LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 11

2023

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Longhorn Army Ammunition Plant

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LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 11

2023

A.	Title:	(Cont'd) Report—Final Eighth Annual Remedial Action Operation Report, LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, February 2023
	Author(s):	Department of the Army
	Recipient:	Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	February 27, 2023
	Bate Stamp:	01152049 – 01152881
B.	Title:	Minutes—Final Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant, January 18, 2023
	Author(s):	Department of the Army
	Recipient:	All Parties
	Date:	February 27, 2023
	Bate Stamp:	01152882 – 01152894
C.	Title:	Report—Year 8 Annual Remedial Action Operation Report (September 2021–August 2022), LHAAP-35A (58) Shops Area, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, March 2023
	Author(s):	Department of the Army
	Recipient:	Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	March 2, 2023
	Bate Stamp:	01152895 – 01154073

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

July 30, 2021

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

RE: HS21070435

Dear Ragen:

Enclosed are the results of the samples submitted to our laboratory on July 12, 2021. For your reference, these analyses have been assigned our service request number P2103703.

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

By Hayden Akers at 9:39 am, Jul 30, 2021

Hayden Akers
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: ALS Environmental - US
Project: HS21070435

Service Request No: P2103703

CASE NARRATIVE

The samples were received intact under chain of custody on July 12, 2021 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.

LCS recovery biased low below DoD requirements, recoveries and RPD within laboratory generated limits. MS/MSD recoveries biased high above DoD requirements, sample concentration high to begin with.

Methane, Ethene and Ethane Analysis

The samples were 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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

The following samples have been manually integrated.

Sample	Analyte
P2103703-001	Ethylene, Ethane
P2103703-002	Ethylene, Ethane
P2103703-003	Ethylene, Ethane
P2103703-004	Ethylene, Ethane
P2103703-005 MSD	Methane

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.

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Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

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	1776326
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	4068-008
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	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
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 Environmental - US
Service Request: P2103703
Project ID: HS21070435

Date Received: 7/12/2021
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW14-210708	P2103703-001	Water	7/8/2021	07:10	X	X
50WW13-210708	P2103703-002	Water	7/8/2021	07:55	X	X
50WW11-210708	P2103703-003	Water	7/8/2021	08:45	X	X
50WW11-210708-FD	P2103703-004	Water	7/8/2021	08:45	X	X
50WW06-210708	P2103703-005	Water	7/8/2021	09:40	X	X
50WW12-210708	P2103703-006	Water	7/8/2021	10:40	X	X

R10 3705

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

SAMPLING STATE: **Dept of Defense** **COC ID:** **16469**

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:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS21070435
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21070435-04**	**50WW14-210708**	**Water**	**08 Jul 2021 07:10**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	23 Jul 2021
2.	**HS21070435-05**	**50WW13-210708**	**Water**	**08 Jul 2021 07:55**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	23 Jul 2021
3.	**HS21070435-06**	**50WW11-210708**	**Water**	**08 Jul 2021 08:45**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	23 Jul 2021
4.	**HS21070435-07**	**50WW11-210708-FD**	**Water**	**08 Jul 2021 08:45**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	23 Jul 2021
5.	**HS21070435-08**	**50WW06-210708**	**Water**	**08 Jul 2021 09:40**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	23 Jul 2021
6.	**HS21070435-09**	**50WW12-210708**	**Water**	**08 Jul 2021 10:40**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	23 Jul 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS21070435-08 MS/MSD

R2103703

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **16469**

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mynard	Date/Time:	7/09/21 18:00
Received By:		Date/Time:	7-12-21 0930
Cooler ID(s):		Temperature(s):	20° C

ALS Environmental
Sample Acceptance Check Form

Client: ALS Environmental - US Work order: P2103703

Project: HS21070435

Sample(s) received on: 7/12/21 Date opened: 7/12/21 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: 20° C Blank Temperature: ° C	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
P2103703-001.01	40mL VOA NP		7		A	CB 7/19/21
P2103703-001.02	40mL VOA NP				A	
P2103703-001.03	40mL VOA NP				A	
P2103703-001.04	40ml VOA HCL		1		A	CB 7/20/21
P2103703-001.05	40ml VOA HCL				A	
P2103703-001.06	40ml VOA HCL				A	
P2103703-002.01	40mL VOA NP		6		A	CB 7/19/21
P2103703-002.02	40mL VOA NP				A	
P2103703-002.03	40mL VOA NP				A	
P2103703-002.04	40ml VOA HCL		1		A	CB 7/20/21
P2103703-002.05	40ml VOA HCL				A	
P2103703-002.06	40ml VOA HCL				A	
P2103703-003.01	40mL VOA NP		6		A	CB 7/19/21
P2103703-003.02	40mL VOA NP				A	
P2103703-003.03	40mL VOA NP				A	

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 Environmental - US Work order: P2103703

Project: HS21070435

Sample(s) received on: 7/12/21 Date opened: 7/12/21 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2103703-003.04	40ml VOA HCL		1		A	CB 7/20/21
P2103703-003.05	40ml VOA HCL				A	
P2103703-003.06	40ml VOA HCL				A	
P2103703-004.01	40mL VOA NP		6		A	CB 7/19/21
P2103703-004.02	40mL VOA NP				A	
P2103703-004.03	40mL VOA NP				A	
P2103703-004.04	40ml VOA HCL		1		A	CB 7/20/21
P2103703-004.05	40ml VOA HCL				A	
P2103703-004.06	40ml VOA HCL				A	
P2103703-005.01	40mL VOA NP		7		A	CB 7/19/21
P2103703-005.02	40mL VOA NP				A	
P2103703-005.03	40mL VOA NP				A	
P2103703-005.04	40ml VOA HCL		1		A	CB 7/20/21
P2103703-005.05	40ml VOA HCL		1		A	CB 7/20/21
P2103703-005.06	40ml VOA HCL		1		A	CB 7/20/21
P2103703-005.07	40ml VOA HCL				A	
P2103703-005.08	40ml VOA HCL				A	
P2103703-005.09	40ml VOA HCL				A	
P2103703-005.10	40ml VOA HCL				A	
P2103703-005.11	40ml VOA HCL				A	
P2103703-005.12	40ml VOA HCL				A	
P2103703-005.13	40mL VOA NP				A	
P2103703-005.14	40mL VOA NP				A	
P2103703-005.15	40mL VOA NP				A	
P2103703-005.16	40mL VOA NP		6		A	CB 7/19/21
P2103703-005.17	40mL VOA NP		6		A	CB 7/19/21
P2103703-005.18	40mL VOA NP				A	
P2103703-006.01	40mL VOA NP		6		A	CB 7/19/21
P2103703-006.02	40mL VOA NP				A	
P2103703-006.03	40mL VOA NP				A	
P2103703-006.04	40ml VOA HCL		1		A	CB 7/20/21
P2103703-006.05	40ml VOA HCL				A	
P2103703-006.06	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 Environmental - US**
Client Project ID: **HS21070435** ALS Project ID: P2103703

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD Date(s) Collected: 7/8/21
Analyst: Connor Barrett Date Received: 7/12/21
Matrix: Liquid Date Analyzed: 7/19/21
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
50WW14-210708	P2103703-001	0.10	**490,000**	1,000	860	370	
50WW13-210708	P2103703-002	0.10	**330,000**	1,000	860	370	
50WW11-210708	P2103703-003	0.10	**730,000**	1,000	860	370	
50WW11-210708-FD	P2103703-004	0.10	**570,000**	1,000	860	370	
50WW06-210708	P2103703-005	0.10	**170,000**	1,000	860	370	
50WW12-210708	P2103703-006	0.10	**570,000**	1,000	860	370	
Method Control Sample	P210719-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 Environmental - US**
Client Sample ID: **50WW06-210708**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P2103703-005MS
P2103703-005DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Connor Barrett
Matrix: Liquid
Test Notes:

Date Collected: 7/8/21
Date Received: 7/12/21
Date Analyzed: 7/19/21
Volume(s) Analyzed: 0.10 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	22,900	166,000	304,000	298,000	**603**	**576**	80-122	5	30	**N**

N = The matrix spike sample recovery is not within control limits. See case narrative.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Environmental - US**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2103703
Client Project ID: **HS21070435** ALS Sample ID: P210719-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Connor Barrett Date Analyzed: 7/19/21
Matrix: Liquid 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	16,800	18,500	**73**	**81**	80-122	10	12	**L**

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.
L = Laboratory control sample recovery outside the specified limits, results may be biased low.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Environmental - US**
Client Sample ID: **50WW14-210708**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P2103703-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 7/8/21
Date Received: 7/12/21
Date Analyzed: 7/20/21
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	**1.6**	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 Environmental - US**
Client Sample ID: **50WW13-210708**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P2103703-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 7/8/21
Date Received: 7/12/21
Date Analyzed: 7/20/21
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	**1.6**	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 Environmental - US**
Client Sample ID: **50WW11-210708**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P2103703-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 7/8/21
Date Received: 7/12/21
Date Analyzed: 7/20/21
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	**2.2**	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 Environmental - US**
Client Sample ID: **50WW11-210708-FD** ALS Project ID: P2103703
Client Project ID: **HS21070435** ALS Sample ID: P2103703-004

Test Code: RSK 175 Date Collected: 7/8/21
Instrument ID: HP5890A/GC10/FID Date Received: 7/12/21
Analyst: Connor Barrett Date Analyzed: 7/20/21
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	**3.2**	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 Environmental - US**
Client Sample ID: **50WW06-210708**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P2103703-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 7/8/21
Date Received: 7/12/21
Date Analyzed: 7/20/21
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	**0.68**	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**

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 Environmental - US**
Client Sample ID: **50WW12-210708**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P2103703-006

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 7/8/21
Date Received: 7/12/21
Date Analyzed: 7/20/21
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	**2.3**	1.3	1.0	0.51	
74-85-1	Ethene	**2.9**	1.0	0.55	0.24	
74-84-0	Ethane	**3.1**	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.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Environmental - US**
Client Sample ID: **Method Control Sample** ALS Project ID: P2103703
Client Project ID: **HS21070435** ALS Sample ID: P210720-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Connor Barrett Date Analyzed: 7/20/21
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 Environmental - US**
Client Sample ID: **50WW06-210708**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P2103703-005MS
P2103703-005DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: 7/8/21
Date Received: 7/12/21
Date Analyzed: 7/20/21
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	2.53	0.678	2.53	2.59	**73**	**76**	73-125	4	30	
74-85-1	Ethene	4.40	ND	3.94	3.97	**90**	**90**	72-133	0	30	
74-84-0	Ethane	4.75	ND	4.05	4.06	**85**	**85**	74-131	0	30	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Environmental - US**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS21070435**

ALS Project ID: P2103703
ALS Sample ID: P210720-LCS
P210720-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Connor Barrett
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 7/20/21
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	2.52	2.63	2.27	**104**	**90**	73-125	14	26	
74-85-1	Ethene	4.40	4.39	4.33	**100**	**98**	72-133	2	11	
74-84-0	Ethane	4.72	4.59	4.53	**97**	**96**	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.

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Client:	Vicki Graves APTIM 2410 Cherahala Blvd Knoxville, TN 37932 US	**Phone:**	865-560-7818 **Fax:**

Identifier: 025SJ **Date Rec:** 10/08/2021 **Report Date:** 10/25/2021

Client Project #: 501032 **Client Project Name:** LHAAP 50 October 2021

Purchase Order #: 204818 CO-04

Test results provided for: CENSUS

Reviewed By:

Charles Slater

NOTICE: This report is intended only for the addressee shown above and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this in error, please notify Microbial Insights, Inc. immediately. The data and other information in this report represent only the sample(s) analyzed and are rendered upon condition that it is not to be reproduced without approval from Microbial Insights, Inc. Thank you for your cooperation.

Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 50 October 2021

MI Project Number: **025SJ**
Date Received: 10/08/2021

Sample Information

Client Sample ID:		**50WW14-211007**	**50WW13-211007**	**50WW11-211007**	**50WW06-211007**	**50WW12-211007**
Sample Date:		10/07/2021	10/07/2021	10/07/2021	10/07/2021	10/07/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CS	HT/CS	HT/CS	HT/CS	HT/CS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**7.00E-01 (J)**	**8.00E-01 (J)**	**1.50E+00**	**2.00E+00**	**6.10E+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 **10/8/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/08/2021	10/18/2021	0 °C	108%	non-detect	non-detect

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Identifier: 025SJ **Date Rec:** 10/08/2021 **Report Date:** 10/25/2021

Client Project #: 501032 **Client Project Name:** LHAAP 50 October 2021

Purchase Order #: 204818 CO-04

Comments: Report revised on 10/25/21 to update the project name at the client's request.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 11, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21100477**

Laboratory Results for: **LHAAP50 October 2021**

Dear Vicki Graves ,

ALS Environmental received 9 sample(s) on Oct 08, 2021 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
Ragen Giga
Project Manager

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Work Order: HS21100477

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21100477-01	50WW14-211007	Groundwater		07-Oct-2021 07:45	08-Oct-2021 10:00	☐
HS21100477-02	50WW13-211007	Groundwater		07-Oct-2021 08:40	08-Oct-2021 10:00	☐
HS21100477-03	50WW11-211007	Groundwater		07-Oct-2021 09:30	08-Oct-2021 10:00	☐
HS21100477-04	50WW11-211007-FD	Groundwater		07-Oct-2021 09:30	08-Oct-2021 10:00	☐
HS21100477-05	50WW06-211007	Groundwater		07-Oct-2021 10:35	08-Oct-2021 10:00	☐
HS21100477-06	50WW12-211007	Groundwater		07-Oct-2021 11:40	08-Oct-2021 10:00	☐
HS21100477-07	50WW29-211007	Groundwater		07-Oct-2021 12:30	08-Oct-2021 10:00	☐
HS21100477-08	50WW05-211007	Groundwater		07-Oct-2021 13:15	08-Oct-2021 10:00	☐
HS21100477-09	Trip Blank	Water	CG-082521 -495	07-Oct-2021 00:00	08-Oct-2021 10:00	☐

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 October 2021
Work Order: HS21100477

Work Order Comments

- The analysis for Methane, Methene, Ethane by RSK175 was sub contracted to ALS Fort Collins, CO sub contracted RSK 175 - CO2 to Pace Labs Baton Rouge Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R393200

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R393959,R394135

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R393942

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW14-211007
Collection Date: 07-Oct-2021 07:45

ANALYTICAL REPORT
WorkOrder:HS21100477
Lab ID:HS21100477-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 15:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 15:12
cis-1,2-Dichloroethene	**4.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:12
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	11-Oct-2021 15:12
Trichloroethene	**28**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 15:12
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 15:12*
Surr: 4-Bromofluorobenzene	*98.9*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 15:12*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 15:12*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 15:12*
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**1.39**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Oct-2021 00:51
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**422**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2021 05:15
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Oct-2021 20:45
Sulfate	**377**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2021 05:15
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBFC
Subcontract Analysis	See Attached		0	0		NA	1	04-Nov-2021 15:28
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	10-Nov-2021 15:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW13-211007
Collection Date: 07-Oct-2021 08:40

ANALYTICAL REPORT
WorkOrder:HS21100477
Lab ID:HS21100477-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**5.0**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Oct-2021 16:57
1,2-Dichloroethane	**28**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Oct-2021 16:57
cis-1,2-Dichloroethene	**130**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Oct-2021 16:57
Tetrachloroethene	**4.7**	J	**1.5**	**5.0**	**5.0**	**ug/L**	5	11-Oct-2021 16:57
Trichloroethene	**2,900**		**10**	**25**	**50**	**ug/L**	50	11-Oct-2021 18:00
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	11-Oct-2021 16:57
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*5*	*11-Oct-2021 16:57*
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*50*	*11-Oct-2021 18:00*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*5*	*11-Oct-2021 16:57*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*50*	*11-Oct-2021 18:00*
Surr: Dibromofluoromethane	*104*			**0**	*80-119*	*%REC*	*5*	*11-Oct-2021 16:57*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*50*	*11-Oct-2021 18:00*
Surr: Toluene-d8	*99.2*			**0**	*89-112*	*%REC*	*50*	*11-Oct-2021 18:00*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*11-Oct-2021 16:57*
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**3.11**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Oct-2021 01:05
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**294**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2021 05:22
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Oct-2021 20:53
Sulfate	**338**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2021 05:22
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBFC
Subcontract Analysis	See Attached		0	0		NA	1	04-Nov-2021 15:28
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	10-Nov-2021 15:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW11-211007
Collection Date: 07-Oct-2021 09:30

ANALYTICAL REPORT
WorkOrder:HS21100477
Lab ID:HS21100477-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**9.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:54
1,2-Dichloroethane	**15**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:54
cis-1,2-Dichloroethene	**33**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:54
Tetrachloroethene	**2.8**		**0.30**	**1.0**	**1.0**	**ug/L**	1	11-Oct-2021 15:54
Trichloroethene	**1,200**		**5.0**	**12**	**25**	**ug/L**	25	11-Oct-2021 18:21
Vinyl chloride	**0.84**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:54
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*25*	*11-Oct-2021 18:21*
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 15:54*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 15:54*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*25*	*11-Oct-2021 18:21*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 15:54*
Surr: Dibromofluoromethane	*100*			**0**	*80-119*	*%REC*	*25*	*11-Oct-2021 18:21*
Surr: Toluene-d8	*97.4*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 15:54*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*25*	*11-Oct-2021 18:21*
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.93**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Oct-2021 01:19
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**275**		**2.00**	**5.00**	**5.00**	**mg/L**	10	23-Oct-2021 05:52
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Oct-2021 21:00
Sulfate	**356**		**2.00**	**5.00**	**5.00**	**mg/L**	10	23-Oct-2021 05:52
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBFC
Subcontract Analysis	See Attached		0	0		NA	1	04-Nov-2021 15:28
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	10-Nov-2021 15:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW11-211007-FD
Collection Date: 07-Oct-2021 09:30

ANALYTICAL REPORT
WorkOrder:HS21100477
Lab ID:HS21100477-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**11**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 16:15
1,2-Dichloroethane	**16**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 16:15
cis-1,2-Dichloroethene	**36**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 16:15
Tetrachloroethene	**3.3**		**0.30**	**1.0**	**1.0**	**ug/L**	1	11-Oct-2021 16:15
Trichloroethene	**1,300**		**5.0**	**12**	**25**	**ug/L**	25	11-Oct-2021 18:42
Vinyl chloride	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 16:15
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 16:15*
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*25*	*11-Oct-2021 18:42*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 16:15*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*25*	*11-Oct-2021 18:42*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*25*	*11-Oct-2021 18:42*
Surr: Dibromofluoromethane	*103*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 16:15*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 16:15*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*25*	*11-Oct-2021 18:42*
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.64**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Oct-2021 01:34
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**279**		**2.00**	**5.00**	**5.00**	**mg/L**	10	23-Oct-2021 05:59
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Oct-2021 21:07
Sulfate	**365**		**2.00**	**5.00**	**5.00**	**mg/L**	10	23-Oct-2021 05:59
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBFC
Subcontract Analysis	See Attached		0	0		NA	1	04-Nov-2021 15:28
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	10-Nov-2021 15:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW06-211007
Collection Date: 07-Oct-2021 10:35

ANALYTICAL REPORT
WorkOrder:HS21100477
Lab ID:HS21100477-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:30
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:30
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:30
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	11-Oct-2021 14:30
Trichloroethene	**2.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 14:30
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:30
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 14:30*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 14:30*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 14:30*
Surr: Toluene-d8	*98.1*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 14:30*
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**5.32**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Oct-2021 01:48
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**42.6**		**0.200**	**0.500**	**0.500**	**mg/L**	1	23-Oct-2021 06:21
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Oct-2021 20:23
Sulfate	**22.9**		**0.200**	**0.500**	**0.500**	**mg/L**	1	23-Oct-2021 06:21
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBFC
Subcontract Analysis	See Attached		0	0		NA	1	04-Nov-2021 15:28
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	10-Nov-2021 15:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW12-211007
Collection Date: 07-Oct-2021 11:40

ANALYTICAL REPORT
WorkOrder:HS21100477
Lab ID:HS21100477-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**2.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 16:36
1,2-Dichloroethane	**2.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 16:36
cis-1,2-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 16:36
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	11-Oct-2021 16:36
Trichloroethene	**290**		**5.0**	**12**	**25**	**ug/L**	25	11-Oct-2021 19:03
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 16:36
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 16:36*
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*25*	*11-Oct-2021 19:03*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 16:36*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*25*	*11-Oct-2021 19:03*
Surr: Dibromofluoromethane	*104*			**0**	*80-119*	*%REC*	*25*	*11-Oct-2021 19:03*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 16:36*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 16:36*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*25*	*11-Oct-2021 19:03*
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.49**		**0.500**	**1.00**	**1.00**	**mg/L**	1	21-Oct-2021 02:17
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**1,120**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2021 06:06
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	08-Oct-2021 21:15
Sulfate	**567**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2021 06:06
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBFC
Subcontract Analysis	See Attached		0	0		NA	1	04-Nov-2021 15:28
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	10-Nov-2021 15:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2021 WorkOrder:HS21100477
Sample ID: 50WW29-211007 Lab ID:HS21100477-07
Collection Date: 07-Oct-2021 12:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:51
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:51
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	11-Oct-2021 14:51
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:51
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:51
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 14:51*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 14:51*
Surr: Dibromofluoromethane	*104*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 14:51*
Surr: Toluene-d8	*99.7*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 14:51*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2021 WorkOrder:HS21100477
Sample ID: 50WW05-211007 Lab ID:HS21100477-08
Collection Date: 07-Oct-2021 13:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	**4.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:33
1,2-Dichloroethane	**2.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:33
cis-1,2-Dichloroethene	**170**		**0.20**	**0.50**	**1.0**	**ug/L**	1	11-Oct-2021 15:33
Tetrachloroethene	**0.89**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	11-Oct-2021 15:33
Trichloroethene	**290**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Oct-2021 19:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 15:33
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*5*	*11-Oct-2021 19:24*
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 15:33*
Surr: 4-Bromofluorobenzene	*99.5*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 15:33*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*85-114*	*%REC*	*5*	*11-Oct-2021 19:24*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*5*	*11-Oct-2021 19:24*
Surr: Dibromofluoromethane	*100*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 15:33*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 15:33*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*5*	*11-Oct-2021 19:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 October 2021 WorkOrder:HS21100477
Sample ID: Trip Blank Lab ID:HS21100477-09
Collection Date: 07-Oct-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:09
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:09
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:09
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	11-Oct-2021 14:09
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:09
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-Oct-2021 14:09
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*11-Oct-2021 14:09*
Surr: 4-Bromofluorobenzene	*100.0*			**0**	*85-114*	*%REC*	*1*	*11-Oct-2021 14:09*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*1*	*11-Oct-2021 14:09*
Surr: Toluene-d8	*99.7*			**0**	*89-112*	*%REC*	*1*	*11-Oct-2021 14:09*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100477

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R393200 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21100477-09	Trip Blank	07 Oct 2021 00:00			11 Oct 2021 14:09	1
Batch ID: R393200 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21100477-01	50WW14-211007	07 Oct 2021 07:45			11 Oct 2021 15:12	1
HS21100477-02	50WW13-211007	07 Oct 2021 08:40			11 Oct 2021 18:00	50
HS21100477-02	50WW13-211007	07 Oct 2021 08:40			11 Oct 2021 16:57	5
HS21100477-03	50WW11-211007	07 Oct 2021 09:30			11 Oct 2021 18:21	25
HS21100477-03	50WW11-211007	07 Oct 2021 09:30			11 Oct 2021 15:54	1
HS21100477-04	50WW11-211007-FD	07 Oct 2021 09:30			11 Oct 2021 18:42	25
HS21100477-04	50WW11-211007-FD	07 Oct 2021 09:30			11 Oct 2021 16:15	1
HS21100477-05	50WW06-211007	07 Oct 2021 10:35			11 Oct 2021 14:30	1
HS21100477-06	50WW12-211007	07 Oct 2021 11:40			11 Oct 2021 19:03	25
HS21100477-06	50WW12-211007	07 Oct 2021 11:40			11 Oct 2021 16:36	1
HS21100477-07	50WW29-211007	07 Oct 2021 12:30			11 Oct 2021 14:51	1
HS21100477-08	50WW05-211007	07 Oct 2021 13:15			11 Oct 2021 19:24	5
HS21100477-08	50WW05-211007	07 Oct 2021 13:15			11 Oct 2021 15:33	1
Batch ID: R393942 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Groundwater	
HS21100477-01	50WW14-211007	07 Oct 2021 07:45			21 Oct 2021 00:51	1
HS21100477-02	50WW13-211007	07 Oct 2021 08:40			21 Oct 2021 01:05	1
HS21100477-03	50WW11-211007	07 Oct 2021 09:30			21 Oct 2021 01:19	1
HS21100477-04	50WW11-211007-FD	07 Oct 2021 09:30			21 Oct 2021 01:34	1
HS21100477-05	50WW06-211007	07 Oct 2021 10:35			21 Oct 2021 01:48	1
HS21100477-06	50WW12-211007	07 Oct 2021 11:40			21 Oct 2021 02:17	1
Batch ID: R393959 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21100477-01	50WW14-211007	07 Oct 2021 07:45			08 Oct 2021 20:45	1
HS21100477-02	50WW13-211007	07 Oct 2021 08:40			08 Oct 2021 20:53	1
HS21100477-03	50WW11-211007	07 Oct 2021 09:30			08 Oct 2021 21:00	1
HS21100477-04	50WW11-211007-FD	07 Oct 2021 09:30			08 Oct 2021 21:07	1
HS21100477-05	50WW06-211007	07 Oct 2021 10:35			08 Oct 2021 20:23	1
HS21100477-06	50WW12-211007	07 Oct 2021 11:40			08 Oct 2021 21:15	1
Batch ID: R394135 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21100477-01	50WW14-211007	07 Oct 2021 07:45			23 Oct 2021 05:15	20
HS21100477-02	50WW13-211007	07 Oct 2021 08:40			23 Oct 2021 05:22	20
HS21100477-03	50WW11-211007	07 Oct 2021 09:30			23 Oct 2021 05:52	10
HS21100477-04	50WW11-211007-FD	07 Oct 2021 09:30			23 Oct 2021 05:59	10
HS21100477-05	50WW06-211007	07 Oct 2021 10:35			23 Oct 2021 06:21	1
HS21100477-06	50WW12-211007	07 Oct 2021 11:40			23 Oct 2021 06:06	20

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100477

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R394918 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS21100477-01	50WW14-211007	07 Oct 2021 07:45			04 Nov 2021 15:28	1
HS21100477-02	50WW13-211007	07 Oct 2021 08:40			04 Nov 2021 15:28	1
HS21100477-03	50WW11-211007	07 Oct 2021 09:30			04 Nov 2021 15:28	1
HS21100477-04	50WW11-211007-FD	07 Oct 2021 09:30			04 Nov 2021 15:28	1
HS21100477-05	50WW06-211007	07 Oct 2021 10:35			04 Nov 2021 15:28	1
HS21100477-06	50WW12-211007	07 Oct 2021 11:40			04 Nov 2021 15:28	1
Batch ID: R395354 (0)	**Test Name :** SUBCONTRACTED ANALYSIS				**Matrix:** Groundwater	
HS21100477-01	50WW14-211007	07 Oct 2021 07:45			10 Nov 2021 15:30	1
HS21100477-02	50WW13-211007	07 Oct 2021 08:40			10 Nov 2021 15:30	1
HS21100477-03	50WW11-211007	07 Oct 2021 09:30			10 Nov 2021 15:30	1
HS21100477-04	50WW11-211007-FD	07 Oct 2021 09:30			10 Nov 2021 15:30	1
HS21100477-05	50WW06-211007	07 Oct 2021 10:35			10 Nov 2021 15:30	1
HS21100477-06	50WW12-211007	07 Oct 2021 11:40			10 Nov 2021 15:30	1

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100477

QC BATCH REPORT

Batch ID: R393200 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-211011** Units: **ug/L** Analysis Date: **11-Oct-2021 13:48**
Client ID: Run ID: **VOA6_393200** SeqNo: **6313858** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*51.77*	*1.0*	*50*	*0*	*104*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.42*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*50.26*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*50.56*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-211011** Units: **ug/L** Analysis Date: **11-Oct-2021 13:05**
Client ID: Run ID: **VOA6_393200** SeqNo: **6313857** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	20.55	1.0	20	0	103	71 - 131				
1,2-Dichloroethane	20.14	1.0	20	0	101	73 - 128				
cis-1,2-Dichloroethene	21.16	1.0	20	0	106	78 - 123				
Tetrachloroethene	20.78	1.0	20	0	104	74 - 129				
Trichloroethene	18.9	1.0	20	0	94.5	79 - 123				
Vinyl chloride	20.01	1.0	20	0	100	58 - 137				
Surr: 1,2-Dichloroethane-d4	*57.51*	*1.0*	*50*	*0*	*115*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.04*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*54.7*	*1.0*	*50*	*0*	*109*	*80 - 119*				
Surr: Toluene-d8	*48.29*	*1.0*	*50*	*0*	*96.6*	*89 - 112*				

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100477

QC BATCH REPORT

Batch ID: R393200 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS21100477-05MS** Units: **ug/L** Analysis Date: **11-Oct-2021 17:18**
Client ID: **50WW06-211007** Run ID: **VOA6_393200** SeqNo: **6313868** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	16.98	1.0	20	0	84.9	71 - 131				
1,2-Dichloroethane	18.56	1.0	20	0	92.8	73 - 128				
cis-1,2-Dichloroethene	18.28	1.0	20	0	91.4	78 - 123				
Tetrachloroethene	18.87	1.0	20	0	94.3	74 - 129				
Trichloroethene	21.55	1.0	20	2.77	93.9	79 - 123				
Vinyl chloride	16.32	1.0	20	0	81.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.37*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.76*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*50.77*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*49.8*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

MSD Sample ID: **HS21100477-05MSD** Units: **ug/L** Analysis Date: **11-Oct-2021 17:39**
Client ID: **50WW06-211007** Run ID: **VOA6_393200** SeqNo: **6313869** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	17.04	1.0	20	0	85.2	71 - 131	16.98	0.361	20	
1,2-Dichloroethane	18.12	1.0	20	0	90.6	73 - 128	18.56	2.38	20	
cis-1,2-Dichloroethene	18.73	1.0	20	0	93.7	78 - 123	18.28	2.46	20	
Tetrachloroethene	18.7	1.0	20	0	93.5	74 - 129	18.87	0.877	20	
Trichloroethene	20.18	1.0	20	2.77	87.0	79 - 123	21.55	6.57	20	
Vinyl chloride	16.46	1.0	20	0	82.3	58 - 137	16.32	0.868	20	
Surr: 1,2-Dichloroethane-d4	*50.58*	*1.0*	*50*	*0*	*101*	*81 - 118*	*50.37*	*0.406*	*20*	
Surr: 4-Bromofluorobenzene	*51.61*	*1.0*	*50*	*0*	*103*	*85 - 114*	*50.76*	*1.66*	*20*	
Surr: Dibromofluoromethane	*50.14*	*1.0*	*50*	*0*	*100*	*80 - 119*	*50.77*	*1.25*	*20*	
Surr: Toluene-d8	*48.83*	*1.0*	*50*	*0*	*97.7*	*89 - 112*	*49.8*	*1.97*	*20*	

The following samples were analyzed in this batch:

HS21100477-01	HS21100477-02	HS21100477-03	HS21100477-04
HS21100477-05	HS21100477-06	HS21100477-07	HS21100477-08
HS21100477-09			

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100477

QC BATCH REPORT

Batch ID: R393942 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK- 10202021** Units: **mg/L** Analysis Date: **21-Oct-2021 00:14**
Client ID: Run ID: **TOC_04_393942** SeqNo: **6331664** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS- 10202021** Units: **mg/L** Analysis Date: **21-Oct-2021 00:25**
Client ID: Run ID: **TOC_04_393942** SeqNo: **6331665** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.51	1.00	10	0	105	85 - 115				

LCSD Sample ID: **LCSD- 10202021** Units: **mg/L** Analysis Date: **21-Oct-2021 00:37**
Client ID: Run ID: **TOC_04_393942** SeqNo: **6331666** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.5	1.00	10	0	105	85 - 115	10.51	0.0952	20	

MS Sample ID: **HS21100477-05MS** Units: **mg/L** Analysis Date: **21-Oct-2021 02:03**
Client ID: **50WW06-211007** Run ID: **TOC_04_393942** SeqNo: **6331672** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	15.73	1.00	10	5.325	104	80 - 120				

The following samples were analyzed in this batch: HS21100477-01 HS21100477-02 HS21100477-03 HS21100477-04 HS21100477-05 HS21100477-06

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100477

QC BATCH REPORT

Batch ID: R393959 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **08-Oct-2021 10:54**
Client ID: Run ID: **ICS-Integrion_393959** SeqNo: **6332428** 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

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **08-Oct-2021 11:01**
Client ID: Run ID: **ICS-Integrion_393959** SeqNo: **6332429** 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)	3.629	0.100	4	0	90.7	80 - 120				

MS Sample ID: **HS21100477-05MS** Units: **mg/L** Analysis Date: **08-Oct-2021 20:30**
Client ID: **50WW06-211007** Run ID: **ICS-Integrion_393959** SeqNo: **6332435** 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)	1.958	0.100	2	0.0068	97.6	80 - 120				

MSD Sample ID: **HS21100477-05MSD** Units: **mg/L** Analysis Date: **08-Oct-2021 20:38**
Client ID: **50WW06-211007** Run ID: **ICS-Integrion_393959** SeqNo: **6332436** 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)	1.977	0.100	2	0.0068	98.5	80 - 120	1.958	0.981	20	

The following samples were analyzed in this batch: HS21100477-01 HS21100477-02 HS21100477-03 HS21100477-04 HS21100477-05 HS21100477-06

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100477

QC BATCH REPORT

Batch ID: R394135 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **23-Oct-2021 04:23**
Client ID: Run ID: **ICS-Integrion_394135** SeqNo: **6336617** 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: **LCS** Units: **mg/L** Analysis Date: **23-Oct-2021 04:30**
Client ID: Run ID: **ICS-Integrion_394135** SeqNo: **6336618** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.68	0.500	20	0	98.4	80 - 120				
Sulfate	19.77	0.500	20	0	98.9	80 - 120				

MS Sample ID: **HS21100477-05MS** Units: **mg/L** Analysis Date: **23-Oct-2021 06:29**
Client ID: **50WW06-211007** Run ID: **ICS-Integrion_394135** SeqNo: **6336632** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	51.83	0.500	10	42.57	92.6	80 - 120				O
Sulfate	31.61	0.500	10	22.9	87.1	80 - 120				

MSD Sample ID: **HS21100477-05MSD** Units: **mg/L** Analysis Date: **23-Oct-2021 06:36**
Client ID: **50WW06-211007** Run ID: **ICS-Integrion_394135** SeqNo: **6336633** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	51.89	0.500	10	42.57	93.2	80 - 120	51.83	0.114	20	O
Sulfate	31.64	0.500	10	22.9	87.4	80 - 120	31.61	0.0952	20	

The following samples were analyzed in this batch: HS21100477-01 HS21100477-02 HS21100477-03 HS21100477-04 HS21100477-05 HS21100477-06

ALS Houston, US Date: 11-Nov-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: **HS21100477**

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

ALS Houston, US Date: 11-Nov-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Texas	T104704231-21-28	30-Apr-2022

ALS Houston, US Date: 11-Nov-21

Sample Receipt Checklist

Work Order ID: HS21100477 **Date/Time Received:** **08-Oct-2021 10:00**

Client Name: CBI-Houston **Received by:** **Jared R. Makan**

Completed By:	/S/ Paresh M. Giga	08-Oct-2021 13:55	**Reviewed by:**	/S/ Ragen Giga	13-Oct-2021 19:07
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **GW/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 ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:none
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
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):	0.8C U/c	IR31
Cooler(s)/Kit(s):	5765	
Date/Time sample(s) sent to storage:	10/8/2021 14:15	

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:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modasbia

Page 1 of 1

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 101032

REVISED

Job: LHAAP50 ~~July~~ October 2021

Prepared By: Scott Beesinger

P.O. Number

HS21100477

Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SDWW14-211007	WG	10/7/21/ 0745		12	X	X	X	X	X			
SDWW13-211007	WG	10/7/21/0840		12	X	X	X	X	X			
SDWW11-211007	WG	10/7/21/0930		12	X	X	X	X	X			
SDWW11-211007-FD	WG	10/7/21/0930		12	X	X	X	X	X			
SDWW06-211007	WG	10/7/21/1035		12	X	X	X	X	X			
SDWW06-211007-MS	WG	10/7/21/1035		12	X	X	X	X	X			
SDWW06-211007-MSD	WG	10/7/21/1035		12	X	X	X	X	X			
SDWW~~14~~ 12 -211007	WG	10/7/21/1140		12	X	X	X	X	X			

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/7/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stanchiff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Page 1 of 1

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

REVISED

Job: OCTOBER
LHAAP50 ~~July~~ 2021

Prepared By: Scott Beesinger

P.O. Number

HS21100477

Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 176	Perchlorate by SW6850					Remarks (Preservatives, etc.)	Lab I.D.#
					Analyses											
50WW29-211007	WG	10/7/21/1230		3	X											
50WW05-211007	WG	10/7/21/1315		3	X											
TRIP BLANK-211007	W	10/7/21		2	X											

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/7/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 July 2021**

Prepared By: Scott Beesinger

P.O. Number

HS21100477
Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850					Remarks (Preservatives, etc.)	Lab I.D.#
50ww14-211007	wG	10/7/21/ 0745		12	X	X	X	X	X							
50ww13-211007	wG	10/7/21/0840		12	X	X	X	X	X							
50ww11-211007	wG	10/7/21/0930		12	X	X	X	X	X							
50ww11-211007-FD	wG	10/7/21/0930		12	X	X	X	X	X							
50ww06-211007	wG	10/7/21/1035		12	X	X	X	X	X							
50ww06-211007-MS	wG	10/7/21/1035		12	X	X	X	X	X							
50ww06-211007-MSD	wG	10/7/21/1035		12	X	X	X	X	X							
50ww~~13~~12-211007	wG	10/7/21/1140		12	X	X	X	X	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/7/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. MARTIN	10/8/21	10:00							

Remarks: Cooler S76S IR3: Temp 0.8°C CF0

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: LHAAP50 July 2021

Prepared By: Scott Beesinger

P.O. Number

HS21100477
Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
50WW29-211007	WG	10/7/21/1230		3	X							
50WW05-211007	WG	10/7/21/1315		3	X							
TRIP BLANK-211007	W	10/7/21		2	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/7/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mastin	10/8/21	10:30							

Remarks: Cooler 5765 1223
Temp 0.8°C CF 0

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

5765

CUSTODY SEAL

Date: 10/7/21 Time: 1430
Name: Scott Beesinger
Company: BHAPTIM

Seal Broken By: YM
Date: 10/08/21

5765 OCT 8 2021

5765

ORIGIN ID:SGRA (903) 930-6193
ATT: SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFRAST. INC
1203-B EAST GRAND AVE PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 040CT21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3504
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099

(281) 530-5668
REF: LHAAP-60-RG

RMA:

FedEx Express

FedEx
TRK# 0221 5300 5223 0403

FRI - 08 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

4730674 070ct2021 CGGA 560G2/0778/1B23

Dissolved Gasses

Case Narrative

ALS Environmental

HS21100477

Work Order Number: 2110295

1. This report consists of 6 water samples. The samples were received intact by ALS on 10/12/21. The samples were received at 12.9°C.

   All samples were free of headspace prior to analysis.

   The samples had a pH < 2 at the time of analysis.

2. These samples were prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

3. Sample 2110295-5 was designated as the quality control sample for this analysis.

   Similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

   All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria with the following exceptions:

Spiked Compound	QC Sample	Direction
Methane	MS/MSD	Low
Ethane	MS/MSD	Low
Ethene	MS/MSD	Low

   The recoveries of these compounds in the laboratory control sample and laboratory control sample duplicate were within control limits, which suggest that the outliers in the matrix spikes may have been due to matrix effects. No further action was taken. Laboratory control sample and laboratory control sample duplicate results have been included.

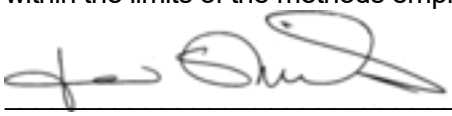
4. All analytical QC were within the acceptance criteria.

5. All preparation criteria were met.

6. The samples were prepared and analyzed within the established holding times.

7. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939. Whenever manual integrations are performed, before and after chromatograms of the peak that was manually integrated are included in the report along with the reason re-integration was necessary.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Organics Final Data Reviewer

11/04/21

Date

ALS
Data Qualifier Flags
Organics

U or ND:	**This flag indicates that the compound was analyzed for but not detected.**
J:	**This flag indicates an estimated value. This flag is used as follows : (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the retention time data indicate the presence of a compound that meets the GC identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.**
B:	**This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.**
E:	**This flag identifies compounds whose concentration exceeds the upper level of the calibration range.**
A:	**This flag indicates that a tentatively identified compound is a suspected aldol-condensation product.**
X:	**This flag indicates that the analyte was diluted below an accurate quantitation level.**
***:**	**This flag indicates that a spike recovery is equal to or outside the control criteria used.**
+:	**This flag indicates that the relative percent difference (RPD) equals or exceeds the control criteria.**

Chain of Custody

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2110295
Client Name: ALS Environmental
Client Project Name:
Client Project Number: HS21100477
Client PO Number: HS21100477

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
50WW14_211007	2110295-1		WATER	07-Oct-21	7:45
50WW13_211007	2110295-2		WATER	07-Oct-21	8:40
50WW11_211007	2110295-3		WATER	07-Oct-21	9:30
50WW11_211007-FD	2110295-4		WATER	07-Oct-21	9:30
50WW06_211007	2110295-5		WATER	07-Oct-21	10:35
50WW12_211007	2110295-6		WATER	07-Oct-21	11:40

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

SAMPLING STATE: **Dept of Defense** **COC ID:** **17064**

SUBCONTRACT TO: # 2110295

ALS Environmental, Fort Collins
225 Commerce Drive
Fort Collins, CO 80524

Phone: +1 970 490 1511

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS21100477
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21100477-01**	**50WW14_211007**	**Groundwater**	**07 Oct 2021 07:45**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	22 Oct 2021
2.	**HS21100477-02**	**50WW13_211007**	**Groundwater**	**07 Oct 2021 08:40**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	22 Oct 2021
3.	**HS21100477-03**	**50WW11_211007**	**Groundwater**	**07 Oct 2021 09:30**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	22 Oct 2021
4.	**HS21100477-04**	**50WW11_211007-FD**	**Groundwater**	**07 Oct 2021 09:30**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	22 Oct 2021
5.	**HS21100477-05**	**50WW06_211007**	**Groundwater**	**07 Oct 2021 10:35**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	22 Oct 2021
6.	**HS21100477-06**	**50WW12_211007**	**Groundwater**	**07 Oct 2021 11:40**
	MEE + CO2. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	22 Oct 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS21100477-05 = MS/MSD
3 x Neat Vials + 3 x HCL Vials per sample

2110295

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **17064**

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	10-12-21 1100
Received By:	Chris Thennes	Date/Time:	10-12-21 0930
Cooler ID(s):		Temperature(s):	

ALS Environmental - Fort Colllins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS SIMI VALLEY Workorder No: 2110295

Project Manager: JWS Initials: CXT Date: 10/14/2021

		N/A	YES	NO
1.	Are airbills / shipping documents present and/or removable?		X	
	Tracking number: 9719 9700 7227			
2.	Are custody seals on **shipping** containers intact?	X		
3.	Are custody seals on **sample** containers intact?	X		
4.	Is there a COC (chain-of-custody) present?		X	
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6.	Are short-hold samples present?			X
7.	Are all samples within holding times for the requested analyses?		X	
8.	Were all sample containers received intact? (not broken or leaking)		X	
9.	Is there sufficient sample for the requested analyses?		X	
10.	Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)	X		
12.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		X	
13.	Were the samples shipped on ice?			X
14.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		X

Cooler #:	1						
Temperature (°C):	12.9						
# of custody seals on cooler:	0						
External µR/hr reading:	11						
Background µR/hr reading:	11						

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES** (If no, see Form 008.)

*** Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.**

Samples Received out of Temp @12.9 C

run per Shiloh see emails attached for clinet conversation

Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: CT

If applicable, was the client contacted? **YES** Contact: __Ragen Giga____ Date/Time: _10/12/21_____

Project Manager Signature / Date: 10/15/21

Form 201r29.xls
(10/15/2019)

*IR Gun #3, VWR SN 170647571
*IR Gun #5, VWR SN 192272629

2110295

11-0
12.9°

ALS

www.alsglobal.com

Part # 159463-434 RIT2 EXP 06/22

ORIGIN ID:SFRA (805) 526-7161
SMO BUSINESS DELIVERY
ALS ENVIRONMENTAL
2655 PARK CENTER DRIVE -
STE. A
SIMI VALLEY, CA 93065
UNITED STATES US

SHIP DATE: 11OCT21
ACTWGT: 10.00 LB
CAD: 110047/CAFE3507

BILL THIRD PARTY

TO

ALS ENV.
225 COMMERCE DRIVE
FORT COLLINS
FORT COLLINS CO 80524
(970) 490-1511

INV:
PO:
REF:
DEPT:

FedEx Express

TRK# 0201 9719 9700 7227

TUE - 12 OCT 10:30A
PRIORITY OVERNIGHT

XH FTCA

80524
CO-US DEN

RT 60

Analytical Results

Dissolved Gasses

Method RSK175

Method Blank

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477

Lab ID: HC211021-91MB

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: N/A
File Name: 12973.dat

Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
74-82-8	METHANE	1	1	U	1	1
74-84-0	ETHANE	1	2	U	2	2
74-85-1	ETHENE	1	1	U	1	1

Data Package ID: *MEE2110295-1*

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477
COC Number: 17064

Field ID: 50WW14_211007
Lab ID: 2110295-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received
File Name: 12977.dat

Analyst: Jessica R. Spiller
Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	LOQ	LOD	DL
74-82-8	METHANE	1	2.5		1.1	1	1
74-84-0	ETHANE	1	2	U	2.2	2	2
74-85-1	ETHENE	1	1	U	1.1	1	1

Data Package ID: *MEE2110295-1*

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477
COC Number: 17064

Field ID: 50WW13_211007
Lab ID: 2110295-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received
File Name: 13000.dat

Analyst: Jessica R. Spiller
Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	LOQ	LOD	DL
74-82-8	METHANE	1	3.3		1.1	1	1
74-84-0	ETHANE	1	2	U	2.2	2	2
74-85-1	ETHENE	1	1	U	1.1	1	1

Data Package ID: *MEE2110295-1*

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477
COC Number: 17064

Field ID: 50WW11_211007
Lab ID: 2110295-3

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received
File Name: 13001.dat

Analyst: Jessica R. Spiller
Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	LOQ	LOD	DL
74-82-8	METHANE	1	3		1.1	1	1
74-84-0	ETHANE	1	2	U	2.2	2	2
74-85-1	ETHENE	1	1	U	1.1	1	1

Data Package ID: *MEE2110295-1*

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477
COC Number: 17064

Field ID: 50WW11_211007-FD
Lab ID: 2110295-4

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received
File Name: 13002.dat

Analyst: Jessica R. Spiller
Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	LOQ	LOD	DL
74-82-8	METHANE	1	4.3		1.1	1	1
74-84-0	ETHANE	1	2	U	2.2	2	2
74-85-1	ETHENE	1	1	U	1.1	1	1

Data Package ID: *MEE2110295-1*

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477
COC Number: 17064

Field ID: 50WW06_211007
Lab ID: 2110295-5

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received
File Name: 13003.dat

Analyst: Jessica R. Spiller
Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	LOQ	LOD	DL
74-82-8	METHANE	1	7.3		1.1	1	1
74-84-0	ETHANE	1	2	U	2.2	2	2
74-85-1	ETHENE	1	1	U	1.1	1	1

Data Package ID: *MEE2110295-1*

Dissolved Gasses

Method RSK175

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477
COC Number: 17064

Field ID: 50WW12_211007
Lab ID: 2110295-6

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received
File Name: 13006.dat

Analyst: Jessica R. Spiller
Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	LOQ	LOD	DL
74-82-8	METHANE	1	810		1.1	1	1
74-84-0	ETHANE	1	2	U	2.2	2	2
74-85-1	ETHENE	1	1	U	1.1	1	1

Data Package ID: *MEE2110295-1*

Supporting QA/QC Data

Dissolved Gasses

Method RSK175

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477

Lab ID: HC211021-91LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 10/21/2021
Date Analyzed: 10/21/2021
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: N/A
File Name: 12967.dat

Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
74-82-8	METHANE	142	155	1		109	73 - 125%
74-84-0	ETHANE	267	294	2		110	74 - 131%
74-85-1	ETHENE	249	277	1		111	72 - 133%

Lab ID: HC211021-91LCSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 10/21/2021
Date Analyzed: 10/21/2021
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: N/A
File Name: 12979.dat

Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
74-82-8	METHANE	142	163	1		114	30	5
74-84-0	ETHANE	267	306	2		115	30	4
74-85-1	ETHENE	249	286	1		115	30	3

Data Package ID: *MEE2110295-1*

Dissolved Gasses

Method RSK175

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins
Work Order Number: 2110295
Client Name: ALS Environmental
ClientProject ID: HS21100477

Field ID: 50WW06_211007
LabID: 2110295-5MS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
File Name: 13004.dat

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
74-82-8	METHANE	7.3		41.9	*	1	71.1	49	73 - 125%
74-84-0	ETHANE	2	U	68.7	*	2	133	52	74 - 131%
74-85-1	ETHENE	1	U	68	*	1	124	55	72 - 133%

Field ID: 50WW06_211007
LabID: 2110295-5MSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 07-Oct-21
Date Extracted: 21-Oct-21
Date Analyzed: 21-Oct-21
Prep Method: METHOD

Prep Batch: HC211021-91
QCBatchID: HC211021-91-3
Run ID: HC211021-91A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 38.5 ml
Final Volume: 38.5 ml
Result Units: UG/L
File Name: 13005.dat

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
74-82-8	METHANE	40.4	*	71.1	47	1	30	4
74-84-0	ETHANE	64.9	*	133	49	2	30	6
74-85-1	ETHENE	63.8	*	124	51	1	30	6

Data Package ID: *MEE2110295-1*

Prep Batch ID: HC211021-91

Start Date: 10/21/21
Start Time: 9:00
Prep Analyst: Jessica R. Spiller

End Date: 10/21/21
End Time: 9:45

Concentration Method: NONE
Extract Method: METHOD
Initial Volume Units: ml
Final Volume Units: ml

Batch Created By: jrs
Date Created: 10/21/21
Time Created: 9:14
Validated By: jrs
Date Validated: 10/21/21
Time Validated: 9:18

Comments:

QC Batch ID: HC211021-91-3

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
HC211021-91	MB	XXXXXX	WATER	XXXXXX	38.5	38.5	NONE	1	2110295
HC211021-91	LCS	XXXXXX	WATER	XXXXXX	38.5	38.5	NONE	1	2110295
HC211021-91	LCSD	XXXXXX	WATER	XXXXXX	38.5	38.5	NONE	1	2110295
2110295-5	MS	50WW06_211007	WATER	10/7/2021	38.5	38.5	NONE	1	2110295
2110295-5	MSD	50WW06_211007	WATER	10/7/2021	38.5	38.5	NONE	1	2110295
2110295-1	SMP	50WW14_211007	WATER	10/7/2021	38.5	38.5	NONE	1	2110295
2110295-2	SMP	50WW13_211007	WATER	10/7/2021	38.5	38.5	NONE	1	2110295
2110295-3	SMP	50WW11_211007	WATER	10/7/2021	38.5	38.5	NONE	1	2110295
2110295-4	SMP	50WW11_211007-FD	WATER	10/7/2021	38.5	38.5	NONE	1	2110295
2110295-5	SMP	50WW06_211007	WATER	10/7/2021	38.5	38.5	NONE	1	2110295
2110295-6	SMP	50WW12_211007	WATER	10/7/2021	38.5	38.5	NONE	1	2110295

QC Types

CAR	Carrier reference sample		DLS	Detection Limit Standard	
DUP	Laboratory Duplicate		LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate		LODV	Limit of Detection Verification	
LOQV	Limit of Quantitation Verification		MB	Method Blank	
MS	Laboratory Matrix Spike		MSD	Laboratory Matrix Spike Duplicate	
REP	Sample replicate		RVS	Reporting Level Verification Standar	
SMP	Field Sample		SYS	Sample Yield Spike	

Calibration Report

Sequence : \\gcserver\gcdata\Projects\GC9\Sequence\2020\meep200409.seq
User : CCL
Printed : 4/10/2020 1:04:06 PM

Instrument : GC9
Method Name : \\gcserver\gcdata\Projects\GC9\Method\2020\Meep200409.met
Method Created : 4/9/2020 9:52:17 AM

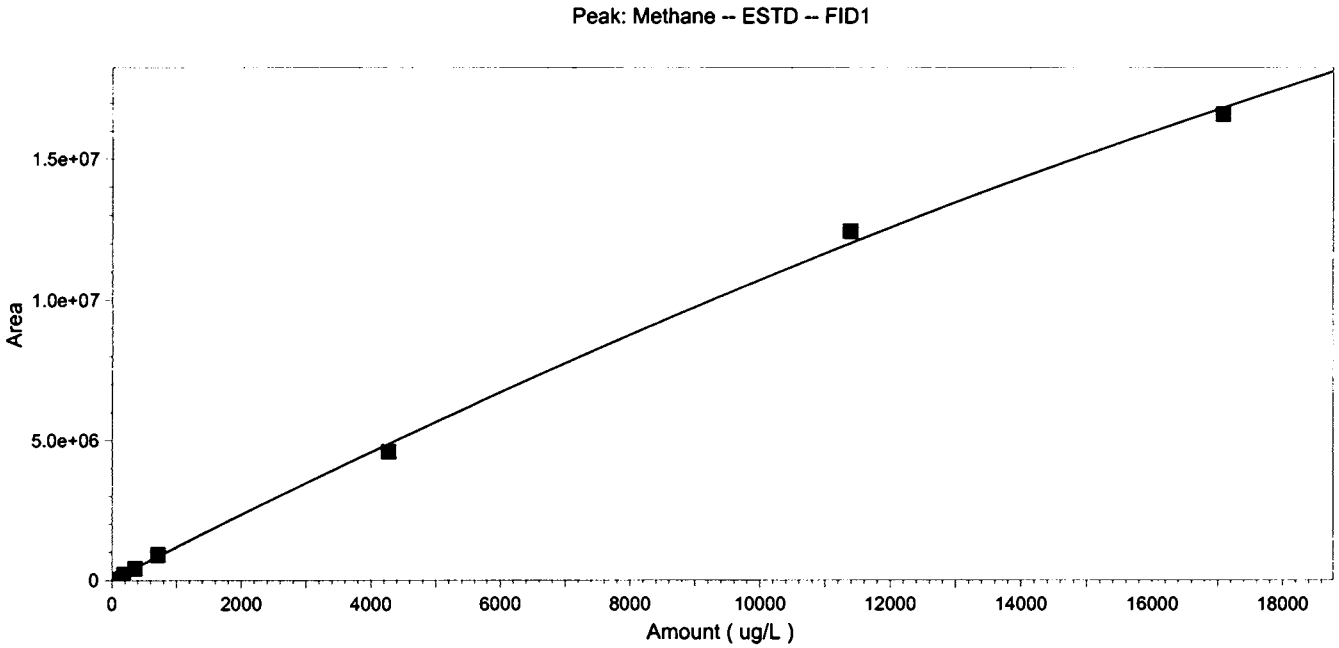
Methane (FID1)
Average RF: 1767.29 RF StDev: 1381.83 RF %RSD: 78.1890
Scaling: None LSQ Weighting: 1/Amount Force Through Zero: Off
Replicate Mode: Replace
Fit Type: Quadratic
$y = -0.0120794x^2 + 1192.41x + 1278.34$
Goodness of fit (r^2): 0.999031

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Amount	0.2845	0.8536	10.6706	35.5687	177.843	355.687
Area	1485	2763	12027	45581	212490	423825
RF	5219.68365553	3236.87910028	1127.11562611	1281.49187347	1194.81521383	1191.56797497
	603	116	287	303	419	124
Last Area						
Residual	0.111186	-0.391508	1.65555	-1.59915	0.394487	0.0422
Rep StDev						
Rep %RSD						
Rep 1 Area	1485	2763	12027	45581	212490	423825

	Level 7	Level 8	Level 9	Level 10
Amount	711.374	4268.24	11382	17073
Area	909663	4593714	12441929	16615764
RF	1278.74175802	1076.25484977	1093.12552174	973.220778696
	163	415	045	977
Last Area				
Residual	-56.4031	253.579	-475.527	284.064
Rep StDev				
Rep %RSD				
Rep 1 Area	909663	4593714	12441929	16615764

Calibration Report

Sequence : \\gcserver\gcdata\Projects\GC9\Sequence\2020\meep200409.seq
User : CCL
Printed : 4/10/2020 1:04:06 PM



Ethene (FID1)
Average RF: 774.674 RF StDev: 89.2825 RF %RSD: 11.5252
Scaling: None LSQ Weighting: 1/Amount Force Through Zero: Off
Replicate Mode: Replace
Fit Type: Quadratic
y = 0.0630580x^2 + 711.260x + 109.455
Goodness of fit (r^2): 0.999987

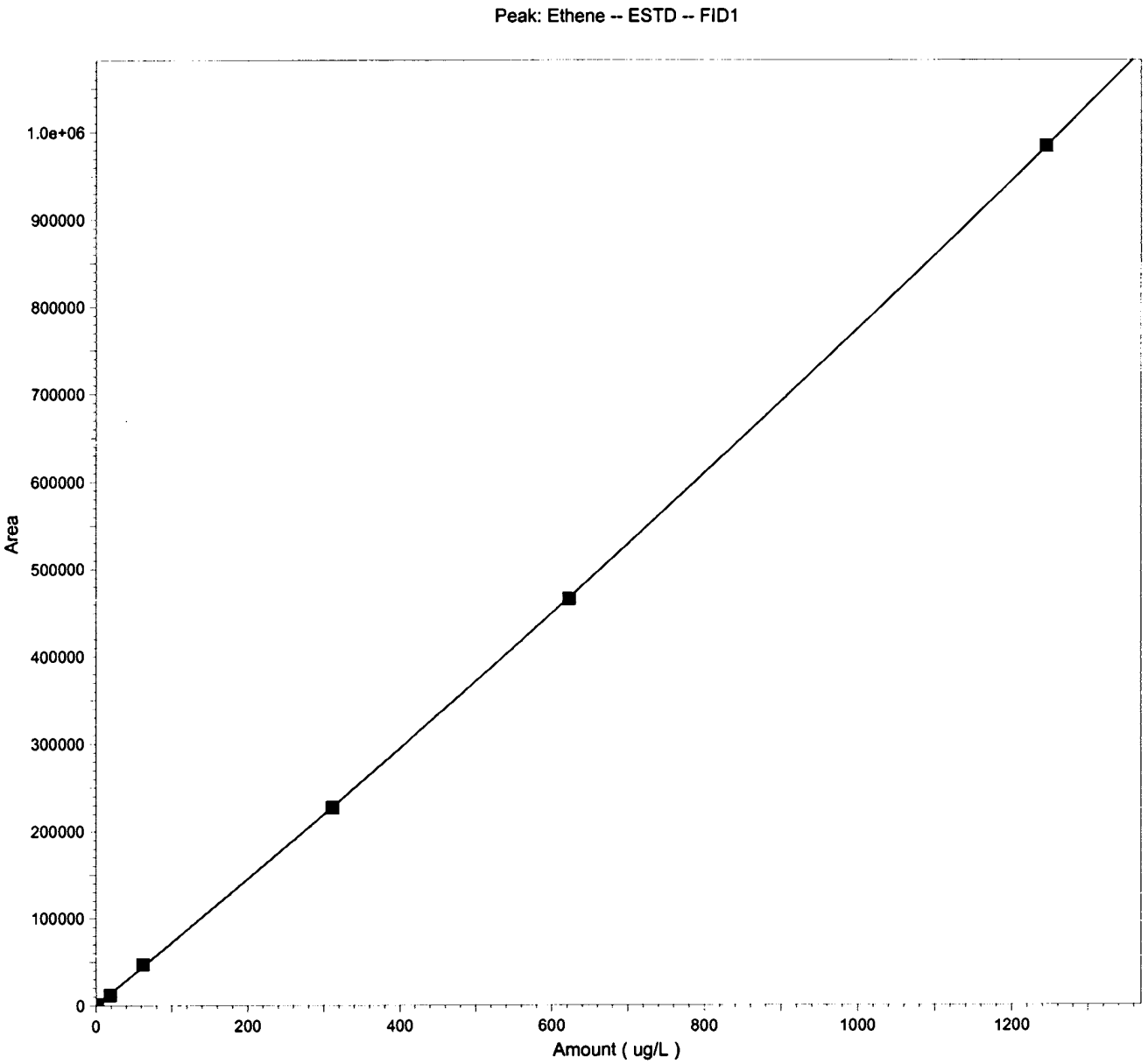
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Amount	0.498	1.4939	18.6736	62.2452	311.226	622.452
Area	462	1239	11949	47114	227183	465889
RF	927.710843373	829.372782649	639.887327564	756.909769749	729.961741615	748.474018389
	494	441	048	314	977	858
Last Area						
Residual	0.0023585	-0.0939674	2.05222	-3.45839	0.528804	1.74386
Rep StDev						
Rep %RSD						
Rep 1 Area	462	1239	11949	47114	227183	465889

	Level 7
Amount	1244.9
Area	983971
RF	790.399353010
	145
Last Area	
Residual	-0.789155
Rep StDev	
Rep %RSD	

Calibration Report

Sequence : \\gcserver\gcdata\Projects\GC9\Sequence\2020\meep200409.seq
User : CCL
Printed : 4/10/2020 1:04:06 PM

Rep 1 Area | 983971 |



Ethane (FID1)
Average RF: 1062.42 RF StDev: 100.132 RF %RSD: 9.42493
Scaling: None LSQ Weighting: 1/Amount Force Through Zero: Off
Replicate Mode: Replace
Fit Type: Quadratic
$y = 0.0861811x^2 + 1063.81x - 85.0544$
Goodness of fit (r^2): 0.999926

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Amount	0.5335	1.6006	20.0074	66.6913	333.456	666.913
Area	498	1665	18546	76413	367586	738033

Calibration Report

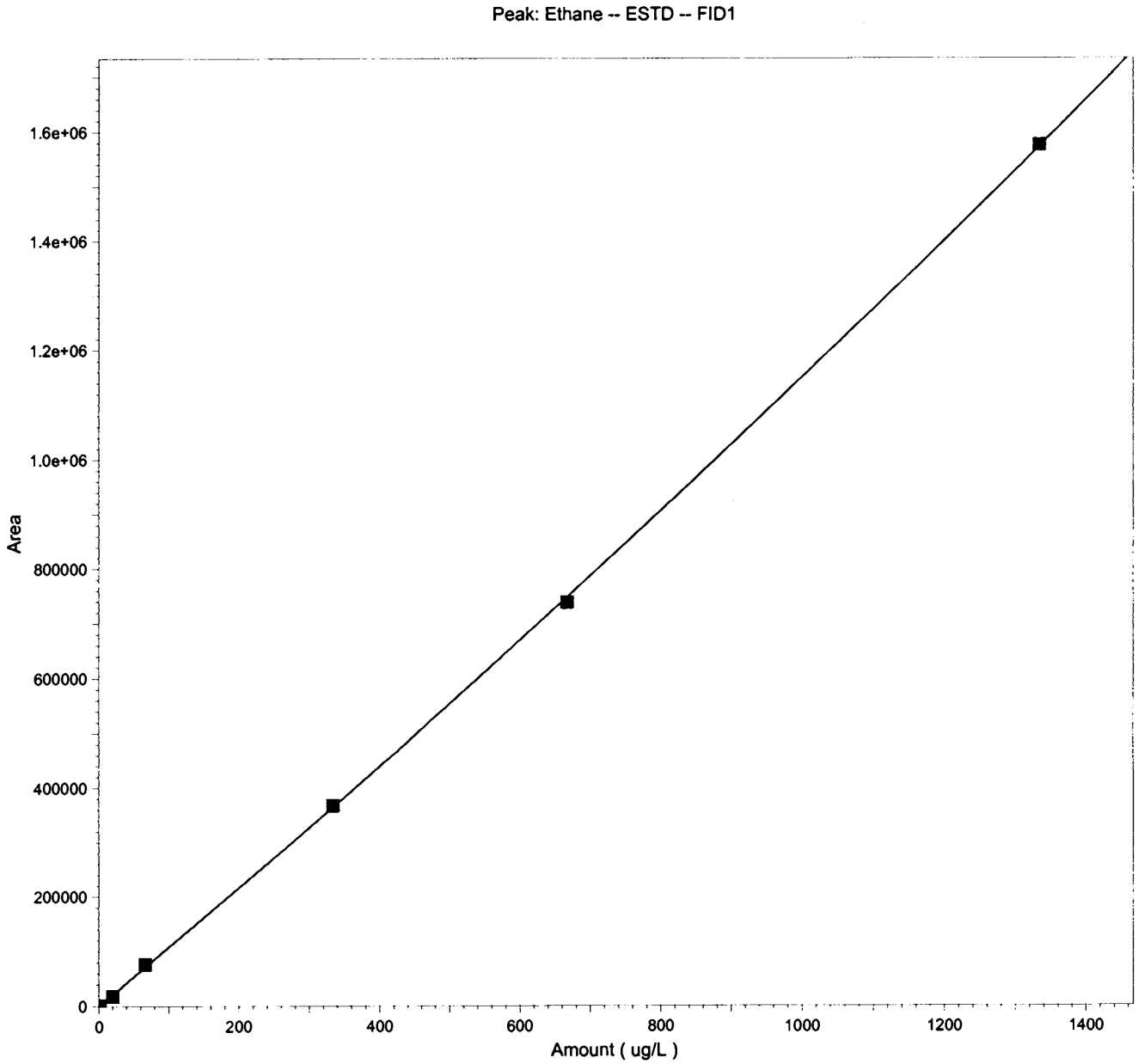
Sequence : \\gcserver\gcdata\Projects\GC9\Sequence\2020\meep200409.seq
User : CCL
Printed : 4/10/2020 1:04:06 PM

RF	933.458294283037	1040.23491190803	926.957025900417	1145.77163737999	1102.35134258972	1106.64109410422
Last Area						
Residual	-0.0145572	-0.0442631	2.51866	-4.80413	-2.99078	8.21788
Rep StDev						
Rep %RSD						
Rep 1 Area	498	1665	18546	76413	367586	738033

	Level 7
Amount	1333.83
Area	1575959
RF	1181.53320517063
Last Area	
Residual	-2.92422
Rep StDev	
Rep %RSD	
Rep 1 Area	1575959

Calibration Report

Sequence : \\gcserver\gcdata\Projects\GC9\Sequence\2020\meep200409.seq
User : CCL
Printed : 4/10/2020 1:04:06 PM



Propane (FID1)
Average RF: 1122.92 RF StDev: 180.185 RF %RSD: 16.0461
Scaling: None LSQ Weighting: 1/Amount Force Through Zero: Off
Replicate Mode: Replace
Fit Type: Quadratic
$y = 0.0641586x^2 + 1183.05x - 370.432$
Goodness of fit (r^2): 0.999904

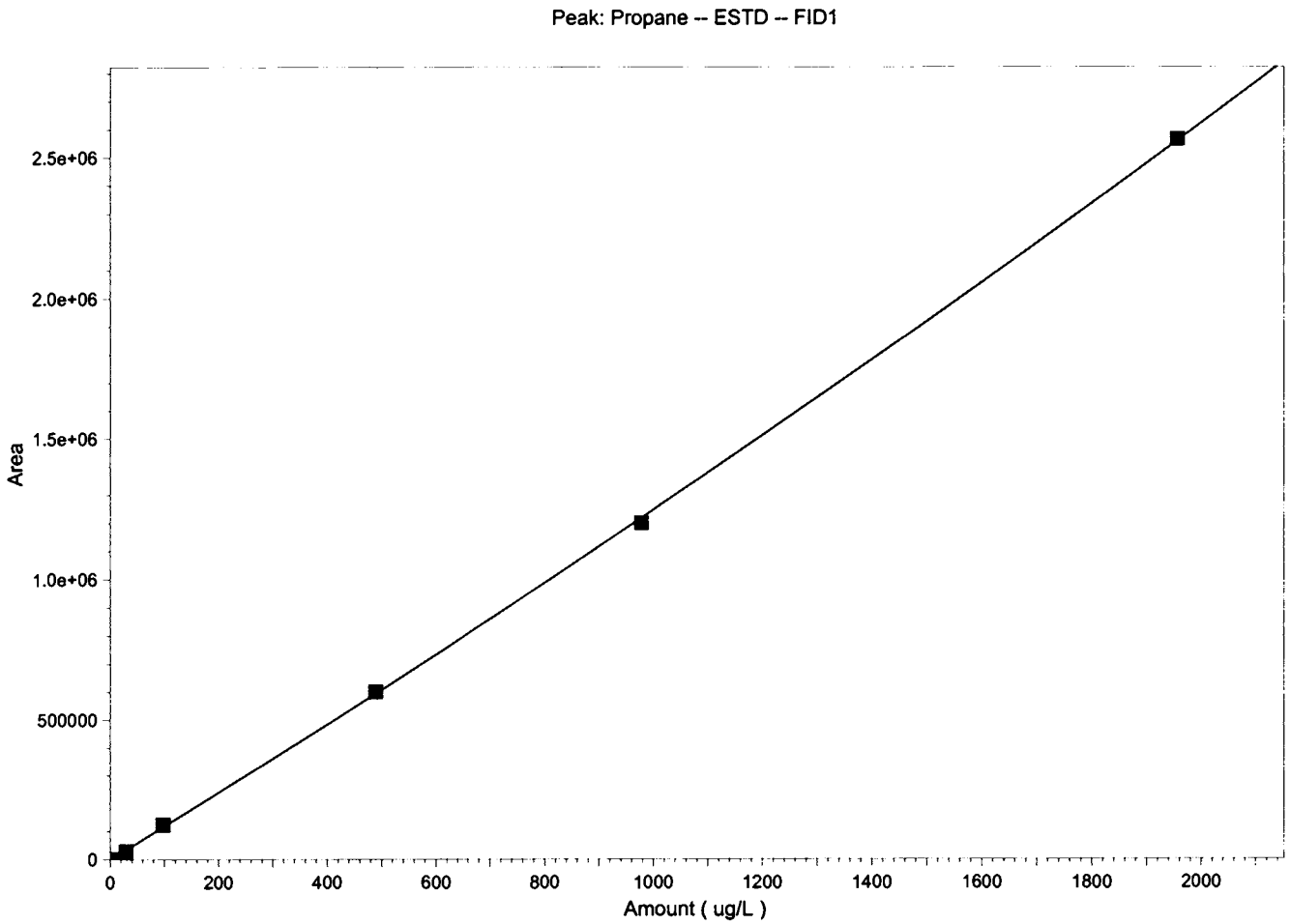
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Amount	0.7825	2.3475	29.3442	97.8139	489.069	978.139
Area	666	2256	29505	124732	600943	1200207
RF	851.118210862	961.022364217	1005.47978816	1275.19708344	1228.74815491	1227.03162925
	62	252	938	111	383	99

Calibration Report

Sequence : \\gcserver\gcdata\Projects\GC9\Sequence\2020\meep200409.seq
User : CCL
Printed : 4/10/2020 1:04:06 PM

Last Area						
Residual	-0.0935244	0.127721	4.12586	-7.33197	-5.91614	13.7619
Rep StDev						
Rep %RSD						
Rep 1 Area	666	2256	29505	124732	600943	1200207

	Level 7
Amount	1956.28
Area	2566335
RF	1311.84629662
	913
Last Area	
Residual	-4.73378
Rep StDev	
Rep %RSD	
Rep 1 Area	2566335



Dissolved Gases (RSK175) Calibration Verification Summary

ALSLG-Fort Collins

Acq. Sequence : \\gcserver\gcdata\Projects\GC9\Sequence\2020\meep200409.seq
Instrument : GC9
Data Acquired By : CCL
Data Processed By : CCL

Methane

(nom. conc. = 142.554 ppb)

Sample	Filename	Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
MEEP ICV	10942.dat	1.262	1.265	0.003	1767.290	149.468	142.554	**105**
HC200409-91CCS	10944.dat	1.262	1.265	0.003	1767.290	139.462	142.554	**98**
HC200409-91CCSD	10956.dat	1.262	1.267	0.005	1767.290	131.896	142.554	**93**
HC200409-91CCV	10962.dat	1.262	1.265	0.003	1767.290	145.270	142.554	**102**

Ethene

(nom. conc. = 249.281 ppb)

Sample	Filename	Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
MEEP ICV	10942.dat	1.393	1.397	0.003	774.674	266.774	249.281	**107**
HC200409-91CCS	10944.dat	1.393	1.397	0.003	774.674	251.783	249.281	**101**
HC200409-91CCSD	10956.dat	1.393	1.398	0.005	774.674	237.100	249.281	**95**
HC200409-91CCV	10962.dat	1.393	1.398	0.005	774.674	256.240	249.281	**103**

Ethane

(nom. conc. = 267.194 ppb)

Sample	Filename	Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
MEEP ICV	10942.dat	1.460	1.462	0.002	1062.421	284.101	267.194	**106**
HC200409-91CCS	10944.dat	1.460	1.463	0.003	1062.421	264.574	267.194	**99**
HC200409-91CCSD	10956.dat	1.460	1.463	0.003	1062.421	250.415	267.194	**94**
HC200409-91CCV	10962.dat	1.460	1.465	0.005	1062.421	273.414	267.194	**102**

Propane

(nom. conc. = 391.835 ppb)

Sample	Filename	Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
MEEP ICV	10942.dat	2.288	2.288	0.000	1122.921	414.863	391.835	**106**
HC200409-91CCS	10944.dat	2.288	2.290	0.002	1122.921	382.769	391.835	**98**
HC200409-91CCSD	10956.dat	2.288	2.292	0.003	1122.921	362.786	391.835	**93**
HC200409-91CCV	10962.dat	2.288	2.293	0.005	1122.921	394.657	391.835	**101**

Dissolved Gases (RSK175) Calibration Verification Summary

ALSLG-Fort Collins

Acq. Sequence : \\NAFCLWS006\gcdata\Projects\GC_9\Sequence\meep211021.seq
Instrument : GC9
Data Acquired By : spiller
Data Processed By : spiller

Methane
(nom. conc. = 142.554 ppb)

Sample	Filename	Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
HC211021-91...	12967.dat	1.212	1.213	0.002	1767.290	154.707	142.554	**109**
HC211021-91...	12979.dat	1.212	1.213	0.002	1767.290	162.531	142.554	**114**
HC211021-91...	12990.dat	1.212	1.212	0.000	1767.290	124.480	142.554	**87**
HC211021-91...	12999.dat	1.212	1.213	0.002	1767.290	118.733	142.554	**83**
HC211021-91...	13007.dat	1.212	1.213	0.002	1767.290	135.896	142.554	**95**

Ethene
(nom. conc. = 249.281 ppb)

Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
1.335	1.337	0.002	774.674	277.090	249.281	**111**
1.335	1.337	0.002	774.674	285.699	249.281	**115**
1.335	1.335	0.000	774.674	220.760	249.281	**89**
1.335	1.337	0.002	774.674	205.637	249.281	**82**
1.335	1.337	0.002	774.674	248.746	249.281	**100**

Ethane
(nom. conc. = 267.194 ppb)

Sample	Filename	Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
HC211021-91...	12967.dat	1.393	1.397	0.003	1062.421	294.491	267.194	**110**
HC211021-91...	12979.dat	1.393	1.397	0.003	1062.421	305.577	267.194	**114**
HC211021-91...	12990.dat	1.393	1.395	0.002	1062.421	234.464	267.194	**88**
HC211021-91...	12999.dat	1.393	1.397	0.003	1062.421	215.320	267.194	**81**
HC211021-91...	13007.dat	1.393	1.397	0.003	1062.421	258.041	267.194	**97**

Propane
(nom. conc. = 391.835 ppb)

Exp. RT (min.)	RT	Dev.	Avg RF	Conc. ug/L	Nom. Conc.	% Rec.
2.175	2.177	0.002	1122.921	435.538	391.835	**111**
2.175	2.178	0.003	1122.921	453.547	391.835	**116**
2.175	2.175	0.000	1122.921	346.532	391.835	**88**
2.175	2.177	0.002	1122.921	314.609	391.835	**80**
2.175	2.177	0.002	1122.921	378.335	391.835	**97**

Pace Analytical®

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 11/08/2021

Report # 221101357

Project HS21100477 Dept of Defense

Samples Collected 10/7/21

Deliver To	***Additional Recipients***
Ragen Giga ALS Houston 10450 Stancliff Rd Suite 210 Houston, TX 77099 281-530-5656	Jumoke Lawal, ALS Houston

PJLA Testing DoD ELAP

ISO 17025

NELAP ACCREDITED TNI LABORATORY

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
Pace Gulf Coast Report 221101357

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ALS Environmental - Houston, TX **Report:** 221101357

Pace Analytical Gulf Coast received and analyzed the sample(s) listed
on the Report Sample Summary page of this report. Receipt of the sample(s) is documented
by the attached chain of custody. This applies only to the sample(s) listed in this report.
No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.3 as specified in the contract.

VOLATILES GAS CHROMATOGRAPHY

In the EPA RSK-175 analysis for analytical batch 724351, the MS/MSD recoveries and RPDs are not applicable to Carbon Dioxide because the spike was diluted out of the samples. The LCS recovery is acceptable.

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22110135701	50WW14_211007	Water	10/07/21 07:45	10/12/21 11:49
22110135702	50WW13_211007	Water	10/07/21 08:40	10/12/21 11:49
22110135703	50WW11_211007	Water	10/07/21 09:30	10/12/21 11:49
22110135704	50WW11_211007-FD	Water	10/07/21 09:30	10/12/21 11:49
22110135705	50WW06_211007	Water	10/07/21 10:35	10/12/21 11:49
22110135706	50WW12_211007	Water	10/07/21 11:40	10/12/21 11:49
22110135707	50WW06_211007-MS	Water	10/07/21 10:35	10/12/21 11:49
22110135708	50WW06_211007-MSD	Water	10/07/21 10:35	10/12/21 11:49

Pace Analytical

Report#: 221101357
Project ID: HS21100477 Dept of Defense **Report Date:** 11/08/2021

Test Summary

EPA RSK-175					
Lab ID	**Client ID**	**Matrix**	**Batch**	**Instru**	**RunDate**
22110135701	50WW14_211007	Water	724351	GCV8B	10/21/21 10:52
22110135702	50WW13_211007	Water	724351	GCV8B	10/21/21 11:02
22110135703	50WW11_211007	Water	724351	GCV8B	10/21/21 11:08
22110135704	50WW11_211007-FD	Water	724351	GCV8B	10/21/21 11:13
22110135705	50WW06_211007	Water	724351	GCV8B	10/21/21 11:19
22110135706	50WW12_211007	Water	724351	GCV8B	10/21/21 11:34
22110135707	50WW06_211007-MS	Water	724351	GCV8B	10/21/21 11:24
22110135708	50WW06_211007-MSD	Water	724351	GCV8B	10/21/21 11:29

Manual Integrations

Lab ID	Client ID	Matrix	Method	Parameter
22110135701	50WW14_211007	Water	EPA RSK-175	Carbon Dioxide
22110135702	50WW13_211007	Water	EPA RSK-175	Carbon Dioxide
22110135705	50WW06_211007	Water	EPA RSK-175	Carbon Dioxide
22110135706	50WW12_211007	Water	EPA RSK-175	Carbon Dioxide
22110135707	50WW06_211007-MS	Water	EPA RSK-175	Carbon Dioxide

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

EPA RSK-175

Lab ID	Client ID	Parameter	Units	Result	Dil.	%Moist
22110135701	50WW14_211007	Carbon Dioxide	ug/L	472000	100	NA
22110135702	50WW13_211007	Carbon Dioxide	ug/L	477000	100	NA
22110135703	50WW11_211007	Carbon Dioxide	ug/L	450000	100	NA
22110135704	50WW11_211007-FD	Carbon Dioxide	ug/L	417000	100	NA
22110135705	50WW06_211007	Carbon Dioxide	ug/L	541000J	100	NA
22110135706	50WW12_211007	Carbon Dioxide	ug/L	366000	100	NA

Pace Analytical

Report#: 221101357
Project ID: HS21100477 Dept of Defense **Report Date:** 11/08/2021

Sample Results

50WW14_211007

Collect Date 10/07/2021 07:45 **Lab ID** 22110135701
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 10:52	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	472000	12700	38600	90000	ug/L

50WW13_211007

Collect Date 10/07/2021 08:40 **Lab ID** 22110135702
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 11:02	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	477000	12700	38600	90000	ug/L

50WW11_211007

Collect Date 10/07/2021 09:30 **Lab ID** 22110135703
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 11:08	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	450000	12700	38600	90000	ug/L

50WW11_211007-FD

Collect Date 10/07/2021 09:30 **Lab ID** 22110135704
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 11:13	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	417000	12700	38600	90000	ug/L

Pace Analytical

Report#: 221101357
Project ID: HS21100477 Dept of Defense **Report Date:** 11/08/2021

Sample Results

50WW06_211007

Collect Date 10/07/2021 10:35 **Lab ID** 22110135705
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 11:19	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	541000J	12700	38600	90000	ug/L

50WW12_211007

Collect Date 10/07/2021 11:40 **Lab ID** 22110135706
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 11:34	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	366000	12700	38600	90000	ug/L

50WW06_211007-MS

Collect Date 10/07/2021 10:35 **Lab ID** 22110135707
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 11:24	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	539000	12700	38600	90000	ug/L

50WW06_211007-MSD

Collect Date 10/07/2021 10:35 **Lab ID** 22110135708
Receive Date 10/12/2021 11:49 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	10/21/21 11:29	724351	BMR	

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	533000	12700	38600	90000	ug/L

Pace Analytical

Report#: 221101357
Project ID: HS21100477 Dept of Defense **Report Date:** 11/08/2021

GC Volatiles QC Summary

Analytical Batch 724351	Client ID	MB724351		LCS724351				LCSD724351				
	Lab ID	2258255		2258256				2258257				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	10/21/21 10:16		10/21/21 10:21				10/21/21 10:28				
	Matrix	Water		Water				Water				
EPA RSK-175		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Carbon Dioxide	124-38-9	900U	386	8700	8880	102	38 - 147	8700	8970	103	1	40

Analytical Batch 724351	Client ID	50WW06_211007		50WW06_211007-MS				50WW06_211007-MSD				
	Lab ID	22110135705		22110135707				22110135708				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	10/21/2021 11:19		10/21/21 11:24				10/21/21 11:29				
	Matrix	Water		Water				Water				
EPA RSK-175		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Carbon Dioxide	124-38-9	541000	38600	8700	539000	**-23***	38 - 147	8700	533000	**-92***	1	40

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

SAMPLING STATE: **Dept of Defense** **COC ID: 17076**

SUBCONTRACT TO:

Pace Analytical
7979 Innovation Park Drive
Baton Rouge, LA 70820

Phone: +1 225 769 4900

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS21100477
TSR:	Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS21100477-01** XXX SUB	**50WW14_211007**	**Groundwater**	**07 Oct 2021 07:45** – 1 22 Oct 2021
2.	**HS21100477-02** XXX SUB	**50WW13_211007**	**Groundwater**	**07 Oct 2021 08:40** – 2 22 Oct 2021
3.	**HS21100477-03** XXX SUB	**50WW11_211007**	**Groundwater**	**07 Oct 2021 09:30** – 3 22 Oct 2021
4.	**HS21100477-04** XXX SUB	**50WW11_211007-FD**	**Groundwater**	**07 Oct 2021 09:30** – 4 22 Oct 2021
5.	**HS21100477-05** XXX SUB	**50WW06_211007**	**Groundwater**	**07 Oct 2021 10:35** – 5 22 Oct 2021
6.	**HS21100477-06** XXX SUB	**50WW12_211007**	**Groundwater**	**07 Oct 2021 11:40** – 6 22 Oct 2021

Comments: Please analyze for RSK 175 - CO2. CO2. Provide DOD LV II & IV pdf separate. Equis EDD. EQuIS 5.0 - Longhorn
Send report to the emails shown above.
HS21100477-05 = MS/MSD
3 x Neat Vials + 3 x HCL Vials per sample

QC Level: DOD IV (DoD Data Package)

Client ID: ALS Houston - ALS Environmental - Houston, TX
SDG: 221101357
PM: RWe

Pace Analytical®

SAMPLE RECEIVING CHECKLIST

221101357

SAMPLE DELIVERY GROUP 221101357	
Client **PM** RWe ALS Houston - ALS Environmental - Houston, TX	**Transport Method** FEDEX
Profile Number 294458	**Received By** McCune, Dodie N. Henderson, Jacob R.
Line Item(s) 1 - CO2	**Receive Date(s)** 10/12/21

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E34	Temp °C
791997007102		0.8

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

October 25, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS21100668**

Laboratory Results for: **LHAAP50 October 2021**

Dear Vicki Graves ,

ALS Environmental received 9 sample(s) on Oct 12, 2021 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Work Order: HS21100668

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21100668-01	50WW09-211011	Water		11-Oct-2021 07:55	12-Oct-2021 10:00	☐
HS21100668-02	50WW08-211011	Water		11-Oct-2021 08:35	12-Oct-2021 10:00	☐
HS21100668-03	50WW22-211011	Water		11-Oct-2021 09:20	12-Oct-2021 10:00	☐
HS21100668-04	50WW23-211011	Water		11-Oct-2021 10:15	12-Oct-2021 10:00	☐
HS21100668-05	50WW15-211011	Water		11-Oct-2021 11:00	12-Oct-2021 10:00	☐
HS21100668-06	50WW16-211011	Water		11-Oct-2021 11:45	12-Oct-2021 10:00	☐
HS21100668-07	50WW16-211011-FD	Water		11-Oct-2021 11:45	12-Oct-2021 10:00	☐
HS21100668-08	50WW18-211011	Water		11-Oct-2021 12:35	12-Oct-2021 10:00	☐
HS21100668-09	Trip Blank-211011	Water	CG-082521-629	11-Oct-2021 00:00	12-Oct-2021 10:00	☐

Revision:1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Work Order: HS21100668

CASE NARRATIVE

Work Order Comments

- Report Revised on October 25,2021 to correct the Project name.

GCMS Volatiles by Method SW8260

Batch ID: R393998

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW09-211011
Collection Date: 11-Oct-2021 07:55

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 00:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 00:27
cis-1,2-Dichloroethene	**0.93**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Oct-2021 00:27
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	22-Oct-2021 00:27
Trichloroethene	**5.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Oct-2021 00:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 00:27
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 00:27*
Surr: 4-Bromofluorobenzene	*98.5*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 00:27*
Surr: Dibromofluoromethane	*98.6*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 00:27*
Surr: Toluene-d8	*99.9*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 00:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW08-211011
Collection Date: 11-Oct-2021 08:35

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	**0.56**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Oct-2021 00:48
1,2-Dichloroethane	**3.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Oct-2021 00:48
cis-1,2-Dichloroethene	**54**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Oct-2021 00:48
Tetrachloroethene	**0.90**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	22-Oct-2021 00:48
Trichloroethene	**370**		**2.0**	**5.0**	**10**	**ug/L**	10	22-Oct-2021 01:51
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 00:48
Surr: 1,2-Dichloroethane-d4	*96.5*			**0**	*81-118*	*%REC*	*10*	*22-Oct-2021 01:51*
Surr: 1,2-Dichloroethane-d4	*99.4*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 00:48*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 00:48*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*10*	*22-Oct-2021 01:51*
Surr: Dibromofluoromethane	*96.9*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 00:48*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*10*	*22-Oct-2021 01:51*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 00:48*
Surr: Toluene-d8	*99.4*			**0**	*89-112*	*%REC*	*10*	*22-Oct-2021 01:51*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW22-211011
Collection Date: 11-Oct-2021 09:20

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:12
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	22-Oct-2021 02:12
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:12
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 02:12*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 02:12*
Surr: Dibromofluoromethane	*97.6*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 02:12*
Surr: Toluene-d8	*98.4*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 02:12*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW23-211011
Collection Date: 11-Oct-2021 10:15

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:33
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:33
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	22-Oct-2021 02:33
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:33
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 02:33*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 02:33*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 02:33*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 02:33*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW15-211011
Collection Date: 11-Oct-2021 11:00

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:54
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:54
cis-1,2-Dichloroethene	**1.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Oct-2021 02:54
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	22-Oct-2021 02:54
Trichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	22-Oct-2021 02:54
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 02:54
Surr: 1,2-Dichloroethane-d4	*97.7*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 02:54*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 02:54*
Surr: Dibromofluoromethane	*96.1*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 02:54*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 02:54*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW16-211011
Collection Date: 11-Oct-2021 11:45

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:16
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:16
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:16
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	22-Oct-2021 03:16
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:16
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:16
Surr: 1,2-Dichloroethane-d4	*98.3*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 03:16*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 03:16*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 03:16*
Surr: Toluene-d8	*97.7*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 03:16*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW16-211011-FD
Collection Date: 11-Oct-2021 11:45

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:37
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	22-Oct-2021 03:37
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:37
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 03:37*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 03:37*
Surr: Dibromofluoromethane	*98.9*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 03:37*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 03:37*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: 50WW18-211011
Collection Date: 11-Oct-2021 12:35

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:58
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	22-Oct-2021 03:58
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	22-Oct-2021 03:58
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2021 03:58*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2021 03:58*
Surr: Dibromofluoromethane	*97.7*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2021 03:58*
Surr: Toluene-d8	*97.5*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2021 03:58*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
Sample ID: Trip Blank-211011
Collection Date: 11-Oct-2021 00:00

ANALYTICAL REPORT
WorkOrder:HS21100668
Lab ID:HS21100668-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Oct-2021 23:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Oct-2021 23:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Oct-2021 23:45
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	21-Oct-2021 23:45
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Oct-2021 23:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Oct-2021 23:45
Surr: 1,2-Dichloroethane-d4	*98.6*			**0**	*81-118*	*%REC*	*1*	*21-Oct-2021 23:45*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*1*	*21-Oct-2021 23:45*
Surr: Dibromofluoromethane	*97.9*			**0**	*80-119*	*%REC*	*1*	*21-Oct-2021 23:45*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*1*	*21-Oct-2021 23:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100668

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R393998 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21100668-01	50WW09-211011	11 Oct 2021 07:55			22 Oct 2021 00:27	1
HS21100668-02	50WW08-211011	11 Oct 2021 08:35			22 Oct 2021 01:51	10
HS21100668-02	50WW08-211011	11 Oct 2021 08:35			22 Oct 2021 00:48	1
HS21100668-03	50WW22-211011	11 Oct 2021 09:20			22 Oct 2021 02:12	1
HS21100668-04	50WW23-211011	11 Oct 2021 10:15			22 Oct 2021 02:33	1
HS21100668-05	50WW15-211011	11 Oct 2021 11:00			22 Oct 2021 02:54	1
HS21100668-06	50WW16-211011	11 Oct 2021 11:45			22 Oct 2021 03:16	1
HS21100668-07	50WW16-211011-FD	11 Oct 2021 11:45			22 Oct 2021 03:37	1
HS21100668-08	50WW18-211011	11 Oct 2021 12:35			22 Oct 2021 03:58	1
HS21100668-09	Trip Blank-211011	11 Oct 2021 00:00			21 Oct 2021 23:45	1

Revision: 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100668

QC BATCH REPORT

Batch ID: R393998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-211021** Units: **ug/L** Analysis Date: **21-Oct-2021 23:24**
Client ID: Run ID: **VOA6_393998** SeqNo: **6333288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.39*	*1.0*	*50*	*0*	*96.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.69*	*1.0*	*50*	*0*	*97.4*	*85 - 114*				
Surr: Dibromofluoromethane	*48.53*	*1.0*	*50*	*0*	*97.1*	*80 - 119*				
Surr: Toluene-d8	*49.27*	*1.0*	*50*	*0*	*98.5*	*89 - 112*				

LCS Sample ID: **VLCSW-211021** Units: **ug/L** Analysis Date: **21-Oct-2021 22:42**
Client ID: Run ID: **VOA6_393998** SeqNo: **6333287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.26	1.0	20	0	96.3	71 - 131				
1,2-Dichloroethane	21.32	1.0	20	0	107	73 - 128				
cis-1,2-Dichloroethene	21.29	1.0	20	0	106	78 - 123				
Tetrachloroethene	21.5	1.0	20	0	107	74 - 129				
Trichloroethene	20.32	1.0	20	0	102	79 - 123				
Vinyl chloride	18.94	1.0	20	0	94.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*56.62*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.82*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*54.5*	*1.0*	*50*	*0*	*109*	*80 - 119*				
Surr: Toluene-d8	*47.14*	*1.0*	*50*	*0*	*94.3*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: HS21100668

QC BATCH REPORT

Batch ID: R393998 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21100668-01MS** Units: **ug/L** Analysis Date: **22-Oct-2021 01:09**
Client ID: **50WW09-211011** Run ID: **VOA6_393998** SeqNo: **6333293** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	15.81	1.0	20	0	79.0	71 - 131				
1,2-Dichloroethane	17.83	1.0	20	0	89.1	73 - 128				
cis-1,2-Dichloroethene	18.52	1.0	20	0.9323	87.9	78 - 123				
Tetrachloroethene	19.5	1.0	20	0	97.5	74 - 129				
Trichloroethene	23.54	1.0	20	5.654	89.4	79 - 123				
Vinyl chloride	13.95	1.0	20	0	69.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.54*	*1.0*	*50*	*0*	*99.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.45*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*48.86*	*1.0*	*50*	*0*	*97.7*	*80 - 119*				
Surr: Toluene-d8	*48.25*	*1.0*	*50*	*0*	*96.5*	*89 - 112*				

MSD Sample ID: **HS21100668-01MSD** Units: **ug/L** Analysis Date: **22-Oct-2021 01:30**
Client ID: **50WW09-211011** Run ID: **VOA6_393998** SeqNo: **6333294** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	15.19	1.0	20	0	75.9	71 - 131	15.81	4	20	
1,2-Dichloroethane	17.93	1.0	20	0	89.6	73 - 128	17.83	0.561	20	
cis-1,2-Dichloroethene	18.05	1.0	20	0.9323	85.6	78 - 123	18.52	2.59	20	
Tetrachloroethene	18.58	1.0	20	0	92.9	74 - 129	19.5	4.84	20	
Trichloroethene	22.37	1.0	20	5.654	83.6	79 - 123	23.54	5.09	20	
Vinyl chloride	14.3	1.0	20	0	71.5	58 - 137	13.95	2.51	20	
Surr: 1,2-Dichloroethane-d4	*47.83*	*1.0*	*50*	*0*	*95.7*	*81 - 118*	*49.54*	*3.51*	*20*	
Surr: 4-Bromofluorobenzene	*50.84*	*1.0*	*50*	*0*	*102*	*85 - 114*	*51.45*	*1.2*	*20*	
Surr: Dibromofluoromethane	*49.02*	*1.0*	*50*	*0*	*98.0*	*80 - 119*	*48.86*	*0.313*	*20*	
Surr: Toluene-d8	*48.61*	*1.0*	*50*	*0*	*97.2*	*89 - 112*	*48.25*	*0.75*	*20*	

The following samples were analyzed in this batch:

HS21100668-01	HS21100668-02	HS21100668-03	HS21100668-04
HS21100668-05	HS21100668-06	HS21100668-07	HS21100668-08
HS21100668-09			

Revision: 1

ALS Houston, US Date: 25-Oct-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 October 2021
WorkOrder: **HS21100668**

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Texas	T104704231-21-28	30-Apr-2022

ALS Houston, US Date: 25-Oct-21

Sample Receipt Checklist

Work Order ID: HS21100668 **Date/Time Received:** **12-Oct-2021 10:00**

Client Name: CBI-Houston **Received by:** **Pablo Marinez**

Completed By:	/S/ Pablo Marinez	12-Oct-2021 15:38	**Reviewed by:**	/S/ Ragen Giga	13-Oct-2021 18:55
	eSignature	Date/Time		eSignature	Date/Time

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 ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
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):	4.1°C UC/C	IR 31
Cooler(s)/Kit(s):	47950	
Date/Time sample(s) sent to storage:	10/12/21 15:45	

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:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS
LONGHORN

Project No.
501032

Job:
LHAAP50 ~~July~~ OCTOBER 2021

REVISED

Prepared By:
Scott Beesinger

P.O. Number

HS21100668

Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D#
SDWW09-211011	W6	10/11/21/0755		3	X							
SDWW08-211011	W6	10/11/21/0835		3	X							
SDWW 22-211011	W6	10/11/21/0920		3	X							
SDWW23-211011	W6	10/11/21/1015		3	X							
SDWW15-211011	W6	10/11/21/1100		3	X							
SDWW16-211011	W6	10/11/21/1145		3	X							
SDWW16-211011-FD	W6	10/11/21/1145		3	X							
SDWW18-211011	W6	10/11/21/1235		3	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to edinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By	Date	Time
Scott Beesinger	10/11/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Page 1 of 1

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: LHAAP50 ~~July~~ OCTOBER 2021

REVISED

Prepared By: Scott Beesinger

P.O. Number

HS21100668

Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
TRip Blank-211011	W	10/11/21		2	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/11/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\U-ees\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stanciff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Page 1 of 1

HS21100668

Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Project: APTIM / ARMY AMMN. PLANT (LHAAP) / GROUNDWATER TREATMENT PLANT (GWTP) / KARNACK, TEXAS	LONGHORN	Project No. 501032
Job: **LHAAP50 July 2021**		
Prepared By: Scott Beesinger		P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SOWW09-211011	WG	10/11/21/0755		3	X							
SOWW08-211011	WG	10/11/21/0835		3	X							
SOWW22-211011	WG	10/11/21/0920		3	X							
SOWW23-211011	WG	10/11/21/1015		3	X							
SOWW15-211011	WG	10/11/21/1100		3	X							
SOWW16-211011	WG	10/11/21/1145		3	X							
SOWW16-211011-FD	WG	10/11/21/1145		3	X							
SOWW18-211011	WG	10/11/21/1235		3	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/11/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

4.7950 4.1C
IRS, CFO

(Word) S:\1-ccs\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 July 2021**

Prepared By: Scott Beesinger

P.O. Number

HS21100668

Aptim Environmental & Infrastucture, Inc.
LHAAP50 July 2021

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
TRIP BLANK-211011	W	10/11/21		2	X							

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/11/21	1430		10/13/21	1020						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

47450 4.1C
1431 CFC

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

47950

CUSTODY SEAL

Date: 10/12/21 Time: 1430
Name: Scott Beesinger
Company: Battelle

Seal Broken By: SMY
Date: 10/12/21

47950 OCT 12 2021

MICROBAC®

Microbac Laboratories Inc., - Marietta, OH

Level IV QA/QC Data Package

Laboratory Report Number:

M1J0510

Client Project ID:

LHAAP

For:

Vicki Graves

APTIM Tennesee

2410 Cherahala BLVD

Knoxville, TN 37932

Project Requested Certification:

Microbac Laboratories Inc., - Marietta, OH	2936.01	American Association for Laboratory Accreditation

Project State of Origin: Texas

All test results meet the requirements of the QAPP and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. I certify that all test results meet all of the requirements of the accrediting authority listed within this report. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Laboratory Project Manager:

Stephanie Mossburg

Stephanie Mossburg
Customer Relations Manager
Stephanie.Mossburg@microbac.com

Authorized By:

Stephanie Mossburg

Stephanie Mossburg
Customer Relations Manager
Issued: 12/06/2021

MICROBAC®

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Cooler Receipt Log

Cooler ID: Default Cooler Temp: 3.1 °C

Cooler Inspection Checklist

Ice Present or not required?	Yes	Shipping containers sealed or not required?	Yes
Custody seals intact or not required?	Yes	Chain of Custody (COC) Present?	Yes
COC includes customer information?	Yes	Relinquished and received signature on COC?	Yes
Sample collector identified on COC?	Yes	Sample type identified on COC?	Yes
Correct type of Containers Received	Yes	Correct number of containers listed on COC?	Yes
Containers Intact?	Yes	COC includes requested analyses?	Yes
Enough sample volume for indicated tests received?	Yes	Sample labels match COC (Name, Date & Time?)	Yes
Samples arrived within hold time?	Yes	Correct preservatives on COC or not required?	Yes
Chemical preservations checked or not required?	Yes	Preservation checks meet method requirements?	Yes
VOA vials have zero headspace, or not recd.?	Yes		

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Sample Summary

MICROBAC®

Sample Summary

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Client Sample ID:	Lab Sample ID:	Sampled:
50WW14-211007	M1J0510-01	10/07/21 07:45
50WW13-211007	M1J0510-02	10/07/21 08:40
50WW11-211007	M1J0510-03	10/07/21 09:30
50WW11-211007-FD	M1J0510-04	10/07/21 09:30
50WW06-211007	M1J0510-05	10/07/21 10:35
50WW12-211007	M1J0510-06	10/07/21 11:40
50WW29-211007	M1J0510-07	10/07/21 12:30
50WW05-211007	M1J0510-08	10/07/21 13:15

Holding Time Summary

MICROBAC®

Specific Method: EPA 6850 **Hold Time**

Laboratory Report Number: M1J0510

Matrix: Aqueous

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Laboratory ID	Date Collected	Date Received	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
50WW14-211007	10/07/21 07:45	10/08/21 09:45	10/11/21 21:07	4.56	28.00	
50WW13-211007	10/07/21 08:40	10/08/21 09:45	10/13/21 21:30	6.53	28.00	
50WW11-211007	10/07/21 09:30	10/08/21 09:45	10/13/21 21:43	6.51	28.00	
50WW11-211007-FD	10/07/21 09:30	10/08/21 09:45	10/13/21 21:56	6.52	28.00	
50WW06-211007	10/07/21 10:35	10/08/21 09:45	10/13/21 22:09	6.48	28.00	
50WW12-211007	10/07/21 11:40	10/08/21 09:45	10/13/21 22:49	6.47	28.00	
50WW29-211007	10/07/21 12:30	10/08/21 09:45	10/11/21 23:32	4.46	28.00	
50WW05-211007	10/07/21 13:15	10/08/21 09:45	10/11/21 23:46	4.44	28.00	

* - Holding time exceeded.

