38	Trichloroethene	130	5.861	5.865	(1.042)	112525	26.0150	26.01
8	Trichlorofluoromethane	101	1.955	1.959	(0.400)	155554	24.2169	24.21
5	Vinyl Chloride	62	1.423	1.426	(0.291)	112308	20.6791	20.67

QC Flag Legend

M - Compound response manually integrated.



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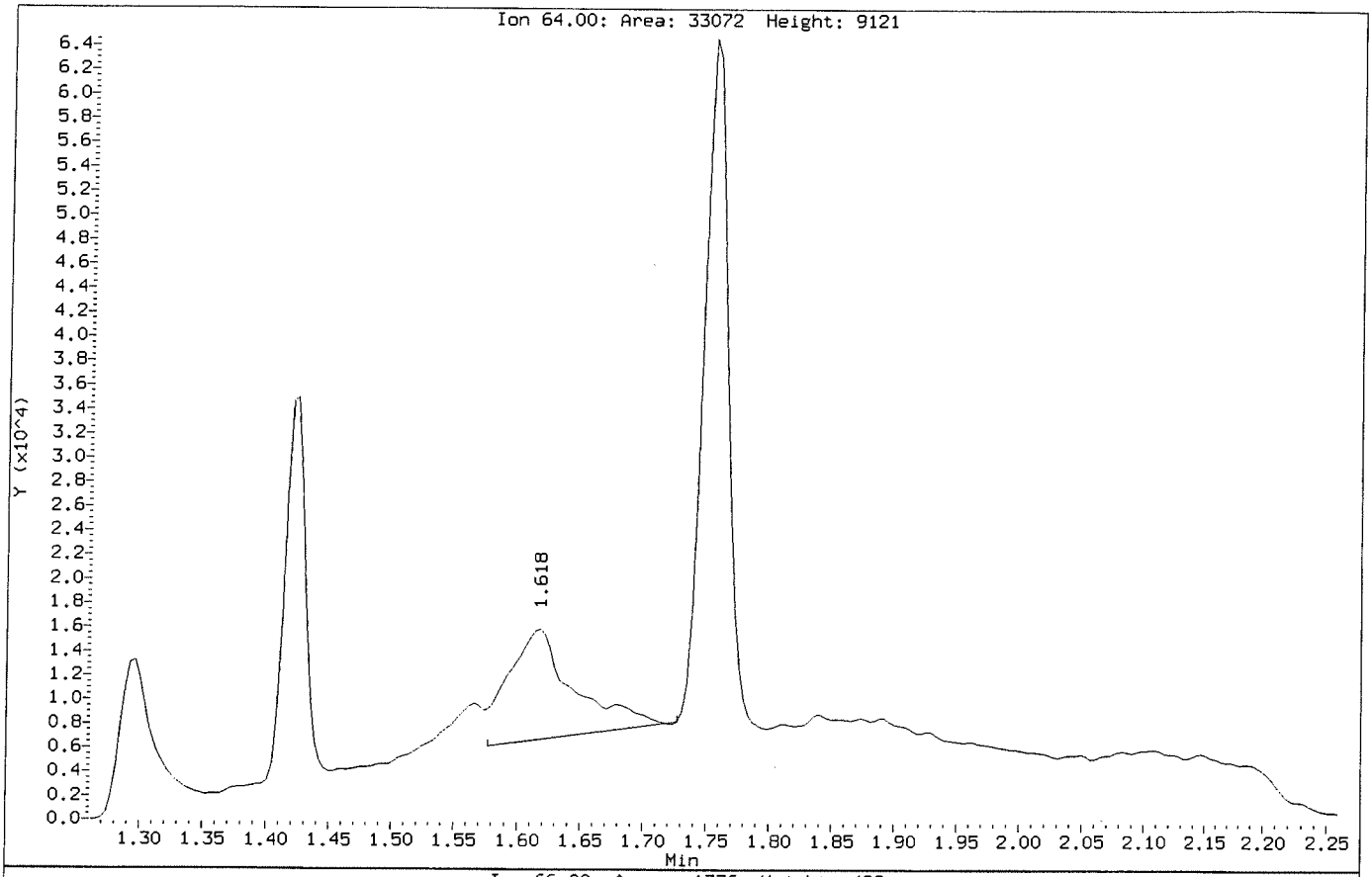
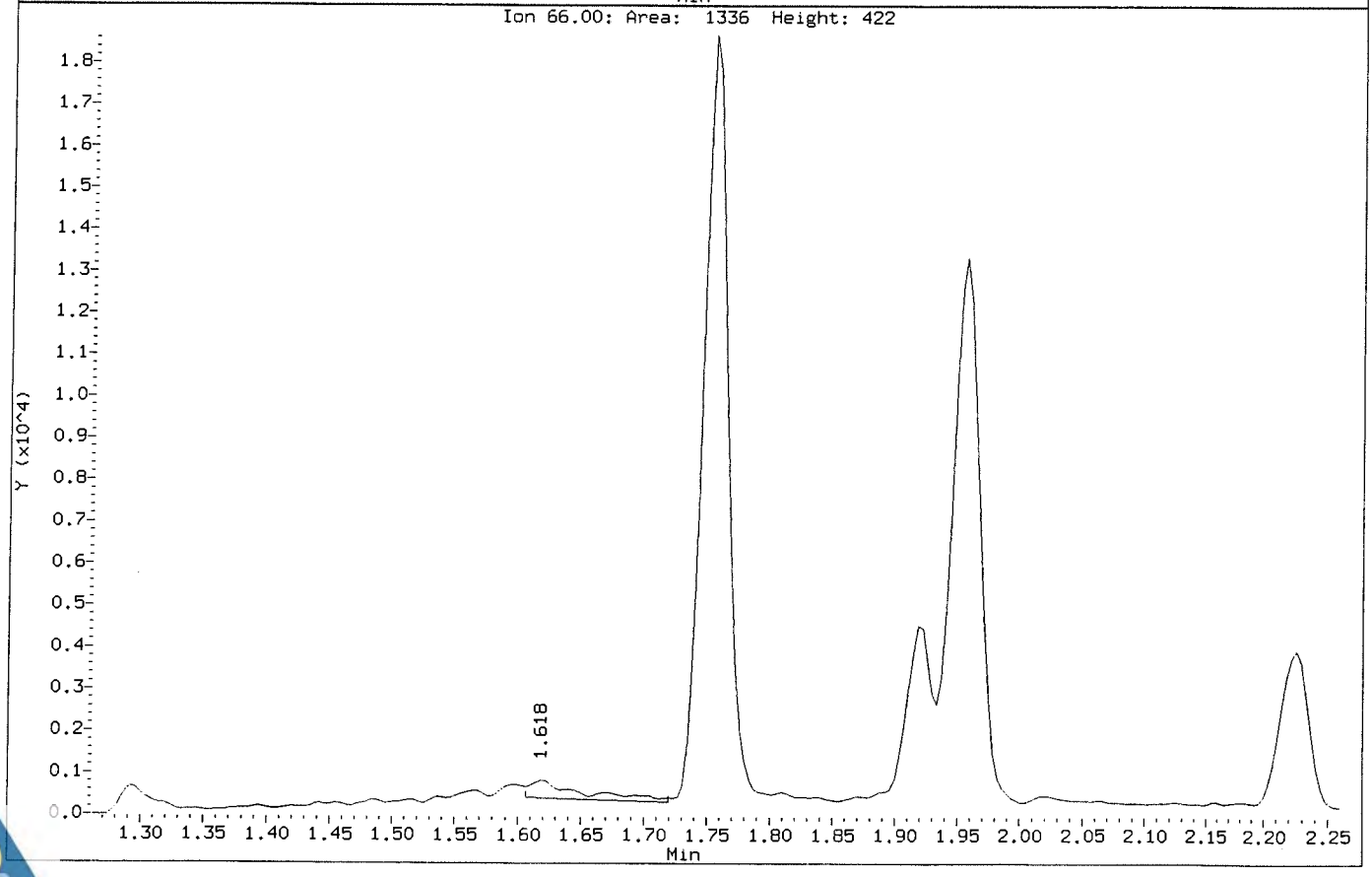
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\Before\U122209.D
Injection Date: 22-DEC-2018 13:57
Instrument: VOA9.i
Client Sample ID: HS18120927-05MS

Compound: Chloroethane
CAS Number: 75-00-3





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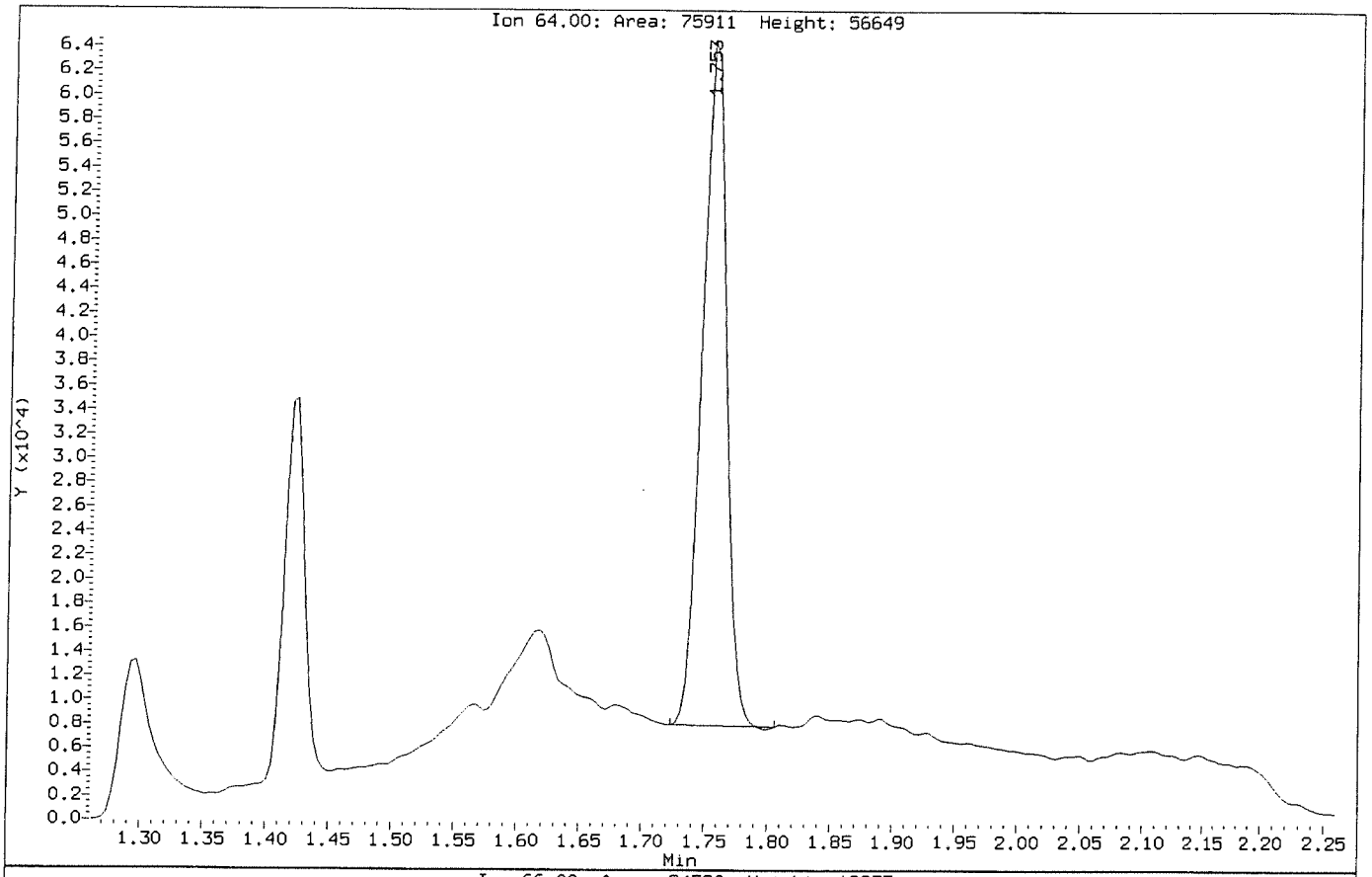
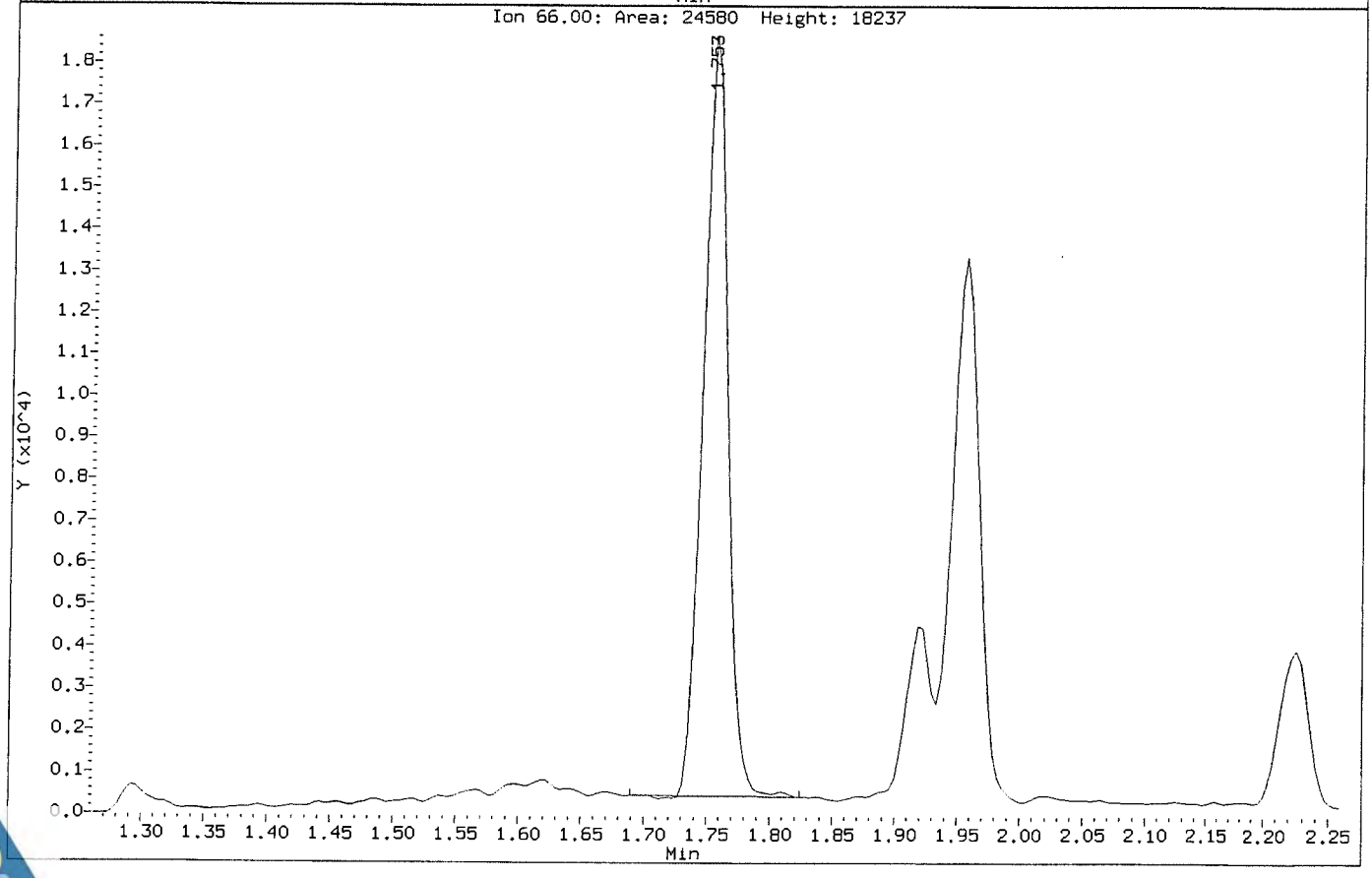
Injection Date: 22-DEC-2018 13:57
Instrument: VOA9.i
Client Sample ID: HS18120927-05MS

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122210.D Page 1
Report Date: 28-Jan-2019 13:52

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122210.D
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Inj Date : 22-DEC-2018 14:22
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120927-05MSD;HS18120927-05MSD;3;;MSD
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 9 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

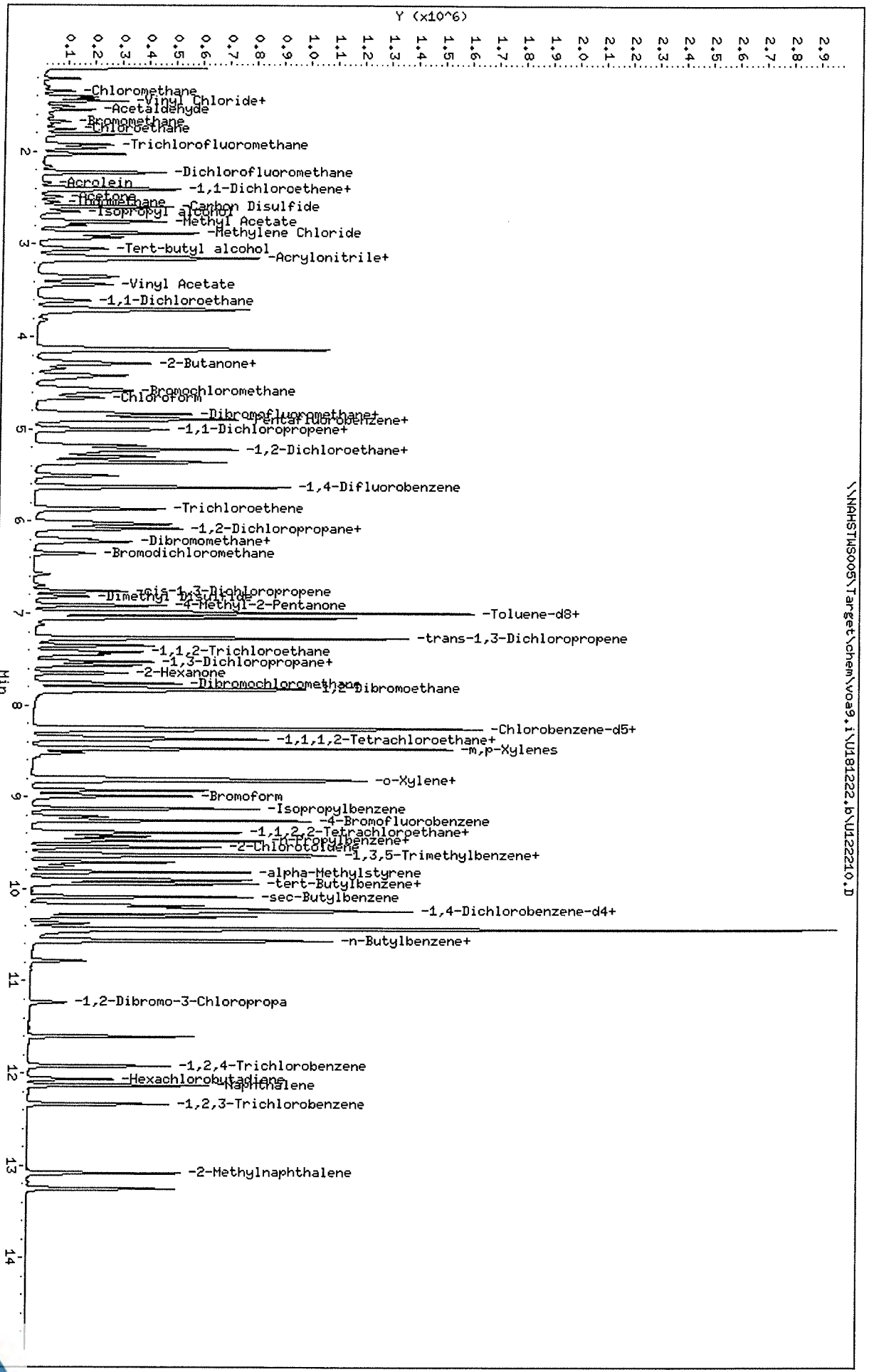
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.898	4.897	(1.000)	396082	50.0000	
*	36 1,4-Difluorobenzene	114	5.629	5.628	(1.000)	673270	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	614956	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	298917	50.0000	
$	30 Dibromofluoromethane	113	4.834	4.834	(0.987)	195450	44.5560	44.55
$	35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	257591	45.7727	45.77
$	48 Toluene-d8	98	6.989	6.989	(0.847)	839449	52.9656	52.96
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	312851	51.8032	51.80
	60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	95635	24.8058	24.80
	31 1,1,1-Trichloroethane	97	4.830	4.830	(0.986)	151476	24.2203	24.22
	68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	169057	25.1136	25.11
	138 Freon TF	101	2.408	2.408	(0.492)	79969	23.7489	23.74
	53 1,1,2-Trichloroethane	83	7.420	7.420	(0.900)	94280	25.7331	25.73
	22 1,1-Dichloroethane	63	3.608	3.608	(0.737)	195548	22.9250	22.92
	11 1,1-Dichloroethene	96	2.405	2.405	(0.491)	86817	23.0529	23.05
	32 1,1-Dichloropropene	75	5.006	5.006	(0.889)	156191	26.0731	26.07
	93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	138315	24.8777	24.87
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	179033	25.5763	25.57
	90 1,2,4-Trichlorobenzene	180	11.926	11.923	(1.165)	140555	25.3974	25.39
	79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	420780	26.8999	26.89
	89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	24448	24.3210	24.32
	57 1,2-Dibromoethane	107	7.852	7.851	(0.952)	110313	26.1411	26.14

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
88 1,2-Dichlorobenzene	146	10.569	10.573	(1.033)	221340	24.9382	24.93
33 1,2-Dichloroethane	62	5.257	5.254	(0.934)	159054	25.8711	25.87
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	119026	25.0197	25.01
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	402960	26.8236	26.82
83 1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	224610	25.3047	25.30
54 1,3-Dichloropropane	76	7.567	7.563	(0.917)	205652	26.0596	26.05
84 1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	227646	24.3243	24.32
26 2,2-Dichloropropane	77	4.279	4.279	(0.874)	122497	23.8299	23.82
24 2-Butanone	43	4.343	4.339	(0.887)	124945	46.9760	46.97
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	355895	25.8410	25.84
52 2-Hexanone	43	7.649	7.649	(0.927)	193394	56.5557	56.55
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	414630	26.0519	26.05
82 p-Isopropyltoluene	119	10.209	10.209	(0.997)	431943	27.3079	27.30
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	273284	55.5430	55.54
10 Acetone	43	2.487	2.483	(0.508)	83751	52.7779	52.77
37 Benzene	78	5.220	5.220	(0.927)	457942	25.5610	25.56
74 Bromobenzene	156	9.381	9.381	(0.917)	116968	25.3261	25.32
29 Bromochloromethane	128	4.556	4.556	(0.930)	54271	24.6545	24.65
39 Bromodichloromethane	83	6.348	6.348	(1.128)	127329	25.1690	25.16
66 Bromoform	173	8.984	8.984	(1.089)	60219	23.7720	23.77
6 Bromomethane	94	1.674	1.674	(0.342)	42989	18.4433	18.44
19 Carbon Disulfide	76	2.596	2.596	(0.530)	612139	44.6093	44.60
34 Carbon Tetrachloride	117	4.999	4.999	(0.888)	119367	25.0951	25.09
59 Chlorobenzene	112	8.275	8.275	(1.003)	302740	25.6220	25.62
7 Chloroethane	64	1.756	1.756	(0.359)	75620	21.9969	21.99(M)
28 Chloroform	83	4.661	4.661	(0.952)	190164	23.1492	23.14
3 Chloromethane	50	1.344	1.344	(0.274)	73942	19.7245	19.72
27 cis-1,2-Dichloroethene	96	4.290	4.290	(0.876)	120115	23.0714	23.07
46 cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	173421	23.2524	23.25
55 Dibromochloromethane	129	7.758	7.758	(0.940)	96569	24.4066	24.40
44 Dibromomethane	93	6.191	6.191	(1.100)	69470	25.3020	25.30
2 Dichlorodifluoromethane	85	1.213	1.209	(0.248)	78502	16.4365	16.43
61 Ethylbenzene	106	8.373	8.373	(1.015)	160257	26.4444	26.44
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	50808	23.9630	23.96
67 Isopropylbenzene	105	9.126	9.126	(1.106)	480775	27.4930	27.49
62 m,p-Xylenes	106	8.474	8.474	(1.027)	398688	53.5138	53.51
17 Methylene Chloride	84	2.877	2.877	(0.587)	114736	22.7995	22.79
87 n-Butylbenzene	91	10.558	10.558	(1.031)	405459	26.5616	26.56
73 n-Propylbenzene	91	9.475	9.475	(0.926)	605284	27.0999	27.09
92 Naphthalene	128	12.133	12.132	(1.185)	456703	25.3144	25.31
63 o-Xylene	106	8.811	8.811	(1.068)	199299	26.5169	26.51
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	511179	27.2322	27.23
64 Styrene	104	8.826	8.826	(1.070)	339873	27.2184	27.21
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	354232	27.2818	27.28
56 Tetrachloroethene	164	7.525	7.525	(0.912)	86000	26.7126	26.71
50 Toluene	91	7.049	7.049	(0.855)	486207	26.5789	26.57
20 trans-1,2-Dichloroethene	96	3.147	3.147	(0.643)	106792	23.0341	23.03
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	147380	23.2011	23.20
38 Trichloroethene	130	5.865	5.865	(1.042)	110236	25.4876	25.48
8 Trichlorofluoromethane	101	1.959	1.959	(0.400)	147862	22.9915	22.99
5 Vinyl Chloride	62	1.426	1.426	(0.291)	113420	20.8220	20.82

QC Flag Legend

M - Compound response manually integrated.

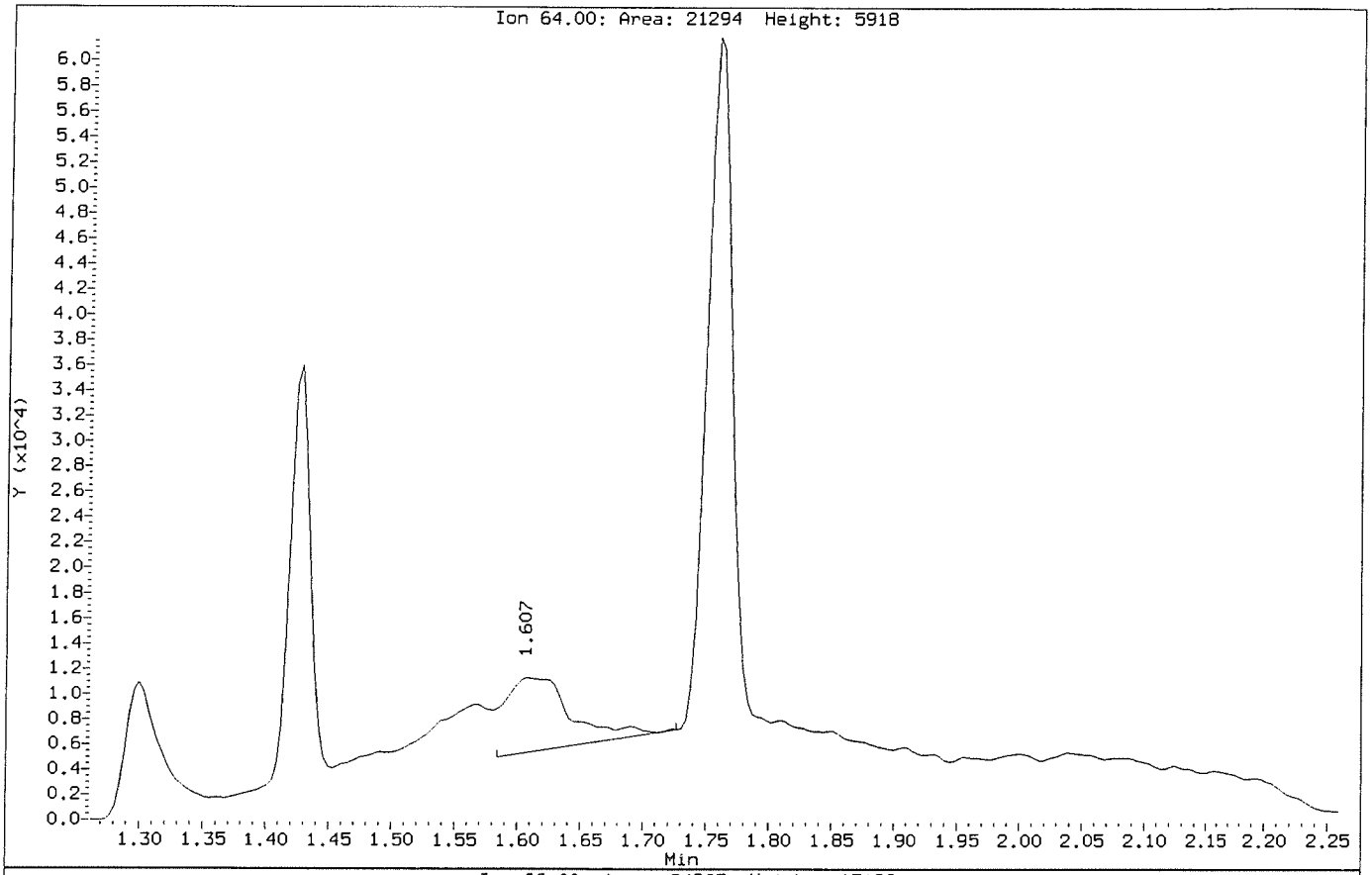


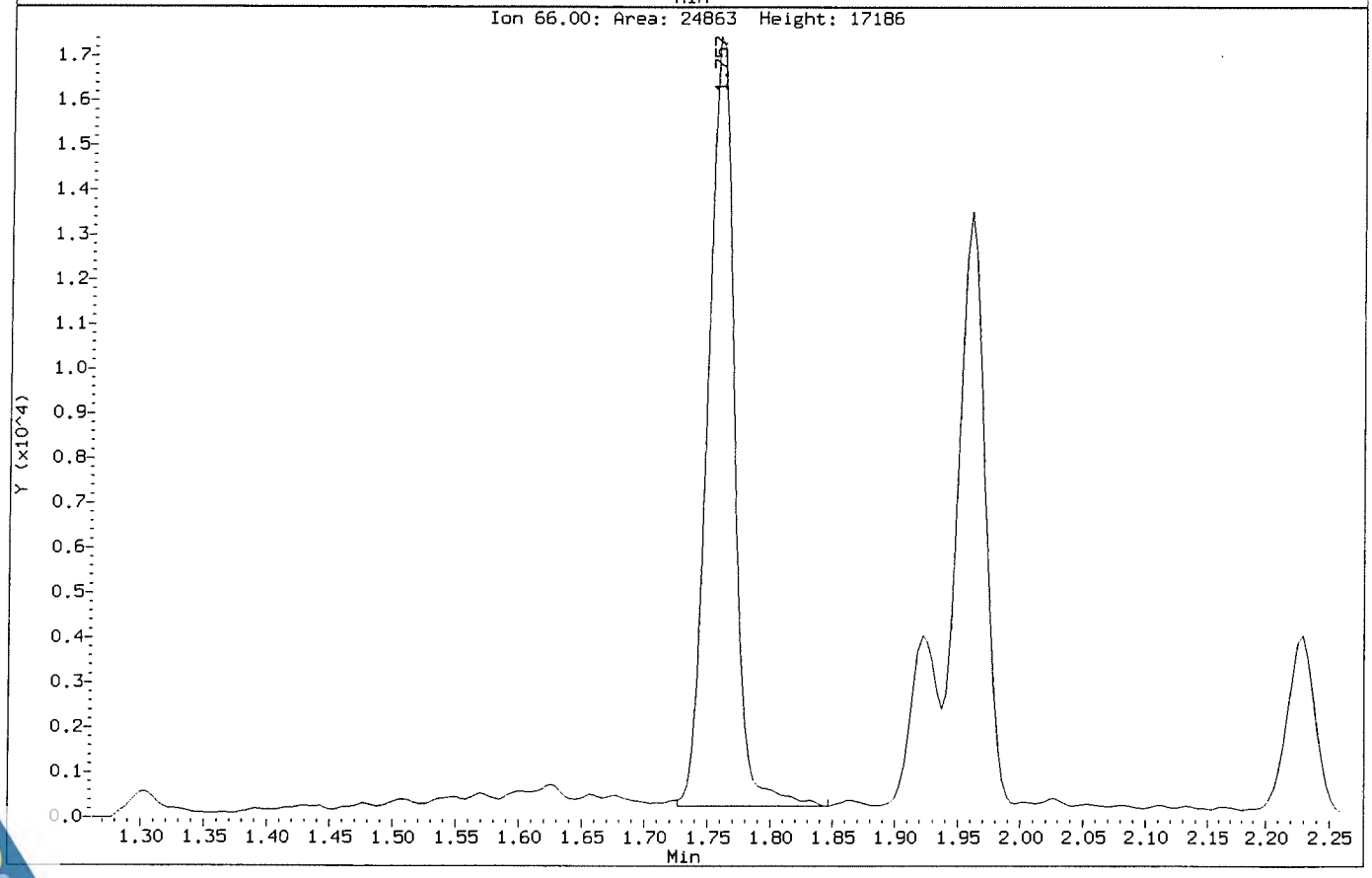
Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122210.D
Date : 22-DEC-2018 14:22
Client ID: HS18120927-05MSD
Sample Info: HS18120927-05MSD;HS18120927-05MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\Before\U122210.D
Injection Date: 22-DEC-2018 14:22
Instrument: VOA9.i
Client Sample ID: HS18120927-05MSD

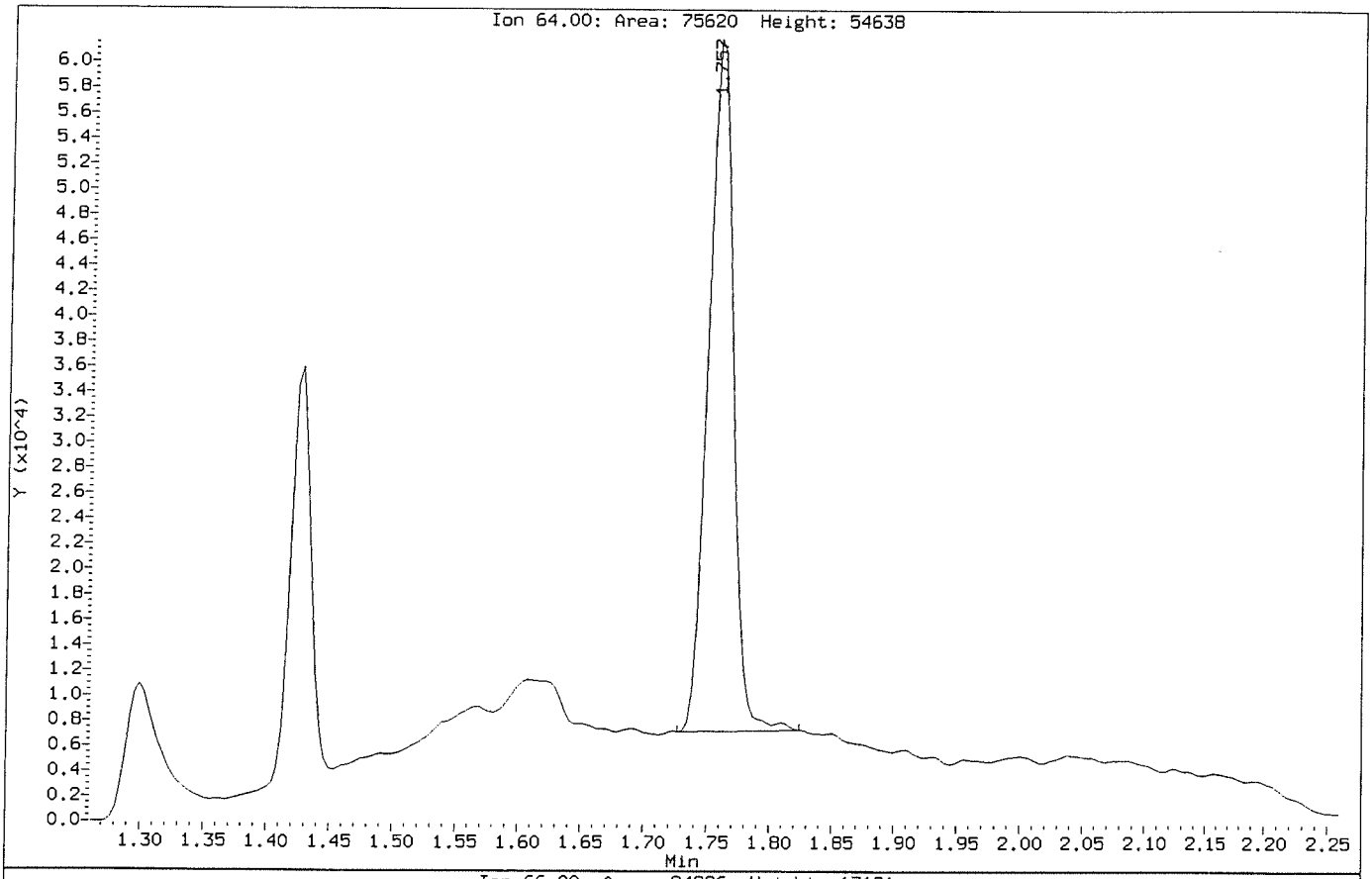
Compound: Chloroethane
CAS Number: 75-00-3

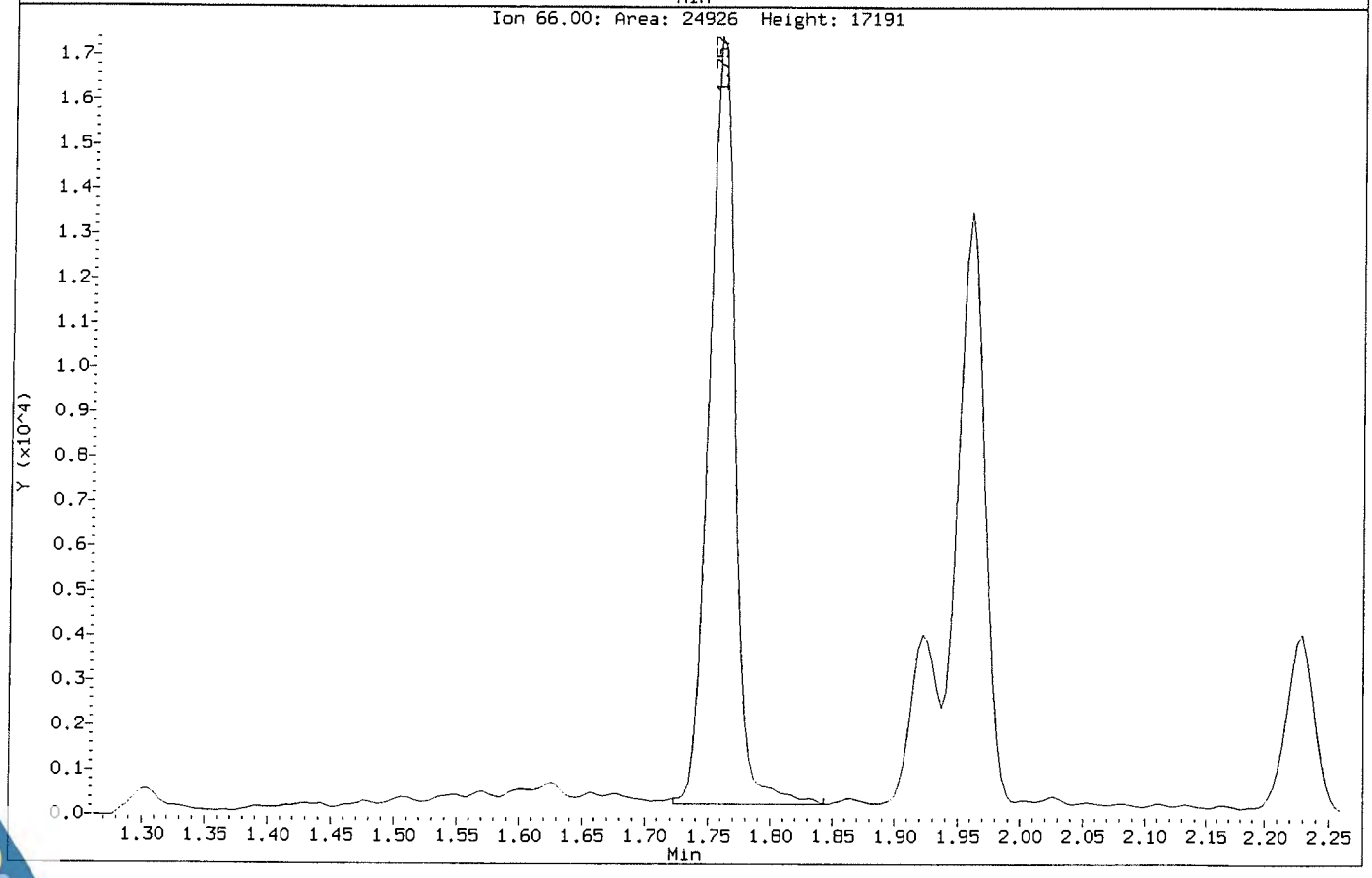




Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122210.D
Injection Date: 22-DEC-2018 14:22
Instrument: VOA9.i
Client Sample ID: HS18120927-05MSD

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122211.D
Lab Smp Id: HS18120642-03DL Client Smp ID: HS18120642-03DL
Inj Date : 22-DEC-2018 14:46
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120642-03;HS18120642-03;;;
Misc Info : 180315V9;WATER;0;10;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 10
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	10.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

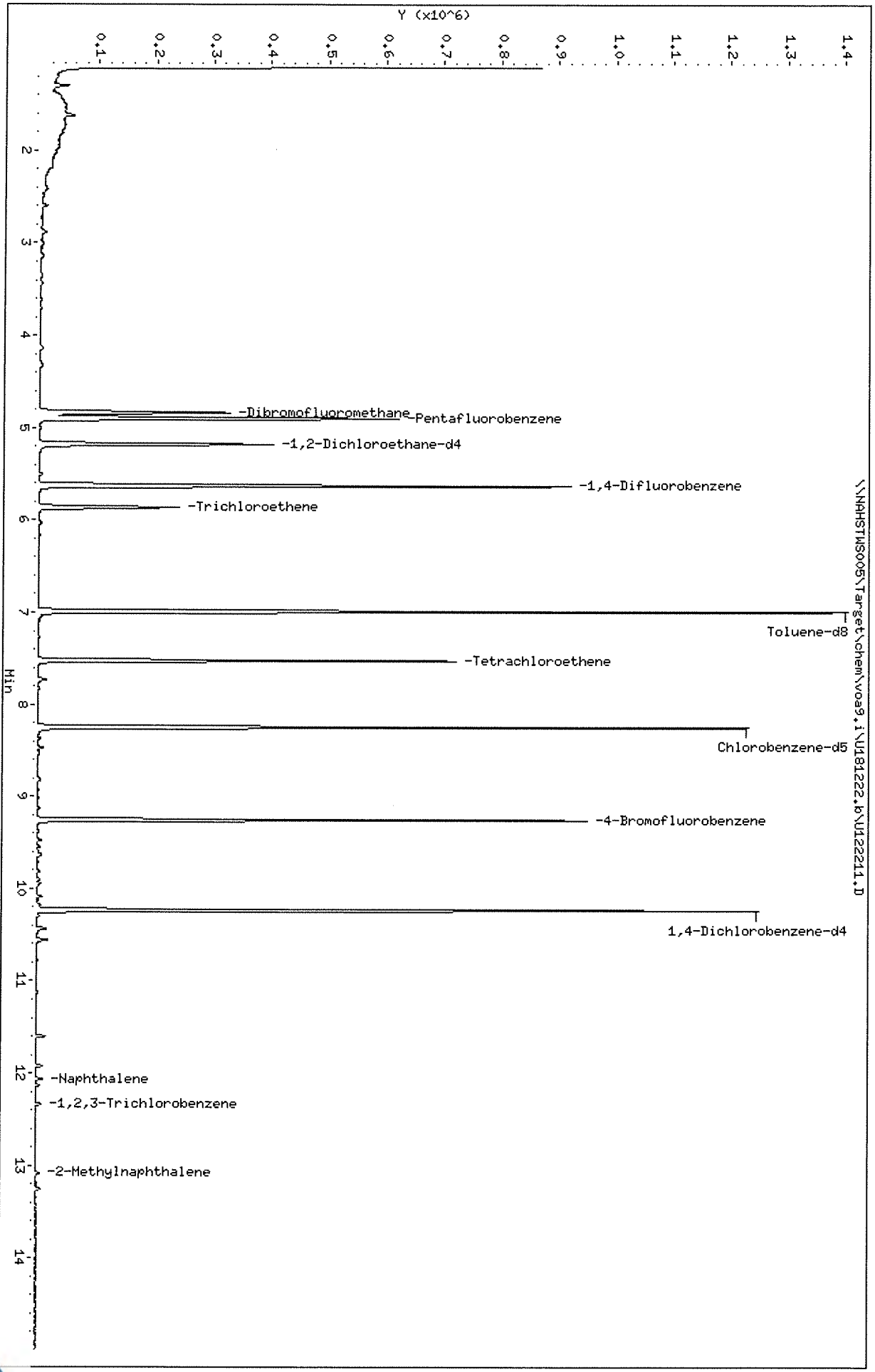
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.897	(1.000)	385415	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.628	(1.000)	666664	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	600892	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	280375	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	191231	44.8091	44.80
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	253450	46.3076	46.30
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	811612	52.3890	52.38
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	292985	49.5897	49.58
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	2466	1.09388	10.93(a)
92 Naphthalene	128	12.136	12.132	(1.186)	4163	0.89488	8.94(a)
56 Tetrachloroethene	164	7.525	7.525	(0.912)	143042	45.4705	454.70
38 Trichloroethene	130	5.865	5.865	(1.042)	72539	16.9379	169.37

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122211.D
Date : 22-DEC-2018 14:46
Client ID: HS18120642-03DL
Sample Info: HS18120642-03;HS18120642-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122211.D Page 3

Date : 22-DEC-2018 14:46

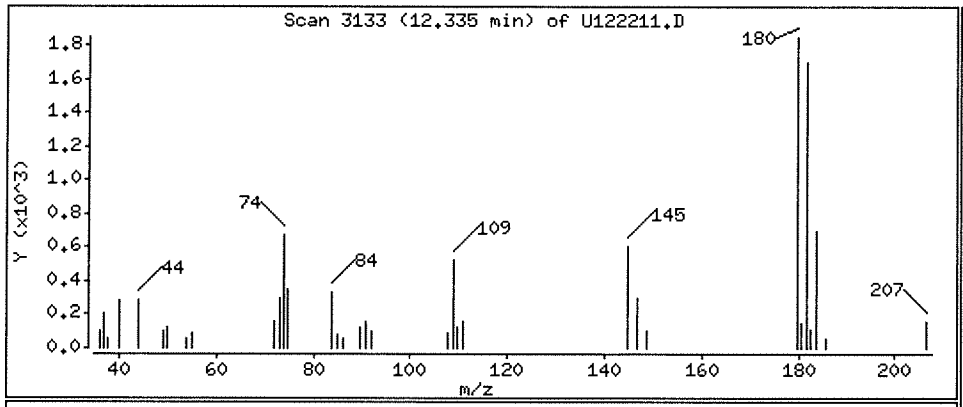
Client ID: HS18120642-03DL Instrument: VOA9.i

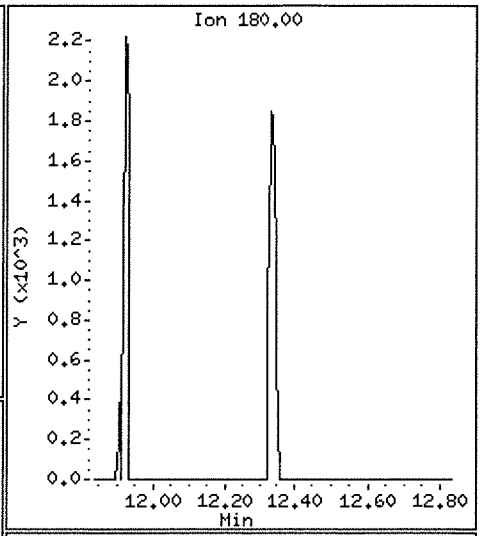
Sample Info: HS18120642-03;HS18120642-03;;;

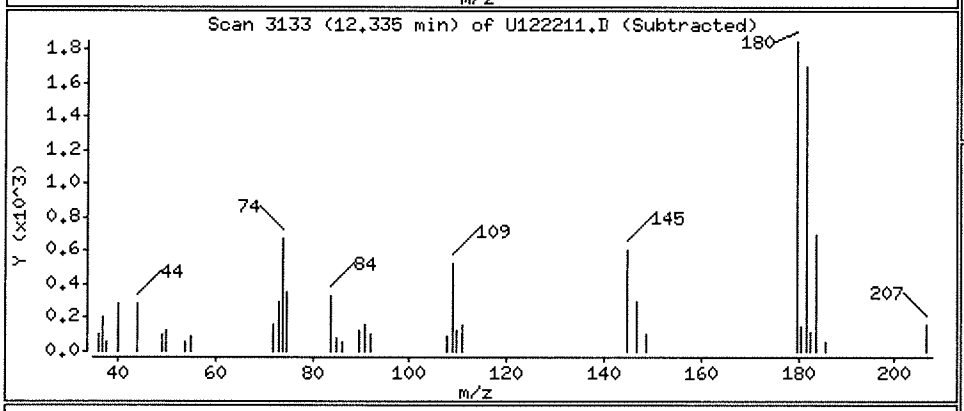
Purge Volume: 5.0 Operator: PC

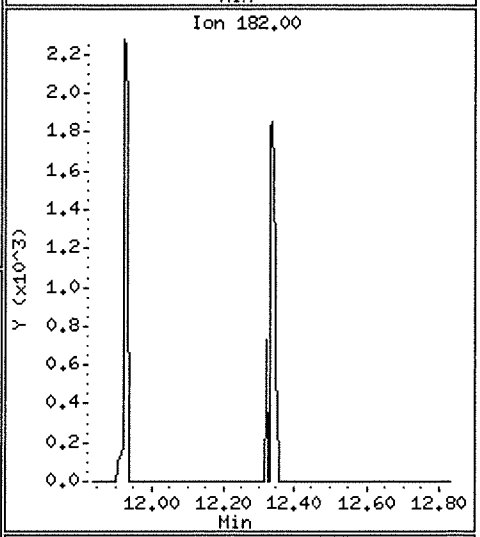
Column phase: DB624 Column diameter: 0.18

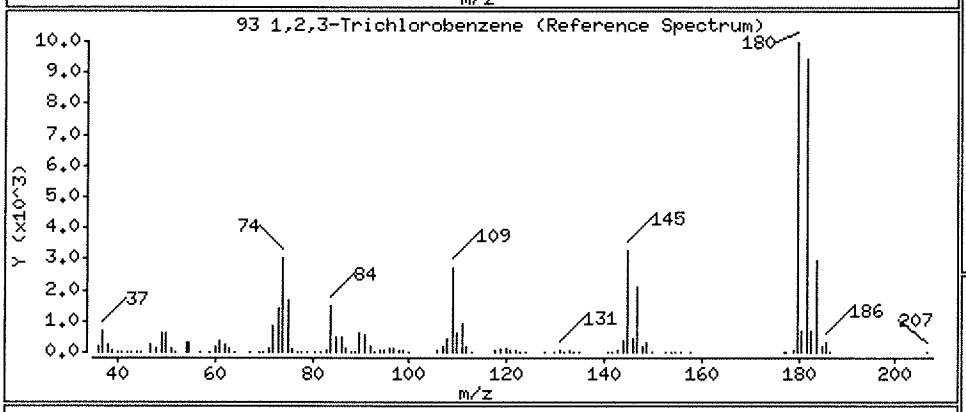
93 1,2,3-Trichlorobenzene Concentration: 10.93 ug/l

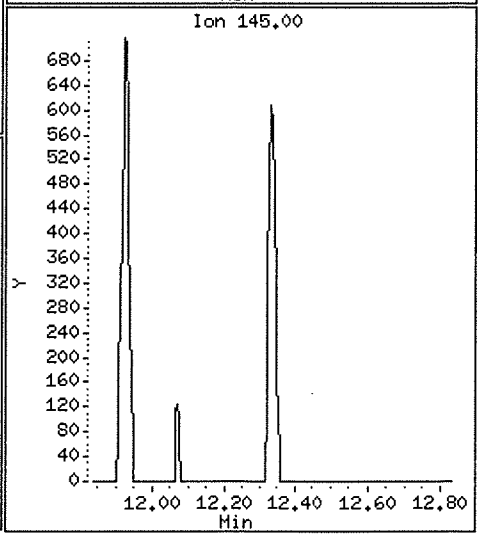


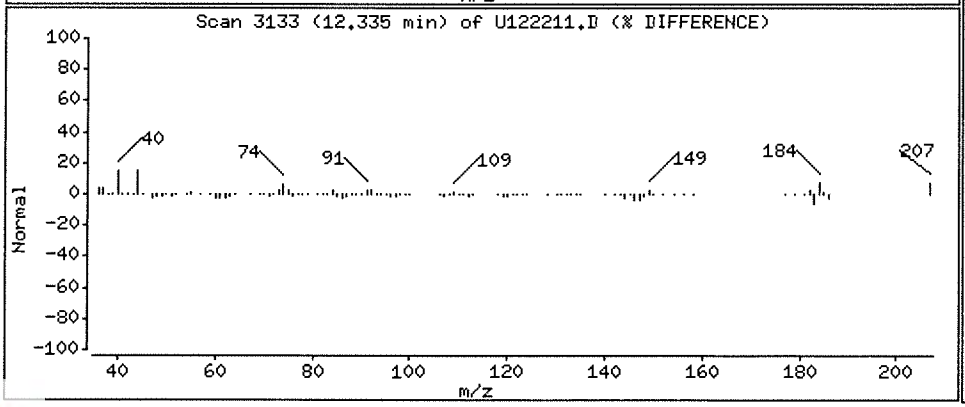












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122211.D

Date : 22-DEC-2018 14:46

Client ID: HS18120642-03DL

Instrument: VOA9.i

Sample Info: HS18120642-03;HS18120642-03;;;

Purge Volume: 5.0

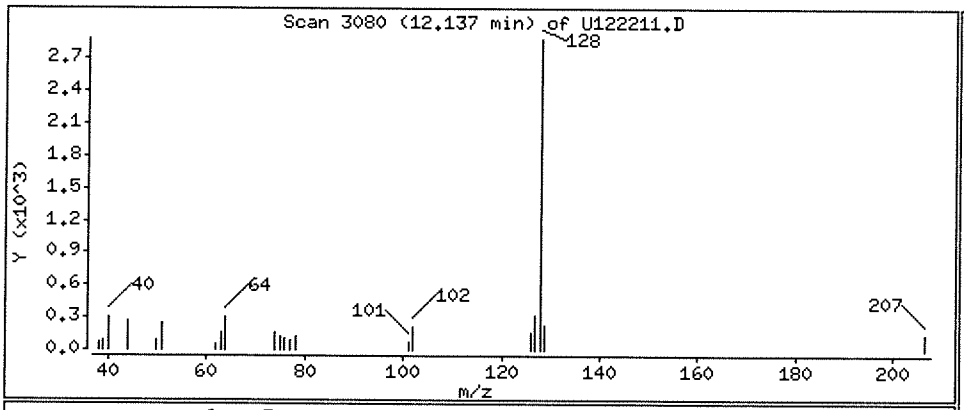
Operator: PC

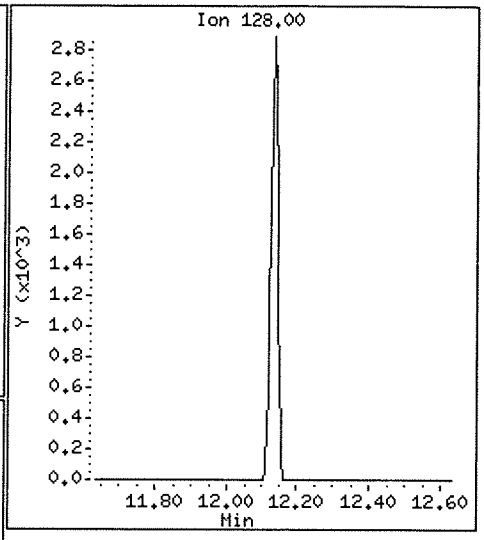
Column phase: DB624

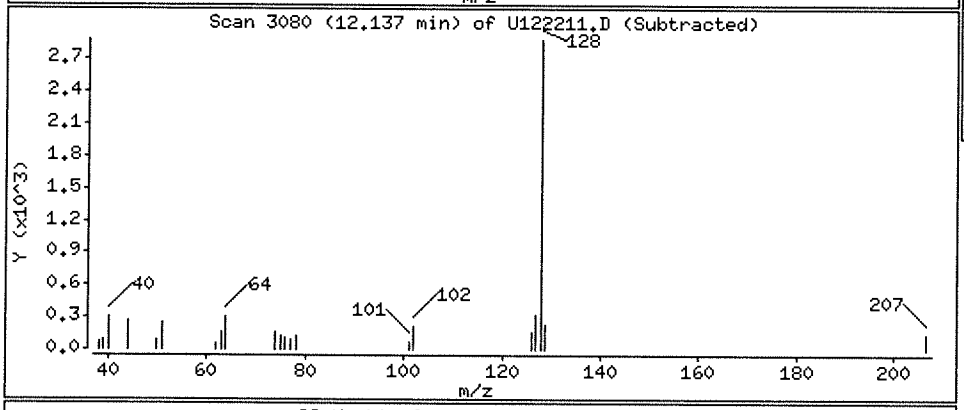
Column diameter: 0.18

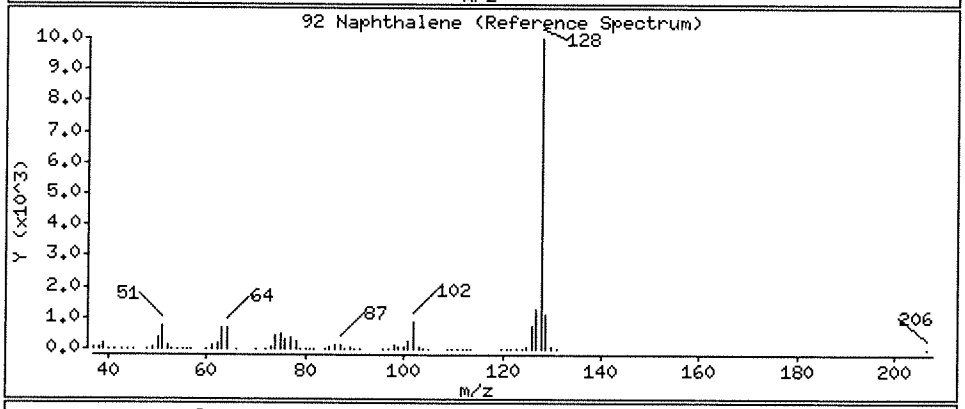
92 Naphthalene

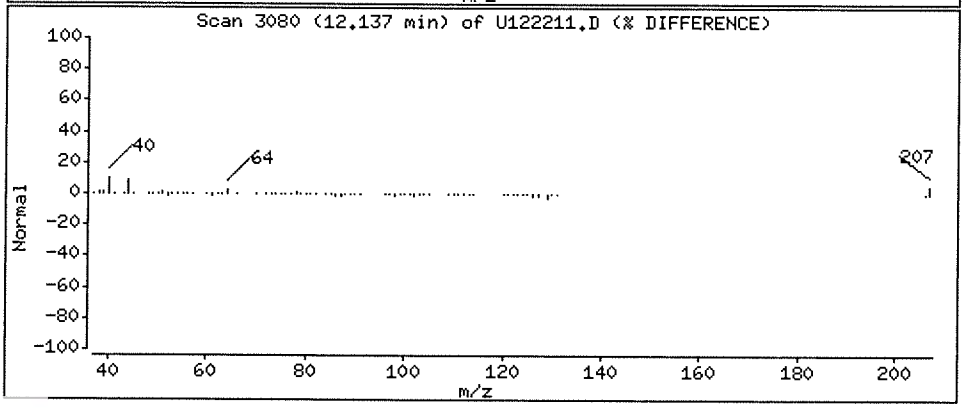
Concentration: 8.94 ug/l











Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122211.D Page 5

Date : 22-DEC-2018 14:46

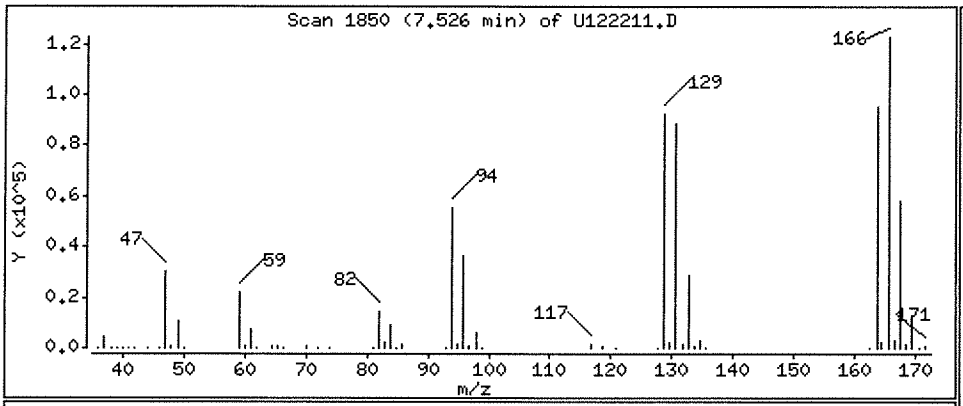
Client ID: HS18120642-03DL Instrument: VOA9.i

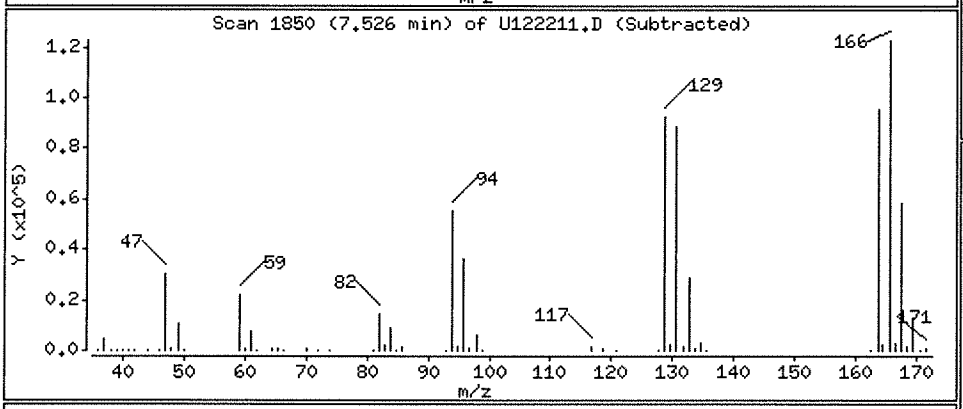
Sample Info: HS18120642-03;HS18120642-03;;;

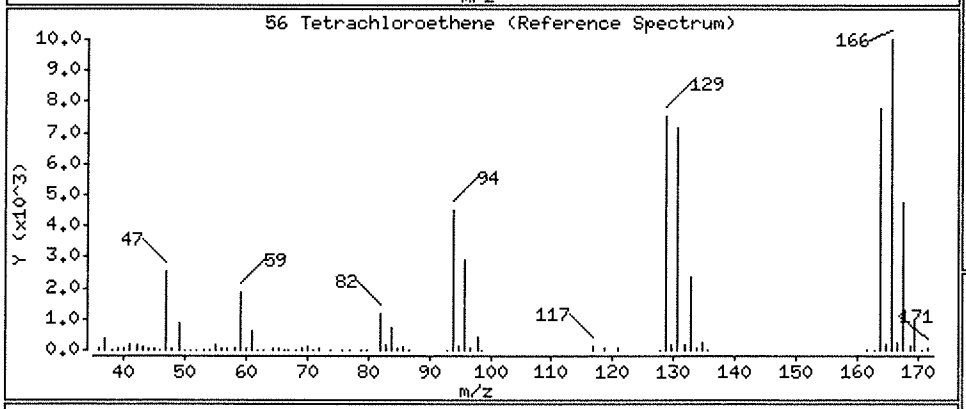
Purge Volume: 5.0 Operator: PC

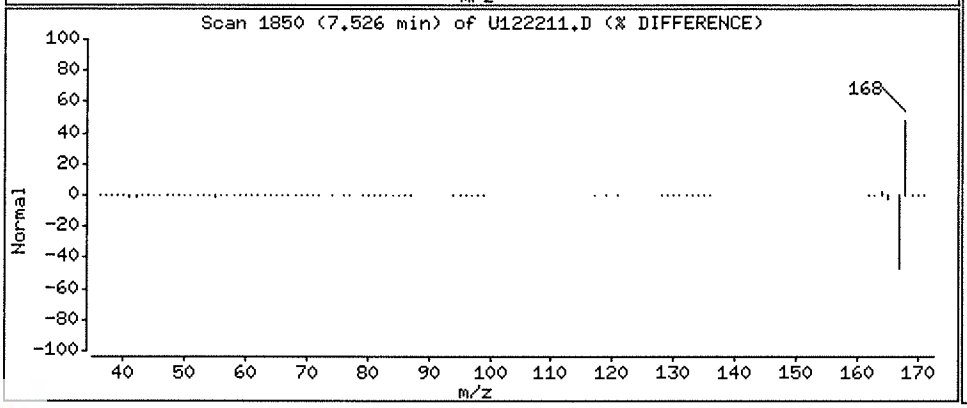
Column phase: DB624 Column diameter: 0.18

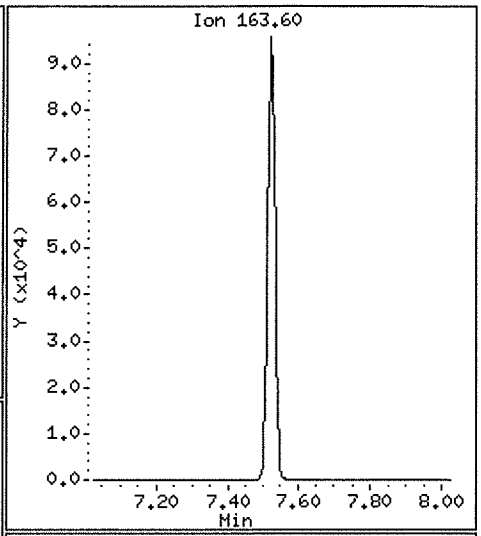
56 Tetrachloroethene Concentration: 454.70 ug/l

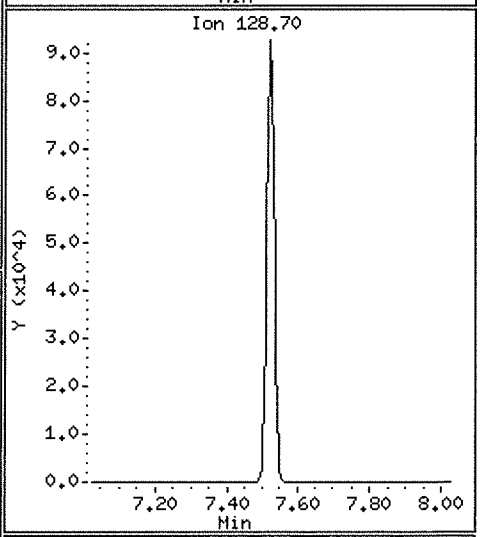


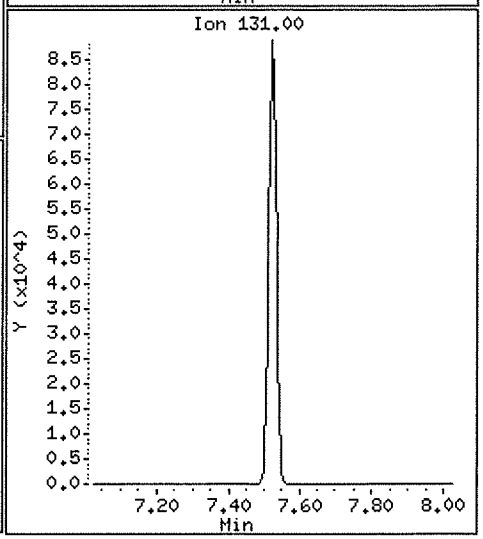












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122211.D Page 6

Date : 22-DEC-2018 14:46

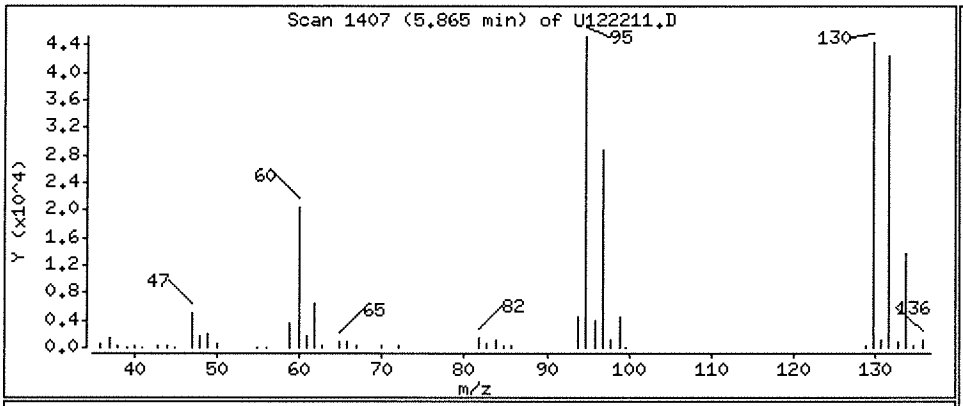
Client ID: HS18120642-03DL Instrument: VOA9.i

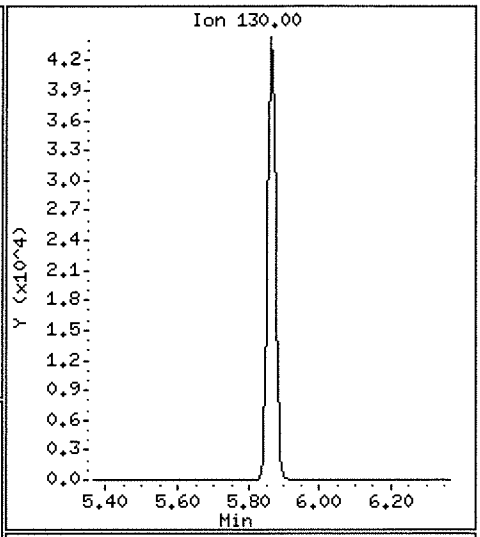
Sample Info: HS18120642-03;HS18120642-03;;;

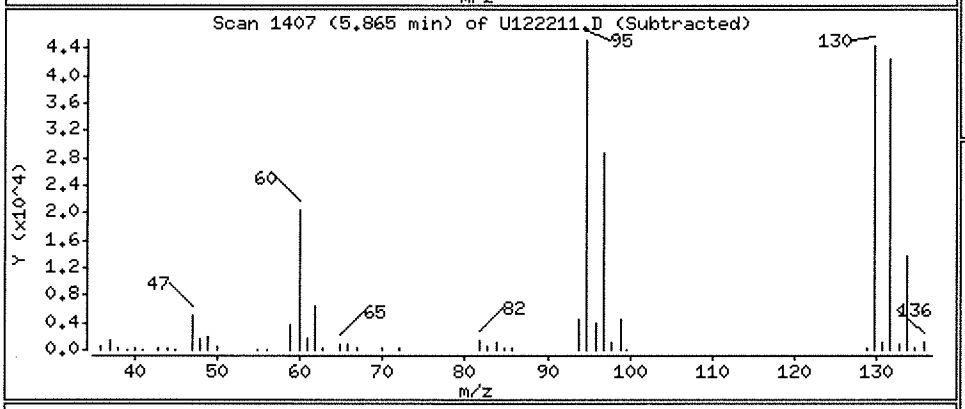
Purge Volume: 5.0 Operator: PC

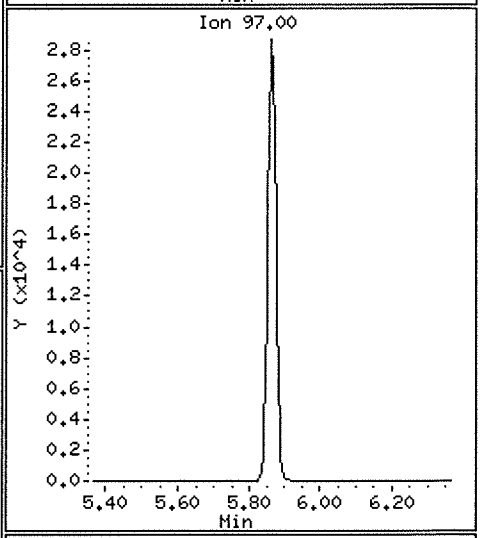
Column phase: DB624 Column diameter: 0.18

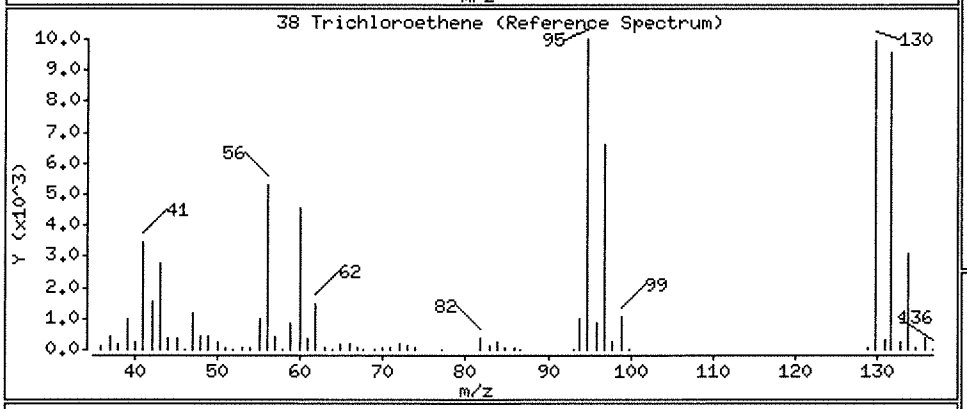
38 Trichloroethene Concentration: 169.37 ug/l

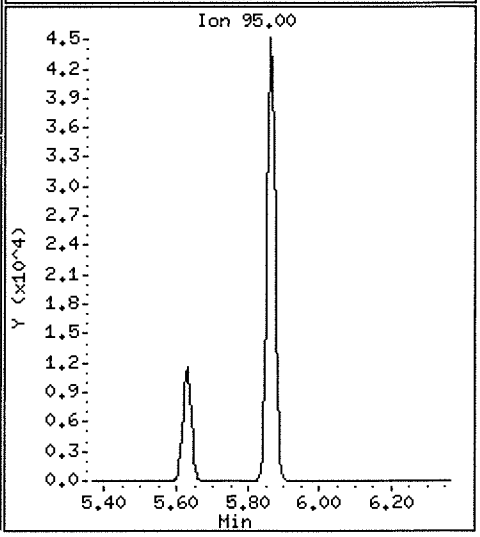


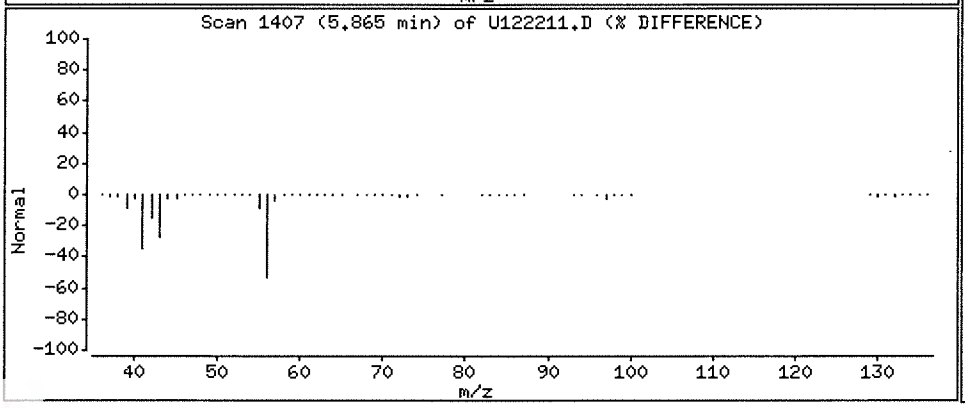












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Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122214.D
Lab Smp Id: HS18120642-05 Client Smp ID: HS18120642-05
Inj Date : 22-DEC-2018 16:01
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120642-05;HS18120642-05;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 13
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

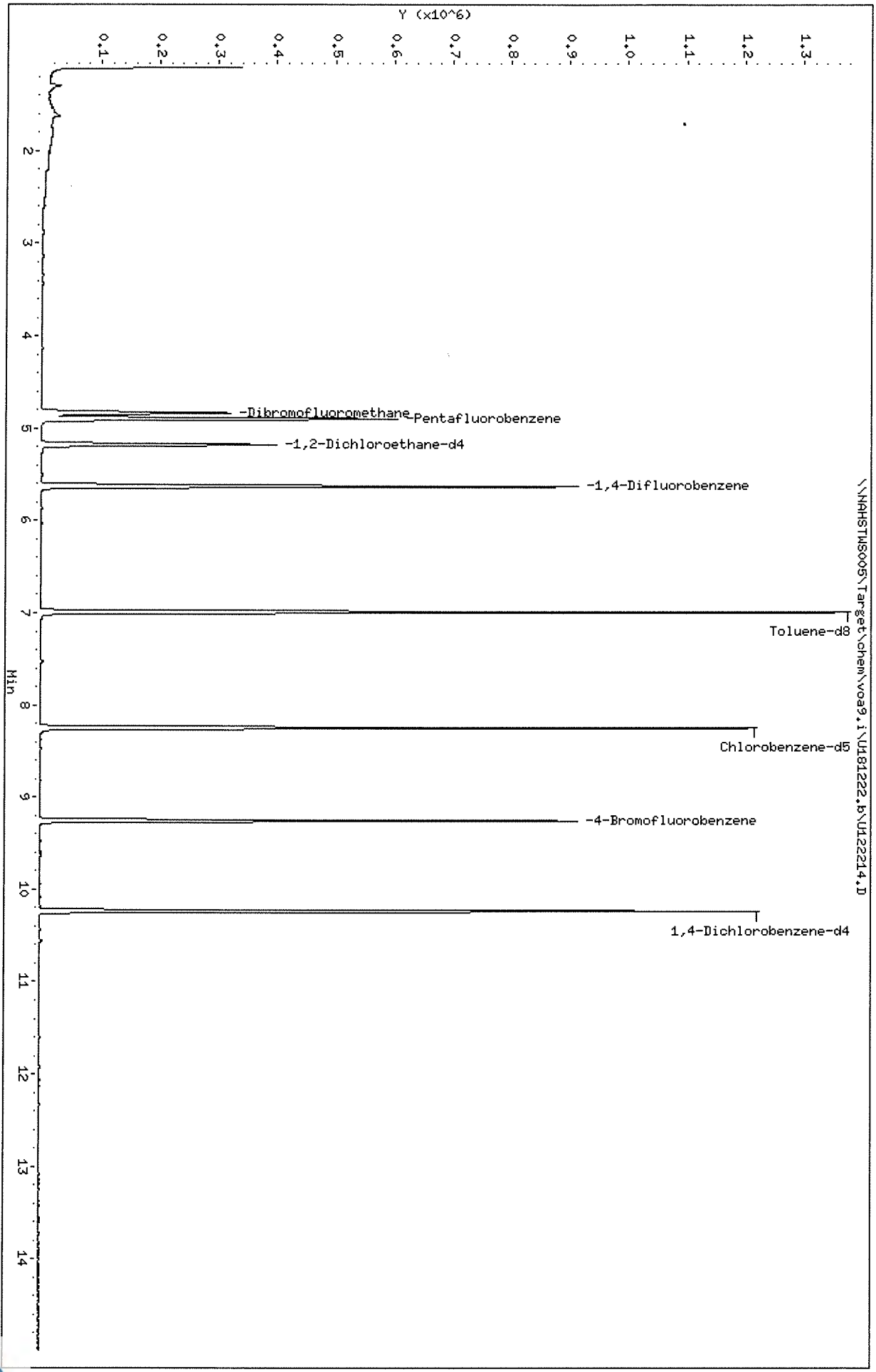
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.897	4.897	(1.000)	376198	50.0000	
* 36 1,4-Difluorobenzene	114	5.628	5.628	(1.000)	650773	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	595211	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	274529	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	186035	44.6545	44.65
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	251380	47.0896	47.08
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	799875	52.1151	52.11
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	285853	48.8229	48.82

Data File: \\NAHSTWS005\Target\chem\voa9,i\U181222,b\U122214.D
Date : 22-DEC-2018 16:01
Client ID: HS18120642-05
Sample Info: HS18120642-05;HS18120642-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18



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Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122221.D
Lab Smp Id: HS18120642-02 Client Smp ID: HS18120642-02
Inj Date : 22-DEC-2018 18:54
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120642-02;HS18120642-02;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

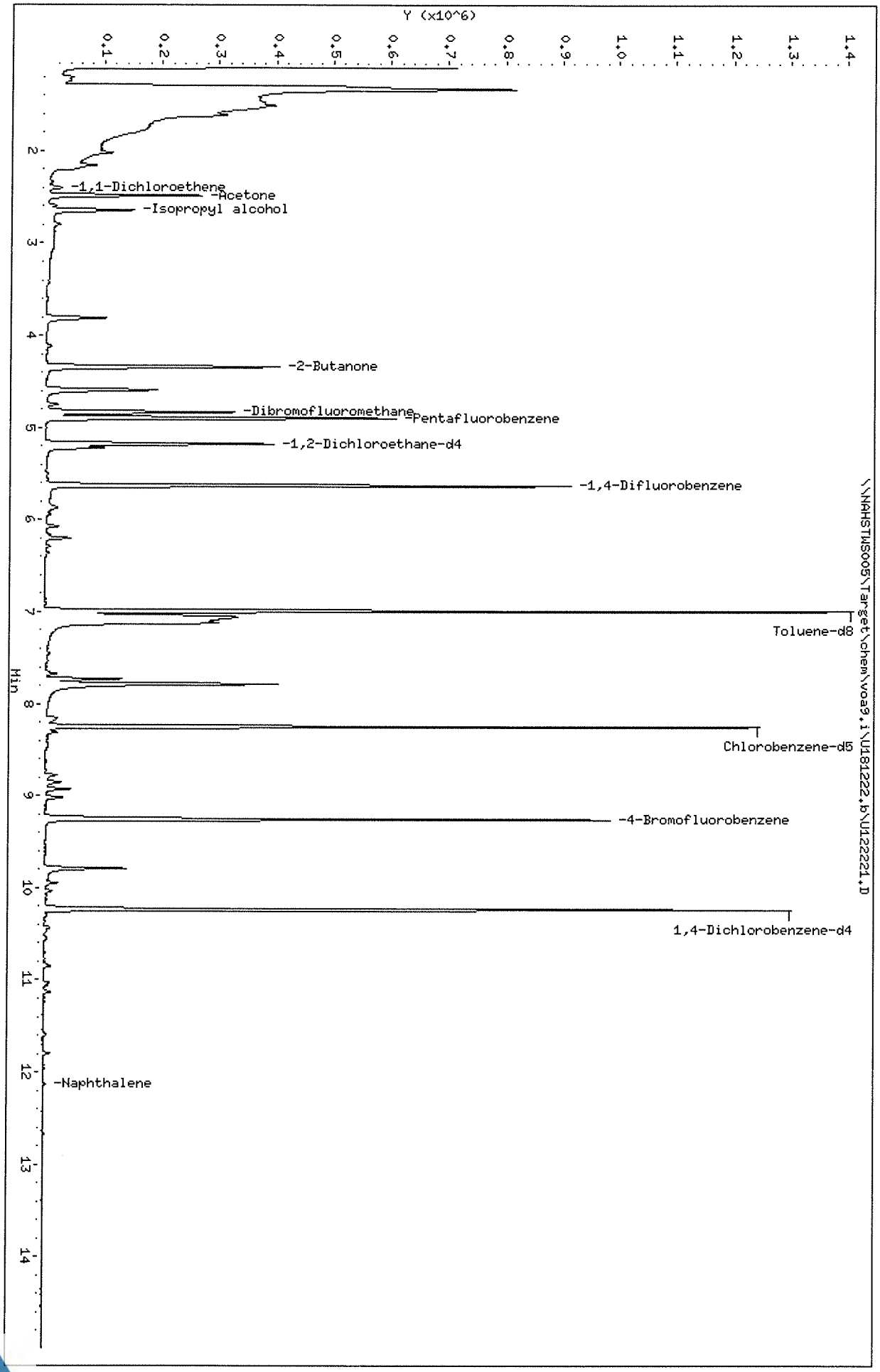
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.897	(1.000)	380200	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.628	(1.000)	658742	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	597502	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	288621	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.834	(0.986)	189615	45.0478	45.04
$ 35 1,2-Dichloroethane-d4	65	5.175	5.179	(1.057)	251493	46.5930	46.59
$ 48 Toluene-d8	98	6.990	6.989	(0.847)	805294	52.2722	52.27
$ 69 4-Bromofluorobenzene	95	9.258	9.257	(1.122)	299265	50.9790	50.97
11 1,1-Dichloroethene	96	2.405	2.405	(0.491)	5806	1.60609	1.60(a)
24 2-Butanone	43	4.339	4.339	(0.886)	494941	201.473	201.47(A)
10 Acetone	43	2.484	2.483	(0.507)	270963	185.056	185.05
92 Naphthalene	128	12.133	12.132	(1.185)	3794	0.86752	0.86(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount
exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122221.D
Date : 22-DEC-2018 18:54
Client ID: HS18120642-02
Sample Info: HS18120642-02;HS18120642-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122221.D

Date : 22-DEC-2018 18:54

Client ID: HS18120642-02

Instrument: VOA9.i

Sample Info: HS18120642-02;HS18120642-02;;;

Purge Volume: 5.0

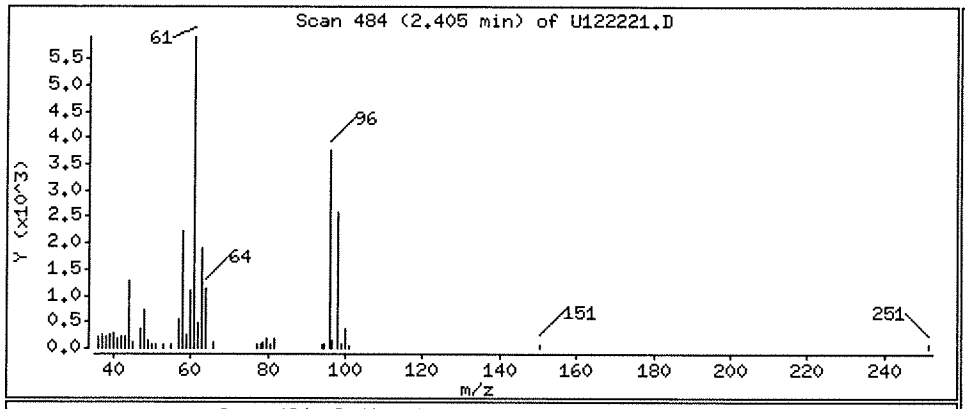
Operator: PC

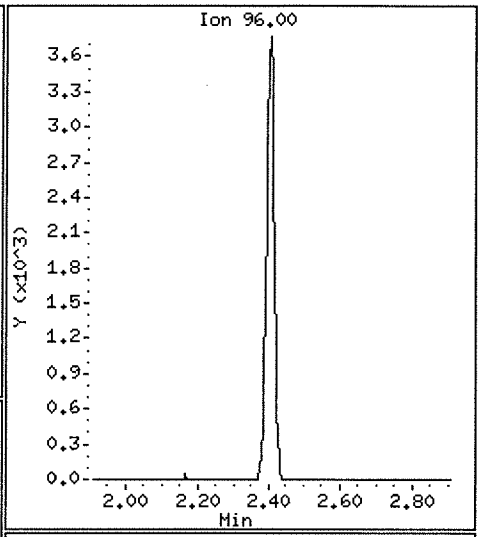
Column phase: DB624

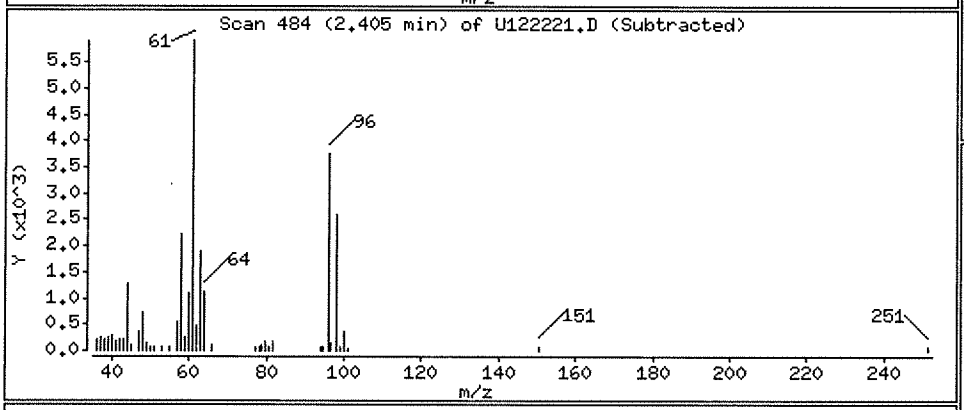
Column diameter: 0.18

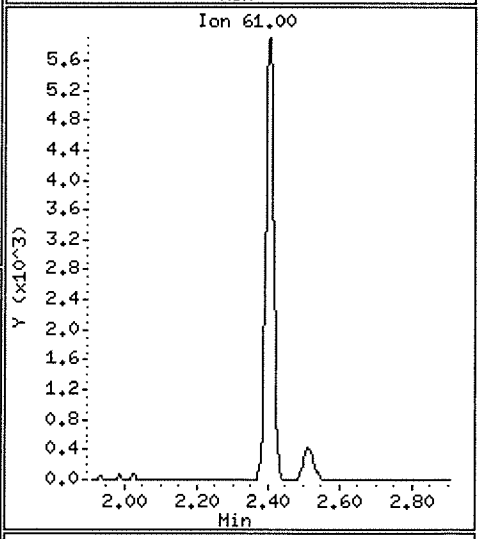
11 1,1-Dichloroethene

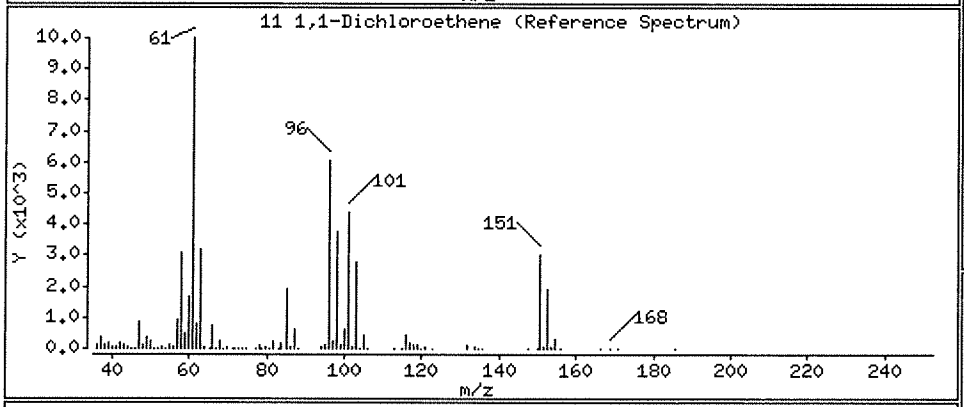
Concentration: 1.60 ug/l

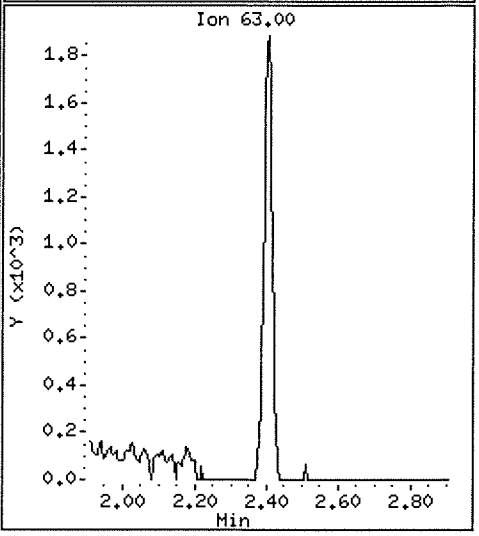


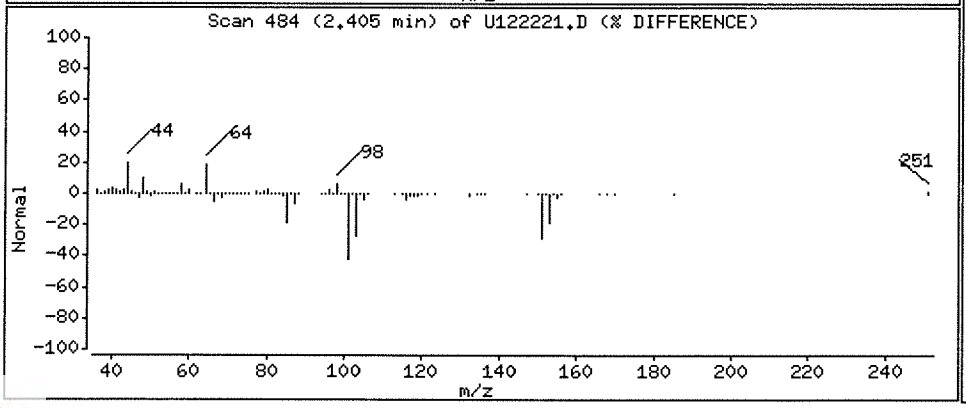












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122221.D

Date : 22-DEC-2018 18:54

Client ID: HS18120642-02

Instrument: VOA9.i

Sample Info: HS18120642-02;HS18120642-02;;;

Purge Volume: 5.0

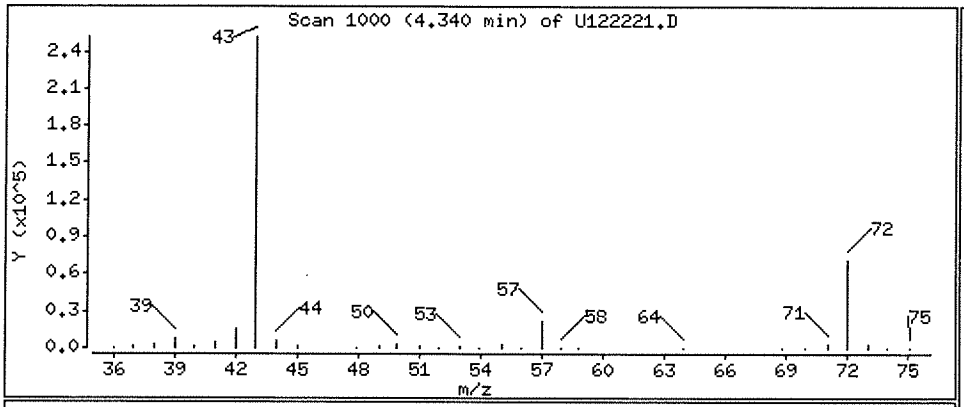
Operator: PC

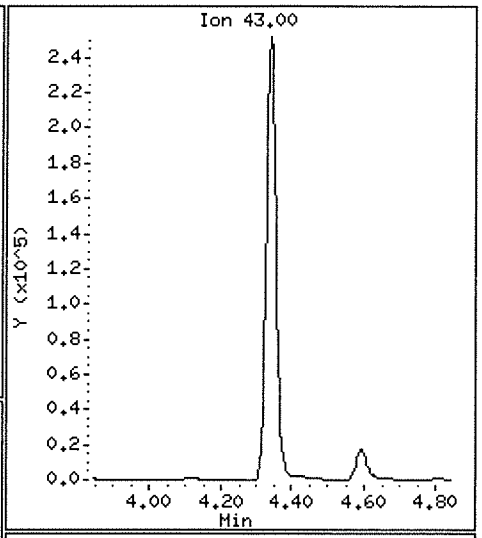
Column phase: DB624

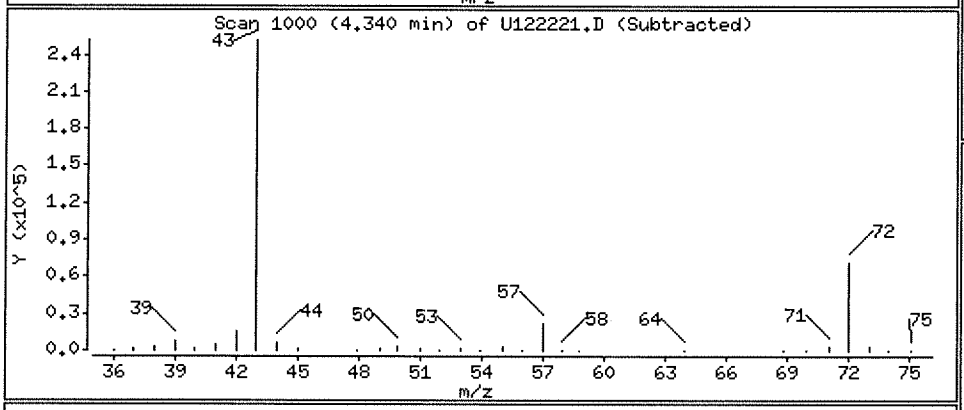
Column diameter: 0.18

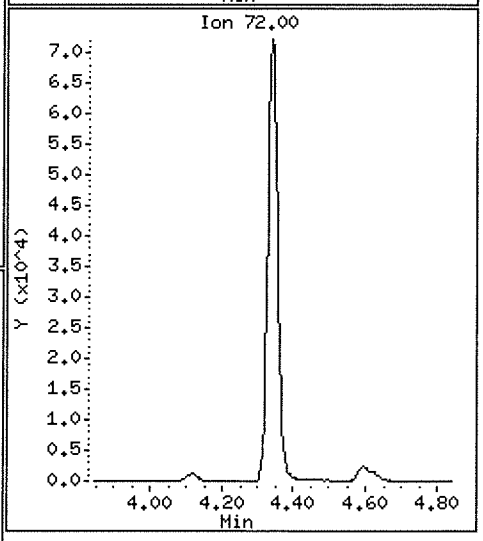
24 2-Butanone

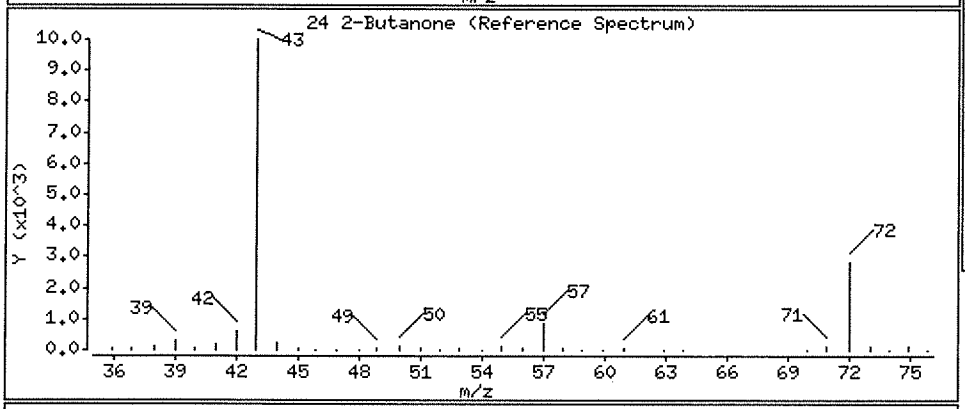
Concentration: 201.47 ug/l

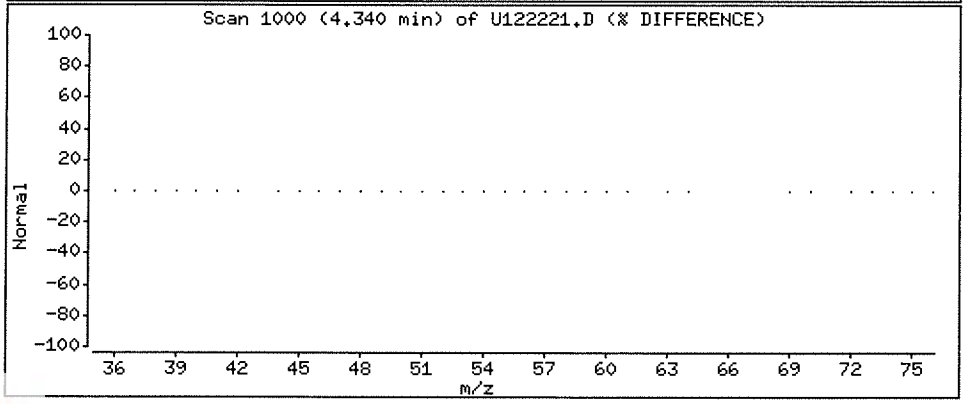












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122221.D Page 5

Date : 22-DEC-2018 18:54

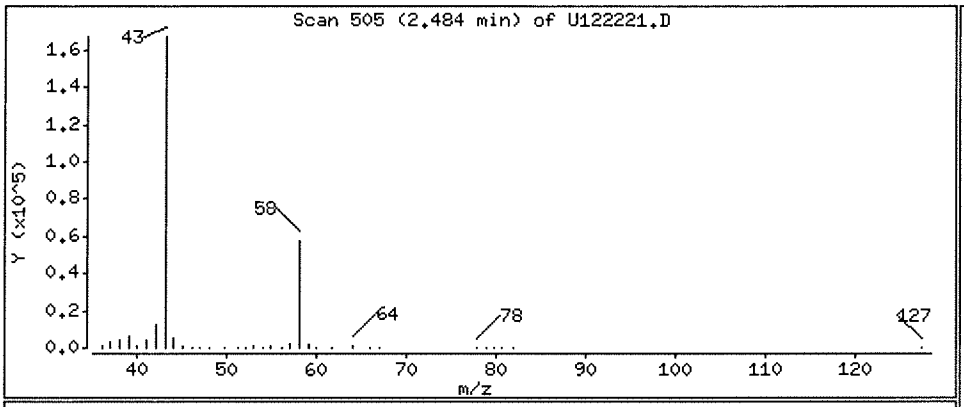
Client ID: HS18120642-02 Instrument: VOA9.i

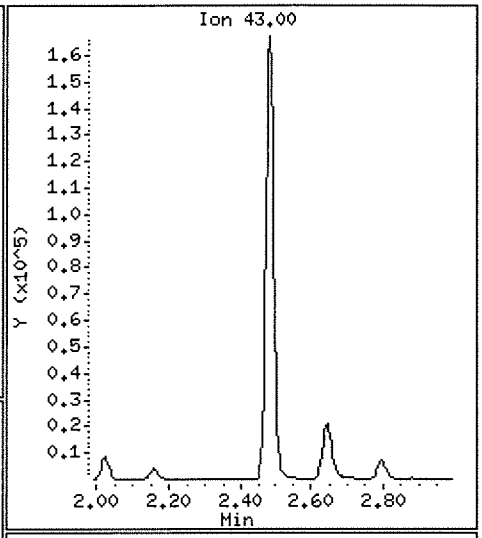
Sample Info: HS18120642-02;HS18120642-02;;;

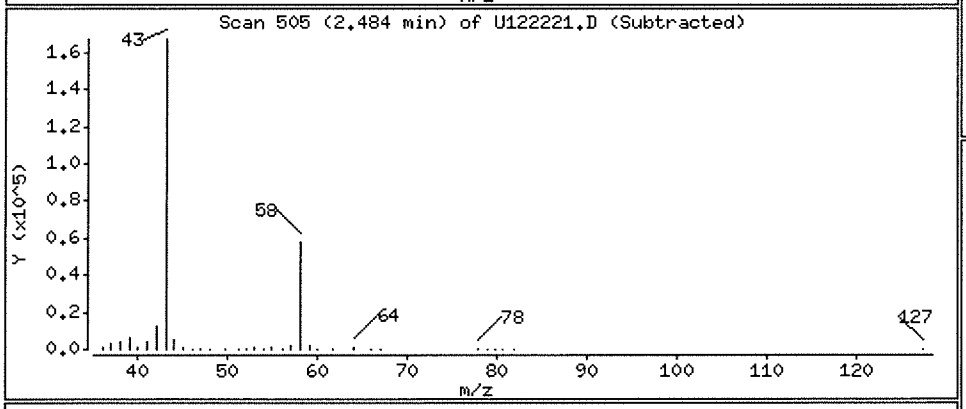
Purge Volume: 5.0 Operator: PC

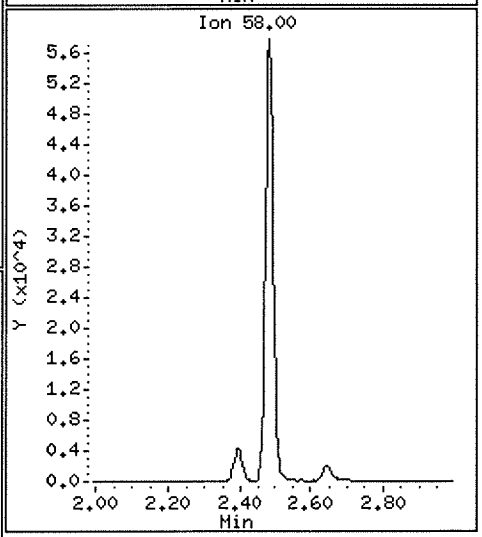
Column phase: DB624 Column diameter: 0.18

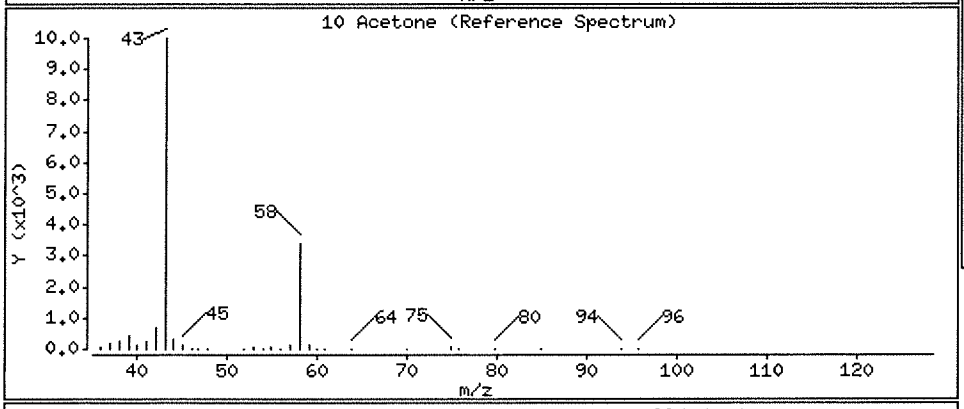
10 Acetone Concentration: 185.05 ug/l

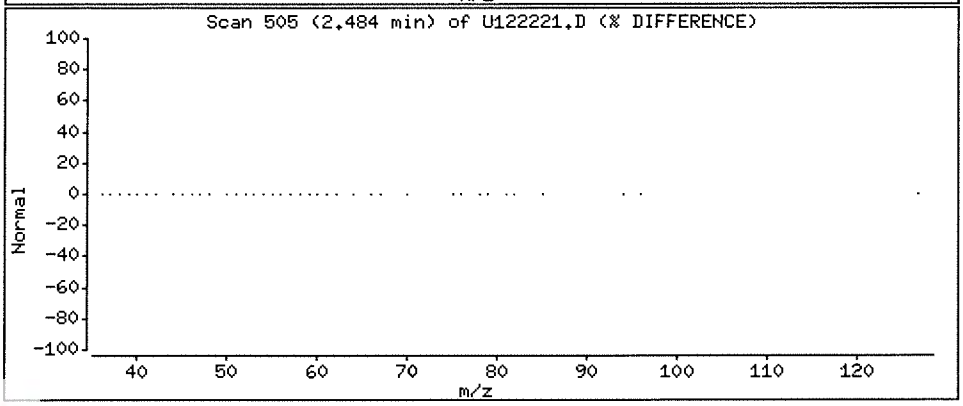












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122221.D

Date : 22-DEC-2018 18:54

Client ID: HS18120642-02

Instrument: VOA9.i

Sample Info: HS18120642-02;HS18120642-02;;;

Purge Volume: 5.0

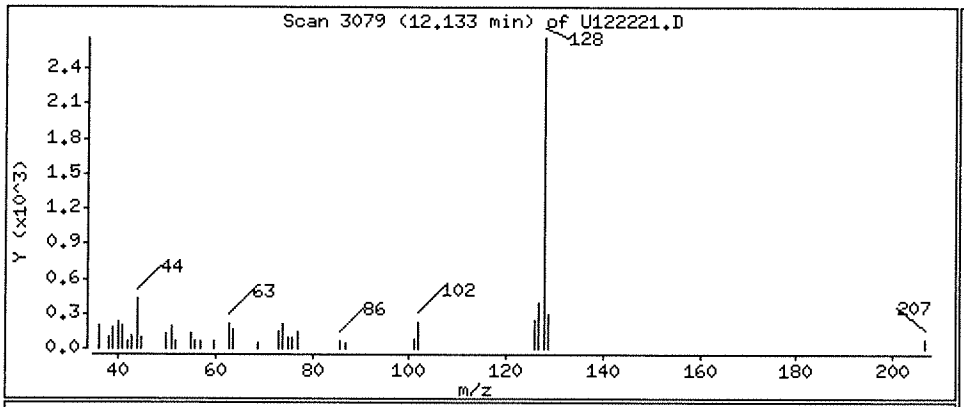
Operator: PC

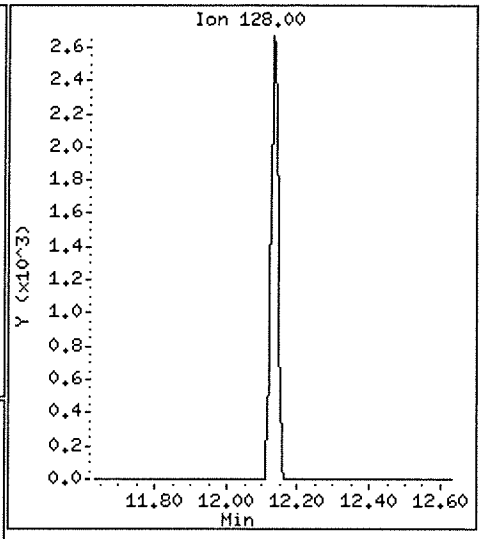
Column phase: DB624

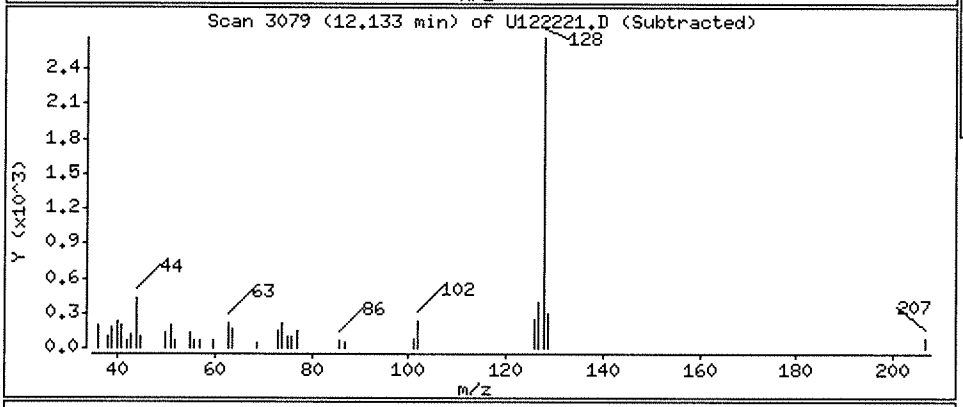
Column diameter: 0.18

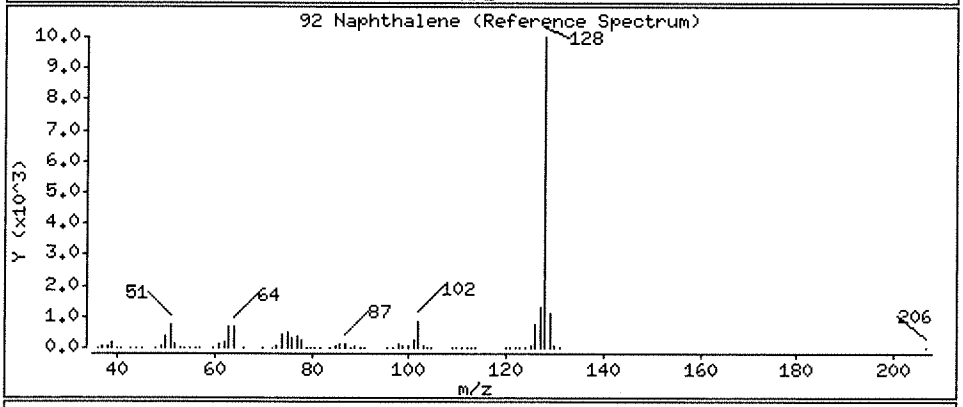
92 Naphthalene

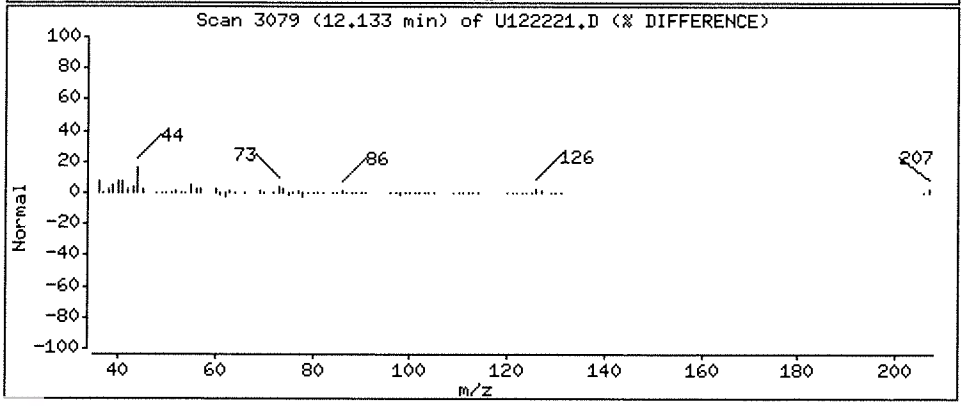
Concentration: 0.86 ug/l











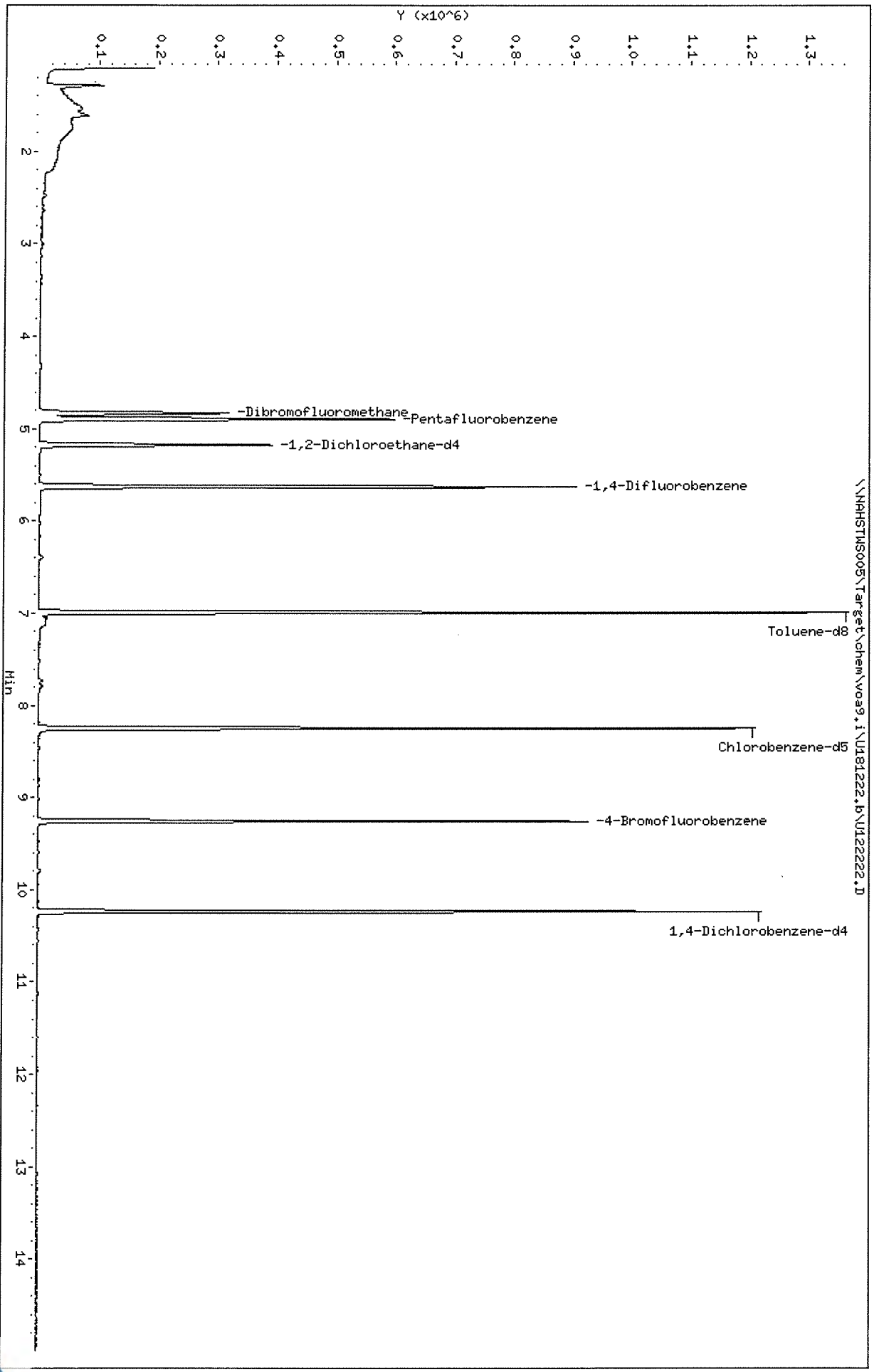
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122222.D
Lab Smp Id: HS18120642-04 Client Smp ID: HS18120642-04
Inj Date : 22-DEC-2018 19:19
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120642-04;HS18120642-04;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.894	4.897	(1.000)	370753	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.628	(1.000)	644909	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	584082	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	267403	50.0000	
$	30 Dibromofluoromethane	113	4.830	4.834	(0.987)	185523	45.2038	45.20
$	35 1,2-Dichloroethane-d4	65	5.175	5.179	(1.057)	252187	47.9735	47.97
$	48 Toluene-d8	98	6.989	6.989	(0.847)	784495	52.0860	52.08
$	69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	280933	48.8990	48.89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Date : 22-DEC-2018 19:19
Client ID: HS18120642-04
Sample Info: HS18120642-04;HS18120642-04;;;
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9,i
Operator: PC
Column diameter: 0.18
Page 2
Y (x10^6)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
2
3
4
5
6
7
8
9
10
11
12
13
14
Min
-Dibromofluoromethane
-Pentafluorobenzene
-1,2-Dichloroethane-d4
-1,4-Difluorobenzene
Toluene-d8
Chlorobenzene-d5
-4-Bromofluorobenzene
1,4-Dichlorobenzene-d4
\\NAHSTWS005\Target\chem\voa9,i\U181222,b\U122222.D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122227.D Page 1
Report Date: 28-Jan-2019 13:53

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122227.D
Lab Smp Id: HS18120642-01DL Client Smp ID: HS18120642-01DL
Inj Date : 22-DEC-2018 21:23
Operator : PC Inst ID: VOA9.i
Smp Info : HS18120642-01;HS18120642-01;;;
Misc Info : 180315V9;WATER;0;5;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:52 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 26
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

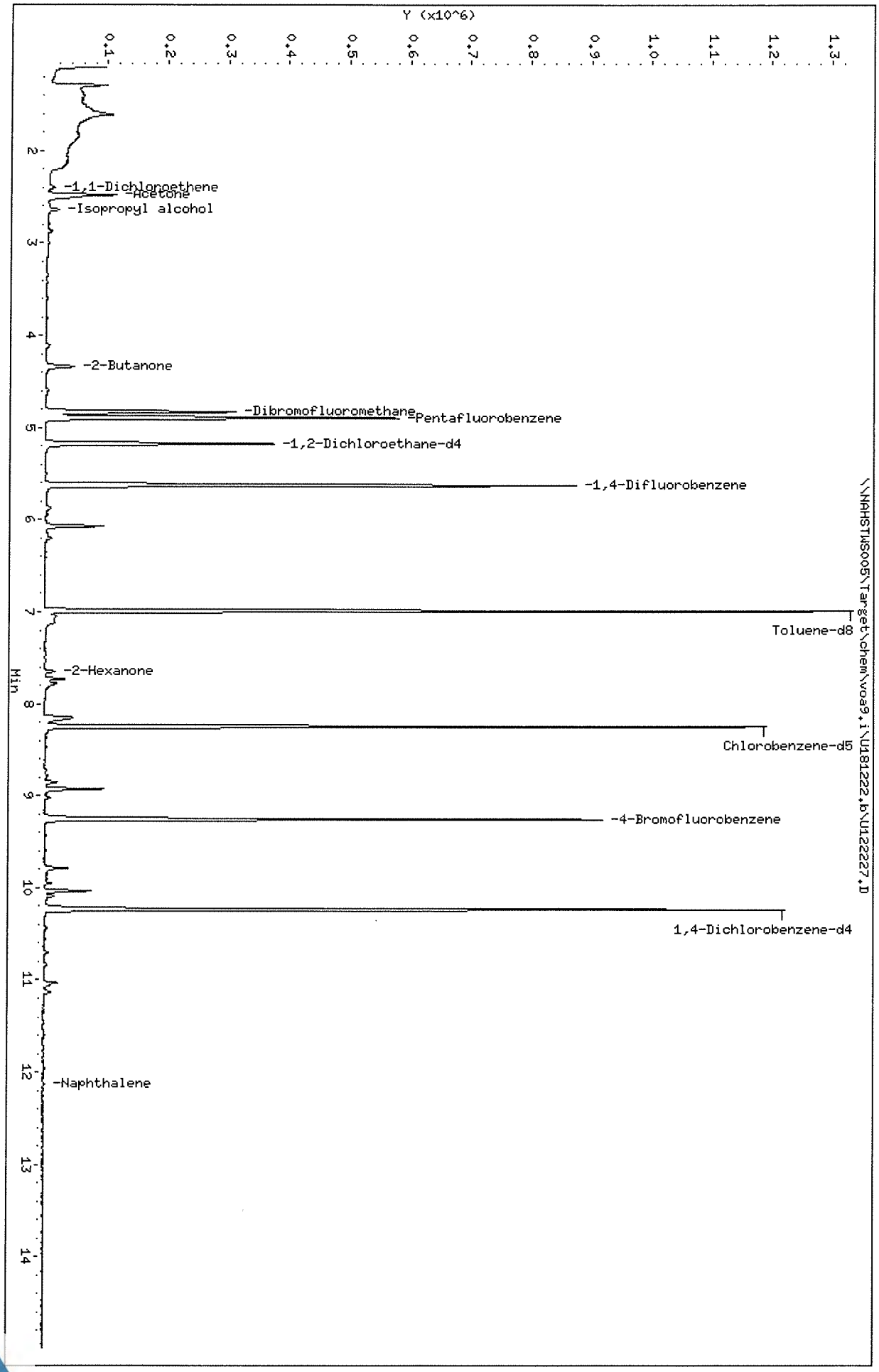
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	5.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.897	(1.000)	357247	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.628	(1.000)	620954	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	567833	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	269640	50.0000	
$ 30 Dibromofluoromethane	113	4.830	4.834	(0.987)	179430	45.3777	45.37
$ 35 1,2-Dichloroethane-d4	65	5.175	5.179	(1.057)	239757	47.3043	47.30
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	765691	52.2994	52.29
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	281826	50.5037	50.50
11 1,1-Dichloroethene	96	2.397	2.405	(0.490)	2467	0.72628	3.63(a)
24 2-Butanone	43	4.339	4.339	(0.887)	58631	23.2715	116.35
52 2-Hexanone	43	7.649	7.649	(0.927)	10481	3.31940	16.59(a)
10 Acetone	43	2.480	2.483	(0.507)	119151	84.9944	424.97
92 Naphthalene	128	12.133	12.132	(1.185)	1859	0.76706	3.83(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9,i\U181222,b\U122227.D
Date : 22-DEC-2018 21:23
Client ID: HS18120642-01DL
Sample Info: HS18120642-01;HS18120642-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122227.D Page 3

Date : 22-DEC-2018 21:23

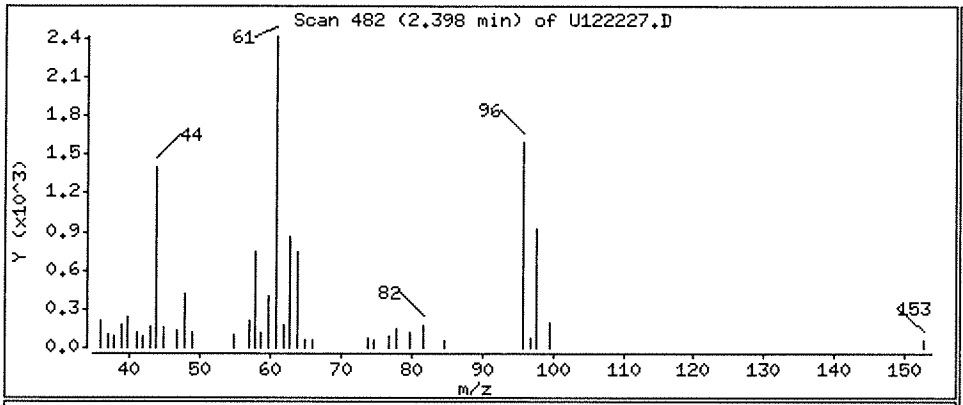
Client ID: HS18120642-01DL Instrument: VOA9.i

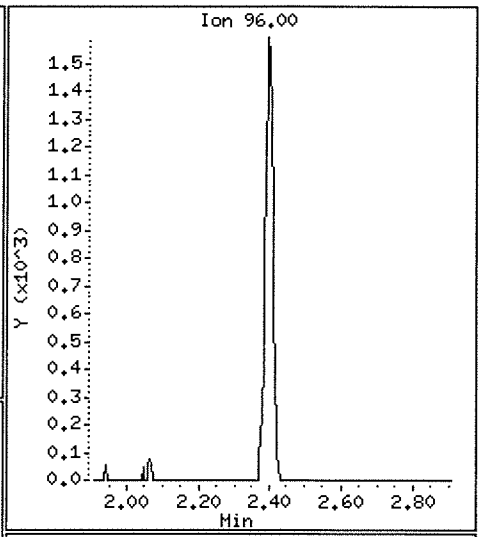
Sample Info: HS18120642-01;HS18120642-01;;;

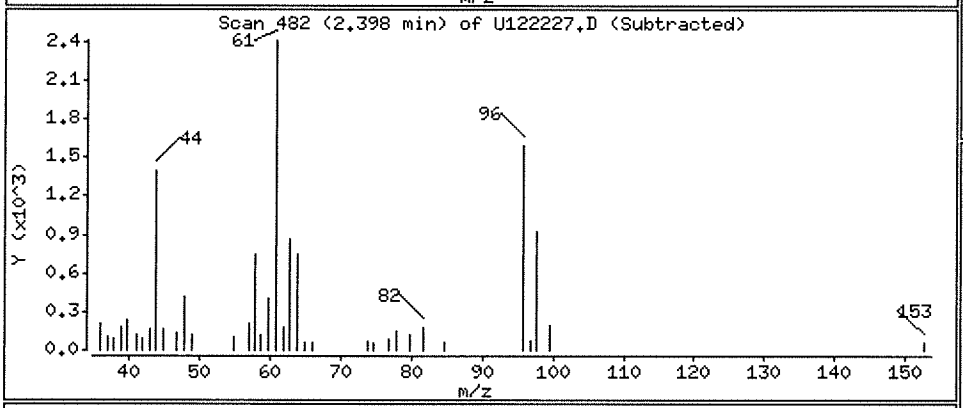
Purge Volume: 5.0 Operator: PC

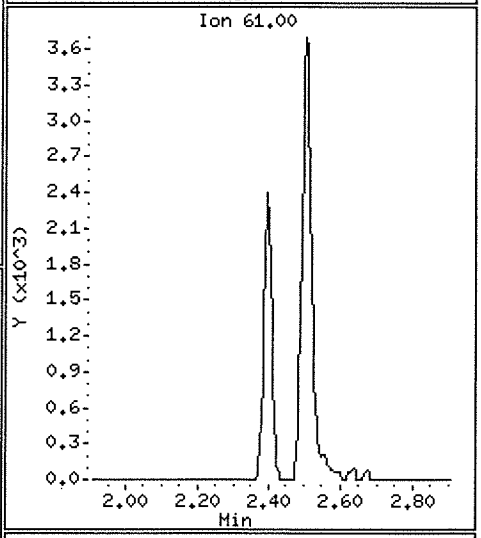
Column phase: DB624 Column diameter: 0.18

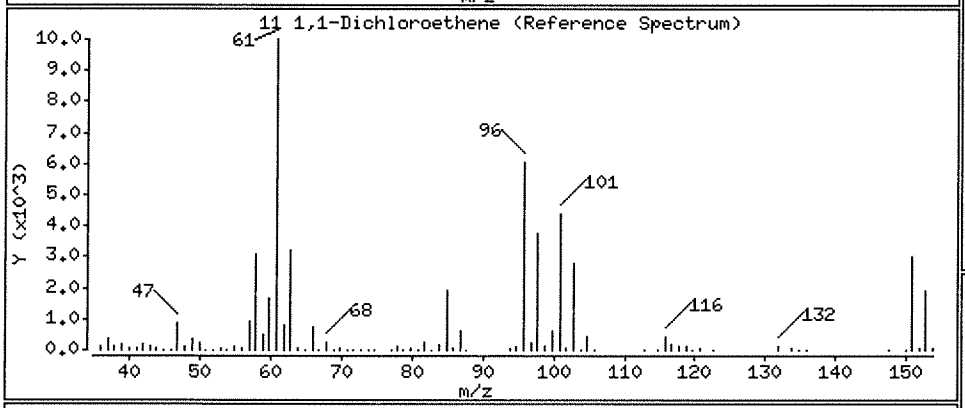
11 1,1-Dichloroethene Concentration: 3.63 ug/l

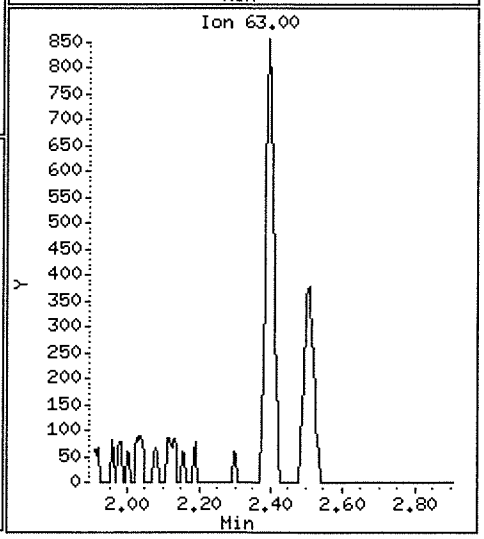


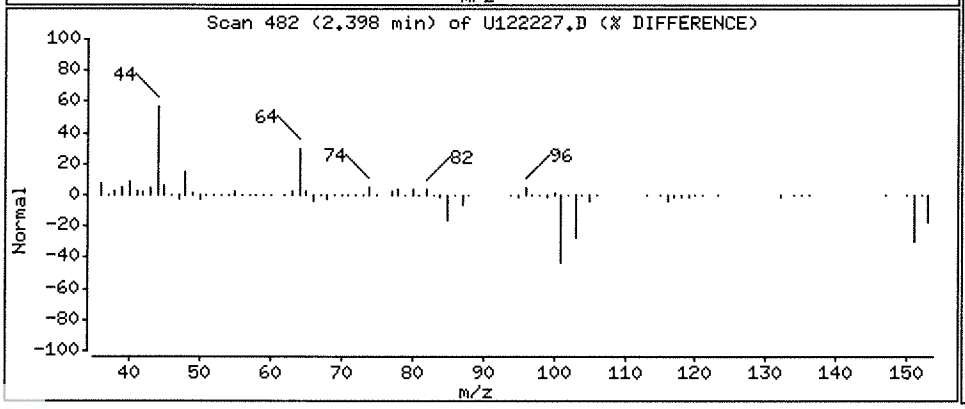












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122227.D Page 4

Date : 22-DEC-2018 21:23

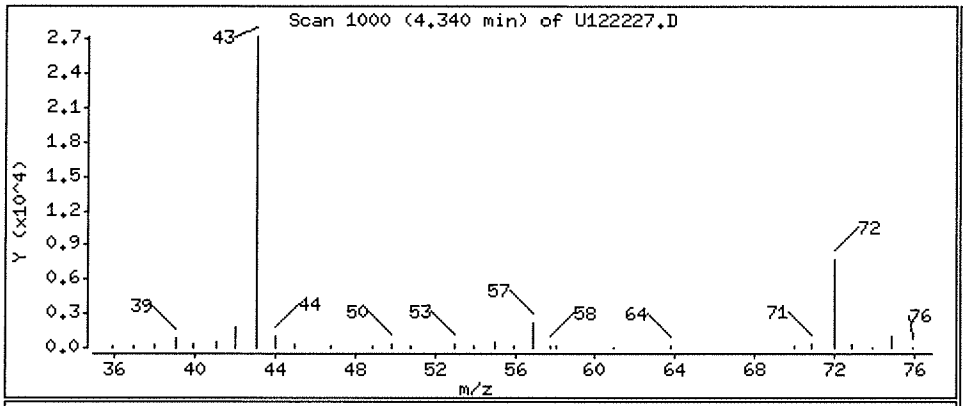
Client ID: HS18120642-01DL Instrument: VOA9.i

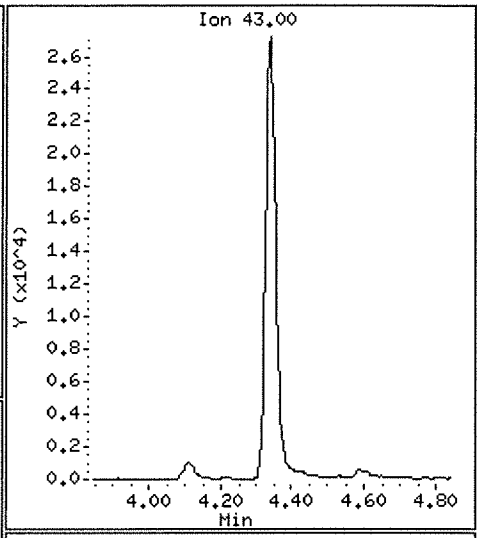
Sample Info: HS18120642-01;HS18120642-01;;;

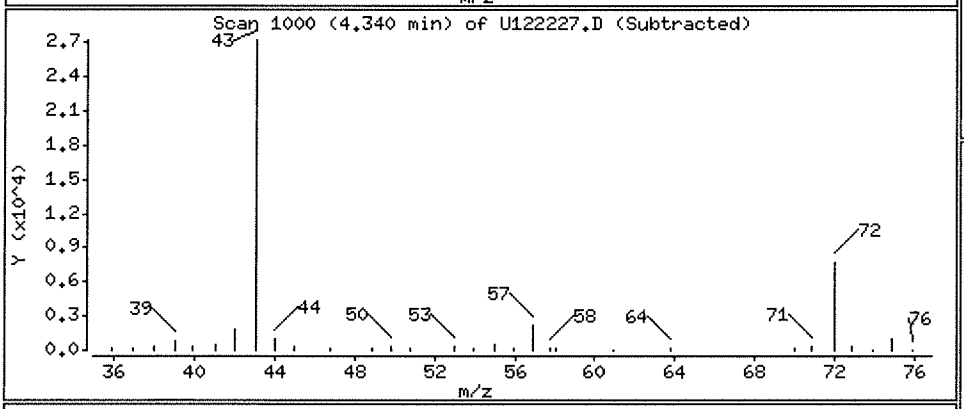
Purge Volume: 5.0 Operator: PC

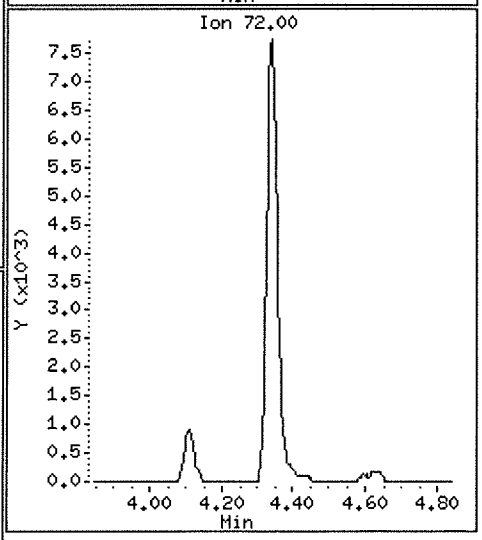
Column phase: DB624 Column diameter: 0.18

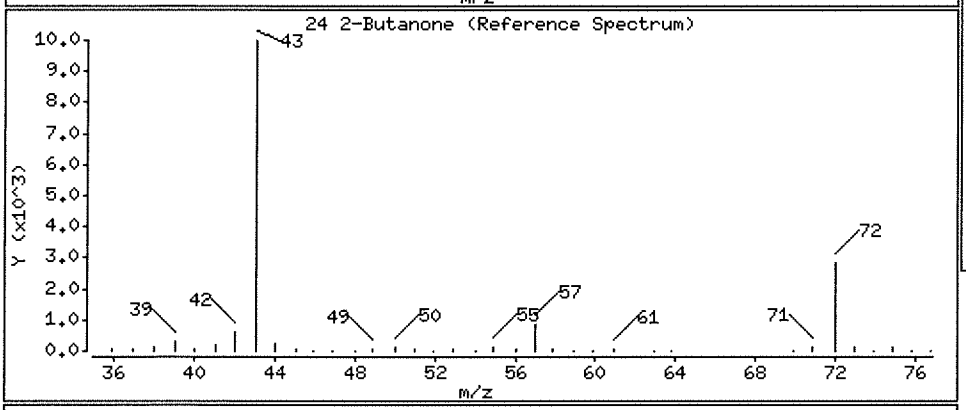
24 2-Butanone Concentration: 116.35 ug/l

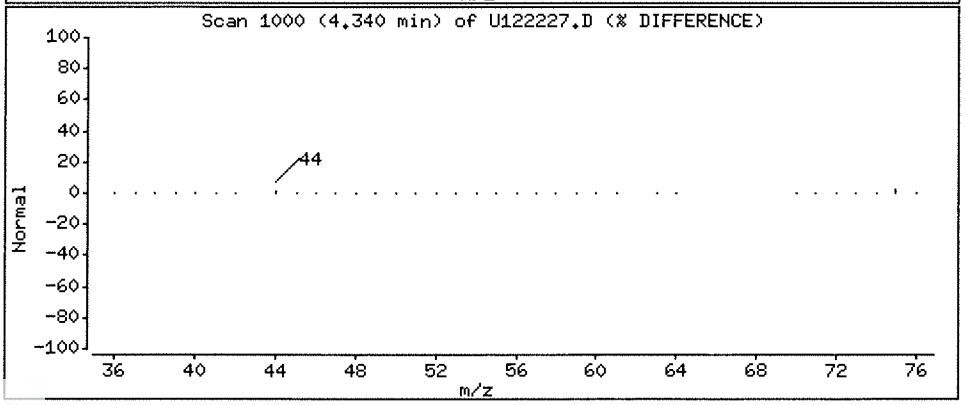












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122227.D

Date : 22-DEC-2018 21:23

Client ID: HS18120642-01DL

Instrument: VOA9.i

Sample Info: HS18120642-01;HS18120642-01;;;

Purge Volume: 5.0

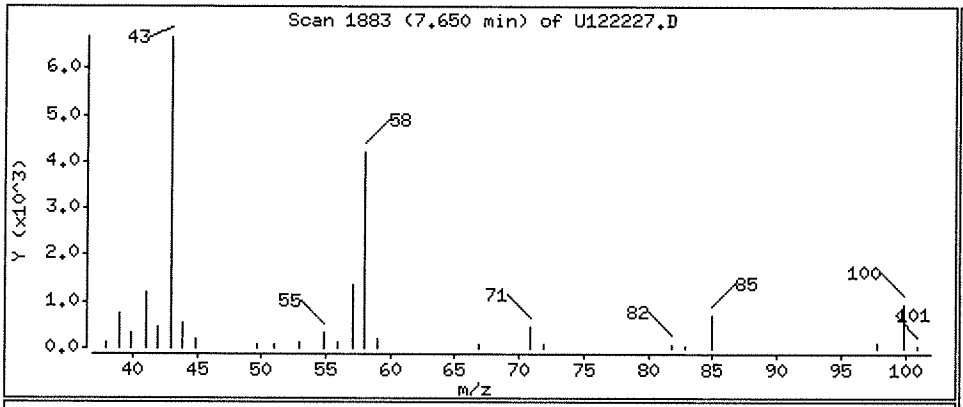
Operator: PC

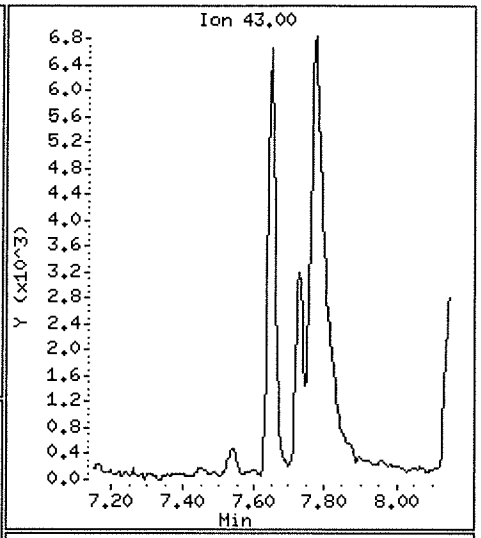
Column phase: DB624

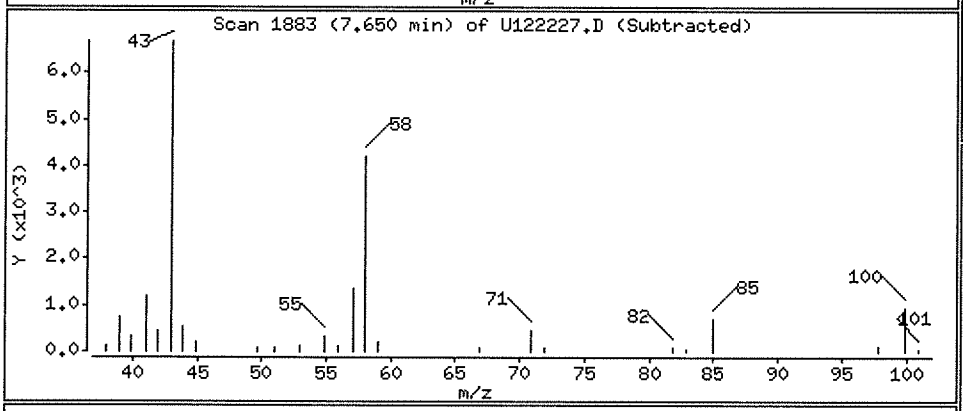
Column diameter: 0.18

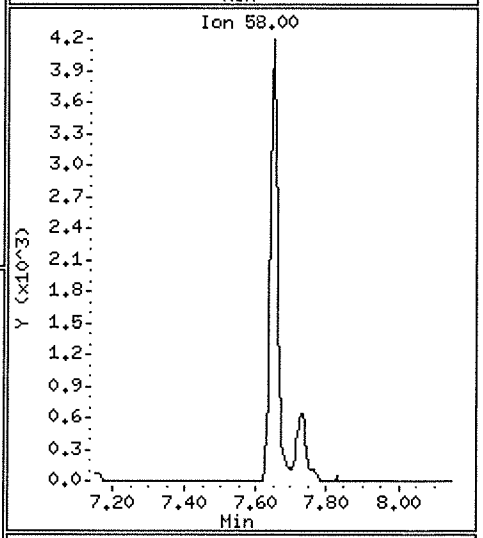
52 2-Hexanone

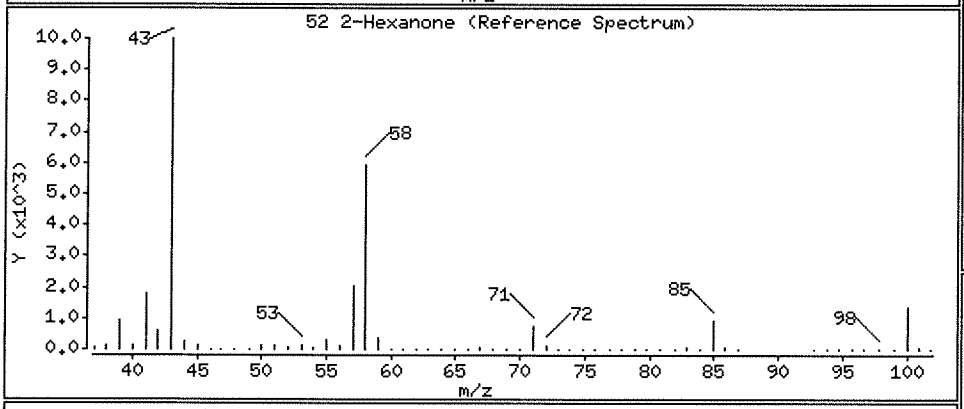
Concentration: 16.59 ug/l

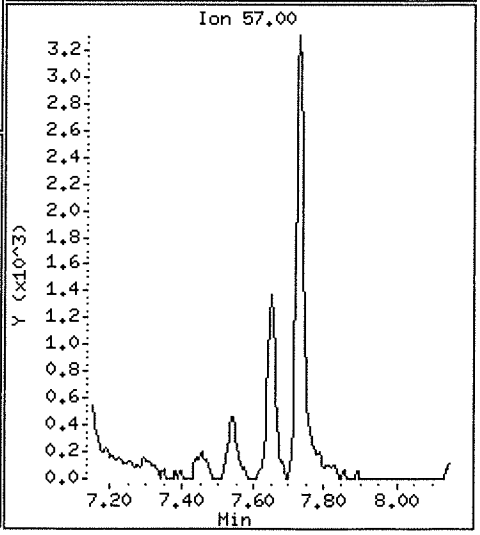


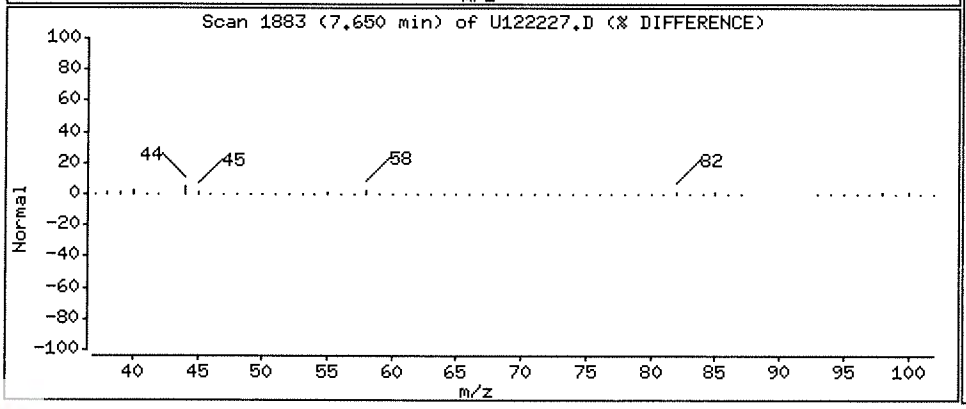












Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122227.D Page 6

Date : 22-DEC-2018 21:23

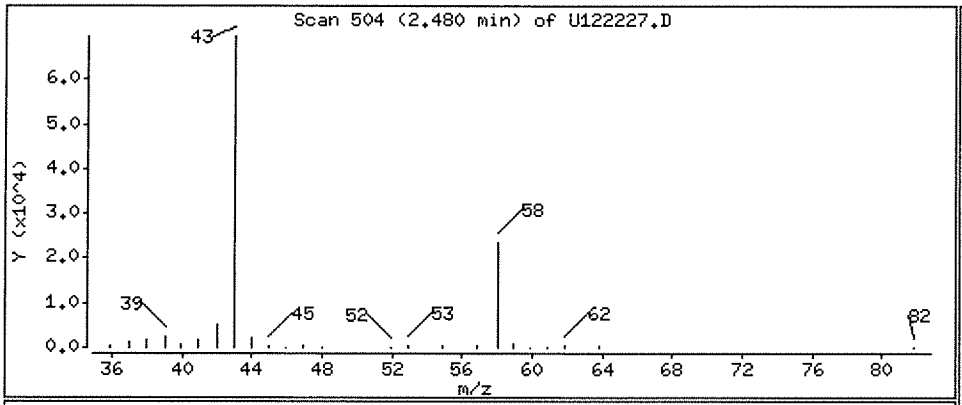
Client ID: HS18120642-01DL Instrument: VOA9.i

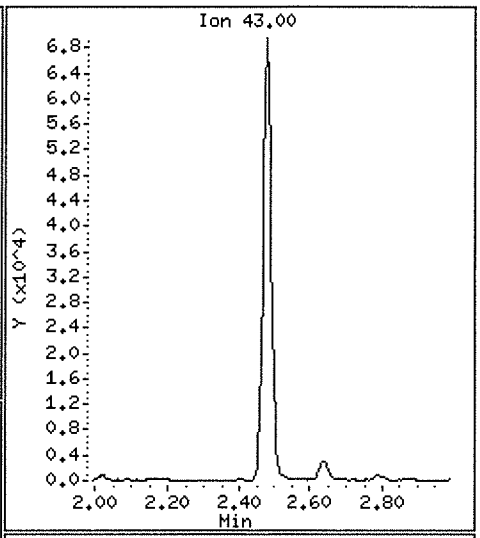
Sample Info: HS18120642-01;HS18120642-01;;;

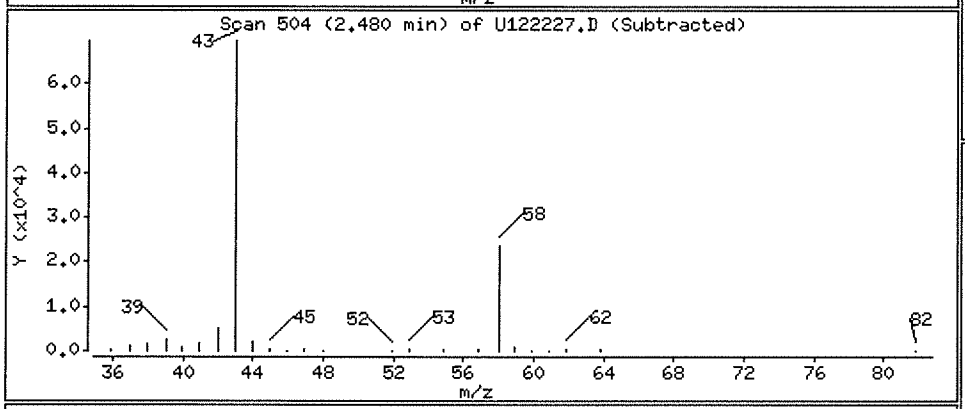
Purge Volume: 5.0 Operator: PC

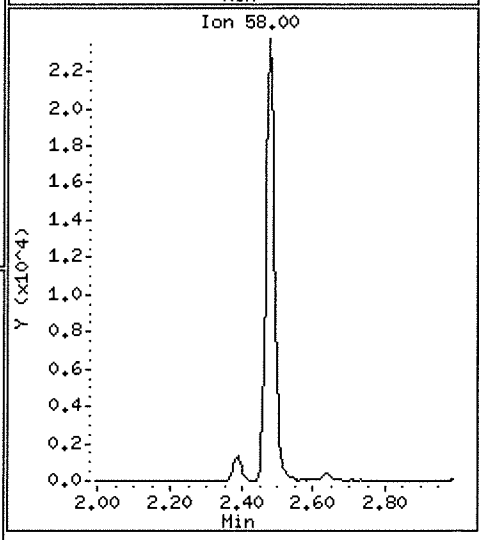
Column phase: DB624 Column diameter: 0.18

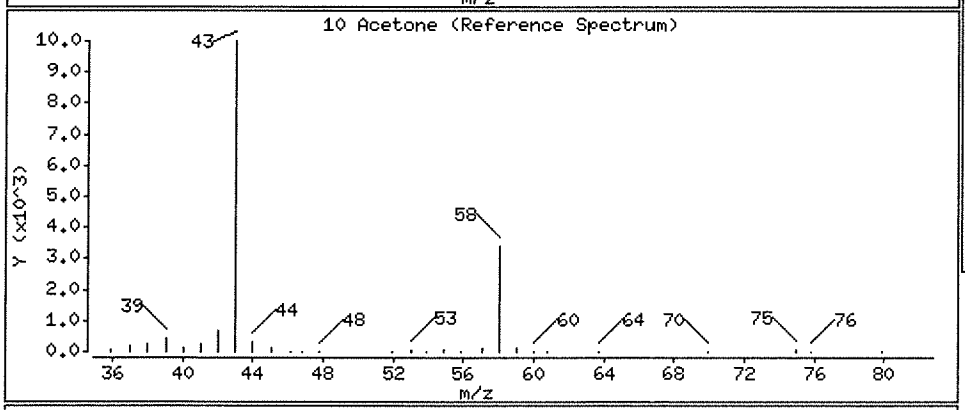
10 Acetone Concentration: 424.97 ug/l

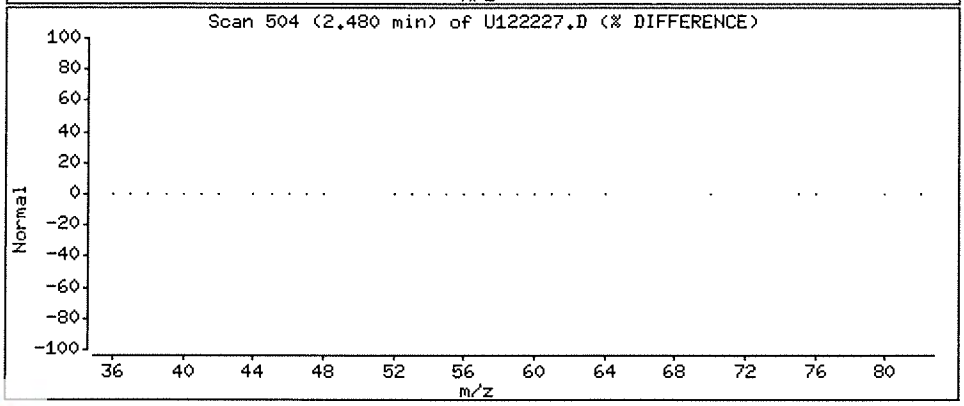












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Date : 22-DEC-2018 21:23

Client ID: HS18120642-01DL

Instrument: VOA9.i

Sample Info: HS18120642-01;HS18120642-01;;;

Purge Volume: 5.0

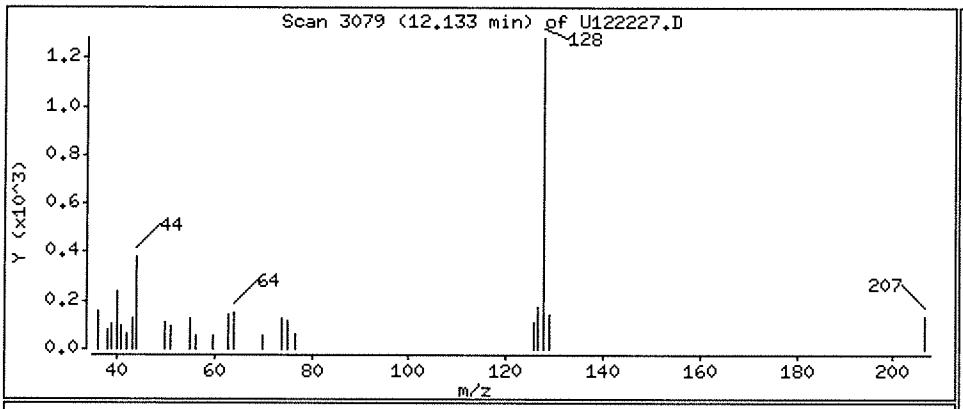
Operator: PC

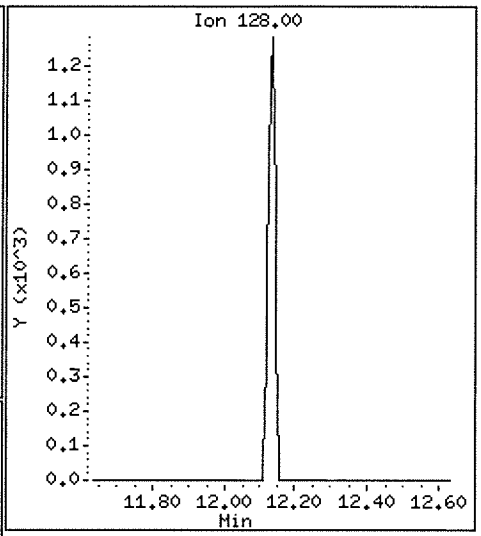
Column phase: DB624

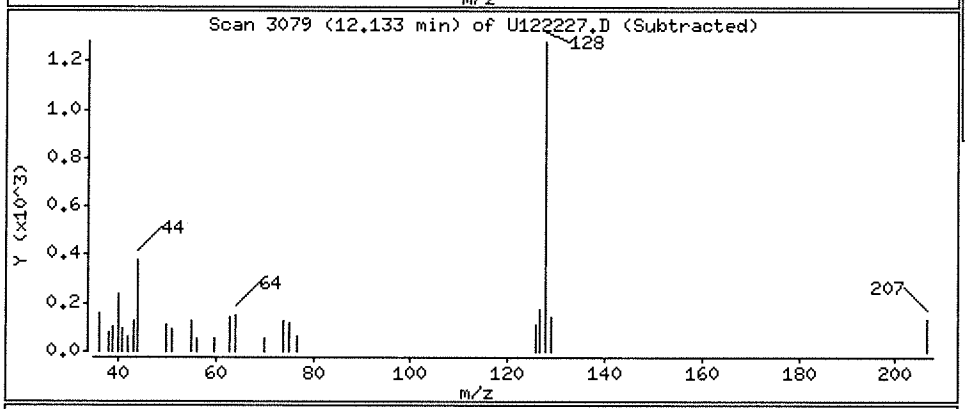
Column diameter: 0.18

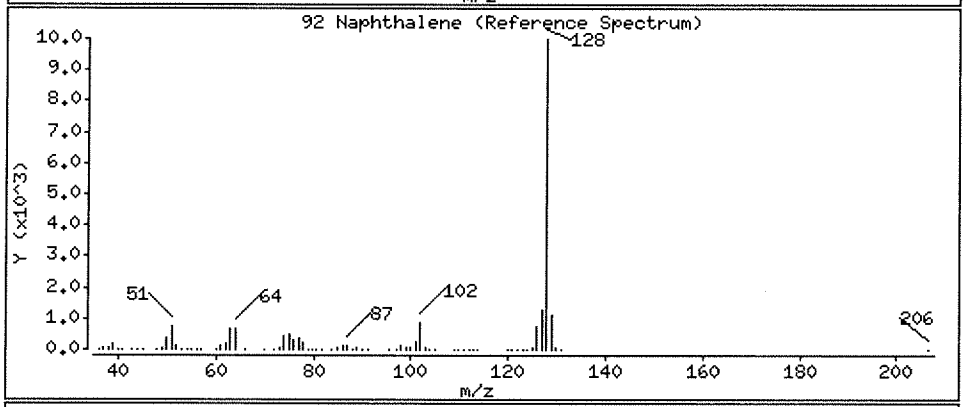
92 Naphthalene

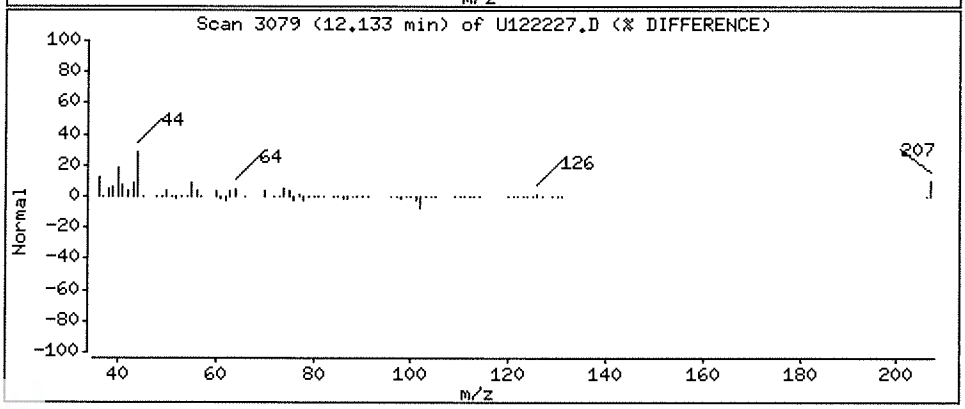
Concentration: 3.83 ug/l











Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122228.D Page 1
Report Date: 28-Jan-2019 13:53

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122228.D
Lab Smp Id: VSTD050-END Client Smp ID: VSTD050-END
Inj Date : 22-DEC-2018 21:47
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050-END;VSTD050-END;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U181222.b\8260C.m
Meth Date : 28-Jan-2019 13:53 VOA9.i Quant Type: ISTD
Cal Date : 21-DEC-2018 16:41 Cal File: U122108.D
Als bottle: 27 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LHAAP.sub
Target Version: 4.14
Processing Host: NAHSTW7087

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

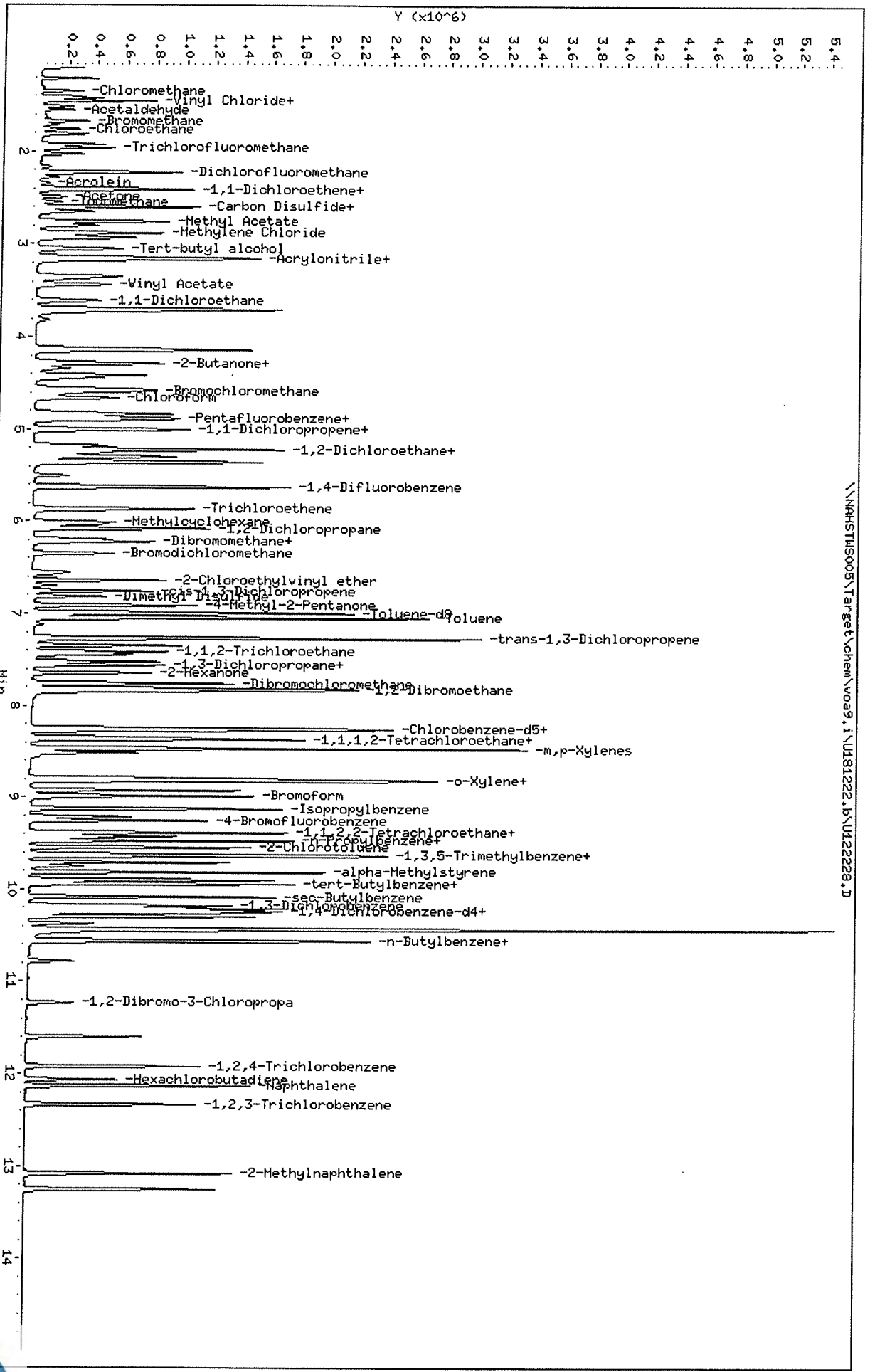
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.898	4.898	(1.000)	416371	50.0000	
* 36 1,4-Difluorobenzene	114	5.629	5.629	(1.000)	780134	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	715426	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.236	10.236	(1.000)	339732	50.0000	
$ 30 Dibromofluoromethane	113	4.834	4.834	(0.987)	237075	50.0000	51.64
$ 35 1,2-Dichloroethane-d4	65	5.179	5.179	(1.057)	309484	50.0000	52.62
$ 48 Toluene-d8	98	6.989	6.989	(0.847)	965100	50.0000	52.32
$ 69 4-Bromofluorobenzene	95	9.257	9.257	(1.122)	364618	50.0000	51.89
60 1,1,1,2-Tetrachloroethane	131	8.350	8.350	(1.012)	219927	50.0000	48.46
31 1,1,1-Trichloroethane	97	4.834	4.834	(0.987)	331166	50.0000	50.37
68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.918)	389319	50.0000	50.88
138 Freon TF	101	2.408	2.408	(0.492)	161787	50.0000	45.70
53 1,1,2-Trichloroethane	83	7.420	7.420	(0.900)	218163	50.0000	51.18
22 1,1-Dichloroethane	63	3.612	3.612	(0.737)	443756	50.0000	49.48
11 1,1-Dichloroethene	96	2.408	2.408	(0.492)	190373	50.0000	48.08
32 1,1-Dichloropropene	75	5.010	5.010	(0.890)	331978	50.0000	47.82
93 1,2,3-Trichlorobenzene	180	12.335	12.335	(1.205)	307435	50.0000	48.04
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	417160	50.0000	52.43
90 1,2,4-Trichlorobenzene	180	11.923	11.923	(1.165)	311238	50.0000	49.48
79 1,2,4-Trimethylbenzene	105	9.943	9.943	(0.971)	898906	50.0000	50.56
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.097)	56973	50.0000	48.34
57 1,2-Dibromoethane	107	7.852	7.852	(0.952)	257294	50.0000	52.40

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122228.D Page 2
Report Date: 28-Jan-2019 13:53

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	492900	50.0000	48.86
33 1,2-Dichloroethane	62	5.257	5.257	(0.934)	362752	50.0000	51.63
42 1,2-Dichloropropane	63	6.082	6.082	(1.081)	273767	50.0000	49.66
75 1,3,5-Trimethylbenzene	105	9.625	9.625	(0.940)	854477	50.0000	50.04
83 1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	488895	50.0000	48.46
54 1,3-Dichloropropane	76	7.567	7.567	(0.917)	469449	50.0000	51.13
84 1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	504246	50.0000	47.40
26 2,2-Dichloropropane	77	4.283	4.283	(0.874)	219604	50.0000	40.63
24 2-Butanone	43	4.343	4.343	(0.887)	288314	100.000	106.02
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	773924	50.0000	49.44
52 2-Hexanone	43	7.649	7.649	(0.927)	442483	100.000	111.22
77 4-Chlorotoluene	91	9.640	9.640	(0.942)	901004	50.0000	49.81
82 p-Isopropyltoluene	119	10.209	10.209	(0.997)	884883	50.0000	49.22
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	617637	100.000	107.90
10 Acetone	43	2.491	2.491	(0.509)	204255	100.000	126.43
37 Benzene	78	5.220	5.220	(0.927)	1031023	50.0000	49.66
74 Bromobenzene	156	9.381	9.381	(0.917)	263528	50.0000	50.20
29 Bromochloromethane	128	4.560	4.560	(0.931)	124861	50.0000	57.65
39 Bromodichloromethane	83	6.348	6.348	(1.128)	305824	50.0000	52.17
66 Bromoform	173	8.984	8.984	(1.089)	145967	50.0000	47.62(T)
6 Bromomethane	94	1.674	1.674	(0.342)	82137	50.0000	32.42
19 Carbon Disulfide	76	2.600	2.600	(0.531)	1403910	100.000	97.32
34 Carbon Tetrachloride	117	4.999	4.999	(0.888)	257630	50.0000	45.53
59 Chlorobenzene	112	8.275	8.275	(1.003)	676298	50.0000	49.19
7 Chloroethane	64	1.760	1.760	(0.359)	176038	50.0000	47.73(M)
28 Chloroform	83	4.661	4.661	(0.952)	431359	50.0000	49.95
3 Chloromethane	50	1.348	1.348	(0.275)	180437	50.0000	41.40
27 cis-1,2-Dichloroethene	96	4.294	4.294	(0.877)	273983	50.0000	50.06
46 cis-1,3-Dichloropropene	75	6.761	6.761	(1.201)	411742	50.0000	46.31
55 Dibromochloromethane	129	7.758	7.758	(0.940)	233359	50.0000	49.64
44 Dibromomethane	93	6.191	6.191	(1.100)	164030	50.0000	51.55
2 Dichlorodifluoromethane	85	1.213	1.213	(0.248)	229811	50.0000	44.90
61 Ethylbenzene	106	8.373	8.373	(1.015)	345442	50.0000	48.99
91 Hexachlorobutadiene	225	12.065	12.065	(1.179)	101233	50.0000	42.00
67 Isopropylbenzene	105	9.126	9.126	(1.106)	1007522	50.0000	49.52
62 m,p-Xylenes	106	8.474	8.474	(1.027)	859119	100.000	99.12
17 Methylene Chloride	84	2.881	2.881	(0.588)	264368	50.0000	51.40
87 n-Butylbenzene	91	10.558	10.558	(1.031)	813354	50.0000	46.88
73 n-Propylbenzene	91	9.475	9.475	(0.926)	1254246	50.0000	49.40
92 Naphthalene	128	12.133	12.133	(1.185)	1038388	50.0000	50.19
63 o-Xylene	106	8.811	8.811	(1.068)	439054	50.0000	50.21
81 sec-Butylbenzene	105	10.086	10.086	(0.985)	1042477	50.0000	48.86
64 Styrene	104	8.826	8.826	(1.070)	768018	50.0000	52.86
78 tert-Butylbenzene	119	9.902	9.902	(0.967)	723133	50.0000	49.00
56 Tetrachloroethene	164	7.525	7.525	(0.912)	168532	50.0000	44.99
50 Toluene	91	7.049	7.049	(0.855)	1067632	50.0000	50.16
20 trans-1,2-Dichloroethene	96	3.151	3.151	(0.643)	239687	50.0000	49.17
51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.290)	352963	50.0000	46.19
38 Trichloroethene	130	5.865	5.865	(1.042)	240967	50.0000	48.08
8 Trichlorofluoromethane	101	1.962	1.962	(0.401)	331792	50.0000	48.36
5 Vinyl Chloride	62	1.426	1.426	(0.291)	272121	50.0000	46.28

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.



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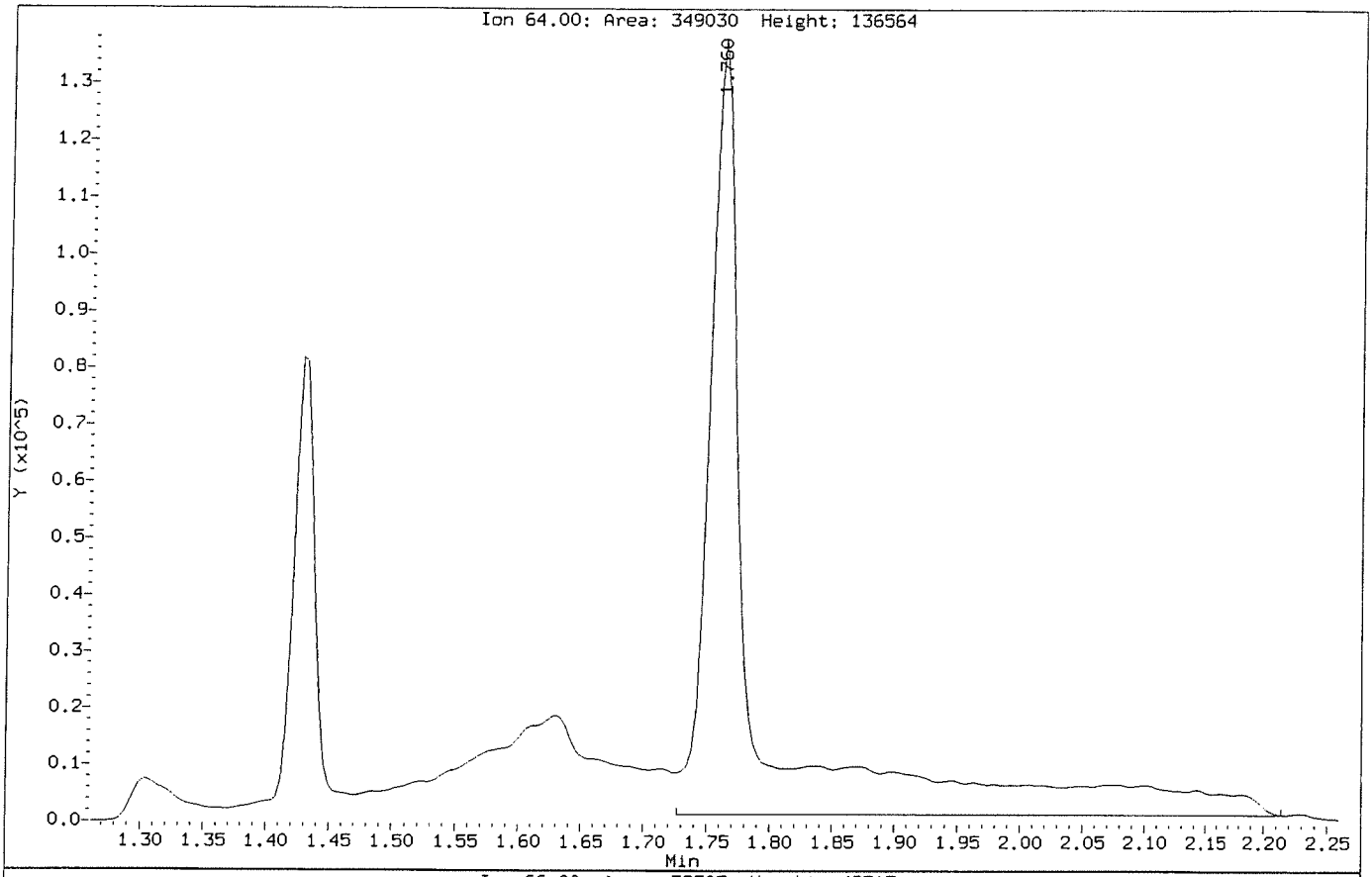
Date : 22-DEC-2018 21:47
Client ID: VSTD050-END
Sample Info: VSTD050-END;VSTD050-END;2;;
Purge Volume: 5.0
Column phase: DB624

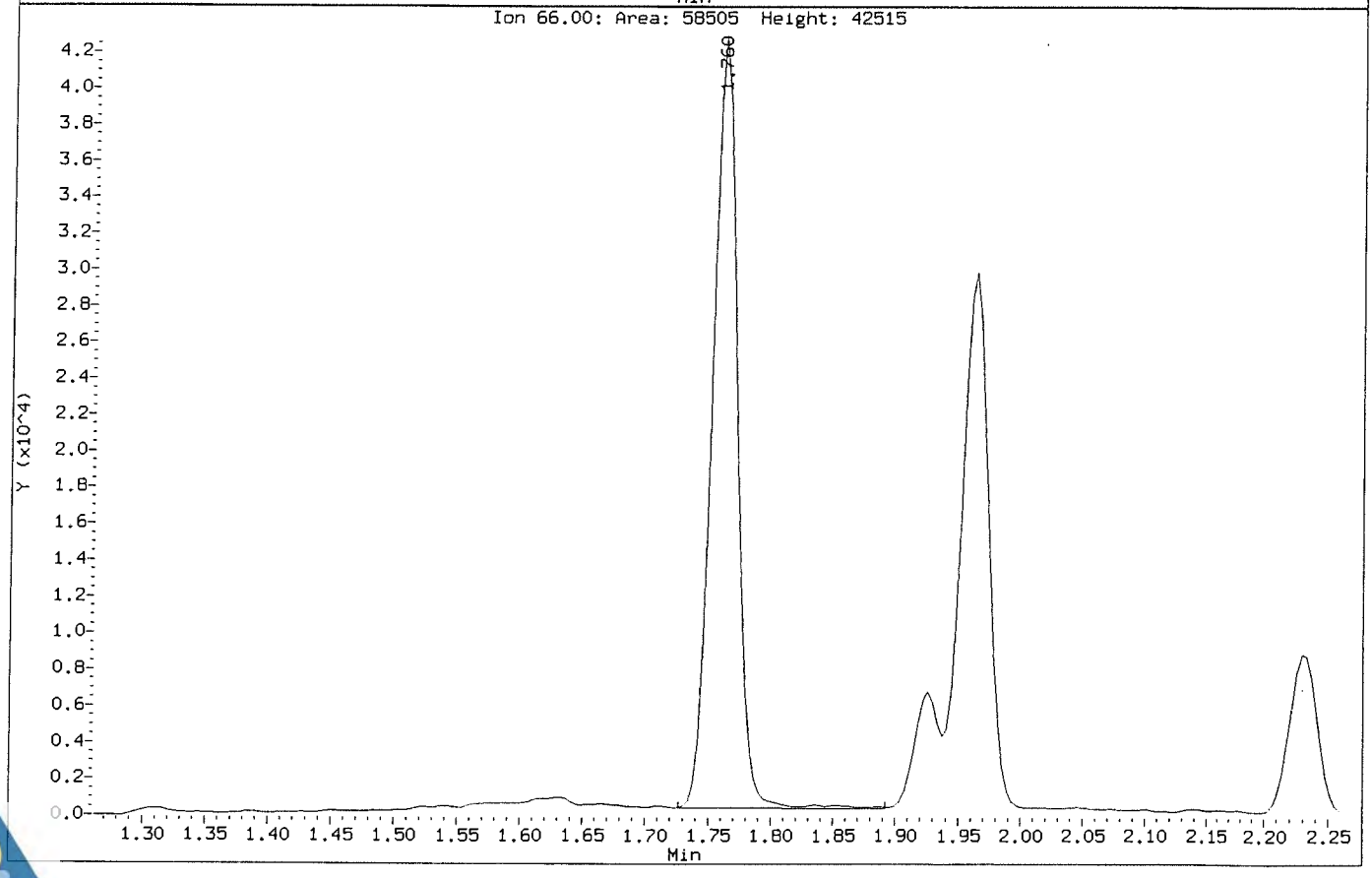
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\NAHSTWS005\Target\chem\voa9.i\U181222.b\U122228.D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U181222.b\Before\U122228.D
Injection Date: 22-DEC-2018 21:47
Instrument: VOA9.i
Client Sample ID: VSTD050-END

Compound: Chloroethane
CAS Number: 75-00-3





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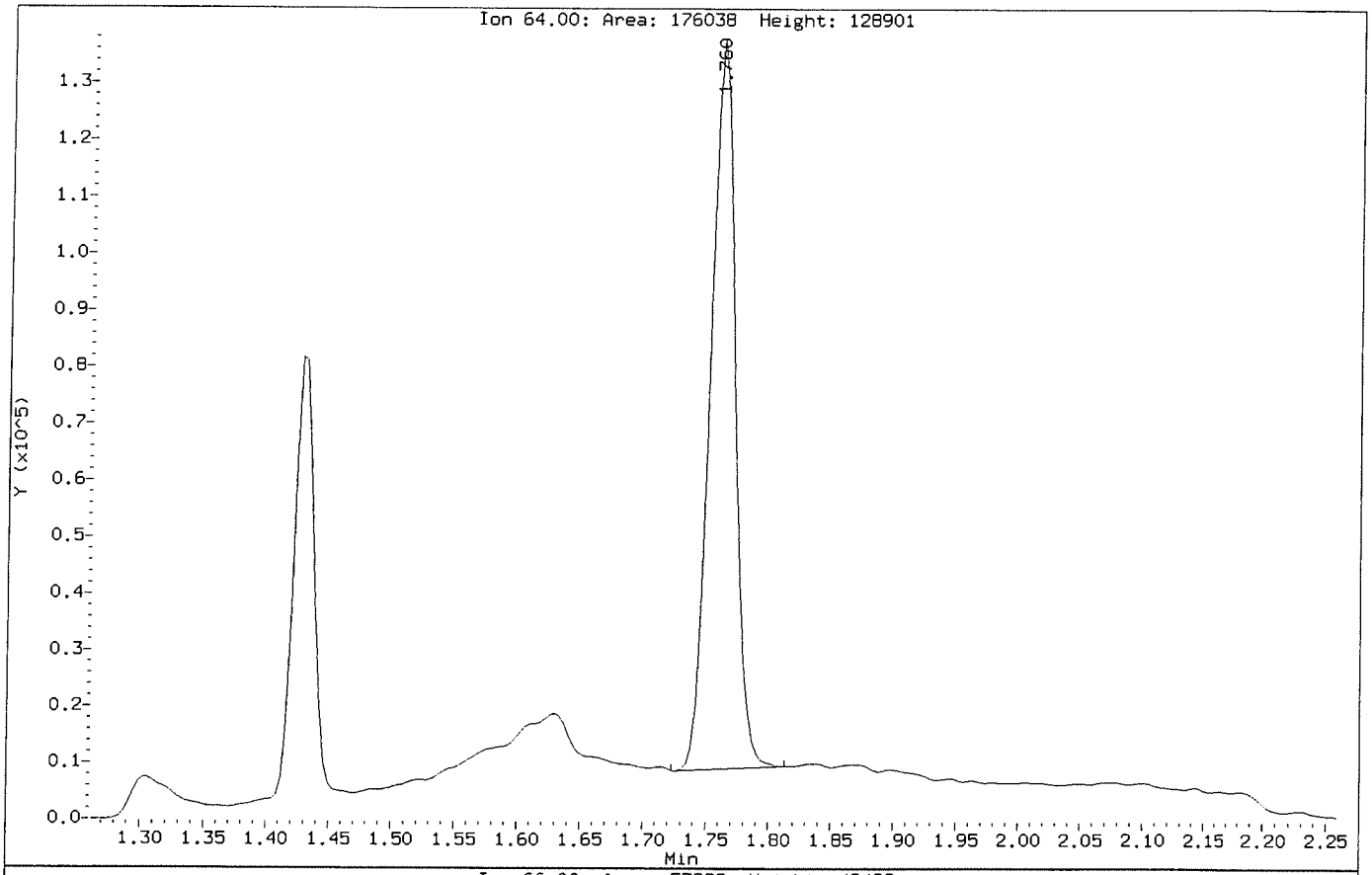
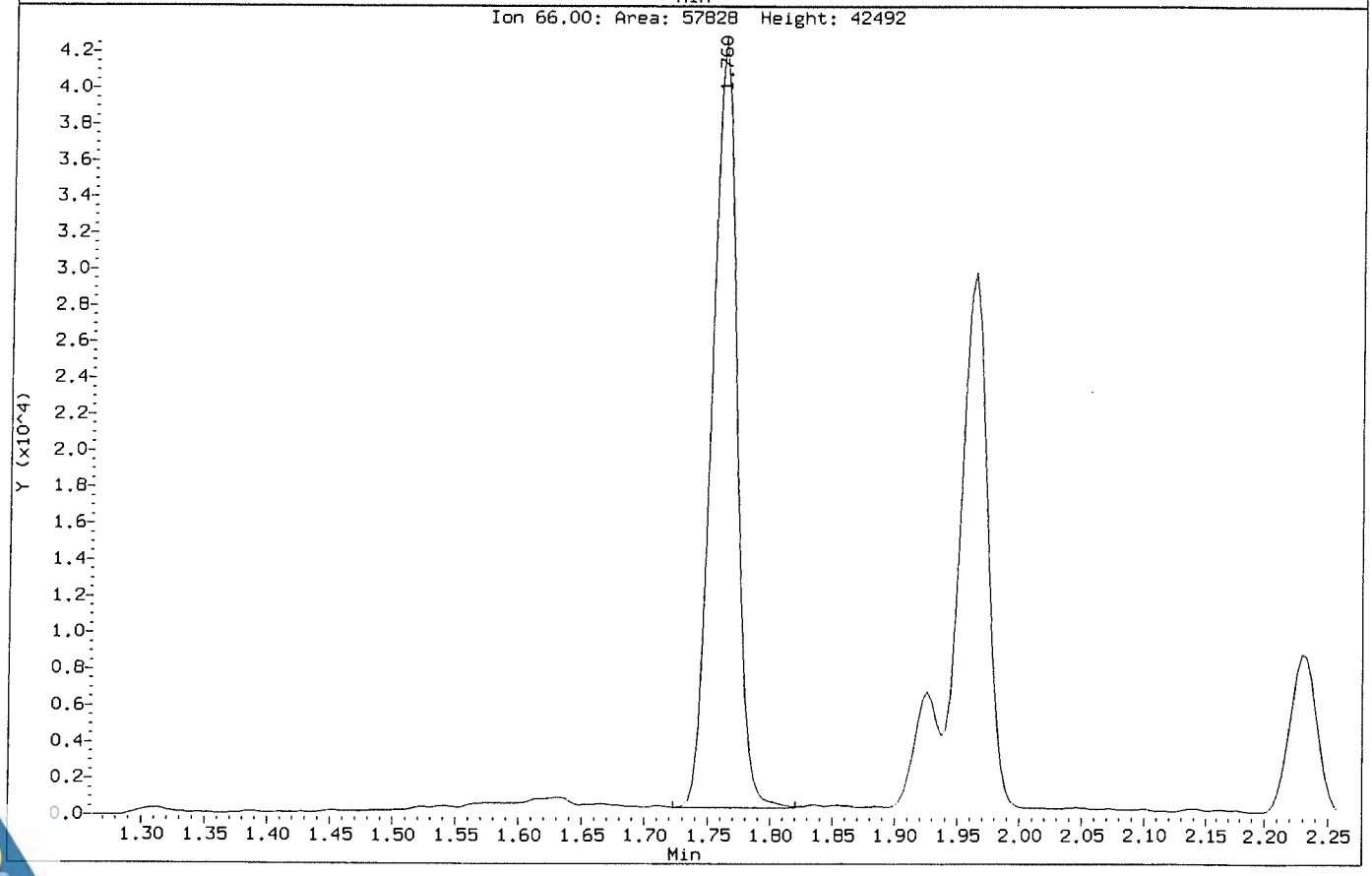
Injection Date: 22-DEC-2018 21:47
Instrument: VOA9.i
Client Sample ID: VSTD050-END

Compound: Chloroethane
CAS Number: 75-00-3





HS18120642 LHAAP58

ALS WO# HS18120642

Form 11 - INTERNAL STANDARD ASSOCIATION

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Instrument:ICPMS04

Mass	Analyte	Assoc Int Standard 1	Assoc Int Standard 2	Mode
9	Beryllium	Lithium		Ar
11	Boron	Lithium		Ar
23	Sodium	Germanium		Ar
24	Magnesium	Germanium		Ar
27	Aluminum	Germanium		Ar
39	Potassium	Germanium		Ar
44	Calcium	Germanium		ArHe
47	Titanium	Germanium		Ar
51	Vanadium	Germanium		ArHe
52	Chromium	Germanium		ArHe
55	Manganese	Germanium		ArHe
56	Iron	Germanium		ArHe
59	Cobalt	Germanium		ArHe
60	Nickel	Germanium		ArHe
63	Copper	Germanium		ArHe
66	Zinc	Germanium		ArHe
75	Arsenic	Germanium		ArHe
78	Selenium	Germanium		ArHe
88	Strontium	Germanium		Ar
95	Molybdenum	Germanium		Ar
105	Palladium	Germanium		Ar
107	Silver	Germanium		Ar
111	Cadmium	Indium		Ar
118	Tin	Germanium		Ar
121	Antimony	Germanium		ArHe
135	Barium	Indium		Ar
203	Thallium	Bismuth		Ar
208	Lead	Bismuth		Ar

Form 11 - INTERNAL STANDARD ASSOCIATION

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Instrument:ICPMS05

Mass	Analyte	Assoc Int Standard 1	Assoc Int Standard 2	Mode
9	Beryllium	Lithium		Ar
11	Boron	Lithium		Ar
23	Sodium	Germanium		Ar
24	Magnesium	Germanium		Ar
27	Aluminum	Germanium		Ar
39	Potassium	Germanium		Ar
44	Calcium	Germanium		Ar
47	Titanium	Germanium		Ar
51	Vanadium	Germanium		ArHe
52	Chromium	Germanium		ArHe
55	Manganese	Germanium		ArHe
56	Iron	Germanium		ArHe
59	Cobalt	Germanium		ArHe
60	Nickel	Germanium		ArHe
63	Copper	Germanium		ArHe
66	Zinc	Germanium		ArHe
75	Arsenic	Germanium		ArHe
78	Selenium	Germanium		ArHe
88	Strontium	Germanium		Ar
95	Molybdenum	Germanium		Ar
105	Palladium	Germanium		Ar
107	Silver	Germanium		Ar
114	Cadmium	Indium		Ar
118	Tin	Germanium		Ar
121	Antimony	Germanium		ArHe
137	Barium	Indium		Ar
205	Thallium	Bismuth		Ar
208	Lead	Bismuth		Ar

FORM 12 - PREPARATION LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642
Start Date: 19-Dec-2018 13:00 End Date: 19-Dec-2018 17:00

Batch ID: 135804
Prep Code: 3010A
Method: SW3010A
Technician:

SampID	ClientID	Matrix	Init Wt	Init Vol	FinalVol (mL)	PrepFac
HS18120642-01	35AWW06_121118	Groundwater		10	10	1
HS18120642-02	35AWW11_121118	Groundwater		10	10	1
HS18120642-03	35AWW09_121118	Groundwater		10	10	1
HS18120913-04MS				10	10	1
HS18120913-04MSD				10	10	1
HS18120913-04PDS				10	10	1
HS18120913-04SD				10	10	1
LCS-135804				10	10	1
MBLK-135804				10	10	1

ALS Houston, US

Date: 09-Jan-19

FORM 12 - PREPARATION LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642
Start Date: 19-Dec-2018 13:00 End Date: 19-Dec-2018 17:00

Batch ID: 135805
Prep Code: 3010A Diss
Method: SW3010A
Technician:

SampID	ClientID	Matrix	Init Wt	Init Vol	FinalVol (mL)	PrepFac
HS18120642-01	35AWW06_121118	Groundwater		10	10	1
HS18120642-02	35AWW11_121118	Groundwater		10	10	1
HS18120642-03	35AWW09_121118	Groundwater		10	10	1
HS18120927-08MS				10	10	1
HS18120927-08MSD				10	10	1
HS18120927-08PDS				10	10	1
HS18120927-08SD				10	10	1
LCS-135805				10	10	1
MBLK-135805				10	10	1

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642
Start Date: 21-Dec-2018 End Date: 22-Dec-2018

Run ID:ICPMS04_329719
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
CAL BLK	1	21-Dec-2018 12:57	014CALB.d_4877193	FE MN
2/10/200	1	21-Dec-2018 12:59	015CALS.d_4877194	FE MN
5/25/500	1	21-Dec-2018 13:01	016CALS.d_4877195	FE MN
10/50/1000	1	21-Dec-2018 13:03	017CALS.d_4877196	FE MN
100/500/10K	1	21-Dec-2018 13:06	018CALS.d_4877197	FE MN
200/1000/20K	1	21-Dec-2018 13:08	019CALS.d_4877198	FE MN
ICV	1	21-Dec-2018 13:12	021_ICV.d_4877200	FE MN
LLICV2	1	21-Dec-2018 13:14	022SMPL.d_4877201	FE MN
LLICV5	1	21-Dec-2018 13:17	023LICV.d_4877202	FE MN
ICB	1	21-Dec-2018 13:19	024_ICB.d_4877203	FE MN
ICSA	1	21-Dec-2018 13:36	025ICSA.d_4877204	FE MN
ICSAB	1	21-Dec-2018 13:38	026ICSB.d_4877205	FE MN
CCV 1	1	21-Dec-2018 14:07	038_CCV.d_4877419	FE MN
CCB 1	1	21-Dec-2018 14:09	039_CCB.d_4877420	FE MN
CCB 2	1	21-Dec-2018 14:47	051_CCB.d_4877517	FE MN
CCV 2	1	21-Dec-2018 15:12	053_CCV.d_4877562	FE MN
CCB 3	1	21-Dec-2018 15:45	064_CCB.d_4877606	FE MN
CCV 3	1	21-Dec-2018 15:57	066_CCV.d_4877806	FE MN
CCV 4	1	21-Dec-2018 16:59	076_CCV.d_4877824	FE MN
CCB 4	1	21-Dec-2018 17:01	077_CCB.d_4877825	FE MN
CCV 5	1	21-Dec-2018 17:32	088_CCV.d_4877944	FE MN
CCB 5	1	21-Dec-2018 17:34	089_CCB.d_4877945	FE MN
CCV 6	1	21-Dec-2018 18:09	093_CCV.d_4878002	FE MN
CCB 6	1	21-Dec-2018 18:11	094_CCB.d_4878003	FE MN
CCV 7	1	21-Dec-2018 18:44	105_CCV.d_4878027	FE MN
CCB 7	1	21-Dec-2018 18:46	106_CCB.d_4878028	FE MN
CCV 8	1	21-Dec-2018 19:16	117_CCV.d_4878173	FE MN
CCB 8	1	21-Dec-2018 19:18	118_CCB.d_4878174	FE MN
CCV 9	1	21-Dec-2018 19:51	129_CCV.d_4878188	FE MN
CCB 9	1	21-Dec-2018 19:53	130_CCB.d_4878189	FE MN
CCV 10	1	21-Dec-2018 20:23	141_CCV.d_4878292	FE MN
CCB 10	1	21-Dec-2018 20:25	142_CCB.d_4878293	FE MN
CCV 11	1	21-Dec-2018 20:40	148_CCV.d_4878299	FE MN
CCB 11	1	21-Dec-2018 20:42	149_CCB.d_4878300	FE MN
MBLK-135804	1	21-Dec-2018 21:07	151SMPL.d_4879116	FE MN
LCS-135804	1	21-Dec-2018 21:10	152SMPL.d_4879117	FE MN
35AWW06_121118	1	21-Dec-2018 21:23	158SMPL.d_4879123	FE
CCV 12	1	21-Dec-2018 21:28	160_CCV.d_4879125	FE MN
CCB 12	1	21-Dec-2018 21:30	161_CCB.d_4879126	FE MN
35AWW11_121118	1	21-Dec-2018 21:32	162SMPL.d_4879127	FE
35AWW09_121118	1	21-Dec-2018 21:34	163SMPL.d_4879128	FE MN
CCV 13	1	21-Dec-2018 21:55	172_CCV.d_4879137	FE MN
CCB 13	1	21-Dec-2018 21:57	173_CCB.d_4879138	FE MN
ZZZZZZSD	5	21-Dec-2018 22:10	176SMPL.d_4879141	FE MN
ZZZZZZMS	1	21-Dec-2018 22:12	177SMPL.d_4879142	FE MN
ZZZZZZMSD	1	21-Dec-2018 22:14	178SMPL.d_4879143	FE MN
ZZZZZZPDS	1	21-Dec-2018 22:17	179SMPL.d_4879144	FE MN
CCV 14	1	21-Dec-2018 22:21	181_CCV.d_4879146	FE MN
CCB 14	1	21-Dec-2018 22:23	182_CCB.d_4879147	FE MN
CAL BLK	1	21-Dec-2018 22:57	193CALB.d_4879261	FE MN
2/10/200	1	21-Dec-2018 22:59	194CALS.d_4879262	FE MN

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642
Start Date: 21-Dec-2018 End Date: 22-Dec-2018

Run ID:ICPMS04_329719
Instrument:ICPMS04
Method:SW6020

Sample No.	D/F	Time	FileID	Analytes
5/25/500	1	21-Dec-2018 23:01	195CALS.d_4879263	FE MN
10/50/1000	1	21-Dec-2018 23:03	196CALS.d_4879264	FE MN
100/500/10K	1	21-Dec-2018 23:06	197CALS.d_4879265	FE MN
200/1000/20K	1	21-Dec-2018 23:08	198CALS.d_4879269	FE MN
ICCV 15	1	21-Dec-2018 23:12	200_ICV.d_4879271	FE MN
LLCCV2	1	21-Dec-2018 23:15	201SMPL.d_4879272	FE MN
LLCCV5	1	21-Dec-2018 23:17	202LICV.d_4879273	FE MN
ICCB 15	1	21-Dec-2018 23:19	203_ICB.d_4879274	FE MN
MBLK-135805	1	21-Dec-2018 23:24	205SMPL.d_4879287	FE MN
LCS-135805	1	21-Dec-2018 23:26	206SMPL.d_4879288	FE MN
35AWW06_121118	1	21-Dec-2018 23:39	212SMPL.d_4879294	FE
CCV 16	1	21-Dec-2018 23:42	213_CCV.d_4879295	FE MN
CCB 16	1	21-Dec-2018 23:44	214_CCB.d_4879296	FE MN
35AWW11_121118	1	21-Dec-2018 23:46	215SMPL.d_4879297	FE
35AWW09_121118	1	21-Dec-2018 23:49	216SMPL.d_4879298	FE MN
CCV 17	1	22-Dec-2018 00:02	222_CCV.d_4879304	FE MN
CCB 17	1	22-Dec-2018 00:04	223_CCB.d_4879305	FE MN
CCV 18	1	22-Dec-2018 00:36	231_CCV.d_4879319	FE MN
CCB 18	1	22-Dec-2018 00:38	232_CCB.d_4879320	FE MN
ZZZZZZSD	50	22-Dec-2018 00:43	234SMPL.d_4879322	FE MN
ZZZZZZMS	10	22-Dec-2018 00:45	235SMPL.d_4879323	FE MN
ZZZZZZMSD	10	22-Dec-2018 00:47	236SMPL.d_4879324	FE MN
ZZZZZZPDS	10	22-Dec-2018 00:50	237SMPL.d_4879325	FE MN
CCV 19	1	22-Dec-2018 00:56	240_CCV.d_4879328	FE MN
CCB 19	1	22-Dec-2018 00:59	241_CCB.d_4879329	FE MN
LLICV2	1	22-Dec-2018 01:01	242SMPL.d_4879330	FE MN
LLICV5	1	22-Dec-2018 01:03	243LICV.d_4879331	FE MN
ICSA	1	22-Dec-2018 01:05	244ICSA.d_4879332	FE MN
ICSAB	1	22-Dec-2018 01:08	245ICSB.d_4879333	FE MN

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642
Start Date: 24-Dec-2018 End Date: 25-Dec-2018

Run ID:ICPMS05_329812
Instrument:ICPMS05
Method:

Sample No.	D/F	Time	FileID	Analytes
ICPMS05_329812_Tune	1	24-Dec-2018 00:00	ICPMS05_329812_Tune_1	
CAL BLK	1	24-Dec-2018 11:33	013CALB.d_4879781	MN
2/10/200	1	24-Dec-2018 11:35	014CALS.d_4879782	MN
5/25/500	1	24-Dec-2018 11:37	015CALS.d_4879783	MN
10/50/1000	1	24-Dec-2018 11:39	016CALS.d_4879784	MN
100/500/10K	1	24-Dec-2018 11:41	017CALS.d_4879785	MN
200/1000/20K	1	24-Dec-2018 11:43	018CALS.d_4879786	MN
LLICV2	1	24-Dec-2018 11:49	021SMPL.d_4879789	MN
LLICV5	1	24-Dec-2018 11:51	022LICV.d_4879790	MN
ICB	1	24-Dec-2018 11:53	023_ICB.d_4879791	FE MN
ICV	1	24-Dec-2018 12:13	025_ICV.d_4879793	FE MN
ICSA	1	24-Dec-2018 12:27	026ICSA.d_4879794	MN
ICSAB	1	24-Dec-2018 12:29	027ICSB.d_4879795	MN
CCV 1	1	24-Dec-2018 13:12	039_CCV.d_4879947	FE MN
CCB 1	1	24-Dec-2018 13:14	040_CCB.d_4879948	FE MN
35AWW06_121118	100	24-Dec-2018 13:34	047SMPL.d_4880206	MN
35AWW11_121118	50	24-Dec-2018 13:36	048SMPL.d_4880207	MN
CCV 2	1	24-Dec-2018 13:42	051_CCV.d_4880210	FE MN
CCB 2	1	24-Dec-2018 13:44	052_CCB.d_4880211	FE MN
CCV 3	1	24-Dec-2018 13:46	053_CCV.d_4880212	FE MN
CCB 3	1	24-Dec-2018 13:48	054_CCB.d_4880213	FE MN
35AWW06_121118	100	24-Dec-2018 13:58	059SMPL.d_4880260	MN
35AWW11_121118	50	24-Dec-2018 14:00	060SMPL.d_4880261	MN
CCV 4	1	24-Dec-2018 14:10	065_CCV.d_4880266	FE MN
CCB 4	1	24-Dec-2018 14:12	066_CCB.d_4880267	FE MN
CCV 5	1	24-Dec-2018 14:20	070_CCV.d_4880594	FE MN
CCB 5	1	24-Dec-2018 14:22	071_CCB.d_4880595	FE MN
CCB 6	1	24-Dec-2018 17:00	083_CCB.d_4880607	FE MN
CCV 6	1	24-Dec-2018 17:05	084_CCV.d_4880608	FE MN
CCB 7	1	24-Dec-2018 17:24	092_CCB.d_4880616	FE MN
CCV 7	1	24-Dec-2018 17:32	094_CCV.d_4880618	FE MN
CCV 8	1	24-Dec-2018 17:50	103_CCV.d_4880669	FE MN
CCB 8	1	24-Dec-2018 17:52	104_CCB.d_4880670	FE MN
CCV 9	1	24-Dec-2018 18:33	113_CCV.d_4880729	FE MN
CCB 9	1	24-Dec-2018 18:35	114_CCB.d_4880730	FE MN
CCV 10	1	24-Dec-2018 18:49	118_CCV.d_4880734	FE MN
CCB 10	1	24-Dec-2018 18:51	119_CCB.d_4880735	FE MN
CAL BLK	1	24-Dec-2018 18:59	123CALB.d_4881006	MN
2/10/200	1	24-Dec-2018 19:01	124CALS.d_4881007	MN
5/25/500	1	24-Dec-2018 19:03	125CALS.d_4881008	MN
10/50/1000	1	24-Dec-2018 19:05	126CALS.d_4881009	MN
100/500/10K	1	24-Dec-2018 19:07	127CALS.d_4881010	MN
200/1000/20K	1	24-Dec-2018 19:09	128CALS.d_4881011	MN
ICCV 11	1	24-Dec-2018 19:11	129_ICV.d_4881012	FE MN
LLCCV5	1	24-Dec-2018 19:15	131LICV.d_4881014	MN
ICCB 11	1	24-Dec-2018 19:17	132_ICB.d_4881015	FE MN
LLCCV2	1	24-Dec-2018 19:19	133SMPL.d_4881016	MN
CCB 12	1	24-Dec-2018 19:33	138_CCB.d_4881048	FE MN
CCV 12	1	24-Dec-2018 19:41	141_CCV.d_4881051	FE MN
CCV 13	1	24-Dec-2018 19:53	147_CCV.d_4881057	FE MN
CCB 13	1	24-Dec-2018 19:55	148_CCB.d_4881058	FE MN

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642
Start Date: 24-Dec-2018 End Date: 25-Dec-2018

Run ID:ICPMS05_329812
Instrument:ICPMS05
Method:

Sample No.	D/F	Time	FileID	Analytes
CCV 14	1	24-Dec-2018 20:17	159_CCV.d_4881069	FE MN
CCB 14	1	24-Dec-2018 20:19	160_CCB.d_4881070	FE MN
CCV 15	1	24-Dec-2018 20:34	168_CCV.d_4881078	FE MN
CCB 15	1	24-Dec-2018 20:36	169_CCB.d_4881079	FE MN
CCV 16	1	24-Dec-2018 20:54	178_CCV.d_4881088	FE MN
CCB 16	1	24-Dec-2018 20:56	179_CCB.d_4881089	FE MN
CCV 17	1	24-Dec-2018 21:18	190_CCV.d_4881167	FE MN
CCB 17	1	24-Dec-2018 21:20	191_CCB.d_4881168	FE MN
CCV 18	1	24-Dec-2018 21:36	199_CCV.d_4881176	FE MN
CCB 18	1	24-Dec-2018 21:38	200_CCB.d_4881177	FE MN
CCV 19	1	24-Dec-2018 22:00	211_CCV.d_4881188	FE MN
CCB 19	1	24-Dec-2018 22:02	212_CCB.d_4881189	FE MN
CCV 20	1	24-Dec-2018 22:23	223_CCV.d_4881200	FE MN
CCB 20	1	24-Dec-2018 22:25	224_CCB.d_4881201	FE MN
CAL BLK	1	24-Dec-2018 22:39	231CALB.d_4881324	MN
2/10/200	1	24-Dec-2018 22:41	232CALS.d_4881325	MN
5/25/500	1	24-Dec-2018 22:43	233CALS.d_4881326	MN
10/50/1000	1	24-Dec-2018 22:45	234CALS.d_4881327	MN
100/500/10K	1	24-Dec-2018 22:47	235CALS.d_4881328	MN
200/1000/20K	1	24-Dec-2018 22:49	236CALS.d_4881329	MN
ICCV 21	1	24-Dec-2018 22:51	237_ICV.d_4881330	FE MN
LLCCV2	1	24-Dec-2018 22:53	238SMPL.d_4881331	MN
LLCCV5	1	24-Dec-2018 22:55	239LICV.d_4881332	MN
ICCB 21	1	24-Dec-2018 22:57	240_ICB.d_4881333	FE MN
CCV 22	1	24-Dec-2018 23:21	252_CCV.d_4881399	FE MN
CCB 22	1	24-Dec-2018 23:23	253_CCB.d_4881400	FE MN
CCV 23	1	24-Dec-2018 23:45	264_CCV.d_4881411	FE MN
CCB 23	1	24-Dec-2018 23:47	265_CCB.d_4881412	FE MN
CCV 24	1	24-Dec-2018 23:53	268_CCV.d_4881415	FE MN
CCB 24	1	24-Dec-2018 23:55	269_CCB.d_4881416	FE MN
LLCCV5	1	24-Dec-2018 23:57	270LICV.d_4881417	MN
LLCCV2	1	24-Dec-2018 23:59	271SMPL.d_4881418	MN
ICSA	1	25-Dec-2018 00:01	272ICSA.d_4881419	MN
ICSAB	1	25-Dec-2018 00:03	273ICSB.d_4881420	MN

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

ICV	Date: 21-Dec-2018 13:12		Seq: 4877200	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10574.02	106	90-110	
Manganese	100	103.623	104	90-110	

CCV1	Date: 21-Dec-2018 14:07		Seq: 4877419	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10839.127	108	90-110	
Manganese	100	103.031	103	90-110	

CCV2	Date: 21-Dec-2018 15:12		Seq: 4877562	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10556.643	106	90-110	
Manganese	100	103.792	104	90-110	

CCV3	Date: 21-Dec-2018 15:57		Seq: 4877806	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10257.711	103	90-110	
Manganese	100	101.308	101	90-110	

CCV4	Date: 21-Dec-2018 16:59		Seq: 4877824	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10046.499	100	90-110	
Manganese	100	96.481	97	90-110	

CCV5	Date: 21-Dec-2018 17:32		Seq: 4877944	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9882.79	99	90-110	
Manganese	100	95.811	96	90-110	

CCV6	Date: 21-Dec-2018 18:09		Seq: 4878002	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10409.029	104	90-110	
Manganese	100	96.201	96	90-110	

CCV7	Date: 21-Dec-2018 18:44		Seq: 4878027	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10070.795	101	90-110	
Manganese	100	100.473	100	90-110	

CCV8	Date: 21-Dec-2018 19:16		Seq: 4878173	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10124.033	101	90-110	
Manganese	100	94.326	94	90-110	

CCV9	Date: 21-Dec-2018 19:51		Seq: 4878188	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10071.437	101	90-110	
Manganese	100	99.427	99	90-110	

CCV10	Date: 21-Dec-2018 20:23		Seq: 4878292	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9853.148	99	90-110	
Manganese	100	94.9	95	90-110	

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

CCV11	Date: 21-Dec-2018 20:40		Seq: 4878299	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10376.441	104	90-110	
Manganese	100	92.065	92	90-110	

CCV12	Date: 21-Dec-2018 21:28		Seq: 4879125	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10422.832	104	90-110	
Manganese	100	98.617	99	90-110	

CCV13	Date: 21-Dec-2018 21:55		Seq: 4879137	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9696.836	97	90-110	
Manganese	100	93.952	94	90-110	

CCV14	Date: 21-Dec-2018 22:21		Seq: 4879146	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9974.439	100	90-110	
Manganese	100	94.062	94	90-110	

ICCV15	Date: 21-Dec-2018 23:12		Seq: 4879271	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9759.1	98	90-110	
Manganese	100	103.783	104	90-110	

CCV16	Date: 21-Dec-2018 23:42		Seq: 4879295	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	10276.043	103	90-110	
Manganese	100	97.859	98	90-110	

CCV17	Date: 22-Dec-2018 00:02		Seq: 4879304	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9312.665	93	90-110	
Manganese	100	102.304	102	90-110	

CCV18	Date: 22-Dec-2018 00:36		Seq: 4879319	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9837.847	98	90-110	
Manganese	100	100.804	101	90-110	

CCV19	Date: 22-Dec-2018 00:56		Seq: 4879328	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Iron	10000	9418.586	94	90-110	
Manganese	100	98.991	99	90-110	

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

ICV	Date: 24-Dec-2018 12:13		Seq: 4879793	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.824	100	90-110	

CCV1	Date: 24-Dec-2018 13:12		Seq: 4879947	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	93.055	93	90-110	

CCV2	Date: 24-Dec-2018 13:42		Seq: 4880210	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	94.979	95	90-110	

CCV3	Date: 24-Dec-2018 13:46		Seq: 4880212	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	93.043	93	90-110	

CCV4	Date: 24-Dec-2018 14:10		Seq: 4880266	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	94.844	95	90-110	

CCV5	Date: 24-Dec-2018 14:20		Seq: 4880594	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	93.871	94	90-110	

CCV6	Date: 24-Dec-2018 17:05		Seq: 4880608	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.304	98	90-110	

CCV7	Date: 24-Dec-2018 17:32		Seq: 4880618	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.278	98	90-110	

CCV8	Date: 24-Dec-2018 17:50		Seq: 4880669	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.614	99	90-110	

CCV9	Date: 24-Dec-2018 18:33		Seq: 4880729	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	97.733	98	90-110	

CCV10	Date: 24-Dec-2018 18:49		Seq: 4880734	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	96.382	96	90-110	

ICCV11	Date: 24-Dec-2018 19:11		Seq: 4881012	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.04	99	90-110	

CCV12	Date: 24-Dec-2018 19:41		Seq: 4881051	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	102.015	102	90-110	

CCV13	Date: 24-Dec-2018 19:53		Seq: 4881057	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.325	99	90-110	

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

CCV14	Date: 24-Dec-2018 20:17		Seq: 4881069	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	101.031	101	90-110	

CCV15	Date: 24-Dec-2018 20:34		Seq: 4881078	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	101.139	101	90-110	

CCV16	Date: 24-Dec-2018 20:54		Seq: 4881088	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.897	100	90-110	

CCV17	Date: 24-Dec-2018 21:18		Seq: 4881167	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.277	98	90-110	

CCV18	Date: 24-Dec-2018 21:36		Seq: 4881176	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.544	99	90-110	

CCV19	Date: 24-Dec-2018 22:00		Seq: 4881188	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	98.793	99	90-110	

CCV20	Date: 24-Dec-2018 22:23		Seq: 4881200	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	97.133	97	90-110	

ICCV21	Date: 24-Dec-2018 22:51		Seq: 4881330	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	96.404	96	90-110	

CCV22	Date: 24-Dec-2018 23:21		Seq: 4881399	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.414	99	90-110	

CCV23	Date: 24-Dec-2018 23:45		Seq: 4881411	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	99.399	99	90-110	

CCV24	Date: 24-Dec-2018 23:53		Seq: 4881415	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Manganese	100	100.691	101	90-110	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

ICB	Date: 21-Dec-2018 13:19		Seq: 4877203	ICB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB1	Date: 21-Dec-2018 14:09		Seq: 4877420	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB2	Date: 21-Dec-2018 14:47		Seq: 4877517	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB3	Date: 21-Dec-2018 15:45		Seq: 4877606	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB4	Date: 21-Dec-2018 17:01		Seq: 4877825	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB5	Date: 21-Dec-2018 17:34		Seq: 4877945	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB6	Date: 21-Dec-2018 18:11		Seq: 4878003	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB7	Date: 21-Dec-2018 18:46		Seq: 4878028	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	0.884	0.7	5	J	

CCB8	Date: 21-Dec-2018 19:18		Seq: 4878174	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB9	Date: 21-Dec-2018 19:53		Seq: 4878189	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB10	Date: 21-Dec-2018 20:25		Seq: 4878293	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	

CCB11	Date: 21-Dec-2018 20:42		Seq: 4878300	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

CCB11	Date: 21-Dec-2018 20:42		Seq: 4878300	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	
MBLK-135804	Date: 21-Dec-2018 21:07		Seq: 4879116	MBLK	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB12	Date: 21-Dec-2018 21:30		Seq: 4879126	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB13	Date: 21-Dec-2018 21:57		Seq: 4879138	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB14	Date: 21-Dec-2018 22:23		Seq: 4879147	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
ICCB15	Date: 21-Dec-2018 23:19		Seq: 4879274	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
MBLK-135805	Date: 21-Dec-2018 23:24		Seq: 4879287	MBLK	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	200	12	200	U	
Manganese	5	0.7	5	U	
CCB16	Date: 21-Dec-2018 23:44		Seq: 4879296	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	23.09	12	200	J	
Manganese	5	0.7	5	U	
CCB17	Date: 22-Dec-2018 00:04		Seq: 4879305	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	12.66	12	200	J	
Manganese	5	0.7	5	U	
CCB18	Date: 22-Dec-2018 00:38		Seq: 4879320	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	25.87	12	200	J	
Manganese	5	0.7	5	U	
CCB19	Date: 22-Dec-2018 00:59		Seq: 4879329	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Iron	17.81	12	200	J	
Manganese	5	0.7	5	U	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

ICB	Date: 24-Dec-2018 11:53		Seq: 4879791	ICB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB1	Date: 24-Dec-2018 13:14		Seq: 4879948	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB2	Date: 24-Dec-2018 13:44		Seq: 4880211	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB3	Date: 24-Dec-2018 13:48		Seq: 4880213	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB4	Date: 24-Dec-2018 14:12		Seq: 4880267	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB5	Date: 24-Dec-2018 14:22		Seq: 4880595	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB6	Date: 24-Dec-2018 17:00		Seq: 4880607	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB7	Date: 24-Dec-2018 17:24		Seq: 4880616	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB8	Date: 24-Dec-2018 17:52		Seq: 4880670	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB9	Date: 24-Dec-2018 18:35		Seq: 4880730	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB10	Date: 24-Dec-2018 18:51		Seq: 4880735	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

ICCB11	Date: 24-Dec-2018 19:17		Seq: 4881015	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB12	Date: 24-Dec-2018 19:33		Seq: 4881048	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.853	0.7	5	J	

CCB13	Date: 24-Dec-2018 19:55		Seq: 4881058	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.84	0.7	5	J	

CCB14	Date: 24-Dec-2018 20:19		Seq: 4881070	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.761	0.7	5	J	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

CCB15	Date: 24-Dec-2018 20:36		Seq: 4881079	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.884	0.7	5	J	

CCB16	Date: 24-Dec-2018 20:56		Seq: 4881089	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.829	0.7	5	J	

CCB17	Date: 24-Dec-2018 21:20		Seq: 4881168	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.804	0.7	5	J	

CCB18	Date: 24-Dec-2018 21:38		Seq: 4881177	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.909	0.7	5	J	

CCB19	Date: 24-Dec-2018 22:02		Seq: 4881189	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.897	0.7	5	J	

CCB20	Date: 24-Dec-2018 22:25		Seq: 4881201	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.803	0.7	5	J	

ICCB21	Date: 24-Dec-2018 22:57		Seq: 4881333	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	5	0.7	5	U	

CCB22	Date: 24-Dec-2018 23:23		Seq: 4881400	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	0.956	0.7	5	J	

CCB23	Date: 24-Dec-2018 23:47		Seq: 4881412	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	1.068	0.7	5	J	

CCB24	Date: 24-Dec-2018 23:55		Seq: 4881416	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Manganese	1.056	0.7	5	J	

Form 4 - ICP Interference Check Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS04_329719
Instrument: ICPMS04
Method: SW6020

ICSA	Date: 21-Dec-2018 13:36	Seq: 4877204	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	100000	106000	106	
Manganese		0.99	0	

ICSAB	Date: 21-Dec-2018 13:38	Seq: 4877205	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	110000	111700	102	
Manganese	100	111.4	111	

ICSA	Date: 22-Dec-2018 01:05	Seq: 4879332	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	100000	95310	95.3	
Manganese		0.473	0	

ICSAB	Date: 22-Dec-2018 01:08	Seq: 4879333	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Iron	110000	111000	101	
Manganese	100	105.3	105	

Form 4 - ICP Interference Check Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Run ID: ICPMS05_329812
Instrument: ICPMS05
Method: SW6020

ICSA	Date: 24-Dec-2018 12:27	Seq: 4879794	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese		0.675	0	

ICSAB	Date: 24-Dec-2018 12:29	Seq: 4879795	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese	100	107.8	108	

ICSA	Date: 25-Dec-2018 00:01	Seq: 4881419	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese		0.748	0	

ICSAB	Date: 25-Dec-2018 00:03	Seq: 4881420	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Manganese	100	109.5	109	

Form 5A - Matrix Spike/Matrix Spike Duplicate Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Date Analyzed: 21-Dec-2018 22:14
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Matrix Spike: HS18120913-04MS — Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	MS Result	Spike Amount	% Rec	MSD Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Iron	10760	15560	5000	96.0	15340	5000	91.6	80-120	1.43	20
Manganese	65.87	113.5	50.00	95.3	108.4	50.00	85.0	80-120	4.65	20

Matrix Spike: HS18120927-08MS — Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	MS Result	Spike Amount	% Rec	MSD Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Iron	2000	4965	5000	97.3	4346	5000	84.9	75-125	13.3	20
Manganese	50.00	41.04	50.00	72.1	35.26	50.00	60.5	75-125	0	20

Form 5B - Post Digest Sample Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Date Analyzed: 21-Dec-2018 22:17
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Lab Sample ID: HS18120913-04PDS Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	PDS Result	Spike Amount	% Rec	% Rec Limits
Iron	10760	22170	10000	114	75-125
Manganese	65.87	163.2	100	97	75-125

Lab Sample ID: HS18120927-08PDS Analysis Method: SW6020
Client Sample ID:

Analyte	Sample Result	PDS Result	Spike Amount	% Rec	% Rec Limits
Iron	0	99190	100000	99	75-125
Manganese	0	1104	1000	110	75-125

Form 7 - Laboratory Control Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Date Analyzed: 21-Dec-2018 21:10
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Lab Sample ID: LCS-135804 Analysis Method: SW6020

Analyte	Spike Amount	LCS Result	% Rec	% Rec Limits
Iron	5000	4811	96	80-120
Manganese	50	47.29	95	80-120

Lab Sample ID: LCS-135805 Analysis Method: SW6020

Analyte	Spike Amount	LCS Result	% Rec	% Rec Limits
Iron	5000	4612	92	80-120
Manganese	50	47.44	95	80-120

ALS Houston, US

Date: 09-Jan-19

Form 8 - ICP Serial Dilutions

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18120642

Date Analyzed: 21-Dec-2018 22:10
Date Extracted: 19-Dec-2018 13:00
Units: ug/L

Lab Sample ID: HS18120913-04SD
Client Sample ID:

Analysis Method: SW6020

Analyte	Sample Result	C	SD Result	C	RPD	Q
Iron	10760		11500		7	
Manganese	65.87		66.12		0	

Lab Sample ID: HS18120927-08SD
Client Sample ID:

Analysis Method: SW6020

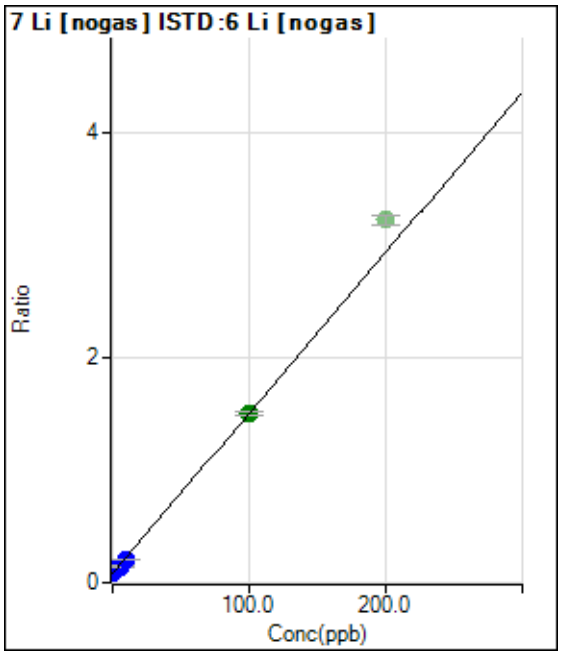
Analyte	Sample Result	C	SD Result	C	RPD	Q
Iron	0	U	620.1	J	514	
Manganese	0	U	0	U	0	

Calibration for 020_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\122418A.b\
Analysis File: 122418A.batch.bin
DA Date-Time: 2018-12-24 19:19:15
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	013CALB.d	CAL BLK	2018-12-24 11:33:27
2	014CALS.d	2/10/200	2018-12-24 11:35:28
3	015CALS.d	5/25/500	2018-12-24 11:37:27
4	016CALS.d	10/50/1000	2018-12-24 11:39:27
5	017CALS.d	100/500/10K	2018-12-24 11:41:25
6	018CALS.d	200/1000/20K	2018-12-24 11:43:24
7			

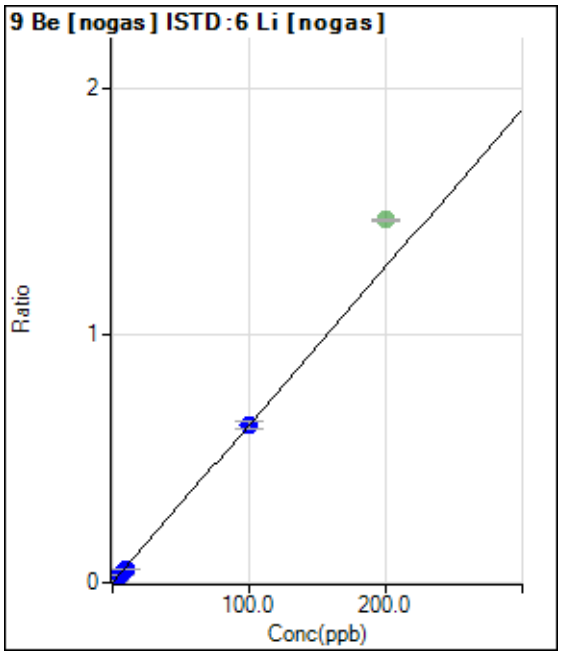
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	111277.55	0.0820	P	5.2
2	☐	2.000	2.088	150039.46	0.1118	P	5.6
3	☐	5.000	4.342	198349.20	0.1440	P	3.6
4	☐	10.000	8.841	280071.44	0.2082	P	0.7
5	☐	100.000	100.147	1883791.43	1.5117	A	2.5
6	☑	200.000		3654384.84	3.2289	A	2.4
7	☐	1.000					

y = 0.0143 * x + 0.0820
R = 0.9999
DL = 0.8936
BEC = 5.741

Weight: <None>
Min Conc: <None>

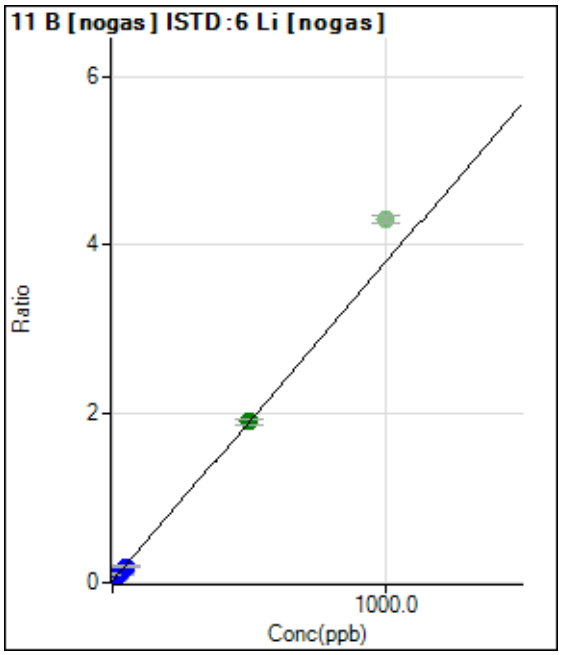


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56.67	0.0000	P	17.
2	☐	2.000	1.830	15760.07	0.0117	P	2.6
3	☐	5.000	4.323	38124.79	0.0277	P	2.0
4	☐	10.000	8.875	76314.45	0.0567	P	2.9
5	☐	100.000	100.150	796335.72	0.6397	P	4.5
6	☑	200.000		1661599.45	1.4681	A	0.3
7	☐	1.000					

y = 0.0064 * x + 4.1581E-005
R = 0.9999
DL = 0.003466
BEC = 0.00651

Weight: <None>
Min Conc: <None>

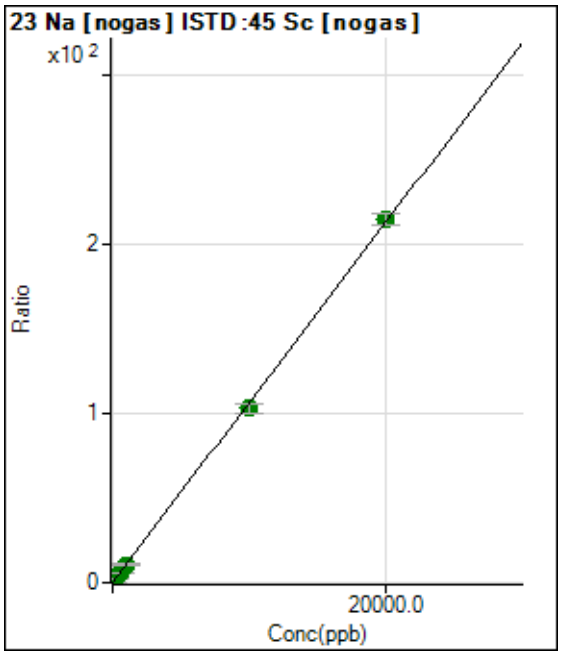
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30501.10	0.0225	P	5.1
2	☐	10.000	8.961	75501.49	0.0563	P	5.3
3	☐	25.000	21.386	141990.64	0.1031	P	5.2
4	☐	50.000	45.152	259170.40	0.1927	P	3.8
5	☐	500.000	500.686	2379058.14	1.9105	A	3.4
6	☑	1000.000		4863367.74	4.2970	A	2.1
7	☐	5.000					

y = 0.0038 * x + 0.0225
R = 1.0000
DL = 0.9088
BEC = 5.958

Weight: <None>
Min Conc: <None>

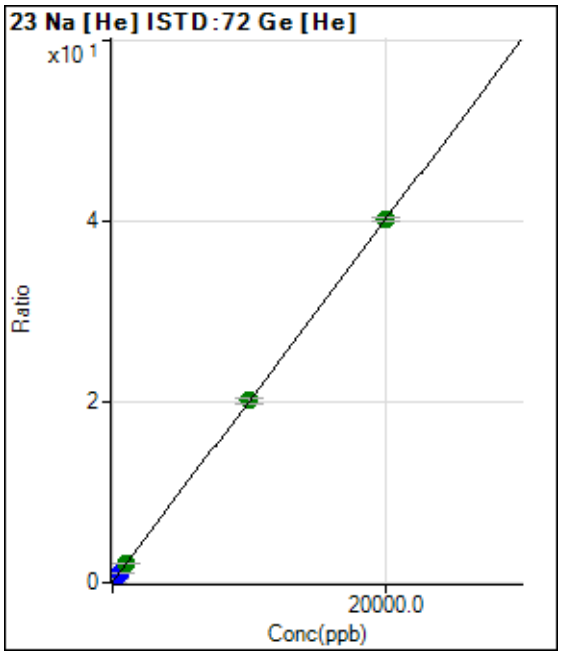


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	417456.77	0.1780	P	5.2
2	☐	200.000	197.753	5379648.04	2.2781	A	2.2
3	☐	500.000	497.504	12786651.07	5.4614	A	3.7
4	☐	1000.000	975.070	24675953.16	10.5330	A	7.1
5	☐	10000.00	9678.099	242452630.4	102.957	A	5.0
6	☐	20000.00	20162.282	494803094.4	214.296	A	3.1
7	☐	100.000					

y = 0.0106 * x + 0.1780
R = 0.9998
DL = 2.637
BEC = 16.76

Weight: <None>
Min Conc: <None>

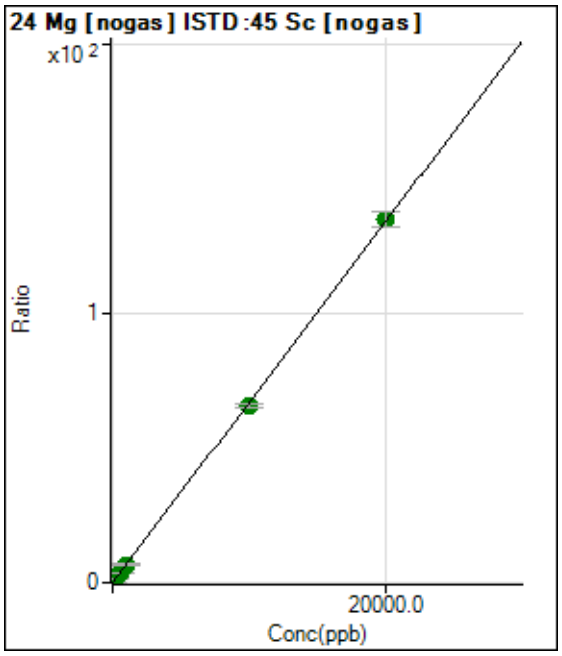
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	54678.81	0.0697	P	3.3
2	☐	200.000	189.988	360618.21	0.4508	P	2.2
3	☐	500.000	493.692	816355.53	1.0601	P	2.8
4	☐	1000.000	994.952	1592790.03	2.0657	A	3.1
5	☐	10000.00	10016.109	15131845.61	20.1637	A	2.6
6	☐	20000.00	19992.456	29835737.89	40.1780	A	1.2
7	☐	100.000					

y = 0.0020 * x + 0.0697
R = 1.0000
DL = 3.479
BEC = 34.73

Weight: <None>
Min Conc: <None>

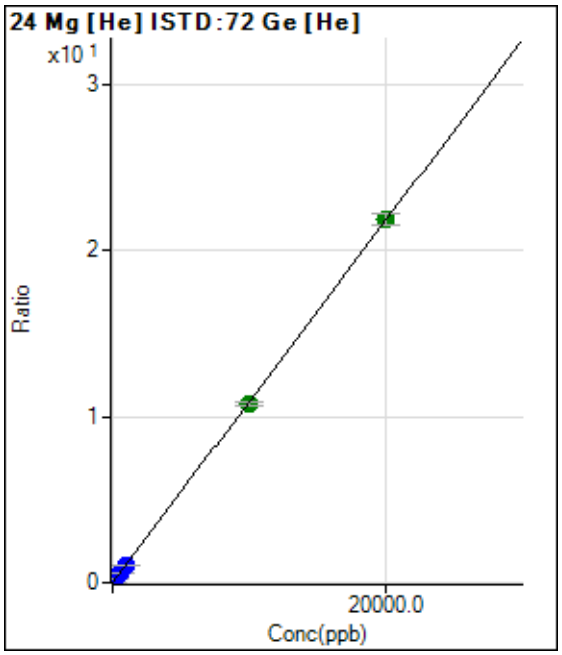


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5901.75	0.0025	P	6.9
2	☐	200.000	206.073	3271575.14	1.3859	A	5.2
3	☐	500.000	504.053	7926348.09	3.3863	A	4.9
4	☐	1000.000	994.333	15657513.37	6.6776	A	5.3
5	☐	10000.00	9795.789	154983028.4	65.7631	A	2.5
6	☐	20000.00	20102.227	311533323.6	134.951	A	4.3
7	☐	100.000					

y = 0.0067 * x + 0.0025
R = 0.9999
DL = 0.07734
BEC = 0.3751

Weight: <None>
Min Conc: <None>

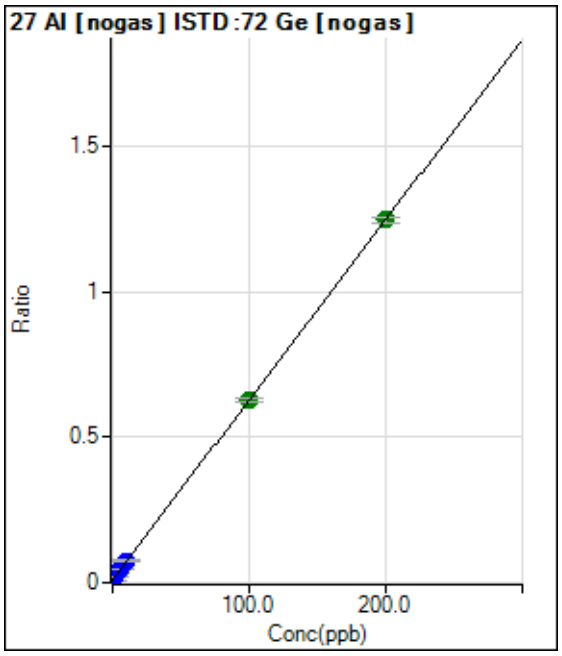
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	453.34	0.0006	P	18.
2	☐	200.000	193.705	169302.41	0.2116	P	0.5
3	☐	500.000	501.933	421390.51	0.5474	P	5.2
4	☐	1000.000	971.240	816215.90	1.0587	P	3.5
5	☐	10000.00	9892.844	8087589.05	10.7782	A	3.0
6	☐	20000.00	20055.031	16222332.26	21.8492	A	3.1
7	☐	100.000					

y = 0.0011 * x + 5.7837E-004
R = 1.0000
DL = 0.3001
BEC = 0.5309

Weight: <None>
Min Conc: <None>

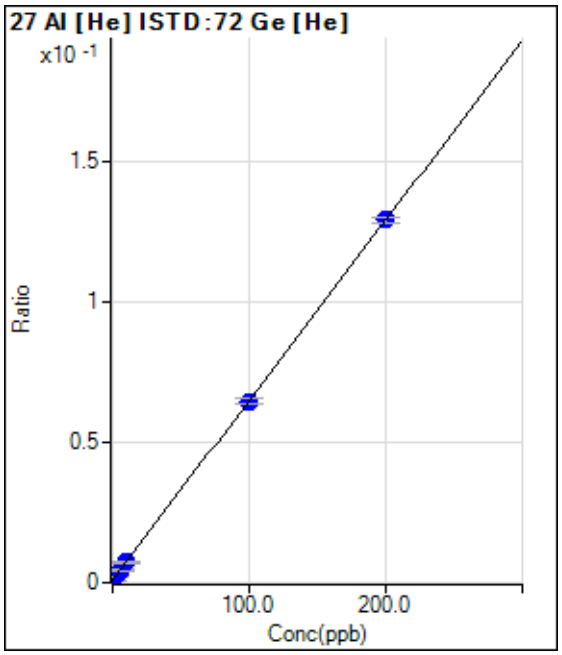


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27887.50	0.0089	P	3.7
2	☐	2.000	1.973	67747.78	0.0211	P	2.7
3	☐	5.000	6.059	146244.49	0.0464	P	1.3
4	☐	10.000	10.753	238007.68	0.0754	P	2.9
5	☐	100.000	99.846	1956520.08	0.6268	A	2.1
6	☐	200.000	200.013	3801721.92	1.2467	A	1.4
7	☐	1.000					

y = 0.0062 * x + 0.0089
R = 1.0000
DL = 0.1587
BEC = 1.433

Weight: <None>
Min Conc: <None>

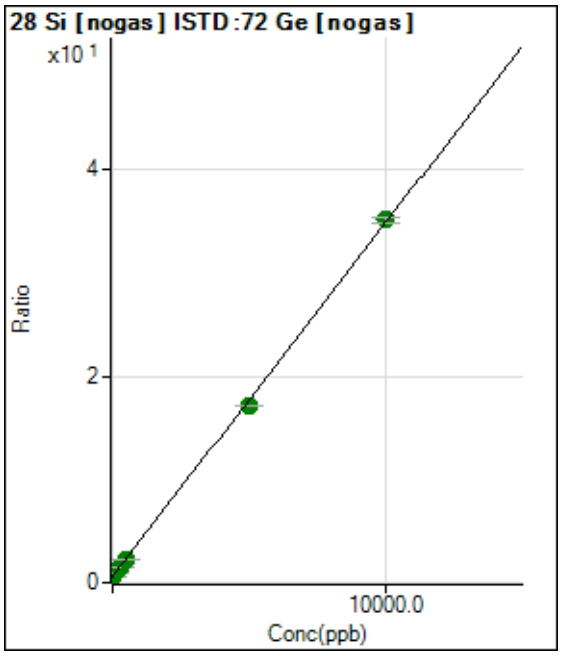
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.178	643.35	0.0008	P	9.4
2	☐	2.000	1.992	1766.78	0.0022	P	11.
3	☐	5.000	5.326	3350.35	0.0043	P	8.4
4	☐	10.000	10.204	5757.64	0.0075	P	9.5
5	☐	100.000	99.349	48475.43	0.0646	P	3.6
6	☐	200.000	200.307	96018.78	0.1293	P	1.5
7	☐	1.000					

y = 6.4090E-004 * x + 9.3424E-004
R = 1.0000
DL = 0.3609
BEC = 1.458

Weight: <None>
Min Conc: <None>

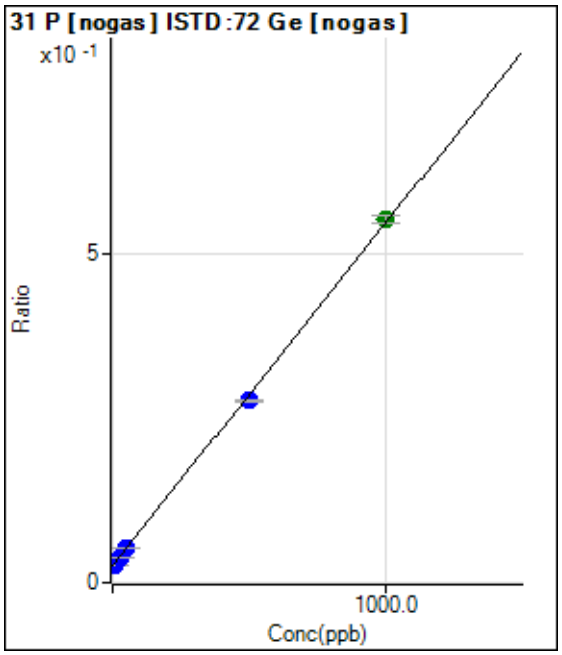


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1941965.44	0.6175	A	1.0
2	☐	100.000	90.473	2979669.96	0.9273	A	0.6
3	☐	250.000	241.405	4555456.60	1.4442	A	1.6
4	☐	500.000	477.424	7109444.47	2.2525	A	2.0
5	☐	5000.000	4831.629	53576002.53	17.1639	A	0.6
6	☐	10000.00	10085.624	107207228.4	35.1567	A	1.6
7	☐	5.000					

y = 0.0034 * x + 0.6175
R = 0.9998
DL = 5.362
BEC = 180.3

Weight: <None>
Min Conc: <None>

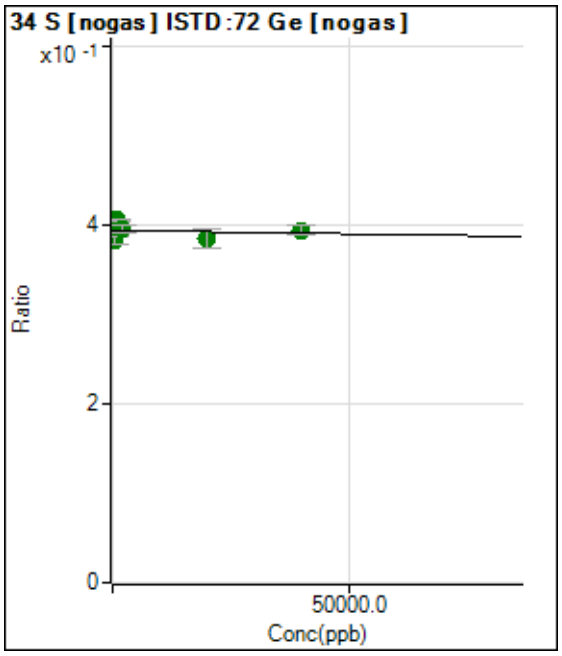
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	81129.62	0.0258	P	1.7
2	☐	10.000	-0.335	82335.14	0.0256	P	1.8
3	☐	25.000	25.323	122878.83	0.0390	P	2.1
4	☐	50.000	51.846	166448.38	0.0527	P	2.1
5	☐	500.000	481.240	861073.53	0.2759	P	0.5
6	☐	1000.000	1009.383	1677933.41	0.5503	A	2.2
7	☐	5.000					

y = 5.1962E-004 * x + 0.0258
R = 0.9997
DL = 2.532
BEC = 49.65

Weight: <None>
Min Conc: <None>

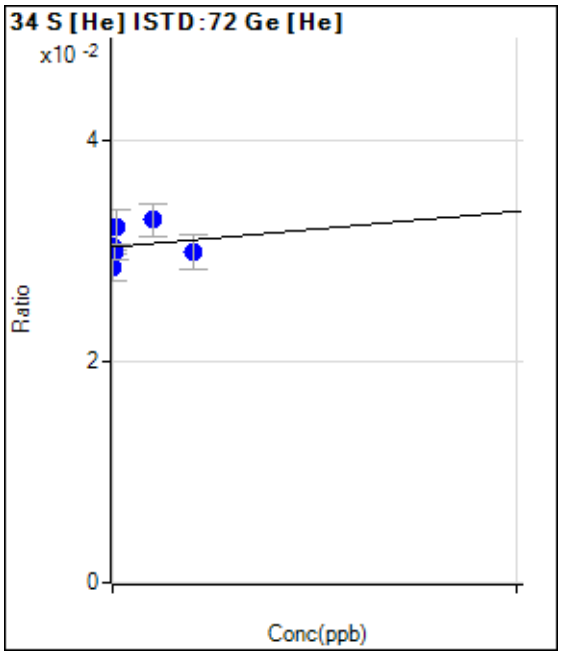


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1240192.18	0.3944	A	2.2
2	☐	400.000	139725.830	1231135.18	0.3832	A	1.8
3	☐	1000.000	-144160.379	1280446.25	0.4059	A	0.8
4	☐	2000.000	-18556.861	1249745.83	0.3959	A	1.8
5	☐	20000.00	111238.432	1203226.78	0.3855	A	5.4
6	☐	40000.00	-2355.622	1202967.12	0.3946	A	3.1
7	☐	100.000					

y = -8.0160E-008 * x + 0.3944
R = -0.1320
DL = -3.312E+05
BEC = -4.92E+06

Weight: <None>
Min Conc: <None>

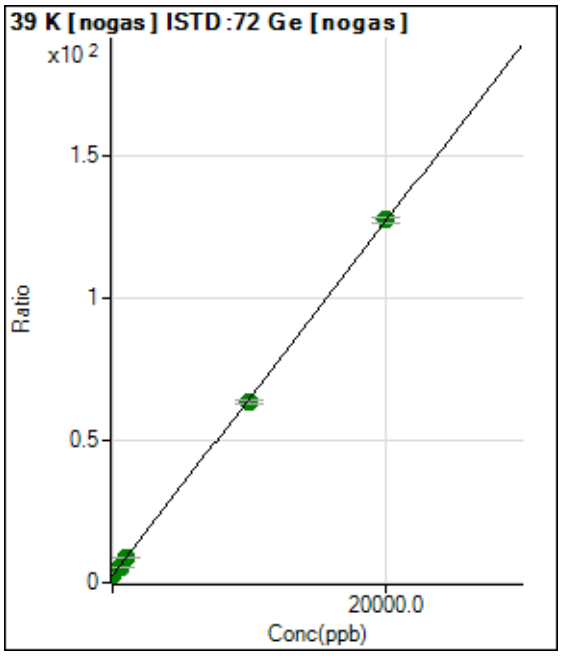
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23818.47	0.0303	P	1.4
2	☐	400.000	-113916.726	22785.07	0.0285	P	8.1
3	☐	1000.000	-22461.142	23084.41	0.0300	P	4.6
4	☐	2000.000	115974.513	24821.47	0.0322	P	9.8
5	☐	20000.00	151642.131	24620.58	0.0328	P	8.8
6	☐	40000.00	-29790.095	22184.52	0.0299	P	10.
7	☐	100.000					

y = 1.6193E-008 * x + 0.0303
R = 0.1153
DL = 8.051E+04
BEC = 1.874E+06

Weight: <None>
Min Conc: <None>

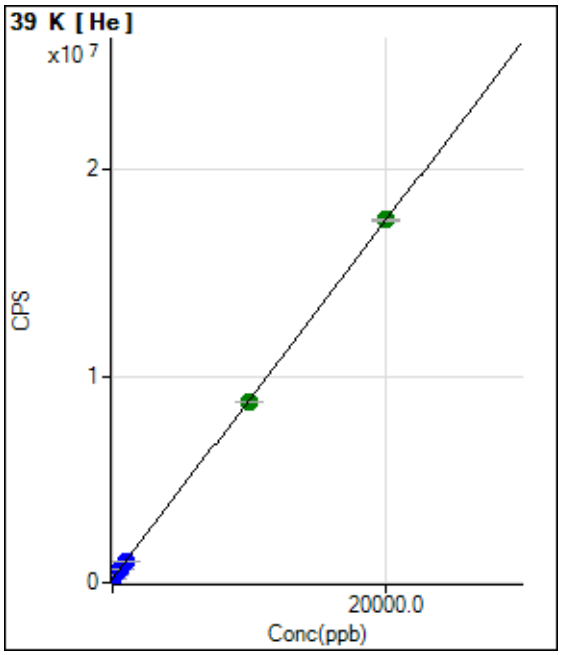


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7950833.77	2.5282	A	1.6
2	☐	200.000	192.139	11954391.93	3.7205	A	1.3
3	☐	500.000	497.868	17719817.06	5.6176	A	1.2
4	☐	1000.000	983.290	27236219.36	8.6297	A	2.3
5	☐	10000.00	9805.112	197795387.7	63.3700	A	2.1
6	☐	20000.00	20098.411	388084200.3	127.241	A	1.8
7	☐	100.000					

y = 0.0062 * x + 2.5282
R = 0.9999
DL = 19.9
BEC = 407.4

Weight: <None>
Min Conc: <None>

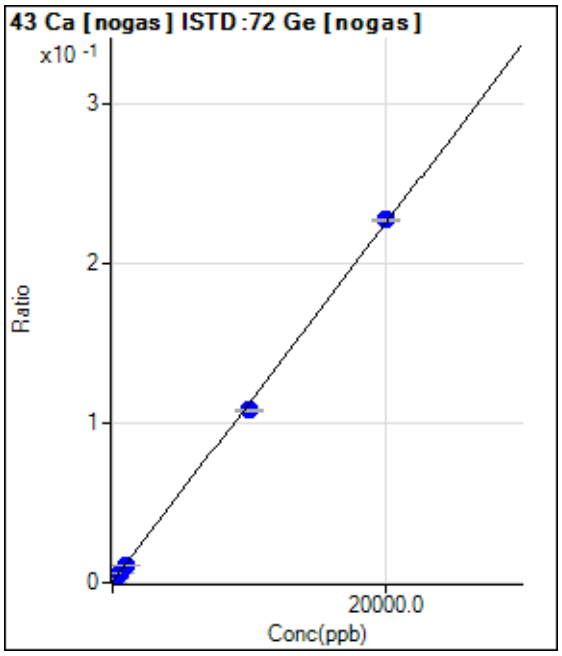
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	191802.98		P	0.2
2	☐	200.000	205.494	370064.71		P	0.3
3	☐	500.000	502.285	627524.74		P	1.3
4	☐	1000.000	998.569	1058041.36		P	1.0
5	☐	10000.00	9891.039	8772076.33		A	0.5
6	☐	20000.00	20054.440	17588618.49		A	0.7
7	☐	100.000					

y = 867.4795 * x + 191802.9833
R = 1.0000
DL = 1.119
BEC = 221.1

Weight: <None>
Min Conc: <None>

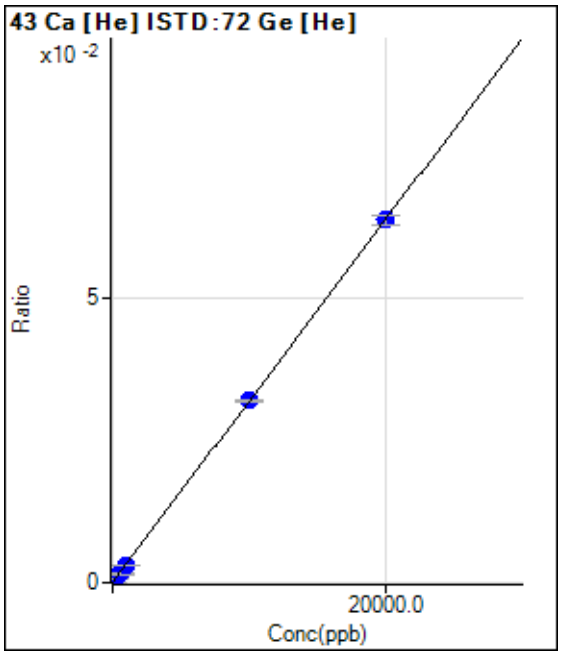


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1386.74	0.0004	P	3.5
2	☐	200.000	190.602	8301.99	0.0026	P	6.1
3	☐	500.000	486.445	18639.59	0.0059	P	1.8
4	☐	1000.000	957.601	35377.28	0.0112	P	3.0
5	☐	10000.00	9577.352	337418.86	0.1081	P	1.4
6	☐	20000.00	20213.877	694444.26	0.2277	P	0.4
7	☐	100.000					

y = 1.1241E-005 * x + 4.4103E-004
R = 0.9997
DL = 4.09
BEC = 39.23

Weight: <None>
Min Conc: <None>

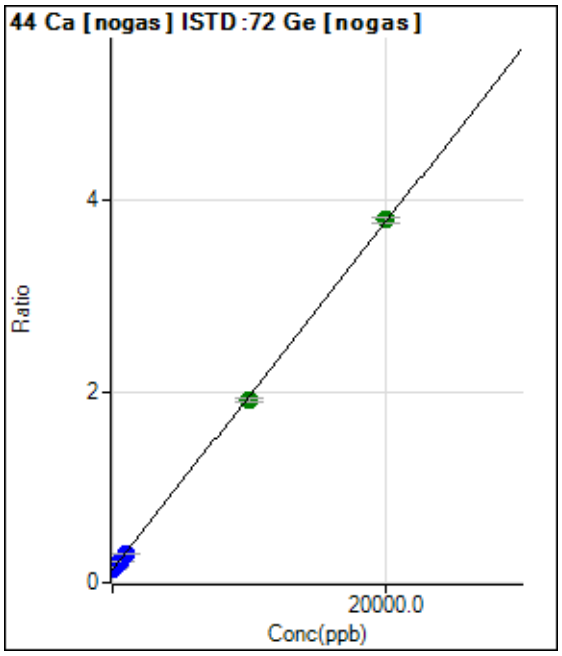
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	36.67	0.0000	P	14.
2	☐	200.000	185.924	510.01	0.0006	P	16.
3	☐	500.000	476.126	1203.39	0.0016	P	12.
4	☐	1000.000	950.440	2363.52	0.0031	P	5.9
5	☐	10000.00	10022.864	23949.08	0.0319	P	1.4
6	☐	20000.00	19991.784	47213.18	0.0636	P	2.3
7	☐	100.000					

y = 3.1775E-006 * x + 4.6654E-005
R = 1.0000
DL = 6.448
BEC = 14.68

Weight: <None>
Min Conc: <None>

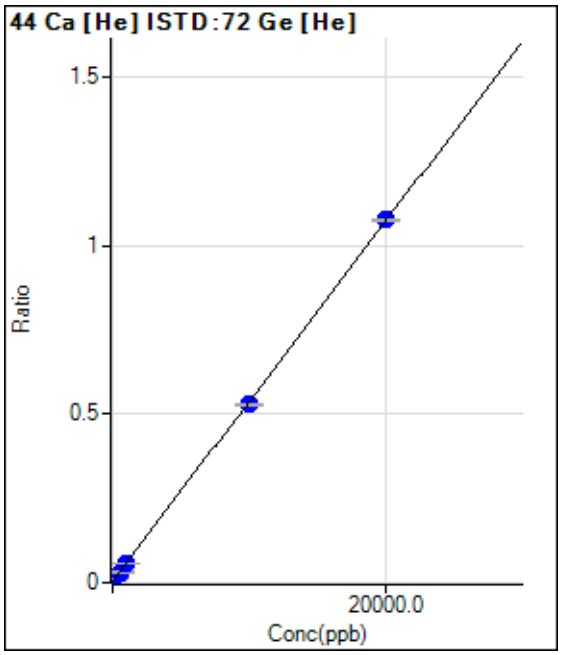


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	427469.51	0.1359	P	1.1
2	☐	200.000	145.767	521914.18	0.1624	P	1.1
3	☐	500.000	440.032	681186.71	0.2159	P	0.9
4	☐	1000.000	887.572	938664.86	0.2973	P	0.3
5	☐	10000.00	9755.300	5961691.37	1.9101	A	2.2
6	☐	20000.00	20130.013	11581260.24	3.7969	A	1.7
7	☐	100.000					

y = 1.8187E-004 * x + 0.1359
R = 0.9999
DL = 23.94
BEC = 747.4

Weight: <None>
Min Conc: <None>

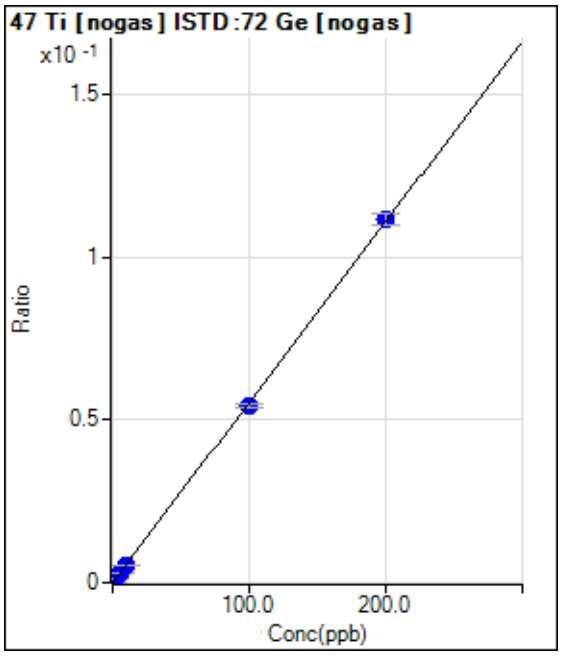
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3250.34	0.0041	P	6.5
2	☐	200.000	191.057	11456.99	0.0143	P	2.6
3	☐	500.000	510.029	24112.53	0.0313	P	6.8
4	☐	1000.000	961.502	42709.23	0.0554	P	4.3
5	☐	10000.00	9817.224	395860.85	0.5274	P	1.4
6	☐	20000.00	20093.152	798401.45	1.0752	P	0.8
7	☐	100.000					

y = 5.3303E-005 * x + 0.0041
R = 0.9999
DL = 15.08
BEC = 77.64

Weight: <None>
Min Conc: <None>

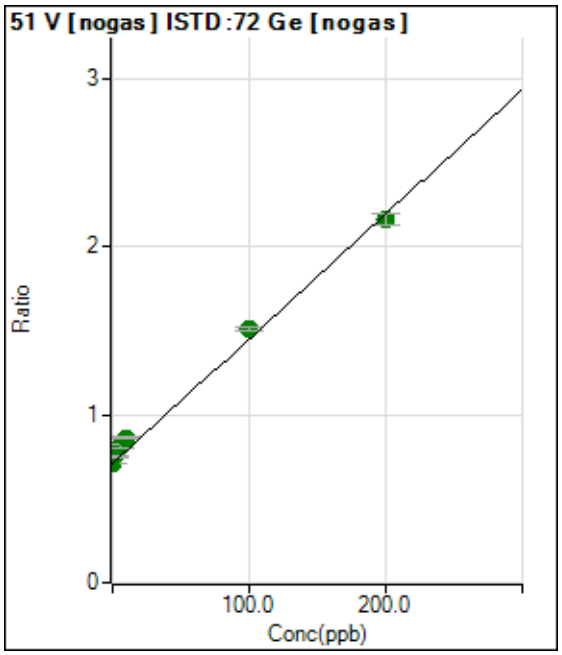


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	293.34	0.0001	P	5.9
2	☐	2.000	1.989	3840.46	0.0012	P	3.7
3	☐	5.000	4.721	8542.09	0.0027	P	3.0
4	☐	10.000	9.795	17421.72	0.0055	P	0.5
5	☐	100.000	97.753	169280.73	0.0542	P	2.4
6	☐	200.000	201.141	339933.58	0.1115	P	3.0
7	☐	1.000					

y = 5.5385E-004 * x + 9.3297E-005
R = 0.9999
DL = 0.02997
BEC = 0.1685

Weight: <None>
Min Conc: <None>

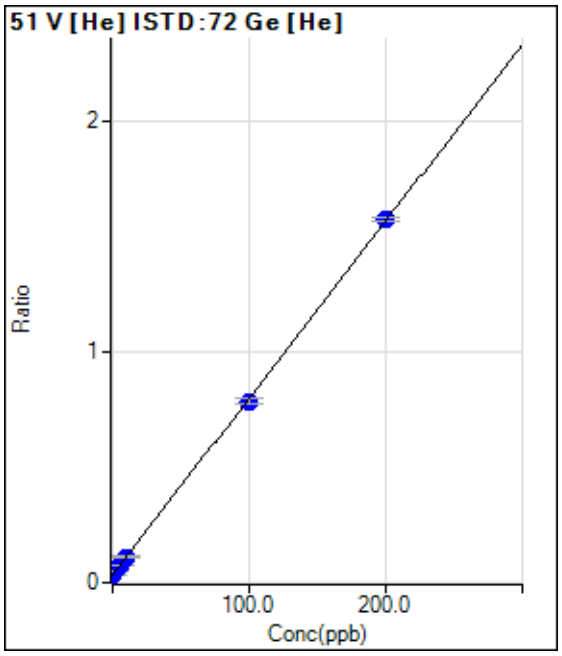
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2231666.65	0.7096	A	0.7
2	☐	2.000	5.461	2409766.40	0.7500	A	2.4
3	☐	5.000	14.093	2567511.26	0.8140	A	3.4
4	☐	10.000	20.640	2722696.22	0.8625	A	0.9
5	☐	100.000	107.667	4705398.80	1.5075	A	1.5
6	☐	200.000	195.372	6578225.28	2.1576	A	3.0
7	☐	1.000					

y = 0.0074 * x + 0.7096
R = 0.9981
DL = 2.021
BEC = 95.74

Weight: <None>
Min Conc: <None>

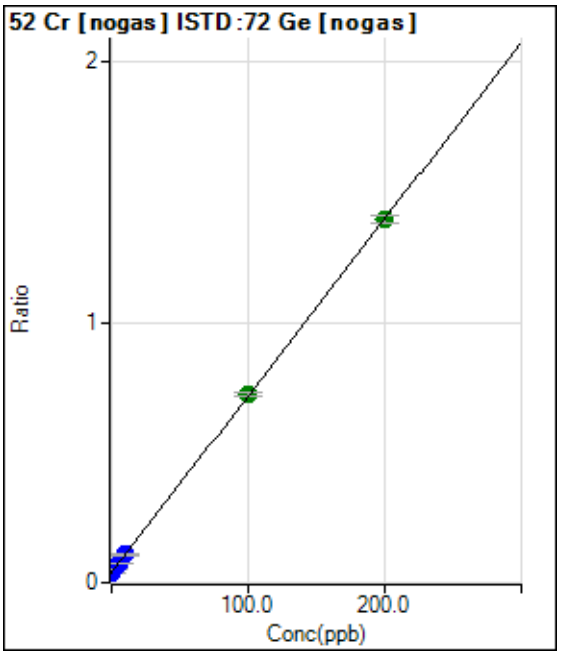


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.065	27333.93	0.0348	P	1.9
2	☐	2.000	2.198	40946.02	0.0512	P	2.3
3	☐	5.000	5.491	58867.50	0.0764	P	2.6
4	☐	10.000	10.166	86588.64	0.1123	P	2.1
5	☐	100.000	98.206	590835.87	0.7874	P	3.3
6	☐	200.000	200.874	1169324.83	1.5747	P	1.2
7	☐	1.000					

y = 0.0077 * x + 0.0343
R = 0.9999
DL = 0.2614
BEC = 4.477

Weight: <None>
Min Conc: <None>

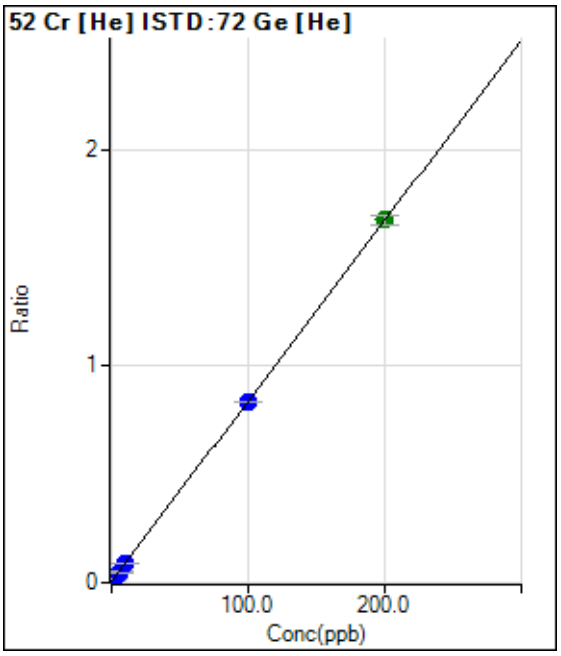
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	123313.64	0.0392	P	1.4
2	☐	2.000	1.981	169203.60	0.0527	P	0.8
3	☐	5.000	5.431	240004.07	0.0761	P	0.4
4	☐	10.000	10.342	345311.34	0.1094	P	4.6
5	☐	100.000	100.722	2257468.30	0.7233	A	1.8
6	☐	200.000	199.612	4253262.23	1.3949	A	2.2
7	☐	1.000					

y = 0.0068 * x + 0.0392
R = 1.0000
DL = 0.2509
BEC = 5.772

Weight: <None>
Min Conc: <None>

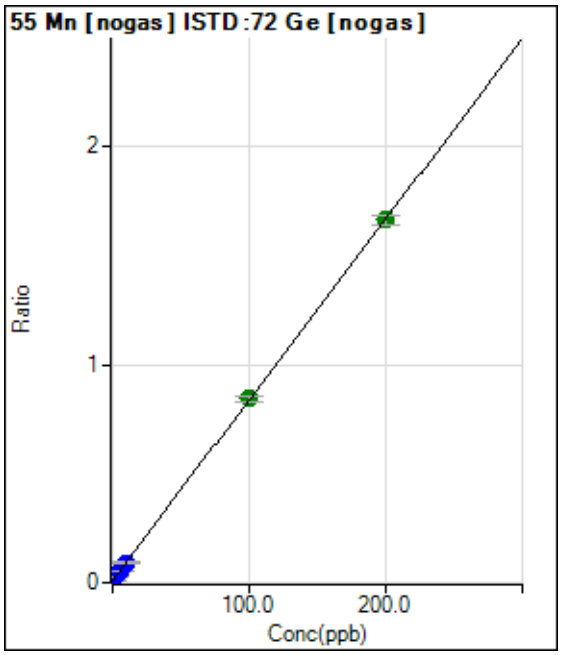


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5294.16	0.0067	P	6.5
2	☐	2.000	1.855	17758.77	0.0222	P	1.7
3	☐	5.000	4.962	37013.70	0.0481	P	4.6
4	☐	10.000	9.636	67101.71	0.0870	P	1.9
5	☐	100.000	99.333	626074.49	0.8341	P	0.8
6	☐	200.000	200.354	1244109.96	1.6754	A	2.4
7	☐	1.000					

y = 0.0083 * x + 0.0067
R = 1.0000
DL = 0.1586
BEC = 0.8104

Weight: <None>
Min Conc: <None>

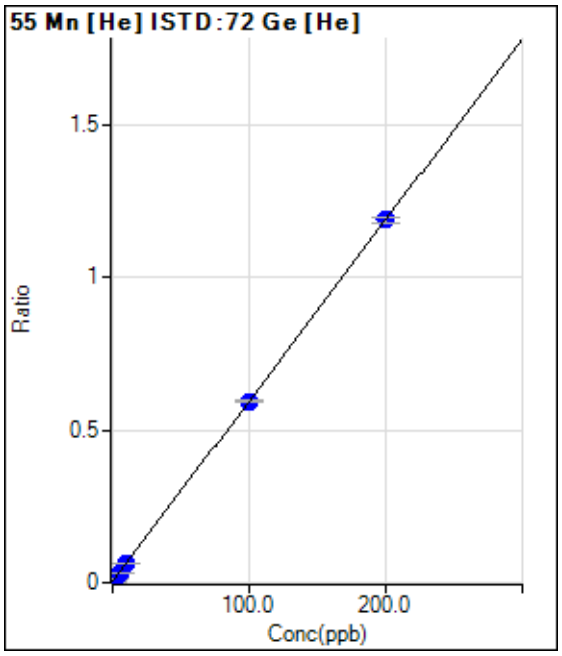
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30719.02	0.0098	P	1.4
2	☐	2.000	1.759	78208.66	0.0243	P	1.6
3	☐	5.000	5.046	162683.94	0.0516	P	1.3
4	☐	10.000	9.952	291039.40	0.0922	P	3.5
5	☐	100.000	100.608	2632425.54	0.8434	A	3.6
6	☐	200.000	199.700	5075225.45	1.6644	A	2.4
7	☐	1.000					

y = 0.0083 * x + 0.0098
R = 1.0000
DL = 0.04863
BEC = 1.179

Weight: <None>
Min Conc: <None>

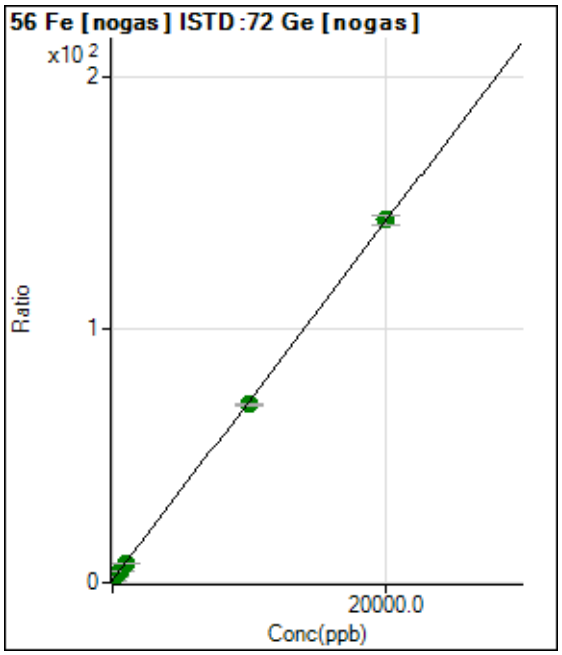


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2523.54	0.0032	P	10.
2	☐	2.000	1.713	10696.63	0.0134	P	6.3
3	☐	5.000	4.970	25187.41	0.0327	P	3.3
4	☐	10.000	10.024	48353.55	0.0627	P	1.1
5	☐	100.000	99.851	447094.04	0.5956	P	1.1
6	☐	200.000	200.077	883838.08	1.1903	P	1.5
7	☐	1.000					

y = 0.0059 * x + 0.0032
R = 1.0000
DL = 0.1694
BEC = 0.5425

Weight: <None>
Min Conc: <None>

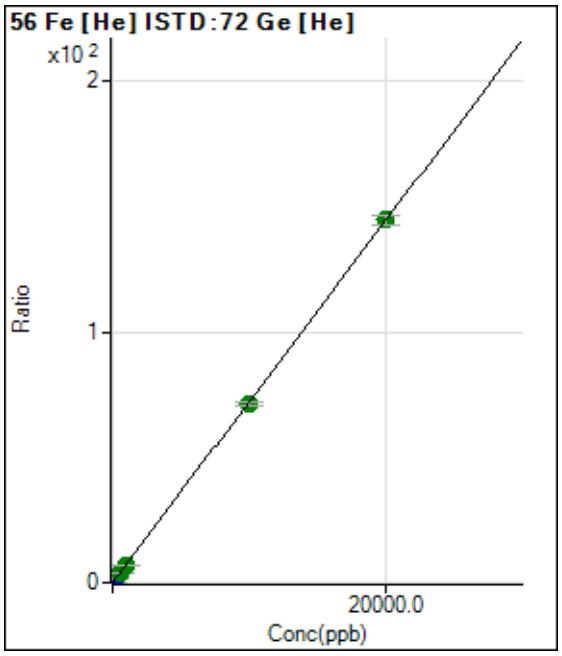
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3039831.91	0.9667	A	2.8
2	☐	200.000	193.286	7507901.21	2.3368	A	2.8
3	☐	500.000	497.123	14164128.44	4.4904	A	1.5
4	☐	1000.000	962.034	24575025.55	7.7858	A	1.9
5	☐	10000.00	9813.214	220141371.5	70.5249	A	0.8
6	☐	20000.00	20095.430	437250959.7	143.407	A	2.7
7	☐	100.000					

y = 0.0071 * x + 0.9667
R = 0.9999
DL = 11.33
BEC = 136.4

Weight: <None>
Min Conc: <None>

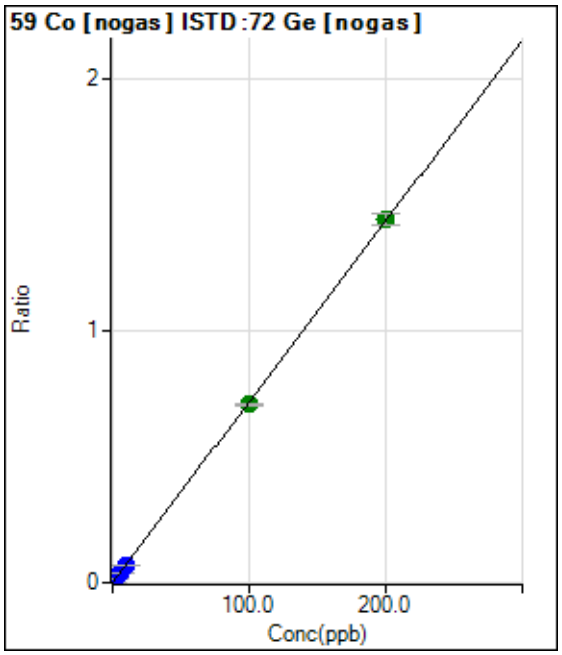


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12284.25	0.0157	P	6.4
2	☐	200.000	189.314	1104282.98	1.3807	P	3.4
3	☐	500.000	495.508	2763312.04	3.5886	A	3.5
4	☐	1000.000	984.058	5485164.71	7.1113	A	0.5
5	☐	10000.00	9895.238	53558117.53	71.3659	A	2.2
6	☐	20000.00	20053.397	107380421.7	144.612	A	2.6
7	☐	100.000					

y = 0.0072 * x + 0.0157
R = 1.0000
DL = 0.4138
BEC = 2.172

Weight: <None>
Min Conc: <None>

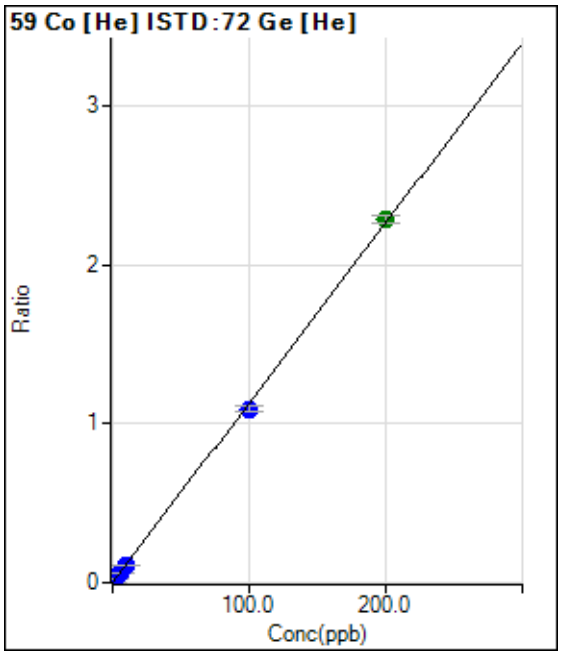
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1063.38	0.0003	P	9.6
2	☐	2.000	1.963	46295.30	0.0144	P	2.8
3	☐	5.000	4.909	112057.49	0.0355	P	2.3
4	☐	10.000	9.648	219439.60	0.0695	P	1.4
5	☐	100.000	98.584	2207038.56	0.7070	A	0.6
6	☐	200.000	200.728	4388040.25	1.4393	A	3.2
7	☐	1.000					

y = 0.0072 * x + 3.3794E-004
R = 1.0000
DL = 0.01354
BEC = 0.04714

Weight: <None>
Min Conc: <None>

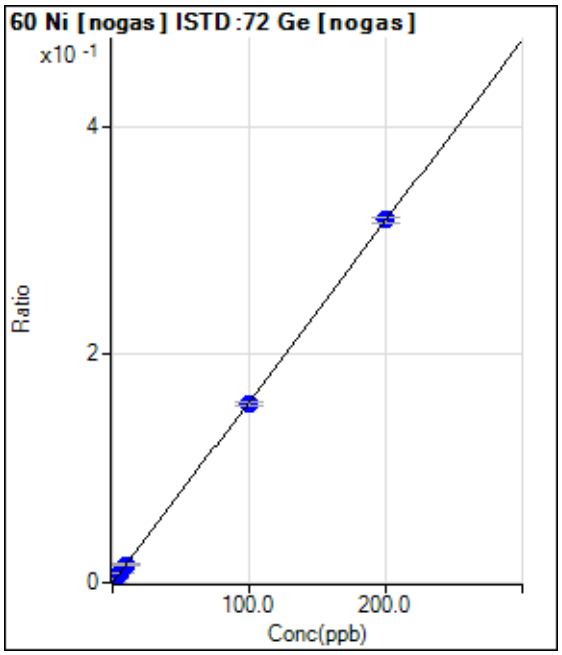


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	396.68	0.0005	P	13.
2	☐	2.000	1.896	17575.26	0.0220	P	3.9
3	☐	5.000	4.914	43214.33	0.0561	P	3.1
4	☐	10.000	9.689	84932.28	0.1102	P	3.8
5	☐	100.000	96.494	819857.80	1.0926	P	3.0
6	☐	200.000	201.772	1696000.70	2.2841	A	2.2
7	☐	1.000					

y = 0.0113 * x + 5.0594E-004
R = 0.9998
DL = 0.01755
BEC = 0.0447

Weight: <None>
Min Conc: <None>

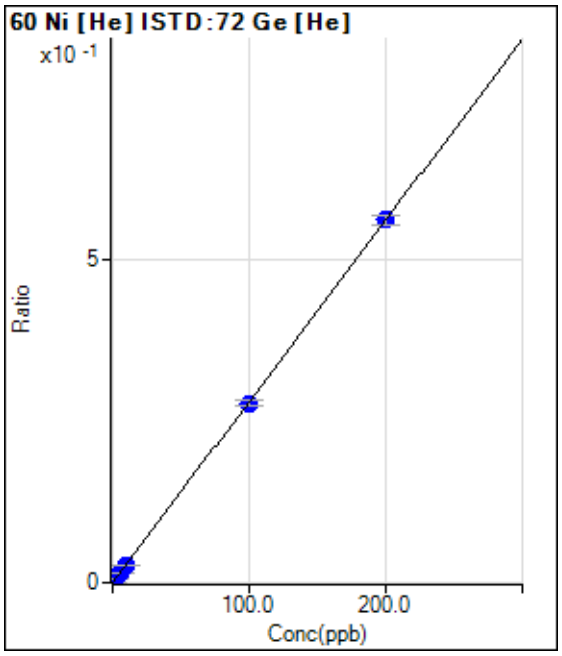
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.119	450.01	0.0001	P	5.5
2	☐	2.000	2.148	10796.68	0.0034	P	4.4
3	☐	5.000	5.248	26108.79	0.0083	P	1.5
4	☐	10.000	10.077	50315.75	0.0159	P	2.2
5	☐	100.000	98.837	489050.58	0.1567	P	2.1
6	☐	200.000	200.570	969721.60	0.3180	P	1.7
7	☐	1.000					

y = 0.0016 * x - 4.5824E-005
R = 1.0000
DL = 0.0148
BEC = -0.0289

Weight: <None>
Min Conc: <None>

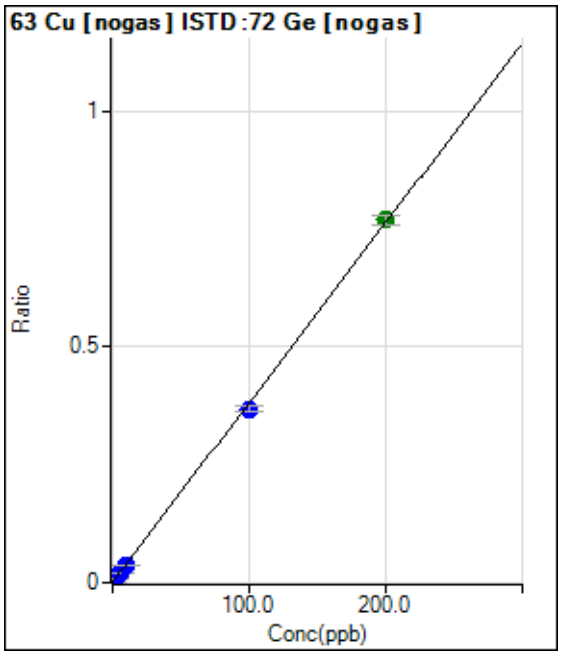


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.122	133.33	0.0002	P	22.
2	☐	2.000	2.063	4480.62	0.0056	P	6.2
3	☐	5.000	5.168	10996.76	0.0143	P	5.8
4	☐	10.000	10.004	21439.45	0.0278	P	2.5
5	☐	100.000	99.298	208204.37	0.2775	P	3.9
6	☐	200.000	200.346	415855.75	0.5601	P	2.8
7	☐	1.000					

y = 0.0028 * x - 1.7175E-004
R = 1.0000
DL = 0.04022
BEC = -0.06142

Weight: <None>
Min Conc: <None>

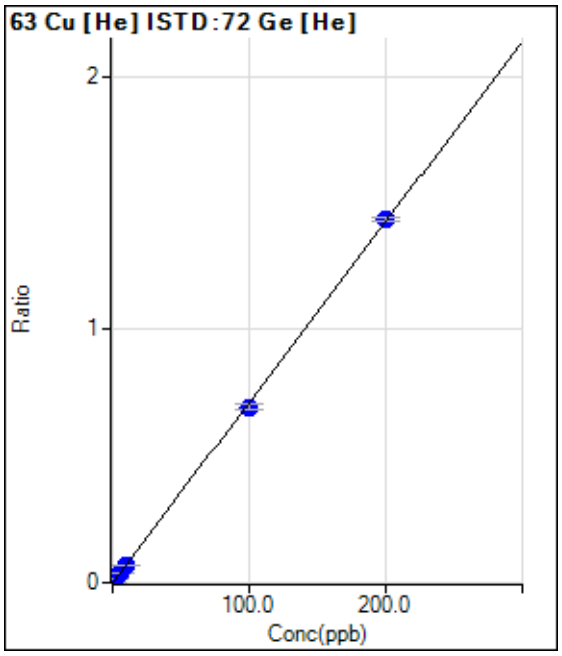
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2390.19	0.0008	P	2.8
2	☐	2.000	1.902	25731.69	0.0080	P	1.6
3	☐	5.000	4.966	62088.55	0.0197	P	0.4
4	☐	10.000	9.747	119631.74	0.0379	P	2.0
5	☐	100.000	96.589	1151186.75	0.3688	P	2.9
6	☐	200.000	201.720	2346111.74	0.7695	A	2.6
7	☐	1.000					

y = 0.0038 * x + 7.5978E-004
R = 0.9998
DL = 0.01703
BEC = 0.1994

Weight: <None>
Min Conc: <None>

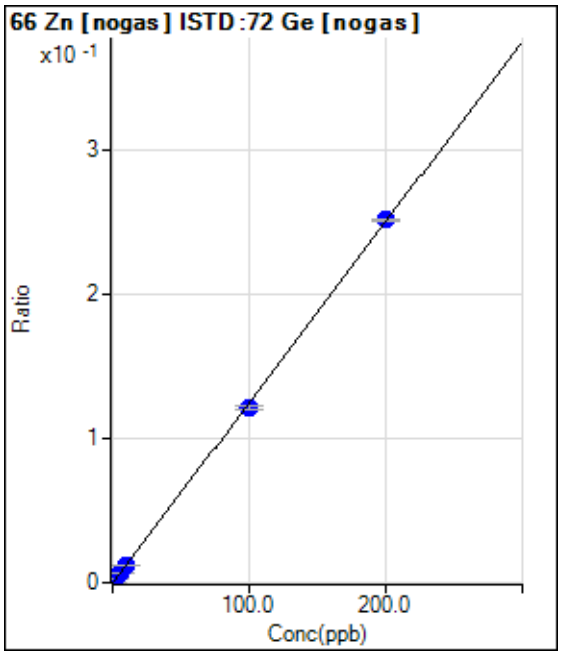


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.407	933.37	0.0012	P	0.9
2	☐	2.000	2.343	11984.10	0.0150	P	5.3
3	☐	5.000	5.452	28602.68	0.0372	P	4.4
4	☐	10.000	9.987	53571.57	0.0695	P	3.3
5	☐	100.000	97.651	521094.98	0.6944	P	2.6
6	☐	200.000	201.160	1063553.26	1.4323	P	1.2
7	☐	1.000					

y = 0.0071 * x - 0.0017
R = 0.9999
DL = 0.004517
BEC = -0.2403

Weight: <None>
Min Conc: <None>

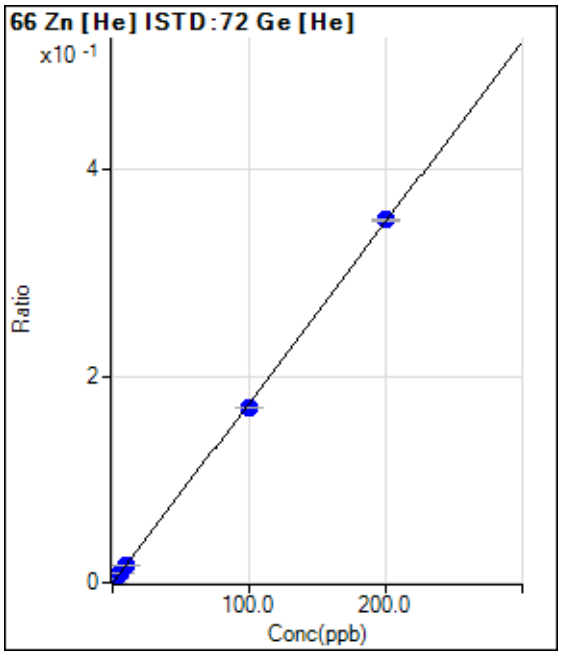
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.302	416.68	0.0001	P	19.
2	☐	2.000	2.291	8425.42	0.0026	P	3.0
3	☐	5.000	5.555	21159.06	0.0067	P	4.1
4	☐	10.000	10.247	39713.40	0.0126	P	1.4
5	☐	100.000	97.268	379268.48	0.1215	P	2.2
6	☐	200.000	201.337	767982.31	0.2518	P	0.4
7	☐	1.000					

y = 0.0013 * x - 2.4569E-004
R = 0.9999
DL = 0.06107
BEC = -0.1963

Weight: <None>
Min Conc: <None>

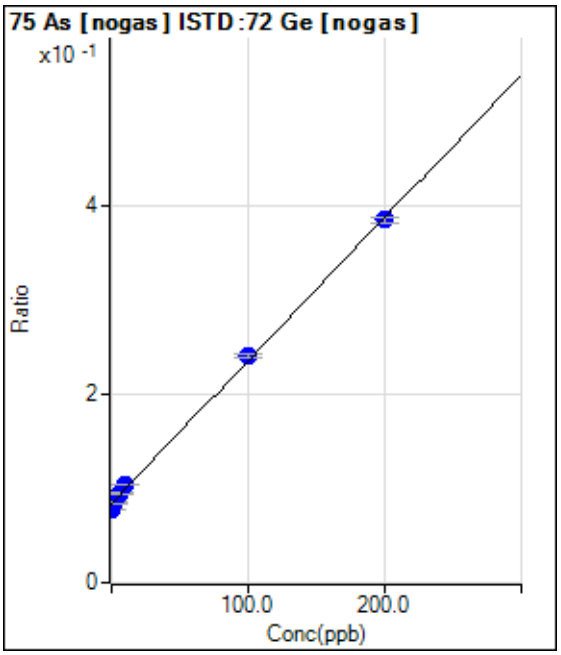


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.494	150.00	0.0002	P	4.9
2	☐	2.000	2.296	2676.90	0.0033	P	3.0
3	☐	5.000	5.573	6991.44	0.0091	P	2.1
4	☐	10.000	10.014	13001.43	0.0168	P	2.3
5	☐	100.000	97.283	127289.02	0.1696	P	0.8
6	☐	200.000	201.341	261124.72	0.3516	P	0.3
7	☐	1.000					

y = 0.0017 * x - 6.7339E-004
R = 0.9999
DL = 0.01604
BEC = -0.3848

Weight: <None>
Min Conc: <None>

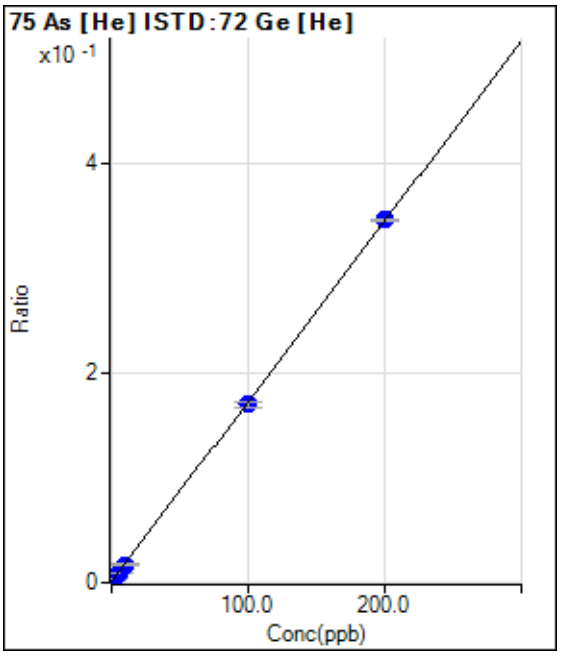
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-4.482	242660.55	0.0772	P	1.4
2	☐	2.000	0.356	271444.50	0.0845	P	2.7
3	☐	5.000	6.863	297594.35	0.0943	P	2.0
4	☐	10.000	12.876	326589.32	0.1035	P	0.9
5	☐	100.000	103.121	749783.24	0.2402	P	1.5
6	☐	200.000	198.265	1172252.04	0.3844	P	1.6
7	☐	1.000					

y = 0.0015 * x + 0.0839
R = 0.9993
DL = 2.109
BEC = 55.4

Weight: <None>
Min Conc: <None>

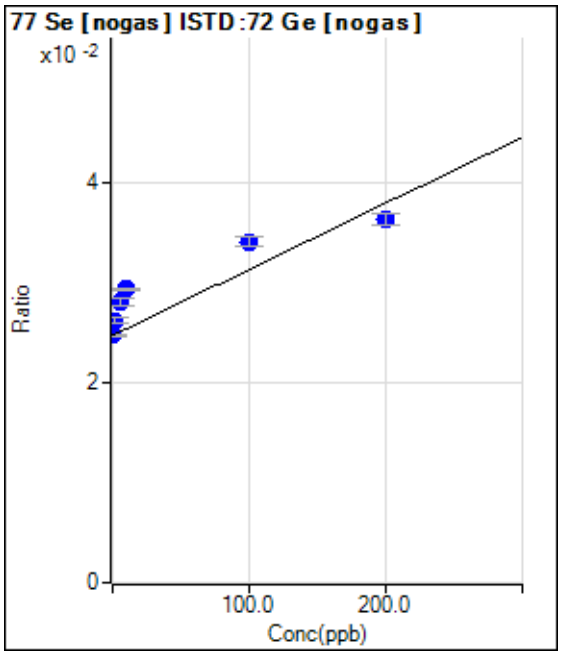


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	812.25	0.0010	P	7.7
2	☐	2.000	1.958	3524.80	0.0044	P	4.2
3	☐	5.000	4.915	7310.38	0.0095	P	3.3
4	☐	10.000	9.422	13301.54	0.0173	P	3.5
5	☐	100.000	98.477	127952.24	0.1705	P	2.9
6	☐	200.000	200.793	257379.97	0.3466	P	0.7
7	☐	1.000					

y = 0.0017 * x + 0.0010
R = 1.0000
DL = 0.1392
BEC = 0.6017

Weight: <None>
Min Conc: <None>

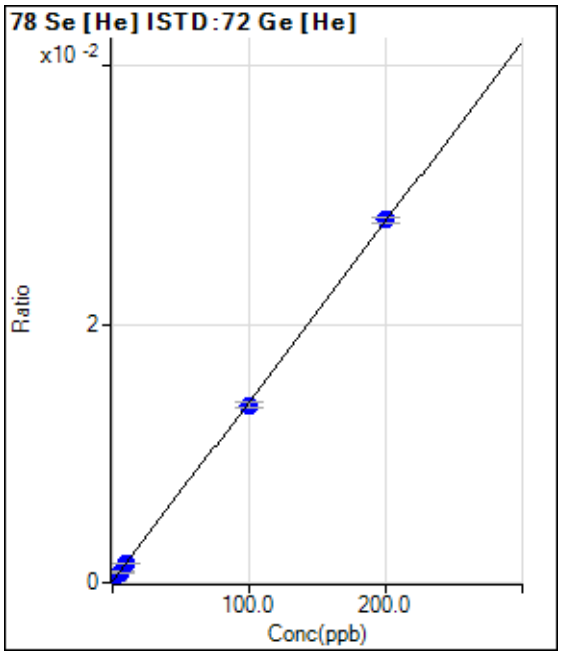
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	77721.89	0.0247	P	0.7
2	☐	2.000	22.658	84207.17	0.0262	P	2.2
3	☐	5.000	49.849	88340.38	0.0280	P	2.9
4	☐	10.000	70.838	92788.44	0.0294	P	0.7
5	☐	100.000	142.006	106428.92	0.0341	P	2.8
6	☐	200.000	174.627	110539.49	0.0363	P	3.1
7	☐	1.000					

y = 6.6121E-005 * x + 0.0247
R = 0.9238
DL = 7.935
BEC = 373.7

Weight: <None>
Min Conc: <None>

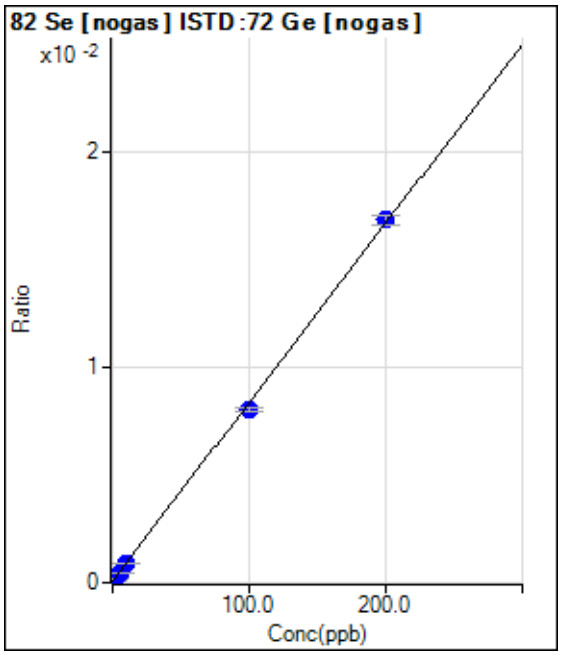


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.637	142.00	0.0002	P	7.4
2	☐	2.000	2.392	340.00	0.0004	P	10.
3	☐	5.000	5.150	622.68	0.0008	P	11.
4	☐	10.000	9.773	1120.04	0.0015	P	3.4
5	☐	100.000	98.089	10317.60	0.0137	P	2.4
6	☐	200.000	200.959	20841.90	0.0281	P	1.6
7	☐	1.000					

y = 1.3921E-004 * x + 9.2096E-005
R = 0.9999
DL = 0.2872
BEC = 0.6615

Weight: <None>
Min Conc: <None>

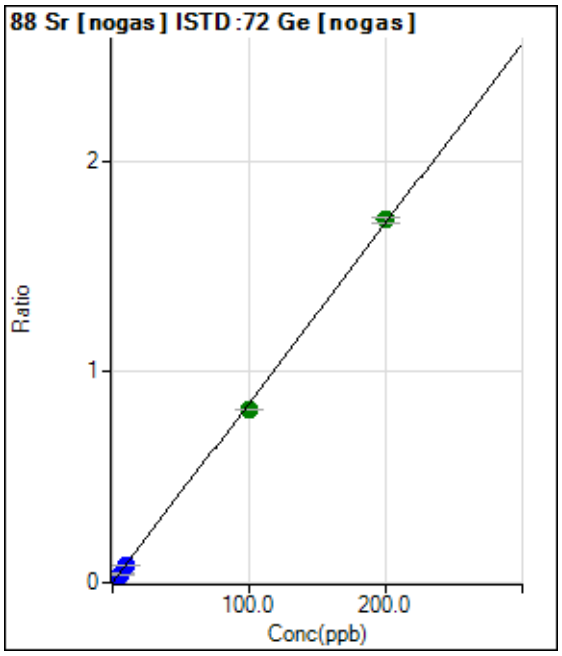
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	240.01	0.0001	P	34.
2	☐	2.000	1.669	690.02	0.0002	P	22.
3	☐	5.000	4.245	1353.41	0.0004	P	7.0
4	☐	10.000	9.600	2756.91	0.0009	P	3.1
5	☐	100.000	96.048	25131.04	0.0081	P	1.5
6	☐	200.000	202.018	51393.05	0.0169	P	2.8
7	☐	1.000					

y = 8.3033E-005 * x + 7.6479E-005
R = 0.9997
DL = 0.9411
BEC = 0.9211

Weight: <None>
Min Conc: <None>

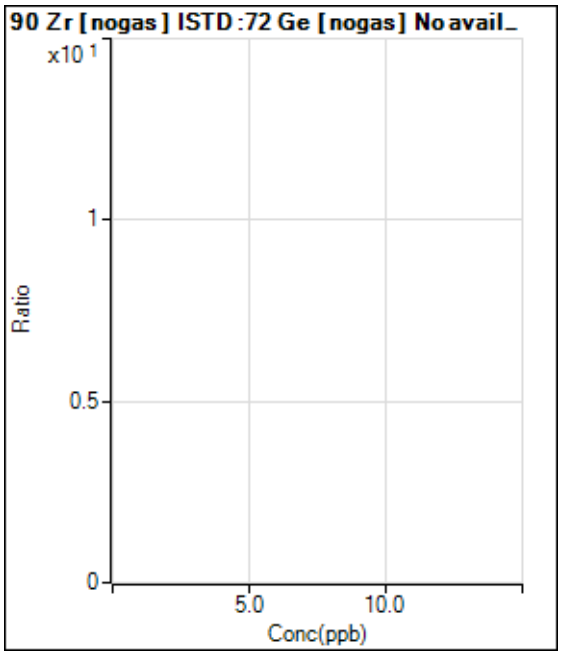


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	810.03	0.0003	P	3.9
2	☐	2.000	1.922	53470.05	0.0166	P	4.2
3	☐	5.000	4.773	129199.14	0.0410	P	2.6
4	☐	10.000	9.392	253599.04	0.0803	P	1.3
5	☐	100.000	96.277	2563408.66	0.8212	A	0.6
6	☐	200.000	201.898	5250985.44	1.7219	A	1.8
7	☐	1.000					

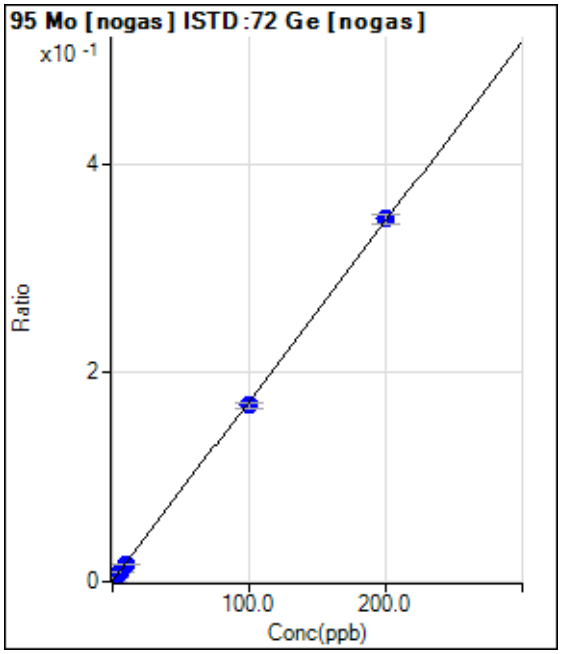
y = 0.0085 * x + 2.5760E-004
R = 0.9998
DL = 0.003553
BEC = 0.03021

Weight: <None>
Min Conc: <None>

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

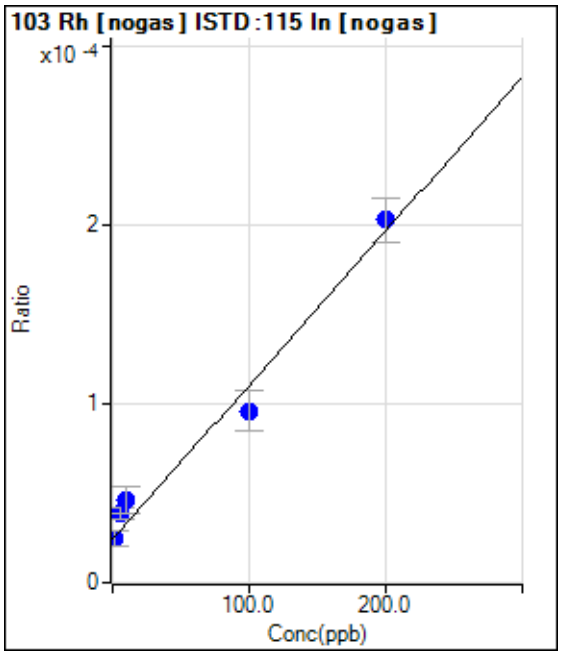


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2346.86	0.0007	P	8.4
2	☐	2.000	1.858	12691.37	0.0039	P	0.6
3	☐	5.000	4.830	28616.63	0.0091	P	3.7
4	☐	10.000	9.509	54099.29	0.0171	P	2.0
5	☐	100.000	97.437	526515.83	0.1687	P	2.3
6	☐	200.000	201.312	1060404.51	0.3477	P	2.8
7	☐	1.000					

y = 0.0017 * x + 7.4666E-004
R = 0.9999
DL = 0.1091
BEC = 0.4332

Weight: <None>
Min Conc: <None>

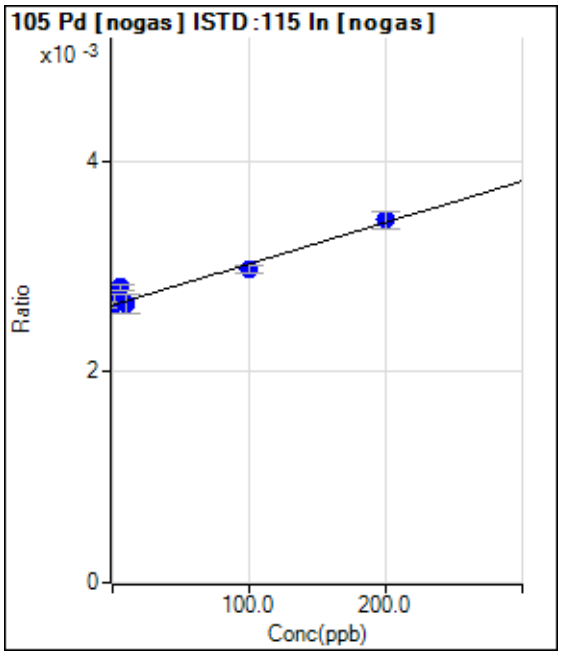
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0000	P	35.
2	☐	2.000	0.528	70.00	0.0000	P	33.
3	☐	5.000	17.218	110.00	0.0000	P	16.
4	☐	10.000	25.475	126.67	0.0000	P	33.
5	☐	100.000	83.468	266.67	0.0001	P	23.
6	☐	200.000	207.201	536.68	0.0002	P	12.
7	☐	1.000					

y = 8.6114E-007 * x + 2.4223E-005
R = 0.9900
DL = 30.06
BEC = 28.13

Weight: <None>
Min Conc: <None>

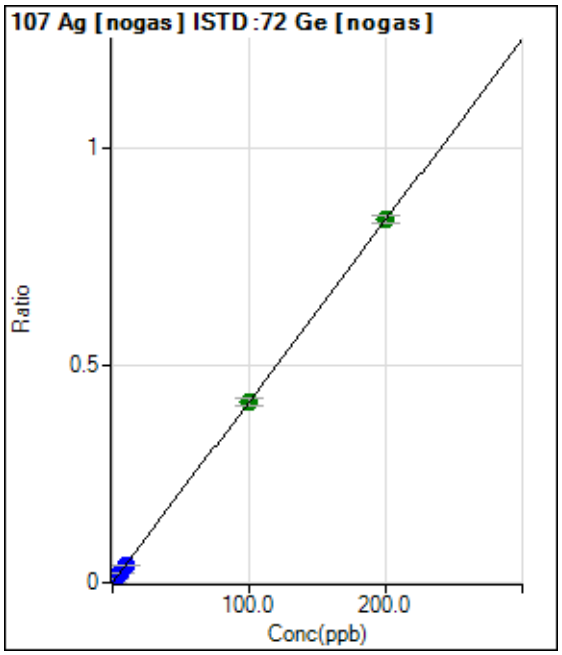


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7274.94	0.0026	P	1.9
2	☐	2.000	25.052	7825.18	0.0027	P	4.8
3	☐	5.000	42.617	7895.25	0.0028	P	1.8
4	☐	10.000	1.560	7281.63	0.0026	P	6.9
5	☐	100.000	86.483	8272.06	0.0030	P	2.7
6	☐	200.000	206.009	9092.51	0.0034	P	4.7
7	☐	1.000					

y = 3.9266E-006 * x + 0.0026
R = 0.9712
DL = 37.3
BEC = 670.8

Weight: <None>
Min Conc: <None>

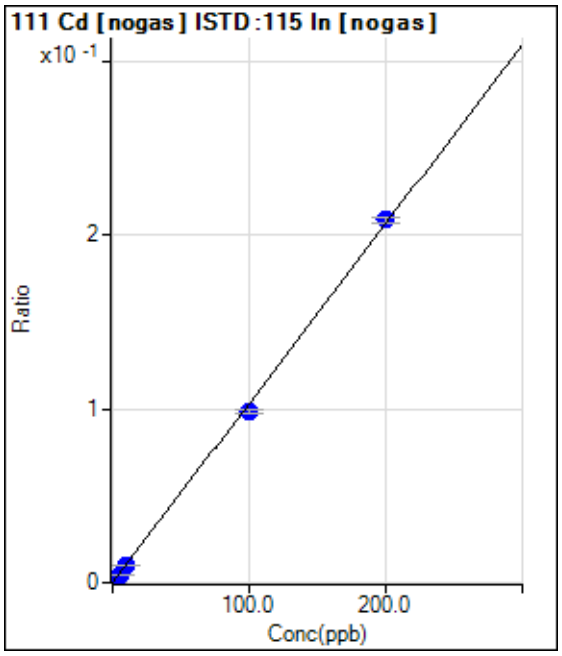
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	313.34	0.0001	P	18.
2	☐	2.000	1.993	27057.61	0.0084	P	2.1
3	☐	5.000	4.847	64139.82	0.0203	P	1.8
4	☐	10.000	9.691	127992.66	0.0406	P	2.9
5	☐	100.000	99.590	1297879.88	0.4158	A	4.7
6	☐	200.000	200.224	2548997.25	0.8360	A	2.2
7	☐	1.000					

y = 0.0042 * x + 9.9494E-005
R = 1.0000
DL = 0.01299
BEC = 0.02383

Weight: <None>
Min Conc: <None>

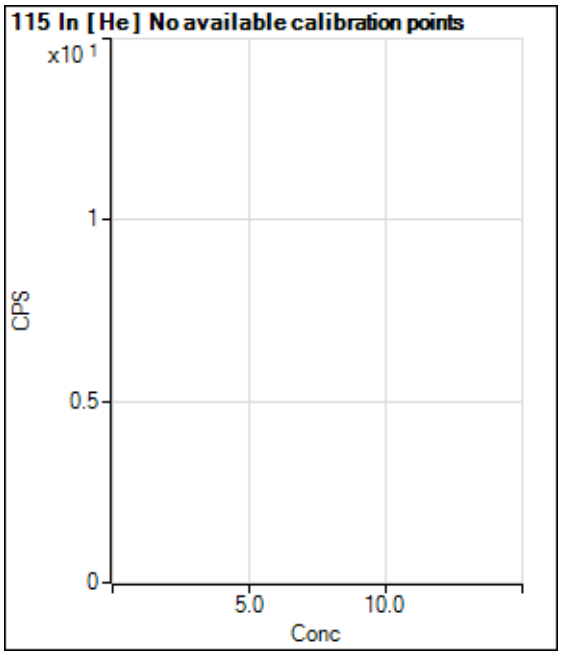


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	16.67	0.0000	P	36.
2	☐	2.000	1.913	5661.00	0.0020	P	9.1
3	☐	5.000	4.673	13618.78	0.0048	P	0.8
4	☐	10.000	9.523	27167.91	0.0098	P	0.3
5	☐	100.000	95.439	273998.84	0.0985	P	1.7
6	☐	200.000	202.314	551807.61	0.2089	P	1.9
7	☐	1.000					

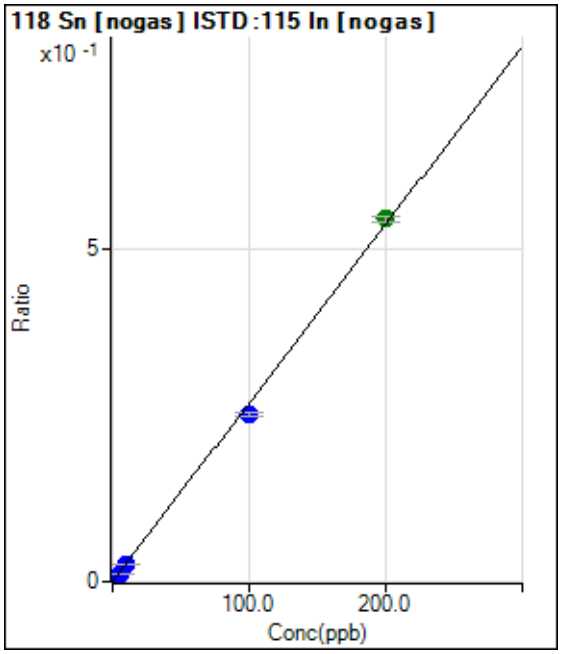
y = 0.0010 * x + 6.0777E-006
R = 0.9996
DL = 0.00647
BEC = 0.005887

Weight: <None>
Min Conc: <None>

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			929411.46		P	0.5
2	☐			963801.71		P	1.7
3	☐			912139.59		P	2.3
4	☐			935971.63		P	0.6
5	☐			884579.95		P	1.9
6	☐			894182.83		P	1.3
7	☐						

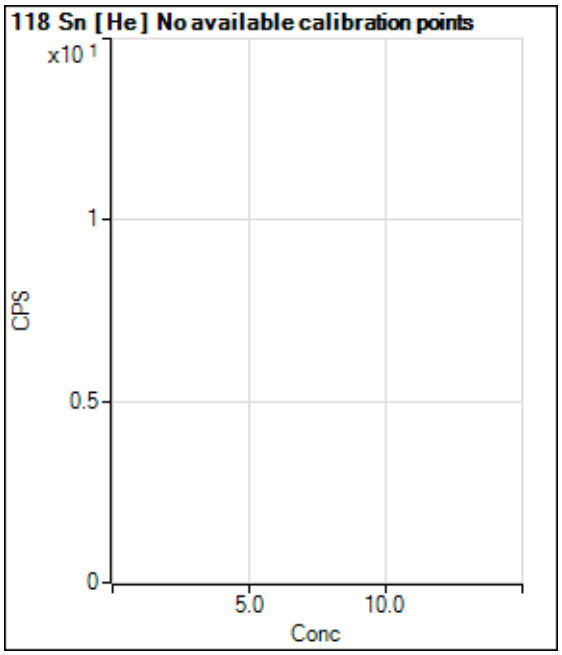


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	900.04	0.0003	P	22.
2	☐	2.000	1.789	14713.08	0.0051	P	1.3
3	☐	5.000	4.547	35382.89	0.0126	P	3.0
4	☐	10.000	9.435	70960.99	0.0257	P	1.0
5	☐	100.000	93.586	700595.80	0.2520	P	2.3
6	☐	200.000	203.248	1444717.17	0.5468	A	1.8
7	☐	1.000					