MICROBAC®

Analysis Class

HPLC Organics

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

HPLC Organics - Class Narrative and Notes

All test results meet the requirements of the QAPP and other applicable contract terms and conditions . Any exceptions are listed below in the sample and qc notes sections. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request.

Sample Notes

EPA 6850

D3 **Dilution was performed due to high target analyte concentration.**

M1J0510-02	50WW13-211007	M1J0510-03	50WW11-211007
M1J0510-04	50WW11-211007-FD	M1J0510-05	50WW06-211007
M1J0510-06	50WW12-211007		

QC Sample Notes

M2 **Matrix spike recovery is outside of acceptance limits, biased low.**

EPA 6850

Perchlorate

B1J0581-MS1	Matrix Spike	B1J0581-MSD1	Matrix Spike Dup

U **The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.**

EPA 6850

Perchlorate

S1J0168-CCB2	Calibration Blank	S1J0196-CCB2	Calibration Blank

MICROBAC®

HPLC Organics
EPA 6850

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

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FORM I:
HPLC Organics
EPA 6850
RESULTS SUMMARY

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW14-211007			**Collection Date:**	10/07/2021 07:45
Laboratory ID:	M1J0510-01			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/11/2021 21:07
Batch / Sequence:	B1J0581 / S1J0168	**Analytical Method:**	EPA 6850	**Calibration:**	21J0010
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031008
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.200	0.100	0.200	0.400	U	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
U: The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW13-211007			**Collection Date:**	10/07/2021 08:40
Laboratory ID:	M1J0510-02			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/13/2021 21:30
Batch / Sequence:	B1J0581 / S1J0196	**Analytical Method:**	EPA 6850	**Calibration:**	21J0013
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031116
Analyst:	CAS	**Dilution:**	10000		

Sample Notes: D3

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	5080	1000	2000	4000		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
D3: Dilution was performed due to high target analyte concentration.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW11-211007			**Collection Date:**	10/07/2021 09:30
Laboratory ID:	M1J0510-03			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/13/2021 21:43
Batch / Sequence:	B1J0581 / S1J0196	**Analytical Method:**	EPA 6850	**Calibration:**	21J0013
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031117
Analyst:	CAS	**Dilution:**	10000		

Sample Notes: D3

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	4500	1000	2000	4000		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
D3: Dilution was performed due to high target analyte concentration.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW11-211007-FD			**Collection Date:**	10/07/2021 09:30
Laboratory ID:	M1J0510-04			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/13/2021 21:56
Batch / Sequence:	B1J0581 / S1J0196	**Analytical Method:**	EPA 6850	**Calibration:**	21J0013
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031118
Analyst:	CAS	**Dilution:**	10000		

Sample Notes: D3

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	4700	1000	2000	4000		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
D3: Dilution was performed due to high target analyte concentration.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW06-211007			**Collection Date:**	10/07/2021 10:35
Laboratory ID:	M1J0510-05			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/13/2021 22:09
Batch / Sequence:	B1J0581 / S1J0196	**Analytical Method:**	EPA 6850	**Calibration:**	21J0013
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031119
Analyst:	CAS	**Dilution:**	10		

Sample Notes: D3

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	15.1	1.00	2.00	4.00		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
D3: Dilution was performed due to high target analyte concentration.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW12-211007			**Collection Date:**	10/07/2021 11:40
Laboratory ID:	M1J0510-06			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/13/2021 22:49
Batch / Sequence:	B1J0581 / S1J0196	**Analytical Method:**	EPA 6850	**Calibration:**	21J0013
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031122
Analyst:	CAS	**Dilution:**	10000		

Sample Notes: D3

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	25500	1000	2000	4000		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
D3: Dilution was performed due to high target analyte concentration.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW29-211007			**Collection Date:**	10/07/2021 12:30
Laboratory ID:	M1J0510-07			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/11/2021 23:32
Batch / Sequence:	B1J0581 / S1J0168	**Analytical Method:**	EPA 6850	**Calibration:**	21J0010
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031019
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	3.58	0.100	0.200	0.400		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0510

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW05-211007			**Collection Date:**	10/07/2021 13:15
Laboratory ID:	M1J0510-08			**Prep Date:**	10/11/2021 11:25
Matrix:	Aqueous			**Analyzed:**	10/11/2021 23:46
Batch / Sequence:	B1J0581 / S1J0168	**Analytical Method:**	EPA 6850	**Calibration:**	21J0010
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031020
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.252	0.100	0.200	0.400	J	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
J: The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
ug/L: Micrograms per Liter

MICROBAC®

FORM III:
HPLC Organics
EPA 6850
BS/BSD, MS/MSD, DUP

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Matrix Spike/Duplicate (MS/MSD)
FORM IIIA

		Parent	Spike	Duplicate
Method:	EPA 6850			
Batch:	B1J0581	**Sample ID:** M1J0510-05	B1J0581-MS1	B1J0581-MSD1
Matrix:	Aqueous	**Prepared:** 10/11/2021 11:25	10/11/21 11:25	10/11/21 11:25
Units:	ug/L	**Analyzed:** 10/13/2021 22:09	10/13/21 22:23	10/13/21 22:36
Instrument:	LCMS2	**File ID:** 2LM031119	2LM031120	2LM031121
Calibration:	21J0013	**Dilution:** 10	10	10
Analyst:	CAS			

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limts	RPD Limit	Q
Perchlorate	15.1	0.200	14.9	-120	0.200	15.3	80.0	2.65	84 - 119	15	*

* - Exceeds %Rec Limit
\# - Exceeds RPD Limit

MICROBAC®

Laboratory Report Number: M1J0510

BLANK SPIKE (BS)

Client Project ID: LHAAP

FORM IIIB

Method:	EPA 6850		**Blank Spike**
Batch:	B1J0581	**Spike ID:**	B1J0581-BS1
Analyst:	CAS	**Prepared:**	10/11/21 11:25
Matrix:	Aqueous	**Analyzed:**	10/11/21 20:00
Units:	ug/L	**File ID:**	2LM031003
Instrument:	LCMS2	**Initial/Final:**	10mL/10mL
Calibration:	21J0010		

Analyte	BS Spiked	BS Found	BS %Rec	%Rec Limts	Q
Perchlorate	0.200	0.212	106	84 - 119	

* - Does not meet %Rec acceptance criteria.
\# - Does not meet RPD acceptance criteria.
NS - Analyte Not Spiked

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FORM IV:
HPLC Organics
EPA 6850
METHOD BLANK SUMMARY

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

METHOD BLANK SUMMARY
FORM IVA

Blank ID:	B1J0581-BLK1	**Batch:**	B1J0581
Blank File ID:	2LM031002	**Instrument:**	LCMS2
Prepared:	10/11/2021 11:25	**Method:**	EPA 6850
Analyzed:	10/11/2021 19:47	**Analyst:**	CAS

This Method Blank Applies To The Following Samples:

Client Sample ID	Laboratory Sample ID	Lab File ID	Time Analyzed
Blank	B1J0581-BLK1	2LM031002	10/11/2021 19:47
LCS	B1J0581-BS1	2LM031003	10/11/2021 20:00
50WW14-211007	M1J0510-01	2LM031008	10/11/2021 21:07
50WW29-211007	M1J0510-07	2LM031019	10/11/2021 23:32
50WW05-211007	M1J0510-08	2LM031020	10/11/2021 23:46
50WW13-211007	M1J0510-02	2LM031116	10/13/2021 21:30
50WW11-211007	M1J0510-03	2LM031117	10/13/2021 21:43
50WW11-211007-FD	M1J0510-04	2LM031118	10/13/2021 21:56
50WW06-211007	M1J0510-05	2LM031119	10/13/2021 22:09
Matrix Spike	B1J0581-MS1	2LM031120	10/13/2021 22:23
Matrix Spike Dup	B1J0581-MSD1	2LM031121	10/13/2021 22:36
50WW12-211007	M1J0510-06	2LM031122	10/13/2021 22:49

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Laboratory Report Number: M1J0510

Client Project ID: LHAAP

METHOD BLANK
FORM IVB

Sample ID:	B1J0581-BLK1	**Prep Date:**	10/11/21 11:25	**Matrix:**	Aqueous
Instrument:	LCMS2	**Analyzed:**	10/11/21 19:47	**Method:**	EPA 6850
File ID:	2LM031002	**Sequence:**	S1J0168	**Analyst:**	CAS
Batch:	B1J0581	**Units:**	ug/L	**Calibration:**	21J0010

Analyte	Result	DL	LOD	LOQ	Dilution	Flag	Q
Perchlorate	0.200	0.100	0.200	0.400	1	U	

Notes and Definitions

* - Detected in the associated method Blank at a concentration >= 1/2xRL

U: The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.

MICROBAC®

FORM VII:
HPLC Organics
EPA 6850
ICV/CCV

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Initial Calibration Verification (ICV)
FORM VIIA

Sample ID: S1J0168-ICV1			**Analyzed:** 10/11/21 18:41			**Method:** EPA 6850		
Instrument: LCMS2			**Calibration:** 21J0010			**Sequence:** S1J0168		
File ID: 2LM030997			**Units:** ug/L			**Analyst:** CAS		
Analyte	**Response**	**Limit**	**Q**	**Expected**	**Found**	**% Drift / % Diff**	**UCL**	**Q**
Perchlorate	0.8851826			1.00	1.01	1.3	15	

Sample ID: S1J0196-ICV1			**Analyzed:** 10/13/21 20:23			**Method:** EPA 6850		
Instrument: LCMS2			**Calibration:** 21J0013			**Sequence:** S1J0196		
File ID: 2LM031111			**Units:** ug/L			**Analyst:** CAS		
Analyte	**Response**	**Limit**	**Q**	**Expected**	**Found**	**% Drift / % Diff**	**UCL**	**Q**
Perchlorate	0.8453111			1.00	0.989	-1.1	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0168-CCV1	**Analyzed:**	10/11/21 19:07	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0010	**Sequence:**	S1J0168
File ID:	2LM030999	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8568324			1.00	0.981	-1.9	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0168-CCV2	**Analyzed:**	10/11/21 21:46	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0010	**Sequence:**	S1J0168
File ID:	2LM031011	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8820062			1.00	1.01	1.0	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0168-CCV3	**Analyzed:**	10/11/21 23:59	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0010	**Sequence:**	S1J0168
File ID:	2LM031021	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8211063			1.00	0.941	-5.9	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0168-CRL1	**Analyzed:**	10/11/21 19:20	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0010	**Sequence:**	S1J0168
File ID:	2LM031000	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.197	98.5	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0168-CRL2	**Analyzed:**	10/11/21 22:00	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0010	**Sequence:**	S1J0168
File ID:	2LM031012	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.215	108	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0168-CRL3	**Analyzed:**	10/12/21 00:12	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0010	**Sequence:**	S1J0168
File ID:	2LM031022	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.222	111	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0196-CCV1	**Analyzed:**	10/13/21 20:50	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0013	**Sequence:**	S1J0196
File ID:	2LM031113	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8275371			1.00	0.969	-3.1	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0196-CCV2	**Analyzed:**	10/13/21 23:02	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0013	**Sequence:**	S1J0196
File ID:	2LM031123	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8363045			1.00	0.979	-2.1	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0196-CRL1	**Analyzed:**	10/13/21 21:03	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0013	**Sequence:**	S1J0196
File ID:	2LM031114	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.203	102	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0196-CRL2	**Analyzed:**	10/13/21 23:16	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0013	**Sequence:**	S1J0196
File ID:	2LM031124	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.200	100	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

MATRIX CONDUCTIVITY TEST
FORM VII

Laboratory ID:	S1J0168-IFA1	**Run Date:**	10/11/21 19:34	**Matrix:**	Aqueous
Instrument:	LCMS2	**Calibration:**	21J0010	**Method:**	EPA 6850
File ID:	2LM031001	**Analyst:**	CAS	**Batch ID:**	S1J0168

Analyte	Known (ug/L)	Result (ug/L)	Recovery	LCL	UCL	MRL (ug/L)	Flags
Perchlorate	0.20000	0.229	115	80	120	0.4000	

MICROBAC®

Laboratory Report Number: M1J0510
Client Project ID: LHAAP

MATRIX CONDUCTIVITY TEST
FORM VII

Laboratory ID:	S1J0196-IFA1	**Run Date:**	10/13/21 21:16	**Matrix:**	Aqueous
Instrument:	LCMS2	**Calibration:**	21J0013	**Method:**	EPA 6850
File ID:	2LM031115	**Analyst:**	CAS	**Batch ID:**	S1J0196

Analyte	Known (ug/L)	Result (ug/L)	Recovery	LCL	UCL	MRL (ug/L)	Flags
Perchlorate	0.20000	0.239	120	80	120	0.4000	

MICROBAC®

FORM VIII:
HPLC Organics
EPA 6850
Internal Standard Area and RT

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

Laboratory:	Microbac Laboratories Inc., - Marietta, OH	**SDG:**	M1J0510
Client:	APTIM Tennessee	**Project:**	Longhorn AAP
Sequence:	S1J0168	**Instrument:**	LCMS2
		Calibration:	21J0010

Blank (B1J0581-BLK1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2224189	8.1	1904544	8.1	117	50 - 150		0.0000	+/-2.00	

LCS (B1J0581-BS1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2203376	8.08	1904544	8.1	116	50 - 150		-0.0200	+/-2.00	

50WW14-211007 (M1J0510-01)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1470568	7.71	1904544	8.1	77	50 - 150		-0.3900	+/-2.00	

50WW29-211007 (M1J0510-07)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1415029	7.71	1904544	8.1	74	50 - 150		-0.3500	+/-2.00	

50WW05-211007 (M1J0510-08)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1438196	7.71	1904544	8.1	76	50 - 150		-0.3500	+/-2.00	

Calibration Blank (S1J0168-CCB1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2067088	8.08	1904544	8.1	109	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0168-CCB2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2311046	8.06	1904544	8.1	121	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0168-CCB3)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2186937	8.06	1904544	8.1	115	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0168-CCV1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1904544	8.1	1904544	8.1	100	50 - 150		0.0000	+/-2.00	

MICROBAC®

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

Calibration Check (S1J0168-CCV2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2198692	8.06	1904544	8.1	115	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0168-CCV3)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2127459	8.06	1904544	8.1	112	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0168-CRL1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1976067	8.1	1904544	8.1	104	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0168-CRL2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2239438	8.06	1904544	8.1	118	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0168-CRL3)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2232424	8.06	1904544	8.1	117	50 - 150		0.0000	+/-2.00	

Initial Cal Blank (S1J0168-ICB1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2117910	8.06	1904544	8.1	111	50 - 150		-0.0200	+/-2.00	

Initial Cal Check (S1J0168-ICV1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2018510	8.08	1904544	8.1	106	50 - 150		0.0000	+/-2.00	

Interference Check A (S1J0168-IFA1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	2056477	7.49	1904544	8.1	108	50 - 150		-0.6100	+/-2.00	

MICROBAC®

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

Laboratory:	Microbac Laboratories Inc., - Marietta, OH	**SDG:**	M1J0510
Client:	APTIM Tennessee	**Project:**	Longhorn AAP
Sequence:	S1J0196	**Instrument:**	LCMS2
		Calibration:	21J0013

Matrix Spike (B1J0581-MS1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1311970	7.96	1270650	7.98	103	50 - 150		-0.0200	+/-2.00	

Matrix Spike Dup (B1J0581-MSD1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1268033	7.96	1270650	7.98	100	50 - 150		-0.0200	+/-2.00	

50WW13-211007 (M1J0510-02)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1358402	7.96	1270650	7.98	107	50 - 150		-0.0200	+/-2.00	

50WW11-211007 (M1J0510-03)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1389100	7.98	1270650	7.98	109	50 - 150		0.0000	+/-2.00	

50WW11-211007-FD (M1J0510-04)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1400744	7.98	1270650	7.98	110	50 - 150		0.0000	+/-2.00	

50WW06-211007 (M1J0510-05)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1321207	7.96	1270650	7.98	104	50 - 150		-0.0200	+/-2.00	

50WW12-211007 (M1J0510-06)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1208230	7.98	1270650	7.98	95	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0196-CCB1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1348345	7.96	1270650	7.98	106	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0196-CCB2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1196847	7.96	1270650	7.98	94	50 - 150		-0.0200	+/-2.00	

MICROBAC®

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

Calibration Check (S1J0196-CCV1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1270650	7.98	1270650	7.98	100	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0196-CCV2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1158920	7.98	1270650	7.98	91	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0196-CRL1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1336182	7.96	1270650	7.98	105	50 - 150		-0.0200	+/-2.00	

Instrument RL Check (S1J0196-CRL2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1156834	7.96	1270650	7.98	91	50 - 150		-0.0200	+/-2.00	

Initial Cal Blank (S1J0196-ICB1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1235039	7.79	1270650	7.98	97	50 - 150		-0.1500	+/-2.00	

Initial Cal Check (S1J0196-ICV1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1324329	7.96	1270650	7.98	104	50 - 150		0.0000	+/-2.00	

Interference Check A (S1J0196-IFA1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1377115	7.39	1270650	7.98	108	50 - 150		-0.5900	+/-2.00	

MICROBAC®

Section A:
HPLC Organics
EPA 6850
Batch / Sequence Raw Data

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Perchlorate Conductivity Check
(perchlorate1)

Conductivity Probe
Calibration Check: 1414 /1410 µs/cm

Working MCT Level: 4,990 µs/cm

Sample	Conductivity (µs/cm)	Pretreatment or Dilution Needed
MII1547-02	5160	
-03	5500	
-04	1.70	
MIJ0510-01	2720	
-02	2440	
-03	2310	
-04	2320	
-05	372	
-06	5240	
-07	4540	
-08	1566	

Analyst: Craig A. Smith

Date/Time: 10/12/21 / 1115

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	Ion Ratio (2.31-3.85)
2LM030989	Unknown		S1J0168-ICB1	1:1	Perchlorate	Target Compound	5848	2.354267311
2LM030989	Unknown		S1J0168-ICB1	1:1	Perchlorate	Target Compound	2484	
2LM030990	Cal Std	1	S1J0168-CAL1	1:1 0012469	Perchlorate	Target Compound	37114	2.951646254
2LM030990	Cal Std	1	S1J0168-CAL1	1:1 0012469	Perchlorate	Target Compound	12574	
2LM030991	Cal Std	2	S1J0168-CAL2	1:1 0012468	Perchlorate	Target Compound	73606	3.047867495
2LM030991	Cal Std	2	S1J0168-CAL2	1:1 0012468	Perchlorate	Target Compound	24150	
2LM030992	Cal Std	3	S1J0168-CAL3	1:1 0012467	Perchlorate	Target Compound	182818	3.058589306
2LM030992	Cal Std	3	S1J0168-CAL3	1:1 0012467	Perchlorate	Target Compound	59772	
2LM030993	Cal Std	4	S1J0168-CAL4	1:1 0012466	Perchlorate	Target Compound	357915	3.132022472
2LM030993	Cal Std	4	S1J0168-CAL4	1:1 0012466	Perchlorate	Target Compound	114276	
2LM030994	Cal Std	5	S1J0168-CAL5	1:1 0012465	Perchlorate	Target Compound	682322	3.111420181
2LM030994	Cal Std	5	S1J0168-CAL5	1:1 0012465	Perchlorate	Target Compound	219296	
2LM030995	Cal Std	6	S1J0168-CAL6	1:1 0012464	Perchlorate	Target Compound	1633713	3.11141943
2LM030995	Cal Std	6	S1J0168-CAL6	1:1 0012464	Perchlorate	Target Compound	525070	
2LM030996	Cal Std	7	S1J0168-CAL7	1:1 0012463	Perchlorate	Target Compound	3166656	3.178904318
2LM030996	Cal Std	7	S1J0168-CAL7	1:1 0012463	Perchlorate	Target Compound	996147	
2LM030997	Chk Std	ICV	S1J0168-ICV1	1:1 0012475	Perchlorate	Target Compound	357350	3.138668821
2LM030997	Chk Std	ICV	S1J0168-ICV1	1:1 0012475	Perchlorate	Target Compound	113854	
2LM030998	Unknown		S1J0168-CCB1	1:1	Perchlorate	Target Compound	4127	4.826900585
2LM030998	Unknown		S1J0168-CCB1	1:1	Perchlorate	Target Compound	855	
2LM030999	Chk Std	CCV	S1J0168-CCV1	1:1 0012466	Perchlorate	Target Compound	326375	3.135537857
2LM030999	Chk Std	CCV	S1J0168-CCV1	1:1 0012466	Perchlorate	Target Compound	104089	
2LM031000	Chk Std	QCMRL	S1J0168-CRL1	1:1 0012468	Perchlorate	Target Compound	63057	2.995866591
2LM031000	Chk Std	QCMRL	S1J0168-CRL1	1:1 0012468	Perchlorate	Target Compound	21048	
2LM031001	Unknown		S1J0168-IFA1	1:1 0012477	Perchlorate	Target Compound	77369	2.738434856
2LM031001	Unknown		S1J0168-IFA1	1:1 0012477	Perchlorate	Target Compound	28253	
2LM031002	Unknown		B1J0581-BLK1	1:1	Perchlorate	Target Compound	5247	#VALUE!
2LM031002	Unknown		B1J0581-BLK1	1:1	Perchlorate	Target Compound	N/F	
2LM031003	Unknown		B1J0581-BS1	1:1 0012474	Perchlorate	Target Compound	76382	3.233511134
2LM031003	Unknown		B1J0581-BS1	1:1 0012474	Perchlorate	Target Compound	23622	
2LM031004	Unknown		B1J0581-MRL1	1:1	Perchlorate	Target Compound	68051	3.075334418
2LM031004	Unknown		B1J0581-MRL1	1:1	Perchlorate	Target Compound	22128	
2LM031005	Unknown		M1I1547-02	1:1	Perchlorate	Target Compound	279605	3.180980443
2LM031005	Unknown		M1I1547-02	1:1	Perchlorate	Target Compound	87899	
2LM031006	Unknown		M1I1547-03	1:1	Perchlorate	Target Compound	155117	2.955059819
2LM031006	Unknown		M1I1547-03	1:1	Perchlorate	Target Compound	52492	
2LM031007	Unknown		M1I1547-04	1:1	Perchlorate	Target Compound	N/F	#VALUE!
2LM031007	Unknown		M1I1547-04	1:1	Perchlorate	Target Compound	N/F	
2LM031008	Unknown		M1J0510-01	1:1	Perchlorate	Target Compound	2793	#VALUE!
2LM031008	Unknown		M1J0510-01	1:1	Perchlorate	Target Compound	N/F	
2LM031009	Unknown		M1J0510-02 (NR)	1:1	Perchlorate	Target Compound	30937	9.196492271
2LM031009	Unknown		M1J0510-02 (NR)	1:1	Perchlorate	Target Compound	3364	
2LM031010	Unknown		M1J0510-03 (NR)	1:1	Perchlorate	Target Compound	222850	12.70090049
2LM031010	Unknown		M1J0510-03 (NR)	1:1	Perchlorate	Target Compound	17546	
2LM031011	Chk Std	CCV	S1J0168-CCV2	1:1 0012466	Perchlorate	Target Compound	387852	3.048336137
2LM031011	Chk Std	CCV	S1J0168-CCV2	1:1 0012466	Perchlorate	Target Compound	127234	
2LM031012	Chk Std	QCMRL	S1J0168-CRL2	1:1 0012468	Perchlorate	Target Compound	78873	3.596416032
2LM031012	Chk Std	QCMRL	S1J0168-CRL2	1:1 0012468	Perchlorate	Target Compound	21931	
2LM031013	Unknown		S1J0168-CCB2	1:1	Perchlorate	Target Compound	N/F	#VALUE!
2LM031013	Unknown		S1J0168-CCB2	1:1	Perchlorate	Target Compound	N/F	
2LM031014	Unknown		M1J0510-04 (NR)	1:1	Perchlorate	Target Compound	172897	3.483438772
2LM031014	Unknown		M1J0510-04 (NR)	1:1	Perchlorate	Target Compound	49634	
2LM031015	Unknown		M1J0510-05 (NR)	1:1	Perchlorate	Target Compound	4317838	3.198588064
2LM031015	Unknown		M1J0510-05 (NR)	1:1	Perchlorate	Target Compound	1349920	
2LM031016	Unknown		B1J0581-MS1 (NR)	1:1	Perchlorate	Target Compound	4388588	3.196801296
2LM031016	Unknown		B1J0581-MS1 (NR)	1:1	Perchlorate	Target Compound	1372806	
2LM031017	Unknown		B1J0581-MSD1 (NR)	1:1	Perchlorate	Target Compound	4365705	3.183367349
2LM031017	Unknown		B1J0581-MSD1 (NR)	1:1	Perchlorate	Target Compound	1371411	

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	Ion Ratio (2.31-3.85)
2LM031018	Unknown		M1J0510-06 (NR)	1:1	Perchlorate	Target Compound	917110	16.38193737
2LM031018	Unknown		M1J0510-06 (NR)	1:1	Perchlorate	Target Compound	55983	
2LM031019	Unknown		M1J0510-07	1:1	Perchlorate	Target Compound	895823	3.151232776
2LM031019	Unknown		M1J0510-07	1:1	Perchlorate	Target Compound	284277	
2LM031020	Unknown		M1J0510-08	1:1	Perchlorate	Target Compound	59936	2.22934722
2LM031020	Unknown		M1J0510-08	1:1	Perchlorate	Target Compound	26885	
2LM031021	Chk Std	CCV	S1J0168-CCV3	1:1 0012466	Perchlorate	Target Compound	349374	3.273897765
2LM031021	Chk Std	CCV	S1J0168-CCV3	1:1 0012466	Perchlorate	Target Compound	106715	
2LM031022	Chk Std	QCMRL	S1J0168-CRL3	1:1 0012468	Perchlorate	Target Compound	81223	3.870711018
2LM031022	Chk Std	QCMRL	S1J0168-CRL3	1:1 0012468	Perchlorate	Target Compound	20984	
2LM031023	Unknown		S1J0168-CCB3	1:1	Perchlorate	Target Compound	4403	#VALUE!
2LM031023	Unknown		S1J0168-CCB3	1:1	Perchlorate	Target Compound	N/F	

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	IS Rec (50-150 Avg. ICAL)
2LM030989	Unknown		S1J0168-ICB1	1:1	O18LP	Internal Standard	2117910	
2LM030990	Cal Std	1	S1J0168-CAL1	1:1 0012469	O18LP	Internal Standard	2327975	
2LM030991	Cal Std	2	S1J0168-CAL2	1:1 0012468	O18LP	Internal Standard	2206660	
2LM030992	Cal Std	3	S1J0168-CAL3	1:1 0012467	O18LP	Internal Standard	2202883	
2LM030993	Cal Std	4	S1J0168-CAL4	1:1 0012466	O18LP	Internal Standard	2068873	2068685.714
2LM030994	Cal Std	5	S1J0168-CAL5	1:1 0012465	O18LP	Internal Standard	2039210	
2LM030995	Cal Std	6	S1J0168-CAL6	1:1 0012464	O18LP	Internal Standard	1891322	
2LM030996	Cal Std	7	S1J0168-CAL7	1:1 0012463	O18LP	Internal Standard	1743877	
2LM030997	Chk Std	ICV	S1J0168-ICV1	1:1 0012475	O18LP	Internal Standard	2018510	97.57451246
2LM030998	Unknown		S1J0168-CCB1	1:1	O18LP	Internal Standard	2067088	99.9227667
2LM030999	Chk Std	CCV	S1J0168-CCV1	1:1 0012466	O18LP	Internal Standard	1904544	92.06541075
2LM031000	Chk Std	QCMRL	S1J0168-CRL1	1:1 0012468	O18LP	Internal Standard	1976067	95.52282332
2LM031001	Unknown		S1J0168-IFA1	1:1 0012477	O18LP	Internal Standard	2056477	99.40983233
2LM031002	Unknown		B1J0581-BLK1	1:1	O18LP	Internal Standard	2224189	107.5170087
2LM031003	Unknown		B1J0581-BS1	1:1 0012474	O18LP	Internal Standard	2203376	106.510911
2LM031004	Unknown		B1J0581-MRL1	1:1	O18LP	Internal Standard	2031363	98.19582482
2LM031005	Unknown		M1I1547-02	1:1	O18LP	Internal Standard	1397210	67.54095078
2LM031006	Unknown		M1I1547-03	1:1	O18LP	Internal Standard	1288427	62.28239462
2LM031007	Unknown		M1I1547-04	1:1	O18LP	Internal Standard	2216265	107.1339636
2LM031008	Unknown		M1J0510-01	1:1	O18LP	Internal Standard	1470568	71.08706701
2LM031009	Unknown		M1J0510-02 (NR)	1:1	O18LP	Internal Standard	N/F	#VALUE!
2LM031010	Unknown		M1J0510-03 (NR)	1:1	O18LP	Internal Standard	N/F	#VALUE!
2LM031011	Chk Std	CCV	S1J0168-CCV2	1:1 0012466	O18LP	Internal Standard	2198692	106.284487
2LM031012	Chk Std	QCMRL	S1J0168-CRL2	1:1 0012468	O18LP	Internal Standard	2239438	108.2541434
2LM031013	Unknown		S1J0168-CCB2	1:1	O18LP	Internal Standard	2311046	111.7156649
2LM031014	Unknown		M1J0510-04 (NR)	1:1	O18LP	Internal Standard	N/F	#VALUE!
2LM031015	Unknown		M1J0510-05 (NR)	1:1	O18LP	Internal Standard	1506846	72.84074084
2LM031016	Unknown		B1J0581-MS1 (NR)	1:1	O18LP	Internal Standard	1562545	75.5332233
2LM031017	Unknown		B1J0581-MSD1 (NR)	1:1	O18LP	Internal Standard	1556853	75.25807276
2LM031018	Unknown		M1J0510-06 (NR)	1:1	O18LP	Internal Standard	N/F	#VALUE!
2LM031019	Unknown		M1J0510-07	1:1	O18LP	Internal Standard	1415029	68.40231893
2LM031020	Unknown		M1J0510-08	1:1	O18LP	Internal Standard	1438196	69.52220872
2LM031021	Chk Std	CCV	S1J0168-CCV3	1:1 0012466	O18LP	Internal Standard	2127459	102.841093
2LM031022	Chk Std	QCMRL	S1J0168-CRL3	1:1 0012468	O18LP	Internal Standard	2232424	107.9150876
2LM031023	Unknown		S1J0168-CCB3	1:1	O18LP	Internal Standard	2186937	105.7162519

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	Ion Ratio (2.31-3.85)
2LM031103	Unknown		S1J0196-ICB1	1:1	Perchlorate	Target Compound	2346	#VALUE!
2LM031103	Unknown		S1J0196-ICB1	1:1	Perchlorate	Confirming Peak	N/F	
2LM031104	Cal Std	1	S1J0196-CAL1	1:1 0012469	Perchlorate	Target Compound	19921	2.929128069
2LM031104	Cal Std	1	S1J0196-CAL1	1:1 0012469	Perchlorate	Confirming Peak	6801	
2LM031105	Cal Std	2	S1J0196-CAL2	1:1 0012468	Perchlorate	Target Compound	43770	3.029904472
2LM031105	Cal Std	2	S1J0196-CAL2	1:1 0012468	Perchlorate	Confirming Peak	14446	
2LM031106	Cal Std	3	S1J0196-CAL3	1:1 0012467	Perchlorate	Target Compound	108160	3.061594203
2LM031106	Cal Std	3	S1J0196-CAL3	1:1 0012467	Perchlorate	Confirming Peak	35328	
2LM031107	Cal Std	4	S1J0196-CAL4	1:1 0012466	Perchlorate	Target Compound	218801	2.979275881
2LM031107	Cal Std	4	S1J0196-CAL4	1:1 0012466	Perchlorate	Confirming Peak	73441	
2LM031108	Cal Std	5	S1J0196-CAL5	1:1 0012465	Perchlorate	Target Compound	426599	3.115566916
2LM031108	Cal Std	5	S1J0196-CAL5	1:1 0012465	Perchlorate	Confirming Peak	136925	
2LM031109	Cal Std	6	S1J0196-CAL6	1:1 0012464	Perchlorate	Target Compound	1098511	3.159146334
2LM031109	Cal Std	6	S1J0196-CAL6	1:1 0012464	Perchlorate	Confirming Peak	347724	
2LM031110	Cal Std	7	S1J0196-CAL7	1:1 0012463	Perchlorate	Target Compound	1977129	3.185711477
2LM031110	Cal Std	7	S1J0196-CAL7	1:1 0012463	Perchlorate	Confirming Peak	620624	
2LM031111	Chk Std	ICV	S1J0196-ICV1	1:1 0012475	Perchlorate	Target Compound	223894	3.075593774
2LM031111	Chk Std	ICV	S1J0196-ICV1	1:1 0012475	Perchlorate	Confirming Peak	72797	
2LM031112	Unknown		S1J0196-CCB1	1:1	Perchlorate	Target Compound	2639	#VALUE!
2LM031112	Unknown		S1J0196-CCB1	1:1	Perchlorate	Confirming Peak	N/F	
2LM031113	Chk Std	CCV	S1J0196-CCV1	1:1 0012466	Perchlorate	Target Compound	210302	3.173220267
2LM031113	Chk Std	CCV	S1J0196-CCV1	1:1 0012466	Perchlorate	Confirming Peak	66274	
2LM031114	Chk Std	QCMRL	S1J0196-CRL1	1:1 0012468	Perchlorate	Target Compound	42299	3.062925416
2LM031114	Chk Std	QCMRL	S1J0196-CRL1	1:1 0012468	Perchlorate	Confirming Peak	13810	
2LM031115	Unknown		S1J0196-IFA1	1:1 0012477	Perchlorate	Target Compound	52121	2.953700555
2LM031115	Unknown		S1J0196-IFA1	1:1 0012477	Perchlorate	Confirming Peak	17646	
2LM031116	Unknown		M1J0510-02@10000	1:10000	Perchlorate	Target Compound	115443	3.021514382
2LM031116	Unknown		M1J0510-02@10000	1:10000	Perchlorate	Confirming Peak	38207	
2LM031117	Unknown		M1J0510-03@10000	1:10000	Perchlorate	Target Compound	104049	2.973338287
2LM031117	Unknown		M1J0510-03@10000	1:10000	Perchlorate	Confirming Peak	34994	
2LM031118	Unknown		M1J0510-04@10000	1:10000	Perchlorate	Target Compound	109657	3.06904562
2LM031118	Unknown		M1J0510-04@10000	1:10000	Perchlorate	Confirming Peak	35730	
2LM031119	Unknown		M1J0510-05@10	1:10	Perchlorate	Target Compound	344244	3.081613836
2LM031119	Unknown		M1J0510-05@10	1:10	Perchlorate	Confirming Peak	111709	
2LM031120	Unknown		B1J0581-MS1@10	1:10	Perchlorate	Target Compound	336242	3.118231306
2LM031120	Unknown		B1J0581-MS1@10	1:10	Perchlorate	Confirming Peak	107831	
2LM031121	Unknown		B1J0581-MSD1@10	1:10	Perchlorate	Target Compound	333852	3.134672263
2LM031121	Unknown		B1J0581-MSD1@10	1:10	Perchlorate	Confirming Peak	106503	
2LM031122	Unknown		M1J0510-06@10000	1:10000	Perchlorate	Target Compound	533669	3.101104073
2LM031122	Unknown		M1J0510-06@10000	1:10000	Perchlorate	Confirming Peak	172090	
2LM031123	Chk Std	CCV	S1J0196-CCV2	1:1 0012466	Perchlorate	Target Compound	193842	3.111029081
2LM031123	Chk Std	CCV	S1J0196-CCV2	1:1 0012466	Perchlorate	Confirming Peak	62308	
2LM031124	Chk Std	QCMRL	S1J0196-CRL2	1:1 0012468	Perchlorate	Target Compound	36036	3.043581081
2LM031124	Chk Std	QCMRL	S1J0196-CRL2	1:1 0012468	Perchlorate	Confirming Peak	11840	
2LM031125	Unknown		S1J0196-CCB2	1:1	Perchlorate	Target Compound	N/F	#VALUE!
2LM031125	Unknown		S1J0196-CCB2	1:1	Perchlorate	Confirming Peak	N/F	

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	IS Rec (50-150 Avg. ICAL)
2LM031103	Unknown		S1J0196-ICB1	1:1	O18LP	Internal Standard	1235039	
2LM031104	Cal Std	1	S1J0196-CAL1	1:1 0012469	O18LP	Internal Standard	1307341	
2LM031105	Cal Std	2	S1J0196-CAL2	1:1 0012468	O18LP	Internal Standard	1372535	
2LM031106	Cal Std	3	S1J0196-CAL3	1:1 0012467	O18LP	Internal Standard	1335572	
2LM031107	Cal Std	4	S1J0196-CAL4	1:1 0012466	O18LP	Internal Standard	1329200	1291728.857
2LM031108	Cal Std	5	S1J0196-CAL5	1:1 0012465	O18LP	Internal Standard	1295253	
2LM031109	Cal Std	6	S1J0196-CAL6	1:1 0012464	O18LP	Internal Standard	1298947	
2LM031110	Cal Std	7	S1J0196-CAL7	1:1 0012463	O18LP	Internal Standard	1103254	
2LM031111	Chk Std	ICV	S1J0196-ICV1	1:1 0012475	O18LP	Internal Standard	1324329	102.5237605
2LM031112	Unknown		S1J0196-CCB1	1:1	O18LP	Internal Standard	1348345	104.3829742
2LM031113	Chk Std	CCV	S1J0196-CCV1	1:1 0012466	O18LP	Internal Standard	1270650	98.36816705
2LM031114	Chk Std	QCMRL	S1J0196-CRL1	1:1 0012468	O18LP	Internal Standard	1336182	103.4413679
2LM031115	Unknown		S1J0196-IFA1	1:1 0012477	O18LP	Internal Standard	1377115	106.6102218
2LM031116	Unknown		M1J0510-02@10000	1:10000	O18LP	Internal Standard	1358402	105.1615432
2LM031117	Unknown		M1J0510-03@10000	1:10000	O18LP	Internal Standard	1389100	107.5380481
2LM031118	Unknown		M1J0510-04@10000	1:10000	O18LP	Internal Standard	1400744	108.4394757
2LM031119	Unknown		M1J0510-05@10	1:10	O18LP	Internal Standard	1321207	102.2820689
2LM031120	Unknown		B1J0581-MS1@10	1:10	O18LP	Internal Standard	1311970	101.5669808
2LM031121	Unknown		B1J0581-MSD1@10	1:10	O18LP	Internal Standard	1268033	98.16557035
2LM031122	Unknown		M1J0510-06@10000	1:10000	O18LP	Internal Standard	1208230	93.53588358
2LM031123	Chk Std	CCV	S1J0196-CCV2	1:1 0012466	O18LP	Internal Standard	1158920	89.71851899
2LM031124	Chk Std	QCMRL	S1J0196-CRL2	1:1 0012468	O18LP	Internal Standard	1156834	89.55702999
2LM031125	Unknown		S1J0196-CCB2	1:1	O18LP	Internal Standard	1196847	92.65466149

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Laboratory Report Number: M1J0510

Client Project ID: LHAAP

BATCH LOG SUMMARY
SECTION A1

Batch: B1J0581
Matrix: Aqueous
Method: EPA 6850

Prepared: 10/11/2021 11:25:00AM
Prepared By: CAS

Laboratory ID	Client / Source ID	Initial	Final						Spike(s)
B1J0581-BLK1		10.0 mL	10.0 mL						
B1J0581-BS1		10.0 mL	10.0 mL						1006965 200µL
M1J0510-01	50WW14-211007	10.0 mL	10.0 mL						
M1J0510-07	50WW29-211007	10.0 mL	10.0 mL						
M1J0510-08	50WW05-211007	10.0 mL	10.0 mL						
M1J0510-02	50WW13-211007	10.0 mL	10.0 mL						
M1J0510-03	50WW11-211007	10.0 mL	10.0 mL						
M1J0510-04	50WW11-211007-FD	10.0 mL	10.0 mL						
M1J0510-05	50WW06-211007	10.0 mL	10.0 mL						
B1J0581-MS1	M1J0510-05	10.0 mL	10.0 mL						1006965 200µL
B1J0581-MSD1	M1J0510-05	10.0 mL	10.0 mL						1006965 200µL
M1J0510-06	50WW12-211007	10.0 mL	10.0 mL						

Standards used in the batch:

Standard ID	Description	Date Prepared	Prepared By
1006965	6850/331 Perchlorate Alternate Solution (10 ppb)	8/11/2021 5:13:38PM	John Richards

Reagents used in the batch:

Reagent ID	Description	Prepared	Prepared By
1008665	0.45 um PTFE Syringe Filter	10/11/2021 10:46:38AM	Asa Timmons

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Laboratory Report Number: M1J0510
Client Project ID: LHAAP

SEQUENCE LOG SUMMARY
SECTION A2

Sequence: S1J0168
Instrument: LCMS2
Calibration: 21J0010
Analyst 1: CAS
Method: EPA 6850
SOP: HPLC06

#	File ID	Laboratory ID	Client ID	Analyzed	Reference	Standard
1	2LM030989	S1J0168-ICB1	Initial Cal Blank	10/11/21 16:55		
2	2LM030990	S1J0168-CAL1	Cal Standard	10/11/21 17:08		1007584
3	2LM030991	S1J0168-CAL2	Cal Standard	10/11/21 17:21		1007583
4	2LM030992	S1J0168-CAL3	Cal Standard	10/11/21 17:34		1007582
5	2LM030993	S1J0168-CAL4	Cal Standard	10/11/21 17:48		1007581
6	2LM030994	S1J0168-CAL5	Cal Standard	10/11/21 18:01		1007580
7	2LM030995	S1J0168-CAL6	Cal Standard	10/11/21 18:14		1007579
8	2LM030996	S1J0168-CAL7	Cal Standard	10/11/21 18:27		1007578
9	2LM030997	S1J0168-ICV1	Initial Cal Check	10/11/21 18:41		1006966
10	2LM030998	S1J0168-CCB1	Calibration Blank	10/11/21 18:54		
11	2LM030999	S1J0168-CCV1	Calibration Check	10/11/21 19:07		1007581
12	2LM031000	S1J0168-CRL1	Instrument RL Check	10/11/21 19:20		1007583
13	2LM031001	S1J0168-IFA1	Interference Check A	10/11/21 19:34		1006967
14	2LM031002	B1J0581-BLK1	Blank	10/11/21 19:47		
15	2LM031003	B1J0581-BS1	LCS	10/11/21 20:00		
20	2LM031008	M1J0510-01	50WW14-211007	10/11/21 21:07		
21	2LM031011	S1J0168-CCV2	Calibration Check	10/11/21 21:46		1007581
22	2LM031012	S1J0168-CRL2	Instrument RL Check	10/11/21 22:00		1007583
23	2LM031013	S1J0168-CCB2	Calibration Blank	10/11/21 22:13		
24	2LM031019	M1J0510-07	50WW29-211007	10/11/21 23:32		
25	2LM031020	M1J0510-08	50WW05-211007	10/11/21 23:46		
26	2LM031021	S1J0168-CCV3	Calibration Check	10/11/21 23:59		1007581
27	2LM031022	S1J0168-CRL3	Instrument RL Check	10/12/21 00:12		1007583
28	2LM031023	S1J0168-CCB3	Calibration Blank	10/12/21 00:25		

Sequence Reagents

Reagent ID	Description	Prepared	PreparedBy
1000181	6850/331 Column	1/8/2021 2:36:22PM	** Vendor **

MICROBAC®

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

SEQUENCE LOG SUMMARY
SECTION A2

Sequence Standards

Standard ID	Description	Prepared	PreparedBy	Expires
1006966	6850/331 Perchlorate ICV (1 ppb)	08/11/2021	John Richards	08/11/2022
1006967	6850 Perchlorate Alternate 0.2 ppb MCT	08/11/2021	John Richards	08/11/2022
1007578	6850/331 ICAL STD @ 10 ppb	09/07/2021	Craig Smith	09/07/2022
1007579	6850/331 ICAL STD @ 5 ppb	09/07/2021	Craig Smith	09/07/2022
1007580	6850/331 ICAL STD @ 2 ppb	09/07/2021	Craig Smith	09/07/2022
1007581	6850/331 ICAL STD-CCV @ 1 ppb	09/07/2021	Craig Smith	09/07/2022
1007582	6850/331 ICAL STD @ 0.5 ppb	09/07/2021	Craig Smith	09/07/2022
1007583	6850/331 ICAL STD-MRL @ 0.2 ppb	09/07/2021	Craig Smith	09/07/2022
1007584	6850/331 ICAL STD @ 0.1 ppb	09/07/2021	Craig Smith	09/07/2022

Sequence Internal Standard

Standard ID	Description	Prepared	PreparedBy	Expires
1000597	6850/331 IS Working (5.0 ppb)	01/20/2021	Craig Smith	01/20/2022

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Laboratory Report Number: M1J0510
Client Project ID: LHAAP

SEQUENCE LOG SUMMARY
SECTION A2

Sequence: S1J0196
Instrument: LCMS2
Calibration: 21J0013
Analyst 1: CAS
Method: EPA 6850
SOP: HPLC06

#	File ID	Laboratory ID	Client ID	Analyzed	Reference	Standard
1	2LM031103	S1J0196-ICB1	Initial Cal Blank	10/13/21 18:37		
2	2LM031104	S1J0196-CAL1	Cal Standard	10/13/21 18:51		1007584
3	2LM031105	S1J0196-CAL2	Cal Standard	10/13/21 19:04		1007583
4	2LM031106	S1J0196-CAL3	Cal Standard	10/13/21 19:17		1007582
5	2LM031107	S1J0196-CAL4	Cal Standard	10/13/21 19:30		1007581
6	2LM031108	S1J0196-CAL5	Cal Standard	10/13/21 19:44		1007580
7	2LM031109	S1J0196-CAL6	Cal Standard	10/13/21 19:57		1007579
8	2LM031110	S1J0196-CAL7	Cal Standard	10/13/21 20:10		1007578
9	2LM031111	S1J0196-ICV1	Initial Cal Check	10/13/21 20:23		1006966
10	2LM031112	S1J0196-CCB1	Calibration Blank	10/13/21 20:37		
11	2LM031113	S1J0196-CCV1	Calibration Check	10/13/21 20:50		1007581
12	2LM031114	S1J0196-CRL1	Instrument RL Check	10/13/21 21:03		1007583
13	2LM031115	S1J0196-IFA1	Interference Check A	10/13/21 21:16		1006967
14	2LM031116	M1J0510-02	50WW13-211007	10/13/21 21:30		
15	2LM031117	M1J0510-03	50WW11-211007	10/13/21 21:43		
16	2LM031118	M1J0510-04	50WW11-211007-FD	10/13/21 21:56		
17	2LM031119	M1J0510-05	50WW06-211007	10/13/21 22:09		
18	2LM031120	B1J0581-MS1	50WW06-211007	10/13/21 22:23	M1J0510-05	
19	2LM031121	B1J0581-MSD1	50WW06-211007	10/13/21 22:36	M1J0510-05	
20	2LM031122	M1J0510-06	50WW12-211007	10/13/21 22:49		
21	2LM031123	S1J0196-CCV2	Calibration Check	10/13/21 23:02		1007581
22	2LM031124	S1J0196-CRL2	Instrument RL Check	10/13/21 23:16		1007583
23	2LM031125	S1J0196-CCB2	Calibration Blank	10/13/21 23:29		

Sequence Reagents

Reagent ID	Description	Prepared	PreparedBy
1000181	6850/331 Column	1/8/2021 2:36:22PM	** Vendor **

MICROBAC®

Laboratory Report Number: M1J0510

Client Project ID: LHAAP

SEQUENCE LOG SUMMARY
SECTION A2

Sequence Standards

Standard ID	Description	Prepared	PreparedBy	Expires
1006966	6850/331 Perchlorate ICV (1 ppb)	08/11/2021	John Richards	08/11/2022
1006967	6850 Perchlorate Alternate 0.2 ppb MCT	08/11/2021	John Richards	08/11/2022
1007578	6850/331 ICAL STD @ 10 ppb	09/07/2021	Craig Smith	09/07/2022
1007579	6850/331 ICAL STD @ 5 ppb	09/07/2021	Craig Smith	09/07/2022
1007580	6850/331 ICAL STD @ 2 ppb	09/07/2021	Craig Smith	09/07/2022
1007581	6850/331 ICAL STD-CCV @ 1 ppb	09/07/2021	Craig Smith	09/07/2022
1007582	6850/331 ICAL STD @ 0.5 ppb	09/07/2021	Craig Smith	09/07/2022
1007583	6850/331 ICAL STD-MRL @ 0.2 ppb	09/07/2021	Craig Smith	09/07/2022
1007584	6850/331 ICAL STD @ 0.1 ppb	09/07/2021	Craig Smith	09/07/2022

Sequence Internal Standard

Standard ID	Description	Prepared	PreparedBy	Expires
1000597	6850/331 IS Working (5.0 ppb)	01/20/2021	Craig Smith	01/20/2022

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Section B:
HPLC Organics
EPA 6850
Sample Raw Data

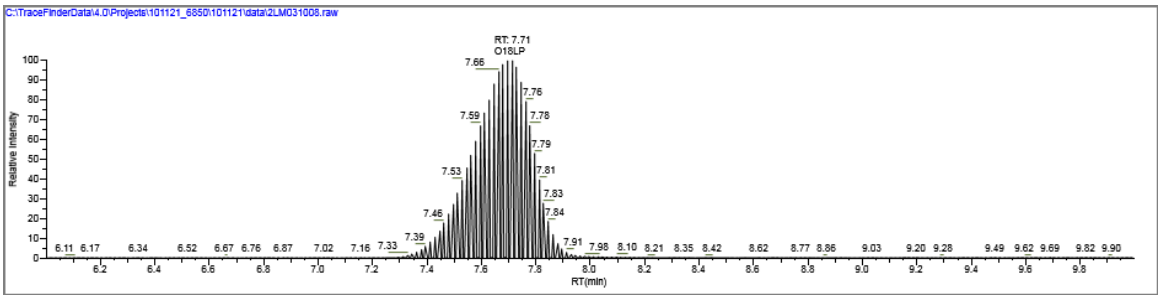
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B8	M1J0510-01	2LM031008	N/A	M1J0510-01	10/11/2021 9:07:00 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.71	89	1470568			5.000	ug/L	5.000	ug/L	

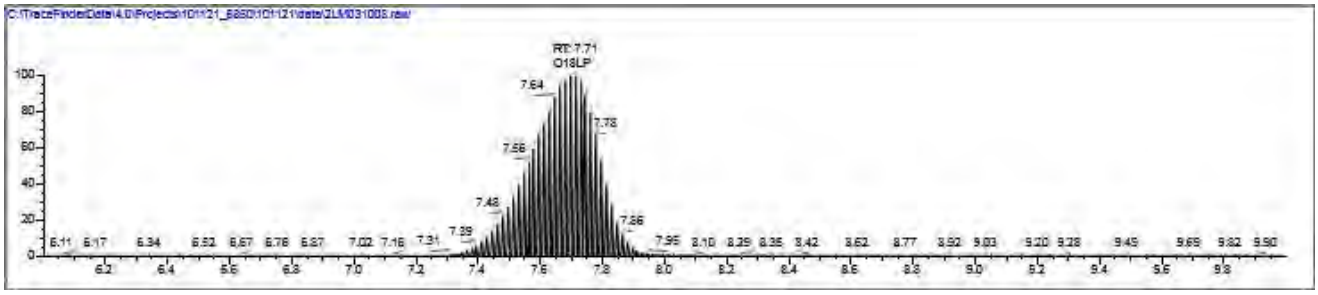
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.73	83	2793	Linear	0.002	0.028	ug/L	0.028	ug/L	I

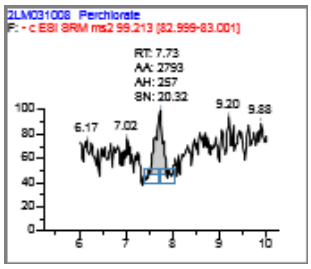
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

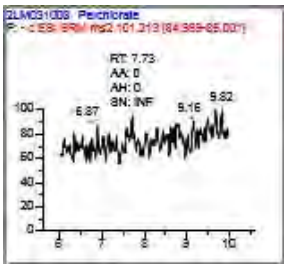
Data File:	2LM031008	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 9:07:00 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	M1J0510-01	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B8
Comments:	1:01		



m/z 83.000



m/z 85.000



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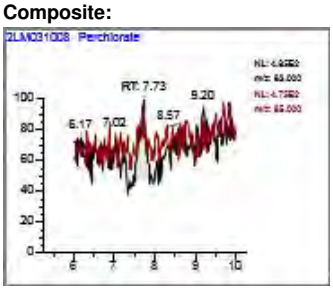
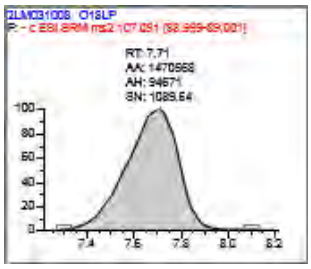


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.73	m/z 83.000	2793	0.028		N/A	I
7.73	m/z 85.000			25.54 - 38.31	*	

m/z 89.000



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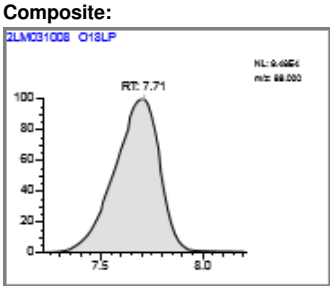


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.71	m/z 89.000	1470568	5.000		N/A

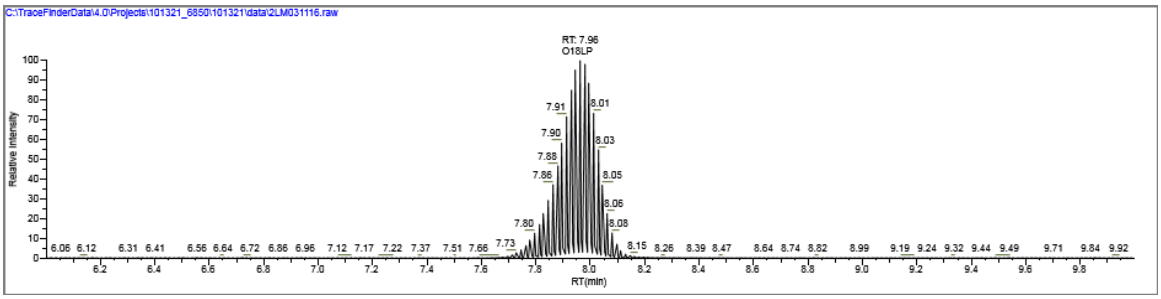
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D1	M1J0510-02@10000	2LM031116	N/A	M1J0510-02@10000	10/13/2021 9:30:10 PM	1:10000



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1358402			5.000	ug/L	5.000	ug/L	

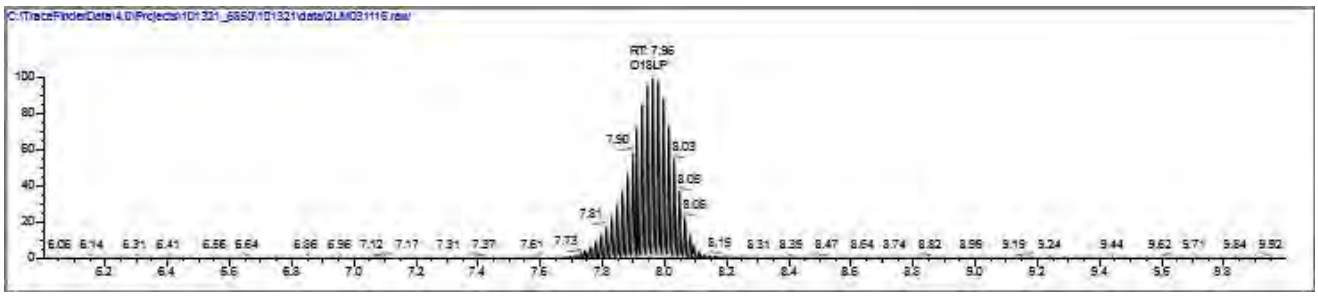
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	115443	Linear	0.085	0.508	ug/L	0.508	ug/L	

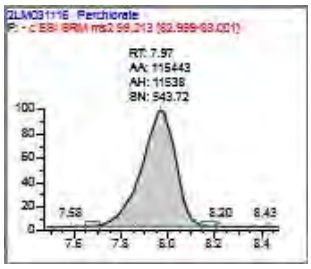
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

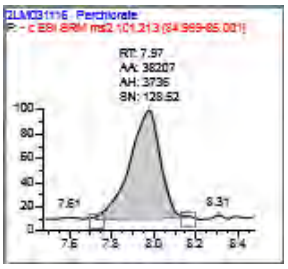
Data File:	2LM031116	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 9:30:10 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	M1J0510-02@10000	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D1
Comments:	1:10000		



m/z 83.000



m/z 85.000



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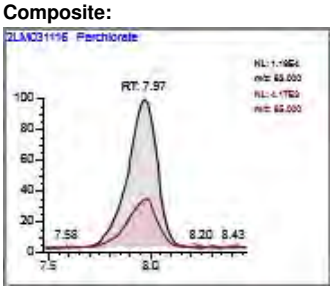
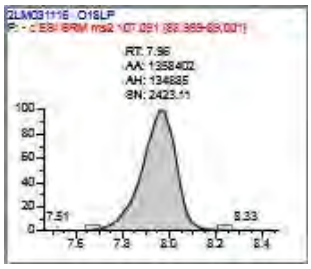


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.97	m/z 83.000	115443	0.508		N/A
7.97	m/z 85.000	38207		26.85 - 40.28	33.1

m/z 89.000



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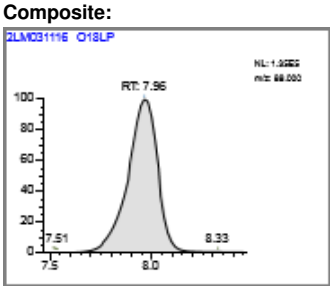


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1358402	5.000		N/A

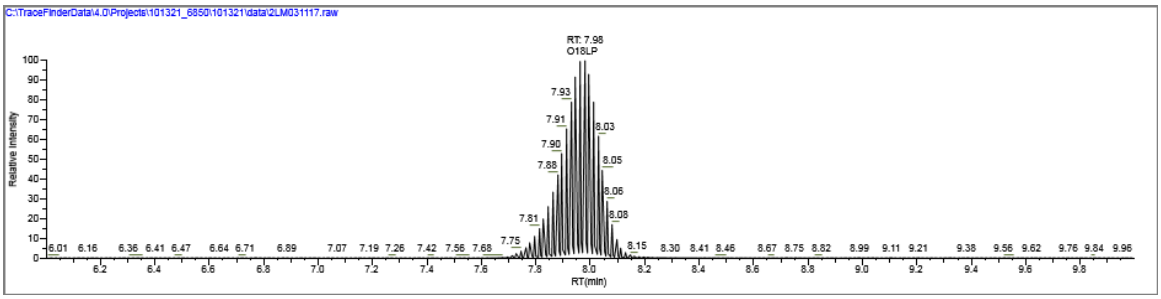
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D2	M1J0510-03@10000	2LM031117	N/A	M1J0510-03@10000	10/13/2021 9:43:24 PM	1:10000



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.98	89	1389100			5.000	ug/L	5.000	ug/L	

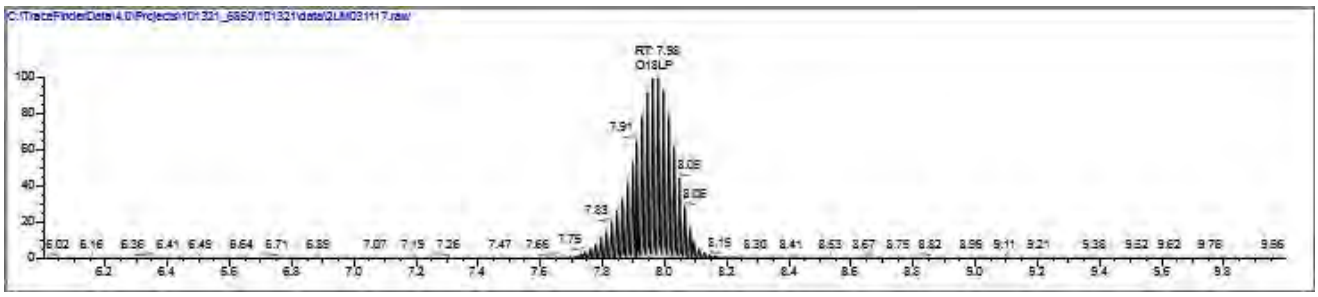
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	104049	Linear	0.075	0.45	ug/L	0.45	ug/L	

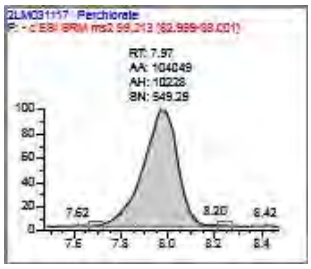
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

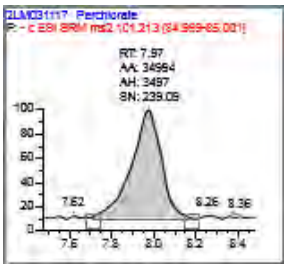
Data File:	2LM031117	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 9:43:24 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	M1J0510-03@10000	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D2
Comments:	1:10000		



m/z 83.000



m/z 85.000



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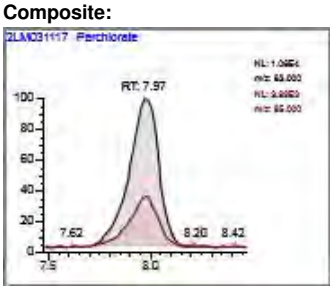
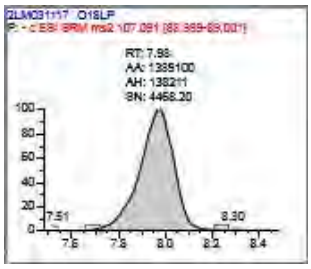


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.97	m/z 83.000	104049	0.450		N/A
7.97	m/z 85.000	34994		26.85 - 40.28	33.63

m/z 89.000



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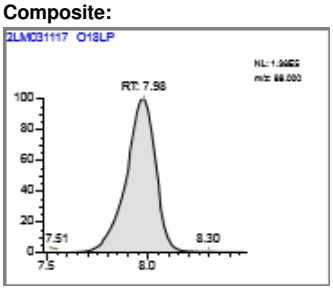


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.98	m/z 89.000	1389100	5.000		N/A

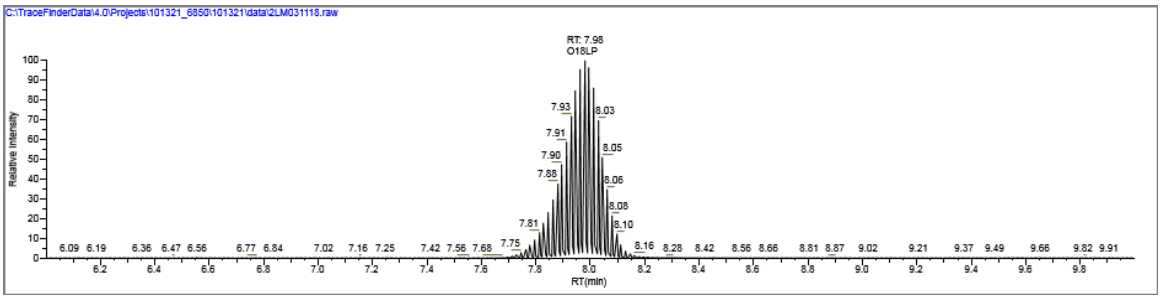
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D3	M1J0510-04@10000	2LM031118	N/A	M1J0510-04@10000	10/13/2021 9:56:37 PM	1:10000



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.98	89	1400744			5.000	ug/L	5.000	ug/L	

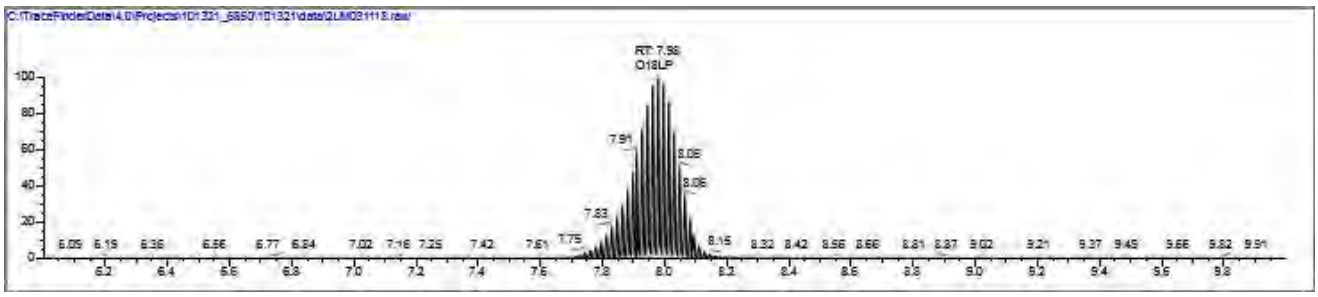
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.98	83	109657	Linear	0.078	0.47	ug/L	0.47	ug/L	

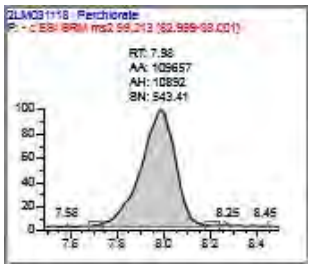
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

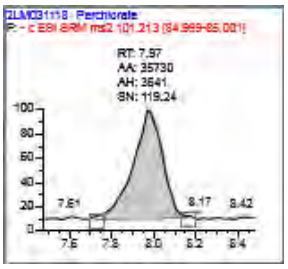
Data File:	2LM031118	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 9:56:37 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	M1J0510-04@10000	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D3
Comments:	1:10000		



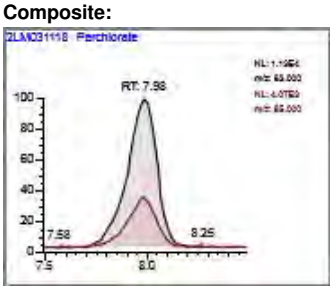
m/z 83.000



m/z 85.000



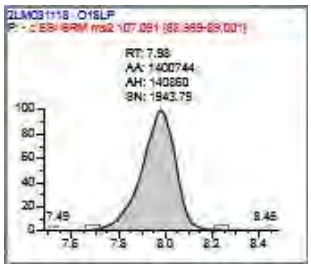
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.98	m/z 83.000	109657	0.470		N/A
7.97	m/z 85.000	35730		26.85 - 40.28	32.58

m/z 89.000



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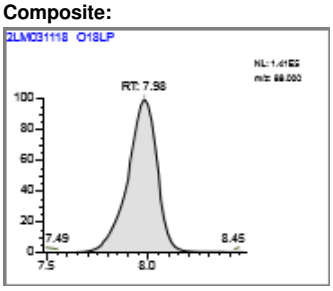


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.98	m/z 89.000	1400744	5.000		N/A

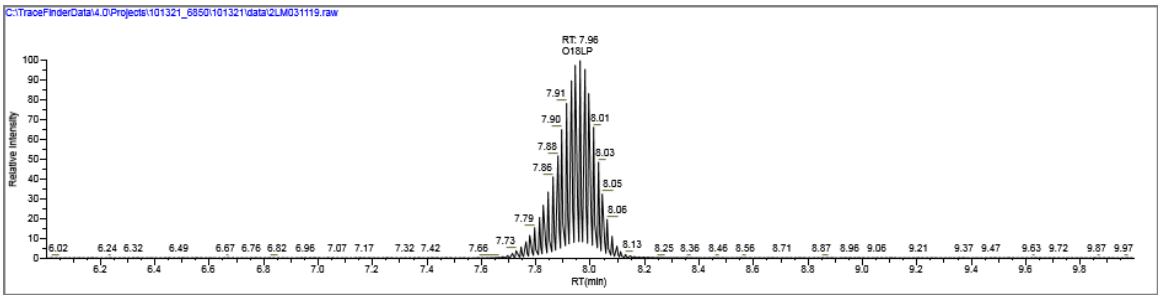
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D4	M1J0510-05@10	2LM031119	N/A	M1J0510-05@10	10/13/2021 10:09:52 PM	1:10



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1321207			5.000	ug/L	5.000	ug/L	

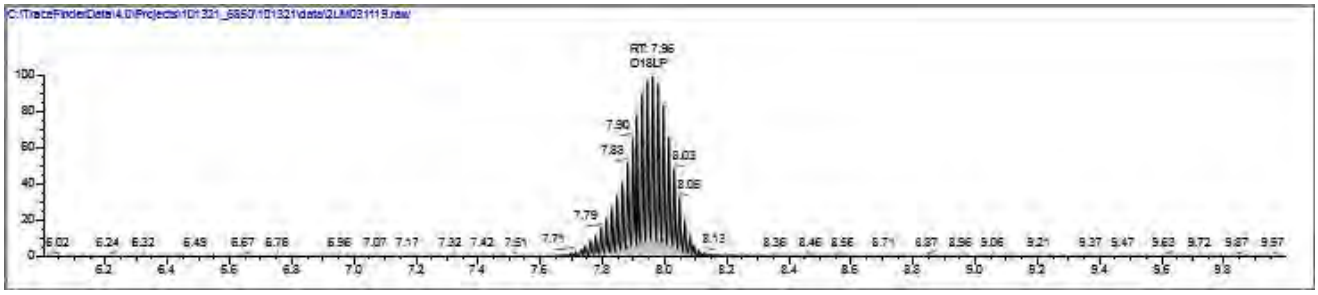
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	344244	Linear	0.261	1.512	ug/L	1.512	ug/L	

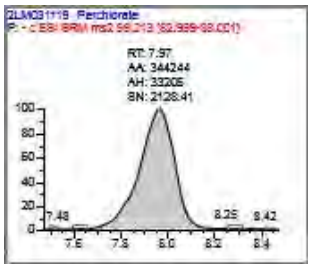
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

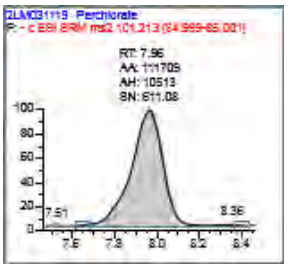
Data File:	2LM031119	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 10:09:52 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	M1J0510-05@10	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D4
Comments:	1:10		



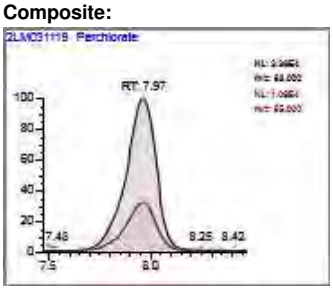
m/z 83.000



m/z 85.000



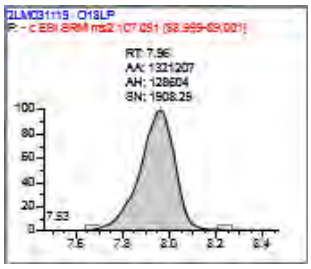
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.97	m/z 83.000	344244	1.512		N/A
7.96	m/z 85.000	111709		26.85 - 40.28	32.45

m/z 89.000



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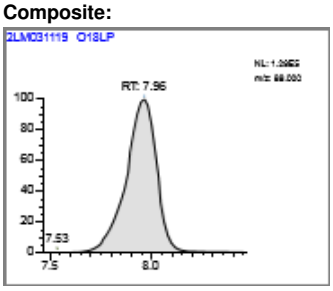


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1321207	5.000		N/A

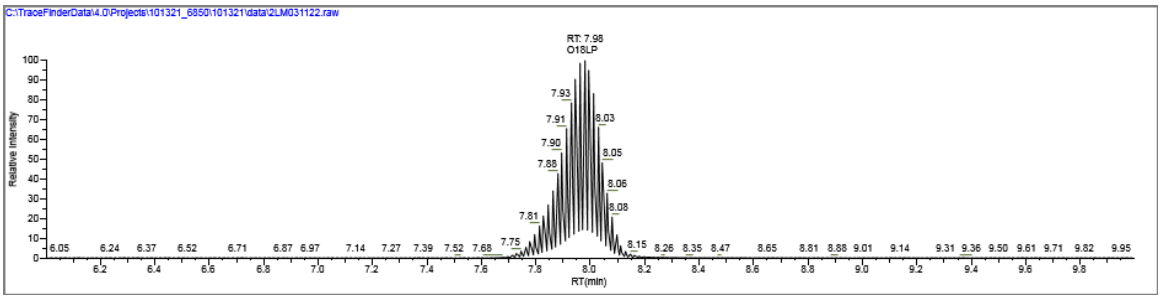
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D7	M1J0510-06@10000	2LM031122	N/A	M1J0510-06@10000	10/13/2021 10:49:37 PM	1:10000



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.98	89	1208230			5.000	ug/L	5.000	ug/L	

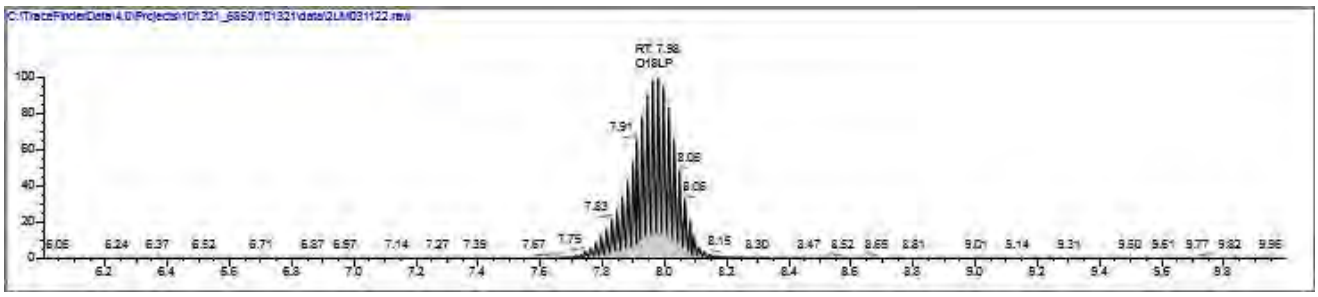
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.98	83	533669	Linear	0.442	2.548	ug/L	2.548	ug/L	

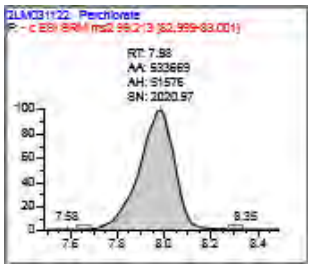
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

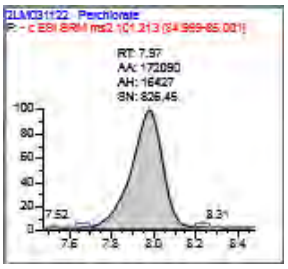
Data File:	2LM031122	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 10:49:37 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	M1J0510-06@10000	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D7
Comments:	1:10000		



m/z 83.000



m/z 85.000



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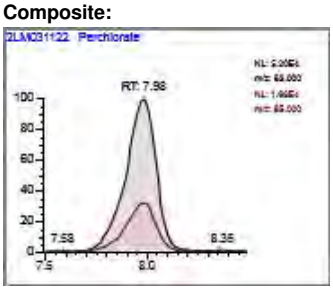
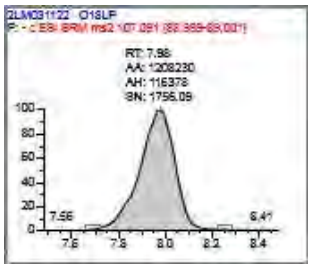


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.98	m/z 83.000	533669	2.548		N/A
7.97	m/z 85.000	172090		26.85 - 40.28	32.25

m/z 89.000



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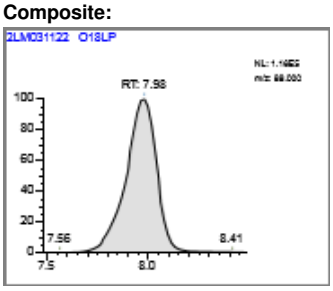


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.98	m/z 89.000	1208230	5.000		N/A

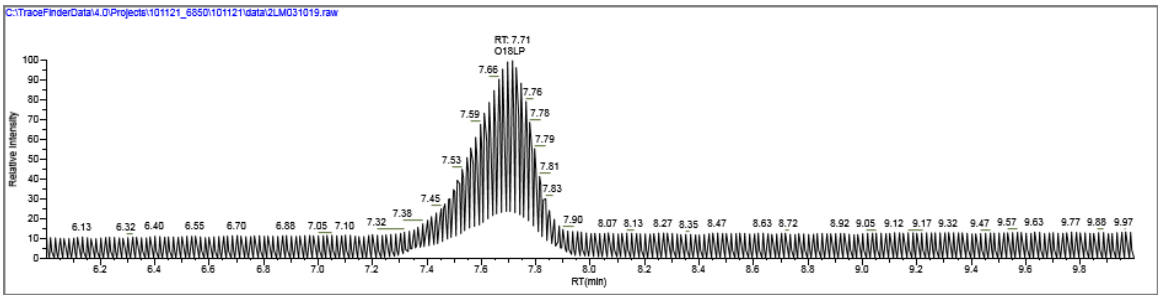
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:C7	M1J0510-07	2LM031019	N/A	M1J0510-07	10/11/2021 11:32:47 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.71	89	1415029			5.000	ug/L	5.000	ug/L	

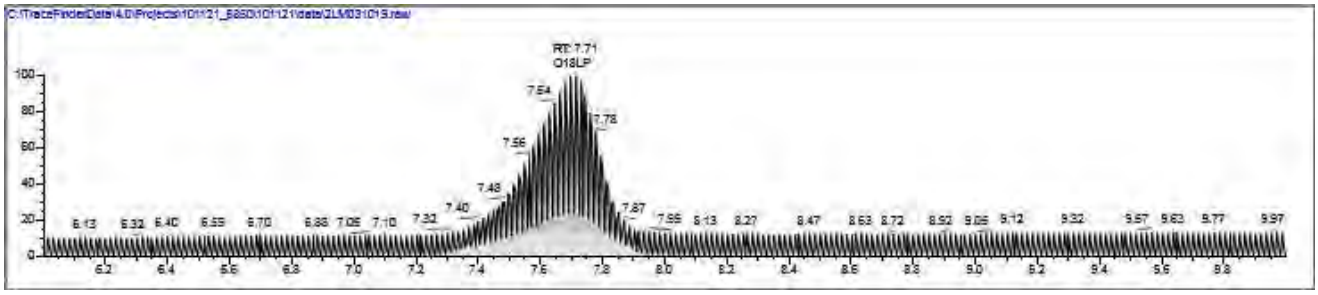
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.7	83	895823	Linear	0.633	3.58	ug/L	3.58	ug/L	

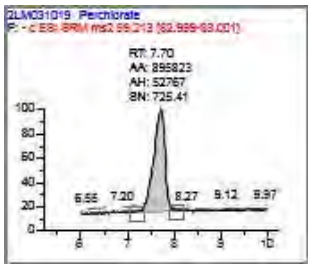
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

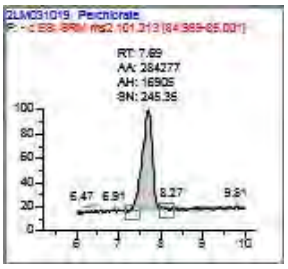
Data File:	2LM031019	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 11:32:47 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	M1J0510-07	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:C7
Comments:	1:01		



m/z 83.000



m/z 85.000



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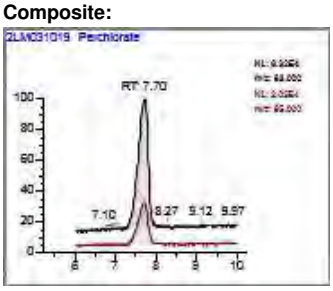
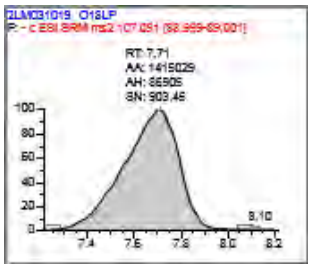


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.70	m/z 83.000	895823	3.580		N/A
7.69	m/z 85.000	284277		25.54 - 38.31	31.73

m/z 89.000



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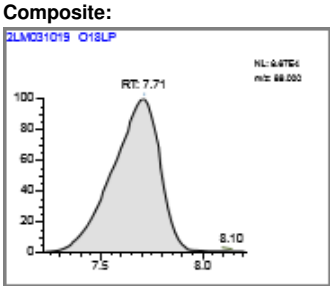


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.71	m/z 89.000	1415029	5.000		N/A

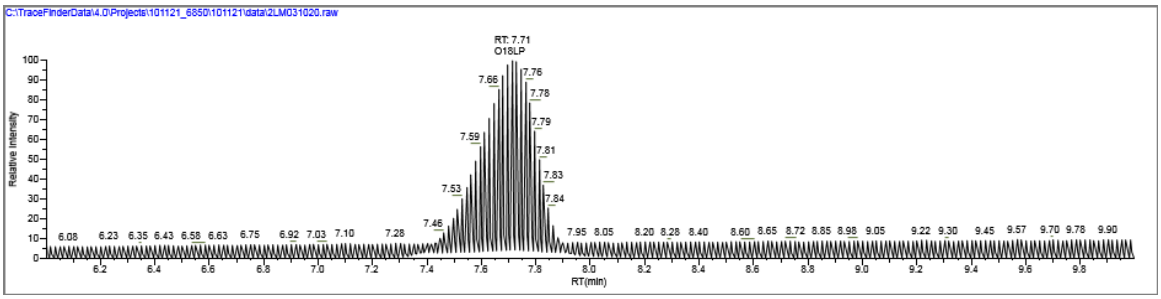
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:C8	M1J0510-08	2LM031020	N/A	M1J0510-08	10/11/2021 11:46:03 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.71	89	1438196			5.000	ug/L	5.000	ug/L	

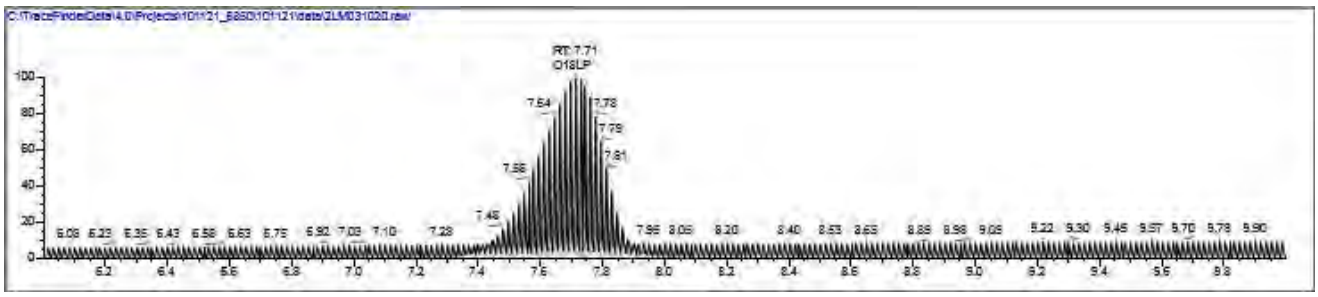
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.68	83	59936	Linear	0.042	0.252	ug/L	0.252	ug/L	I

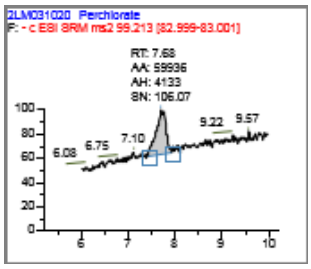
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

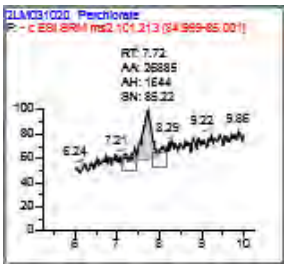
Data File:	2LM031020	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 11:46:03 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	M1J0510-08	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:C8
Comments:	1:01		



m/z 83.000



m/z 85.000



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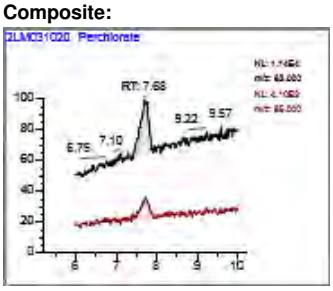
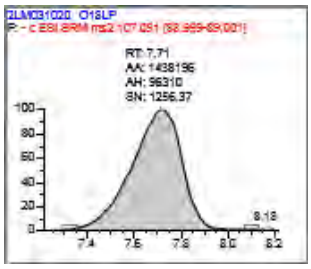


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.68	m/z 83.000	59936	0.252		N/A	I
7.72	m/z 85.000	26885		25.54 - 38.31	44.86 *	

m/z 89.000



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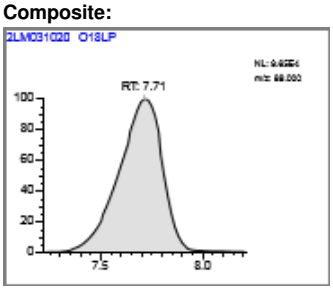


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.71	m/z 89.000	1438196	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

MICROBAC®

Section C:
HPLC Organics
EPA 6850
QC Sample Raw Data

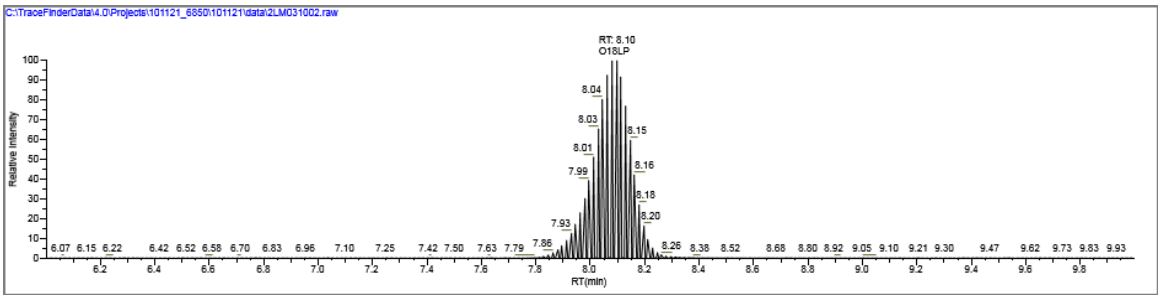
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B2	B1J0581-BLK1	2LM031002	N/A	BLANK	10/11/2021 7:47:29 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.10	89	2224189			5.000	ug/L	5.000	ug/L	

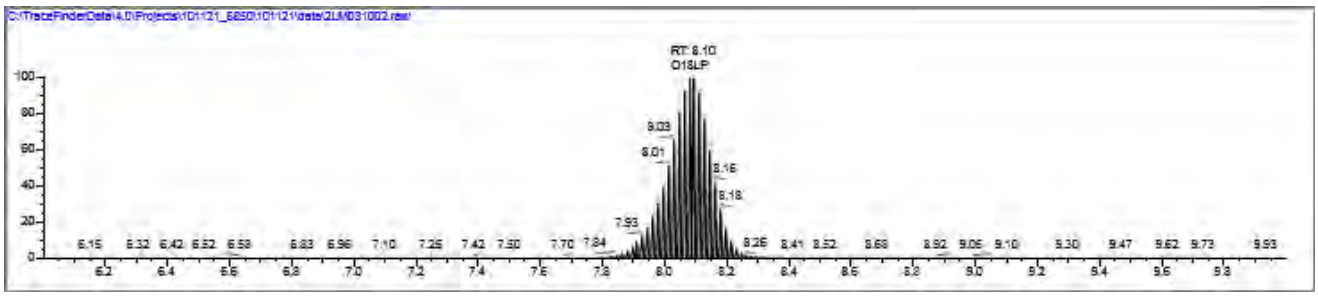
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	5247	Linear	0.002	0.03	ug/L	0.03	ug/L	I

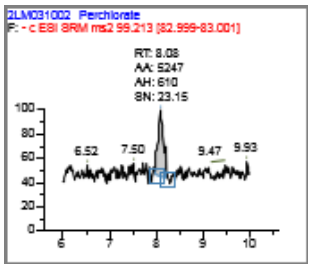
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

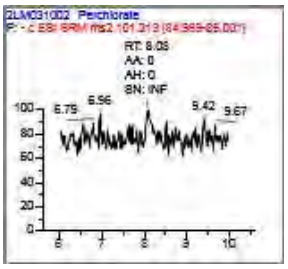
Data File:	2LM031002	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 7:47:29 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	B1J0581-BLK1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B2
Comments:	1:01		



m/z 83.000



m/z 85.000



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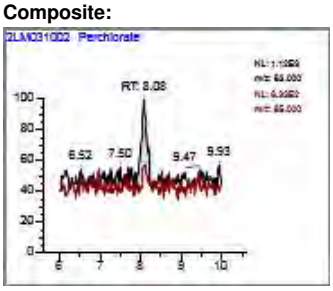
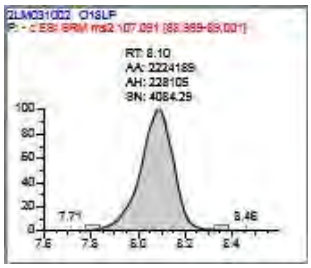


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
8.08	m/z 83.000	5247	0.030		N/A	I
8.08	m/z 85.000			25.54 - 38.31	*	

m/z 89.000



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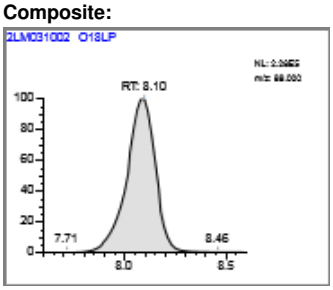


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.10	m/z 89.000	2224189	5.000		N/A

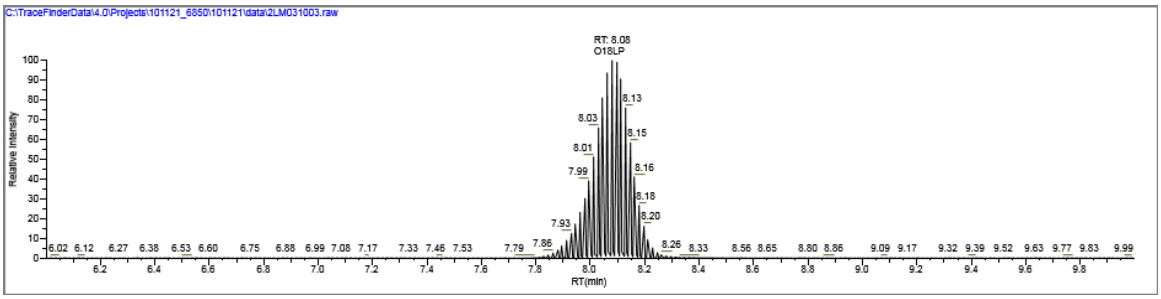
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B3	B1J0581-BS1	2LM031003	N/A	LCS (0.2ug/L)	10/11/2021 8:00:43 PM	1:1 0012474



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	2203376			5.000	ug/L	5.000	ug/L	

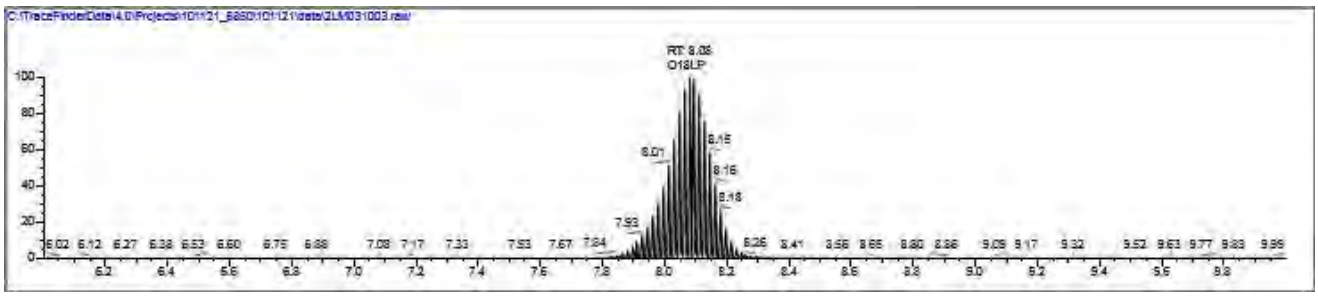
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.1	83	76382	Linear	0.035	0.212	ug/L	0.212	ug/L	

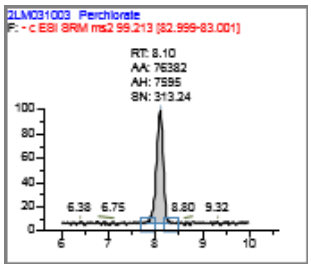
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

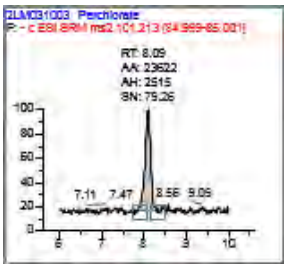
Data File:	2LM031003	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 8:00:43 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	B1J0581-BS1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B3
Comments:	1:1 0012474		



m/z 83.000



m/z 85.000



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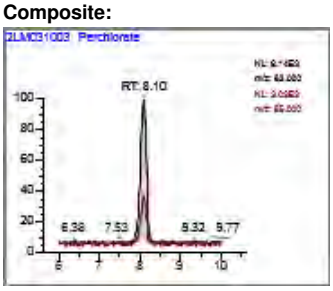
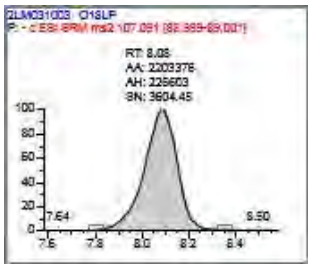


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.10	m/z 83.000	76382	0.212		N/A
8.09	m/z 85.000	23622		25.54 - 38.31	30.93

m/z 89.000



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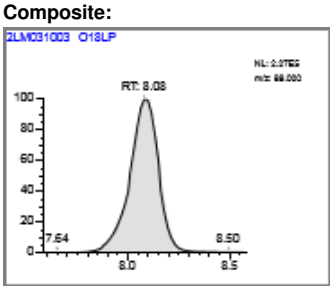


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	2203376	5.000		N/A

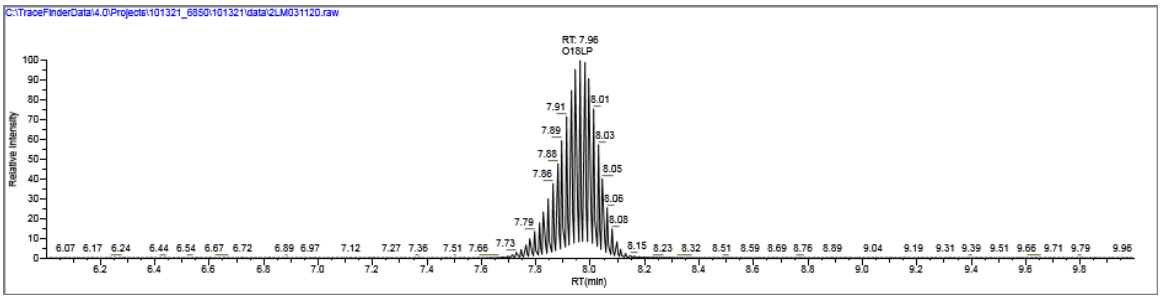
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D5	B1J0581-MS1@10	2LM031120	N/A	MATRIX SPIKE 10x	10/13/2021 10:23:07 PM	1:10



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1311970			5.000	ug/L	5.000	ug/L	

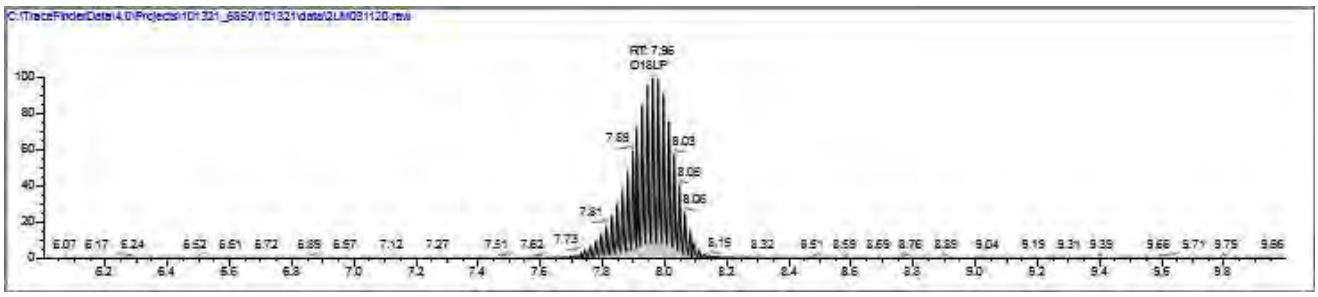
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	336242	Linear	0.256	1.488	ug/L	1.488	ug/L	

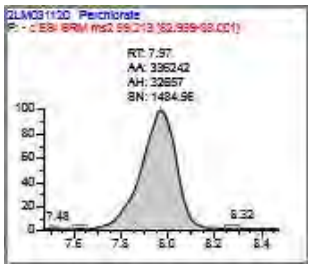
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

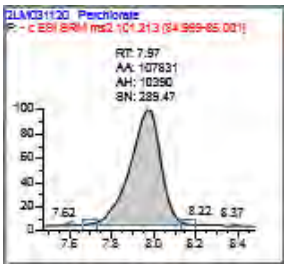
Data File:	2LM031120	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 10:23:07 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	B1J0581-MS1@10	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D5
Comments:	1:10		



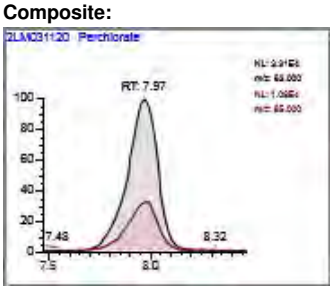
m/z 83.000



m/z 85.000



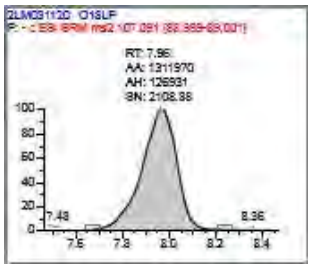
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.97	m/z 83.000	336242	1.488		N/A
7.97	m/z 85.000	107831		26.85 - 40.28	32.07

m/z 89.000



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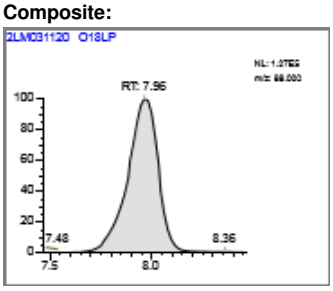


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1311970	5.000		N/A

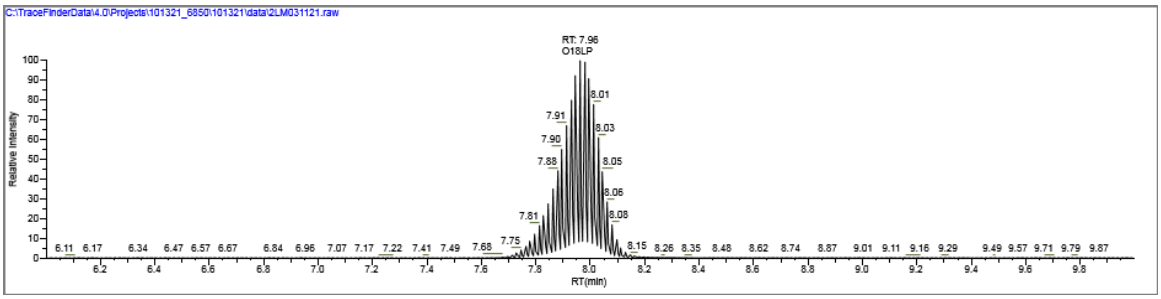
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D6	B1J0581-MSD1@10	2LM031121	N/A	MATRIX SPIKE DUP 10x	10/13/2021 10:36:22 PM	1:10



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1268033			5.000	ug/L	5.000	ug/L	

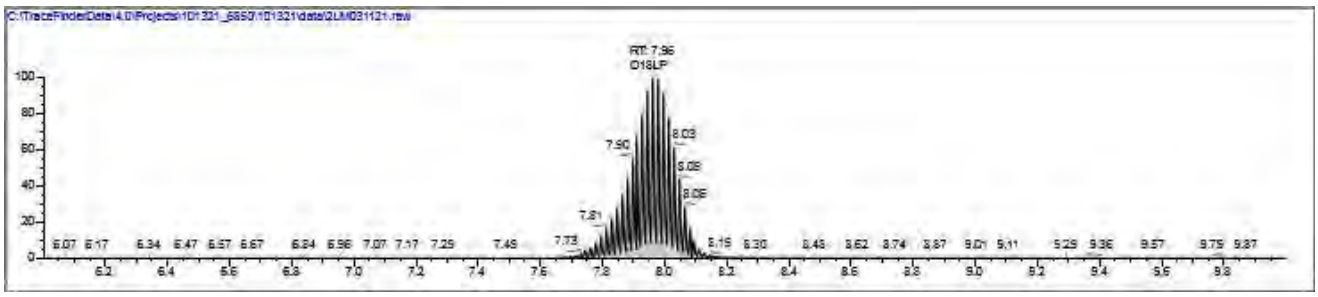
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	333852	Linear	0.263	1.528	ug/L	1.528	ug/L	

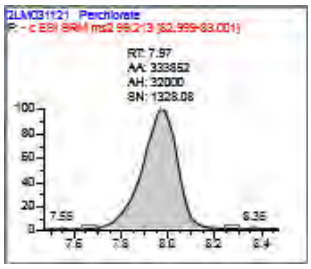
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

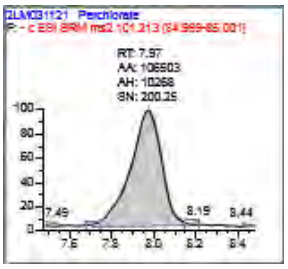
Data File:	2LM031121	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 10:36:22 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	B1J0581-MSD1@10	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D6
Comments:	1:10		



m/z 83.000



m/z 85.000



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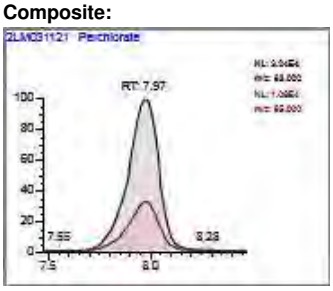
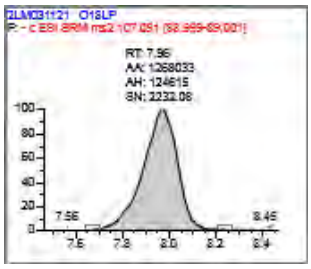


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.97	m/z 83.000	333852	1.528		N/A
7.97	m/z 85.000	106503		26.85 - 40.28	31.9

m/z 89.000



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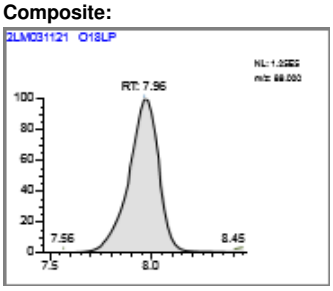

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1268033	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

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Section D:
HPLC Organics
EPA 6850
Calibration Raw Data

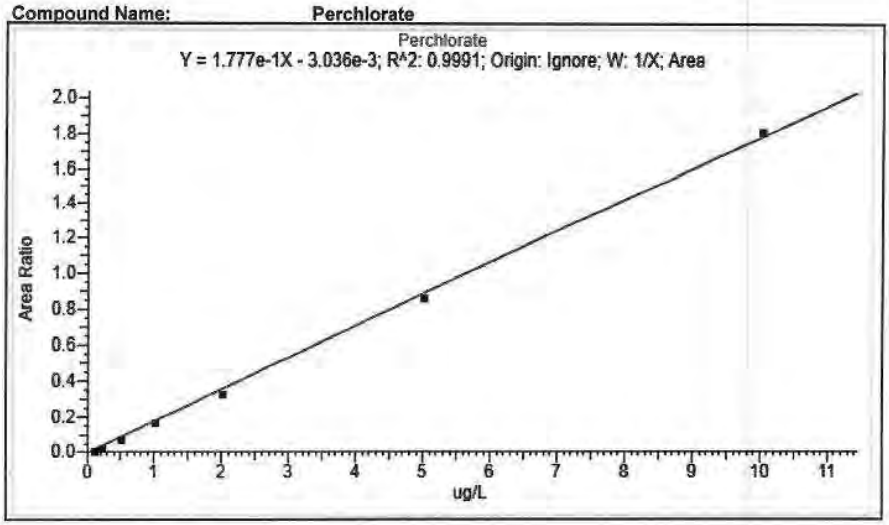
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Compound Calibration Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121.00

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Compound Name: **Perchlorate**



Linear
Pass

Level	Std Amount	Std Area	IS Amount	IS Area	Resp factor/ ratio	Calc Amount	Units	% CV	% RSD
1	0.1	37114	5	2327975	0.016	0.107	ug/L	N/A	N/A
2	0.2	73606	5	2206660	0.033	0.205	ug/L	N/A	N/A
3	0.5	182818	5	2202883	0.083	0.484	ug/L	N/A	N/A
4	1	357915	5	2068873	0.173	0.991	ug/L	N/A	N/A
5	2	682322	5	2039210	0.335	1.9	ug/L	N/A	N/A
6	5	1633713	5	1891322	0.864	4.878	ug/L	N/A	N/A
7	10	3166656	5	1743877	1.816	10.236	ug/L	N/A	N/A

Bordered cell = Manually Integrated; Calibration flags: D=RSD; F=Response factor; R=R Squared; A=Amount.