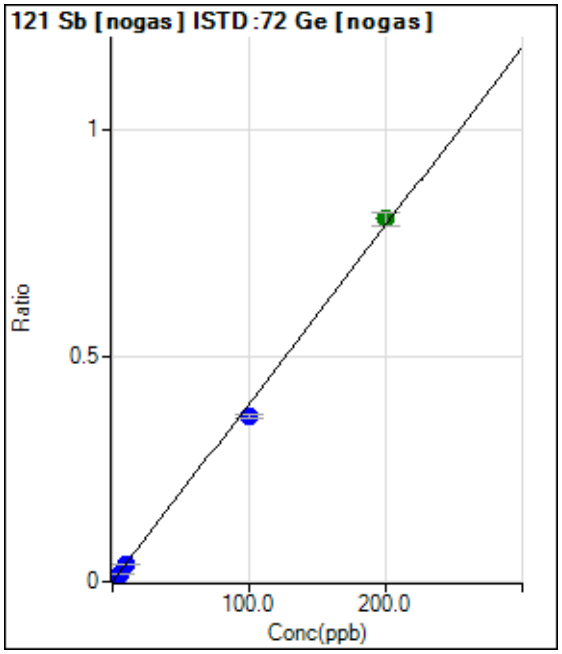
y = 0.0027 * x + 3.2733E-004
R = 0.9993
DL = 0.08178
BEC = 0.1217

Weight: <None>
Min Conc: <None>

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			346.68		P	31.
2	☐			5827.72		P	1.5
3	☐			14075.82		P	4.8
4	☐			27051.31		P	2.0
5	☐			269593.39		P	1.8
6	☐			551640.48		P	0.7
7	☐						

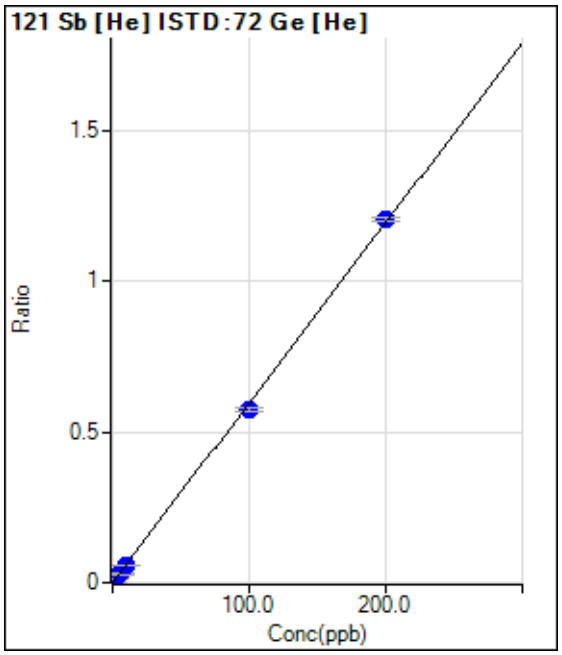


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	220.00	0.0001	P	5.0
2	☐	2.000	1.854	23726.40	0.0074	P	2.2
3	☐	5.000	4.748	59290.80	0.0188	P	2.8
4	☐	10.000	9.562	119295.20	0.0378	P	1.3
5	☐	100.000	92.731	1141841.70	0.3659	P	3.1
6	☐	200.000	203.664	2449177.36	0.8034	A	4.0
7	☐	1.000					

y = 0.0039 * x + 6.9961E-005
R = 0.9991
DL = 0.002662
BEC = 0.01774

Weight: <None>
Min Conc: <None>

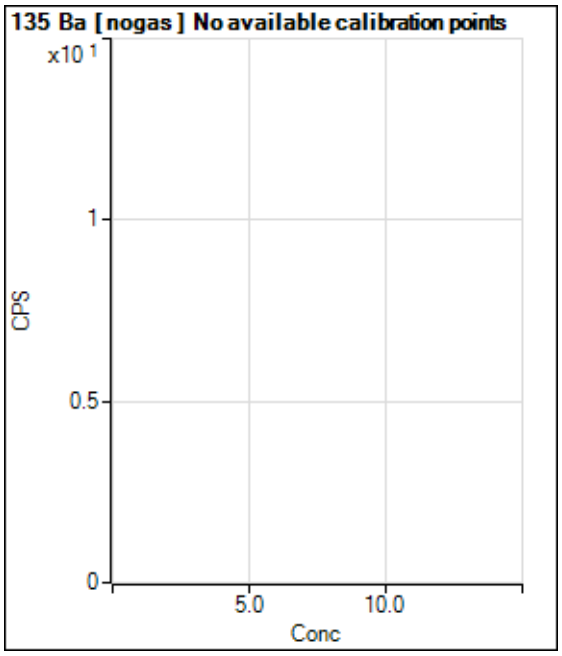
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	93.33	0.0001	P	33.
2	☐	2.000	1.839	8885.72	0.0111	P	3.3
3	☐	5.000	4.805	22200.94	0.0288	P	2.4
4	☐	10.000	9.649	44553.84	0.0578	P	2.3
5	☐	100.000	96.563	433078.86	0.5771	P	2.1
6	☐	200.000	201.742	895149.57	1.2055	P	1.0
7	☐	1.000					

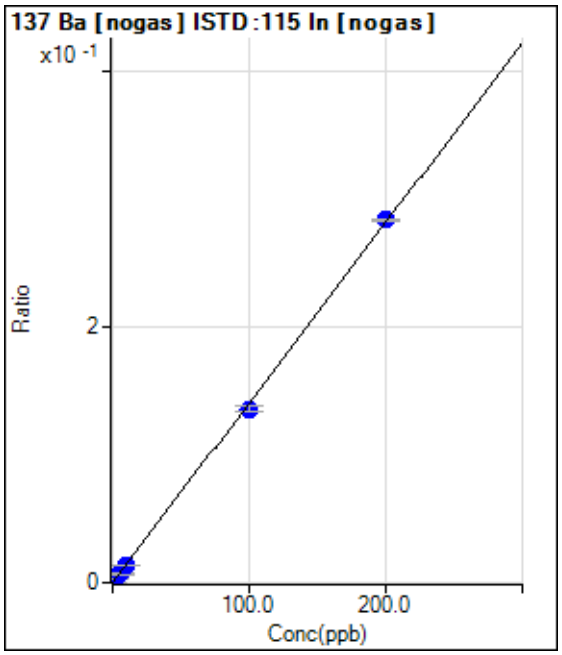
y = 0.0060 * x + 1.1896E-004
R = 0.9998
DL = 0.01984
BEC = 0.01991

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			50.00		P	0.0
2	☐			4527.33		P	5.2
3	☐			11167.10		P	0.4
4	☐			22127.70		P	1.3
5	☐			219963.50		P	2.6
6	☐			443919.46		P	0.7
7	☐						

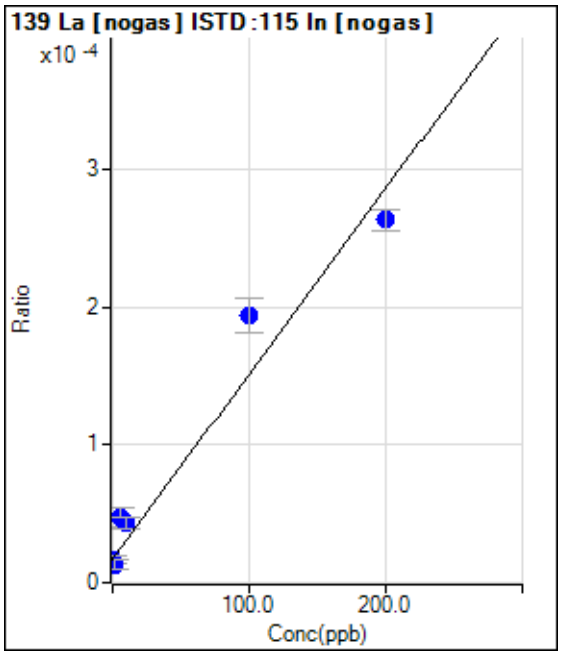
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	58.
2	☐	2.000	1.835	7428.38	0.0026	P	4.8
3	☐	5.000	4.801	19077.54	0.0068	P	3.2
4	☐	10.000	9.553	37116.85	0.0134	P	4.5
5	☐	100.000	96.668	377867.18	0.1359	P	3.2
6	☐	200.000	201.695	749343.66	0.2836	P	0.6
7	☐	1.000					

y = 0.0014 * x + 1.8059E-005
R = 0.9998
DL = 0.02242
BEC = 0.01285

Weight: <None>
Min Conc: <None>

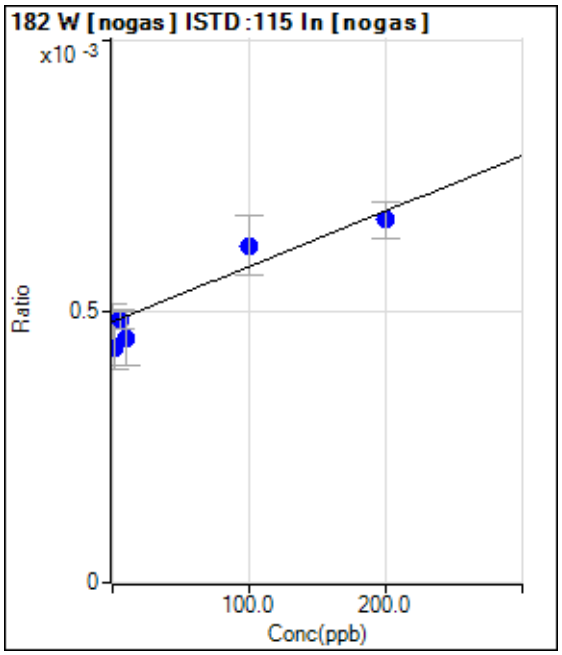


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	46.67	0.0000	P	35.
2	☐	2.000	-3.147	36.67	0.0000	P	54.
3	☐	5.000	22.464	133.33	0.0000	P	30.
4	☐	10.000	19.781	120.00	0.0000	P	19.
5	☐	100.000	131.828	540.02	0.0002	P	13.
6	☐	200.000	183.212	696.69	0.0003	P	6.1
7	☐	1.000					

y = 1.3460E-006 * x + 1.6995E-005
R = 0.9775
DL = 13.32
BEC = 12.63

Weight: <None>
Min Conc: <None>

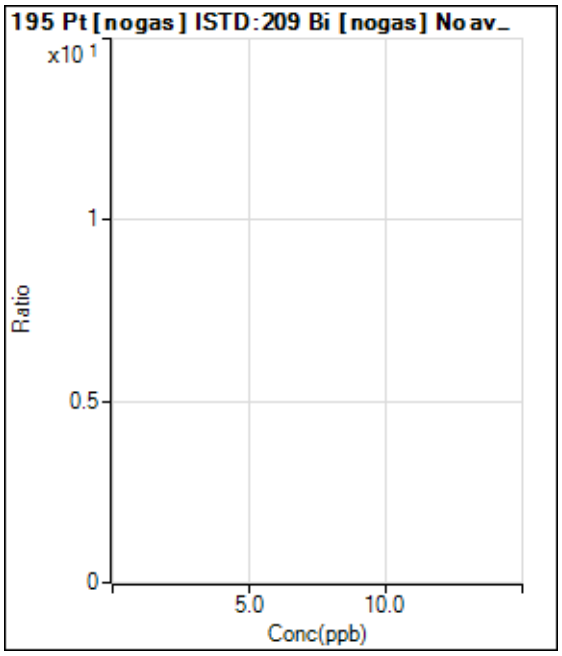
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1323.41	0.0005	P	13.
2	☐	2.000	-46.758	1233.40	0.0004	P	19.
3	☐	5.000	5.083	1370.08	0.0005	P	7.6
4	☐	10.000	-30.301	1236.73	0.0004	P	22.
5	☐	100.000	137.403	1726.86	0.0006	P	17.
6	☐	200.000	183.799	1766.78	0.0007	P	10.
7	☐	1.000					

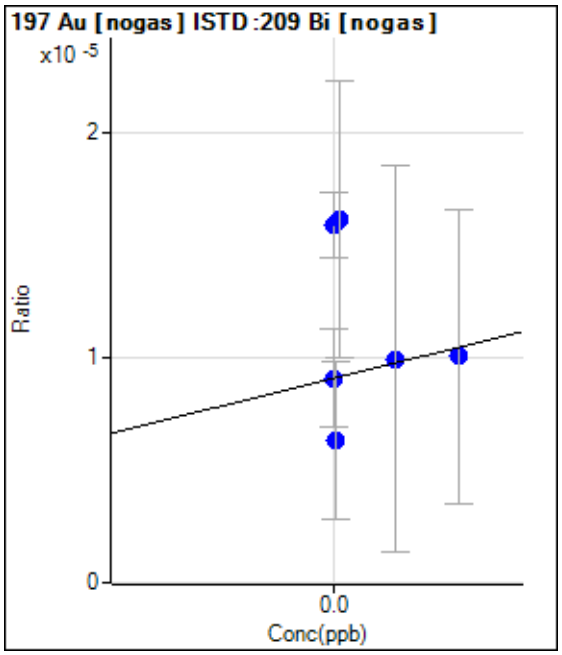
y = 1.0216E-006 * x + 4.8084E-004
R = 0.9490
DL = 189.8
BEC = 470.7

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

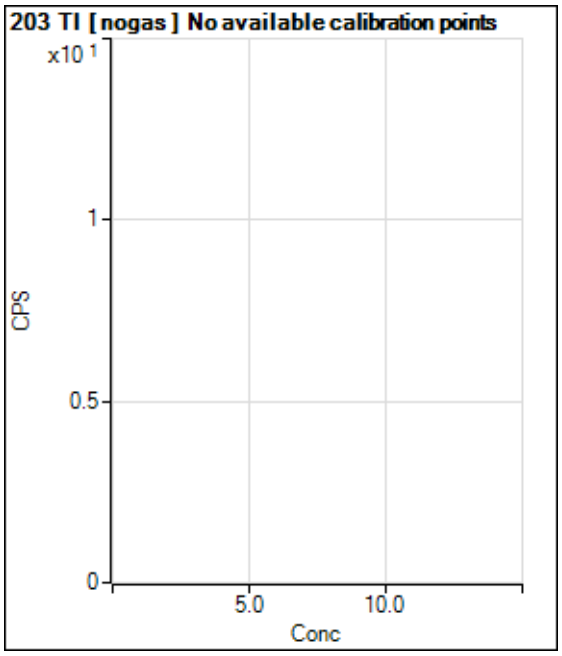
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	48.
2	☐	2.000	984.237	33.33	0.0000	P	18.
3	☐	5.000	-400.848	13.33	0.0000	P	111
4	☐	10.000	1013.815	33.33	0.0000	P	76.
5	☐	100.000	122.077	20.00	0.0000	P	173
6	☐	200.000	139.095	20.00	0.0000	P	130
7	☐	1.000					

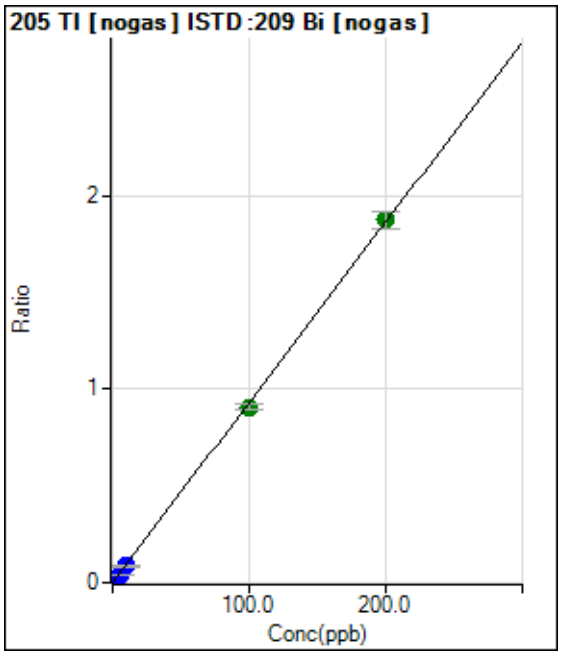
y = 6.9401E-009 * x + 9.0850E-006
R = -0.2069
DL = 1901
BEC = 1309

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			396.68		P	6.3
2	☐			15177.28		P	1.9
3	☐			37206.19		P	2.6
4	☐			74657.31		P	2.8
5	☐			754513.63		P	0.6
6	☐			1615787.06		A	4.1
7	☐						

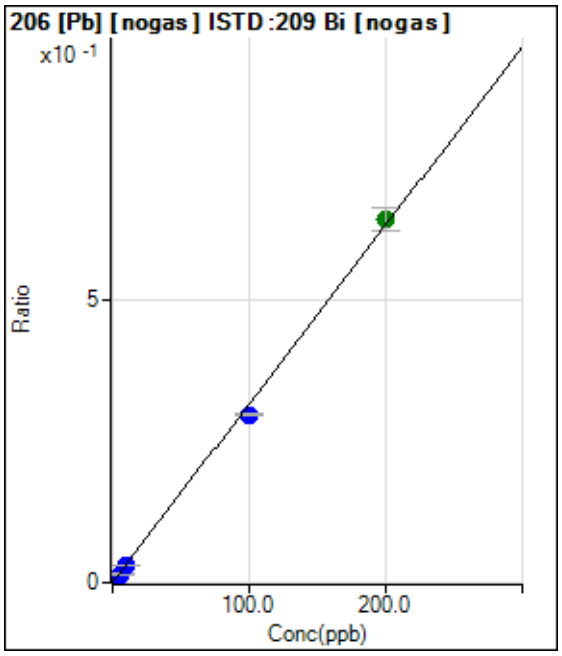
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	950.04	0.0004	P	26.
2	☐	2.000	1.846	36978.93	0.0176	P	5.3
3	☐	5.000	4.650	90889.89	0.0438	P	3.6
4	☐	10.000	9.123	177386.68	0.0855	P	3.5
5	☐	100.000	97.375	1871198.98	0.9080	A	3.2
6	☐	200.000	201.366	3729505.46	1.8773	A	5.1
7	☐	1.000					

y = 0.0093 * x + 4.3290E-004
R = 0.9999
DL = 0.03734
BEC = 0.04645

Weight: <None>
Min Conc: <None>

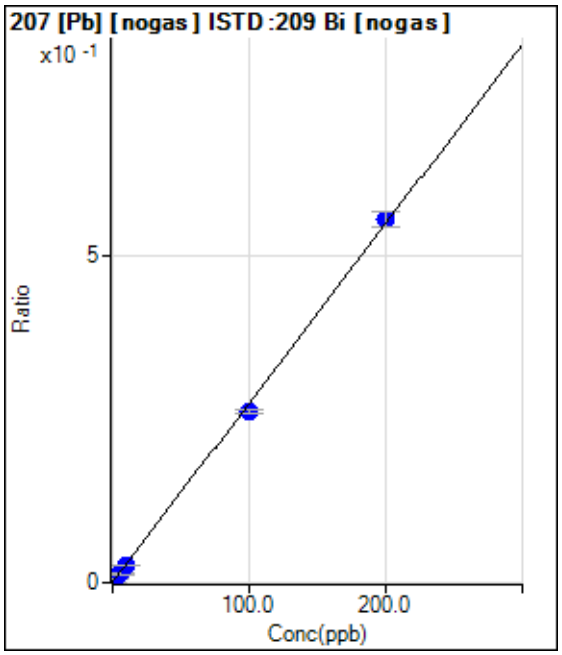


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1443.42	0.0007	P	2.7
2	☐	2.000	1.898	13959.54	0.0067	P	2.6
3	☐	5.000	4.594	31470.82	0.0152	P	8.4
4	☐	10.000	9.218	61834.71	0.0298	P	3.3
5	☐	100.000	93.880	612633.70	0.2974	P	1.3
6	☐	200.000	203.110	1276227.35	0.6426	A	6.3
7	☐	1.000					

y = 0.0032 * x + 6.5882E-004
R = 0.9994
DL = 0.01697
BEC = 0.2084

Weight: <None>
Min Conc: <None>

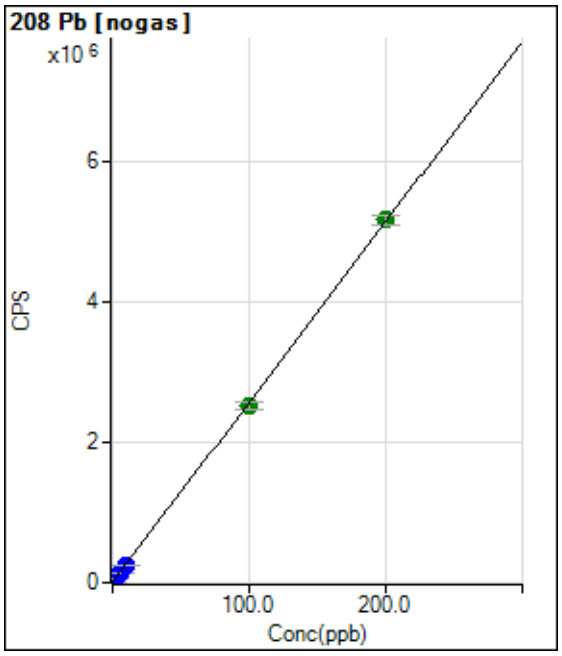
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1286.74	0.0006	P	10.
2	☐	2.000	1.901	12171.41	0.0058	P	1.7
3	☐	5.000	4.736	28181.32	0.0136	P	5.2
4	☐	10.000	9.431	54919.53	0.0265	P	3.7
5	☐	100.000	95.639	541907.69	0.2630	P	2.5
6	☐	200.000	202.216	1103714.62	0.5554	P	4.3
7	☐	1.000					

y = 0.0027 * x + 5.8827E-004
R = 0.9997
DL = 0.06788
BEC = 0.2144

Weight: <None>
Min Conc: <None>

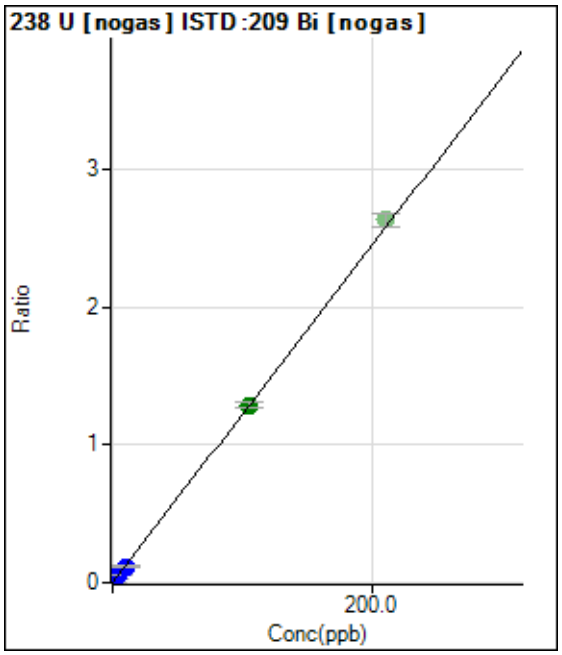


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5600.46		P	3.4
2	☐	2.000	1.947	55658.05		P	1.7
3	☐	5.000	4.775	128327.18		P	0.4
4	☐	10.000	9.450	248511.29		P	1.3
5	☐	100.000	97.744	2517963.92		A	4.1
6	☐	200.000	201.162	5176179.64		A	2.9
7	☐	1.000					

y = 25703.5855 * x + 5600.4633
R = 0.9999
DL = 0.02227
BEC = 0.2179

Weight: <None>
Min Conc: <None>

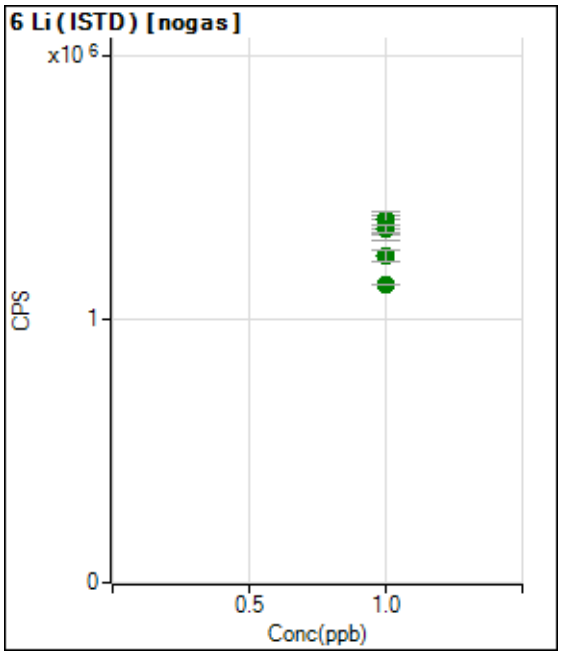
Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.33	0.0000	P	22.
2	☐	2.000	1.905	49056.52	0.0234	P	1.0
3	☐	5.000	4.872	124200.91	0.0598	P	1.6
4	☐	10.000	9.631	245233.03	0.1181	P	1.8
5	☐	105.000	105.043	2655341.11	1.2884	A	2.6
6	☑	210.000		5233637.32	2.6334	A	3.4
7	☐	1.000					

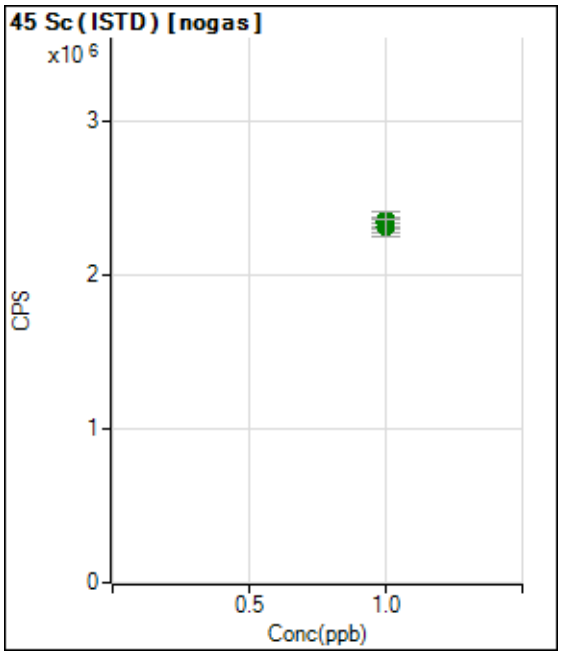
y = 0.0123 * x + 2.8842E-005
R = 1.0000
DL = 0.001568
BEC = 0.002352

Weight: <None>
Min Conc: <None>

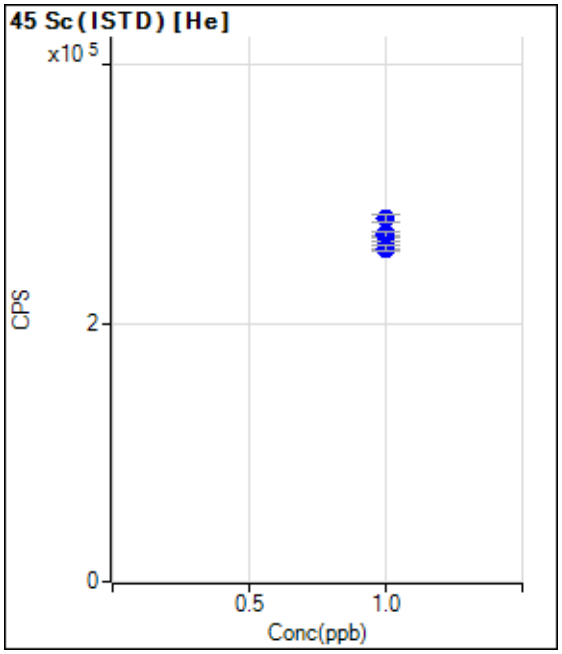


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1359891.36		A	4.9
2	☐	1.000		1344970.86		A	6.0
3	☐	1.000		1379508.00		A	5.0
4	☐	1.000		1345500.42		A	2.3
5	☐	1.000		1246083.87		A	3.4
6	☐	1.000		1131773.55		A	0.1
7	☐	1.000					

Calibration for 020_ICV.d

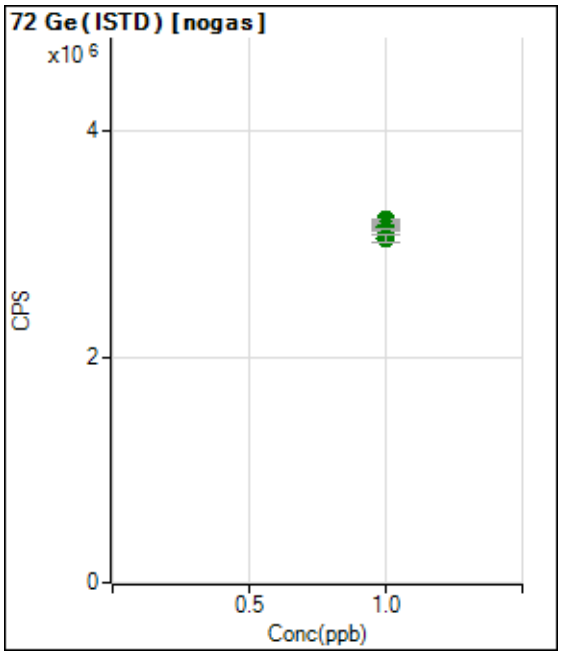


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2346055.54		A	2.6
2	☐	1.000		2362147.52		A	1.9
3	☐	1.000		2342697.83		A	2.7
4	☐	1.000		2348832.83		A	5.5
5	☐	1.000		2358413.77		A	4.5
6	☐	1.000		2311042.67		A	4.5
7	☐	1.000					

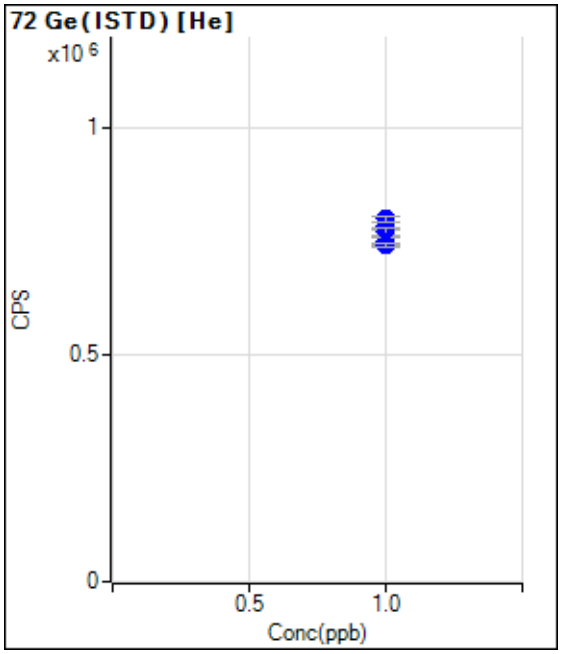


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		268993.35		P	1.0
2	☐	1.000		280693.89		P	2.1
3	☐	1.000		266646.73		P	0.5
4	☐	1.000		267248.55		P	2.8
5	☐	1.000		260197.88		P	2.3
6	☐	1.000		257615.65		P	1.6
7	☐	1.000					

Calibration for 020_ICV.d

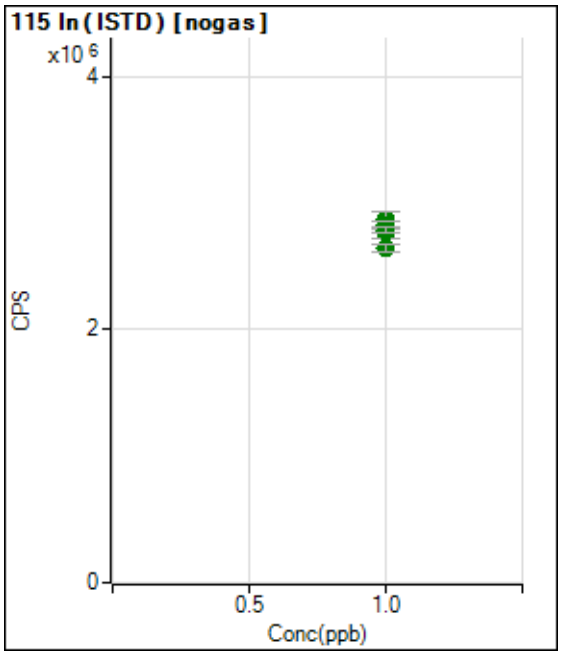


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3145209.43		A	1.2
2	☐	1.000		3213340.79		A	0.9
3	☐	1.000		3154457.97		A	0.5
4	☐	1.000		3156956.72		A	1.8
5	☐	1.000		3121481.00		A	0.8
6	☐	1.000		3050026.83		A	2.0
7	☐	1.000					

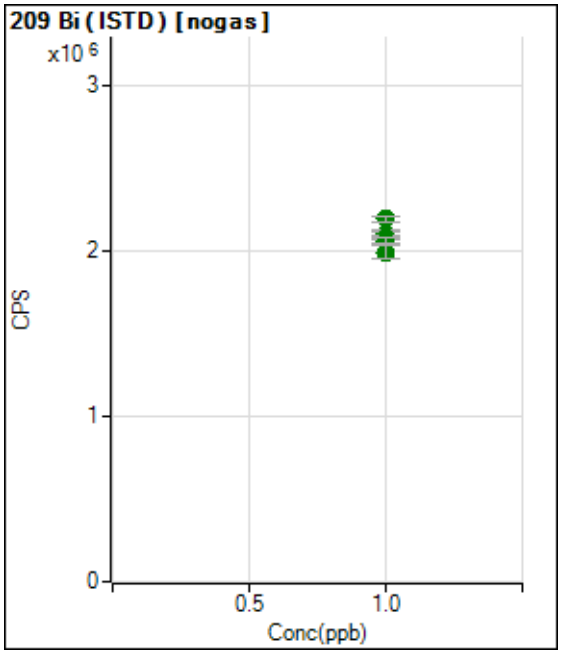


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		785019.94		P	1.9
2	☐	1.000		800121.60		P	1.9
3	☐	1.000		770398.48		P	2.3
4	☐	1.000		771369.03		P	2.2
5	☐	1.000		750724.47		P	2.4
6	☐	1.000		742606.29		P	0.9
7	☐	1.000					

Calibration for 020_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2761163.82		A	3.7
2	☐	1.000		2864140.74		A	4.8
3	☐	1.000		2819102.61		A	2.0
4	☐	1.000		2761826.92		A	3.1
5	☐	1.000		2781244.33		A	1.7
6	☐	1.000		2642789.96		A	2.6
7	☐	1.000					



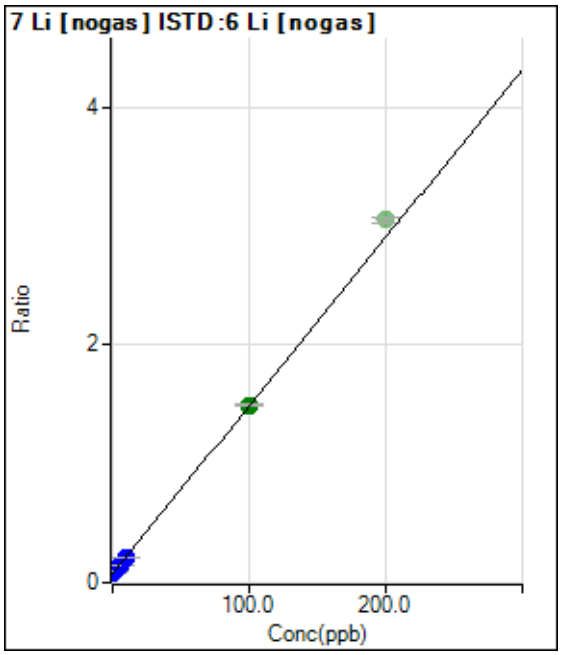
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2190176.74		A	1.9
2	☐	1.000		2096933.25		A	1.0
3	☐	1.000		2078205.39		A	4.3
4	☐	1.000		2075763.61		A	0.8
5	☐	1.000		2060332.52		A	2.0
6	☐	1.000		1989046.90		A	3.9
7	☐	1.000					

Calibration for 129_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\122418A.b\
Analysis File: 122418A.batch.bin
DA Date-Time: 2018-12-24 19:19:15
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	123CALB.d	CAL BLK	2018-12-24 18:59:56
2	124CALS.d	2/10/200	2018-12-24 19:01:55
3	125CALS.d	5/25/500	2018-12-24 19:03:54
4	126CALS.d	10/50/1000	2018-12-24 19:05:53
5	127CALS.d	100/500/10K	2018-12-24 19:07:51
6	128CALS.d	200/1000/20K	2018-12-24 19:09:49
7			

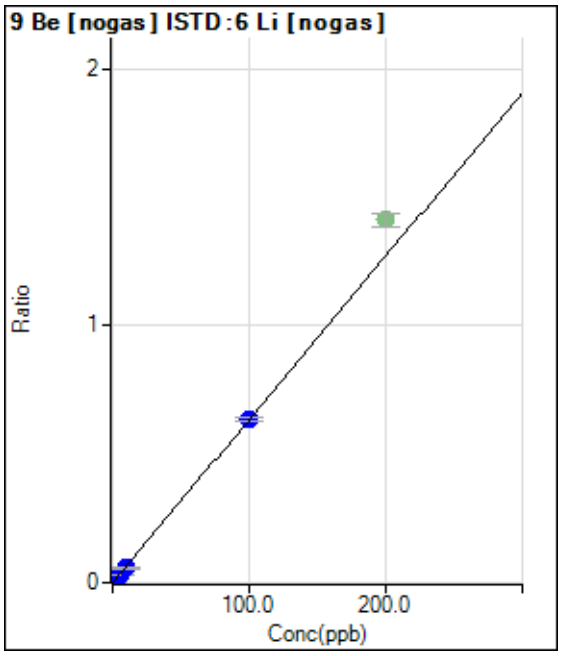
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	109987.48	0.0761	P	4.0
2	☐	2.000	2.015	144042.98	0.1046	P	3.7
3	☐	5.000	5.051	196257.95	0.1475	P	4.2
4	☐	10.000	9.293	278269.37	0.2074	P	4.0
5	☐	100.000	100.068	1809426.95	1.4908	A	1.3
6	☑	200.000		3539333.70	3.0537	A	1.8
7	☐	1.000					

y = 0.0141 * x + 0.0761
R = 1.0000
DL = 0.6449
BEC = 5.38

Weight: <None>
Min Conc: <None>

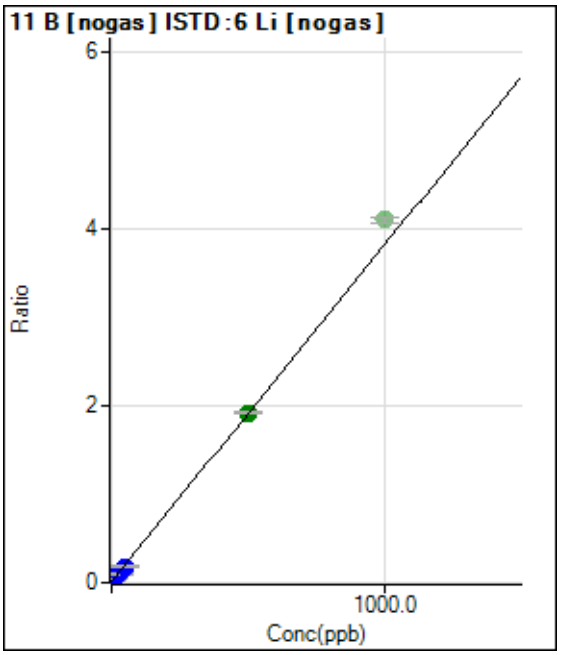


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	70.00	0.0000	P	37.
2	☐	2.000	1.825	16016.87	0.0116	P	5.3
3	☐	5.000	4.751	40216.01	0.0302	P	3.1
4	☐	10.000	9.062	77147.95	0.0576	P	6.7
5	☐	100.000	100.110	770857.12	0.6353	P	1.3
6	☑	200.000		1635048.00	1.4106	A	3.5
7	☐	1.000					

y = 0.0063 * x + 4.8377E-005
R = 1.0000
DL = 0.008578
BEC = 0.007624

Weight: <None>
Min Conc: <None>

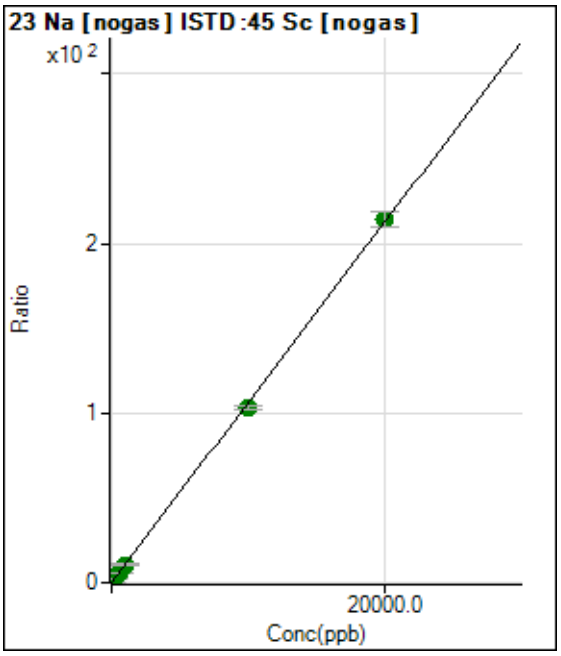
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	18916.23	0.0131	P	2.2
2	☐	10.000	8.712	63562.20	0.0462	P	6.2
3	☐	25.000	22.388	130645.87	0.0982	P	3.7
4	☐	50.000	44.565	244624.14	0.1824	P	5.6
5	☐	500.000	500.700	2325500.28	1.9158	A	1.0
6	☑	1000.000		4747091.91	4.0959	A	1.8
7	☐	5.000					

y = 0.0038 * x + 0.0131
R = 1.0000
DL = 0.2234
BEC = 3.442

Weight: <None>
Min Conc: <None>

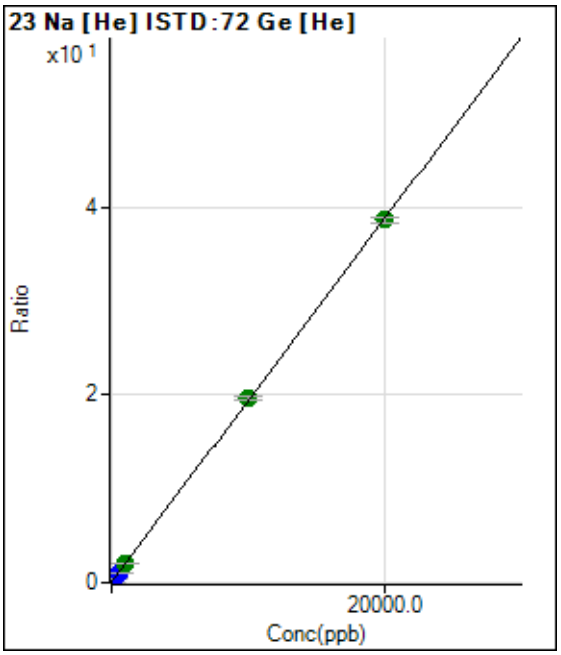


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	400648.68	0.1735	P	0.5
2	☐	200.000	196.654	5490362.49	2.2612	A	3.5
3	☐	500.000	506.361	12844224.25	5.5491	A	3.5
4	☐	1000.000	993.358	25250872.44	10.7190	A	2.4
5	☐	10000.00	9722.634	242498655.4	103.389	A	1.5
6	☐	20000.00	20138.890	487938144.2	213.968	A	4.4
7	☐	100.000					

y = 0.0106 * x + 0.1735
R = 0.9999
DL = 0.2609
BEC = 16.34

Weight: <None>
Min Conc: <None>

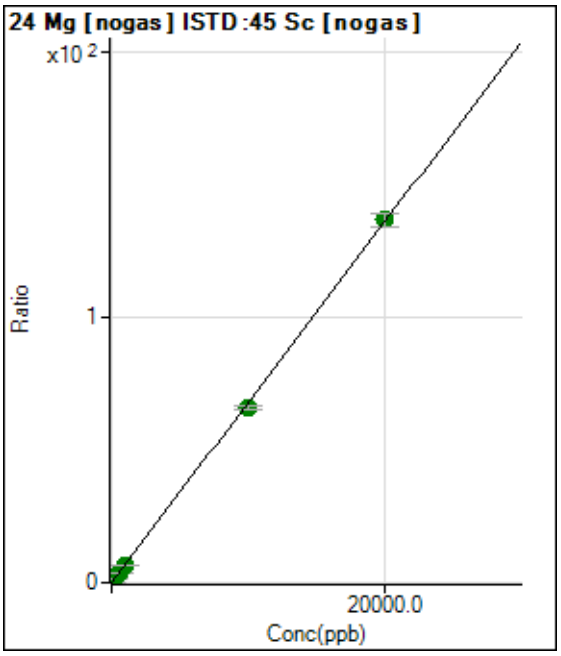
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	45584.69	0.0604	P	3.2
2	☐	200.000	199.795	338996.83	0.4467	P	2.9
3	☐	500.000	478.901	782019.52	0.9862	P	1.4
4	☐	1000.000	1043.104	1603255.50	2.0769	A	3.7
5	☐	10000.00	10100.867	14697812.28	19.5869	A	1.8
6	☐	20000.00	19947.941	28670344.57	38.6227	A	1.8
7	☐	100.000					

y = 0.0019 * x + 0.0604
R = 1.0000
DL = 3.039
BEC = 31.26

Weight: <None>
Min Conc: <None>

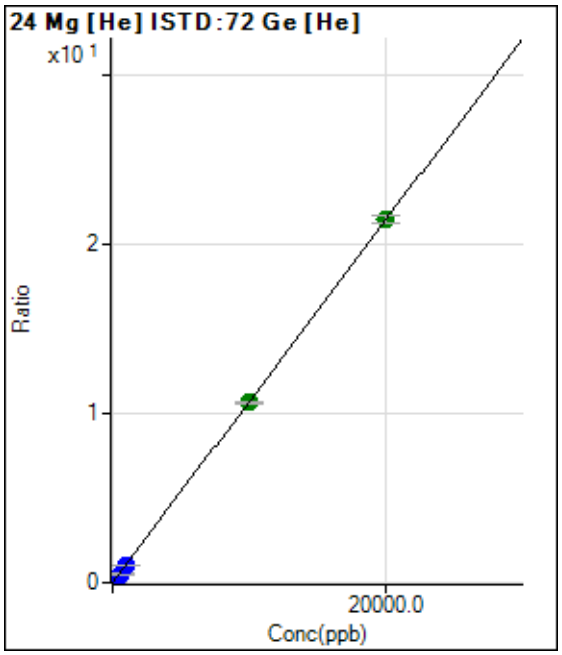


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8169.72	0.0035	P	17.
2	☐	200.000	207.727	3430175.73	1.4130	A	5.2
3	☐	500.000	509.339	8008672.58	3.4594	A	2.3
4	☐	1000.000	990.209	15834309.73	6.7222	A	2.5
5	☐	10000.00	9731.414	154874207.6	66.0318	A	2.7
6	☐	20000.00	20134.472	311599648.6	136.617	A	3.7
7	☐	100.000					

y = 0.0068 * x + 0.0035
R = 0.9999
DL = 0.276
BEC = 0.5222

Weight: <None>
Min Conc: <None>

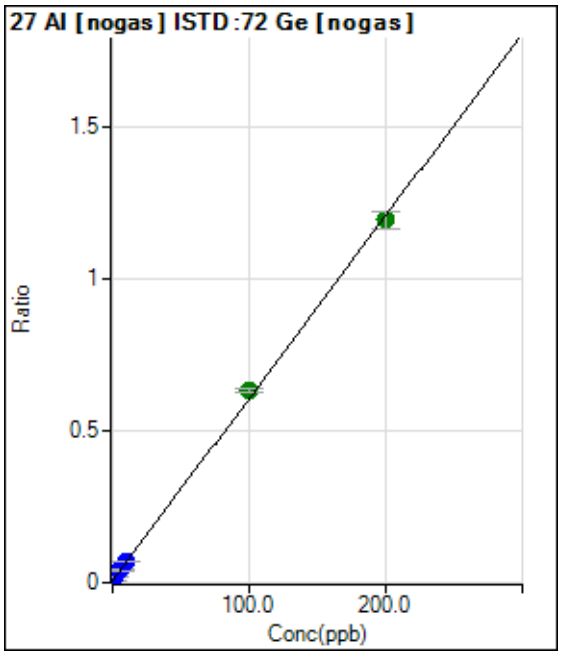
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	583.35	0.0008	P	14.
2	☐	200.000	200.524	163587.70	0.2155	P	2.7
3	☐	500.000	475.935	404818.80	0.5105	P	1.2
4	☐	1000.000	985.076	815125.67	1.0558	P	2.7
5	☐	10000.00	9942.707	7992093.84	10.6500	A	0.8
6	☐	20000.00	20029.989	15925250.18	21.4541	A	2.0
7	☐	100.000					

y = 0.0011 * x + 7.7207E-004
R = 1.0000
DL = 0.303
BEC = 0.7208

Weight: <None>
Min Conc: <None>

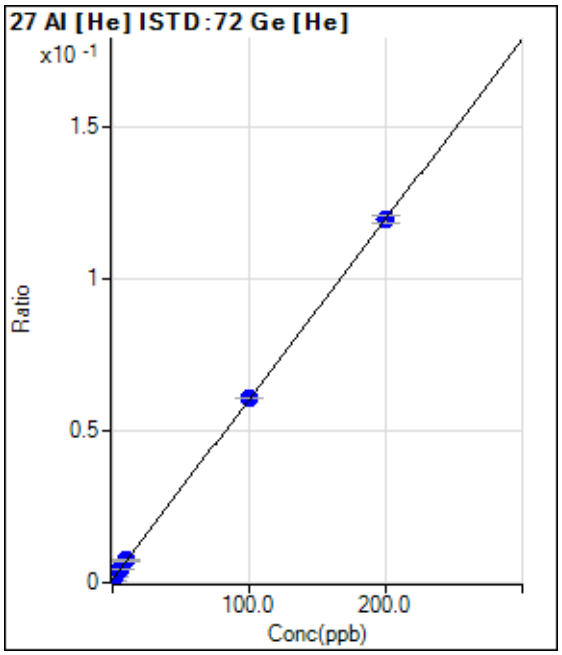


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	21442.36	0.0067	P	4.3
2	☐	2.000	2.061	62001.74	0.0190	P	3.2
3	☐	5.000	5.801	140606.19	0.0415	P	3.0
4	☐	10.000	10.560	232007.90	0.0700	P	0.4
5	☐	100.000	104.066	1990080.39	0.6309	A	2.4
6	☐	200.000	197.918	3720618.90	1.1938	A	5.1
7	☐	1.000					

y = 0.0060 * x + 0.0067
R = 0.9997
DL = 0.144
BEC = 1.115

Weight: <None>
Min Conc: <None>

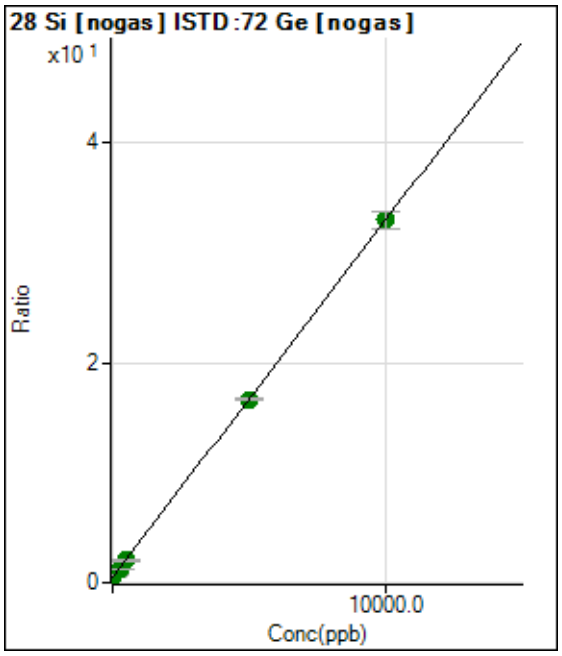
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.865	436.68	0.0006	P	18.
2	☐	2.000	1.605	1553.42	0.0020	P	8.1
3	☐	5.000	5.532	3467.04	0.0044	P	1.9
4	☐	10.000	10.454	5627.60	0.0073	P	5.8
5	☐	100.000	100.613	45588.36	0.0607	P	0.6
6	☐	200.000	199.662	88686.85	0.1195	P	2.0
7	☐	1.000					

y = 5.9290E-004 * x + 0.0011
R = 1.0000
DL = 0.5335
BEC = 1.843

Weight: <None>
Min Conc: <None>

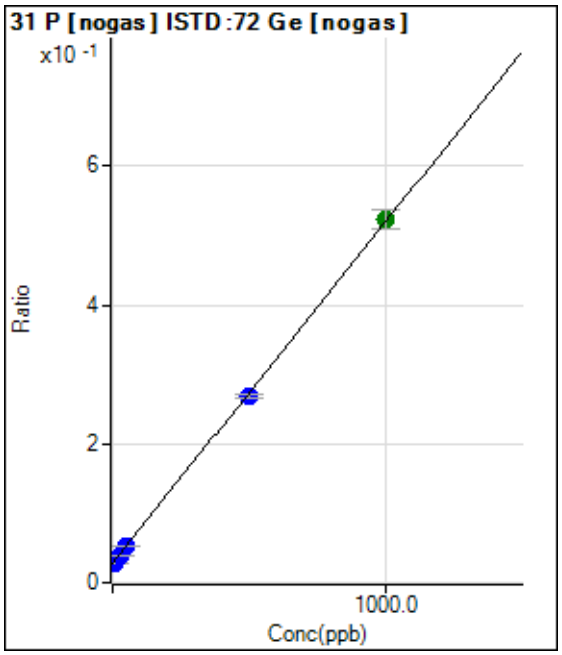


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1541531.96	0.4807	A	2.8
2	☐	100.000	95.072	2570600.17	0.7897	A	3.4
3	☐	250.000	231.577	4181612.54	1.2334	A	1.6
4	☐	500.000	471.512	6670116.15	2.0133	A	0.5
5	☐	5000.000	4990.719	52692804.22	16.7021	A	1.9
6	☐	10000.00	10006.575	102886088.4	33.0051	A	4.6
7	☐	5.000					

y = 0.0033 * x + 0.4807
R = 1.0000
DL = 12.53
BEC = 147.9

Weight: <None>
Min Conc: <None>

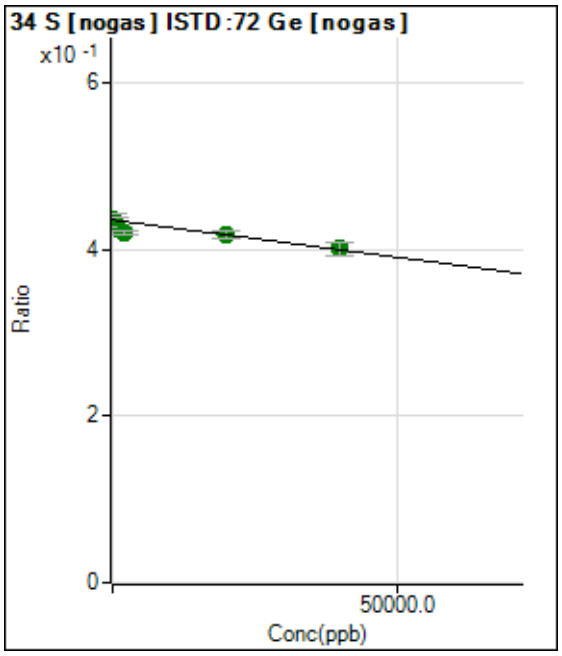
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90461.85	0.0282	P	1.7
2	☐	10.000	-2.420	87959.88	0.0270	P	3.0
3	☐	25.000	21.272	131059.88	0.0387	P	3.5
4	☐	50.000	49.693	174335.07	0.0526	P	2.4
5	☐	500.000	488.610	846504.44	0.2683	P	2.4
6	☐	1000.000	1005.928	1628622.27	0.5226	A	5.4
7	☐	5.000					

y = 4.9145E-004 * x + 0.0282
R = 0.9999
DL = 2.983
BEC = 57.4

Weight: <None>
Min Conc: <None>

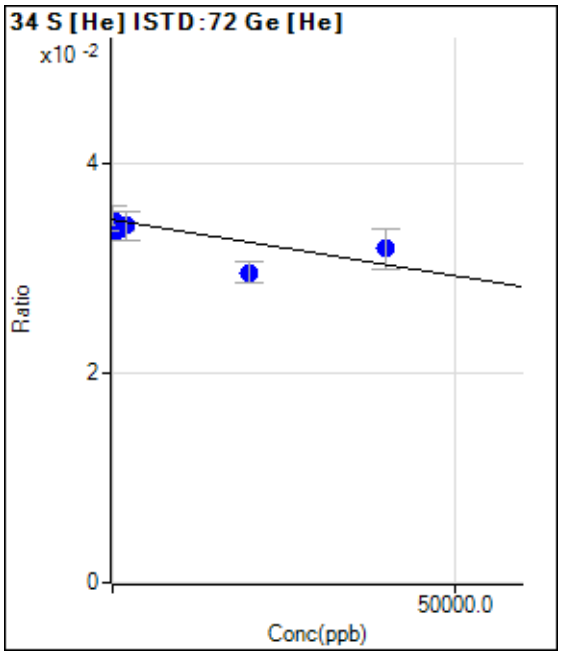


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1396824.77	0.4356	A	3.9
2	☐	400.000	3152.730	1408824.22	0.4328	A	2.8
3	☐	1000.000	13056.907	1437071.29	0.4239	A	1.5
4	☐	2000.000	17104.652	1392253.03	0.4203	A	1.1
5	☐	20000.00	19982.618	1317836.85	0.4177	A	1.8
6	☐	40000.00	38924.509	1249132.51	0.4007	A	4.4
7	☐	100.000					

y = -8.9599E-007 * x + 0.4356
R = -0.9057
DL = -5.671E+04
BEC = -4.862E+05

Weight: <None>
Min Conc: <None>

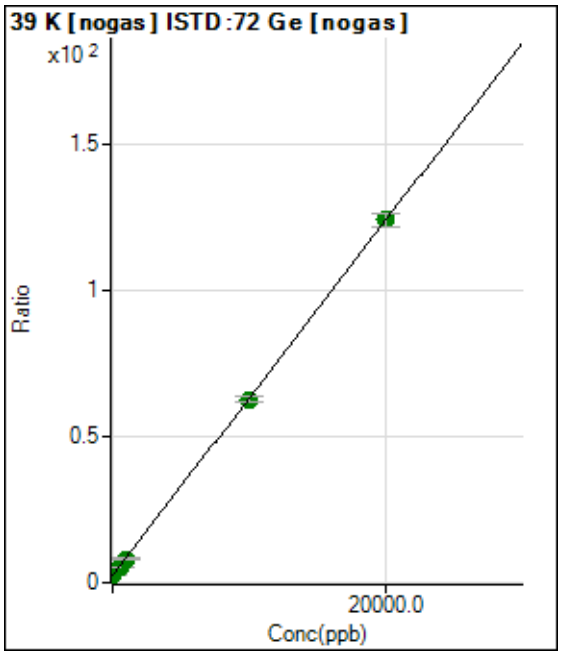
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	26123.34	0.0346	P	7.8
2	☐	400.000	11341.660	25388.79	0.0334	P	0.6
3	☐	1000.000	7300.970	26857.01	0.0339	P	1.5
4	☐	2000.000	5032.600	26322.65	0.0341	P	8.1
5	☐	20000.00	46969.867	22250.35	0.0296	P	6.8
6	☐	40000.00	26096.495	23652.87	0.0319	P	11.
7	☐	100.000					

y = -1.0641E-007 * x + 0.0346
R = -0.6867
DL = -7.658E+04
BEC = -3.256E+05

Weight: <None>
Min Conc: <None>

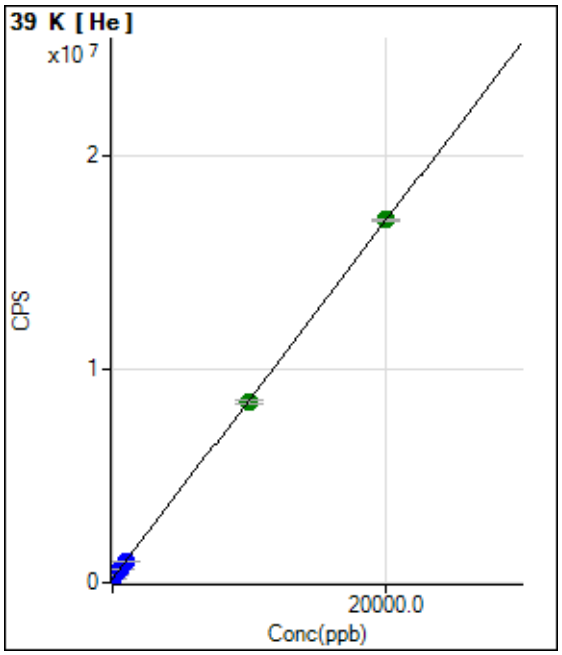


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7853188.46	2.4490	A	0.9
2	☐	200.000	201.119	11948323.96	3.6702	A	2.3
3	☐	500.000	465.004	17872185.82	5.2724	A	2.8
4	☐	1000.000	947.779	27175798.52	8.2036	A	1.5
5	☐	10000.00	9928.145	197878504.4	62.7298	A	3.1
6	☐	20000.00	20039.402	387013200.3	124.122	A	3.8
7	☐	100.000					

y = 0.0061 * x + 2.4490
R = 1.0000
DL = 10.79
BEC = 403.3

Weight: <None>
Min Conc: <None>

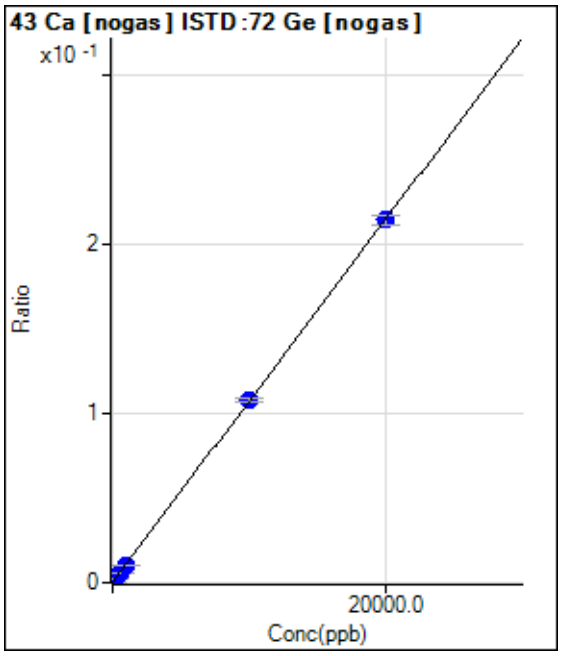
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	181917.03		P	1.6
2	☐	200.000	200.744	350063.77		P	0.8
3	☐	500.000	496.267	597599.06		P	0.8
4	☐	1000.000	976.799	1000101.37		P	0.3
5	☐	10000.00	9873.819	8452403.42		A	1.7
6	☐	20000.00	20064.336	16988162.25		A	0.8
7	☐	100.000					

y = 837.6178 * x + 181917.0300
R = 1.0000
DL = 10.5
BEC = 217.2

Weight: <None>
Min Conc: <None>

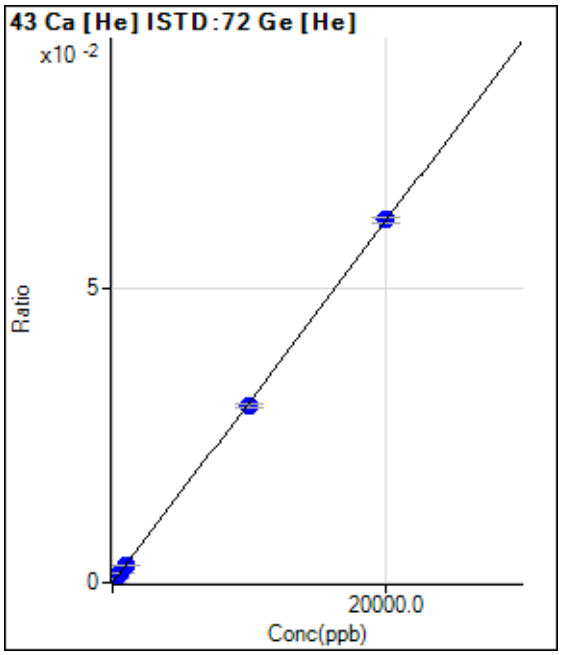


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.35	0.0002	P	15.
2	☐	200.000	205.812	7758.39	0.0024	P	5.1
3	☐	500.000	483.954	18202.48	0.0054	P	1.1
4	☐	1000.000	968.960	35026.59	0.0106	P	0.9
5	☐	10000.00	10035.124	340305.98	0.1079	P	1.5
6	☐	20000.00	19984.333	669374.60	0.2146	P	2.9
7	☐	100.000					

y = 1.0730E-005 * x + 1.7572E-004
R = 1.0000
DL = 7.357
BEC = 16.38

Weight: <None>
Min Conc: <None>

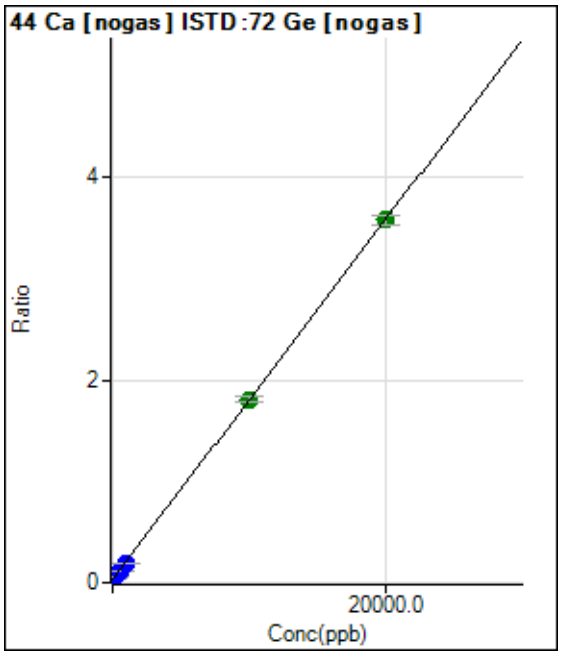
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10.00	0.0000	P	173
2	☐	200.000	211.627	503.35	0.0007	P	12.
3	☐	500.000	532.767	1306.73	0.0016	P	9.8
4	☐	1000.000	976.133	2323.51	0.0030	P	3.7
5	☐	10000.00	9819.239	22630.66	0.0302	P	2.4
6	☐	20000.00	20090.638	45786.34	0.0617	P	1.5
7	☐	100.000					

y = 3.0694E-006 * x + 1.3487E-005
R = 0.9999
DL = 22.83
BEC = 4.394

Weight: <None>
Min Conc: <None>

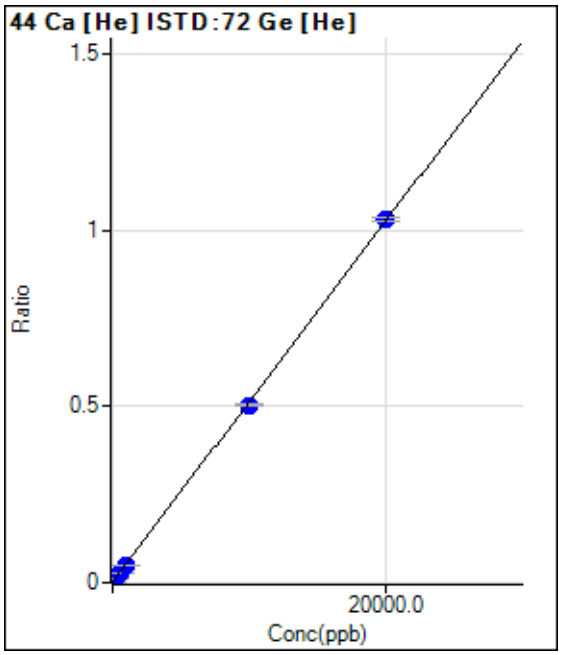


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	95927.98	0.0299	P	1.3
2	☐	200.000	183.548	203606.75	0.0625	P	2.9
3	☐	500.000	453.515	374776.73	0.1105	P	1.3
4	☐	1000.000	921.185	641708.45	0.1937	P	1.0
5	☐	10000.00	10030.191	5719862.00	1.8132	A	2.3
6	☐	20000.00	19990.172	11178437.75	3.5839	A	2.7
7	☐	100.000					

y = 1.7779E-004 * x + 0.0299
R = 1.0000
DL = 6.327
BEC = 168.3

Weight: <None>
Min Conc: <None>

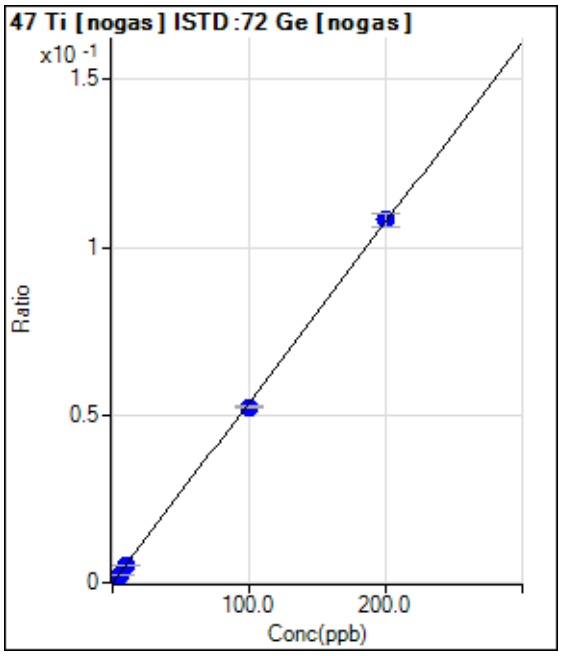
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1076.71	0.0014	P	3.7
2	☐	200.000	201.046	8882.24	0.0117	P	2.3
3	☐	500.000	472.581	20271.27	0.0256	P	5.3
4	☐	1000.000	960.055	38974.26	0.0505	P	0.6
5	☐	10000.00	9808.540	377152.79	0.5025	P	0.9
6	☐	20000.00	20098.402	763233.06	1.0282	P	1.0
7	☐	100.000					

y = 5.1089E-005 * x + 0.0014
R = 0.9999
DL = 3.109
BEC = 27.94

Weight: <None>
Min Conc: <None>

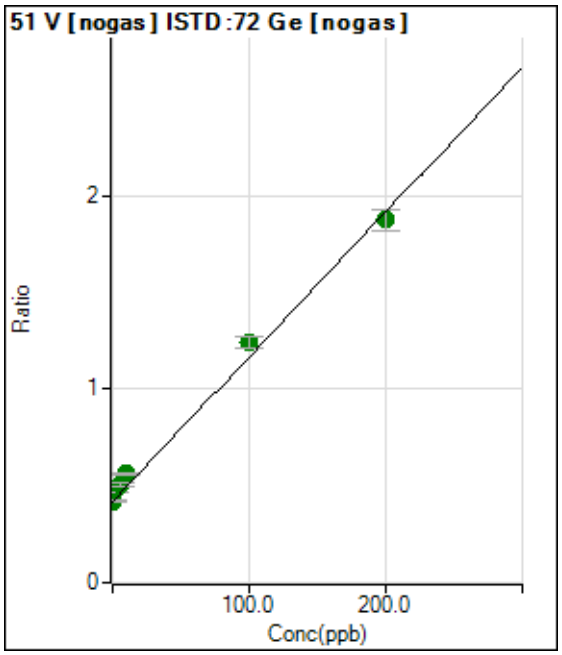


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	236.67	0.0001	P	26.
2	☐	2.000	1.976	3690.42	0.0011	P	10.
3	☐	5.000	4.628	8675.50	0.0026	P	1.6
4	☐	10.000	9.227	16657.76	0.0050	P	3.2
5	☐	100.000	97.395	165245.99	0.0524	P	0.9
6	☐	200.000	201.351	337306.81	0.1082	P	3.6
7	☐	1.000					

y = 5.3690E-004 * x + 7.3776E-005
R = 0.9999
DL = 0.111
BEC = 0.1374

Weight: <None>
Min Conc: <None>

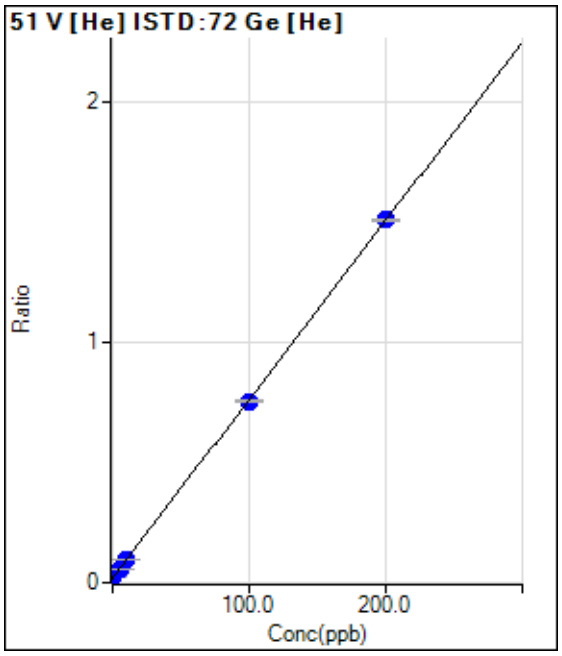
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1345869.72	0.4197	A	1.7
2	☐	2.000	7.600	1551444.86	0.4766	A	4.6
3	☐	5.000	11.570	1716980.12	0.5064	A	2.6
4	☐	10.000	19.280	1868880.05	0.5641	A	1.6
5	☐	100.000	109.718	3915445.92	1.2417	A	4.3
6	☐	200.000	194.457	5847591.93	1.8765	A	5.7
7	☐	1.000					

y = 0.0075 * x + 0.4197
R = 0.9980
DL = 2.823
BEC = 56.03

Weight: <None>
Min Conc: <None>

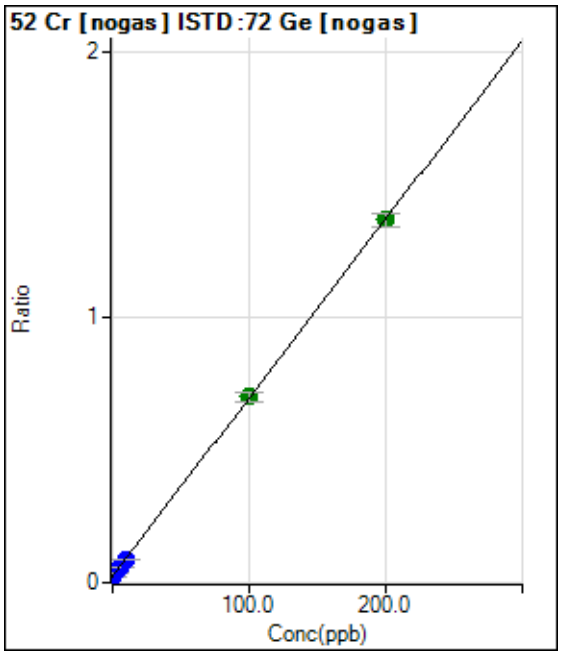


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.142	15473.08	0.0205	P	1.2
2	☐	2.000	2.262	27507.52	0.0362	P	0.3
3	☐	5.000	5.039	45060.12	0.0568	P	1.1
4	☐	10.000	10.104	72880.65	0.0944	P	0.7
5	☐	100.000	98.926	565139.19	0.7531	P	1.2
6	☐	200.000	200.528	1118348.42	1.5066	P	0.2
7	☐	1.000					

y = 0.0074 * x + 0.0195
R = 1.0000
DL = 0.09877
BEC = 2.624

Weight: <None>
Min Conc: <None>

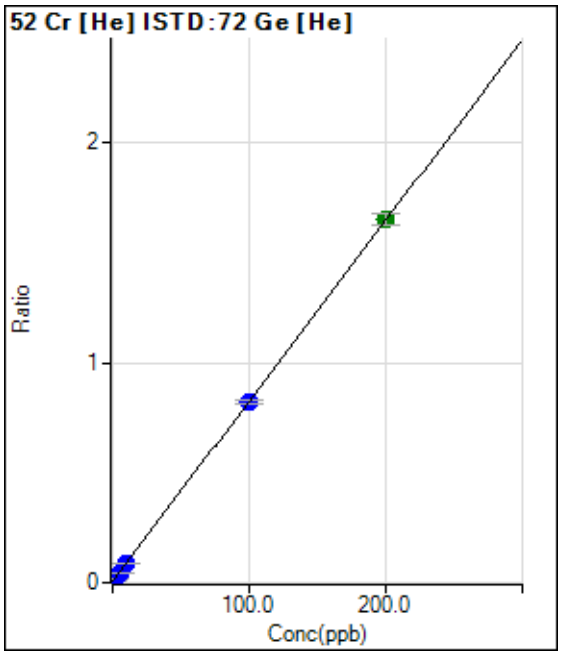
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	77474.30	0.0242	P	1.4
2	☐	2.000	1.994	122256.54	0.0376	P	4.7
3	☐	5.000	4.791	191121.94	0.0564	P	0.4
4	☐	10.000	9.499	291583.32	0.0880	P	2.4
5	☐	100.000	100.766	2212533.61	0.7017	A	5.0
6	☐	200.000	199.647	4260513.48	1.3665	A	4.0
7	☐	1.000					

y = 0.0067 * x + 0.0242
R = 1.0000
DL = 0.1503
BEC = 3.593

Weight: <None>
Min Conc: <None>

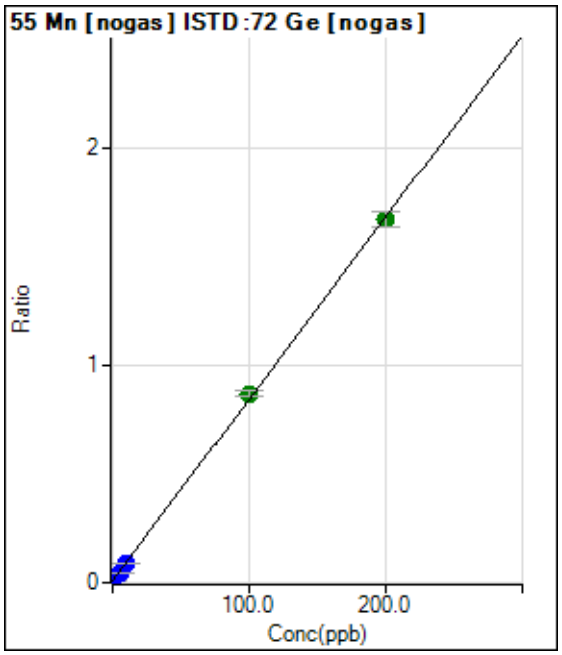


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4597.30	0.0061	P	3.4
2	☐	2.000	1.867	16257.30	0.0214	P	3.3
3	☐	5.000	4.784	35978.61	0.0454	P	1.3
4	☐	10.000	9.709	66251.86	0.0858	P	1.5
5	☐	100.000	99.373	616895.43	0.8220	P	1.4
6	☐	200.000	200.335	1225420.61	1.6509	A	3.2
7	☐	1.000					

y = 0.0082 * x + 0.0061
R = 1.0000
DL = 0.07617
BEC = 0.7421

Weight: <None>
Min Conc: <None>

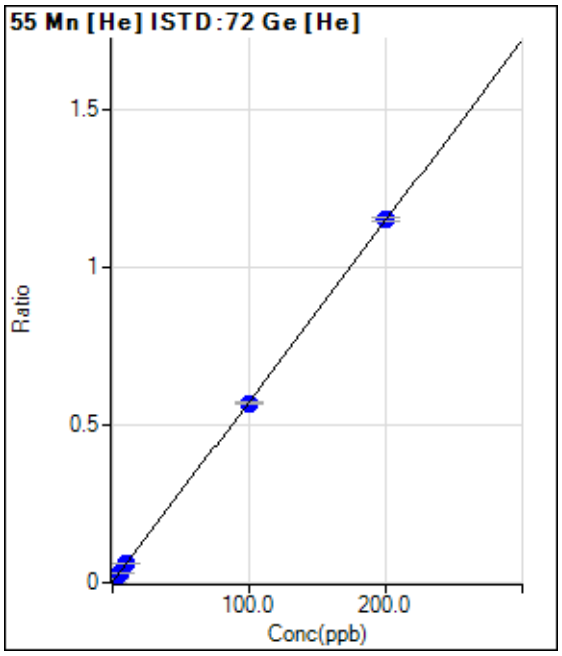
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27807.86	0.0087	P	0.8
2	☐	2.000	1.686	74188.43	0.0228	P	1.7
3	☐	5.000	4.699	162791.83	0.0480	P	1.1
4	☐	10.000	9.328	287456.10	0.0868	P	3.8
5	☐	100.000	102.828	2743316.41	0.8696	A	2.8
6	☐	200.000	198.630	5212488.15	1.6718	A	4.1
7	☐	1.000					

y = 0.0084 * x + 0.0087
R = 0.9998
DL = 0.02612
BEC = 1.036

Weight: <None>
Min Conc: <None>

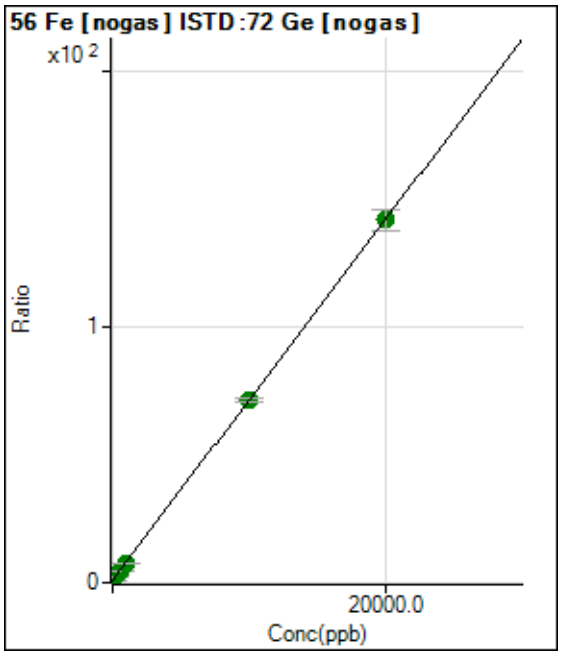


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1256.73	0.0017	P	3.9
2	☐	2.000	1.970	9842.76	0.0130	P	1.3
3	☐	5.000	4.923	23715.60	0.0299	P	0.9
4	☐	10.000	9.988	45526.55	0.0590	P	2.2
5	☐	100.000	99.099	427894.37	0.5701	P	1.7
6	☐	200.000	200.454	854743.11	1.1515	P	1.0
7	☐	1.000					

y = 0.0057 * x + 0.0017
R = 1.0000
DL = 0.03398
BEC = 0.2903

Weight: <None>
Min Conc: <None>

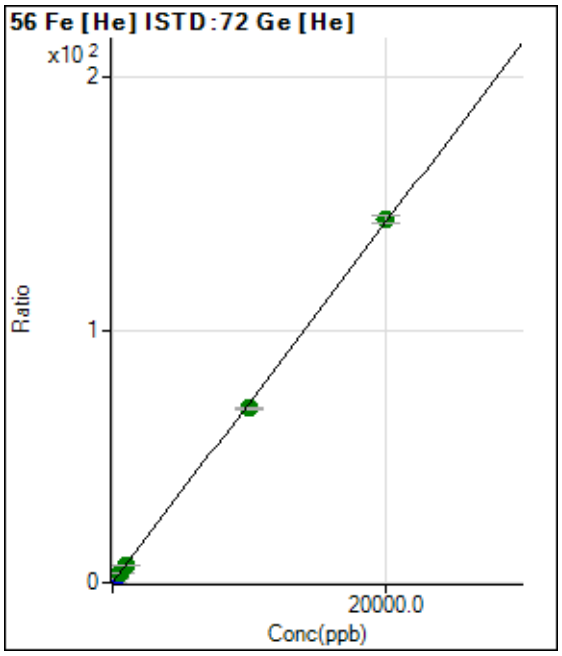
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2809088.74	0.8760	A	0.7
2	☐	200.000	189.203	7193806.41	2.2096	A	2.1
3	☐	500.000	473.883	14293152.92	4.2160	A	1.5
4	☐	1000.000	958.960	25285242.23	7.6350	A	4.1
5	☐	10000.00	10026.192	225714363.3	71.5426	A	1.7
6	☐	20000.00	19989.717	441805293.2	141.767	A	5.6
7	☐	100.000					

y = 0.0070 * x + 0.8760
R = 1.0000
DL = 2.691
BEC = 124.3

Weight: <None>
Min Conc: <None>

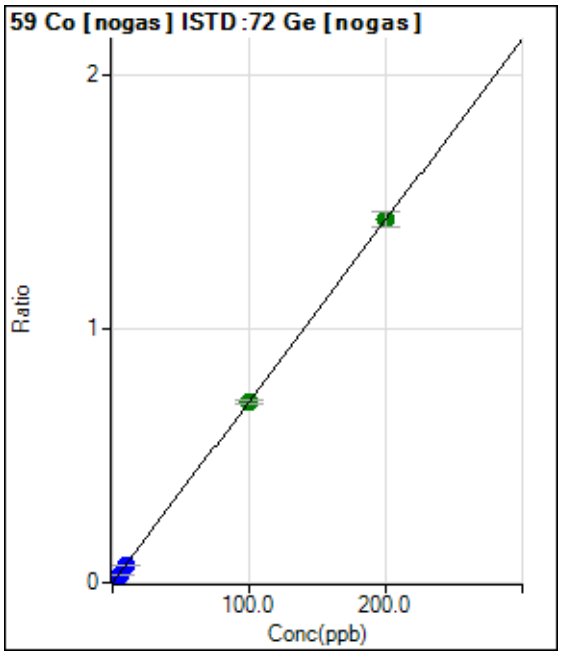


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11797.23	0.0156	P	2.6
2	☐	200.000	199.295	1088582.51	1.4341	P	1.4
3	☐	500.000	495.867	2811433.19	3.5449	A	3.8
4	☐	1000.000	984.982	5424213.25	7.0261	A	3.1
5	☐	10000.00	9671.886	51671207.56	68.8543	A	1.5
6	☐	20000.00	20164.918	106540595.0	143.537	A	2.2
7	☐	100.000					

y = 0.0071 * x + 0.0156
R = 0.9998
DL = 0.1681
BEC = 2.196

Weight: <None>
Min Conc: <None>

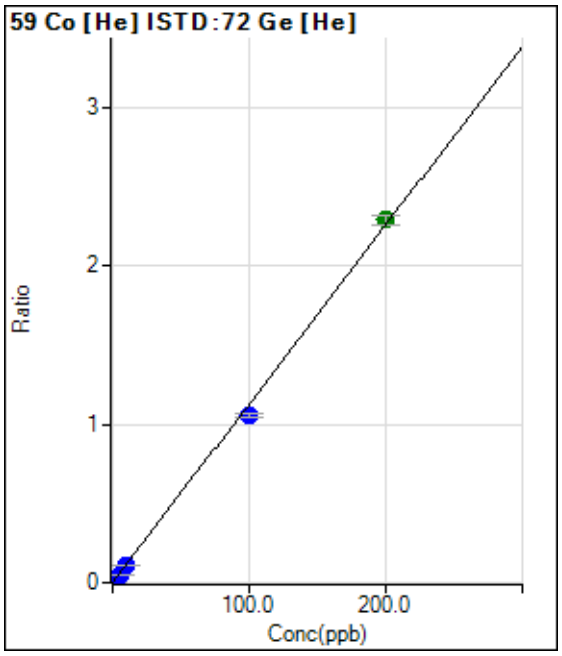
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	823.36	0.0003	P	13.
2	☐	2.000	1.931	45800.60	0.0141	P	2.3
3	☐	5.000	4.541	111007.64	0.0327	P	2.7
4	☐	10.000	9.334	221975.59	0.0670	P	3.2
5	☐	100.000	99.830	2253591.58	0.7143	A	1.5
6	☐	200.000	200.131	4462955.14	1.4316	A	4.3
7	☐	1.000					

y = 0.0072 * x + 2.5681E-004
R = 1.0000
DL = 0.01409
BEC = 0.03591

Weight: <None>
Min Conc: <None>

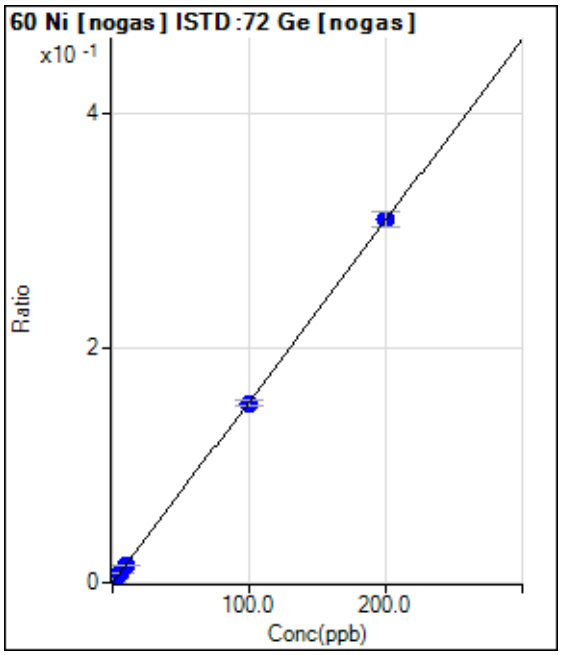


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	303.34	0.0004	P	34.
2	☐	2.000	2.008	17481.91	0.0230	P	3.6
3	☐	5.000	4.625	41647.48	0.0525	P	1.0
4	☐	10.000	9.577	83632.45	0.1083	P	4.2
5	☐	100.000	93.961	794999.44	1.0594	P	1.9
6	☐	200.000	203.050	1698959.71	2.2890	A	2.8
7	☐	1.000					

y = 0.0113 * x + 4.0067E-004
R = 0.9994
DL = 0.03644
BEC = 0.03555

Weight: <None>
Min Conc: <None>

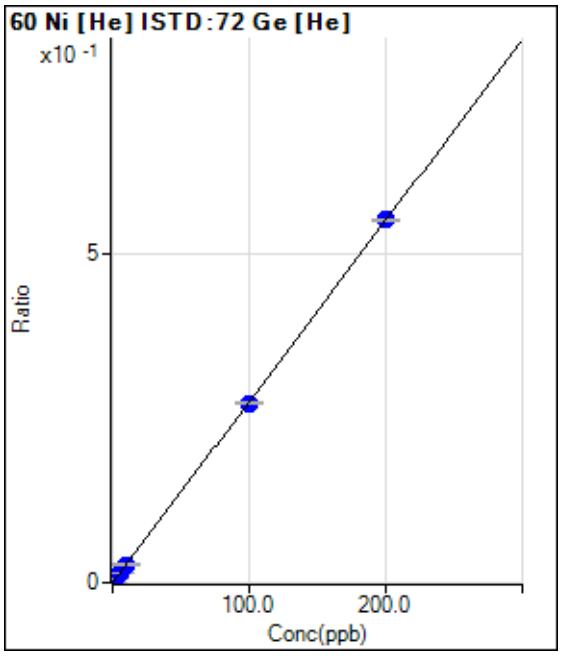
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.164	466.68	0.0001	P	14.
2	☐	2.000	2.273	11060.15	0.0034	P	5.2
3	☐	5.000	5.045	26012.14	0.0077	P	4.6
4	☐	10.000	9.871	50081.84	0.0151	P	0.9
5	☐	100.000	99.287	482568.22	0.1530	P	3.1
6	☐	200.000	200.359	962911.47	0.3089	P	4.1
7	☐	1.000					

y = 0.0015 * x - 1.0791E-004
R = 1.0000
DL = 0.0401
BEC = -0.06998

Weight: <None>
Min Conc: <None>

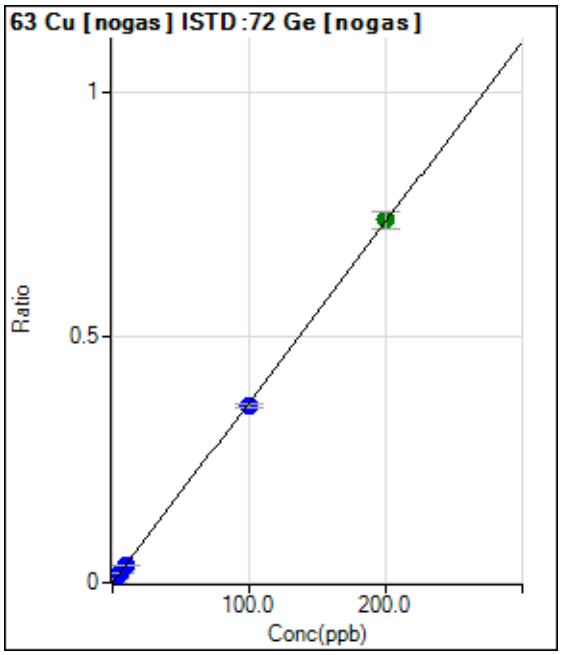


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.182	136.67	0.0002	P	27.
2	☐	2.000	2.306	4577.31	0.0060	P	7.6
3	☐	5.000	5.035	10746.59	0.0136	P	0.3
4	☐	10.000	9.957	20928.95	0.0271	P	5.1
5	☐	100.000	99.044	204531.13	0.2726	P	1.1
6	☐	200.000	200.476	409741.28	0.5520	P	0.8
7	☐	1.000					

y = 0.0028 * x - 3.1895E-004
R = 1.0000
DL = 0.05336
BEC = -0.1158

Weight: <None>
Min Conc: <None>

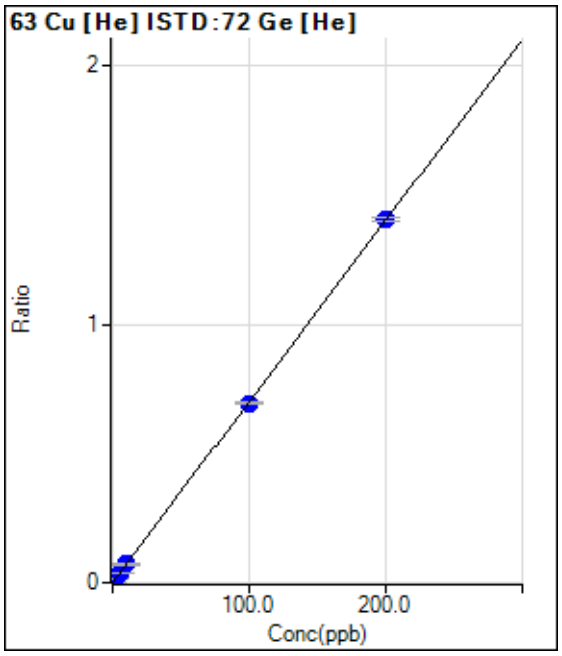
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1483.42	0.0005	P	6.5
2	☐	2.000	2.046	25972.06	0.0080	P	5.5
3	☐	5.000	4.903	62661.18	0.0185	P	0.9
4	☐	10.000	9.574	118091.77	0.0356	P	1.1
5	☐	100.000	97.756	1134783.24	0.3597	P	2.6
6	☐	200.000	201.145	2305482.72	0.7397	A	4.9
7	☐	1.000					

y = 0.0037 * x + 4.6260E-004
R = 0.9999
DL = 0.02447
BEC = 0.1259

Weight: <None>
Min Conc: <None>

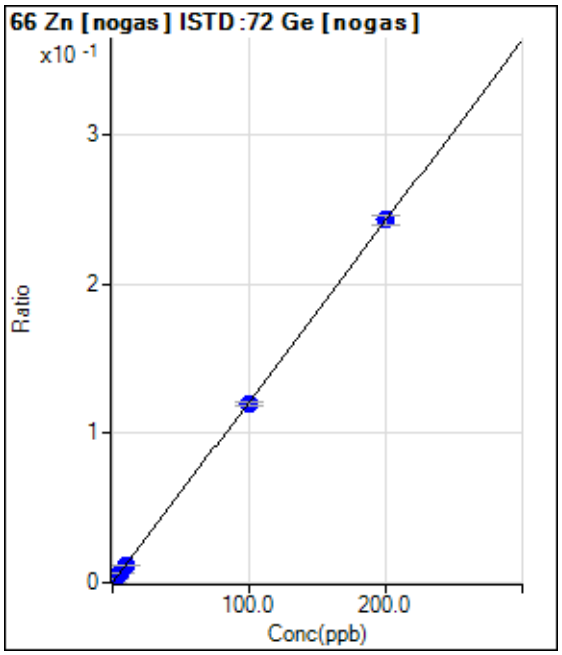


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.129	643.36	0.0009	P	13.
2	☐	2.000	2.160	11443.73	0.0151	P	5.0
3	☐	5.000	5.021	27858.12	0.0351	P	2.7
4	☐	10.000	10.108	54648.24	0.0708	P	4.3
5	☐	100.000	99.179	521586.57	0.6950	P	0.6
6	☐	200.000	200.403	1042534.70	1.4045	P	1.1
7	☐	1.000					

y = 0.0070 * x - 5.1993E-005
R = 1.0000
DL = 0.04848
BEC = -0.007419

Weight: <None>
Min Conc: <None>

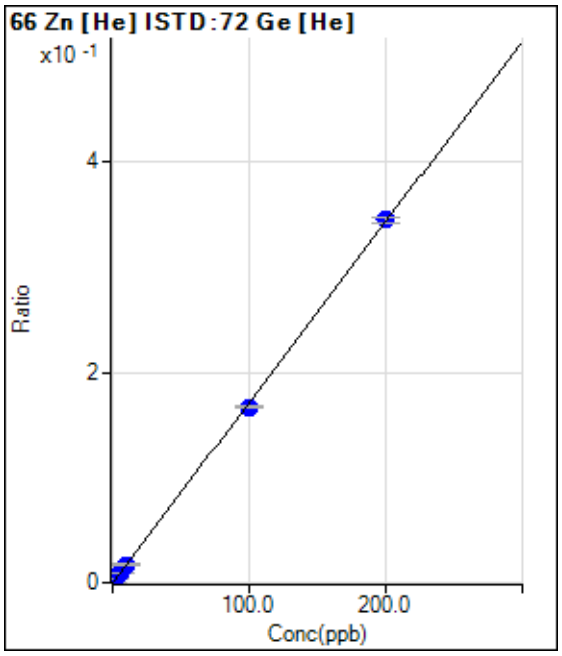
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.213	656.69	0.0002	P	1.1
2	☐	2.000	2.099	8108.57	0.0025	P	2.2
3	☐	5.000	5.451	22220.47	0.0066	P	1.9
4	☐	10.000	9.832	39309.16	0.0119	P	1.6
5	☐	100.000	98.817	377717.74	0.1197	P	2.3
6	☐	200.000	200.588	758180.98	0.2431	P	2.8
7	☐	1.000					

y = 0.0012 * x - 5.3672E-005
R = 1.0000
DL = 0.005603
BEC = -0.04428

Weight: <None>
Min Conc: <None>

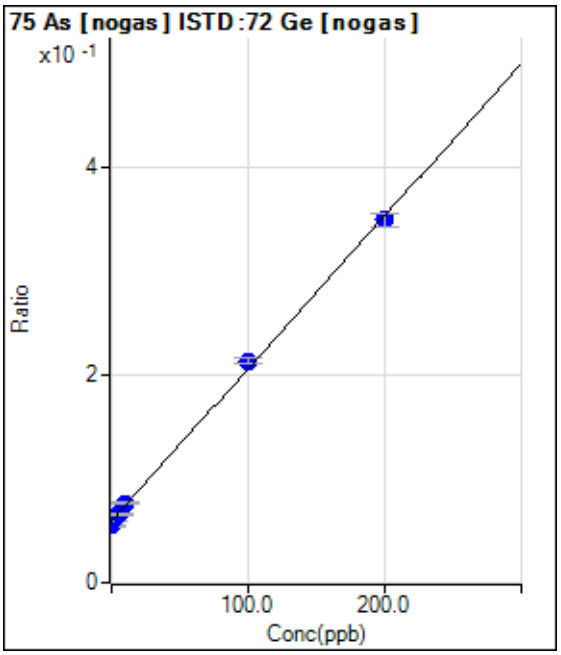


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.350	136.67	0.0002	P	5.1
2	☐	2.000	2.336	2726.91	0.0036	P	9.1
3	☐	5.000	5.428	7051.43	0.0089	P	0.9
4	☐	10.000	10.146	13118.21	0.0170	P	4.6
5	☐	100.000	97.522	125242.89	0.1669	P	1.5
6	☐	200.000	201.218	255917.88	0.3448	P	1.4
7	☐	1.000					

y = 0.0017 * x - 4.1943E-004
R = 0.9999
DL = 0.01621
BEC = -0.2445

Weight: <None>
Min Conc: <None>

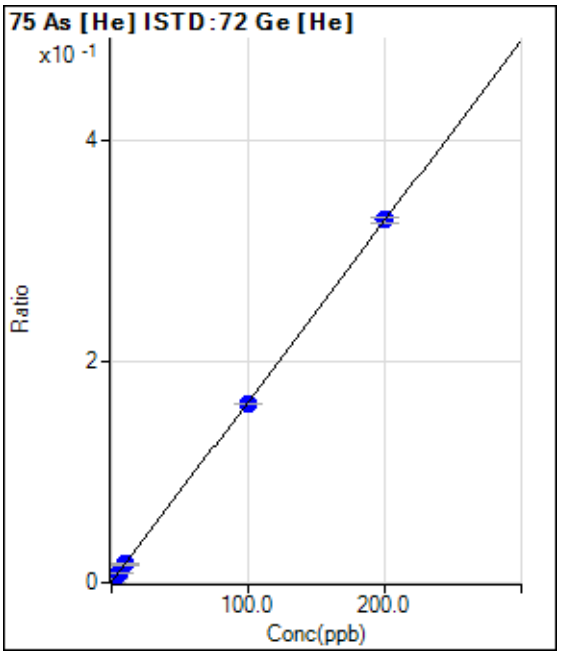
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-2.922	176956.50	0.0552	P	3.2
2	☐	2.000	1.313	199835.54	0.0614	P	4.7
3	☐	5.000	4.609	224623.49	0.0662	P	2.3
4	☐	10.000	11.544	253155.24	0.0764	P	3.3
5	☐	100.000	105.033	674391.92	0.2138	P	2.5
6	☐	200.000	197.423	1089834.52	0.3495	P	3.5
7	☐	1.000					

y = 0.0015 * x + 0.0595
R = 0.9993
DL = 3.566
BEC = 40.48

Weight: <None>
Min Conc: <None>

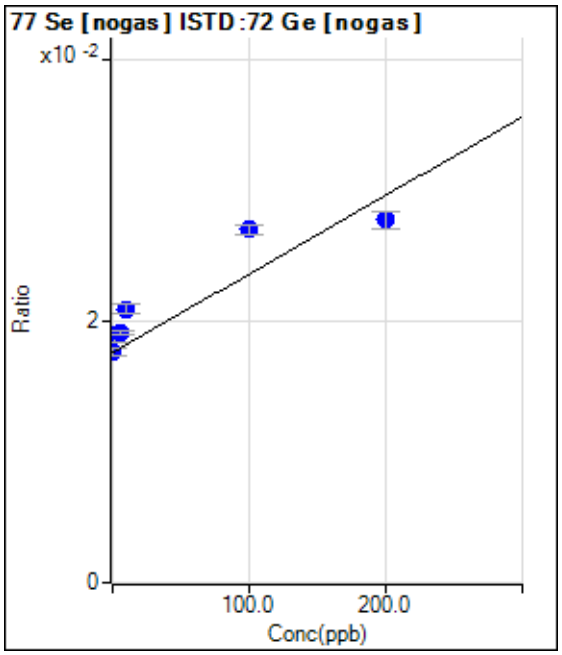


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	587.79	0.0008	P	12.
2	☐	2.000	2.092	3179.19	0.0042	P	3.8
3	☐	5.000	4.757	6767.95	0.0085	P	1.0
4	☐	10.000	9.694	12804.53	0.0166	P	1.9
5	☐	100.000	98.743	121406.67	0.1618	P	0.5
6	☐	200.000	200.649	243420.94	0.3279	P	1.5
7	☐	1.000					

y = 0.0016 * x + 7.7857E-004
R = 1.0000
DL = 0.1832
BEC = 0.4775

Weight: <None>
Min Conc: <None>

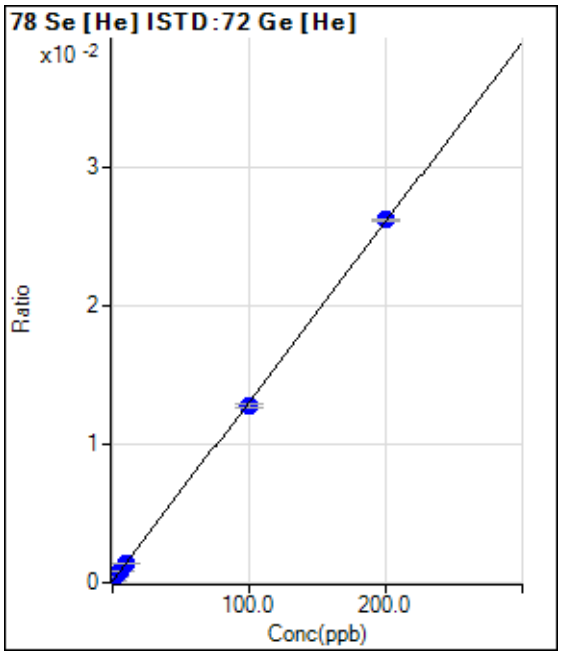
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56517.86	0.0176	P	3.6
2	☐	2.000	22.371	61734.53	0.0190	P	5.5
3	☐	5.000	24.659	64798.32	0.0191	P	1.3
4	☐	10.000	55.367	69418.67	0.0210	P	3.2
5	☐	100.000	156.673	85332.25	0.0271	P	2.7
6	☐	200.000	168.700	86585.12	0.0278	P	4.6
7	☐	1.000					

y = 6.0169E-005 * x + 0.0176
R = 0.9224
DL = 31.38
BEC = 292.9

Weight: <None>
Min Conc: <None>

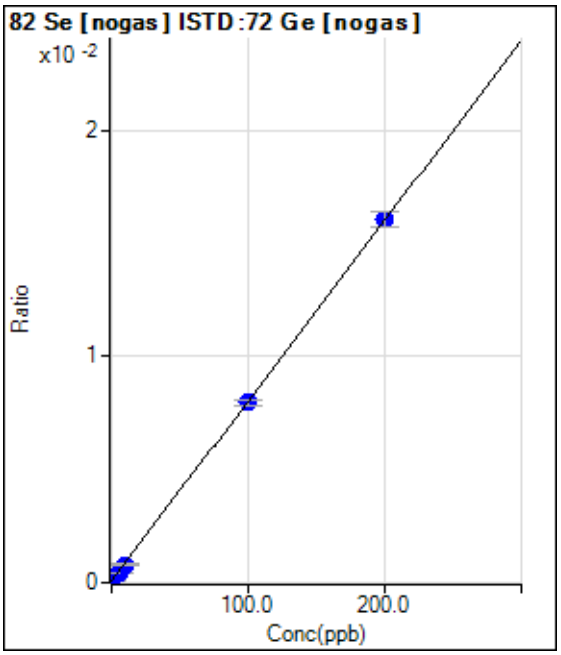


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.440	122.67	0.0002	P	5.6
2	☐	2.000	2.465	323.33	0.0004	P	8.1
3	☐	5.000	5.241	623.34	0.0008	P	0.8
4	☐	10.000	9.964	1080.70	0.0014	P	2.0
5	☐	100.000	97.799	9609.88	0.0128	P	1.9
6	☐	200.000	201.092	19463.03	0.0262	P	0.6
7	☐	1.000					

y = 1.2987E-004 * x + 1.0549E-004
R = 0.9999
DL = 0.2113
BEC = 0.8123

Weight: <None>
Min Conc: <None>

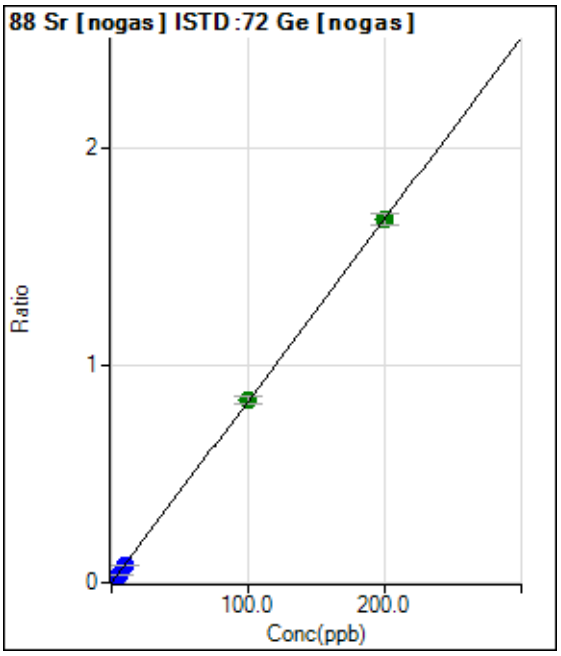
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	246.67	0.0001	P	26.
2	☐	2.000	2.248	833.37	0.0003	P	14.
3	☐	5.000	4.650	1516.75	0.0004	P	3.4
4	☐	10.000	9.068	2650.24	0.0008	P	3.9
5	☐	100.000	99.137	25164.51	0.0080	P	3.2
6	☐	200.000	200.485	50052.68	0.0161	P	4.1
7	☐	1.000					

y = 7.9697E-005 * x + 7.6897E-005
R = 1.0000
DL = 0.7576
BEC = 0.9649

Weight: <None>
Min Conc: <None>

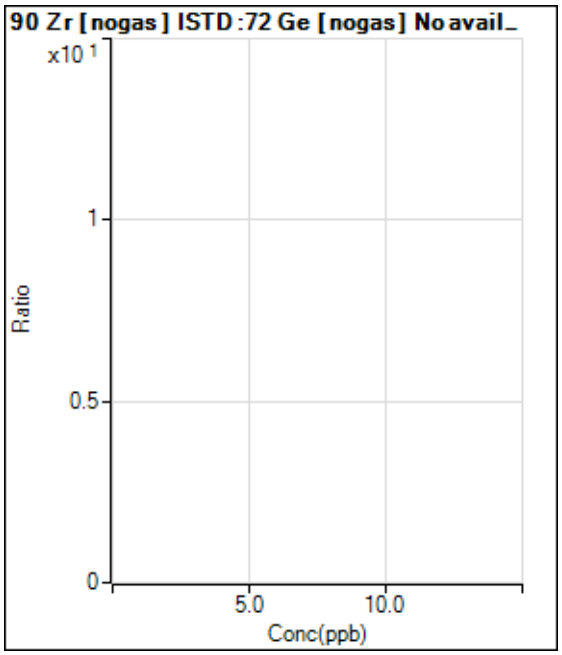


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	866.70	0.0003	P	11.
2	☐	2.000	1.940	53710.75	0.0165	P	2.5
3	☐	5.000	4.609	131562.39	0.0388	P	3.3
4	☐	10.000	9.294	258306.50	0.0780	P	5.2
5	☐	100.000	100.673	2656690.90	0.8422	A	3.5
6	☐	200.000	199.709	5208977.74	1.6704	A	3.2
7	☐	1.000					

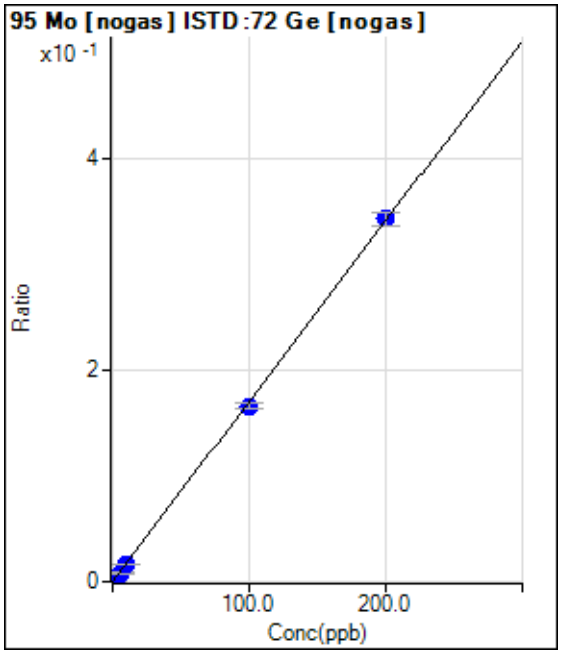
y = 0.0084 * x + 2.7023E-004
R = 1.0000
DL = 0.01099
BEC = 0.03231

Weight: <None>
Min Conc: <None>

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

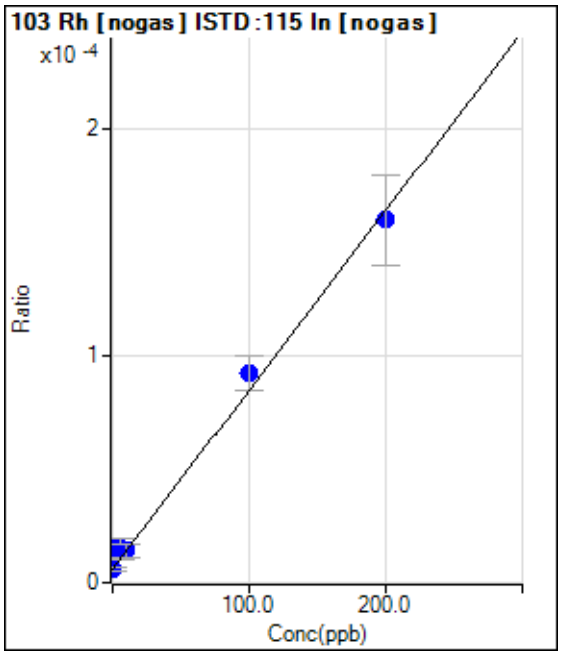


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	496.68	0.0002	P	11.
2	☐	2.000	1.886	10960.19	0.0034	P	5.8
3	☐	5.000	4.668	27484.93	0.0081	P	3.7
4	☐	10.000	9.532	54296.62	0.0164	P	3.5
5	☐	100.000	97.436	523950.83	0.1661	P	3.7
6	☐	200.000	201.315	1069772.80	0.3431	P	3.9
7	☐	1.000					

y = 0.0017 * x + 1.5487E-004
R = 0.9999
DL = 0.03185
BEC = 0.09092

Weight: <None>
Min Conc: <None>

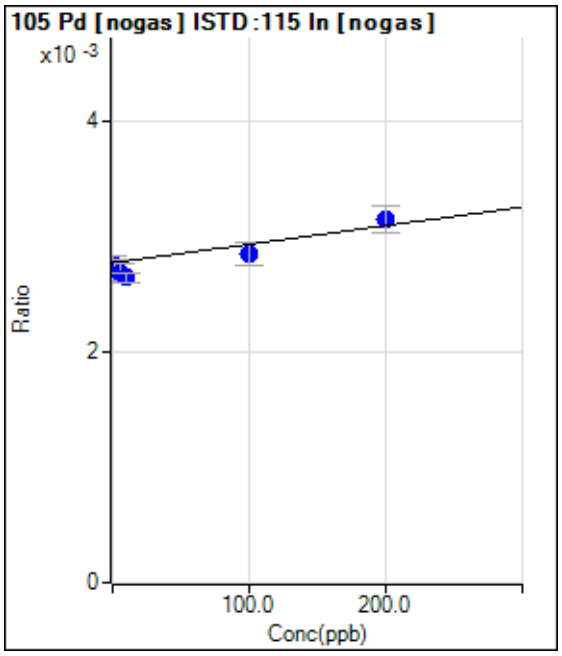
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	16.67	0.0000	P	33.
2	☐	2.000	11.751	43.33	0.0000	P	13.
3	☐	5.000	11.758	43.33	0.0000	P	60.
4	☐	10.000	10.351	40.00	0.0000	P	45.
5	☐	100.000	109.576	253.34	0.0001	P	16.
6	☐	200.000	194.928	433.35	0.0002	P	25.
7	☐	1.000					

y = 7.8982E-007 * x + 5.8977E-006
R = 0.9977
DL = 7.401
BEC = 7.467

Weight: <None>
Min Conc: <None>

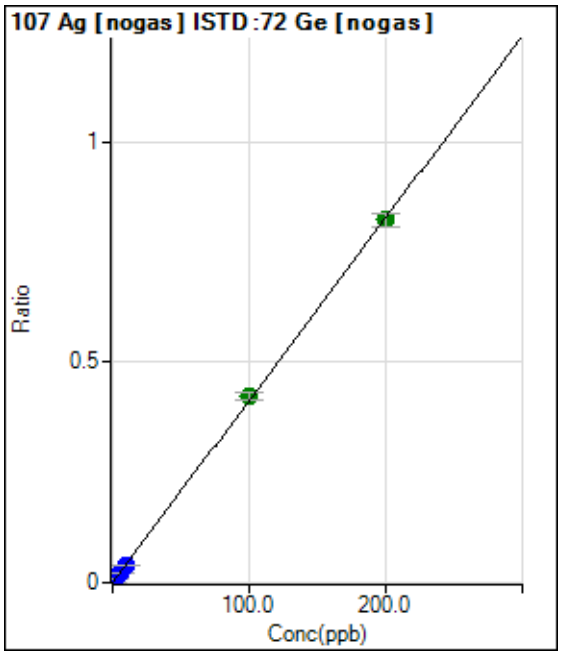


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7811.87	0.0028	P	4.0
2	☐	2.000	-24.485	7818.53	0.0027	P	5.4
3	☐	5.000	-50.386	7751.84	0.0027	P	5.9
4	☐	10.000	-76.600	7601.77	0.0027	P	3.2
5	☐	100.000	50.731	7801.88	0.0029	P	7.1
6	☐	200.000	230.614	8575.56	0.0031	P	7.3
7	☐	1.000					

y = 1.6147E-006 * x + 0.0028
R = 0.9515
DL = 207.7
BEC = 1720

Weight: <None>
Min Conc: <None>

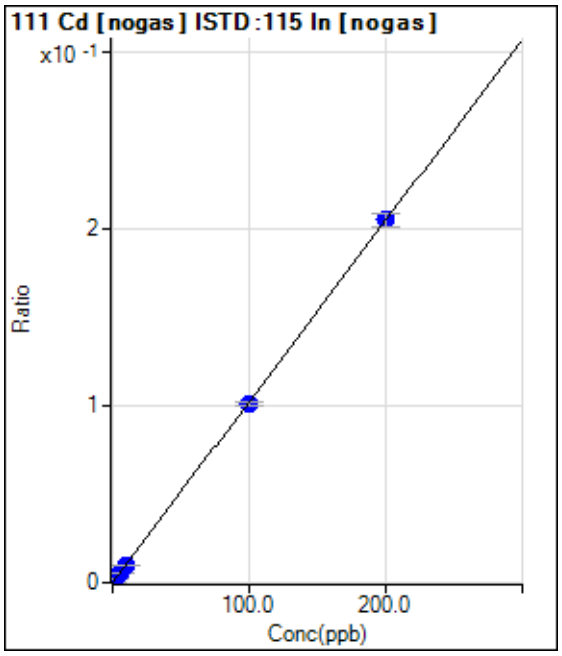
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	93.33	0.0000	P	32.
2	☐	2.000	2.027	27351.63	0.0084	P	5.2
3	☐	5.000	4.797	67315.62	0.0199	P	1.4
4	☐	10.000	9.436	129290.62	0.0390	P	1.1
5	☐	100.000	101.924	1328341.75	0.4212	A	4.3
6	☐	200.000	199.071	2566118.56	0.8227	A	4.0
7	☐	1.000					

y = 0.0041 * x + 2.9096E-005
R = 0.9999
DL = 0.006881
BEC = 0.007041

Weight: <None>
Min Conc: <None>

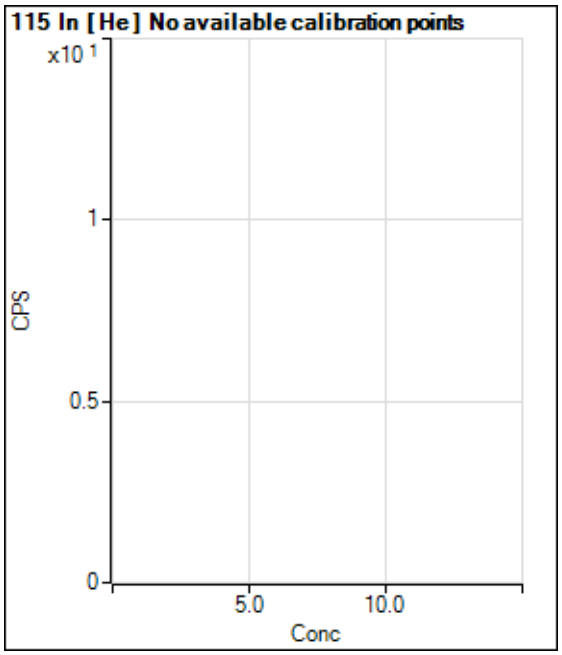


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	2.8
2	☐	2.000	1.972	5784.38	0.0020	P	6.5
3	☐	5.000	4.899	14449.45	0.0050	P	3.9
4	☐	10.000	9.543	28029.17	0.0098	P	1.3
5	☐	100.000	99.088	277142.05	0.1015	P	2.4
6	☐	200.000	200.481	558850.07	0.2053	P	3.8
7	☐	1.000					

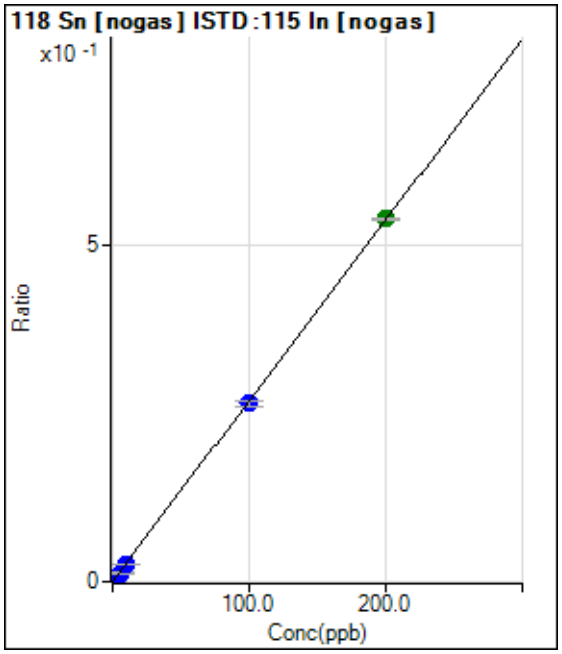
y = 0.0010 * x + 7.1151E-006
R = 1.0000
DL = 0.0005885
BEC = 0.006947

Weight: <None>
Min Conc: <None>

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			924588.48		P	2.6
2	☐			938696.40		P	1.2
3	☐			932803.78		P	0.6
4	☐			927555.38		P	1.4
5	☐			896048.56		P	2.1
6	☐			876757.50		P	1.0
7	☐						

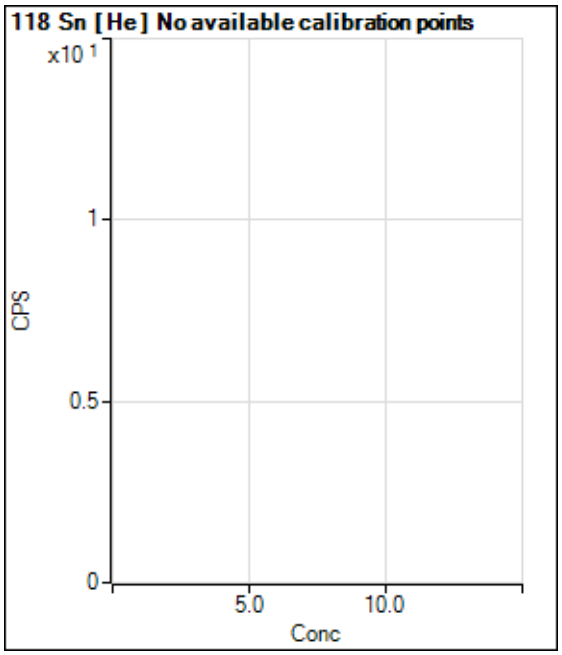


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1126.72	0.0004	P	3.4
2	☐	2.000	1.825	15113.47	0.0053	P	3.9
3	☐	5.000	4.625	36809.40	0.0128	P	1.8
4	☐	10.000	9.399	73307.27	0.0256	P	2.1
5	☐	100.000	98.638	722784.34	0.2647	P	3.4
6	☐	200.000	200.722	1465774.77	0.5383	A	0.8
7	☐	1.000					

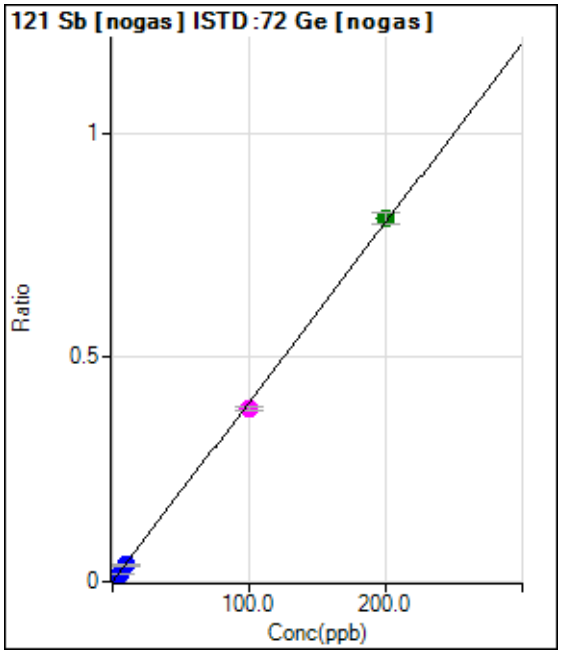
y = 0.0027 * x + 4.0036E-004
R = 1.0000
DL = 0.0152
BEC = 0.1494

Weight: <None>
Min Conc: <None>

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			373.34		P	17.
2	☐			5847.76		P	3.3
3	☐			14269.29		P	0.8
4	☐			27832.47		P	1.0
5	☐			265444.29		P	1.5
6	☐			543348.95		P	1.8
7	☐						

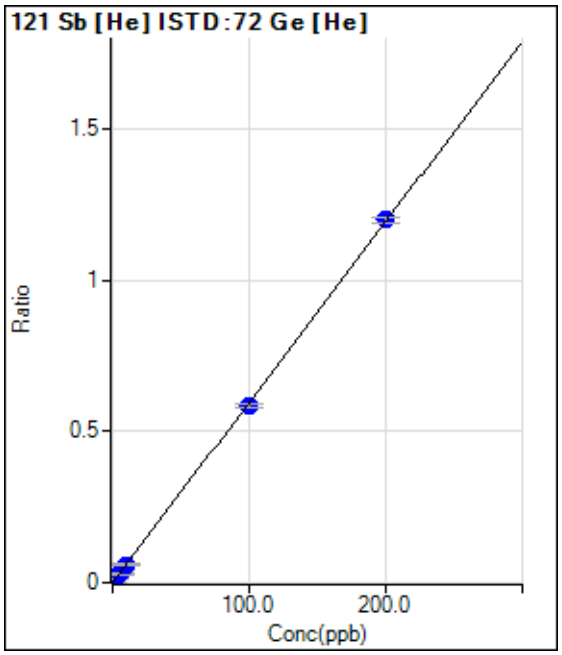


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1043.38	0.0003	P	15.
2	☐	2.000	1.857	25245.26	0.0078	P	4.7
3	☐	5.000	4.597	63499.05	0.0187	P	0.4
4	☐	10.000	9.115	121934.04	0.0368	P	2.6
5	☐	100.000	95.907	1212061.60	0.3842	M	2.4
6	☐	200.000	202.102	2523836.73	0.8093	A	3.2
7	☐	1.000					

y = 0.0040 * x + 3.2531E-004
R = 0.9997
DL = 0.03833
BEC = 0.08127

Weight: <None>
Min Conc: <None>

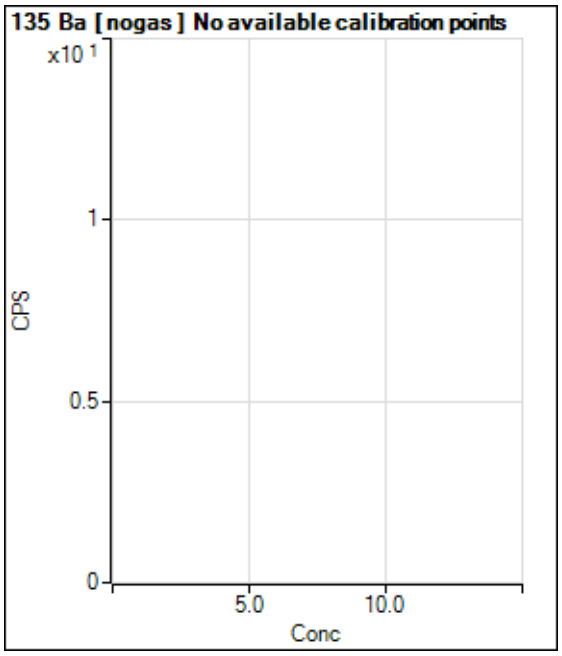
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	476.68	0.0006	P	17.
2	☐	2.000	1.995	9522.71	0.0125	P	3.1
3	☐	5.000	4.727	22875.24	0.0288	P	3.6
4	☐	10.000	9.774	45516.07	0.0590	P	5.2
5	☐	100.000	97.885	438848.72	0.5848	P	2.3
6	☐	200.000	201.076	891259.91	1.2007	P	1.8
7	☐	1.000					

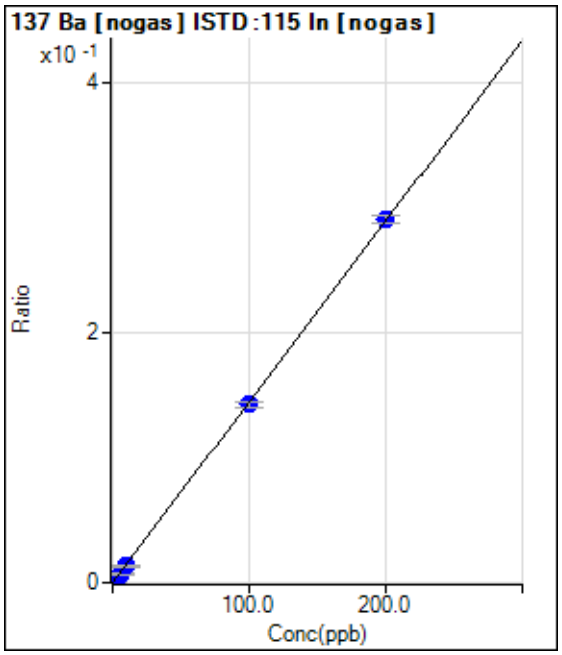
y = 0.0060 * x + 6.3200E-004
R = 0.9999
DL = 0.05422
BEC = 0.1059

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			63.33		P	32.
2	☐			4587.34		P	9.2
3	☐			11730.85		P	3.5
4	☐			22027.74		P	1.8
5	☐			228028.79		P	0.9
6	☐			456665.88		P	0.2
7	☐						

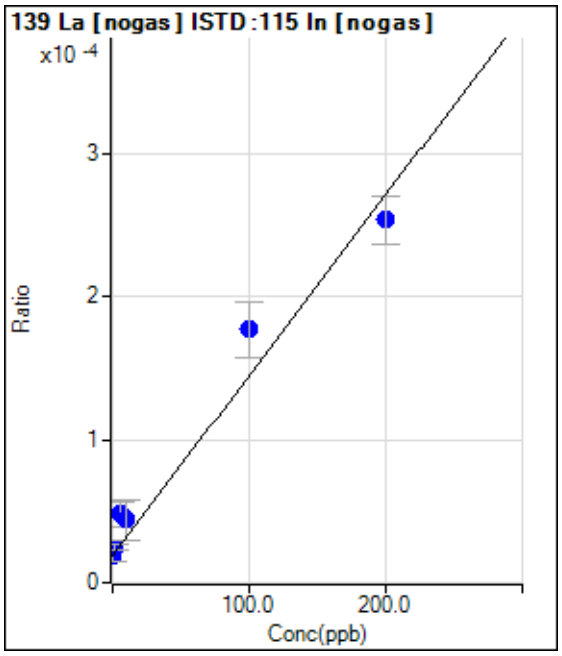
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.33	0.0000	P	24.
2	☐	2.000	2.023	8465.55	0.0030	P	4.3
3	☐	5.000	4.754	19901.80	0.0069	P	2.0
4	☐	10.000	9.158	38019.18	0.0133	P	5.6
5	☐	100.000	98.556	389153.08	0.1425	P	3.0
6	☐	200.000	200.770	790275.46	0.2903	P	2.2
7	☐	1.000					

y = 0.0014 * x + 4.0122E-005
R = 1.0000
DL = 0.02041
BEC = 0.02775

Weight: <None>
Min Conc: <None>

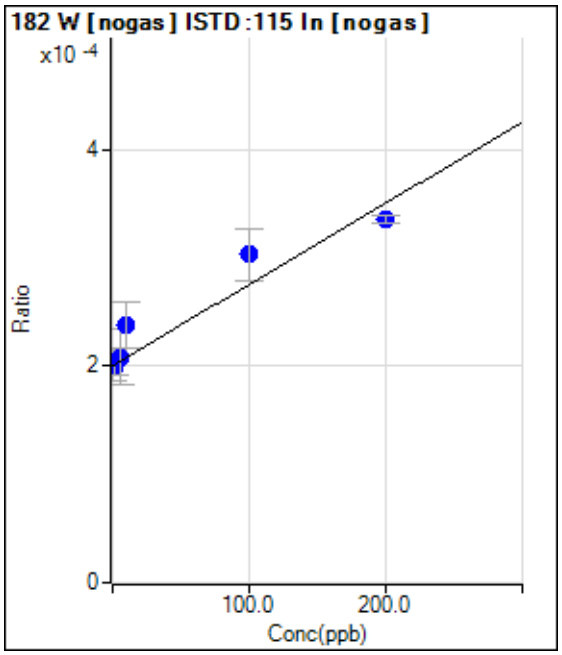


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0000	P	38.
2	☐	2.000	4.455	70.00	0.0000	P	15.
3	☐	5.000	22.918	136.67	0.0000	P	37.
4	☐	10.000	19.984	126.67	0.0000	P	63.
5	☐	100.000	125.352	483.35	0.0002	P	21.
6	☐	200.000	186.352	690.02	0.0003	P	13.
7	☐	1.000					

y = 1.2589E-006 * x + 1.8927E-005
R = 0.9863
DL = 17.18
BEC = 15.03

Weight: <None>
Min Conc: <None>

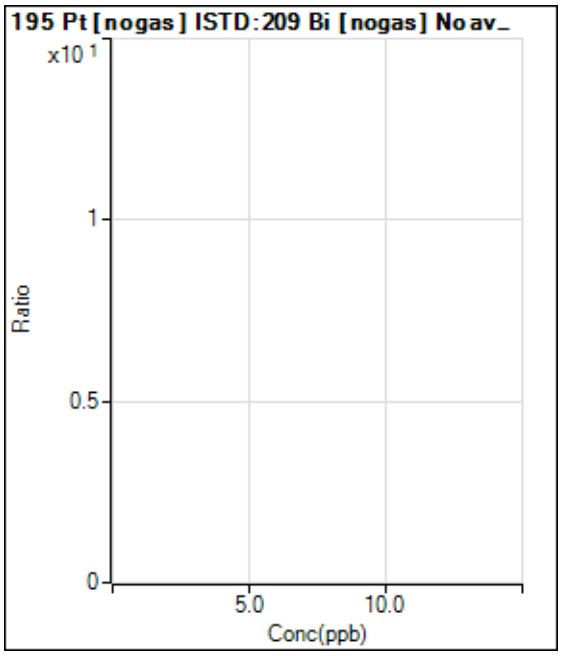
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.35	0.0002	P	13.
2	☐	2.000	-2.765	566.69	0.0002	P	6.3
3	☐	5.000	10.883	600.02	0.0002	P	23.
4	☐	10.000	50.125	680.03	0.0002	P	18.
5	☐	100.000	137.124	826.70	0.0003	P	15.
6	☐	200.000	179.332	913.37	0.0003	P	2.2
7	☐	1.000					

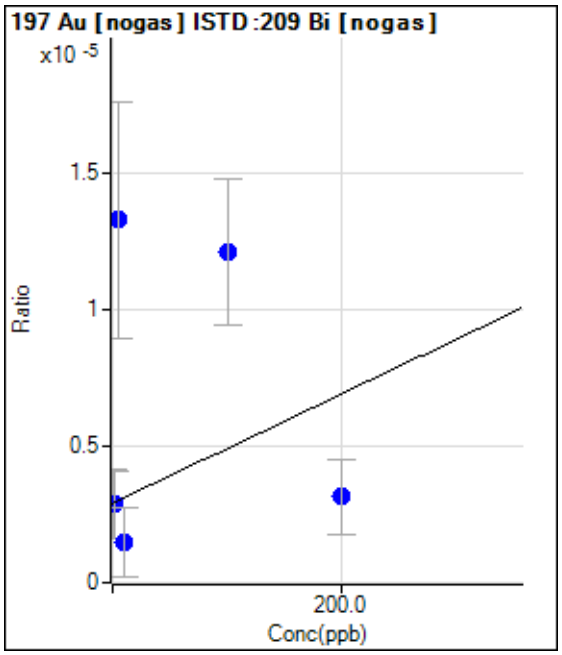
y = 7.5110E-007 * x + 2.0057E-004
R = 0.9553
DL = 111
BEC = 267

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

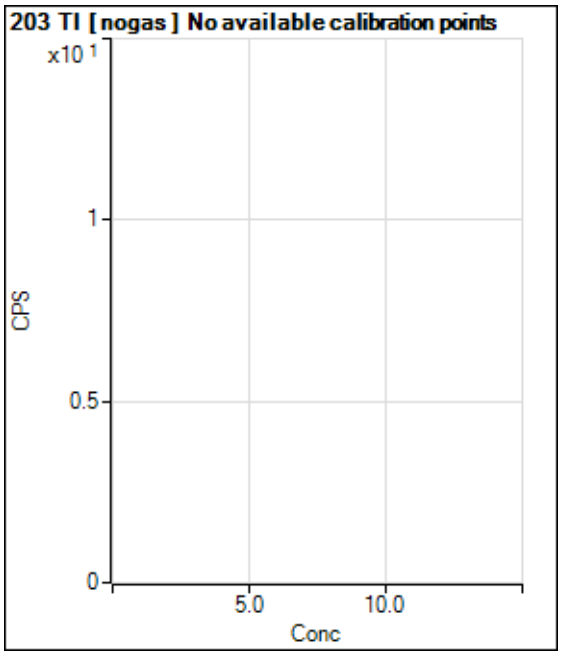
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6.67	0.0000	P	86.
2	☐	2.000	-2.739	6.67	0.0000	P	86.
3	☐	5.000	517.822	30.00	0.0000	P	65.
4	☐	10.000	-72.509	3.33	0.0000	P	173
5	☐	100.000	458.676	26.67	0.0000	P	44.
6	☐	200.000	12.014	6.67	0.0000	P	86.
7	☐	1.000					

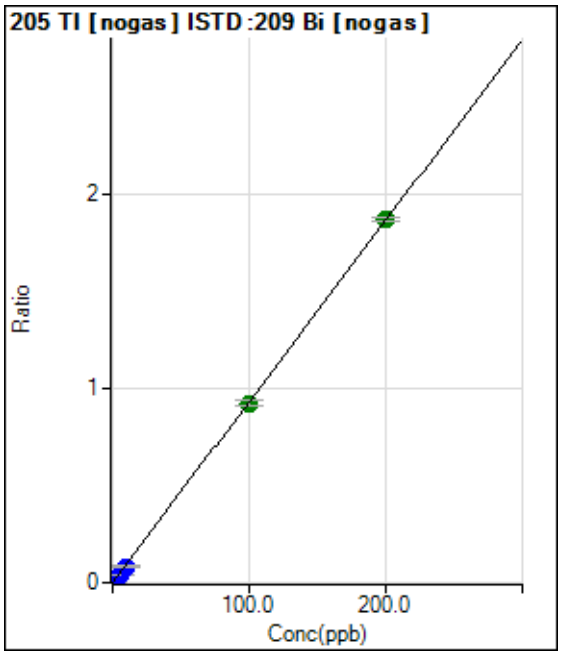
y = 2.0072E-008 * x + 2.9169E-006
R = 0.0175
DL = 377.8
BEC = 145.3

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			206.67		P	22.
2	☐			15477.57		P	3.1
3	☐			40122.92		P	3.0
4	☐			78697.21		P	2.4
5	☐			807880.77		P	1.0
6	☐			1654189.30		A	2.6
7	☐						

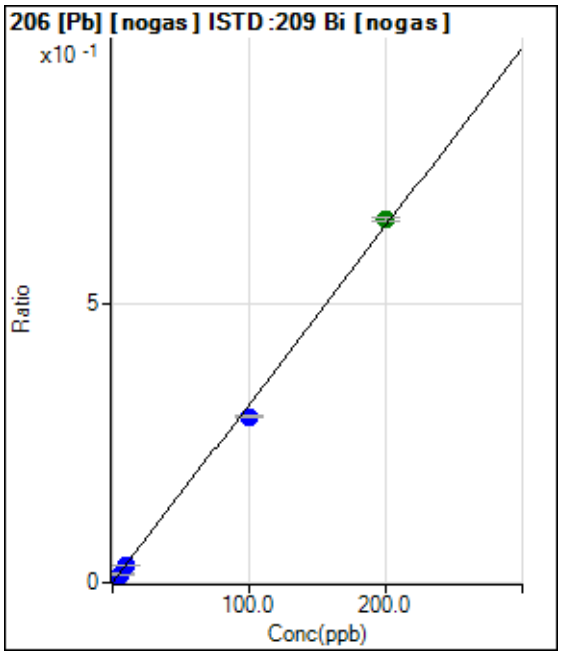
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.36	0.0002	P	11.
2	☐	2.000	1.731	37546.73	0.0164	P	4.4
3	☐	5.000	4.545	95807.61	0.0426	P	6.4
4	☐	10.000	9.002	187552.39	0.0841	P	3.4
5	☐	100.000	99.263	2038051.48	0.9248	A	2.8
6	☐	200.000	200.432	3971253.48	1.8672	A	1.1
7	☐	1.000					

y = 0.0093 * x + 2.4203E-004
R = 1.0000
DL = 0.008693
BEC = 0.02598

Weight: <None>
Min Conc: <None>

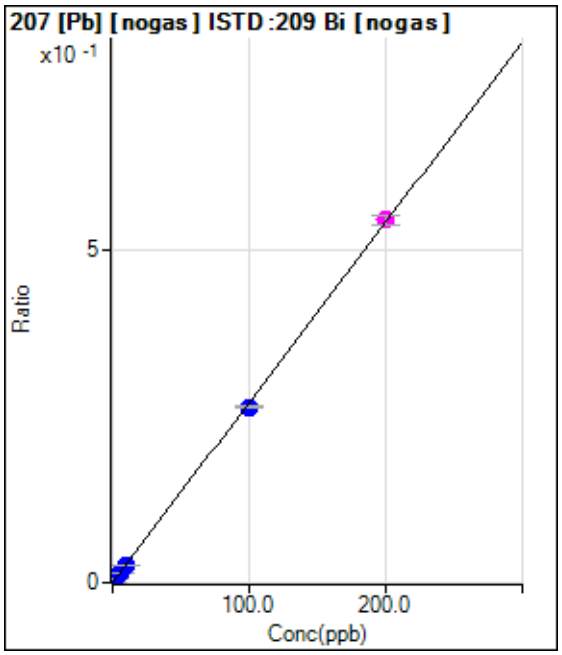


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	433.35	0.0002	P	4.9
2	☐	2.000	1.855	13999.62	0.0061	P	2.9
3	☐	5.000	4.743	34453.53	0.0153	P	5.5
4	☐	10.000	9.241	66161.27	0.0297	P	2.3
5	☐	100.000	93.101	654697.63	0.2971	P	1.6
6	☐	200.000	203.495	1380705.40	0.6491	A	1.2
7	☐	1.000					

y = 0.0032 * x + 1.8642E-004
R = 0.9992
DL = 0.008565
BEC = 0.05846

Weight: <None>
Min Conc: <None>

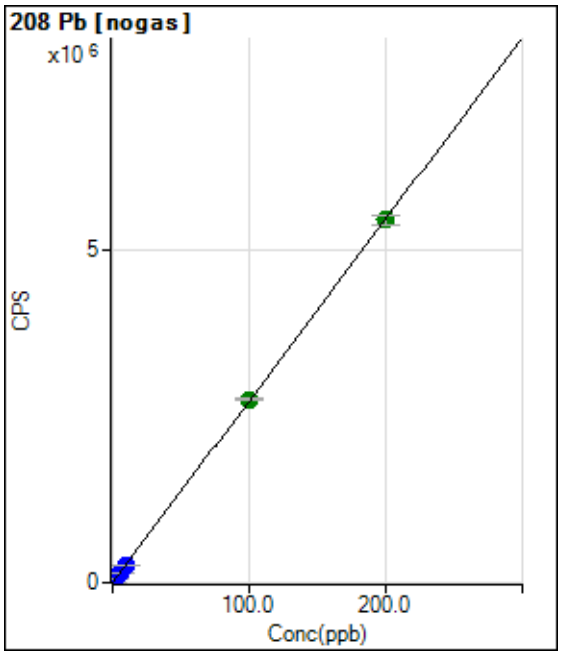
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	330.01	0.0001	P	34.
2	☐	2.000	1.923	12281.46	0.0053	P	0.3
3	☐	5.000	4.813	29667.48	0.0132	P	1.3
4	☐	10.000	9.462	57468.60	0.0258	P	2.5
5	☐	100.000	97.255	580556.16	0.2634	P	1.3
6	☐	200.000	201.405	1160139.85	0.5454	M	2.8
7	☐	1.000					

y = 0.0027 * x + 1.4312E-004
R = 0.9999
DL = 0.05483
BEC = 0.05287

Weight: <None>
Min Conc: <None>

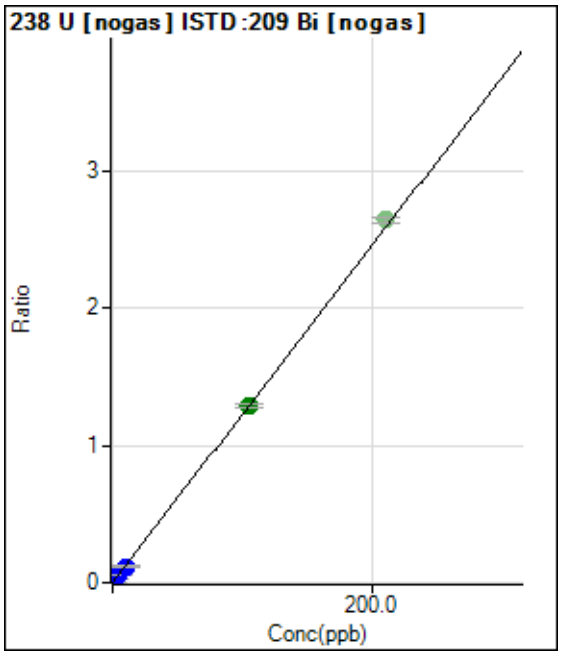


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1573.39		P	15.
2	☐	2.000	1.958	55103.58		P	1.3
3	☐	5.000	4.922	136140.68		P	1.0
4	☐	10.000	9.620	264590.69		P	1.6
5	☐	100.000	100.698	2754631.90		A	1.1
6	☐	200.000	199.672	5460578.44		A	2.7
7	☐	1.000					

y = 27339.8019 * x + 1573.3867
R = 1.0000
DL = 0.02693
BEC = 0.05755

Weight: <None>
Min Conc: <None>

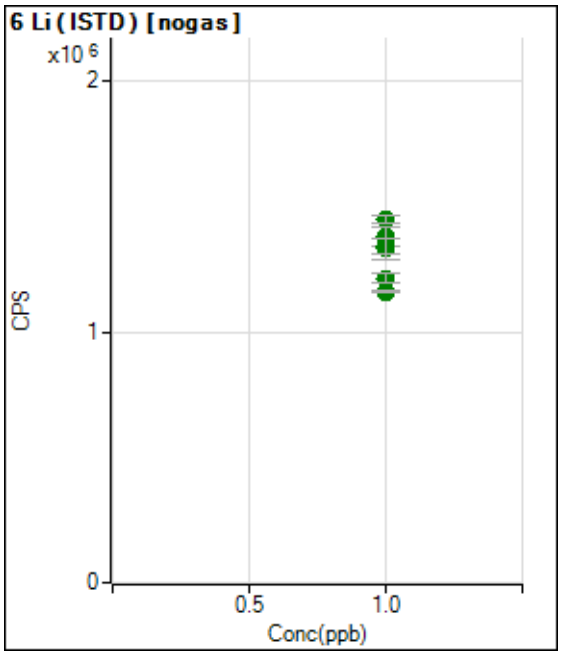
Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	103.33	0.0000	P	19.
2	☐	2.000	1.902	53848.33	0.0235	P	1.9
3	☐	5.000	4.838	134181.11	0.0596	P	4.2
4	☐	10.000	9.609	263964.47	0.1184	P	4.9
5	☐	105.000	105.047	2850735.37	1.2936	A	1.7
6	☑	210.000		5626737.83	2.6457	A	1.3
7	☐	1.000					

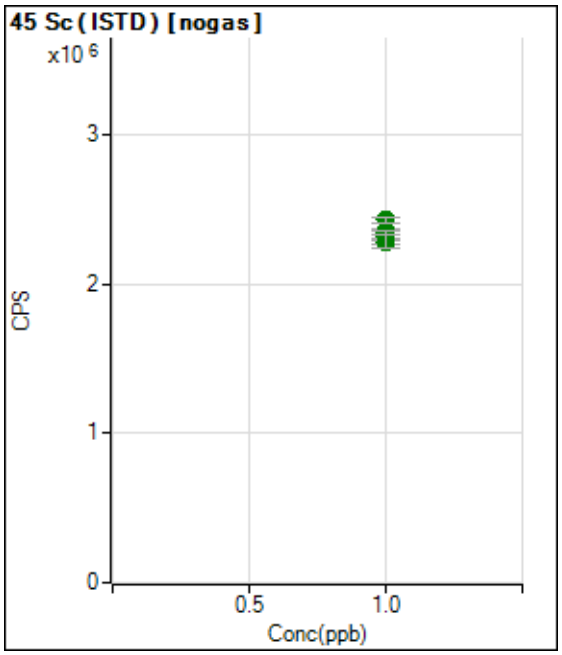
y = 0.0123 * x + 4.4356E-005
R = 1.0000
DL = 0.002109
BEC = 0.003602

Weight: <None>
Min Conc: <None>

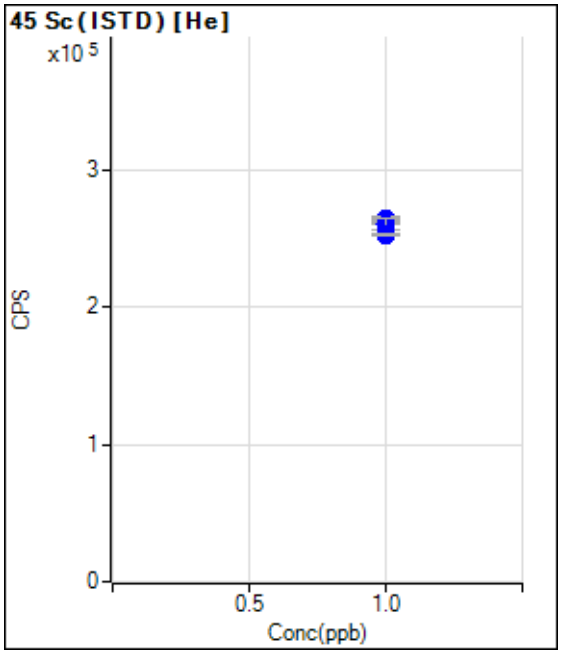


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1446752.57		A	2.1
2	☐	1.000		1379209.18		A	5.2
3	☐	1.000		1333091.36		A	6.3
4	☐	1.000		1343071.92		A	4.5
5	☐	1.000		1213625.72		A	3.2
6	☐	1.000		1159034.25		A	0.5
7	☐	1.000					

Calibration for 129_ICV.d

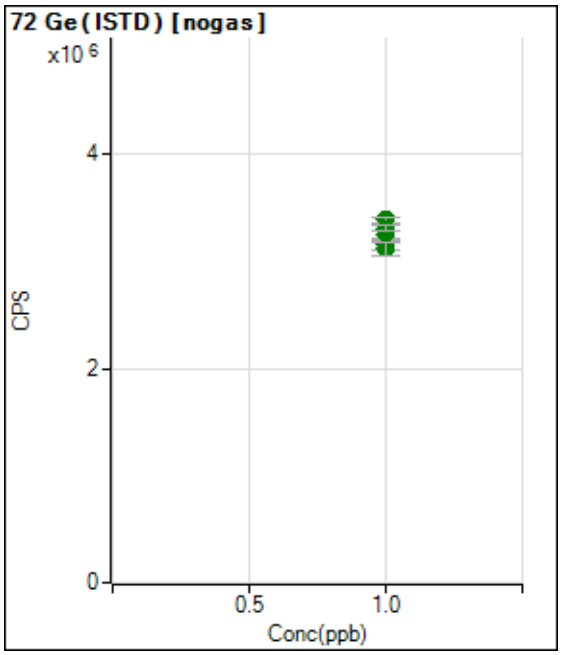


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2309011.32		A	1.7
2	☐	1.000		2428765.17		A	1.4
3	☐	1.000		2316466.74		A	4.2
4	☐	1.000		2357261.94		A	4.3
5	☐	1.000		2345627.52		A	1.3
6	☐	1.000		2282837.62		A	3.8
7	☐	1.000					

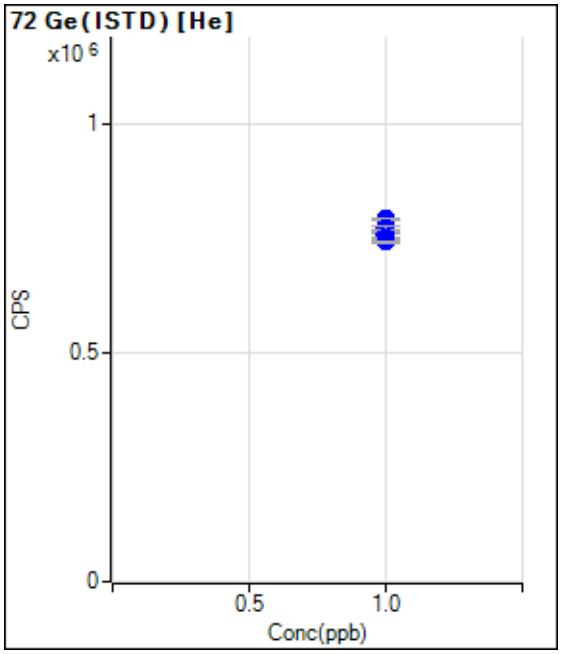


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		262357.18		P	0.7
2	☐	1.000		264294.63		P	1.9
3	☐	1.000		264479.17		P	1.0
4	☐	1.000		261102.73		P	3.0
5	☐	1.000		253211.31		P	0.8
6	☐	1.000		252623.69		P	0.7
7	☐	1.000					