Compound Calibration Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121.00

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A2	S1J0168-CAL1	2LM030990	1	CAL STD 1	10/11/2021 5:08:27 PM	1:1 0012469
R:A3	S1J0168-CAL2	2LM030991	2	CAL STD 2	10/11/2021 5:21:44 PM	1:1 0012468
R:A4	S1J0168-CAL3	2LM030992	3	CAL STD 3	10/11/2021 5:34:59 PM	1:1 0012467
R:A5	S1J0168-CAL4	2LM030993	4	CAL STD 4	10/11/2021 5:48:14 PM	1:1 0012466
R:A6	S1J0168-CAL5	2LM030994	5	CAL STD 5	10/11/2021 6:01:29 PM	1:1 0012465
R:A7	S1J0168-CAL6	2LM030995	6	CAL STD 6	10/11/2021 6:14:44 PM	1:1 0012464
R:A8	S1J0168-CAL7	2LM030996	7	CAL STD 7	10/11/2021 6:27:59 PM	1:1 0012463

Bordered cell = Manually Integrated; Calibration flags: D=RSD; F=Response factor; R=R Squared; A=Amount.

Data Review Report

Printed: 10/12/2021 10:48 an

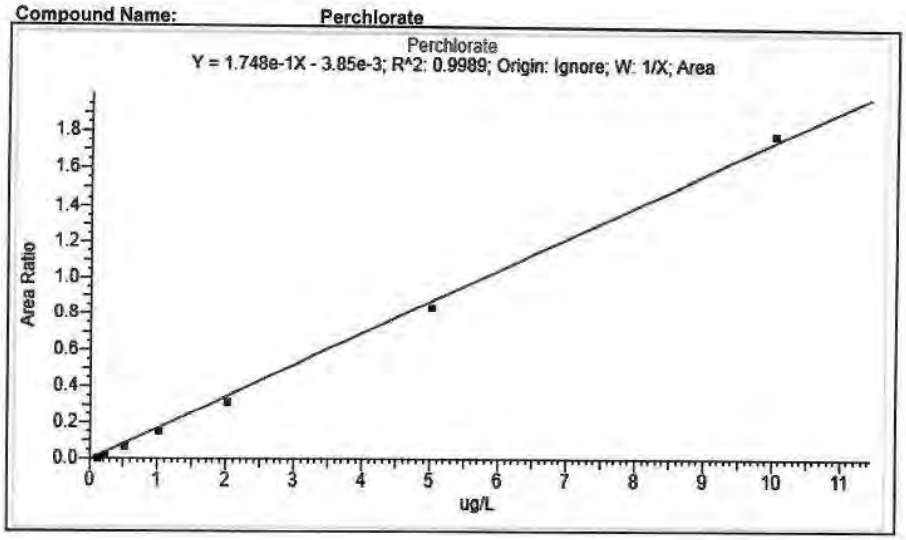
Analysis	Analyte	CalResult	True Value	% D	% Rec
Lab ID: S1J0168-CAL1 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.11	0.10000	6.80	106.80
Lab ID: S1J0168-CAL2 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.20	0.20000	2.40	102.40
Lab ID: S1J0168-CAL3 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.48	0.50000	-3.18	96.82
Lab ID: S1J0168-CAL4 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.99	1.0000	-0.94	99.06
Lab ID: S1J0168-CAL5 Cal Standard					
6850 Perchlorate DOD	Perchlorate	1.90	2.0000	-5.00	95.00
Lab ID: S1J0168-CAL6 Cal Standard					
6850 Perchlorate DOD	Perchlorate	4.88	5.0000	-2.44	97.56
Lab ID: S1J0168-CAL7 Cal Standard					
6850 Perchlorate DOD	Perchlorate	10.24	10.000	2.36	102.36

Compound Calibration Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321.00

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Compound Name: **Perchlorate**



Linear
Pass

Level	Std Amount	Std Area	IS Amount	IS Area	Resp factor/ ratio	Calc Amount	Units	% CV	% RSD
1	0.1	19921	5	1307341	0.015	0.109	ug/L	N/A	N/A
2	0.2	43770	5	1372535	0.032	0.204	ug/L	N/A	N/A
3	0.5	108160	5	1335572	0.081	0.485	ug/L	N/A	N/A
4	1	218801	5	1329200	0.165	0.964	ug/L	N/A	N/A
5	2	426599	5	1295253	0.329	1.906	ug/L	N/A	N/A
6	5	1098511	5	1298947	0.846	4.859	ug/L	N/A	N/A
7	10	1977129	5	1103254	1.792	10.272	ug/L	N/A	N/A

Bordered cell = Manually Integrated; Calibration flags: D=RSD; F=Response factor; R=R Squared; A=Amount.

Compound Calibration Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321.00

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A2	S1J0196-CAL1	2LM031104	1	CAL STD 1	10/13/2021 6:51:11 PM	1:1 0012469
R:A3	S1J0196-CAL2	2LM031105	2	CAL STD 2	10/13/2021 7:04:25 PM	1:1 0012468
R:A4	S1J0196-CAL3	2LM031106	3	CAL STD 3	10/13/2021 7:17:40 PM	1:1 0012467
R:A5	S1J0196-CAL4	2LM031107	4	CAL STD 4	10/13/2021 7:30:55 PM	1:1 0012466
R:A6	S1J0196-CAL5	2LM031108	5	CAL STD 5	10/13/2021 7:44:10 PM	1:1 0012465
R:A7	S1J0196-CAL6	2LM031109	6	CAL STD 6	10/13/2021 7:57:25 PM	1:1 0012464
R:A8	S1J0196-CAL7	2LM031110	7	CAL STD 7	10/13/2021 8:10:41 PM	1:1 0012463

Bordered cell = Manually Integrated; Calibration flags: D=RSD; F=Response factor; R=R Squared; A=Amount.

Data Review Report

Printed: 10/14/2021 11:09 am

Analysis	Analyte	CalResult	True Value	% D	% Rec
Lab ID: S1J0196-CAL1 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.11	0.10000	9.18	109.18
Lab ID: S1J0196-CAL2 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.20	0.20000	2.21	102.21
Lab ID: S1J0196-CAL3 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.49	0.50000	-2.95	97.05
Lab ID: S1J0196-CAL4 Cal Standard					
6850 Perchlorate DOD	Perchlorate	0.96	1.0000	-3.64	96.36
Lab ID: S1J0196-CAL5 Cal Standard					
6850 Perchlorate DOD	Perchlorate	1.91	2.0000	-4.71	95.29
Lab ID: S1J0196-CAL6 Cal Standard					
6850 Perchlorate DOD	Perchlorate	4.86	5.0000	-2.82	97.18
Lab ID: S1J0196-CAL7 Cal Standard					
6850 Perchlorate DOD	Perchlorate	10.27	10.000	2.73	102.73

MICROBAC®

Section E:
HPLC Organics
EPA 6850
Sequence QC Sample Raw Data

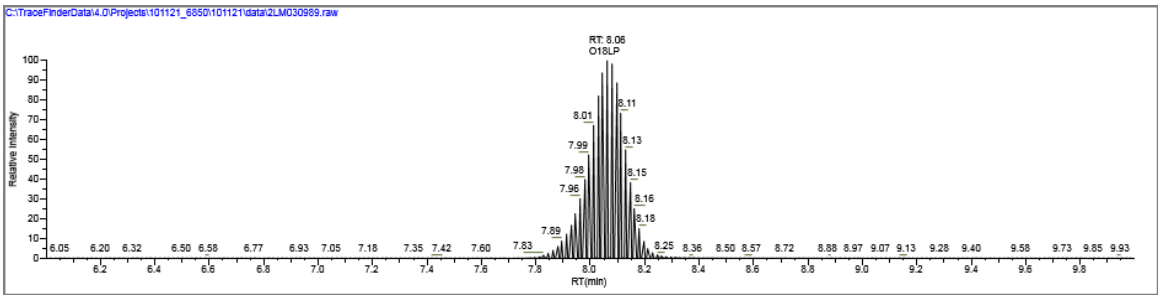
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0168-ICB1	2LM030989	N/A	CCB	10/11/2021 4:55:11 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.06	89	2117910			5.000	ug/L	5.000	ug/L	

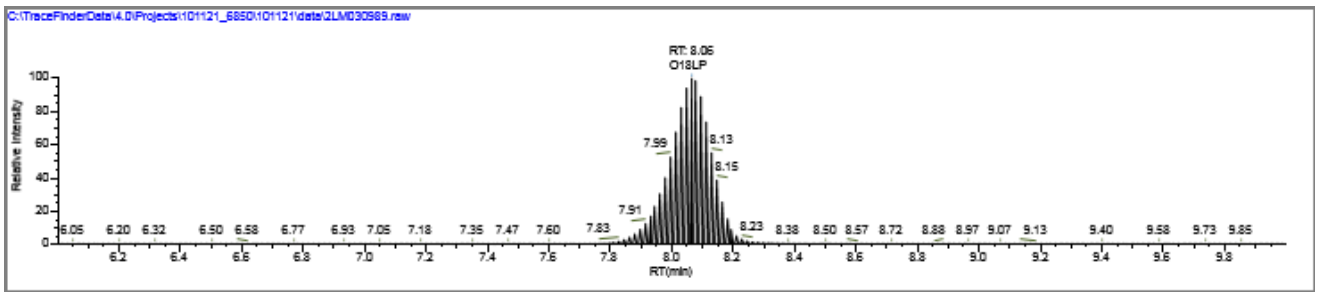
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.07	83	5848	Linear	0.003	0.033	ug/L	0.033	ug/L	I

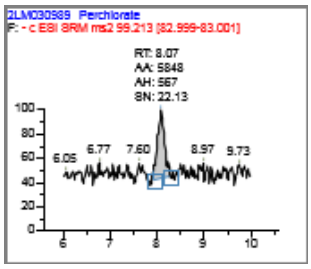
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

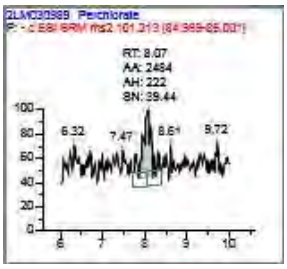
Data File:	2LM030989	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 4:55:11 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-ICB1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 83.000



m/z 85.000



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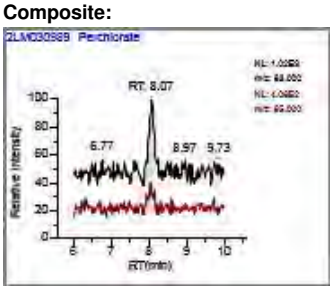
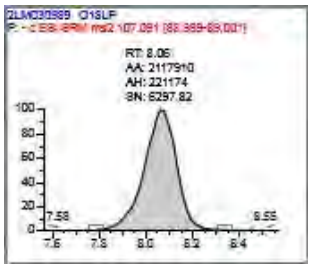


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
8.07	m/z 83.000	5848	0.033		N/A	I
8.07	m/z 85.000	2484		25.54 - 38.31	42.47 *	

m/z 89.000



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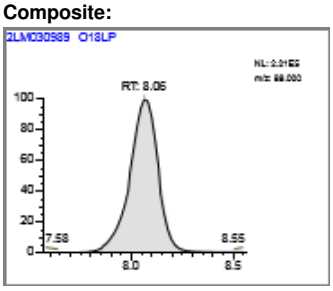


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.06	m/z 89.000	2117910	5.000		N/A

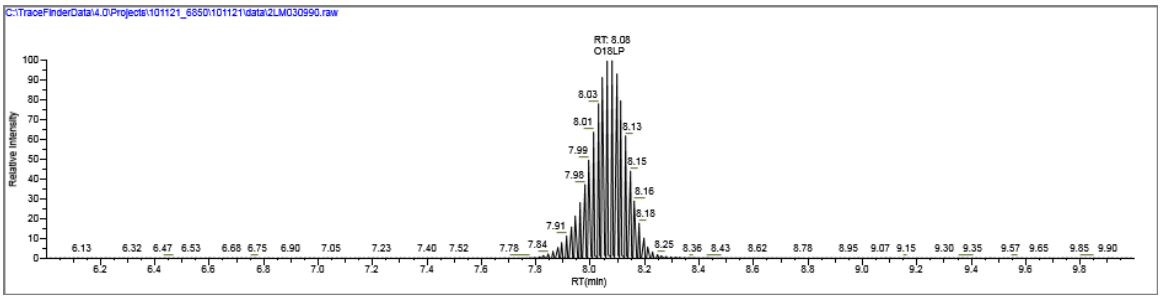
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A2	S1J0168-CAL1	2LM030990	1	CAL STD 1	10/11/2021 5:08:27 PM	1:1 0012469



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	2327975			5.000	ug/L	5.000	ug/L	

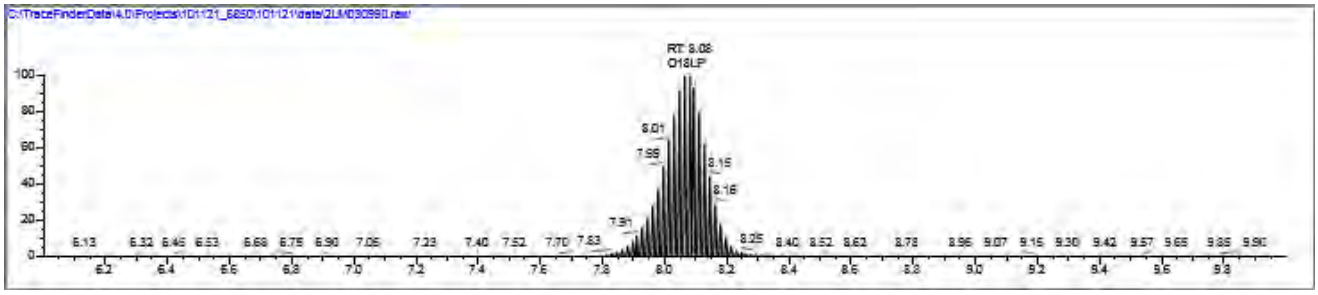
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.07	83	37114	Linear	0.016	0.107	ug/L	0.107	ug/L	

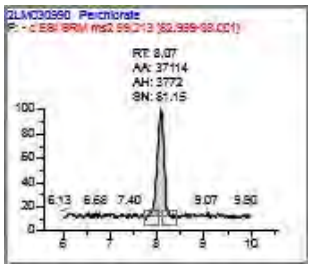
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

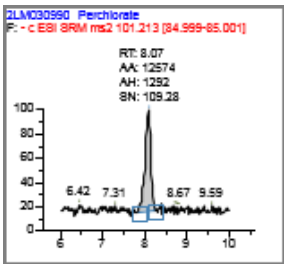
Data File:	2LM030990	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 5:08:27 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CAL1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A2
Comments:	1:1 0012469		



m/z 83.000



m/z 85.000



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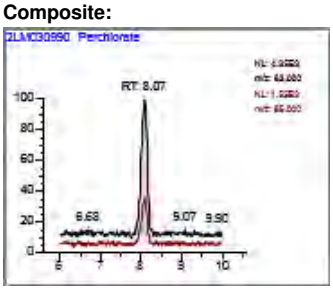
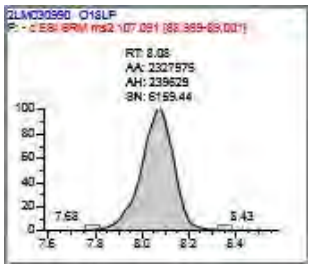


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.100	0.080 - 2.100	
8.07	m/z 83.000	37114	0.107		N/A
8.07	m/z 85.000	12574		25.54 - 38.31	33.88

m/z 89.000



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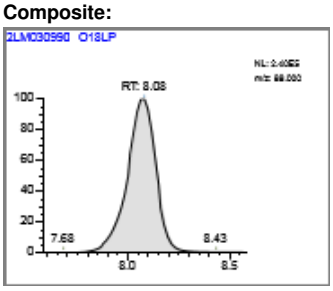


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	2327975	5.000		N/A

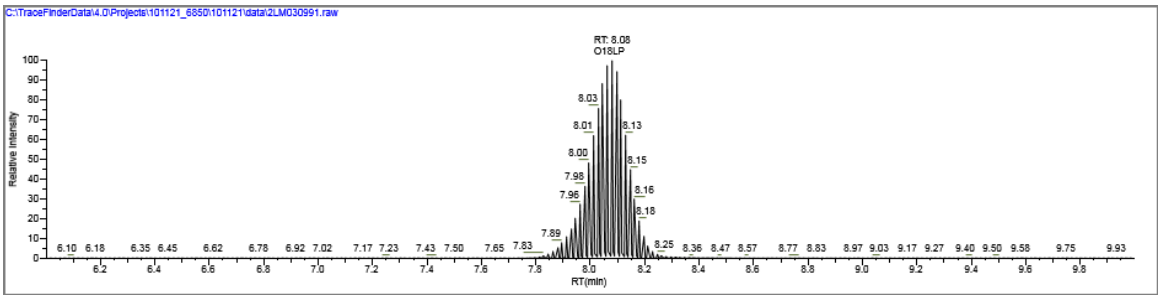
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0168-CAL2	2LM030991	2	CAL STD 2	10/11/2021 5:21:44 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	2206660			5.000	ug/L	5.000	ug/L	

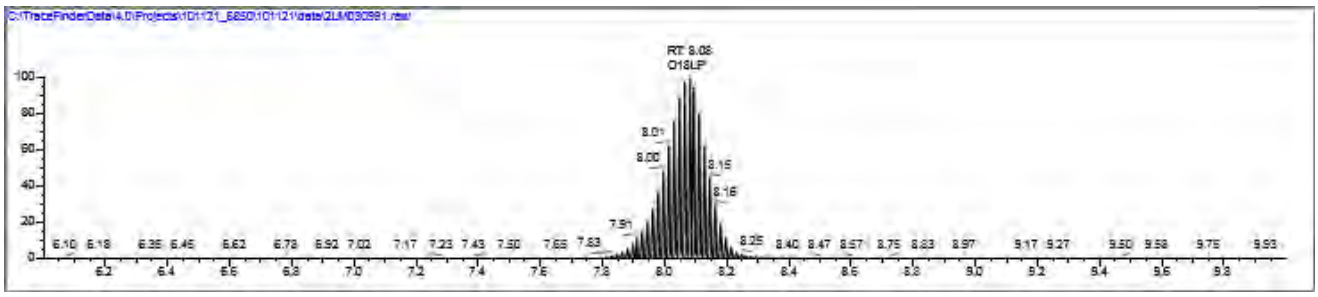
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.07	83	73606	Linear	0.033	0.205	ug/L	0.205	ug/L	

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM030991	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 5:21:44 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CAL2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



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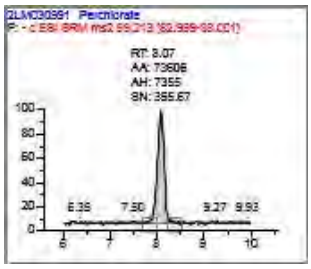

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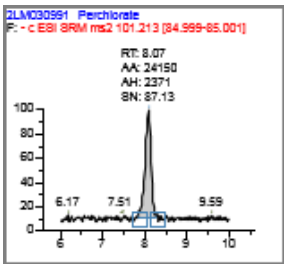

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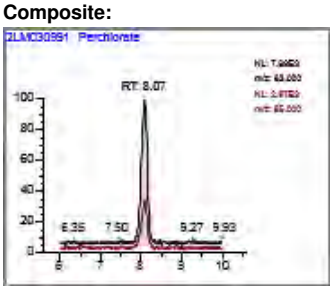
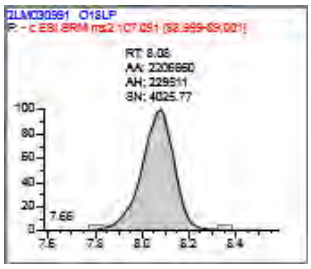


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.200	0.160 - 4.200	
8.07	m/z 83.000	73606	0.205		N/A
8.07	m/z 85.000	24150		25.54 - 38.31	32.81

m/z 89.000



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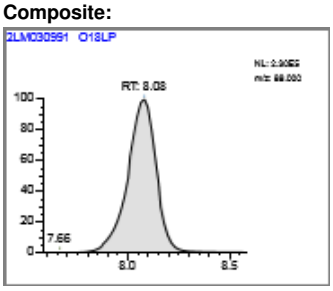


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	2206660	5.000		N/A

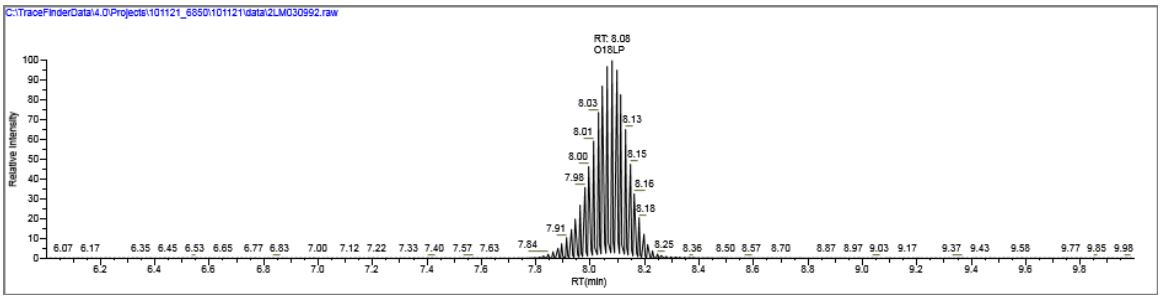
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A4	S1J0168-CAL3	2LM030992	3	CAL STD 3	10/11/2021 5:34:59 PM	1:1 0012467



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	2202883			5.000	ug/L	5.000	ug/L	

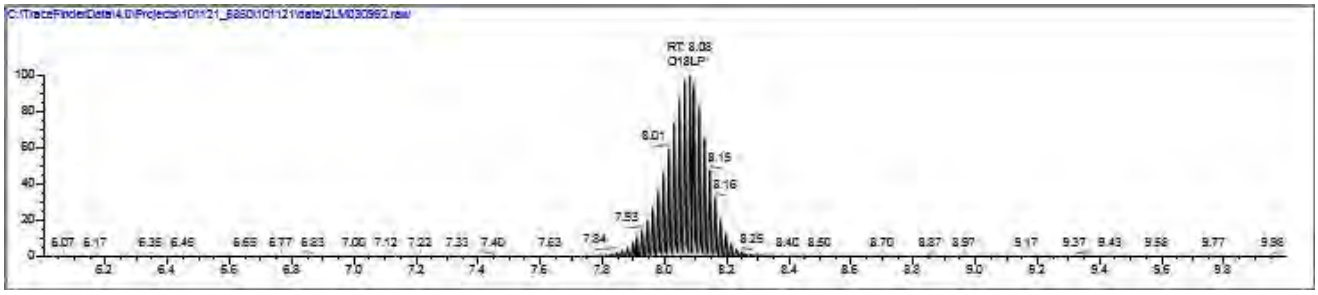
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	182818	Linear	0.083	0.484	ug/L	0.484	ug/L	

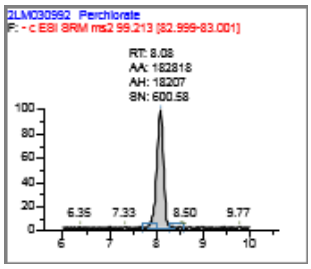
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM030992	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 5:34:59 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CAL3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A4
Comments:	1:1 0012467		



m/z 83.000



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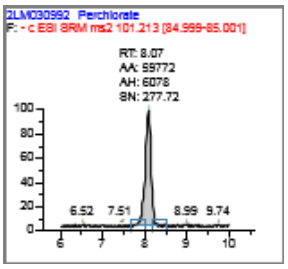

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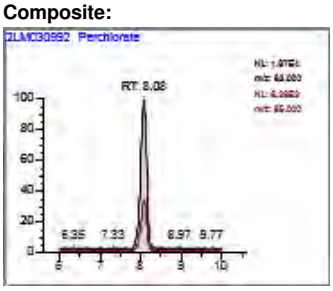
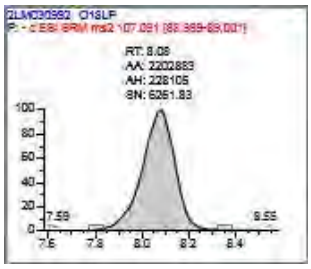


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.500	0.400 - 10.500	
8.08	m/z 83.000	182818	0.484		N/A
8.07	m/z 85.000	59772		25.54 - 38.31	32.69

m/z 89.000



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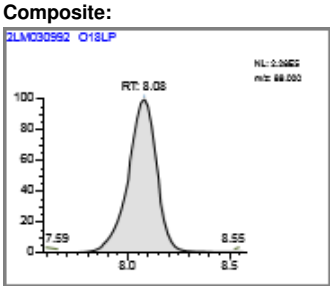


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	2202883	5.000		N/A

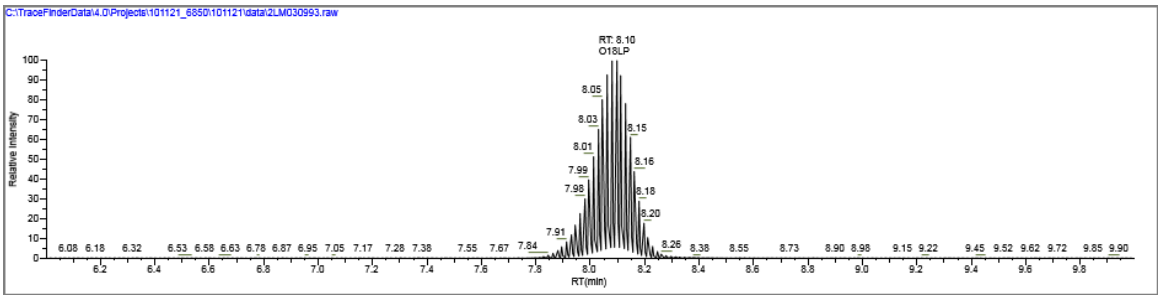
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0168-CAL4	2LM030993	4	CAL STD 4	10/11/2021 5:48:14 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.10	89	2068873			5.000	ug/L	5.000	ug/L	

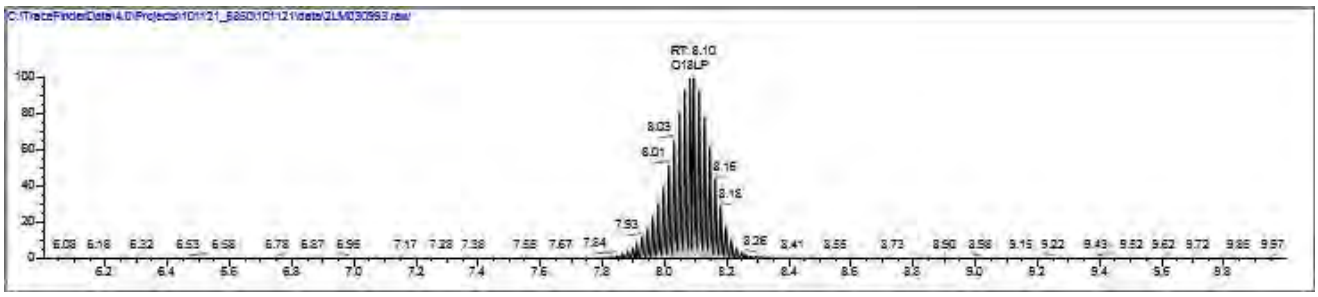
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	357915	Linear	0.173	0.991	ug/L	0.991	ug/L	

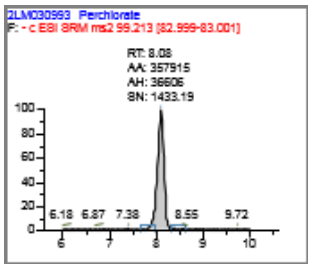
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

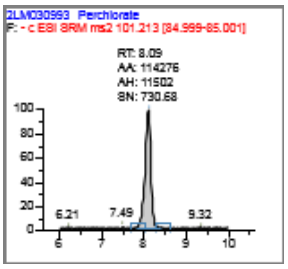
Data File:	2LM030993	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 5:48:14 PM
Cali File:	101121.calx	Cali File Date:	10/12/2021 9:43:57 AM
Sample ID:	S1J0168-CAL4	Operator ID:	CAS
Diln Factor:	1.00	Instrument ID:	LCMS2
Comments:	1:1 0012466	Vial Number:	R:A5



m/z 83.000



m/z 85.000



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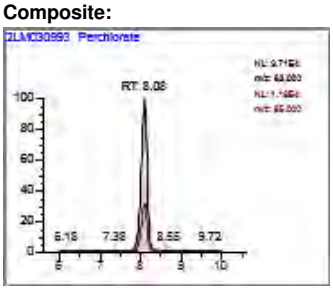
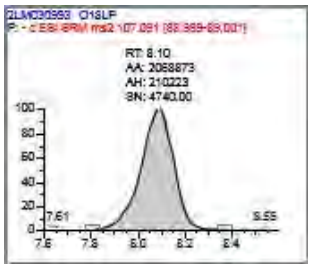


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 1.000	0.800 - 21.000	
8.08	m/z 83.000	357915	0.991		N/A
8.09	m/z 85.000	114276		25.54 - 38.31	31.93

m/z 89.000



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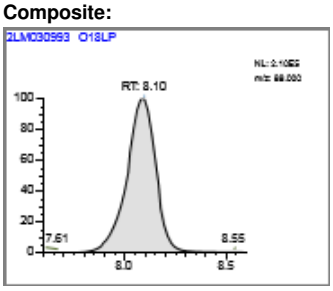

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.10	m/z 89.000	2068873	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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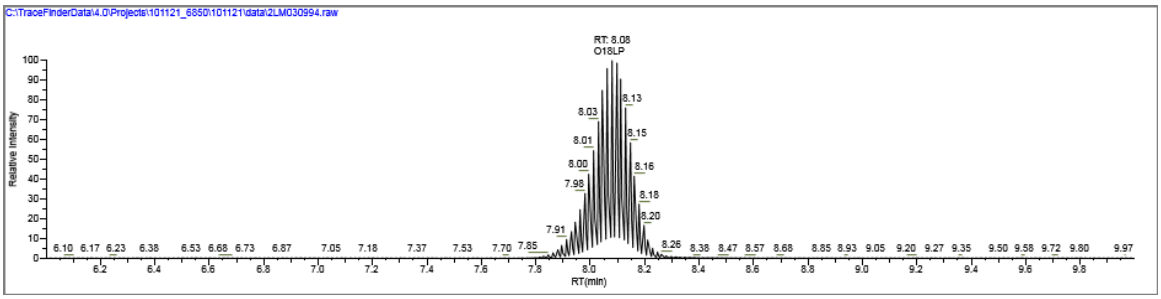


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	2039210			5.000	ug/L	5.000	ug/L	

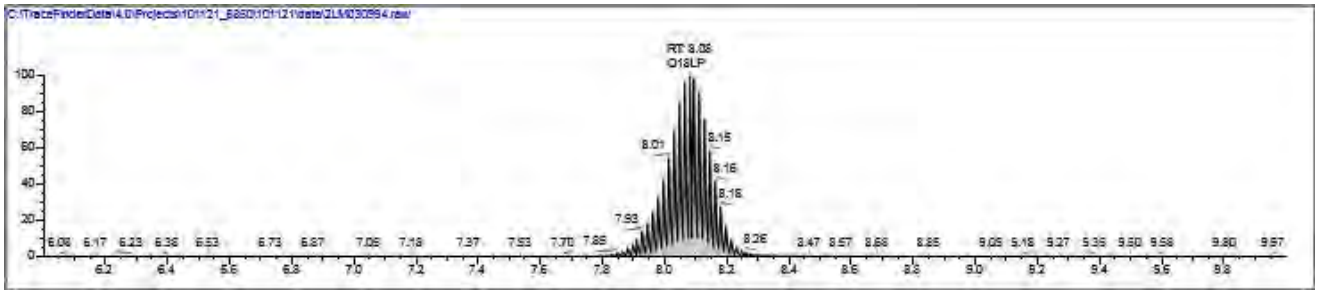
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	682322	Linear	0.335	1.9	ug/L	1.9	ug/L	

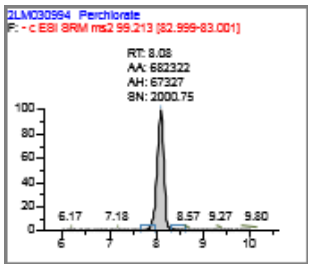
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

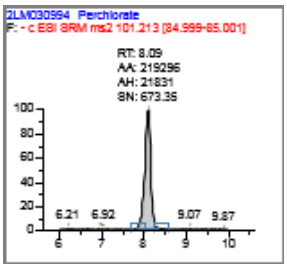
Data File:	2LM030994	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 6:01:29 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CAL5	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A6
Comments:	1:1 0012465		



m/z 83.000



m/z 85.000



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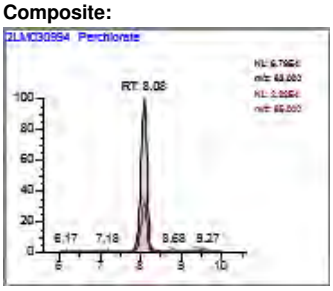
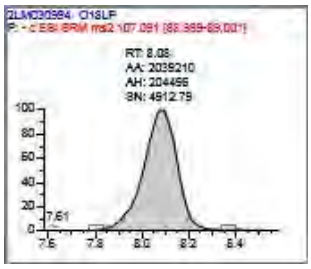


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 2.000	1.600 - 42.000	
8.08	m/z 83.000	682322	1.900		N/A
8.09	m/z 85.000	219296		25.54 - 38.31	32.14

m/z 89.000



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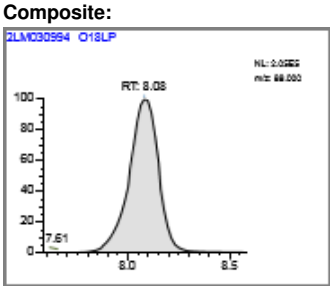

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	2039210	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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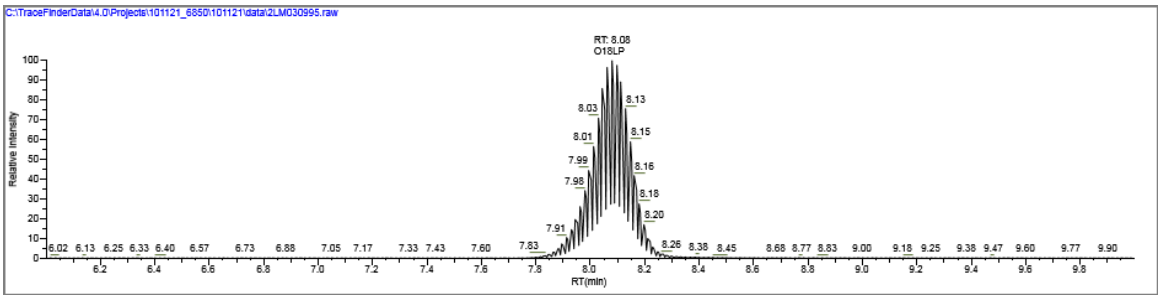


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	1891322			5.000	ug/L	5.000	ug/L	

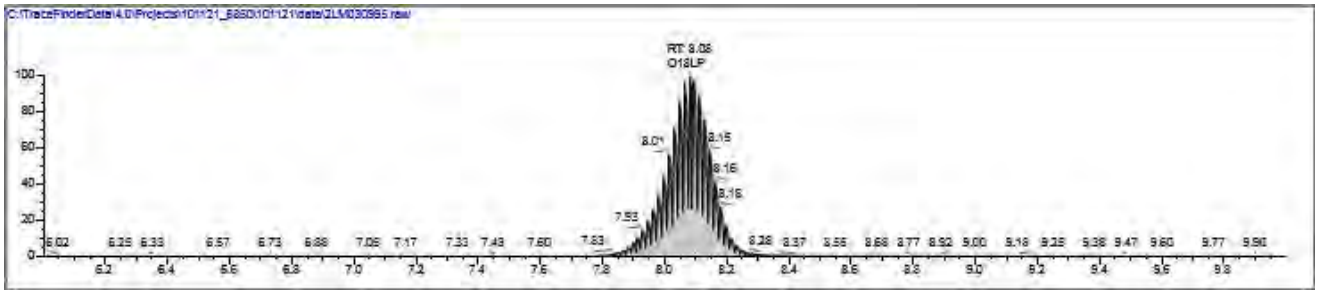
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	1633713	Linear	0.864	4.878	ug/L	4.878	ug/L	

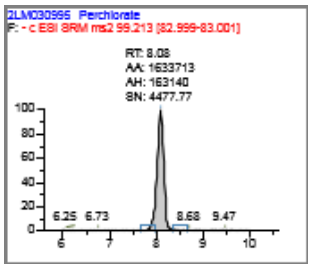
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM030995	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 6:14:44 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CAL6	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A7
Comments:	1:1 0012464		



m/z 83.000



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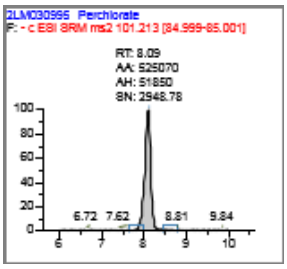

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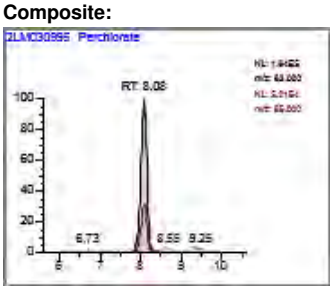
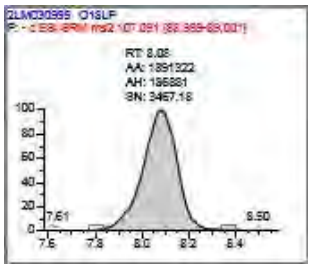


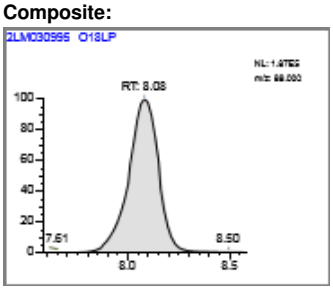
Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 5.000	4.000 - 105.000	
8.08	m/z 83.000	1633713	4.878		N/A
8.09	m/z 85.000	525070		25.54 - 38.31	32.14

m/z 89.000



Composite:



O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	1891322	5.000		N/A

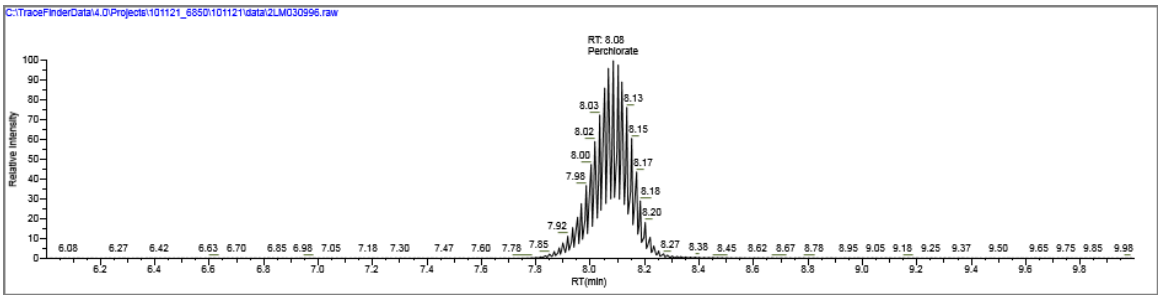
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A8	S1J0168-CAL7	2LM030996	7	CAL STD 7	10/11/2021 6:27:59 PM	1:1 0012463



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	1743877			5.000	ug/L	5.000	ug/L	

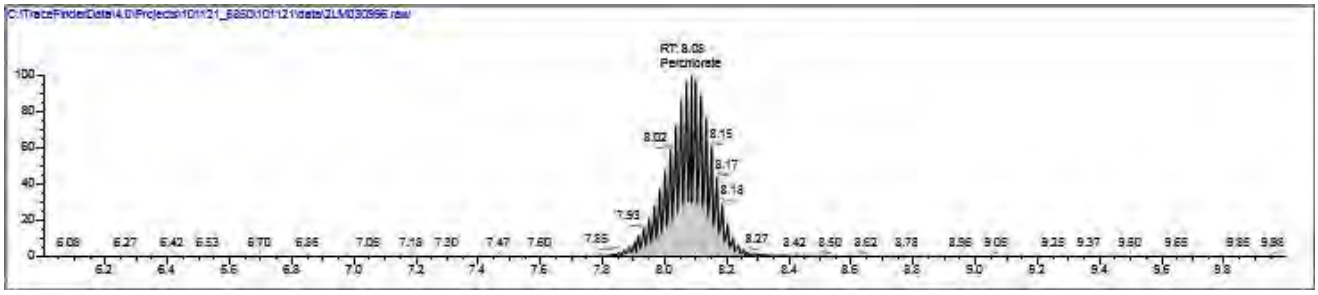
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	3166656	Linear	1.816	10.236	ug/L	10.236	ug/L	

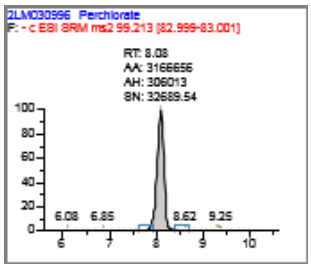
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM030996	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 6:27:59 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CAL7	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A8
Comments:	1:1 0012463		



m/z 83.000



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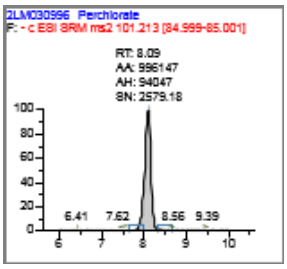

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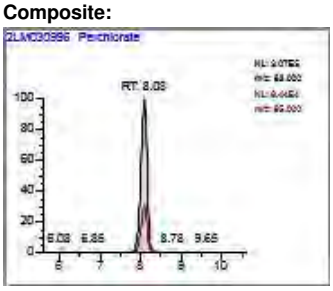
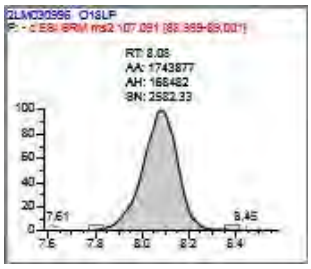


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 10.000	8.000 - 210.000	
8.08	m/z 83.000	3166656	10.236		N/A
8.09	m/z 85.000	996147		25.54 - 38.31	31.46

m/z 89.000



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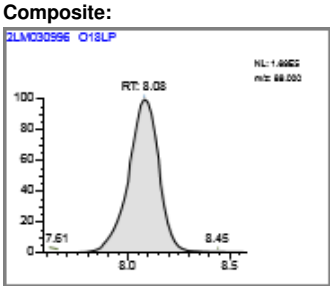


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	1743877	5.000		N/A

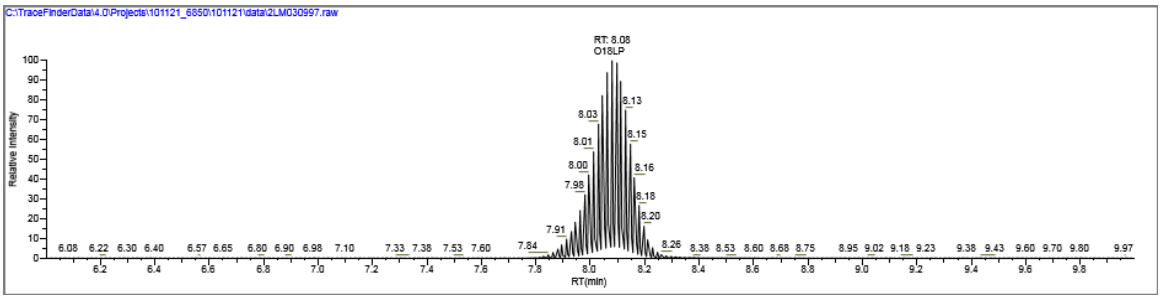
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A9	S1J0168-ICV1	2LM030997	ICV	ICV	10/11/2021 6:41:14 PM	1:1 0012475



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	2018510			5.000	ug/L	5.000	ug/L	

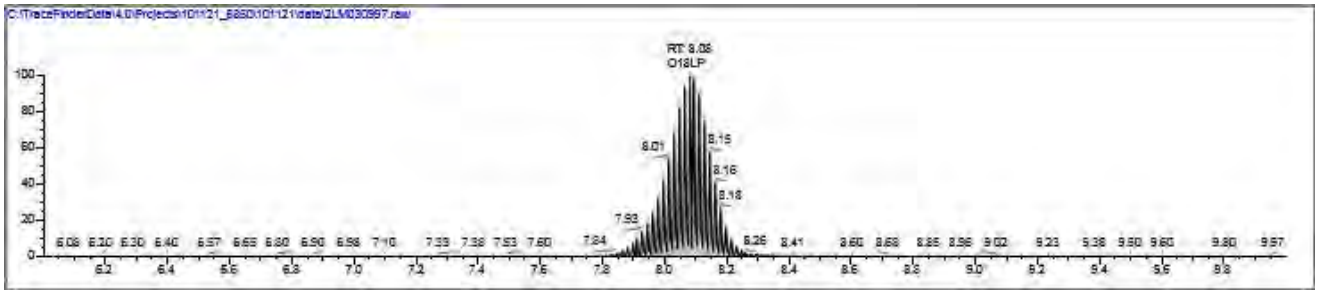
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	357350	Linear	0.177	1.013	ug/L	1.013	ug/L	

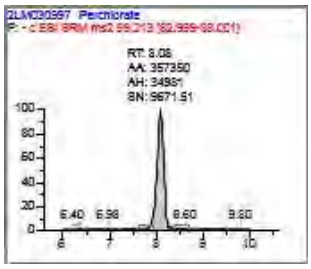
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

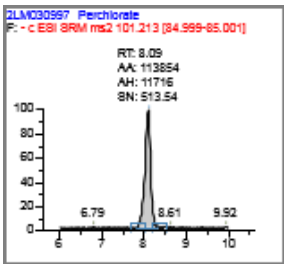
Data File:	2LM030997	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 6:41:14 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-ICV1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A9
Comments:	1:1 0012475		