Calibration for 129_ICV.d

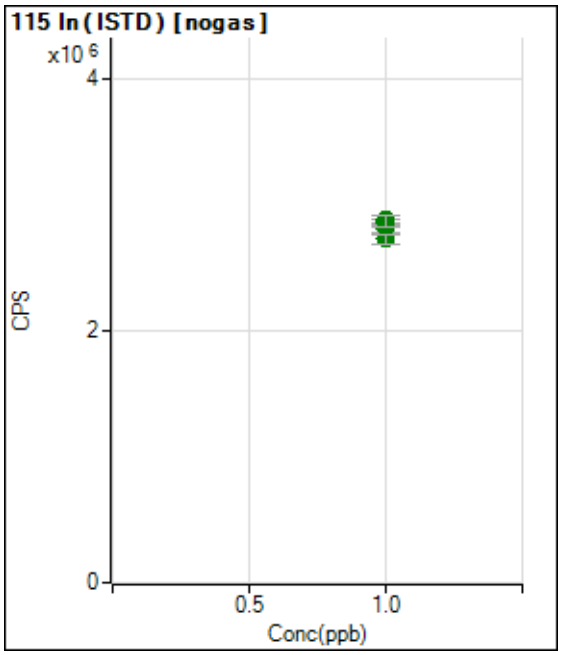


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3206703.70		A	0.2
2	☐	1.000		3256494.54		A	2.1
3	☐	1.000		3390666.51		A	1.4
4	☐	1.000		3313199.85		A	1.7
5	☐	1.000		3155984.95		A	2.9
6	☐	1.000		3121229.43		A	4.3
7	☐	1.000					

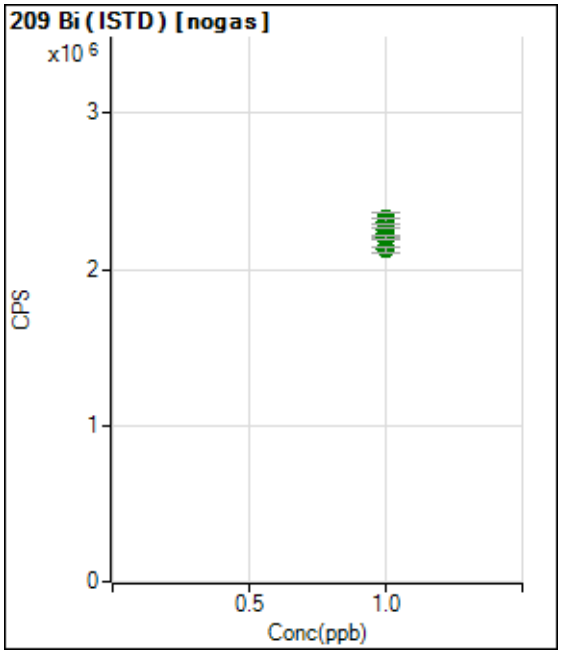


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		754516.31		P	1.5
2	☐	1.000		759218.17		P	2.0
3	☐	1.000		792957.05		P	0.8
4	☐	1.000		772137.67		P	1.0
5	☐	1.000		750459.39		P	0.8
6	☐	1.000		742295.35		P	0.5
7	☐	1.000					

Calibration for 129_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2812441.48		A	2.8
2	☐	1.000		2856142.23		A	1.5
3	☐	1.000		2877773.69		A	3.0
4	☐	1.000		2866425.42		A	3.5
5	☐	1.000		2731957.65		A	3.1
6	☐	1.000		2723277.97		A	2.9
7	☐	1.000					



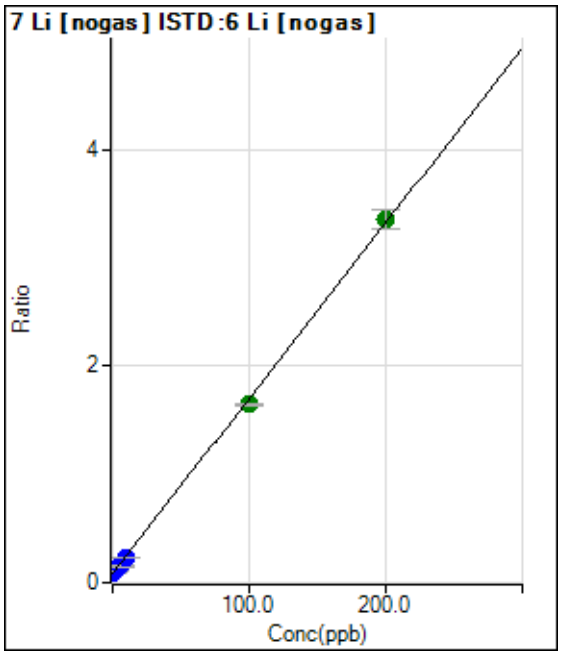
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2322159.81		A	3.3
2	☐	1.000		2295873.82		A	2.7
3	☐	1.000		2252571.94		A	2.9
4	☐	1.000		2231631.69		A	2.4
5	☐	1.000		2203864.45		A	0.7
6	☐	1.000		2126871.01		A	1.7
7	☐	1.000					

Calibration for 237_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\122418A.b\
Analysis File: 122418A.batch.bin
DA Date-Time: 2018-12-24 22:52:36
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	231CALB.d	CAL BLK	2018-12-24 22:39:46
2	232CALS.d	2/10/200	2018-12-24 22:41:46
3	233CALS.d	5/25/500	2018-12-24 22:43:44
4	234CALS.d	10/50/1000	2018-12-24 22:45:43
5	235CALS.d	100/500/10K	2018-12-24 22:47:41
6	236CALS.d	200/1000/20K	2018-12-24 22:49:41
7			

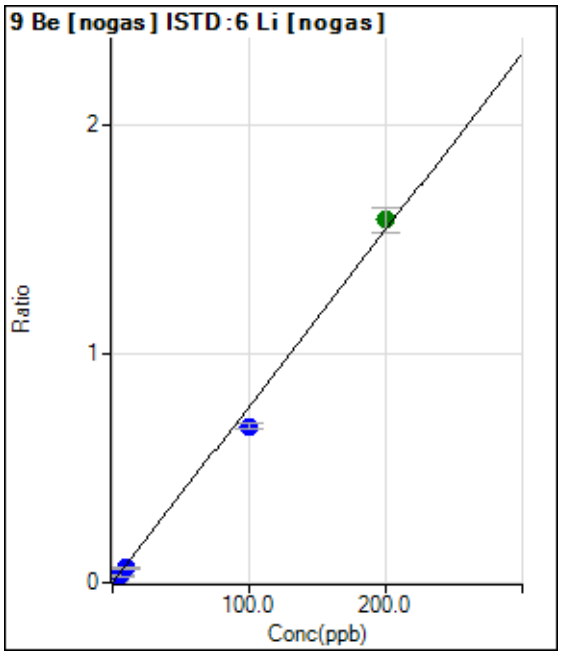
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	100282.20	0.0839	P	2.8
2	☐	2.000	1.791	131914.44	0.1129	P	2.8
3	☐	5.000	4.401	178581.34	0.1552	P	11.
4	☐	10.000	8.924	258322.35	0.2284	P	4.7
5	☐	100.000	96.401	1745197.84	1.6449	A	2.0
6	☐	200.000	201.871	3462610.88	3.3528	A	5.4
7	☐	1.000					

y = 0.0162 * x + 0.0839
R = 0.9998
DL = 0.4311
BEC = 5.182

Weight: <None>
Min Conc: <None>

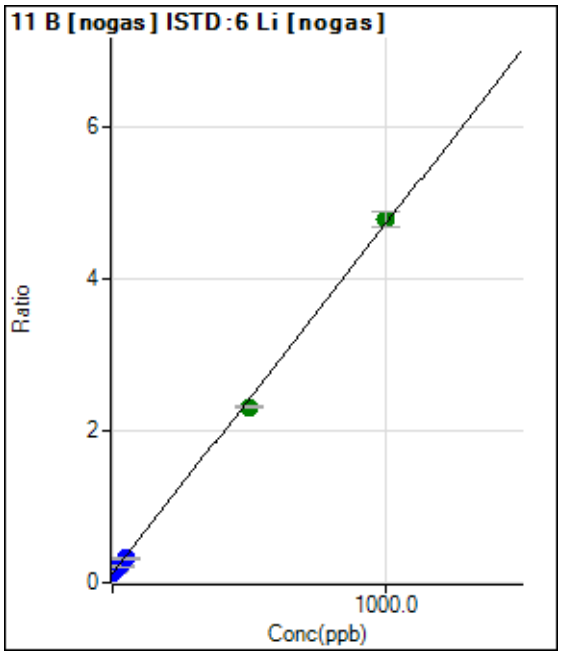


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	86.67	0.0001	P	30.
2	☐	2.000	1.617	14652.45	0.0125	P	3.6
3	☐	5.000	4.042	35793.66	0.0313	P	15.
4	☐	10.000	8.270	72216.09	0.0639	P	5.5
5	☐	100.000	88.782	726394.57	0.6849	P	3.7
6	☐	200.000	205.723	1638982.79	1.5870	A	7.0
7	☐	1.000					

y = 0.0077 * x + 7.2804E-005
R = 0.9979
DL = 0.008732
BEC = 0.009438

Weight: <None>
Min Conc: <None>

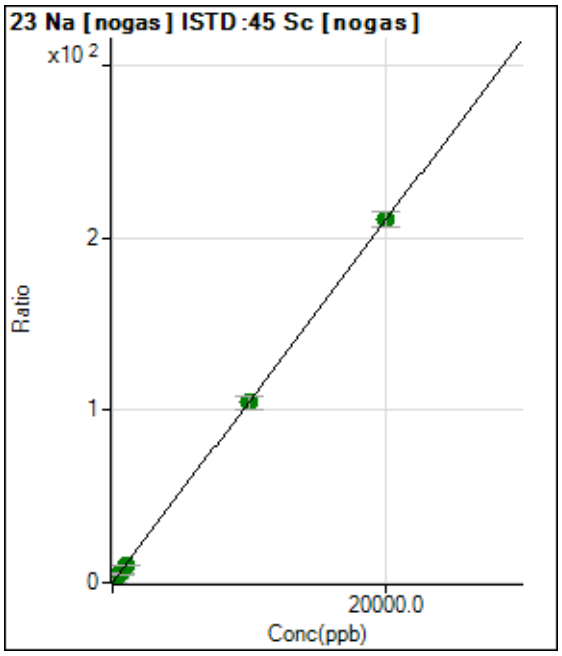
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146565.61	0.1226	P	1.5
2	☐	10.000	7.909	185683.78	0.1590	P	3.3
3	☐	25.000	21.823	255437.83	0.2230	P	15.
4	☐	50.000	42.817	361363.28	0.3195	P	4.5
5	☐	500.000	476.507	2454033.14	2.3135	A	1.9
6	☐	1000.000	1012.206	4934583.05	4.7765	A	4.1
7	☐	5.000					

y = 0.0046 * x + 0.1226
R = 0.9996
DL = 1.191
BEC = 26.67

Weight: <None>
Min Conc: <None>

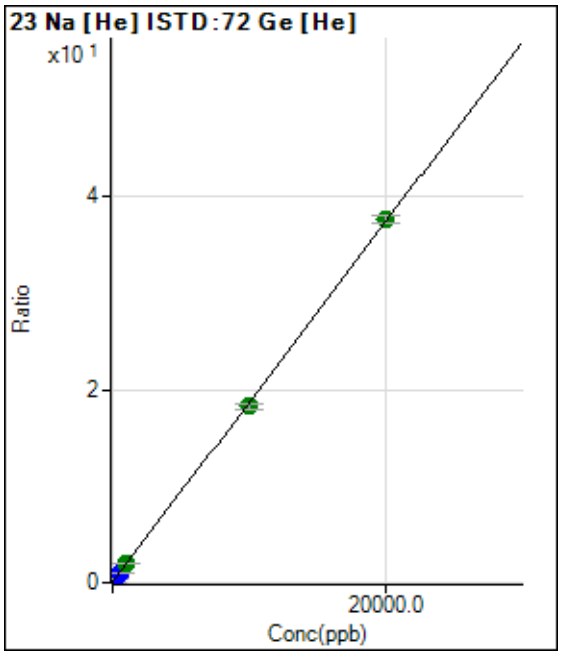


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	331428.93	0.1292	P	4.5
2	☐	200.000	193.251	5578139.71	2.1574	A	5.7
3	☐	500.000	477.044	13289388.58	5.1360	A	10.
4	☐	1000.000	960.287	26451403.72	10.2078	A	6.3
5	☐	10000.00	9941.907	259402164.1	104.473	A	7.3
6	☐	20000.00	20031.674	528973661.8	210.370	A	4.2
7	☐	100.000					

y = 0.0105 * x + 0.1292
R = 1.0000
DL = 1.657
BEC = 12.31

Weight: <None>
Min Conc: <None>

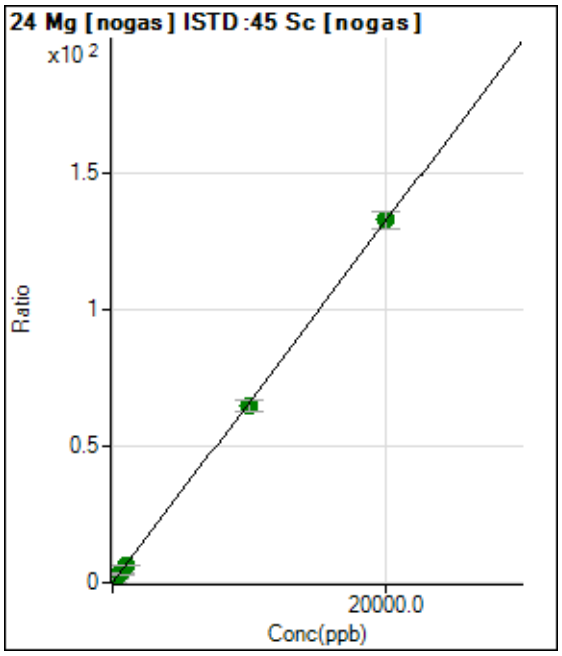
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	41901.40	0.0500	P	4.8
2	☐	200.000	191.960	342970.00	0.4085	P	2.5
3	☐	500.000	486.986	795148.82	0.9595	P	1.9
4	☐	1000.000	1035.445	1638657.99	1.9837	A	4.2
5	☐	10000.00	9749.808	15297982.69	18.2576	A	3.9
6	☐	20000.00	20123.729	30809609.54	37.6308	A	2.0
7	☐	100.000					

y = 0.0019 * x + 0.0500
R = 0.9999
DL = 3.853
BEC = 26.8

Weight: <None>
Min Conc: <None>

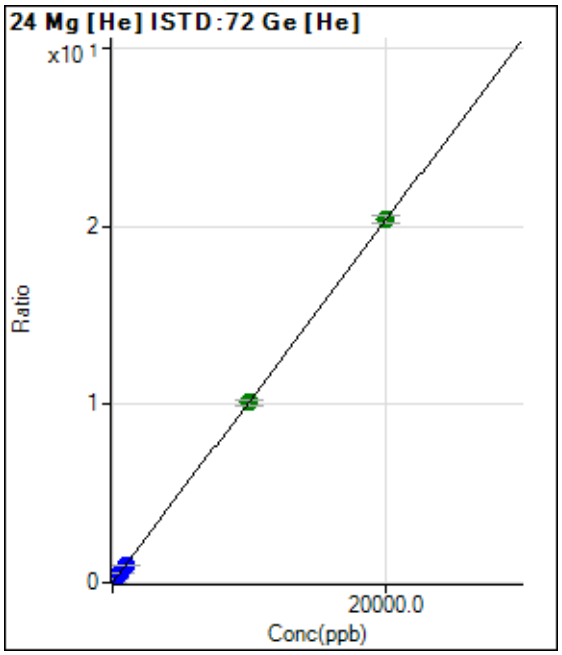


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30464.54	0.0119	P	7.1
2	☐	200.000	196.489	3393444.87	1.3123	A	5.4
3	☐	500.000	487.773	8405434.04	3.2400	A	5.0
4	☐	1000.000	971.147	16702194.13	6.4391	A	3.5
5	☐	10000.00	9812.306	161352099.4	64.9513	A	6.8
6	☐	20000.00	20095.630	334413790.8	133.008	A	4.6
7	☐	100.000					

y = 0.0066 * x + 0.0119
R = 0.9999
DL = 0.383
BEC = 1.794

Weight: <None>
Min Conc: <None>

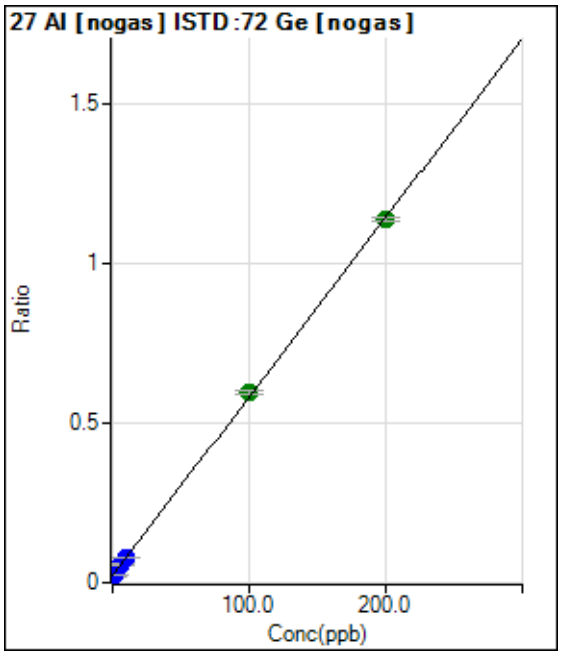
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1586.76	0.0019	P	11.
2	☐	200.000	194.116	167203.86	0.1992	P	2.3
3	☐	500.000	494.618	418151.05	0.5045	P	1.4
4	☐	1000.000	975.086	820275.85	0.9928	P	2.6
5	☐	10000.00	9930.966	8458521.33	10.0942	A	2.6
6	☐	20000.00	20035.956	16672742.25	20.3634	A	2.1
7	☐	100.000					

y = 0.0010 * x + 0.0019
R = 1.0000
DL = 0.6604
BEC = 1.863

Weight: <None>
Min Conc: <None>

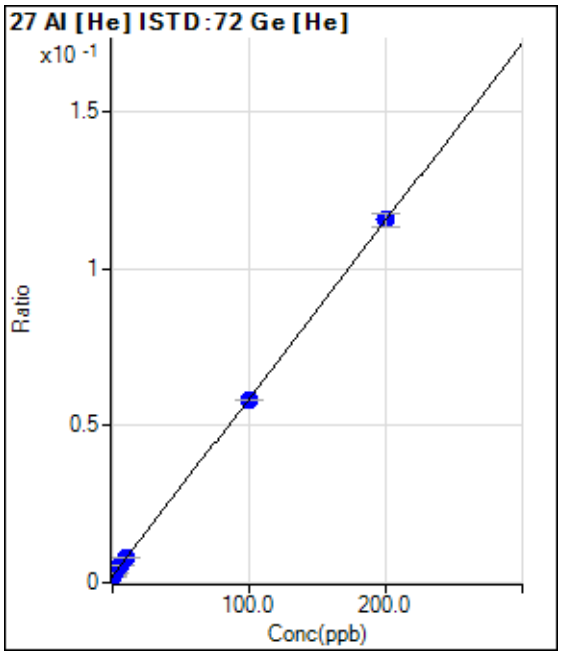


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	77457.87	0.0218	P	8.6
2	☐	2.000	0.667	91527.10	0.0256	P	3.3
3	☐	5.000	6.204	201937.25	0.0566	P	4.7
4	☐	10.000	10.379	287698.43	0.0800	P	1.7
5	☐	100.000	102.274	2058982.05	0.5953	A	1.9
6	☐	200.000	198.827	4165751.08	1.1368	A	1.0
7	☐	1.000					

y = 0.0056 * x + 0.0218
R = 0.9999
DL = 0.9989
BEC = 3.894

Weight: <None>
Min Conc: <None>

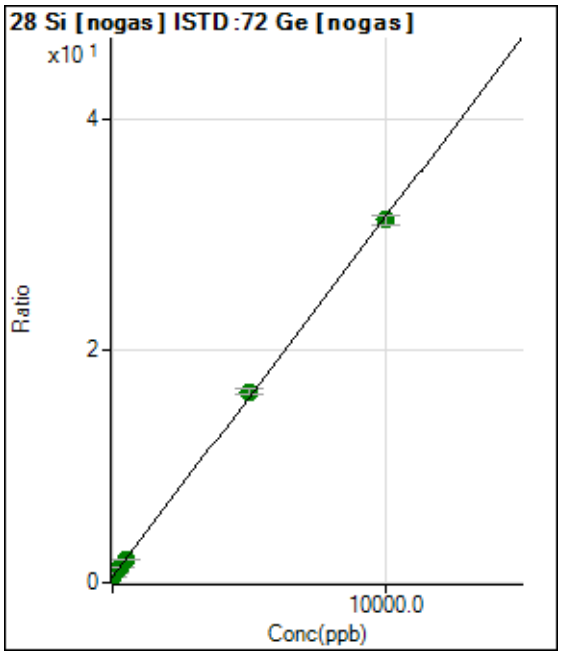
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.003	1763.45	0.0021	P	9.4
2	☐	2.000	1.485	2476.87	0.0029	P	11.
3	☐	5.000	5.705	4423.92	0.0053	P	4.2
4	☐	10.000	10.339	6584.58	0.0080	P	7.5
5	☐	100.000	99.007	48759.78	0.0582	P	0.7
6	☐	200.000	200.467	94669.15	0.1157	P	3.5
7	☐	1.000					

y = 5.6640E-004 * x + 0.0021
R = 1.0000
DL = 1.053
BEC = 3.72

Weight: <None>
Min Conc: <None>

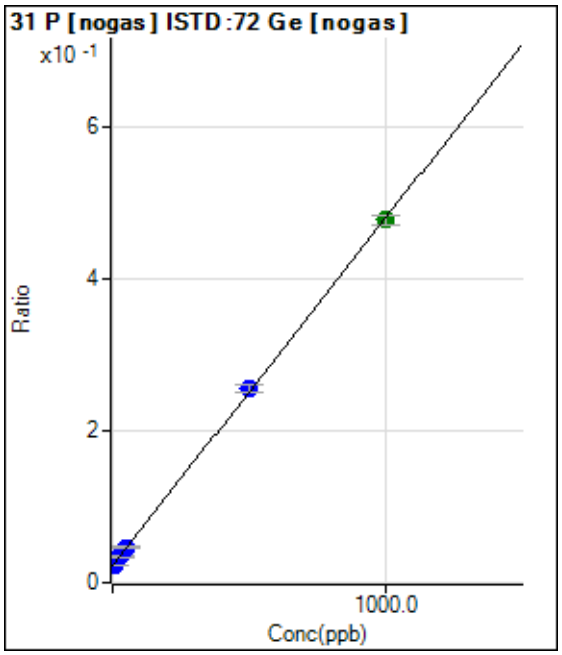


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1786795.86	0.5033	A	3.0
2	☐	100.000	87.831	2777141.21	0.7758	A	2.1
3	☐	250.000	254.258	4591023.16	1.2922	A	5.5
4	☐	500.000	487.963	7250697.18	2.0173	A	2.7
5	☐	5000.000	5153.189	57019467.49	16.4923	A	2.9
6	☐	10000.00	9924.022	114625554.9	31.2949	A	2.7
7	☐	5.000					

y = 0.0031 * x + 0.5033
R = 0.9998
DL = 14.44
BEC = 162.2

Weight: <None>
Min Conc: <None>

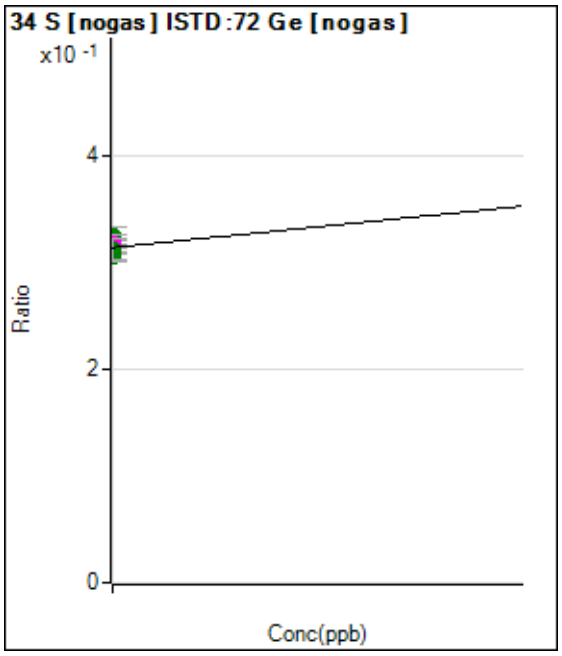
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	80236.18	0.0226	P	3.4
2	☐	10.000	-0.139	80633.97	0.0225	P	4.1
3	☐	25.000	26.987	123922.83	0.0349	P	9.8
4	☐	50.000	52.754	167931.26	0.0467	P	3.5
5	☐	500.000	509.447	883777.23	0.2557	P	3.3
6	☐	1000.000	995.190	1750887.01	0.4779	A	2.3
7	☐	5.000					

y = 4.5752E-004 * x + 0.0226
R = 0.9999
DL = 4.974
BEC = 49.4

Weight: <None>
Min Conc: <None>

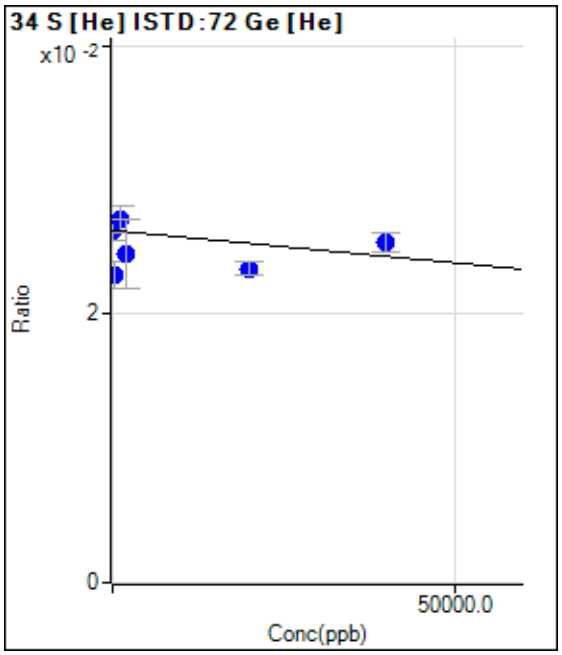


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1113053.57	0.3134	M	3.8
2	☐	400.000	-27825656.57	1097233.46	0.3063	A	2.5
3	☐	1000.000	41489022.92	1152275.19	0.3242	A	5.3
4	☐	2000.000	36090880.65	1161027.37	0.3228	A	1.3
5	☐	20000.00	14108207.03	1096116.82	0.3171	M	2.9
6	☐	40000.00	-9567487.560	1138341.66	0.3110	A	6.8
7	☐	100.000					

y = 2.5821E-010 * x + 0.3134
R = -0.2609
DL = 1.375E+08
BEC = 1.214E+09

Weight: <None>
Min Conc: <None>

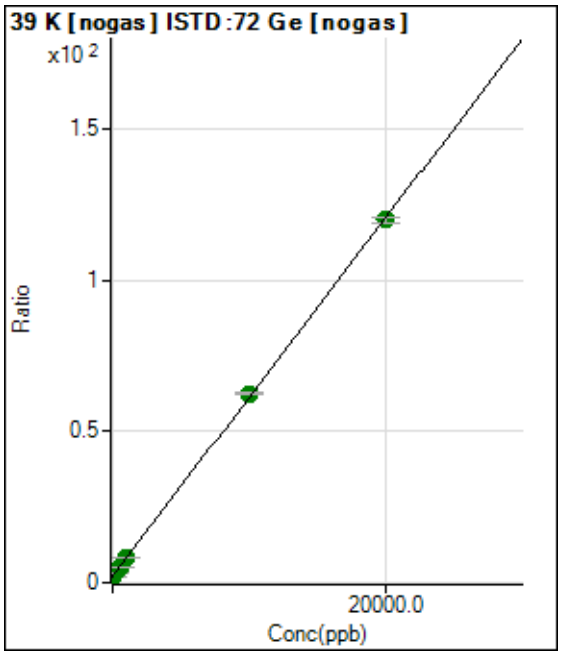
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	21950.22	0.0262	P	5.6
2	☐	400.000	68262.296	19246.23	0.0229	P	8.6
3	☐	1000.000	-16293.142	22384.11	0.0270	P	7.5
4	☐	2000.000	37018.140	20148.30	0.0244	P	20.
5	☐	20000.00	59369.552	19580.39	0.0234	P	4.5
6	☐	40000.00	18318.022	20748.34	0.0253	P	6.0
7	☐	100.000					

y = -4.8102E-008 * x + 0.0262
R = -0.0898
DL = -9.232E+04
BEC = -5.45E+05

Weight: <None>
Min Conc: <None>

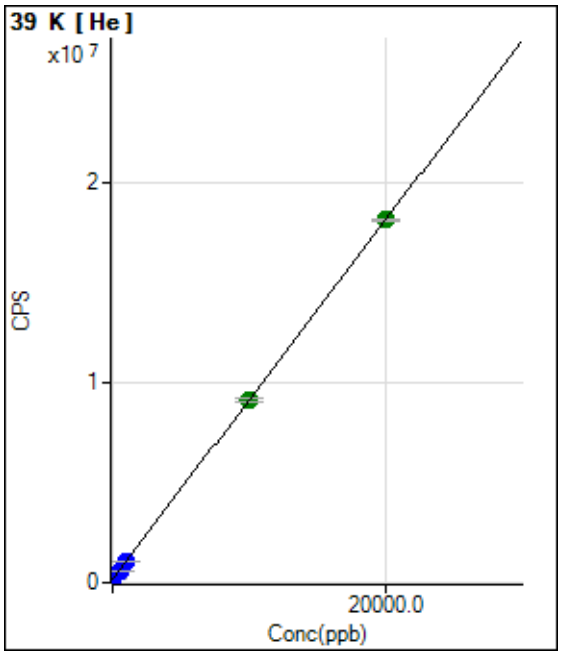


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7580101.73	2.1349	A	2.4
2	☐	200.000	202.537	11936197.14	3.3352	A	2.9
3	☐	500.000	510.936	18312033.74	5.1630	A	9.1
4	☐	1000.000	1011.498	29212752.74	8.1297	A	3.2
5	☐	10000.00	10207.707	216604788.1	62.6332	A	1.3
6	☐	20000.00	19895.273	439767909.8	120.048	A	1.8
7	☐	100.000					

y = 0.0059 * x + 2.1349
R = 0.9999
DL = 26.13
BEC = 360.2

Weight: <None>
Min Conc: <None>

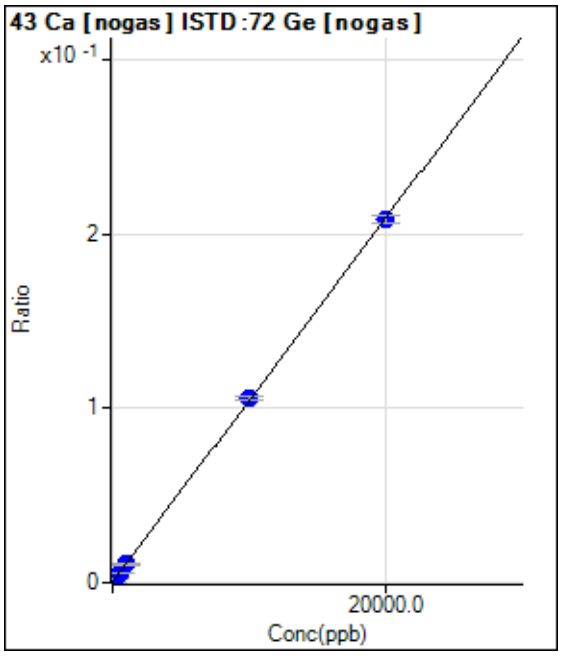
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	170285.97		P	0.3
2	☐	200.000	201.047	350759.06		P	0.7
3	☐	500.000	492.010	611946.24		P	1.1
4	☐	1000.000	968.975	1040100.25		P	0.7
5	☐	10000.00	9989.647	9137636.95		A	1.7
6	☐	20000.00	20006.917	18129783.90		A	0.5
7	☐	100.000					

y = 897.6644 * x + 170285.9667
R = 1.0000
DL = 1.483
BEC = 189.7

Weight: <None>
Min Conc: <None>

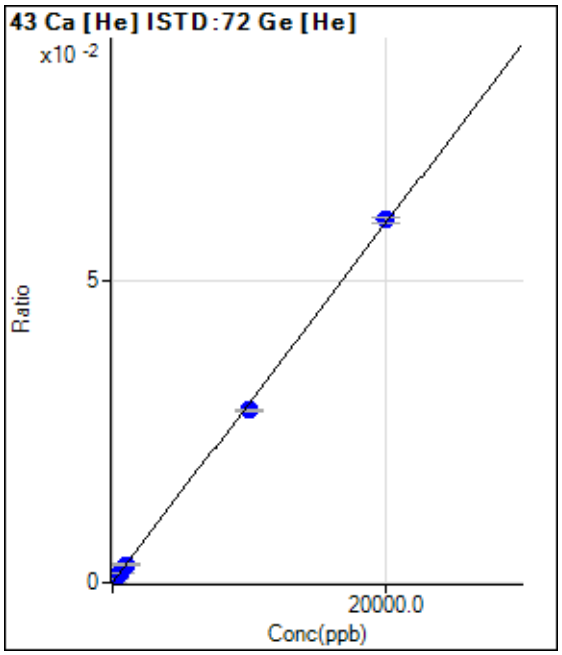


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	823.37	0.0002	P	11.
2	☐	200.000	198.398	8231.93	0.0023	P	2.7
3	☐	500.000	499.213	19320.28	0.0054	P	4.6
4	☐	1000.000	990.750	37928.98	0.0106	P	4.5
5	☐	10000.00	10146.229	366611.83	0.1060	P	1.4
6	☐	20000.00	19927.384	761679.34	0.2079	P	2.3
7	☐	100.000					

y = 1.0423E-005 * x + 2.3215E-004
R = 1.0000
DL = 7.682
BEC = 22.27

Weight: <None>
Min Conc: <None>

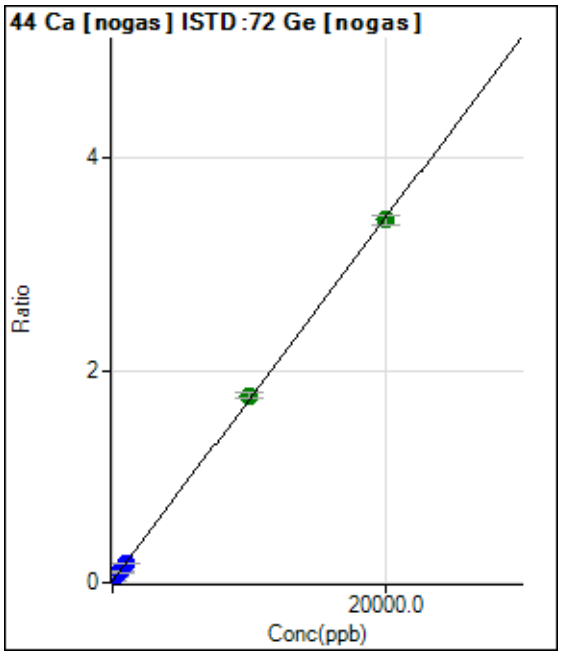
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	36.67	0.0000	P	78.
2	☐	200.000	176.102	476.68	0.0006	P	3.8
3	☐	500.000	506.136	1283.40	0.0015	P	9.9
4	☐	1000.000	993.585	2476.87	0.0030	P	9.6
5	☐	10000.00	9588.297	23948.89	0.0286	P	1.6
6	☐	20000.00	20206.258	49271.69	0.0602	P	1.8
7	☐	100.000					

y = 2.9757E-006 * x + 4.3619E-005
R = 0.9997
DL = 34.29
BEC = 14.66

Weight: <None>
Min Conc: <None>

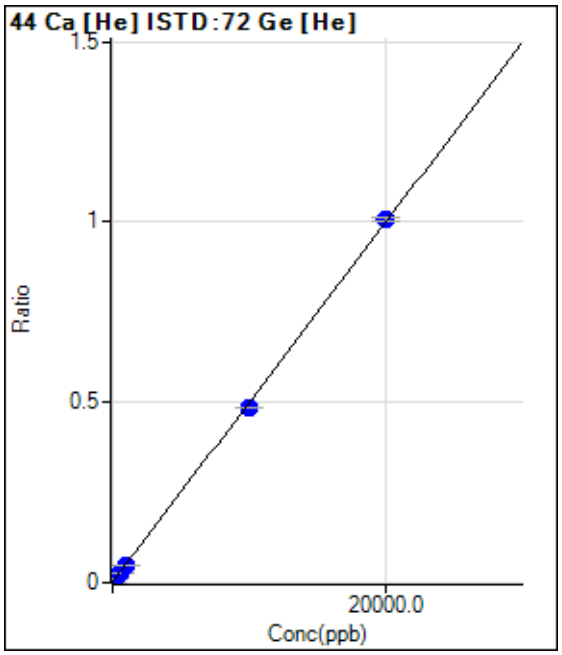


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	54583.02	0.0154	P	4.3
2	☐	200.000	191.137	172085.82	0.0481	P	2.7
3	☐	500.000	495.058	354984.02	0.1001	P	8.9
4	☐	1000.000	970.672	652308.58	0.1814	P	1.2
5	☐	10000.00	10226.911	6101094.91	1.7650	A	3.3
6	☐	20000.00	19888.223	12519365.23	3.4179	A	3.0
7	☐	100.000					

y = 1.7108E-004 * x + 0.0154
R = 0.9999
DL = 11.57
BEC = 89.89

Weight: <None>
Min Conc: <None>

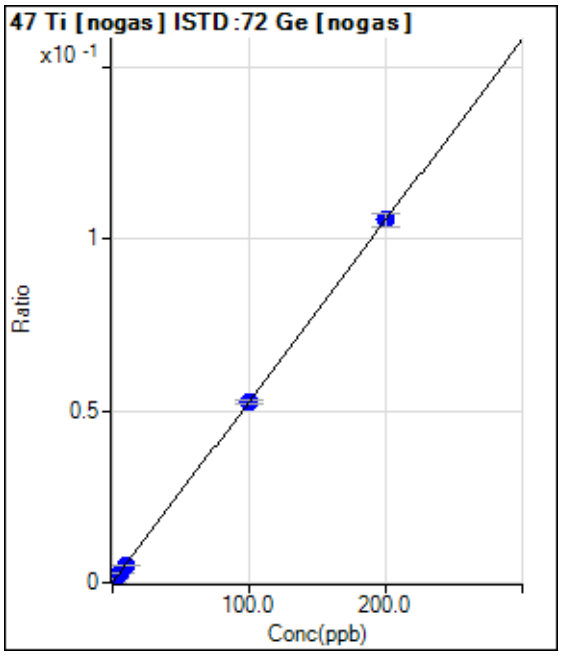
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	916.71	0.0011	P	13.
2	☐	200.000	195.242	9095.68	0.0108	P	1.7
3	☐	500.000	489.347	21132.21	0.0255	P	3.2
4	☐	1000.000	962.277	40547.68	0.0491	P	4.8
5	☐	10000.00	9714.364	406952.36	0.4856	P	0.9
6	☐	20000.00	20145.018	823613.63	1.0058	P	1.1
7	☐	100.000					

y = 4.9875E-005 * x + 0.0011
R = 0.9999
DL = 9.082
BEC = 21.96

Weight: <None>
Min Conc: <None>

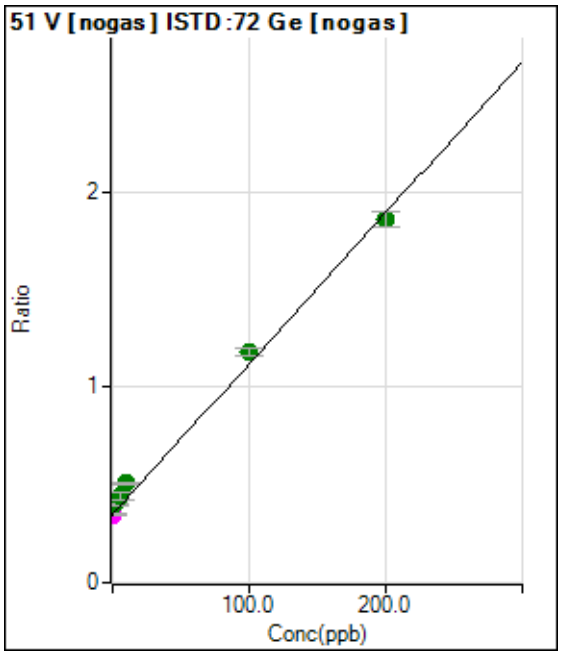


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	283.34	0.0001	P	41.
2	☐	2.000	1.783	3643.75	0.0010	P	10.
3	☐	5.000	4.942	9529.26	0.0027	P	7.9
4	☐	10.000	9.421	18139.09	0.0050	P	2.1
5	☐	100.000	99.521	181696.77	0.0525	P	2.2
6	☐	200.000	200.272	386985.39	0.1057	P	3.4
7	☐	1.000					

y = 5.2719E-004 * x + 7.9746E-005
R = 1.0000
DL = 0.1862
BEC = 0.1513

Weight: <None>
Min Conc: <None>

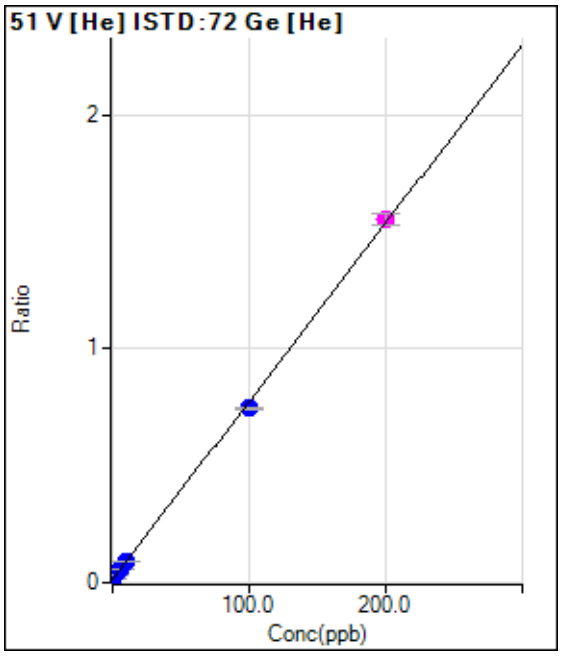
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1238421.94	0.3488	M	4.1
2	☐	2.000	6.452	1427472.62	0.3985	A	1.0
3	☐	5.000	12.441	1577439.88	0.4447	A	9.0
4	☐	10.000	20.625	1826105.38	0.5078	A	2.4
5	☐	100.000	107.948	4082141.63	1.1811	A	3.5
6	☐	200.000	195.264	6790929.32	1.8542	A	4.1
7	☐	1.000					

y = 0.0077 * x + 0.3488
R = 0.9982
DL = 5.552
BEC = 45.24

Weight: <None>
Min Conc: <None>

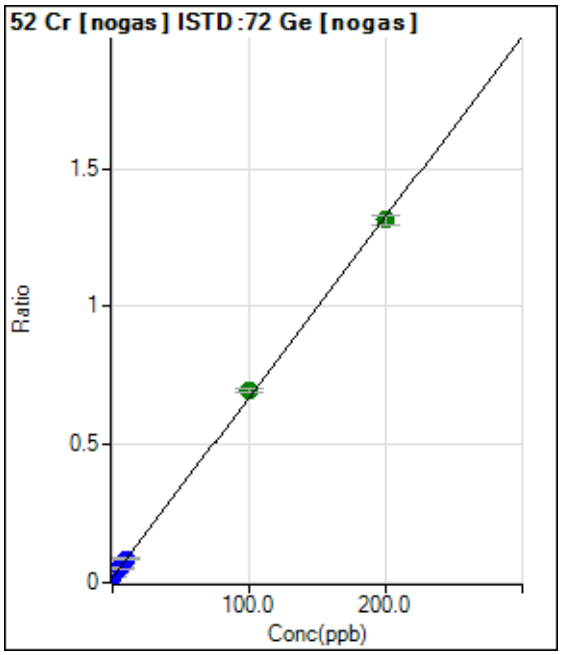


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.474	14259.45	0.0170	P	1.5
2	☐	2.000	2.475	27090.25	0.0323	P	0.5
3	☐	5.000	5.536	46057.91	0.0556	P	1.5
4	☐	10.000	10.508	77214.15	0.0934	P	1.3
5	☐	100.000	96.102	624534.88	0.7453	P	1.1
6	☐	200.000	201.905	1270034.29	1.5510	M	3.2
7	☐	1.000					

y = 0.0076 * x + 0.0134
R = 0.9997
DL = 0.1009
BEC = 1.762

Weight: <None>
Min Conc: <None>

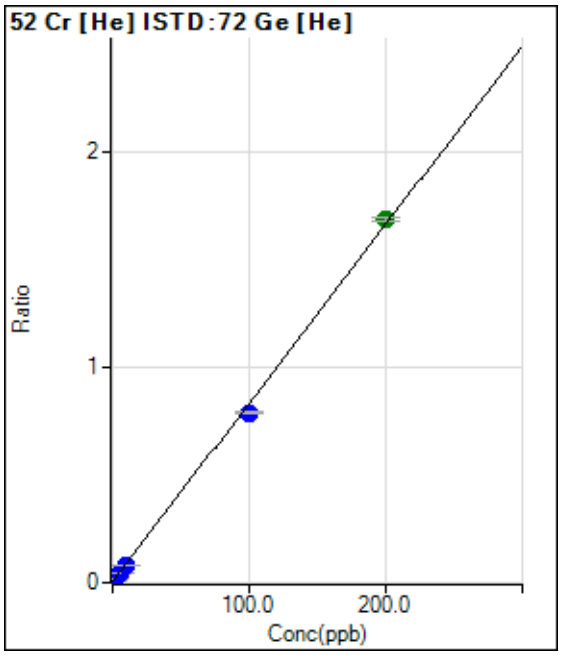
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	68853.87	0.0194	P	1.9
2	☐	2.000	1.992	115869.71	0.0324	P	5.1
3	☐	5.000	5.184	189061.97	0.0532	P	6.3
4	☐	10.000	10.108	306749.05	0.0854	P	3.9
5	☐	100.000	103.412	2401368.77	0.6945	A	2.3
6	☐	200.000	198.284	4813022.43	1.3139	A	2.6
7	☐	1.000					

y = 0.0065 * x + 0.0194
R = 0.9998
DL = 0.1677
BEC = 2.97

Weight: <None>
Min Conc: <None>

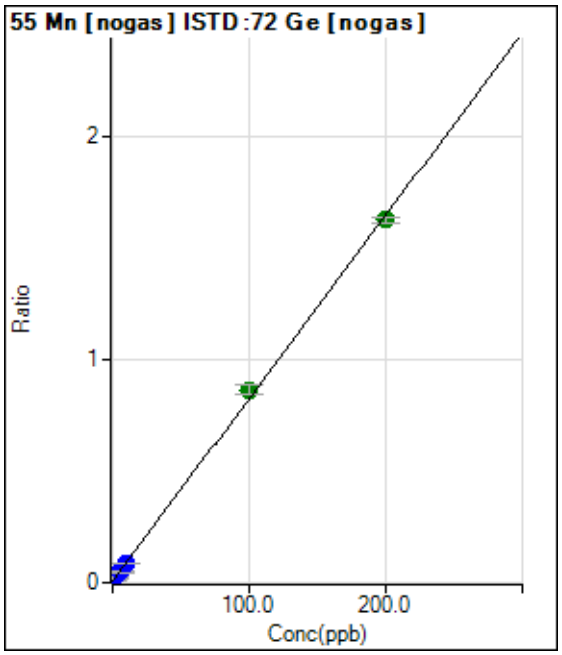


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4123.86	0.0049	P	7.9
2	☐	2.000	1.841	16961.33	0.0202	P	4.4
3	☐	5.000	4.823	37254.53	0.0450	P	1.4
4	☐	10.000	9.406	68580.62	0.0830	P	0.5
5	☐	100.000	94.594	661999.05	0.7900	P	0.9
6	☐	200.000	202.739	1381847.06	1.6874	A	1.0
7	☐	1.000					

y = 0.0083 * x + 0.0049
R = 0.9995
DL = 0.1411
BEC = 0.5935

Weight: <None>
Min Conc: <None>

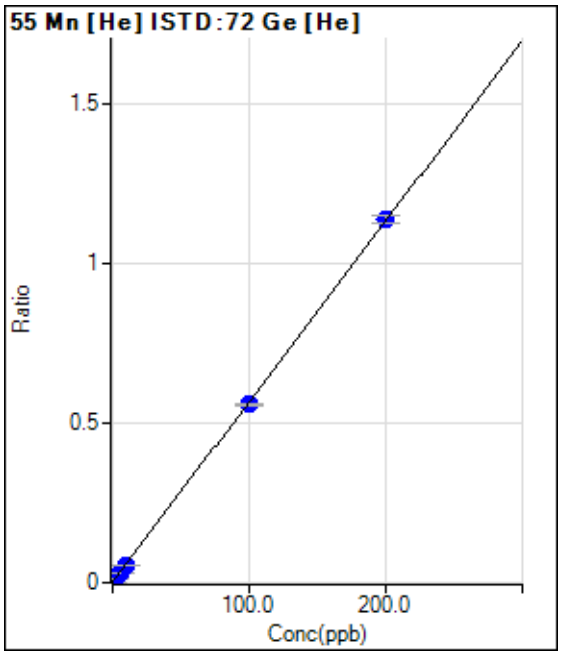
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23391.62	0.0066	P	2.2
2	☐	2.000	1.830	77277.42	0.0216	P	4.2
3	☐	5.000	5.053	170429.78	0.0480	P	9.0
4	☐	10.000	9.837	313711.41	0.0873	P	2.9
5	☐	100.000	104.638	2988634.12	0.8650	A	4.7
6	☐	200.000	197.689	5965128.45	1.6283	A	1.8
7	☐	1.000					

y = 0.0082 * x + 0.0066
R = 0.9996
DL = 0.05259
BEC = 0.8029

Weight: <None>
Min Conc: <None>

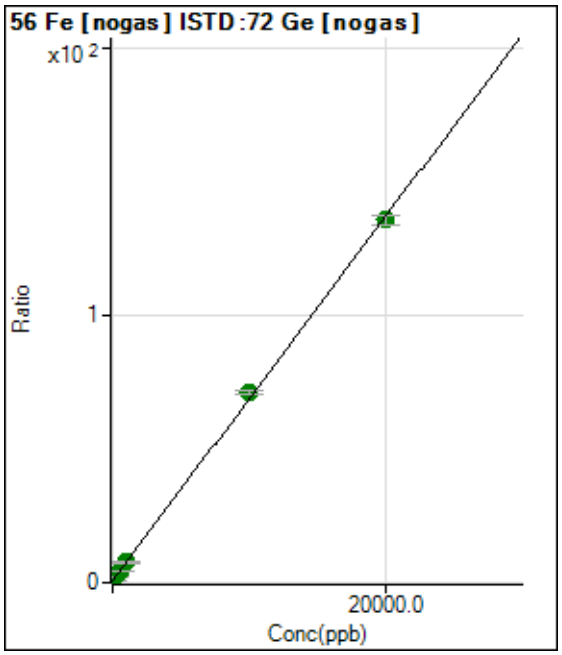


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1073.38	0.0013	P	1.3
2	☐	2.000	1.903	10109.54	0.0120	P	1.8
3	☐	5.000	5.007	24523.30	0.0296	P	2.3
4	☐	10.000	9.795	46836.19	0.0567	P	1.7
5	☐	100.000	98.581	468165.88	0.5586	P	1.0
6	☐	200.000	200.721	930186.86	1.1361	P	2.1
7	☐	1.000					

y = 0.0057 * x + 0.0013
R = 1.0000
DL = 0.00862
BEC = 0.2267

Weight: <None>
Min Conc: <None>

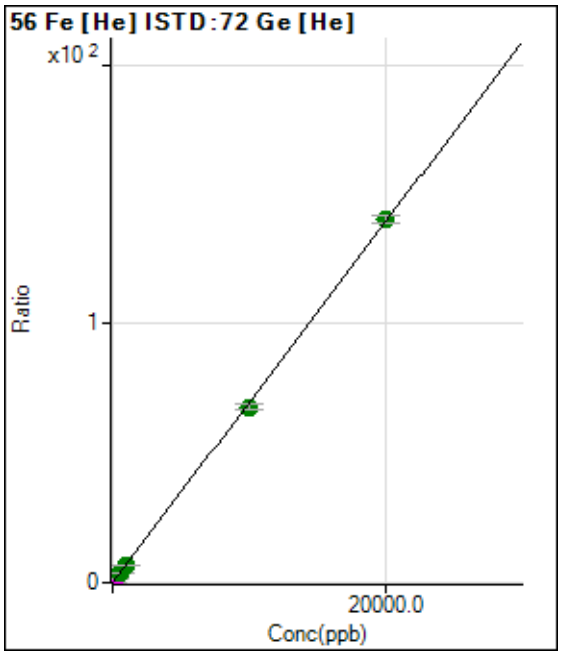
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2564814.12	0.7225	A	3.4
2	☐	200.000	202.138	7515341.57	2.1001	A	3.7
3	☐	500.000	502.916	14726538.35	4.1501	A	8.1
4	☐	1000.000	1003.383	27184109.98	7.5610	A	3.4
5	☐	10000.00	10349.989	246346363.8	71.2630	A	2.9
6	☐	20000.00	19824.742	497565694.4	135.838	A	2.9
7	☐	100.000					

y = 0.0068 * x + 0.7225
R = 0.9998
DL = 10.95
BEC = 106

Weight: <None>
Min Conc: <None>

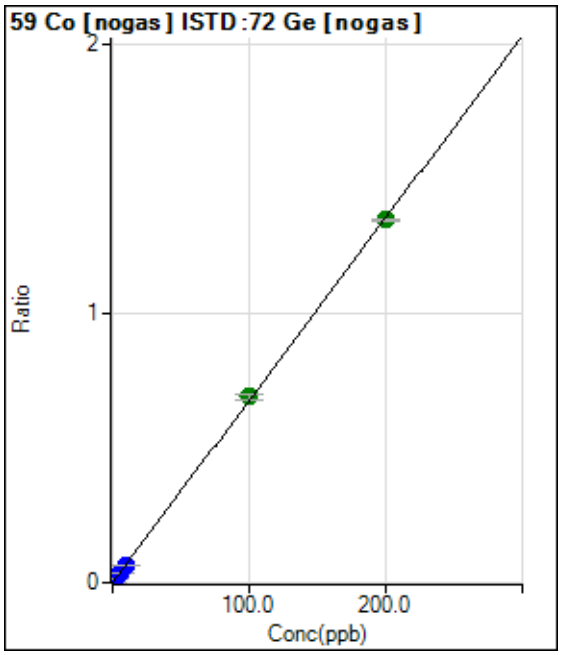


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	26058.62	0.0311	P	2.7
2	☐	200.000	195.537	1169440.84	1.3926	M	3.6
3	☐	500.000	506.315	2947197.25	3.5564	A	2.8
4	☐	1000.000	997.225	5763138.04	6.9744	A	1.4
5	☐	10000.00	9750.429	56918027.49	67.9201	A	2.9
6	☐	20000.00	20124.811	114749171.6	140.153	A	1.9
7	☐	100.000					

y = 0.0070 * x + 0.0311
R = 0.9999
DL = 0.3597
BEC = 4.468

Weight: <None>
Min Conc: <None>

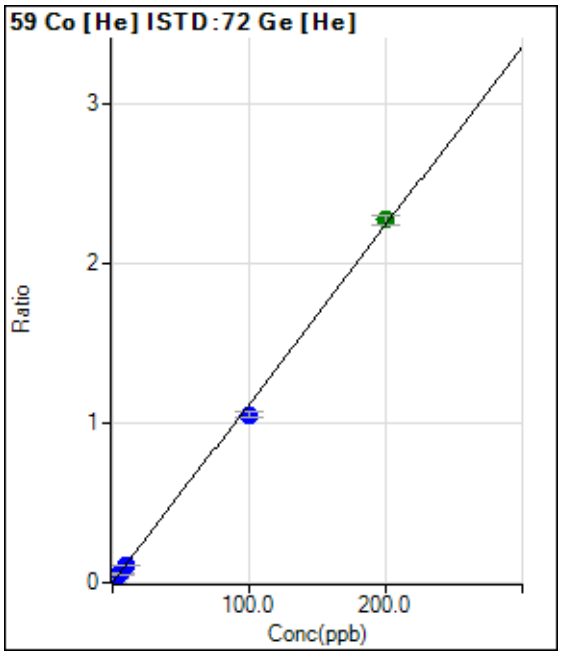
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	833.37	0.0002	P	23.
2	☐	2.000	1.968	48547.84	0.0136	P	3.8
3	☐	5.000	5.035	121849.42	0.0343	P	8.8
4	☐	10.000	9.823	240024.07	0.0668	P	2.5
5	☐	100.000	101.857	2385751.06	0.6902	A	3.3
6	☐	200.000	199.080	4942486.70	1.3488	A	0.4
7	☐	1.000					

y = 0.0068 * x + 2.3546E-004
R = 0.9999
DL = 0.0246
BEC = 0.03476

Weight: <None>
Min Conc: <None>

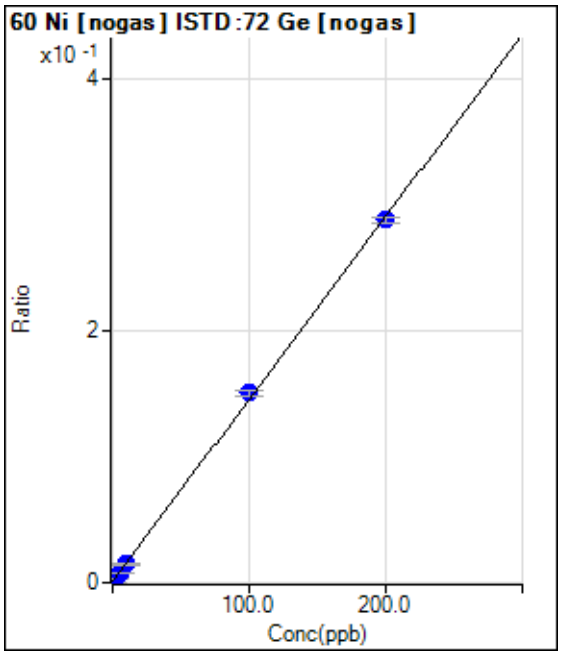


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	200.00	0.0002	P	19.
2	☐	2.000	1.909	18122.51	0.0216	P	3.9
3	☐	5.000	4.826	44908.45	0.0542	P	3.9
4	☐	10.000	9.659	89413.80	0.1082	P	2.9
5	☐	100.000	93.892	879775.77	1.0499	P	3.1
6	☐	200.000	203.076	1859116.69	2.2705	A	2.3
7	☐	1.000					

y = 0.0112 * x + 2.3910E-004
R = 0.9994
DL = 0.01221
BEC = 0.02139

Weight: <None>
Min Conc: <None>

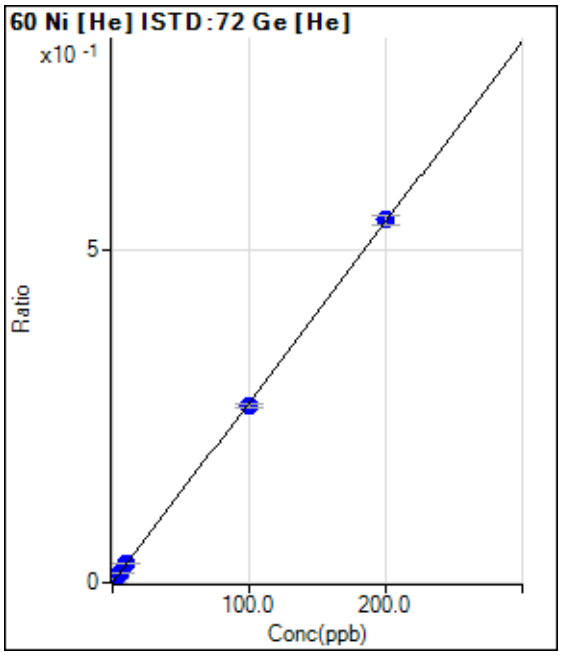
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.567	323.34	0.0001	P	33.
2	☐	2.000	1.559	11323.63	0.0032	P	2.8
3	☐	5.000	4.714	27387.42	0.0077	P	9.8
4	☐	10.000	9.584	53023.58	0.0148	P	5.1
5	☐	100.000	103.354	519375.60	0.1503	P	3.8
6	☐	200.000	198.355	1053570.63	0.2876	P	1.6
7	☐	1.000					

y = 0.0014 * x + 9.1050E-004
R = 0.9998
DL = 0.06411
BEC = 0.63

Weight: <None>
Min Conc: <None>

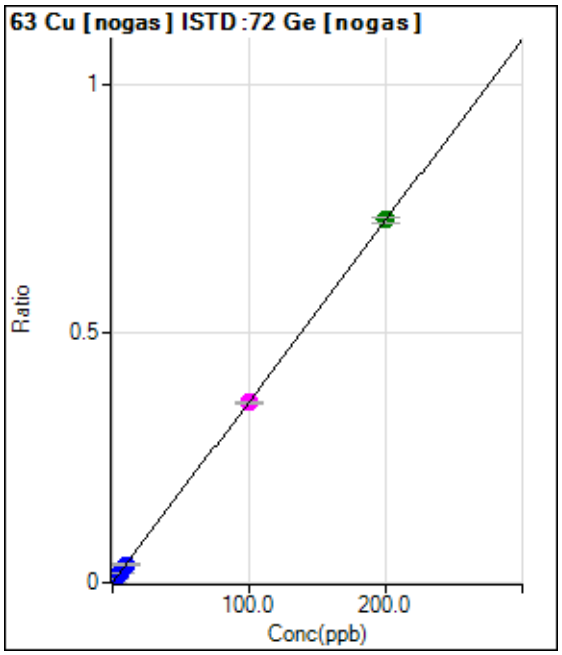


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.161	136.67	0.0002	P	41.
2	☐	2.000	2.157	4694.00	0.0056	P	4.9
3	☐	5.000	5.286	11683.86	0.0141	P	2.0
4	☐	10.000	10.568	23505.24	0.0285	P	5.5
5	☐	100.000	97.733	222439.34	0.2654	P	2.3
6	☐	200.000	201.096	447375.24	0.5465	P	2.7
7	☐	1.000					

y = 0.0027 * x - 2.7316E-004
R = 0.9999
DL = 0.07395
BEC = -0.1005

Weight: <None>
Min Conc: <None>

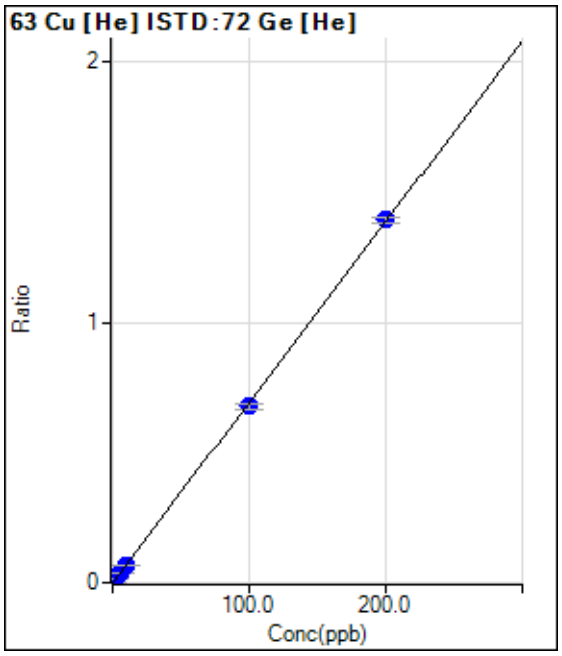
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1536.76	0.0004	P	7.2
2	☐	2.000	1.980	27267.28	0.0076	P	6.3
3	☐	5.000	5.096	67119.88	0.0189	P	9.8
4	☐	10.000	9.859	130176.97	0.0362	P	2.6
5	☐	100.000	99.382	1249207.25	0.3612	M	1.4
6	☐	200.000	200.314	2665951.31	0.7276	A	1.5
7	☐	1.000					

y = 0.0036 * x + 4.3227E-004
R = 1.0000
DL = 0.02555
BEC = 0.1191

Weight: <None>
Min Conc: <None>

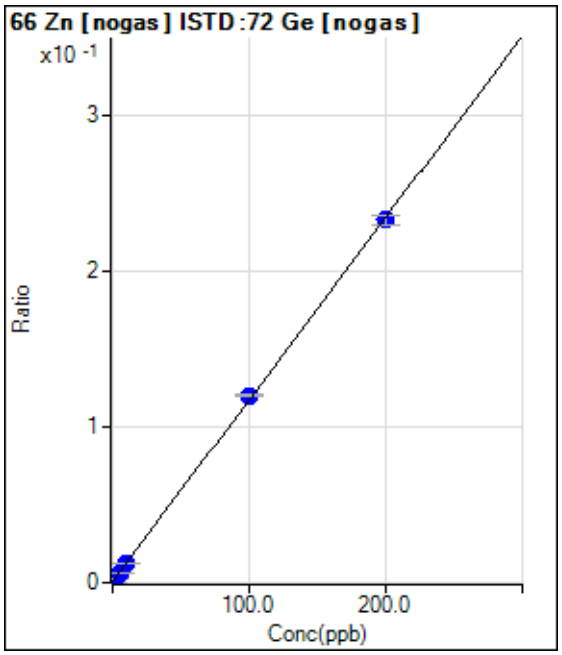


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.354	663.35	0.0008	P	6.9
2	☐	2.000	2.253	11717.23	0.0140	P	2.5
3	☐	5.000	5.415	29744.31	0.0359	P	1.2
4	☐	10.000	10.145	56751.49	0.0687	P	1.6
5	☐	100.000	97.706	566330.52	0.6758	P	2.3
6	☐	200.000	201.127	1140693.89	1.3930	P	1.7
7	☐	1.000					

y = 0.0069 * x - 0.0017
R = 0.9999
DL = 0.02375
BEC = -0.24

Weight: <None>
Min Conc: <None>

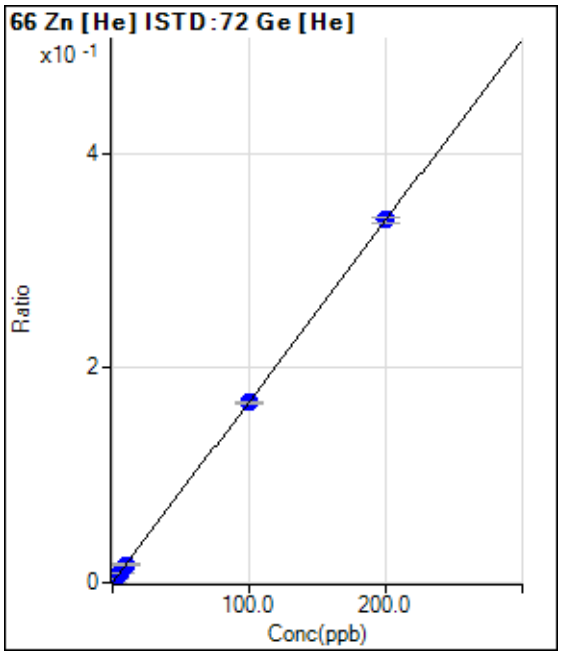
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.358	940.04	0.0003	P	11.
2	☐	2.000	1.539	8885.64	0.0025	P	2.6
3	☐	5.000	4.957	22994.75	0.0065	P	6.3
4	☐	10.000	9.742	43381.86	0.0121	P	1.5
5	☐	100.000	102.201	415264.80	0.1201	P	1.2
6	☐	200.000	198.918	853679.49	0.2331	P	2.6
7	☐	1.000					

y = 0.0012 * x + 6.8307E-004
R = 0.9999
DL = 0.07476
BEC = 0.5847

Weight: <None>
Min Conc: <None>

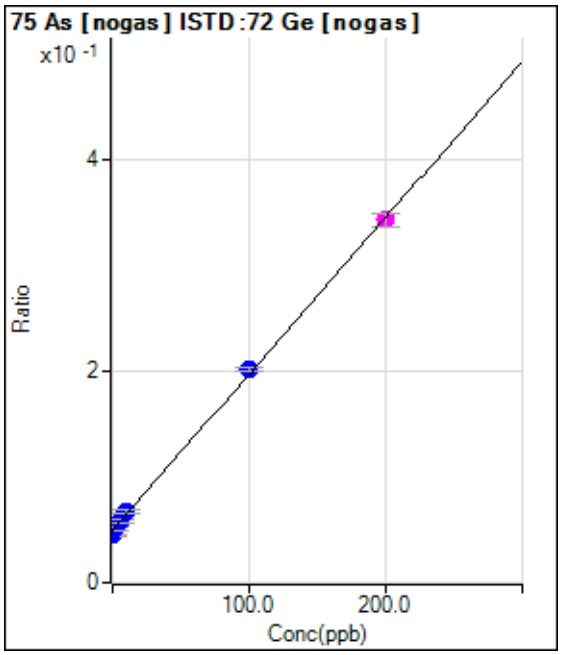


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.098	293.34	0.0004	P	8.1
2	☐	2.000	2.070	3083.65	0.0037	P	8.9
3	☐	5.000	5.272	7518.32	0.0091	P	0.8
4	☐	10.000	9.888	13932.20	0.0169	P	5.0
5	☐	100.000	99.347	140491.93	0.1676	P	1.7
6	☐	200.000	200.325	276667.38	0.3379	P	1.3
7	☐	1.000					

y = 0.0017 * x + 1.8448E-004
R = 1.0000
DL = 0.0504
BEC = 0.1094

Weight: <None>
Min Conc: <None>

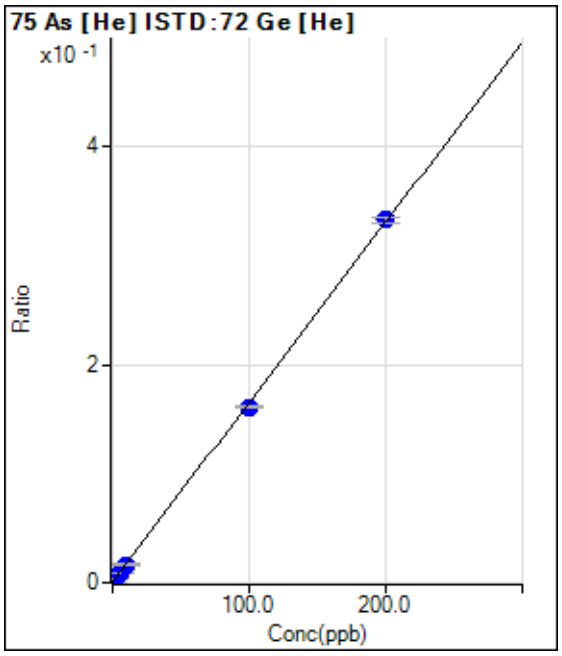
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-2.979	160545.89	0.0452	P	3.6
2	☐	2.000	0.732	181430.39	0.0507	P	5.6
3	☐	5.000	6.124	208319.85	0.0587	P	7.6
4	☐	10.000	11.865	241432.28	0.0672	P	3.9
5	☐	100.000	102.732	697353.22	0.2017	P	1.9
6	☐	200.000	198.525	1258438.00	0.3434	M	3.5
7	☐	1.000					

y = 0.0015 * x + 0.0496
R = 0.9996
DL = 3.285
BEC = 33.53

Weight: <None>
Min Conc: <None>

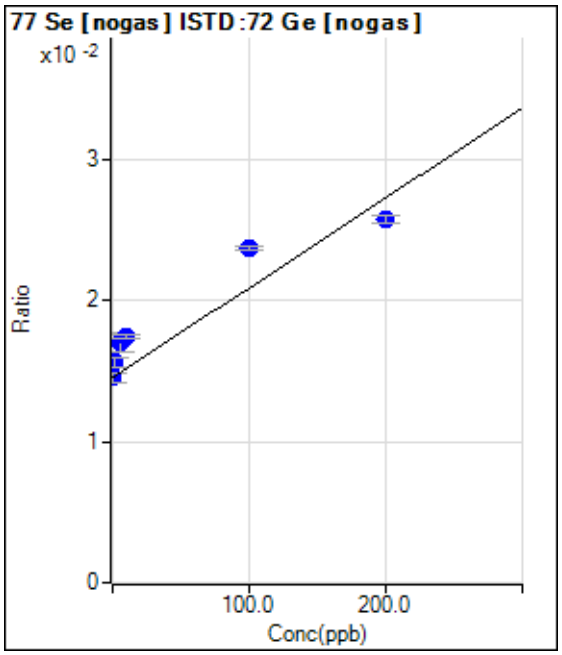


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	517.79	0.0006	P	4.1
2	☐	2.000	1.974	3250.30	0.0039	P	3.8
3	☐	5.000	4.759	7013.60	0.0085	P	1.1
4	☐	10.000	9.753	13794.13	0.0167	P	1.7
5	☐	100.000	97.310	134927.85	0.1610	P	1.5
6	☐	200.000	201.364	272270.03	0.3325	P	1.5
7	☐	1.000					

y = 0.0016 * x + 6.1815E-004
R = 0.9999
DL = 0.0466
BEC = 0.375

Weight: <None>
Min Conc: <None>

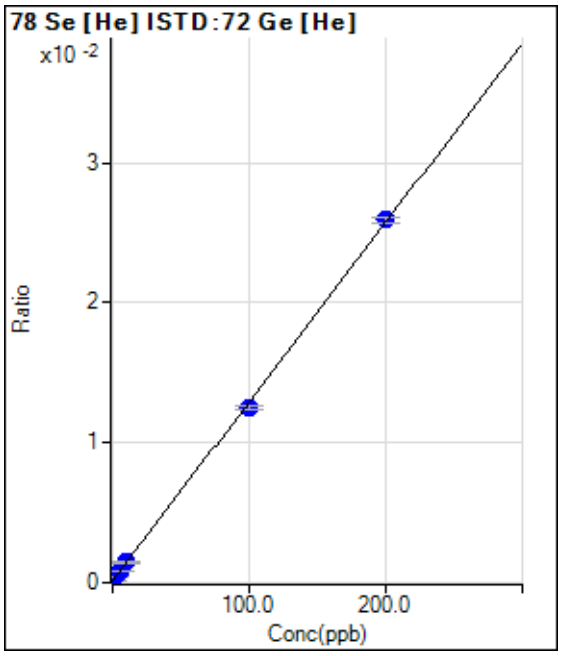
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	51536.35	0.0145	P	4.4
2	☐	2.000	17.552	55932.62	0.0156	P	4.5
3	☐	5.000	40.226	60607.48	0.0171	P	8.1
4	☐	10.000	45.725	62674.42	0.0174	P	1.1
5	☐	100.000	143.713	81930.11	0.0237	P	1.3
6	☐	200.000	175.321	94138.40	0.0257	P	2.2
7	☐	1.000					

y = 6.3804E-005 * x + 0.0145
R = 0.9502
DL = 30.25
BEC = 227.5

Weight: <None>
Min Conc: <None>

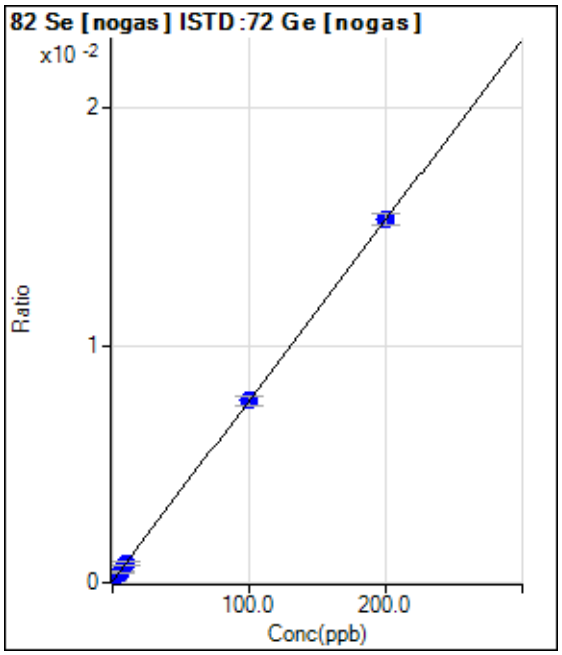


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.465	160.67	0.0002	P	11.
2	☐	2.000	2.298	358.00	0.0004	P	7.1
3	☐	5.000	5.553	698.68	0.0008	P	5.4
4	☐	10.000	10.265	1194.71	0.0014	P	2.0
5	☐	100.000	96.897	10495.03	0.0125	P	2.7
6	☐	200.000	201.522	21213.01	0.0259	P	1.7
7	☐	1.000					

y = 1.2789E-004 * x + 1.3247E-004
R = 0.9998
DL = 0.5215
BEC = 1.036

Weight: <None>
Min Conc: <None>

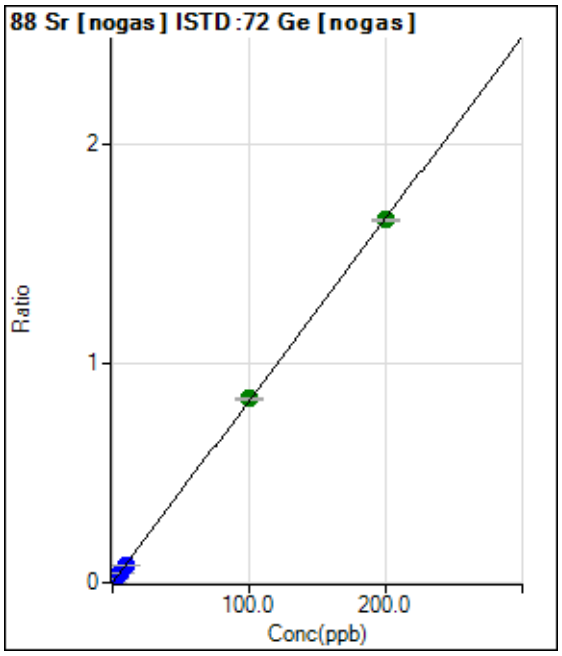
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	233.34	0.0001	P	31.
2	☐	2.000	1.895	753.36	0.0002	P	4.8
3	☐	5.000	4.759	1516.75	0.0004	P	10.
4	☐	10.000	9.753	2903.61	0.0008	P	12.
5	☐	100.000	99.844	26466.36	0.0077	P	5.1
6	☐	200.000	200.097	55986.64	0.0153	P	3.2
7	☐	1.000					

y = 7.6063E-005 * x + 6.5945E-005
R = 1.0000
DL = 0.8149
BEC = 0.867

Weight: <None>
Min Conc: <None>

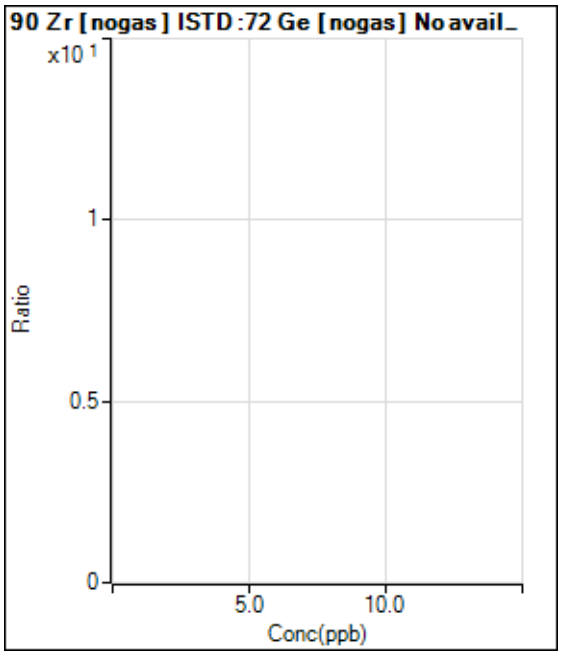


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1203.39	0.0003	P	12.
2	☐	2.000	1.967	59542.57	0.0166	P	3.6
3	☐	5.000	4.960	147098.93	0.0414	P	7.5
4	☐	10.000	9.678	289603.17	0.0805	P	3.4
5	☐	100.000	101.327	2905616.62	0.8401	A	1.0
6	☐	200.000	199.354	6055608.04	1.6525	A	0.5
7	☐	1.000					

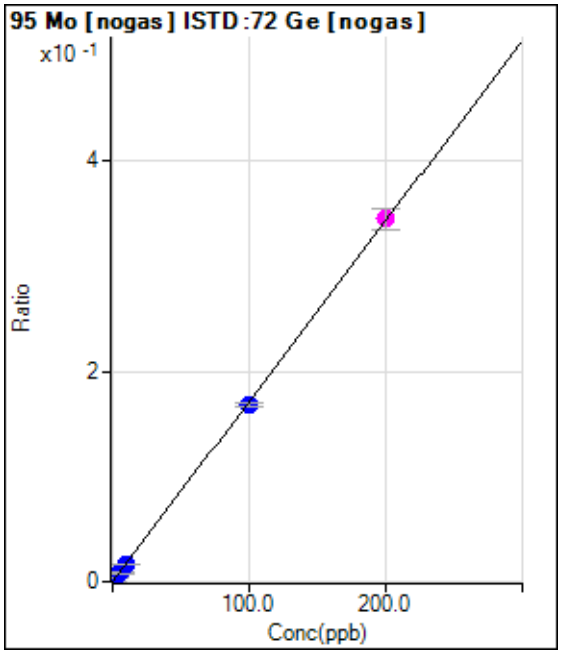
y = 0.0083 * x + 3.3852E-004
R = 1.0000
DL = 0.0149
BEC = 0.04085

Weight: <None>
Min Conc: <None>

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

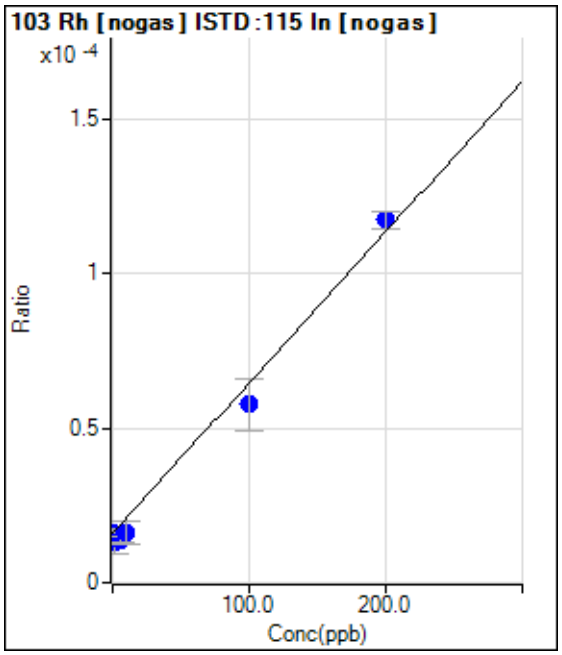


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	366.68	0.0001	P	11.
2	☐	2.000	1.897	12030.90	0.0034	P	1.0
3	☐	5.000	4.829	29718.45	0.0084	P	12.
4	☐	10.000	9.496	58958.25	0.0164	P	1.4
5	☐	100.000	97.915	581340.93	0.1681	P	2.3
6	☐	200.000	201.073	1263968.29	0.3452	M	5.6
7	☐	1.000					

y = 0.0017 * x + 1.0310E-004
R = 0.9999
DL = 0.02143
BEC = 0.06007

Weight: <None>
Min Conc: <None>

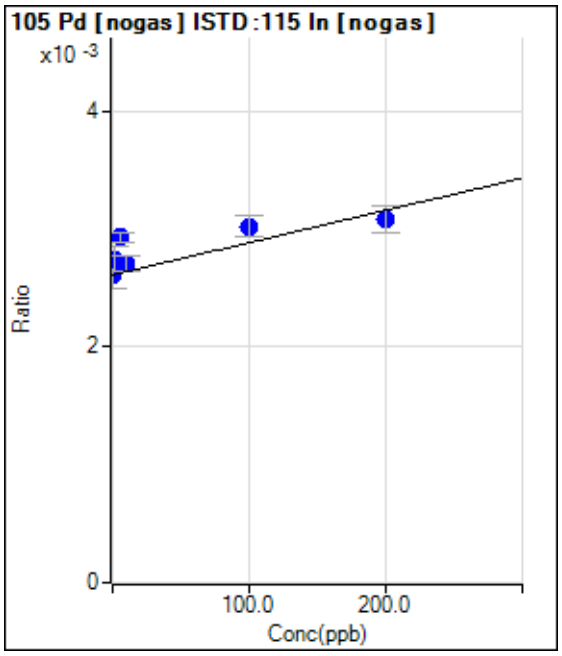
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	18.
2	☐	2.000	-6.375	40.00	0.0000	P	53.
3	☐	5.000	-4.110	43.33	0.0000	P	16.
4	☐	10.000	0.625	50.00	0.0000	P	44.
5	☐	100.000	85.526	166.67	0.0001	P	29.
6	☐	200.000	208.017	370.01	0.0001	P	4.8
7	☐	1.000					

y = 4.8684E-007 * x + 1.5924E-005
R = 0.9968
DL = 18.05
BEC = 32.71

Weight: <None>
Min Conc: <None>

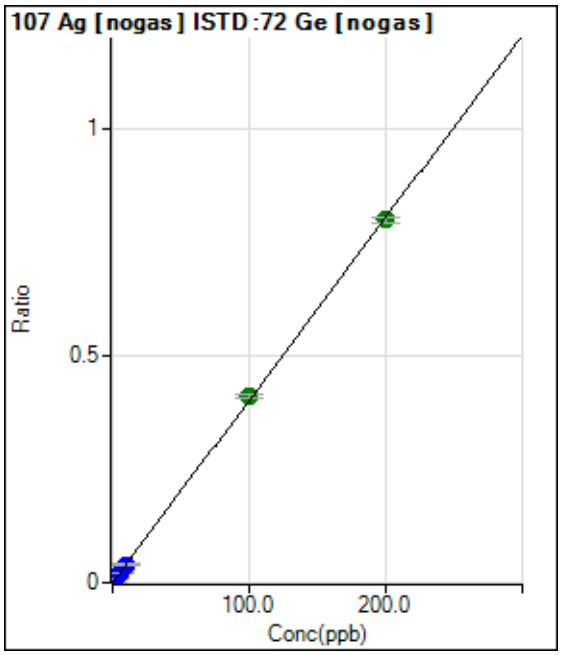


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8185.39	0.0026	P	8.5
2	☐	2.000	49.327	8632.26	0.0027	P	7.7
3	☐	5.000	115.584	9175.86	0.0029	P	2.6
4	☐	10.000	34.068	8422.14	0.0027	P	4.8
5	☐	100.000	150.972	8842.37	0.0030	P	6.4
6	☐	200.000	170.073	9722.85	0.0031	P	7.3
7	☐	1.000					

y = 2.7432E-006 * x + 0.0026
R = 0.8071
DL = 244
BEC = 952.3

Weight: <None>
Min Conc: <None>

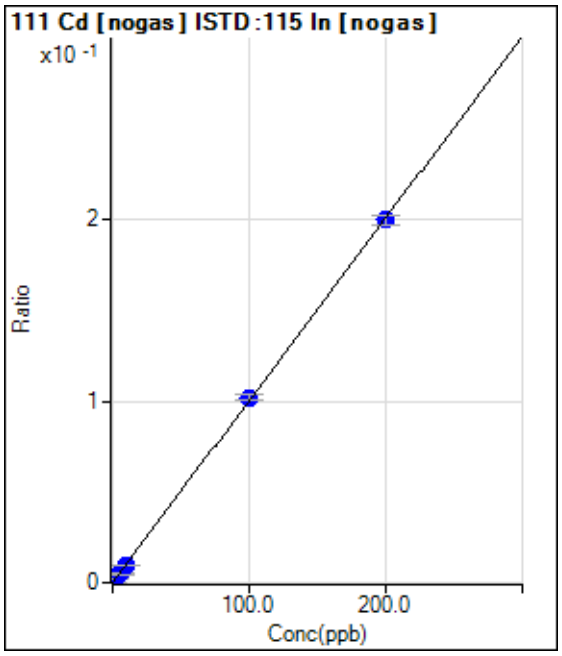
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	106.67	0.0000	P	26.
2	☐	2.000	1.969	28470.00	0.0080	P	4.9
3	☐	5.000	5.007	71682.94	0.0202	P	7.7
4	☐	10.000	9.955	144161.09	0.0401	P	3.6
5	☐	100.000	102.200	1423334.30	0.4116	A	2.3
6	☐	200.000	198.903	2935946.62	0.8011	A	1.7
7	☐	1.000					

y = 0.0040 * x + 3.0181E-005
R = 0.9999
DL = 0.005888
BEC = 0.007494

Weight: <None>
Min Conc: <None>

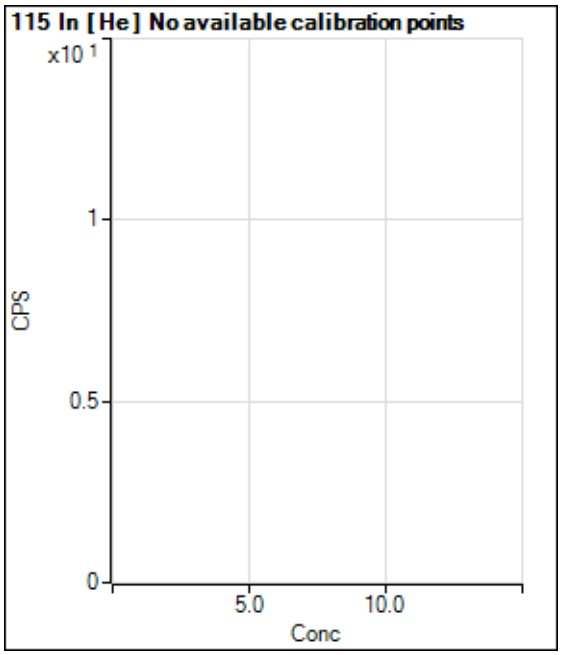


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30.00	0.0000	P	34.
2	☐	2.000	1.955	6194.56	0.0020	P	5.4
3	☐	5.000	4.899	15313.56	0.0049	P	12.
4	☐	10.000	9.562	29909.14	0.0096	P	0.8
5	☐	100.000	101.672	298090.90	0.1020	P	3.6
6	☐	200.000	199.189	630632.96	0.1998	P	2.9
7	☐	1.000					

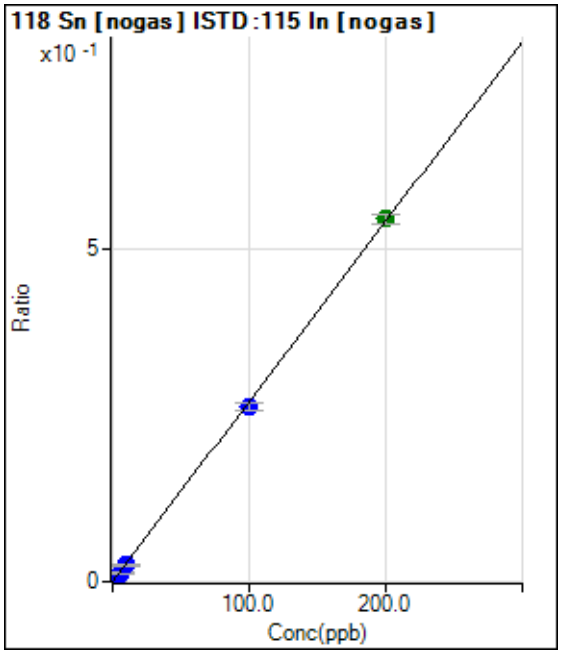
y = 0.0010 * x + 9.5819E-006
R = 0.9999
DL = 0.009776
BEC = 0.009553

Weight: <None>
Min Conc: <None>

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			971469.59		P	0.4
2	☐			996597.28		P	1.5
3	☐			978413.97		P	1.3
4	☐			968391.47		P	1.3
5	☐			972463.34		P	1.3
6	☐			957539.97		P	1.9
7	☐						

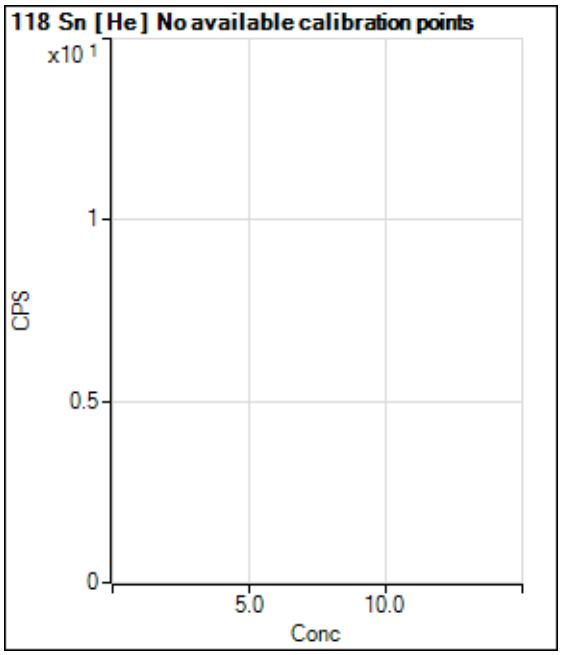


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1396.74	0.0004	P	4.8
2	☐	2.000	1.789	16651.44	0.0053	P	2.9
3	☐	5.000	4.591	40106.35	0.0129	P	10.
4	☐	10.000	9.120	78295.66	0.0252	P	4.4
5	☐	100.000	96.994	769397.70	0.2633	P	4.3
6	☐	200.000	201.559	1726992.22	0.5467	A	2.7
7	☐	1.000					

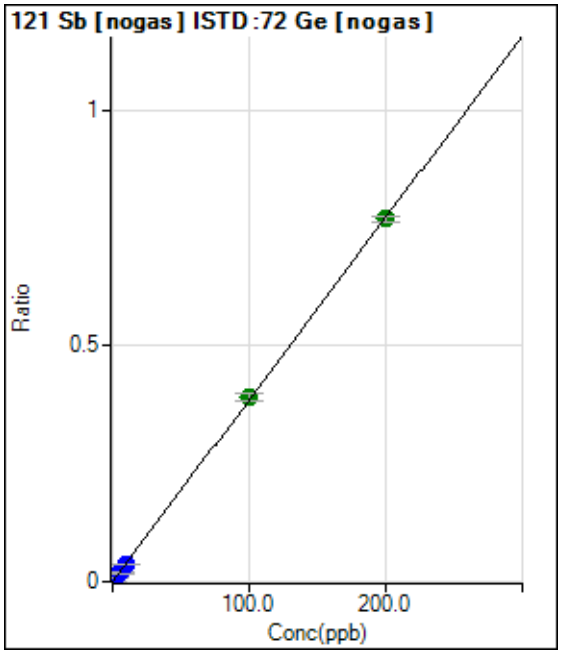
y = 0.0027 * x + 4.4587E-004
R = 0.9998
DL = 0.02353
BEC = 0.1645

Weight: <None>
Min Conc: <None>

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			463.35		P	21.
2	☐			6037.80		P	1.6
3	☐			15483.77		P	3.0
4	☐			29081.10		P	2.2
5	☐			294483.25		P	1.4
6	☐			595594.91		P	0.5
7	☐						

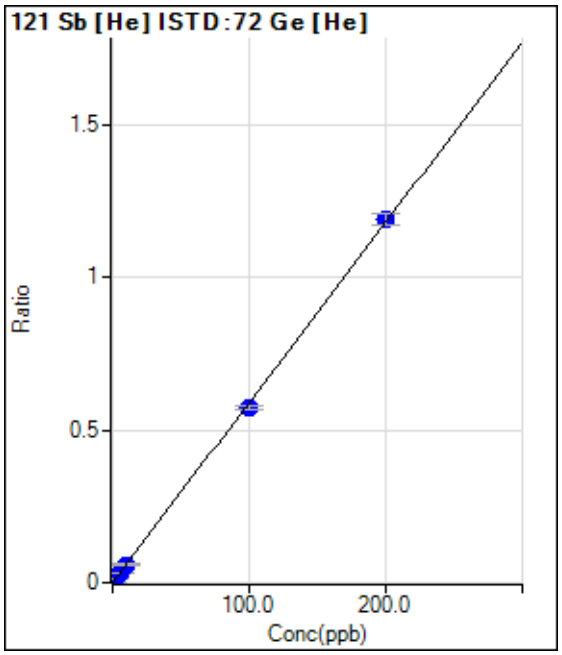


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	286.68	0.0001	P	4.7
2	☐	2.000	2.018	28126.33	0.0079	P	3.5
3	☐	5.000	4.909	67460.12	0.0190	P	7.6
4	☐	10.000	9.774	135630.07	0.0378	P	4.7
5	☐	100.000	101.191	1348371.80	0.3901	A	4.0
6	☐	200.000	199.418	2816753.71	0.7687	A	1.5
7	☐	1.000					

y = 0.0039 * x + 8.0707E-005
R = 1.0000
DL = 0.002945
BEC = 0.02094

Weight: <None>
Min Conc: <None>

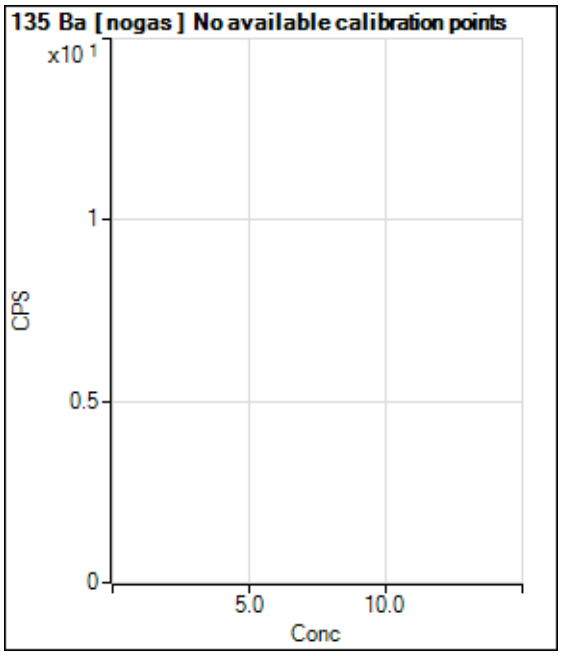
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	96.67	0.0001	P	47.
2	☐	2.000	1.920	9612.77	0.0114	P	0.6
3	☐	5.000	4.924	24190.25	0.0292	P	1.4
4	☐	10.000	10.064	49185.62	0.0595	P	3.5
5	☐	100.000	96.999	479992.53	0.5728	P	2.3
6	☐	200.000	201.500	974034.72	1.1898	P	3.0
7	☐	1.000					

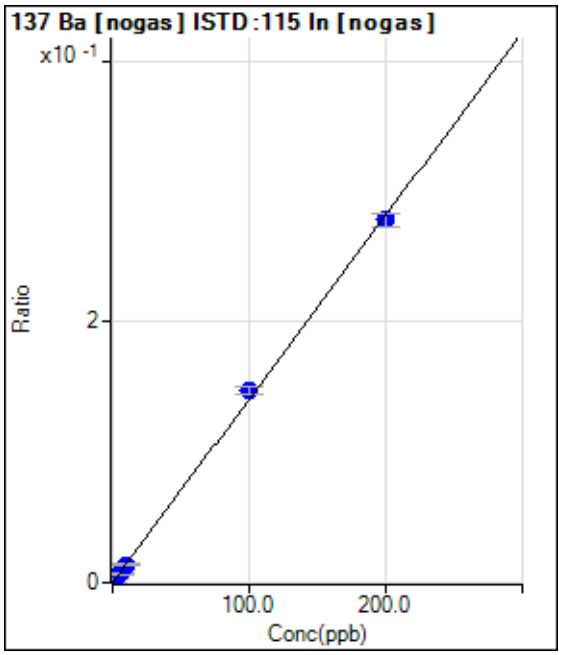
y = 0.0059 * x + 1.1517E-004
R = 0.9998
DL = 0.02749
BEC = 0.01951

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			133.33		P	11.
2	☐			5024.13		P	6.5
3	☐			12828.29		P	4.7
4	☐			24280.82		P	4.1
5	☐			249783.18		P	1.8
6	☐			511235.85		P	0.8
7	☐						

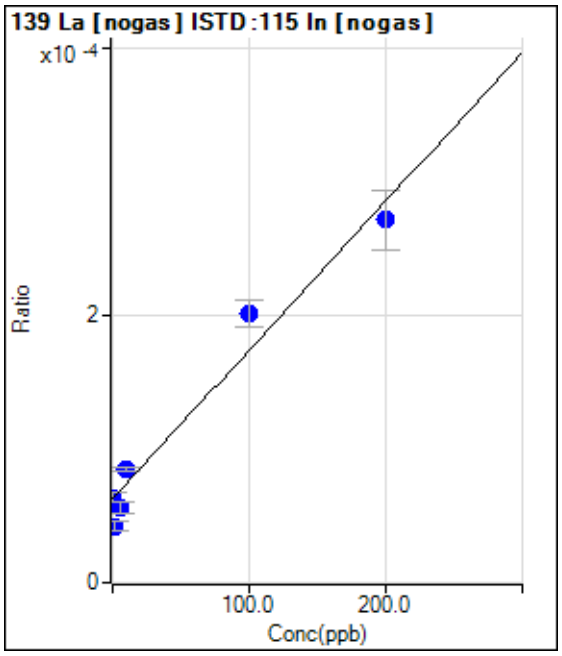
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	200.00	0.0001	P	31.
2	☐	2.000	1.970	8915.78	0.0028	P	3.0
3	☐	5.000	4.773	21053.14	0.0068	P	12.
4	☐	10.000	9.866	43341.16	0.0139	P	6.2
5	☐	100.000	104.606	429972.42	0.1471	P	4.0
6	☐	200.000	197.710	877489.42	0.2780	P	3.8
7	☐	1.000					

y = 0.0014 * x + 6.3940E-005
R = 0.9996
DL = 0.04272
BEC = 0.04548

Weight: <None>
Min Conc: <None>

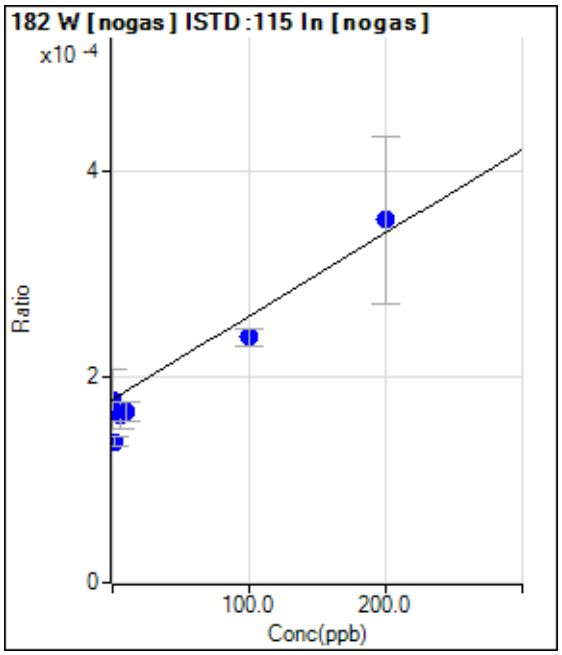


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	196.67	0.0001	P	13.
2	☐	2.000	-18.561	133.33	0.0000	P	18.
3	☐	5.000	-6.340	173.33	0.0001	P	15.
4	☐	10.000	19.422	263.34	0.0001	P	3.0
5	☐	100.000	125.119	590.02	0.0002	P	10.
6	☐	200.000	187.458	856.70	0.0003	P	16.
7	☐	1.000					

y = 1.1149E-006 * x + 6.2864E-005
R = 0.9802
DL = 22.99
BEC = 56.39

Weight: <None>
Min Conc: <None>

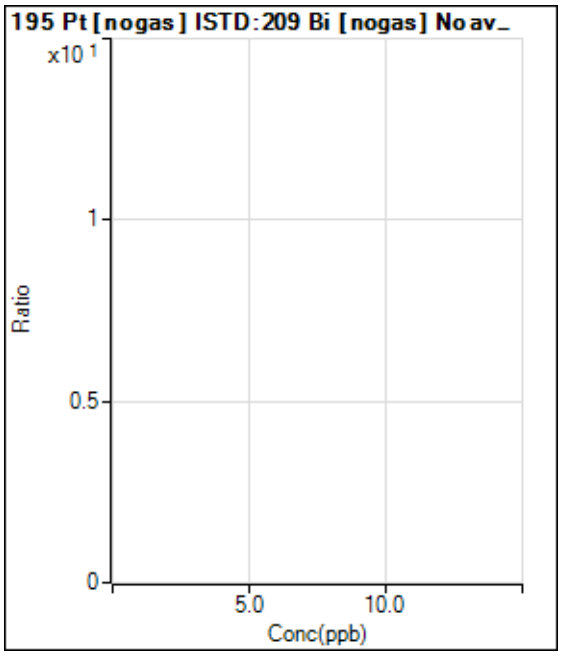
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	560.06	0.0002	P	32.
2	☐	2.000	-50.727	433.34	0.0001	P	7.4
3	☐	5.000	-19.118	516.68	0.0002	P	16.
4	☐	10.000	-15.695	516.68	0.0002	P	11.
5	☐	100.000	74.191	696.69	0.0002	P	7.6
6	☐	200.000	215.320	1123.86	0.0004	P	46.
7	☐	1.000					

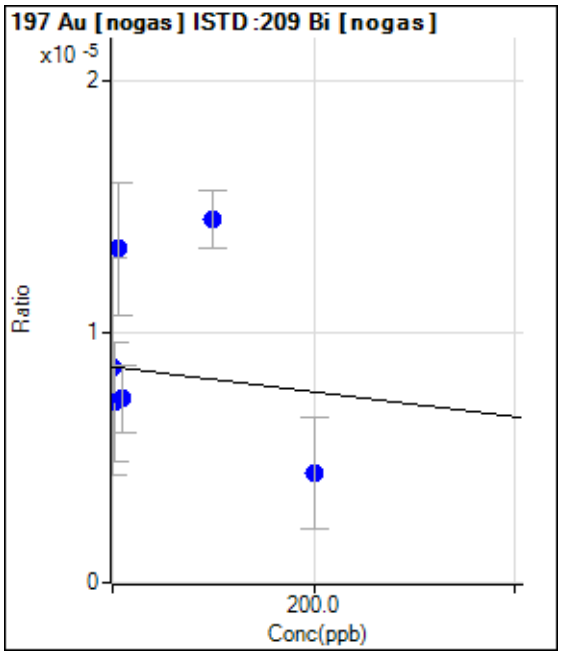
y = 8.1069E-007 * x + 1.7857E-004
R = 0.9819
DL = 216.1
BEC = 220.3

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

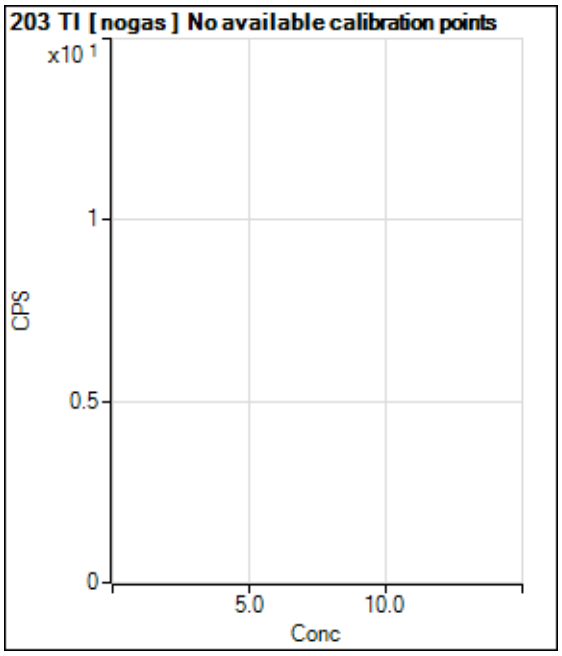
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	100
2	☐	2.000	286.194	16.67	0.0000	P	66.
3	☐	5.000	-948.969	30.00	0.0000	P	39.
4	☐	10.000	257.538	16.67	0.0000	P	36.
5	☐	100.000	-1176.891	33.33	0.0000	P	16.
6	☐	200.000	847.076	10.00	0.0000	P	101
7	☐	1.000					

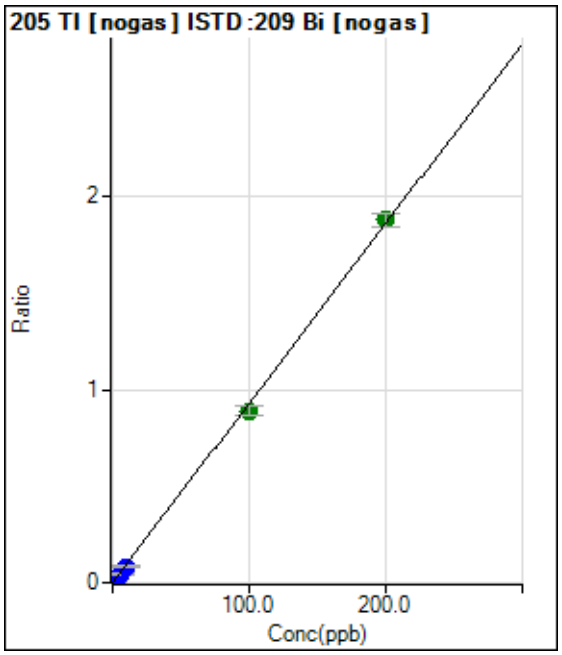
y = -4.9793E-009 * x + 8.6093E-006
R = -0.2783
DL = -5221
BEC = -1729

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			213.34		P	29.
2	☐			16331.70		P	5.6
3	☐			40684.41		P	5.7
4	☐			80267.70		P	0.2
5	☐			819156.65		P	1.2
6	☐			1844820.39		A	2.8
7	☐						

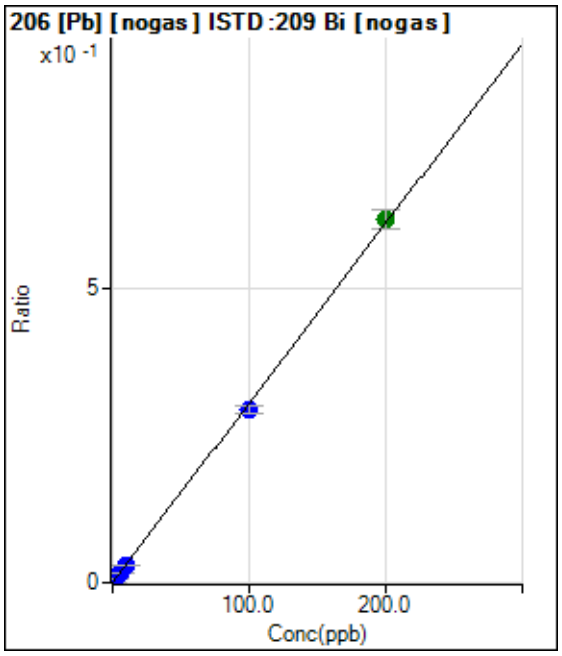
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	380.01	0.0002	P	38.
2	☐	2.000	1.830	39274.31	0.0172	P	7.1
3	☐	5.000	4.641	98185.70	0.0433	P	12.
4	☐	10.000	9.085	193554.71	0.0846	P	6.1
5	☐	100.000	95.704	2045124.29	0.8893	A	5.5
6	☐	200.000	202.204	4279644.73	1.8787	A	3.5
7	☐	1.000					

y = 0.0093 * x + 1.6261E-004
R = 0.9997
DL = 0.02021
BEC = 0.0175

Weight: <None>
Min Conc: <None>

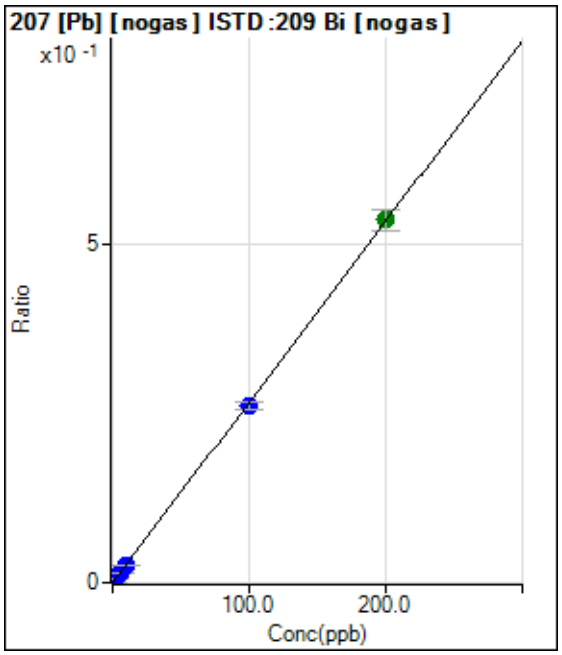


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	336.68	0.0001	P	3.5
2	☐	2.000	1.988	14209.77	0.0062	P	6.1
3	☐	5.000	5.119	35776.53	0.0158	P	10.
4	☐	10.000	9.725	68239.95	0.0298	P	5.3
5	☐	100.000	95.882	672926.50	0.2926	P	4.4
6	☐	200.000	202.070	1403975.03	0.6165	A	5.2
7	☐	1.000					

y = 0.0031 * x + 1.4405E-004
R = 0.9997
DL = 0.004993
BEC = 0.04723

Weight: <None>
Min Conc: <None>

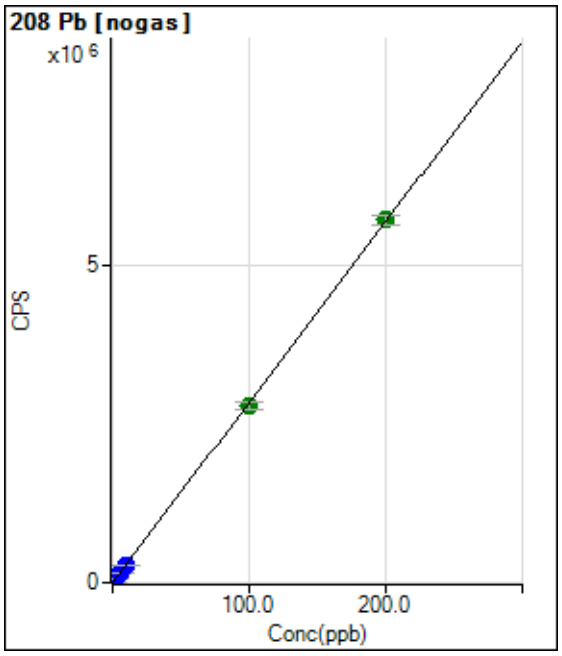
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	266.67	0.0001	P	12.
2	☐	2.000	1.941	12074.65	0.0053	P	5.6
3	☐	5.000	5.059	30829.73	0.0136	P	8.9
4	☐	10.000	9.759	59689.44	0.0261	P	3.6
5	☐	100.000	98.015	599558.95	0.2607	P	3.9
6	☐	200.000	201.004	1218131.49	0.5345	A	5.5
7	☐	1.000					

y = 0.0027 * x + 1.1419E-004
R = 0.9999
DL = 0.01632
BEC = 0.04295

Weight: <None>
Min Conc: <None>

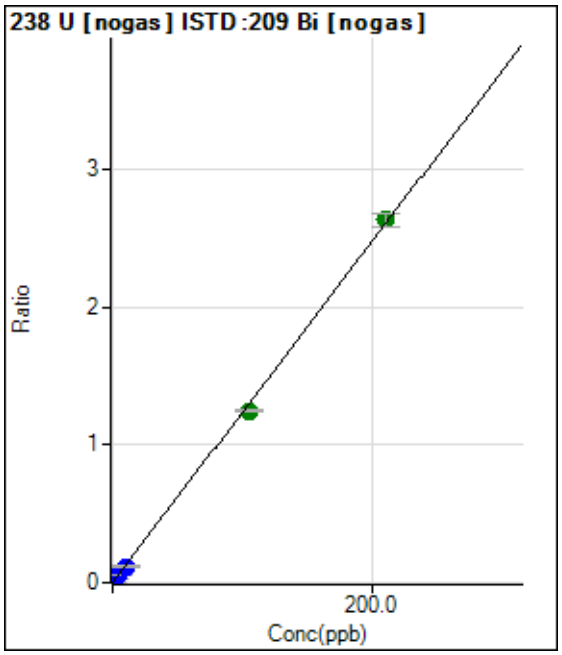


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1156.70		P	4.9
2	☐	2.000	1.929	55911.63		P	1.7
3	☐	5.000	4.909	140517.76		P	2.2
4	☐	10.000	9.642	274873.43		P	0.8
5	☐	100.000	97.879	2779809.90		A	3.6
6	☐	200.000	201.081	5709558.25		A	2.6
7	☐	1.000					

y = 28388.5398 * x + 1156.7000
R = 0.9999
DL = 0.006009
BEC = 0.04075

Weight: <None>
Min Conc: <None>

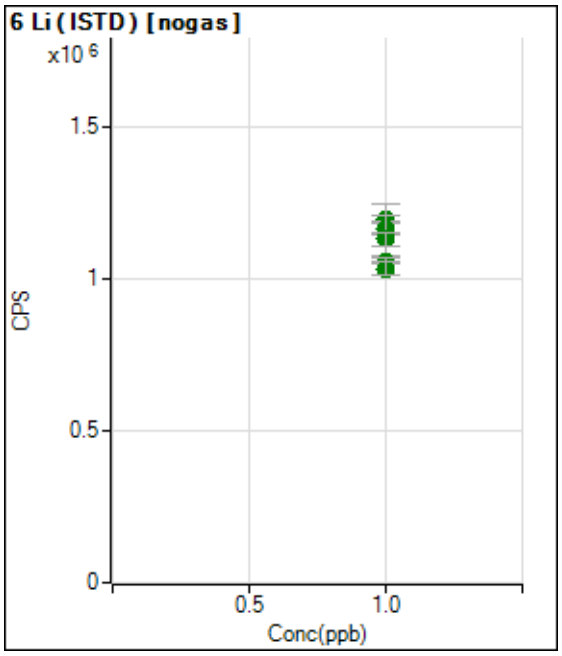
Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.33	0.0000	P	33.
2	☐	2.000	1.908	54252.90	0.0237	P	4.5
3	☐	5.000	4.681	131925.35	0.0581	P	10.
4	☐	10.000	9.479	269102.50	0.1175	P	4.8
5	☐	105.000	100.536	2866775.68	1.2461	A	1.4
6	☐	210.000	212.265	5994404.08	2.6309	A	3.4
7	☐	1.000					

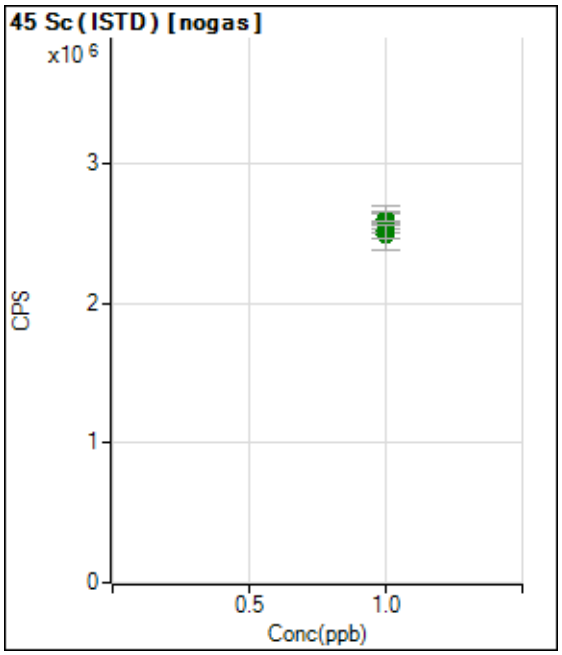
y = 0.0124 * x + 4.8561E-005
R = 0.9997
DL = 0.003965
BEC = 0.003918

Weight: <None>
Min Conc: <None>

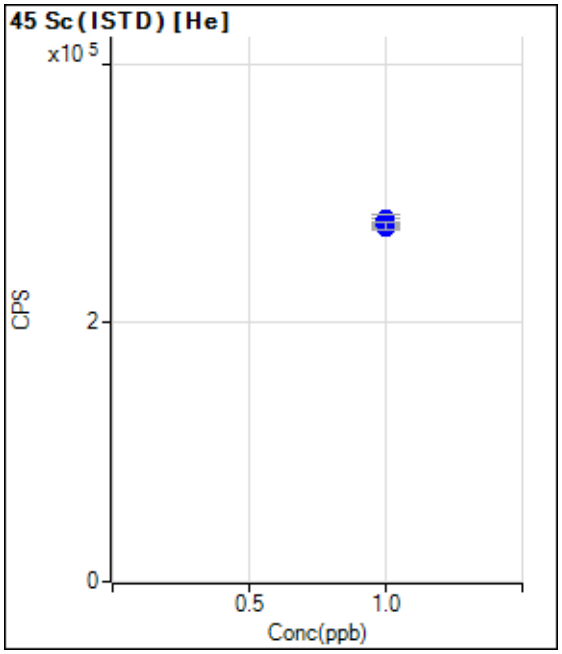


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1195275.88		A	2.0
2	☐	1.000		1168683.46		A	3.7
3	☐	1.000		1163476.39		A	14.
4	☐	1.000		1132234.16		A	3.7
5	☐	1.000		1060926.36		A	1.5
6	☐	1.000		1034178.70		A	4.0
7	☐	1.000					

Calibration for 237_ICV.d

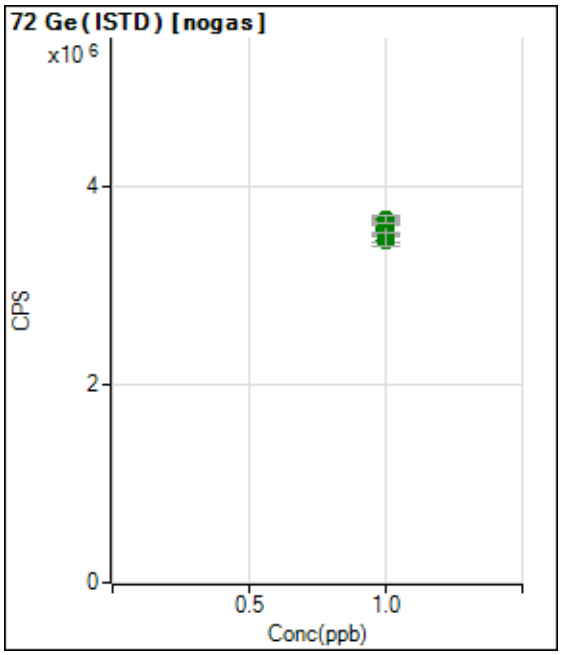


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2566071.68		A	0.7
2	☐	1.000		2589550.74		A	4.1
3	☐	1.000		2599959.86		A	7.4
4	☐	1.000		2596425.69		A	4.8
5	☐	1.000		2492914.81		A	8.3
6	☐	1.000		2517040.22		A	3.7
7	☐	1.000					

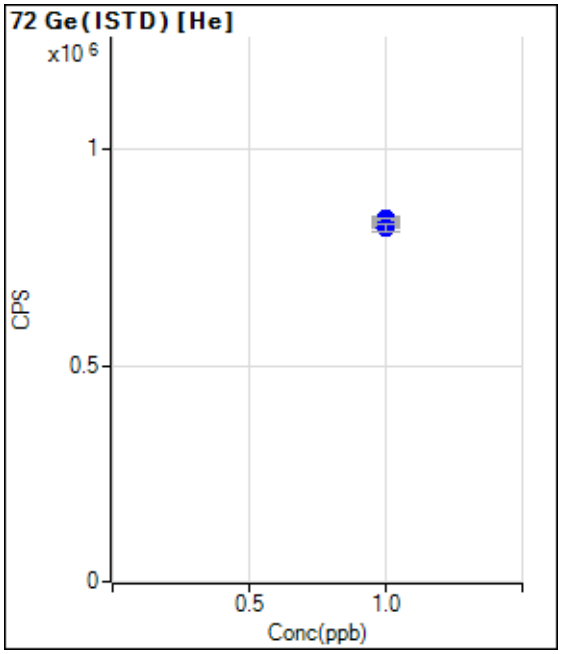


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		279368.62		P	1.3
2	☐	1.000		280028.35		P	2.6
3	☐	1.000		275242.97		P	1.8
4	☐	1.000		272484.55		P	0.7
5	☐	1.000		276038.34		P	1.1
6	☐	1.000		274476.28		P	2.6
7	☐	1.000					

Calibration for 237_ICV.d

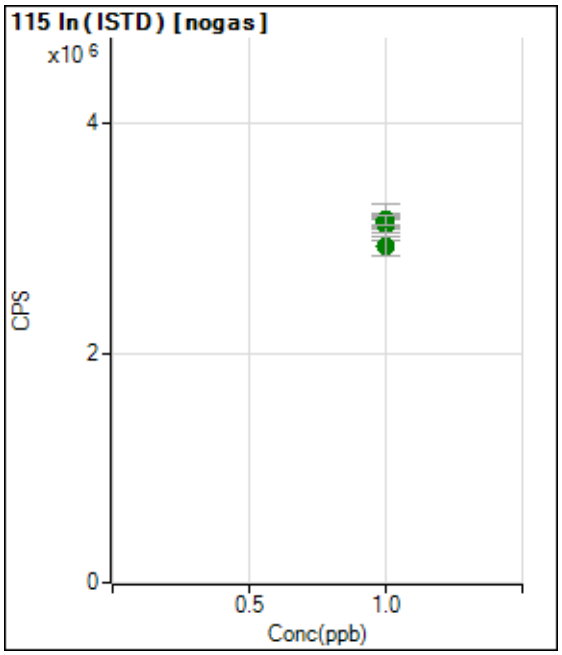


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3552236.82		A	2.9
2	☐	1.000		3581534.84		A	4.0
3	☐	1.000		3561727.86		A	6.9
4	☐	1.000		3596075.88		A	3.7
5	☐	1.000		3459543.90		A	4.0
6	☐	1.000		3664189.63		A	2.2
7	☐	1.000					

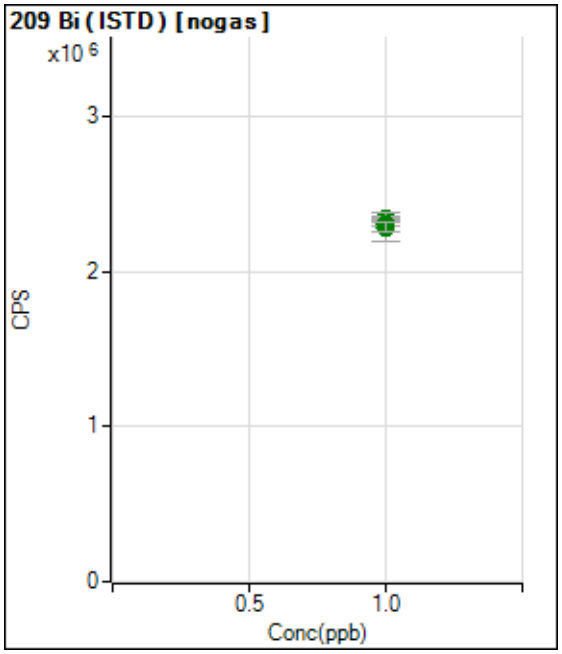


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		837497.54		P	1.0
2	☐	1.000		839654.65		P	0.9
3	☐	1.000		828863.79		P	1.3
4	☐	1.000		826445.74		P	1.7
5	☐	1.000		838051.13		P	0.7
6	☐	1.000		818977.98		P	2.3
7	☐	1.000					

Calibration for 237_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3134247.07		A	2.1
2	☐	1.000		3148097.36		A	4.4
3	☐	1.000		3134209.51		A	10.
4	☐	1.000		3115479.65		A	4.6
5	☐	1.000		2926930.47		A	5.9
6	☐	1.000		3158107.90		A	2.9
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2336630.64		A	1.1
2	☐	1.000		2292528.61		A	3.8
3	☐	1.000		2284348.25		A	8.3
4	☐	1.000		2292360.33		A	3.7
5	☐	1.000		2300731.79		A	1.3
6	☐	1.000		2279274.91		A	2.7
7	☐	1.000					

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	013CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:33:27-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	57	35.96
Na	23	1	nogas	417457	0.00
Mg	24	1	nogas	5902	0.09
Al	27	1	nogas	27888	0.01
K	39	1	nogas	7950834	0.00
Ti	47	1	nogas	293	1.78
V	51	1	nogas	2231667	0.00
Cr	52	1	nogas	123314	0.00
Mn	55	1	nogas	30719	0.00
Co	59	1	nogas	1063	0.97
Ni	60	1	nogas	450	1.31
Cu	63	1	nogas	2390	0.17
Zn	66	1	nogas	417	4.36
As	75	1	nogas	242661	0.00
Sr	88	1	nogas	810	0.40
Ag	107	1	nogas	313	6.14
Cd	111	1	nogas	17	207.85
Sb	121	1	nogas	220	2.07
Tl	205	1	nogas	950	2.93
Pb	208	1	nogas	5600	0.06
[Pb]	206	1	nogas	1443	0.32
[Pb]	207	1	nogas	1287	0.69
Na	23	2	He	54679	0.00
Mg	24	2	He	453	3.93
Al	27	2	He	643	1.33
K	39	2	He	191803	0.00
Ca	43	2	He	37	42.94
Ca	44	2	He	3250	0.24
V	51	2	He	27334	0.00
Cr	52	2	He	5294	0.09
Mn	55	2	He	2524	0.34
Fe	56	2	He	12284	0.04
Co	59	2	He	397	2.94
Ni	60	2	He	133	18.08
Cu	63	2	He	933	0.29
Zn	66	2	He	150	4.44
As	75	2	He	812	0.76
Se	78	2	He	142	6.50
B	11	1	nogas	30501	0.00
Si	28	1	nogas	1941965	0.00
Ca	43	1	nogas	1387	0.17
Ca	44	1	nogas	427470	0.00

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	3039832	0.00
Se	77	1	nogas	77722	0.00
Se	82	1	nogas	240	13.78
Mo	95	1	nogas	2347	0.31
Sn	118	1	nogas	900	2.16
Ba	137	1	nogas	50	120.00
Sb	121	2	He	93	35.07
Li	7	1	nogas	111278	0.00
P	31	1	nogas	81130	0.00
La	139	1	nogas	47	70.14

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	6	1	nogas	1359891	4.87
Ge	72	1	nogas	3145209	1.18
In	115	1	nogas	2761164	3.66
Bi	209	1	nogas	2190177	1.88
Ge	72	2	He	785020	1.85

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	014CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:35:28-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	15760	0.02
Na	23	1	nogas	5379648	0.00
Mg	24	1	nogas	3271575	0.00
Al	27	1	nogas	67748	0.01
K	39	1	nogas	11954392	0.00
Ti	47	1	nogas	3840	0.11
V	51	1	nogas	2409766	0.00
Cr	52	1	nogas	169204	0.00
Mn	55	1	nogas	78209	0.00
Co	59	1	nogas	46295	0.00
Ni	60	1	nogas	10797	0.03
Cu	63	1	nogas	25732	0.01
Zn	66	1	nogas	8425	0.04
As	75	1	nogas	271445	0.00
Sr	88	1	nogas	53470	0.01
Ag	107	1	nogas	27058	0.01
Cd	111	1	nogas	5661	0.11
Sb	121	1	nogas	23726	0.01
Tl	205	1	nogas	36979	0.01
Pb	208	1	nogas	55658	0.00
[Pb]	206	1	nogas	13960	0.01
[Pb]	207	1	nogas	12171	0.02
Na	23	2	He	360618	0.00
Mg	24	2	He	169302	0.00
Al	27	2	He	1767	0.53
K	39	2	He	370065	0.00
Ca	43	2	He	510	3.15
Ca	44	2	He	11457	0.02
V	51	2	He	40946	0.00
Cr	52	2	He	17759	0.00
Mn	55	2	He	10697	0.04
Fe	56	2	He	1104283	0.00
Co	59	2	He	17575	0.03
Ni	60	2	He	4481	0.17
Cu	63	2	He	11984	0.03
Zn	66	2	He	2677	0.17
As	75	2	He	3525	0.14
Se	78	2	He	340	3.06
B	11	1	nogas	75501	0.00
Si	28	1	nogas	2979670	0.00

Calibration Standard Report

Ca	43	1	nogas	8302	0.07
Ca	44	1	nogas	521914	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	7507901	0.00
Se	77	1	nogas	84207	0.00
Se	82	1	nogas	690	3.18
Mo	95	1	nogas	12691	0.01
Sn	118	1	nogas	14713	0.03
Ba	137	1	nogas	7428	0.01
Sb	121	2	He	8886	0.03
P	31	1	nogas	82335	0.00
La	139	1	nogas	37	154.83

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1344971	6.02	1359891	98.90	70	125	
Ge	72	1	nogas	3213341	0.87	3145209	102.17	70	125	
In	115	1	nogas	2864141	4.82	2761164	103.73	70	125	
Bi	209	1	nogas	2096933	1.01	2190177	95.74	70	125	
Ge	72	2	He	800122	1.86	785020	101.92	70	125	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	015CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:37:27-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	38125	0.01
Na	23	1	nogas	12786651	0.00
Mg	24	1	nogas	7926348	0.00
Al	27	1	nogas	146244	0.00
K	39	1	nogas	17719817	0.00
Ti	47	1	nogas	8542	0.04
V	51	1	nogas	2567511	0.00
Cr	52	1	nogas	240004	0.00
Mn	55	1	nogas	162684	0.00
Co	59	1	nogas	112057	0.00
Ni	60	1	nogas	26109	0.01
Cu	63	1	nogas	62089	0.00
Zn	66	1	nogas	21159	0.02
As	75	1	nogas	297594	0.00
Sr	88	1	nogas	129199	0.00
Ag	107	1	nogas	64140	0.00
Cd	111	1	nogas	13619	0.02
Sb	121	1	nogas	59291	0.00
Tl	205	1	nogas	90890	0.00
Pb	208	1	nogas	128327	0.00
[Pb]	206	1	nogas	31471	0.01
[Pb]	207	1	nogas	28181	0.00
Na	23	2	He	816356	0.00
Mg	24	2	He	421391	0.00
Al	27	2	He	3350	0.27
K	39	2	He	627525	0.00
Ca	43	2	He	1203	1.16
Ca	44	2	He	24113	0.02
V	51	2	He	58867	0.00
Cr	52	2	He	37014	0.01
Mn	55	2	He	25187	0.01
Fe	56	2	He	2763312	0.00
Co	59	2	He	43214	0.00
Ni	60	2	He	10997	0.05
Cu	63	2	He	28603	0.01
Zn	66	2	He	6991	0.02
As	75	2	He	7310	0.02
Se	78	2	He	623	1.62
B	11	1	nogas	141991	0.00
Si	28	1	nogas	4555457	0.00

Calibration Standard Report

Ca	43	1	nogas	18640	0.01
Ca	44	1	nogas	681187	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	14164128	0.00
Se	77	1	nogas	88340	0.00
Se	82	1	nogas	1353	0.55
Mo	95	1	nogas	28617	0.01
Sn	118	1	nogas	35383	0.01
Ba	137	1	nogas	19078	0.02
Sb	121	2	He	22201	0.00
P	31	1	nogas	122879	0.00
La	139	1	nogas	133	22.73

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1379508	5.03	1359891	101.44	70	125	
Ge	72	1	nogas	3154458	0.48	3145209	100.29	70	125	
In	115	1	nogas	2819103	1.99	2761164	102.10	70	125	
Bi	209	1	nogas	2078205	4.29	2190177	94.89	70	125	
Ge	72	2	He	770398	2.31	785020	98.14	70	125	

Calibration Standard Report

Sample Table

Sample Name	10/50/1000
Data File Name	016CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:39:27-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	76314	0.00
Na	23	1	nogas	24675953	0.00
Mg	24	1	nogas	15657513	0.00
Al	27	1	nogas	238008	0.00
K	39	1	nogas	27236219	0.00
Ti	47	1	nogas	17422	0.01
V	51	1	nogas	2722696	0.00
Cr	52	1	nogas	345311	0.00
Mn	55	1	nogas	291039	0.00
Co	59	1	nogas	219440	0.00
Ni	60	1	nogas	50316	0.01
Cu	63	1	nogas	119632	0.00
Zn	66	1	nogas	39713	0.00
As	75	1	nogas	326589	0.00
Sr	88	1	nogas	253599	0.00
Ag	107	1	nogas	127993	0.00
Cd	111	1	nogas	27168	0.01
Sb	121	1	nogas	119295	0.00
Tl	205	1	nogas	177387	0.00
Pb	208	1	nogas	248511	0.00
[Pb]	206	1	nogas	61835	0.00
[Pb]	207	1	nogas	54920	0.01
Na	23	2	He	1592790	0.00
Mg	24	2	He	816216	0.00
Al	27	2	He	5758	0.13
K	39	2	He	1058041	0.00
Ca	43	2	He	2364	0.15
Ca	44	2	He	42709	0.01
V	51	2	He	86589	0.00
Cr	52	2	He	67102	0.00
Mn	55	2	He	48354	0.00
Fe	56	2	He	5485165	0.00
Co	59	2	He	84932	0.00
Ni	60	2	He	21439	0.01
Cu	63	2	He	53572	0.00
Zn	66	2	He	13001	0.03
As	75	2	He	13302	0.02
Se	78	2	He	1120	0.12
B	11	1	nogas	259170	0.00
Si	28	1	nogas	7109444	0.00

Calibration Standard Report

Ca	43	1	nogas	35377	0.01
Ca	44	1	nogas	938665	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	24575026	0.00
Se	77	1	nogas	92788	0.00
Se	82	1	nogas	2757	0.05
Mo	95	1	nogas	54099	0.01
Sn	118	1	nogas	70961	0.00
Ba	137	1	nogas	37117	0.01
Sb	121	2	He	44554	0.01
P	31	1	nogas	166448	0.00
La	139	1	nogas	120	13.89

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1345500	2.35	1359891	98.94	70	125	
Ge	72	1	nogas	3156957	1.79	3145209	100.37	70	125	
In	115	1	nogas	2761827	3.07	2761164	100.02	70	125	
Bi	209	1	nogas	2075764	0.81	2190177	94.78	70	125	
Ge	72	2	He	771369	2.21	785020	98.26	70	125	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	017CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:41:25-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	796336	0.00
Na	23	1	nogas	242452630	0.00
Mg	24	1	nogas	154983028	0.00
Al	27	1	nogas	1956520	0.00
K	39	1	nogas	197795388	0.00
Ti	47	1	nogas	169281	0.00
V	51	1	nogas	4705399	0.00
Cr	52	1	nogas	2257468	0.00
Mn	55	1	nogas	2632426	0.00
Co	59	1	nogas	2207039	0.00
Ni	60	1	nogas	489051	0.00
Cu	63	1	nogas	1151187	0.00
Zn	66	1	nogas	379268	0.00
As	75	1	nogas	749783	0.00
Sr	88	1	nogas	2563409	0.00
Ag	107	1	nogas	1297880	0.00
Cd	111	1	nogas	273999	0.00
Sb	121	1	nogas	1141842	0.00
Tl	205	1	nogas	1871199	0.00
Pb	208	1	nogas	2517964	0.00
[Pb]	206	1	nogas	612634	0.00
[Pb]	207	1	nogas	541908	0.00
Na	23	2	He	15131846	0.00
Mg	24	2	He	8087589	0.00
Al	27	2	He	48475	0.00
K	39	2	He	8772076	0.00
Ca	43	2	He	23949	0.02
Ca	44	2	He	395861	0.00
V	51	2	He	590836	0.00
Cr	52	2	He	626074	0.00
Mn	55	2	He	447094	0.00
Fe	56	2	He	53558118	0.00
Co	59	2	He	819858	0.00
Ni	60	2	He	208204	0.00
Cu	63	2	He	521095	0.00
Zn	66	2	He	127289	0.00
As	75	2	He	127952	0.00
Se	78	2	He	10318	0.02
B	11	1	nogas	2379058	0.00
Si	28	1	nogas	53576003	0.00

Calibration Standard Report

Ca	43	1	nogas	337419	0.00
Ca	44	1	nogas	5961691	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	220141372	0.00
Se	77	1	nogas	106429	0.00
Se	82	1	nogas	25131	0.00
Mo	95	1	nogas	526516	0.00
Sn	118	1	nogas	700596	0.00
Ba	137	1	nogas	377867	0.00
Sb	121	2	He	433079	0.00
P	31	1	nogas	861074	0.00
La	139	1	nogas	540	2.14

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1246084	3.43	1359891	91.63	70	125	
Ge	72	1	nogas	3121481	0.75	3145209	99.25	70	125	
In	115	1	nogas	2781244	1.71	2761164	100.73	70	125	
Bi	209	1	nogas	2060333	1.98	2190177	94.07	70	125	
Ge	72	2	He	750724	2.40	785020	95.63	70	125	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	018CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:43:24-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	1661599	0.00
Na	23	1	nogas	494803094	0.00
Mg	24	1	nogas	311533324	0.00
Al	27	1	nogas	3801722	0.00
K	39	1	nogas	388084200	0.00
Ti	47	1	nogas	339934	0.00
V	51	1	nogas	6578225	0.00
Cr	52	1	nogas	4253262	0.00
Mn	55	1	nogas	5075225	0.00
Co	59	1	nogas	4388040	0.00
Ni	60	1	nogas	969722	0.00
Cu	63	1	nogas	2346112	0.00
Zn	66	1	nogas	767982	0.00
As	75	1	nogas	1172252	0.00
Sr	88	1	nogas	5250985	0.00
Ag	107	1	nogas	2548997	0.00
Cd	111	1	nogas	551808	0.00
Sb	121	1	nogas	2449177	0.00
Tl	205	1	nogas	3729505	0.00
Pb	208	1	nogas	5176180	0.00
[Pb]	206	1	nogas	1276227	0.00
[Pb]	207	1	nogas	1103715	0.00
Na	23	2	He	29835738	0.00
Mg	24	2	He	16222332	0.00
Al	27	2	He	96019	0.00
K	39	2	He	17588618	0.00
Ca	43	2	He	47213	0.01
Ca	44	2	He	798401	0.00
V	51	2	He	1169325	0.00
Cr	52	2	He	1244110	0.00
Mn	55	2	He	883838	0.00
Fe	56	2	He	107380422	0.00
Co	59	2	He	1696001	0.00
Ni	60	2	He	415856	0.00
Cu	63	2	He	1063553	0.00
Zn	66	2	He	261125	0.00
As	75	2	He	257380	0.00
Se	78	2	He	20842	0.00
B	11	1	nogas	4863368	0.00
Si	28	1	nogas	107207228	0.00

Calibration Standard Report

Ca	43	1	nogas	694444	0.00
Ca	44	1	nogas	11581260	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	437250960	0.00
Se	77	1	nogas	110539	0.00
Se	82	1	nogas	51393	0.01
Mo	95	1	nogas	1060405	0.00
Sn	118	1	nogas	1444717	0.00
Ba	137	1	nogas	749344	0.00
Sb	121	2	He	895150	0.00
P	31	1	nogas	1677933	0.00
La	139	1	nogas	697	0.97

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1131774	0.15	1359891	83.23	70	125	
Ge	72	1	nogas	3050027	2.04	3145209	96.97	70	125	
In	115	1	nogas	2642790	2.60	2761164	95.71	70	125	
Bi	209	1	nogas	1989047	3.85	2190177	90.82	70	125	
Ge	72	2	He	742606	0.91	785020	94.60	70	125	

Sample Report

Sample Table

Sample Name	LLICV2
Data File Name	021SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:49:21-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.709	1.709	0.77	16974	0.01	2000	
Na	23	1	nogas	212.815	212.815	2.06	5737076	0.00	200000	
Mg	24	1	nogas	217.117	217.117	3.32	3435474	0.01	200000	
Al	27	1	nogas	2.163	2.163	4.03	70217	0.00	2000	
K	39	1	nogas	212.202	212.202	1.03	12132281	0.00	200000	
Ti	47	1	nogas	2.136	2.136	6.14	4027	0.05	2000	
V	51	1	nogas	-22.939	-22.939	-6.95	1702410	0.00	2000	
Cr	52	1	nogas	1.180	1.180	4.92	148996	0.00	2000	
Mn	55	1	nogas	1.900	1.900	3.88	80502	0.00	2000	
Co	59	1	nogas	2.113	2.113	2.34	48858	0.00	2000	
Ni	60	1	nogas	2.341	2.341	2.84	11570	0.02	2000	
Cu	63	1	nogas	2.050	2.050	5.25	27044	0.01	2000	
Zn	66	1	nogas	2.332	2.332	2.35	8435	0.03	2000	
As	75	1	nogas	-8.548	-8.548	-19.04	224000	0.00	2000	
Sr	88	1	nogas	2.044	2.044	2.28	55807	0.00	2000	
Ag	107	1	nogas	2.039	2.039	5.42	27171	0.01	2000	
Cd	111	1	nogas	1.991	1.991	1.97	5764	0.03	2000	
Sb	121	1	nogas	2.412	2.412	3.30	30236	0.01	2000	
Tl	205	1	nogas	2.311	2.311	5.73	46584	0.00	2000	
Pb	208	1	nogas	2.090	2.090	2.21	59317	0.00	2000	
U	238	1	nogas	2.108	2.108	2.47	55825	0.00	2000	
[Pb]	206	1	nogas	2.000	2.000	2.90	14784	0.01	2000	
[Pb]	207	1	nogas	1.990	1.990	2.18	12809	0.02	2000	
Na	23	2	He	203.646	203.646	2.15	364998	0.06	200000	
Mg	24	2	He	210.488	210.488	2.36	175457	0.12	200000	
Al	27	2	He	2.046	2.046	16.52	1713	0.12	2000	
K	39	2	He	201.924	201.924	0.63	366968	0.06	200000	
Ca	43	2	He	199.726	199.726	1.90	520	38.41	200000	
Ca	44	2	He	188.018	188.018	5.48	10807	1.74	200000	
V	51	2	He	0.962	0.962	5.49	31838	0.00	2000	
Cr	52	2	He	1.873	1.873	1.97	17058	0.01	2000	
Mn	55	2	He	1.886	1.886	1.80	10997	0.02	2000	
Fe	56	2	He	201.929	201.929	1.72	1123251	0.02	200000	
Co	59	2	He	1.980	1.980	4.47	17485	0.01	2000	
Ni	60	2	He	2.226	2.226	2.51	4621	0.05	2000	
Cu	63	2	He	2.495	2.495	0.24	12271	0.02	2000	
Zn	66	2	He	2.589	2.589	2.65	2944	0.09	2000	
As	75	2	He	2.038	2.038	1.69	3468	0.06	2000	
Se	78	2	He	2.568	2.568	11.00	343	0.75	2000	
B	11	1	nogas	17.275	17.275	9.31	130770	0.01	2000	
Si	28	1	nogas	87.540	87.540	2.96	2894276	0.00	2000	
Ca	43	1	nogas	195.960	195.960	6.85	8342	2.35	200000	
Ca	44	1	nogas	77.831	77.831	2.17	473544	0.02	200000	
Fe	56	1	nogas	179.878	179.878	5.86	7073659	0.00	200000	
Se	77	1	nogas	-45.564	-45.564	-21.51	68462	-0.07	2000	
Se	82	1	nogas	2.031	2.031	16.98	773	0.26	2000	

Sample Report

Mo	95	1	nogas	2.236	2.236	8.08	14519	0.02	2000	
Sn	118	1	nogas	2.173	2.173	4.14	17239	0.01	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	2.000	2.000	0.72	7909	0.03	2000	
Sb	121	2	He	2.461	2.461	3.19	11314	0.02	2000	
La	139	1	nogas	-5.469	-5.469	-76.91	27	-20.51	2000	
Au	197	1	nogas	-178.475	-178.475	-213.63	17	-1070.85	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1384555	2.53	1359891	101.81	70	125	
Ge	72	1	nogas	3155369	0.15	3145209	100.32	70	125	
In	115	1	nogas	2795560	2.50	2761164	101.25	70	125	
Bi	209	1	nogas	2118182	2.58	2190177	96.71	70	125	
Ge	72	2	He	763289	0.78	785020	97.23	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLICV5
Data File Name	022LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:51:21-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.174	5.114	39164	1.77	5	83.5	70	130	
Na	23	1	nogas	502.599	3.335	12874329	1.41	500	100.5	70	130	
Mg	24	1	nogas	515.793	5.643	8083463	2.35	500	103.2	70	130	
Al	27	1	nogas	5.858	0.840	142554	0.64	5	117.2	70	130	
K	39	1	nogas	486.190	1.901	17519631	1.39	500	97.2	70	130	
Ti	47	1	nogas	4.747	1.098	8602	1.54	5	94.9	70	130	
V	51	1	nogas	-10.788	-16.663	1989136	2.11	5	-215.8	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	4.480	1.108	219990	0.61	5	89.6	70	130	
Mn	55	1	nogas	5.069	0.947	163563	1.05	5	101.4	70	130	
Co	59	1	nogas	4.844	1.674	110777	2.13	5	96.9	70	130	
Ni	60	1	nogas	5.184	2.566	25828	3.06	5	103.7	70	130	
Cu	63	1	nogas	4.849	0.870	60778	0.97	5	97.0	70	130	
Zn	66	1	nogas	5.494	0.955	20952	1.45	5	109.9	70	130	
As	75	1	nogas	-0.852	-109.424	261150	2.05	5	-17.0	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	4.723	1.482	128075	1.93	5	94.5	70	130	
Ag	107	1	nogas	4.897	0.505	64906	0.69	5	97.9	70	130	
Cd	111	1	nogas	4.969	1.811	14096	4.13	5	99.4	70	130	
Sb	121	1	nogas	5.157	1.099	64489	1.36	5	103.1	70	130	
Tl	205	1	nogas	4.422	6.055	89677	4.69	5	88.4	70	130	
Pb	208	1	nogas	4.828	1.428	129689	1.37	5	96.6	70	130	
U	238	1	nogas	4.681	0.969	125966	0.61	5	93.6	70	130	
[Pb]	206	1	nogas	4.476	3.061	31892	1.50	5	89.5	70	130	
[Pb]	207	1	nogas	4.612	4.941	28515	3.35	5	92.2	70	130	
Na	23	2	He	500.362	1.325	813261	0.86	500	100.1	70	130	
Mg	24	2	He	510.748	3.130	421959	2.75	500	102.1	70	130	
Al	27	2	He	5.806	5.547	3527	4.54	5	116.1	70	130	
K	39	2	He	490.951	1.710	617693	1.18	500	98.2	70	130	
Ca	43	2	He	526.842	8.206	1303	7.68	500	105.4	70	130	
Ca	44	2	He	494.135	3.933	23088	3.07	500	98.8	70	130	
V	51	2	He	4.347	0.999	51267	0.45	5	86.9	70	130	
Cr	52	2	He	5.155	1.199	37638	0.96	5	103.1	70	130	
Mn	55	2	He	5.082	4.065	25281	3.51	5	101.6	70	130	
Fe	56	2	He	508.044	0.726	2787234	0.98	500	101.6	70	130	
Co	59	2	He	4.962	4.127	42924	3.81	5	99.2	70	130	
Ni	60	2	He	5.463	1.332	11444	1.58	5	109.3	70	130	
Cu	63	2	He	5.589	1.492	28886	1.86	5	111.8	70	130	
Zn	66	2	He	5.922	2.434	7342	2.95	5	118.4	70	130	
As	75	2	He	4.836	1.427	7090	0.90	5	96.7	70	130	
Se	78	2	He	5.116	3.340	609	2.67	5	102.3	70	130	
B	11	1	nogas	26.535	2.752	174722	1.55	25	106.1	70	130	
Si	28	1	nogas	233.175	0.868	4473684	0.37	25	932.7	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	486.797	1.493	18683	1.71	500	97.4	70	130	
Ca	44	1	nogas	338.868	1.385	624135	0.15	500	67.8	70	130	LLICV Main CR1 Failed
Fe	56	1	nogas	469.057	1.663	13558763	1.53	500	93.8	70	130	
Se	77	1	nogas	-10.436	-122.028	75898	3.96	5	-208.7	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	5.040	13.068	1563	10.82	5	100.8	70	130	
Mo	95	1	nogas	4.898	0.911	29034	0.93	5	98.0	70	130	
Sn	118	1	nogas	4.733	5.029	35784	1.66	5	94.7	70	130	
Ba	137	1	nogas	4.889	4.426	18891	1.38	5	97.8	70	130	
Sb	121	2	He	5.369	2.593	24394	2.74	5	107.4	70	130	
Li	7	1	nogas	4.454	6.655	197703	0.37	5	89.1	70	130	
P	31	1	nogas	25.940	2.751	124087	0.54	25	103.8	70	130	
La	139	1	nogas	10.918	64.626	87	29.04	5	218.4	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	717.052	283.933	30	100.00	5	14341.0	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1312445	3.32	1359891	96.51	70	125	
Ge	72	1	nogas	3159412	0.48	3145209	100.45	70	125	
In	115	1	nogas	2744168	3.20	2761164	99.38	70	125	
Bi	209	1	nogas	2154629	1.46	2190177	98.38	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	757610	0.38	785020	96.51	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICB
Data File Name	023_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T11:53:21-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.022	7.4	253	4.6	1	
Na	23	1	nogas	2.816	3.2	475313	3.4	100	
Mg	24	1	nogas	2.476	5.1	43758	5.8	100	
Al	27	1	nogas	0.947	2.0	45147	0.7	5	
K	39	1	nogas	6.201	106.6	7865893	0.7	100	
Ti	47	1	nogas	0.053	11.9	377	3.1	2.5	
V	51	1	nogas	-7.345	-13.6	2007772	1.1	2.5	
Cr	52	1	nogas	-0.092	-130.4	118247	2.7	2.5	
Mn	55	1	nogas	0.041	42.4	30973	0.7	2.5	
Co	59	1	nogas	0.021	17.9	1490	6.5	2.5	
Ni	60	1	nogas	0.194	9.2	803	11.8	2.5	
Cu	63	1	nogas	0.019	25.2	2547	1.9	1	
Zn	66	1	nogas	0.438	5.7	927	10.6	2.5	
As	75	1	nogas	-4.560	-15.8	236122	2.2	2.5	
Sr	88	1	nogas	0.039	4.5	1803	2.3	2.5	
Ag	107	1	nogas	0.027	14.2	653	7.2	2.5	
Cd	111	1	nogas	0.024	47.8	80	37.5	1	
Sb	121	1	nogas	0.275	2.6	3544	1.3	2.5	
Tl	205	1	nogas	0.065	37.0	2127	18.6	1	
Pb	208	1	nogas	-0.018	-52.6	5127	4.9	2.5	
U	238	1	nogas	0.028	19.8	787	16.9	2.5	
[Pb]	206	1	nogas	0.001	2718.3	1363	8.5	2.5	
[Pb]	207	1	nogas	-0.028	-72.3	1053	6.7	2.5	
Na	23	2	He	2.852	33.1	56674	1.8	100	
Mg	24	2	He	2.219	2.9	2254	5.1	100	
Al	27	2	He	0.954	52.0	1157	17.5	5	
K	39	2	He	-4.431	-46.2	187959	0.9	100	
Ca	43	2	He	7.639	84.5	53	28.6	100	
Ca	44	2	He	-1.300	-80.5	3060	4.1	100	
V	51	2	He	-0.218	-65.3	24546	1.5	2.5	
Cr	52	2	He	0.023	12.7	5221	3.7	2.5	
Mn	55	2	He	0.068	15.0	2724	1.8	2.5	
Fe	56	2	He	2.075	5.1	23031	4.8	100	
Co	59	2	He	0.001	603.8	390	16.0	2.5	
Ni	60	2	He	0.169	26.4	227	40.0	2.5	
Cu	63	2	He	0.424	6.1	990	17.5	1	
Zn	66	2	He	0.625	5.8	317	16.2	2.5	
As	75	2	He	0.028	86.7	814	2.1	2.5	
Se	78	2	He	0.623	17.4	135	11.3	1	
B	11	1	nogas	4.387	20.4	52104	1.7	10	
Si	28	1	nogas	-5.570	-118.8	1833433	2.4	5	
Ca	43	1	nogas	4.686	33.2	1513	4.4	100	
Ca	44	1	nogas	-136.192	-5.0	340644	0.3	100	
Fe	56	1	nogas	-15.384	-14.5	2628266	0.7	100	
Se	77	1	nogas	2.132	10.8	76169	1.4	2.5	
Se	82	1	nogas	0.272	66.4	303	13.7	1	