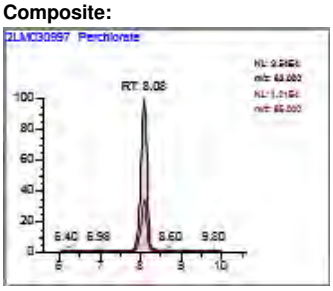
m/z 83.000



m/z 85.000



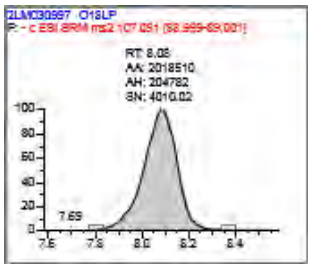
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
8.08	m/z 83.000	357350	1.013		N/A
8.09	m/z 85.000	113854		25.54 - 38.31	31.86

m/z 89.000



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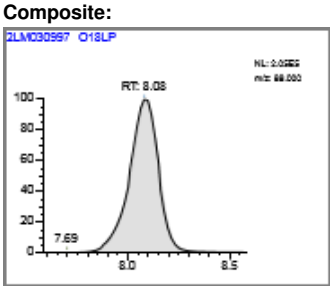


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	2018510	5.000		N/A

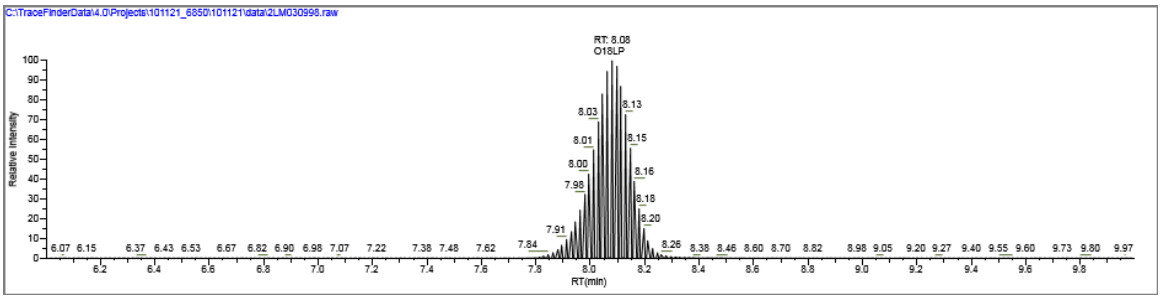
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0168-CCB1	2LM030998	N/A	CCB	10/11/2021 6:54:28 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.08	89	2067088			5.000	ug/L	5.000	ug/L	

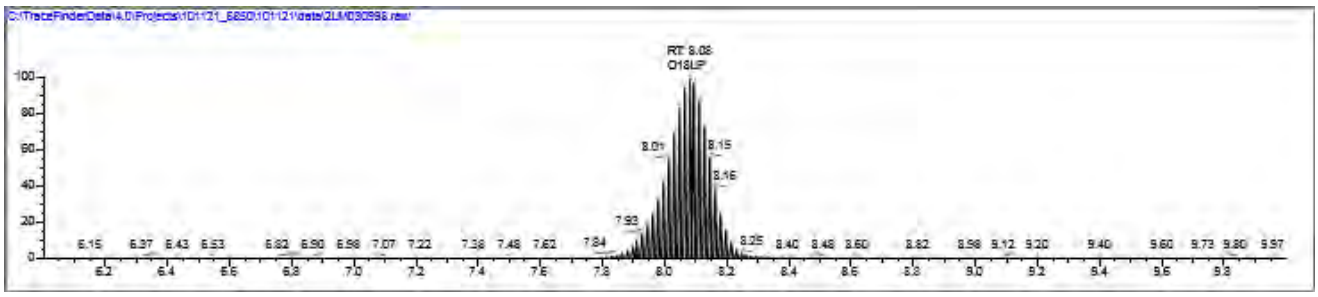
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	4127	Linear	0.002	0.028	ug/L	0.028	ug/L	I

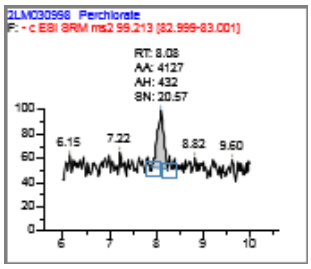
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

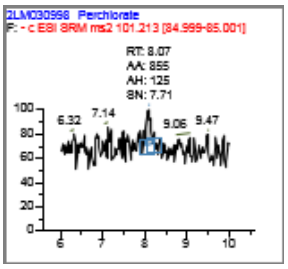
Data File:	2LM030998	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 6:54:28 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CCB1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



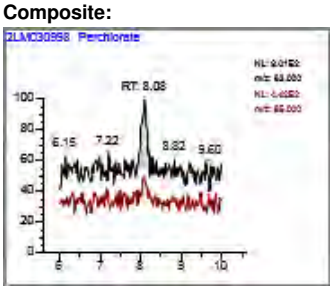
m/z 83.000



m/z 85.000



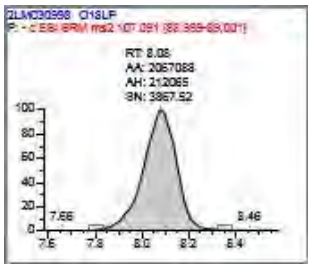
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
8.08	m/z 83.000	4127	0.028		N/A	I
8.07	m/z 85.000	855		25.54 - 38.31	20.72 *	

m/z 89.000



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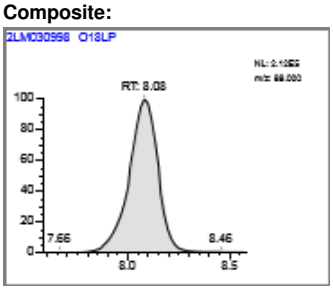


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.08	m/z 89.000	2067088	5.000		N/A

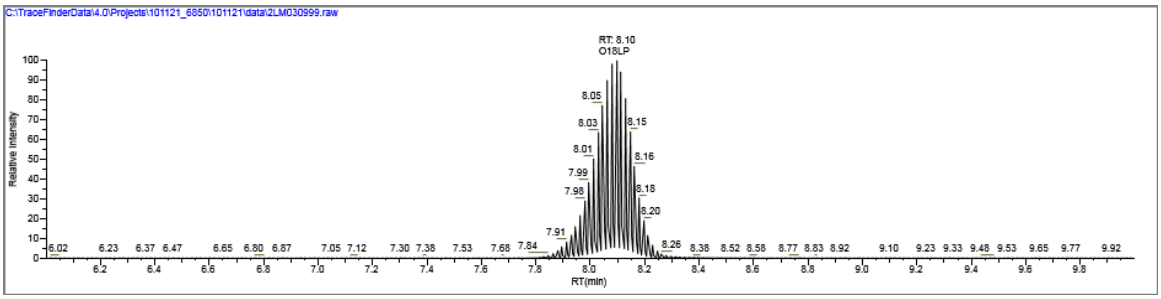
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0168-CCV1	2LM030999	CCV	CCV 1.0 ug/L	10/11/2021 7:07:43 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.10	89	1904544			5.000	ug/L	5.000	ug/L	

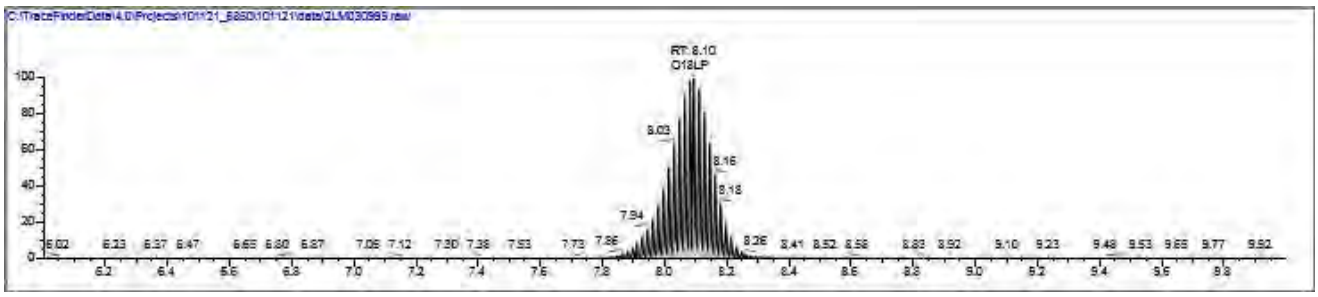
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	326375	Linear	0.171	0.981	ug/L	0.981	ug/L	

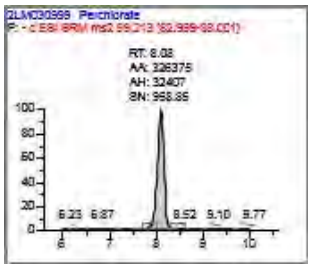
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

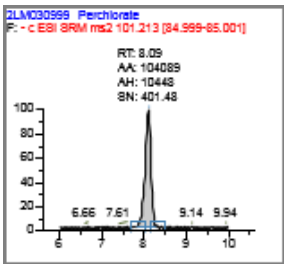
Data File:	2LM030999	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 7:07:43 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CCV1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



m/z 83.000



m/z 85.000



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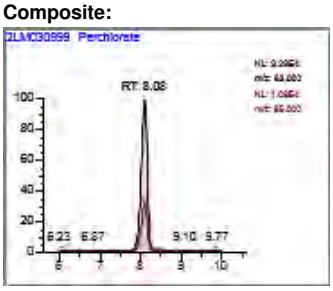
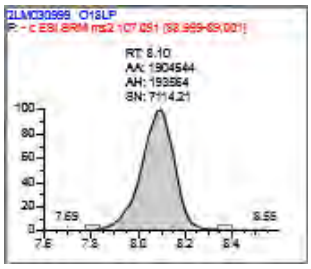


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
8.08	m/z 83.000	326375	0.981		N/A
8.09	m/z 85.000	104089		25.54 - 38.31	31.89

m/z 89.000



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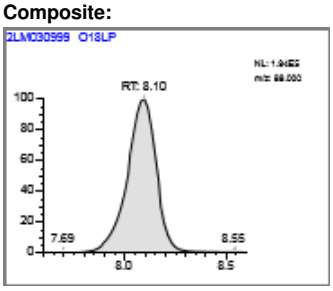

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.10	m/z 89.000	1904544	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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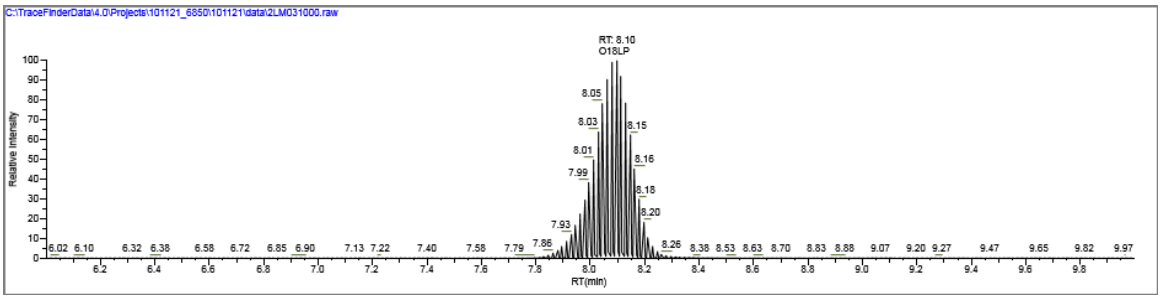


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.10	89	1976067			5.000	ug/L	5.000	ug/L	

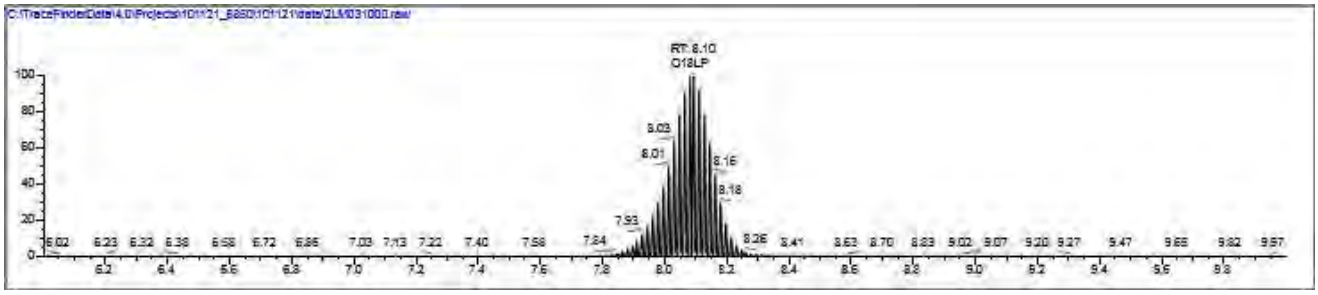
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.08	83	63057	Linear	0.032	0.197	ug/L	0.197	ug/L	

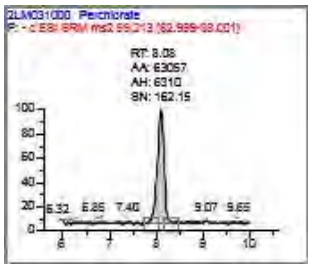
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031000	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 7:20:58 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CRL1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 83.000



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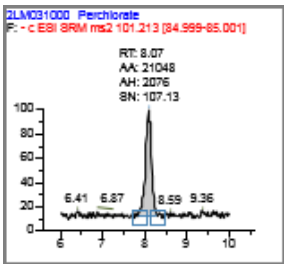

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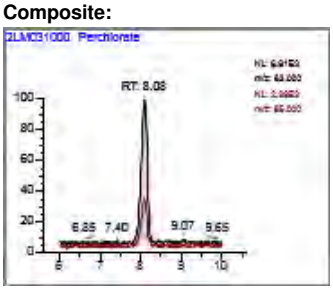
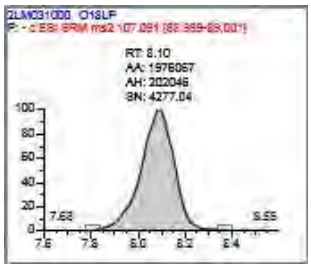


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
8.08	m/z 83.000	63057	0.197		N/A
8.07	m/z 85.000	21048		25.54 - 38.31	33.38

m/z 89.000



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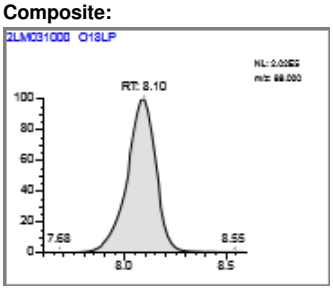


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.10	m/z 89.000	1976067	5.000		N/A

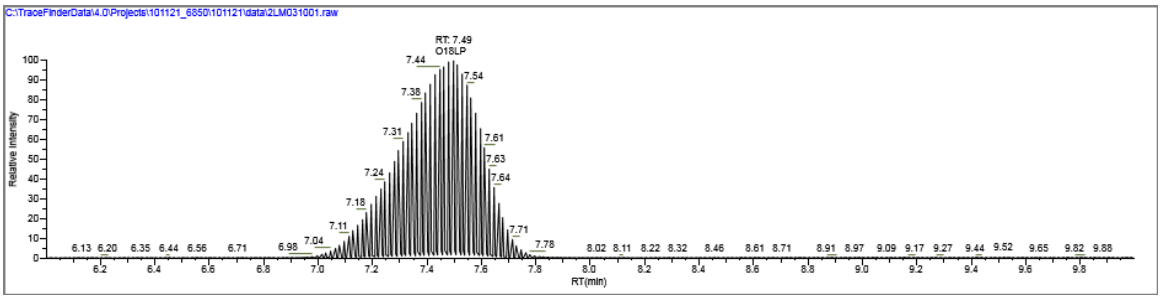
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B1	S1J0168-IFA1	2LM031001	N/A	MCT 0.2 ug/L	10/11/2021 7:34:13 PM	1:1 0012477



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.49	89	2056477			5.000	ug/L	5.000	ug/L	

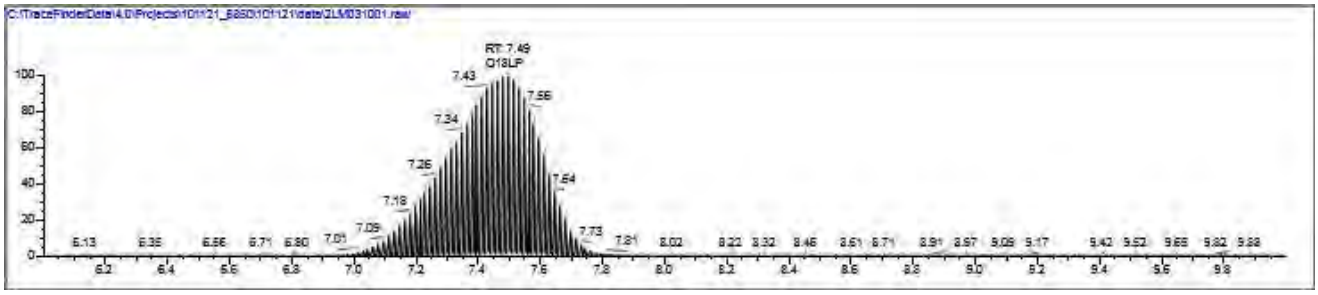
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.45	83	77369	Linear	0.038	0.229	ug/L	0.229	ug/L	

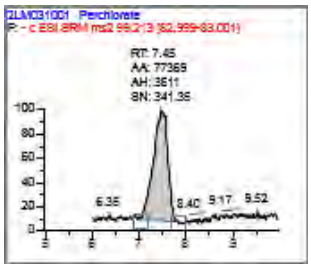
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031001	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 7:34:13 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-IFA1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B1
Comments:	1:1 0012477		



m/z 83.000



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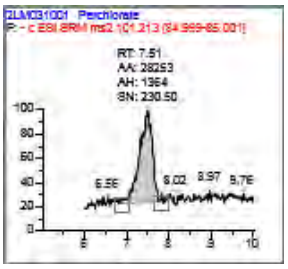

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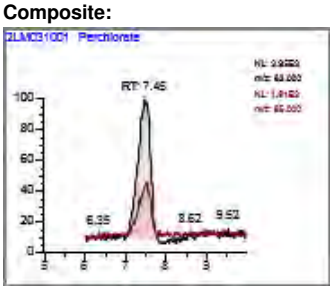
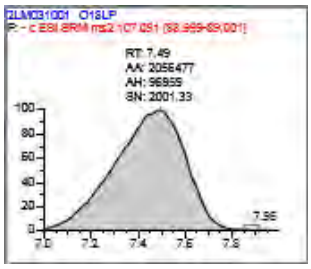


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.45	m/z 83.000	77369	0.229		N/A
7.51	m/z 85.000	28253		25.54 - 38.31	36.52

m/z 89.000



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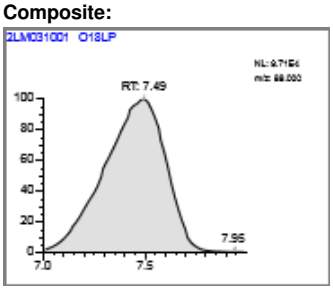


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.49	m/z 89.000	2056477	5.000		N/A

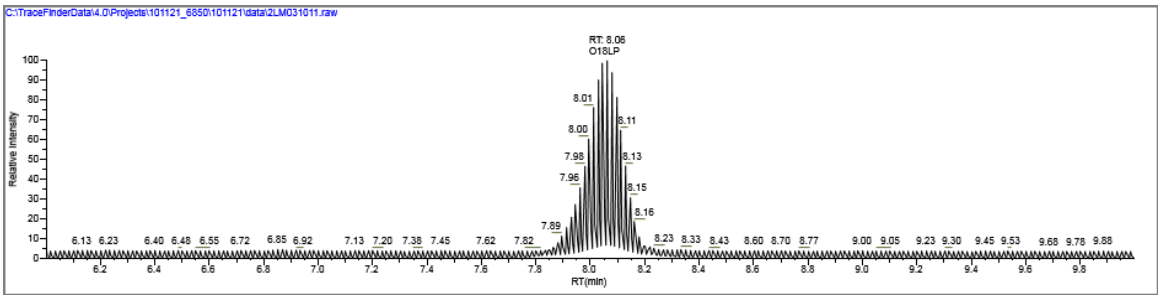
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0168-CCV2	2LM031011	CCV	CCV 1.0 ug/L	10/11/2021 9:46:46 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.06	89	2198692			5.000	ug/L	5.000	ug/L	

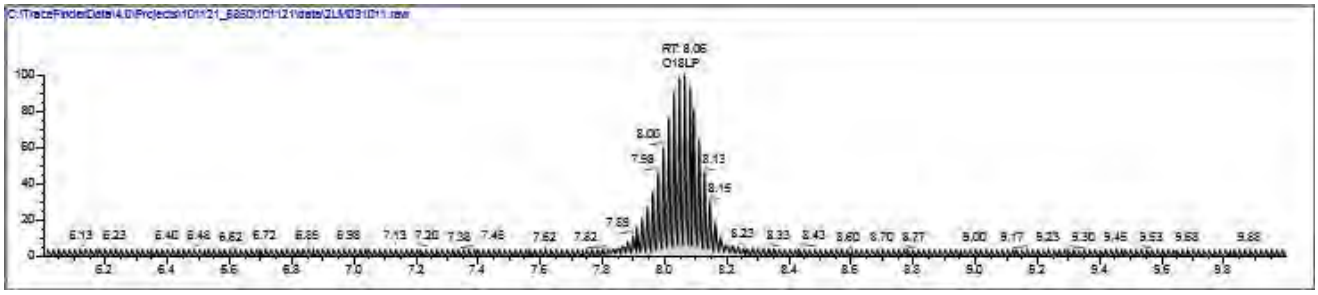
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.07	83	387852	Linear	0.176	1.01	ug/L	1.01	ug/L	

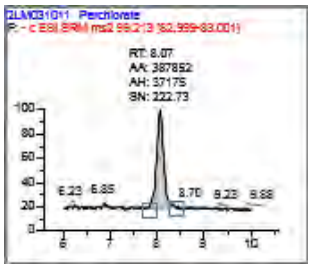
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

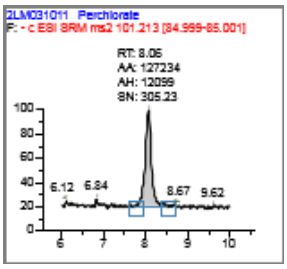
Data File:	2LM031011	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 9:46:46 PM
Cali File:	101121.calx	Cali File Date:	10/12/2021 9:43:57 AM
Sample ID:	S1J0168-CCV2	Operator ID:	CAS
Diln Factor:	1.00	Instrument ID:	LCMS2
Comments:	1:1 0012466	Vial Number:	R:A5



m/z 83.000



m/z 85.000



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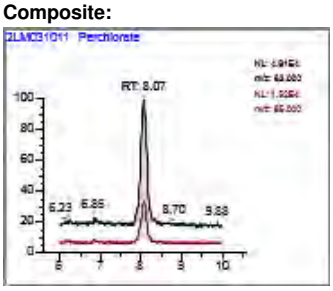
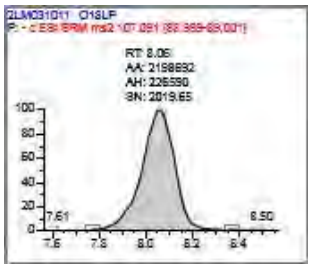


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
8.07	m/z 83.000	387852	1.010		N/A
8.06	m/z 85.000	127234		25.54 - 38.31	32.8

m/z 89.000



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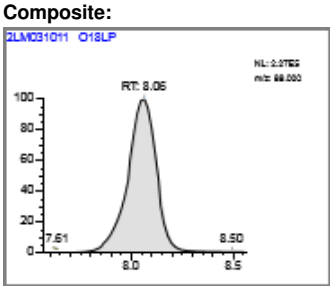


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.06	m/z 89.000	2198692	5.000		N/A

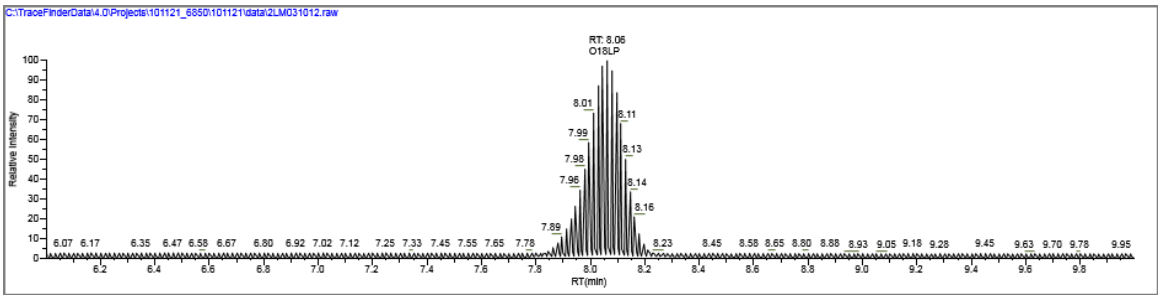
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0168-CRL2	2LM031012	QCMRL	QCMRL 0.2 ug/L	10/11/2021 10:00:01 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.06	89	2239438			5.000	ug/L	5.000	ug/L	

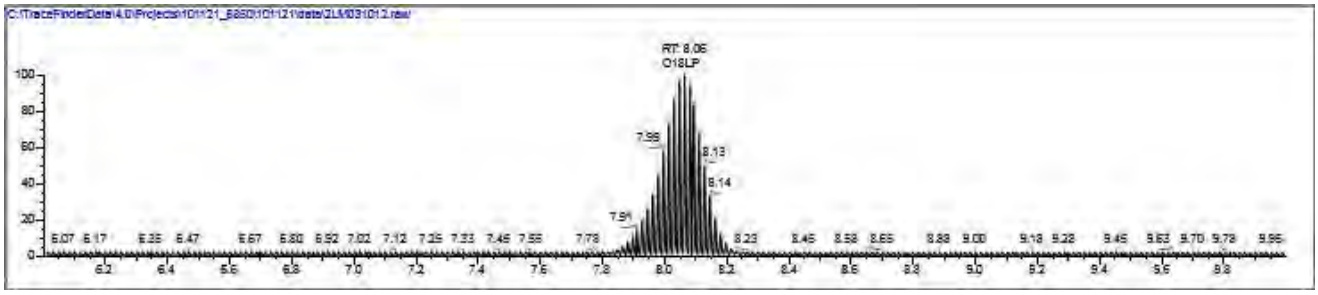
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.07	83	78873	Linear	0.035	0.215	ug/L	0.215	ug/L	

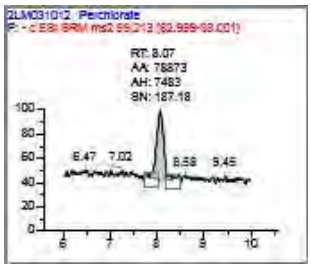
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

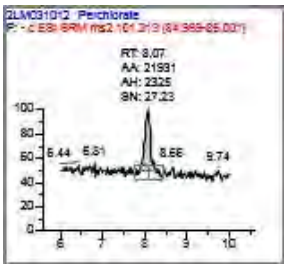
Data File:	2LM031012	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 10:00:01 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CRL2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 83.000



m/z 85.000



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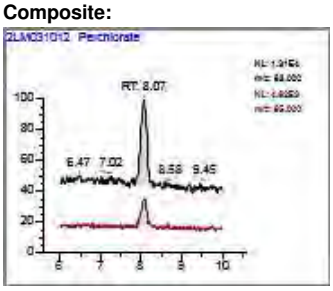
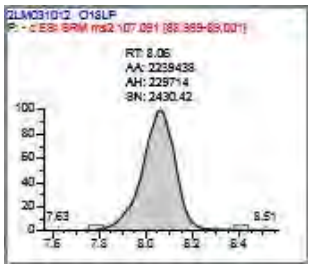


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
8.07	m/z 83.000	78873	0.215		N/A
8.07	m/z 85.000	21931		25.54 - 38.31	27.81

m/z 89.000



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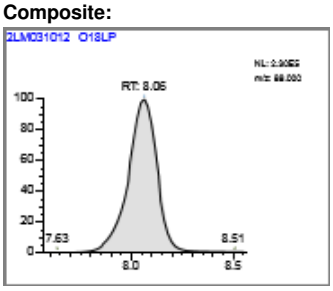

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.06	m/z 89.000	2239438	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850
Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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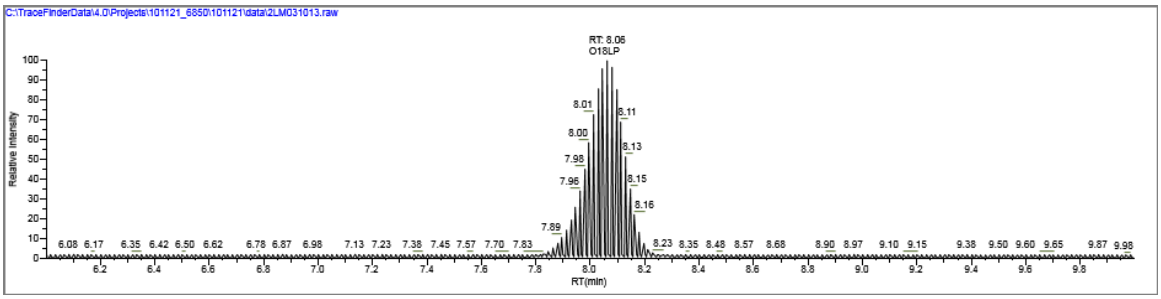


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.06	89	2311046			5.000	ug/L	5.000	ug/L	

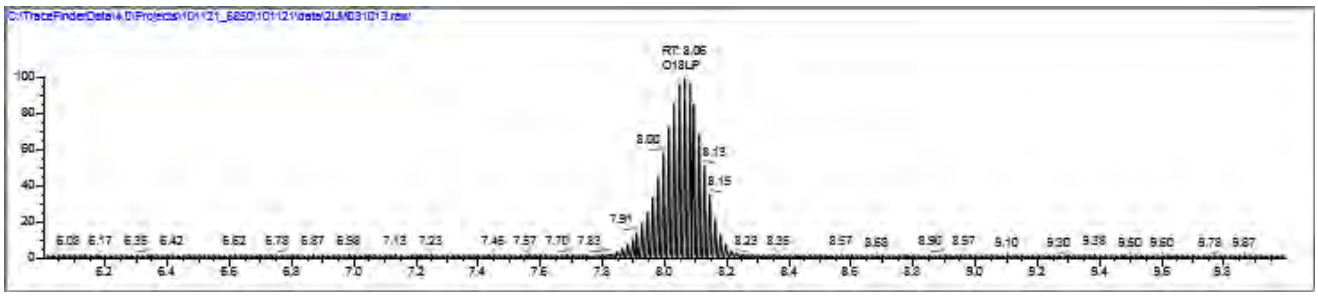
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	N/F	N/F	N/F	Linear	0.000	N/F	ug/L	N/F	ug/L	

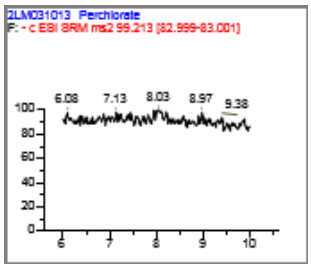
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

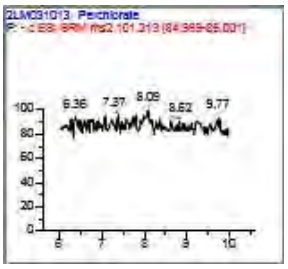
Data File:	2LM031013	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 10:13:16 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CCB2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 83.000



m/z 85.000



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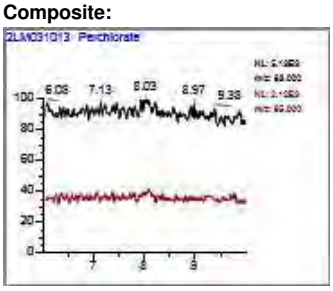
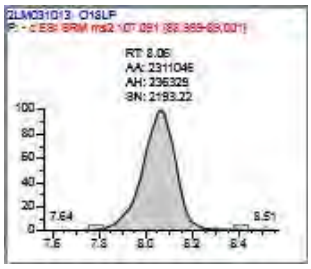


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
			Compound Not Found		
0.00	m/z 83.000		N/A		
	m/z 85.000				

m/z 89.000



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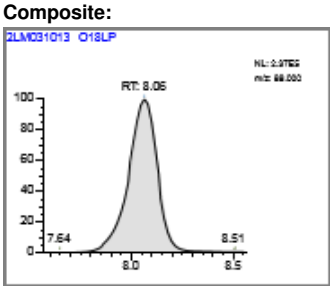


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.06	m/z 89.000	2311046	5.000		N/A

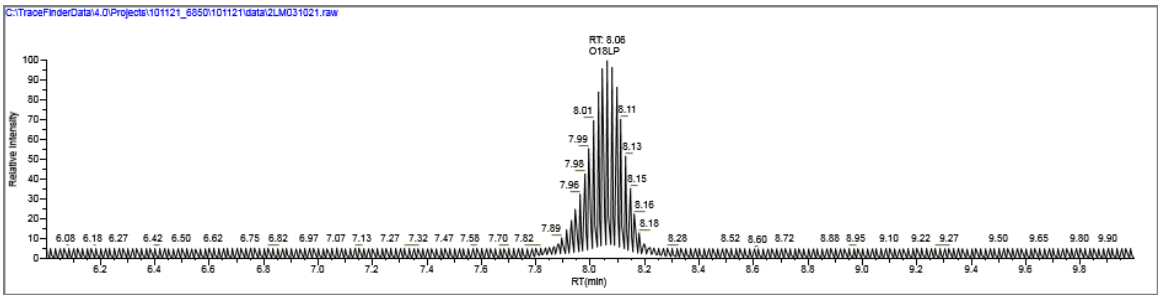
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0168-CCV3	2LM031021	CCV	CCV 1.0 ug/L	10/11/2021 11:59:17 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.06	89	2127459			5.000	ug/L	5.000	ug/L	

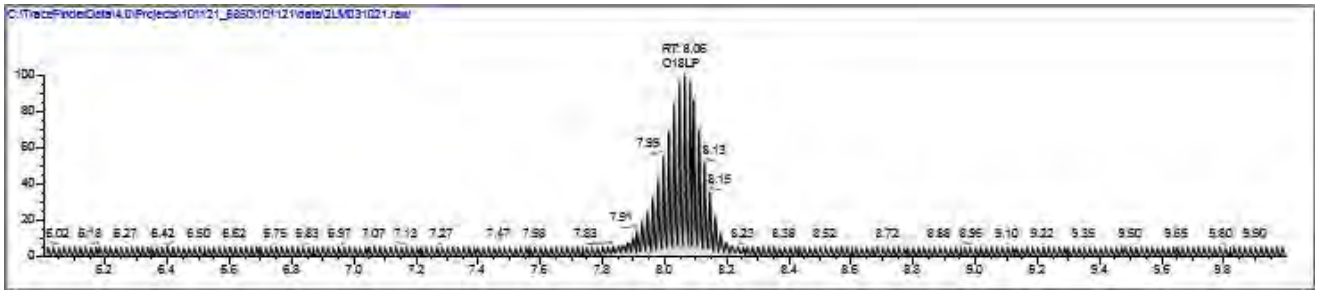
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.07	83	349374	Linear	0.164	0.941	ug/L	0.941	ug/L	

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031021	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/11/2021 11:59:17 PM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CCV3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



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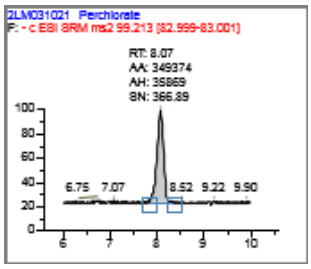

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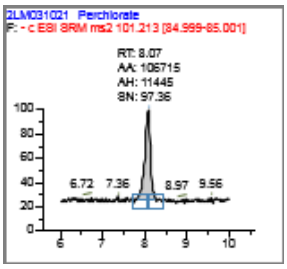

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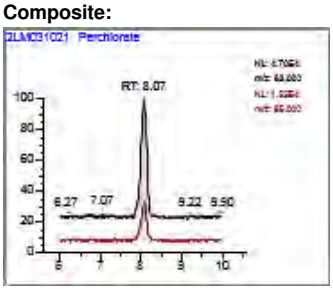
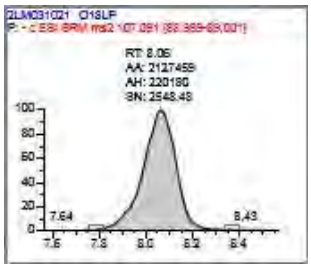


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
8.07	m/z 83.000	349374	0.941		N/A
8.07	m/z 85.000	106715		25.54 - 38.31	30.54

m/z 89.000



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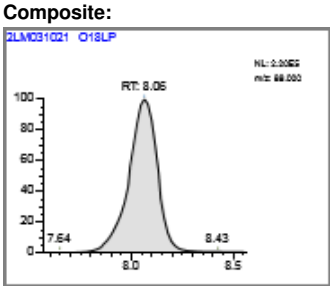


O18LP

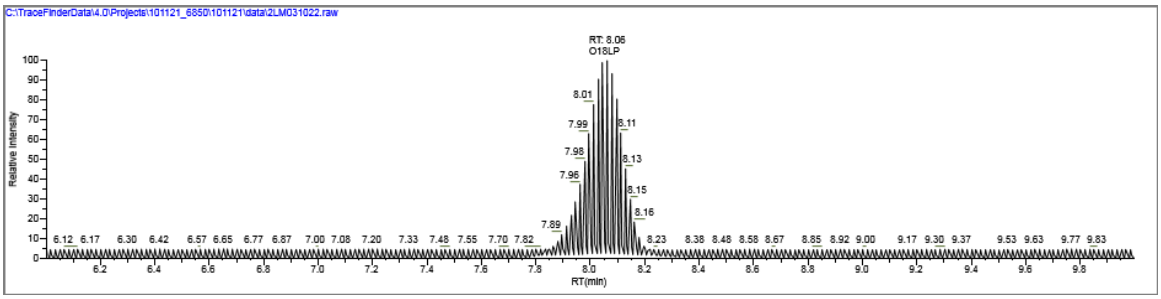
RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.06	m/z 89.000	2127459	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name:	Microbac OVD		
Instrument:	LCMS2	**Method:**	101121_Perchlorate 6850 Perchlorate 6850
User:	CAS		
Batch:	101121	**Cali File:**	101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0168-CRL3	2LM031022	QCMRL	QCMRL 0.2 ug/L	10/12/2021 12:12:34 AM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.06	89	2232424			5.000	ug/L	5.000	ug/L	

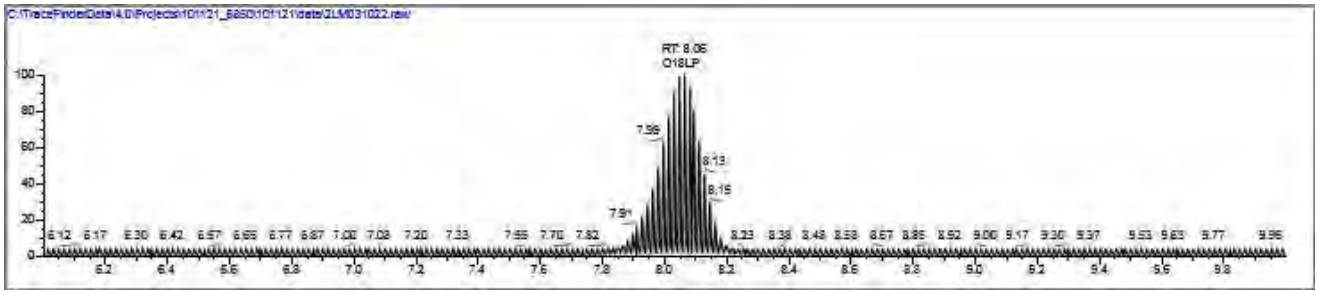
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	8.07	83	81223	Linear	0.036	0.222	ug/L	0.222	ug/L	

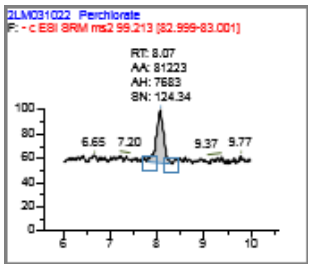
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

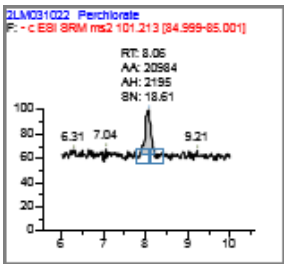
Data File:	2LM031022	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/12/2021 12:12:34 AM
Cali File:	101121.calx	Cali File Date:	10/12/2021 9:43:57 AM
Sample ID:	S1J0168-CRL3	Operator ID:	CAS
Diln Factor:	1.00	Instrument ID:	LCMS2
Comments:	1:1 0012468	Vial Number:	R:A3



m/z 83.000



m/z 85.000



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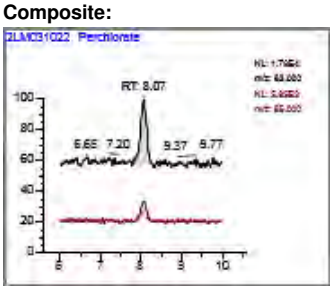
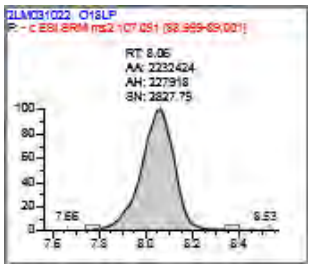


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
8.07	m/z 83.000	81223	0.222		N/A
8.06	m/z 85.000	20984		25.54 - 38.31	25.84

m/z 89.000



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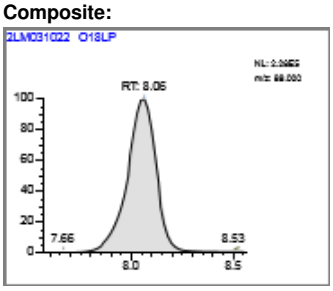


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.06	m/z 89.000	2232424	5.000		N/A

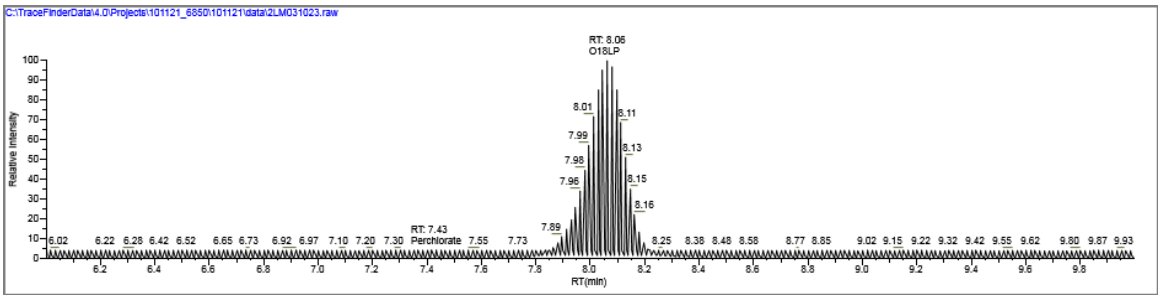
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101121

Method: 101121_Perchlorate 6850 Perchlorate 6850
Cali File: 101121.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0168-CCB3	2LM031023	N/A	CCB	10/12/2021 12:25:53 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	8.06	89	2186937			5.000	ug/L	5.000	ug/L	

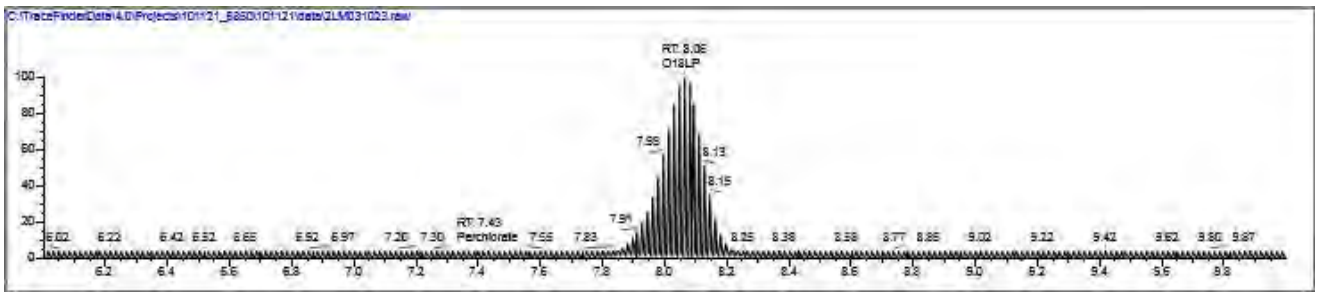
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.43	83	4403	Linear	0.002	0.028	ug/L	0.028	ug/L	I

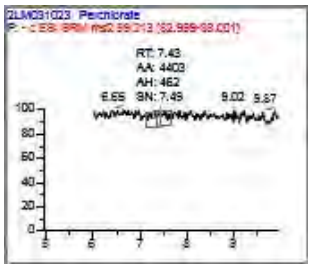
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

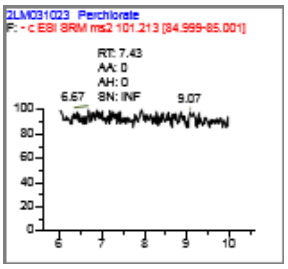
Data File:	2LM031023	Tune Report Date:	Tune report not found
Method:	101121_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/12/2021 12:25:53 AM
		Cali File Date:	10/12/2021 9:43:57 AM
Cali File:	101121.calx	Operator ID:	CAS
Sample ID:	S1J0168-CCB3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



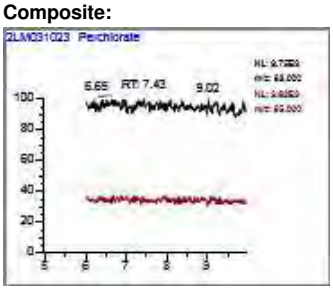
m/z 83.000



m/z 85.000



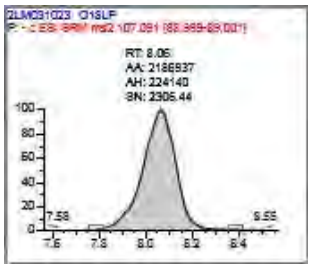
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.43	m/z 83.000	4403	0.028		N/A	I
7.43	m/z 85.000			25.54 - 38.31	*	

m/z 89.000



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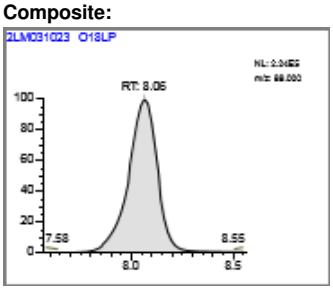


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
8.06	m/z 89.000	2186937	5.000		N/A

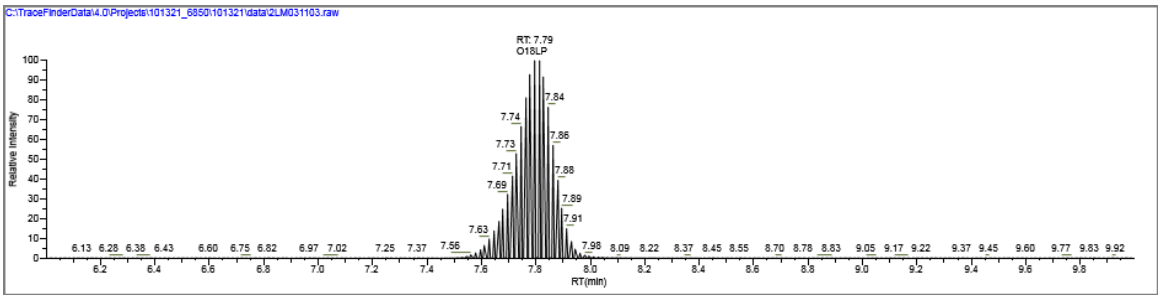
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0196-ICB1	2LM031103	N/A	CCB	10/13/2021 6:37:56 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.79	89	1235039			5.000	ug/L	5.000	ug/L	

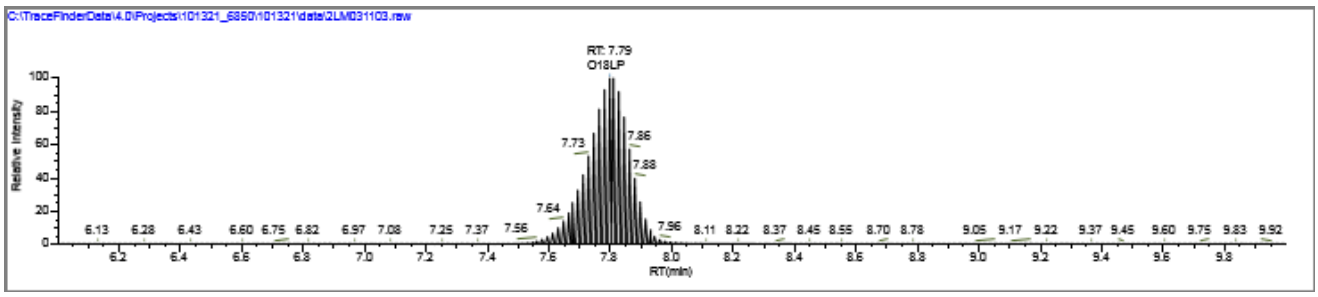
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.78	83	2346	Linear	0.002	0.033	ug/L	0.033	ug/L	I

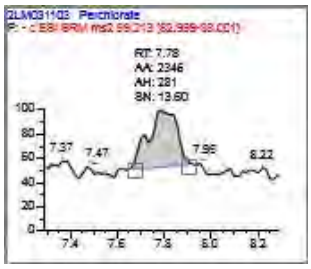
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

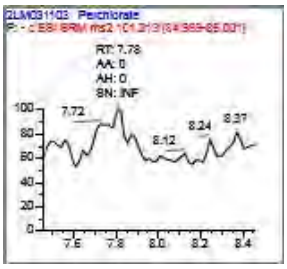
Data File:	2LM031103	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 6:37:56 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-ICB1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 83.000



m/z 85.000



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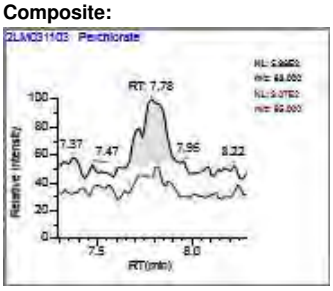
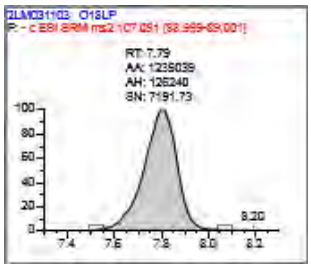


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.78	m/z 83.000	2346	0.033		N/A	I
7.78	m/z 85.000			26.85 - 40.28	*	

m/z 89.000



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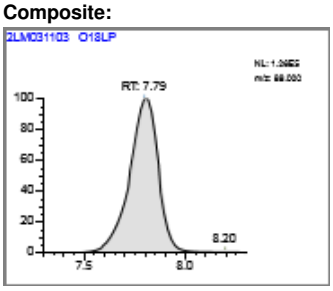


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.79	m/z 89.000	1235039	5.000		N/A

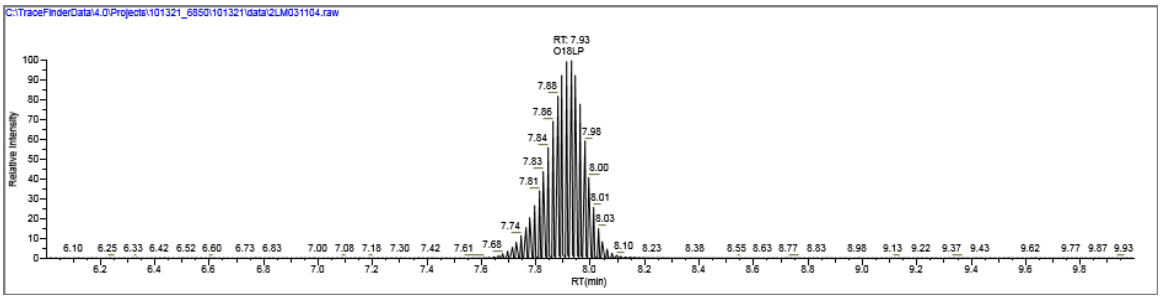
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A2	S1J0196-CAL1	2LM031104	1	CAL STD 1	10/13/2021 6:51:11 PM	1:1 0012469



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.93	89	1307341			5.000	ug/L	5.000	ug/L	

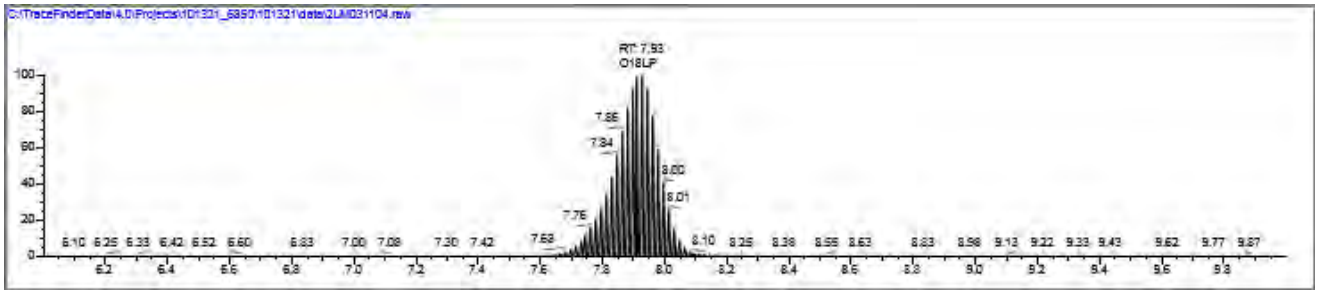
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.92	83	19921	Linear	0.015	0.109	ug/L	0.109	ug/L	

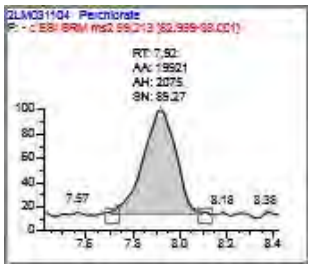
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

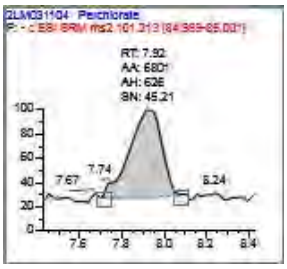
Data File:	2LM031104	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 6:51:11 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CAL1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A2
Comments:	1:1 0012469		



m/z 83.000



m/z 85.000



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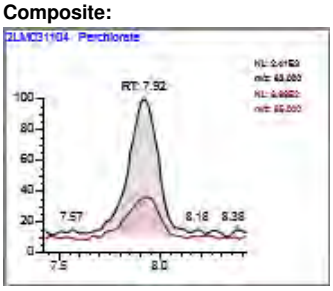
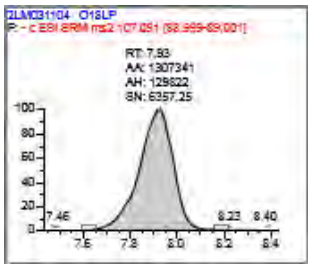


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.100	0.080 - 2.100	
7.92	m/z 83.000	19921	0.109		N/A
7.92	m/z 85.000	6801		26.85 - 40.28	34.14

m/z 89.000



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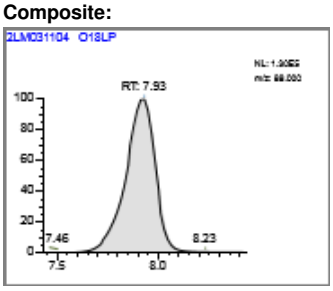


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.93	m/z 89.000	1307341	5.000		N/A

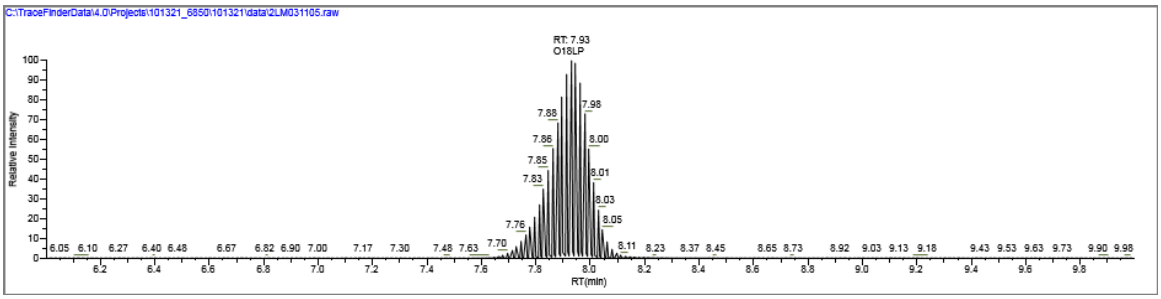
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0196-CAL2	2LM031105	2	CAL STD 2	10/13/2021 7:04:25 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.93	89	1372535			5.000	ug/L	5.000	ug/L	

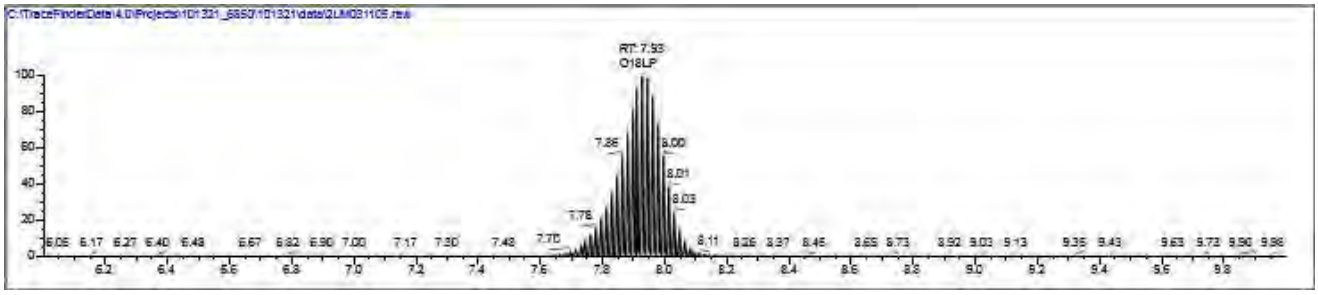
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	43770	Linear	0.032	0.204	ug/L	0.204	ug/L	

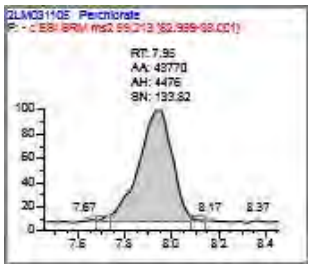
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

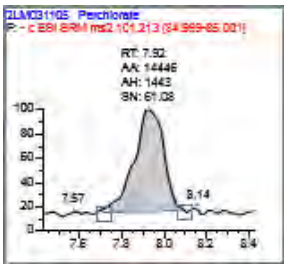
Data File:	2LM031105	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 7:04:25 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CAL2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



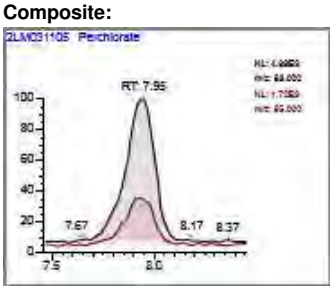
m/z 83.000



m/z 85.000



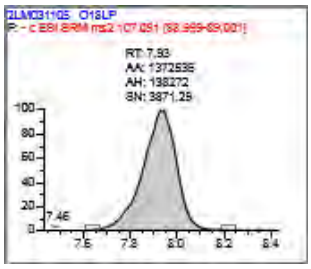
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.200	0.160 - 4.200	
7.95	m/z 83.000	43770	0.204		N/A
7.92	m/z 85.000	14446		26.85 - 40.28	33

m/z 89.000



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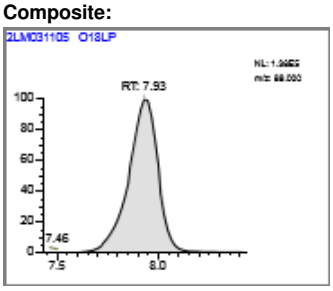


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.93	m/z 89.000	1372535	5.000		N/A

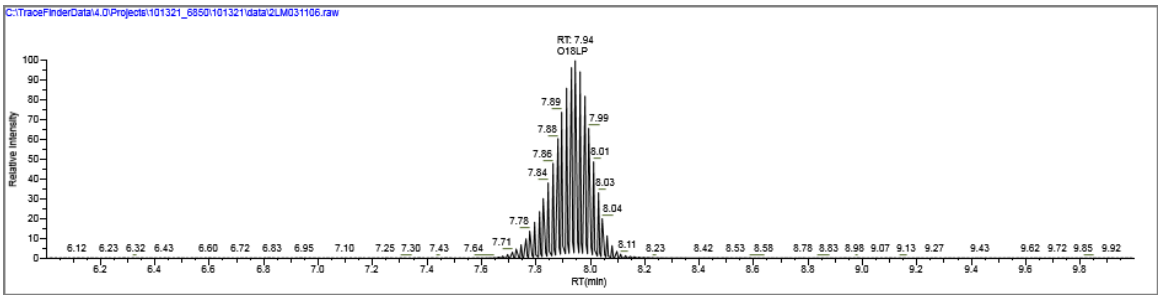
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A4	S1J0196-CAL3	2LM031106	3	CAL STD 3	10/13/2021 7:17:40 PM	1:1 0012467



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.94	89	1335572			5.000	ug/L	5.000	ug/L	

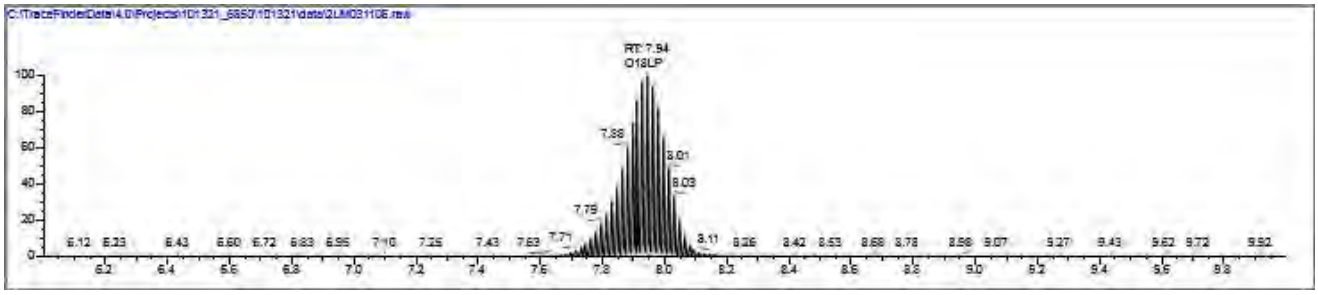
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	108160	Linear	0.081	0.485	ug/L	0.485	ug/L	

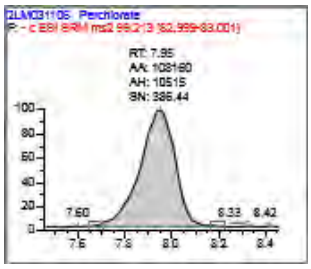
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

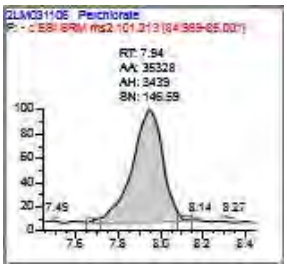
Data File:	2LM031106	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 7:17:40 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CAL3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A4
Comments:	1:1 0012467		



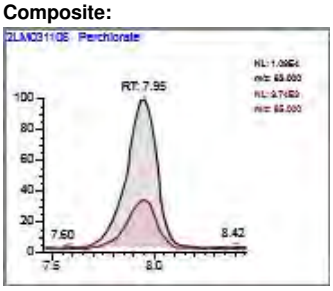
m/z 83.000



m/z 85.000



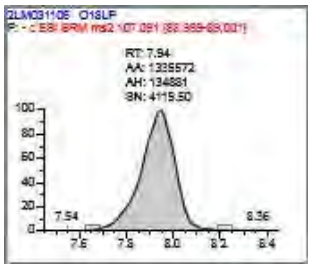
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.500	0.400 - 10.500	
7.95	m/z 83.000	108160	0.485		N/A
7.94	m/z 85.000	35328		26.85 - 40.28	32.66

m/z 89.000



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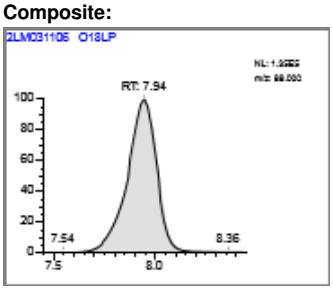


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.94	m/z 89.000	1335572	5.000		N/A

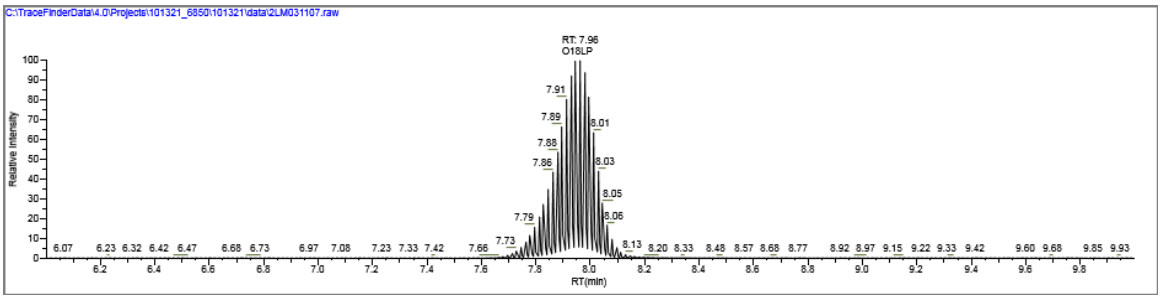
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0196-CAL4	2LM031107	4	CAL STD 4	10/13/2021 7:30:55 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1329200			5.000	ug/L	5.000	ug/L	

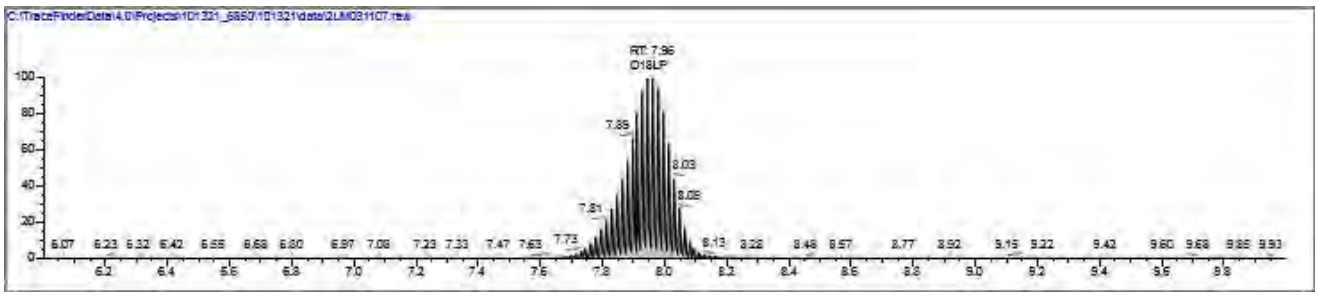
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	218801	Linear	0.165	0.964	ug/L	0.964	ug/L	

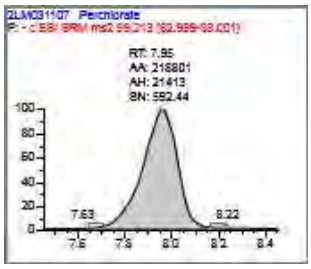
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

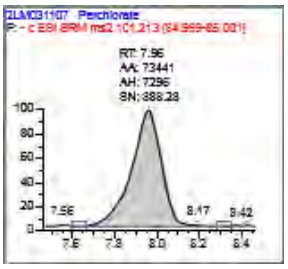
Data File:	2LM031107	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 7:30:55 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CAL4	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



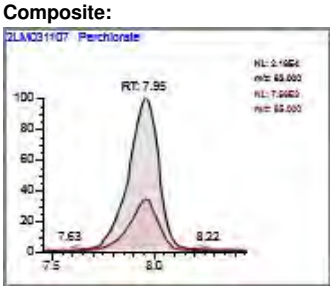
m/z 83.000



m/z 85.000



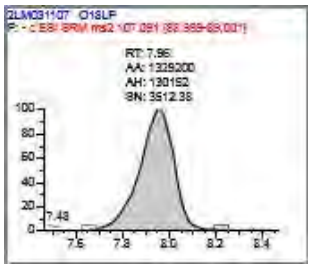
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 1.000	0.800 - 21.000	
7.95	m/z 83.000	218801	0.964		N/A
7.96	m/z 85.000	73441		26.85 - 40.28	33.57

m/z 89.000



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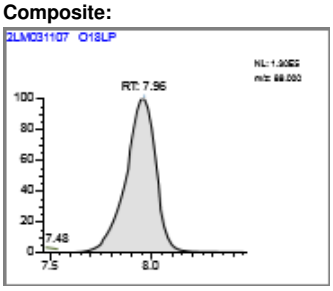

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1329200	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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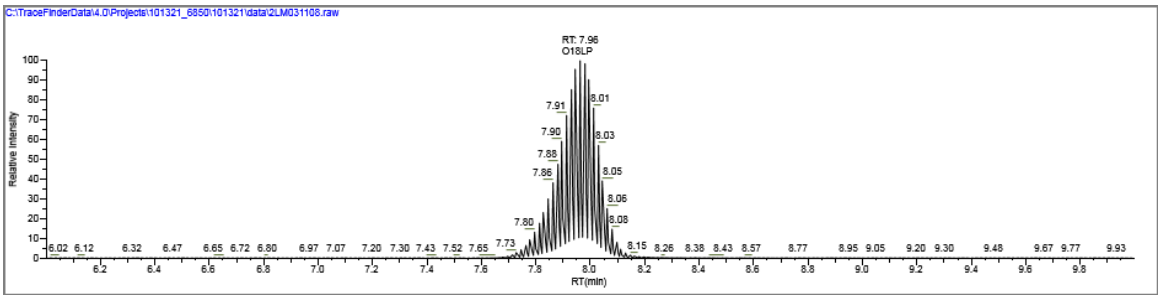


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1295253			5.000	ug/L	5.000	ug/L	

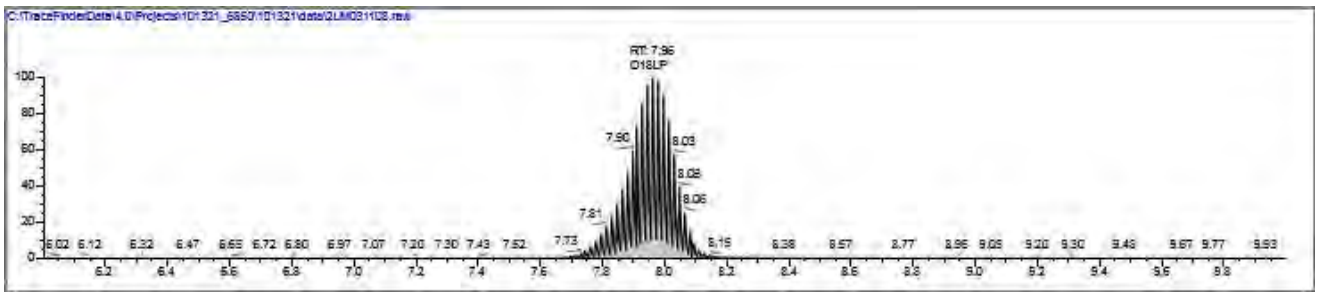
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	426599	Linear	0.329	1.906	ug/L	1.906	ug/L	

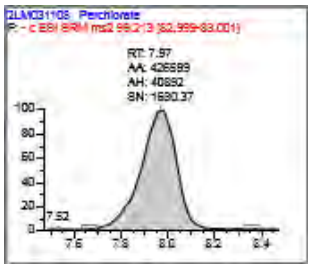
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

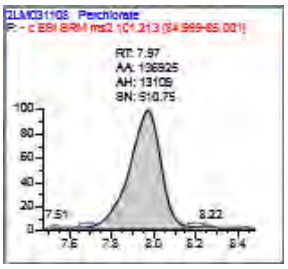
Data File:	2LM031108	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 7:44:10 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CAL5	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A6
Comments:	1:1 0012465		



m/z 83.000



m/z 85.000



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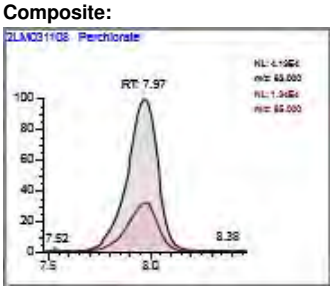
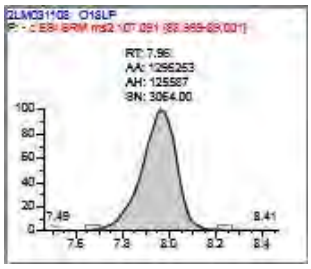


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 2.000	1.600 - 42.000	
7.97	m/z 83.000	426599	1.906		N/A
7.97	m/z 85.000	136925		26.85 - 40.28	32.1

m/z 89.000



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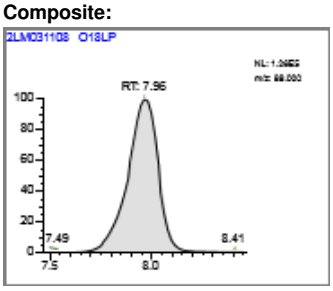


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1295253	5.000		N/A

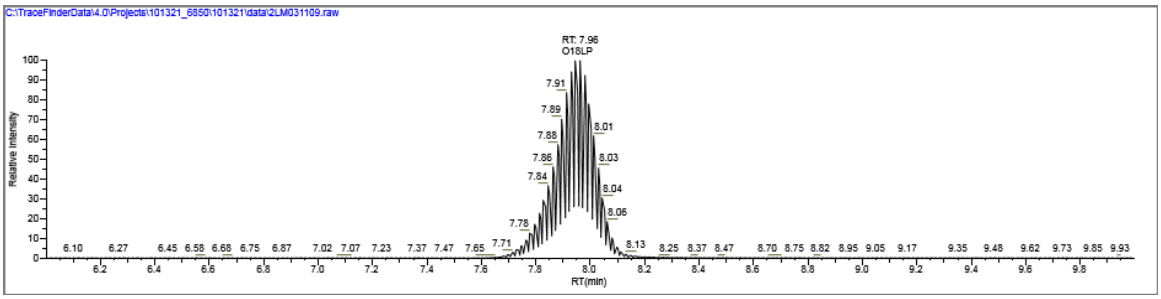
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A7	S1J0196-CAL6	2LM031109	6	CAL STD 6	10/13/2021 7:57:25 PM	1:1 0012464



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1298947			5.000	ug/L	5.000	ug/L	

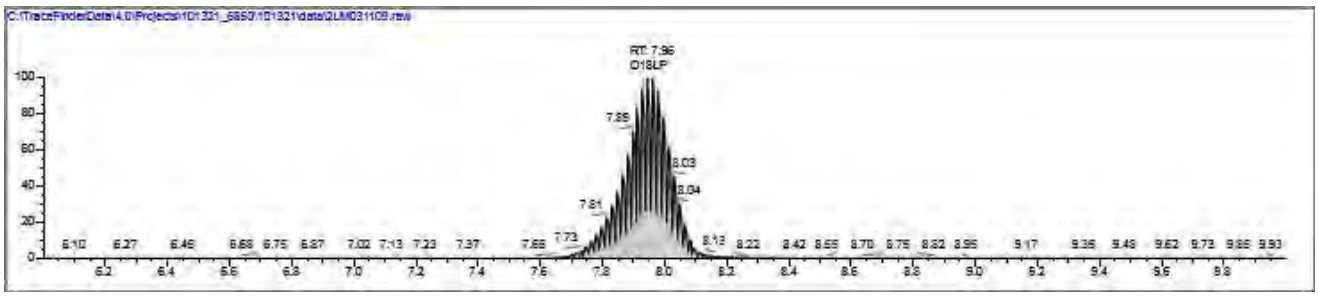
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	1098511	Linear	0.846	4.859	ug/L	4.859	ug/L	

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031109	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 7:57:25 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CAL6	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A7
Comments:	1:1 0012464		



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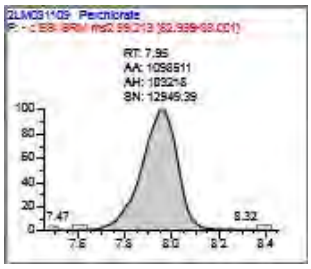

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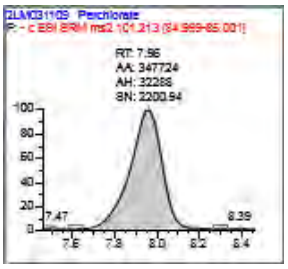

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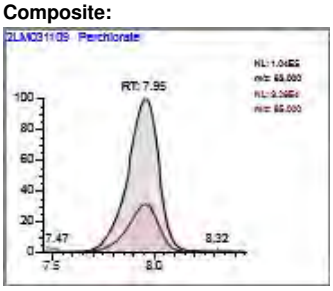
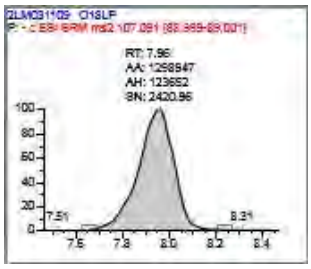


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 5.000	4.000 - 105.000	
7.95	m/z 83.000	1098511	4.859		N/A
7.96	m/z 85.000	347724		26.85 - 40.28	31.65

m/z 89.000



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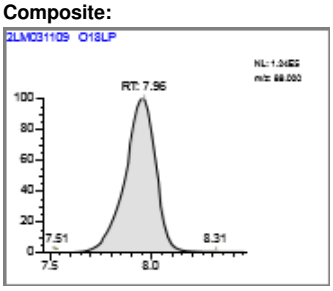


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1298947	5.000		N/A

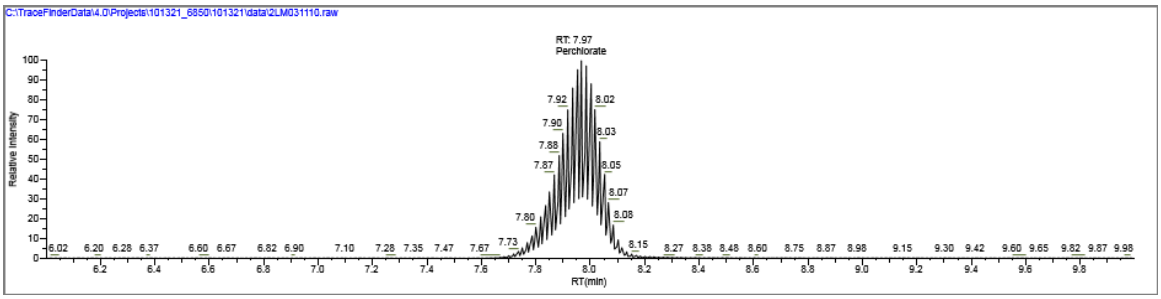
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A8	S1J0196-CAL7	2LM031110	7	CAL STD 7	10/13/2021 8:10:41 PM	1:1 0012463



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1103254			5.000	ug/L	5.000	ug/L	

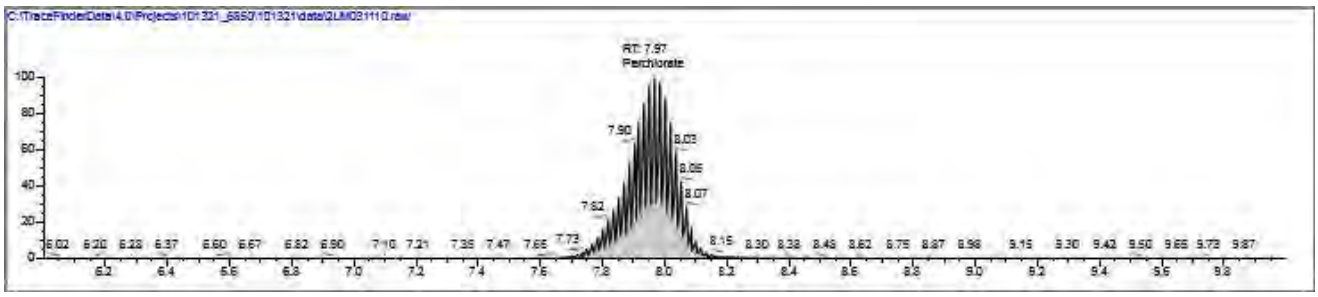
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	1977129	Linear	1.792	10.272	ug/L	10.272	ug/L	

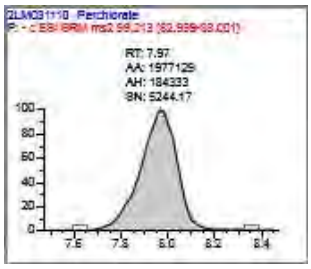
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031110	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 8:10:41 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CAL7	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A8
Comments:	1:1 0012463		



m/z 83.000



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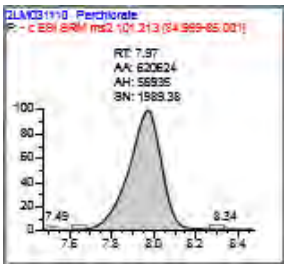
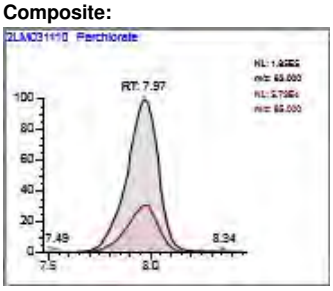


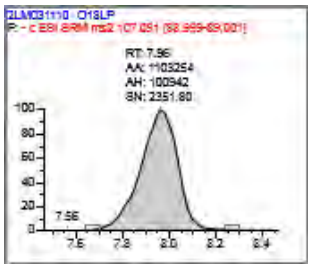
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 10.000	8.000 - 210.000	
7.97	m/z 83.000	1977129	10.272		N/A
7.97	m/z 85.000	620624		26.85 - 40.28	31.39

m/z 89.000



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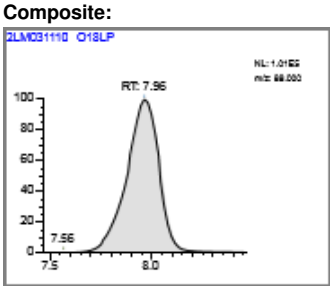


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1103254	5.000		N/A

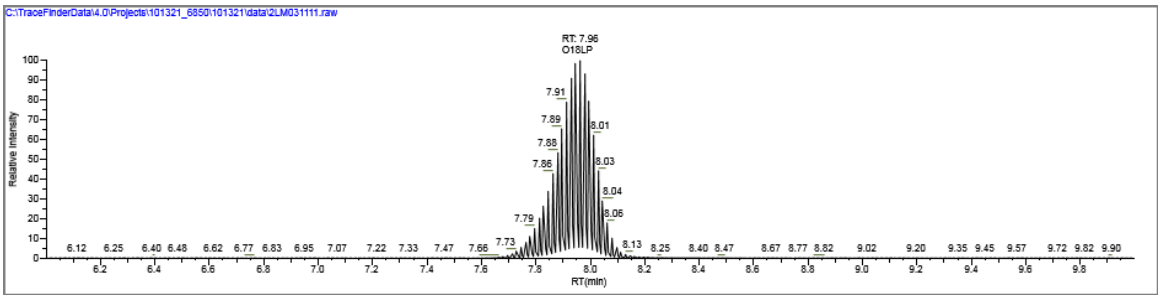
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A9	S1J0196-ICV1	2LM031111	ICV	ICV	10/13/2021 8:23:55 PM	1:1 0012475



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1324329			5.000	ug/L	5.000	ug/L	

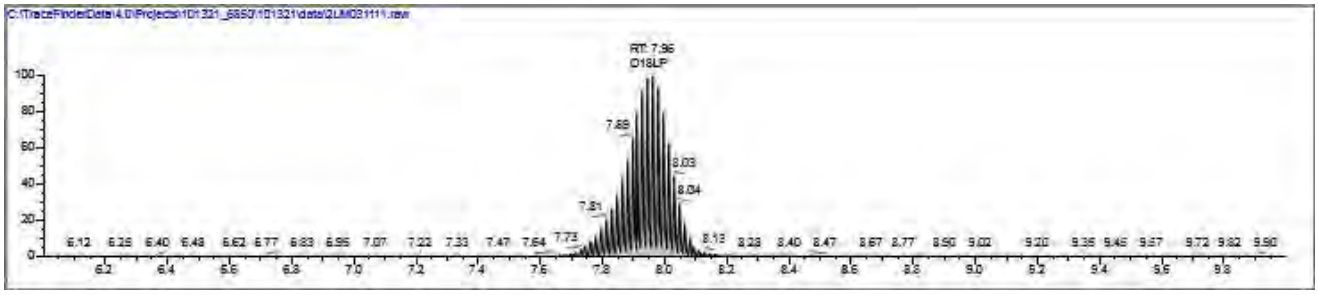
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	223894	Linear	0.169	0.989	ug/L	0.989	ug/L	

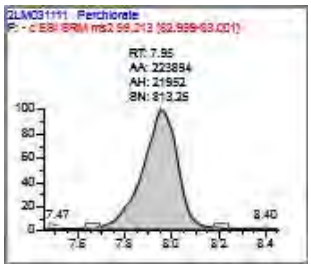
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

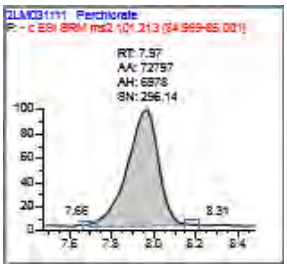
Data File:	2LM031111	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 8:23:55 PM
Cali File:	101321.calx	Cali File Date:	10/14/2021 9:56:54 AM
Sample ID:	S1J0196-ICV1	Operator ID:	CAS
Diln Factor:	1.00	Instrument ID:	LCMS2
Comments:	1:1 0012475	Vial Number:	R:A9



m/z 83.000



m/z 85.000



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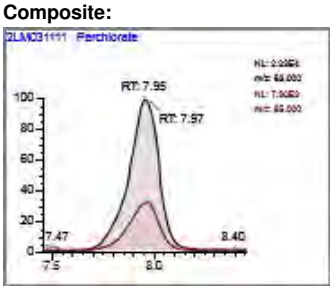
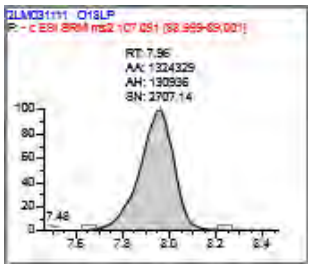


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.95	m/z 83.000	223894	0.989		N/A
7.97	m/z 85.000	72797		26.85 - 40.28	32.51

m/z 89.000



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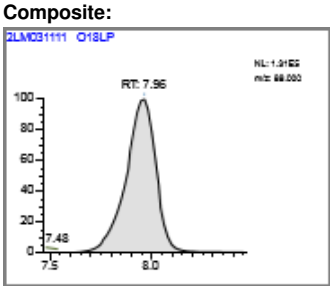

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1324329	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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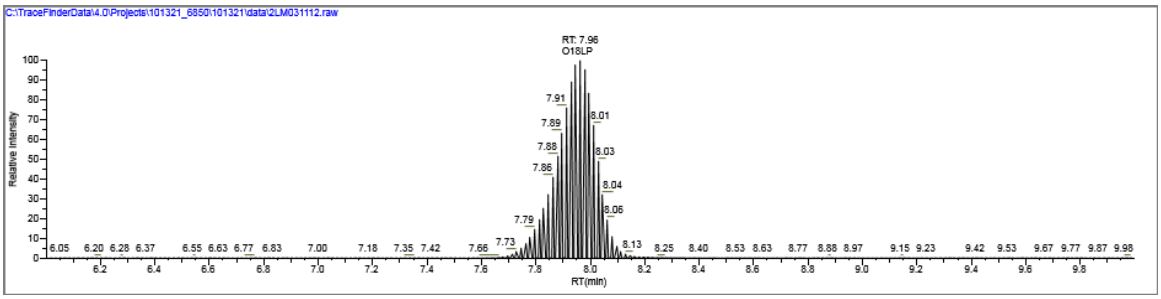


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1348345			5.000	ug/L	5.000	ug/L	

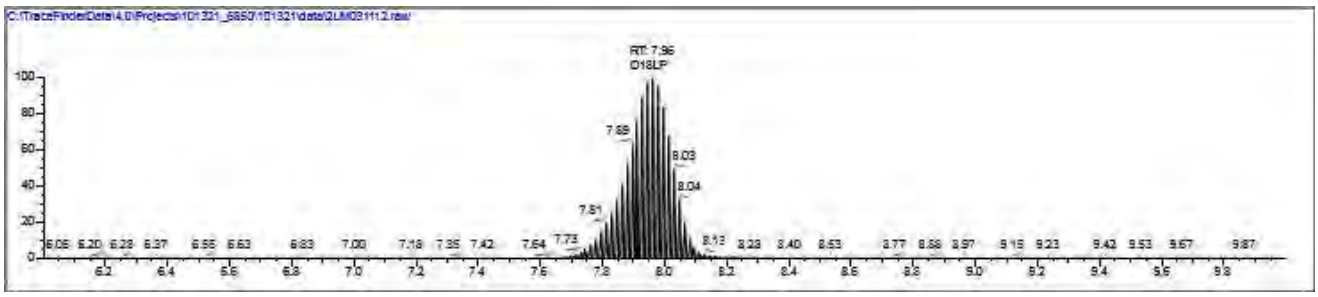
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	2639	Linear	0.002	0.033	ug/L	0.033	ug/L	I

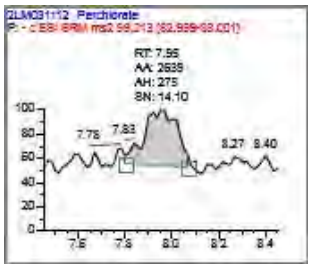
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

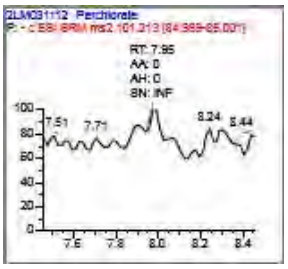
Data File:	2LM031112	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 8:37:10 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CCB1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 83.000



m/z 85.000



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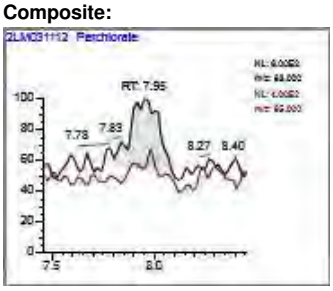
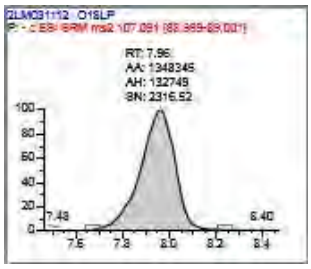


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.95	m/z 83.000	2639	0.033		N/A	I
7.95	m/z 85.000			26.85 - 40.28	*	

m/z 89.000



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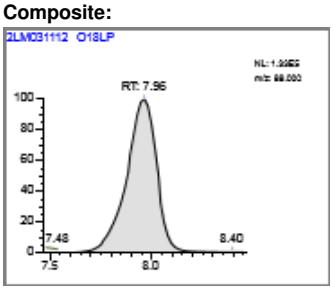

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1348345	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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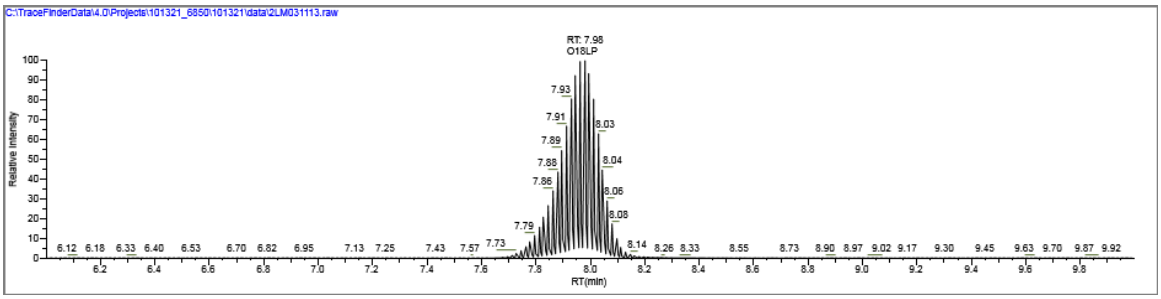


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.98	89	1270650			5.000	ug/L	5.000	ug/L	

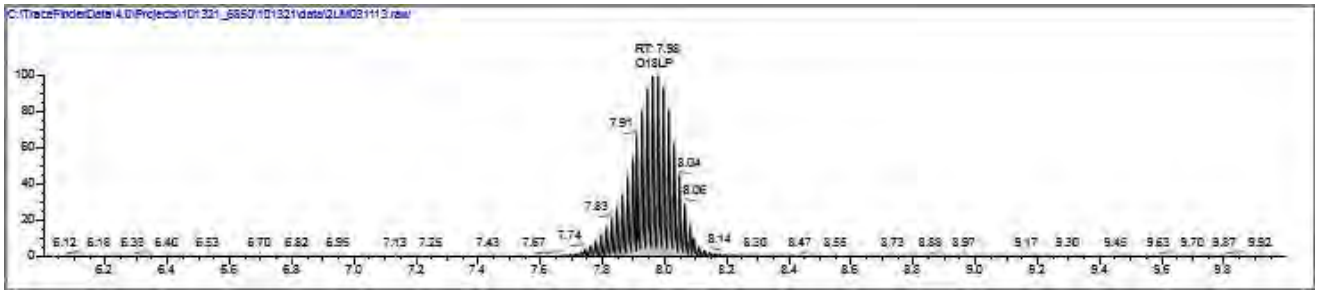
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	210302	Linear	0.166	0.969	ug/L	0.969	ug/L	

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031113	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 8:50:25 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CCV1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



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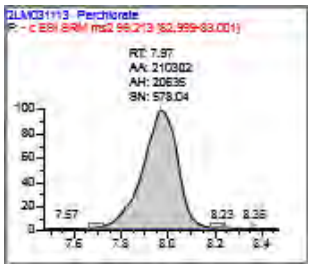

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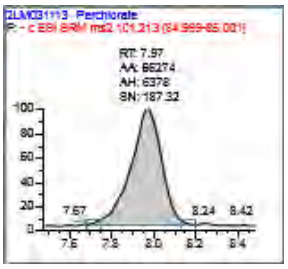
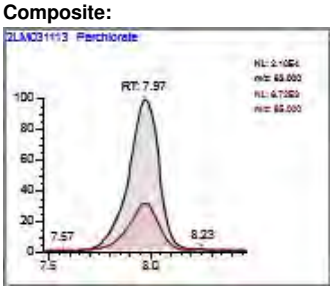


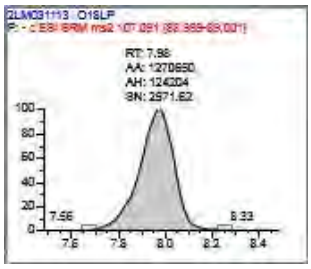
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.97	m/z 83.000	210302	0.969		N/A
7.97	m/z 85.000	66274		26.85 - 40.28	31.51

m/z 89.000



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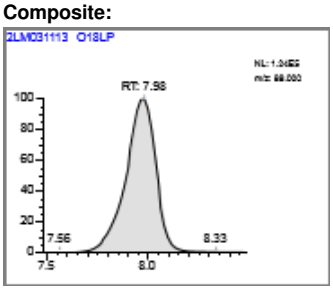


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.98	m/z 89.000	1270650	5.000		N/A

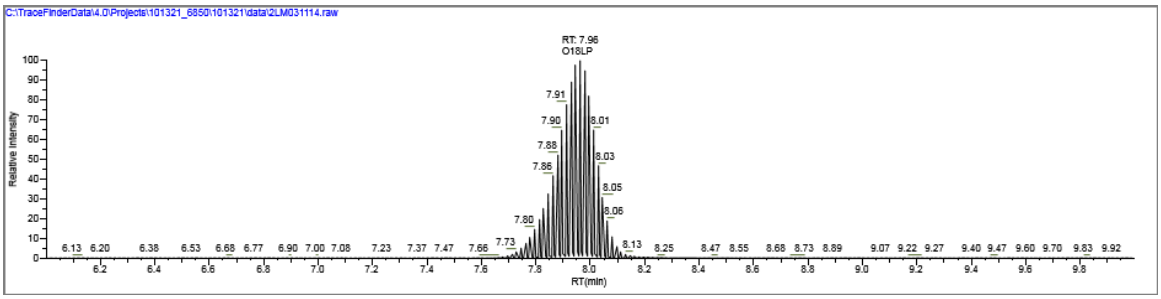
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0196-CRL1	2LM031114	QCMRL	QCMRL 0.2 ug/L	10/13/2021 9:03:40 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1336182			5.000	ug/L	5.000	ug/L	

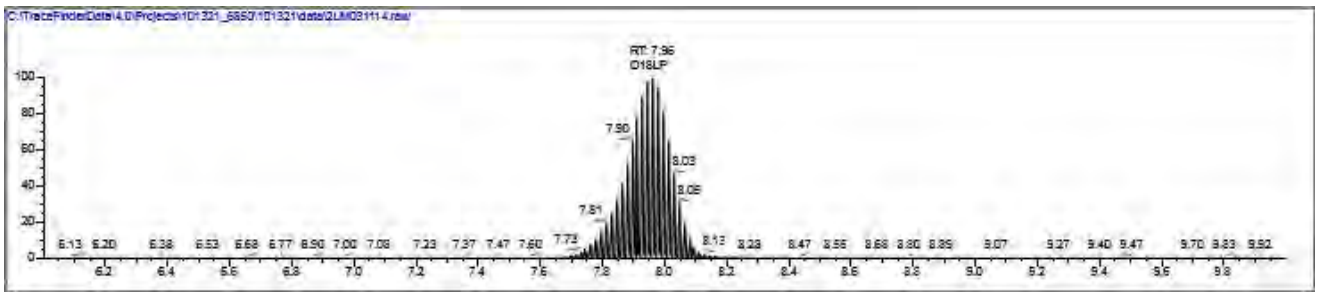
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	42299	Linear	0.032	0.203	ug/L	0.203	ug/L	

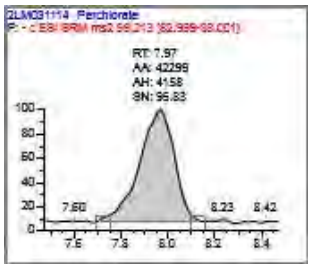
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

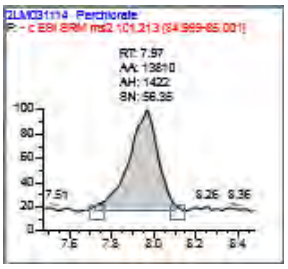
Data File:	2LM031114	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 9:03:40 PM
Cali File:	101321.calx	Cali File Date:	10/14/2021 9:56:54 AM
Sample ID:	S1J0196-CRL1	Operator ID:	CAS
Diln Factor:	1.00	Instrument ID:	LCMS2
Comments:	1:1 0012468	Vial Number:	R:A3



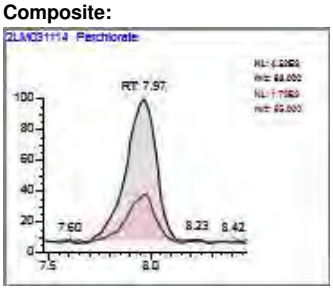
m/z 83.000



m/z 85.000



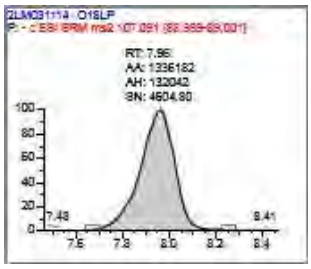
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.97	m/z 83.000	42299	0.203		N/A
7.97	m/z 85.000	13810		26.85 - 40.28	32.65

m/z 89.000



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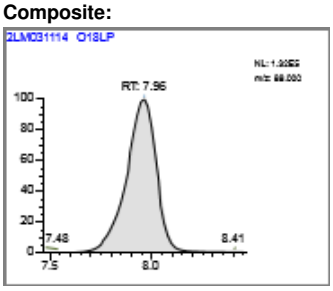


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1336182	5.000		N/A

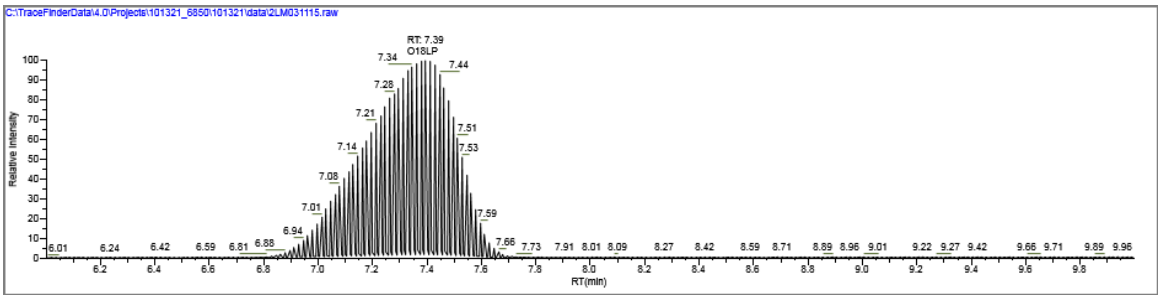
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850
Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B1	S1J0196-IFA1	2LM031115	N/A	MCT 0.2 ug/L	10/13/2021 9:16:55 PM	1:1 0012477



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.39	89	1377115			5.000	ug/L	5.000	ug/L	