Initial Calibration Blank (ICB) Report

Mo	95	1	nogas	-0.020	-202.1	2180	8.4	2.5	
Sn	118	1	nogas	0.051	35.8	1213	8.1	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.043	36.5	207	28.4	2.5	
Sb	121	2	He	0.265	14.9	1277	12.5	2.5	
P	31	1	nogas	0.916	129.3	80524	2.4	10	
La	139	1	nogas	9.998	73.9	80	33.1	2.5	ICB Main CR1 Failed
Au	197	1	nogas	554.422	198.1	27	57.3	2.5	ICB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1284061	7.78	1359891	94.42	70	125	
Ge	72	1	nogas	3065001	1.44	3145209	97.45	70	125	
In	115	1	nogas	2622503	2.58	2761164	94.98	70	125	
Bi	209	1	nogas	2067529	4.45	2190177	94.40	70	125	
Ge	72	2	He	752035	3.44	785020	95.80	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICV
Data File Name	025_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T12:13:20-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	86.278	7.101	788269	0.87	100	86.3	90	110	ICV Main CR1 Failed
Na	23	1	nogas	9835.947	3.389	247382022	5.53	10000	98.4	90	110	
Mg	24	1	nogas	9774.600	2.568	155052749	2.65	10000	97.7	90	110	
Al	27	1	nogas	99.512	2.704	1946605	3.69	100	99.5	90	110	
K	39	1	nogas	9915.206	4.341	199452296	1.52	10000	99.2	90	110	
Ti	47	1	nogas	98.680	2.638	170521	0.48	100	98.7	90	110	
V	51	1	nogas	109.991	5.857	4748856	1.02	100	110.0	90	110	
Cr	52	1	nogas	102.420	5.132	2287925	2.73	100	102.4	90	110	
Mn	55	1	nogas	103.177	4.151	2692605	2.03	100	103.2	90	110	
Co	59	1	nogas	99.431	2.905	2221032	0.32	100	99.4	90	110	
Ni	60	1	nogas	97.326	2.563	480569	0.31	100	97.3	90	110	
Cu	63	1	nogas	95.347	1.804	1134262	1.33	100	95.3	90	110	
Zn	66	1	nogas	98.877	1.385	384862	1.91	100	98.9	90	110	
As	75	1	nogas	104.155	3.535	753131	0.64	100	104.2	90	110	
Sr	88	1	nogas	98.158	1.102	2608702	2.01	100	98.2	90	110	
Ag	107	1	nogas	97.958	2.606	1274157	1.81	100	98.0	90	110	
Cd	111	1	nogas	96.514	1.365	270878	0.99	100	96.5	90	110	
Sb	121	1	nogas	92.612	2.792	1138283	2.68	100	92.6	90	110	
Tl	205	1	nogas	95.528	3.474	1857320	2.88	100	95.5	90	110	
Pb	208	1	nogas	98.619	1.214	2540456	1.21	100	98.6	90	110	
U	238	1	nogas	100.972	1.695	2628695	1.84	100	101.0	90	110	
[Pb]	206	1	nogas	92.352	3.212	610013	3.04	100	92.4	90	110	
[Pb]	207	1	nogas	94.744	3.567	543016	0.91	100	94.7	90	110	
Na	23	2	He	10051.013	1.491	15112106	0.53	10000	100.5	90	110	
Mg	24	2	He	10214.835	3.764	8310797	2.82	10000	102.1	90	110	
Al	27	2	He	99.157	1.120	48165	1.13	100	99.2	90	110	
K	39	2	He	9937.260	0.822	8812172	0.80	10000	99.4	90	110	
Ca	43	2	He	9668.727	3.205	22984	3.62	10000	96.7	90	110	
Ca	44	2	He	9774.487	0.757	392242	0.67	10000	97.7	90	110	
V	51	2	He	99.204	1.198	593851	0.87	100	99.2	90	110	
Cr	52	2	He	98.054	0.491	615025	0.71	100	98.1	90	110	
Mn	55	2	He	99.824	1.199	444759	0.25	100	99.8	90	110	
Fe	56	2	He	9975.439	0.848	53735766	0.36	10000	99.8	90	110	
Co	59	2	He	97.805	2.181	827079	1.06	100	97.8	90	110	
Ni	60	2	He	100.737	2.217	210262	1.17	100	100.7	90	110	
Cu	63	2	He	98.771	1.892	524582	0.74	100	98.8	90	110	
Zn	66	2	He	97.943	1.344	127503	0.81	100	97.9	90	110	
As	75	2	He	97.414	1.577	125990	1.02	100	97.4	90	110	
Se	78	2	He	97.012	0.971	10156	0.61	100	97.0	90	110	
B	11	1	nogas	450.167	8.096	2428887	2.24	500	90.0	90	110	
Si	28	1	nogas	4947.472	2.024	54719164	3.13	5000	98.9	90	110	
Ca	43	1	nogas	9776.353	3.579	343708	2.99	10000	97.8	90	110	
Ca	44	1	nogas	9751.848	3.584	5947167	1.71	10000	97.5	90	110	
Fe	56	1	nogas	9935.397	4.796	222306388	2.90	10000	99.4	90	110	
Se	77	1	nogas	146.148	3.350	107103	2.24	100	146.1	90	110	ICV Main CR1 Failed
Se	82	1	nogas	98.113	2.380	25615	1.44	100	98.1	90	110	
Mo	95	1	nogas	99.123	1.162	534676	2.38	100	99.1	90	110	
Sn	118	1	nogas	95.187	0.718	696674	0.90	100	95.2	90	110	
Ba	137	1	nogas	98.937	1.792	378120	0.25	100	98.9	90	110	
Sb	121	2	He	96.957	1.005	432768	0.54	100	97.0	90	110	
Li	7	1	nogas	89.962	6.707	1880704	0.43	100	90.0	90	110	ICV Main CR1 Failed
P	31	1	nogas	487.791	1.616	870045	1.80	500	97.6	90	110	
La	139	1	nogas	112.367	21.626	457	18.23	100	112.4	90	110	ICV Main CR1 Failed
Au	197	1	nogas	1024.820	164.588	33	69.28	100	1024.8	90	110	ICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1281982	6.39	1359891	94.27	70	125	
Ge	72	1	nogas	3116223	2.81	3145209	99.08	70	125	
In	115	1	nogas	2718798	1.59	2761164	98.47	70	125	
Bi	209	1	nogas	2085992	3.21	2190177	95.24	70	125	

Initial Calibration Verification (ICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	746958	1.19	785020	95.15	70	125	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	026ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T12:27:37-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	-0.003	-45.4	27	43.3	0	ICSA Main CR1 Failed
Na	23	1	nogas	99772.419	2.6	2268122384	1.6	0	
Mg	24	1	nogas	98284.273	1.1	1412465198	2.0	0	
Al	27	1	nogas	91269.915	3.0	1627286056	2.1	0	
K	39	1	nogas	100855.122	2.2	1810364040	1.4	0	
Ti	47	1	nogas	2111.723	1.2	3370309	1.1	0	
V	51	1	nogas	-35.932	-0.7	1277173	0.7	0	ICSA Main CR1 Failed
Cr	52	1	nogas	-0.515	-9.4	102886	1.4	0	ICSA Main CR1 Failed
Mn	55	1	nogas	0.883	6.0	49239	3.5	0	ICSA Main CR1 Failed
Co	59	1	nogas	0.478	0.6	10850	1.3	0	ICSA Main CR1 Failed
Ni	60	1	nogas	1.509	0.4	6765	1.0	0	ICSA Main CR1 Failed
Cu	63	1	nogas	1.054	5.0	13765	4.2	0	ICSA Main CR1 Failed
Zn	66	1	nogas	3.426	3.1	11647	2.5	0	ICSA Main CR1 Failed
As	75	1	nogas	-14.028	-10.0	180601	2.5	0	ICSA Main CR1 Failed
Sr	88	1	nogas	0.845	1.9	21513	1.6	0	ICSA Main CR1 Failed
Ag	107	1	nogas	0.037	26.3	727	16.8	0	ICSA Main CR1 Failed
Cd	111	1	nogas	1.887	5.1	4861	3.3	0	ICSA Main CR1 Failed
Sb	121	1	nogas	1.289	11.4	14867	12.1	0	ICSA Main CR1 Failed
Tl	205	1	nogas	0.050	83.5	1894	51.3	0	ICSA Main CR1 Failed
Pb	208	1	nogas	0.111	38.4	8444	12.9	0	ICSA Main CR1 Failed
[Pb]	206	1	nogas	0.131	26.0	2210	14.7	0	ICSA Main CR1 Failed
[Pb]	207	1	nogas	0.091	30.5	1727	13.7	0	ICSA Main CR1 Failed
Na	23	2	He	97693.153	1.3	141335218	1.7	0	
Mg	24	2	He	97265.766	1.4	76387947	1.7	0	
Al	27	2	He	91579.752	0.5	42312337	1.4	0	
K	39	2	He	94564.302	1.0	82224395	1.0	0	
Ca	43	2	He	93346.096	2.9	213857	3.2	0	
Ca	44	2	He	97704.215	1.5	3757513	2.3	0	
V	51	2	He	-1.531	-3.7	16283	1.8	0	ICSA Main CR1 Failed
Cr	52	2	He	0.266	25.5	6465	6.1	0	ICSA Main CR1 Failed
Mn	55	2	He	0.675	7.2	5207	3.6	0	ICSA Main CR1 Failed
Fe	56	2	He	96155.471	0.6	499799473	0.3	0	
Co	59	2	He	0.246	9.4	2367	7.1	0	ICSA Main CR1 Failed
Ni	60	2	He	0.719	9.9	1327	11.3	0	ICSA Main CR1 Failed
Cu	63	2	He	0.752	3.0	2630	5.0	0	ICSA Main CR1 Failed
Zn	66	2	He	2.156	1.0	2234	0.5	0	ICSA Main CR1 Failed
As	75	2	He	0.041	68.5	798	5.2	0	ICSA Main CR1 Failed
Se	78	2	He	0.700	21.0	137	11.1	0	ICSA Main CR1 Failed
B	11	1	nogas	1.423	38.1	37567	4.5	0	ICSA Main CR1 Failed
Si	28	1	nogas	71.978	8.3	2489176	1.5	0	
Ca	43	1	nogas	95597.549	1.5	3098104	2.3	0	
Ca	44	1	nogas	96363.689	1.0	50888596	0.2	0	
Fe	56	1	nogas	98346.164	2.0	2011258512	1.2	0	
Se	77	1	nogas	-70.143	-13.1	57829	2.2	0	ICSA Main CR1 Failed
Se	82	1	nogas	0.278	59.1	287	13.2	0	ICSA Main CR1 Failed
Mo	95	1	nogas	1966.748	2.1	9770045	2.0	0	
Sn	118	1	nogas	0.195	15.8	2123	11.8	0	ICSA Main CR1 Failed
Ba	137	1	nogas	0.238	14.5	880	15.9	0	ICSA Main CR1 Failed
Sb	121	2	He	0.939	3.9	4131	3.4	0	ICSA Main CR1 Failed

Interference Check Solution A (ICS-A) Report

P	31	1	nogas	95539.734	1.6	143110505	0.7	0	
La	139	1	nogas	66.059	13.3	263	9.6	0	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1325005	3.60	1359891	97.43	70	125	
Ge	72	1	nogas	2881516	0.91	3145209	91.62	70	125	
In	115	1	nogas	2489400	2.22	2761164	90.16	70	125	
Bi	209	1	nogas	2056783	8.29	2190177	93.91	70	125	
Ge	72	2	He	720869	0.83	785020	91.83	70	125	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	027ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T12:29:40-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	88.896	7.631	826908	0.53	100	88.9	80	120	
Na	23	1	nogas	107475.280	6.996	2496804056	0.21	100	107475.3	80	120	ICSB Main CR1 Failed
Mg	24	1	nogas	104767.308	8.522	1537287468	1.60	100	104767.3	80	120	ICSB Main CR1 Failed
Al	27	1	nogas	89501.065	6.489	1635600669	0.84	100	89501.1	80	120	ICSB Main CR1 Failed
K	39	1	nogas	106208.920	6.969	1953231644	0.86	100	106208.9	80	120	ICSB Main CR1 Failed
Ti	47	1	nogas	2184.702	5.537	3575601	2.72	100	2184.7	80	120	ICSB Main CR1 Failed
V	51	1	nogas	84.153	10.178	3940234	2.22	100	84.2	80	120	ICSB Main CR1 Failed
Cr	52	1	nogas	106.120	2.684	2248532	4.98	100	106.1	80	120	
Mn	55	1	nogas	109.119	1.679	2706396	6.77	100	109.1	80	120	
Co	59	1	nogas	108.027	2.536	2291703	4.04	100	108.0	80	120	
Ni	60	1	nogas	106.971	6.590	500763	0.83	100	107.0	80	120	
Cu	63	1	nogas	103.370	6.564	1165497	1.32	100	103.4	80	120	
Zn	66	1	nogas	110.844	6.542	409045	1.71	100	110.8	80	120	
As	75	1	nogas	99.913	10.639	694935	1.33	100	99.9	80	120	
Sr	88	1	nogas	106.906	2.308	2699990	6.74	100	106.9	80	120	
Ag	107	1	nogas	99.024	6.987	1220737	0.49	100	99.0	80	120	
Cd	111	1	nogas	108.286	3.933	284388	2.08	100	108.3	80	120	
Sb	121	1	nogas	104.806	5.416	1221638	1.76	100	104.8	80	120	
Tl	205	1	nogas	107.582	3.091	1847373	6.61	100	107.6	80	120	
Pb	208	1	nogas	96.871	6.416	2495535	6.40	100	96.9	80	120	
U	238	1	nogas	117.360	4.268	2694410	2.99	100	117.4	80	120	
[Pb]	206	1	nogas	106.892	7.419	621587	1.38	100	106.9	80	120	
[Pb]	207	1	nogas	107.937	7.726	544763	1.53	100	107.9	80	120	
Na	23	2	He	106806.913	2.230	155707248	2.06	100	106806.9	80	120	
Mg	24	2	He	105680.566	1.366	83634235	0.36	100	105680.6	80	120	
Al	27	2	He	89413.345	0.471	41631124	0.85	100	89413.3	80	120	ICSB Main CR1 Failed
K	39	2	He	105046.267	0.664	91317285	0.66	100	105046.3	80	120	
Ca	43	2	He	102464.222	0.437	236569	1.37	100	102464.2	80	120	
Ca	44	2	He	107334.985	1.617	4159308	1.74	100	107335.0	80	120	
V	51	2	He	104.576	0.666	607511	0.47	100	104.6	80	120	
Cr	52	2	He	104.304	0.708	636023	1.58	100	104.3	80	120	
Mn	55	2	He	107.790	1.529	466980	2.40	100	107.8	80	120	
Fe	56	2	He	106340.940	0.882	557089938	1.81	100	106340.9	80	120	
Co	59	2	He	104.046	0.847	855814	0.19	100	104.0	80	120	
Ni	60	2	He	106.452	2.151	216120	1.64	100	106.5	80	120	
Cu	63	2	He	103.551	1.564	535015	1.59	100	103.6	80	120	
Zn	66	2	He	107.351	1.635	135978	1.87	100	107.4	80	120	
As	75	2	He	105.233	0.241	132323	0.82	100	105.2	80	120	
Se	78	2	He	106.610	1.027	10850	2.02	100	106.6	80	120	
B	11	1	nogas	449.643	7.894	2470720	1.63	100	449.6	80	120	
Si	28	1	nogas	5381.151	7.053	56232369	0.34	100	5381.2	80	120	ICSB Main CR1 Failed
Ca	43	1	nogas	105287.348	8.179	3493725	1.60	100	105287.3	80	120	
Ca	44	1	nogas	105851.660	6.889	57243939	1.32	100	105851.7	80	120	
Fe	56	1	nogas	105420.584	4.862	2211100116	2.18	100	105420.6	80	120	ICSB Main CR1 Failed
Se	77	1	nogas	59.857	56.308	84609	1.29	100	59.9	80	120	ICSB Main CR1 Failed
Se	82	1	nogas	107.720	5.571	26650	1.61	100	107.7	80	120	
Mo	95	1	nogas	2069.610	5.399	10541086	1.18	100	2069.6	80	120	
Sn	118	1	nogas	104.910	4.972	718104	1.49	100	104.9	80	120	
Ba	137	1	nogas	109.134	4.275	390261	1.76	100	109.1	80	120	
Sb	121	2	He	107.148	1.025	465148	0.83	100	107.1	80	120	
La	139	1	nogas	240.588	6.523	867	4.05	100	240.6	80	120	ICSB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1305981	7.06	1359891	96.04	70	125	
Ge	72	1	nogas	2961308	6.55	3145209	94.15	70	125	
In	115	1	nogas	2547892	6.13	2761164	92.28	70	125	
Bi	209	1	nogas	1842791	7.32	2190177	84.14	70	125	
Ge	72	2	He	726482	1.00	785020	92.54	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	039_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:12:56-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	82.581	4.416	731555	0.94	100	82.6	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	9534.220	0.951	233218130	1.31	10000	95.3	90	110	
Mg	24	1	nogas	9729.392	1.174	150187274	1.59	10000	97.3	90	110	
Al	27	1	nogas	114.025	1.651	2272225	1.51	100	114.0	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9403.535	4.665	193492221	1.80	10000	94.0	90	110	
Ti	47	1	nogas	94.023	2.202	165882	1.13	100	94.0	90	110	
V	51	1	nogas	88.641	9.067	4343756	2.37	100	88.6	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	94.363	2.955	2162226	0.85	100	94.4	90	110	
Mn	55	1	nogas	96.837	4.544	2581103	1.37	100	96.8	90	110	
Co	59	1	nogas	93.619	4.322	2134156	1.48	100	93.6	90	110	
Ni	60	1	nogas	92.348	2.509	465475	0.99	100	92.3	90	110	
Cu	63	1	nogas	90.028	4.450	1092858	2.11	100	90.0	90	110	
Zn	66	1	nogas	93.492	2.903	371300	0.41	100	93.5	90	110	
As	75	1	nogas	85.298	2.877	678016	1.50	100	85.3	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.941	1.717	2629593	1.51	100	96.9	90	110	
Ag	107	1	nogas	95.934	1.678	1273939	1.81	100	95.9	90	110	
Cd	111	1	nogas	96.242	1.367	273977	0.58	100	96.2	90	110	
Sb	121	1	nogas	89.518	2.825	1122878	0.73	100	89.5	90	110	CCV Main CR1-2 Failed
Tl	205	1	nogas	96.005	0.857	1912662	1.77	100	96.0	90	110	
Pb	208	1	nogas	97.695	2.651	2516717	2.64	100	97.7	90	110	
U	238	1	nogas	98.363	3.842	2622706	2.63	100	98.4	90	110	
[Pb]	206	1	nogas	90.186	2.464	610277	1.74	100	90.2	90	110	
[Pb]	207	1	nogas	91.278	3.329	536100	2.19	100	91.3	90	110	
Na	23	2	He	9623.064	3.235	14415564	1.68	10000	96.2	90	110	
Mg	24	2	He	9540.055	1.642	7734491	0.19	10000	95.4	90	110	
Al	27	2	He	107.256	1.192	51865	2.95	100	107.3	90	110	
K	39	2	He	9322.177	1.535	8278600	1.50	10000	93.2	90	110	
Ca	43	2	He	9498.496	2.213	22494	1.34	10000	95.0	90	110	
Ca	44	2	He	9331.236	2.330	373183	1.11	10000	93.3	90	110	
V	51	2	He	93.345	2.417	558196	1.25	100	93.3	90	110	
Cr	52	2	He	94.422	2.820	590140	1.03	100	94.4	90	110	
Mn	55	2	He	93.055	1.725	413235	0.34	100	93.1	90	110	
Fe	56	2	He	9491.722	1.050	50950106	1.93	10000	94.9	90	110	
Co	59	2	He	93.403	0.242	787182	1.78	100	93.4	90	110	
Ni	60	2	He	95.865	0.471	199406	1.94	100	95.9	90	110	
Cu	63	2	He	95.724	2.377	506501	1.50	100	95.7	90	110	
Zn	66	2	He	95.179	1.678	123436	0.78	100	95.2	90	110	
As	75	2	He	92.664	0.757	119458	1.12	100	92.7	90	110	
Se	78	2	He	93.170	1.117	9721	0.93	100	93.2	90	110	
B	11	1	nogas	433.350	1.839	2270764	3.33	500	86.7	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4547.796	1.635	51492616	1.59	5000	91.0	90	110	
Ca	43	1	nogas	9148.026	4.787	328218	1.64	10000	91.5	90	110	
Ca	44	1	nogas	8874.170	5.333	5560960	1.88	10000	88.7	90	110	CCV Main CR1-2 Failed
Fe	56	1	nogas	9453.672	1.340	216186963	1.85	10000	94.5	90	110	
Se	77	1	nogas	52.203	33.980	89512	1.23	100	52.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.835	4.194	25008	1.16	100	93.8	90	110	
Mo	95	1	nogas	94.673	3.017	521161	0.18	100	94.7	90	110	
Sn	118	1	nogas	91.988	1.885	682853	0.71	100	92.0	90	110	
Ba	137	1	nogas	96.340	1.964	373465	0.74	100	96.3	90	110	
Sb	121	2	He	93.010	2.014	413602	0.60	100	93.0	90	110	
Li	7	1	nogas	96.477	3.818	1809007	1.98	100	96.5	90	110	
P	31	1	nogas	444.547	2.197	816596	1.56	500	88.9	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	156.420	17.540	627	15.17	100	156.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	271.125	292.305	23	49.49	100	271.1	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1241092	5.04	1359891	91.26	70	125	
Ge	72	1	nogas	3181162	3.09	3145209	101.14	70	125	
In	115	1	nogas	2757635	1.24	2761164	99.87	70	125	
Bi	209	1	nogas	2136405	1.24	2190177	97.54	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	744285	1.78	785020	94.81	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	040_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:14:54-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.029	56.4	330	47.6	1	
Na	23	1	nogas	8.110	23.9	628294	5.8	100	
Mg	24	1	nogas	5.524	31.5	93958	27.5	100	
Al	27	1	nogas	19.975	4.0	426475	2.1	5	CCB Main CR1 Failed
K	39	1	nogas	-14.388	-133.8	7847500	0.6	100	
Ti	47	1	nogas	0.095	72.4	467	21.5	2.5	
V	51	1	nogas	-7.112	-37.1	2114627	1.5	2.5	
Cr	52	1	nogas	-1.421	-13.5	95109	2.0	2.5	
Mn	55	1	nogas	0.153	50.7	35494	1.8	2.5	
Co	59	1	nogas	0.031	40.6	1790	11.7	2.5	
Ni	60	1	nogas	0.201	17.1	873	15.9	2.5	
Cu	63	1	nogas	0.012	171.5	2584	5.1	2	
Zn	66	1	nogas	0.603	9.8	1633	10.0	2.5	
As	75	1	nogas	-8.727	-15.2	227700	2.0	2.5	
Sr	88	1	nogas	0.375	9.7	11104	5.9	2.5	
Ag	107	1	nogas	0.016	53.9	537	17.3	2.5	
Cd	111	1	nogas	0.042	88.7	143	76.9	1	
Sb	121	1	nogas	1.928	27.7	24528	22.8	2.5	
Tl	205	1	nogas	0.115	71.1	3254	51.0	1	
Pb	208	1	nogas	-0.011	-357.9	5327	18.4	2.5	
U	238	1	nogas	0.133	64.9	3634	64.2	2.5	
[Pb]	206	1	nogas	-0.002	-803.1	1403	9.0	2.5	
[Pb]	207	1	nogas	-0.010	-442.3	1210	21.4	2.5	
Na	23	2	He	7.836	7.2	64051	1.3	100	
Mg	24	2	He	3.613	7.8	3387	7.5	100	
Al	27	2	He	20.645	2.6	10623	1.1	5	CCB Main CR1 Failed
K	39	2	He	-13.863	-15.0	179777	1.0	100	
Ca	43	2	He	71.958	42.3	207	35.7	100	
Ca	44	2	He	57.380	4.1	5398	1.0	100	
V	51	2	He	-0.066	-94.6	25371	0.7	2.5	
Cr	52	2	He	-0.017	-214.6	4957	3.9	2.5	
Mn	55	2	He	0.070	34.4	2724	3.9	2.5	
Fe	56	2	He	3.397	5.2	30125	4.1	100	
Co	59	2	He	0.002	425.2	393	15.5	2.5	
Ni	60	2	He	0.176	12.9	240	20.8	2.5	
Cu	63	2	He	0.443	10.7	1083	22.2	2	
Zn	66	2	He	0.766	5.6	500	10.0	2.5	
As	75	2	He	0.060	101.2	853	8.7	2.5	
Se	78	2	He	0.629	19.5	135	8.4	2	
B	11	1	nogas	4.069	8.9	52001	3.5	10	
Si	28	1	nogas	-28.516	-29.5	1672283	1.5	5	
Ca	43	1	nogas	77.086	15.6	4201	5.9	100	
Ca	44	1	nogas	-316.270	-4.0	252410	1.6	100	
Fe	56	1	nogas	-18.838	-54.1	2677824	4.2	100	
Se	77	1	nogas	-35.408	-40.2	71999	2.1	2.5	
Se	82	1	nogas	0.073	283.3	267	22.6	2	
Mo	95	1	nogas	0.156	123.5	3240	28.1	2.5	
Sn	118	1	nogas	0.207	31.9	2567	19.3	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.262	13.6	1123	12.2	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.229	9.8	5601	10.8	2.5	
P	31	1	nogas	-1.781	-74.9	80079	1.8	10	
La	139	1	nogas	70.702	17.2	327	15.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	477.217	324.2	27	86.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1318699	2.38	1359891	96.97	70	125	
Ge	72	1	nogas	3222207	4.42	3145209	102.45	70	125	
In	115	1	nogas	2910199	0.94	2761164	105.40	70	125	
Bi	209	1	nogas	2155319	0.75	2190177	98.41	70	125	
Ge	72	2	He	750098	1.35	785020	95.55	70	125	

Sample Report

Sample Table

Sample Name	HS18120642-01
Data File Name	047SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:34:37-06:00
Sample Type	Sample
Dilution	100
Comment	TW135804Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.000	-0.017	-880.85	53	0.00	2000	
Na	23	1	nogas	6522.326	652232.645	0.83	164168658	0.00	200000	
Mg	24	1	nogas	1811.960	181195.992	2.34	28754913	0.01	200000	
Al	27	1	nogas	0.855	85.494	7.81	45488	0.00	2000	
K	39	1	nogas	68.399	6839.934	4.66	9486700	0.00	200000	
Ti	47	1	nogas	0.075	7.535	63.35	433	0.02	2000	
V	51	1	nogas	3.860	385.977	15.05	2371813	0.00	2000	
Cr	52	1	nogas	-1.197	-119.701	-13.08	99826	0.00	2000	
Mn	55	1	nogas	89.337	8933.680	1.72	2409546	0.00	2000	
Co	59	1	nogas	0.181	18.092	9.50	5251	0.00	2000	
Ni	60	1	nogas	0.298	29.763	10.72	1370	0.02	2000	
Cu	63	1	nogas	0.016	1.599	30.21	2637	0.00	2000	
Zn	66	1	nogas	0.764	76.405	1.29	2284	0.03	2000	
As	75	1	nogas	-6.414	-641.401	-15.02	238488	0.00	2000	
Sr	88	1	nogas	86.629	8662.918	2.45	2374149	0.00	2000	
Ag	107	1	nogas	-0.011	-1.092	-33.69	173	-0.01	2000	
Cd	111	1	nogas	0.000	0.000	-198350.69	17	0.00	2000	
Sb	121	1	nogas	0.086	8.618	15.60	1317	0.01	2000	
Tl	205	1	nogas	-0.020	-2.048	-31.60	533	0.00	2000	
Pb	208	1	nogas	-0.111	-11.102	-9.65	2747	0.00	2000	
U	238	1	nogas	0.002	0.240	36.94	130	0.00	2000	
[Pb]	206	1	nogas	-0.113	-11.275	-17.92	667	-0.02	2000	
[Pb]	207	1	nogas	-0.119	-11.926	-8.12	577	-0.02	2000	
Na	23	2	He	6702.363	670236.323	0.42	10062532	0.07	200000	
Mg	24	2	He	1890.134	189013.448	3.90	1533820	0.12	200000	
Al	27	2	He	0.911	91.073	22.27	1130	0.08	2000	
K	39	2	He	66.212	6621.220	4.23	249241	0.03	200000	
Ca	43	2	He	2513.774	251377.430	9.21	5984	42.01	200000	
Ca	44	2	He	2470.884	247088.408	1.45	101126	2.44	200000	
V	51	2	He	0.453	45.321	14.31	28147	0.00	2000	
Cr	52	2	He	-0.002	-0.184	-3508.09	5011	0.00	2000	
Mn	55	2	He	85.152	8515.175	1.20	378508	0.02	2000	
Fe	56	2	He	927.915	92791.478	0.86	4992982	0.02	200000	
Co	59	2	He	0.177	17.685	1.63	1867	0.01	2000	
Ni	60	2	He	0.241	24.077	9.97	373	0.06	2000	
Cu	63	2	He	0.432	43.182	7.35	1017	0.04	2000	
Zn	66	2	He	0.973	97.308	4.56	767	0.13	2000	
As	75	2	He	0.308	30.822	15.60	1166	0.03	2000	
Se	78	2	He	0.818	81.788	9.44	153	0.53	2000	
B	11	1	nogas	0.239	23.935	110.11	30915	0.00	2000	
Si	28	1	nogas	229.085	22908.503	1.38	4504633	0.01	2000	
Ca	43	1	nogas	2389.560	238955.994	1.01	87730	2.72	200000	
Ca	44	1	nogas	2080.703	208070.342	0.91	1652627	0.13	200000	
Fe	56	1	nogas	923.374	92337.395	1.28	24137375	0.00	200000	
Se	77	1	nogas	-14.255	-1425.479	-29.62	76370	-0.02	2000	
Se	82	1	nogas	-0.020	-2.036	-882.07	240	-0.01	2000	

Sample Report

Mo	95	1	nogas	-0.155	-15.499	-12.62	1540	-0.01	2000	
Sn	118	1	nogas	-0.023	-2.292	-51.45	753	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	4.371	437.129	5.40	17419	0.03	2000	
Sb	121	2	He	0.079	7.901	4.83	440	0.02	2000	
La	139	1	nogas	23.302	2330.230	15.45	137	17.05	2000	
Au	197	1	nogas	-226.329	-22632.902	-159.42	17	-1357.97	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1318801	3.25	1359891	96.98	70	125	
Ge	72	1	nogas	3213055	0.92	3145209	102.16	70	125	
In	115	1	nogas	2830468	4.15	2761164	102.51	70	125	
Bi	209	1	nogas	2209195	2.02	2190177	100.87	70	125	
Ge	72	2	He	744493	0.97	785020	94.84	70	125	

Sample Report

Sample Table

Sample Name	HS18120642-02
Data File Name	048SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:36:35-06:00
Sample Type	Sample
Dilution	50
Comment	TW135804Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.004	0.202	32.81	90	0.00	2000	
Na	23	1	nogas	14388.215	719410.771	1.39	356675450	0.00	200000	
Mg	24	1	nogas	10132.871	506643.525	4.37	158528629	0.01	200000	
Al	27	1	nogas	1.470	73.499	10.69	56227	0.00	2000	
K	39	1	nogas	42.659	2132.928	16.12	8735997	0.00	200000	
Ti	47	1	nogas	0.151	7.526	36.17	553	0.03	2000	
V	51	1	nogas	-12.941	-647.072	-27.08	1919078	0.00	2000	
Cr	52	1	nogas	-1.623	-81.151	-5.92	88142	0.00	2000	
Mn	55	1	nogas	164.389	8219.460	2.99	4290403	0.00	2000	
Co	59	1	nogas	0.193	9.638	2.66	5381	0.00	2000	
Ni	60	1	nogas	0.449	22.454	4.63	2083	0.02	2000	
Cu	63	1	nogas	0.024	1.213	49.28	2667	0.00	2000	
Zn	66	1	nogas	0.493	24.657	7.43	1163	0.04	2000	
As	75	1	nogas	-11.366	-568.293	-5.39	208702	-0.01	2000	
Sr	88	1	nogas	265.075	13253.733	3.08	7071726	0.00	2000	
Ag	107	1	nogas	-0.015	-0.744	-35.29	117	-0.01	2000	
Cd	111	1	nogas	0.008	0.409	154.86	40	0.02	2000	
Sb	121	1	nogas	0.076	3.802	6.75	1157	0.01	2000	
Tl	205	1	nogas	-0.020	-0.981	-7.21	560	0.00	2000	
Pb	208	1	nogas	-0.126	-6.297	-5.75	2363	-0.01	2000	
U	238	1	nogas	0.007	0.344	11.24	257	0.00	2000	
[Pb]	206	1	nogas	-0.117	-5.840	-17.49	647	-0.02	2000	
[Pb]	207	1	nogas	-0.123	-6.160	-2.21	560	-0.02	2000	
Na	23	2	He	14518.435	725921.759	3.98	21567498	0.07	200000	
Mg	24	2	He	10195.571	509778.568	1.89	8207883	0.12	200000	
Al	27	2	He	1.547	77.374	13.65	1423	0.11	2000	
K	39	2	He	32.598	1629.889	7.26	220081	0.01	200000	
Ca	43	2	He	12708.919	635445.968	1.77	29884	42.53	200000	
Ca	44	2	He	12112.647	605632.354	2.02	480131	2.52	200000	
V	51	2	He	-0.475	-23.757	-12.46	22678	0.00	2000	
Cr	52	2	He	0.004	0.187	427.87	5011	0.00	2000	
Mn	55	2	He	160.001	8000.044	2.54	703733	0.02	2000	
Fe	56	2	He	1245.439	62271.966	1.51	6647290	0.02	200000	
Co	59	2	He	0.176	8.800	5.22	1847	0.01	2000	
Ni	60	2	He	0.352	17.599	11.42	600	0.06	2000	
Cu	63	2	He	0.378	18.887	4.71	723	0.05	2000	
Zn	66	2	He	0.689	34.446	2.94	393	0.18	2000	
As	75	2	He	-0.003	-0.162	-1327.95	761	0.00	2000	
Se	78	2	He	0.519	25.953	22.67	121	0.43	2000	
B	11	1	nogas	3.092	154.617	2.07	45264	0.01	2000	
Si	28	1	nogas	484.274	24213.691	0.71	7119531	0.01	2000	
Ca	43	1	nogas	11853.700	592684.980	1.34	418187	2.83	200000	
Ca	44	1	nogas	11845.201	592260.043	2.94	7162999	0.17	200000	
Fe	56	1	nogas	1233.309	61665.445	4.53	30360667	0.00	200000	
Se	77	1	nogas	-44.733	-2236.649	-22.65	68033	-0.07	2000	
Se	82	1	nogas	-0.034	-1.716	-438.48	230	-0.01	2000	

Sample Report

Mo	95	1	nogas	-0.184	-9.211	-11.38	1343	-0.01	2000	
Sn	118	1	nogas	-0.016	-0.803	-33.48	790	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	7.530	376.488	3.37	29489	0.03	2000	
Sb	121	2	He	0.075	3.762	29.17	420	0.02	2000	
La	139	1	nogas	30.101	1505.065	26.80	160	18.81	2000	
Au	197	1	nogas	-883.539	-44176.974	-41.73	7	-13253.09	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1279856	2.35	1359891	94.11	70	125	
Ge	72	1	nogas	3128283	1.31	3145209	99.46	70	125	
In	115	1	nogas	2782109	1.84	2761164	100.76	70	125	
Bi	209	1	nogas	2238348	2.63	2190177	102.20	70	125	
Ge	72	2	He	739024	1.68	785020	94.14	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	051_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:42:32-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	85.242	6.233	746063	1.73	100	85.2	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10106.138	2.238	246517314	3.04	10000	101.1	90	110	
Mg	24	1	nogas	9753.154	0.324	150136603	1.50	10000	97.5	90	110	
Al	27	1	nogas	115.336	0.376	2224526	2.15	100	115.3	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9662.862	0.870	192340267	1.47	10000	96.6	90	110	
Ti	47	1	nogas	95.923	2.146	163795	1.48	100	95.9	90	110	
V	51	1	nogas	89.335	8.821	4220449	2.78	100	89.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	98.016	2.515	2170398	4.15	100	98.0	90	110	
Mn	55	1	nogas	99.358	2.694	2564559	3.81	100	99.4	90	110	
Co	59	1	nogas	97.725	1.543	2157428	2.10	100	97.7	90	110	
Ni	60	1	nogas	95.974	2.462	468269	2.20	100	96.0	90	110	
Cu	63	1	nogas	93.300	2.775	1096403	0.78	100	93.3	90	110	
Zn	66	1	nogas	95.730	3.590	367953	1.40	100	95.7	90	110	
As	75	1	nogas	87.720	2.643	667491	0.75	100	87.7	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	95.720	3.206	2512412	1.60	100	95.7	90	110	
Ag	107	1	nogas	95.939	5.097	1232494	3.63	100	95.9	90	110	
Cd	111	1	nogas	94.231	4.648	268218	1.23	100	94.2	90	110	
Sb	121	1	nogas	95.509	0.887	1159997	2.50	100	95.5	90	110	
Tl	205	1	nogas	97.225	1.215	1894554	1.38	100	97.2	90	110	
Pb	208	1	nogas	99.053	2.991	2551610	2.98	100	99.1	90	110	
U	238	1	nogas	101.132	1.514	2638473	1.86	100	101.1	90	110	
[Pb]	206	1	nogas	94.107	2.097	622917	2.20	100	94.1	90	110	
[Pb]	207	1	nogas	95.903	1.744	551041	2.01	100	95.9	90	110	
Na	23	2	He	9649.507	2.347	14165282	1.26	10000	96.5	90	110	
Mg	24	2	He	9691.734	1.730	7699047	0.65	10000	96.9	90	110	
Al	27	2	He	110.540	1.509	52339	0.84	100	110.5	90	110	CCV Main CR1-2 Failed
K	39	2	He	9295.201	2.150	8255199	2.10	10000	93.0	90	110	
Ca	43	2	He	9536.295	0.885	22130	0.82	10000	95.4	90	110	
Ca	44	2	He	9331.597	1.256	365726	1.35	10000	93.3	90	110	
V	51	2	He	93.814	1.456	549598	0.05	100	93.8	90	110	
Cr	52	2	He	96.799	0.973	592797	0.61	100	96.8	90	110	
Mn	55	2	He	94.979	1.041	413254	0.70	100	95.0	90	110	
Fe	56	2	He	9516.557	0.942	50048763	0.84	10000	95.2	90	110	
Co	59	2	He	94.625	0.357	781346	1.15	100	94.6	90	110	
Ni	60	2	He	98.902	0.511	201557	0.87	100	98.9	90	110	
Cu	63	2	He	98.270	1.498	509545	0.32	100	98.3	90	110	
Zn	66	2	He	95.432	1.086	121289	1.93	100	95.4	90	110	
As	75	2	He	92.654	0.852	117034	0.85	100	92.7	90	110	
Se	78	2	He	91.542	1.101	9360	0.32	100	91.5	90	110	
B	11	1	nogas	446.060	3.907	2308220	1.49	500	89.2	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4691.460	1.641	51348961	0.99	5000	93.8	90	110	
Ca	43	1	nogas	9441.217	1.581	328041	2.05	10000	94.4	90	110	
Ca	44	1	nogas	9164.330	1.999	5548196	1.65	10000	91.6	90	110	
Fe	56	1	nogas	9769.863	2.054	216224221	4.24	10000	97.7	90	110	
Se	77	1	nogas	61.316	19.398	88514	0.58	100	61.3	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	91.927	4.064	23719	1.89	100	91.9	90	110	
Mo	95	1	nogas	95.679	1.848	509849	0.74	100	95.7	90	110	
Sn	118	1	nogas	93.453	1.993	694199	2.66	100	93.5	90	110	
Ba	137	1	nogas	95.989	6.293	371905	2.14	100	96.0	90	110	
Sb	121	2	He	94.319	1.364	410995	0.68	100	94.3	90	110	
Li	7	1	nogas	96.753	5.390	1792971	3.83	100	96.8	90	110	
P	31	1	nogas	459.962	2.074	814948	0.37	500	92.0	90	110	
La	139	1	nogas	147.731	23.151	593	18.49	100	147.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	65.504	1805.300	20	86.60	100	65.5	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1226650	4.46	1359891	90.20	70	125	
Ge	72	1	nogas	3078432	2.24	3145209	97.88	70	125	
In	115	1	nogas	2760799	4.57	2761164	99.99	70	125	
Bi	209	1	nogas	2089691	0.60	2190177	95.41	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	729245	1.34	785020	92.90	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	052_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:44:32-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.030	17.8	337	17.4	1	
Na	23	1	nogas	7.972	14.5	620749	3.9	100	
Mg	24	1	nogas	5.200	27.3	88363	24.7	100	
Al	27	1	nogas	19.442	2.2	419698	0.8	5	CCB Main CR1 Failed
K	39	1	nogas	-21.004	-43.6	7789812	0.6	100	
Ti	47	1	nogas	0.026	200.0	350	25.7	2.5	
V	51	1	nogas	-17.572	-12.9	1882430	3.3	2.5	
Cr	52	1	nogas	-1.778	-7.0	88145	3.2	2.5	
Mn	55	1	nogas	0.061	58.0	33360	1.3	2.5	
Co	59	1	nogas	0.020	99.1	1557	27.6	2.5	
Ni	60	1	nogas	0.209	20.9	927	22.2	2.5	
Cu	63	1	nogas	0.015	293.7	2647	18.6	2	
Zn	66	1	nogas	0.600	14.3	1637	19.3	2.5	
As	75	1	nogas	-12.684	-4.5	210322	2.2	2.5	
Sr	88	1	nogas	0.382	8.9	11410	7.6	2.5	
Ag	107	1	nogas	0.017	45.0	557	17.3	2.5	
Cd	111	1	nogas	0.032	89.5	107	71.6	1	
Sb	121	1	nogas	1.801	22.1	23263	20.2	2.5	
Tl	205	1	nogas	0.113	62.1	3337	46.7	1	
Pb	208	1	nogas	-0.036	-74.3	4684	14.5	2.5	
U	238	1	nogas	0.114	65.8	3254	67.2	2.5	
[Pb]	206	1	nogas	-0.032	-35.2	1240	9.3	2.5	
[Pb]	207	1	nogas	-0.058	-40.4	957	17.5	2.5	
Na	23	2	He	6.831	14.1	61138	1.6	100	
Mg	24	2	He	3.616	10.1	3314	9.2	100	
Al	27	2	He	19.200	6.6	9709	6.1	5	CCB Main CR1 Failed
K	39	2	He	-13.503	-31.0	180090	2.0	100	
Ca	43	2	He	71.055	14.4	200	13.2	100	
Ca	44	2	He	57.537	2.2	5284	2.1	100	
V	51	2	He	-0.521	-18.8	22241	0.6	2.5	
Cr	52	2	He	-0.042	-96.7	4689	3.9	2.5	
Mn	55	2	He	-0.019	-144.0	2277	3.2	2.5	
Fe	56	2	He	3.107	6.5	27931	5.9	100	
Co	59	2	He	-0.003	-116.6	347	6.0	2.5	
Ni	60	2	He	0.179	21.1	240	31.5	2.5	
Cu	63	2	He	0.415	3.4	913	8.4	2	
Zn	66	2	He	0.761	12.1	480	21.9	2.5	
As	75	2	He	0.026	278.1	791	9.1	2.5	
Se	78	2	He	0.672	30.2	136	14.2	2	
B	11	1	nogas	4.318	6.4	52489	3.7	10	
Si	28	1	nogas	-35.874	-15.5	1608009	5.6	5	
Ca	43	1	nogas	66.822	12.9	3870	6.4	100	
Ca	44	1	nogas	-359.633	-1.8	229096	0.6	100	
Fe	56	1	nogas	-20.693	-33.4	2662709	4.1	100	
Se	77	1	nogas	-52.315	-16.9	69037	1.7	2.5	
Se	82	1	nogas	0.158	206.3	290	28.2	2	
Mo	95	1	nogas	0.132	171.8	3150	38.2	2.5	
Sn	118	1	nogas	0.226	26.2	2607	12.5	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.258	1.9	1067	4.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.217	6.1	5421	7.4	2.5	
P	31	1	nogas	-1.912	-45.0	80584	0.6	10	
La	139	1	nogas	85.569	17.8	370	16.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-27.213	-4753.9	20	100.0	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1296977	4.14	1359891	95.37	70	125	
Ge	72	1	nogas	3249536	1.87	3145209	103.32	70	125	
In	115	1	nogas	2798792	4.43	2761164	101.36	70	125	
Bi	209	1	nogas	2223599	3.08	2190177	101.53	70	125	
Ge	72	2	He	733533	3.03	785020	93.44	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	053_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:46:30-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	90.368	9.962	747571	0.68	100	90.4	90	110	
Na	23	1	nogas	9593.978	3.767	237573905	2.25	10000	95.9	90	110	
Mg	24	1	nogas	9547.284	3.352	149194324	1.46	10000	95.5	90	110	
Al	27	1	nogas	119.921	1.852	2275102	2.27	100	119.9	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9873.448	5.090	193108779	1.59	10000	98.7	90	110	
Ti	47	1	nogas	97.014	2.439	163023	1.21	100	97.0	90	110	
V	51	1	nogas	88.584	7.816	4136299	0.26	100	88.6	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	99.085	4.473	2156617	2.95	100	99.1	90	110	
Mn	55	1	nogas	100.306	2.333	2547094	1.96	100	100.3	90	110	
Co	59	1	nogas	97.255	2.302	2112769	1.60	100	97.3	90	110	
Ni	60	1	nogas	95.594	3.860	458860	1.30	100	95.6	90	110	
Cu	63	1	nogas	93.901	2.337	1086155	1.61	100	93.9	90	110	
Zn	66	1	nogas	97.100	2.322	367427	1.60	100	97.1	90	110	
As	75	1	nogas	89.380	5.368	664359	0.38	100	89.4	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.583	1.486	2496956	4.26	100	96.6	90	110	
Ag	107	1	nogas	96.700	2.042	1223158	2.00	100	96.7	90	110	
Cd	111	1	nogas	96.072	3.712	267828	1.14	100	96.1	90	110	
Sb	121	1	nogas	94.466	1.051	1129440	3.64	100	94.5	90	110	
Tl	205	1	nogas	96.544	5.096	1926371	3.06	100	96.5	90	110	
Pb	208	1	nogas	100.485	1.404	2588429	1.40	100	100.5	90	110	
U	238	1	nogas	99.352	3.108	2657124	5.23	100	99.4	90	110	
[Pb]	206	1	nogas	90.818	3.030	615788	1.16	100	90.8	90	110	
[Pb]	207	1	nogas	94.072	2.743	553673	0.86	100	94.1	90	110	
Na	23	2	He	9578.242	0.745	14197159	1.46	10000	95.8	90	110	
Mg	24	2	He	9508.536	2.207	7625536	1.84	10000	95.1	90	110	
Al	27	2	He	111.041	2.937	53071	2.45	100	111.0	90	110	CCV Main CR1-2 Failed
K	39	2	He	9329.340	2.402	8284814	2.35	10000	93.3	90	110	
Ca	43	2	He	8980.647	1.061	21042	1.78	10000	89.8	90	110	CCV Main CR1-2 Failed
Ca	44	2	He	9378.342	0.787	371025	0.51	10000	93.8	90	110	
V	51	2	He	92.449	1.718	547116	1.01	100	92.4	90	110	
Cr	52	2	He	95.230	1.886	588773	1.20	100	95.2	90	110	
Mn	55	2	He	93.043	0.444	408731	0.29	100	93.0	90	110	
Fe	56	2	He	9558.381	0.181	50747584	0.89	10000	95.6	90	110	
Co	59	2	He	92.916	0.430	774495	0.45	100	92.9	90	110	
Ni	60	2	He	95.727	0.981	196944	1.70	100	95.7	90	110	
Cu	63	2	He	96.187	1.838	503452	1.13	100	96.2	90	110	
Zn	66	2	He	94.123	2.979	120729	2.28	100	94.1	90	110	
As	75	2	He	92.640	0.339	118128	0.59	100	92.6	90	110	
Se	78	2	He	91.354	4.538	9428	3.78	100	91.4	90	110	
B	11	1	nogas	465.693	8.979	2276480	1.53	500	93.1	90	110	
Si	28	1	nogas	4733.570	2.114	50974519	1.73	5000	94.7	90	110	
Ca	43	1	nogas	9536.096	4.468	325862	1.11	10000	95.4	90	110	
Ca	44	1	nogas	9637.238	5.332	5718126	2.90	10000	96.4	90	110	
Fe	56	1	nogas	9813.913	5.086	213491396	1.71	10000	98.1	90	110	
Se	77	1	nogas	51.381	26.338	85118	0.74	100	51.4	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	95.239	0.974	24193	2.94	100	95.2	90	110	
Mo	95	1	nogas	97.206	2.345	509775	1.88	100	97.2	90	110	
Sn	118	1	nogas	95.603	3.005	695156	1.93	100	95.6	90	110	
Ba	137	1	nogas	97.031	3.832	368365	1.06	100	97.0	90	110	
Sb	121	2	He	93.344	0.406	410632	0.38	100	93.3	90	110	
Li	7	1	nogas	98.575	6.181	1730151	7.36	100	98.6	90	110	
P	31	1	nogas	470.188	3.669	817951	0.47	500	94.0	90	110	
La	139	1	nogas	186.390	13.941	727	16.99	100	186.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-640.567	-102.870	10	100.00	100	-640.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1164707	9.61	1359891	85.65	70	125	
Ge	72	1	nogas	3030619	3.70	3145209	96.36	70	125	
In	115	1	nogas	2703077	4.34	2761164	97.90	70	125	
Bi	209	1	nogas	2141308	2.17	2190177	97.77	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	736138	0.73	785020	93.77	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	054_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:48:28-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.043	48.6	457	41.0	1	
Na	23	1	nogas	8.160	31.2	619447	6.9	100	
Mg	24	1	nogas	5.870	27.3	97810	22.4	100	
Al	27	1	nogas	20.026	1.6	419687	1.7	5	CCB Main CR1 Failed
K	39	1	nogas	-10.580	-12.6	7782219	0.5	100	
Ti	47	1	nogas	0.112	44.7	490	17.4	2.5	
V	51	1	nogas	-17.498	-11.2	1832599	2.9	2.5	
Cr	52	1	nogas	-1.633	-4.6	88842	2.2	2.5	
Mn	55	1	nogas	0.088	21.6	33163	1.5	2.5	
Co	59	1	nogas	0.027	42.2	1673	15.0	2.5	
Ni	60	1	nogas	0.222	4.3	967	5.3	2.5	
Cu	63	1	nogas	0.012	157.2	2544	8.7	2	
Zn	66	1	nogas	0.612	9.0	1643	13.0	2.5	
As	75	1	nogas	-11.362	-8.0	210875	2.1	2.5	
Sr	88	1	nogas	0.395	1.0	11467	0.7	2.5	
Ag	107	1	nogas	0.023	53.3	623	26.1	2.5	
Cd	111	1	nogas	0.043	49.4	147	45.4	1	
Sb	121	1	nogas	1.918	21.3	24121	20.9	2.5	
Tl	205	1	nogas	0.140	68.8	3831	50.7	1	
Pb	208	1	nogas	-0.027	-156.0	4894	22.5	2.5	
U	238	1	nogas	0.141	66.3	3951	64.4	2.5	
[Pb]	206	1	nogas	-0.026	-119.4	1273	16.2	2.5	
[Pb]	207	1	nogas	-0.063	-57.6	920	22.8	2.5	
Na	23	2	He	6.332	17.8	60402	2.2	100	
Mg	24	2	He	4.097	3.9	3697	3.7	100	
Al	27	2	He	19.422	7.0	9813	6.4	5	CCB Main CR1 Failed
K	39	2	He	-15.256	-15.2	178569	1.1	100	
Ca	43	2	He	86.999	32.6	237	27.2	100	
Ca	44	2	He	55.840	0.3	5217	1.4	100	
V	51	2	He	-0.676	-10.5	21374	0.7	2.5	
Cr	52	2	He	-0.007	-674.8	4904	4.7	2.5	
Mn	55	2	He	0.021	130.1	2450	3.7	2.5	
Fe	56	2	He	3.581	3.4	30425	3.3	100	
Co	59	2	He	0.004	79.1	403	5.2	2.5	
Ni	60	2	He	0.144	8.5	170	15.6	2.5	
Cu	63	2	He	0.410	6.8	890	17.3	2	
Zn	66	2	He	0.746	3.7	463	7.6	2.5	
As	75	2	He	0.026	238.6	791	8.6	2.5	
Se	78	2	He	0.749	23.6	144	12.7	2	
B	11	1	nogas	5.665	13.8	60813	4.1	10	
Si	28	1	nogas	-33.448	-15.6	1589172	3.1	5	
Ca	43	1	nogas	74.227	6.8	4030	4.3	100	
Ca	44	1	nogas	-348.767	-0.5	229086	0.7	100	
Fe	56	1	nogas	-18.613	-20.5	2637835	2.9	100	
Se	77	1	nogas	-47.999	-14.2	68061	2.3	2.5	
Se	82	1	nogas	0.184	165.8	290	27.6	2	
Mo	95	1	nogas	0.138	121.0	3107	28.9	2.5	
Sn	118	1	nogas	0.214	14.3	2577	9.2	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.255	11.0	1073	7.8	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.376	1.7	6118	2.9	2.5	
P	31	1	nogas	-0.298	-148.5	81036	1.0	10	
La	139	1	nogas	98.010	16.0	427	17.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-442.743	-224.9	13	114.6	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1320998	3.17	1359891	97.14	70	125	
Ge	72	1	nogas	3160184	0.43	3145209	100.48	70	125	
In	115	1	nogas	2855874	3.49	2761164	103.43	70	125	
Bi	209	1	nogas	2212615	0.95	2190177	101.02	70	125	
Ge	72	2	He	733334	1.27	785020	93.42	70	125	

Sample Report

Sample Table

Sample Name	HS18120642-01
Data File Name	059SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T13:58:22-06:00
Sample Type	Sample
Dilution	100
Comment	Diss135805Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.004	0.415	89.49	93	0.00	2000	
Na	23	1	nogas	7044.953	704495.285	1.10	179608662	0.00	200000	
Mg	24	1	nogas	1951.672	195167.208	2.25	31379641	0.01	200000	
Al	27	1	nogas	0.865	86.513	11.92	44372	0.00	2000	
K	39	1	nogas	94.794	9479.389	19.46	9724294	0.00	200000	
Ti	47	1	nogas	0.090	8.977	17.71	447	0.02	2000	
V	51	1	nogas	-2.742	-274.238	-81.13	2151190	0.00	2000	
Cr	52	1	nogas	-1.234	-123.385	-6.02	96232	0.00	2000	
Mn	55	1	nogas	101.766	10176.635	2.67	2664236	0.00	2000	
Co	59	1	nogas	0.218	21.798	3.76	5931	0.00	2000	
Ni	60	1	nogas	0.305	30.544	8.37	1367	0.02	2000	
Cu	63	1	nogas	0.031	3.111	50.51	2744	0.00	2000	
Zn	66	1	nogas	0.754	75.423	7.56	2177	0.03	2000	
As	75	1	nogas	-7.418	-741.828	-17.07	226911	0.00	2000	
Sr	88	1	nogas	98.205	9820.520	2.28	2615715	0.00	2000	
Ag	107	1	nogas	-0.016	-1.635	-23.50	97	-0.02	2000	
Cd	111	1	nogas	-0.001	-0.145	-340.50	13	-0.01	2000	
Sb	121	1	nogas	0.148	14.837	2.05	2047	0.01	2000	
Tl	205	1	nogas	-0.023	-2.287	-21.51	493	0.00	2000	
Pb	208	1	nogas	-0.127	-12.671	-11.04	2343	-0.01	2000	
U	238	1	nogas	0.003	0.272	39.56	140	0.00	2000	
[Pb]	206	1	nogas	-0.125	-12.474	-5.62	593	-0.02	2000	
[Pb]	207	1	nogas	-0.134	-13.444	-11.91	490	-0.03	2000	
Na	23	2	He	7303.520	730352.015	4.77	11003604	0.07	200000	
Mg	24	2	He	2072.802	207280.209	5.77	1688192	0.12	200000	
Al	27	2	He	0.657	65.719	15.97	1013	0.06	2000	
K	39	2	He	71.266	7126.583	1.95	253625	0.03	200000	
Ca	43	2	He	2827.741	282774.131	1.74	6751	41.88	200000	
Ca	44	2	He	2739.929	273992.880	2.22	112259	2.44	200000	
V	51	2	He	-0.131	-13.053	-38.71	24915	0.00	2000	
Cr	52	2	He	-0.049	-4.883	-57.78	4741	0.00	2000	
Mn	55	2	He	92.938	9293.833	0.73	414588	0.02	2000	
Fe	56	2	He	1014.583	101458.288	1.70	5480277	0.02	200000	
Co	59	2	He	0.198	19.843	11.88	2057	0.01	2000	
Ni	60	2	He	0.246	24.641	15.74	387	0.06	2000	
Cu	63	2	He	0.422	42.229	5.49	970	0.04	2000	
Zn	66	2	He	0.895	89.451	4.84	667	0.13	2000	
As	75	2	He	0.289	28.890	17.48	1146	0.03	2000	
Se	78	2	He	0.569	56.867	41.80	128	0.44	2000	
B	11	1	nogas	1.161	116.127	41.28	36234	0.00	2000	
Si	28	1	nogas	265.282	26528.184	5.77	4761776	0.01	2000	
Ca	43	1	nogas	2671.793	267179.282	2.24	95146	2.81	200000	
Ca	44	1	nogas	2433.171	243317.073	1.36	1806144	0.13	200000	
Fe	56	1	nogas	1009.516	100951.585	1.52	25358964	0.00	200000	

Sample Report

Se	77	1	nogas	-16.914	-1691.373	-51.32	73635	-0.02	2000	
Se	82	1	nogas	-0.228	-22.767	-118.92	180	-0.13	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	-0.197	-19.664	-31.70	1267	-0.02	2000	
Sn	118	1	nogas	-0.026	-2.625	-73.30	727	0.00	2000	
Ba	137	1	nogas	4.831	483.078	3.17	19311	0.03	2000	
Sb	121	2	He	0.128	12.791	15.96	660	0.02	2000	
La	139	1	nogas	24.698	2469.787	26.98	143	17.23	2000	
Au	197	1	nogas	152.529	15252.922	1020.68	23	653.70	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1330818	6.46	1359891	97.86	70	125	
Ge	72	1	nogas	3122756	3.20	3145209	99.29	70	125	
In	115	1	nogas	2838496	4.35	2761164	102.80	70	125	
Bi	209	1	nogas	2239982	3.82	2190177	102.27	70	125	
Ge	72	2	He	747524	0.47	785020	95.22	70	125	

Sample Report

Sample Table

Sample Name	HS18120642-02
Data File Name	060SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:00:20-06:00
Sample Type	Sample
Dilution	50
Comment	Diss135805Mn
ISTD Ref FileName	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.005	0.248	28.42	100	0.00	2000	
Na	23	1	nogas	14439.619	721980.955	5.53	352420050	0.00	200000	
Mg	24	1	nogas	10238.422	511921.092	5.81	157761220	0.01	200000	
Al	27	1	nogas	1.296	64.808	2.52	53583	0.00	2000	
K	39	1	nogas	36.791	1839.537	22.82	8743892	0.00	200000	
Ti	47	1	nogas	0.143	7.130	7.45	547	0.03	2000	
V	51	1	nogas	-16.831	-841.537	-11.88	1854967	0.00	2000	
Cr	52	1	nogas	-1.655	-82.761	-9.12	88684	0.00	2000	
Mn	55	1	nogas	160.342	8017.117	2.68	4245208	0.00	2000	
Co	59	1	nogas	0.172	8.584	8.80	4974	0.00	2000	
Ni	60	1	nogas	0.420	21.024	2.12	1970	0.02	2000	
Cu	63	1	nogas	0.000	0.023	3036.34	2417	0.00	2000	
Zn	66	1	nogas	0.563	28.150	2.82	1457	0.04	2000	
As	75	1	nogas	-12.894	-644.700	-8.22	204291	-0.01	2000	
Sr	88	1	nogas	265.872	13293.588	2.67	7192106	0.00	2000	
Ag	107	1	nogas	-0.010	-0.510	-46.54	180	-0.01	2000	
Cd	111	1	nogas	-0.001	-0.067	-388.23	13	-0.01	2000	
Sb	121	1	nogas	0.118	5.905	4.75	1700	0.01	2000	
Tl	205	1	nogas	-0.023	-1.137	-14.93	470	0.00	2000	
Pb	208	1	nogas	-0.137	-6.835	-0.59	2087	-0.01	2000	
U	238	1	nogas	0.008	0.405	39.67	277	0.00	2000	
[Pb]	206	1	nogas	-0.135	-6.755	-5.57	493	-0.03	2000	
[Pb]	207	1	nogas	-0.131	-6.550	-8.48	487	-0.03	2000	
Na	23	2	He	14271.268	713563.415	0.68	21296381	0.07	200000	
Mg	24	2	He	9971.124	498556.203	1.92	8060093	0.12	200000	
Al	27	2	He	1.355	67.738	35.21	1337	0.10	2000	
K	39	2	He	28.539	1426.935	1.29	216560	0.01	200000	
Ca	43	2	He	12201.470	610073.519	3.89	28796	42.37	200000	
Ca	44	2	He	12027.979	601398.974	2.46	478727	2.51	200000	
V	51	2	He	-0.822	-41.101	-6.33	20800	0.00	2000	
Cr	52	2	He	-0.064	-3.211	-126.25	4607	0.00	2000	
Mn	55	2	He	158.228	7911.378	1.53	698927	0.02	2000	
Fe	56	2	He	1175.224	58761.205	1.59	6299125	0.02	200000	
Co	59	2	He	0.155	7.743	9.94	1677	0.01	2000	
Ni	60	2	He	0.309	15.449	6.89	513	0.06	2000	
Cu	63	2	He	0.378	18.918	3.35	730	0.05	2000	
Zn	66	2	He	0.662	33.098	3.72	360	0.18	2000	
As	75	2	He	-0.044	-2.221	-177.86	711	-0.01	2000	
Se	78	2	He	0.392	19.614	60.65	109	0.36	2000	
B	11	1	nogas	3.440	171.981	25.29	47295	0.01	2000	
Si	28	1	nogas	466.231	23311.534	0.79	7024170	0.01	2000	
Ca	43	1	nogas	11573.039	578651.971	2.65	414054	2.80	200000	
Ca	44	1	nogas	11594.337	579716.851	3.34	7119709	0.16	200000	
Fe	56	1	nogas	1134.837	56741.838	3.30	28581089	0.00	200000	
Se	77	1	nogas	-56.985	-2849.253	-9.37	66431	-0.09	2000	
Se	82	1	nogas	0.169	8.438	176.33	287	0.06	2000	

Sample Report

Mo	95	1	nogas	-0.194	-9.705	-6.78	1307	-0.01	2000	
Sn	118	1	nogas	-0.007	-0.355	-207.17	867	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	6.981	349.047	3.60	27636	0.03	2000	
Sb	121	2	He	0.125	6.247	24.41	643	0.02	2000	
La	139	1	nogas	48.936	2446.776	22.65	233	20.97	2000	
Au	197	1	nogas	-636.097	-31804.866	-105.73	10	-6360.97	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1290408	7.09	1359891	94.89	70	125	
Ge	72	1	nogas	3172573	1.34	3145209	100.87	70	125	
In	115	1	nogas	2811349	1.41	2761164	101.82	70	125	
Bi	209	1	nogas	2128270	1.00	2190177	97.17	70	125	
Ge	72	2	He	742064	1.29	785020	94.53	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	065_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:10:18-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	84.030	2.983	747275	0.89	100	84.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	9718.500	6.889	241232972	3.35	10000	97.2	90	110	
Mg	24	1	nogas	9486.793	5.035	148666299	0.20	10000	94.9	90	110	
Al	27	1	nogas	111.770	2.280	2181116	1.59	100	111.8	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9672.968	0.905	194755579	0.46	10000	96.7	90	110	
Ti	47	1	nogas	93.669	0.797	161834	1.70	100	93.7	90	110	
V	51	1	nogas	86.759	4.931	4211268	2.02	100	86.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	96.546	2.836	2164102	3.60	100	96.5	90	110	
Mn	55	1	nogas	100.714	3.108	2628924	3.46	100	100.7	90	110	
Co	59	1	nogas	97.628	0.888	2180229	1.28	100	97.6	90	110	
Ni	60	1	nogas	94.674	0.744	467342	1.65	100	94.7	90	110	
Cu	63	1	nogas	93.612	0.465	1113153	1.39	100	93.6	90	110	
Zn	66	1	nogas	96.061	0.900	373651	0.82	100	96.1	90	110	
As	75	1	nogas	86.737	2.376	670605	0.56	100	86.7	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.629	0.720	2566521	1.45	100	96.6	90	110	
Ag	107	1	nogas	99.873	3.595	1298716	4.27	100	99.9	90	110	
Cd	111	1	nogas	94.779	1.881	270017	1.38	100	94.8	90	110	
Sb	121	1	nogas	93.547	1.738	1149140	1.66	100	93.5	90	110	
Tl	205	1	nogas	90.605	1.718	1882106	3.13	100	90.6	90	110	
Pb	208	1	nogas	101.662	2.801	2618675	2.79	100	101.7	90	110	
U	238	1	nogas	99.708	2.569	2772504	3.01	100	99.7	90	110	
[Pb]	206	1	nogas	88.164	1.064	622059	1.54	100	88.2	90	110	CCV Main CR1-2 Failed
[Pb]	207	1	nogas	90.351	1.226	553360	1.73	100	90.4	90	110	
Na	23	2	He	9678.006	0.923	14225419	1.52	10000	96.8	90	110	
Mg	24	2	He	9682.787	1.259	7700863	0.46	10000	96.8	90	110	
Al	27	2	He	115.023	2.521	54489	1.22	100	115.0	90	110	CCV Main CR1-2 Failed
K	39	2	He	9402.050	1.601	8347889	1.56	10000	94.0	90	110	
Ca	43	2	He	9448.418	0.457	21953	1.71	10000	94.5	90	110	
Ca	44	2	He	9395.441	1.469	368594	0.58	10000	94.0	90	110	
V	51	2	He	93.613	1.116	549110	0.80	100	93.6	90	110	
Cr	52	2	He	95.528	1.579	585756	1.81	100	95.5	90	110	
Mn	55	2	He	94.844	2.185	413157	2.41	100	94.8	90	110	
Fe	56	2	He	9712.651	2.126	51132256	1.26	10000	97.1	90	110	
Co	59	2	He	94.268	1.256	779197	0.31	100	94.3	90	110	
Ni	60	2	He	97.527	2.499	198954	1.81	100	97.5	90	110	
Cu	63	2	He	97.719	2.490	507224	1.64	100	97.7	90	110	
Zn	66	2	He	95.237	1.444	121158	0.70	100	95.2	90	110	
As	75	2	He	93.352	1.473	118033	0.34	100	93.4	90	110	
Se	78	2	He	90.869	3.548	9300	2.12	100	90.9	90	110	
B	11	1	nogas	437.566	5.335	2298706	3.21	500	87.5	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4671.641	0.437	51739239	1.34	5000	93.4	90	110	
Ca	43	1	nogas	9428.537	1.984	331375	1.67	10000	94.3	90	110	
Ca	44	1	nogas	9088.714	2.844	5569923	2.62	10000	90.9	90	110	
Fe	56	1	nogas	9642.451	1.451	215844896	2.31	10000	96.4	90	110	
Se	77	1	nogas	45.031	23.558	86203	1.97	100	45.0	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.429	3.075	24393	3.12	100	93.4	90	110	
Mo	95	1	nogas	94.456	0.962	509287	1.72	100	94.5	90	110	
Sn	118	1	nogas	91.618	1.203	680731	1.74	100	91.6	90	110	
Ba	137	1	nogas	96.287	4.067	373403	1.32	100	96.3	90	110	
Sb	121	2	He	94.704	2.273	413182	2.65	100	94.7	90	110	
Li	7	1	nogas	95.337	4.565	1794920	2.40	100	95.3	90	110	
P	31	1	nogas	456.604	0.863	819121	1.60	500	91.3	90	110	
La	139	1	nogas	181.158	11.806	720	11.37	100	181.2	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	833.064	111.744	33	45.83	100	833.1	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1244588	2.12	1359891	91.52	70	125	
Ge	72	1	nogas	3113742	0.92	3145209	99.00	70	125	
In	115	1	nogas	2760370	2.91	2761164	99.97	70	125	
Bi	209	1	nogas	2227461	2.33	2190177	101.70	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	730077	1.55	785020	93.00	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	066_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:12:17-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.039	37.2	443	29.0	1	
Na	23	1	nogas	10.866	13.4	670765	5.3	100	
Mg	24	1	nogas	6.202	18.3	100961	17.3	100	
Al	27	1	nogas	19.828	1.3	424873	2.4	5	CCB Main CR1 Failed
K	39	1	nogas	-14.951	-45.9	7862592	0.7	100	
Ti	47	1	nogas	0.087	54.6	457	17.6	2.5	
V	51	1	nogas	-21.480	-5.6	1777174	2.8	2.5	
Cr	52	1	nogas	-1.796	-3.1	87190	1.4	2.5	
Mn	55	1	nogas	0.060	30.3	33150	0.7	2.5	
Co	59	1	nogas	0.033	55.4	1857	21.8	2.5	
Ni	60	1	nogas	0.237	20.4	1063	22.1	2.5	
Cu	63	1	nogas	0.020	48.5	2694	3.2	2	
Zn	66	1	nogas	0.581	6.6	1553	8.7	2.5	
As	75	1	nogas	-13.362	-4.7	205660	1.7	2.5	
Sr	88	1	nogas	0.387	3.5	11490	3.7	2.5	
Ag	107	1	nogas	0.028	30.6	703	15.7	2.5	
Cd	111	1	nogas	0.049	23.0	157	18.4	1	
Sb	121	1	nogas	1.657	21.7	21290	20.3	2.5	
Tl	205	1	nogas	0.129	66.5	3727	46.5	1	
Pb	208	1	nogas	-0.044	-76.8	4474	19.4	2.5	
U	238	1	nogas	0.116	60.2	3351	56.7	2.5	
[Pb]	206	1	nogas	-0.055	-32.8	1107	11.2	2.5	
[Pb]	207	1	nogas	-0.062	-61.6	953	22.4	2.5	
Na	23	2	He	6.386	19.8	61563	2.1	100	
Mg	24	2	He	4.313	4.6	3940	5.3	100	
Al	27	2	He	20.018	3.4	10273	2.7	5	CCB Main CR1 Failed
K	39	2	He	-11.824	-18.0	181546	1.0	100	
Ca	43	2	He	91.911	40.7	253	35.8	100	
Ca	44	2	He	48.128	5.0	5004	2.2	100	
V	51	2	He	-0.802	-4.2	21038	0.6	2.5	
Cr	52	2	He	-0.093	-16.4	4457	1.0	2.5	
Mn	55	2	He	-0.055	-65.4	2157	6.9	2.5	
Fe	56	2	He	3.633	11.3	31237	6.7	100	
Co	59	2	He	0.004	132.8	413	12.2	2.5	
Ni	60	2	He	0.178	14.7	243	23.7	2.5	
Cu	63	2	He	0.433	1.2	1027	3.7	2	
Zn	66	2	He	0.775	6.7	510	14.1	2.5	
As	75	2	He	0.055	69.6	843	6.4	2.5	
Se	78	2	He	0.731	22.2	145	11.2	2	
B	11	1	nogas	3.822	23.2	53324	5.8	10	
Si	28	1	nogas	-40.245	-30.6	1547600	7.6	5	
Ca	43	1	nogas	68.120	13.8	3894	7.5	100	
Ca	44	1	nogas	-376.219	-1.5	217915	0.6	100	
Fe	56	1	nogas	-19.758	-29.7	2668004	3.8	100	
Se	77	1	nogas	-60.697	-5.8	66826	1.6	2.5	
Se	82	1	nogas	0.111	8.6	277	2.1	2	
Mo	95	1	nogas	0.142	120.1	3194	28.5	2.5	
Sn	118	1	nogas	0.226	36.8	2577	24.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.286	20.3	1157	19.8	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.048	6.0	4764	6.3	2.5	
P	31	1	nogas	0.875	99.8	84752	0.8	10	
La	139	1	nogas	80.810	23.2	347	22.0	2.5	CCB Main CR1 Failed
Au	197	1	nogas	576.966	109.1	30	33.3	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1391875	4.52	1359891	102.35	70	125	
Ge	72	1	nogas	3228810	1.21	3145209	102.66	70	125	
In	115	1	nogas	2749225	2.08	2761164	99.57	70	125	
Bi	209	1	nogas	2289745	3.47	2190177	104.55	70	125	
Ge	72	2	He	746487	1.15	785020	95.09	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	070_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:20:17-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	80.564	2.167	752794	2.03	100	80.6	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	9714.897	4.961	236686914	2.88	10000	97.1	90	110	
Mg	24	1	nogas	9640.629	2.894	148266416	0.30	10000	96.4	90	110	
Al	27	1	nogas	112.601	2.304	2225662	2.10	100	112.6	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9403.085	1.183	191997288	1.30	10000	94.0	90	110	
Ti	47	1	nogas	92.590	3.648	162026	3.56	100	92.6	90	110	
V	51	1	nogas	80.346	0.517	4116000	0.47	100	80.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	93.742	3.282	2131691	3.35	100	93.7	90	110	
Mn	55	1	nogas	99.328	0.944	2626399	0.56	100	99.3	90	110	
Co	59	1	nogas	95.818	0.646	2167381	0.34	100	95.8	90	110	
Ni	60	1	nogas	92.440	1.729	462169	1.60	100	92.4	90	110	
Cu	63	1	nogas	90.086	1.177	1085073	0.80	100	90.1	90	110	
Zn	66	1	nogas	92.984	0.366	366334	0.63	100	93.0	90	110	
As	75	1	nogas	84.341	1.186	667880	1.08	100	84.3	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	96.137	3.476	2586363	3.52	100	96.1	90	110	
Ag	107	1	nogas	94.903	2.712	1249808	2.59	100	94.9	90	110	
Cd	111	1	nogas	92.505	1.356	274151	3.29	100	92.5	90	110	
Sb	121	1	nogas	91.000	1.547	1132366	1.92	100	91.0	90	110	
Tl	205	1	nogas	100.910	0.449	1981863	2.53	100	100.9	90	110	
Pb	208	1	nogas	98.472	1.531	2536672	1.53	100	98.5	90	110	
U	238	1	nogas	100.679	0.931	2647304	2.52	100	100.7	90	110	
[Pb]	206	1	nogas	93.253	1.744	621983	0.84	100	93.3	90	110	
[Pb]	207	1	nogas	93.192	0.878	539636	1.42	100	93.2	90	110	
Na	23	2	He	9667.026	1.478	14308121	1.56	10000	96.7	90	110	
Mg	24	2	He	9758.610	1.904	7817162	3.00	10000	97.6	90	110	
Al	27	2	He	109.756	1.745	52406	2.85	100	109.8	90	110	
K	39	2	He	9292.220	1.049	8252613	1.02	10000	92.9	90	110	
Ca	43	2	He	9503.449	2.367	22230	1.22	10000	95.0	90	110	
Ca	44	2	He	9426.638	2.543	372367	1.58	10000	94.3	90	110	
V	51	2	He	93.157	2.020	550333	0.82	100	93.2	90	110	
Cr	52	2	He	94.328	1.652	582440	0.50	100	94.3	90	110	
Mn	55	2	He	93.871	0.984	411786	1.01	100	93.9	90	110	
Fe	56	2	He	9567.227	2.513	50720341	2.04	10000	95.7	90	110	
Co	59	2	He	93.193	0.974	775730	0.63	100	93.2	90	110	
Ni	60	2	He	96.856	1.983	198977	1.61	100	96.9	90	110	
Cu	63	2	He	96.255	2.054	503204	2.64	100	96.3	90	110	
Zn	66	2	He	94.657	1.738	121285	2.78	100	94.7	90	110	
As	75	2	He	92.483	1.913	117758	1.02	100	92.5	90	110	
Se	78	2	He	91.203	1.732	9401	1.37	100	91.2	90	110	
B	11	1	nogas	412.178	2.969	2277104	1.12	500	82.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4567.310	1.793	51276331	1.36	5000	91.3	90	110	
Ca	43	1	nogas	9087.777	1.291	323596	1.52	10000	90.9	90	110	
Ca	44	1	nogas	8582.125	0.448	5351323	0.27	10000	85.8	90	110	CCV Main CR1-2 Failed
Fe	56	1	nogas	9623.248	2.423	218189247	2.61	10000	96.2	90	110	
Se	77	1	nogas	39.883	22.838	86247	1.86	100	39.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	91.485	3.283	24200	3.37	100	91.5	90	110	
Mo	95	1	nogas	94.326	1.851	515121	1.70	100	94.3	90	110	
Sn	118	1	nogas	89.591	2.164	692288	2.82	100	89.6	90	110	CCV Main CR1-2 Failed
Ba	137	1	nogas	92.430	3.651	372780	1.13	100	92.4	90	110	
Sb	121	2	He	94.228	2.753	413889	1.76	100	94.2	90	110	
Li	7	1	nogas	93.017	0.539	1843280	2.17	100	93.0	90	110	
P	31	1	nogas	453.830	1.181	825104	0.98	500	90.8	90	110	
La	139	1	nogas	170.533	21.702	710	22.67	100	170.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-172.412	-221.503	17	34.64	100	-172.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1307344	1.83	1359891	96.14	70	125	
Ge	72	1	nogas	3153911	0.38	3145209	100.28	70	125	
In	115	1	nogas	2871676	4.53	2761164	104.00	70	125	
Bi	209	1	nogas	2106084	2.09	2190177	96.16	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	735155	1.17	785020	93.65	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	071_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T14:22:16-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.043	26.3	467	23.7	1	
Na	23	1	nogas	8.090	18.8	623864	4.8	100	
Mg	24	1	nogas	6.083	22.4	102329	19.3	100	
Al	27	1	nogas	20.074	5.9	422190	1.3	5	CCB Main CR1 Failed
K	39	1	nogas	-6.602	-328.0	7889992	0.4	100	
Ti	47	1	nogas	0.082	99.2	437	28.3	2.5	
V	51	1	nogas	-19.277	-20.8	1798084	2.8	2.5	
Cr	52	1	nogas	-1.629	-9.3	89320	1.5	2.5	
Mn	55	1	nogas	0.068	179.1	32736	4.9	2.5	
Co	59	1	nogas	0.032	60.4	1787	19.6	2.5	
Ni	60	1	nogas	0.208	1.7	903	5.5	2.5	
Cu	63	1	nogas	0.017	178.7	2614	11.3	2	
Zn	66	1	nogas	0.576	8.4	1503	7.7	2.5	
As	75	1	nogas	-11.229	-22.7	212323	2.7	2.5	
Sr	88	1	nogas	0.391	18.6	11337	12.2	2.5	
Ag	107	1	nogas	0.025	61.0	643	27.4	2.5	
Cd	111	1	nogas	0.047	64.7	160	60.3	1	
Sb	121	1	nogas	1.710	27.0	21514	22.7	2.5	
Tl	205	1	nogas	0.138	67.0	3814	49.0	1	
Pb	208	1	nogas	-0.052	-35.5	4260	11.2	2.5	
U	238	1	nogas	0.128	64.2	3597	61.8	2.5	
[Pb]	206	1	nogas	-0.045	-51.0	1143	12.8	2.5	
[Pb]	207	1	nogas	-0.065	-51.2	910	23.2	2.5	
Na	23	2	He	6.399	18.0	60894	2.4	100	
Mg	24	2	He	4.420	4.8	3980	3.9	100	
Al	27	2	He	20.254	5.7	10266	4.1	5	CCB Main CR1 Failed
K	39	2	He	-11.944	-15.9	181442	0.9	100	
Ca	43	2	He	94.450	39.7	257	35.4	100	
Ca	44	2	He	42.765	8.2	4737	3.7	100	
V	51	2	He	-0.695	-9.2	21404	0.7	2.5	
Cr	52	2	He	-0.078	-43.0	4504	5.3	2.5	
Mn	55	2	He	-0.098	-15.3	1947	2.6	2.5	
Fe	56	2	He	3.790	3.9	31734	3.4	100	
Co	59	2	He	0.006	145.6	420	16.5	2.5	
Ni	60	2	He	0.194	19.5	273	29.6	2.5	
Cu	63	2	He	0.430	3.8	1000	7.8	2	
Zn	66	2	He	0.757	11.9	480	24.0	2.5	
As	75	2	He	0.027	212.6	798	8.1	2.5	
Se	78	2	He	0.611	32.5	131	15.3	2	
B	11	1	nogas	4.695	11.8	56504	5.2	10	
Si	28	1	nogas	-29.824	-33.1	1634119	1.6	5	
Ca	43	1	nogas	66.223	25.2	3747	10.8	100	
Ca	44	1	nogas	-379.380	-4.5	212348	0.6	100	
Fe	56	1	nogas	-19.939	-42.5	2616656	2.4	100	
Se	77	1	nogas	-46.556	-47.4	68619	4.2	2.5	
Se	82	1	nogas	-0.093	-270.2	217	27.0	2	
Mo	95	1	nogas	0.001	10528.5	2360	24.5	2.5	
Sn	118	1	nogas	0.216	27.3	2627	19.9	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.249	12.6	1063	14.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	1.166	6.6	5231	7.6	2.5	
P	31	1	nogas	1.432	175.6	84207	0.2	10	
La	139	1	nogas	67.892	13.9	313	14.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-438.731	-229.4	13	114.6	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1343762	1.49	1359891	98.81	70	125	
Ge	72	1	nogas	3177961	5.10	3145209	101.04	70	125	
In	115	1	nogas	2885254	2.71	2761164	104.49	70	125	
Bi	209	1	nogas	2222796	1.44	2190177	101.49	70	125	
Ge	72	2	He	738075	1.27	785020	94.02	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	083_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:00:51-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.062	13.3	667	10.6	1	
Na	23	1	nogas	29.264	8.1	1122579	3.9	100	
Mg	24	1	nogas	9.489	16.7	151945	14.8	100	
Al	27	1	nogas	20.159	1.3	421847	1.9	5	CCB Main CR1 Failed
K	39	1	nogas	12.688	126.2	8225653	0.8	100	
Ti	47	1	nogas	0.079	12.5	433	3.5	2.5	
V	51	1	nogas	-31.887	-3.8	1494711	4.6	2.5	
Cr	52	1	nogas	-2.062	-4.0	79556	2.5	2.5	
Mn	55	1	nogas	0.190	39.9	35775	2.3	2.5	
Co	59	1	nogas	0.061	16.7	2444	6.9	2.5	
Ni	60	1	nogas	0.312	14.3	1413	12.8	2.5	
Cu	63	1	nogas	0.079	24.9	3347	5.8	2	
Zn	66	1	nogas	0.618	11.1	1663	13.2	2.5	
As	75	1	nogas	-17.069	-5.2	183322	1.5	2.5	
Sr	88	1	nogas	0.441	5.3	12671	2.2	2.5	
Ag	107	1	nogas	0.042	29.6	863	15.8	2.5	
Cd	111	1	nogas	0.068	65.8	210	60.8	1	
Sb	121	1	nogas	0.137	10.0	1927	6.4	2.5	
Tl	205	1	nogas	0.605	65.1	13157	61.9	1	
Pb	208	1	nogas	-0.014	-271.3	5230	19.2	2.5	
U	238	1	nogas	0.151	47.9	4161	48.6	2.5	
[Pb]	206	1	nogas	-0.020	-170.2	1287	19.1	2.5	
[Pb]	207	1	nogas	-0.023	-253.8	1137	31.3	2.5	
Na	23	2	He	22.508	6.4	85383	1.5	100	
Mg	24	2	He	7.584	2.9	6575	2.8	100	
Al	27	2	He	20.943	3.8	10680	4.7	5	CCB Main CR1 Failed
K	39	2	He	-0.969	-121.0	190963	0.5	100	
Ca	43	2	He	85.578	19.9	237	16.0	100	
Ca	44	2	He	49.281	6.5	5031	2.4	100	
V	51	2	He	-1.386	-2.5	17631	1.9	2.5	
Cr	52	2	He	-0.004	-703.5	4994	3.5	2.5	
Mn	55	2	He	0.063	59.0	2670	5.0	2.5	
Fe	56	2	He	6.469	9.8	46312	6.3	100	
Co	59	2	He	0.039	33.2	703	15.7	2.5	
Ni	60	2	He	0.222	12.3	333	16.5	2.5	
Cu	63	2	He	0.443	4.4	1073	10.0	2	
Zn	66	2	He	0.738	8.7	460	19.0	2.5	
As	75	2	He	-0.050	-52.6	707	5.9	2.5	
Se	78	2	He	0.685	19.4	139	8.8	2	
B	11	1	nogas	5.836	16.4	64883	7.2	10	
Si	28	1	nogas	-29.597	-22.2	1628314	1.6	5	
Ca	43	1	nogas	70.202	14.5	3877	6.1	100	
Ca	44	1	nogas	-445.331	-2.2	173334	0.4	100	
Fe	56	1	nogas	-25.754	-29.0	2472802	3.8	100	
Se	77	1	nogas	-92.997	-5.9	58594	2.2	2.5	
Se	82	1	nogas	-0.040	-413.7	230	15.7	2	
Mo	95	1	nogas	0.106	179.4	2914	31.8	2.5	
Sn	118	1	nogas	0.282	26.7	2970	19.6	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.286	2.5	1150	4.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.097	3.0	520	1.9	2.5	
P	31	1	nogas	3.794	53.6	87618	0.9	10	
La	139	1	nogas	75.823	24.1	327	23.0	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-414.995	-97.2	13	43.3	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1387049	1.70	1359891	102.00	70	125	
Ge	72	1	nogas	3157720	3.12	3145209	100.40	70	125	
In	115	1	nogas	2734738	2.44	2761164	99.04	70	125	
Bi	209	1	nogas	2159308	1.77	2190177	98.59	70	125	
Ge	72	2	He	743688	1.13	785020	94.73	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	084_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:05:07-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	87.005	2.572	788394	0.81	100	87.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10296.773	2.910	246228039	1.10	10000	103.0	90	110	
Mg	24	1	nogas	10191.867	3.440	153829612	2.56	10000	101.9	90	110	
Al	27	1	nogas	105.822	2.917	2002895	2.86	100	105.8	90	110	
K	39	1	nogas	10155.845	1.701	197801621	2.14	10000	101.6	90	110	
Ti	47	1	nogas	99.853	0.541	167185	2.08	100	99.9	90	110	
V	51	1	nogas	89.502	1.209	4143023	1.38	100	89.5	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.068	1.068	2169045	0.89	100	100.1	90	110	
Mn	55	1	nogas	103.134	1.587	2608311	2.31	100	103.1	90	110	
Co	59	1	nogas	103.791	4.936	2245161	3.36	100	103.8	90	110	
Ni	60	1	nogas	100.669	1.517	481547	0.88	100	100.7	90	110	
Cu	63	1	nogas	97.030	1.734	1118259	2.98	100	97.0	90	110	
Zn	66	1	nogas	98.709	0.799	372121	0.94	100	98.7	90	110	
As	75	1	nogas	94.568	1.778	685814	1.97	100	94.6	90	110	
Sr	88	1	nogas	100.231	1.806	2580061	2.39	100	100.2	90	110	
Ag	107	1	nogas	102.514	1.086	1291949	2.74	100	102.5	90	110	
Cd	111	1	nogas	96.592	2.501	272319	2.04	100	96.6	90	110	
Sb	121	1	nogas	98.042	2.093	1167213	2.20	100	98.0	90	110	
Tl	205	1	nogas	93.424	4.118	1921521	1.37	100	93.4	90	110	
Pb	208	1	nogas	101.230	0.944	2607582	0.94	100	101.2	90	110	
U	238	1	nogas	99.630	4.033	2743538	1.56	100	99.6	90	110	
[Pb]	206	1	nogas	90.731	4.667	633819	0.55	100	90.7	90	110	
[Pb]	207	1	nogas	93.241	5.895	565175	1.60	100	93.2	90	110	
Na	23	2	He	9924.085	2.070	14715864	0.86	10000	99.2	90	110	
Mg	24	2	He	9966.378	2.759	7997483	1.70	10000	99.7	90	110	
Al	27	2	He	99.103	2.451	47470	1.18	100	99.1	90	110	
K	39	2	He	9765.013	2.729	8662752	2.67	10000	97.7	90	110	
Ca	43	2	He	9603.067	0.264	22514	1.38	10000	96.0	90	110	
Ca	44	2	He	9655.031	2.478	382114	1.63	10000	96.6	90	110	
V	51	2	He	96.015	0.378	567727	1.63	100	96.0	90	110	
Cr	52	2	He	96.700	0.510	598260	0.76	100	96.7	90	110	
Mn	55	2	He	98.304	1.621	432010	1.51	100	98.3	90	110	
Fe	56	2	He	9988.294	2.063	53060028	0.98	10000	99.9	90	110	
Co	59	2	He	96.671	1.323	806305	0.18	100	96.7	90	110	
Ni	60	2	He	100.002	2.173	205854	1.11	100	100.0	90	110	
Cu	63	2	He	98.261	1.807	514685	0.58	100	98.3	90	110	
Zn	66	2	He	98.198	1.292	126078	0.77	100	98.2	90	110	
As	75	2	He	94.497	1.441	120559	0.64	100	94.5	90	110	
Se	78	2	He	96.980	2.171	10013	1.63	100	97.0	90	110	
B	11	1	nogas	450.809	2.865	2414011	3.71	500	90.2	90	110	
Si	28	1	nogas	4893.989	1.882	52433873	1.19	5000	97.9	90	110	
Ca	43	1	nogas	9823.491	0.859	334599	2.17	10000	98.2	90	110	
Ca	44	1	nogas	9456.412	1.025	5599707	0.69	10000	94.6	90	110	
Fe	56	1	nogas	10091.338	2.819	218752097	2.55	10000	100.9	90	110	
Se	77	1	nogas	79.226	4.945	90376	1.52	100	79.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	96.442	5.038	24394	4.81	100	96.4	90	110	
Mo	95	1	nogas	99.697	1.940	520942	3.52	100	99.7	90	110	
Sn	118	1	nogas	95.477	2.127	701880	1.08	100	95.5	90	110	
Ba	137	1	nogas	99.459	1.676	381903	2.08	100	99.5	90	110	
Sb	121	2	He	97.420	2.372	428802	1.19	100	97.4	90	110	
Li	7	1	nogas	99.324	3.702	1901974	3.91	100	99.3	90	110	
P	31	1	nogas	485.793	0.832	839560	0.93	500	97.2	90	110	
La	139	1	nogas	115.400	17.925	470	14.89	100	115.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-21.764	-2731.739	20	50.00	100	-21.8	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1268052	1.93	1359891	93.25	70	125	
Ge	72	1	nogas	3017813	1.65	3145209	95.95	70	125	
In	115	1	nogas	2731094	1.33	2761164	98.91	70	125	
Bi	209	1	nogas	2208247	4.50	2190177	100.83	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	736688	1.26	785020	93.84	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	092_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:24:05-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.064	13.4	697	6.8	1	
Na	23	1	nogas	26.644	8.7	1046678	3.5	100	
Mg	24	1	nogas	10.031	3.8	158718	3.9	100	
Al	27	1	nogas	20.471	1.5	427281	1.1	5	CCB Main CR1 Failed
K	39	1	nogas	0.301	773.7	7975381	0.3	100	
Ti	47	1	nogas	0.101	23.8	470	9.3	2.5	
V	51	1	nogas	-45.862	-1.2	1165180	1.2	2.5	
Cr	52	1	nogas	-2.525	-2.9	69523	1.9	2.5	
Mn	55	1	nogas	0.120	21.3	33935	2.2	2.5	
Co	59	1	nogas	0.071	17.1	2667	10.7	2.5	
Ni	60	1	nogas	0.293	5.9	1320	6.2	2.5	
Cu	63	1	nogas	0.097	10.0	3560	3.7	2	
Zn	66	1	nogas	0.621	3.2	1677	4.3	2.5	
As	75	1	nogas	-22.700	-4.2	156173	2.7	2.5	
Sr	88	1	nogas	0.438	5.5	12588	5.5	2.5	
Ag	107	1	nogas	0.038	37.5	810	23.1	2.5	
Cd	111	1	nogas	0.071	29.0	220	25.3	1	
Sb	121	1	nogas	1.346	14.6	16959	14.7	2.5	
Tl	205	1	nogas	0.317	54.8	7759	47.8	1	
Pb	208	1	nogas	-0.037	-55.4	4637	11.5	2.5	
U	238	1	nogas	0.137	43.0	3981	42.2	2.5	
[Pb]	206	1	nogas	-0.054	-13.1	1120	4.7	2.5	
[Pb]	207	1	nogas	-0.044	-94.9	1070	24.5	2.5	
Na	23	2	He	17.268	8.0	78220	1.6	100	
Mg	24	2	He	8.083	12.2	7031	10.3	100	
Al	27	2	He	20.831	4.3	10713	4.3	5	CCB Main CR1 Failed
K	39	2	He	-6.792	-26.1	185911	0.8	100	
Ca	43	2	He	81.927	15.0	230	11.5	100	
Ca	44	2	He	55.245	10.5	5311	3.8	100	
V	51	2	He	-2.077	-1.5	13802	0.6	2.5	
Cr	52	2	He	-0.090	-54.5	4504	7.9	2.5	
Mn	55	2	He	0.064	64.2	2700	6.4	2.5	
Fe	56	2	He	7.218	7.7	50753	4.7	100	
Co	59	2	He	0.039	13.3	713	5.3	2.5	
Ni	60	2	He	0.213	10.0	317	13.1	2.5	
Cu	63	2	He	0.492	6.4	1343	11.6	2	
Zn	66	2	He	0.758	5.6	490	10.8	2.5	
As	75	2	He	-0.074	-54.6	681	6.5	2.5	
Se	78	2	He	0.602	13.2	132	6.9	2	
B	11	1	nogas	12.116	13.1	101926	3.6	10	CCB Main CR1 Failed
Si	28	1	nogas	-23.283	-9.8	1695065	1.5	5	
Ca	43	1	nogas	78.734	6.4	4181	4.6	100	
Ca	44	1	nogas	-443.355	-0.2	174281	0.2	100	
Fe	56	1	nogas	-23.142	-11.4	2530181	2.4	100	
Se	77	1	nogas	-131.096	-4.3	50567	2.2	2.5	
Se	82	1	nogas	0.149	42.4	280	6.2	2	
Mo	95	1	nogas	0.089	98.7	2837	17.0	2.5	
Sn	118	1	nogas	0.286	16.8	3057	9.4	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.293	12.1	1197	8.4	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.984	4.9	4497	4.4	2.5	
P	31	1	nogas	4.647	13.6	88928	0.8	10	
La	139	1	nogas	75.934	12.5	333	12.1	2.5	CCB Main CR1 Failed
Au	197	1	nogas	156.515	231.1	23	24.7	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1400382	5.40	1359891	102.98	70	125	
Ge	72	1	nogas	3152228	0.41	3145209	100.22	70	125	
In	115	1	nogas	2794576	3.28	2761164	101.21	70	125	
Bi	209	1	nogas	2293933	0.96	2190177	104.74	70	125	
Ge	72	2	He	749964	1.19	785020	95.53	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	094_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:32:55-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	86.504	1.884	796478	0.71	100	86.5	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10259.893	5.486	247743922	1.35	10000	102.6	90	110	
Mg	24	1	nogas	10099.943	3.412	154007349	0.83	10000	101.0	90	110	
Al	27	1	nogas	99.187	2.071	1940040	1.03	100	99.2	90	110	
K	39	1	nogas	9853.819	1.023	198393971	0.75	10000	98.5	90	110	
Ti	47	1	nogas	96.371	0.395	166610	1.34	100	96.4	90	110	
V	51	1	nogas	79.821	4.509	4053736	0.47	100	79.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	99.499	1.900	2227928	2.44	100	99.5	90	110	
Mn	55	1	nogas	103.552	2.976	2704690	4.20	100	103.6	90	110	
Co	59	1	nogas	100.211	1.083	2239355	0.50	100	100.2	90	110	
Ni	60	1	nogas	97.807	0.073	483162	1.51	100	97.8	90	110	
Cu	63	1	nogas	96.175	2.072	1144177	0.61	100	96.2	90	110	
Zn	66	1	nogas	98.307	1.759	382645	0.22	100	98.3	90	110	
As	75	1	nogas	89.158	1.166	682573	0.99	100	89.2	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	99.198	3.198	2635843	1.61	100	99.2	90	110	
Ag	107	1	nogas	98.635	1.507	1283579	2.82	100	98.6	90	110	
Cd	111	1	nogas	97.136	2.691	276426	1.69	100	97.1	90	110	
Sb	121	1	nogas	98.556	0.871	1211543	0.71	100	98.6	90	110	
Tl	205	1	nogas	98.897	2.974	1973409	2.54	100	98.9	90	110	
Pb	208	1	nogas	103.057	1.048	2654527	1.05	100	103.1	90	110	
U	238	1	nogas	104.005	0.832	2778699	0.23	100	104.0	90	110	
[Pb]	206	1	nogas	95.112	2.910	644661	2.27	100	95.1	90	110	
[Pb]	207	1	nogas	96.435	2.356	567386	1.74	100	96.4	90	110	
Na	23	2	He	9906.302	0.339	14581438	1.59	10000	99.1	90	110	
Mg	24	2	He	10042.396	0.538	7999488	1.65	10000	100.4	90	110	
Al	27	2	He	97.329	3.466	46283	3.13	100	97.3	90	110	
K	39	2	He	9533.132	0.309	8461600	0.30	10000	95.3	90	110	
Ca	43	2	He	9656.450	2.663	22470	3.57	10000	96.6	90	110	
Ca	44	2	He	9653.701	1.469	379200	0.92	10000	96.5	90	110	
V	51	2	He	97.466	2.411	571449	1.22	100	97.5	90	110	
Cr	52	2	He	98.356	1.209	603798	0.75	100	98.4	90	110	
Mn	55	2	He	98.278	1.103	428635	1.00	100	98.3	90	110	
Fe	56	2	He	10050.643	1.571	52989324	0.39	10000	100.5	90	110	
Co	59	2	He	97.125	1.270	804018	1.41	100	97.1	90	110	
Ni	60	2	He	99.039	2.010	202330	0.75	100	99.0	90	110	
Cu	63	2	He	100.560	2.882	522754	2.06	100	100.6	90	110	
Zn	66	2	He	97.996	2.318	124859	1.59	100	98.0	90	110	
As	75	2	He	96.478	0.750	122153	1.43	100	96.5	90	110	
Se	78	2	He	94.329	1.565	9668	1.62	100	94.3	90	110	
B	11	1	nogas	446.875	2.776	2430521	1.00	500	89.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	4755.042	1.807	52658589	0.22	5000	95.1	90	110	
Ca	43	1	nogas	9500.408	3.657	334045	2.08	10000	95.0	90	110	
Ca	44	1	nogas	9098.566	2.526	5578895	1.43	10000	91.0	90	110	
Fe	56	1	nogas	10018.598	1.135	224311588	2.18	10000	100.2	90	110	
Se	77	1	nogas	50.938	16.751	87479	0.64	100	50.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	94.211	3.149	24607	1.59	100	94.2	90	110	
Mo	95	1	nogas	99.500	3.401	536595	2.27	100	99.5	90	110	
Sn	118	1	nogas	95.774	0.295	710912	2.10	100	95.8	90	110	
Ba	137	1	nogas	98.895	2.753	383224	0.61	100	98.9	90	110	
Sb	121	2	He	100.801	1.915	440343	0.67	100	100.8	90	110	
Li	7	1	nogas	97.483	2.030	1898321	1.83	100	97.5	90	110	
P	31	1	nogas	474.614	2.324	848708	0.70	500	94.9	90	110	
La	139	1	nogas	107.163	21.532	443	16.93	100	107.2	90	110	
Au	197	1	nogas	487.563	81.155	27	21.65	100	487.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1288484	2.61	1359891	94.75	70	125	
Ge	72	1	nogas	3116163	1.57	3145209	99.08	70	125	
In	115	1	nogas	2757260	2.24	2761164	99.86	70	125	
Bi	209	1	nogas	2140093	0.68	2190177	97.71	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	731118	1.26	785020	93.13	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	103_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:50:44-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	87.309	5.651	779798	0.91	100	87.3	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10329.644	3.724	245290539	1.58	10000	103.3	90	110	
Mg	24	1	nogas	10029.838	3.837	150307858	1.15	10000	100.3	90	110	
Al	27	1	nogas	97.737	3.407	1913733	3.79	100	97.7	90	110	
K	39	1	nogas	9703.465	1.843	195612138	1.57	10000	97.0	90	110	
Ti	47	1	nogas	96.222	1.672	166464	2.19	100	96.2	90	110	
V	51	1	nogas	68.720	2.173	3800313	0.57	100	68.7	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.919	3.136	2259087	2.58	100	100.9	90	110	
Mn	55	1	nogas	103.054	4.024	2692423	3.50	100	103.1	90	110	
Co	59	1	nogas	100.858	7.439	2254762	6.89	100	100.9	90	110	
Ni	60	1	nogas	95.307	1.592	471062	1.19	100	95.3	90	110	
Cu	63	1	nogas	94.051	0.868	1119859	1.13	100	94.1	90	110	
Zn	66	1	nogas	96.728	1.202	376787	1.68	100	96.7	90	110	
As	75	1	nogas	84.388	0.202	660476	0.56	100	84.4	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	98.189	4.588	2611103	4.22	100	98.2	90	110	
Ag	107	1	nogas	105.294	5.805	1370589	5.33	100	105.3	90	110	
Cd	111	1	nogas	96.101	1.755	276572	3.88	100	96.1	90	110	
Sb	121	1	nogas	102.456	12.279	1259786	11.73	100	102.5	90	110	
Tl	205	1	nogas	99.422	1.020	2040585	4.55	100	99.4	90	110	
Pb	208	1	nogas	104.476	2.123	2691005	2.12	100	104.5	90	110	
U	238	1	nogas	101.358	5.926	2780217	1.10	100	101.4	90	110	
[Pb]	206	1	nogas	91.979	6.448	640068	1.76	100	92.0	90	110	
[Pb]	207	1	nogas	92.696	5.599	560135	1.72	100	92.7	90	110	
Na	23	2	He	9967.136	3.927	14529269	3.38	10000	99.7	90	110	
Mg	24	2	He	10068.846	2.432	7943662	1.91	10000	100.7	90	110	
Al	27	2	He	97.743	1.753	46040	1.24	100	97.7	90	110	
K	39	2	He	9574.604	3.208	8497576	3.14	10000	95.7	90	110	
Ca	43	2	He	9783.857	0.729	22547	0.20	10000	97.8	90	110	
Ca	44	2	He	9844.691	1.225	383001	0.74	10000	98.4	90	110	
V	51	2	He	96.682	0.370	561787	0.81	100	96.7	90	110	
Cr	52	2	He	99.526	1.744	605153	1.38	100	99.5	90	110	
Mn	55	2	He	98.614	1.806	426029	1.55	100	98.6	90	110	
Fe	56	2	He	10086.179	0.737	52679304	0.78	10000	100.9	90	110	
Co	59	2	He	97.794	3.497	801862	3.24	100	97.8	90	110	
Ni	60	2	He	101.586	2.952	205593	2.69	100	101.6	90	110	
Cu	63	2	He	99.691	1.890	513391	1.57	100	99.7	90	110	
Zn	66	2	He	99.249	2.794	125286	3.01	100	99.2	90	110	
As	75	2	He	96.312	0.552	120786	0.29	100	96.3	90	110	
Se	78	2	He	95.610	1.922	9706	1.99	100	95.6	90	110	
B	11	1	nogas	450.315	2.284	2378365	2.41	500	90.1	90	110	
Si	28	1	nogas	4731.874	1.988	52454666	2.44	5000	94.6	90	110	
Ca	43	1	nogas	9324.015	1.615	328174	1.49	10000	93.2	90	110	
Ca	44	1	nogas	8880.845	1.185	5459733	1.17	10000	88.8	90	110	CCV Main CR1-2 Failed
Fe	56	1	nogas	9658.433	2.421	216457447	1.96	10000	96.6	90	110	
Se	77	1	nogas	22.409	18.680	81662	0.53	100	22.4	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.338	3.578	24400	3.04	100	93.3	90	110	
Mo	95	1	nogas	95.848	0.531	517431	0.26	100	95.8	90	110	
Sn	118	1	nogas	93.308	4.250	699559	0.41	100	93.3	90	110	
Ba	137	1	nogas	98.090	2.969	384208	1.67	100	98.1	90	110	
Sb	121	2	He	101.481	2.411	439149	1.97	100	101.5	90	110	
Li	7	1	nogas	98.989	2.529	1870517	3.69	100	99.0	90	110	
P	31	1	nogas	463.793	0.578	831844	0.65	500	92.8	90	110	
La	139	1	nogas	125.777	20.347	517	14.53	100	125.8	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	863.675	29.758	33	17.32	100	863.7	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1251628	4.61	1359891	92.04	70	125	
Ge	72	1	nogas	3117959	0.53	3145209	99.13	70	125	
In	115	1	nogas	2788278	4.47	2761164	100.98	70	125	
Bi	209	1	nogas	2201715	5.39	2190177	100.53	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	724192	0.53	785020	92.25	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	104_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T17:52:41-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.052	16.0	550	14.4	1	
Na	23	1	nogas	13.867	19.0	756707	6.0	100	
Mg	24	1	nogas	5.777	21.1	95896	17.2	100	
Al	27	1	nogas	0.102	23.6	29917	1.1	5	
K	39	1	nogas	-8.733	-139.3	7791166	0.7	100	
Ti	47	1	nogas	0.095	33.7	460	11.5	2.5	
V	51	1	nogas	-42.275	-3.1	1248831	4.7	2.5	
Cr	52	1	nogas	-2.327	-1.8	73723	2.4	2.5	
Mn	55	1	nogas	0.036	61.9	31707	0.8	2.5	
Co	59	1	nogas	0.052	28.1	2237	12.4	2.5	
Ni	60	1	nogas	0.236	8.4	1033	9.3	2.5	
Cu	63	1	nogas	0.041	20.1	2890	3.3	2	
Zn	66	1	nogas	0.441	0.4	963	2.2	2.5	
As	75	1	nogas	-20.238	-3.1	167886	3.6	2.5	
Sr	88	1	nogas	0.064	21.4	2527	13.0	2.5	
Ag	107	1	nogas	0.028	25.9	687	12.4	2.5	
Cd	111	1	nogas	0.055	59.7	170	56.7	1	
Sb	121	1	nogas	1.104	21.1	13902	18.4	2.5	
Tl	205	1	nogas	0.282	70.2	6695	58.2	1	
Pb	208	1	nogas	-0.076	-36.6	3657	19.5	2.5	
U	238	1	nogas	0.126	51.7	3517	48.5	2.5	
[Pb]	206	1	nogas	-0.061	-68.7	1023	25.5	2.5	
[Pb]	207	1	nogas	-0.087	-21.7	770	11.7	2.5	
Na	23	2	He	9.830	12.5	66666	3.2	100	
Mg	24	2	He	3.951	1.4	3640	0.5	100	
Al	27	2	He	0.389	60.2	883	13.5	5	
K	39	2	He	-15.581	-23.5	178286	1.8	100	
Ca	43	2	He	-3.462	-183.3	27	57.3	100	
Ca	44	2	He	-40.173	-8.3	1490	10.0	100	
V	51	2	He	-1.971	-1.9	14331	0.7	2.5	
Cr	52	2	He	-0.042	-32.1	4774	1.2	2.5	
Mn	55	2	He	-0.126	-42.1	1843	11.8	2.5	
Fe	56	2	He	3.847	7.5	32359	4.7	100	
Co	59	2	He	0.020	116.2	547	35.5	2.5	
Ni	60	2	He	0.164	22.2	213	35.2	2.5	
Cu	63	2	He	0.434	4.1	1030	10.2	2	
Zn	66	2	He	0.640	6.0	333	15.1	2.5	
As	75	2	He	-0.107	-16.7	634	2.5	2.5	
Se	78	2	He	0.704	60.3	142	31.8	2	
B	11	1	nogas	4.662	16.5	53582	6.9	10	

Continuing Calibration Blank (CCB) Report

Si	28	1	nogas	-30.138	-34.4	1618622	4.8	5	
Ca	43	1	nogas	-15.217	-7.7	850	3.1	100	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ca	44	1	nogas	-547.123	-0.9	114696	0.9	100	
Fe	56	1	nogas	-25.414	-22.4	2476263	2.9	100	
Se	77	1	nogas	-112.280	-4.7	54472	3.8	2.5	
Se	82	1	nogas	-0.092	-248.7	217	27.0	2	
Mo	95	1	nogas	-0.037	-406.7	2140	35.2	2.5	
Sn	118	1	nogas	0.194	37.3	2287	22.3	5	
Ba	137	1	nogas	0.088	6.5	383	3.0	2.5	
Sb	121	2	He	0.758	2.3	3467	3.1	2.5	
P	31	1	nogas	8.229	12.2	94726	0.6	10	
La	139	1	nogas	0.352	2061.8	47	53.9	2.5	
Au	197	1	nogas	-1086.852	-35.4	3	173.2	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1339493	5.37	1359891	98.50	70	125	
Ge	72	1	nogas	3150615	2.28	3145209	100.17	70	125	
In	115	1	nogas	2700027	2.84	2761164	97.79	70	125	
Bi	209	1	nogas	2210528	3.82	2190177	100.93	70	125	
Ge	72	2	He	745712	1.16	785020	94.99	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	113_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:33:07-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	91.027	6.203	768390	1.98	100	91.0	90	110	
Na	23	1	nogas	9911.914	5.260	237655589	1.63	10000	99.1	90	110	
Mg	24	1	nogas	10092.400	3.062	152806091	1.54	10000	100.9	90	110	
Al	27	1	nogas	100.703	2.355	1943447	3.08	100	100.7	90	110	
K	39	1	nogas	9756.080	4.952	193737971	0.30	10000	97.6	90	110	
Ti	47	1	nogas	96.904	3.383	165240	1.87	100	96.9	90	110	
V	51	1	nogas	87.826	10.525	4179048	0.44	100	87.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.608	4.956	2219518	0.12	100	100.6	90	110	
Mn	55	1	nogas	101.330	4.348	2609988	2.15	100	101.3	90	110	
Co	59	1	nogas	100.041	1.248	2206587	3.56	100	100.0	90	110	
Ni	60	1	nogas	95.426	4.549	464897	3.19	100	95.4	90	110	
Cu	63	1	nogas	92.995	5.368	1090864	1.89	100	93.0	90	110	
Zn	66	1	nogas	97.644	4.234	374800	0.69	100	97.6	90	110	
As	75	1	nogas	93.195	6.840	691848	0.96	100	93.2	90	110	
Sr	88	1	nogas	97.264	2.516	2550579	2.49	100	97.3	90	110	
Ag	107	1	nogas	101.749	2.810	1307861	6.93	100	101.7	90	110	
Cd	111	1	nogas	95.714	4.449	274579	1.26	100	95.7	90	110	
Sb	121	1	nogas	96.183	4.570	1165792	0.53	100	96.2	90	110	
Tl	205	1	nogas	97.000	4.405	1957504	3.33	100	97.0	90	110	
Pb	208	1	nogas	103.281	0.704	2660287	0.70	100	103.3	90	110	
U	238	1	nogas	103.764	3.219	2803894	2.57	100	103.8	90	110	
[Pb]	206	1	nogas	92.027	2.121	630964	0.65	100	92.0	90	110	
[Pb]	207	1	nogas	95.788	2.523	570047	1.47	100	95.8	90	110	
Na	23	2	He	9822.871	1.990	14312438	2.07	10000	98.2	90	110	
Mg	24	2	He	9964.856	1.302	7856922	0.95	10000	99.6	90	110	
Al	27	2	He	95.220	1.689	44840	1.18	100	95.2	90	110	
K	39	2	He	9463.572	0.664	8401258	0.65	10000	94.6	90	110	
Ca	43	2	He	9900.468	3.742	22804	4.24	10000	99.0	90	110	
Ca	44	2	He	9620.873	1.056	374130	1.05	10000	96.2	90	110	
V	51	2	He	96.251	1.240	559037	1.44	100	96.3	90	110	
Cr	52	2	He	98.926	0.516	601168	0.51	100	98.9	90	110	
Mn	55	2	He	97.733	0.521	421992	1.01	100	97.7	90	110	
Fe	56	2	He	9859.495	0.456	51463333	0.95	10000	98.6	90	110	
Co	59	2	He	95.221	1.430	780325	1.53	100	95.2	90	110	
Ni	60	2	He	97.869	1.045	197956	1.54	100	97.9	90	110	
Cu	63	2	He	98.652	0.882	507708	0.43	100	98.7	90	110	
Zn	66	2	He	99.495	1.339	125507	0.92	100	99.5	90	110	
As	75	2	He	96.278	1.297	120669	1.46	100	96.3	90	110	
Se	78	2	He	93.595	0.727	9496	0.68	100	93.6	90	110	
B	11	1	nogas	459.256	5.877	2319083	2.98	500	91.9	90	110	
Si	28	1	nogas	4669.768	3.971	51043859	1.84	5000	93.4	90	110	
Ca	43	1	nogas	9616.145	6.266	333292	2.13	10000	96.2	90	110	
Ca	44	1	nogas	9193.067	8.063	5550277	4.03	10000	91.9	90	110	
Fe	56	1	nogas	9699.768	4.199	214235096	1.55	10000	97.0	90	110	
Se	77	1	nogas	88.786	25.360	93941	0.17	100	88.8	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	94.156	1.305	24283	4.24	100	94.2	90	110	
Mo	95	1	nogas	96.519	4.194	513456	0.67	100	96.5	90	110	
Sn	118	1	nogas	93.515	4.532	699561	1.43	100	93.5	90	110	
Ba	137	1	nogas	96.994	3.945	379121	3.62	100	97.0	90	110	
Sb	121	2	He	100.280	1.346	433704	1.40	100	100.3	90	110	
Li	7	1	nogas	92.949	1.224	1865625	5.16	100	92.9	90	110	
P	31	1	nogas	466.033	3.663	823549	1.63	500	93.2	90	110	
La	139	1	nogas	88.870	18.808	380	17.26	100	88.9	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	233.999	422.642	23	65.47	100	234.0	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1324116	4.92	1359891	97.37	70	125	
Ge	72	1	nogas	3076636	4.77	3145209	97.82	70	125	
In	115	1	nogas	2781876	4.05	2761164	100.75	70	125	
Bi	209	1	nogas	2164882	1.51	2190177	98.85	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	723722	0.49	785020	92.19	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	114_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:35:05-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.054	32.2	527	29.4	1	
Na	23	1	nogas	10.349	32.0	641042	8.0	100	
Mg	24	1	nogas	6.276	39.6	98736	33.0	100	
Al	27	1	nogas	0.121	90.8	29697	3.2	5	
K	39	1	nogas	-3.461	-613.8	7745088	0.2	100	
Ti	47	1	nogas	0.062	89.3	393	20.7	2.5	
V	51	1	nogas	-26.907	-4.4	1579748	6.6	2.5	
Cr	52	1	nogas	-1.936	-7.6	80558	2.5	2.5	
Mn	55	1	nogas	0.170	56.9	34506	2.0	2.5	
Co	59	1	nogas	0.055	58.2	2237	26.0	2.5	
Ni	60	1	nogas	0.225	14.5	957	12.2	2.5	
Cu	63	1	nogas	0.035	141.3	2747	15.7	2	
Zn	66	1	nogas	0.460	9.8	1017	11.7	2.5	
As	75	1	nogas	-13.783	-10.3	194965	2.1	2.5	
Sr	88	1	nogas	0.060	46.5	2350	25.8	2.5	
Ag	107	1	nogas	0.023	40.2	603	14.5	2.5	
Cd	111	1	nogas	0.059	45.8	180	38.9	1	
Sb	121	1	nogas	1.067	26.7	13132	21.1	2.5	
Tl	205	1	nogas	0.321	62.7	7622	56.0	1	
Pb	208	1	nogas	-0.070	-54.0	3814	25.3	2.5	
U	238	1	nogas	0.151	55.0	4267	55.3	2.5	
[Pb]	206	1	nogas	-0.059	-56.0	1050	23.3	2.5	
[Pb]	207	1	nogas	-0.078	-44.9	833	26.5	2.5	
Na	23	2	He	5.203	5.7	58225	0.5	100	
Mg	24	2	He	3.067	10.5	2850	9.8	100	
Al	27	2	He	-0.011	-1357.9	673	9.7	5	
K	39	2	He	-15.880	-2.3	178027	0.2	100	
Ca	43	2	He	-0.253	-4943.6	33	86.6	100	
Ca	44	2	He	-47.114	-8.7	1183	14.4	100	
V	51	2	He	-1.218	-2.0	18163	0.5	2.5	
Cr	52	2	He	-0.007	-671.3	4861	5.7	2.5	
Mn	55	2	He	-0.038	-32.5	2173	2.2	2.5	
Fe	56	2	He	3.193	10.5	28122	6.8	100	
Co	59	2	He	0.021	61.5	540	20.0	2.5	
Ni	60	2	He	0.170	5.5	220	9.1	2.5	
Cu	63	2	He	0.412	9.1	890	22.4	2	
Zn	66	2	He	0.574	2.9	240	8.3	2.5	
As	75	2	He	0.042	84.4	804	4.6	2.5	
Se	78	2	He	0.651	43.2	133	20.6	2	
B	11	1	nogas	3.162	26.8	46484	9.3	10	

Continuing Calibration Blank (CCB) Report

Si	28	1	nogas	-27.354	-33.1	1618000	0.8	5	
Ca	43	1	nogas	-14.249	-16.3	867	4.8	100	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ca	44	1	nogas	-571.267	-2.3	98870	2.4	100	
Fe	56	1	nogas	-16.559	-36.0	2624823	2.4	100	
Se	77	1	nogas	-65.256	-15.8	63056	1.8	2.5	
Se	82	1	nogas	-0.113	-136.2	207	15.6	2	
Mo	95	1	nogas	0.006	3187.0	2310	36.5	2.5	
Sn	118	1	nogas	0.210	46.7	2397	26.6	5	
Ba	137	1	nogas	0.103	39.8	437	32.6	2.5	
Sb	121	2	He	0.721	7.2	3220	7.8	2.5	
P	31	1	nogas	9.542	30.6	95037	0.8	10	
La	139	1	nogas	1.050	685.1	50	52.9	2.5	
Au	197	1	nogas	-215.528	-635.2	17	124.9	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1351813	1.88	1359891	99.41	70	125	
Ge	72	1	nogas	3095115	5.02	3145209	98.41	70	125	
In	115	1	nogas	2701826	3.73	2761164	97.85	70	125	
Bi	209	1	nogas	2216122	1.20	2190177	101.18	70	125	
Ge	72	2	He	726803	0.89	785020	92.58	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	118_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:49:57-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	96.700	1.963	783523	1.51	100	96.7	90	110	
Na	23	1	nogas	10242.178	0.797	245346164	1.44	10000	102.4	90	110	
Mg	24	1	nogas	10305.105	3.127	155792799	3.29	10000	103.1	90	110	
Al	27	1	nogas	102.039	4.546	1984207	4.47	100	102.0	90	110	
K	39	1	nogas	9950.587	0.339	199167625	1.13	10000	99.5	90	110	
Ti	47	1	nogas	96.005	1.189	165051	1.12	100	96.0	90	110	
V	51	1	nogas	68.817	6.619	3778913	2.42	100	68.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	96.501	2.313	2152149	1.58	100	96.5	90	110	
Mn	55	1	nogas	100.903	3.423	2620537	2.70	100	100.9	90	110	
Co	59	1	nogas	99.319	1.312	2207195	1.17	100	99.3	90	110	
Ni	60	1	nogas	97.208	1.591	477510	1.54	100	97.2	90	110	
Cu	63	1	nogas	95.696	2.045	1132318	1.83	100	95.7	90	110	
Zn	66	1	nogas	98.043	2.246	379508	1.57	100	98.0	90	110	
As	75	1	nogas	82.487	2.574	647425	0.77	100	82.5	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	98.743	1.141	2609811	0.56	100	98.7	90	110	
Ag	107	1	nogas	99.093	1.880	1282341	2.85	100	99.1	90	110	
Cd	111	1	nogas	96.404	2.945	273554	0.79	100	96.4	90	110	
Sb	121	1	nogas	98.681	2.623	1206601	3.51	100	98.7	90	110	
Tl	205	1	nogas	97.752	2.473	1940284	1.64	100	97.8	90	110	
Pb	208	1	nogas	102.612	0.309	2643106	0.31	100	102.6	90	110	
U	238	1	nogas	103.897	1.901	2761020	0.48	100	103.9	90	110	
[Pb]	206	1	nogas	94.908	2.191	639894	1.00	100	94.9	90	110	
[Pb]	207	1	nogas	96.355	1.781	563937	0.39	100	96.4	90	110	
Na	23	2	He	9647.815	0.905	14255185	0.72	10000	96.5	90	110	
Mg	24	2	He	9836.313	1.889	7864143	1.36	10000	98.4	90	110	
Al	27	2	He	94.018	2.366	44900	1.28	100	94.0	90	110	
K	39	2	He	9499.093	1.508	8432071	1.47	10000	95.0	90	110	
Ca	43	2	He	9571.467	1.817	22357	2.74	10000	95.7	90	110	
Ca	44	2	He	9569.290	1.086	377374	1.46	10000	95.7	90	110	
V	51	2	He	94.641	1.360	557797	1.09	100	94.6	90	110	
Cr	52	2	He	96.962	0.731	597615	1.18	100	97.0	90	110	
Mn	55	2	He	96.382	0.891	422034	1.43	100	96.4	90	110	
Fe	56	2	He	9796.663	0.779	51850966	0.46	10000	98.0	90	110	
Co	59	2	He	95.268	0.393	791661	0.73	100	95.3	90	110	
Ni	60	2	He	99.200	0.552	203460	0.87	100	99.2	90	110	
Cu	63	2	He	98.512	1.548	514082	0.97	100	98.5	90	110	
Zn	66	2	He	97.601	1.086	124836	0.14	100	97.6	90	110	
As	75	2	He	93.580	0.540	118962	1.65	100	93.6	90	110	
Se	78	2	He	93.373	0.713	9607	0.91	100	93.4	90	110	
B	11	1	nogas	490.077	1.791	2372749	1.30	500	98.0	90	110	
Si	28	1	nogas	4757.427	1.207	52398789	1.37	5000	95.1	90	110	
Ca	43	1	nogas	9638.702	1.251	337149	2.20	10000	96.4	90	110	
Ca	44	1	nogas	9130.681	1.808	5566356	0.73	10000	91.3	90	110	
Fe	56	1	nogas	9711.833	2.598	216284705	1.88	10000	97.1	90	110	
Se	77	1	nogas	10.413	49.457	78699	0.70	100	10.4	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.625	2.303	24323	1.42	100	93.6	90	110	
Mo	95	1	nogas	98.133	1.527	526409	0.56	100	98.1	90	110	
Sn	118	1	nogas	96.290	1.821	712646	1.60	100	96.3	90	110	
Ba	137	1	nogas	99.573	3.117	384764	0.80	100	99.6	90	110	
Sb	121	2	He	98.690	2.223	432759	1.09	100	98.7	90	110	
Li	7	1	nogas	97.880	3.544	1876630	3.27	100	97.9	90	110	
P	31	1	nogas	469.825	2.090	836365	1.35	500	94.0	90	110	
La	139	1	nogas	94.120	32.360	393	25.97	100	94.1	90	110	
Au	197	1	nogas	-1083.363	-36.082	3	173.21	100	-1083.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1268610	0.50	1359891	93.29	70	125	
Ge	72	1	nogas	3098768	0.97	3145209	98.52	70	125	
In	115	1	nogas	2749695	2.33	2761164	99.58	70	125	
Bi	209	1	nogas	2128987	1.43	2190177	97.21	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	733900	1.12	785020	93.49	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	119_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:51:57-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	013CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.051	23.8	490	23.2	1	
Na	23	1	nogas	8.641	26.2	627778	3.4	100	
Mg	24	1	nogas	5.450	29.0	90333	20.5	100	
Al	27	1	nogas	0.155	39.0	30618	1.8	5	
K	39	1	nogas	-1.661	-569.5	7844785	0.5	100	
Ti	47	1	nogas	0.027	114.8	337	14.0	2.5	
V	51	1	nogas	-43.373	-4.0	1209871	4.9	2.5	
Cr	52	1	nogas	-2.421	-2.6	70938	3.2	2.5	
Mn	55	1	nogas	0.110	27.1	33277	0.3	2.5	
Co	59	1	nogas	0.045	29.6	2043	12.3	2.5	
Ni	60	1	nogas	0.217	4.1	930	3.2	2.5	
Cu	63	1	nogas	0.020	137.8	2604	10.8	2	
Zn	66	1	nogas	0.460	17.8	1027	29.1	2.5	
As	75	1	nogas	-21.878	-3.1	158336	4.0	2.5	
Sr	88	1	nogas	0.058	16.2	2354	9.2	2.5	
Ag	107	1	nogas	0.025	46.0	630	21.5	2.5	
Cd	111	1	nogas	0.043	53.3	143	44.9	1	
Sb	121	1	nogas	0.969	22.1	12091	19.6	2.5	
Tl	205	1	nogas	0.382	48.1	9313	47.3	1	
Pb	208	1	nogas	-0.087	-36.9	3374	24.4	2.5	
U	238	1	nogas	0.131	53.3	3904	56.9	2.5	
[Pb]	206	1	nogas	-0.097	-14.2	813	16.7	2.5	
[Pb]	207	1	nogas	-0.109	-15.7	670	20.9	2.5	
Na	23	2	He	3.600	38.9	58101	3.3	100	
Mg	24	2	He	3.296	10.5	3150	9.1	100	
Al	27	2	He	0.049	437.0	730	14.5	5	
K	39	2	He	-12.854	-13.1	180652	0.8	100	
Ca	43	2	He	6.125	65.8	50	20.0	100	
Ca	44	2	He	-41.375	-8.7	1460	9.5	100	
V	51	2	He	-2.121	-3.1	13657	3.5	2.5	
Cr	52	2	He	-0.076	-10.1	4624	1.4	2.5	
Mn	55	2	He	-0.111	-36.6	1937	9.7	2.5	
Fe	56	2	He	3.289	5.8	29748	3.0	100	
Co	59	2	He	0.009	58.0	460	9.5	2.5	
Ni	60	2	He	0.175	16.7	240	25.3	2.5	
Cu	63	2	He	0.407	4.5	900	11.8	2	
Zn	66	2	He	0.632	3.9	327	9.4	2.5	
As	75	2	He	-0.115	-48.5	632	10.8	2.5	
Se	78	2	He	0.365	5.6	108	1.9	2	
B	11	1	nogas	3.838	14.0	49337	7.3	10	
Si	28	1	nogas	-33.061	-4.6	1571735	3.1	5	
Ca	43	1	nogas	-13.628	-5.0	897	0.6	100	
Ca	44	1	nogas	-561.325	-0.9	105405	0.8	100	
Fe	56	1	nogas	-17.110	-14.3	2634236	1.5	100	
Se	77	1	nogas	-126.878	-3.1	50875	3.5	2.5	
Se	82	1	nogas	-0.111	-258.7	210	36.0	2	
Mo	95	1	nogas	-0.034	-334.6	2137	26.5	2.5	
Sn	118	1	nogas	0.181	37.1	2320	17.5	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.149	44.6	657	44.1	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.632	8.4	2944	7.5	2.5	
P	31	1	nogas	9.320	17.4	95456	0.7	10	
La	139	1	nogas	52.151	184.6	257	149.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	-682.662	-4.1	10	0.0	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1334937	2.40	1359891	98.16	70	125	
Ge	72	1	nogas	3116553	2.08	3145209	99.09	70	125	
In	115	1	nogas	2864732	4.32	2761164	103.75	70	125	
Bi	209	1	nogas	2303506	4.57	2190177	105.17	70	125	
Ge	72	2	He	755645	0.72	785020	96.26	70	125	

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	123CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T18:59:56-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	70	53.99
Na	23	1	nogas	400649	0.00
Mg	24	1	nogas	8170	0.20
Al	27	1	nogas	21442	0.02
K	39	1	nogas	7853188	0.00
Ti	47	1	nogas	237	11.48
V	51	1	nogas	1345870	0.00
Cr	52	1	nogas	77474	0.00
Mn	55	1	nogas	27808	0.00
Co	59	1	nogas	823	1.56
Ni	60	1	nogas	467	3.06
Cu	63	1	nogas	1483	0.44
Zn	66	1	nogas	657	0.13
As	75	1	nogas	176957	0.00
Sr	88	1	nogas	867	1.33
Ag	107	1	nogas	93	35.07
Cd	111	1	nogas	20	0.00
Sb	121	1	nogas	1043	1.53
Tl	205	1	nogas	563	2.55
Pb	208	1	nogas	1573	0.99
[Pb]	206	1	nogas	433	1.87
[Pb]	207	1	nogas	330	9.72
Na	23	2	He	45585	0.00
Mg	24	2	He	583	2.63
Al	27	2	He	437	3.79
K	39	2	He	181917	0.00
Ca	43	2	He	10	1732.05
Ca	44	2	He	1077	0.30
V	51	2	He	15473	0.01
Cr	52	2	He	4597	0.08
Mn	55	2	He	1257	0.41
Fe	56	2	He	11797	0.03
Co	59	2	He	303	11.62
Ni	60	2	He	137	18.80
Cu	63	2	He	643	1.97
Zn	66	2	He	137	3.09
As	75	2	He	588	2.31
Se	78	2	He	123	3.84
B	11	1	nogas	18916	0.01
Si	28	1	nogas	1541532	0.00
Ca	43	1	nogas	563	2.62
Ca	44	1	nogas	95928	0.00

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	2809089	0.00
Se	77	1	nogas	56518	0.01
Se	82	1	nogas	247	10.69
Mo	95	1	nogas	497	2.38
Sn	118	1	nogas	1127	0.55
Ba	137	1	nogas	113	23.78
Sb	121	2	He	477	3.56
Li	7	1	nogas	109987	0.00
P	31	1	nogas	90462	0.00
La	139	1	nogas	53	73.18

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	6	1	nogas	1446753	2.09
Ge	72	1	nogas	3206704	0.23
In	115	1	nogas	2812441	2.84
Bi	209	1	nogas	2322160	3.31
Ge	72	2	He	754516	1.50

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	124CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:01:55-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	16017	0.01
Na	23	1	nogas	5490362	0.00
Mg	24	1	nogas	3430176	0.00
Al	27	1	nogas	62002	0.00
K	39	1	nogas	11948324	0.00
Ti	47	1	nogas	3690	0.22
V	51	1	nogas	1551445	0.00
Cr	52	1	nogas	122257	0.00
Mn	55	1	nogas	74188	0.00
Co	59	1	nogas	45801	0.00
Ni	60	1	nogas	11060	0.04
Cu	63	1	nogas	25972	0.01
Zn	66	1	nogas	8109	0.02
As	75	1	nogas	199836	0.00
Sr	88	1	nogas	53711	0.00
Ag	107	1	nogas	27352	0.01
Cd	111	1	nogas	5784	0.09
Sb	121	1	nogas	25245	0.01
Tl	205	1	nogas	37547	0.01
Pb	208	1	nogas	55104	0.00
[Pb]	206	1	nogas	14000	0.01
[Pb]	207	1	nogas	12281	0.02
Na	23	2	He	338997	0.00
Mg	24	2	He	163588	0.00
Al	27	2	He	1553	0.65
K	39	2	He	350064	0.00
Ca	43	2	He	503	2.54
Ca	44	2	He	8882	0.04
V	51	2	He	27508	0.01
Cr	52	2	He	16257	0.01
Mn	55	2	He	9843	0.03
Fe	56	2	He	1088583	0.00
Co	59	2	He	17482	0.01
Ni	60	2	He	4577	0.13
Cu	63	2	He	11444	0.03
Zn	66	2	He	2727	0.41
As	75	2	He	3179	0.07
Se	78	2	He	323	2.97
B	11	1	nogas	63562	0.00
Si	28	1	nogas	2570600	0.00

Calibration Standard Report

Ca	43	1	nogas	7758	0.04
Ca	44	1	nogas	203607	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	7193806	0.00
Se	77	1	nogas	61735	0.01
Se	82	1	nogas	833	1.72
Mo	95	1	nogas	10960	0.04
Sn	118	1	nogas	15113	0.02
Ba	137	1	nogas	8466	0.04
Sb	121	2	He	9523	0.05
P	31	1	nogas	87960	0.00
La	139	1	nogas	70	20.41

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1379209	5.18	1446753	95.33	70	125	
Ge	72	1	nogas	3256495	2.07	3206704	101.55	70	125	
In	115	1	nogas	2856142	1.49	2812441	101.55	70	125	
Bi	209	1	nogas	2295874	2.67	2322160	98.87	70	125	
Ge	72	2	He	759218	2.00	754516	100.62	70	125	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	125CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:03:54-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	40216	0.01
Na	23	1	nogas	12844224	0.00
Mg	24	1	nogas	8008673	0.00
Al	27	1	nogas	140606	0.00
K	39	1	nogas	17872186	0.00
Ti	47	1	nogas	8675	0.03
V	51	1	nogas	1716980	0.00
Cr	52	1	nogas	191122	0.00
Mn	55	1	nogas	162792	0.00
Co	59	1	nogas	111008	0.00
Ni	60	1	nogas	26012	0.02
Cu	63	1	nogas	62661	0.00
Zn	66	1	nogas	22220	0.00
As	75	1	nogas	224623	0.00
Sr	88	1	nogas	131562	0.00
Ag	107	1	nogas	67316	0.00
Cd	111	1	nogas	14449	0.02
Sb	121	1	nogas	63499	0.00
Tl	205	1	nogas	95808	0.00
Pb	208	1	nogas	136141	0.00
[Pb]	206	1	nogas	34454	0.01
[Pb]	207	1	nogas	29667	0.01
Na	23	2	He	782020	0.00
Mg	24	2	He	404819	0.00
Al	27	2	He	3467	0.06
K	39	2	He	597599	0.00
Ca	43	2	He	1307	0.69
Ca	44	2	He	20271	0.02
V	51	2	He	45060	0.00
Cr	52	2	He	35979	0.01
Mn	55	2	He	23716	0.01
Fe	56	2	He	2811433	0.00
Co	59	2	He	41647	0.00
Ni	60	2	He	10747	0.01
Cu	63	2	He	27858	0.01
Zn	66	2	He	7051	0.01
As	75	2	He	6768	0.02
Se	78	2	He	623	0.23
B	11	1	nogas	130646	0.00
Si	28	1	nogas	4181613	0.00

Calibration Standard Report

Ca	43	1	nogas	18202	0.01
Ca	44	1	nogas	374777	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	14293153	0.00
Se	77	1	nogas	64798	0.00
Se	82	1	nogas	1517	0.13
Mo	95	1	nogas	27485	0.01
Sn	118	1	nogas	36809	0.01
Ba	137	1	nogas	19902	0.03
Sb	121	2	He	22875	0.02
P	31	1	nogas	131060	0.00
La	139	1	nogas	137	26.41

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1333091	6.34	1446753	92.14	70	125	
Ge	72	1	nogas	3390667	1.43	3206704	105.74	70	125	
In	115	1	nogas	2877774	3.00	2812441	102.32	70	125	
Bi	209	1	nogas	2252572	2.89	2322160	97.00	70	125	
Ge	72	2	He	792957	0.80	754516	105.09	70	125	

Calibration Standard Report

Sample Table

Sample Name	10/50/1000
Data File Name	126CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:05:53-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	77148	0.00
Na	23	1	nogas	25250872	0.00
Mg	24	1	nogas	15834310	0.00
Al	27	1	nogas	232008	0.00
K	39	1	nogas	27175799	0.00
Ti	47	1	nogas	16658	0.02
V	51	1	nogas	1868880	0.00
Cr	52	1	nogas	291583	0.00
Mn	55	1	nogas	287456	0.00
Co	59	1	nogas	221976	0.00
Ni	60	1	nogas	50082	0.01
Cu	63	1	nogas	118092	0.00
Zn	66	1	nogas	39309	0.00
As	75	1	nogas	253155	0.00
Sr	88	1	nogas	258307	0.00
Ag	107	1	nogas	129291	0.00
Cd	111	1	nogas	28029	0.01
Sb	121	1	nogas	121934	0.00
Tl	205	1	nogas	187552	0.00
Pb	208	1	nogas	264591	0.00
[Pb]	206	1	nogas	66161	0.00
[Pb]	207	1	nogas	57469	0.00
Na	23	2	He	1603255	0.00
Mg	24	2	He	815126	0.00
Al	27	2	He	5628	0.09
K	39	2	He	1000101	0.00
Ca	43	2	He	2324	0.13
Ca	44	2	He	38974	0.00
V	51	2	He	72881	0.00
Cr	52	2	He	66252	0.00
Mn	55	2	He	45527	0.01
Fe	56	2	He	5424213	0.00
Co	59	2	He	83632	0.00
Ni	60	2	He	20929	0.02
Cu	63	2	He	54648	0.01
Zn	66	2	He	13118	0.04
As	75	2	He	12805	0.01
Se	78	2	He	1081	0.27
B	11	1	nogas	244624	0.00
Si	28	1	nogas	6670116	0.00

Calibration Standard Report

Ca	43	1	nogas	35027	0.00
Ca	44	1	nogas	641708	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	25285242	0.00
Se	77	1	nogas	69419	0.00
Se	82	1	nogas	2650	0.21
Mo	95	1	nogas	54297	0.01
Sn	118	1	nogas	73307	0.00
Ba	137	1	nogas	38019	0.01
Sb	121	2	He	45516	0.01
P	31	1	nogas	174335	0.00
La	139	1	nogas	127	50.38

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1343072	4.51	1446753	92.83	70	125	
Ge	72	1	nogas	3313200	1.72	3206704	103.32	70	125	
In	115	1	nogas	2866425	3.53	2812441	101.92	70	125	
Bi	209	1	nogas	2231632	2.44	2322160	96.10	70	125	
Ge	72	2	He	772138	1.02	754516	102.34	70	125	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	127CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:07:51-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	770857	0.00
Na	23	1	nogas	242498655	0.00
Mg	24	1	nogas	154874208	0.00
Al	27	1	nogas	1990080	0.00
K	39	1	nogas	197878504	0.00
Ti	47	1	nogas	165246	0.00
V	51	1	nogas	3915446	0.00
Cr	52	1	nogas	2212534	0.00
Mn	55	1	nogas	2743316	0.00
Co	59	1	nogas	2253592	0.00
Ni	60	1	nogas	482568	0.00
Cu	63	1	nogas	1134783	0.00
Zn	66	1	nogas	377718	0.00
As	75	1	nogas	674392	0.00
Sr	88	1	nogas	2656691	0.00
Ag	107	1	nogas	1328342	0.00
Cd	111	1	nogas	277142	0.00
Sb	121	1	nogas	1212062	0.00
Tl	205	1	nogas	2038051	0.00
Pb	208	1	nogas	2754632	0.00
[Pb]	206	1	nogas	654698	0.00
[Pb]	207	1	nogas	580556	0.00
Na	23	2	He	14697812	0.00
Mg	24	2	He	7992094	0.00
Al	27	2	He	45588	0.00
K	39	2	He	8452403	0.00
Ca	43	2	He	22631	0.01
Ca	44	2	He	377153	0.00
V	51	2	He	565139	0.00
Cr	52	2	He	616895	0.00
Mn	55	2	He	427894	0.00
Fe	56	2	He	51671208	0.00
Co	59	2	He	794999	0.00
Ni	60	2	He	204531	0.00
Cu	63	2	He	521587	0.00
Zn	66	2	He	125243	0.00
As	75	2	He	121407	0.00
Se	78	2	He	9610	0.02
B	11	1	nogas	2325500	0.00
Si	28	1	nogas	52692804	0.00

Calibration Standard Report

Ca	43	1	nogas	340306	0.00
Ca	44	1	nogas	5719862	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	225714363	0.00
Se	77	1	nogas	85332	0.00
Se	82	1	nogas	25165	0.01
Mo	95	1	nogas	523951	0.00
Sn	118	1	nogas	722784	0.00
Ba	137	1	nogas	389153	0.00
Sb	121	2	He	438849	0.00
P	31	1	nogas	846504	0.00
La	139	1	nogas	483	4.72

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1213626	3.21	1446753	83.89	70	125	
Ge	72	1	nogas	3155985	2.86	3206704	98.42	70	125	
In	115	1	nogas	2731958	3.08	2812441	97.14	70	125	
Bi	209	1	nogas	2203864	0.68	2322160	94.91	70	125	
Ge	72	2	He	750459	0.80	754516	99.46	70	125	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	128CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:09:49-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	1635048	0.00
Na	23	1	nogas	487938144	0.00
Mg	24	1	nogas	311599649	0.00
Al	27	1	nogas	3720619	0.00
K	39	1	nogas	387013200	0.00
Ti	47	1	nogas	337307	0.00
V	51	1	nogas	5847592	0.00
Cr	52	1	nogas	4260513	0.00
Mn	55	1	nogas	5212488	0.00
Co	59	1	nogas	4462955	0.00
Ni	60	1	nogas	962911	0.00
Cu	63	1	nogas	2305483	0.00
Zn	66	1	nogas	758181	0.00
As	75	1	nogas	1089835	0.00
Sr	88	1	nogas	5208978	0.00
Ag	107	1	nogas	2566119	0.00
Cd	111	1	nogas	558850	0.00
Sb	121	1	nogas	2523837	0.00
Tl	205	1	nogas	3971253	0.00
Pb	208	1	nogas	5460578	0.00
[Pb]	206	1	nogas	1380705	0.00
[Pb]	207	1	nogas	1160140	0.00
Na	23	2	He	28670345	0.00
Mg	24	2	He	15925250	0.00
Al	27	2	He	88687	0.00
K	39	2	He	16988162	0.00
Ca	43	2	He	45786	0.00
Ca	44	2	He	763233	0.00
V	51	2	He	1118348	0.00
Cr	52	2	He	1225421	0.00
Mn	55	2	He	854743	0.00
Fe	56	2	He	106540595	0.00
Co	59	2	He	1698960	0.00
Ni	60	2	He	409741	0.00
Cu	63	2	He	1042535	0.00
Zn	66	2	He	255918	0.00
As	75	2	He	243421	0.00
Se	78	2	He	19463	0.00
B	11	1	nogas	4747092	0.00
Si	28	1	nogas	102886088	0.00

Calibration Standard Report

Ca	43	1	nogas	669375	0.00
Ca	44	1	nogas	11178438	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	441805293	0.00
Se	77	1	nogas	86585	0.00
Se	82	1	nogas	50053	0.00
Mo	95	1	nogas	1069773	0.00
Sn	118	1	nogas	1465775	0.00
Ba	137	1	nogas	790275	0.00
Sb	121	2	He	891260	0.00
P	31	1	nogas	1628622	0.00
La	139	1	nogas	690	1.87

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1159034	0.52	1446753	80.11	70	125	
Ge	72	1	nogas	3121229	4.29	3206704	97.33	70	125	
In	115	1	nogas	2723278	2.90	2812441	96.83	70	125	
Bi	209	1	nogas	2126871	1.71	2322160	91.59	70	125	
Ge	72	2	He	742295	0.54	754516	98.38	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICCV
Data File Name	129_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:11:49-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	90.301	4.598	786718	2.51	100	90.3	90	110	
Na	23	1	nogas	10384.490	4.839	254714922	1.49	10000	103.8	90	110	
Mg	24	1	nogas	10216.194	4.105	159942195	1.00	10000	102.2	90	110	
Al	27	1	nogas	100.587	5.820	1978560	2.61	100	100.6	90	110	
K	39	1	nogas	10263.903	4.337	210149896	1.02	10000	102.6	90	110	
Ti	47	1	nogas	100.515	5.206	175305	2.20	100	100.5	90	110	
V	51	1	nogas	78.579	5.035	3273331	2.45	100	78.6	90	110	ICV Main CR1 Failed
Cr	52	1	nogas	95.915	0.426	2172786	3.25	100	95.9	90	110	
Mn	55	1	nogas	98.108	3.002	2694291	1.34	100	98.1	90	110	
Co	59	1	nogas	97.795	2.315	2271185	0.95	100	97.8	90	110	
Ni	60	1	nogas	97.599	4.497	487945	1.48	100	97.6	90	110	
Cu	63	1	nogas	96.507	2.348	1152762	1.19	100	96.5	90	110	
Zn	66	1	nogas	98.631	2.099	387944	1.34	100	98.6	90	110	
As	75	1	nogas	88.407	5.316	614466	0.51	100	88.4	90	110	ICV Main CR1 Failed
Sr	88	1	nogas	100.095	2.438	2717900	1.04	100	100.1	90	110	
Ag	107	1	nogas	96.628	1.502	1296693	2.79	100	96.6	90	110	
Cd	111	1	nogas	101.761	1.019	285954	1.10	100	101.8	90	110	
Sb	121	1	nogas	100.652	0.288	1309455	3.17	100	100.7	90	110	
Tl	205	1	nogas	100.746	4.261	2013533	4.36	100	100.7	90	110	
Pb	208	1	nogas	97.632	2.193	2670818	2.19	100	97.6	90	110	
U	238	1	nogas	89.697	1.525	2413131	1.56	100	89.7	90	110	ICV Main CR1 Failed
[Pb]	206	1	nogas	98.621	1.406	675010	0.65	100	98.6	90	110	
[Pb]	207	1	nogas	96.898	1.884	562952	0.91	100	96.9	90	110	
Na	23	2	He	10474.107	2.100	15647264	0.58	10000	104.7	90	110	
Mg	24	2	He	10151.008	1.080	8378945	1.49	10000	101.5	90	110	
Al	27	2	He	101.205	2.229	47076	1.36	100	101.2	90	110	
K	39	2	He	10491.084	0.429	8969435	0.42	10000	104.9	90	110	
Ca	43	2	He	10065.061	3.960	23815	3.76	10000	100.7	90	110	
Ca	44	2	He	10033.963	2.027	396076	0.67	10000	100.3	90	110	
V	51	2	He	98.605	1.094	578483	0.64	100	98.6	90	110	
Cr	52	2	He	96.922	1.559	617857	0.49	100	96.9	90	110	
Mn	55	2	He	99.040	1.904	439081	2.12	100	99.0	90	110	
Fe	56	2	He	9957.403	2.767	54623416	2.72	10000	99.6	90	110	
Co	59	2	He	94.907	1.887	824547	1.17	100	94.9	90	110	
Ni	60	2	He	99.154	2.596	210237	1.87	100	99.2	90	110	
Cu	63	2	He	99.383	1.107	536715	1.70	100	99.4	90	110	
Zn	66	2	He	98.604	1.440	130032	1.95	100	98.6	90	110	
As	75	2	He	99.804	2.341	125983	1.29	100	99.8	90	110	
Se	78	2	He	98.760	3.198	9962	1.69	100	98.8	90	110	
B	11	1	nogas	437.724	2.810	2239070	2.43	500	87.5	90	110	ICV Main CR1 Failed
Si	28	1	nogas	507.303	6.864	6908083	2.09	5000	10.1	90	110	ICV Main CR1 Failed
Ca	43	1	nogas	9993.413	4.144	348511	1.52	10000	99.9	90	110	
Ca	44	1	nogas	9827.861	3.325	5768005	1.71	10000	98.3	90	110	
Fe	56	1	nogas	9810.284	5.205	227146205	2.03	10000	98.1	90	110	
Se	77	1	nogas	28.175	49.147	62688	1.61	100	28.2	90	110	ICV Main CR1 Failed
Se	82	1	nogas	95.569	5.992	24954	2.86	100	95.6	90	110	
Mo	95	1	nogas	96.081	3.743	531609	1.03	100	96.1	90	110	
Sn	118	1	nogas	102.400	1.837	753861	0.40	100	102.4	90	110	
Ba	137	1	nogas	99.957	1.470	396552	0.55	100	100.0	90	110	
Sb	121	2	He	101.772	0.899	468578	1.72	100	101.8	90	110	
Li	7	1	nogas	99.125	3.686	1937876	1.69	100	99.1	90	110	
P	31	1	nogas	445.692	5.088	802166	1.30	500	89.1	90	110	ICV Main CR1 Failed
La	139	1	nogas	139.329	16.802	533	15.61	100	139.3	90	110	ICV Main CR1 Failed
Au	197	1	nogas	238.391	200.378	17	124.90	100	238.4	90	110	ICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1261564	2.14	1446753	87.20	70	125	
Ge	72	1	nogas	3247576	3.27	3206704	101.27	70	125	
In	115	1	nogas	2743656	1.57	2812441	97.55	70	125	
Bi	209	1	nogas	2145193	1.08	2322160	92.38	70	125	

Initial Calibration Verification (ICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	770652	1.61	754516	102.14	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLCCV5
Data File Name	131LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:15:48-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.255	3.454	37998	2.70	5	85.1	70	130	
Na	23	1	nogas	499.242	2.195	12873645	2.74	500	99.8	70	130	
Mg	24	1	nogas	512.335	3.599	8184982	4.27	500	102.5	70	130	
Al	27	1	nogas	6.095	2.904	141154	3.05	5	121.9	70	130	
K	39	1	nogas	486.238	5.330	17624482	1.33	500	97.2	70	130	
Ti	47	1	nogas	5.232	7.021	9420	9.15	5	104.6	70	130	
V	51	1	nogas	-6.283	-22.118	1216227	2.87	5	-125.7	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	4.473	0.892	177047	2.39	5	89.5	70	130	
Mn	55	1	nogas	5.009	1.429	165200	1.51	5	100.2	70	130	
Co	59	1	nogas	4.733	4.242	111279	2.42	5	94.7	70	130	
Ni	60	1	nogas	5.315	1.560	26396	0.80	5	106.3	70	130	
Cu	63	1	nogas	5.045	2.503	62005	0.18	5	100.9	70	130	
Zn	66	1	nogas	5.552	3.479	21783	1.98	5	111.0	70	130	
As	75	1	nogas	-2.705	-11.160	181175	2.69	5	-54.1	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	4.780	1.920	131338	0.41	5	95.6	70	130	
Ag	107	1	nogas	4.957	1.445	66943	0.84	5	99.1	70	130	
Cd	111	1	nogas	4.876	5.119	14386	2.78	5	97.5	70	130	
Sb	121	1	nogas	5.026	3.099	66704	1.22	5	100.5	70	130	
Tl	205	1	nogas	4.611	3.786	96348	4.14	5	92.2	70	130	
Pb	208	1	nogas	4.932	2.201	136423	2.18	5	98.6	70	130	
U	238	1	nogas	4.789	0.734	134083	2.16	5	95.8	70	130	
[Pb]	206	1	nogas	4.732	2.820	34076	3.37	5	94.6	70	130	
[Pb]	207	1	nogas	4.809	4.102	29343	2.62	5	96.2	70	130	
Na	23	2	He	498.970	4.063	792259	1.09	500	99.8	70	130	
Mg	24	2	He	494.997	4.875	410285	1.85	500	99.0	70	130	
Al	27	2	He	5.852	7.510	3527	5.25	5	117.0	70	130	
K	39	2	He	506.396	2.047	606084	1.43	500	101.3	70	130	
Ca	43	2	He	491.416	14.325	1173	10.52	500	98.3	70	130	
Ca	44	2	He	496.079	4.147	20692	0.88	500	99.2	70	130	
V	51	2	He	4.386	5.926	40180	0.32	5	87.7	70	130	
Cr	52	2	He	4.874	6.575	35625	2.28	5	97.5	70	130	
Mn	55	2	He	5.090	5.175	23849	1.62	5	101.8	70	130	
Fe	56	2	He	504.862	2.218	2790513	1.75	500	101.0	70	130	
Co	59	2	He	4.795	3.819	42098	3.30	5	95.9	70	130	
Ni	60	2	He	5.348	1.558	11154	4.76	5	107.0	70	130	
Cu	63	2	He	5.165	2.576	27965	4.78	5	103.3	70	130	
Zn	66	2	He	5.473	6.880	6928	4.04	5	109.5	70	130	
As	75	2	He	4.975	3.427	6872	0.50	5	99.5	70	130	
Se	78	2	He	5.009	13.099	583	8.04	5	100.2	70	130	
B	11	1	nogas	30.841	3.806	177033	2.05	25	123.4	70	130	
Si	28	1	nogas	249.369	3.184	4214325	2.02	25	997.5	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	509.856	6.326	18416	4.14	500	102.0	70	130	
Ca	44	1	nogas	474.314	2.975	372822	1.35	500	94.9	70	130	
Fe	56	1	nogas	478.755	2.307	13872788	2.19	500	95.8	70	130	
Se	77	1	nogas	-24.944	-3.683	52633	2.27	5	-498.9	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	4.839	17.649	1507	12.76	5	96.8	70	130	
Mo	95	1	nogas	4.829	0.906	27351	1.49	5	96.6	70	130	
Sn	118	1	nogas	4.772	2.072	37958	1.83	5	95.4	70	130	
Ba	137	1	nogas	4.742	4.076	19838	1.91	5	94.8	70	130	
Sb	121	2	He	5.265	4.079	24788	3.90	5	105.3	70	130	
Li	7	1	nogas	5.160	4.362	196270	2.54	5	103.2	70	130	
P	31	1	nogas	28.079	5.950	137092	0.42	25	112.3	70	130	
La	139	1	nogas	9.723	50.979	90	22.22	5	194.5	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	301.460	2.209	20	0.00	5	6029.2	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1290480	1.84	1446753	89.20	70	125	
Ge	72	1	nogas	3264303	2.29	3206704	101.80	70	125	
In	115	1	nogas	2878758	2.35	2812441	102.36	70	125	
Bi	209	1	nogas	2230517	1.48	2322160	96.05	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	773591	3.51	754516	102.53	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICCB
Data File Name	132_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:17:46-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.013	4.8	167	3.5	1	
Na	23	1	nogas	0.207	280.8	412239	2.5	100	
Mg	24	1	nogas	0.620	26.4	18112	8.7	100	
Al	27	1	nogas	2.320	102.5	69027	73.1	5	
K	39	1	nogas	-8.421	-138.7	7898197	0.8	100	
Ti	47	1	nogas	0.021	141.8	280	16.4	2.5	
V	51	1	nogas	-8.276	-5.8	1179353	4.6	2.5	
Cr	52	1	nogas	-0.384	-19.7	71092	2.4	2.5	
Mn	55	1	nogas	-0.015	-280.8	28148	3.7	2.5	
Co	59	1	nogas	-0.006	-51.6	700	14.3	2.5	
Ni	60	1	nogas	0.181	2.3	563	7.4	2.5	
Cu	63	1	nogas	0.037	16.8	1970	2.2	1	
Zn	66	1	nogas	0.269	5.7	897	7.6	2.5	
As	75	1	nogas	-6.762	-9.3	163234	2.5	2.5	
Sr	88	1	nogas	0.022	24.7	1500	8.8	2.5	
Ag	107	1	nogas	0.004	34.4	153	16.4	2.5	
Cd	111	1	nogas	0.012	65.2	57	44.4	1	
Sb	121	1	nogas	0.157	9.7	3140	4.1	2.5	
Tl	205	1	nogas	0.093	43.0	2510	36.4	1	
Pb	208	1	nogas	0.011	58.4	1863	9.1	2.5	
U	238	1	nogas	0.015	30.6	533	28.7	2.5	
[Pb]	206	1	nogas	0.001	454.9	423	8.9	2.5	
[Pb]	207	1	nogas	0.018	20.0	430	4.0	2.5	
Na	23	2	He	-0.581	-104.0	46597	1.6	100	
Mg	24	2	He	0.607	18.6	1117	7.6	100	
Al	27	2	He	0.447	31.4	1067	6.0	5	
K	39	2	He	-2.860	-88.1	179521	1.2	100	
Ca	43	2	He	12.124	117.0	40	86.6	100	
Ca	44	2	He	2.221	142.5	1210	9.9	100	
V	51	2	He	-0.476	-12.0	12512	2.3	2.5	
Cr	52	2	He	-0.075	-48.7	4301	4.6	2.5	
Mn	55	2	He	0.068	45.2	1617	9.0	2.5	
Fe	56	2	He	0.433	9.9	14706	2.5	100	
Co	59	2	He	-0.008	-47.9	243	13.2	2.5	
Ni	60	2	He	0.220	17.7	227	38.0	2.5	
Cu	63	2	He	0.145	11.1	760	12.6	1	
Zn	66	2	He	0.435	4.0	257	9.0	2.5	
As	75	2	He	-0.006	-317.5	604	3.0	2.5	
Se	78	2	He	0.626	20.9	147	8.2	1	
B	11	1	nogas	6.668	5.8	49812	1.3	10	
Si	28	1	nogas	0.052	8967.4	1584000	1.4	5	
Ca	43	1	nogas	9.121	54.2	903	20.9	100	
Ca	44	1	nogas	-0.468	-1366.5	98243	0.7	100	
Fe	56	1	nogas	-10.589	-37.4	2639254	0.1	100	

Initial Calibration Blank (ICB) Report

Se	77	1	nogas	-30.346	-17.1	52075	4.0	2.5	
Se	82	1	nogas	-0.029	-417.0	247	16.4	1	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Mo	95	1	nogas	0.035	83.0	703	19.9	2.5	
Sn	118	1	nogas	0.039	67.2	1420	9.9	5	
Ba	137	1	nogas	0.017	6.4	183	6.3	2.5	
Sb	121	2	He	0.123	27.9	1073	15.1	2.5	
P	31	1	nogas	-0.016	-5605.1	92937	2.9	10	
La	139	1	nogas	5.719	90.3	73	20.8	2.5	ICB Main CR1 Failed
Au	197	1	nogas	162.485	222.8	13	114.6	2.5	ICB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1297781	3.56	1446753	89.70	70	125	
Ge	72	1	nogas	3296160	3.64	3206704	102.79	70	125	
In	115	1	nogas	2824301	3.91	2812441	100.42	70	125	
Bi	209	1	nogas	2246613	5.11	2322160	96.75	70	125	
Ge	72	2	He	785684	0.89	754516	104.13	70	125	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	133SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:19:46-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	123CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.882	1.882	5.62	15770	0.01	2000	
Na	23	1	nogas	201.336	201.336	2.88	5469477	0.00	200000	
Mg	24	1	nogas	205.217	205.217	3.10	3303223	0.01	200000	
Al	27	1	nogas	1.933	1.933	3.87	61601	0.00	2000	
K	39	1	nogas	185.801	185.801	4.93	12054502	0.00	200000	
Ti	47	1	nogas	1.806	1.806	4.19	3517	0.05	2000	
V	51	1	nogas	-6.160	-6.160	-14.00	1258913	0.00	2000	
Cr	52	1	nogas	1.455	1.455	10.77	114367	0.00	2000	
Mn	55	1	nogas	1.651	1.651	7.03	75799	0.00	2000	
Co	59	1	nogas	1.840	1.840	4.00	45193	0.00	2000	
Ni	60	1	nogas	2.090	2.090	3.98	10500	0.02	2000	
Cu	63	1	nogas	1.917	1.917	3.45	25308	0.01	2000	
Zn	66	1	nogas	2.084	2.084	2.76	8335	0.03	2000	
As	75	1	nogas	-4.977	-4.977	-26.69	175762	0.00	2000	
Sr	88	1	nogas	1.912	1.912	2.87	54784	0.00	2000	
Ag	107	1	nogas	1.965	1.965	4.33	27458	0.01	2000	
Cd	111	1	nogas	2.001	2.001	2.31	5994	0.03	2000	
Sb	121	1	nogas	1.906	1.906	2.02	26811	0.01	2000	
Tl	205	1	nogas	1.816	1.816	7.34	39168	0.00	2000	
Pb	208	1	nogas	1.957	1.957	1.65	55080	0.00	2000	
U	238	1	nogas	1.904	1.904	3.13	53621	0.00	2000	
[Pb]	206	1	nogas	1.863	1.863	2.76	13996	0.01	2000	
[Pb]	207	1	nogas	1.906	1.906	0.63	12111	0.02	2000	
Na	23	2	He	196.462	196.462	0.70	349443	0.06	200000	
Mg	24	2	He	198.864	198.864	0.86	169682	0.12	200000	
Al	27	2	He	1.431	1.431	18.44	1540	0.09	2000	
K	39	2	He	202.776	202.776	1.30	351766	0.06	200000	
Ca	43	2	He	246.074	246.074	21.96	610	40.34	200000	
Ca	44	2	He	191.830	191.830	1.03	8912	2.15	200000	
V	51	2	He	1.557	1.557	2.27	24613	0.01	2000	
Cr	52	2	He	1.692	1.692	0.69	15864	0.01	2000	
Mn	55	2	He	1.873	1.873	3.83	9849	0.02	2000	
Fe	56	2	He	192.979	192.979	1.59	1102649	0.02	200000	
Co	59	2	He	1.896	1.896	2.10	17282	0.01	2000	
Ni	60	2	He	2.085	2.085	6.24	4307	0.05	2000	
Cu	63	2	He	2.038	2.038	2.10	11294	0.02	2000	
Zn	66	2	He	2.293	2.293	7.40	2790	0.08	2000	
As	75	2	He	1.932	1.932	1.48	3119	0.06	2000	
Se	78	2	He	2.240	2.240	2.71	315	0.71	2000	
B	11	1	nogas	13.939	13.939	6.27	86879	0.02	2000	
Si	28	1	nogas	90.823	90.823	5.09	2614779	0.00	2000	
Ca	43	1	nogas	188.371	188.371	2.11	7405	2.54	200000	

Sample Report

Ca	44	1	nogas	170.299	170.299	2.45	202849	0.08	200000	
Fe	56	1	nogas	176.064	176.064	4.53	7133054	0.00	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	-26.984	-26.984	-2.66	53930	-0.05	2000	
Se	82	1	nogas	1.877	1.877	0.88	763	0.25	2000	
Mo	95	1	nogas	1.909	1.909	2.06	11481	0.02	2000	
Sn	118	1	nogas	1.823	1.823	5.27	15400	0.01	2000	
Ba	137	1	nogas	1.970	1.970	7.76	8416	0.02	2000	
Sb	121	2	He	2.007	2.007	4.82	10006	0.02	2000	
La	139	1	nogas	-7.752	-7.752	-21.51	27	-29.07	2000	
Au	197	1	nogas	437.229	437.229	29.88	27	1639.61	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1316939	3.63	1446753	91.03	70	125	
Ge	72	1	nogas	3370304	1.34	3206704	105.10	70	125	
In	115	1	nogas	2915299	1.61	2812441	103.66	70	125	
Bi	209	1	nogas	2283724	1.07	2322160	98.34	70	125	
Ge	72	2	He	793775	0.77	754516	105.20	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	138_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:33:43-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.034	32.1	357	26.1	1	
Na	23	1	nogas	8.695	38.6	619732	5.4	100	
Mg	24	1	nogas	4.329	35.2	76039	23.2	100	
Al	27	1	nogas	3.334	4.1	85623	1.7	5	
K	39	1	nogas	3.908	261.5	7935173	1.1	100	
Ti	47	1	nogas	0.071	50.4	360	18.2	2.5	
V	51	1	nogas	-10.161	-1.0	1103147	3.0	2.5	
Cr	52	1	nogas	-0.455	-18.2	67716	1.5	2.5	
Mn	55	1	nogas	0.835	5.9	50258	0.9	2.5	
Co	59	1	nogas	0.060	22.4	2197	11.1	2.5	
Ni	60	1	nogas	0.274	4.3	1010	3.0	2.5	
Cu	63	1	nogas	0.103	19.1	2697	8.5	2	
Zn	66	1	nogas	0.548	6.5	1957	5.5	2.5	
As	75	1	nogas	-7.871	-10.2	153746	0.7	2.5	
Sr	88	1	nogas	0.049	28.1	2184	13.9	2.5	
Ag	107	1	nogas	0.029	13.7	473	8.5	2.5	
Cd	111	1	nogas	0.044	50.9	147	41.7	1	
Sb	121	1	nogas	0.977	27.0	13539	22.3	2.5	
Tl	205	1	nogas	0.369	56.7	8410	56.0	1	
Pb	208	1	nogas	0.051	52.5	2957	24.6	2.5	
U	238	1	nogas	0.139	61.5	4007	63.0	2.5	
[Pb]	206	1	nogas	0.033	83.8	663	31.4	2.5	
[Pb]	207	1	nogas	0.053	30.6	653	18.5	2.5	
Na	23	2	He	7.915	11.9	57831	2.4	100	
Mg	24	2	He	2.673	10.9	2777	9.5	100	
Al	27	2	He	2.569	8.4	1997	3.7	5	
K	39	2	He	1.563	161.5	183226	1.2	100	
Ca	43	2	He	6.977	34.8	27	21.7	100	
Ca	44	2	He	9.659	3.4	1467	1.4	100	
V	51	2	He	-0.495	-5.6	12053	0.5	2.5	
Cr	52	2	He	-0.027	-76.0	4481	2.5	2.5	
Mn	55	2	He	0.853	6.4	5007	4.8	2.5	
Fe	56	2	He	3.313	9.4	29938	5.1	100	
Co	59	2	He	0.032	37.7	580	16.6	2.5	
Ni	60	2	He	0.282	8.5	350	15.9	2.5	
Cu	63	2	He	0.213	8.5	1097	7.1	2	
Zn	66	2	He	0.727	7.7	633	12.9	2.5	
As	75	2	He	0.001	3616.8	596	6.0	2.5	
Se	78	2	He	0.554	61.2	135	24.0	2	
B	11	1	nogas	9.981	7.6	68838	6.0	10	
Si	28	1	nogas	5.313	30.7	1598930	3.4	5	CCB Main CR1 Failed
Ca	43	1	nogas	15.667	5.1	1103	1.4	100	
Ca	44	1	nogas	2.448	207.5	97385	0.3	100	
Fe	56	1	nogas	-17.295	-46.9	2417812	4.9	100	
Se	77	1	nogas	-39.790	-11.7	48882	1.5	2.5	
Se	82	1	nogas	-0.064	-228.4	230	15.1	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.353	47.3	2410	34.5	2.5	
Sn	118	1	nogas	0.243	40.4	2980	20.8	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.065	33.6	383	21.7	2.5	
Sb	121	2	He	0.692	9.4	3634	6.8	2.5	
P	31	1	nogas	6.323	34.3	100485	1.3	10	
La	139	1	nogas	-3.812	-85.5	40	25.0	2.5	
Au	197	1	nogas	227.151	208.2	17	124.9	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1349535	1.36	1446753	93.28	70	125	
Ge	72	1	nogas	3210634	3.09	3206704	100.12	70	125	
In	115	1	nogas	2854242	4.17	2812441	101.49	70	125	
Bi	209	1	nogas	2266004	3.07	2322160	97.58	70	125	
Ge	72	2	He	763674	1.80	754516	101.21	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	141_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:41:27-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	102.812	3.292	795235	2.22	100	102.8	90	110	
Na	23	1	nogas	10340.483	2.172	255082981	1.86	10000	103.4	90	110	
Mg	24	1	nogas	10062.903	3.553	158367295	1.64	10000	100.6	90	110	
Al	27	1	nogas	97.706	1.884	1888953	0.61	100	97.7	90	110	
K	39	1	nogas	10467.538	2.061	210404055	2.73	10000	104.7	90	110	
Ti	47	1	nogas	100.690	1.427	172538	0.99	100	100.7	90	110	
V	51	1	nogas	101.563	1.884	3762915	1.39	100	101.6	90	110	
Cr	52	1	nogas	100.273	2.268	2225655	1.25	100	100.3	90	110	
Mn	55	1	nogas	100.838	2.787	2718536	2.31	100	100.8	90	110	
Co	59	1	nogas	101.097	4.476	2304952	3.64	100	101.1	90	110	
Ni	60	1	nogas	99.660	3.112	489389	2.00	100	99.7	90	110	
Cu	63	1	nogas	97.470	1.514	1143128	0.23	100	97.5	90	110	
Zn	66	1	nogas	100.054	0.756	386412	0.74	100	100.1	90	110	
As	75	1	nogas	101.369	1.547	664239	0.99	100	101.4	90	110	
Sr	88	1	nogas	103.326	4.120	2754507	3.42	100	103.3	90	110	
Ag	107	1	nogas	102.557	3.834	1350925	3.74	100	102.6	90	110	
Cd	111	1	nogas	98.383	0.869	288138	0.13	100	98.4	90	110	
Sb	121	1	nogas	102.522	3.257	1308764	2.00	100	102.5	90	110	
Tl	205	1	nogas	102.511	6.470	2132674	1.73	100	102.5	90	110	
Pb	208	1	nogas	100.066	3.028	2737353	3.03	100	100.1	90	110	
U	238	1	nogas	88.815	3.127	2445212	2.90	100	88.8	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	93.339	6.660	665109	2.58	100	93.3	90	110	
[Pb]	207	1	nogas	92.365	4.473	559268	3.84	100	92.4	90	110	
Na	23	2	He	10540.257	2.502	15329537	1.74	10000	105.4	90	110	
Mg	24	2	He	10273.068	1.083	8254690	0.23	10000	102.7	90	110	
Al	27	2	He	101.254	3.206	45852	2.74	100	101.3	90	110	
K	39	2	He	10456.458	2.356	8940433	2.31	10000	104.6	90	110	
Ca	43	2	He	10208.892	1.111	23518	1.42	10000	102.1	90	110	
Ca	44	2	He	10384.631	0.455	399093	1.05	10000	103.8	90	110	
V	51	2	He	101.688	1.780	580312	1.15	100	101.7	90	110	
Cr	52	2	He	100.269	1.996	622205	2.44	100	100.3	90	110	
Mn	55	2	He	102.015	1.065	440245	0.79	100	102.0	90	110	
Fe	56	2	He	10160.819	2.283	54259449	1.52	10000	101.6	90	110	
Co	59	2	He	96.621	2.055	817210	1.32	100	96.6	90	110	
Ni	60	2	He	101.382	3.156	209279	2.67	100	101.4	90	110	
Cu	63	2	He	102.238	1.594	537465	1.02	100	102.2	90	110	
Zn	66	2	He	98.935	1.620	127001	0.77	100	98.9	90	110	
As	75	2	He	102.351	0.299	125785	1.14	100	102.4	90	110	
Se	78	2	He	102.187	1.326	10034	0.50	100	102.2	90	110	
B	11	1	nogas	457.541	4.746	2134011	0.91	500	91.5	90	110	
Si	28	1	nogas	485.486	0.407	6562317	1.60	5000	9.7	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10236.072	1.117	350670	1.98	10000	102.4	90	110	
Ca	44	1	nogas	10091.318	2.995	5813739	2.86	10000	100.9	90	110	
Fe	56	1	nogas	10039.854	2.717	228322572	2.28	10000	100.4	90	110	
Se	77	1	nogas	102.366	1.568	75810	1.09	100	102.4	90	110	
Se	82	1	nogas	98.580	1.539	25285	0.53	100	98.6	90	110	
Mo	95	1	nogas	96.190	1.639	522713	0.58	100	96.2	90	110	
Sn	118	1	nogas	98.748	2.361	757826	2.28	100	98.7	90	110	
Ba	137	1	nogas	96.297	3.275	398138	2.29	100	96.3	90	110	
Sb	121	2	He	101.639	1.280	455531	0.51	100	101.6	90	110	
Li	7	1	nogas	108.415	0.288	1962769	4.85	100	108.4	90	110	
P	31	1	nogas	459.663	0.076	809994	1.36	500	91.9	90	110	
La	139	1	nogas	112.708	8.028	460	7.84	100	112.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	156.141	167.682	13	86.60	100	156.1	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1220140	5.12	1446753	84.34	70	125	
Ge	72	1	nogas	3187513	1.29	3206704	99.40	70	125	
In	115	1	nogas	2859495	1.00	2812441	101.67	70	125	
Bi	209	1	nogas	2237658	4.90	2322160	96.36	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	750211	0.86	754516	99.43	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	147_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:53:20-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	100.098	6.666	777669	1.61	100	100.1	90	110	
Na	23	1	nogas	10321.189	4.890	250356081	1.73	10000	103.2	90	110	
Mg	24	1	nogas	10223.789	3.802	158311658	1.97	10000	102.2	90	110	
Al	27	1	nogas	104.558	5.640	2023351	1.57	100	104.6	90	110	
K	39	1	nogas	10030.938	5.820	202260767	1.88	10000	100.3	90	110	
Ti	47	1	nogas	102.108	3.332	175380	2.08	100	102.1	90	110	
V	51	1	nogas	86.769	3.694	3418815	3.03	100	86.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	97.861	1.319	2181601	5.20	100	97.9	90	110	
Mn	55	1	nogas	98.906	1.603	2676280	5.34	100	98.9	90	110	
Co	59	1	nogas	98.935	4.108	2261816	3.82	100	98.9	90	110	
Ni	60	1	nogas	97.546	3.540	480128	0.79	100	97.5	90	110	
Cu	63	1	nogas	96.916	3.481	1139211	0.93	100	96.9	90	110	
Zn	66	1	nogas	99.377	2.539	384762	2.22	100	99.4	90	110	
As	75	1	nogas	93.103	4.874	626920	1.04	100	93.1	90	110	
Sr	88	1	nogas	104.161	4.050	2783763	3.15	100	104.2	90	110	
Ag	107	1	nogas	98.657	3.570	1302396	0.89	100	98.7	90	110	
Cd	111	1	nogas	99.568	5.051	284769	1.96	100	99.6	90	110	
Sb	121	1	nogas	99.088	7.094	1267428	5.04	100	99.1	90	110	
Tl	205	1	nogas	102.826	6.816	2042064	7.56	100	102.8	90	110	
Pb	208	1	nogas	97.148	1.113	2657590	1.11	100	97.1	90	110	
U	238	1	nogas	92.603	1.618	2430110	2.21	100	92.6	90	110	
[Pb]	206	1	nogas	98.972	1.824	672913	1.27	100	99.0	90	110	
[Pb]	207	1	nogas	97.694	3.833	563696	2.45	100	97.7	90	110	
Na	23	2	He	10168.292	0.763	15099804	1.14	10000	101.7	90	110	
Mg	24	2	He	10061.984	0.209	8253815	0.90	10000	100.6	90	110	
Al	27	2	He	100.373	1.211	46414	1.91	100	100.4	90	110	
K	39	2	He	10252.470	0.212	8769568	0.21	10000	102.5	90	110	
Ca	43	2	He	10055.173	1.556	23645	1.31	10000	100.6	90	110	
Ca	44	2	He	10091.529	2.272	395879	1.52	10000	100.9	90	110	
V	51	2	He	99.097	1.138	577684	0.49	100	99.1	90	110	
Cr	52	2	He	97.225	1.301	616010	1.93	100	97.2	90	110	
Mn	55	2	He	99.325	0.637	437593	0.47	100	99.3	90	110	
Fe	56	2	He	10032.096	0.710	54692263	0.81	10000	100.3	90	110	
Co	59	2	He	94.864	0.381	819129	0.74	100	94.9	90	110	
Ni	60	2	He	99.541	1.725	209754	0.80	100	99.5	90	110	
Cu	63	2	He	99.129	2.779	531913	1.88	100	99.1	90	110	
Zn	66	2	He	97.982	1.482	128410	2.15	100	98.0	90	110	
As	75	2	He	100.041	0.871	125511	0.68	100	100.0	90	110	
Se	78	2	He	98.655	2.732	9891	1.73	100	98.7	90	110	
B	11	1	nogas	472.280	7.270	2212422	1.13	500	94.5	90	110	
Si	28	1	nogas	496.346	8.308	6683269	2.29	5000	9.9	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	9976.656	5.079	342356	0.93	10000	99.8	90	110	
Ca	44	1	nogas	9847.424	5.776	5686667	3.60	10000	98.5	90	110	
Fe	56	1	nogas	9901.329	2.506	225806405	2.54	10000	99.0	90	110	
Se	77	1	nogas	55.954	31.335	67023	0.91	100	56.0	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	95.577	2.944	24584	2.19	100	95.6	90	110	
Mo	95	1	nogas	98.344	4.641	535433	0.49	100	98.3	90	110	
Sn	118	1	nogas	99.238	4.175	743825	0.96	100	99.2	90	110	
Ba	137	1	nogas	97.909	2.120	395716	3.03	100	97.9	90	110	
Sb	121	2	He	101.105	1.590	462572	1.21	100	101.1	90	110	
Li	7	1	nogas	105.849	5.883	1926457	3.09	100	105.8	90	110	
P	31	1	nogas	448.209	4.482	793643	0.98	500	89.6	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	130.154	10.808	510	7.07	100	130.2	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	637.362	57.958	33	45.83	100	637.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1227694	6.59	1446753	84.86	70	125	
Ge	72	1	nogas	3197421	4.25	3206704	99.71	70	125	
In	115	1	nogas	2796582	5.01	2812441	99.44	70	125	
Bi	209	1	nogas	2131008	1.38	2322160	91.77	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	765831	1.10	754516	101.50	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	148_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T19:55:18-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.061	32.3	570	25.3	1	
Na	23	1	nogas	17.047	14.7	833421	3.8	100	
Mg	24	1	nogas	6.237	25.1	107433	19.5	100	
Al	27	1	nogas	3.314	5.0	86122	2.3	5	
K	39	1	nogas	8.210	234.2	8097944	0.8	100	
Ti	47	1	nogas	0.104	16.0	420	6.3	2.5	
V	51	1	nogas	-18.661	-8.2	908686	6.9	2.5	
Cr	52	1	nogas	-0.764	-8.8	61702	2.6	2.5	
Mn	55	1	nogas	0.777	12.5	49179	1.5	2.5	
Co	59	1	nogas	0.069	30.2	2417	16.2	2.5	
Ni	60	1	nogas	0.310	2.3	1200	4.2	2.5	
Cu	63	1	nogas	0.120	36.7	2924	14.0	2	
Zn	66	1	nogas	0.556	2.1	2013	2.5	2.5	
As	75	1	nogas	-11.844	-4.3	136474	3.3	2.5	
Sr	88	1	nogas	0.072	22.0	2824	11.2	2.5	
Ag	107	1	nogas	0.039	32.1	617	23.1	2.5	
Cd	111	1	nogas	0.056	12.9	183	12.6	1	
Sb	121	1	nogas	0.522	13.9	7809	8.8	2.5	
Tl	205	1	nogas	0.769	62.7	16434	60.4	1	
Pb	208	1	nogas	0.060	47.7	3200	24.2	2.5	
U	238	1	nogas	0.147	52.8	4114	51.3	2.5	
[Pb]	206	1	nogas	0.051	77.8	777	36.1	2.5	
[Pb]	207	1	nogas	0.079	52.3	790	31.2	2.5	
Na	23	2	He	15.472	17.0	68540	4.1	100	
Mg	24	2	He	4.287	3.7	4070	1.6	100	
Al	27	2	He	2.420	20.3	1917	10.3	5	
K	39	2	He	4.765	38.5	185909	0.8	100	
Ca	43	2	He	18.614	67.7	53	54.1	100	
Ca	44	2	He	17.171	14.8	1750	7.0	100	
V	51	2	He	-0.722	-2.8	10706	0.9	2.5	
Cr	52	2	He	-0.001	-3292.1	4621	3.5	2.5	
Mn	55	2	He	0.840	7.5	4924	6.7	2.5	
Fe	56	2	He	4.440	9.9	35828	5.1	100	
Co	59	2	He	0.045	21.9	687	10.9	2.5	
Ni	60	2	He	0.257	8.6	297	16.6	2.5	
Cu	63	2	He	0.213	9.2	1093	8.2	2	
Zn	66	2	He	0.639	7.8	513	11.4	2.5	
As	75	2	He	-0.054	-72.0	523	7.7	2.5	
Se	78	2	He	0.709	12.4	150	6.9	2	
B	11	1	nogas	12.149	18.7	78187	9.1	10	CCB Main CR1 Failed
Si	28	1	nogas	10.023	70.5	1663537	0.8	5	CCB Main CR1 Failed
Ca	43	1	nogas	18.341	34.6	1203	14.5	100	
Ca	44	1	nogas	0.067	8720.5	97014	0.4	100	
Fe	56	1	nogas	-13.397	-66.0	2530743	4.1	100	
Se	77	1	nogas	-67.312	-2.8	44040	3.7	2.5	
Se	82	1	nogas	0.043	959.9	260	40.7	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.438	45.9	2897	34.2	2.5	
Sn	118	1	nogas	0.298	30.6	3394	16.4	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.104	21.5	540	13.0	2.5	
Sb	121	2	He	0.431	5.0	2434	2.6	2.5	
P	31	1	nogas	5.293	34.0	99898	1.3	10	
La	139	1	nogas	1.838	303.1	60	28.9	2.5	
Au	197	1	nogas	601.050	77.1	33	62.4	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1326497	5.41	1446753	91.69	70	125	
Ge	72	1	nogas	3244478	3.79	3206704	101.18	70	125	
In	115	1	nogas	2847870	3.71	2812441	101.26	70	125	
Bi	209	1	nogas	2219885	0.68	2322160	95.60	70	125	
Ge	72	2	He	759079	1.55	754516	100.60	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	159_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:17:04-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	103.960	4.988	788231	1.56	100	104.0	90	110	
Na	23	1	nogas	10259.326	1.218	254488314	0.96	10000	102.6	90	110	
Mg	24	1	nogas	10091.346	0.918	159772699	2.43	10000	100.9	90	110	
Al	27	1	nogas	100.470	5.061	1936392	1.37	100	100.5	90	110	
K	39	1	nogas	10728.759	3.033	214946438	1.96	10000	107.3	90	110	
Ti	47	1	nogas	104.238	4.626	178113	0.46	100	104.2	90	110	
V	51	1	nogas	100.850	8.654	3734390	1.46	100	100.8	90	110	
Cr	52	1	nogas	101.197	6.665	2239156	4.14	100	101.2	90	110	
Mn	55	1	nogas	101.045	4.345	2717178	1.93	100	101.0	90	110	
Co	59	1	nogas	99.371	2.298	2261453	2.62	100	99.4	90	110	
Ni	60	1	nogas	99.278	4.998	486173	0.13	100	99.3	90	110	
Cu	63	1	nogas	98.934	4.759	1157057	0.36	100	98.9	90	110	
Zn	66	1	nogas	100.419	2.467	387014	2.65	100	100.4	90	110	
As	75	1	nogas	100.819	5.137	660007	1.18	100	100.8	90	110	
Sr	88	1	nogas	102.255	4.272	2719070	0.60	100	102.3	90	110	
Ag	107	1	nogas	100.428	2.722	1320027	2.37	100	100.4	90	110	
Cd	111	1	nogas	99.814	1.082	284692	2.23	100	99.8	90	110	
Sb	121	1	nogas	103.435	5.354	1316899	2.40	100	103.4	90	110	
Tl	205	1	nogas	98.427	5.989	2029796	5.71	100	98.4	90	110	
Pb	208	1	nogas	99.002	0.800	2708274	0.80	100	99.0	90	110	
U	238	1	nogas	89.831	2.873	2448207	0.93	100	89.8	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	95.749	3.659	676152	2.11	100	95.7	90	110	
[Pb]	207	1	nogas	94.536	1.635	566812	0.93	100	94.5	90	110	
Na	23	2	He	10575.884	3.846	15452084	1.59	10000	105.8	90	110	
Mg	24	2	He	10399.832	3.366	8395441	1.55	10000	104.0	90	110	
Al	27	2	He	102.480	2.501	46621	0.58	100	102.5	90	110	
K	39	2	He	10375.651	1.673	8872747	1.64	10000	103.8	90	110	
Ca	43	2	He	10182.161	1.280	23575	2.53	10000	101.8	90	110	
Ca	44	2	He	10090.987	1.421	389758	1.98	10000	100.9	90	110	
V	51	2	He	101.702	2.362	583175	0.50	100	101.7	90	110	
Cr	52	2	He	99.254	1.936	618866	0.52	100	99.3	90	110	
Mn	55	2	He	101.031	1.211	438179	1.57	100	101.0	90	110	
Fe	56	2	He	10174.869	2.605	54598609	1.54	10000	101.7	90	110	
Co	59	2	He	97.431	2.860	827978	1.04	100	97.4	90	110	
Ni	60	2	He	101.725	4.799	210925	2.66	100	101.7	90	110	
Cu	63	2	He	101.818	3.004	537764	0.75	100	101.8	90	110	
Zn	66	2	He	99.810	1.792	128757	1.03	100	99.8	90	110	
As	75	2	He	101.203	1.848	124974	0.46	100	101.2	90	110	
Se	78	2	He	101.348	0.938	10002	1.35	100	101.3	90	110	
B	11	1	nogas	473.013	6.810	2161676	1.37	500	94.6	90	110	
Si	28	1	nogas	485.909	5.283	6549028	1.12	5000	9.7	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10239.294	4.633	349762	0.33	10000	102.4	90	110	
Ca	44	1	nogas	10005.055	5.446	5747401	0.58	10000	100.1	90	110	
Fe	56	1	nogas	10090.460	3.278	228930030	1.62	10000	100.9	90	110	
Se	77	1	nogas	98.227	16.644	74813	0.68	100	98.2	90	110	
Se	82	1	nogas	101.457	4.908	25942	0.33	100	101.5	90	110	
Mo	95	1	nogas	97.445	5.423	527943	0.64	100	97.4	90	110	
Sn	118	1	nogas	100.535	3.014	751069	1.35	100	100.5	90	110	
Ba	137	1	nogas	100.286	2.008	403781	1.49	100	100.3	90	110	
Sb	121	2	He	101.698	1.169	458067	1.46	100	101.7	90	110	
Li	7	1	nogas	105.962	4.516	1881192	2.15	100	106.0	90	110	
P	31	1	nogas	460.175	5.056	808506	0.78	500	92.0	90	110	
La	139	1	nogas	136.995	2.865	533	5.73	100	137.0	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	378.334	31.524	23	24.74	100	378.3	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1197250	6.32	1446753	82.75	70	125	
Ge	72	1	nogas	3183053	4.78	3206704	99.26	70	125	
In	115	1	nogas	2785286	3.29	2812441	99.03	70	125	
Bi	209	1	nogas	2214088	2.32	2322160	95.35	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	754009	2.28	754516	99.93	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	160_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:19:01-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.046	19.4	440	15.9	1	
Na	23	1	nogas	12.809	12.1	734140	3.0	100	
Mg	24	1	nogas	5.667	22.4	99378	18.2	100	
Al	27	1	nogas	3.408	2.8	86508	1.4	5	
K	39	1	nogas	13.562	60.0	8072156	0.6	100	
Ti	47	1	nogas	0.283	111.7	717	74.6	2.5	
V	51	1	nogas	-11.423	-14.0	1065497	2.9	2.5	
Cr	52	1	nogas	-0.373	-2.8	69068	1.8	2.5	
Mn	55	1	nogas	0.799	5.4	48992	1.1	2.5	
Co	59	1	nogas	0.068	24.4	2377	14.8	2.5	
Ni	60	1	nogas	0.322	2.9	1240	2.9	2.5	
Cu	63	1	nogas	0.097	12.4	2607	4.3	2	
Zn	66	1	nogas	0.555	5.1	1977	6.6	2.5	
As	75	1	nogas	-8.138	-11.6	151588	4.1	2.5	
Sr	88	1	nogas	0.069	25.2	2704	15.9	2.5	
Ag	107	1	nogas	0.035	30.9	553	24.5	2.5	
Cd	111	1	nogas	0.053	82.8	173	68.8	1	
Sb	121	1	nogas	0.051	47.9	1690	17.3	2.5	
Tl	205	1	nogas	0.731	59.1	15613	58.6	1	
Pb	208	1	nogas	0.059	38.5	3197	19.6	2.5	
U	238	1	nogas	0.137	56.7	3824	56.6	2.5	
[Pb]	206	1	nogas	0.053	11.6	783	5.2	2.5	
[Pb]	207	1	nogas	0.062	58.7	687	32.9	2.5	
Na	23	2	He	11.656	1.3	62526	0.3	100	
Mg	24	2	He	3.790	10.2	3640	8.4	100	
Al	27	2	He	2.805	12.4	2077	7.8	5	
K	39	2	He	4.445	165.4	185640	3.3	100	
Ca	43	2	He	25.848	57.6	70	49.5	100	
Ca	44	2	He	14.654	21.7	1640	7.8	100	
V	51	2	He	-0.320	-14.1	12877	1.7	2.5	
Cr	52	2	He	0.003	962.9	4611	4.3	2.5	
Mn	55	2	He	0.761	7.6	4544	5.7	2.5	
Fe	56	2	He	3.819	11.0	32262	7.0	100	
Co	59	2	He	0.045	16.1	687	9.2	2.5	
Ni	60	2	He	0.272	7.4	323	12.5	2.5	
Cu	63	2	He	0.218	11.5	1110	11.5	2	
Zn	66	2	He	0.693	8.0	580	11.9	2.5	
As	75	2	He	-0.027	-30.1	553	1.6	2.5	
Se	78	2	He	0.598	31.5	138	12.9	2	
B	11	1	nogas	7.477	11.4	54104	8.0	10	
Si	28	1	nogas	8.191	18.2	1618137	1.5	5	CCB Main CR1 Failed
Ca	43	1	nogas	17.426	5.5	1157	2.8	100	
Ca	44	1	nogas	-7.461	-33.7	91171	0.7	100	
Fe	56	1	nogas	-13.329	-64.3	2492840	6.6	100	
Se	77	1	nogas	-34.875	-12.5	49527	3.0	2.5	
Se	82	1	nogas	-0.086	-82.9	223	6.8	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.351	59.0	2394	45.8	2.5	
Sn	118	1	nogas	0.238	41.6	2974	21.5	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.101	34.9	537	26.6	2.5	
Sb	121	2	He	0.001	1187.4	480	9.1	2.5	
P	31	1	nogas	6.704	25.2	100459	1.3	10	
La	139	1	nogas	-3.930	-186.9	40	66.1	2.5	
Au	197	1	nogas	153.406	221.1	13	114.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1304191	3.41	1446753	90.15	70	125	
Ge	72	1	nogas	3189465	1.47	3206704	99.46	70	125	
In	115	1	nogas	2884666	4.12	2812441	102.57	70	125	
Bi	209	1	nogas	2203694	1.44	2322160	94.90	70	125	
Ge	72	2	He	753619	0.46	754516	99.88	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	168_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:34:46-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	106.169	0.951	724460	0.90	100	106.2	90	110	
Na	23	1	nogas	10222.546	4.778	262375206	2.88	10000	102.2	90	110	
Mg	24	1	nogas	9870.243	3.028	161697770	1.11	10000	98.7	90	110	
Al	27	1	nogas	101.644	0.520	2033078	0.44	100	101.6	90	110	
K	39	1	nogas	10367.424	0.700	215722096	0.27	10000	103.7	90	110	
Ti	47	1	nogas	103.352	1.148	183279	0.31	100	103.4	90	110	
V	51	1	nogas	98.046	4.291	3806926	1.91	100	98.0	90	110	
Cr	52	1	nogas	102.129	2.490	2344578	1.65	100	102.1	90	110	
Mn	55	1	nogas	101.438	1.782	2830369	1.94	100	101.4	90	110	
Co	59	1	nogas	97.918	0.685	2310999	0.40	100	97.9	90	110	
Ni	60	1	nogas	100.043	2.457	508493	1.92	100	100.0	90	110	
Cu	63	1	nogas	100.676	2.390	1221929	1.84	100	100.7	90	110	
Zn	66	1	nogas	100.553	1.939	401875	1.06	100	100.6	90	110	
As	75	1	nogas	98.412	2.259	673090	1.11	100	98.4	90	110	
Sr	88	1	nogas	102.509	0.975	2828727	1.13	100	102.5	90	110	
Ag	107	1	nogas	96.662	0.810	1317785	0.81	100	96.7	90	110	
Cd	111	1	nogas	99.600	1.656	291656	1.46	100	99.6	90	110	
Sb	121	1	nogas	104.611	1.966	1382247	1.04	100	104.6	90	110	
Tl	205	1	nogas	102.529	3.337	1988130	1.89	100	102.5	90	110	
Pb	208	1	nogas	97.054	1.593	2655018	1.59	100	97.1	90	110	
U	238	1	nogas	93.161	3.899	2387296	1.59	100	93.2	90	110	
[Pb]	206	1	nogas	98.846	4.652	656292	2.54	100	98.8	90	110	
[Pb]	207	1	nogas	98.169	2.266	553492	1.39	100	98.2	90	110	
Na	23	2	He	10499.901	3.520	16016712	2.21	10000	105.0	90	110	
Mg	24	2	He	10017.487	3.217	8442024	1.92	10000	100.2	90	110	
Al	27	2	He	98.983	0.373	47045	1.35	100	99.0	90	110	
K	39	2	He	11002.774	2.123	9398036	2.08	10000	110.0	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10331.871	2.108	24967	2.17	10000	103.3	90	110	
Ca	44	2	He	10281.543	1.277	414482	1.25	10000	102.8	90	110	
V	51	2	He	101.396	2.517	606967	1.17	100	101.4	90	110	
Cr	52	2	He	99.575	0.070	648186	1.26	100	99.6	90	110	
Mn	55	2	He	101.139	1.328	457924	2.40	100	101.1	90	110	
Fe	56	2	He	10121.089	0.603	56705459	1.82	10000	101.2	90	110	
Co	59	2	He	96.677	2.303	857683	1.04	100	96.7	90	110	
Ni	60	2	He	103.013	3.565	223031	2.27	100	103.0	90	110	
Cu	63	2	He	101.587	3.055	560131	2.02	100	101.6	90	110	
Zn	66	2	He	99.270	0.922	133682	0.71	100	99.3	90	110	
As	75	2	He	102.570	1.611	132212	0.65	100	102.6	90	110	
Se	78	2	He	100.516	3.385	10353	2.08	100	100.5	90	110	
B	11	1	nogas	2272.710	9.279	9296038	8.52	500	454.5	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	564.091	2.364	7633273	1.16	5000	11.3	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10633.821	1.299	376971	1.39	10000	106.3	90	110	
Ca	44	1	nogas	10292.644	1.412	6134662	0.46	10000	102.9	90	110	
Fe	56	1	nogas	10056.283	2.041	236678139	1.29	10000	100.6	90	110	
Se	77	1	nogas	95.294	2.454	77052	0.49	100	95.3	90	110	
Se	82	1	nogas	101.050	4.082	26813	3.14	100	101.1	90	110	
Mo	95	1	nogas	101.746	1.461	572246	1.58	100	101.7	90	110	
Sn	118	1	nogas	100.710	1.213	772788	1.83	100	100.7	90	110	
Ba	137	1	nogas	97.276	0.585	402188	0.31	100	97.3	90	110	
Sb	121	2	He	101.693	3.546	478004	2.37	100	101.7	90	110	
Li	7	1	nogas	111.250	2.256	1772833	1.65	100	111.3	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	449.201	1.190	821268	0.75	500	89.8	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	155.429	17.227	613	15.41	100	155.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	173.556	79.018	13	43.30	100	173.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1075314	1.37	1446753	74.33	70	125	
Ge	72	1	nogas	3298798	0.95	3206704	102.87	70	125	
In	115	1	nogas	2858972	0.65	2812441	101.65	70	125	
Bi	209	1	nogas	2082212	2.43	2322160	89.67	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	786980	1.30	754516	104.30	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	169_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:36:44-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.064	26.7	560	23.4	1	
Na	23	1	nogas	95.761	8.0	2912460	2.0	100	
Mg	24	1	nogas	8.433	18.3	148156	11.6	100	
Al	27	1	nogas	3.550	2.3	92429	0.7	5	
K	39	1	nogas	18.674	63.5	8463341	0.8	100	
Ti	47	1	nogas	0.081	39.6	387	12.2	2.5	
V	51	1	nogas	-5.729	-47.7	1245510	6.8	2.5	
Cr	52	1	nogas	-0.142	-22.7	76658	1.4	2.5	
Mn	55	1	nogas	0.848	9.2	52080	1.7	2.5	
Co	59	1	nogas	0.082	37.6	2767	23.7	2.5	
Ni	60	1	nogas	0.516	6.5	2270	5.8	2.5	
Cu	63	1	nogas	0.242	13.7	4464	8.2	2	
Zn	66	1	nogas	0.600	7.6	2224	7.3	2.5	
As	75	1	nogas	-5.087	-10.6	171807	2.1	2.5	
Sr	88	1	nogas	0.111	6.4	3951	5.2	2.5	
Ag	107	1	nogas	0.041	32.8	650	25.3	2.5	
Cd	111	1	nogas	0.063	17.6	213	16.5	1	
Sb	121	1	nogas	0.336	2.5	5518	2.9	2.5	
Tl	205	1	nogas	0.659	63.2	14405	61.4	1	
Pb	208	1	nogas	0.052	69.5	3004	33.1	2.5	
U	238	1	nogas	0.139	59.4	3967	58.6	2.5	
[Pb]	206	1	nogas	0.054	67.3	807	32.9	2.5	
[Pb]	207	1	nogas	0.047	49.1	610	23.6	2.5	
Na	23	2	He	91.360	2.9	187800	1.1	100	
Mg	24	2	He	6.372	11.3	6014	8.9	100	
Al	27	2	He	2.756	4.2	2160	0.8	5	
K	39	2	He	16.515	16.5	195751	1.2	100	
Ca	43	2	He	55.164	110.6	143	101.0	100	
Ca	44	2	He	32.174	65.3	2425	33.2	100	
V	51	2	He	-0.137	-33.8	14614	0.9	2.5	
Cr	52	2	He	0.048	79.5	5141	3.2	2.5	
Mn	55	2	He	0.884	7.6	5341	6.9	2.5	
Fe	56	2	He	8.058	11.2	57839	9.3	100	
Co	59	2	He	0.044	3.6	707	0.8	2.5	
Ni	60	2	He	0.267	14.0	330	22.9	2.5	
Cu	63	2	He	0.253	14.8	1360	14.2	2	
Zn	66	2	He	0.694	6.7	610	8.7	2.5	
As	75	2	He	0.066	20.6	702	4.3	2.5	
Se	78	2	He	0.704	17.1	156	7.8	2	
B	11	1	nogas	981.451	4.1	4601279	5.2	10	CCB Main CR1 Failed
Si	28	1	nogas	29.712	27.3	1906442	2.9	5	CCB Main CR1 Failed
Ca	43	1	nogas	168.723	5.5	6558	2.9	100	CCB Main CR1 Failed
Ca	44	1	nogas	21.978	17.0	111728	0.8	100	
Fe	56	1	nogas	-13.578	-69.5	2575101	6.2	100	
Se	77	1	nogas	-16.693	-8.2	54916	2.1	2.5	
Se	82	1	nogas	0.290	73.8	330	15.7	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	1.093	23.4	6645	19.5	2.5	
Sn	118	1	nogas	0.307	41.2	3627	24.6	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.142	5.1	730	6.8	2.5	
Sb	121	2	He	0.236	16.9	1617	11.7	2.5	
P	31	1	nogas	1.680	138.6	95885	1.7	10	
La	139	1	nogas	13.289	40.9	107	21.7	2.5	CCB Main CR1 Failed
Au	197	1	nogas	147.764	226.8	13	114.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1229035	1.29	1446753	84.95	70	125	
Ge	72	1	nogas	3304307	2.36	3206704	103.04	70	125	
In	115	1	nogas	2980582	2.90	2812441	105.98	70	125	
Bi	209	1	nogas	2254777	0.70	2322160	97.10	70	125	
Ge	72	2	He	792420	1.80	754516	105.02	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	178_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:54:25-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	107.563	1.874	731375	0.78	100	107.6	90	110	
Na	23	1	nogas	10091.516	0.731	260743664	1.33	10000	100.9	90	110	
Mg	24	1	nogas	9758.920	2.090	160878495	0.74	10000	97.6	90	110	
Al	27	1	nogas	102.746	2.679	2030892	2.38	100	102.7	90	110	
K	39	1	nogas	10652.651	0.698	218859955	0.30	10000	106.5	90	110	
Ti	47	1	nogas	103.870	0.598	182065	0.92	100	103.9	90	110	
V	51	1	nogas	104.253	2.568	3914874	1.95	100	104.3	90	110	
Cr	52	1	nogas	100.939	1.075	2291564	1.48	100	100.9	90	110	
Mn	55	1	nogas	103.320	2.285	2848648	1.96	100	103.3	90	110	
Co	59	1	nogas	100.175	1.145	2336714	0.77	100	100.2	90	110	
Ni	60	1	nogas	102.202	0.703	513469	0.38	100	102.2	90	110	
Cu	63	1	nogas	103.891	2.398	1246437	2.86	100	103.9	90	110	
Zn	66	1	nogas	102.510	1.426	404958	1.01	100	102.5	90	110	
As	75	1	nogas	102.770	1.420	686151	0.56	100	102.8	90	110	
Sr	88	1	nogas	108.083	1.782	2947668	1.40	100	108.1	90	110	
Ag	107	1	nogas	103.517	2.732	1394860	2.86	100	103.5	90	110	
Cd	111	1	nogas	97.827	0.879	298139	0.64	100	97.8	90	110	
Sb	121	1	nogas	103.126	1.721	1346994	2.14	100	103.1	90	110	
Tl	205	1	nogas	101.834	1.471	2045506	1.58	100	101.8	90	110	
Pb	208	1	nogas	102.046	1.643	2791483	1.64	100	102.0	90	110	
U	238	1	nogas	90.107	5.690	2390700	3.54	100	90.1	90	110	
[Pb]	206	1	nogas	99.942	0.183	687638	2.08	100	99.9	90	110	
[Pb]	207	1	nogas	98.675	2.233	576131	0.84	100	98.7	90	110	
Na	23	2	He	10283.694	2.193	15614934	2.23	10000	102.8	90	110	
Mg	24	2	He	10020.446	1.158	8404626	0.27	10000	100.2	90	110	
Al	27	2	He	100.538	3.529	47537	3.68	100	100.5	90	110	
K	39	2	He	10879.850	1.576	9295073	1.55	10000	108.8	90	110	
Ca	43	2	He	9873.796	1.516	23745	2.23	10000	98.7	90	110	
Ca	44	2	He	10090.920	3.848	404717	2.62	10000	100.9	90	110	
V	51	2	He	102.018	0.695	607699	0.74	100	102.0	90	110	
Cr	52	2	He	99.598	1.446	645102	1.09	100	99.6	90	110	
Mn	55	2	He	99.897	3.247	450007	2.86	100	99.9	90	110	
Fe	56	2	He	10198.383	4.302	56851709	4.21	10000	102.0	90	110	
Co	59	2	He	98.093	1.240	866092	1.16	100	98.1	90	110	
Ni	60	2	He	100.671	0.905	216949	1.38	100	100.7	90	110	
Cu	63	2	He	99.370	0.937	545312	0.91	100	99.4	90	110	
Zn	66	2	He	97.461	2.994	130586	2.55	100	97.5	90	110	
As	75	2	He	103.110	1.256	132257	0.51	100	103.1	90	110	
Se	78	2	He	99.399	3.113	10190	2.26	100	99.4	90	110	
B	11	1	nogas	698.239	2.424	2856827	1.36	500	139.6	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	519.893	1.828	7076587	1.26	5000	10.4	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10566.872	0.885	370240	0.75	10000	105.7	90	110	
Ca	44	1	nogas	10385.476	1.564	6117304	1.22	10000	103.9	90	110	
Fe	56	1	nogas	10390.176	1.720	241607114	1.27	10000	103.9	90	110	
Se	77	1	nogas	106.960	7.576	78442	1.63	100	107.0	90	110	
Se	82	1	nogas	102.641	2.201	26920	2.05	100	102.6	90	110	
Mo	95	1	nogas	100.070	1.970	556244	1.53	100	100.1	90	110	
Sn	118	1	nogas	99.066	1.294	791075	0.56	100	99.1	90	110	
Ba	137	1	nogas	95.579	1.972	411299	2.38	100	95.6	90	110	
Sb	121	2	He	100.744	1.074	471349	1.42	100	100.7	90	110	
Li	7	1	nogas	112.232	0.960	1781672	0.44	100	112.2	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	452.041	1.611	816269	1.24	500	90.4	90	110	
La	139	1	nogas	142.467	7.956	590	7.39	100	142.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	83.203	275.182	10	100.00	100	83.2	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1071602	1.27	1446753	74.07	70	125	
Ge	72	1	nogas	3260364	0.46	3206704	101.67	70	125	
In	115	1	nogas	2975481	0.93	2812441	105.80	70	125	
Bi	209	1	nogas	2156260	2.10	2322160	92.86	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	783119	1.25	754516	103.79	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	179_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T20:56:24-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.060	31.2	510	25.7	1	
Na	23	1	nogas	29.484	6.1	1207165	0.9	100	
Mg	24	1	nogas	6.131	25.3	111523	19.6	100	
Al	27	1	nogas	4.444	19.2	111108	13.8	5	
K	39	1	nogas	2.019	373.3	8212336	0.2	100	
Ti	47	1	nogas	0.097	20.4	420	7.1	2.5	
V	51	1	nogas	-5.864	-48.5	1254556	6.7	2.5	
Cr	52	1	nogas	-0.324	-8.2	73361	1.8	2.5	
Mn	55	1	nogas	0.744	7.5	49703	1.9	2.5	
Co	59	1	nogas	0.074	20.6	2614	11.9	2.5	
Ni	60	1	nogas	0.364	9.5	1513	10.2	2.5	
Cu	63	1	nogas	0.150	21.1	3377	9.5	2	
Zn	66	1	nogas	0.603	7.6	2260	6.5	2.5	
As	75	1	nogas	-7.039	-3.3	163963	1.5	2.5	
Sr	88	1	nogas	0.080	14.9	3130	8.6	2.5	
Ag	107	1	nogas	0.033	47.4	543	37.2	2.5	
Cd	111	1	nogas	0.046	34.3	163	28.3	1	
Sb	121	1	nogas	0.030	79.1	1483	19.5	2.5	
Tl	205	1	nogas	0.526	66.8	11486	63.7	1	
Pb	208	1	nogas	0.048	67.0	2880	30.4	2.5	
U	238	1	nogas	0.132	60.8	3714	59.2	2.5	
[Pb]	206	1	nogas	0.046	73.1	747	32.2	2.5	
[Pb]	207	1	nogas	0.050	53.8	623	26.1	2.5	
Na	23	2	He	33.664	2.1	98526	0.6	100	
Mg	24	2	He	4.339	7.7	4257	7.9	100	
Al	27	2	He	3.529	2.3	2500	1.6	5	
K	39	2	He	10.734	28.1	190908	1.3	100	
Ca	43	2	He	25.970	79.3	73	68.6	100	
Ca	44	2	He	13.165	32.1	1647	8.6	100	
V	51	2	He	-0.189	-17.4	14177	1.5	2.5	
Cr	52	2	He	-0.051	-86.8	4454	5.8	2.5	
Mn	55	2	He	0.829	5.8	5037	3.4	2.5	
Fe	56	2	He	8.823	2.2	61579	3.1	100	
Co	59	2	He	0.037	36.4	637	17.2	2.5	
Ni	60	2	He	0.288	5.7	373	11.2	2.5	
Cu	63	2	He	0.236	1.9	1260	2.9	2	
Zn	66	2	He	0.685	8.2	593	13.6	2.5	
As	75	2	He	0.059	45.4	687	6.3	2.5	
Se	78	2	He	0.704	23.2	155	11.1	2	
B	11	1	nogas	161.530	4.6	751912	1.0	10	CCB Main CR1 Failed
Si	28	1	nogas	19.410	38.2	1813970	2.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	39.055	19.5	1987	14.9	100	
Ca	44	1	nogas	-22.749	-11.3	86324	0.9	100	
Fe	56	1	nogas	-12.847	-83.4	2618170	7.7	100	
Se	77	1	nogas	-33.786	-6.6	52031	1.2	2.5	
Se	82	1	nogas	-0.051	-339.2	243	19.4	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.407	40.6	2817	31.3	2.5	
Sn	118	1	nogas	0.226	49.4	3027	27.6	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.107	21.8	587	15.3	2.5	
Sb	121	2	He	-0.012	-248.6	440	31.2	2.5	
P	31	1	nogas	-2.088	-62.8	90706	1.7	10	
La	139	1	nogas	9.650	119.4	93	44.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	373.899	123.2	23	89.2	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1200688	3.57	1446753	82.99	70	125	
Ge	72	1	nogas	3337458	2.02	3206704	104.08	70	125	
In	115	1	nogas	3022626	2.14	2812441	107.47	70	125	
Bi	209	1	nogas	2235581	1.38	2322160	96.27	70	125	
Ge	72	2	He	785091	1.64	754516	104.05	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	190_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:18:13-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	109.023	2.722	730878	1.06	100	109.0	90	110	
Na	23	1	nogas	10367.449	5.763	261920789	2.90	10000	103.7	90	110	
Mg	24	1	nogas	10062.041	5.296	162212699	0.78	10000	100.6	90	110	
Al	27	1	nogas	100.829	3.912	2038320	1.49	100	100.8	90	110	
K	39	1	nogas	10130.921	2.768	213288846	1.89	10000	101.3	90	110	
Ti	47	1	nogas	101.477	1.100	181982	2.54	100	101.5	90	110	
V	51	1	nogas	102.685	4.161	3964509	1.15	100	102.7	90	110	
Cr	52	1	nogas	99.385	2.866	2308572	0.35	100	99.4	90	110	
Mn	55	1	nogas	102.809	2.847	2899057	0.63	100	102.8	90	110	
Co	59	1	nogas	98.385	4.190	2346470	1.52	100	98.4	90	110	
Ni	60	1	nogas	97.197	2.923	499363	0.29	100	97.2	90	110	
Cu	63	1	nogas	96.751	0.960	1187503	1.94	100	96.8	90	110	
Zn	66	1	nogas	100.440	0.968	405914	1.81	100	100.4	90	110	
As	75	1	nogas	100.479	2.185	690641	1.13	100	100.5	90	110	
Sr	88	1	nogas	102.688	3.157	2864259	1.89	100	102.7	90	110	
Ag	107	1	nogas	99.612	3.106	1372545	0.53	100	99.6	90	110	
Cd	111	1	nogas	99.261	0.591	299874	0.64	100	99.3	90	110	
Sb	121	1	nogas	100.664	1.220	1344952	1.43	100	100.7	90	110	
Tl	205	1	nogas	98.316	1.549	2057284	2.97	100	98.3	90	110	
Pb	208	1	nogas	101.634	2.080	2780240	2.08	100	101.6	90	110	
U	238	1	nogas	87.541	2.788	2421032	3.56	100	87.5	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	96.546	1.000	691844	2.13	100	96.5	90	110	
[Pb]	207	1	nogas	96.367	1.276	586194	2.41	100	96.4	90	110	
Na	23	2	He	10409.044	1.576	15560005	1.65	10000	104.1	90	110	
Mg	24	2	He	10091.378	1.236	8333714	1.60	10000	100.9	90	110	
Al	27	2	He	97.196	1.771	45271	1.86	100	97.2	90	110	
K	39	2	He	10478.139	0.889	8958593	0.87	10000	104.8	90	110	
Ca	43	2	He	9822.292	5.651	23241	4.06	10000	98.2	90	110	
Ca	44	2	He	9944.985	3.678	392674	1.78	10000	99.4	90	110	
V	51	2	He	101.819	1.895	597083	0.17	100	101.8	90	110	
Cr	52	2	He	99.778	0.756	636383	2.43	100	99.8	90	110	
Mn	55	2	He	98.277	1.800	435860	0.21	100	98.3	90	110	
Fe	56	2	He	10138.108	2.685	55629329	0.76	10000	101.4	90	110	
Co	59	2	He	97.208	4.067	844655	2.11	100	97.2	90	110	
Ni	60	2	He	102.509	4.064	217400	2.15	100	102.5	90	110	
Cu	63	2	He	103.094	3.117	556912	2.32	100	103.1	90	110	
Zn	66	2	He	99.869	1.895	131775	2.63	100	99.9	90	110	
As	75	2	He	100.845	3.408	127327	1.45	100	100.8	90	110	
Se	78	2	He	99.664	2.288	10058	0.60	100	99.7	90	110	
B	11	1	nogas	602.997	2.113	2434612	0.67	500	120.6	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	474.841	4.818	6747808	1.16	5000	9.5	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10149.708	1.140	363812	1.52	10000	101.5	90	110	
Ca	44	1	nogas	10036.793	1.104	6053513	3.70	10000	100.4	90	110	
Fe	56	1	nogas	10332.408	2.934	245736380	0.94	10000	103.3	90	110	
Se	77	1	nogas	97.883	7.402	78415	0.88	100	97.9	90	110	
Se	82	1	nogas	100.102	4.347	26857	3.43	100	100.1	90	110	
Mo	95	1	nogas	96.834	1.796	550639	1.80	100	96.8	90	110	
Sn	118	1	nogas	99.773	1.889	789737	1.09	100	99.8	90	110	
Ba	137	1	nogas	96.906	2.672	413293	1.82	100	96.9	90	110	
Sb	121	2	He	101.343	1.911	466738	0.06	100	101.3	90	110	
Li	7	1	nogas	110.381	4.823	1728290	2.27	100	110.4	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	437.580	1.498	811292	1.36	500	87.5	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	160.095	27.901	650	25.19	100	160.1	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	297.717	128.449	20	86.60	100	297.7	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1056780	2.30	1446753	73.04	70	125	
Ge	72	1	nogas	3335844	2.63	3206704	104.03	70	125	
In	115	1	nogas	2949511	0.87	2812441	104.87	70	125	
Bi	209	1	nogas	2245617	1.48	2322160	96.70	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	771054	1.98	754516	102.19	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	191_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:20:13-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.068	28.4	543	19.9	1	
Na	23	1	nogas	22.778	21.6	942411	0.3	100	
Mg	24	1	nogas	6.263	27.1	103436	12.1	100	
Al	27	1	nogas	4.160	24.3	100207	9.3	5	
K	39	1	nogas	23.235	179.2	8251191	0.4	100	
Ti	47	1	nogas	0.097	39.6	400	6.6	2.5	
V	51	1	nogas	-7.862	-46.1	1151109	2.7	2.5	
Cr	52	1	nogas	-0.204	-125.4	72695	2.2	2.5	
Mn	55	1	nogas	0.851	21.4	50339	0.1	2.5	
Co	59	1	nogas	0.070	34.9	2387	14.0	2.5	
Ni	60	1	nogas	0.326	15.5	1250	9.7	2.5	
Cu	63	1	nogas	0.117	4.4	2857	9.2	2	
Zn	66	1	nogas	0.626	14.5	2240	8.6	2.5	
As	75	1	nogas	-5.364	-57.2	164488	2.7	2.5	
Sr	88	1	nogas	0.072	33.4	2747	14.4	2.5	
Ag	107	1	nogas	0.036	27.4	560	12.9	2.5	
Cd	111	1	nogas	0.047	29.1	157	20.5	1	
Sb	121	1	nogas	0.134	13.1	2744	3.1	2.5	
Tl	205	1	nogas	0.618	60.5	12393	51.4	1	
Pb	208	1	nogas	0.038	31.9	2600	12.6	2.5	
U	238	1	nogas	0.112	47.7	2960	38.9	2.5	
[Pb]	206	1	nogas	0.039	40.7	657	9.9	2.5	
[Pb]	207	1	nogas	0.042	26.9	543	11.2	2.5	
Na	23	2	He	23.165	7.1	82089	2.5	100	
Mg	24	2	He	4.422	6.6	4297	5.2	100	
Al	27	2	He	3.181	8.4	2324	4.2	5	
K	39	2	He	8.089	2.3	188692	0.1	100	
Ca	43	2	He	30.379	6.1	83	6.9	100	
Ca	44	2	He	11.850	6.5	1587	4.1	100	
V	51	2	He	-0.329	-4.2	13283	2.0	2.5	
Cr	52	2	He	-0.007	-373.8	4711	4.7	2.5	
Mn	55	2	He	0.804	4.1	4901	3.8	2.5	
Fe	56	2	He	6.254	3.4	46943	3.9	100	
Co	59	2	He	0.051	30.1	760	19.6	2.5	
Ni	60	2	He	0.274	6.3	340	12.8	2.5	
Cu	63	2	He	0.231	12.6	1223	14.7	2	
Zn	66	2	He	0.702	7.5	613	13.6	2.5	
As	75	2	He	0.055	20.5	678	4.0	2.5	
Se	78	2	He	0.859	8.6	169	3.8	2	
B	11	1	nogas	85.735	8.9	384397	0.6	10	CCB Main CR1 Failed
Si	28	1	nogas	15.803	117.2	1693468	1.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	30.922	6.8	1630	12.8	100	
Ca	44	1	nogas	-23.212	-72.3	82062	1.8	100	
Fe	56	1	nogas	-13.469	-94.8	2485607	1.8	100	
Se	77	1	nogas	-18.032	-70.8	52857	4.8	2.5	
Se	82	1	nogas	0.167	128.6	290	23.9	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.307	36.3	2134	17.7	2.5	
Sn	118	1	nogas	0.248	34.2	2994	15.6	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.121	12.5	610	12.4	2.5	
Sb	121	2	He	0.103	28.2	973	15.7	2.5	
P	31	1	nogas	5.702	128.3	98685	1.9	10	
La	139	1	nogas	8.584	176.3	83	60.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	787.140	73.8	40	66.1	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1139544	8.09	1446753	78.77	70	125	
Ge	72	1	nogas	3204804	9.17	3206704	99.94	70	125	
In	115	1	nogas	2837543	5.85	2812441	100.89	70	125	
Bi	209	1	nogas	2119125	6.58	2322160	91.26	70	125	
Ge	72	2	He	780405	2.19	754516	103.43	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	199_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:36:11-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	105.963	3.667	758935	1.52	100	106.0	90	110	
Na	23	1	nogas	10269.909	0.903	261157281	1.93	10000	102.7	90	110	
Mg	24	1	nogas	10214.768	2.077	165741112	1.82	10000	102.1	90	110	
Al	27	1	nogas	147.794	14.013	3010165	13.13	100	147.8	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	9980.316	3.447	212558659	1.56	10000	99.8	90	110	
Ti	47	1	nogas	103.105	2.480	186903	0.94	100	103.1	90	110	
V	51	1	nogas	69.979	2.880	3183140	0.16	100	70.0	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	97.160	1.615	2284563	1.58	100	97.2	90	110	
Mn	55	1	nogas	101.145	4.230	2884150	2.44	100	101.1	90	110	
Co	59	1	nogas	96.933	1.079	2339080	1.81	100	96.9	90	110	
Ni	60	1	nogas	98.631	0.971	512552	0.81	100	98.6	90	110	
Cu	63	1	nogas	98.659	0.808	1224352	1.07	100	98.7	90	110	
Zn	66	1	nogas	102.286	1.022	417998	1.60	100	102.3	90	110	
As	75	1	nogas	83.733	1.020	615458	1.23	100	83.7	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	103.404	0.893	2917198	1.07	100	103.4	90	110	
Ag	107	1	nogas	101.238	1.703	1410937	1.09	100	101.2	90	110	
Cd	111	1	nogas	100.529	2.738	309393	1.12	100	100.5	90	110	
Sb	121	1	nogas	101.534	1.247	1371877	2.18	100	101.5	90	110	
Tl	205	1	nogas	102.649	2.740	2164239	0.96	100	102.6	90	110	
Pb	208	1	nogas	103.037	1.236	2818579	1.24	100	103.0	90	110	
U	238	1	nogas	90.297	3.543	2516131	1.84	100	90.3	90	110	
[Pb]	206	1	nogas	99.166	0.621	716262	1.25	100	99.2	90	110	
[Pb]	207	1	nogas	97.332	1.635	596704	1.17	100	97.3	90	110	
Na	23	2	He	9660.603	1.411	14967809	1.26	10000	96.6	90	110	
Mg	24	2	He	9533.278	0.241	8157990	0.46	10000	95.3	90	110	
Al	27	2	He	111.180	2.664	53536	2.72	100	111.2	90	110	CCV Main CR1-2 Failed
K	39	2	He	10332.649	0.509	8836728	0.50	10000	103.3	90	110	
Ca	43	2	He	9629.485	4.266	23625	4.46	10000	96.3	90	110	
Ca	44	2	He	9775.627	1.211	400143	1.43	10000	97.8	90	110	
V	51	2	He	97.492	0.507	593159	0.29	100	97.5	90	110	
Cr	52	2	He	97.910	1.108	647077	0.91	100	97.9	90	110	
Mn	55	2	He	98.544	0.585	452933	0.80	100	98.5	90	110	
Fe	56	2	He	9802.638	1.186	55751918	1.35	10000	98.0	90	110	
Co	59	2	He	95.347	0.216	858874	0.41	100	95.3	90	110	
Ni	60	2	He	100.812	1.332	221637	1.42	100	100.8	90	110	
Cu	63	2	He	99.351	0.688	556228	0.88	100	99.4	90	110	
Zn	66	2	He	97.395	1.700	133147	1.85	100	97.4	90	110	
As	75	2	He	99.782	0.526	130600	0.61	100	99.8	90	110	
Se	78	2	He	96.907	2.853	10138	2.71	100	96.9	90	110	
B	11	1	nogas	563.851	4.596	2432269	1.17	500	112.8	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	513.383	2.972	7247443	0.73	5000	10.3	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10244.423	2.124	371288	1.82	10000	102.4	90	110	
Ca	44	1	nogas	10156.515	1.637	6190007	0.43	10000	101.6	90	110	
Fe	56	1	nogas	10067.602	2.284	242218597	0.70	10000	100.7	90	110	
Se	77	1	nogas	-26.637	-9.837	54040	2.24	100	-26.6	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	98.157	3.387	26633	1.62	100	98.2	90	110	
Mo	95	1	nogas	97.475	1.344	560466	0.84	100	97.5	90	110	
Sn	118	1	nogas	98.720	0.509	796502	2.94	100	98.7	90	110	
Ba	137	1	nogas	100.285	3.962	435653	1.15	100	100.3	90	110	
Sb	121	2	He	100.602	0.667	480185	0.77	100	100.6	90	110	
Li	7	1	nogas	109.838	2.422	1839051	2.26	100	109.8	90	110	
P	31	1	nogas	432.694	1.294	812283	1.22	500	86.5	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	420.605	28.930	1640	24.97	100	420.6	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	294.395	73.482	20	50.00	100	294.4	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1129481	3.55	1446753	78.07	70	125	
Ge	72	1	nogas	3372768	1.76	3206704	105.18	70	125	
In	115	1	nogas	3006134	2.86	2812441	106.89	70	125	
Bi	209	1	nogas	2263748	1.86	2322160	97.48	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	798901	0.22	754516	105.88	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	200_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T21:38:11-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.075	31.4	673	29.0	1	
Na	23	1	nogas	13.233	12.9	762480	4.7	100	
Mg	24	1	nogas	8.644	19.5	150903	17.2	100	
Al	27	1	nogas	13.670	53.6	304933	50.9	5	CCB Main CR1 Failed
K	39	1	nogas	-26.164	-29.1	7843630	1.1	100	
Ti	47	1	nogas	0.173	17.9	570	9.3	2.5	
V	51	1	nogas	-35.315	-2.3	531389	3.5	2.5	
Cr	52	1	nogas	-1.598	-3.3	45950	2.1	2.5	
Mn	55	1	nogas	0.780	8.7	52060	3.3	2.5	
Co	59	1	nogas	0.080	23.9	2827	15.8	2.5	
Ni	60	1	nogas	0.286	4.7	1140	7.0	2.5	
Cu	63	1	nogas	0.162	13.1	3624	8.0	2	
Zn	66	1	nogas	0.581	3.9	2227	4.1	2.5	
As	75	1	nogas	-21.639	-3.4	94816	3.8	2.5	
Sr	88	1	nogas	0.124	24.4	4477	19.1	2.5	
Ag	107	1	nogas	0.045	44.4	743	38.2	2.5	
Cd	111	1	nogas	0.060	24.2	200	18.0	1	
Sb	121	1	nogas	0.095	10.7	2417	6.3	2.5	
Tl	205	1	nogas	0.738	64.0	16648	61.8	1	
Pb	208	1	nogas	0.072	45.8	3540	25.4	2.5	
U	238	1	nogas	0.128	54.2	3794	52.7	2.5	
[Pb]	206	1	nogas	0.060	58.2	883	29.2	2.5	
[Pb]	207	1	nogas	0.066	45.2	750	26.0	2.5	
Na	23	2	He	12.134	6.1	64077	2.2	100	
Mg	24	2	He	6.073	6.4	5558	5.9	100	
Al	27	2	He	6.244	11.6	3664	9.9	5	CCB Main CR1 Failed
K	39	2	He	-6.511	-62.9	176463	1.9	100	
Ca	43	2	He	28.286	6.9	77	7.5	100	
Ca	44	2	He	23.419	16.1	2003	6.9	100	
V	51	2	He	-1.536	-2.6	6159	2.1	2.5	
Cr	52	2	He	-0.098	-25.9	4044	5.3	2.5	
Mn	55	2	He	0.909	2.9	5254	2.4	2.5	
Fe	56	2	He	7.753	11.4	54127	10.2	100	
Co	59	2	He	0.058	24.3	803	14.6	2.5	
Ni	60	2	He	0.292	12.9	370	21.6	2.5	
Cu	63	2	He	0.243	6.9	1260	5.5	2	
Zn	66	2	He	0.733	1.6	640	2.7	2.5	
As	75	2	He	-0.128	-23.6	436	8.5	2.5	
Se	78	2	He	0.723	35.4	152	15.2	2	
B	11	1	nogas	56.773	4.5	293036	2.9	10	CCB Main CR1 Failed
Si	28	1	nogas	1.130	198.9	1659430	2.6	5	
Ca	43	1	nogas	44.564	37.4	2240	27.2	100	
Ca	44	1	nogas	-17.489	-51.5	91804	5.6	100	
Fe	56	1	nogas	-19.471	-45.4	2530138	8.1	100	
Se	77	1	nogas	-148.399	-3.6	29785	3.7	2.5	
Se	82	1	nogas	-0.025	-380.3	257	9.8	2	
Mo	95	1	nogas	0.356	49.0	2604	38.6	2.5	
Sn	118	1	nogas	0.223	37.6	2927	18.9	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.360	24.8	1647	19.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.042	57.6	677	17.8	2.5	
P	31	1	nogas	-3.628	-50.0	90509	2.7	10	
La	139	1	nogas	57.325	40.7	267	28.6	2.5	CCB Main CR1 Failed
Au	197	1	nogas	1.272	19964.0	7	173.2	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1281708	3.91	1446753	88.59	70	125	
Ge	72	1	nogas	3425422	1.18	3206704	106.82	70	125	
In	115	1	nogas	2951342	4.02	2812441	104.94	70	125	
Bi	209	1	nogas	2335081	3.02	2322160	100.56	70	125	
Ge	72	2	He	763822	1.60	754516	101.23	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	211_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:00:10-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	109.744	5.238	750975	1.07	100	109.7	90	110	
Na	23	1	nogas	9941.517	2.735	269524356	1.65	10000	99.4	90	110	
Mg	24	1	nogas	9966.554	1.116	172462725	1.95	10000	99.7	90	110	
Al	27	1	nogas	175.118	16.945	3691247	16.47	100	175.1	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10405.391	3.191	229260372	1.95	10000	104.1	90	110	
Ti	47	1	nogas	103.697	2.033	194761	0.63	100	103.7	90	110	
V	51	1	nogas	94.203	0.230	3932631	1.72	100	94.2	90	110	
Cr	52	1	nogas	101.226	0.268	2462680	1.71	100	101.2	90	110	
Mn	55	1	nogas	103.473	2.204	3057270	1.86	100	103.5	90	110	
Co	59	1	nogas	101.423	3.421	2534721	1.83	100	101.4	90	110	
Ni	60	1	nogas	100.360	2.018	540311	1.44	100	100.4	90	110	
Cu	63	1	nogas	100.911	3.277	1297241	2.68	100	100.9	90	110	
Zn	66	1	nogas	100.457	2.284	425270	1.77	100	100.5	90	110	
As	75	1	nogas	95.915	1.090	700160	0.85	100	95.9	90	110	
Sr	88	1	nogas	105.682	2.077	3088549	1.05	100	105.7	90	110	
Ag	107	1	nogas	100.293	3.490	1447930	2.39	100	100.3	90	110	
Cd	111	1	nogas	99.536	0.929	311655	1.77	100	99.5	90	110	
Sb	121	1	nogas	103.581	1.974	1449791	1.85	100	103.6	90	110	
Tl	205	1	nogas	102.035	4.190	2185705	2.11	100	102.0	90	110	
Pb	208	1	nogas	105.727	2.997	2892122	3.00	100	105.7	90	110	
U	238	1	nogas	88.520	1.381	2507386	1.45	100	88.5	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	99.346	0.607	729264	2.16	100	99.3	90	110	
[Pb]	207	1	nogas	97.375	0.964	606745	2.13	100	97.4	90	110	
Na	23	2	He	10004.291	1.384	16209107	1.19	10000	100.0	90	110	
Mg	24	2	He	9887.381	1.562	8848515	1.15	10000	98.9	90	110	
Al	27	2	He	133.074	2.530	66839	2.74	100	133.1	90	110	CCV Main CR1-2 Failed
K	39	2	He	11151.701	1.440	9522780	1.41	10000	111.5	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	9859.021	1.828	25297	2.33	10000	98.6	90	110	
Ca	44	2	He	9916.431	1.131	424503	1.46	10000	99.2	90	110	
V	51	2	He	100.996	0.790	642065	0.58	100	101.0	90	110	
Cr	52	2	He	97.796	2.186	675959	2.05	100	97.8	90	110	
Mn	55	2	He	98.793	1.520	474871	1.08	100	98.8	90	110	
Fe	56	2	He	9843.026	1.947	58542711	1.19	10000	98.4	90	110	
Co	59	2	He	96.223	1.505	906489	1.36	100	96.2	90	110	
Ni	60	2	He	100.879	2.759	231941	2.58	100	100.9	90	110	
Cu	63	2	He	99.387	1.259	581946	1.43	100	99.4	90	110	
Zn	66	2	He	95.549	0.965	136608	1.38	100	95.5	90	110	
As	75	2	He	101.844	1.493	139392	1.13	100	101.8	90	110	
Se	78	2	He	96.860	1.244	10598	0.75	100	96.9	90	110	
B	11	1	nogas	546.574	5.678	2253653	1.96	500	109.3	90	110	
Si	28	1	nogas	541.639	3.318	7829344	1.05	5000	10.8	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10233.898	2.228	384241	0.88	10000	102.3	90	110	
Ca	44	1	nogas	10063.326	1.843	6355161	0.51	10000	100.6	90	110	
Fe	56	1	nogas	10313.795	0.635	257063356	1.27	10000	103.1	90	110	
Se	77	1	nogas	64.207	12.220	75074	1.67	100	64.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.338	0.523	27932	1.37	100	99.3	90	110	
Mo	95	1	nogas	98.867	2.457	588908	1.51	100	98.9	90	110	
Sn	118	1	nogas	101.002	2.563	828429	1.24	100	101.0	90	110	
Ba	137	1	nogas	100.090	1.352	442422	0.66	100	100.1	90	110	
Sb	121	2	He	100.739	1.281	502866	0.79	100	100.7	90	110	
Li	7	1	nogas	117.533	5.590	1874442	3.54	100	117.5	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	436.458	1.719	848016	1.41	500	87.3	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	972.731	35.484	3787	33.44	100	972.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	509.576	86.184	30	66.67	100	509.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1080526	6.00	1446753	74.69	70	125	
Ge	72	1	nogas	3494299	1.59	3206704	108.97	70	125	
In	115	1	nogas	3057011	1.91	2812441	108.70	70	125	
Bi	209	1	nogas	2300762	2.77	2322160	99.08	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	835546	0.83	754516	110.74	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	212_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:02:11-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.052	37.2	460	31.4	1	
Na	23	1	nogas	10.373	14.1	714582	1.9	100	
Mg	24	1	nogas	7.940	22.2	144115	17.0	100	
Al	27	1	nogas	17.788	19.0	395476	17.1	5	CCB Main CR1 Failed
K	39	1	nogas	-39.486	-25.4	7712879	2.1	100	
Ti	47	1	nogas	0.147	48.6	533	24.5	2.5	
V	51	1	nogas	-16.718	-2.5	1028212	1.7	2.5	
Cr	52	1	nogas	-0.773	-5.0	66208	1.2	2.5	
Mn	55	1	nogas	0.817	8.4	54139	2.8	2.5	
Co	59	1	nogas	0.071	36.6	2657	23.8	2.5	
Ni	60	1	nogas	0.287	3.6	1167	4.1	2.5	
Cu	63	1	nogas	0.119	17.5	3137	7.9	2	
Zn	66	1	nogas	0.613	5.2	2407	6.7	2.5	
As	75	1	nogas	-12.193	-3.8	145113	1.8	2.5	
Sr	88	1	nogas	0.090	13.4	3570	9.0	2.5	
Ag	107	1	nogas	0.033	11.9	580	9.1	2.5	
Cd	111	1	nogas	0.034	16.6	130	15.4	1	
Sb	121	1	nogas	0.009	136.1	1260	12.8	2.5	
Tl	205	1	nogas	0.604	60.3	14135	59.5	1	
Pb	208	1	nogas	0.061	43.9	3254	22.7	2.5	
U	238	1	nogas	0.118	54.4	3607	54.6	2.5	
[Pb]	206	1	nogas	0.056	53.1	873	27.2	2.5	
[Pb]	207	1	nogas	0.059	27.4	723	15.5	2.5	
Na	23	2	He	7.665	13.8	62004	1.1	100	
Mg	24	2	He	5.507	5.0	5501	6.5	100	
Al	27	2	He	11.299	5.7	6425	6.3	5	CCB Main CR1 Failed
K	39	2	He	-5.417	-39.0	177380	1.0	100	
Ca	43	2	He	37.591	42.4	107	39.0	100	
Ca	44	2	He	11.986	29.3	1680	7.9	100	
V	51	2	He	-0.669	-3.7	11947	2.5	2.5	
Cr	52	2	He	-0.062	-72.2	4601	4.4	2.5	
Mn	55	2	He	0.897	5.2	5614	3.8	2.5	
Fe	56	2	He	10.837	7.8	76526	8.6	100	
Co	59	2	He	0.030	14.1	613	7.4	2.5	
Ni	60	2	He	0.265	4.7	340	10.2	2.5	
Cu	63	2	He	0.211	6.7	1173	7.2	2	
Zn	66	2	He	0.756	7.2	723	10.0	2.5	
As	75	2	He	-0.077	-38.9	538	5.3	2.5	
Se	78	2	He	0.792	39.7	171	18.3	2	
B	11	1	nogas	44.680	3.2	221136	1.9	10	CCB Main CR1 Failed
Si	28	1	nogas	17.871	15.1	1881138	0.6	5	CCB Main CR1 Failed
Ca	43	1	nogas	36.257	19.9	1970	12.8	100	
Ca	44	1	nogas	-42.891	-11.7	77808	3.0	100	
Fe	56	1	nogas	-8.133	-144.8	2857002	9.4	100	
Se	77	1	nogas	-73.013	-6.4	46205	3.0	2.5	
Se	82	1	nogas	-0.232	-142.7	203	44.6	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.302	56.4	2334	42.7	2.5	
Sn	118	1	nogas	0.214	40.7	3014	21.5	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.245	9.5	1227	5.9	2.5	
Sb	121	2	He	-0.024	-21.4	403	7.6	2.5	
P	31	1	nogas	-8.287	-13.4	84280	2.5	10	
La	139	1	nogas	160.616	40.2	683	33.9	2.5	CCB Main CR1 Failed
Au	197	1	nogas	762.601	84.6	43	70.5	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1209527	1.10	1446753	83.60	70	125	
Ge	72	1	nogas	3491653	1.02	3206704	108.89	70	125	
In	115	1	nogas	3109819	2.59	2812441	110.57	70	125	
Bi	209	1	nogas	2395987	1.68	2322160	103.18	70	125	
Ge	72	2	He	824251	2.20	754516	109.24	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	223_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:23:51-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	109.517	1.837	736165	1.84	100	109.5	90	110	
Na	23	1	nogas	9896.047	6.073	267727589	1.75	10000	99.0	90	110	
Mg	24	1	nogas	9805.076	4.940	169329179	0.99	10000	98.1	90	110	
Al	27	1	nogas	112.091	3.896	2404943	2.03	100	112.1	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10210.366	2.622	228314063	1.74	10000	102.1	90	110	
Ti	47	1	nogas	100.016	3.134	190471	0.86	100	100.0	90	110	
V	51	1	nogas	86.262	5.846	3775697	1.73	100	86.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	96.626	2.441	2387298	1.45	100	96.6	90	110	
Mn	55	1	nogas	98.721	3.456	2958562	1.35	100	98.7	90	110	
Co	59	1	nogas	96.998	5.126	2457285	2.11	100	97.0	90	110	
Ni	60	1	nogas	99.358	3.028	542340	0.96	100	99.4	90	110	
Cu	63	1	nogas	100.086	2.481	1305349	3.91	100	100.1	90	110	
Zn	66	1	nogas	99.480	1.391	427184	2.85	100	99.5	90	110	
As	75	1	nogas	89.884	4.559	678418	0.63	100	89.9	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	103.683	0.994	3074003	2.96	100	103.7	90	110	
Ag	107	1	nogas	100.611	3.035	1472972	1.51	100	100.6	90	110	
Cd	111	1	nogas	97.024	2.437	315550	0.46	100	97.0	90	110	
Sb	121	1	nogas	99.390	2.071	1410760	1.82	100	99.4	90	110	
Tl	205	1	nogas	102.566	3.635	2182623	1.49	100	102.6	90	110	
Pb	208	1	nogas	104.133	0.674	2848545	0.67	100	104.1	90	110	
U	238	1	nogas	88.553	2.854	2491021	0.74	100	88.6	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	97.822	3.439	712953	0.80	100	97.8	90	110	
[Pb]	207	1	nogas	95.746	2.801	592417	0.43	100	95.7	90	110	
Na	23	2	He	9854.404	0.974	15942207	0.60	10000	98.5	90	110	
Mg	24	2	He	9607.042	1.302	8584426	0.97	10000	96.1	90	110	
Al	27	2	He	110.706	2.298	55669	2.36	100	110.7	90	110	CCV Main CR1-2 Failed
K	39	2	He	11289.247	1.095	9637991	1.07	10000	112.9	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10078.164	1.912	25818	2.08	10000	100.8	90	110	
Ca	44	2	He	9901.816	0.514	423208	0.41	10000	99.0	90	110	
V	51	2	He	98.886	0.612	628011	0.22	100	98.9	90	110	
Cr	52	2	He	97.003	2.682	669448	2.30	100	97.0	90	110	
Mn	55	2	He	97.133	0.874	466203	0.65	100	97.1	90	110	
Fe	56	2	He	9828.631	2.693	58370346	2.62	10000	98.3	90	110	
Co	59	2	He	96.227	1.600	905109	1.34	100	96.2	90	110	
Ni	60	2	He	101.170	1.289	232252	0.96	100	101.2	90	110	
Cu	63	2	He	100.743	2.189	588970	2.26	100	100.7	90	110	
Zn	66	2	He	96.736	2.059	138094	2.21	100	96.7	90	110	
As	75	2	He	100.474	0.625	137316	0.36	100	100.5	90	110	
Se	78	2	He	95.638	1.222	10449	0.87	100	95.6	90	110	
B	11	1	nogas	542.736	1.827	2198400	1.75	500	108.5	90	110	
Si	28	1	nogas	530.537	4.021	7811003	0.96	5000	10.6	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10207.701	4.270	388484	0.61	10000	102.1	90	110	
Ca	44	1	nogas	10020.231	5.748	6412303	2.08	10000	100.2	90	110	
Fe	56	1	nogas	9928.592	3.292	250975922	1.00	10000	99.3	90	110	
Se	77	1	nogas	33.897	31.117	69653	0.75	100	33.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.506	2.322	28376	3.10	100	99.5	90	110	
Mo	95	1	nogas	95.748	2.254	578409	1.53	100	95.7	90	110	
Sn	118	1	nogas	97.611	1.640	831954	0.81	100	97.6	90	110	
Ba	137	1	nogas	96.139	1.639	441597	2.44	100	96.1	90	110	
Sb	121	2	He	100.220	1.897	499501	1.62	100	100.2	90	110	
Li	7	1	nogas	113.125	3.062	1774552	2.83	100	113.1	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	422.612	3.770	835569	0.46	500	84.5	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	269.702	14.992	1137	12.51	100	269.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	80.215	486.985	10	173.21	100	80.2	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1059214	0.09	1446753	73.21	70	125	
Ge	72	1	nogas	3544923	3.75	3206704	110.55	70	125	
In	115	1	nogas	3176231	2.04	2812441	112.94	70	125	
Bi	209	1	nogas	2285557	2.90	2322160	98.42	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	834235	0.37	754516	110.57	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	224_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:25:50-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	123CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.074	15.2	600	12.0	1	
Na	23	1	nogas	7.733	19.4	665828	6.4	100	
Mg	24	1	nogas	6.928	21.8	131687	20.4	100	
Al	27	1	nogas	10.335	12.7	244304	9.0	5	CCB Main CR1 Failed
K	39	1	nogas	-46.645	-25.2	7714249	0.8	100	
Ti	47	1	nogas	0.162	38.6	570	18.2	2.5	
V	51	1	nogas	-19.527	-5.4	974167	2.6	2.5	
Cr	52	1	nogas	-1.064	-10.6	60569	2.5	2.5	
Mn	55	1	nogas	0.658	7.5	50506	1.0	2.5	
Co	59	1	nogas	0.069	20.7	2660	13.1	2.5	
Ni	60	1	nogas	0.260	14.2	1040	18.0	2.5	
Cu	63	1	nogas	0.095	39.3	2889	15.1	2	
Zn	66	1	nogas	0.545	15.3	2160	16.1	2.5	
As	75	1	nogas	-14.377	-4.1	136630	0.8	2.5	
Sr	88	1	nogas	0.088	9.2	3574	4.6	2.5	
Ag	107	1	nogas	0.042	24.2	723	18.7	2.5	
Cd	111	1	nogas	0.046	11.3	163	7.1	1	
Sb	121	1	nogas	0.013	186.0	1347	24.2	2.5	
Tl	205	1	nogas	0.690	58.8	15513	57.8	1	
Pb	208	1	nogas	0.076	45.3	3660	25.8	2.5	
U	238	1	nogas	0.134	65.5	3957	65.1	2.5	
[Pb]	206	1	nogas	0.087	20.6	1077	13.0	2.5	
[Pb]	207	1	nogas	0.063	59.1	730	33.2	2.5	
Na	23	2	He	6.180	13.3	59242	0.8	100	
Mg	24	2	He	5.233	4.9	5217	1.4	100	
Al	27	2	He	9.400	8.5	5451	4.4	5	CCB Main CR1 Failed
K	39	2	He	-6.621	-24.8	176371	0.8	100	
Ca	43	2	He	23.308	57.7	70	49.5	100	
Ca	44	2	He	13.132	17.5	1717	4.1	100	
V	51	2	He	-0.688	-9.2	11752	2.0	2.5	
Cr	52	2	He	-0.034	-74.3	4761	4.5	2.5	
Mn	55	2	He	0.803	7.1	5131	2.7	2.5	
Fe	56	2	He	10.749	3.0	75407	0.6	100	
Co	59	2	He	0.047	13.8	763	5.0	2.5	
Ni	60	2	He	0.257	4.5	320	11.3	2.5	
Cu	63	2	He	0.216	8.9	1193	7.8	2	
Zn	66	2	He	0.767	4.7	733	4.4	2.5	
As	75	2	He	-0.101	-40.3	502	8.9	2.5	
Se	78	2	He	1.081	17.1	201	10.3	2	
B	11	1	nogas	37.653	4.1	181958	3.3	10	CCB Main CR1 Failed
Si	28	1	nogas	16.297	29.1	1901084	0.6	5	CCB Main CR1 Failed
Ca	43	1	nogas	29.809	3.7	1767	4.8	100	
Ca	44	1	nogas	-58.924	-8.1	69228	1.8	100	
Fe	56	1	nogas	-10.844	-127.1	2844146	9.7	100	
Se	77	1	nogas	-89.430	-7.4	43633	4.0	2.5	
Se	82	1	nogas	-0.121	-62.2	240	11.0	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.314	55.8	2440	40.7	2.5	
Sn	118	1	nogas	0.270	40.1	3340	21.3	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.209	3.5	1023	1.1	2.5	
Sb	121	2	He	-0.034	-42.7	353	19.9	2.5	
P	31	1	nogas	-8.395	-19.9	85784	0.9	10	
La	139	1	nogas	110.528	30.5	470	22.2	2.5	CCB Main CR1 Failed
Au	197	1	nogas	213.916	59.6	17	34.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1165420	1.77	1446753	80.55	70	125	
Ge	72	1	nogas	3563819	2.52	3206704	111.14	70	125	
In	115	1	nogas	2995581	4.15	2812441	106.51	70	125	
Bi	209	1	nogas	2318074	1.43	2322160	99.82	70	125	
Ge	72	2	He	818849	3.07	754516	108.53	70	125	

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	231CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:39:46-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	87	33.51
Na	23	1	nogas	331429	0.00
Mg	24	1	nogas	30465	0.02
Al	27	1	nogas	77458	0.01
K	39	1	nogas	7580102	0.00
Ti	47	1	nogas	283	14.44
V	51	1	nogas	1238422	0.00
Cr	52	1	nogas	68854	0.00
Mn	55	1	nogas	23392	0.01
Co	59	1	nogas	833	2.61
Ni	60	1	nogas	323	9.63
Cu	63	1	nogas	1537	0.60
Zn	66	1	nogas	940	0.88
As	75	1	nogas	160546	0.00
Sr	88	1	nogas	1203	1.09
Ag	107	1	nogas	107	22.12
Cd	111	1	nogas	30	111.11
Sb	121	1	nogas	287	1.86
Tl	205	1	nogas	380	10.20
Pb	208	1	nogas	1157	0.42
[Pb]	206	1	nogas	337	1.35
[Pb]	207	1	nogas	267	4.52
Na	23	2	He	41901	0.01
Mg	24	2	He	1587	0.80
Al	27	2	He	1763	0.57
K	39	2	He	170286	0.00
Ca	43	2	He	37	214.72
Ca	44	2	He	917	1.43
V	51	2	He	14259	0.00
Cr	52	2	He	4124	0.18
Mn	55	2	He	1073	0.13
Fe	56	2	He	26059	0.01
Co	59	2	He	200	9.01
Ni	60	2	He	137	29.49
Cu	63	2	He	663	1.14
Zn	66	2	He	293	2.92
As	75	2	He	518	0.93
Se	78	2	He	161	6.59
B	11	1	nogas	146566	0.00
Si	28	1	nogas	1786796	0.00
Ca	43	1	nogas	823	1.19
Ca	44	1	nogas	54583	0.00

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	2564814	0.00
Se	77	1	nogas	51536	0.01
Se	82	1	nogas	233	12.50
Mo	95	1	nogas	367	3.67
Sn	118	1	nogas	1397	0.24
Ba	137	1	nogas	200	15.21
Sb	121	2	He	97	49.43
Li	7	1	nogas	100282	0.00
P	31	1	nogas	80236	0.00
La	139	1	nogas	197	5.97

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	6	1	nogas	1195276	2.00
Ge	72	1	nogas	3552237	2.91
In	115	1	nogas	3134247	2.05
Bi	209	1	nogas	2336631	1.06
Ge	72	2	He	837498	0.96

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	232CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:41:46-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	14652	0.01
Na	23	1	nogas	5578140	0.00
Mg	24	1	nogas	3393445	0.00
Al	27	1	nogas	91527	0.00
K	39	1	nogas	11936197	0.00
Ti	47	1	nogas	3644	0.21
V	51	1	nogas	1427473	0.00
Cr	52	1	nogas	115870	0.00
Mn	55	1	nogas	77277	0.00
Co	59	1	nogas	48548	0.00
Ni	60	1	nogas	11324	0.02
Cu	63	1	nogas	27267	0.02
Zn	66	1	nogas	8886	0.05
As	75	1	nogas	181430	0.00
Sr	88	1	nogas	59543	0.00
Ag	107	1	nogas	28470	0.00
Cd	111	1	nogas	6195	0.04
Sb	121	1	nogas	28126	0.00
Tl	205	1	nogas	39274	0.01
Pb	208	1	nogas	55912	0.00
[Pb]	206	1	nogas	14210	0.02
[Pb]	207	1	nogas	12075	0.02
Na	23	2	He	342970	0.00
Mg	24	2	He	167204	0.00
Al	27	2	He	2477	0.49
K	39	2	He	350759	0.00
Ca	43	2	He	477	0.92
Ca	44	2	He	9096	0.02
V	51	2	He	27090	0.00
Cr	52	2	He	16961	0.02
Mn	55	2	He	10110	0.02
Fe	56	2	He	1169441	0.00
Co	59	2	He	18123	0.03
Ni	60	2	He	4694	0.10
Cu	63	2	He	11717	0.02
Zn	66	2	He	3084	0.27
As	75	2	He	3250	0.09
Se	78	2	He	358	1.95
B	11	1	nogas	185684	0.00
Si	28	1	nogas	2777141	0.00

Calibration Standard Report

Ca	43	1	nogas	8232	0.02
Ca	44	1	nogas	172086	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	7515342	0.00
Se	77	1	nogas	55933	0.00
Se	82	1	nogas	753	1.17
Mo	95	1	nogas	12031	0.04
Sn	118	1	nogas	16651	0.01
Ba	137	1	nogas	8916	0.03
Sb	121	2	He	9613	0.01
P	31	1	nogas	80634	0.00
La	139	1	nogas	133	16.24

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1168683	3.75	1195276	97.78	70	125	
Ge	72	1	nogas	3581535	3.98	3552237	100.82	70	125	
In	115	1	nogas	3148097	4.38	3134247	100.44	70	125	
Bi	209	1	nogas	2292529	3.78	2336631	98.11	70	125	
Ge	72	2	He	839655	0.93	837498	100.26	70	125	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	233CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:43:44-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	35794	0.01
Na	23	1	nogas	13289389	0.00
Mg	24	1	nogas	8405434	0.00
Al	27	1	nogas	201937	0.01
K	39	1	nogas	18312034	0.00
Ti	47	1	nogas	9529	0.01
V	51	1	nogas	1577440	0.00
Cr	52	1	nogas	189062	0.00
Mn	55	1	nogas	170430	0.00
Co	59	1	nogas	121849	0.00
Ni	60	1	nogas	27387	0.01
Cu	63	1	nogas	67120	0.00
Zn	66	1	nogas	22995	0.01
As	75	1	nogas	208320	0.00
Sr	88	1	nogas	147099	0.00
Ag	107	1	nogas	71683	0.00
Cd	111	1	nogas	15314	0.04
Sb	121	1	nogas	67460	0.00
Tl	205	1	nogas	98186	0.00
Pb	208	1	nogas	140518	0.00
[Pb]	206	1	nogas	35777	0.01
[Pb]	207	1	nogas	30830	0.00
Na	23	2	He	795149	0.00
Mg	24	2	He	418151	0.00
Al	27	2	He	4424	0.08
K	39	2	He	611946	0.00
Ca	43	2	He	1283	0.67
Ca	44	2	He	21132	0.01
V	51	2	He	46058	0.00
Cr	52	2	He	37255	0.00
Mn	55	2	He	24523	0.01
Fe	56	2	He	2947197	0.00
Co	59	2	He	44908	0.01
Ni	60	2	He	11684	0.01
Cu	63	2	He	29744	0.01
Zn	66	2	He	7518	0.01
As	75	2	He	7014	0.00
Se	78	2	He	699	0.91
B	11	1	nogas	255438	0.00
Si	28	1	nogas	4591023	0.00

Calibration Standard Report

Ca	43	1	nogas	19320	0.01
Ca	44	1	nogas	354984	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	14726538	0.00
Se	77	1	nogas	60607	0.00
Se	82	1	nogas	1517	0.25
Mo	95	1	nogas	29718	0.02
Sn	118	1	nogas	40106	0.01
Ba	137	1	nogas	21053	0.01
Sb	121	2	He	24190	0.00
P	31	1	nogas	123923	0.00
La	139	1	nogas	173	5.08

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1163476	14.78	1195276	97.34	70	125	
Ge	72	1	nogas	3561728	6.92	3552237	100.27	70	125	
In	115	1	nogas	3134210	10.14	3134247	100.00	70	125	
Bi	209	1	nogas	2284348	8.33	2336631	97.76	70	125	
Ge	72	2	He	828864	1.32	837498	98.97	70	125	

Calibration Standard Report

Sample Table

Sample Name	10/50/1000
Data File Name	234CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:45:43-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	72216	0.00
Na	23	1	nogas	26451404	0.00
Mg	24	1	nogas	16702194	0.00
Al	27	1	nogas	287698	0.00
K	39	1	nogas	29212753	0.00
Ti	47	1	nogas	18139	0.01
V	51	1	nogas	1826105	0.00
Cr	52	1	nogas	306749	0.00
Mn	55	1	nogas	313711	0.00
Co	59	1	nogas	240024	0.00
Ni	60	1	nogas	53024	0.00
Cu	63	1	nogas	130177	0.00
Zn	66	1	nogas	43382	0.01
As	75	1	nogas	241432	0.00
Sr	88	1	nogas	289603	0.00
Ag	107	1	nogas	144161	0.00
Cd	111	1	nogas	29909	0.02
Sb	121	1	nogas	135630	0.00
Tl	205	1	nogas	193555	0.00
Pb	208	1	nogas	274873	0.00
[Pb]	206	1	nogas	68240	0.00
[Pb]	207	1	nogas	59689	0.00
Na	23	2	He	1638658	0.00
Mg	24	2	He	820276	0.00
Al	27	2	He	6585	0.13
K	39	2	He	1040100	0.00
Ca	43	2	He	2477	0.32
Ca	44	2	He	40548	0.01
V	51	2	He	77214	0.00
Cr	52	2	He	68581	0.00
Mn	55	2	He	46836	0.01
Fe	56	2	He	5763138	0.00
Co	59	2	He	89414	0.00
Ni	60	2	He	23505	0.02
Cu	63	2	He	56751	0.00
Zn	66	2	He	13932	0.04
As	75	2	He	13794	0.01
Se	78	2	He	1195	0.31
B	11	1	nogas	361363	0.00
Si	28	1	nogas	7250697	0.00

Calibration Standard Report

Ca	43	1	nogas	37929	0.00
Ca	44	1	nogas	652309	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	27184110	0.00
Se	77	1	nogas	62674	0.01
Se	82	1	nogas	2904	0.43
Mo	95	1	nogas	58958	0.00
Sn	118	1	nogas	78296	0.00
Ba	137	1	nogas	43341	0.01
Sb	121	2	He	49186	0.00
P	31	1	nogas	167931	0.00
La	139	1	nogas	263	2.20

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1132234	3.66	1195276	94.73	70	125	
Ge	72	1	nogas	3596076	3.70	3552237	101.23	70	125	
In	115	1	nogas	3115480	4.58	3134247	99.40	70	125	
Bi	209	1	nogas	2292360	3.72	2336631	98.11	70	125	
Ge	72	2	He	826446	1.69	837498	98.68	70	125	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	235CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:47:41-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	726395	0.00
Na	23	1	nogas	259402164	0.00
Mg	24	1	nogas	161352099	0.00
Al	27	1	nogas	2058982	0.00
K	39	1	nogas	216604788	0.00
Ti	47	1	nogas	181697	0.00
V	51	1	nogas	4082142	0.00
Cr	52	1	nogas	2401369	0.00
Mn	55	1	nogas	2988634	0.00
Co	59	1	nogas	2385751	0.00
Ni	60	1	nogas	519376	0.00
Cu	63	1	nogas	1249207	0.00
Zn	66	1	nogas	415265	0.00
As	75	1	nogas	697353	0.00
Sr	88	1	nogas	2905617	0.00
Ag	107	1	nogas	1423334	0.00
Cd	111	1	nogas	298091	0.00
Sb	121	1	nogas	1348372	0.00
Tl	205	1	nogas	2045124	0.00
Pb	208	1	nogas	2779810	0.00
[Pb]	206	1	nogas	672927	0.00
[Pb]	207	1	nogas	599559	0.00
Na	23	2	He	15297983	0.00
Mg	24	2	He	8458521	0.00
Al	27	2	He	48760	0.00
K	39	2	He	9137637	0.00
Ca	43	2	He	23949	0.01
Ca	44	2	He	406952	0.00
V	51	2	He	624535	0.00
Cr	52	2	He	661999	0.00
Mn	55	2	He	468166	0.00
Fe	56	2	He	56918027	0.00
Co	59	2	He	879776	0.00
Ni	60	2	He	222439	0.00
Cu	63	2	He	566331	0.00
Zn	66	2	He	140492	0.00
As	75	2	He	134928	0.00
Se	78	2	He	10495	0.02
B	11	1	nogas	2454033	0.00
Si	28	1	nogas	57019467	0.00

Calibration Standard Report

Ca	43	1	nogas	366612	0.00
Ca	44	1	nogas	6101095	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	246346364	0.00
Se	77	1	nogas	81930	0.01
Se	82	1	nogas	26466	0.01
Mo	95	1	nogas	581341	0.00
Sn	118	1	nogas	769398	0.00
Ba	137	1	nogas	429972	0.00
Sb	121	2	He	479993	0.00
P	31	1	nogas	883777	0.00
La	139	1	nogas	590	0.76

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1060926	1.54	1195276	88.76	70	125	
Ge	72	1	nogas	3459544	4.03	3552237	97.39	70	125	
In	115	1	nogas	2926930	5.89	3134247	93.39	70	125	
Bi	209	1	nogas	2300732	1.28	2336631	98.46	70	125	
Ge	72	2	He	838051	0.73	837498	100.07	70	125	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	236CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:49:41-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	1638983	0.00
Na	23	1	nogas	528973662	0.00
Mg	24	1	nogas	334413791	0.00
Al	27	1	nogas	4165751	0.00
K	39	1	nogas	439767910	0.00
Ti	47	1	nogas	386985	0.00
V	51	1	nogas	6790929	0.00
Cr	52	1	nogas	4813022	0.00
Mn	55	1	nogas	5965128	0.00
Co	59	1	nogas	4942487	0.00
Ni	60	1	nogas	1053571	0.00
Cu	63	1	nogas	2665951	0.00
Zn	66	1	nogas	853679	0.00
As	75	1	nogas	1258438	0.00
Sr	88	1	nogas	6055608	0.00
Ag	107	1	nogas	2935947	0.00
Cd	111	1	nogas	630633	0.00
Sb	121	1	nogas	2816754	0.00
Tl	205	1	nogas	4279645	0.00
Pb	208	1	nogas	5709558	0.00
[Pb]	206	1	nogas	1403975	0.00
[Pb]	207	1	nogas	1218131	0.00
Na	23	2	He	30809610	0.00
Mg	24	2	He	16672742	0.00
Al	27	2	He	94669	0.00
K	39	2	He	18129784	0.00
Ca	43	2	He	49272	0.00
Ca	44	2	He	823614	0.00
V	51	2	He	1270034	0.00
Cr	52	2	He	1381847	0.00
Mn	55	2	He	930187	0.00
Fe	56	2	He	114749172	0.00
Co	59	2	He	1859117	0.00
Ni	60	2	He	447375	0.00
Cu	63	2	He	1140694	0.00
Zn	66	2	He	276667	0.00
As	75	2	He	272270	0.00
Se	78	2	He	21213	0.01
B	11	1	nogas	4934583	0.00
Si	28	1	nogas	114625555	0.00

Calibration Standard Report

Ca	43	1	nogas	761679	0.00
Ca	44	1	nogas	12519365	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	497565694	0.00
Se	77	1	nogas	94138	0.00
Se	82	1	nogas	55987	0.00
Mo	95	1	nogas	1263968	0.00
Sn	118	1	nogas	1726992	0.00
Ba	137	1	nogas	877489	0.00
Sb	121	2	He	974035	0.00
P	31	1	nogas	1750887	0.00
La	139	1	nogas	857	1.70

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1034179	4.01	1195276	86.52	70	125	
Ge	72	1	nogas	3664190	2.17	3552237	103.15	70	125	
In	115	1	nogas	3158108	2.87	3134247	100.76	70	125	
Bi	209	1	nogas	2279275	2.70	2336631	97.55	70	125	
Ge	72	2	He	818978	2.26	837498	97.79	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICCV
Data File Name	237_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:51:40-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	83.848	0.814	744799	1.68	100	83.8	90	110	ICV Main CR1 Failed
Na	23	1	nogas	9473.067	5.158	257674256	1.59	10000	94.7	90	110	
Mg	24	1	nogas	9458.791	3.408	162157504	2.39	10000	94.6	90	110	
Al	27	1	nogas	123.163	6.727	2519908	2.50	100	123.2	90	110	ICV Main CR1 Failed
K	39	1	nogas	10070.174	5.002	218747330	1.47	10000	100.7	90	110	
Ti	47	1	nogas	98.615	4.900	184262	2.22	100	98.6	90	110	
V	51	1	nogas	98.785	7.338	3929371	2.24	100	98.8	90	110	
Cr	52	1	nogas	99.376	6.943	2363220	2.85	100	99.4	90	110	
Mn	55	1	nogas	96.139	5.599	2813361	1.63	100	96.1	90	110	
Co	59	1	nogas	98.503	7.880	2360011	3.78	100	98.5	90	110	
Ni	60	1	nogas	100.308	5.793	516068	1.85	100	100.3	90	110	
Cu	63	1	nogas	97.046	4.866	1248080	0.78	100	97.0	90	110	
Zn	66	1	nogas	99.904	3.042	415569	1.07	100	99.9	90	110	
As	75	1	nogas	94.192	3.025	669338	1.83	100	94.2	90	110	
Sr	88	1	nogas	98.328	5.314	2884457	1.68	100	98.3	90	110	
Ag	107	1	nogas	99.452	3.828	1418022	2.48	100	99.5	90	110	
Cd	111	1	nogas	96.549	1.316	298612	2.35	100	96.5	90	110	
Sb	121	1	nogas	101.649	7.001	1385989	3.36	100	101.6	90	110	
Tl	205	1	nogas	96.489	5.000	2071395	3.23	100	96.5	90	110	
Pb	208	1	nogas	97.753	1.335	2776234	1.33	100	97.8	90	110	
U	238	1	nogas	99.133	2.988	2839626	1.94	100	99.1	90	110	
[Pb]	206	1	nogas	95.225	4.964	671276	2.54	100	95.2	90	110	
[Pb]	207	1	nogas	97.381	2.566	598545	0.93	100	97.4	90	110	
Na	23	2	He	9545.903	2.850	14839266	0.64	10000	95.5	90	110	
Mg	24	2	He	9556.307	3.231	8062486	1.00	10000	95.6	90	110	
Al	27	2	He	115.494	1.159	56063	1.12	100	115.5	90	110	ICV Main CR1 Failed
K	39	2	He	9904.423	0.473	9061134	0.46	10000	99.0	90	110	
Ca	43	2	He	9659.751	3.386	23909	4.40	10000	96.6	90	110	
Ca	44	2	He	9743.988	1.700	404385	0.57	10000	97.4	90	110	
V	51	2	He	94.206	2.359	606696	0.37	100	94.2	90	110	
Cr	52	2	He	93.363	2.651	647309	1.31	100	93.4	90	110	
Mn	55	2	He	96.404	1.324	453614	1.04	100	96.4	90	110	
Fe	56	2	He	9562.688	1.193	55312104	1.86	10000	95.6	90	110	
Co	59	2	He	93.457	2.764	867467	0.58	100	93.5	90	110	
Ni	60	2	He	97.000	4.252	218644	2.03	100	97.0	90	110	
Cu	63	2	He	95.689	4.025	549293	1.81	100	95.7	90	110	
Zn	66	2	He	94.294	2.680	132120	2.57	100	94.3	90	110	
As	75	2	He	96.645	1.892	132758	0.41	100	96.6	90	110	
Se	78	2	He	95.670	3.454	10266	1.33	100	95.7	90	110	
B	11	1	nogas	449.770	1.233	2522051	1.40	500	90.0	90	110	ICV Main CR1 Failed
Si	28	1	nogas	5024.767	3.947	56961241	0.29	5000	100.5	90	110	
Ca	43	1	nogas	10068.410	3.841	372307	2.19	10000	100.7	90	110	
Ca	44	1	nogas	10091.344	3.500	6165577	0.74	10000	100.9	90	110	
Fe	56	1	nogas	9859.966	2.794	240470664	1.30	10000	98.6	90	110	
Se	77	1	nogas	90.576	11.463	71848	2.72	100	90.6	90	110	
Se	82	1	nogas	100.935	3.252	27411	1.03	100	100.9	90	110	
Mo	95	1	nogas	95.675	3.362	581598	1.07	100	95.7	90	110	
Sn	118	1	nogas	93.246	2.550	780269	1.00	100	93.2	90	110	
Ba	137	1	nogas	98.047	2.279	425148	1.98	100	98.0	90	110	
Sb	121	2	He	99.497	1.789	487836	1.57	100	99.5	90	110	
Li	7	1	nogas	93.698	4.466	1843806	4.90	100	93.7	90	110	
P	31	1	nogas	503.287	4.209	895021	1.33	500	100.7	90	110	
La	139	1	nogas	158.627	15.772	740	13.03	100	158.6	90	110	ICV Main CR1 Failed
Au	197	1	nogas	271.390	486.350	17	91.65	100	271.4	90	110	ICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1151366	1.39	1195276	96.33	70	125	
Ge	72	1	nogas	3542945	4.01	3552237	99.74	70	125	
In	115	1	nogas	3084221	3.57	3134247	98.40	70	125	
Bi	209	1	nogas	2312209	3.10	2336631	98.95	70	125	

Initial Calibration Verification (ICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	830435	2.25	837498	99.16	70	125	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	238SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:53:38-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	231CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.628	1.628	11.47	16020	0.01	2000	
Na	23	1	nogas	207.294	207.294	2.13	6001586	0.00	200000	
Mg	24	1	nogas	205.541	205.541	3.69	3571595	0.01	200000	
Al	27	1	nogas	0.431	0.431	25.46	88441	0.00	2000	
K	39	1	nogas	220.006	220.006	6.80	12540609	0.00	200000	
Ti	47	1	nogas	2.230	2.230	0.68	4581	0.05	2000	
V	51	1	nogas	8.852	8.852	25.57	1521333	0.00	2000	
Cr	52	1	nogas	2.253	2.253	6.07	124331	0.00	2000	
Mn	55	1	nogas	1.881	1.881	4.21	80287	0.00	2000	
Co	59	1	nogas	2.103	2.103	3.00	52816	0.00	2000	
Ni	60	1	nogas	1.662	1.662	5.85	12077	0.01	2000	
Cu	63	1	nogas	2.078	2.078	3.04	29087	0.01	2000	
Zn	66	1	nogas	1.745	1.745	9.52	9916	0.02	2000	
As	75	1	nogas	1.863	1.863	32.54	191066	0.00	2000	
Sr	88	1	nogas	2.004	2.004	1.98	61817	0.00	2000	
Ag	107	1	nogas	2.072	2.072	1.01	30550	0.01	2000	
Cd	111	1	nogas	1.938	1.938	2.12	6408	0.03	2000	
Sb	121	1	nogas	3.159	3.159	5.57	44687	0.01	2000	
Tl	205	1	nogas	2.268	2.268	13.54	52492	0.00	2000	
Pb	208	1	nogas	2.139	2.139	1.55	61887	0.00	2000	
U	238	1	nogas	2.026	2.026	6.08	62203	0.00	2000	
[Pb]	206	1	nogas	1.993	1.993	6.96	15377	0.01	2000	
[Pb]	207	1	nogas	2.023	2.023	2.74	13589	0.01	2000	
Na	23	2	He	209.802	209.802	1.99	369617	0.06	200000	
Mg	24	2	He	213.119	213.119	0.65	182803	0.12	200000	
Al	27	2	He	0.994	0.994	26.74	2234	0.04	2000	
K	39	2	He	219.547	219.547	0.46	367366	0.06	200000	
Ca	43	2	He	191.411	191.411	6.41	513	37.29	200000	
Ca	44	2	He	196.609	196.609	2.93	9122	2.16	200000	
V	51	2	He	2.918	2.918	2.97	29813	0.01	2000	
Cr	52	2	He	1.961	1.961	3.50	17739	0.01	2000	
Mn	55	2	He	2.065	2.065	5.86	10843	0.02	2000	
Fe	56	2	He	210.766	210.766	3.42	1253761	0.02	200000	
Co	59	2	He	2.048	2.048	4.05	19344	0.01	2000	
Ni	60	2	He	2.342	2.342	7.24	5097	0.05	2000	
Cu	63	2	He	2.529	2.529	6.57	13268	0.02	2000	
Zn	66	2	He	2.087	2.087	1.06	3097	0.07	2000	
As	75	2	He	2.176	2.176	0.56	3518	0.06	2000	
Se	78	2	He	2.810	2.810	8.05	411	0.68	2000	
B	11	1	nogas	13.867	13.867	15.71	237077	0.01	2000	
Si	28	1	nogas	99.677	99.677	14.63	2963510	0.00	2000	
Ca	43	1	nogas	208.155	208.155	2.27	8759	2.38	200000	

Sample Report

Ca	44	1	nogas	197.239	197.239	2.30	179157	0.11	200000	
Fe	56	1	nogas	209.399	209.399	6.85	7837006	0.00	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	26.571	26.571	46.96	59116	0.04	2000	
Se	82	1	nogas	2.370	2.370	15.23	897	0.26	2000	
Mo	95	1	nogas	2.253	2.253	8.30	14463	0.02	2000	
Sn	118	1	nogas	2.103	2.103	3.08	20172	0.01	2000	
Ba	137	1	nogas	1.981	1.981	3.96	9343	0.02	2000	
Sb	121	2	He	3.107	3.107	2.70	15444	0.02	2000	
La	139	1	nogas	-37.203	-37.203	-8.32	70	-53.15	2000	
Au	197	1	nogas	649.630	649.630	186.19	13	4872.23	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1275207	7.51	1195276	106.69	70	125	
Ge	72	1	nogas	3647931	2.22	3552237	102.69	70	125	
In	115	1	nogas	3280686	2.68	3134247	104.67	70	125	
Bi	209	1	nogas	2475617	4.11	2336631	105.95	70	125	
Ge	72	2	He	836673	1.49	837498	99.90	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLCCV5
Data File Name	239LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:55:37-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.530	9.453	37901	1.37	5	90.6	70	130	
Na	23	1	nogas	468.673	10.476	13683101	3.06	500	93.7	70	130	
Mg	24	1	nogas	468.089	9.387	8433335	2.81	500	93.6	70	130	
Al	27	1	nogas	4.734	6.322	181334	3.53	5	94.7	70	130	
K	39	1	nogas	498.228	6.152	19061074	0.11	500	99.6	70	130	
Ti	47	1	nogas	4.705	6.193	9586	2.65	5	94.1	70	130	
V	51	1	nogas	20.671	21.678	1906283	8.33	5	413.4	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	5.178	7.065	199255	0.95	5	103.6	70	130	
Mn	55	1	nogas	4.808	4.378	172449	0.94	5	96.2	70	130	
Co	59	1	nogas	4.805	5.906	122761	2.66	5	96.1	70	130	
Ni	60	1	nogas	4.684	7.140	28763	4.19	5	93.7	70	130	
Cu	63	1	nogas	4.813	6.059	67046	3.27	5	96.3	70	130	
Zn	66	1	nogas	4.743	6.717	23305	2.48	5	94.9	70	130	
As	75	1	nogas	6.789	34.112	223455	2.24	5	135.8	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	4.822	3.420	150992	0.61	5	96.4	70	130	
Ag	107	1	nogas	4.879	2.723	73754	2.35	5	97.6	70	130	
Cd	111	1	nogas	4.976	4.174	15921	0.57	5	99.5	70	130	
Sb	121	1	nogas	5.342	4.712	77424	1.15	5	106.8	70	130	
Tl	205	1	nogas	4.975	1.935	101479	1.48	5	99.5	70	130	
Pb	208	1	nogas	5.034	2.373	144051	2.35	5	100.7	70	130	
U	238	1	nogas	5.139	2.329	139440	0.78	5	102.8	70	130	
[Pb]	206	1	nogas	5.405	3.777	36381	3.16	5	108.1	70	130	
[Pb]	207	1	nogas	5.370	4.884	31464	2.27	5	107.4	70	130	
Na	23	2	He	501.112	1.227	822290	1.00	500	100.2	70	130	
Mg	24	2	He	503.854	2.023	428633	1.30	500	100.8	70	130	
Al	27	2	He	4.762	16.015	4007	9.10	5	95.2	70	130	
K	39	2	He	508.721	0.350	626947	0.25	500	101.7	70	130	
Ca	43	2	He	463.254	10.843	1187	11.19	500	92.7	70	130	
Ca	44	2	He	509.433	0.991	22110	2.47	500	101.9	70	130	
V	51	2	He	5.915	2.841	48755	0.77	5	118.3	70	130	
Cr	52	2	He	4.903	2.277	38056	3.21	5	98.1	70	130	
Mn	55	2	He	5.126	1.692	25241	1.38	5	102.5	70	130	
Fe	56	2	He	504.462	1.773	2955918	2.51	500	100.9	70	130	
Co	59	2	He	4.878	2.450	45684	2.41	5	97.6	70	130	
Ni	60	2	He	5.428	5.165	12081	5.17	5	108.6	70	130	
Cu	63	2	He	5.413	2.735	29911	1.30	5	108.3	70	130	
Zn	66	2	He	5.094	4.879	7315	4.52	5	101.9	70	130	
As	75	2	He	5.025	3.440	7425	4.15	5	100.5	70	130	
Se	78	2	He	6.027	3.636	753	2.41	5	120.5	70	130	
B	11	1	nogas	30.057	13.879	282626	0.67	25	120.2	70	130	
Si	28	1	nogas	240.868	14.210	4682363	6.32	25	963.5	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	487.462	5.687	19898	2.33	500	97.5	70	130	
Ca	44	1	nogas	472.137	4.437	360231	0.67	500	94.4	70	130	
Fe	56	1	nogas	491.450	4.324	15257974	2.17	500	98.3	70	130	
Se	77	1	nogas	47.180	32.878	65621	2.32	5	943.6	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	4.849	2.638	1630	4.02	5	97.0	70	130	
Mo	95	1	nogas	4.673	5.813	30420	2.35	5	93.5	70	130	
Sn	118	1	nogas	4.775	4.284	42625	2.59	5	95.5	70	130	
Ba	137	1	nogas	4.915	3.456	22208	2.21	5	98.3	70	130	
Sb	121	2	He	5.474	1.513	27051	1.07	5	109.5	70	130	
Li	7	1	nogas	5.564	17.680	188357	1.10	5	111.3	70	130	
P	31	1	nogas	27.947	14.489	132540	2.34	25	111.8	70	130	
La	139	1	nogas	6.001	342.949	220	29.81	5	120.0	70	130	
Au	197	1	nogas	-91.200	-949.432	20	50.00	5	-1824.0	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1087629	7.70	1195276	90.99	70	125	
Ge	72	1	nogas	3749725	3.63	3552237	105.56	70	125	
In	115	1	nogas	3186690	3.57	3134247	101.67	70	125	
Bi	209	1	nogas	2188629	2.80	2336631	93.67	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	834160	1.58	837498	99.60	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICCB
Data File Name	240_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T22:57:35-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.022	33.5	287	26.2	1	
Na	23	1	nogas	3.189	35.7	384853	3.7	100	
Mg	24	1	nogas	1.016	38.6	43794	3.6	100	
Al	27	1	nogas	-0.380	-64.1	66457	1.2	5	
K	39	1	nogas	40.124	72.0	8002143	0.8	100	
Ti	47	1	nogas	0.126	166.2	477	68.7	2.5	
V	51	1	nogas	17.152	29.5	1621827	1.6	2.5	ICB Main CR1 Failed
Cr	52	1	nogas	0.858	25.9	84337	2.1	2.5	
Mn	55	1	nogas	0.087	74.6	24610	1.3	2.5	
Co	59	1	nogas	0.001	834.3	807	11.1	2.5	
Ni	60	1	nogas	-0.510	-1.6	587	1.0	2.5	
Cu	63	1	nogas	0.057	22.9	2157	3.3	1	
Zn	66	1	nogas	-0.349	-6.0	927	1.6	2.5	
As	75	1	nogas	5.554	40.1	195257	2.3	2.5	ICB Main CR1 Failed
Sr	88	1	nogas	0.020	40.0	1690	7.7	2.5	
Ag	107	1	nogas	0.005	86.7	173	29.6	2.5	
Cd	111	1	nogas	0.016	30.3	73	20.8	1	
Sb	121	1	nogas	0.257	3.4	3624	4.7	2.5	
Tl	205	1	nogas	0.090	43.4	2144	30.0	1	
Pb	208	1	nogas	0.003	125.1	1253	9.7	2.5	
U	238	1	nogas	0.014	29.1	493	20.3	2.5	
[Pb]	206	1	nogas	0.002	696.1	323	20.6	2.5	
[Pb]	207	1	nogas	0.007	121.0	290	15.0	2.5	
Na	23	2	He	2.300	38.3	44729	3.2	100	
Mg	24	2	He	1.038	12.8	2427	5.0	100	
Al	27	2	He	0.191	277.8	1823	13.7	5	
K	39	2	He	15.090	13.3	183831	1.0	100	
Ca	43	2	He	8.488	74.2	57	27.0	100	
Ca	44	2	He	2.081	47.4	987	3.6	100	
V	51	2	He	1.200	2.2	18565	1.4	2.5	
Cr	52	2	He	0.058	17.0	4451	2.1	2.5	
Mn	55	2	He	0.068	23.2	1370	5.1	2.5	
Fe	56	2	He	0.104	486.7	26203	11.2	100	
Co	59	2	He	0.003	220.3	223	26.2	2.5	
Ni	60	2	He	0.206	12.7	237	24.4	2.5	
Cu	63	2	He	0.395	3.7	887	9.7	1	
Zn	66	2	He	0.138	30.2	343	16.6	2.5	
As	75	2	He	0.086	65.7	626	12.0	2.5	
Se	78	2	He	0.762	26.3	189	11.6	1	
B	11	1	nogas	3.281	40.0	159852	2.6	10	
Si	28	1	nogas	7.551	152.6	1776849	1.2	5	ICB Main CR1 Failed
Ca	43	1	nogas	6.277	19.1	1007	7.5	100	
Ca	44	1	nogas	6.129	106.2	55415	1.0	100	
Fe	56	1	nogas	8.009	125.4	2618680	2.3	100	

Initial Calibration Blank (ICB) Report

Se	77	1	nogas	65.522	24.2	63119	3.5	2.5	ICB Main CR1 Failed
Se	82	1	nogas	-0.025	-217.1	217	9.6	1	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Mo	95	1	nogas	0.031	32.7	527	12.4	2.5	
Sn	118	1	nogas	0.013	178.8	1380	6.3	5	
Ba	137	1	nogas	0.029	76.7	297	22.4	2.5	
Sb	121	2	He	0.261	6.9	1363	6.1	2.5	
P	31	1	nogas	5.499	75.8	84699	0.4	10	
La	139	1	nogas	-16.882	-9.2	127	4.6	2.5	
Au	197	1	nogas	806.992	7.4	10	0.0	2.5	ICB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1161998	4.83	1195276	97.22	70	125	
Ge	72	1	nogas	3385374	7.82	3552237	95.30	70	125	
In	115	1	nogas	2881253	7.72	3134247	91.93	70	125	
Bi	209	1	nogas	2184286	6.51	2336631	93.48	70	125	
Ge	72	2	He	823081	0.55	837498	98.28	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	252_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:21:23-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	86.986	4.957	747728	1.22	100	87.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10445.514	0.351	282560673	2.13	10000	104.5	90	110	
Mg	24	1	nogas	10115.302	1.611	172357862	2.17	10000	101.2	90	110	
Al	27	1	nogas	111.418	5.099	2251866	0.28	100	111.4	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10659.147	6.487	227342897	1.63	10000	106.6	90	110	
Ti	47	1	nogas	101.182	5.359	186021	0.67	100	101.2	90	110	
V	51	1	nogas	128.716	4.983	4672770	1.51	100	128.7	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	101.495	4.686	2378656	6.21	100	101.5	90	110	
Mn	55	1	nogas	101.172	3.658	2919480	7.24	100	101.2	90	110	
Co	59	1	nogas	99.828	4.093	2356538	0.76	100	99.8	90	110	
Ni	60	1	nogas	103.247	5.355	522772	0.79	100	103.2	90	110	
Cu	63	1	nogas	96.636	7.627	1222207	3.14	100	96.6	90	110	
Zn	66	1	nogas	100.708	4.093	412200	0.66	100	100.7	90	110	
As	75	1	nogas	110.350	4.666	741953	1.52	100	110.3	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	101.161	3.714	2922477	2.12	100	101.2	90	110	
Ag	107	1	nogas	100.143	4.117	1405201	1.66	100	100.1	90	110	
Cd	111	1	nogas	98.636	2.864	295347	0.64	100	98.6	90	110	
Sb	121	1	nogas	100.023	3.737	1343594	1.96	100	100.0	90	110	
Tl	205	1	nogas	99.834	0.958	2010797	0.79	100	99.8	90	110	
Pb	208	1	nogas	92.751	2.827	2634221	2.83	100	92.8	90	110	
U	238	1	nogas	85.700	2.006	2302180	0.35	100	85.7	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	98.188	2.189	649389	0.96	100	98.2	90	110	
[Pb]	207	1	nogas	94.486	5.172	544532	4.09	100	94.5	90	110	
Na	23	2	He	10801.288	0.275	16808372	1.67	10000	108.0	90	110	
Mg	24	2	He	10287.141	0.348	8691425	1.71	10000	102.9	90	110	
Al	27	2	He	105.962	2.105	51628	0.65	100	106.0	90	110	
K	39	2	He	10644.298	0.776	9725294	0.76	10000	106.4	90	110	
Ca	43	2	He	10304.580	0.270	25524	1.64	10000	103.0	90	110	
Ca	44	2	He	10363.457	1.309	430502	0.94	10000	103.6	90	110	
V	51	2	He	98.868	0.738	636938	0.97	100	98.9	90	110	
Cr	52	2	He	94.391	0.966	655256	2.21	100	94.4	90	110	
Mn	55	2	He	99.414	3.584	468126	2.41	100	99.4	90	110	
Fe	56	2	He	9761.148	1.914	56508889	1.09	10000	97.6	90	110	
Co	59	2	He	92.601	1.858	860524	0.47	100	92.6	90	110	
Ni	60	2	He	97.011	2.593	218963	1.52	100	97.0	90	110	
Cu	63	2	He	95.412	2.123	548444	1.14	100	95.4	90	110	
Zn	66	2	He	93.814	0.662	131591	1.20	100	93.8	90	110	
As	75	2	He	97.803	1.873	134482	0.56	100	97.8	90	110	
Se	78	2	He	97.982	0.980	10526	1.45	100	98.0	90	110	
B	11	1	nogas	619.414	4.036	3310898	1.20	500	123.9	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	555.125	5.911	7752419	1.23	5000	11.1	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10657.415	5.749	387586	1.64	10000	106.6	90	110	
Ca	44	1	nogas	10455.927	6.997	6279410	2.44	10000	104.6	90	110	
Fe	56	1	nogas	10238.822	3.934	245884455	5.65	10000	102.4	90	110	
Se	77	1	nogas	209.743	8.568	97174	0.61	100	209.7	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.319	5.519	26536	1.73	100	99.3	90	110	
Mo	95	1	nogas	91.802	4.168	549206	1.33	100	91.8	90	110	
Sn	118	1	nogas	95.955	0.702	777906	2.46	100	96.0	90	110	
Ba	137	1	nogas	99.351	3.799	417102	1.93	100	99.4	90	110	
Sb	121	2	He	97.913	1.343	480556	0.81	100	97.9	90	110	
Li	7	1	nogas	96.445	4.701	1834127	2.28	100	96.4	90	110	
P	31	1	nogas	473.343	5.372	832948	0.83	500	94.7	90	110	
La	139	1	nogas	199.325	11.967	850	6.55	100	199.3	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-442.941	-435.383	23	89.21	100	-442.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1115999	4.98	1195276	93.37	70	125	
Ge	72	1	nogas	3488105	4.84	3552237	98.19	70	125	
In	115	1	nogas	2986720	2.93	3134247	95.29	70	125	
Bi	209	1	nogas	2167806	1.66	2336631	92.77	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	831202	1.41	837498	99.25	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	253_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:23:23-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.079	27.5	830	21.7	1	
Na	23	1	nogas	367.394	6.7	10106001	1.1	100	CCB Main CR1 Failed
Mg	24	1	nogas	18.654	14.1	342464	7.6	100	
Al	27	1	nogas	2.756	1.6	126404	0.8	5	
K	39	1	nogas	73.620	5.1	8716121	1.2	100	
Ti	47	1	nogas	0.149	19.5	537	10.9	2.5	
V	51	1	nogas	17.404	21.0	1636644	4.8	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	0.424	17.8	75088	1.1	2.5	
Mn	55	1	nogas	1.104	3.4	53053	3.2	2.5	
Co	59	1	nogas	0.102	20.7	3140	16.6	2.5	
Ni	60	1	nogas	1.350	6.8	9696	3.4	2.5	
Cu	63	1	nogas	0.643	0.7	9376	0.8	2	
Zn	66	1	nogas	0.499	9.0	4291	4.2	2.5	
As	75	1	nogas	4.398	40.8	190232	3.6	2.5	CCB Main CR1 Failed
Sr	88	1	nogas	0.392	6.0	12174	6.6	2.5	
Ag	107	1	nogas	0.072	17.9	1087	17.1	2.5	
Cd	111	1	nogas	0.067	44.9	230	35.6	1	
Sb	121	1	nogas	0.134	21.7	2027	19.8	2.5	
Tl	205	1	nogas	0.902	56.7	19384	55.7	1	
Pb	208	1	nogas	0.088	45.1	3644	30.8	2.5	
U	238	1	nogas	0.171	48.3	4904	47.4	2.5	
[Pb]	206	1	nogas	0.077	46.6	857	28.9	2.5	
[Pb]	207	1	nogas	0.094	37.5	823	25.7	2.5	
Na	23	2	He	375.898	4.2	627445	2.3	100	CCB Main CR1 Failed
Mg	24	2	He	21.051	11.1	19430	9.7	100	
Al	27	2	He	3.287	3.8	3314	3.7	5	
K	39	2	He	39.126	6.4	205408	1.1	100	
Ca	43	2	He	25.702	33.8	100	20.0	100	
Ca	44	2	He	31.599	4.2	2230	4.0	100	
V	51	2	He	1.368	3.4	19893	1.1	2.5	
Cr	52	2	He	0.101	36.7	4814	5.4	2.5	
Mn	55	2	He	0.956	8.8	5581	6.2	2.5	
Fe	56	2	He	7.398	7.7	68928	3.1	100	
Co	59	2	He	0.077	8.3	920	6.8	2.5	
Ni	60	2	He	0.340	8.5	543	10.8	2.5	
Cu	63	2	He	0.475	3.4	1360	5.8	2	
Zn	66	2	He	0.410	10.8	730	7.2	2.5	
As	75	2	He	0.170	17.3	749	4.0	2.5	
Se	78	2	He	0.895	19.1	206	7.6	2	
B	11	1	nogas	177.387	9.1	1141533	4.5	10	CCB Main CR1 Failed
Si	28	1	nogas	25.836	12.9	1977801	1.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	41.427	18.7	2250	12.0	100	
Ca	44	1	nogas	46.577	3.7	79157	2.6	100	
Fe	56	1	nogas	53.311	11.5	3681656	4.8	100	
Se	77	1	nogas	51.555	29.8	60340	5.1	2.5	CCB Main CR1 Failed
Se	82	1	nogas	0.026	546.4	230	15.1	2	
Mo	95	1	nogas	0.478	40.4	3140	36.8	2.5	
Sn	118	1	nogas	0.256	31.3	3417	14.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.218	33.9	1107	23.2	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.124	23.1	707	18.8	2.5	
P	31	1	nogas	6.887	13.2	87294	1.0	10	
La	139	1	nogas	-18.657	-65.7	127	32.9	2.5	
Au	197	1	nogas	257.284	524.0	17	91.7	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1219280	4.78	1195276	102.01	70	125	
Ge	72	1	nogas	3390051	1.32	3552237	95.43	70	125	
In	115	1	nogas	3013427	4.53	3134247	96.15	70	125	
Bi	209	1	nogas	2268399	0.43	2336631	97.08	70	125	
Ge	72	2	He	834717	1.92	837498	99.67	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	264_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:45:19-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	87.096	2.669	753350	2.24	100	87.1	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10371.125	3.451	271943106	1.66	10000	103.7	90	110	
Mg	24	1	nogas	10167.893	2.619	167980516	1.76	10000	101.7	90	110	
Al	27	1	nogas	113.354	2.985	2182729	2.47	100	113.4	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	11358.738	1.619	230634547	2.63	10000	113.6	90	110	CCV Main CR1-2 Failed
Ti	47	1	nogas	107.627	3.818	188561	0.60	100	107.6	90	110	
V	51	1	nogas	117.291	5.274	4159320	2.58	100	117.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	106.520	3.833	2372744	2.52	100	106.5	90	110	
Mn	55	1	nogas	108.748	6.502	2980584	3.29	100	108.7	90	110	
Co	59	1	nogas	107.085	3.898	2408282	1.86	100	107.1	90	110	
Ni	60	1	nogas	106.648	4.511	514445	1.24	100	106.6	90	110	
Cu	63	1	nogas	101.206	2.681	1220988	0.91	100	101.2	90	110	
Zn	66	1	nogas	102.769	2.938	400777	1.54	100	102.8	90	110	
As	75	1	nogas	107.757	2.827	694201	1.25	100	107.8	90	110	
Sr	88	1	nogas	107.660	2.283	2964268	3.51	100	107.7	90	110	
Ag	107	1	nogas	105.883	3.397	1415401	0.11	100	105.9	90	110	
Cd	111	1	nogas	99.511	2.244	292953	0.95	100	99.5	90	110	
Sb	121	1	nogas	103.757	3.597	1327631	1.65	100	103.8	90	110	
Tl	205	1	nogas	99.995	0.921	2031167	3.00	100	100.0	90	110	
Pb	208	1	nogas	94.831	3.171	2693257	3.17	100	94.8	90	110	
U	238	1	nogas	87.015	2.961	2356580	1.77	100	87.0	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	100.023	1.226	667069	1.58	100	100.0	90	110	
[Pb]	207	1	nogas	94.940	1.831	551810	1.33	100	94.9	90	110	
Na	23	2	He	10468.489	1.550	16012758	2.26	10000	104.7	90	110	
Mg	24	2	He	10459.216	0.611	8685904	2.20	10000	104.6	90	110	
Al	27	2	He	106.833	1.647	51149	0.83	100	106.8	90	110	
K	39	2	He	10673.170	2.487	9751211	2.44	10000	106.7	90	110	
Ca	43	2	He	10084.810	4.259	24540	2.17	10000	100.8	90	110	
Ca	44	2	He	10216.425	2.719	417050	0.47	10000	102.2	90	110	
V	51	2	He	98.121	1.379	621371	1.26	100	98.1	90	110	
Cr	52	2	He	94.468	2.442	644347	0.20	100	94.5	90	110	
Mn	55	2	He	99.399	1.765	460098	0.50	100	99.4	90	110	
Fe	56	2	He	9940.074	0.475	56574426	2.48	10000	99.4	90	110	
Co	59	2	He	93.848	2.642	857549	4.15	100	93.8	90	110	
Ni	60	2	He	98.691	2.132	218996	2.68	100	98.7	90	110	
Cu	63	2	He	97.127	2.672	548715	1.17	100	97.1	90	110	
Zn	66	2	He	96.184	1.489	132597	1.57	100	96.2	90	110	
As	75	2	He	97.008	1.879	131110	0.79	100	97.0	90	110	
Se	78	2	He	97.921	0.518	10340	1.76	100	97.9	90	110	
B	11	1	nogas	734.652	5.522	3922075	2.64	500	146.9	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	619.251	6.286	8044260	1.71	5000	12.4	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10818.810	3.150	375061	1.14	10000	108.2	90	110	
Ca	44	1	nogas	10814.241	3.490	6192753	2.60	10000	108.1	90	110	
Fe	56	1	nogas	10614.070	2.923	242517922	0.94	10000	106.1	90	110	
Se	77	1	nogas	156.226	7.427	81264	1.72	100	156.2	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	104.622	4.299	26630	2.63	100	104.6	90	110	
Mo	95	1	nogas	96.099	2.410	547826	0.92	100	96.1	90	110	
Sn	118	1	nogas	97.048	0.658	773423	2.47	100	97.0	90	110	
Ba	137	1	nogas	101.742	2.322	419981	0.87	100	101.7	90	110	
Sb	121	2	He	100.436	0.248	484615	2.53	100	100.4	90	110	
Li	7	1	nogas	96.803	3.712	1851175	1.98	100	96.8	90	110	
P	31	1	nogas	598.157	7.880	982856	5.22	500	119.6	90	110	CCV Main CR1-2 Failed
La	139	1	nogas	209.530	15.389	870	11.95	100	209.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-1971.920	-86.092	40	43.30	100	-1971.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1122032	4.54	1195276	93.87	70	125	
Ge	72	1	nogas	3321355	3.34	3552237	93.50	70	125	
In	115	1	nogas	2936215	3.13	3134247	93.68	70	125	
Bi	209	1	nogas	2185904	2.54	2336631	93.55	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	817052	2.28	837498	97.56	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	265_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:47:18-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.076	33.1	793	25.5	1	
Na	23	1	nogas	125.336	9.2	3523086	2.6	100	CCB Main CR1 Failed
Mg	24	1	nogas	13.816	25.1	250642	16.3	100	
Al	27	1	nogas	2.293	6.4	116198	1.6	5	
K	39	1	nogas	155.734	8.5	10240559	0.9	100	CCB Main CR1 Failed
Ti	47	1	nogas	0.411	34.5	990	23.3	2.5	
V	51	1	nogas	6.074	45.7	1326165	7.1	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	0.663	5.1	79456	1.7	2.5	
Mn	55	1	nogas	1.388	1.5	60191	1.0	2.5	
Co	59	1	nogas	0.147	11.8	4131	8.2	2.5	
Ni	60	1	nogas	-0.136	-42.4	2390	9.9	2.5	
Cu	63	1	nogas	0.300	14.4	5091	8.4	2	
Zn	66	1	nogas	0.200	42.0	3070	10.7	2.5	
As	75	1	nogas	1.294	62.1	172710	4.1	2.5	
Sr	88	1	nogas	0.218	18.9	7182	14.0	2.5	
Ag	107	1	nogas	0.070	9.5	1043	7.7	2.5	
Cd	111	1	nogas	0.098	45.9	327	40.0	1	
Sb	121	1	nogas	0.288	10.5	3981	7.9	2.5	
Tl	205	1	nogas	0.976	53.1	20573	54.9	1	
Pb	208	1	nogas	0.099	48.0	3970	34.0	2.5	
U	238	1	nogas	0.212	55.6	5971	57.4	2.5	
[Pb]	206	1	nogas	0.087	51.5	913	36.1	2.5	
[Pb]	207	1	nogas	0.099	54.8	840	41.2	2.5	
Na	23	2	He	121.939	6.9	229267	2.2	100	CCB Main CR1 Failed
Mg	24	2	He	11.996	6.7	11630	4.3	100	
Al	27	2	He	2.535	31.6	2917	8.2	5	
K	39	2	He	103.286	1.1	263002	0.4	100	CCB Main CR1 Failed
Ca	43	2	He	31.876	58.4	113	36.7	100	
Ca	44	2	He	25.081	5.8	1940	6.2	100	
V	51	2	He	0.705	26.3	15496	2.7	2.5	
Cr	52	2	He	0.070	49.3	4547	1.9	2.5	
Mn	55	2	He	1.068	8.0	6038	2.1	2.5	
Fe	56	2	He	7.513	6.5	68896	2.2	100	
Co	59	2	He	0.119	15.4	1297	8.9	2.5	
Ni	60	2	He	0.314	0.7	480	5.5	2.5	
Cu	63	2	He	0.523	5.0	1623	10.3	2	
Zn	66	2	He	0.427	5.3	747	4.3	2.5	
As	75	2	He	0.109	54.0	658	10.1	2.5	
Se	78	2	He	1.138	38.9	229	18.8	2	
B	11	1	nogas	203.047	9.6	1278371	3.9	10	CCB Main CR1 Failed
Si	28	1	nogas	54.289	10.9	2249803	2.1	5	CCB Main CR1 Failed
Ca	43	1	nogas	63.208	7.0	2984	4.4	100	
Ca	44	1	nogas	70.107	12.3	91637	3.5	100	
Fe	56	1	nogas	33.063	30.2	3172265	5.3	100	
Se	77	1	nogas	31.669	9.5	55394	2.9	2.5	CCB Main CR1 Failed
Se	82	1	nogas	0.573	19.5	367	6.3	2	
Mo	95	1	nogas	0.489	56.8	3137	48.7	2.5	
Sn	118	1	nogas	0.319	37.1	3967	22.0	5	
Ba	137	1	nogas	0.222	24.4	1140	18.1	2.5	

Continuing Calibration Blank (CCB) Report

Sb	121	2	He	0.237	6.4	1250	7.9	2.5	
P	31	1	nogas	21.447	16.2	108526	3.2	10	CCB Main CR1 Failed
La	139	1	nogas	-24.976	-16.3	107	14.3	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Au	197	1	nogas	-1627.090	-89.8	37	41.7	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1213799	5.29	1195276	101.55	70	125	
Ge	72	1	nogas	3349960	1.85	3552237	94.31	70	125	
In	115	1	nogas	3042287	2.61	3134247	97.07	70	125	
Bi	209	1	nogas	2211162	2.71	2336631	94.63	70	125	
Ge	72	2	He	826869	5.10	837498	98.73	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	268_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:53:12-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	85.009	1.863	750986	0.84	100	85.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	10337.709	5.012	263320848	2.07	10000	103.4	90	110	
Mg	24	1	nogas	10313.860	5.918	165426145	1.62	10000	103.1	90	110	
Al	27	1	nogas	112.635	5.285	2206420	3.53	100	112.6	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10814.002	1.682	223706480	0.68	10000	108.1	90	110	
Ti	47	1	nogas	102.995	1.931	183688	1.48	100	103.0	90	110	
V	51	1	nogas	115.791	3.875	4193468	1.94	100	115.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	101.725	6.789	2308106	5.65	100	101.7	90	110	
Mn	55	1	nogas	101.476	4.822	2834606	5.05	100	101.5	90	110	
Co	59	1	nogas	104.527	2.762	2392616	2.37	100	104.5	90	110	
Ni	60	1	nogas	103.430	4.116	507860	2.32	100	103.4	90	110	
Cu	63	1	nogas	96.530	3.615	1184854	1.74	100	96.5	90	110	
Zn	66	1	nogas	99.495	2.826	394851	0.97	100	99.5	90	110	
As	75	1	nogas	107.510	3.917	704994	1.12	100	107.5	90	110	
Sr	88	1	nogas	104.558	3.506	2928233	3.11	100	104.6	90	110	
Ag	107	1	nogas	100.290	2.748	1364376	1.68	100	100.3	90	110	
Cd	111	1	nogas	100.266	5.016	294426	0.42	100	100.3	90	110	
Sb	121	1	nogas	104.997	2.300	1367523	2.63	100	105.0	90	110	
Tl	205	1	nogas	97.605	6.862	2030841	3.85	100	97.6	90	110	
Pb	208	1	nogas	95.249	2.492	2705149	2.49	100	95.2	90	110	
U	238	1	nogas	86.383	6.105	2397543	2.02	100	86.4	90	110	CCV Main CR1-2 Failed
[Pb]	206	1	nogas	97.183	6.667	663985	2.98	100	97.2	90	110	
[Pb]	207	1	nogas	93.605	5.934	557533	2.51	100	93.6	90	110	
Na	23	2	He	10341.013	1.460	15593669	1.02	10000	103.4	90	110	
Mg	24	2	He	10238.993	0.418	8382361	0.95	10000	102.4	90	110	
Al	27	2	He	109.057	3.064	51450	3.21	100	109.1	90	110	
K	39	2	He	10367.453	1.898	9476780	1.86	10000	103.7	90	110	
Ca	43	2	He	10272.065	3.196	24657	3.63	10000	102.7	90	110	
Ca	44	2	He	10386.182	1.860	418069	1.14	10000	103.9	90	110	
V	51	2	He	98.618	0.991	615662	0.31	100	98.6	90	110	
Cr	52	2	He	95.481	1.076	642158	0.63	100	95.5	90	110	
Mn	55	2	He	100.691	2.890	459468	1.68	100	100.7	90	110	
Fe	56	2	He	10080.647	4.451	56541154	3.51	10000	100.8	90	110	
Co	59	2	He	93.785	4.023	844400	2.88	100	93.8	90	110	
Ni	60	2	He	98.145	2.449	214672	1.42	100	98.1	90	110	
Cu	63	2	He	97.820	1.483	544972	1.55	100	97.8	90	110	
Zn	66	2	He	96.810	0.821	131583	1.24	100	96.8	90	110	
As	75	2	He	97.878	1.460	130424	0.35	100	97.9	90	110	
Se	78	2	He	98.962	3.187	10298	1.97	100	99.0	90	110	
B	11	1	nogas	647.088	2.781	3546885	1.13	500	129.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	565.946	5.461	7629022	2.36	5000	11.3	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10743.652	2.437	379006	0.55	10000	107.4	90	110	
Ca	44	1	nogas	10404.255	3.959	6062831	2.06	10000	104.0	90	110	
Fe	56	1	nogas	10292.923	3.531	239373672	2.49	10000	102.9	90	110	
Se	77	1	nogas	171.580	10.022	85979	2.76	100	171.6	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	101.285	3.948	26239	2.32	100	101.3	90	110	
Mo	95	1	nogas	94.726	4.632	549331	3.27	100	94.7	90	110	
Sn	118	1	nogas	97.670	3.862	776461	1.57	100	97.7	90	110	
Ba	137	1	nogas	99.917	4.356	411573	2.46	100	99.9	90	110	
Sb	121	2	He	100.004	1.530	475603	0.27	100	100.0	90	110	
Li	7	1	nogas	96.244	5.199	1880210	3.68	100	96.2	90	110	
P	31	1	nogas	501.467	2.762	851241	0.65	500	100.3	90	110	
La	139	1	nogas	205.193	25.659	850	16.47	100	205.2	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-407.821	-365.258	23	65.47	100	-407.8	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1145347	2.03	1195276	95.82	70	125	
Ge	72	1	nogas	3378546	1.88	3552237	95.11	70	125	
In	115	1	nogas	2932676	5.39	3134247	93.57	70	125	
Bi	209	1	nogas	2243494	4.90	2336631	96.01	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	805459	1.26	837498	96.17	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	269_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:55:13-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.090	29.7	923	23.0	1	
Na	23	1	nogas	101.048	10.0	2904419	1.3	100	CCB Main CR1 Failed
Mg	24	1	nogas	12.395	24.1	227940	13.3	100	
Al	27	1	nogas	2.256	6.5	114987	2.6	5	
K	39	1	nogas	132.225	18.0	9723561	0.9	100	CCB Main CR1 Failed
Ti	47	1	nogas	0.405	8.9	977	5.2	2.5	
V	51	1	nogas	11.462	6.6	1458297	4.0	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	0.762	18.8	81186	0.7	2.5	
Mn	55	1	nogas	1.296	5.9	57392	0.7	2.5	
Co	59	1	nogas	0.131	23.2	3737	14.2	2.5	
Ni	60	1	nogas	-0.206	-1.7	2043	4.5	2.5	
Cu	63	1	nogas	0.257	11.5	4551	5.0	2	
Zn	66	1	nogas	0.166	24.2	2924	2.5	2.5	
As	75	1	nogas	2.327	17.6	176991	3.0	2.5	
Sr	88	1	nogas	0.191	21.3	6375	13.4	2.5	
Ag	107	1	nogas	0.081	17.6	1180	12.3	2.5	
Cd	111	1	nogas	0.070	23.7	230	19.0	1	
Sb	121	1	nogas	0.275	16.6	3784	11.3	2.5	
Tl	205	1	nogas	0.941	57.8	20106	56.8	1	
Pb	208	1	nogas	0.088	46.5	3664	31.8	2.5	
U	238	1	nogas	0.192	56.0	5485	55.0	2.5	
[Pb]	206	1	nogas	0.084	38.5	903	24.8	2.5	
[Pb]	207	1	nogas	0.092	33.0	810	22.5	2.5	
Na	23	2	He	98.828	1.7	191978	1.3	100	
Mg	24	2	He	10.887	1.2	10603	1.6	100	
Al	27	2	He	2.287	14.7	2784	5.2	5	
K	39	2	He	82.690	3.9	244514	1.2	100	
Ca	43	2	He	9.888	120.5	60	50.0	100	
Ca	44	2	He	25.050	8.9	1920	6.8	100	
V	51	2	He	0.765	10.4	15741	1.0	2.5	
Cr	52	2	He	0.079	32.9	4564	2.4	2.5	
Mn	55	2	He	1.056	6.2	5934	3.8	2.5	
Fe	56	2	He	7.962	2.6	70846	3.7	100	
Co	59	2	He	0.110	17.3	1203	13.0	2.5	
Ni	60	2	He	0.284	15.2	410	25.7	2.5	
Cu	63	2	He	0.520	1.0	1590	2.3	2	
Zn	66	2	He	0.432	14.8	747	10.8	2.5	
As	75	2	He	0.106	11.0	649	0.3	2.5	
Se	78	2	He	1.073	13.1	221	6.0	2	
B	11	1	nogas	206.061	8.5	1292034	3.2	10	CCB Main CR1 Failed
Si	28	1	nogas	47.064	25.5	2162808	1.7	5	CCB Main CR1 Failed
Ca	43	1	nogas	76.383	14.4	3420	7.1	100	
Ca	44	1	nogas	70.318	11.8	91311	1.5	100	
Fe	56	1	nogas	28.541	54.7	3049600	7.4	100	
Se	77	1	nogas	42.324	2.1	57421	3.8	2.5	CCB Main CR1 Failed
Se	82	1	nogas	0.488	41.3	343	14.7	2	

Continuing Calibration Blank (CCB) Report

Mo	95	1	nogas	0.449	55.1	2877	44.3	2.5	
Sn	118	1	nogas	0.346	58.5	3981	35.2	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.196	8.3	987	7.3	2.5	
Sb	121	2	He	0.245	6.2	1280	5.4	2.5	
P	31	1	nogas	17.011	22.0	101212	1.7	10	CCB Main CR1 Failed
La	139	1	nogas	-19.369	-31.6	120	16.7	2.5	
Au	197	1	nogas	540.846	95.1	13	43.3	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1210124	4.48	1195276	101.24	70	125	
Ge	72	1	nogas	3335904	3.95	3552237	93.91	70	125	
In	115	1	nogas	2910023	4.03	3134247	92.85	70	125	
Bi	209	1	nogas	2254062	1.90	2336631	96.47	70	125	
Ge	72	2	He	818433	2.16	837498	97.72	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLCCV5
Data File Name	270LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:57:12-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	3.988	1.405	38051	3.80	5	79.8	70	130	
Na	23	1	nogas	594.913	5.530	15456887	1.82	500	119.0	70	130	
Mg	24	1	nogas	526.157	7.033	8469084	1.92	500	105.2	70	130	
Al	27	1	nogas	4.462	2.630	159413	0.55	5	89.2	70	130	
K	39	1	nogas	607.413	2.925	19509654	0.69	500	121.5	70	130	
Ti	47	1	nogas	5.346	5.596	9859	5.00	5	106.9	70	130	
V	51	1	nogas	22.839	5.014	1785758	1.27	5	456.8	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	5.918	1.817	197400	0.31	5	118.4	70	130	
Mn	55	1	nogas	5.366	0.950	172180	0.91	5	107.3	70	130	
Co	59	1	nogas	4.965	2.448	115223	1.08	5	99.3	70	130	
Ni	60	1	nogas	4.915	1.983	27264	0.49	5	98.3	70	130	
Cu	63	1	nogas	5.106	0.927	64540	1.80	5	102.1	70	130	
Zn	66	1	nogas	4.905	3.163	21820	2.80	5	98.1	70	130	
As	75	1	nogas	12.418	18.707	231295	3.86	5	248.4	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	5.070	2.405	144102	1.75	5	101.4	70	130	
Ag	107	1	nogas	5.032	2.088	69051	0.84	5	100.6	70	130	
Cd	111	1	nogas	5.012	7.904	14463	1.96	5	100.2	70	130	
Sb	121	1	nogas	5.107	4.594	67229	3.58	5	102.1	70	130	
Tl	205	1	nogas	4.530	4.526	93843	2.39	5	90.6	70	130	
Pb	208	1	nogas	4.613	0.389	132102	0.39	5	92.3	70	130	
U	238	1	nogas	4.692	4.024	129317	2.30	5	93.8	70	130	
[Pb]	206	1	nogas	4.958	3.388	33916	1.41	5	99.2	70	130	
[Pb]	207	1	nogas	4.888	4.190	29120	1.97	5	97.8	70	130	
Na	23	2	He	570.944	1.790	917151	0.52	500	114.2	70	130	
Mg	24	2	He	498.123	2.687	417416	0.76	500	99.6	70	130	
Al	27	2	He	4.996	10.881	4054	4.33	5	99.9	70	130	
K	39	2	He	548.704	1.251	662838	0.93	500	109.7	70	130	
Ca	43	2	He	543.253	6.536	1363	4.88	500	108.7	70	130	
Ca	44	2	He	506.627	3.493	21660	2.64	500	101.3	70	130	
V	51	2	He	5.677	0.619	46554	1.60	5	113.5	70	130	
Cr	52	2	He	4.674	3.565	35912	1.39	5	93.5	70	130	
Mn	55	2	He	5.292	6.357	25625	4.44	5	105.8	70	130	
Fe	56	2	He	478.635	1.276	2764151	2.05	500	95.7	70	130	
Co	59	2	He	4.705	2.222	43408	1.00	5	94.1	70	130	
Ni	60	2	He	4.968	6.141	10867	4.32	5	99.4	70	130	
Cu	63	2	He	5.342	3.592	29060	2.11	5	106.8	70	130	
Zn	66	2	He	5.013	4.908	7095	4.88	5	100.3	70	130	
As	75	2	He	4.716	1.755	6898	3.68	5	94.3	70	130	
Se	78	2	He	5.172	6.528	653	6.50	5	103.4	70	130	
B	11	1	nogas	189.859	5.575	1227276	2.35	25	759.4	70	130	LLICV Main CR1 Failed
Si	28	1	nogas	280.924	2.821	4677439	0.57	25	1123.7	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	577.336	1.450	21266	2.23	500	115.5	70	130	
Ca	44	1	nogas	544.355	1.483	369174	1.12	500	108.9	70	130	
Fe	56	1	nogas	522.506	1.198	14573826	0.77	500	104.5	70	130	
Se	77	1	nogas	84.076	14.586	67632	4.09	5	1681.5	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	5.019	6.081	1523	5.51	5	100.4	70	130	
Mo	95	1	nogas	4.966	5.617	29341	4.83	5	99.3	70	130	
Sn	118	1	nogas	4.958	2.748	39951	3.72	5	99.2	70	130	
Ba	137	1	nogas	5.203	6.463	21200	1.09	5	104.1	70	130	
Sb	121	2	He	4.845	4.842	23616	6.91	5	96.9	70	130	
Li	7	1	nogas	4.068	5.193	184897	5.21	5	81.4	70	130	
P	31	1	nogas	35.966	3.044	132892	1.84	25	143.9	70	130	LLICV Main CR1 Failed
La	139	1	nogas	-7.207	-207.031	157	26.57	5	-144.1	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	220.306	477.045	17	69.28	5	4406.1	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1233854	2.97	1195276	103.23	70	125	
Ge	72	1	nogas	3402500	1.38	3552237	95.78	70	125	
In	115	1	nogas	2880269	5.73	3134247	91.90	70	125	
Bi	209	1	nogas	2223022	2.65	2336631	95.14	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	821806	2.06	837498	98.13	70	125	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	271SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-24T23:59:10-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	231CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.627	1.627	2.50	15053	0.01	2000	
Na	23	1	nogas	249.638	249.638	1.88	7100862	0.00	200000	
Mg	24	1	nogas	194.388	194.388	1.40	3355377	0.01	200000	
Al	27	1	nogas	0.248	0.248	103.00	80522	0.00	2000	
K	39	1	nogas	279.208	279.208	7.34	13141152	0.00	200000	
Ti	47	1	nogas	2.243	2.243	7.31	4374	0.05	2000	
V	51	1	nogas	20.530	20.530	24.29	1756824	0.00	2000	
Cr	52	1	nogas	2.468	2.468	6.54	123119	0.00	2000	
Mn	55	1	nogas	2.075	2.075	5.47	81847	0.00	2000	
Co	59	1	nogas	1.991	1.991	7.08	47552	0.00	2000	
Ni	60	1	nogas	1.598	1.598	11.11	11157	0.01	2000	
Cu	63	1	nogas	2.083	2.083	5.08	27714	0.01	2000	
Zn	66	1	nogas	1.606	1.606	6.08	8879	0.02	2000	
As	75	1	nogas	8.032	8.032	26.08	213231	0.00	2000	
Sr	88	1	nogas	2.067	2.067	4.57	60572	0.00	2000	
Ag	107	1	nogas	1.968	1.968	4.01	27578	0.01	2000	
Cd	111	1	nogas	1.900	1.900	10.58	5941	0.03	2000	
Sb	121	1	nogas	2.038	2.038	1.65	27532	0.01	2000	
Tl	205	1	nogas	1.887	1.887	6.06	39756	0.00	2000	
Pb	208	1	nogas	1.874	1.874	3.12	54367	0.00	2000	
U	238	1	nogas	1.885	1.885	4.05	52621	0.00	2000	
[Pb]	206	1	nogas	1.901	1.901	4.65	13369	0.01	2000	
[Pb]	207	1	nogas	1.960	1.960	6.59	11961	0.02	2000	
Na	23	2	He	266.634	266.634	1.00	450199	0.06	200000	
Mg	24	2	He	200.675	200.675	3.38	169105	0.12	200000	
Al	27	2	He	0.312	0.312	18.31	1877	0.02	2000	
K	39	2	He	246.834	246.834	0.89	391860	0.06	200000	
Ca	43	2	He	235.915	235.915	5.03	613	38.46	200000	
Ca	44	2	He	200.862	200.862	6.12	9126	2.20	200000	
V	51	2	He	2.814	2.814	4.94	28616	0.01	2000	
Cr	52	2	He	1.744	1.744	5.18	15927	0.01	2000	
Mn	55	2	He	2.093	2.093	5.22	10763	0.02	2000	
Fe	56	2	He	193.195	193.195	5.22	1129490	0.02	200000	
Co	59	2	He	1.909	1.909	3.17	17722	0.01	2000	
Ni	60	2	He	2.237	2.237	4.38	4767	0.05	2000	
Cu	63	2	He	2.361	2.361	2.83	12074	0.02	2000	
Zn	66	2	He	1.929	1.929	8.90	2824	0.07	2000	
As	75	2	He	1.884	1.884	1.72	3060	0.06	2000	
Se	78	2	He	2.578	2.578	14.87	381	0.68	2000	
B	11	1	nogas	157.333	157.333	6.55	1007568	0.02	2000	
Si	28	1	nogas	112.891	112.891	5.69	2961235	0.00	2000	
Ca	43	1	nogas	247.817	247.817	9.02	9756	2.54	200000	

Sample Report

Ca	44	1	nogas	230.648	230.648	4.05	190189	0.12	200000	
Fe	56	1	nogas	215.517	215.517	6.70	7596452	0.00	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	67.543	67.543	15.96	65264	0.10	2000	
Se	82	1	nogas	2.171	2.171	18.49	800	0.27	2000	
Mo	95	1	nogas	1.880	1.880	1.18	11551	0.02	2000	
Sn	118	1	nogas	1.752	1.752	1.20	16151	0.01	2000	
Ba	137	1	nogas	1.934	1.934	3.62	8646	0.02	2000	
Sb	121	2	He	2.051	2.051	3.90	10036	0.02	2000	
La	139	1	nogas	-28.466	-28.466	-7.56	97	-29.45	2000	
Au	197	1	nogas	549.704	549.704	84.38	13	4122.78	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1192689	4.12	1195276	99.78	70	125	
Ge	72	1	nogas	3469998	3.27	3552237	97.68	70	125	
In	115	1	nogas	3109113	3.47	3134247	99.20	70	125	
Bi	209	1	nogas	2249644	3.67	2336631	96.28	70	125	
Ge	72	2	He	821667	3.58	837498	98.11	70	125	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	272ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-25T00:01:09-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.007	25.3	137	4.2	0	ICSA Main CR1 Failed
Na	23	1	nogas	101367.269	8.2	2349594453	1.7	0	
Mg	24	1	nogas	101831.323	9.4	1487158067	0.3	0	
Al	27	1	nogas	101285.905	10.9	1742370801	1.8	0	
K	39	1	nogas	108230.766	10.6	1974944177	2.7	0	
Ti	47	1	nogas	2321.774	8.8	3759910	0.7	0	
V	51	1	nogas	8.626	97.6	1270737	7.2	0	
Cr	52	1	nogas	1.366	34.2	86849	1.6	0	ICSA Main CR1 Failed
Mn	55	1	nogas	0.916	20.3	43267	2.5	0	ICSA Main CR1 Failed
Co	59	1	nogas	0.468	8.2	10460	2.3	0	ICSA Main CR1 Failed
Ni	60	1	nogas	1.035	14.0	7392	0.9	0	ICSA Main CR1 Failed
Cu	63	1	nogas	1.051	6.7	13068	3.6	0	ICSA Main CR1 Failed
Zn	66	1	nogas	3.046	14.7	13001	3.2	0	ICSA Main CR1 Failed
As	75	1	nogas	7.880	60.6	187948	2.4	0	
Sr	88	1	nogas	0.979	10.3	25936	1.9	0	ICSA Main CR1 Failed
Ag	107	1	nogas	0.025	18.8	397	6.3	0	ICSA Main CR1 Failed
Cd	111	1	nogas	1.693	5.1	4504	6.2	0	ICSA Main CR1 Failed
Sb	121	1	nogas	0.250	18.8	3197	8.2	0	ICSA Main CR1 Failed
Tl	205	1	nogas	0.044	27.5	1097	11.1	0	ICSA Main CR1 Failed
Pb	208	1	nogas	0.045	18.8	2433	9.9	0	ICSA Main CR1 Failed
[Pb]	206	1	nogas	0.066	43.3	660	19.7	0	ICSA Main CR1 Failed
[Pb]	207	1	nogas	0.059	16.7	523	1.1	0	ICSA Main CR1 Failed
Na	23	2	He	98411.987	2.5	137346271	1.2	0	
Mg	24	2	He	97925.606	1.6	74359109	0.3	0	
Al	27	2	He	94308.093	2.3	39912231	1.4	0	
K	39	2	He	92206.860	0.5	82941105	0.5	0	
Ca	43	2	He	96797.106	1.3	215258	0.3	0	
Ca	44	2	He	101586.698	1.0	3787366	2.2	0	
V	51	2	He	0.496	4.5	12850	0.9	0	ICSA Main CR1 Failed
Cr	52	2	He	0.236	9.2	5144	2.5	0	ICSA Main CR1 Failed
Mn	55	2	He	0.748	1.3	4117	1.6	0	ICSA Main CR1 Failed
Fe	56	2	He	97302.219	4.4	506125179	3.2	0	
Co	59	2	He	0.282	3.2	2534	1.6	0	ICSA Main CR1 Failed
Ni	60	2	He	0.782	3.4	1383	2.7	0	ICSA Main CR1 Failed
Cu	63	2	He	0.674	4.0	2250	6.8	0	ICSA Main CR1 Failed
Zn	66	2	He	1.839	7.0	2454	5.9	0	ICSA Main CR1 Failed
As	75	2	He	0.186	12.5	691	5.1	0	ICSA Main CR1 Failed
Se	78	2	He	0.793	41.0	175	17.4	0	ICSA Main CR1 Failed
B	11	1	nogas	155.367	13.9	901144	4.0	0	
Si	28	1	nogas	85.893	26.3	2363991	0.0	0	
Ca	43	1	nogas	107666.168	10.0	3445245	1.6	0	
Ca	44	1	nogas	105903.726	9.8	55666348	0.7	0	
Fe	56	1	nogas	104925.232	11.4	2195304782	2.2	0	
Se	77	1	nogas	76.857	46.5	59537	2.6	0	
Se	82	1	nogas	0.486	117.1	310	32.7	0	ICSA Main CR1 Failed
Mo	95	1	nogas	2049.112	11.4	10785464	2.2	0	
Sn	118	1	nogas	0.092	49.4	1854	24.0	0	ICSA Main CR1 Failed
Ba	137	1	nogas	0.263	17.0	1137	8.4	0	ICSA Main CR1 Failed
Sb	121	2	He	0.228	4.1	1093	2.8	0	ICSA Main CR1 Failed

Interference Check Solution A (ICS-A) Report

P	31	1	nogas	104595.665	12.0	146775791	2.8	0	
La	139	1	nogas	28.821	30.1	250	6.9	0	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	1083094	7.51	1195276	90.61	70	125	
Ge	72	1	nogas	3087359	8.77	3552237	86.91	70	125	
In	115	1	nogas	2646821	10.32	3134247	84.45	70	125	
Bi	209	1	nogas	1938124	8.13	2336631	82.95	70	125	
Ge	72	2	He	747291	1.32	837498	89.23	70	125	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	273ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\122
Acq Date Time	2018-12-25T00:03:11-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	231CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	106.335	13.777	772121	0.42	100	106.3	80	120	
Na	23	1	nogas	120547.122	12.828	2636618259	0.17	100	120547.1	80	120	ICSB Main CR1 Failed
Mg	24	1	nogas	117328.144	14.124	1616265869	1.82	100	117328.1	80	120	ICSB Main CR1 Failed
Al	27	1	nogas	104664.465	12.831	1706755761	0.25	100	104664.5	80	120	ICSB Main CR1 Failed
K	39	1	nogas	123908.011	12.539	2142302715	0.20	100	123908.0	80	120	ICSB Main CR1 Failed
Ti	47	1	nogas	2514.916	10.251	3863700	2.22	100	2514.9	80	120	ICSB Main CR1 Failed
V	51	1	nogas	130.437	14.157	3945968	1.98	100	130.4	80	120	ICSB Main CR1 Failed
Cr	52	1	nogas	124.132	11.644	2416175	1.94	100	124.1	80	120	ICSB Main CR1 Failed
Mn	55	1	nogas	121.557	14.297	2916099	2.25	100	121.6	80	120	ICSB Main CR1 Failed
Co	59	1	nogas	123.888	11.931	2442995	0.93	100	123.9	80	120	ICSB Main CR1 Failed
Ni	60	1	nogas	124.704	13.125	526724	1.68	100	124.7	80	120	ICSB Main CR1 Failed
Cu	63	1	nogas	119.195	14.817	1257539	2.20	100	119.2	80	120	
Zn	66	1	nogas	126.841	13.533	432640	0.96	100	126.8	80	120	ICSB Main CR1 Failed
As	75	1	nogas	128.313	14.318	697378	1.18	100	128.3	80	120	ICSB Main CR1 Failed
Sr	88	1	nogas	121.442	14.372	2924263	1.74	100	121.4	80	120	ICSB Main CR1 Failed
Ag	107	1	nogas	117.824	14.074	1378626	1.52	100	117.8	80	120	
Cd	111	1	nogas	124.944	13.744	303488	1.33	100	124.9	80	120	ICSB Main CR1 Failed
Sb	121	1	nogas	126.956	12.961	1423132	1.79	100	127.0	80	120	ICSB Main CR1 Failed
Tl	205	1	nogas	122.974	8.920	2077038	2.90	100	123.0	80	120	ICSB Main CR1 Failed
Pb	208	1	nogas	98.827	1.054	2806718	1.05	100	98.8	80	120	
U	238	1	nogas	131.189	11.900	2948829	1.00	100	131.2	80	120	ICSB Main CR1 Failed
[Pb]	206	1	nogas	123.573	11.873	683822	1.05	100	123.6	80	120	ICSB Main CR1 Failed
[Pb]	207	1	nogas	124.166	10.318	599567	1.53	100	124.2	80	120	ICSB Main CR1 Failed
Na	23	2	He	110269.342	2.780	154082611	1.70	100	110269.3	80	120	
Mg	24	2	He	108970.204	1.867	82847489	0.80	100	108970.2	80	120	
Al	27	2	He	94571.275	2.271	40072659	1.16	100	94571.3	80	120	ICSB Main CR1 Failed
K	39	2	He	99930.370	1.812	89874225	1.81	100	99930.4	80	120	ICSB Main CR1 Failed
Ca	43	2	He	105499.893	0.451	234924	1.19	100	105499.9	80	120	
Ca	44	2	He	111136.897	0.752	4148237	1.58	100	111136.9	80	120	
V	51	2	He	107.074	1.619	620061	0.64	100	107.1	80	120	
Cr	52	2	He	103.381	1.091	645583	0.82	100	103.4	80	120	
Mn	55	2	He	109.463	1.363	463985	0.82	100	109.5	80	120	
Fe	56	2	He	108165.335	1.451	563524258	1.97	100	108165.3	80	120	
Co	59	2	He	104.465	1.307	873894	0.53	100	104.5	80	120	
Ni	60	2	He	108.631	1.060	220765	0.50	100	108.6	80	120	
Cu	63	2	He	107.299	1.021	555475	2.05	100	107.3	80	120	
Zn	66	2	He	108.753	1.642	137294	1.87	100	108.8	80	120	
As	75	2	He	108.163	0.919	133843	0.22	100	108.2	80	120	
Se	78	2	He	110.618	2.030	10683	1.56	100	110.6	80	120	
B	11	1	nogas	681.333	15.432	3060974	0.61	100	681.3	80	120	
Si	28	1	nogas	6235.205	12.431	57763436	1.89	100	6235.2	80	120	ICSB Main CR1 Failed
Ca	43	1	nogas	123526.457	13.748	3741967	1.25	100	123526.5	80	120	ICSB Main CR1 Failed
Ca	44	1	nogas	124180.887	15.110	61714852	2.44	100	124180.9	80	120	ICSB Main CR1 Failed
Fe	56	1	nogas	120143.232	12.915	2383171587	0.58	100	120143.2	80	120	ICSB Main CR1 Failed
Se	77	1	nogas	202.393	18.099	80039	4.32	100	202.4	80	120	ICSB Main CR1 Failed
Se	82	1	nogas	124.846	14.787	27765	2.02	100	124.8	80	120	ICSB Main CR1 Failed
Mo	95	1	nogas	2245.357	12.315	11211017	1.78	100	2245.4	80	120	ICSB Main CR1 Failed
Sn	118	1	nogas	119.841	12.782	788088	0.49	100	119.8	80	120	
Ba	137	1	nogas	127.425	14.067	433831	1.87	100	127.4	80	120	ICSB Main CR1 Failed
Sb	121	2	He	112.272	1.712	496037	1.77	100	112.3	80	120	
La	139	1	nogas	269.373	13.116	883	8.57	100	269.4	80	120	ICSB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	952813	13.25	1195276	79.71	70	125	
Ge	72	1	nogas	2937900	11.93	3552237	82.71	70	125	
In	115	1	nogas	2448930	12.30	3134247	78.13	70	125	
Bi	209	1	nogas	1829652	11.20	2336631	78.30	70	125	
Ge	72	2	He	748210	1.09	837498	89.34	70	125	

Tune Report

Batch Folder C:\Agilent\ICPMH\1\DATA\122418A.b
Report Comment
Instrument Name G3281A JP11080910

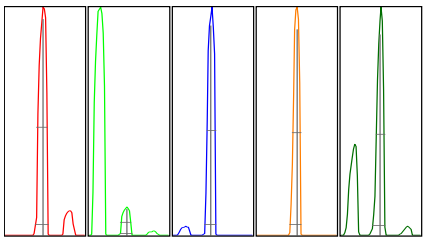
[nogas]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
9		21396				NaN	-	
24		43271				NaN	-	
59		48170				NaN	-	
115		42261				NaN	-	
208		26050				NaN	-	

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
9	0.71	5.00				
24	0.24	5.00				
59	0.34	5.00				
115	1.73	5.00				
208	0.65	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	21443	21454	21266	21221	21596
24	43115	43333	43234	43289	43386
59	48457	48041	48109	48090	48153
115	41738	41896	41658	42659	43355
208	26336	26067	25969	25909	25970

Integration Time [sec] 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
9	6029.04	8.95	8.9 - 9.1		0.37	0.467	0.750	
24	12180.39	23.95	23.9 - 24.1		0.36	0.445	0.750	
59	14533.27	58.95	58.9 - 59.1		0.33	0.436	0.750	
115	13634.77	115.05	114.9 - 115.1		0.29	0.433	0.750	
208	7923.62	208.00	207.9 - 208.1		0.31	0.486	0.750	

X = 5 **Integration Time [sec]** 0.1 **Acquisition Time [sec]** 168.5 **Y Axis** Linear

Tune Parameters
Plasma Paramters

RF Power	1600 W	Carrier Gas	0.40 L/min	S/C Temp	2 ℃
RF Matching	1.70 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.40 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Extract 1	0.0 V	Omega Lens	8.0 V	Deflect	15.0 V
Extract 2	-200.0 V	Cell Entrance	-30 V	Plate Bias	-50 V
Omega Bias	-100 V	Cell Exit	-58 V		

Cell Parameters

OctP Bias	-8.0 V	He Flow	0.0 mL/min	Energy Discrimination	5.0 V
OctP RF	190 V	H2 Flow	0.0 mL/min		
Use Gas	true	3rd Gas Flow	0 %		

[He]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
9		376				NaN	-	
24		2579				NaN	-	
59		19689				NaN	-	

Tune Report

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
9	3.23	5.00				
24	2.44	5.00				
59	1.03	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	366	393	364	383	377
24	2549	2663	2627	2511	2547
59	19803	19591	19429	19663	19960

Integration Time [sec] 0.1

Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
9	103.64	8.95	8.9 - 9.1		0.37	0.482	0.750	
24	721.03	23.95	23.9 - 24.1		0.37	0.444	0.750	
59	6137.87	58.95	58.9 - 59.1		0.31	0.431	0.750	

X = 5 **Integration Time [sec]** 0.1 **Acquisition Time [sec]** 100.6 **Y Axis** Linear

Tune Parameters

Plasma Paramters

RF Power	1600 W	Carrier Gas	0.40 L/min	S/C Temp	2 ℃
RF Matching	1.70 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.40 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Extract 1	0.0 V	Omega Lens	8.0 V	Deflect	2.0 V
Extract 2	-200.0 V	Cell Entrance	-32 V	Plate Bias	-60 V
Omega Bias	-100 V	Cell Exit	-70 V		

Cell Parameters

OctP Bias	-18.0 V	He Flow	4.0 mL/min	Energy Discrimination	5.0 V
OctP RF	190 V	H2 Flow	0.0 mL/min		
Use Gas	true	3rd Gas Flow	0 %		

HS18120642 Wet Chem Raw Data

ALS WO# HS18120642

HS18120642

00946451

PREP BATCH REPORT

Batch ID: **135598**

Prep Code: **P_TW_PR**

InitSampWt/Vol: 0

FinSampVol: 50

Start Date: **13-Dec-18 11:00 am**

End Date: **13-Dec-18 12:30 pm**

OriginalFac: 1

Technician:

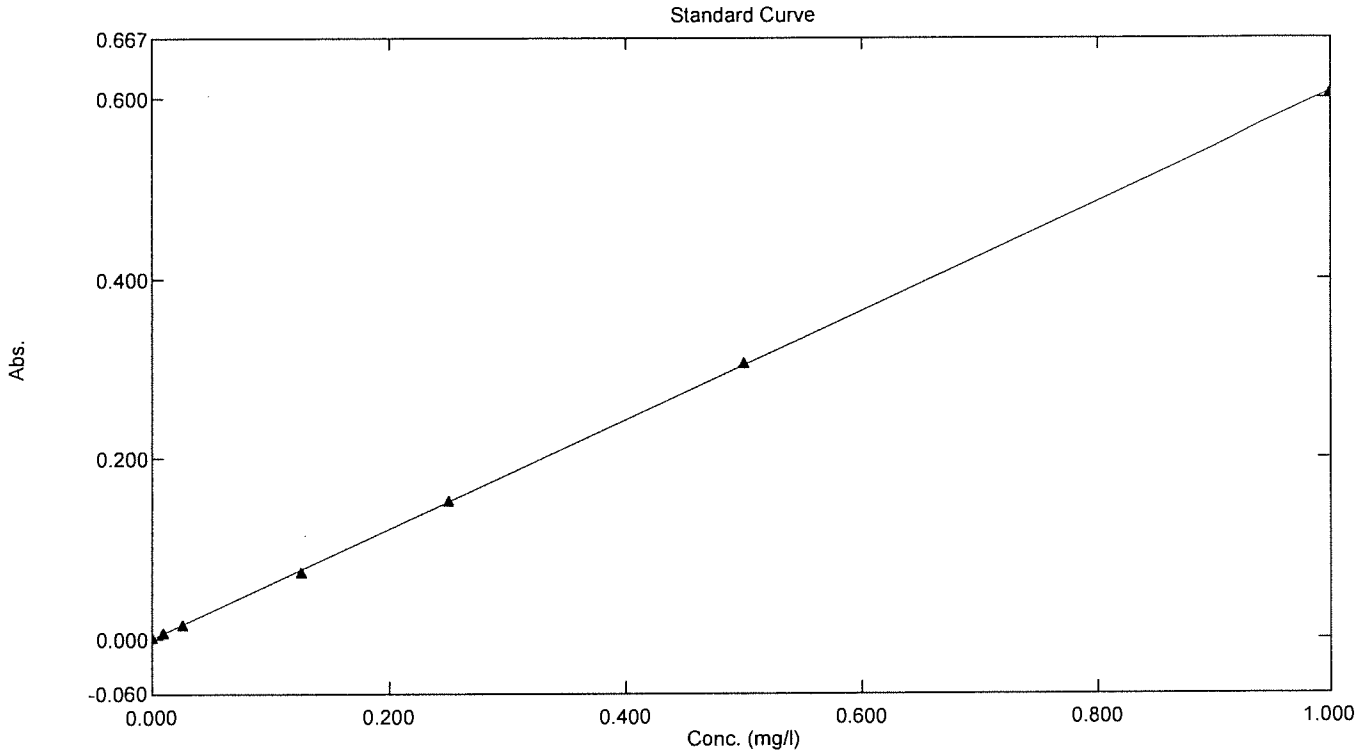
PrepUnitFac: 1

SampID	Frac	Matrix	pH	Init Wt/Vol	FinalVol (mL)	PrepFac	SpkFac	Comments
HS18120487-01	A	Water		50	50	1	1	
HS18120487-01MS	A			50	50	1	1	
HS18120487-01MSD	A			50	50	1	1	
HS18120569-01	H	Groundwater		50	50	1	1	
HS18120569-02	H	Groundwater		50	50	1	1	
HS18120569-03	H	Groundwater		50	50	1	1	
HS18120569-04	H	Groundwater		50	50	1	1	
HS18120569-05	H	Groundwater		50	50	1	1	
HS18120642-01	H	Groundwater		50	50	1	1	
HS18120642-02	H	Groundwater		50	50	1	1	
HS18120642-03	H	Groundwater		50	50	1	1	
LCS-135598	A			50	50	1	1	
MBLK-135598	A			50	50	1	1	

Standard Table Report

01/21/2019 04:58:49 PM

File Name: C:\Program Files (x86)\Shimadzu\UVProbe\Data\T_PO4_UNKNOWN\2018P_TW\181213_P_TW_.pho



Correlation Coefficient r2 = 0.99993

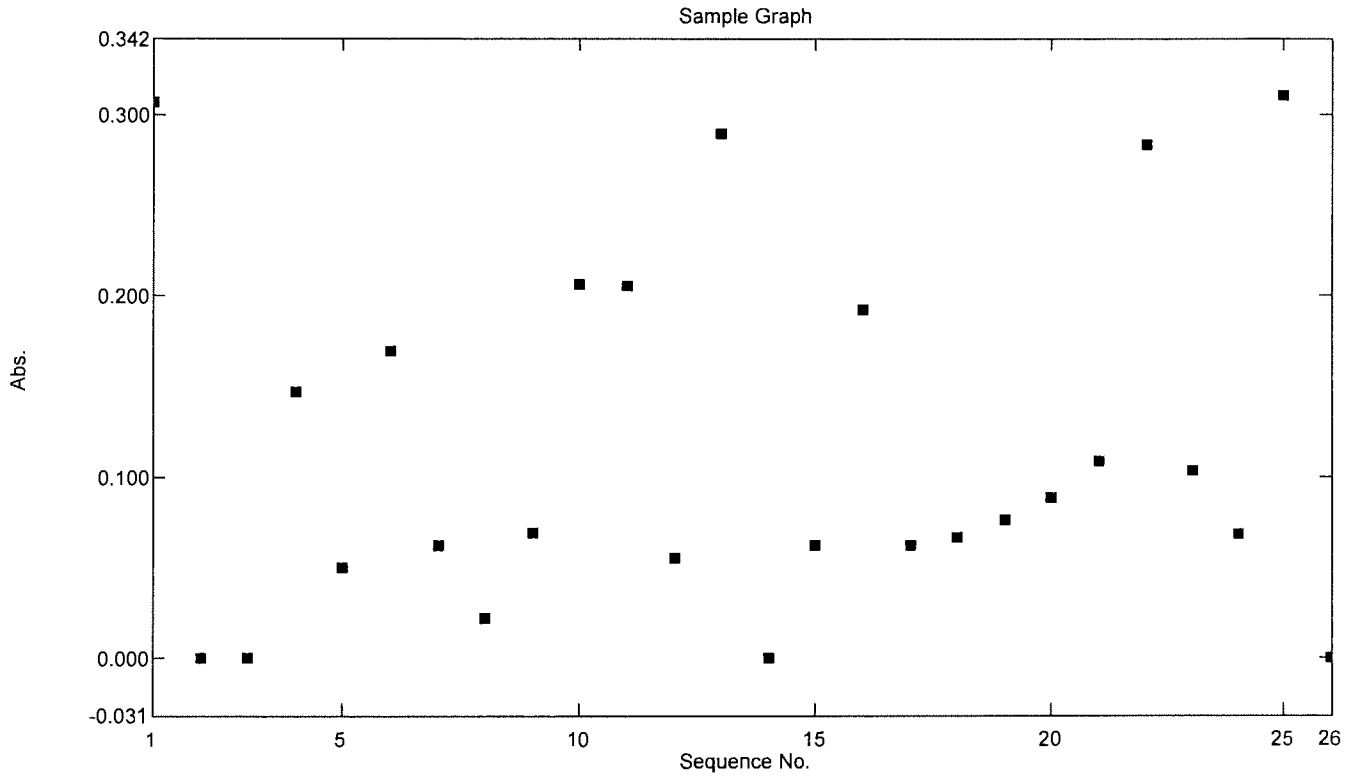
Standard Table

	Sample ID	Type	Ex	Conc	WL880.0	Wgt.Facto	Comments
1	STD1	Standard		0.000	0.001	1.000	
2	STD2	Standard		0.010	0.007	1.000	
3	STD3	Standard		0.025	0.016	1.000	
4	STD4	Standard		0.125	0.073	1.000	
5	STD5	Standard		0.250	0.153	1.000	
6	STD6	Standard		0.500	0.307	1.000	
7	STD7	Standard		1.000	0.606	1.000	
8							

Sample Table Report

01/21/2019 04:58:53 PM

File Name: C:\Program Files (x86)\Shimadzu\UVProbe\Data\T_PO4_UNKNOWN\2018P_TW\181213_P_TW_.pho



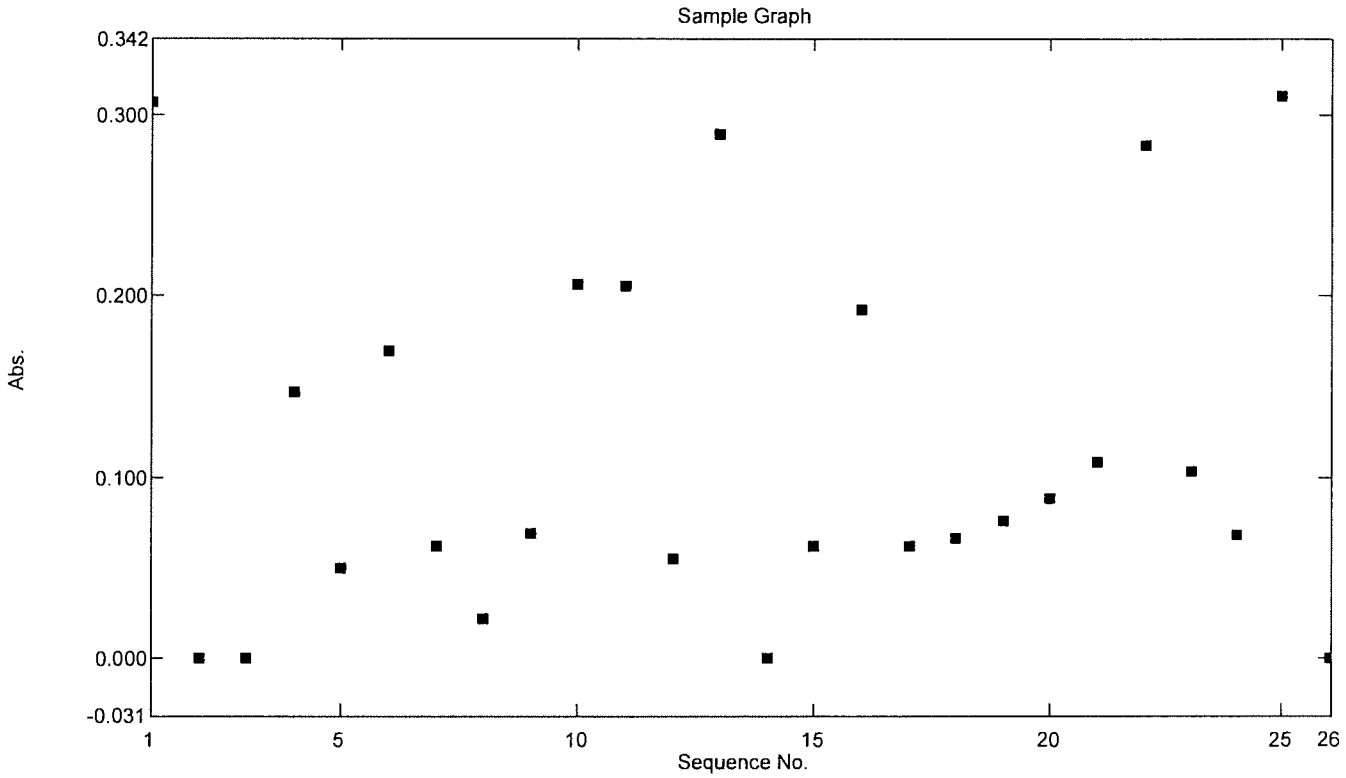
Sample Table

	Sample ID	Type	Ex	Conc	WL880.0	Comments
1	CCV	Unknown		0.505	0.307	
2	CCB	Unknown		-0.001	0.001	
3	MBLK	Unknown		-0.002	-0.000	
4	LCS	Unknown		0.241	0.147	
5	18120262.01	Unknown		0.082	0.050	
6	18120370.01	Unknown		0.279	0.170	PF:10X
7	18120370.02	Unknown		0.101	0.062	
8	18120442.01	Unknown		0.034	0.022	
9	18120487.01	Unknown		0.113	0.069	
10	18120487.01MS	Unknown		0.339	0.206	
11	18120487.01MSD	Unknown		0.338	0.206	
12	18120490.01	Unknown		0.090	0.055	
13	CCV2	Unknown		0.476	0.289	
14	CCB2	Unknown		-0.000	0.001	
15	18120569.01	Unknown		0.101	0.062	
16	18120569.02	Unknown		0.316	0.193	
17	18120569.03	Unknown		0.101	0.062	
18	18120569.04	Unknown		0.108	0.066	DF:10X
19	18120569.05	Unknown		0.125	0.076	

Sample Table Report

01/21/2019 04:58:53 PM

File Name: C:\Program Files (x86)\Shimadzu\UVProbe\Data\T_PO4_UNKNOWN\2018P_TW\181213_P_TW_.pho



Sample Table

	Sample ID	Type	Ex	Conc	WL880.0	Comments
20	18120572.01	Unknown		0.144	0.088	
21	18120574.01	Unknown		0.177	0.108	
22	18120642.01	Unknown		0.467	0.284	
23	18120642.02	Unknown		0.169	0.103	
24	18120642.03	Unknown		0.112	0.069	
25	CCV3	Unknown		0.511	0.311	
26	CCB3	Unknown		-0.001	0.000	
27						

HS18120642

Reagent ID:	Prep. Date:		Date/Time:	12/17/18 14:30	Reported by:	JHD/
2970207819			Batch ID:		Reviewed by:	
2970207820					Log Book #:	
2970207101			LCS ID# :	2970206703 →	Prep. Date:	
308055203	10/31/18		MS ID# :	2970206703 →	Prep. Date:	

Calculated Iodine Normality => 0.024875 Iodine (N)

WO	WO	Sx Vol. (mL)	Iodine (mL)	Titrant used (mL)	Sod. Thio. (N)	Iodine (N)	Init. Conc.	Final Conc.
STD1	STD1	0	20	19.90	0.0250	0.02488		
STD2	STD2	0	20	19.90	0.0250	0.02488	0.0249	
STD3	STD3	0	20	19.90	0.0250	0.02488	Iodine (N)	(mg/L)
BLK	BLK	200	20	20.00	0.0250	0.0249		-0.16
LCS	LCS	200	20	8.80	0.0250	0.0249		22.24
LCSD	LCSD	200	20	8.70	0.0250	0.0249		22.44
HS18120550-01	SAMP	200	30	14.50	0.0250	0.0249		30.76
HS18120550-02	SAMP	200	20	16.40	0.0250	0.0249		7.04
HS18120550-03	SAMP	200	20	19.10	0.0250	0.0249		1.64
HS18120569-01	SAMP	200	20	9.20	0.0250	0.0249		21.44
HS18120569-02	SAMP	200	20	20.20	0.0250	0.0249		-0.56
HS18120569-03	SAMP	200	20	20.50	0.0250	0.0249		-1.16
HS18120569-04	SAMP	200	20	19.90	0.0250	0.0249		0.04
HS18120569-05	SAMP	200	20	12.50	0.0250	0.0249		14.84
HS18120642-01	SAMP	200	20	20.00	0.0250	0.0249		-0.16
HS18120642-02	SAMP	200	20	16.00	0.0250	0.0249		7.84
HS18120642-03	SAMP	200	20	20.40	0.0250	0.0249		-0.96
HS18120569-04MS	MS	200	20	7.60	0.0250	0.0249		24.64
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			
					0.0250			

Report Date: 12/20/2018 : 8:27

PC-TitratION PLUS
Calibration Report

HS18120642

Calibration Record # 2064

Calibration Settings

Calibration ID	PH CAL 4-7-10	Date	12/20/2018
Channel	1	Time	8:27 PM
Probe Type	pH	Temperature	295.99 K 22.84 C
Probe ID	PH ELECTRODE	Analysis Type	Single Line Fit

Calibration Results

Slope	-57.452	CorrCoeff	0.9997
Intercept	3.867	Equation:	Y = (-57.452) X + (3.867)

Calibration Validity True Operator

	Result	Minimum	Maximum
Slope	-57.452	-65.00	-53.00
Intercept	3.867	-100.00	100.00
Correlation Coefficient	0.9997	0.99	1.00

Note: "True" means the calibration was within the specified ranges
"False" means the calibration was NOT within the specified ranges

AIKA: 329695
AIKB: 329699
AIKC: 329708

Calibration Data	Standard	Reading
	4.00	178.58
	7.00	-0.85
	10.00	-166.13

PC-TitratION PLUS by Man-Tech Associates, Inc.
CALRPRTLive1.SRW
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Report Date: 12/21/2018 : 7:56 AM

PC-TitratION PLUS
Water Analysis Report

Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
ICV-PH	12/20/2018	8:34 PM	22.92	-1.00	6.05	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TAP WATER	12/20/2018	8:41 PM	23.33	-1.00	7.72	.00	149.66	149.66	.00	.00	.00	1.43	1.43
WBLKW1-181220	12/20/2018	8:45 PM	22.78	-1.00	5.84	.00	.34	.34	.00	.00	.00	.02	.02
LCS1-181220	12/20/2018	8:54 PM	22.86	-1.00	10.95	547.45	1,060.90	.00	1,026.91	33.99	5.21	10.10	10.10
LCSD1-181220	12/20/2018	9:04 PM	22.86	-1.00	10.95	544.55	1,056.90	.00	1,024.69	32.21	5.19	10.07	10.07
HS18120569-01	12/20/2018	9:13 PM	22.74	-1.00	6.90	.00	1,193.63	1,193.63	.00	.00	.00	11.37	11.37
HS18120569-02	12/20/2018	9:18 PM	22.60	-1.00	5.95	.00	45.86	45.86	.00	.00	.00	.44	.44
HS18120569-03	12/20/2018	9:24 PM	22.43	-1.00	6.56	.00	198.03	198.03	.00	.00	.00	1.89	1.89
HS18120569-04	12/20/2018	9:34 PM	22.35	-1.00	6.11	.00	1,109.93	1,109.93	.00	.00	.00	10.57	10.57
HS18120569-05	12/20/2018	9:45 PM	22.49	-1.00	7.25	.00	1,637.90	1,637.90	.00	.00	.00	15.60	15.60
HS18120642-01	12/20/2018	9:55 PM	22.57	-1.00	6.13	.00	1,212.56	1,212.56	.00	.00	.00	11.55	11.55
CCV-PH	12/20/2018	9:57 PM	22.70	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/20/2018	10:06 PM	22.42	-1.00	10.92	542.50	1,065.15	.00	1,045.28	19.86	5.17	10.14	10.14
DI RINSE	12/20/2018	10:11 PM	22.37	-1.00	5.87	.00	.51	.51	.00	.00	.00	.02	.02
HS18120642-02	12/20/2018	10:22 PM	22.26	-1.00	6.34	.00	1,429.21	1,429.21	.00	.00	.00	13.61	13.61
HS18120642-03	12/20/2018	10:27 PM	22.23	-1.00	6.42	.00	281.92	281.92	.00	.00	.00	2.68	2.68
HS18120927-01	12/20/2018	10:34 PM	22.16	-1.00	7.56	.00	511.17	511.17	.00	.00	.00	4.87	4.87
HS18120927-03	12/20/2018	10:42 PM	22.08	-1.00	7.65	.00	515.51	515.51	.00	.00	.00	4.91	4.91
HS18120927-04	12/20/2018	10:50 PM	22.08	-1.00	7.41	.00	869.76	869.76	.00	.00	.00	8.28	8.28
HS18120927-05	12/20/2018	10:57 PM	22.13	-1.00	7.99	.00	647.59	647.59	.00	.00	.00	6.17	6.17
HS18120927-05DUP	12/20/2018	11:05 PM	22.07	-1.00	7.98	.00	650.20	650.20	.00	.00	.00	6.19	6.19
HS18120736-01DF5	12/20/2018	11:12 PM	21.87	-1.00	7.26	.00	172.44	172.44	.00	.00	.00	1.64	1.64
HS18120736-02DF10	12/20/2018	11:18 PM	21.71	-1.00	7.72	.00	342.28	342.28	.00	.00	.00	3.26	3.26
CCV-PH	12/20/2018	11:21 PM	21.56	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/20/2018	11:29 PM	21.34	-1.00	10.92	542.29	1,061.88	.00	1,039.18	22.70	5.16	10.11	10.11
DI RINSE	12/20/2018	11:34 PM	21.45	-1.00	6.11	.00	.52	.52	.00	.00	.00	.02	.02
HS18120736-03	12/20/2018	11:39 PM	21.40	-1.00	6.15	.00	50.38	50.38	.00	.00	.00	.48	.48

PC-TitratION PLUS by Man-Tech Associates, Inc.

GENERAL RESULTS REPORT.SRW

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Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS18120736-04	12/20/2018	11:45 PM	21.41	-1.00	6.13	.00	55.09	55.09	.00	.00	.00	.52	.52
HS18120779-23	12/20/2018	11:49 PM	21.58	-1.00	5.76	.00	.44	.44	.00	.00	.00	.02	.02
HS18120927-06	12/20/2018	11:57 PM	21.48	-1.00	7.87	.00	97.35	97.35	.00	.00	.00	.93	.93
HS18120927-07	12/21/2018	12:03 AM	21.38	-1.00	7.66	.00	514.19	514.19	.00	.00	.00	4.90	4.90
HS18120927-08	12/21/2018	12:11 AM	21.31	-1.00	7.79	.00	289.56	289.56	.00	.00	.00	2.76	2.76
WBLKW2-181220	12/21/2018	12:15 AM	21.19	-1.00	5.84	.00	.42	.42	.00	.00	.00	.02	.02
WLCS2-181220	12/21/2018	12:24 AM	21.06	-1.00	10.91	543.38	1,065.28	.00	1,043.80	21.48	5.18	10.15	10.15
WLCSD2-181220	12/21/2018	12:33 AM	21.06	-1.00	10.91	540.17	1,057.87	.00	1,035.40	22.47	5.14	10.07	10.07
CCV-PH	12/21/2018	12:35 AM	21.03	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	12:44 AM	20.94	-1.00	10.90	543.35	1,065.58	.00	1,044.46	21.12	5.17	10.15	10.15
DI RINSE	12/21/2018	12:49 AM	21.21	-1.00	6.13	.00	.63	.63	.00	.00	.00	.02	.02
HS18120779-01	12/21/2018	12:56 AM	21.06	-1.00	8.63	16.83	478.96	445.31	33.65	.00	.16	4.56	4.56
HS18120779-02	12/21/2018	1:03 AM	20.96	-1.00	7.51	.00	322.36	322.36	.00	.00	.00	3.07	3.07
HS18120779-02DUP	12/21/2018	1:09 AM	20.89	-1.00	7.52	.00	321.87	321.87	.00	.00	.00	3.07	3.07
HS18120779-03	12/21/2018	1:16 AM	20.81	-1.00	7.54	.00	412.60	412.60	.00	.00	.00	3.93	3.93
HS18120779-04	12/21/2018	1:23 AM	20.78	-1.00	7.72	.00	466.80	466.80	.00	.00	.00	4.45	4.45
HS18120779-05	12/21/2018	1:31 AM	20.74	-1.00	8.22	.00	634.92	634.92	.00	.00	.00	6.05	6.05
HS18120779-06	12/21/2018	1:38 AM	20.73	-1.00	8.17	.00	664.91	664.91	.00	.00	.00	6.33	6.33
HS18120779-07	12/21/2018	1:46 AM	20.91	-1.00	8.48	11.64	501.47	478.19	23.27	.00	.11	4.78	4.78
HS18120779-08	12/21/2018	1:52 AM	20.83	-1.00	7.36	.00	231.19	231.19	.00	.00	.00	2.20	2.20
CCV-PH	12/21/2018	1:55 AM	20.63	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	2:04 AM	20.48	-1.00	10.89	541.68	1,070.54	.00	1,057.72	12.82	5.16	10.20	10.20
DI RINSE	12/21/2018	2:09 AM	20.49	-1.00	6.10	.00	.57	.57	.00	.00	.00	.02	.02
HS18120779-09	12/21/2018	2:17 AM	20.43	-1.00	7.98	.00	926.02	926.02	.00	.00	.00	8.82	8.82
HS18120779-10	12/21/2018	2:22 AM	20.40	-1.00	6.01	.00	.79	.79	.00	.00	.00	.02	.02
HS18120779-12	12/21/2018	2:29 AM	20.40	-1.00	7.93	.00	515.07	515.07	.00	.00	.00	4.91	4.91
HS18120779-13	12/21/2018	2:38 AM	20.41	-1.00	8.08	.00	731.43	731.43	.00	.00	.00	6.97	6.97
HS18120779-14	12/21/2018	2:44 AM	20.49	-1.00	7.70	.00	453.37	453.37	.00	.00	.00	4.32	4.32
HS18120779-15	12/21/2018	2:51 AM	20.36	-1.00	7.50	.00	247.94	247.94	.00	.00	.00	2.36	2.36
HS18120779-16	12/21/2018	2:58 AM	20.25	-1.00	7.70	.00	395.33	395.33	.00	.00	.00	3.77	3.77

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Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS18120779-17	12/21/2018	3:05 AM	20.19	-1.00	8.41	7.88	401.51	385.76	15.76	.00	.08	3.82	3.82
HS18120779-18	12/21/2018	3:12 AM	20.08	-1.00	7.57	.00	722.42	722.42	.00	.00	.00	6.88	6.88
CCV-PH	12/21/2018	3:15 AM	20.00	-1.00	7.07	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	3:24 AM	19.92	-1.00	10.87	539.52	1,065.42	.00	1,051.80	13.62	5.14	10.15	10.15
DI RINSE	12/21/2018	3:29 AM	19.96	-1.00	6.08	.00	.53	.53	.00	.00	.00	.02	.02
HS18120779-19	12/21/2018	3:38 AM	20.15	-1.00	7.51	.00	1,226.68	1,226.68	.00	.00	.00	11.68	11.68
HS18120779-20	12/21/2018	3:47 AM	20.00	-1.00	7.48	.00	951.67	951.67	.00	.00	.00	9.06	9.06
HS18120779-21	12/21/2018	3:54 AM	19.92	-1.00	7.48	.00	681.28	681.28	.00	.00	.00	6.49	6.49
WBLKW3-181220	12/21/2018	4:00 AM	20.00	-1.00	6.38	.00	26.88	26.88	.00	.00	.00	.26	.26
LCS3-181220	12/21/2018	4:09 AM	19.68	-1.00	10.87	542.57	1,069.49	.00	1,053.85	15.64	5.17	10.19	10.19
LCSD3-181220	12/21/2018	4:18 AM	19.71	-1.00	10.87	538.56	1,061.72	.00	1,046.31	15.41	5.13	10.11	10.11
HS18121010-01	12/21/2018	4:24 AM	19.63	-1.00	6.76	.00	298.43	298.43	.00	.00	.00	2.84	2.84
HS18121010-01DUP	12/21/2018	4:30 AM	19.56	-1.00	6.78	.00	296.07	296.07	.00	.00	.00	2.82	2.82
HS18121010-02	12/21/2018	4:36 AM	19.50	-1.00	6.68	.00	267.13	267.13	.00	.00	.00	2.54	2.54
CCV-PH	12/21/2018	4:39 AM	19.63	-1.00	7.07	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	4:48 AM	19.59	-1.00	10.84	539.66	1,072.45	.00	1,065.58	6.87	5.14	10.21	10.21
DI RINSE	12/21/2018	4:53 AM	19.55	-1.00	6.08	.00	.49	.49	.00	.00	.00	.02	.02
HS18120779-22	12/21/2018	5:02 AM	19.51	-1.00	7.57	.00	1,240.44	1,240.44	.00	.00	.00	11.81	11.81
HS18120832-01DF5	12/21/2018	5:09 AM	19.43	-1.00	6.96	.00	8.33	8.33	.00	.00	.00	.10	.10
HS18120918-01	12/21/2018	5:17 AM	19.38	-1.00	8.64	33.51	956.57	889.54	67.02	.00	.32	9.11	9.11
HS18120829-01	12/21/2018	5:26 AM	19.35	-1.00	7.22	.00	1,007.30	1,007.30	.00	.00	.00	9.59	9.59
HS18120829-02	12/21/2018	5:34 AM	19.22	-1.00	7.11	.00	755.96	755.96	.00	.00	.00	7.20	7.20
HS18120829-03	12/21/2018	5:41 AM	19.36	-1.00	7.16	.00	758.73	758.73	.00	.00	.00	7.23	7.23
HS18120829-04	12/21/2018	5:54 AM	19.31	-1.00	7.52	.00	1,902.18	1,902.18	.00	.00	.00	18.12	18.12
HS18120829-05	12/21/2018	6:03 AM	19.24	-1.00	7.26	.00	895.16	895.16	.00	.00	.00	8.53	8.53
HS18120829-06	12/21/2018	6:11 AM	19.23	-1.00	7.21	.00	920.45	920.45	.00	.00	.00	8.77	8.77
CCV-PH	12/21/2018	6:13 AM	19.05	-1.00	7.07	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	6:22 AM	18.96	-1.00	10.84	536.26	1,061.91	.00	1,051.30	10.61	5.11	10.11	10.11
DI RINSE	12/21/2018	6:26 AM	18.94	-1.00	6.07	.00	.43	.43	.00	.00	.00	.02	.02
HS18120829-07	12/21/2018	6:37 AM	18.93	-1.00	7.56	.00	1,303.08	1,303.08	.00	.00	.00	12.41	12.41

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Run Number 3446 **Order Number** 20181220-7

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS18120829-08	12/21/2018	6:44 AM	18.93	-1.00	7.31	.00	774.69	774.69	.00	.00	.00	7.38	7.38
HS18120829-09	12/21/2018	6:57 AM	19.10	-1.00	7.51	.00	1,910.33	1,910.33	.00	.00	.00	18.19	18.19
HS18120947-01	12/21/2018	7:05 AM	19.18	-1.00	7.67	.00	925.75	925.75	.00	.00	.00	8.82	8.82
HS18120991-05	12/21/2018	7:10 AM	19.10	-1.00	6.41	.00	1.04	1.04	.00	.00	.00	.03	.03
HS18120991-06	12/21/2018	7:16 AM	19.07	-1.00	6.19	.00	.73	.73	.00	.00	.00	.02	.02
HS18120991-07	12/21/2018	7:24 AM	19.07	-1.00	11.73	246.49	310.75	.00	128.53	182.23	2.35	2.96	2.96
HS18120992-04	12/21/2018	7:31 AM	19.09	-1.00	7.42	.00	355.60	355.60	.00	.00	.00	3.39	3.39
HS18120992-05	12/21/2018	7:38 AM	19.05	-1.00	7.84	00.	247.09	247.09	.00	.00	.00	2.35	2.35
CCV-PH	12/21/2018	7:41 AM	19.02	-1.00	7.08	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	12/21/2018	7:49 AM	19.17	-1.00	10.80	527.01	1,061.96	7.93	1,054.03	.00	5.02	10.11	10.11
DI RINSE	12/21/2018	7:53 AM	19.38	-1.00	6.00	.00	.55	.55	.00	.00	.00	.02	.02

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GENERAL RESULTS REPORT.SRW

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HS18120642

Sequence: 121218
Operator: alshs.nouser

Printed: 12/13/2018 6:21:52 PM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 101

Created: 12/12/2018 9:24:30 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
1	STD1		Standard	91	1.0000	10.0	1.00	1.00
2	STD2		Standard	92	1.0000	10.0	1.00	1.00
3	STD3		Standard	93	1.0000	10.0	1.00	1.00
4	STD4		Standard	94	1.0000	10.0	1.00	1.00
5	STD5		Standard	95	1.0000	10.0	1.00	1.00
6	STD6		Standard	96	1.0000	10.0	1.00	1.00
7	ICV		Unknown	97	1.0000	10.0	1.00	1.00
8	ICB		Unknown	98	1.0000	10.0	1.00	1.00
9	CCV		Unknown	1	1.0000	10.0	1.00	1.00
10	CCB		Unknown	2	1.0000	10.0	1.00	1.00
11	WBLKW1-121218	300_W 9056_W	Unknown	11	1.0000	10.0	1.00	1.00
12	WLCSW1-121218		Unknown	12	1.0000	10.0	1.00	1.00
13	WLCSDW1-121218		Unknown	13	1.0000	10.0	1.00	1.00
14	HS18120642-01DF2	9056_W	Unknown	14	2.0000	10.0	1.00	1.00
15	HS18120642-01DF20		Unknown	15	20.0000	10.0	1.00	1.00
16	HS18120642-02DF2		Unknown	16	2.0000	10.0	1.00	1.00
17	HS18120642-02DF20		Unknown	17	20.0000	10.0	1.00	1.00
18	HS18120642-03		Unknown	18	1.0000	10.0	1.00	1.00
19	HS18120642-03DF2		Unknown	19	2.0000	10.0	1.00	1.00
20	HS18120642-03DF20		Unknown	20	20.0000	10.0	1.00	1.00
21	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
22	CCB		Unknown	4	1.0000	10.0	1.00	1.00
23	HS18120459-01	9056_W	Unknown	24	1.0000	10.0	1.00	1.00
24	HS18120459-01MS		Unknown	25	1.0000	10.0	1.00	1.00
25	HS18120459-01MSD		Unknown	26	1.0000	10.0	1.00	1.00
26	HS18120582-01DF5		Unknown	21	5.0000	10.0	1.00	1.00
27	HS18120582-02DF5		Unknown	22	5.0000	10.0	1.00	1.00
28	HS18120582-03DF5	HI SO4	Unknown	23	5.0000	10.0	1.00	1.00
29	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00
30	DI H2O		Unknown	10	1.0000	10.0	1.00	1.00
31	HS18120166-11DF5		Unknown	27	5.0000	10.0	1.00	1.00
32	HS18120166-43DF5		Unknown	28	5.0000	10.0	1.00	1.00
33	CCV		Unknown	1	1.0000	10.0	1.00	1.00
34	CCB		Unknown	2	1.0000	10.0	1.00	1.00
35	HS18120067-01DF20		Unknown	32	20.0000	10.0	1.00	1.00
36	HS18120067-02DF100		Unknown	33	100.0000	10.0	1.00	1.00
37	HS18120067-03DF100		Unknown	34	100.0000	10.0	1.00	1.00
38	HS18120067-04DF100		Unknown	35	100.0000	10.0	1.00	1.00
39	HS18120067-05DF20		Unknown	36	20.0000	10.0	1.00	1.00
40	HS18120067-06DF100		Unknown	37	100.0000	10.0	1.00	1.00
41	HS18120173-06		Unknown	29	1.0000	10.0	1.00	1.00
42	HS18120173-06MS		Unknown	30	1.0000	10.0	1.00	1.00

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Sequence: 121218
Operator: alshs.nouser

Printed: 12/13/2018 6:21:52 PM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 101

Created: 12/12/2018 9:24:30 PM by alshs.nouser (Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
1	STD1	121218	Finished	12/12/2018 3:52:35 PM	Anions Gradient Program
2	STD2	121218	Finished	12/12/2018 4:07:08 PM	Anions Gradient Program
3	STD3	121218	Finished	12/12/2018 4:21:41 PM	Anions Gradient Program
4	STD4	121218	Finished	12/12/2018 4:36:13 PM	Anions Gradient Program
5	STD5	121218	Finished	12/12/2018 4:50:46 PM	Anions Gradient Program
6	STD6	121218	Finished	12/12/2018 5:05:19 PM	Anions Gradient Program
7	ICV	121218	Finished	12/12/2018 5:19:52 PM	Anions Gradient Program
8	ICB	121218	Finished	12/12/2018 5:34:25 PM	Anions Gradient Program
9	CCV	121218	Finished	12/12/2018 9:36:19 PM	Anions Gradient Program
10	CCB	121218	Finished	12/12/2018 9:50:51 PM	Anions Gradient Program
11	WBLKW1-121218	121218	Finished	12/12/2018 10:05:24 PM	Anions Gradient Program
12	WLCSW1-121218	121218	Finished	12/12/2018 10:19:57 PM	Anions Gradient Program
13	WLCSDW1-121218	121218	Finished	12/12/2018 10:34:30 PM	Anions Gradient Program
14	HS18120642-01DF2	121218	Finished	12/12/2018 10:49:03 PM	Anions Gradient Program
15	HS18120642-01DF20	121218	Finished	12/12/2018 11:03:36 PM	Anions Gradient Program
16	HS18120642-02DF2	121218	Finished	12/12/2018 11:18:09 PM	Anions Gradient Program
17	HS18120642-02DF20	121218	Finished	12/12/2018 11:32:42 PM	Anions Gradient Program
18	HS18120642-03	121218	Finished	12/12/2018 11:47:14 PM	Anions Gradient Program
19	HS18120642-03DF2	121218	Finished	12/13/2018 12:01:47 AM	Anions Gradient Program
20	HS18120642-03DF20	121218	Finished	12/13/2018 12:16:20 AM	Anions Gradient Program
21	CCV1	121218	Finished	12/13/2018 12:30:53 AM	Anions Gradient Program
22	CCB	121218	Finished	12/13/2018 12:45:26 AM	Anions Gradient Program
23	HS18120459-01	121218	Finished	12/13/2018 12:59:58 AM	Anions Gradient Program
24	HS18120459-01MS	121218	Finished	12/13/2018 1:14:31 AM	Anions Gradient Program
25	HS18120459-01MSD	121218	Finished	12/13/2018 1:29:04 AM	Anions Gradient Program
26	HS18120582-01DF5	121218	Finished	12/13/2018 1:43:37 AM	Anions Gradient Program
27	HS18120582-02DF5	121218	Finished	12/13/2018 1:58:10 AM	Anions Gradient Program
28	HS18120582-03DF5	121218	Finished	12/13/2018 2:12:43 AM	Anions Gradient Program
29	DI H2O	121218	Finished	12/13/2018 2:27:15 AM	Anions Gradient Program
30	DI H2O	121218	Finished	12/13/2018 2:41:48 AM	Anions Gradient Program
31	HS18120166-11DF5	121218	Finished	12/13/2018 2:56:22 AM	Anions Gradient Program
32	HS18120166-43DF5	121218	Finished	12/13/2018 3:10:55 AM	Anions Gradient Program
33	CCV	121218	Finished	12/13/2018 3:25:27 AM	Anions Gradient Program
34	CCB	121218	Finished	12/13/2018 3:40:00 AM	Anions Gradient Program
35	HS18120067-01DF20	121218	Finished	12/13/2018 3:54:32 AM	Anions Gradient Program
36	HS18120067-02DF100	121218	Finished	12/13/2018 4:09:05 AM	Anions Gradient Program
37	HS18120067-03DF100	121218	Finished	12/13/2018 4:23:38 AM	Anions Gradient Program
38	HS18120067-04DF100	121218	Finished	12/13/2018 4:38:11 AM	Anions Gradient Program
39	HS18120067-05DF20	121218	Finished	12/13/2018 4:52:44 AM	Anions Gradient Program
40	HS18120067-06DF100	121218	Finished	12/13/2018 5:07:17 AM	Anions Gradient Program
41	HS18120173-06	121218	Finished	12/13/2018 5:21:50 AM	Anions Gradient Program
42	HS18120173-06MS	121218	Finished	12/13/2018 5:36:23 AM	Anions Gradient Program

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Sequence:	121218		Page 3 of 9
Operator:	alshs.nouser		Printed: 12/13/2018 6:21:52 PM
Title:			
Datasource:	DB7CGHK1_local		
Location:	ICS2100\Sequences and Data\01-2018		
Timebase:	ICS2100	Created:	12/12/2018 9:24:30 PM by alshs.nouser
#Samples:	101		(Modified, not saved)

No.	Name	GUID
1	STD1	1ad81188-fe58-11e8-b6da-a24899608423
2	STD2	2312cf21-fe5a-11e8-b6da-a24899608423
3	STD3	2b6c8b0b-fe5c-11e8-b6da-a24899608423
4	STD4	3332765f-fe5e-11e8-b6da-a24899608423
5	STD5	3b9f44f1-fe60-11e8-b6da-a24899608423
6	STD6	43711bee-fe62-11e8-b6da-a24899608423
7	ICV	4be5117f-fe64-11e8-b6da-a24899608423
8	ICB	544d1b67-fe66-11e8-b6da-a24899608423
9	CCV	c02730d6-fe87-11e8-b6da-a24899608423
10	CCB	27c8bfc3-fe8a-11e8-b6da-a24899608423
11	WBLKW1-121218	2fb26e12-fe8c-11e8-b6da-a24899608423
12	WLCSW1-121218	381cda4f-fe8e-11e8-b6da-a24899608423
13	WLCSDW1-121218	40553593-fe90-11e8-b6da-a24899608423
14	HS18120642-01DF2	488d90d7-fe92-11e8-b6da-a24899608423
15	HS18120642-01DF20	50e9af16-fe94-11e8-b6da-a24899608423
16	HS18120642-02DF2	591fa805-fe96-11e8-b6da-a24899608423
17	HS18120642-02DF20	619ac495-fe98-11e8-b6da-a24899608423
18	HS18120642-03	695e4d94-fe9a-11e8-b6da-a24899608423
19	HS18120642-03DF2	7196a8d8-fe9c-11e8-b6da-a24899608423
20	HS18120642-03DF20	7a011515-fe9e-11e8-b6da-a24899608423
21	CCV1	82397059-fea0-11e8-b6da-a24899608423
22	CCB	8a84de45-fea2-11e8-b6da-a24899608423
23	HS18120459-01	92cb8787-fea4-11e8-b6da-a24899608423
24	HS18120459-01MS	9b14931e-fea6-11e8-b6da-a24899608423
25	HS18120459-01MSD	a34cee62-fea8-11e8-b6da-a24899608423
26	HS18120582-01DF5	ab8549a6-feaa-11e8-b6da-a24899608423
27	HS18120582-02DF5	b3ce553d-feac-11e8-b6da-a24899608423
28	HS18120582-03DF5	bc1760d4-feae-11e8-b6da-a24899608423
29	DI H2O	c44fbc18-feb0-11e8-b6da-a24899608423
30	DI H2O	cc88175c-feb2-11e8-b6da-a24899608423
31	HS18120166-11DF5	d4d122f3-feb4-11e8-b6da-a24899608423
32	HS18120166-43DF5	dd8f00cf-feb6-11e8-b6da-a24899608423
33	CCV	e5a5fb6d-feb8-11e8-b6da-a24899608423
34	CCB	edef0704-feba-11e8-b6da-a24899608423
35	HS18120067-01DF20	f5e23ea7-febc-11e8-b6da-a24899608423
36	HS18120067-02DF100	fe09e998-febe-11e8-b6da-a24899608423
37	HS18120067-03DF100	0644a731-fec1-11e8-b6da-a24899608423
38	HS18120067-04DF100	0e8db2c8-fec3-11e8-b6da-a24899608423
39	HS18120067-05DF20	16d6be5f-fec5-11e8-b6da-a24899608423
40	HS18120067-06DF100	1f0f19a3-fec7-11e8-b6da-a24899608423
41	HS18120173-06	2755c2e5-fec9-11e8-b6da-a24899608423
42	HS18120173-06MS	2f97a77d-fecb-11e8-b6da-a24899608423

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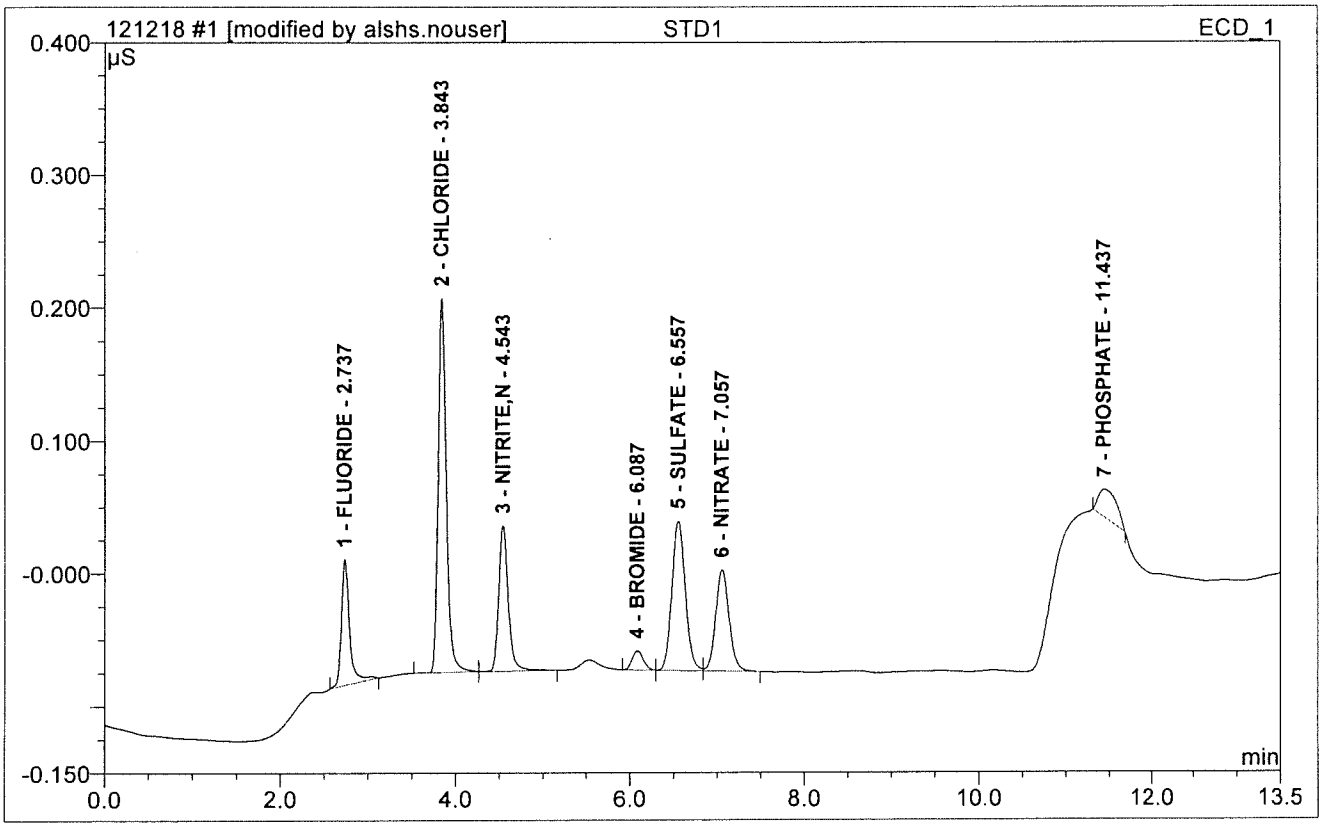
1 STD1

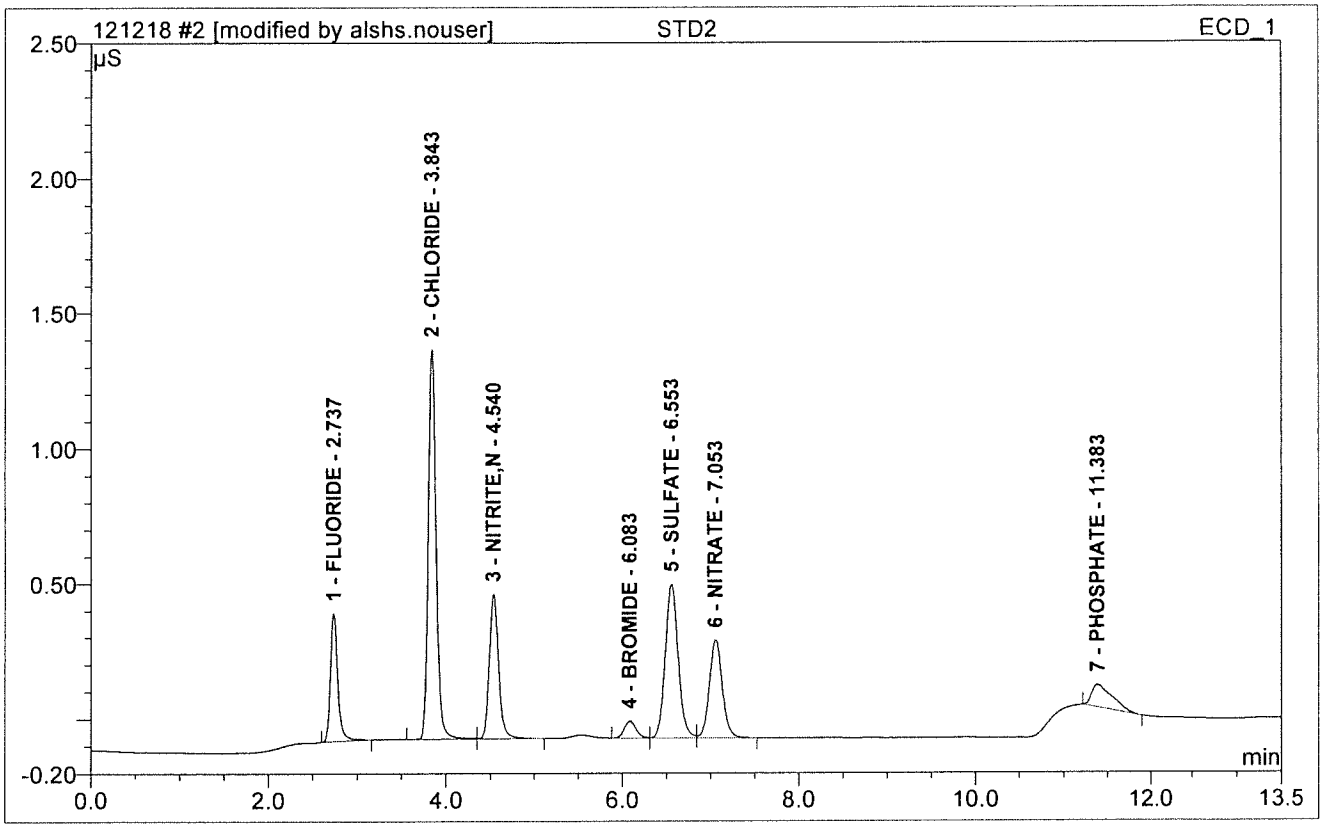
Sample Name:	**STD1**	*Injection Volume:*	**10.0**
Vial Number:	**91**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 15:52**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.095	0.010	10.60	0.106	1.
2	3.84	CHLORIDE	0.281	0.030	31.72	0.532	1.
3	4.54	NITRITE,N	0.110	0.014	14.54	0.096	1.
4	6.09	BROMIDE	0.015	0.002	2.26	0.137	1.
5	6.56	SULFATE	0.112	0.020	21.05	0.570	1.
6	7.06	NITRATE	0.076	0.014	14.23	0.121	1.
7	11.44	PHOSPHATE	0.021	0.005	5.60	0.138	1.
Total:			0.709	0.096	100.00	1.700	

2 STD2

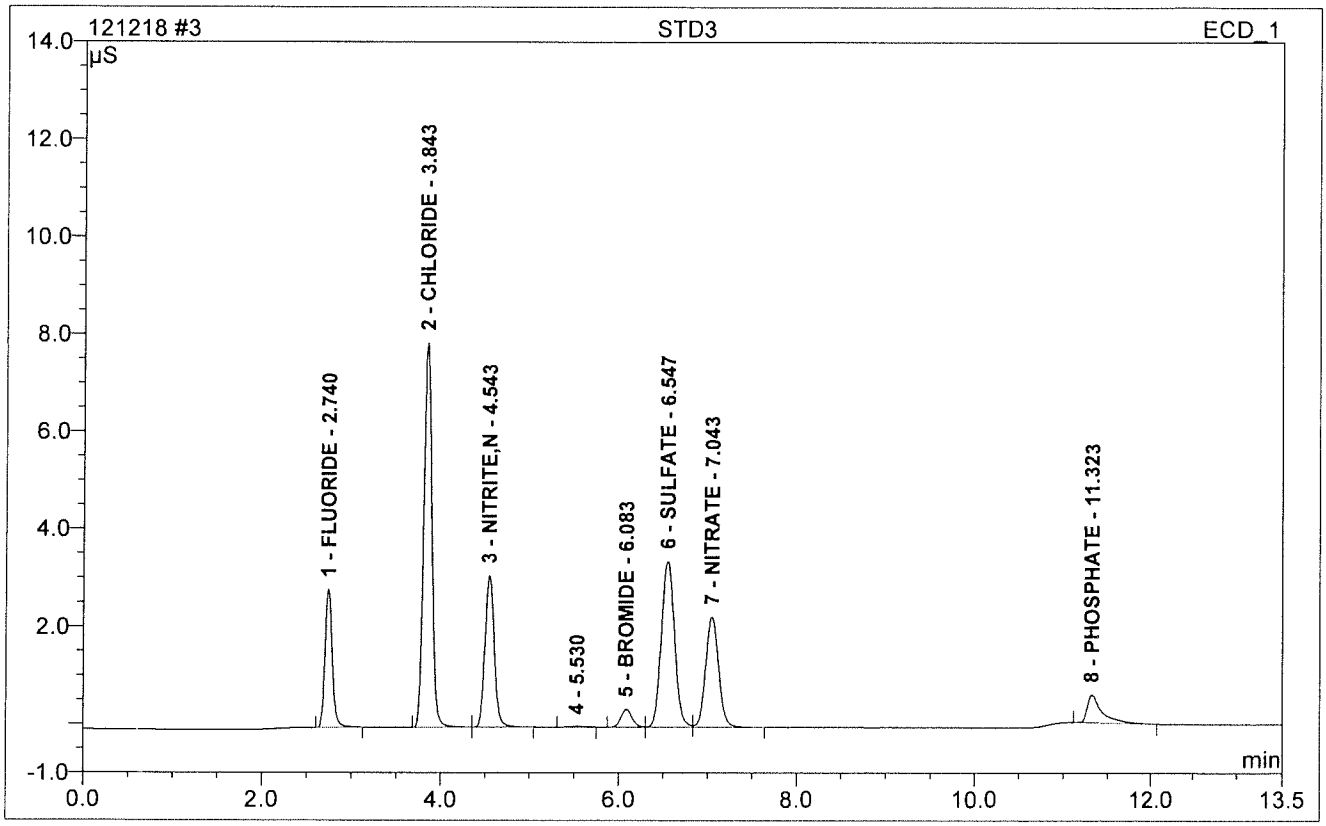
Sample Name:	**STD2**	*Injection Volume:*	**10.0**
Vial Number:	**92**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:07**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.474	0.046	10.15	0.359	1.
2	3.84	CHLORIDE	1.439	0.149	33.19	1.875	1.
3	4.54	NITRITE,N	0.535	0.064	14.31	0.366	1.
4	6.08	BROMIDE	0.063	0.010	2.13	0.348	1.
5	6.55	SULFATE	0.568	0.097	21.51	1.771	1.
6	7.05	NITRATE	0.361	0.062	13.74	0.341	1.
7	11.38	PHOSPHATE	0.083	0.022	4.97	0.367	1.
Total:			3.522	0.449	100.00	5.427	

3 STD3

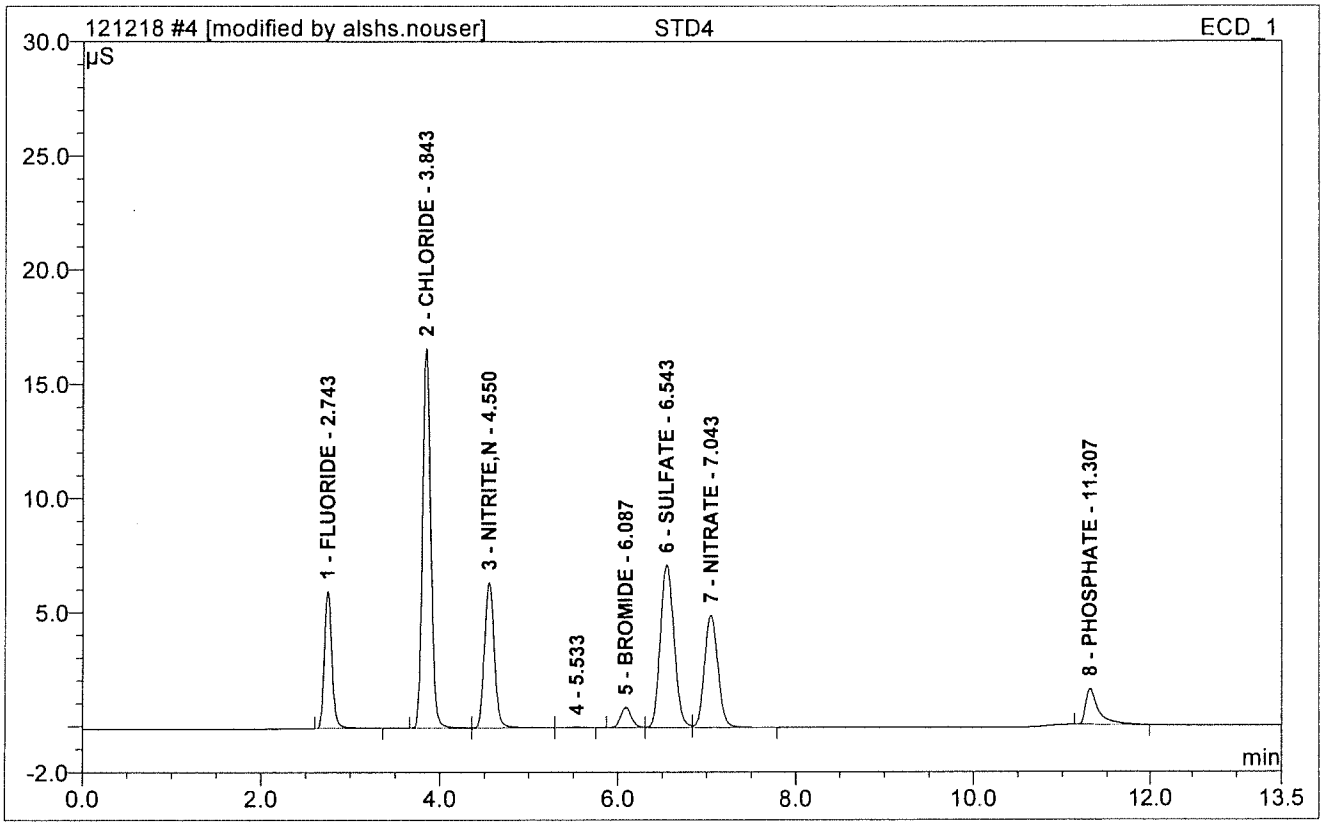
Sample Name:	**STD3**	*Injection Volume:*	**10.0**
Vial Number:	**93**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:21**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	2.841	0.270	10.24	1.964	1.
2	3.84	CHLORIDE	7.900	0.843	31.93	9.717	1.
3	4.54	NITRITE,N	3.116	0.382	14.47	2.062	1.
5	6.08	BROMIDE	0.372	0.054	2.05	1.615	1.
6	6.55	SULFATE	3.415	0.589	22.31	9.499	1.
7	7.04	NITRATE	2.279	0.388	14.71	1.837	1.
8	11.32	PHOSPHATE	0.580	0.109	4.15	1.542	1.
Total:			20.503	2.635	99.86	28.236	

4 STD4

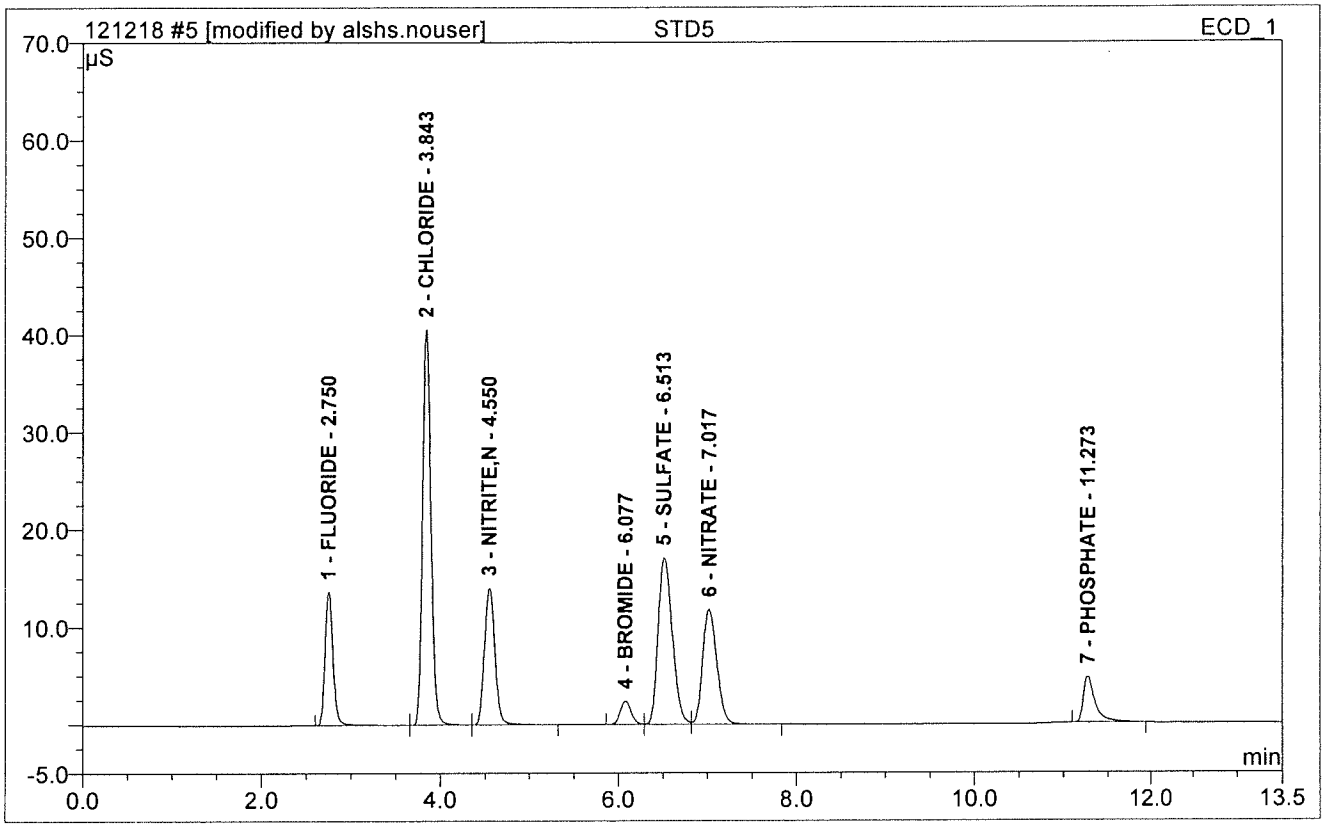
Sample Name:	**STD4**	*Injection Volume:*	**10.0**
Vial Number:	**94**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:36**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	6.010	0.591	10.29	4.251	1.
2	3.84	CHLORIDE	16.630	1.799	31.33	20.529	1.
3	4.55	NITRITE,N	6.372	0.816	14.22	4.383	1.
5	6.09	BROMIDE	0.887	0.126	2.20	3.678	1.
6	6.54	SULFATE	7.129	1.281	22.31	20.361	1.
7	7.04	NITRATE	4.918	0.866	15.08	4.026	1.
8	11.31	PHOSPHATE	1.568	0.258	4.49	3.545	1.
Total:			43.514	5.736	99.92	60.772	

5 STD5

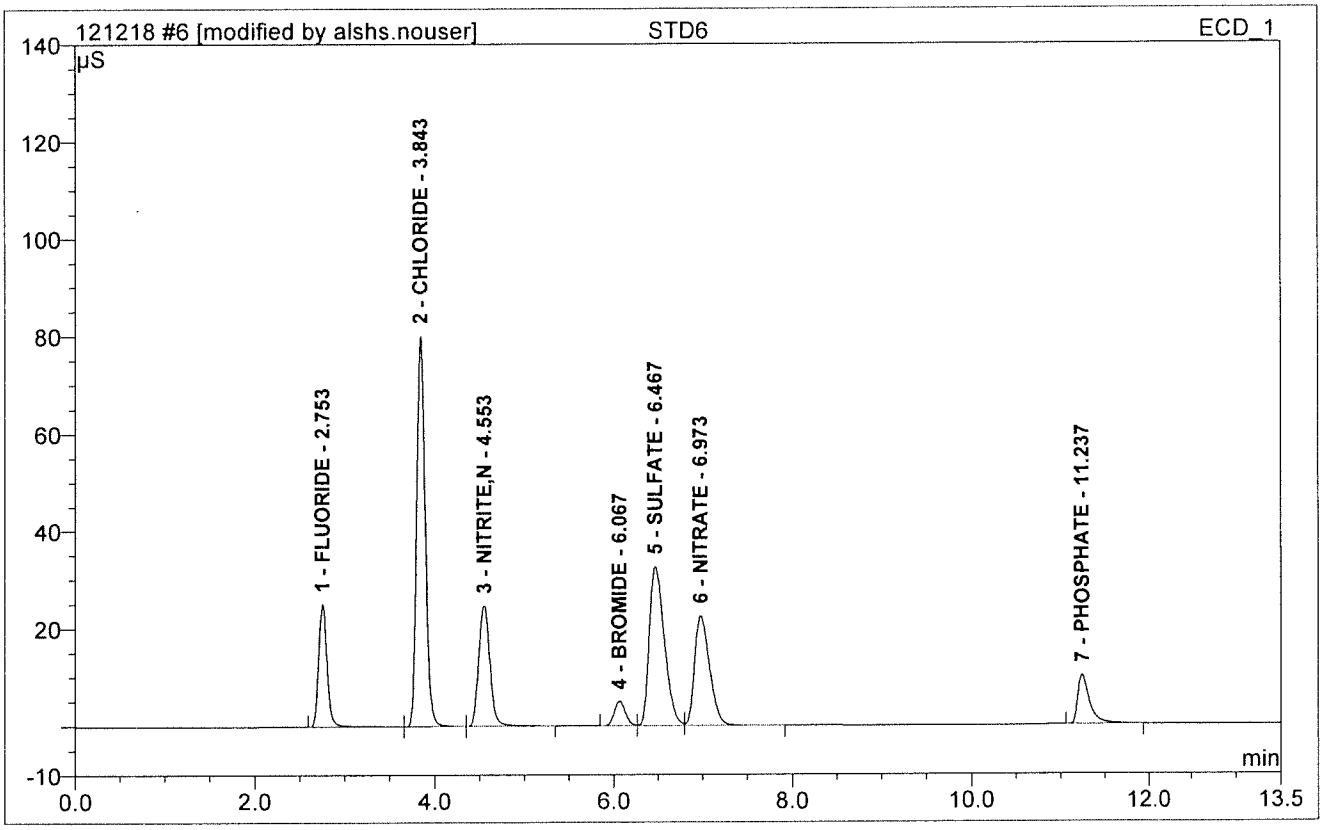
Sample Name:	**STD5**	*Injection Volume:*	**10.0**
Vial Number:	**95**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:50**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	13.744	1.431	10.06	10.252	1.
2	3.84	CHLORIDE	40.596	4.426	31.11	50.239	1.
3	4.55	NITRITE,N	14.095	1.927	13.54	10.316	1.
4	6.08	BROMIDE	2.438	0.346	2.43	9.953	1.
5	6.51	SULFATE	17.140	3.186	22.39	50.277	1.
6	7.02	NITRATE	11.863	2.183	15.35	10.065	1.
7	11.27	PHOSPHATE	4.736	0.728	5.12	9.884	1.
Total:			104.613	14.227	100.00	150.986	

6 STD6

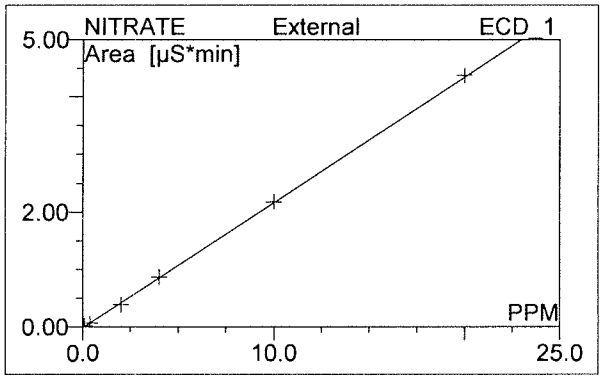
Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:05**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**

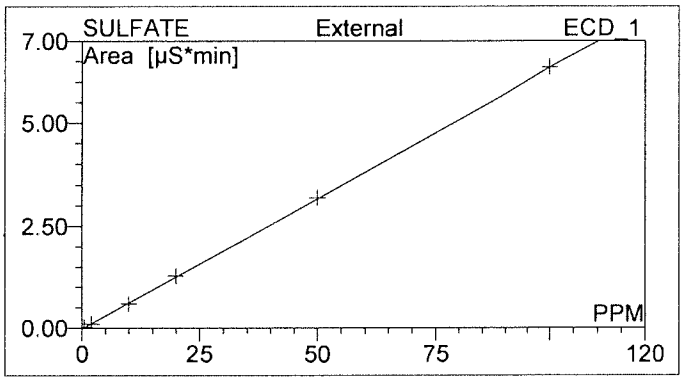


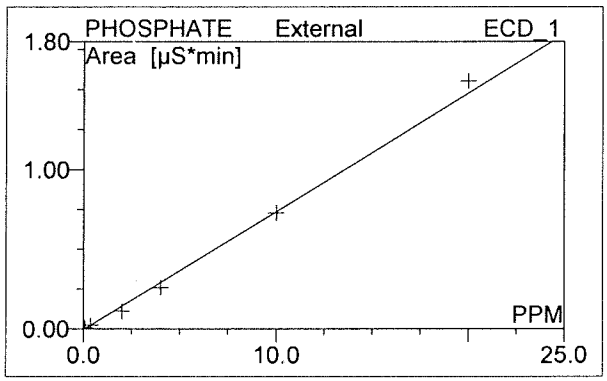
No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	25.094	2.735	9.72	19.570	1.
2	3.84	CHLORIDE	80.004	8.792	31.24	99.609	1.
3	4.55	NITRITE,N	24.712	3.604	12.81	19.277	1.
4	6.07	BROMIDE	5.009	0.726	2.58	20.769	1.
5	6.47	SULFATE	32.582	6.354	22.58	100.022	1.
6	6.97	NITRATE	22.503	4.375	15.55	20.109	1.
7	11.24	PHOSPHATE	10.023	1.553	5.52	21.023	1.
Total:			199.927	28.140	100.00	300.378	

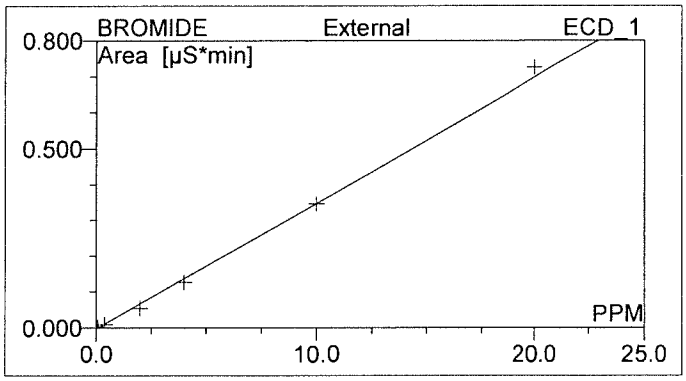
6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**###############**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**









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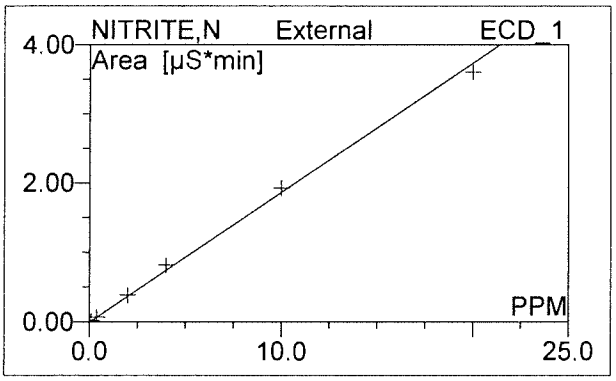
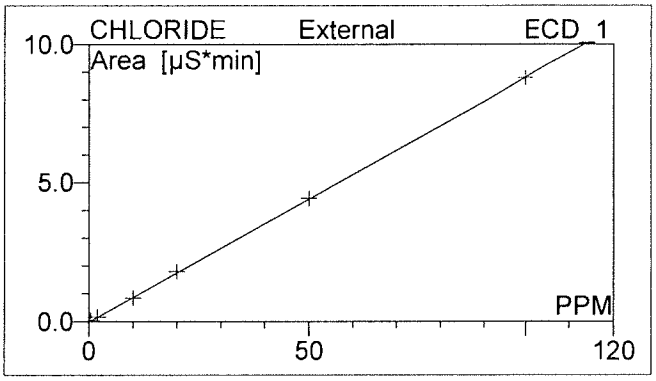
No.	Ret.Time min	Peak Name	Cal.Type	Points	Coeff.Det. %	Offset	Slope	Curve
1	2.75	FLUORIDE	XLOff	6	99.892	-0.0046	0.1400	0.000
2	3.84	CHLORIDE	XLOff	6	99.980	-0.0166	0.0884	0.000
3	4.55	NITRITE,N	XLOff	6	99.770	-0.0041	0.1872	0.000
4	6.07	BROMIDE	XLOff	6	99.558	-0.0026	0.0351	0.000
5	6.47	SULFATE	XLOff	6	99.959	-0.0162	0.0637	0.000
6	6.97	NITRATE	XLOff	6	99.919	-0.0128	0.2182	0.000
7	11.24	PHOSPHATE	XLOff	6	99.331	-0.0049	0.0741	0.000
Average:					99.7727	-0.0088	0.1152	0.0000

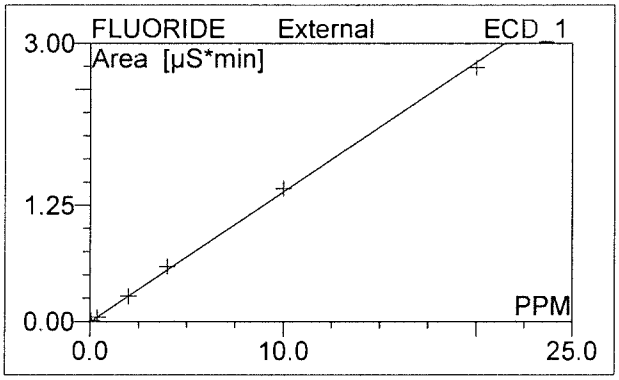
No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	RF-Value	Std.Dev.	RSD %
1	2.75	FLUORIDE	XLOff	6	99.946	7.143	0.009	15.424
2	3.84	CHLORIDE	XLOff	6	99.990	11.308	0.012	6.781
3	4.55	NITRITE,N	XLOff	6	99.885	5.343	0.017	21.923
4	6.07	BROMIDE	XLOff	6	99.779	28.515	0.005	34.807
5	6.47	SULFATE	XLOff	6	99.980	15.701	0.013	9.915
6	6.97	NITRATE	XLOff	6	99.960	4.583	0.012	14.214
7	11.24	PHOSPHATE	XLOff	6	99.665	13.491	0.012	41.812
Average:					99.8862	12.2975	0.0114	20.6967

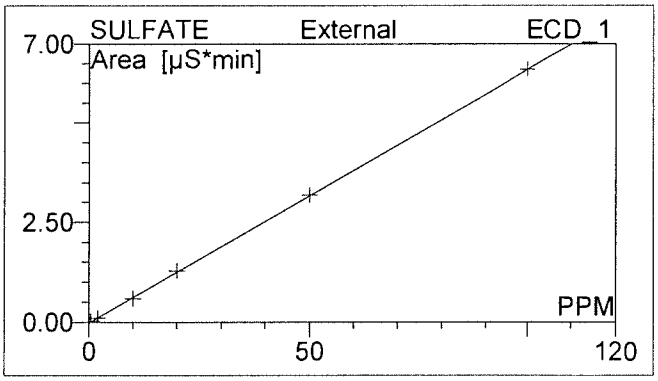
6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.000**
Recording Time:	**12/12/2018 17:05**	*Sample Weight/Volume:*	**1.000**
Run Time (min):	**13.50**	*Final Volume:*	**1.000**









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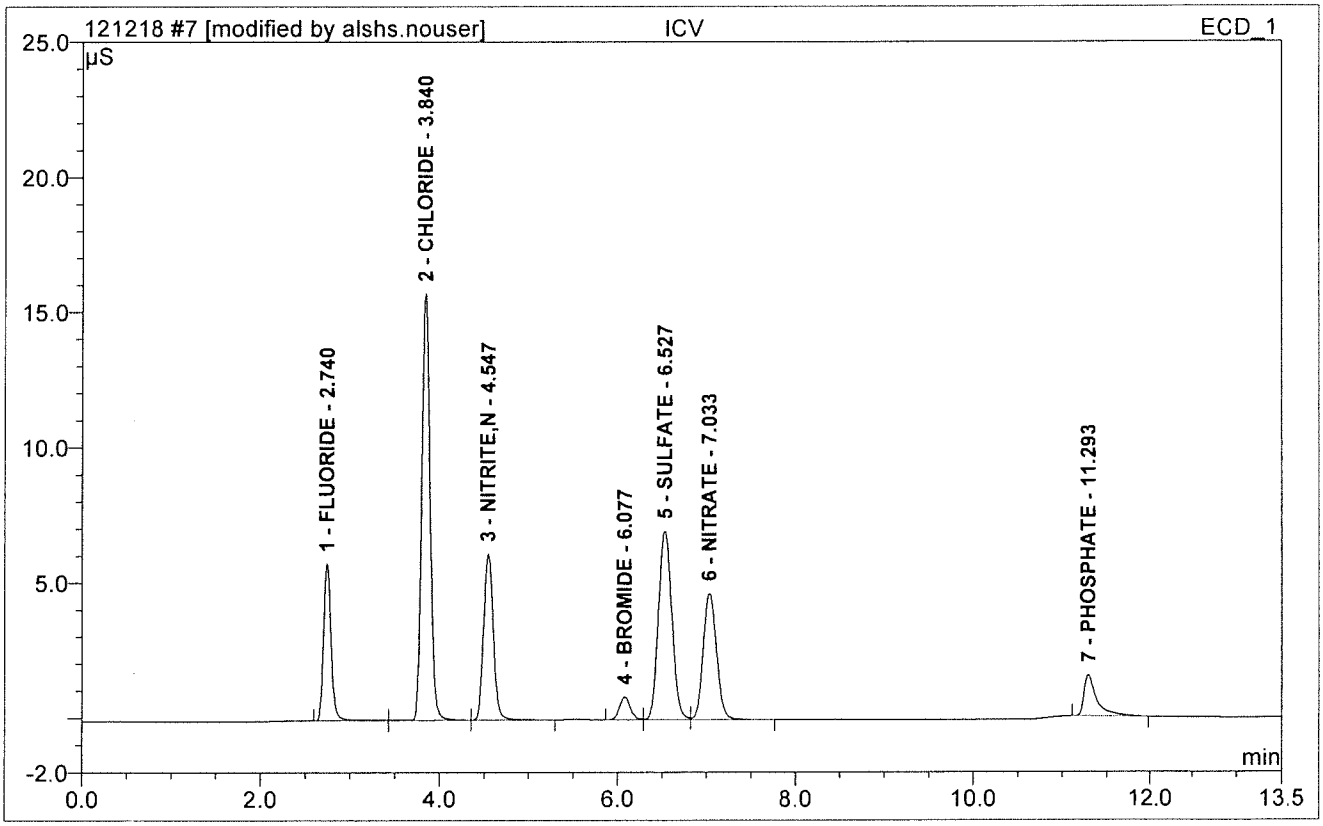
No.	Ret.Time min	Peak Name	Cal.Type	Points	Coeff.Det. %	Offset	Slope	Curve
1	2.75	FLUORIDE	XLOff	6	99.8920	-0.0046	0.1400	0.000
2	3.84	CHLORIDE	XLOff	6	99.9796	-0.0166	0.0884	0.000
3	4.55	NITRITE,N	XLOff	6	99.7703	-0.0041	0.1872	0.000
4	6.07	BROMIDE	XLOff	6	99.5575	-0.0026	0.0351	0.000
5	6.47	SULFATE	XLOff	6	99.9591	-0.0162	0.0637	0.000
6	6.97	NITRATE	XLOff	6	99.9192	-0.0128	0.2182	0.000
7	11.24	PHOSPHATE	XLOff	6	99.3314	-0.0049	0.0741	0.000
Average:					99.7727	-0.0088	0.1152	0.000

No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	RF-Value	Std.Dev.	RSD %
1	2.75	FLUORIDE	XLOff	6	99.946	7.143	0.009	15.424
2	3.84	CHLORIDE	XLOff	6	99.990	11.308	0.012	6.781
3	4.55	NITRITE,N	XLOff	6	99.885	5.343	0.017	21.923
4	6.07	BROMIDE	XLOff	6	99.779	28.515	0.005	34.807
5	6.47	SULFATE	XLOff	6	99.980	15.701	0.013	9.915
6	6.97	NITRATE	XLOff	6	99.960	4.583	0.012	14.214
7	11.24	PHOSPHATE	XLOff	6	99.665	13.491	0.012	41.812
Average:					99.8862	12.298	0.011	20.697

7 ICV

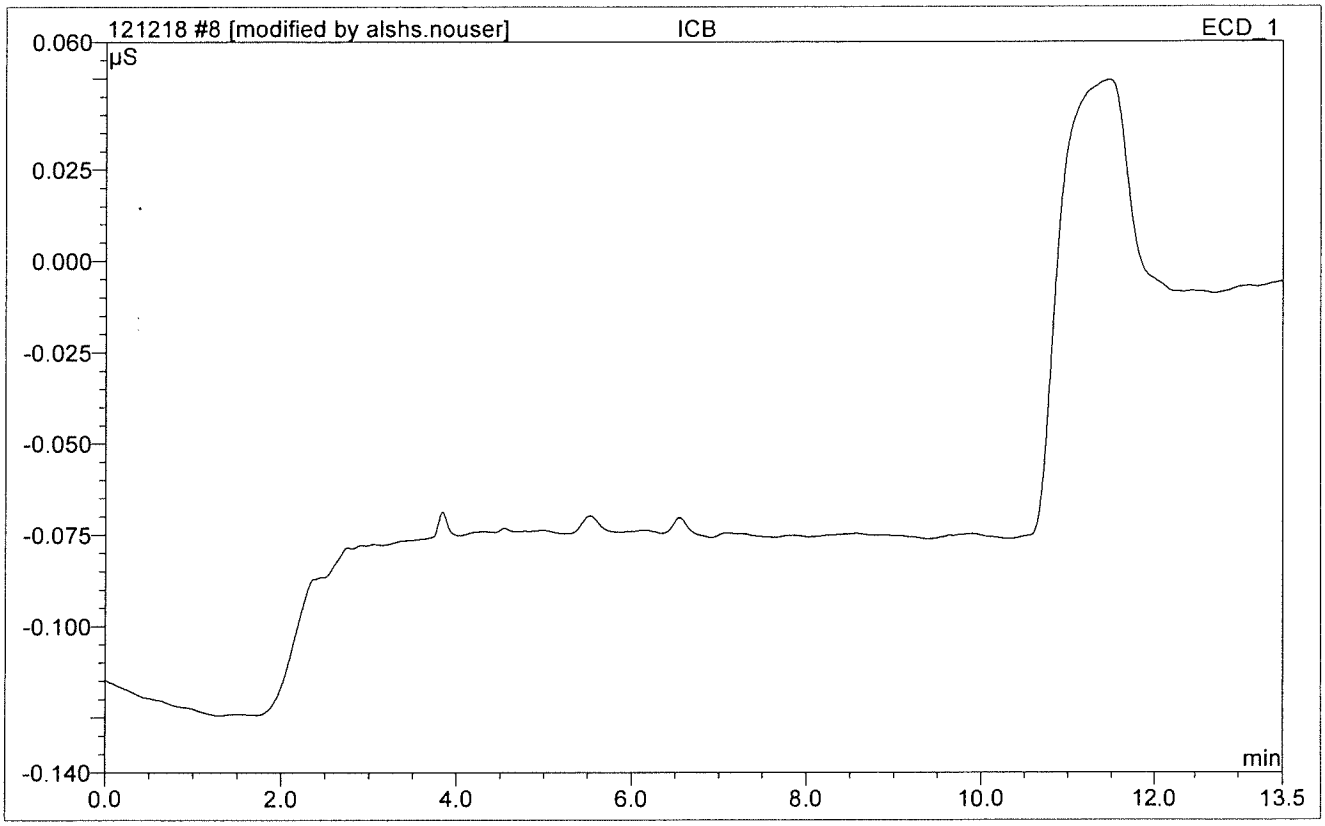
Sample Name:	**ICV**	*Injection Volume:*	**10.0**
Vial Number:	**97**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:19**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.803	0.572	10.40	4.119	1.
2	3.84	CHLORIDE	15.767	1.715	31.18	19.578	1.
3	4.55	NITRITE,N	6.151	0.786	14.30	4.224	1.
4	6.08	BROMIDE	0.844	0.120	2.19	3.509	1.
5	6.53	SULFATE	6.990	1.234	22.43	19.623	1.
6	7.03	NITRATE	4.677	0.820	14.90	3.814	1.
7	11.29	PHOSPHATE	1.523	0.252	4.58	3.465	1.
Total:			41.755	5.499	100.00	58.332	

8 ICB

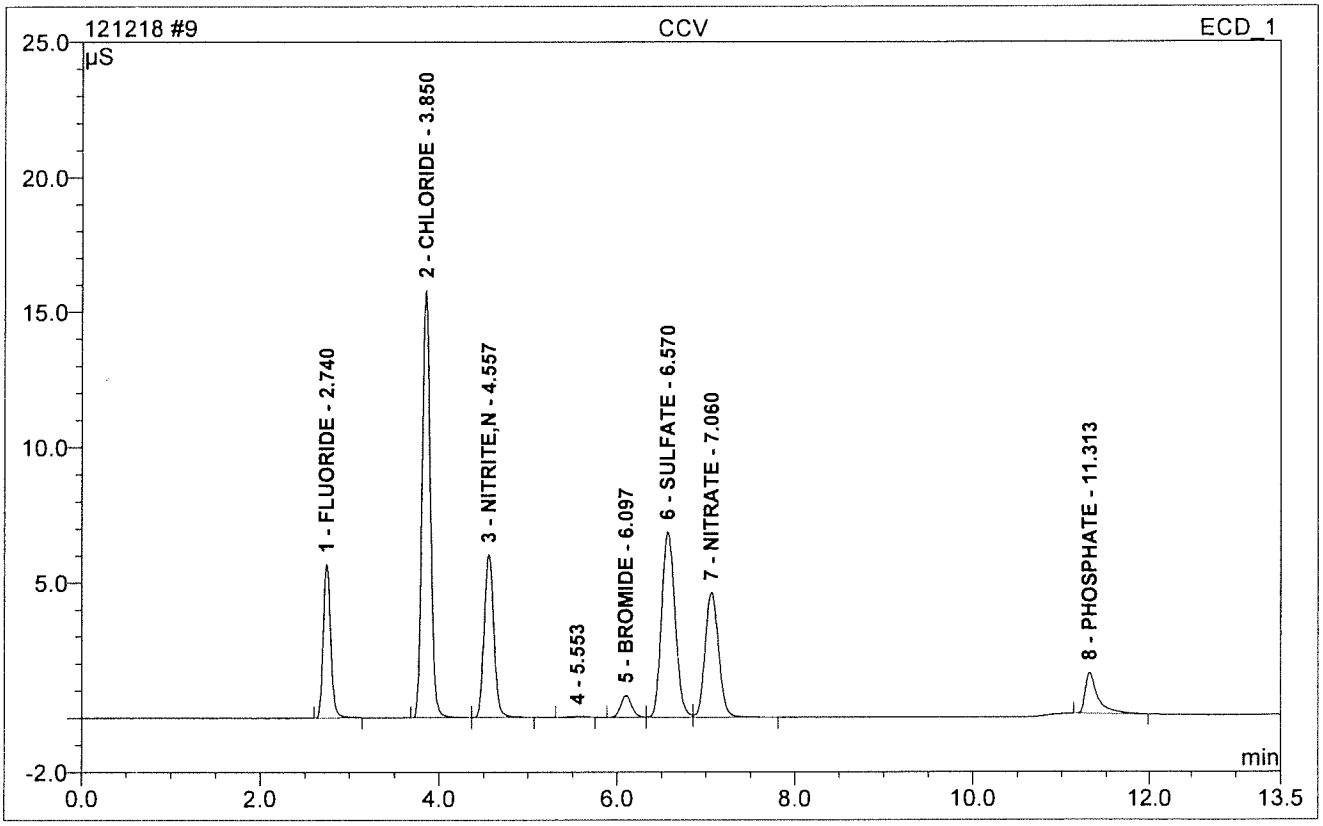
Sample Name:	**ICB**	*Injection Volume:*	**10.0**
Vial Number:	**98**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:34**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

9 CCV

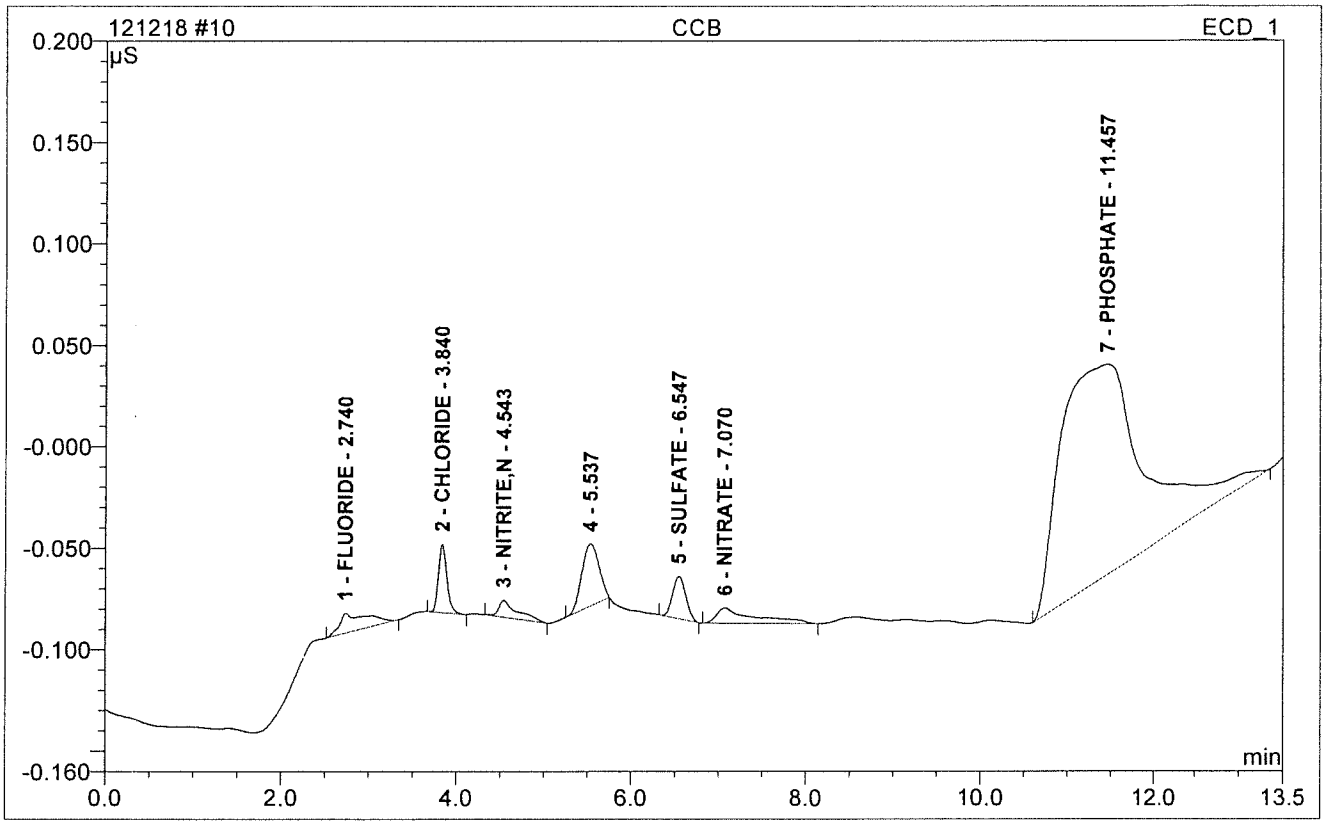
Sample Name:	**CCV**	*Injection Volume:*	**10.0**
Vial Number:	**1**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 21:36**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.691	0.554	10.22	3.993	1.
2	3.85	CHLORIDE	15.792	1.701	31.35	19.420	1.
3	4.56	NITRITE,N	6.044	0.768	14.15	4.125	1.
5	6.10	BROMIDE	0.808	0.117	2.15	3.398	1.
6	6.57	SULFATE	6.884	1.219	22.47	19.397	1.
7	7.06	NITRATE	4.631	0.814	15.00	3.789	1.
8	11.31	PHOSPHATE	1.516	0.246	4.54	3.388	1.
Total:			41.366	5.419	99.87	57.510	

10 CCB

Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**2**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 21:50**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**

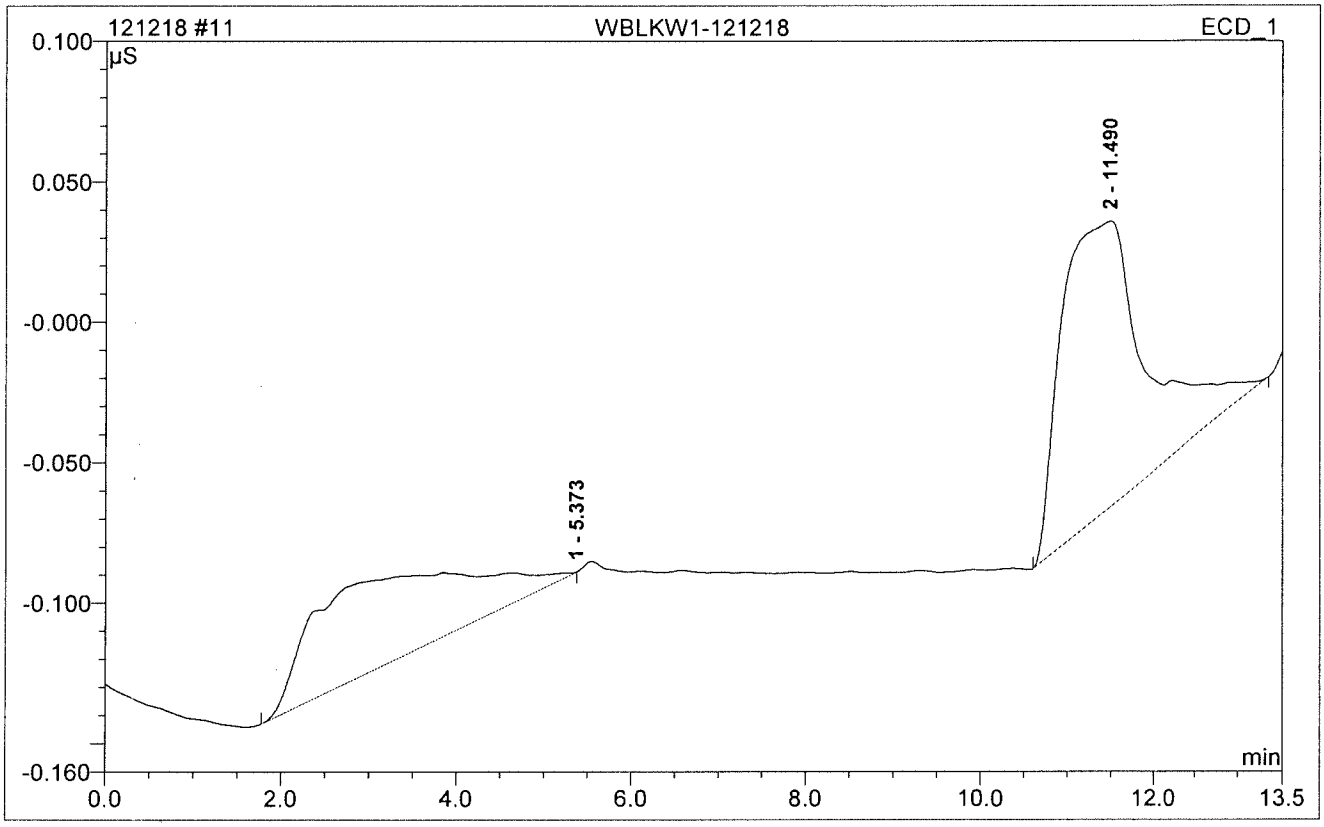


No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.010	0.003	2.45	0.058	1.
2	3.84	CHLORIDE	0.034	0.004	2.65	0.230	1.
3	4.54	NITRITE,N	0.008	0.002	1.48	0.033	1.
5	6.55	SULFATE	0.021	0.004	2.59	0.311	1.
6	7.07	NITRATE	0.008	0.004	2.70	0.076	1.
7	11.46	PHOSPHATE	0.104	0.117	83.21	1.649	1.
Total:			0.184	0.134	95.08	2.358	

11 WBLKW1-121218

300_W 9056_W

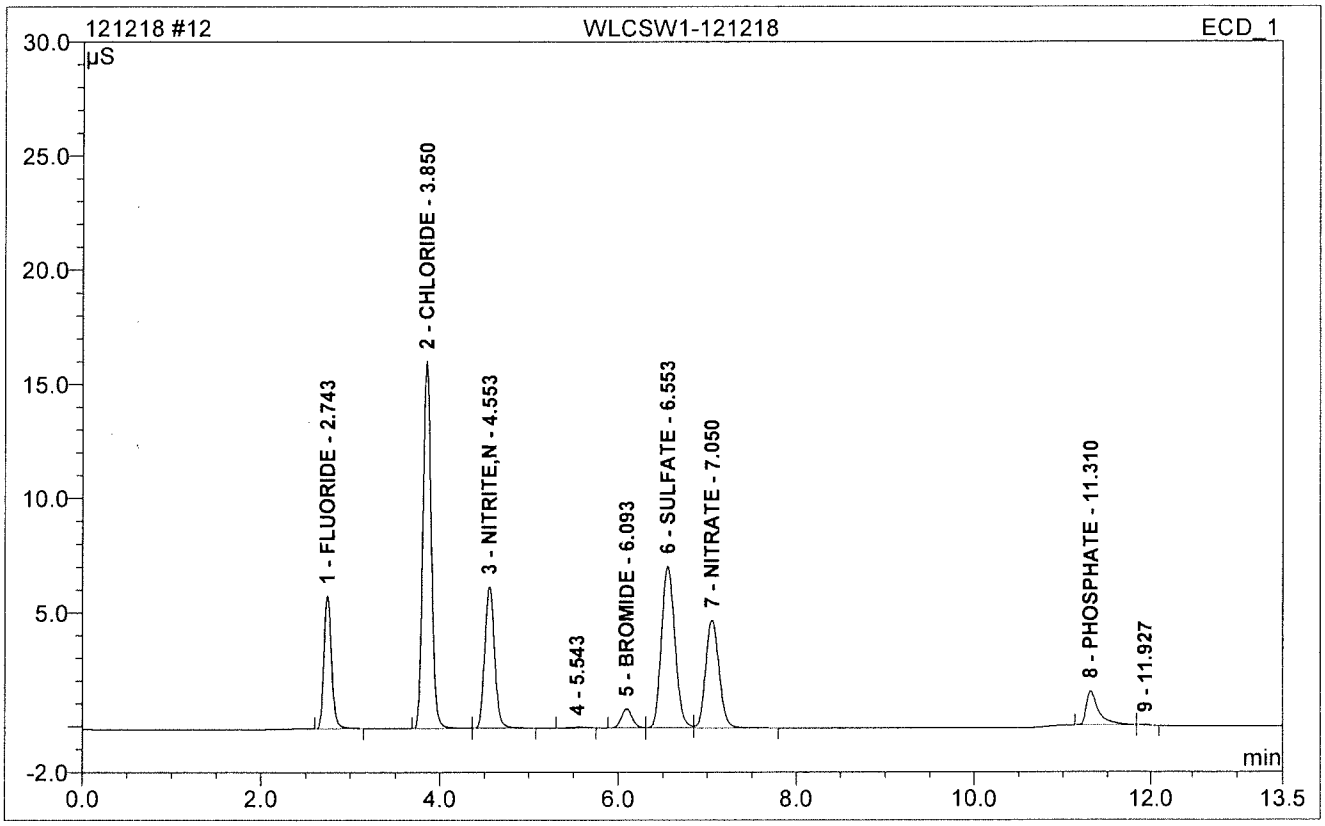
Sample Name:	**WBLKW1-121218**	*Injection Volume:*	**10.0**
Vial Number:	**11**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 22:05**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

12 WLCSW1-121218

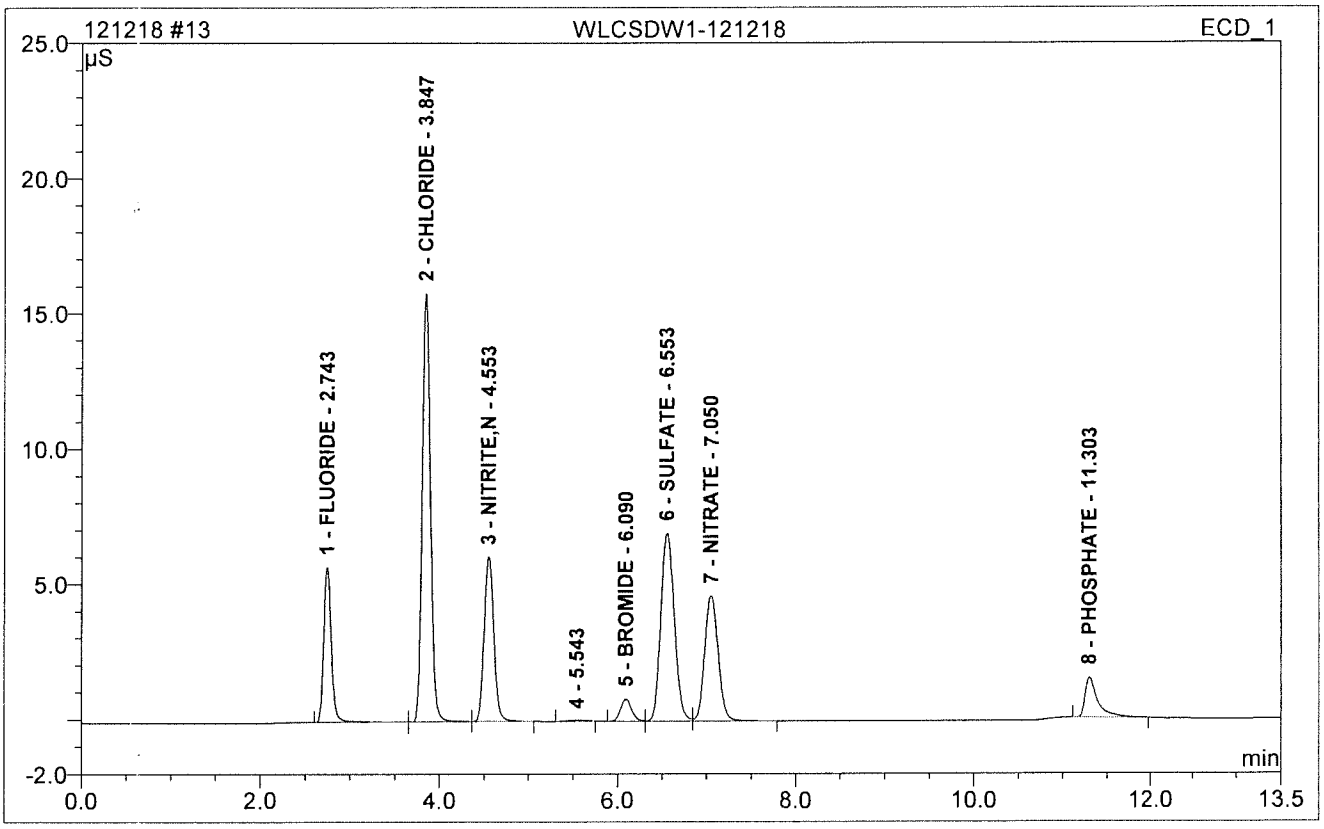
Sample Name:	**WLCSW1-121218**	*Injection Volume:*	**10.0**
Vial Number:	**12**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 22:19**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.833	0.573	10.27	4.123	1.
2	3.85	CHLORIDE	16.099	1.745	31.31	19.921	1.
3	4.55	NITRITE,N	6.227	0.794	14.25	4.266	1.
5	6.09	BROMIDE	0.847	0.121	2.17	3.526	1.
6	6.55	SULFATE	7.105	1.255	22.53	19.966	1.
7	7.05	NITRATE	4.763	0.835	14.97	3.883	1.
8	11.31	PHOSPHATE	1.500	0.238	4.28	3.282	1.
Total:			42.375	5.561	99.78	58.967	

13 WLCSDW1-121218

Sample Name:	**WLCSDW1-121218**	*Injection Volume:*	**10.0**
Vial Number:	**13**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 22:34**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**

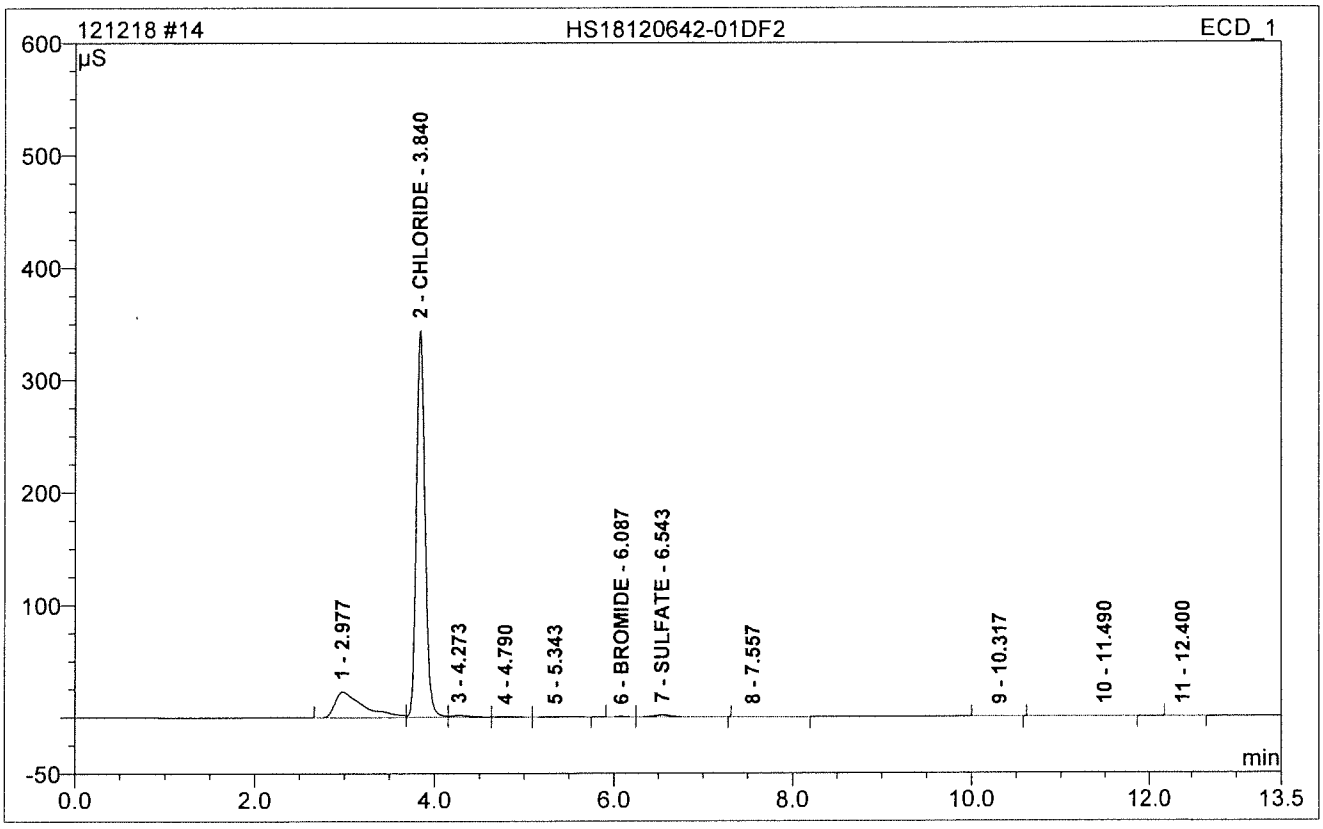


No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.730	0.568	10.40	4.088	1.
2	3.85	CHLORIDE	15.823	1.709	31.31	19.512	1.
3	4.55	NITRITE,N	6.079	0.773	14.17	4.154	1.
5	6.09	BROMIDE	0.820	0.118	2.15	3.426	1.
6	6.55	SULFATE	6.950	1.229	22.51	19.545	1.
7	7.05	NITRATE	4.634	0.812	14.88	3.782	1.
8	11.30	PHOSPHATE	1.480	0.241	4.42	3.318	1.
Total:			41.518	5.450	99.84	57.824	

14 HS18120642-01DF2

9056_W

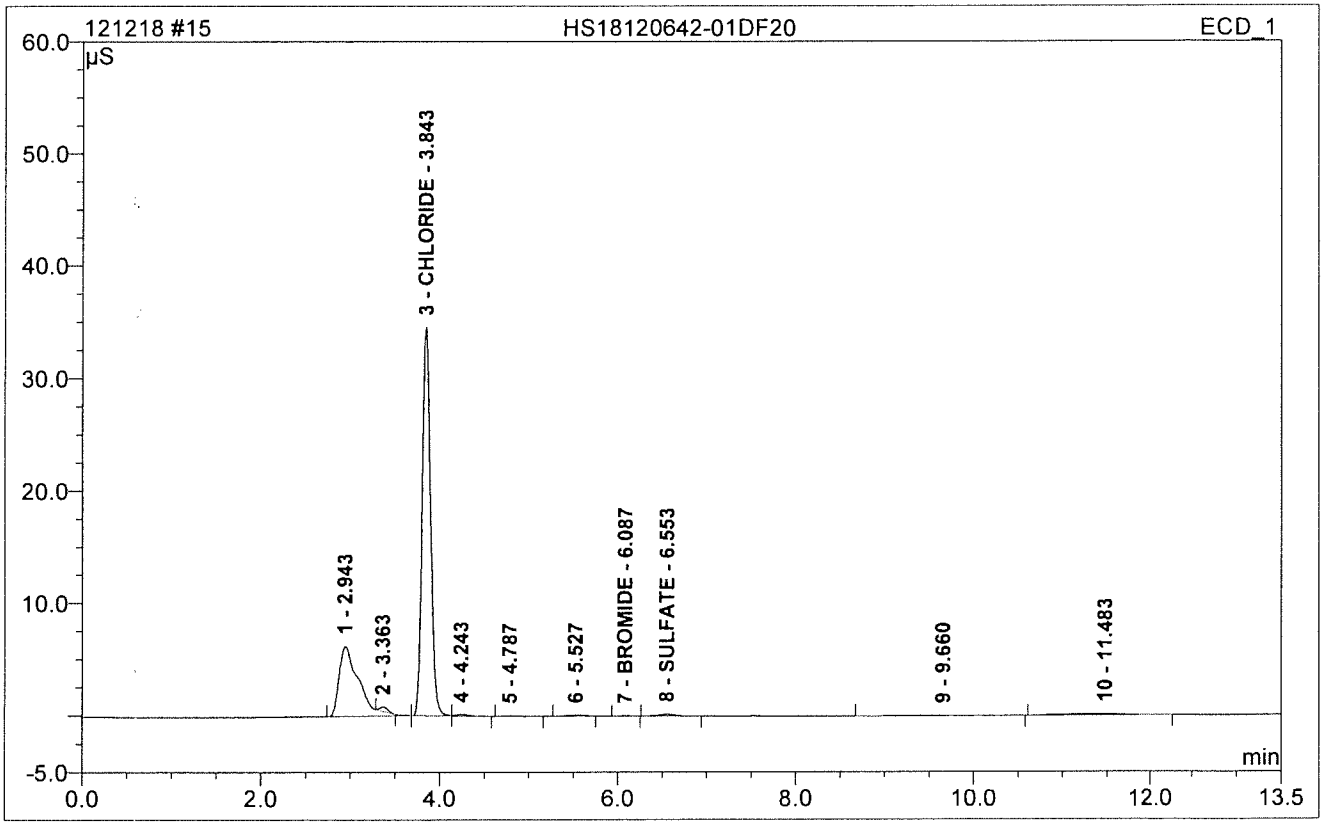
Sample Name:	**HS18120642-01DF2**	*Injection Volume:*	**10.0**
Vial Number:	**14**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**2.**
Recording Time:	**12/12/2018 22:49**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
2	3.84	CHLORIDE	344.265	38.483	79.85	870.699	2.
6	6.09	BROMIDE	0.431	0.060	0.12	3.570	2.
7	6.54	SULFATE	1.851	0.410	0.85	13.368	2.
Total:			346.547	38.953	80.82	887.636	

15 HS18120642-01DF20

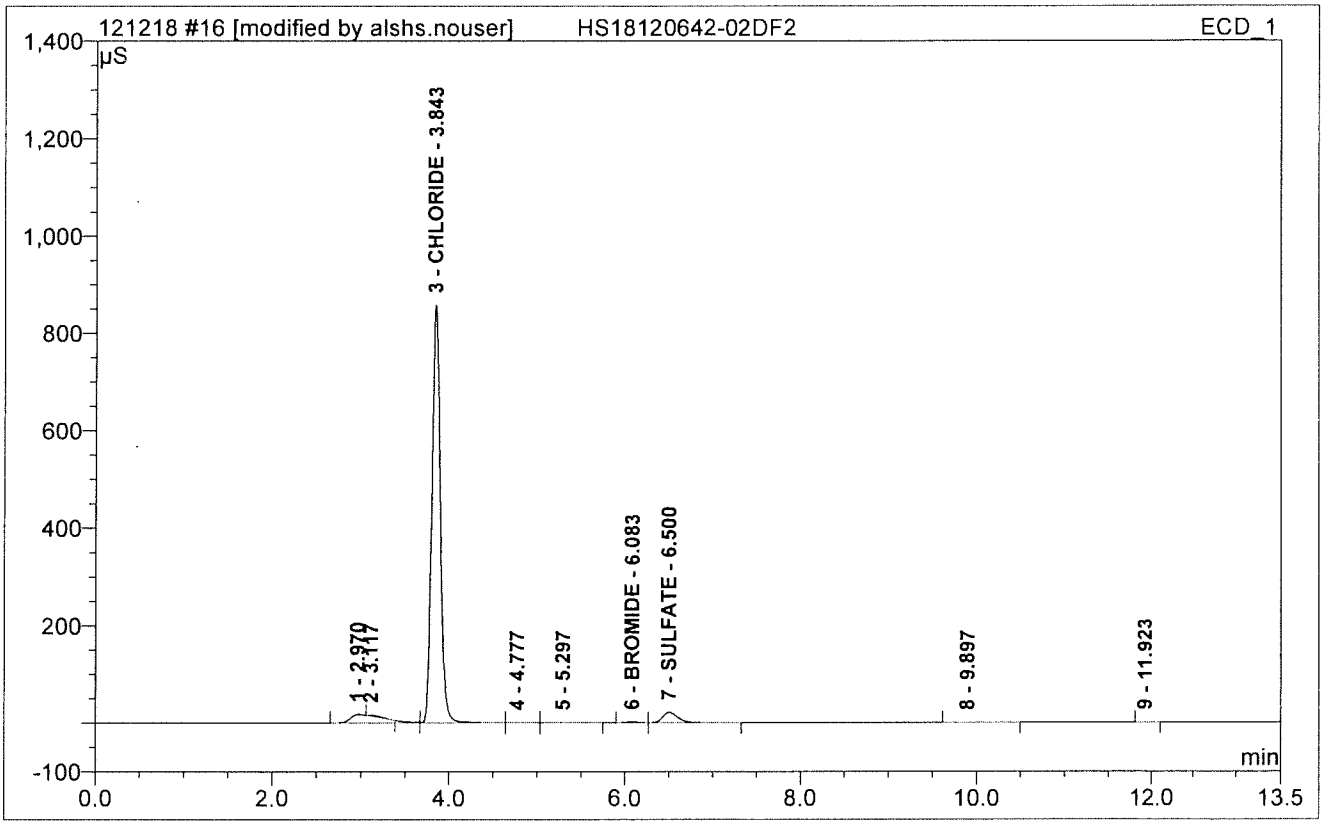
Sample Name:	**HS18120642-01DF20**	*Injection Volume:*	**10.0**
Vial Number:	**15**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**20.**
Recording Time:	**12/12/2018 23:03**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
3	3.84	CHLORIDE	34.503	3.777	67.50	857.926	20.
7	6.09	BROMIDE	0.033	0.005	0.08	4.099	20.
8	6.55	SULFATE	0.176	0.037	0.66	16.704	20.
Total:			34.712	3.818	68.25	878.729	

16 HS18120642-02DF2

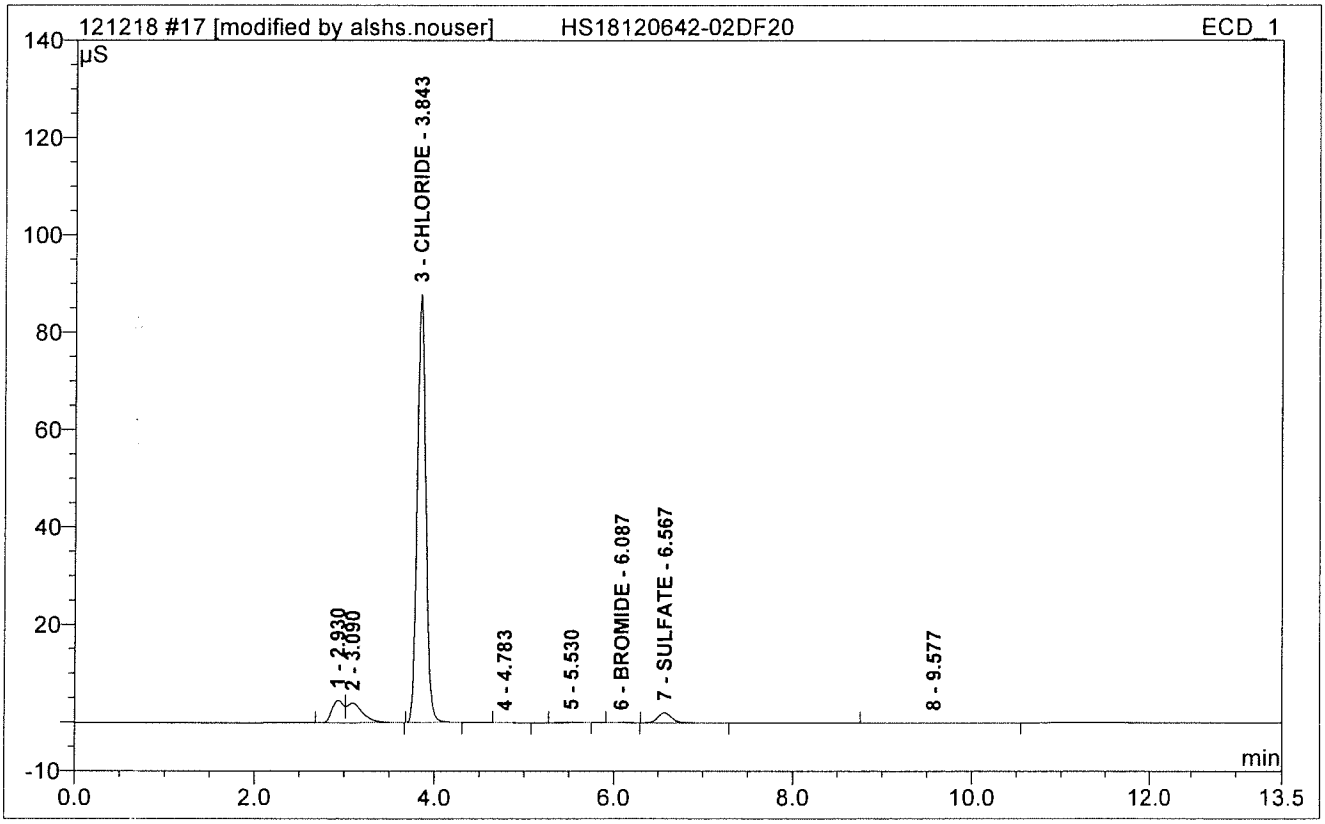
Sample Name:	**HS18120642-02DF2**	*Injection Volume:*	**10.0**
Vial Number:	**16**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**2.**
Recording Time:	**12/12/2018 23:18**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
3	3.84	CHLORIDE	858.581	96.653	88.93	2186.248	2.
6	6.08	BROMIDE	1.159	0.162	0.15	9.379	2.
7	6.50	SULFATE	20.851	4.026	3.70	126.942	2.
Total:			880.591	100.841	92.78	2322.570	

17 HS18120642-02DF20

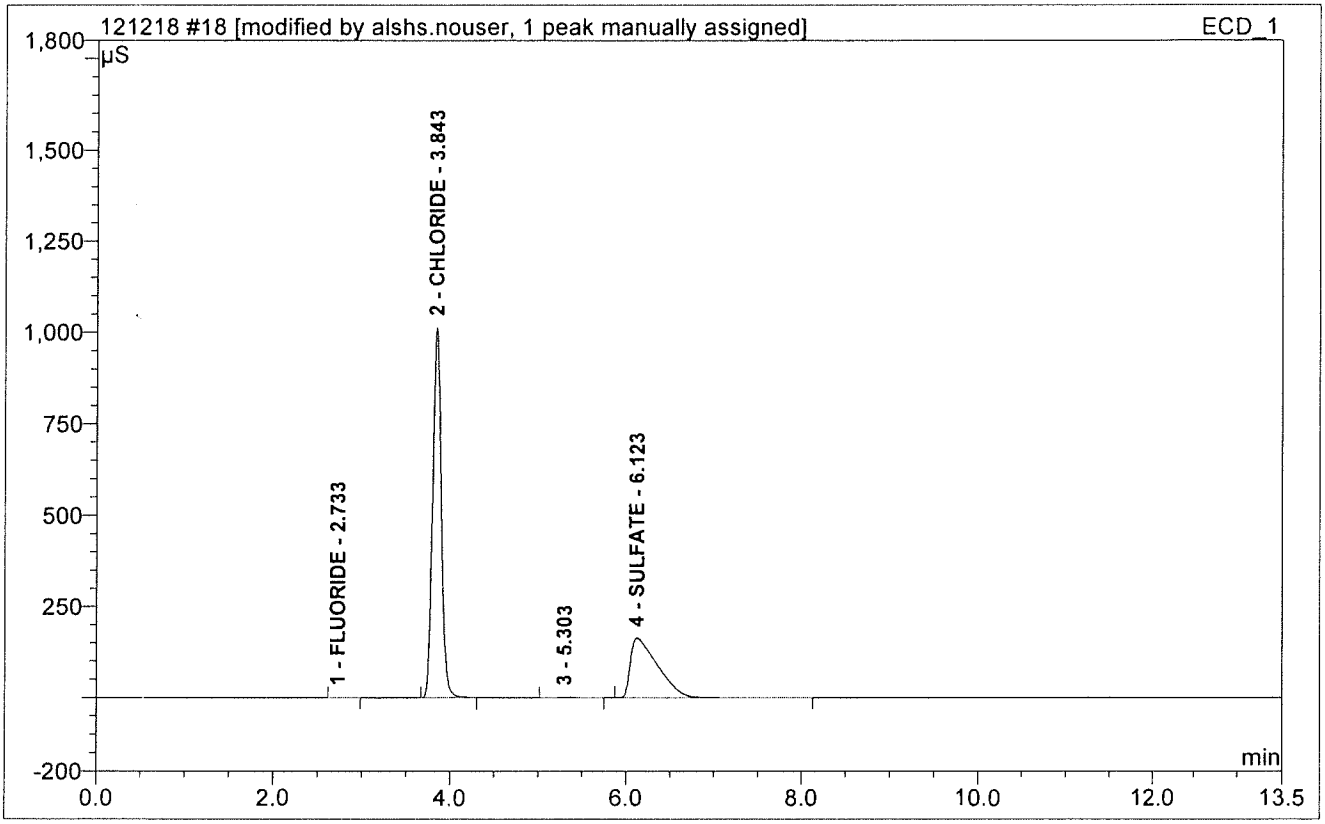
Sample Name:	**HS18120642-02DF20**	*Injection Volume:*	**10.0**
Vial Number:	**17**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**20.**
Recording Time:	**12/12/2018 23:32**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
3	3.84	CHLORIDE	87.826	9.763	83.74	2211.639	20.
6	6.09	BROMIDE	0.085	0.012	0.11	8.538	20.
7	6.57	SULFATE	2.049	0.363	3.11	119.029	20.
Total:			89.960	10.138	86.96	2339.206	

18 HS18120642-03

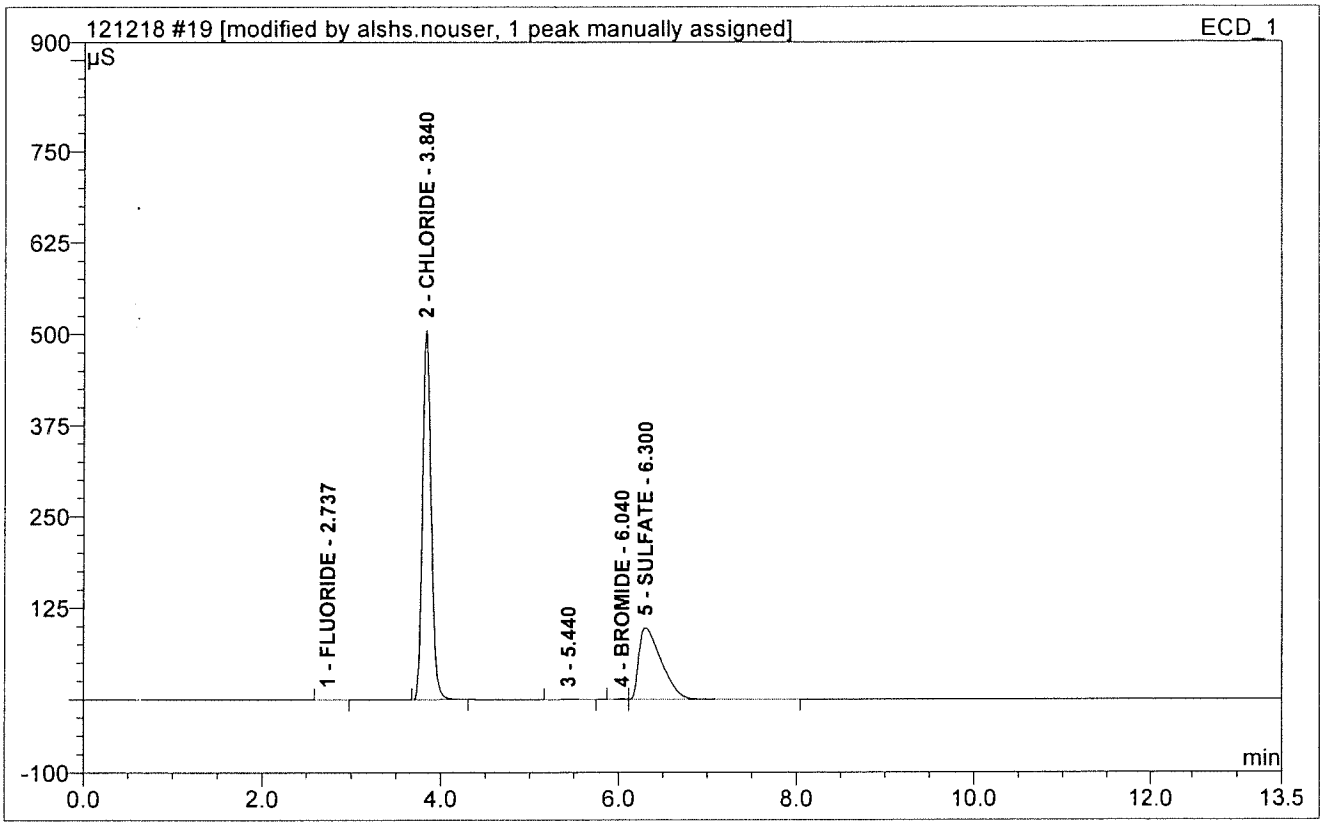
Sample Name:	**HS18120642-03**	*Injection Volume:*	**10.0**
Vial Number:	**18**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 23:47**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.213	0.025	0.01	0.210	1.
2	3.84	CHLORIDE	1011.542	115.465	66.74	1305.853	1.
4	6.12	SULFATE	163.339	57.413	33.19	901.710	1.
Total:			1175.094	172.903	99.94	2207.773	

19 HS18120642-03DF2

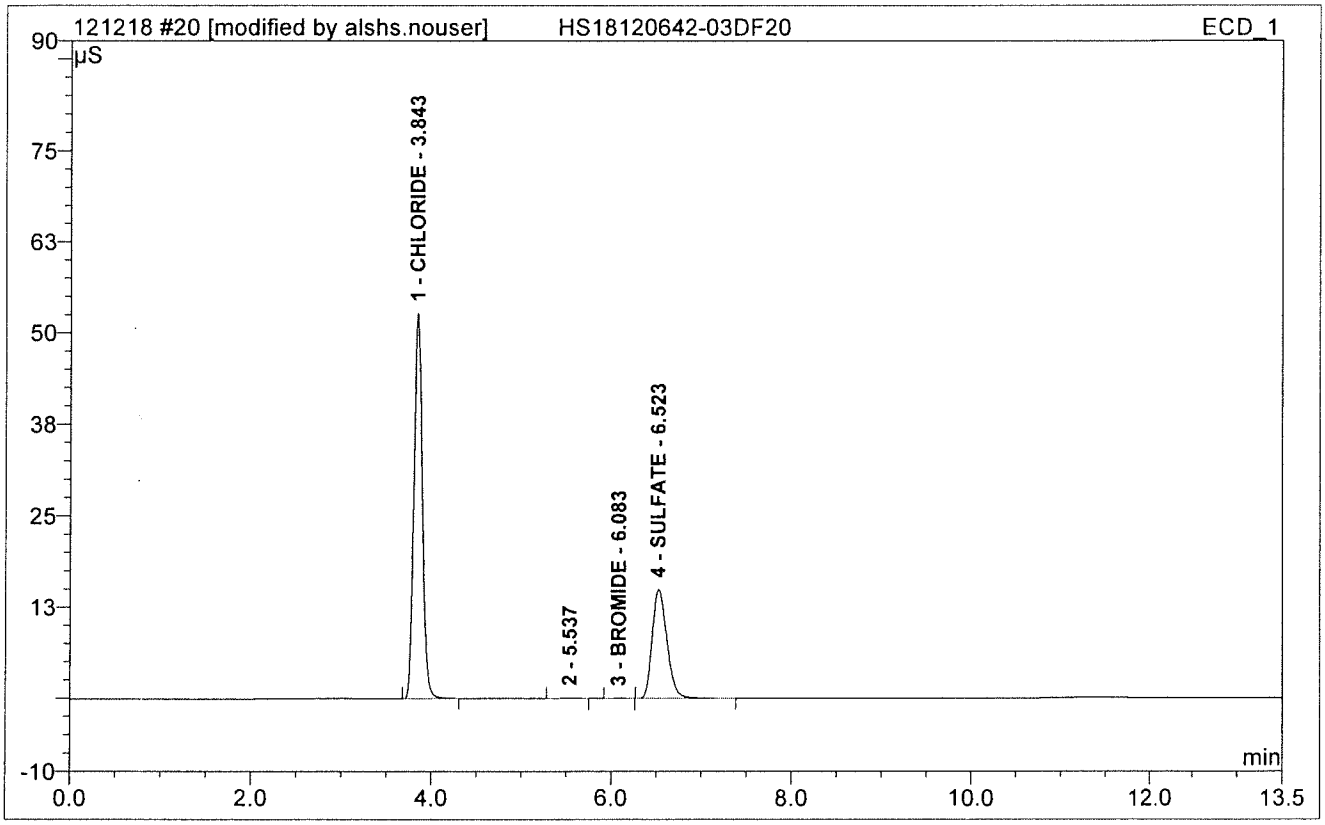
Sample Name:	**HS18120642-03DF2**	*Injection Volume:*	**10.0**
Vial Number:	**19**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**2.**
Recording Time:	**12/13/2018 0:01**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.108	0.012	0.01	0.240	2.
2	3.84	CHLORIDE	505.149	56.704	66.59	1282.778	2.
4	6.04	BROMIDE	0.653	0.079	0.09	4.683	2.
5	6.30	SULFATE	98.229	28.298	33.23	889.131	2.
Total:			604.139	85.094	99.94	2176.831	

20 HS18120642-03DF20

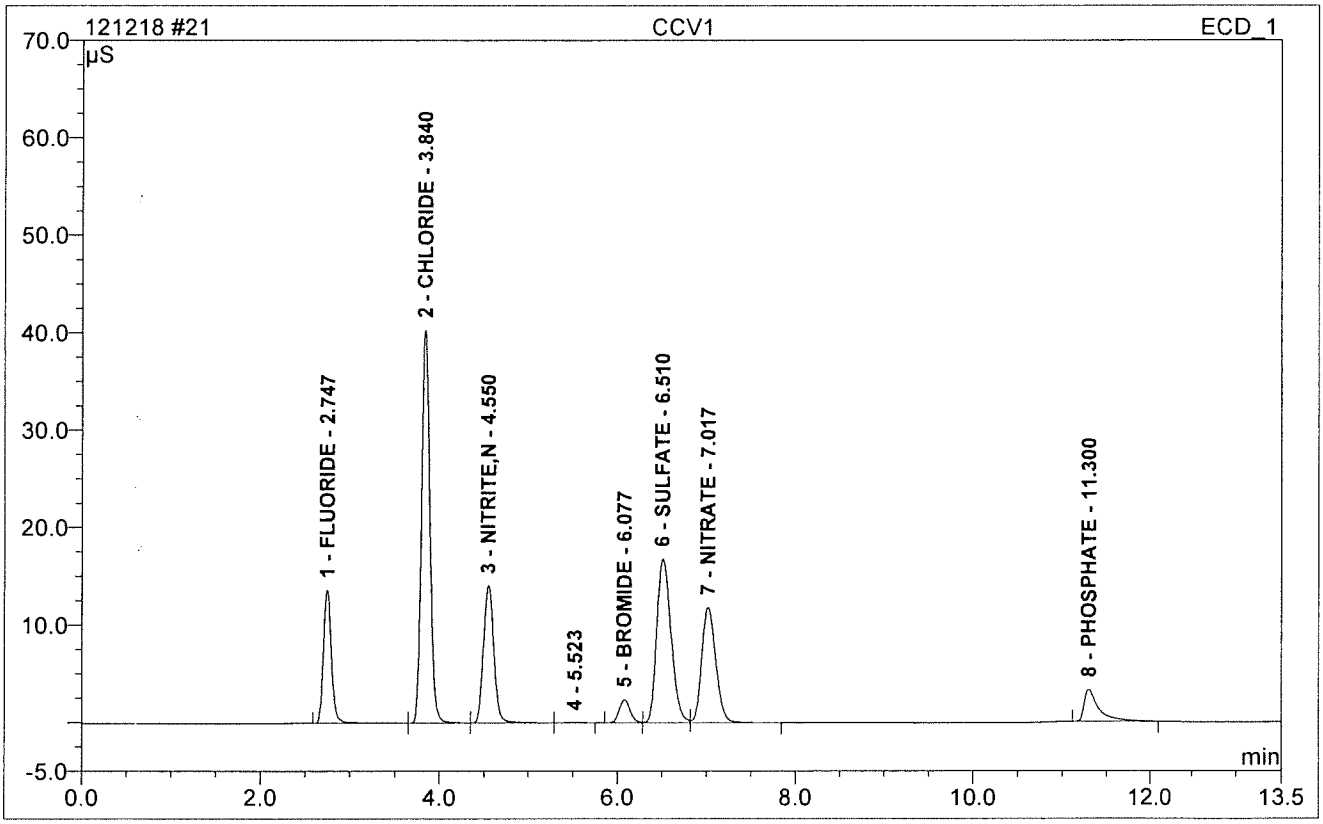
Sample Name:	**HS18120642-03DF20**	*Injection Volume:*	**10.0**
Vial Number:	**20**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**20.**
Recording Time:	**12/13/2018 0:16**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	3.84	CHLORIDE	52.712	5.810	66.87	1317.628	20.
3	6.08	BROMIDE	0.050	0.007	0.08	5.548	20.
4	6.52	SULFATE	14.983	2.858	32.90	902.654	20.
Total:			67.745	8.675	99.86	2225.830	

21 CCV1

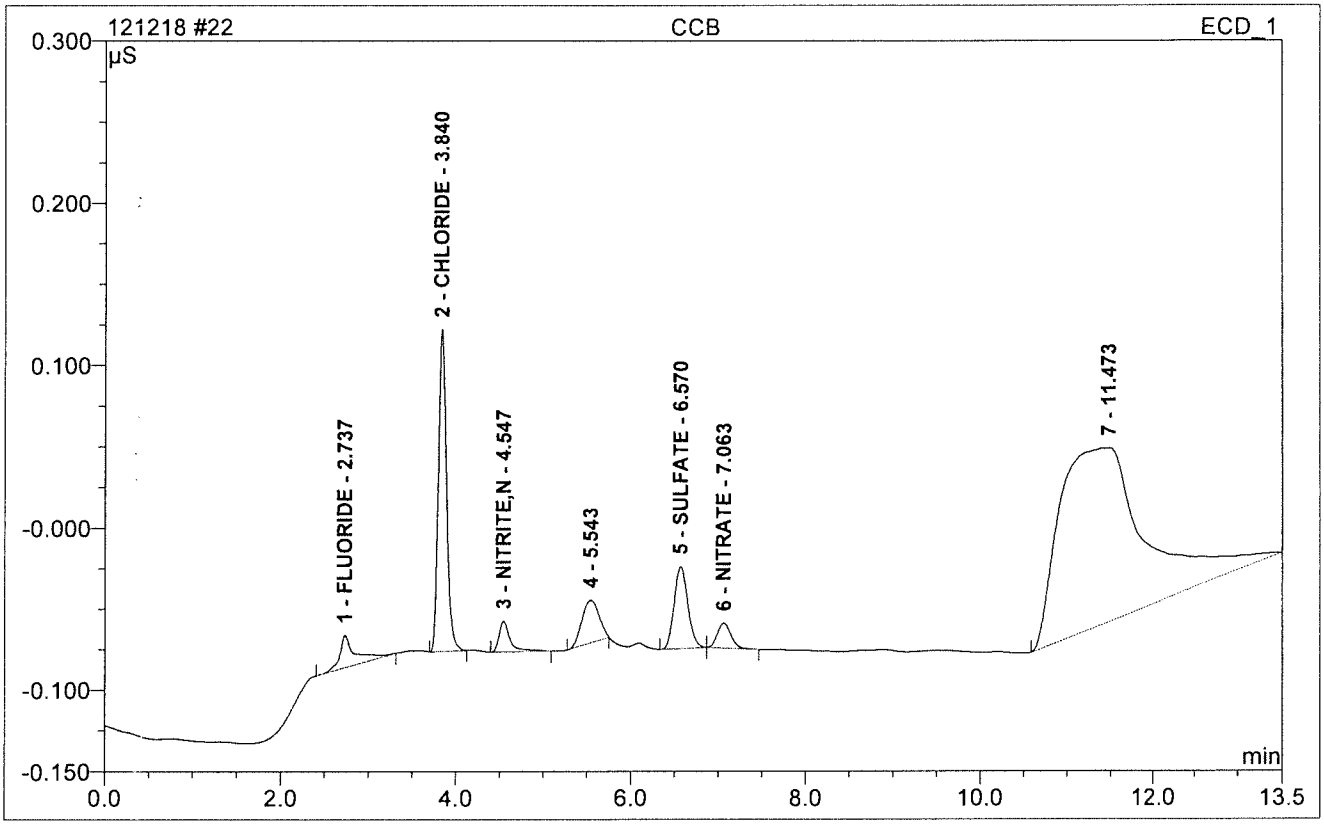
Sample Name:	**CCV1**	*Injection Volume:*	**10.0**
Vial Number:	**3**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 0:30**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	13.664	1.430	10.13	10.250	1.
2	3.84	CHLORIDE	40.342	4.428	31.35	50.257	1.
3	4.55	NITRITE,N	14.114	1.937	13.71	10.368	1.
5	6.08	BROMIDE	2.387	0.343	2.43	9.842	1.
6	6.51	SULFATE	16.816	3.162	22.39	49.906	1.
7	7.02	NITRATE	11.898	2.188	15.49	10.086	1.
8	11.30	PHOSPHATE	3.328	0.625	4.43	8.502	1.
Total:			102.550	14.113	99.93	149.212	

22 CCB

Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**4**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 0:45**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**

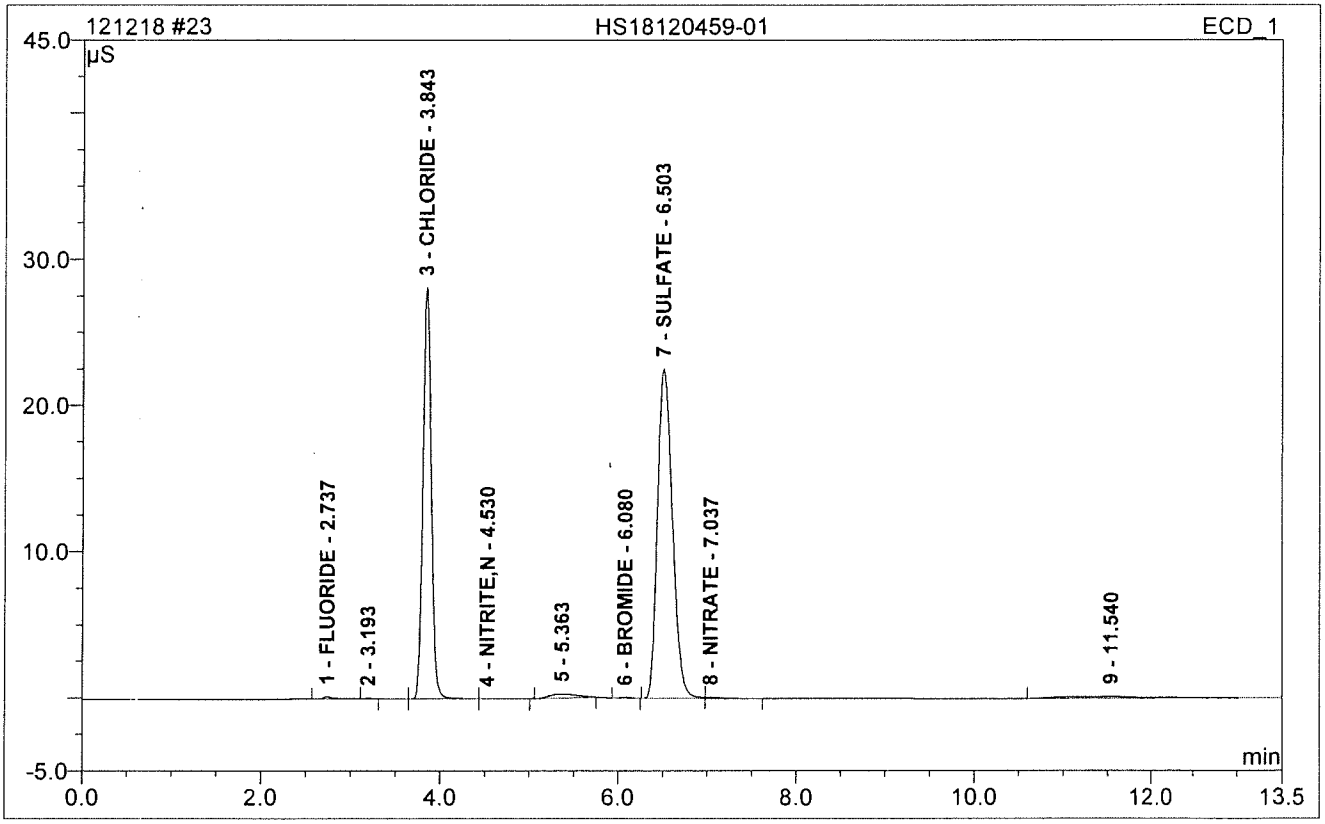


No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.020	0.004	2.33	0.062	1.
2	3.84	CHLORIDE	0.198	0.021	12.37	0.430	1.
3	4.55	NITRITE,N	0.019	0.003	1.63	0.037	1.
5	6.57	SULFATE	0.051	0.009	5.35	0.399	1.
6	7.06	NITRATE	0.016	0.003	1.62	0.071	1.
Total:			0.304	0.040	23.30	0.999	

23 HS18120459-01

9056_W

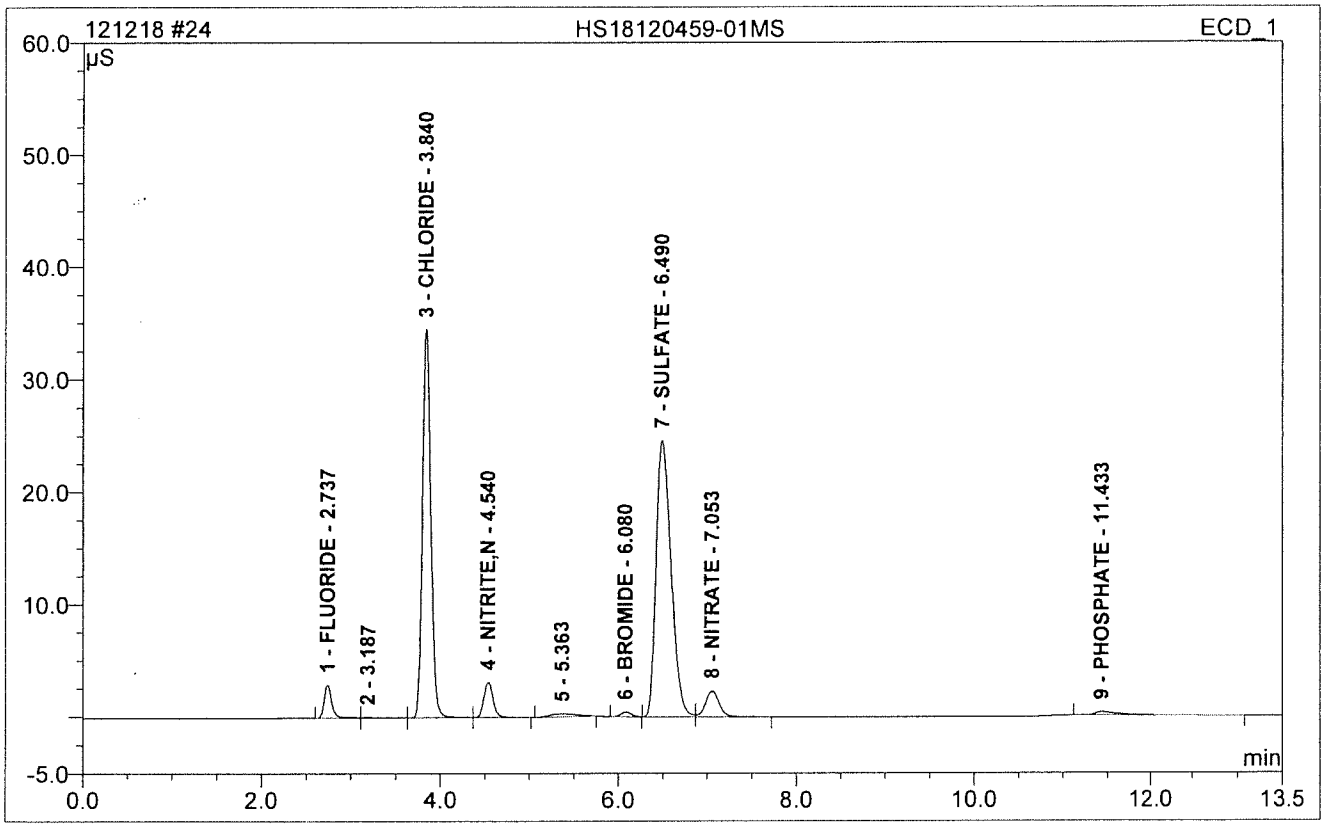
Sample Name:	**HS18120459-01**	*Injection Volume:*	**10.0**
Vial Number:	**24**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 0:59**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.167	0.028	0.36	0.232	1.
3	3.84	CHLORIDE	28.141	3.062	39.35	34.817	1.
4	4.53	NITRITE,N	0.017	0.003	0.04	0.041	1.
6	6.08	BROMIDE	0.050	0.007	0.09	0.269	1.
7	6.50	SULFATE	22.532	4.423	56.83	69.693	1.
8	7.04	NITRATE	0.081	0.017	0.21	0.135	1.
Total:			50.988	7.540	96.88	105.186	

24 HS18120459-01MS

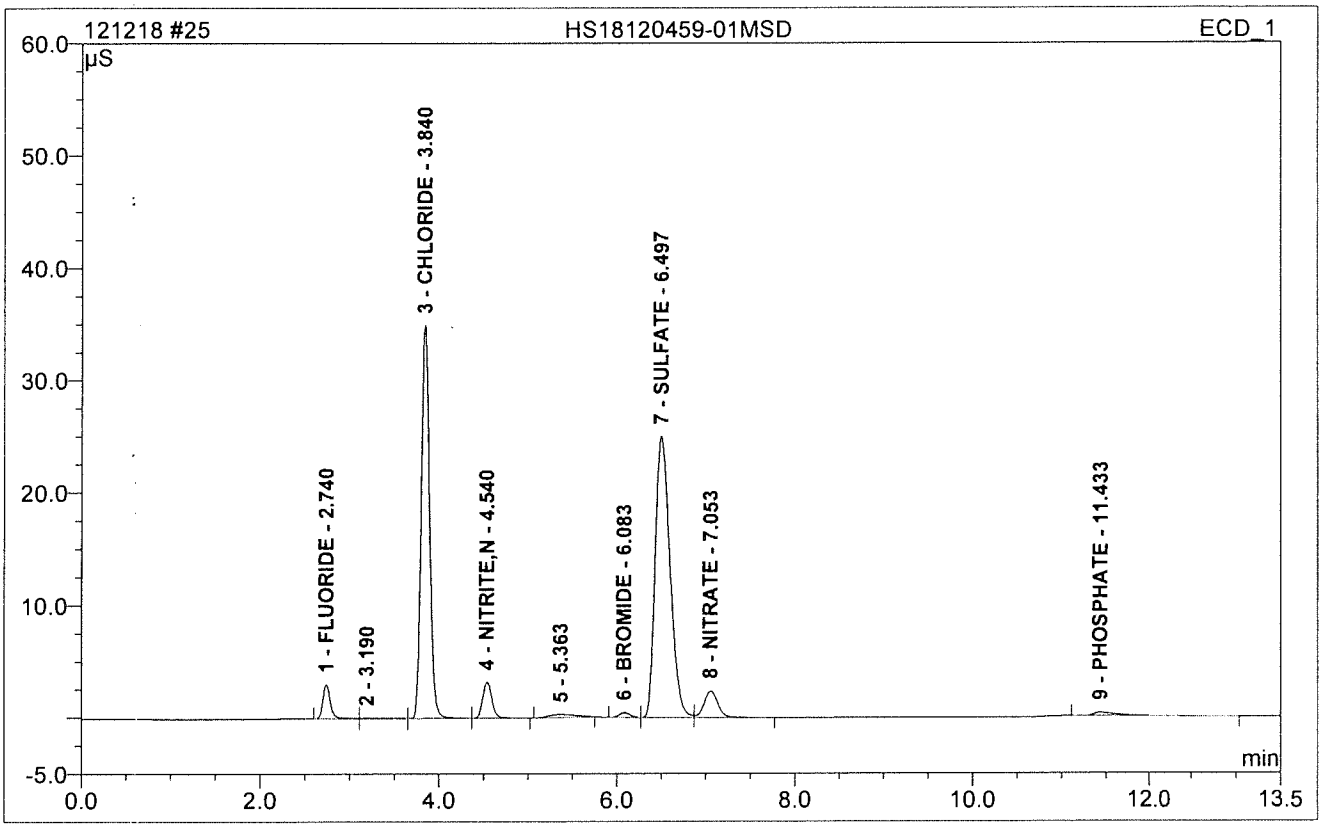
Sample Name:	**HS18120459-01MS**	*Injection Volume:*	**10.0**
Vial Number:	**25**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 1:14**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	2.931	0.288	2.92	2.092	1.
3	3.84	CHLORIDE	34.518	3.763	38.08	42.734	1.
4	4.54	NITRITE,N	3.161	0.377	3.81	2.035	1.
6	6.08	BROMIDE	0.411	0.057	0.57	1.689	1.
7	6.49	SULFATE	24.647	4.805	48.64	75.697	1.
8	7.05	NITRATE	2.297	0.403	4.08	1.906	1.
9	11.43	PHOSPHATE	0.287	0.084	0.85	1.198	1.
Total:			68.251	9.776	98.95	127.352	

25 HS18120459-01MSD

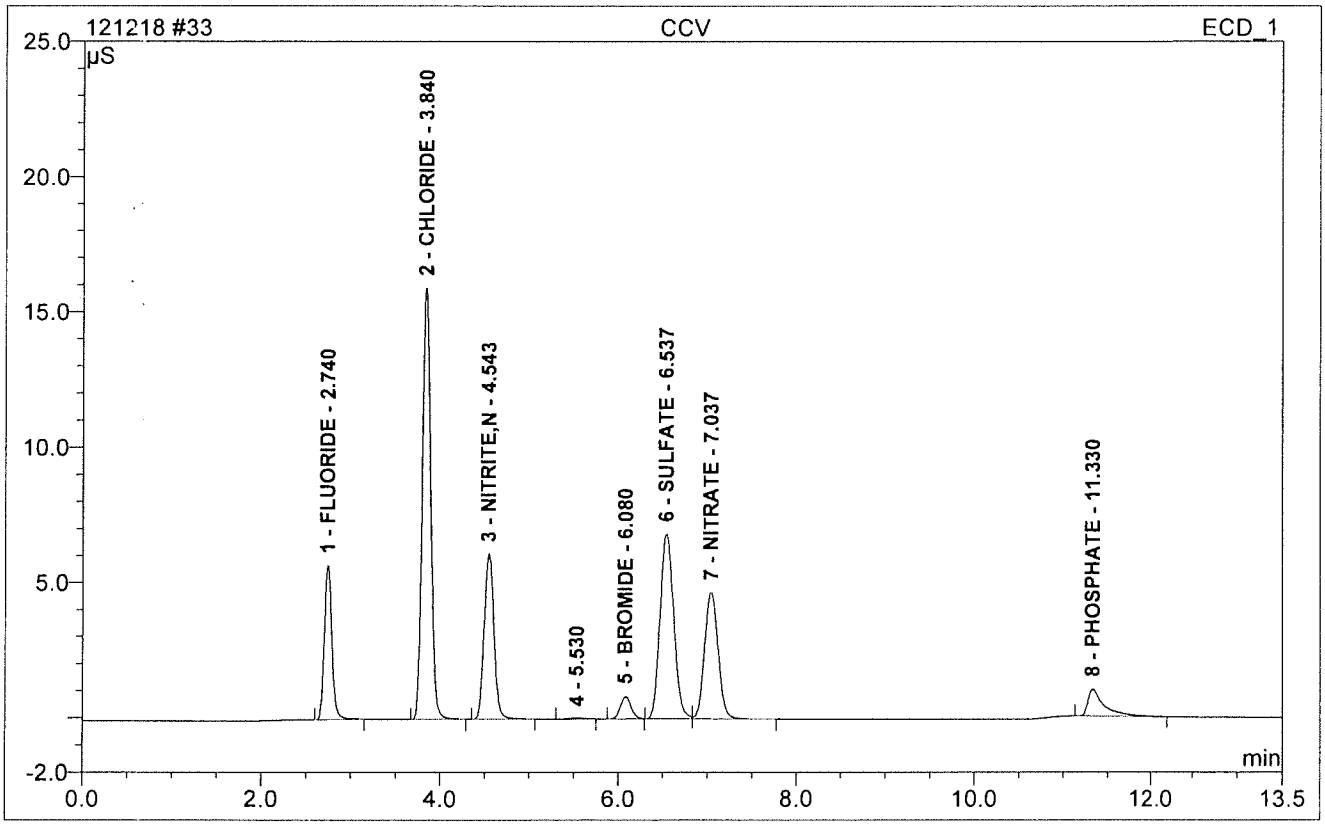
Sample Name:	**HS18120459-01MSD**	*Injection Volume:*	**10.0**
Vial Number:	**26**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 1:29**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	3.028	0.298	2.97	2.160	1.
3	3.84	CHLORIDE	34.965	3.813	38.07	43.301	1.
4	4.54	NITRITE,N	3.257	0.390	3.89	2.103	1.
6	6.08	BROMIDE	0.426	0.059	0.59	1.751	1.
7	6.50	SULFATE	25.019	4.845	48.38	76.328	1.
8	7.05	NITRATE	2.369	0.418	4.17	1.973	1.
9	11.43	PHOSPHATE	0.298	0.089	0.89	1.267	1.
Total:			69.361	9.911	98.96	128.884	

33 CCV

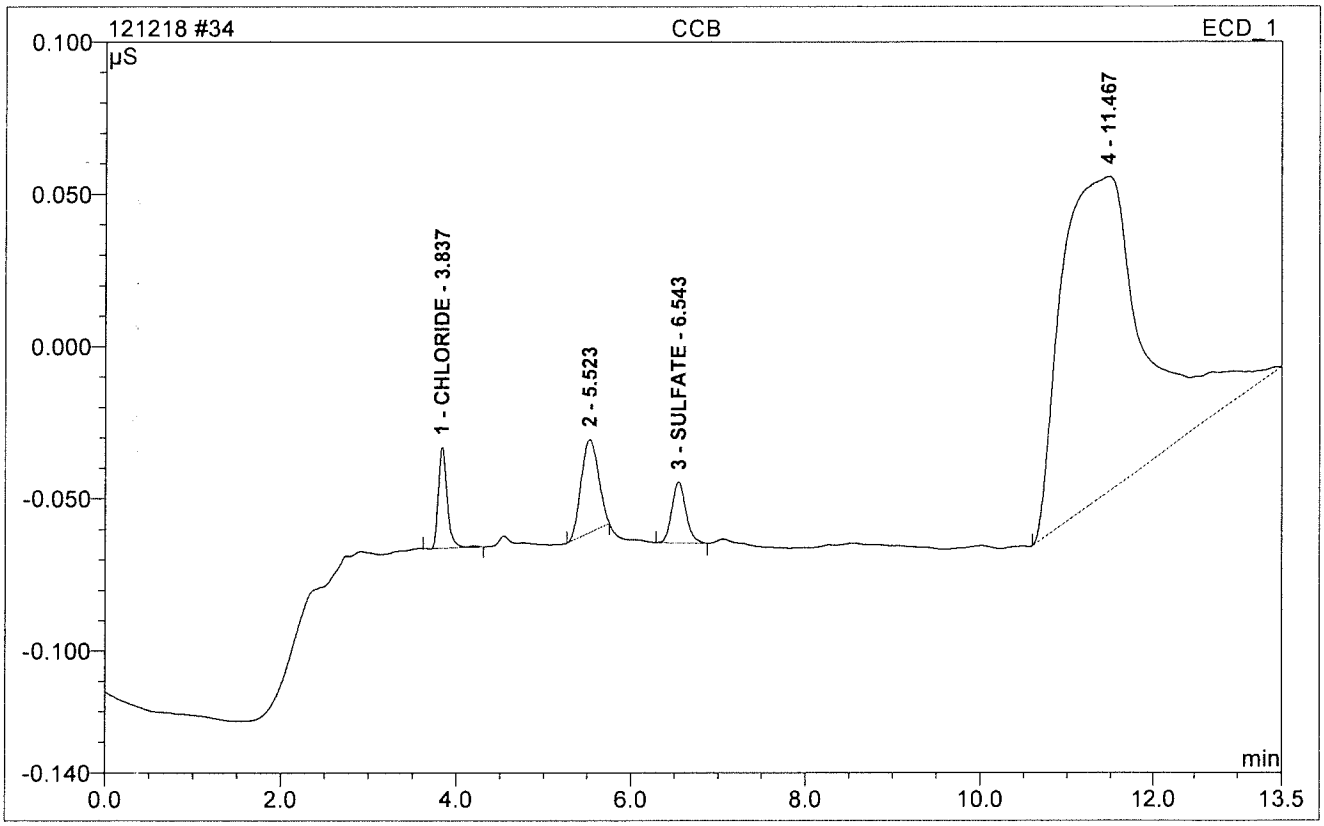
Sample Name:	**CCV**	*Injection Volume:*	**10.0**
Vial Number:	**1**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 3:25**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.712	0.563	10.32	4.055	1.
2	3.84	CHLORIDE	15.944	1.730	31.71	19.752	1.
3	4.54	NITRITE,N	6.123	0.781	14.31	4.193	1.
5	6.08	BROMIDE	0.827	0.116	2.13	3.383	1.
6	6.54	SULFATE	6.840	1.227	22.49	19.517	1.
7	7.04	NITRATE	4.692	0.825	15.11	3.837	1.
8	11.33	PHOSPHATE	0.991	0.207	3.80	2.860	1.
Total:			41.129	5.448	99.86	57.596	

34 CCB

Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**2**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 3:40**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	3.84	CHLORIDE	0.033	0.004	2.83	0.231	1.
3	6.54	SULFATE	0.020	0.004	2.77	0.312	1.
Total:			0.053	0.007	5.60	0.543	

HS18120642

Sequence: 121318
Operator: ALSHS.NoUser

Printed: 1/21/2019 6:41:39 PM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 153

Created: 12/13/2018 7:20:14 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
1	STD1		Standard	91	1.0000	10.0	1.00	1.00
2	STD2		Standard	92	1.0000	10.0	1.00	1.00
3	STD3		Standard	93	1.0000	10.0	1.00	1.00
4	STD4		Standard	94	1.0000	10.0	1.00	1.00
5	STD5		Standard	95	1.0000	10.0	1.00	1.00
6	STD6		Standard	96	1.0000	10.0	1.00	1.00
7	ICV		Unknown	97	1.0000	10.0	1.00	1.00
8	ICB		Unknown	98	1.0000	10.0	1.00	1.00
9	CCV		Unknown	1	1.0000	10.0	1.00	1.00
10	CCB		Unknown	2	1.0000	10.0	1.00	1.00
11	MBLK-135564		Unknown	11	1.0000	10.0	1.00	1.00
12	LCS-135564		Unknown	12	1.0000	10.0	1.00	1.00
13	LCSD-135564		Unknown	13	1.0000	10.0	1.00	1.00
14	HS18120413-02DF10		Unknown	14	10.0000	10.0	1.00	1.00
15	HS18120413-04		Unknown	15	1.0000	10.0	1.00	1.00
16	HS18120413-06DF5		Unknown	16	5.0000	10.0	1.00	1.00
17	HS18120413-08DF20		Unknown	17	20.0000	10.0	1.00	1.00
18	HS18120413-08MSDF20		Unknown	18	20.0000	10.0	1.00	1.00
19	HS18120413-08MSDDF20		Unknown	19	20.0000	10.0	1.00	1.00
20	HS18120413-10DF10		Unknown	20	10.0000	10.0	1.00	1.00
21	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
22	CCB		Unknown	4	1.0000	10.0	1.00	1.00
23	WBLKW1-121318		Unknown	21	1.0000	10.0	1.00	1.00
24	WLCSW1-121318		Unknown	22	1.0000	10.0	1.00	1.00
25	WLCSDW1-121318		Unknown	23	1.0000	10.0	1.00	1.00
26	HS18120736-03		Unknown	28	1.0000	10.0	1.00	1.00
27	HS18120736-03DF5		Unknown	29	5.0000	10.0	1.00	1.00
28	HS18120736-04		Unknown	30	1.0000	10.0	1.00	1.00
29	HS18120736-04MS		Unknown	31	1.0000	10.0	1.00	1.00
30	HS18120736-04MSD		Unknown	32	1.0000	10.0	1.00	1.00
31	HS18120783-01		Unknown	42	1.0000	10.0	1.00	1.00
32	HS18111386-01		Unknown	36	1.0000	10.0	1.00	1.00
33	CCV		Unknown	1	1.0000	10.0	1.00	1.00
34	CCB		Unknown	2	1.0000	10.0	1.00	1.00
35	HS18120736-01DF2		Unknown	24	2.0000	10.0	1.00	1.00
36	HS18120736-01DF50		Unknown	25	50.0000	10.0	1.00	1.00
37	HS18120736-02DF2		Unknown	26	2.0000	10.0	1.00	1.00
38	HS18120736-02DF50		Unknown	27	50.0000	10.0	1.00	1.00
39	HS18120736-01		Unknown	45	1.0000	10.0	1.00	1.00
40	HS18120757-01		Unknown	37	1.0000	10.0	1.00	1.00
41	HS18120757-02		Unknown	38	1.0000	10.0	1.00	1.00
42	HS18120757-02MS		Unknown	39	1.0000	10.0	1.00	1.00

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Sequence: 121318
Operator: ALSHS.NoUser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 153

Created: 12/13/2018 7:20:14 PM by alshs.nouser
(Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
1	STD1	121218	Finished	12/12/2018 3:52:35 PM	Anions Gradient Program
2	STD2	121218	Finished	12/12/2018 4:07:08 PM	Anions Gradient Program
3	STD3	121218	Finished	12/12/2018 4:21:41 PM	Anions Gradient Program
4	STD4	121218	Finished	12/12/2018 4:36:13 PM	Anions Gradient Program
5	STD5	121218	Finished	12/12/2018 4:50:46 PM	Anions Gradient Program
6	STD6	121218	Finished	12/12/2018 5:05:19 PM	Anions Gradient Program
7	ICV	121218	Finished	12/12/2018 5:19:52 PM	Anions Gradient Program
8	ICB	121218	Finished	12/12/2018 5:34:25 PM	Anions Gradient Program
9	CCV	121218	Finished	12/13/2018 12:10:57 PM	Anions Gradient Program
10	CCB	121218	Finished	12/13/2018 12:25:30 PM	Anions Gradient Program
11	MBLK-135564	121218	Finished	12/13/2018 1:17:50 PM	Anions Gradient Program
12	LCS-135564	121218	Finished	12/13/2018 1:32:23 PM	Anions Gradient Program
13	LCSD-135564	121218	Finished	12/13/2018 1:46:56 PM	Anions Gradient Program
14	HS18120413-02DF10	121218	Finished	12/13/2018 2:01:29 PM	Anions Gradient Program
15	HS18120413-04	121218	Finished	12/13/2018 2:16:03 PM	Anions Gradient Program
16	HS18120413-06DF5	121218	Finished	12/13/2018 2:30:35 PM	Anions Gradient Program
17	HS18120413-08DF20	121218	Finished	12/13/2018 2:45:08 PM	Anions Gradient Program
18	HS18120413-08MSDF20	121218	Finished	12/13/2018 2:59:41 PM	Anions Gradient Program
19	HS18120413-08MSDDF20	121218	Finished	12/13/2018 3:14:13 PM	Anions Gradient Program
20	HS18120413-10DF10	121218	Finished	12/13/2018 3:28:46 PM	Anions Gradient Program
21	CCV1	121218	Finished	12/13/2018 3:43:18 PM	Anions Gradient Program
22	CCB	121218	Finished	12/13/2018 3:57:51 PM	Anions Gradient Program
23	WBLKW1-121318	121218	Finished	12/13/2018 4:12:24 PM	Anions Gradient Program
24	WLCSW1-121318	121218	Finished	12/13/2018 4:26:57 PM	Anions Gradient Program
25	WLCSDW1-121318	121218	Finished	12/13/2018 4:41:30 PM	Anions Gradient Program
26	HS18120736-03	121218	Finished	12/13/2018 4:56:02 PM	Anions Gradient Program
27	HS18120736-03DF5	121218	Finished	12/13/2018 5:10:35 PM	Anions Gradient Program
28	HS18120736-04	121218	Finished	12/13/2018 5:25:08 PM	Anions Gradient Program
29	HS18120736-04MS	121218	Finished	12/13/2018 5:39:41 PM	Anions Gradient Program
30	HS18120736-04MSD	121218	Finished	12/13/2018 5:54:13 PM	Anions Gradient Program
31	HS18120783-01	121218	Finished	12/13/2018 6:08:46 PM	Anions Gradient Program
32	HS18111386-01	121218	Finished	12/13/2018 6:23:19 PM	Anions Gradient Program
33	CCV	121218	Finished	12/13/2018 6:37:51 PM	Anions Gradient Program
34	CCB	121218	Finished	12/13/2018 6:52:24 PM	Anions Gradient Program
35	HS18120736-01DF2	121218	Finished	12/13/2018 7:24:41 PM	Anions Gradient Program
36	HS18120736-01DF50	121218	Finished	12/13/2018 7:39:14 PM	Anions Gradient Program
37	HS18120736-02DF2	121218	Finished	12/13/2018 7:53:48 PM	Anions Gradient Program
38	HS18120736-02DF50	121218	Finished	12/13/2018 8:08:20 PM	Anions Gradient Program
39	HS18120736-01	121218	Finished	12/13/2018 8:37:43 PM	Anions Gradient Program
40	HS18120757-01	121218	Finished	12/13/2018 8:52:16 PM	Anions Gradient Program
41	HS18120757-02	121218	Finished	12/13/2018 9:06:49 PM	Anions Gradient Program
42	HS18120757-02MS	121218	Finished	12/13/2018 9:21:22 PM	Anions Gradient Program

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Sequence: 121318
Operator: ALSHS.NoUser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 153

Created: 12/13/2018 7:20:14 PM by alshs.nouser
(Modified, not saved)

No.	Name	GUID
1	STD1	1ad81188-fe58-11e8-b6da-a24899608423
2	STD2	2312cf21-fe5a-11e8-b6da-a24899608423
3	STD3	2b6c8b0b-fe5c-11e8-b6da-a24899608423
4	STD4	3332765f-fe5e-11e8-b6da-a24899608423
5	STD5	3b9f44f1-fe60-11e8-b6da-a24899608423
6	STD6	43711bee-fe62-11e8-b6da-a24899608423
7	ICV	4be5117f-fe64-11e8-b6da-a24899608423
8	ICB	544d1b67-fe66-11e8-b6da-a24899608423
9	CCV	4f2554d2-ff02-11e8-b6da-a24899608423
10	CCB	56f004d0-ff04-11e8-b6da-a24899608423
11	MBLK-135564	47503773-ff0b-11e8-b6da-a24899608423
12	LCS-135564	ae81b8c5-ff0d-11e8-b6da-a24899608423
13	LCSD-135564	b7255cfa-ff0f-11e8-b6da-a24899608423
14	HS18120413-02DF10	bf918c4f-ff11-11e8-b6da-a24899608423
15	HS18120413-04	c87b2097-ff13-11e8-b6da-a24899608423
16	HS18120413-06DF5	d0bc1d17-ff15-11e8-b6da-a24899608423
17	HS18120413-08DF20	d8f9c809-ff17-11e8-b6da-a24899608423
18	HS18120413-08MSDF20	e0deb1ae-ff19-11e8-b6da-a24899608423
19	HS18120413-08MSDDF20	e91bd19c-ff1b-11e8-b6da-a24899608423
20	HS18120413-10DF10	f164dd33-ff1d-11e8-b6da-a24899608423
21	CCV1	f94e8b82-ff1f-11e8-b6da-a24899608423
22	CCB	0167e875-ff22-11e8-b6da-a24899608423
23	WBLKW1-121318	09a50863-ff24-11e8-b6da-a24899608423
24	WLCSW1-121318	11dfc5fc-ff26-11e8-b6da-a24899608423
25	WLCSDW1-121318	1a2ff892-ff28-11e8-b6da-a24899608423
26	HS18120736-03	226ab62b-ff2a-11e8-b6da-a24899608423
27	HS18120736-03DF5	2a4adb26-ff2c-11e8-b6da-a24899608423
28	HS18120736-04	32b54763-ff2e-11e8-b6da-a24899608423
29	HS18120736-04MS	3afe52fa-ff30-11e8-b6da-a24899608423
30	HS18120736-04MSD	43344be9-ff32-11e8-b6da-a24899608423
31	HS18120783-01	4b16d339-ff34-11e8-b6da-a24899608423
32	HS18111386-01	536e2cce-ff36-11e8-b6da-a24899608423
33	CCV	5ba425bd-ff38-11e8-b6da-a24899608423
34	CCB	63ed3154-ff3a-11e8-b6da-a24899608423
35	HS18120736-01DF2	876241de-ff3e-11e8-b6da-a24899608423
36	HS18120736-01DF50	eeb2c181-ff40-11e8-b6da-a24899608423
37	HS18120736-02DF2	f72dde11-ff42-11e8-b6da-a24899608423
38	HS18120736-02DF50	ff8c5ea5-ff44-11e8-b6da-a24899608423
39	HS18120736-01	bb0e010d-ff48-11e8-b6da-a24899608423
40	HS18120757-01	229c7d52-ff4b-11e8-b6da-a24899608423
41	HS18120757-02	2ae588e9-ff4d-11e8-b6da-a24899608423
42	HS18120757-02MS	3348ce27-ff4f-11e8-b6da-a24899608423

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Sequence: 121318
Operator: ALSHS.NoUser

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100
#Samples: 153

Created: 12/13/2018 7:20:14 PM by alshs.nouser
(Modified, not saved)

No.	Name	Comment	Type	Pos.	Dil. Factor	Inj. Vol.	*Initial_Vol_Wt	*Final_Volume
43	HS18120757-02MSD		Unknown	40	1.0000	10.0	1.00	1.00
44	HS18120642-02DF50		Unknown	46	50.0000	10.0	1.00	1.00
45	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
46	CCB		Unknown	4	1.0000	10.0	1.00	1.00
47	HS18111386-01DF2		Unknown	44	2.0000	10.0	1.00	1.00
48	HS18120741-01DF10		Unknown	41	10.0000	10.0	1.00	1.00
49	HS18111369-01DF20		Unknown	33	20.0000	10.0	1.00	1.00
50	HS18111369-01DF400		Unknown	34	400.0000	10.0	1.00	1.00
51	HS18111369-01DF4000		Unknown	35	4000.0000	10.0	1.00	1.00
52	HS18111473-01DF20		Unknown	47	20.0000	10.0	1.00	1.00
53	HS18111473-01DF400		Unknown	48	400.0000	10.0	1.00	1.00
54	HS18111473-02DF20		Unknown	49	20.0000	10.0	1.00	1.00
55	HS18111473-02DF400		Unknown	50	400.0000	10.0	1.00	1.00
56	HS18111377-12DF50		Unknown	51	50.0000	10.0	1.00	1.00
57	CCV		Unknown	1	1.0000	10.0	1.00	1.00
58	CCB		Unknown	2	1.0000	10.0	1.00	1.00
59	HS18111377-14		Unknown	52	1.0000	10.0	1.00	1.00
60	HS18111377-13DF50		Unknown	53	50.0000	10.0	1.00	1.00
61	HS18111377-11DF10		Unknown	54	10.0000	10.0	1.00	1.00
62	HS18111377-10		Unknown	55	1.0000	10.0	1.00	1.00
63	HS18111377-09		Unknown	56	1.0000	10.0	1.00	1.00
64	HS18111377-08DF5		Unknown	57	5.0000	10.0	1.00	1.00
65	HS18120449-02		Unknown	70	1.0000	10.0	1.00	1.00
66	HS18120449-03		Unknown	71	1.0000	10.0	1.00	1.00
67	HS18120312-01		Unknown	76	1.0000	10.0	1.00	1.00
68	HS18120312-02		Unknown	77	1.0000	10.0	1.00	1.00
69	CCV1		Unknown	3	1.0000	10.0	1.00	1.00
70	CCB		Unknown	4	1.0000	10.0	1.00	1.00
71	HS18120305-01		Unknown	72	1.0000	10.0	1.00	1.00
72	HS18120305-01MS		Unknown	73	1.0000	10.0	1.00	1.00
73	HS18120305-01MSD		Unknown	74	1.0000	10.0	1.00	1.00
74	HS18120306-01		Unknown	75	1.0000	10.0	1.00	1.00
75	HS18120315-01		Unknown	78	1.0000	10.0	1.00	1.00
76	HS18120315-02		Unknown	79	1.0000	10.0	1.00	1.00
77	HS18120432-01		Unknown	80	1.0000	10.0	1.00	1.00
78	HS18120432-02		Unknown	81	1.0000	10.0	1.00	1.00
79	HS18120435-01		Unknown	82	1.0000	10.0	1.00	1.00
80	HS18120435-02		Unknown	83	1.0000	10.0	1.00	1.00
81	CCV		Unknown	1	1.0000	10.0	1.00	1.00
82	CCB		Unknown	2	1.0000	10.0	1.00	1.00
83	WBLKW1-121418		Unknown	67	1.0000	10.0	1.00	1.00
84	WLCSW1-121418		Unknown	68	1.0000	10.0	1.00	1.00

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Sequence: 121318 Page 5 of 12
Operator: ALSHS.NoUser Printed: 1/21/2019 6:41:39 PM

Title:
Datasource: DB7CGHK1_local
Location: ICS2100\Sequences and Data\01-2018
Timebase: ICS2100 Created: 12/13/2018 7:20:14 PM by alshs.nouser
#Samples: 153 (Modified, not saved)

No.	Name	Method	Status	Inj. Date/Time	Program
43	HS18120757-02MSD	121218	Finished	12/13/2018 9:35:55 PM	Anions Gradient Program
44	HS18120642-02DF50	121218	Finished	12/13/2018 9:50:28 PM	Anions Gradient Program
45	CCV1	121218	Finished	12/13/2018 10:05:00 PM	Anions Gradient Program
46	CCB	121218	Finished	12/13/2018 10:19:32 PM	Anions Gradient Program
47	HS18111386-01DF2	121218	Finished	12/13/2018 10:44:24 PM	Anions Gradient Program
48	HS18120741-01DF10	121218	Finished	12/13/2018 10:58:57 PM	Anions Gradient Program
49	HS18111369-01DF20	121218	Finished	12/13/2018 11:13:30 PM	Anions Gradient Program
50	HS18111369-01DF400	121218	Finished	12/13/2018 11:28:03 PM	Anions Gradient Program
51	HS18111369-01DF4000	121218	Finished	12/13/2018 11:42:36 PM	Anions Gradient Program
52	HS18111473-01DF20	121218	Finished	12/13/2018 11:57:09 PM	Anions Gradient Program
53	HS18111473-01DF400	121218	Finished	12/14/2018 12:11:41 AM	Anions Gradient Program
54	HS18111473-02DF20	121218	Finished	12/14/2018 12:26:14 AM	Anions Gradient Program
55	HS18111473-02DF400	121218	Finished	12/14/2018 12:40:47 AM	Anions Gradient Program
56	HS18111377-12DF50	121218	Finished	12/14/2018 12:55:20 AM	Anions Gradient Program
57	CCV	121218	Finished	12/14/2018 1:09:52 AM	Anions Gradient Program
58	CCB	121218	Finished	12/14/2018 1:24:25 AM	Anions Gradient Program
59	HS18111377-14	121218	Finished	12/14/2018 1:38:58 AM	Anions Gradient Program
60	HS18111377-13DF50	121218	Finished	12/14/2018 1:53:31 AM	Anions Gradient Program
61	HS18111377-11DF10	121218	Finished	12/14/2018 2:08:03 AM	Anions Gradient Program
62	HS18111377-10	121218	Finished	12/14/2018 2:22:36 AM	Anions Gradient Program
63	HS18111377-09	121218	Finished	12/14/2018 2:37:09 AM	Anions Gradient Program
64	HS18111377-08DF5	121218	Finished	12/14/2018 2:51:42 AM	Anions Gradient Program
65	HS18120449-02	121218	Finished	12/14/2018 3:06:15 AM	Anions Gradient Program
66	HS18120449-03	121218	Finished	12/14/2018 3:20:48 AM	Anions Gradient Program
67	HS18120312-01	121218	Finished	12/14/2018 3:35:21 AM	Anions Gradient Program
68	HS18120312-02	121218	Finished	12/14/2018 3:49:54 AM	Anions Gradient Program
69	CCV1	121218	Finished	12/14/2018 4:04:27 AM	Anions Gradient Program
70	CCB	121218	Finished	12/14/2018 4:19:00 AM	Anions Gradient Program
71	HS18120305-01	121218	Finished	12/14/2018 4:33:32 AM	Anions Gradient Program
72	HS18120305-01MS	121218	Finished	12/14/2018 4:48:05 AM	Anions Gradient Program
73	HS18120305-01MSD	121218	Finished	12/14/2018 5:02:38 AM	Anions Gradient Program
74	HS18120306-01	121218	Finished	12/14/2018 5:17:10 AM	Anions Gradient Program
75	HS18120315-01	121218	Finished	12/14/2018 5:31:43 AM	Anions Gradient Program
76	HS18120315-02	121218	Finished	12/14/2018 5:46:16 AM	Anions Gradient Program
77	HS18120432-01	121218	Finished	12/14/2018 6:00:49 AM	Anions Gradient Program
78	HS18120432-02	121218	Finished	12/14/2018 6:15:22 AM	Anions Gradient Program
79	HS18120435-01	121218	Finished	12/14/2018 6:29:55 AM	Anions Gradient Program
80	HS18120435-02	121218	Finished	12/14/2018 6:44:28 AM	Anions Gradient Program
81	CCV	121218	Finished	12/14/2018 6:59:00 AM	Anions Gradient Program
82	CCB	121218	Finished	12/14/2018 7:13:33 AM	Anions Gradient Program
83	WBLKW1-121418	121218	Finished	12/14/2018 7:28:06 AM	Anions Gradient Program
84	WLCSW1-121418	121218	Finished	12/14/2018 7:42:39 AM	Anions Gradient Program

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Sequence: 121318 Page 6 of 12
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66	HS18120449-03	69bdd8f3-ff81-11e8-b6da-a24899608423
67	HS18120312-01	72048235-ff83-11e8-b6da-a24899608423
68	HS18120312-02	7a1ddf28-ff85-11e8-b6da-a24899608423
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75	HS18120315-01	b3a5fbaf-ff93-11e8-b6da-a24899608423
76	HS18120315-02	bc0e0597-ff95-11e8-b6da-a24899608423
77	HS18120432-01	c430ebde-ff97-11e8-b6da-a24899608423
78	HS18120432-02	cc8380c9-ff99-11e8-b6da-a24899608423
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84	WLCSW1-121418	fe0a17af-ffa5-11e8-b6da-a24899608423

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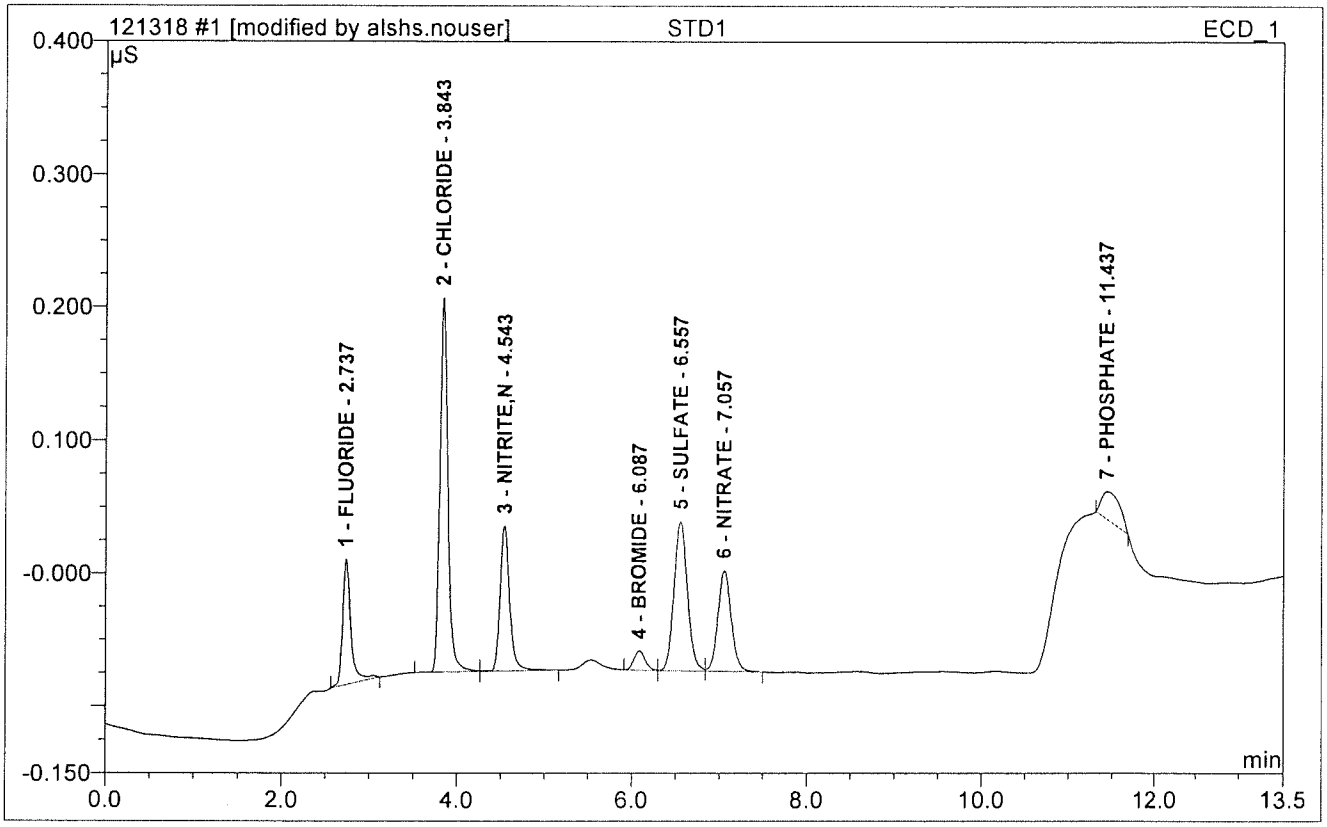
1 STD1

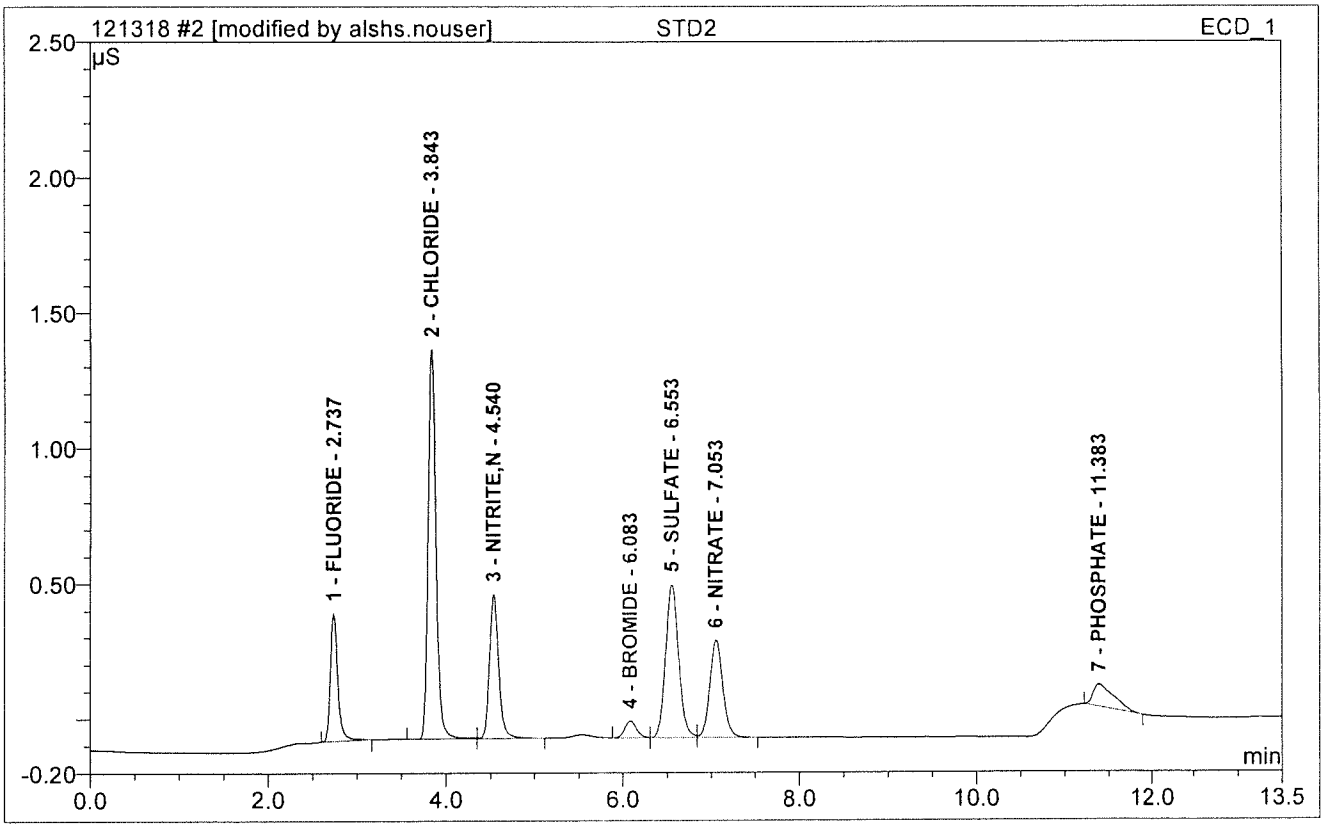
Sample Name:	**STD1**	*Injection Volume:*	**10.0**
Vial Number:	**91**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 15:52**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.095	0.010	10.60	0.106	1.
2	3.84	CHLORIDE	0.281	0.030	31.72	0.532	1.
3	4.54	NITRITE,N	0.110	0.014	14.54	0.096	1.
4	6.09	BROMIDE	0.015	0.002	2.26	0.137	1.
5	6.56	SULFATE	0.112	0.020	21.05	0.571	1.
6	7.06	NITRATE	0.076	0.014	14.23	0.121	1.
7	11.44	PHOSPHATE	0.021	0.005	5.60	0.138	1.
Total:			0.709	0.096	100.00	1.701	

2 STD2

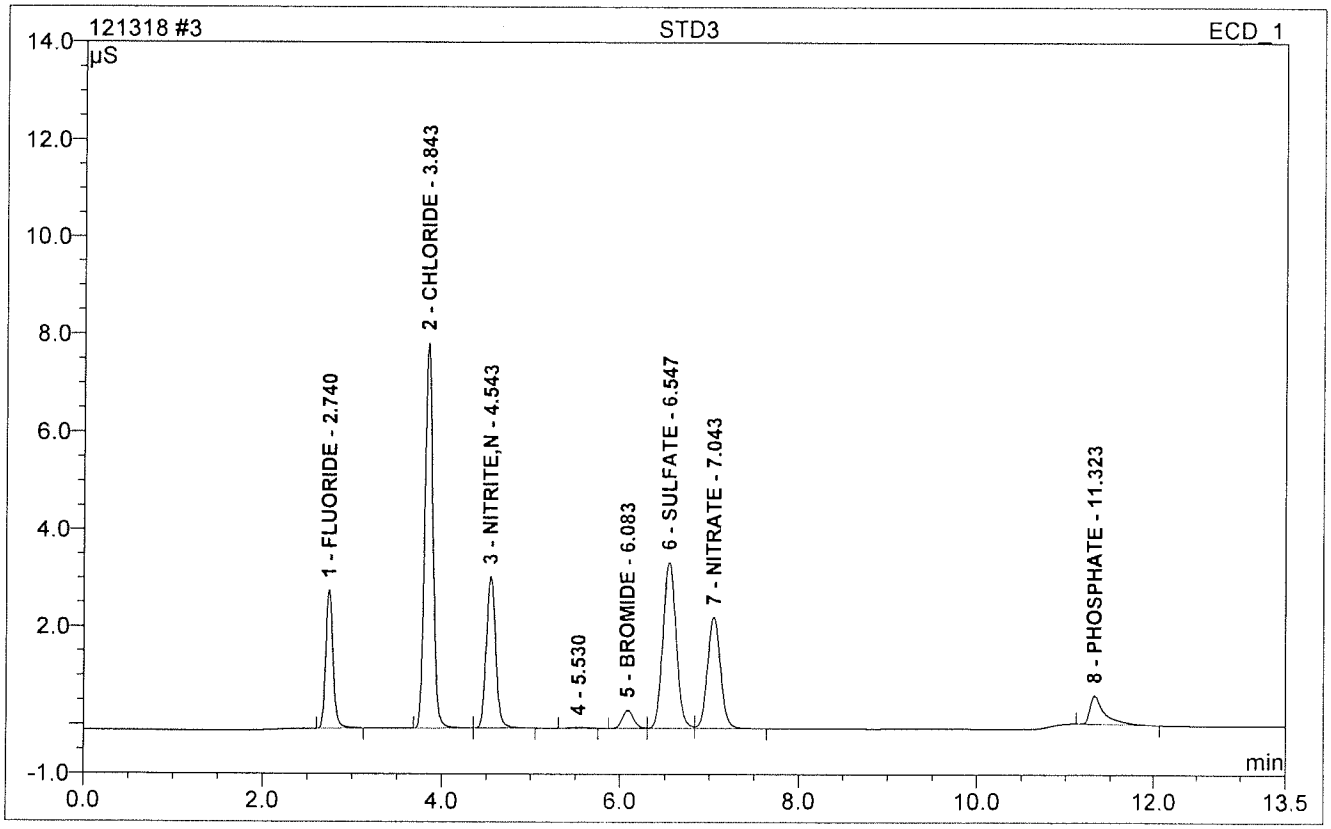
Sample Name:	**STD2**	*Injection Volume:*	**10.0**
Vial Number:	**92**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:07**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	0.474	0.046	10.15	0.359	1.
2	3.84	CHLORIDE	1.439	0.149	33.19	1.875	1.
3	4.54	NITRITE,N	0.535	0.064	14.31	0.366	1.
4	6.08	BROMIDE	0.063	0.010	2.13	0.348	1.
5	6.55	SULFATE	0.568	0.097	21.51	1.771	1.
6	7.05	NITRATE	0.361	0.062	13.74	0.341	1.
7	11.38	PHOSPHATE	0.083	0.022	4.97	0.367	1.
Total:			3.522	0.449	100.00	5.427	

3 STD3

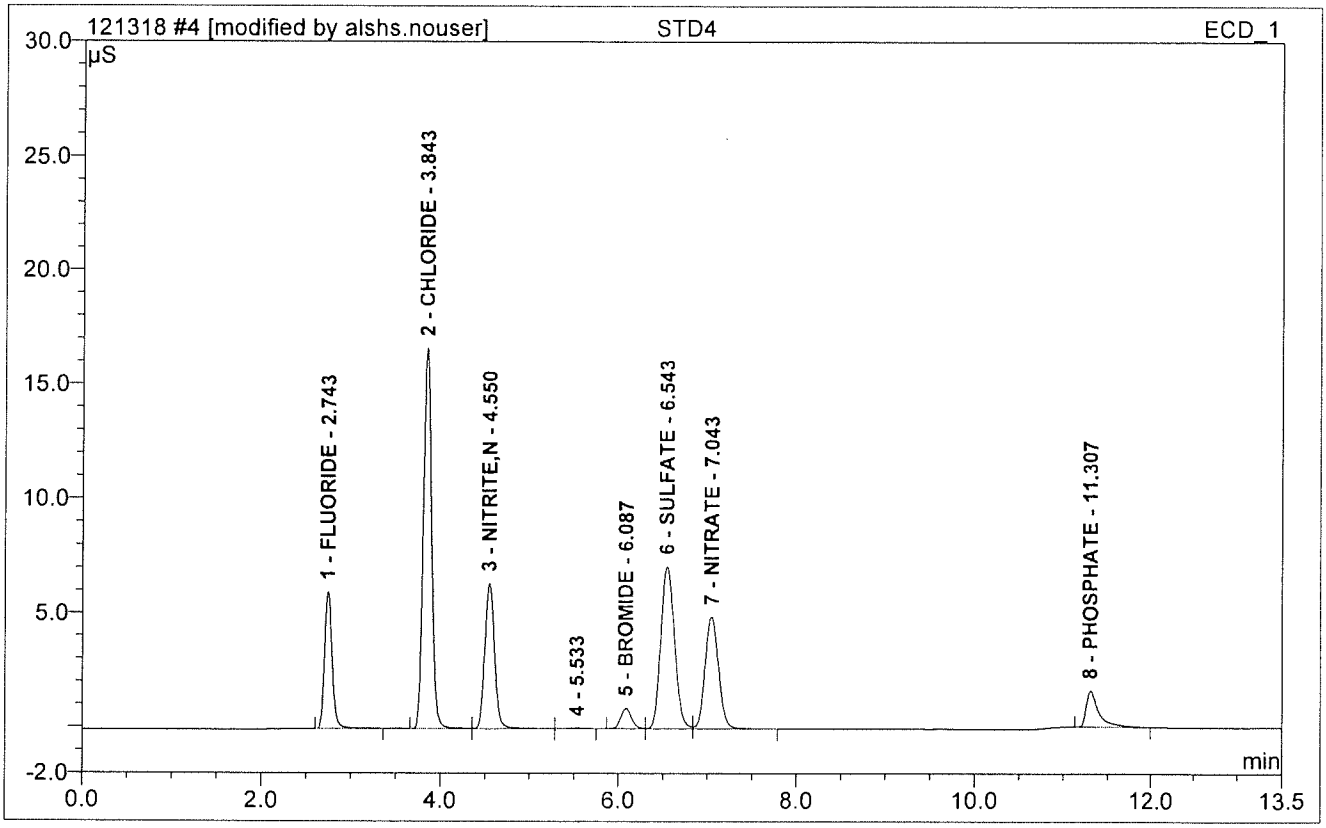
Sample Name:	**STD3**	*Injection Volume:*	**10.0**
Vial Number:	**93**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:21**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	2.841	0.270	10.24	1.964	1.
2	3.84	CHLORIDE	7.900	0.843	31.93	9.717	1.
3	4.54	NITRITE,N	3.116	0.382	14.47	2.062	1.
5	6.08	BROMIDE	0.372	0.054	2.05	1.614	1.
6	6.55	SULFATE	3.415	0.589	22.31	9.497	1.
7	7.04	NITRATE	2.279	0.388	14.71	1.837	1.
8	11.32	PHOSPHATE	0.580	0.109	4.15	1.542	1.
Total:			20.503	2.635	99.86	28.233	

4 STD4

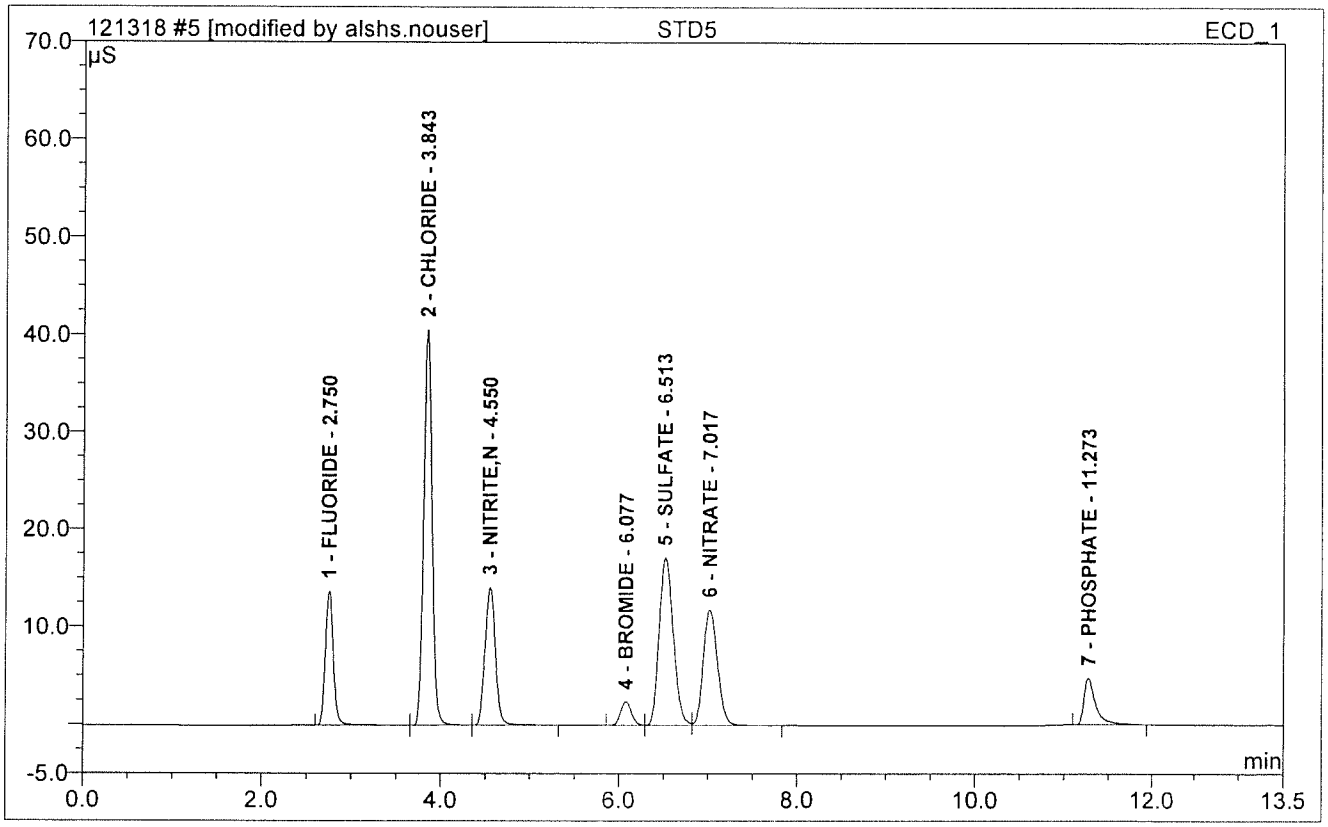
Sample Name:	**STD4**	*Injection Volume:*	**10.0**
Vial Number:	**94**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:36**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	6.010	0.591	10.29	4.251	1.
2	3.84	CHLORIDE	16.630	1.799	31.33	20.529	1.
3	4.55	NITRITE,N	6.372	0.816	14.22	4.383	1.
5	6.09	BROMIDE	0.887	0.126	2.20	3.675	1.
6	6.54	SULFATE	7.129	1.281	22.31	20.357	1.
7	7.04	NITRATE	4.918	0.866	15.08	4.025	1.
8	11.31	PHOSPHATE	1.568	0.258	4.49	3.545	1.
Total:			43.514	5.736	99.92	60.764	

5 STD5

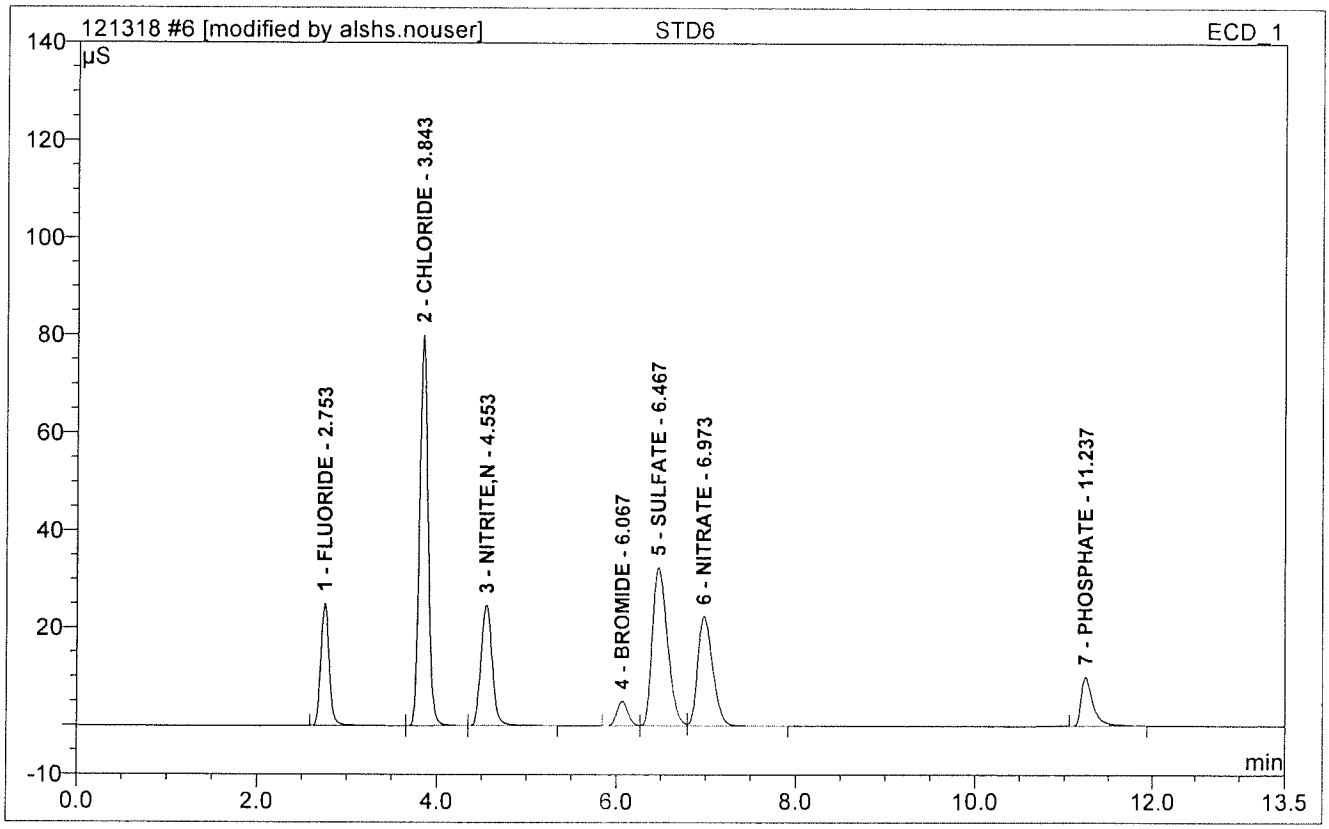
Sample Name:	**STD5**	*Injection Volume:*	**10.0**
Vial Number:	**95**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 16:50**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	13.744	1.431	10.06	10.252	1.
2	3.84	CHLORIDE	40.596	4.426	31.11	50.239	1.
3	4.55	NITRITE,N	14.095	1.927	13.54	10.316	1.
4	6.08	BROMIDE	2.438	0.346	2.43	9.945	1.
5	6.51	SULFATE	17.140	3.186	22.39	50.267	1.
6	7.02	NITRATE	11.863	2.183	15.35	10.062	1.
7	11.27	PHOSPHATE	4.736	0.728	5.12	9.884	1.
Total:			104.613	14.227	100.00	150.965	

6 STD6

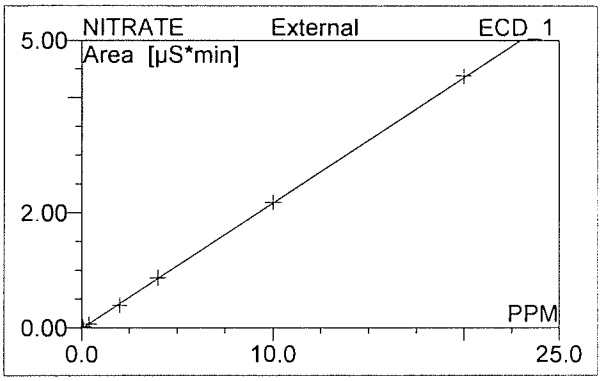
Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:05**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**

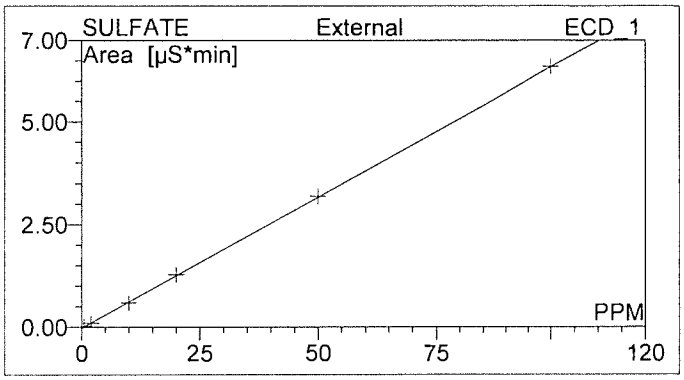


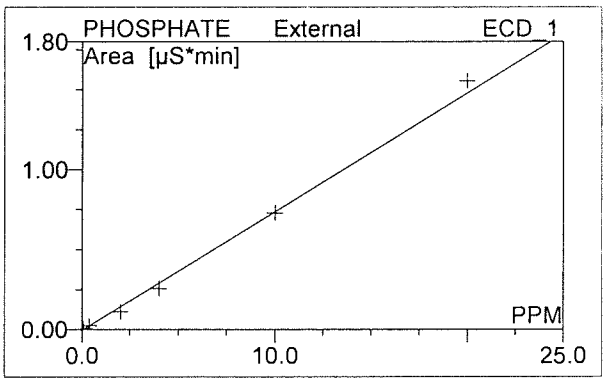
No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.75	FLUORIDE	25.094	2.735	9.72	19.570	1.
2	3.84	CHLORIDE	80.004	8.792	31.24	99.609	1.
3	4.55	NITRITE,N	24.712	3.604	12.80	19.277	1.
4	6.07	BROMIDE	5.012	0.727	2.58	20.782	1.
5	6.47	SULFATE	32.586	6.356	22.58	100.037	1.
6	6.97	NITRATE	22.506	4.377	15.55	20.113	1.
7	11.24	PHOSPHATE	10.023	1.553	5.52	21.023	1.
Total:			199.937	28.145	100.00	300.410	

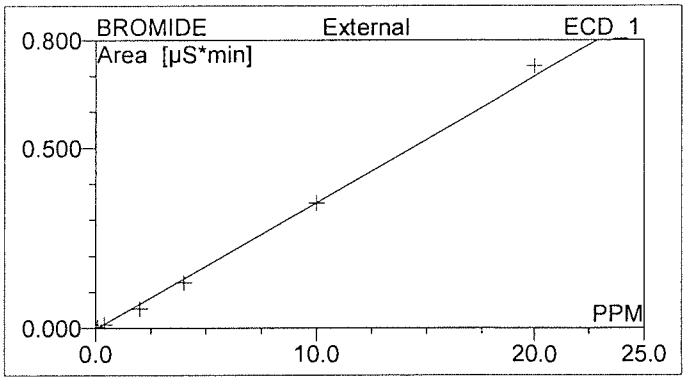
6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**###############**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**









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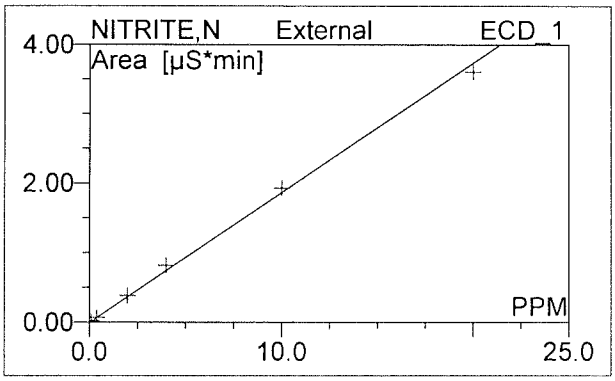
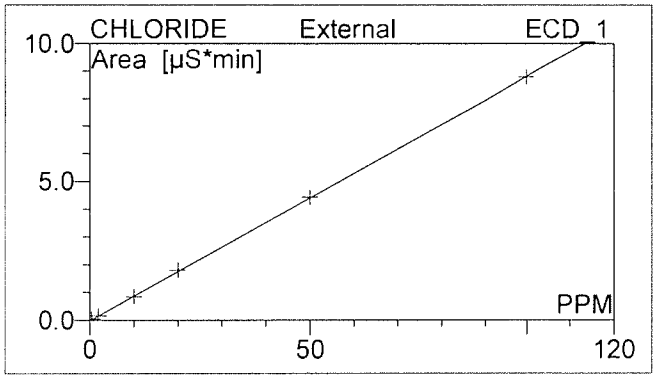
No.	Ret.Time min	Peak Name	Cal.Type	Points	Coeff.Det. %	Offset	Slope	Curve
1	2.75	FLUORIDE	XLOff	6	99.892	-0.0046	0.1400	0.000
2	3.84	CHLORIDE	XLOff	6	99.980	-0.0166	0.0884	0.000
3	4.55	NITRITE,N	XLOff	6	99.770	-0.0041	0.1872	0.000
4	6.07	BROMIDE	XLOff	6	99.551	-0.0026	0.0351	0.000
5	6.47	SULFATE	XLOff	6	99.959	-0.0162	0.0637	0.000
6	6.97	NITRATE	XLOff	6	99.919	-0.0128	0.2183	0.000
7	11.24	PHOSPHATE	XLOff	6	99.331	-0.0049	0.0741	0.000
Average:					99.7718	-0.0088	0.1153	0.0000

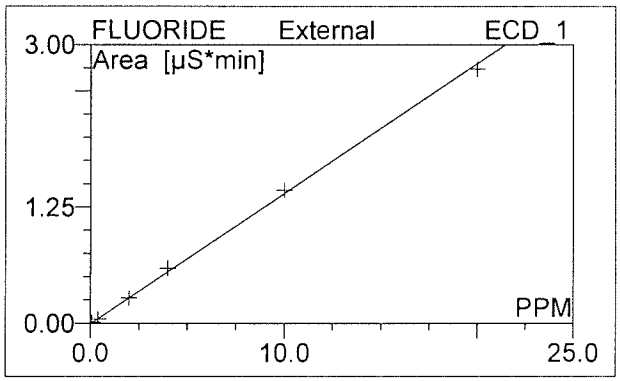
No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	RF-Value	Std.Dev.	RSD %
1	2.75	FLUORIDE	XLOff	6	99.946	7.143	0.009	15.424
2	3.84	CHLORIDE	XLOff	6	99.990	11.308	0.012	6.781
3	4.55	NITRITE,N	XLOff	6	99.885	5.343	0.017	21.923
4	6.07	BROMIDE	XLOff	6	99.775	28.489	0.005	35.074
5	6.47	SULFATE	XLOff	6	99.980	15.698	0.013	9.916
6	6.97	NITRATE	XLOff	6	99.959	4.582	0.012	14.239
7	11.24	PHOSPHATE	XLOff	6	99.665	13.491	0.012	41.812
Average:					99.8858	12.2932	0.0114	20.7385

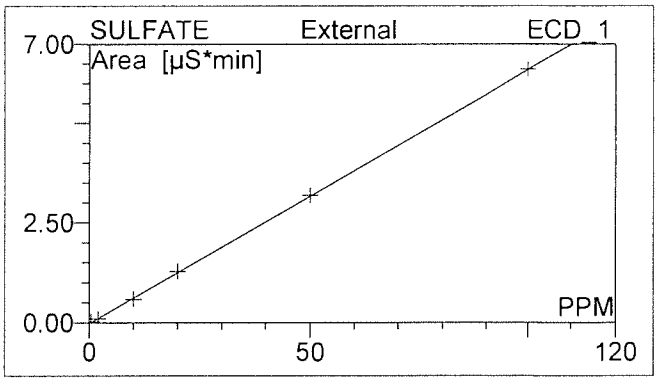
6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**10.0**
Vial Number:	**96**	*Channel:*	**ECD_1**
Sample Type:	**standard**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.000**
Recording Time:	**12/12/2018 17:05**	*Sample Weight/Volume:*	**1.000**
Run Time (min):	**13.50**	*Final Volume:*	**1.000**









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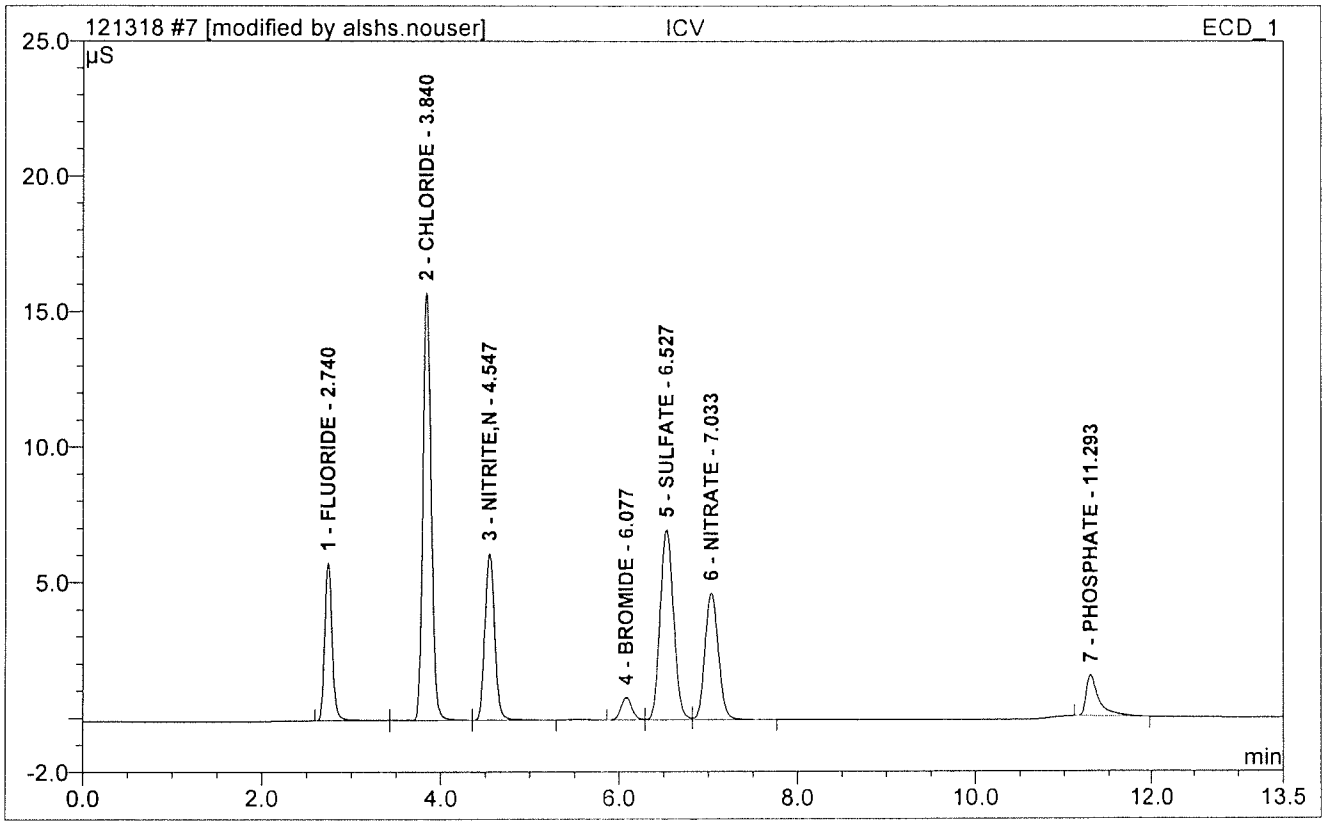
No.	Ret.Time min	Peak Name	Cal.Type	Points	Coeff.Det. %	Offset	Slope	Curve
1	2.75	FLUORIDE	XLOff	6	99.8920	-0.0046	0.1400	0.000
2	3.84	CHLORIDE	XLOff	6	99.9796	-0.0166	0.0884	0.000
3	4.55	NITRITE,N	XLOff	6	99.7703	-0.0041	0.1872	0.000
4	6.07	BROMIDE	XLOff	6	99.5513	-0.0026	0.0351	0.000
5	6.47	SULFATE	XLOff	6	99.9591	-0.0162	0.0637	0.000
6	6.97	NITRATE	XLOff	6	99.9189	-0.0128	0.2183	0.000
7	11.24	PHOSPHATE	XLOff	6	99.3314	-0.0049	0.0741	0.000
Average:					99.7718	-0.0088	0.1153	0.000

No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	RF-Value	Std.Dev.	RSD %
1	2.75	FLUORIDE	XLOff	6	99.946	7.143	0.009	15.424
2	3.84	CHLORIDE	XLOff	6	99.990	11.308	0.012	6.781
3	4.55	NITRITE,N	XLOff	6	99.885	5.343	0.017	21.923
4	6.07	BROMIDE	XLOff	6	99.775	28.489	0.005	35.074
5	6.47	SULFATE	XLOff	6	99.980	15.698	0.013	9.916
6	6.97	NITRATE	XLOff	6	99.959	4.582	0.012	14.239
7	11.24	PHOSPHATE	XLOff	6	99.665	13.491	0.012	41.812
Average:					99.8858	12.293	0.011	20.739

7 ICV

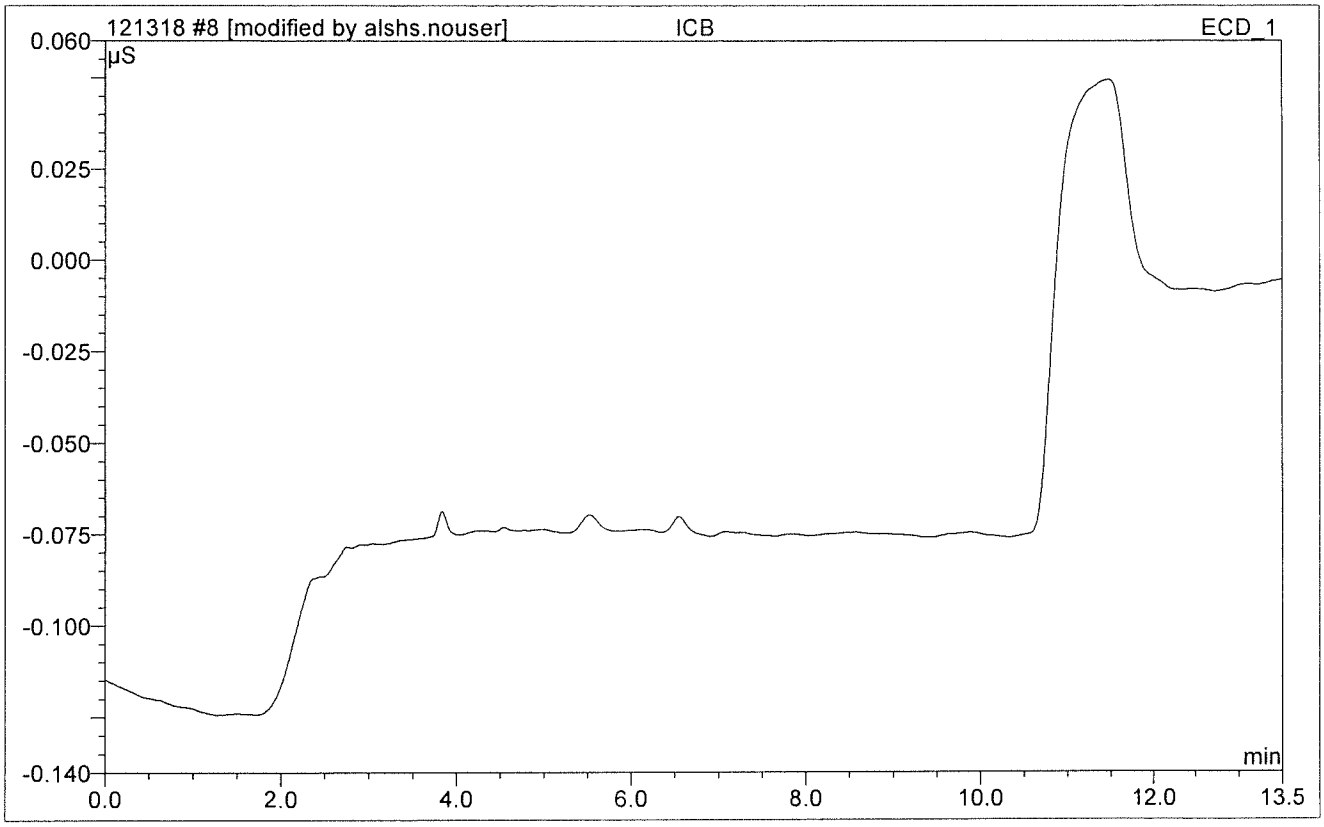
Sample Name:	**ICV**	*Injection Volume:*	**10.0**
Vial Number:	**97**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:19**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	5.803	0.572	10.40	4.119	1.
2	3.84	CHLORIDE	15.767	1.715	31.18	19.578	1.
3	4.55	NITRITE,N	6.151	0.786	14.30	4.224	1.
4	6.08	BROMIDE	0.844	0.120	2.19	3.506	1.
5	6.53	SULFATE	6.990	1.234	22.43	19.619	1.
6	7.03	NITRATE	4.677	0.820	14.90	3.813	1.
7	11.29	PHOSPHATE	1.523	0.252	4.58	3.465	1.
Total:			41.755	5.499	100.00	58.324	

8 ICB

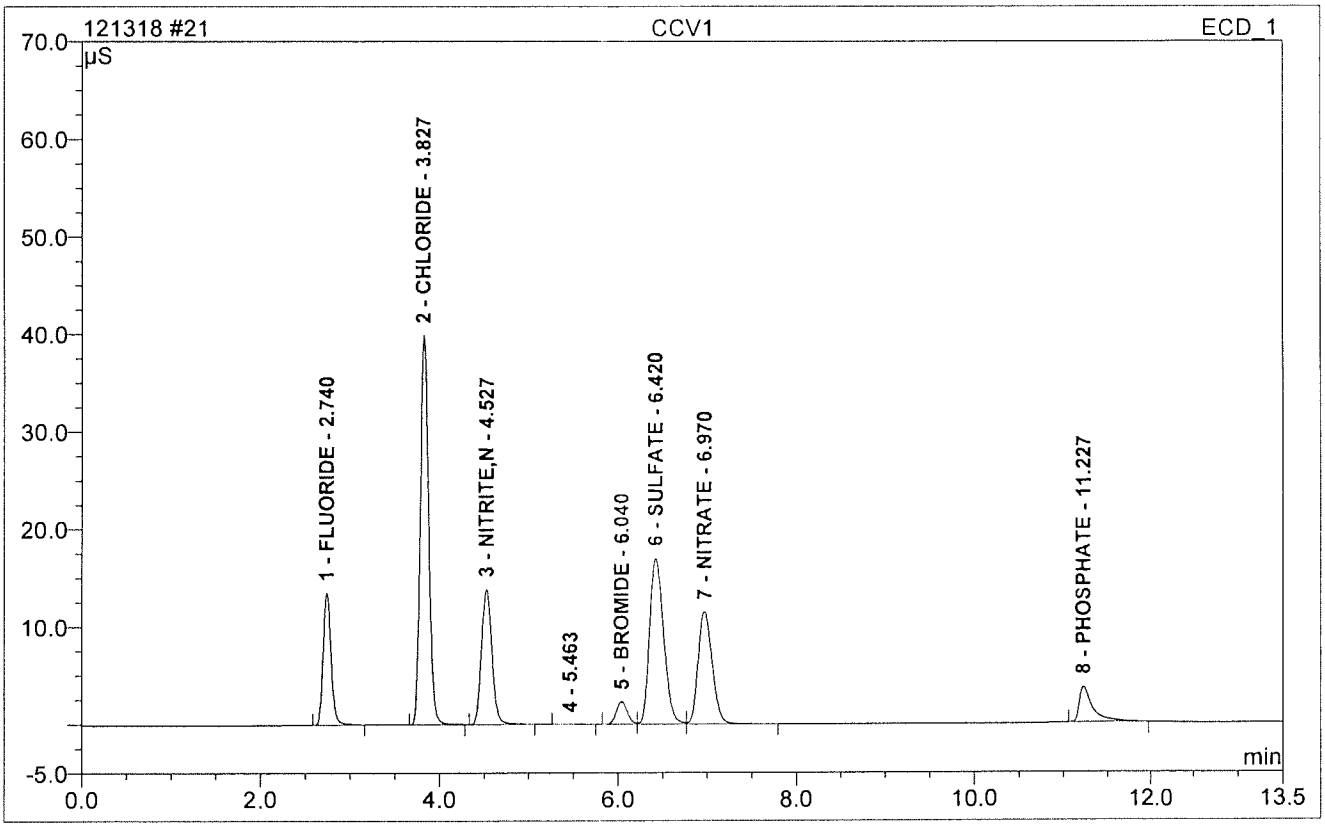
Sample Name:	**ICB**	*Injection Volume:*	**10.0**
Vial Number:	**98**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/12/2018 17:34**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

21 CCV1

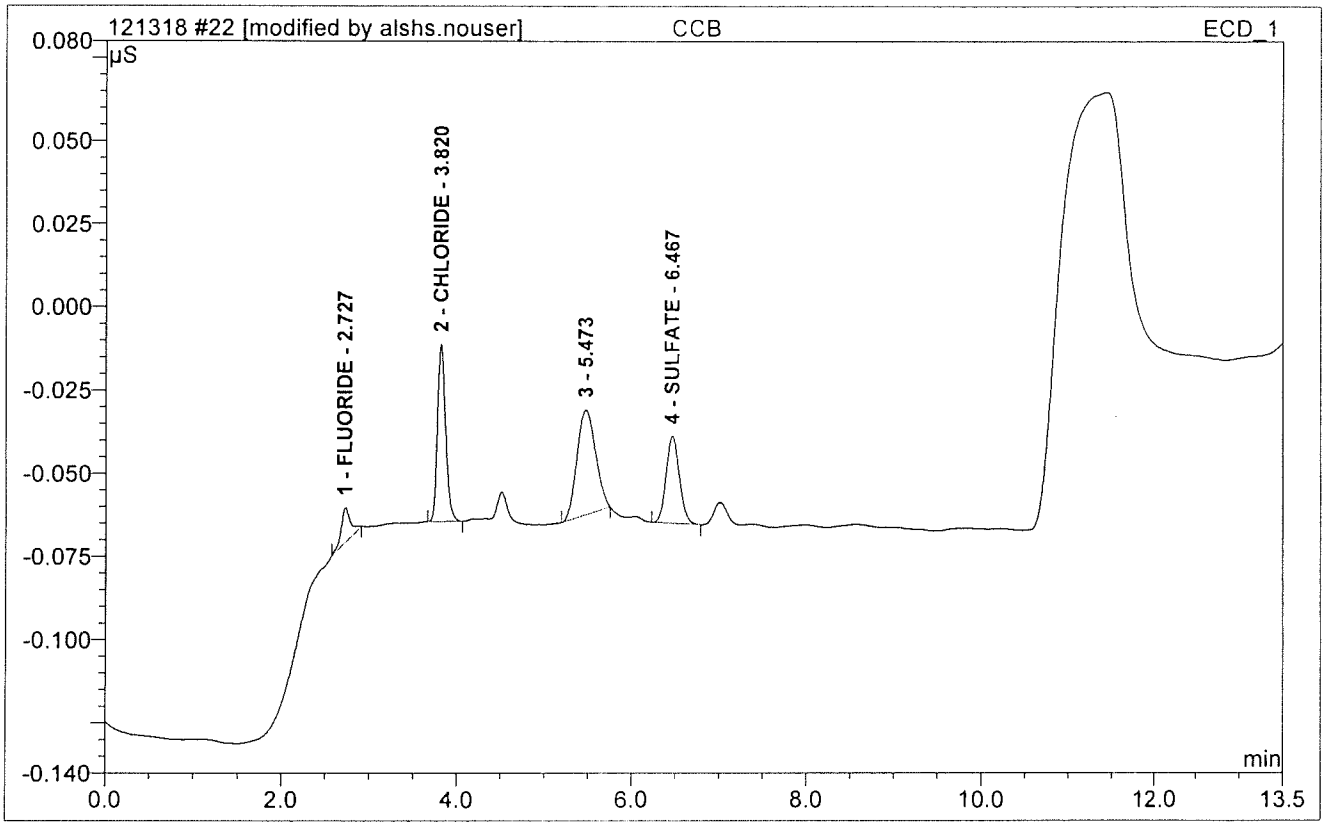
Sample Name:	**CCV1**	*Injection Volume:*	**10.0**
Vial Number:	**3**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 15:43**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	13.559	1.393	10.04	9.981	1.
2	3.83	CHLORIDE	39.956	4.347	31.33	49.341	1.
3	4.53	NITRITE,N	13.899	1.889	13.62	10.117	1.
5	6.04	BROMIDE	2.328	0.332	2.39	9.536	1.
6	6.42	SULFATE	17.031	3.132	22.58	49.421	1.
7	6.97	NITRATE	11.597	2.134	15.38	9.837	1.
8	11.23	PHOSPHATE	3.684	0.640	4.61	8.694	1.
Total:			102.053	13.867	99.96	146.927	

22 CCB

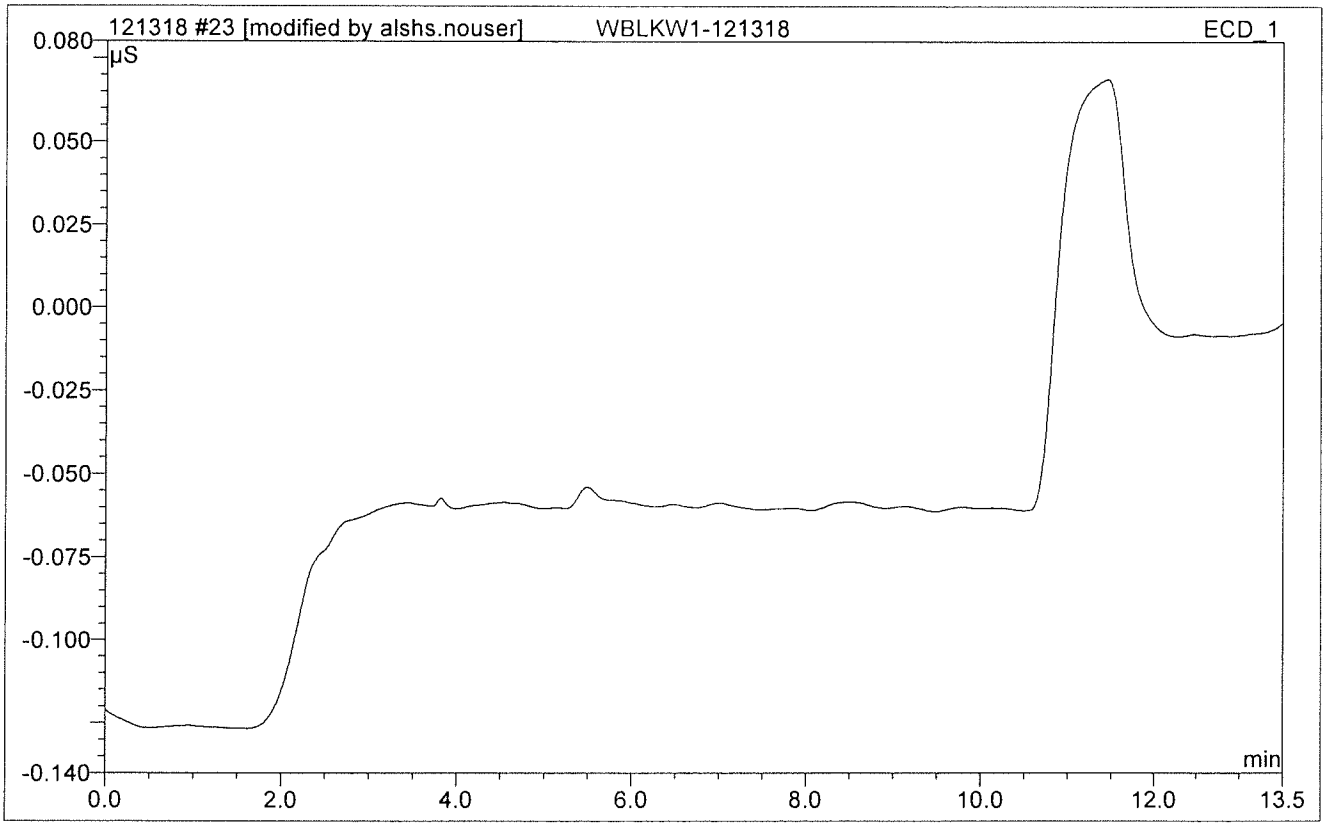
Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**4**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 15:57**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.010	0.001	6.29	0.042	1.
2	3.82	CHLORIDE	0.053	0.006	29.83	0.254	1.
4	6.47	SULFATE	0.026	0.005	24.07	0.328	1.
Total:			0.090	0.012	60.18	0.623	

23 WBLKW1-121318

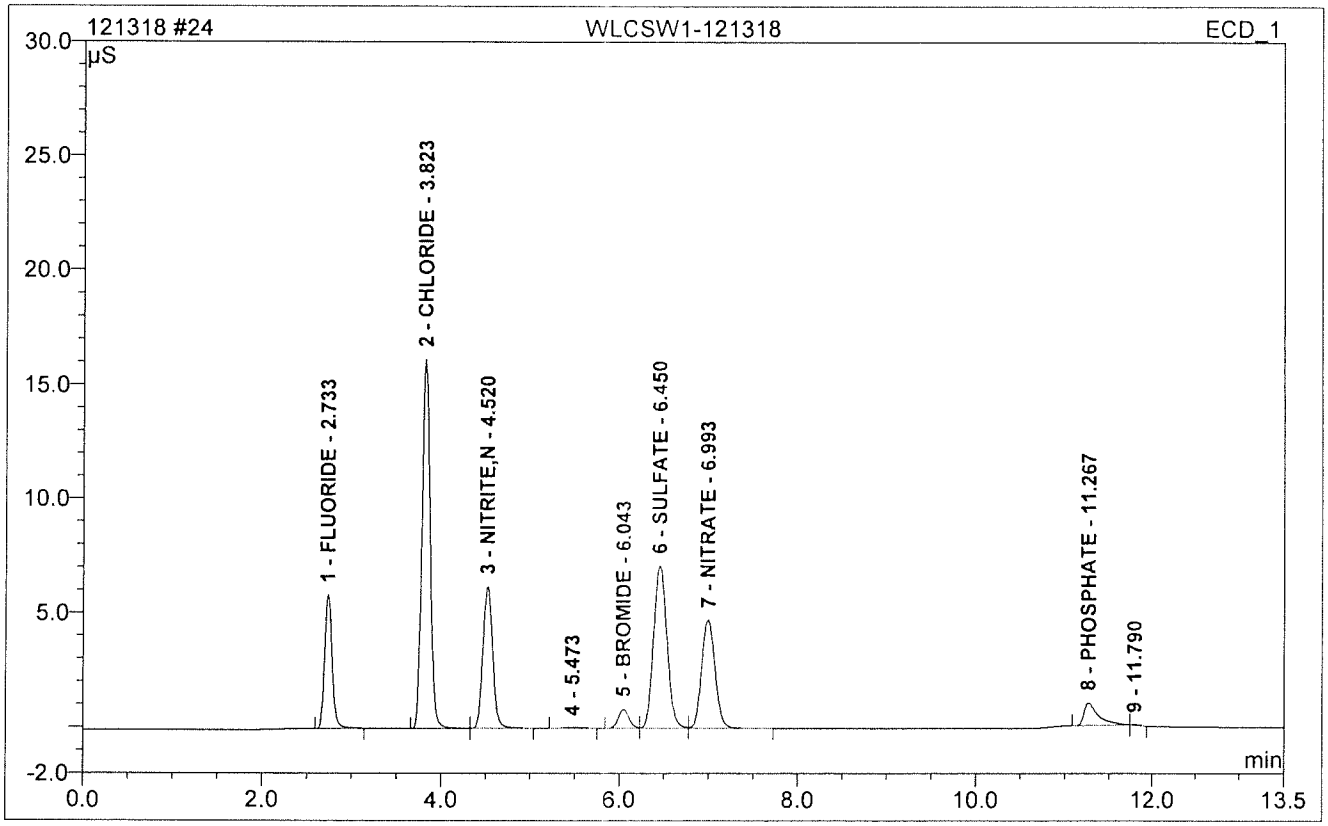
Sample Name:	**WBLKW1-121318**	*Injection Volume:*	**10.0**
Vial Number:	**21**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 16:12**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
Total:			0.000	0.000	0.00	0.000	

24 WLCSW1-121318

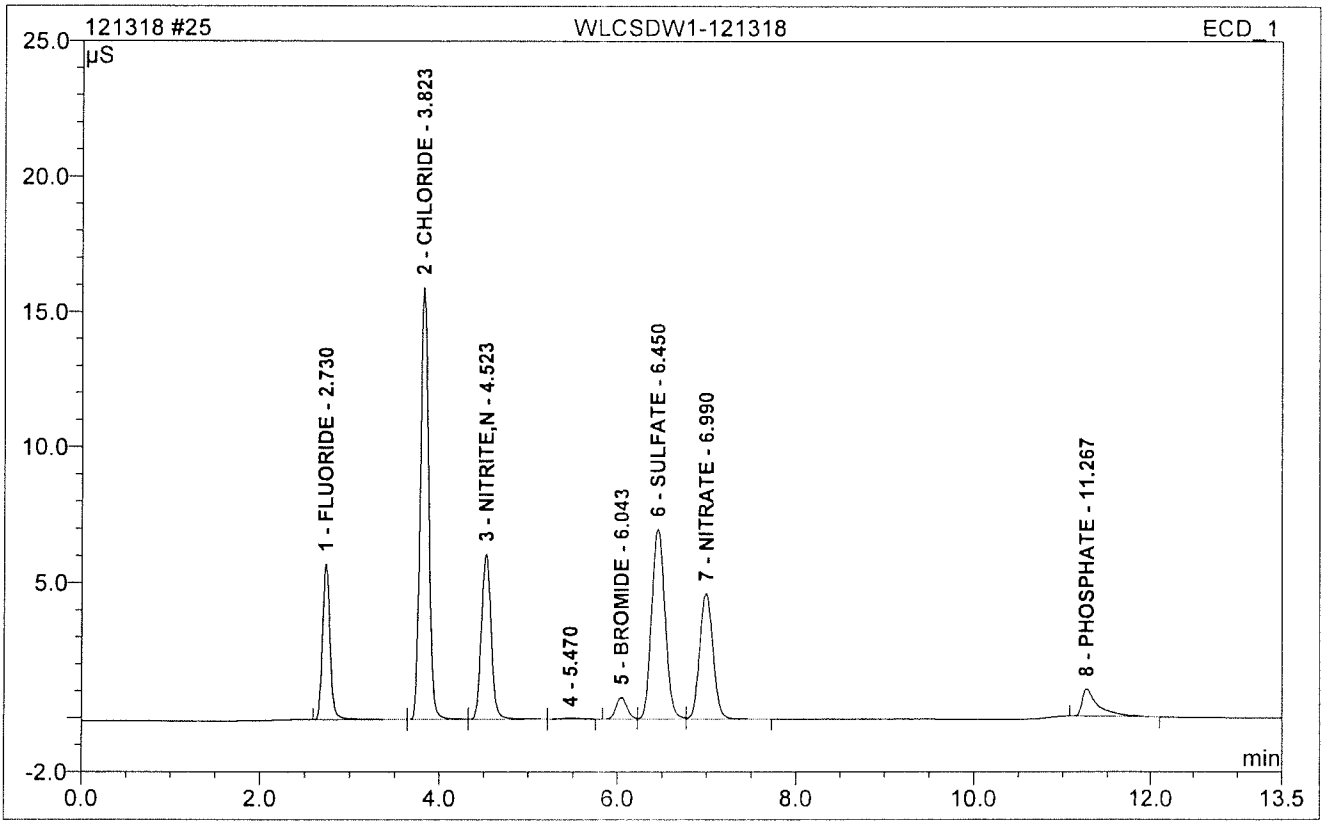
Sample Name:	**WLCSW1-121318**	*Injection Volume:*	**10.0**
Vial Number:	**22**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 16:26**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	5.834	0.569	10.38	4.101	1.
2	3.82	CHLORIDE	16.157	1.739	31.70	19.851	1.
3	4.52	NITRITE,N	6.180	0.787	14.35	4.228	1.
5	6.04	BROMIDE	0.828	0.118	2.15	3.428	1.
6	6.45	SULFATE	7.090	1.251	22.81	19.895	1.
7	6.99	NITRATE	4.732	0.825	15.05	3.840	1.
8	11.27	PHOSPHATE	0.988	0.183	3.34	2.537	1.
Total:			41.807	5.473	99.77	57.880	

25 WLCSDW1-121318

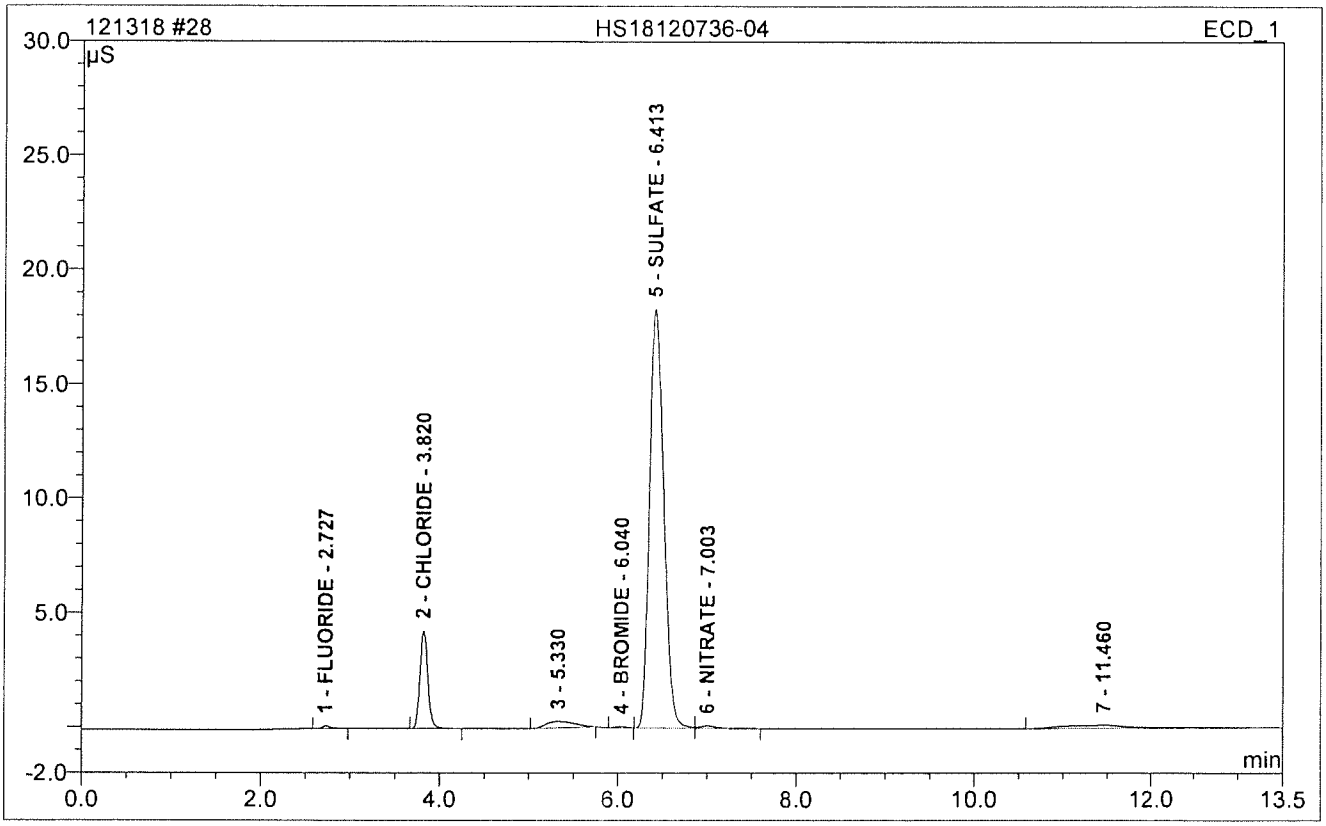
Sample Name:	**WLCSDW1-121318**	*Injection Volume:*	**10.0**
Vial Number:	**23**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 16:41**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	5.764	0.571	10.43	4.109	1.
2	3.82	CHLORIDE	15.977	1.726	31.54	19.706	1.
3	4.52	NITRITE,N	6.115	0.783	14.31	4.204	1.
5	6.04	BROMIDE	0.819	0.116	2.13	3.390	1.
6	6.45	SULFATE	7.032	1.238	22.62	19.688	1.
7	6.99	NITRATE	4.680	0.815	14.90	3.794	1.
8	11.27	PHOSPHATE	1.020	0.212	3.88	2.931	1.
Total:			41.407	5.462	99.81	57.822	

28 HS18120736-04

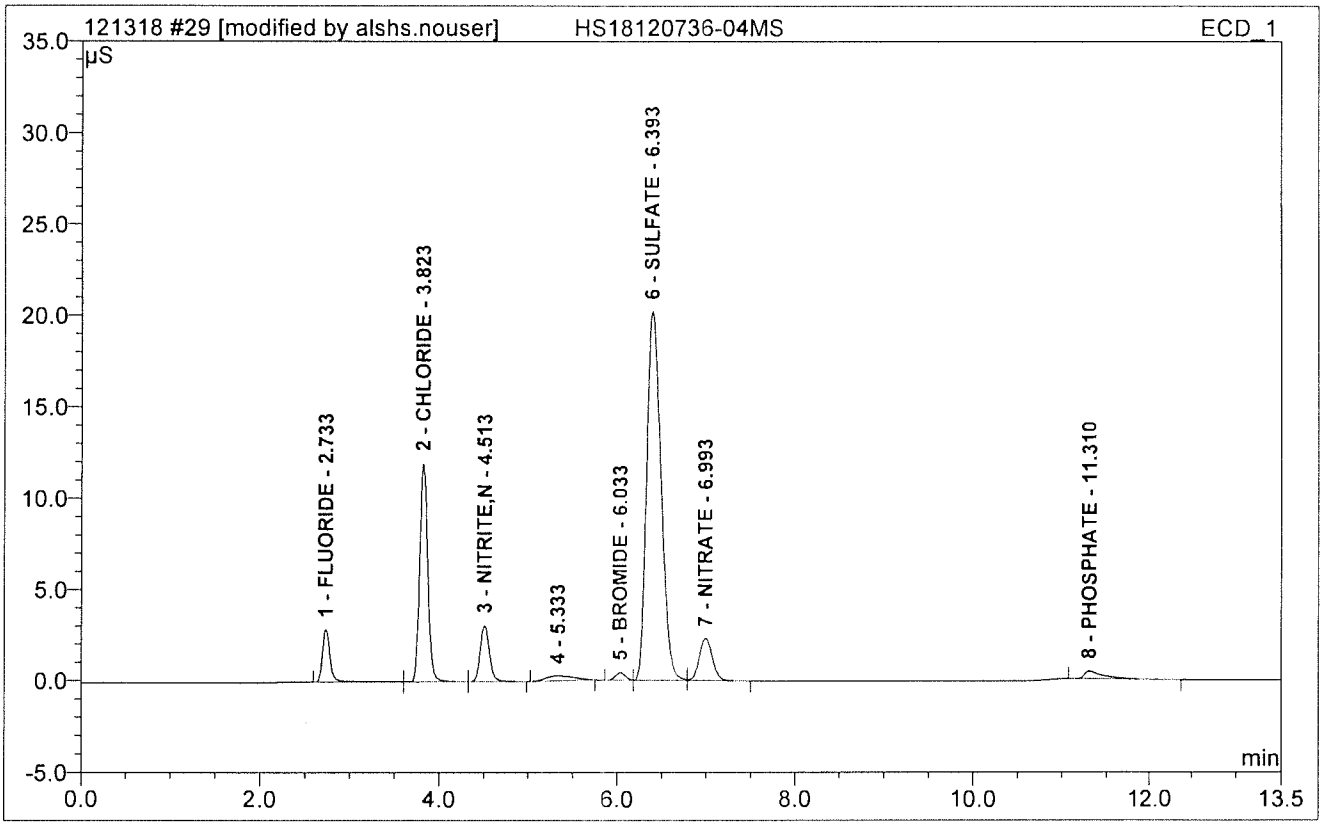
Sample Name:	**HS18120736-04**	*Injection Volume:*	**10.0**
Vial Number:	**30**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 17:25**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	0.119	0.013	0.31	0.123	1.
2	3.82	CHLORIDE	4.254	0.440	10.71	5.166	1.
4	6.04	BROMIDE	0.060	0.008	0.19	0.295	1.
5	6.41	SULFATE	18.307	3.387	82.39	53.420	1.
6	7.00	NITRATE	0.107	0.022	0.53	0.159	1.
Total:			22.846	3.869	94.12	59.163	

29 HS18120736-04MS

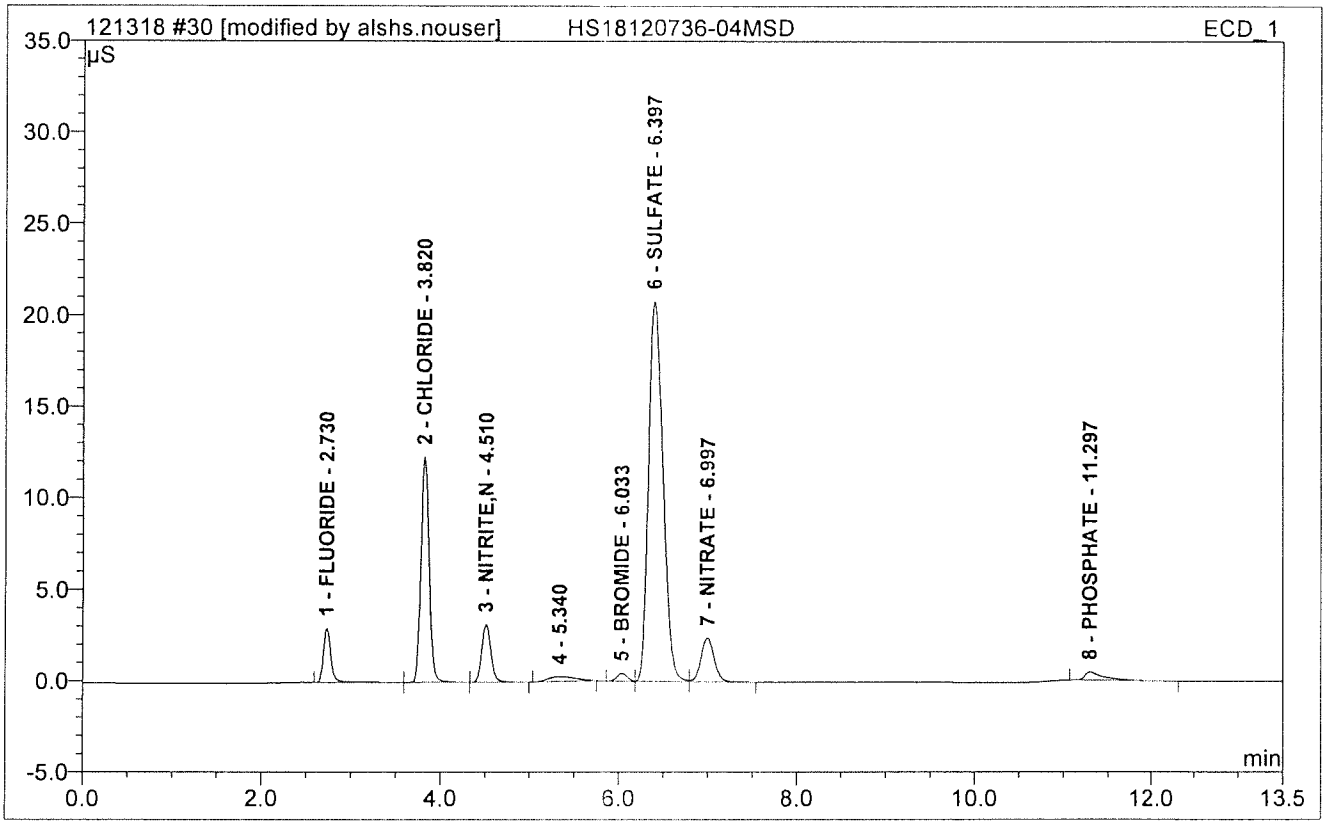
Sample Name:	**HS18120736-04MS**	*Injection Volume:*	**10.0**
Vial Number:	**31**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 17:39**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	2.885	0.281	4.39	2.040	1.
2	3.82	CHLORIDE	11.974	1.272	19.89	14.571	1.
3	4.51	NITRITE,N	3.092	0.368	5.75	1.988	1.
5	6.03	BROMIDE	0.416	0.056	0.88	1.674	1.
6	6.39	SULFATE	20.209	3.818	59.70	60.183	1.
7	6.99	NITRATE	2.327	0.398	6.23	1.884	1.
8	11.31	PHOSPHATE	0.422	0.103	1.61	1.451	1.
Total:			41.326	6.296	98.45	83.790	

30 HS18120736-04MSD

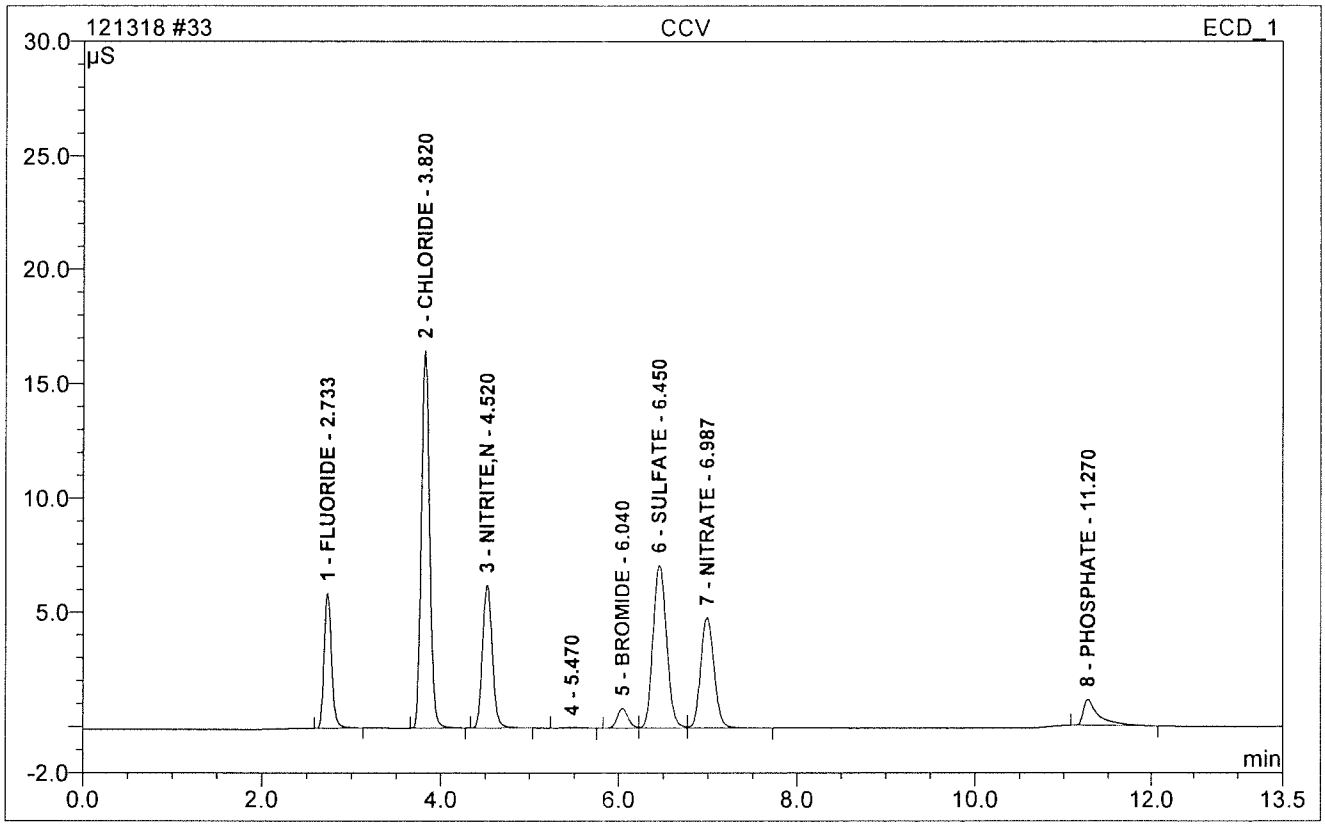
Sample Name:	**HS18120736-04MSD**	*Injection Volume:*	**10.0**
Vial Number:	**32**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 17:54**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	2.960	0.289	4.41	2.097	1.
2	3.82	CHLORIDE	12.293	1.307	19.92	14.967	1.
3	4.51	NITRITE,N	3.171	0.379	5.78	2.047	1.
5	6.03	BROMIDE	0.431	0.058	0.89	1.741	1.
6	6.40	SULFATE	20.774	3.910	59.59	61.632	1.
7	7.00	NITRATE	2.403	0.411	6.27	1.942	1.
8	11.30	PHOSPHATE	0.458	0.109	1.66	1.533	1.
Total:			42.490	6.463	98.51	85.961	

33 CCV

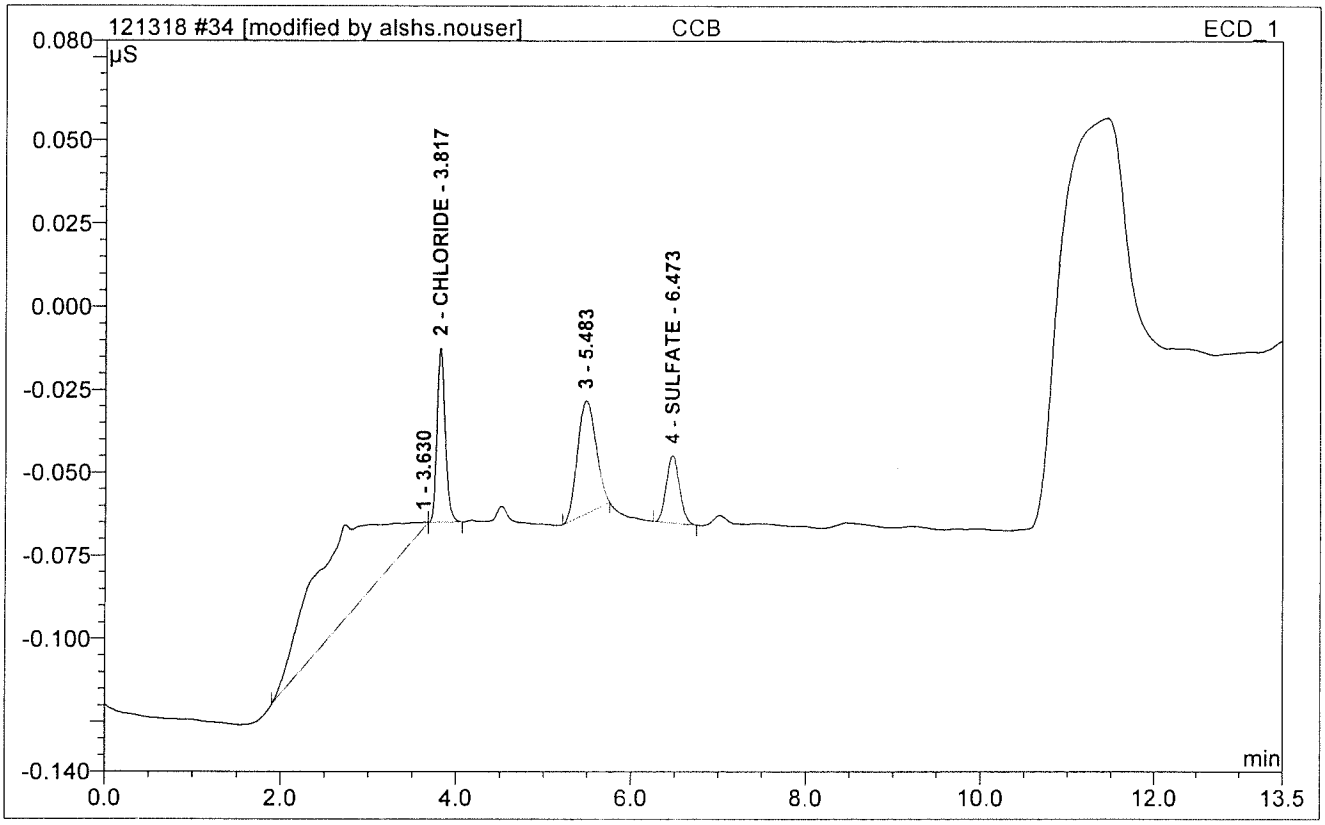
Sample Name:	**CCV**	*Injection Volume:*	**10.0**
Vial Number:	**1**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 18:37**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	5.902	0.575	10.28	4.139	1.
2	3.82	CHLORIDE	16.494	1.771	31.66	20.218	1.
3	4.52	NITRITE,N	6.262	0.794	14.20	4.266	1.
5	6.04	BROMIDE	0.854	0.121	2.16	3.519	1.
6	6.45	SULFATE	7.135	1.260	22.52	20.028	1.
7	6.99	NITRATE	4.828	0.843	15.07	3.921	1.
8	11.27	PHOSPHATE	1.132	0.225	4.02	3.096	1.
Total:			42.607	5.589	99.90	59.187	

34 CCB

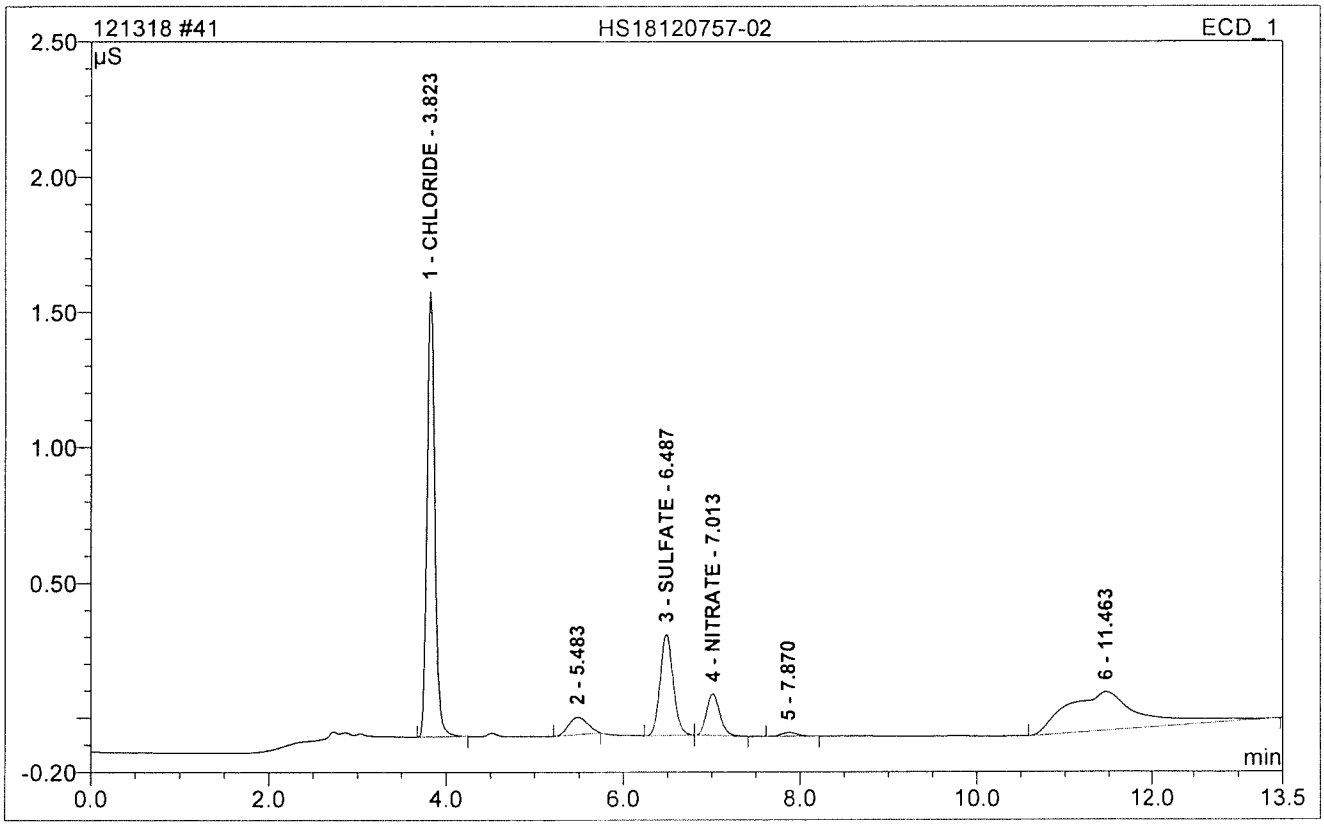
Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**2**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 18:52**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
2	3.82	CHLORIDE	0.053	0.006	12.77	0.253	1.
4	6.47	SULFATE	0.020	0.004	7.95	0.310	1.
Total:			0.073	0.009	20.72	0.563	

41 HS18120757-02

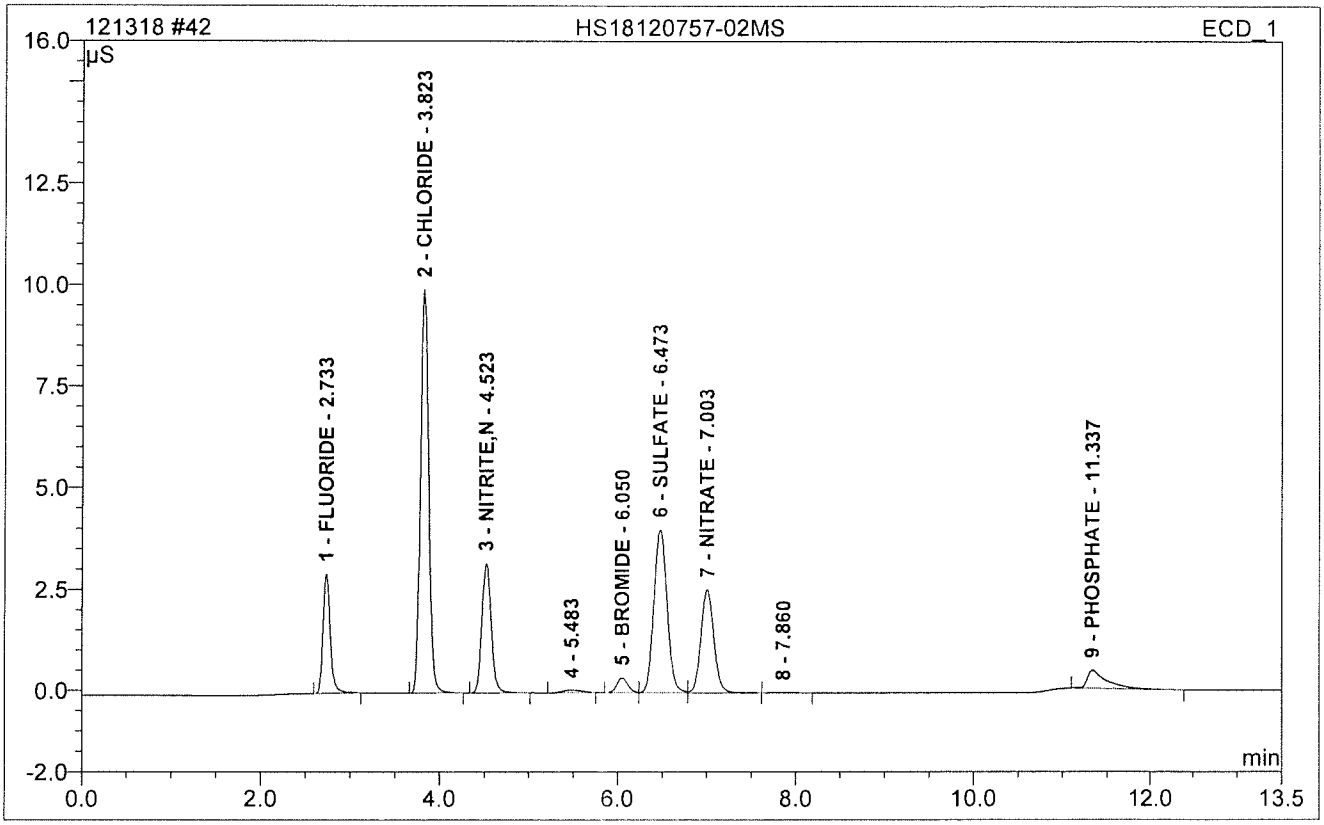
Sample Name:	**HS18120757-02**	*Injection Volume:*	**10.0**
Vial Number:	**38**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 21:06**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	3.82	CHLORIDE	1.647	0.170	40.54	2.107	1.
3	6.49	SULFATE	0.376	0.065	15.44	1.268	1.
4	7.01	NITRATE	0.155	0.027	6.39	0.181	1.
Total:			2.177	0.261	62.36	3.556	

42 HS18120757-02MS

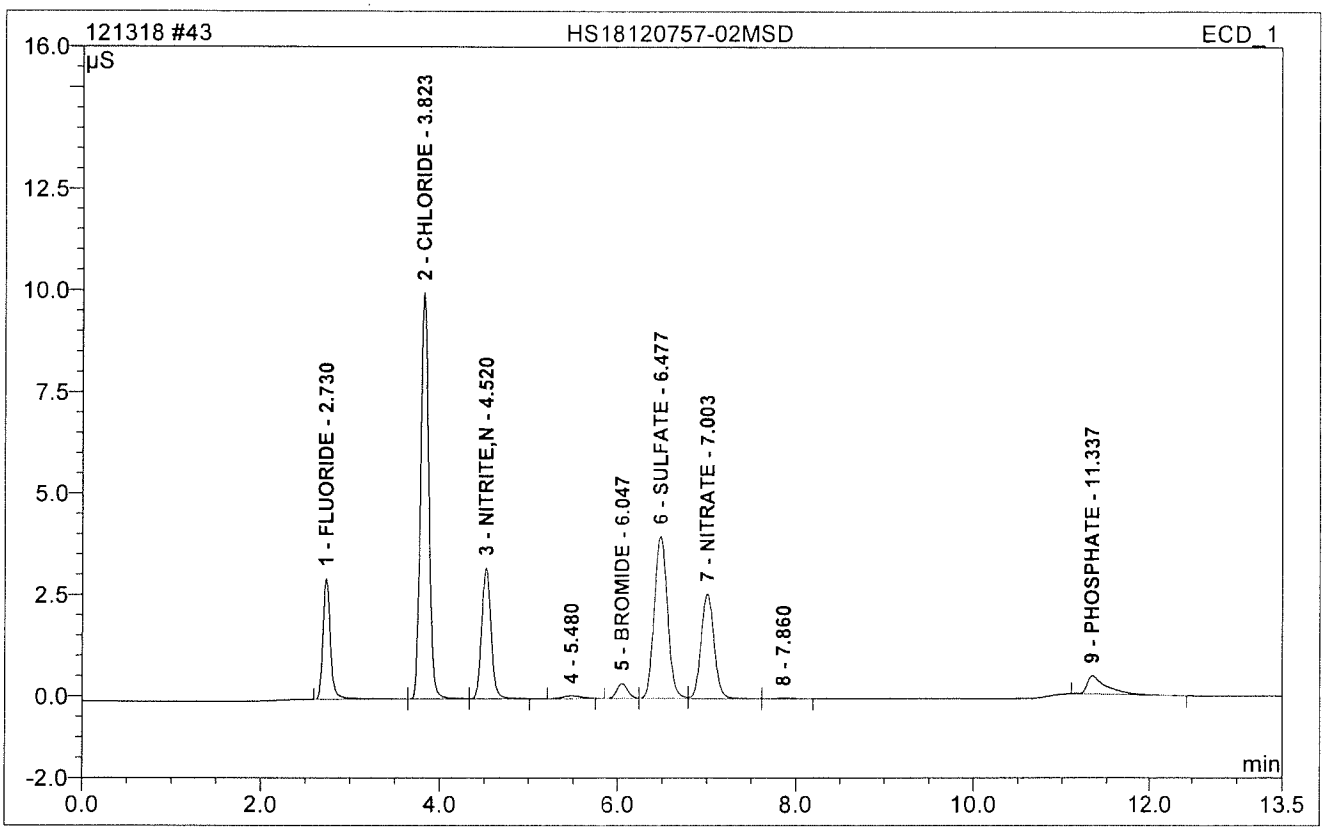
Sample Name:	**HS18120757-02MS**	*Injection Volume:*	**10.0**
Vial Number:	**39**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 21:21**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	2.953	0.284	9.28	2.064	1.
2	3.82	CHLORIDE	9.949	1.067	34.83	12.251	1.
3	4.52	NITRITE,N	3.199	0.392	12.81	2.117	1.
5	6.05	BROMIDE	0.374	0.054	1.76	1.610	1.
6	6.47	SULFATE	4.024	0.698	22.78	11.204	1.
7	7.00	NITRATE	2.560	0.438	14.29	2.063	1.
9	11.34	PHOSPHATE	0.451	0.111	3.62	1.560	1.
Total:			23.509	3.043	99.36	32.870	

43 HS18120757-02MSD

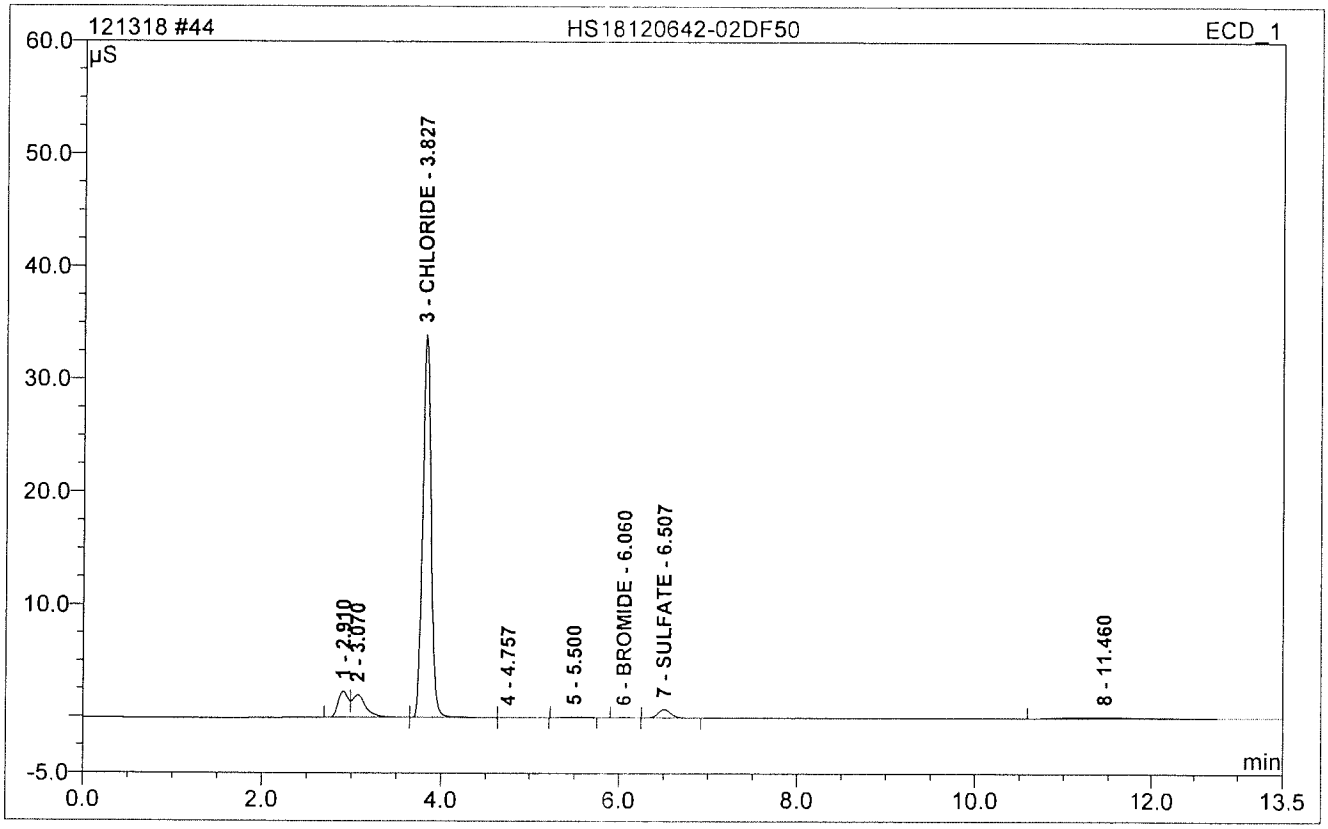
Sample Name:	**HS18120757-02MSD**	*Injection Volume:*	**10.0**
Vial Number:	**40**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 21:35**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.73	FLUORIDE	2.975	0.293	9.50	2.125	1.
2	3.82	CHLORIDE	10.006	1.072	34.78	12.306	1.
3	4.52	NITRITE,N	3.218	0.394	12.80	2.129	1.
5	6.05	BROMIDE	0.373	0.054	1.75	1.611	1.
6	6.48	SULFATE	3.997	0.699	22.67	11.220	1.
7	7.00	NITRATE	2.580	0.439	14.24	2.069	1.
9	11.34	PHOSPHATE	0.447	0.111	3.62	1.570	1.
Total:			23.596	3.062	99.37	33.029	

44 HS18120642-02DF50

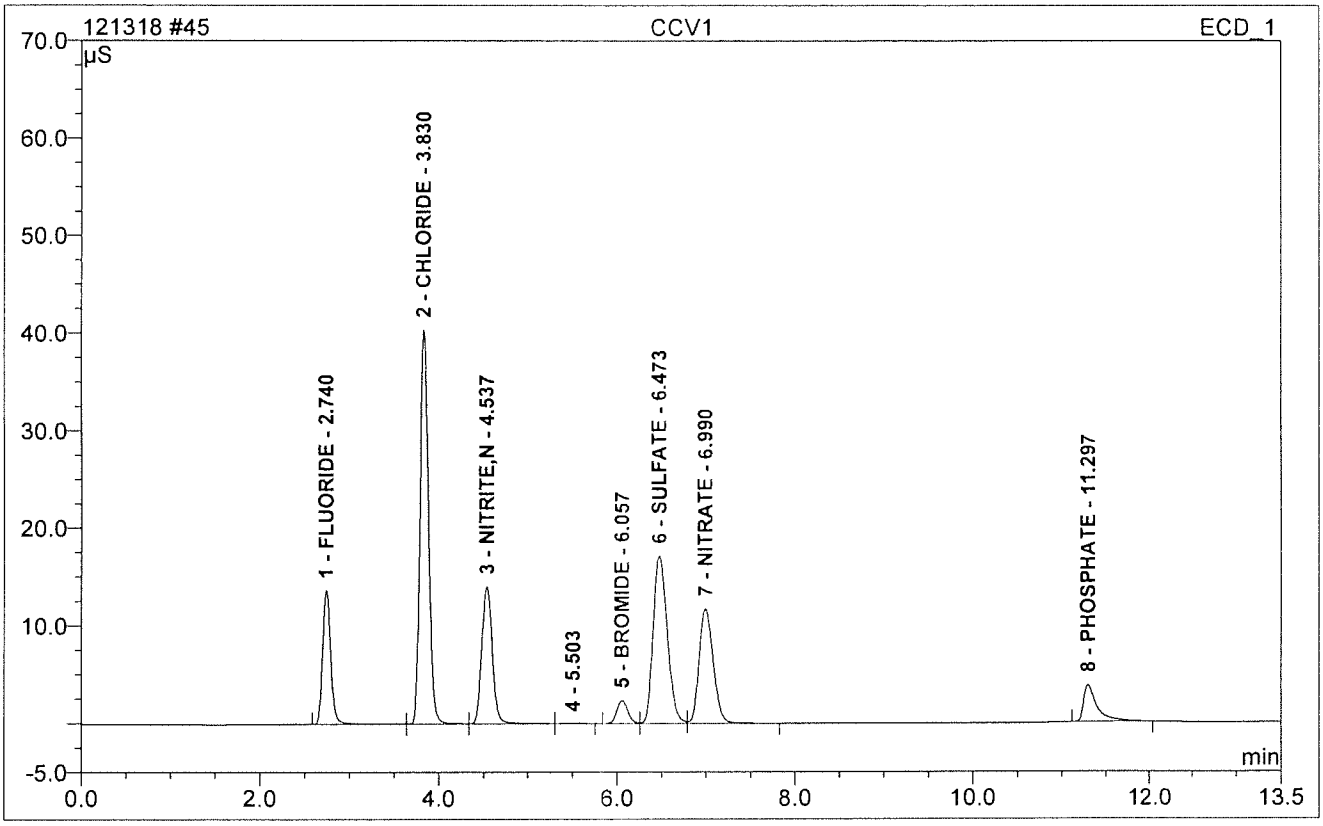
Sample Name:	**HS18120642-02DF50**	*Injection Volume:*	**10.0**
Vial Number:	**46**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**50.**
Recording Time:	**12/13/2018 21:50**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
3	3.83	CHLORIDE	34.036	3.738	79.80	2123.020	50.
6	6.06	BROMIDE	0.029	0.004	0.09	9.642	50.
7	6.51	SULFATE	0.761	0.129	2.74	113.605	50.
Total:			34.826	3.871	82.63	2246.267	

45 CCV1

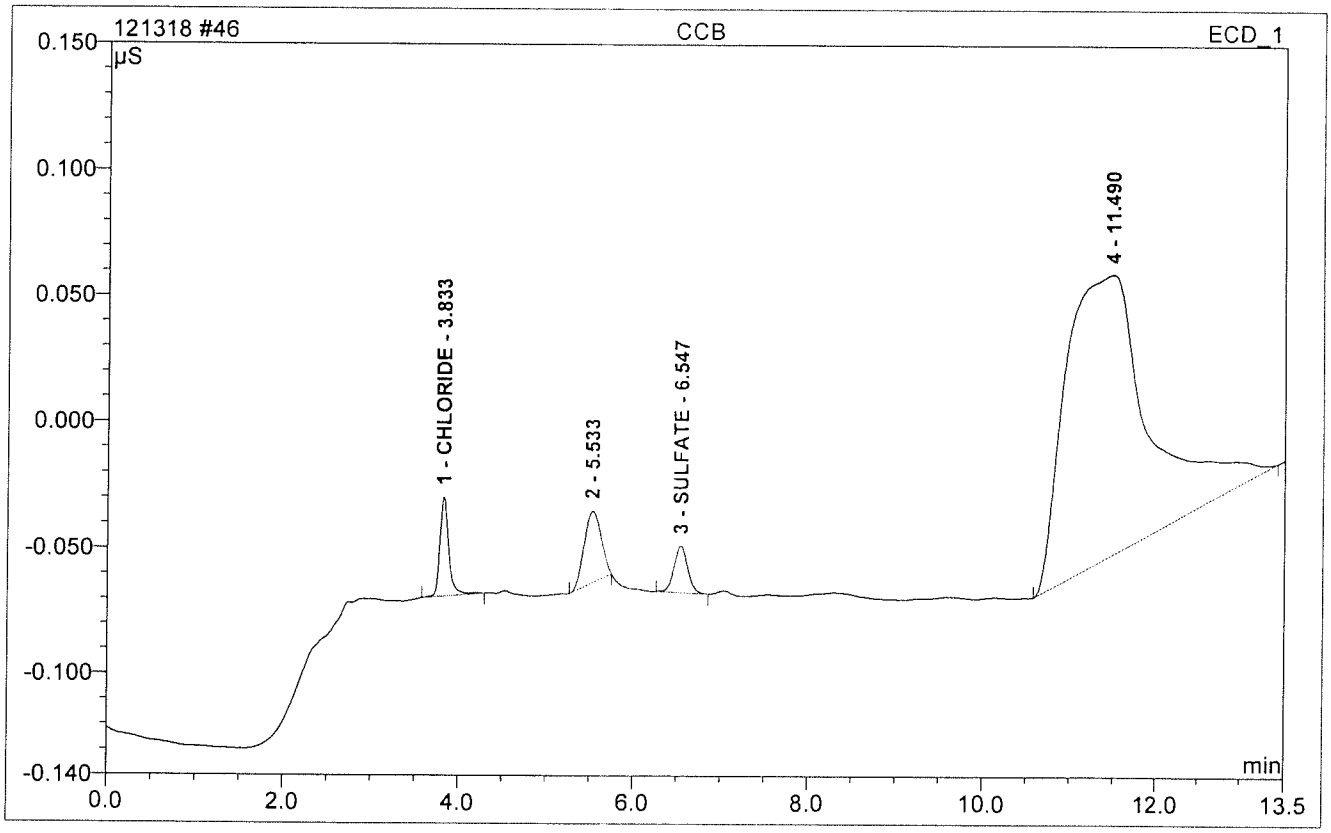
Sample Name:	**CCV1**	*Injection Volume:*	**10.0**
Vial Number:	**3**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 22:05**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	2.74	FLUORIDE	13.665	1.428	10.10	10.233	1.
2	3.83	CHLORIDE	40.386	4.423	31.29	50.206	1.
3	4.54	NITRITE,N	14.054	1.935	13.68	10.358	1.
5	6.06	BROMIDE	2.367	0.339	2.40	9.741	1.
6	6.47	SULFATE	17.142	3.178	22.48	50.142	1.
7	6.99	NITRATE	11.745	2.172	15.37	10.012	1.
8	11.30	PHOSPHATE	3.766	0.654	4.63	8.889	1.
Total:			103.127	14.130	99.94	149.582	

46 CCB

Sample Name:	**CCB**	*Injection Volume:*	**10.0**
Vial Number:	**4**	*Channel:*	**ECD_1**
Sample Type:	**unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Gradient Program**	*Bandwidth:*	**n.a.**
Quantif. Method:	**121218**	*Dilution Factor:*	**1.**
Recording Time:	**12/13/2018 22:19**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.50**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount PPM	Dil.Fac.
1	3.83	CHLORIDE	0.039	0.005	3.31	0.241	1.
3	6.55	SULFATE	0.019	0.003	2.40	0.307	1.
Total:			0.058	0.008	5.71	0.548	