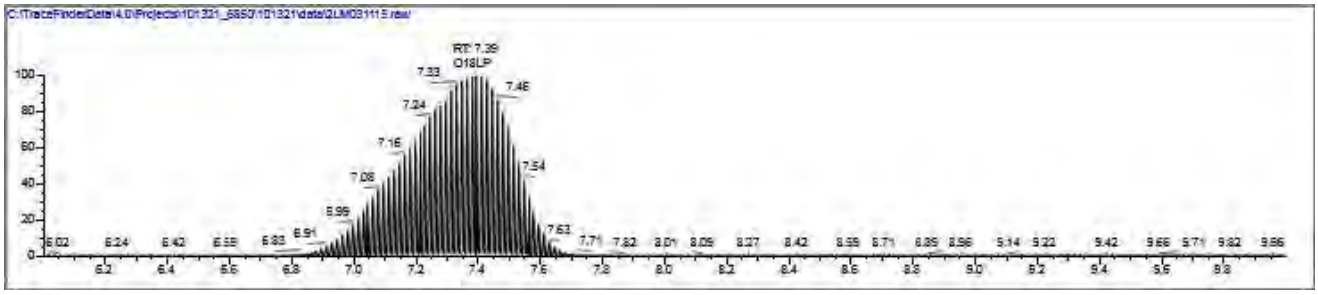
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.38	83	52121	Linear	0.038	0.239	ug/L	0.239	ug/L	

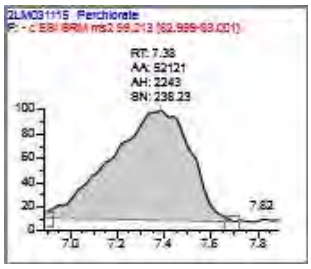
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

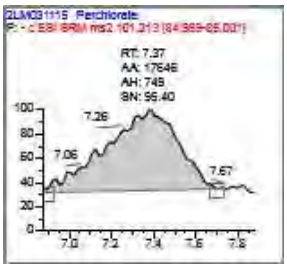
Data File:	2LM031115	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 9:16:55 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-IFA1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B1
Comments:	1:1 0012477		



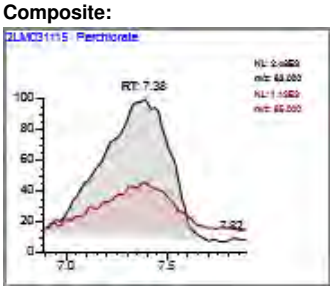
m/z 83.000



m/z 85.000



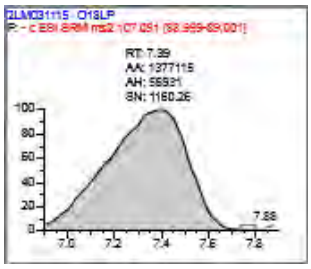
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.38	m/z 83.000	52121	0.239		N/A
7.37	m/z 85.000	17646		26.85 - 40.28	33.86

m/z 89.000



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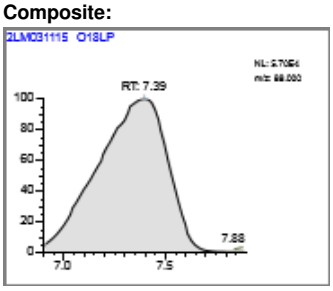


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.39	m/z 89.000	1377115	5.000		N/A

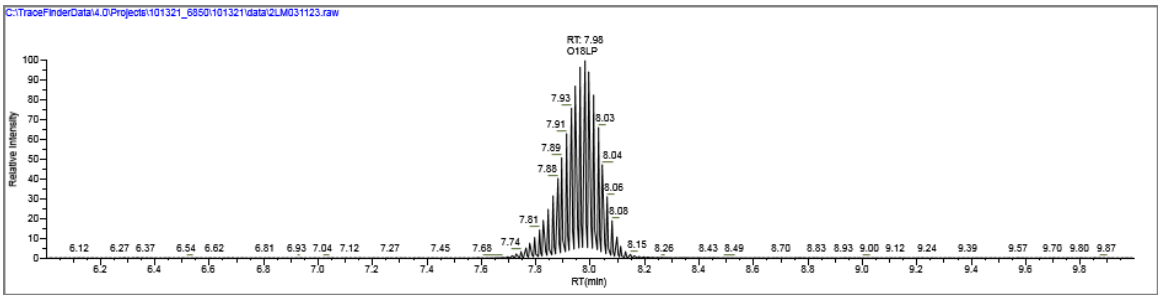
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0196-CCV2	2LM031123	CCV	CCV 1.0 ug/L	10/13/2021 11:02:52 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.98	89	1158920			5.000	ug/L	5.000	ug/L	

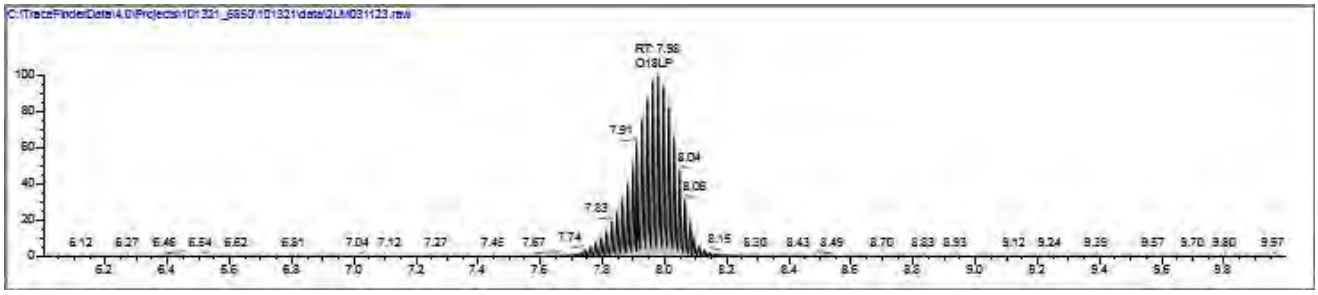
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.98	83	193842	Linear	0.167	0.979	ug/L	0.979	ug/L	

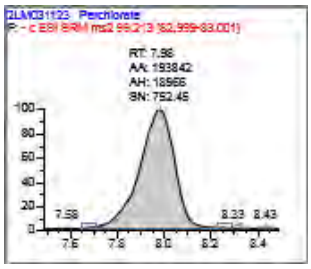
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

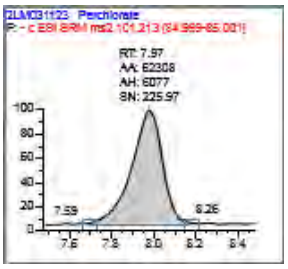
Data File:	2LM031123	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 11:02:52 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CCV2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



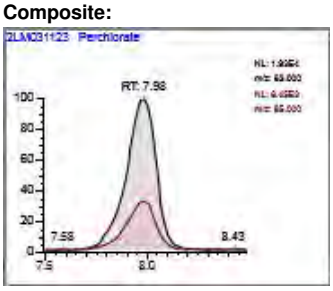
m/z 83.000



m/z 85.000



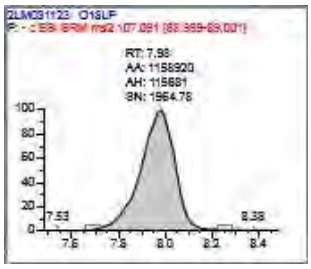
Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.98	m/z 83.000	193842	0.979		N/A
7.97	m/z 85.000	62308		26.85 - 40.28	32.14

m/z 89.000



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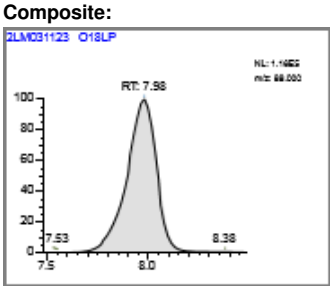

O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.98	m/z 89.000	1158920	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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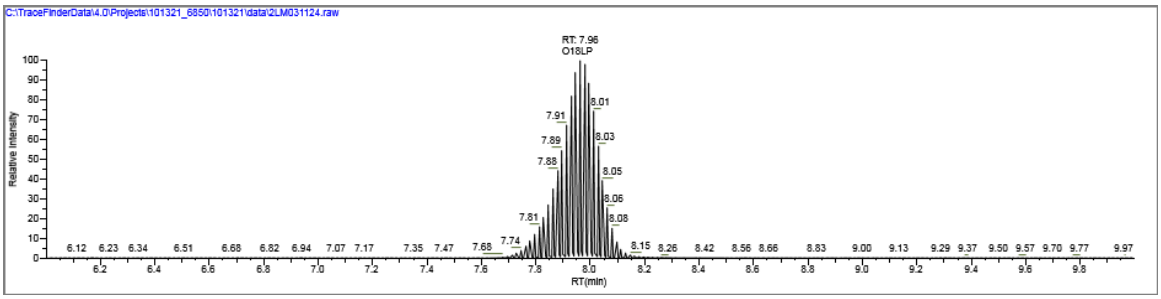


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1156834			5.000	ug/L	5.000	ug/L	

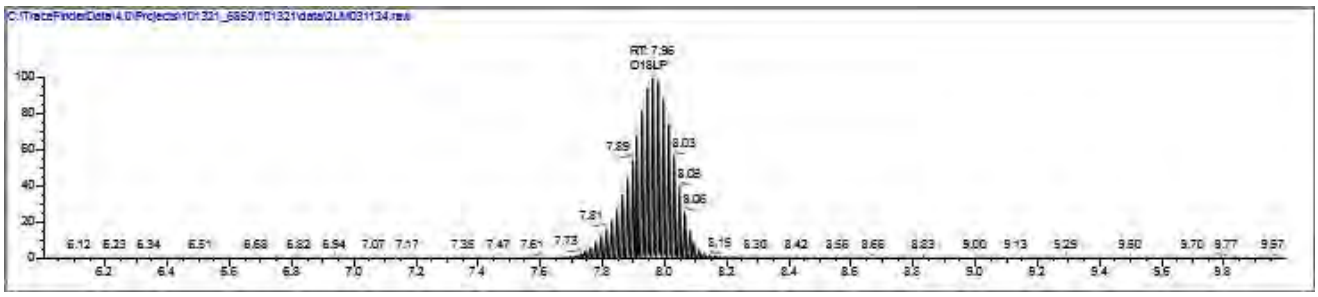
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.97	83	36036	Linear	0.031	0.2	ug/L	0.2	ug/L	

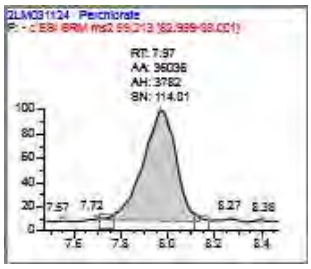
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

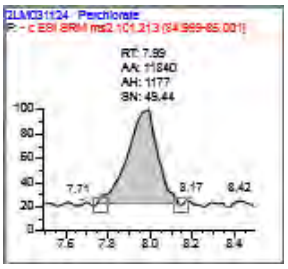
Data File:	2LM031124	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 11:16:07 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CRL2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 83.000



m/z 85.000



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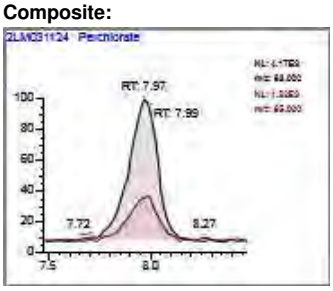
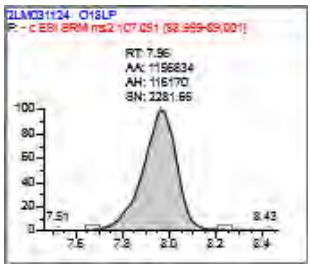


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.97	m/z 83.000	36036	0.200		N/A
7.99	m/z 85.000	11840		26.85 - 40.28	32.86

m/z 89.000



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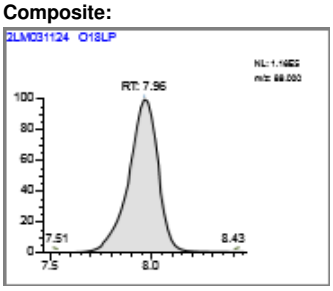


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1156834	5.000		N/A

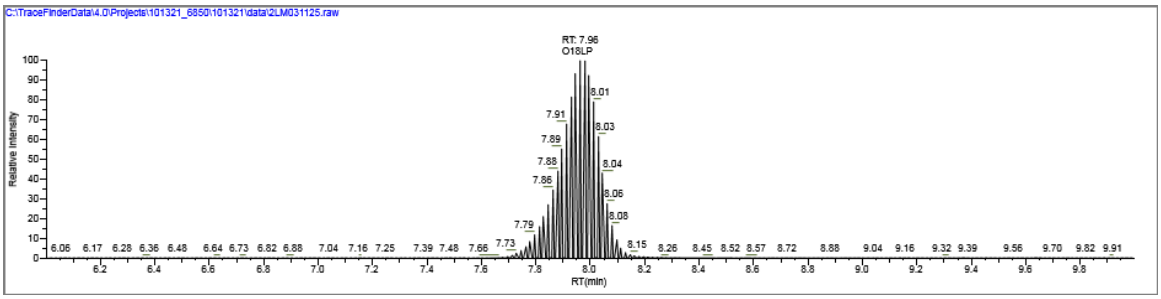
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 101321

Method: 101321_Perchlorate 6850 Perchlorate 6850
Cali File: 101321.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0196-CCB2	2LM031125	N/A	CCB	10/13/2021 11:29:21 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1196847			5.000	ug/L	5.000	ug/L	

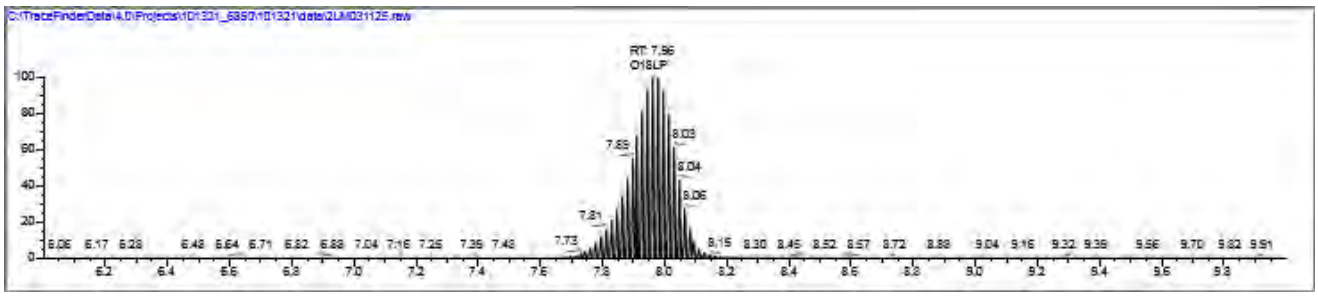
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	N/F	N/F	N/F	Linear	0.000	N/F	ug/L	N/F	ug/L	

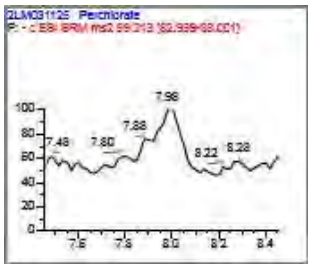
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

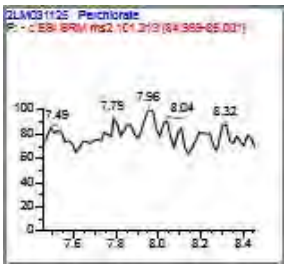
Data File:	2LM031125	Tune Report Date:	Tune report not found
Method:	101321_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/13/2021 11:29:21 PM
		Cali File Date:	10/14/2021 9:56:54 AM
Cali File:	101321.calx	Operator ID:	CAS
Sample ID:	S1J0196-CCB2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



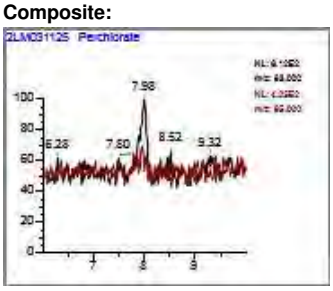
m/z 83.000



m/z 85.000



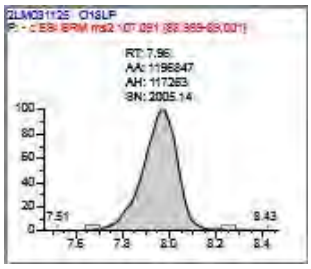
Composite:



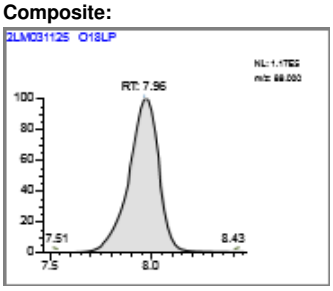
Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
			Compound Not Found		
0.00	m/z 83.000		N/A		
	m/z 85.000				

m/z 89.000



Composite:



O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1196847	5.000		N/A

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

01152327

CHAIN OF CUSTODY

Name Of Lab Shipping To: Microbac 158 Starlite Drive Marietta, OH. 45750 (304) 299-4976 Cell (740)-373-4071 Office ATTN: Stephanie Mossburg

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 50 October 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SOWW14-211007	WG	10/7/21/0745		1	X		
SOWW13-211007	WG	10/7/21/0840		1	X		
SOWW11-211007	WG	10/7/21/0930		1	X		
SOWW11-211007-FD	WG	10/7/21/0930		1	X		
SOWW06-211007	WG	10/7/21/1035		1	X		
SOWW06-211007-MS	WG	10/7/21/1035		1	X		
SOWW06-211007-MSD	WG	10/7/21/1035		1	X		
SOWW12-211007	WG	10/7/21/1140		1	X		

Additional Remarks: **Standard TAT on all parameters. Please email results to** Vicki.Graves@aptim.com **and invoices to** fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/7/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
Stephanie Murphy	10/8/21	0945							

Remarks:

M1J0510

APTIM Tennessee
Rec'd: 10/08/2021 09:45
By: Stephanie Murphy Temp: 3.1 (Signature)

01152328

CHAIN OF CUSTODY

Name Of Lab Shipping To: Microbac 158 Starlite Drive Marietta, OH, 45750 (304) 299-4976 Cell (740)-373-4071 Office ATTN: Stephanie Mossburg

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 50 October 2021**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: Perchlorate by SW6850										Remarks (Preservatives, etc.)	Lab I.D.#
SDWW29-211007	WG	10/7/21/1230		1	X											
SDWW05-211007	WG	10/7/21/1315		1	X											

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/7/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
Stephanie Murphy	10/8/21	0945							

Remarks:

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Work Order # M1J0510

COOLER TEMP >6° C LOG

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

BJ9 10-8-21

pH Lot # HC157842 pH Exceptions

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

BJ9 10-8-21

PRESERVATIVE EXCEPTIONS

☑ NONE

☐ AS NOTED

BJ9 10-8-21

Document Control # 1957
Last 04-10-2019

Issued to: Document Master File

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Microbac Laboratories Inc., - Marietta, OH

Level IV QA/QC Data Package

Laboratory Report Number:

M1J0726

Client Project ID:

LHAAP

For:

Vicki Graves

APTIM Tennesee

2410 Cherahala BLVD

Knoxville, TN 37932

Project Requested Certification:

Microbac Laboratories Inc., - Marietta, OH	2936.01	American Association for Laboratory Accreditation

Project State of Origin: Texas

All test results meet the requirements of the QAPP and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. I certify that all test results meet all of the requirements of the accrediting authority listed within this report. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Laboratory Project Manager:

Stephanie Mossburg

Stephanie Mossburg
Customer Relations Manager
Stephanie.Mossburg@microbac.com

Authorized By:

Stephanie Mossburg

Stephanie Mossburg
Customer Relations Manager
Issued: 12/06/2021

MICROBAC®

Laboratory Report Number: M1J0726

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Cooler Receipt Log

Cooler ID: Default Cooler Temp: 5.6°C

Cooler Inspection Checklist

Ice Present or not required?	Yes	Shipping containers sealed or not required?	Yes
Custody seals intact or not required?	Yes	Chain of Custody (COC) Present?	Yes
COC includes customer information?	Yes	Relinquished and received signature on COC?	Yes
Sample collector identified on COC?	Yes	Sample type identified on COC?	Yes
Correct type of Containers Received	Yes	Correct number of containers listed on COC?	Yes
Containers Intact?	Yes	COC includes requested analyses?	Yes
Enough sample volume for indicated tests received?	Yes	Sample labels match COC (Name, Date & Time?)	Yes
Samples arrived within hold time?	Yes	Correct preservatives on COC or not required?	Yes
Chemical preservations checked or not required?	Yes	Preservation checks meet method requirements?	Yes
VOA vials have zero headspace, or not recd.?	Yes		

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Sample Summary

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Sample Summary

Laboratory Report Number: M1J0726

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Client Sample ID:	Lab Sample ID:	Sampled:
50WW09-211011	M1J0726-01	10/11/21 07:55
50WW08-211011	M1J0726-02	10/11/21 08:35
50WW22-211011	M1J0726-03	10/11/21 09:20
50WW23-211011	M1J0726-04	10/11/21 10:15
50WW15-211011	M1J0726-05	10/11/21 11:00
50WW16-211011	M1J0726-06	10/11/21 11:45
50WW16-211011-FD	M1J0726-07	10/11/21 11:45
50WW18-211011	M1J0726-08	10/11/21 12:35

Holding Time Summary

MICROBAC®

Specific Method: EPA 6850 **Hold Time**

Laboratory Report Number: M1J0726

Matrix: Aqueous

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Laboratory ID	Date Collected	Date Received	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
50WW09-211011	10/11/21 07:55	10/12/21 10:10	10/28/21 21:35	17.57	28.00	
50WW08-211011	10/11/21 08:35	10/12/21 10:10	10/29/21 11:49	18.14	28.00	
50WW22-211011	10/11/21 09:20	10/12/21 10:10	10/28/21 22:01	17.53	28.00	
50WW23-211011	10/11/21 10:15	10/12/21 10:10	10/28/21 22:14	17.50	28.00	
50WW15-211011	10/11/21 11:00	10/12/21 10:10	10/28/21 22:28	17.48	28.00	
50WW16-211011	10/11/21 11:45	10/12/21 10:10	10/28/21 22:41	17.46	28.00	
50WW16-211011-FD	10/11/21 11:45	10/12/21 10:10	10/28/21 23:34	17.49	28.00	
50WW18-211011	10/11/21 12:35	10/12/21 10:10	10/28/21 23:47	17.47	28.00	

* - Holding time exceeded.

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Analysis Class

HPLC Organics

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

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HPLC Organics - Class Narrative and Notes

All test results meet the requirements of the QAPP and other applicable contract terms and conditions . Any exceptions are listed below in the sample and qc notes sections. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request.

Sample Notes

EPA 6850

D3	**Dilution was performed due to high target analyte concentration.**

M1J0726-02 50WW08-211011

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HPLC Organics
EPA 6850

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

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FORM I:
HPLC Organics
EPA 6850
RESULTS SUMMARY

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

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Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW09-211011			**Collection Date:**	10/11/2021 07:55
Laboratory ID:	M1J0726-01			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/28/2021 21:35
Batch / Sequence:	B1J1573 / S1J0510	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031252
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.167	0.100	0.200	0.400	J	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
J: The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW08-211011			**Collection Date:**	10/11/2021 08:35
Laboratory ID:	M1J0726-02			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/29/2021 11:49
Batch / Sequence:	B1J1573 / S1J0523	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031301
Analyst:	CAS	**Dilution:**	1000		

Sample Notes: D3

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	682	100	200	400		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
D3: Dilution was performed due to high target analyte concentration.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW22-211011			**Collection Date:**	10/11/2021 09:20
Laboratory ID:	M1J0726-03			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/28/2021 22:01
Batch / Sequence:	B1J1573 / S1J0510	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031254
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.464	0.100	0.200	0.400		

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW23-211011			**Collection Date:**	10/11/2021 10:15
Laboratory ID:	M1J0726-04			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/28/2021 22:14
Batch / Sequence:	B1J1573 / S1J0510	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031255
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.139	0.100	0.200	0.400	J	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
J: The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
ug/L: Micrograms per Liter

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Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW15-211011			**Collection Date:**	10/11/2021 11:00
Laboratory ID:	M1J0726-05			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/28/2021 22:28
Batch / Sequence:	B1J1573 / S1J0510	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031256
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.200	0.100	0.200	0.400	U	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
U: The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW16-211011			**Collection Date:**	10/11/2021 11:45
Laboratory ID:	M1J0726-06			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/28/2021 22:41
Batch / Sequence:	B1J1573 / S1J0510	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031257
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.200	0.100	0.200	0.400	U	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
U: The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW16-211011-FD			**Collection Date:**	10/11/2021 11:45
Laboratory ID:	M1J0726-07			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/28/2021 23:34
Batch / Sequence:	B1J1573 / S1J0510	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031261
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.200	0.100	0.200	0.400	U	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
U: The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.
ug/L: Micrograms per Liter

MICROBAC®

Laboratory Report Number: M1J0726

CERTIFICATE OF ANALYSIS
FORM I

Client Project ID: LHAAP

Microbac Laboratories Inc., - Marietta, OH

Perchlorate by LCMS

Client ID:	50WW18-211011			**Collection Date:**	10/11/2021 12:35
Laboratory ID:	M1J0726-08			**Prep Date:**	10/28/2021 14:19
Matrix:	Aqueous			**Analyzed:**	10/28/2021 23:47
Batch / Sequence:	B1J1573 / S1J0510	**Analytical Method:**	EPA 6850	**Calibration:**	21J0034
Instrument:	LCMS2	**Units:**	ug/L	**File ID:**	2LM031262
Analyst:	CAS	**Dilution:**	1		

Analyte	CAS Number	Result	DL	LOD	LOQ	Flag	Qual
Perchlorate	14797-73-0	0.200	0.100	0.200	0.400	U	

Notes and Definitions

DL: Detection Limit
LOD: Limit of Detection
LOQ: Limit of Quantitation
U: The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.
ug/L: Micrograms per Liter

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FORM III:
HPLC Organics
EPA 6850
BS/BSD, MS/MSD, DUP

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

Laboratory Report Number: M1J0726

BLANK SPIKE (BS)

Client Project ID: LHAAP

FORM IIIB

Method:	EPA 6850		**Blank Spike**
Batch:	B1J1573	**Spike ID:**	B1J1573-BS1
Analyst:	CAS	**Prepared:**	10/28/21 14:19
Matrix:	Aqueous	**Analyzed:**	10/28/21 18:16
Units:	ug/L	**File ID:**	2LM031237
Instrument:	LCMS2	**Initial/Final:**	10mL/10mL
Calibration:	21J0034		

Analyte	BS Spiked	BS Found	BS %Rec	%Rec Limts	Q
Perchlorate	0.200	0.206	103	84 - 119	

* - Does not meet %Rec acceptance criteria.
\# - Does not meet RPD acceptance criteria.
NS - Analyte Not Spiked

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FORM IV:
HPLC Organics
EPA 6850
METHOD BLANK SUMMARY

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

METHOD BLANK SUMMARY
FORM IVA

Blank ID:	B1J1573-BLK1	**Batch:**	B1J1573
Blank File ID:	2LM031236	**Instrument:**	LCMS2
Prepared:	10/28/2021 14:19	**Method:**	EPA 6850
Analyzed:	10/28/2021 18:03	**Analyst:**	CAS

This Method Blank Applies To The Following Samples:

Client Sample ID	Laboratory Sample ID	Lab File ID	Time Analyzed
Blank	B1J1573-BLK1	2LM031236	10/28/2021 18:03
LCS	B1J1573-BS1	2LM031237	10/28/2021 18:16
MRL Check	B1J1573-MRL1	2LM031238	10/28/2021 18:29
50WW09-211011	M1J0726-01	2LM031252	10/28/2021 21:35
50WW22-211011	M1J0726-03	2LM031254	10/28/2021 22:01
50WW23-211011	M1J0726-04	2LM031255	10/28/2021 22:14
50WW15-211011	M1J0726-05	2LM031256	10/28/2021 22:28
50WW16-211011	M1J0726-06	2LM031257	10/28/2021 22:41
50WW16-211011-FD	M1J0726-07	2LM031261	10/28/2021 23:34
50WW18-211011	M1J0726-08	2LM031262	10/28/2021 23:47
50WW08-211011	M1J0726-02	2LM031301	10/29/2021 11:49

MICROBAC®

Laboratory Report Number: M1J0726

Client Project ID: LHAAP

METHOD BLANK
FORM IVB

Sample ID:	B1J1573-BLK1	**Prep Date:**	10/28/21 14:19	**Matrix:**	Aqueous
Instrument:	LCMS2	**Analyzed:**	10/28/21 18:03	**Method:**	EPA 6850
File ID:	2LM031236	**Sequence:**	S1J0510	**Analyst:**	CAS
Batch:	B1J1573	**Units:**	ug/L	**Calibration:**	21J0034

Analyte	Result	DL	LOD	LOQ	Dilution	Flag	Q
Perchlorate	0.200	0.100	0.200	0.400	1	U	

Notes and Definitions

* - Detected in the associated method Blank at a concentration >= 1/2xRL

U: The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.

MICROBAC®

FORM VII:
HPLC Organics
EPA 6850
ICV/CCV

Microbac Laboratories, Inc.
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MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Initial Calibration Verification (ICV)
FORM VIIA

Sample ID:	S1J0510-ICV1	**Analyzed:**	10/28/21 16:56	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031231	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8512392			1.00	0.990	-1.0	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0510-CCV1	**Analyzed:**	10/28/21 17:23	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031233	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8206075			1.00	0.955	-4.5	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0510-CCV2	**Analyzed:**	10/28/21 20:02	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031245	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8179542			1.00	0.952	-4.8	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0510-CCV3	**Analyzed:**	10/28/21 22:54	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031258	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8094733			1.00	0.942	-5.8	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0510-CCV4	**Analyzed:**	10/29/21 01:46	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031271	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8175338			1.00	0.951	-4.9	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0510-CCV5	**Analyzed:**	10/29/21 04:39	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031284	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8277726			1.00	0.963	-3.7	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0510-CCV6	**Analyzed:**	10/29/21 07:04	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031295	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8182149			1.00	0.952	-4.8	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0510-CRL1	**Analyzed:**	10/28/21 17:36	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031234	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.200	100	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0510-CRL2	**Analyzed:**	10/28/21 20:15	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031246	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.200	100	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0510-CRL3	**Analyzed:**	10/28/21 23:07	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031259	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.198	99.0	70	130	

* - Does not meet acceptance criteria.

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0510-CRL4	**Analyzed:**	10/29/21 02:00	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031272	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.204	102	70	130	

* - Does not meet acceptance criteria.

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0510-CRL5	**Analyzed:**	10/29/21 04:52	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031285	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.201	101	70	130	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0510-CRL6	**Analyzed:**	10/29/21 07:18	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0510
File ID:	2LM031296	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.203	102	70	130	

* - Does not meet acceptance criteria.

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0523-CCV1	**Analyzed:**	10/29/21 11:22	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0523
File ID:	2LM031299	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8115317			1.00	0.944	-5.6	15	

* - Does not meet acceptance criteria.

MICROBAC®

Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Continuing Calibration Verification (CCV)
FORM VIIB

Laboratory ID:	S1J0523-CCV2	**Analyzed:**	10/29/21 13:08	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0523
File ID:	2LM031307	**Units:**	ug/L	**Analyst:**	CAS

Analyte	Response	Limit	Q	Expected	Found	% Drift / % Diff	UCL	Q
Perchlorate	0.8141257			1.00	0.947	-5.3	15	

* - Does not meet acceptance criteria.

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0523-CRL1	**Analyzed:**	10/29/21 11:36	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0523
File ID:	2LM031300	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.203	102	70	130	

* - Does not meet acceptance criteria.

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

Instrument Reporting Limit Check (CRL)
FORM VIIB

Laboratory ID:	S1J0523-CRL2	**Analyzed:**	10/29/21 13:22	**Method:**	EPA 6850
Instrument:	LCMS2	**Calibration:**	21J0034	**Sequence:**	S1J0523
File ID:	2LM031308	**Units:**	ug/L		

Analyte	Expected	Found	Recovery	LCL	UCL	Q
Perchlorate	0.200	0.198	99.0	70	130	

* - Does not meet acceptance criteria.

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

MATRIX CONDUCTIVITY TEST
FORM VII

Laboratory ID:	S1J0510-IFA1	**Run Date:**	10/28/21 17:49	**Matrix:**	Aqueous
Instrument:	LCMS2	**Calibration:**	21J0034	**Method:**	EPA 6850
File ID:	2LM031235	**Analyst:**	CAS	**Batch ID:**	S1J0510

Analyte	Known (ug/L)	Result (ug/L)	Recovery	LCL	UCL	MRL (ug/L)	Flags
Perchlorate	0.20000	0.231	116	80	120	0.4000	

MICROBAC®

FORM VIII:
HPLC Organics
EPA 6850
Internal Standard Area and RT

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MICROBAC®

Laboratory Report Number: M1J0726

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

Laboratory:	Microbac Laboratories Inc., - Marietta, OH	**SDG:**	M1J0726
Client:	APTIM Tennessee	**Project:**	Longhorn AAP
Sequence:	S1J0510	**Instrument:**	LCMS2
		Calibration:	21J0034

Blank (B1J1573-BLK1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1719059	7.83	1651234	7.79	104	50 - 150		0.0400	+/-2.00	

LCS (B1J1573-BS1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1717089	7.83	1651234	7.79	104	50 - 150		0.0400	+/-2.00	

MRL Check (B1J1573-MRL1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1782991	7.84	1651234	7.79	108	50 - 150		0.0500	+/-2.00	

50WW09-211011 (M1J0726-01)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1058284	7.49	1651234	7.79	64	50 - 150		-0.3600	+/-2.00	

50WW22-211011 (M1J0726-03)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	960457	7.49	1651234	7.79	58	50 - 150		-0.3600	+/-2.00	

50WW23-211011 (M1J0726-04)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1040402	7.53	1651234	7.79	63	50 - 150		-0.3200	+/-2.00	

50WW15-211011 (M1J0726-05)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	992981	7.54	1651234	7.79	60	50 - 150		-0.3100	+/-2.00	

50WW16-211011 (M1J0726-06)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1534277	7.81	1651234	7.79	93	50 - 150		-0.0400	+/-2.00	

50WW16-211011-FD (M1J0726-07)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1371981	7.8	1651234	7.79	83	50 - 150		-0.0600	+/-2.00	

MICROBAC®

Laboratory Report Number: M1J0726

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

50WW18-211011 (M1J0726-08)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	977669	7.53	1651234	7.79	59	50 - 150		-0.3300	+/-2.00	

Calibration Blank (S1J0510-CCB1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1742679	7.78	1651234	7.79	106	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0510-CCB2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1766918	7.84	1651234	7.79	107	50 - 150		-0.0100	+/-2.00	

Calibration Blank (S1J0510-CCB3)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1650476	7.86	1651234	7.79	100	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0510-CCB4)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1344678	7.88	1651234	7.79	81	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0510-CCB5)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1248933	7.88	1651234	7.79	76	50 - 150		0.0000	+/-2.00	

Calibration Blank (S1J0510-CCB6)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1446848	7.89	1651234	7.79	88	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0510-CCV1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1651234	7.79	1651234	7.79	100	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0510-CCV2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1739535	7.85	1651234	7.79	105	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0510-CCV3)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1623988	7.86	1651234	7.79	98	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0510-CCV4)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1214280	7.88	1651234	7.79	74	50 - 150		0.0000	+/-2.00	

MICROBAC®

Laboratory Report Number: M1J0726

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

Calibration Check (S1J0510-CCV5)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1115711	7.88	1651234	7.79	68	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0510-CCV6)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1377847	7.89	1651234	7.79	83	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0510-CRL1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1672014	7.81	1651234	7.79	101	50 - 150		0.0200	+/-2.00	

Instrument RL Check (S1J0510-CRL2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1701939	7.84	1651234	7.79	103	50 - 150		-0.0100	+/-2.00	

Instrument RL Check (S1J0510-CRL3)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1575526	7.86	1651234	7.79	95	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0510-CRL4)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1241809	7.88	1651234	7.79	75	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0510-CRL5)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1192196	7.88	1651234	7.79	72	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0510-CRL6)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1512320	7.9	1651234	7.79	92	50 - 150		0.0100	+/-2.00	

Initial Cal Blank (S1J0510-ICB1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1680592	7.59	1651234	7.79	102	50 - 150		-0.1000	+/-2.00	

Initial Cal Check (S1J0510-ICV1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1674312	7.78	1651234	7.79	101	50 - 150		0.0000	+/-2.00	

Interference Check A (S1J0510-IFA1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1633945	7.29	1651234	7.79	99	50 - 150		-0.5000	+/-2.00	

MICROBAC®

Laboratory Report Number: M1J0726

Client Project ID: LHAAP

INTERNAL STANDARD AREA SUMMARY
FORM VIIIA

Laboratory:	Microbac Laboratories Inc., - Marietta, OH	**SDG:**	M1J0726
Client:	APTIM Tennessee	**Project:**	Longhorn AAP
Sequence:	S1J0523	**Instrument:**	LCMS2
		Calibration:	21J0034

50WW08-211011 (M1J0726-02)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1357428	7.96	1320355	7.91	103	50 - 150		0.0500	+/-2.00	

Calibration Blank (S1J0523-CCB1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1238370	7.84	1708009	7.69	73	50 - 150		0.1500	+/-2.00	

Calibration Blank (S1J0523-CCB2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1428653	7.93	1320355	7.91	108	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0523-CCV1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1320355	7.91	1320355	7.91	100	50 - 150		0.0000	+/-2.00	

Calibration Check (S1J0523-CCV2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1361915	7.93	1320355	7.91	103	50 - 150		0.0000	+/-2.00	

Instrument RL Check (S1J0523-CRL1)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1326434	7.93	1320355	7.91	100	50 - 150		0.0200	+/-2.00	

Instrument RL Check (S1J0523-CRL2)

Analyte	Resp	RT	RefResp	RefRT	Area%	ISAreaLimit	Flg	RTDiff	RTDiffLimit	Flg
O18LP	1445889	7.93	1320355	7.91	110	50 - 150		0.0000	+/-2.00	

MICROBAC®

Section A:
HPLC Organics
EPA 6850
Batch / Sequence Raw Data

Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Perchlorate Conductivity Check

(perchlorate1)

Conductivity Probe
Calibration Check: 1418 /1410 µs/cm

Working MCT Level: 9920 µs/cm

Sample	Conductivity (µs/cm)	Pretreatment or Dilution Needed
MIJ0726-01	2620	
-02	2730	
-03	4400	
-04	5430	
-05	1997	
-06	282	
-07	284	
-08	3550	
MIJ0978-01	8050	

Analyst: Craig A. Smith

Date/Time: 10/29/21 / 1215

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	Ion Ratio (2.31-3.85)
2LM031223	Unknown		S1J0510-ICB1	1:1	Perchlorate	Target Compound	3111	2.537520392
2LM031223	Unknown		S1J0510-ICB1	1:1	Perchlorate	Confirming Peak	1226	
2LM031224	Cal Std	1	S1J0510-CAL1	1:1 0012469	Perchlorate	Target Compound	26495	2.991081508
2LM031224	Cal Std	1	S1J0510-CAL1	1:1 0012469	Perchlorate	Confirming Peak	8858	
2LM031225	Cal Std	2	S1J0510-CAL2	1:1 0012468	Perchlorate	Target Compound	55643	2.957688832
2LM031225	Cal Std	2	S1J0510-CAL2	1:1 0012468	Perchlorate	Confirming Peak	18813	
2LM031226	Cal Std	3	S1J0510-CAL3	1:1 0012467	Perchlorate	Target Compound	141805	3.099427347
2LM031226	Cal Std	3	S1J0510-CAL3	1:1 0012467	Perchlorate	Confirming Peak	45752	
2LM031227	Cal Std	4	S1J0510-CAL4	1:1 0012466	Perchlorate	Target Compound	295153	3.041873647
2LM031227	Cal Std	4	S1J0510-CAL4	1:1 0012466	Perchlorate	Confirming Peak	97030	
2LM031228	Cal Std	5	S1J0510-CAL5	1:1 0012465	Perchlorate	Target Compound	563232	3.074259452
2LM031228	Cal Std	5	S1J0510-CAL5	1:1 0012465	Perchlorate	Confirming Peak	183209	
2LM031229	Cal Std	6	S1J0510-CAL6	1:1 0012464	Perchlorate	Target Compound	1363180	3.145860497
2LM031229	Cal Std	6	S1J0510-CAL6	1:1 0012464	Perchlorate	Confirming Peak	433325	
2LM031230	Cal Std	7	S1J0510-CAL7	1:1 0012463	Perchlorate	Target Compound	2528538	3.201718532
2LM031230	Cal Std	7	S1J0510-CAL7	1:1 0012463	Perchlorate	Confirming Peak	789744	
2LM031231	Chk Std	ICV	S1J0510-ICV1	1:1 0012475	Perchlorate	Target Compound	285048	3.038308214
2LM031231	Chk Std	ICV	S1J0510-ICV1	1:1 0012475	Perchlorate	Confirming Peak	93818	
2LM031232	Unknown		S1J0510-CCB1	1:1	Perchlorate	Target Compound	4617	3.497727273
2LM031232	Unknown		S1J0510-CCB1	1:1	Perchlorate	Confirming Peak	1320	
2LM031233	Chk Std	CCV	S1J0510-CCV1	1:1 0012466	Perchlorate	Target Compound	271003	3.015835744
2LM031233	Chk Std	CCV	S1J0510-CCV1	1:1 0012466	Perchlorate	Confirming Peak	89860	
2LM031234	Chk Std	QCMRL	S1J0510-CRL1	1:1 0012468	Perchlorate	Target Compound	54161	3.224828818
2LM031234	Chk Std	QCMRL	S1J0510-CRL1	1:1 0012468	Perchlorate	Confirming Peak	16795	
2LM031235	Unknown		S1J0510-IFA1	1:1 0012477	Perchlorate	Target Compound	61825	2.673976039
2LM031235	Unknown		S1J0510-IFA1	1:1 0012477	Perchlorate	Confirming Peak	23121	
2LM031236	Unknown		B1J1573-BLK1	1:1	Perchlorate	Target Compound	5196	2.938914027
2LM031236	Unknown		B1J1573-BLK1	1:1	Perchlorate	Confirming Peak	1768	
2LM031237	Unknown		B1J1573-BS1	1:1 0012474	Perchlorate	Target Compound	57586	2.882615007
2LM031237	Unknown		B1J1573-BS1	1:1 0012474	Perchlorate	Confirming Peak	19977	
2LM031238	Unknown		B1J1573-MRL1	1:1	Perchlorate	Target Compound	60164	3.216810137
2LM031238	Unknown		B1J1573-MRL1	1:1	Perchlorate	Confirming Peak	18703	
2LM031239	Unknown		M1J0723-01	1:1	Perchlorate	Target Compound	109760	3.011083068
2LM031239	Unknown		M1J0723-01	1:1	Perchlorate	Confirming Peak	36452	
2LM031240	Unknown		M1J0723-02	1:1	Perchlorate	Target Compound	178174	3.090347758
2LM031240	Unknown		M1J0723-02	1:1	Perchlorate	Confirming Peak	57655	
2LM031241	Unknown		B1J1573-MS1	1:1	Perchlorate	Target Compound	216626	3.079479707
2LM031241	Unknown		B1J1573-MS1	1:1	Perchlorate	Confirming Peak	70345	
2LM031242	Unknown		B1J1573-MSD1	1:1	Perchlorate	Target Compound	218175	3.066322802
2LM031242	Unknown		B1J1573-MSD1	1:1	Perchlorate	Confirming Peak	71152	
2LM031243	Unknown		M1J0723-04	1:1	Perchlorate	Target Compound	548053	3.096397114
2LM031243	Unknown		M1J0723-04	1:1	Perchlorate	Confirming Peak	176997	
2LM031244	Unknown		M1J0723-06	1:1	Perchlorate	Target Compound	750315	3.14078629
2LM031244	Unknown		M1J0723-06	1:1	Perchlorate	Confirming Peak	238894	
2LM031245	Chk Std	CCV	S1J0510-CCV2	1:1 0012466	Perchlorate	Target Compound	284572	3.04465795
2LM031245	Chk Std	CCV	S1J0510-CCV2	1:1 0012466	Perchlorate	Confirming Peak	93466	
2LM031246	Chk Std	QCMRL	S1J0510-CRL2	1:1 0012468	Perchlorate	Target Compound	55330	3.11525252
2LM031246	Chk Std	QCMRL	S1J0510-CRL2	1:1 0012468	Perchlorate	Confirming Peak	17761	
2LM031247	Unknown		S1J0510-CCB2	1:1	Perchlorate	Target Compound	3895	3.653846154
2LM031247	Unknown		S1J0510-CCB2	1:1	Perchlorate	Confirming Peak	1066	
2LM031248	Unknown		M1J0723-08	1:1	Perchlorate	Target Compound	86159	3.065720182
2LM031248	Unknown		M1J0723-08	1:1	Perchlorate	Confirming Peak	28104	
2LM031249	Unknown		M1J0723-10	1:1	Perchlorate	Target Compound	76189	3.039899453
2LM031249	Unknown		M1J0723-10	1:1	Perchlorate	Confirming Peak	25063	
2LM031250	Unknown		M1J0723-12	1:1	Perchlorate	Target Compound	235384	3.062901757
2LM031250	Unknown		M1J0723-12	1:1	Perchlorate	Confirming Peak	76850	
2LM031251	Unknown		M1J0723-14	1:1	Perchlorate	Target Compound	122794	3.114701705

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	Ion Ratio (2.31-3.85)
2LM031251	Unknown		M1J0723-14	1:1	Perchlorate	Confirming Peak	39424	
2LM031252	Unknown		M1J0726-01	1:1	Perchlorate	Target Compound	28170	3.489841427
2LM031252	Unknown		M1J0726-01	1:1	Perchlorate	Confirming Peak	8072	
2LM031253	Unknown		M1J0726-02	1:1	Perchlorate	Target Compound	50906112	3.062491694
2LM031253	Unknown		M1J0726-02	1:1	Perchlorate	Confirming Peak	16622449	
2LM031254	Unknown		M1J0726-03	1:1	Perchlorate	Target Compound	75462	2.996664284
2LM031254	Unknown		M1J0726-03	1:1	Perchlorate	Confirming Peak	25182	
2LM031255	Unknown		M1J0726-04	1:1	Perchlorate	Target Compound	22679	3.287764569
2LM031255	Unknown		M1J0726-04	1:1	Perchlorate	Confirming Peak	6898	
2LM031256	Unknown		M1J0726-05	1:1	Perchlorate	Target Compound	14391	2.073631124
2LM031256	Unknown		M1J0726-05	1:1	Perchlorate	Confirming Peak	6940	
2LM031257	Unknown		M1J0726-06	1:1	Perchlorate	Target Compound	11935	2.600784485
2LM031257	Unknown		M1J0726-06	1:1	Perchlorate	Confirming Peak	4589	
2LM031258	Chk Std	CCV	S1J0510-CCV3	1:1 0012466	Perchlorate	Target Compound	262915	3.092499147
2LM031258	Chk Std	CCV	S1J0510-CCV3	1:1 0012466	Perchlorate	Confirming Peak	85017	
2LM031259	Chk Std	QCMRL	S1J0510-CRL3	1:1 0012468	Perchlorate	Target Compound	50485	3.017632995
2LM031259	Chk Std	QCMRL	S1J0510-CRL3	1:1 0012468	Perchlorate	Confirming Peak	16730	
2LM031260	Unknown		S1J0510-CCB3	1:1	Perchlorate	Target Compound	3257	3.4685836
2LM031260	Unknown		S1J0510-CCB3	1:1	Perchlorate	Confirming Peak	939	
2LM031261	Unknown		M1J0726-07	1:1	Perchlorate	Target Compound	8645	3.101901686
2LM031261	Unknown		M1J0726-07	1:1	Perchlorate	Confirming Peak	2787	
2LM031262	Unknown		M1J0726-08	1:1	Perchlorate	Target Compound	3359	#VALUE!
2LM031262	Unknown		M1J0726-08	1:1	Perchlorate	Confirming Peak	N/F	
2LM031263	Unknown		M1J0825-11	1:1	Perchlorate	Target Compound	N/F	#VALUE!
2LM031263	Unknown		M1J0825-11	1:1	Perchlorate	Confirming Peak	N/F	
2LM031264	Unknown		M1J0978-01	1:1	Perchlorate	Target Compound	3525	#VALUE!
2LM031264	Unknown		M1J0978-01	1:1	Perchlorate	Confirming Peak	N/F	
2LM031265	Unknown		B1J1574-BLK1	1:1	Perchlorate	Target Compound	3473	#VALUE!
2LM031265	Unknown		B1J1574-BLK1	1:1	Perchlorate	Confirming Peak	N/F	
2LM031266	Unknown		B1J1574-BS1	1:1	Perchlorate	Target Compound	45667	3.215306625
2LM031266	Unknown		B1J1574-BS1	1:1	Perchlorate	Confirming Peak	14203	
2LM031267	Unknown		M1J0978-02	1:1	Perchlorate	Target Compound	3508	#VALUE!
2LM031267	Unknown		M1J0978-02	1:1	Perchlorate	Confirming Peak	N/F	
2LM031268	Unknown		M1J0978-03	1:1	Perchlorate	Target Compound	3200	2.45210728
2LM031268	Unknown		M1J0978-03	1:1	Perchlorate	Confirming Peak	1305	
2LM031269	Unknown		M1J0978-04	1:1	Perchlorate	Target Compound	2229	3.211815562
2LM031269	Unknown		M1J0978-04	1:1	Perchlorate	Confirming Peak	694	
2LM031270	Unknown		M1J0978-05	1:1	Perchlorate	Target Compound	1267	#VALUE!
2LM031270	Unknown		M1J0978-05	1:1	Perchlorate	Confirming Peak	N/F	
2LM031271	Chk Std	CCV	S1J0510-CCV4	1:1	Perchlorate	Target Compound	198543	3.056388547
2LM031271	Chk Std	CCV	S1J0510-CCV4	1:1	Perchlorate	Confirming Peak	64960	
2LM031272	Chk Std	QCMRL	S1J0510-CRL4	1:1	Perchlorate	Target Compound	41087	3.447763699
2LM031272	Chk Std	QCMRL	S1J0510-CRL4	1:1	Perchlorate	Confirming Peak	11917	
2LM031273	Unknown		S1J0510-CCB4	1:1	Perchlorate	Target Compound	3202	#VALUE!
2LM031273	Unknown		S1J0510-CCB4	1:1	Perchlorate	Confirming Peak	N/F	
2LM031274	Unknown		M1J0978-06	1:1	Perchlorate	Target Compound	N/F	#VALUE!
2LM031274	Unknown		M1J0978-06	1:1	Perchlorate	Confirming Peak	N/F	
2LM031275	Unknown		M1J0978-07	1:1	Perchlorate	Target Compound	28418679	3.101773911
2LM031275	Unknown		M1J0978-07	1:1	Perchlorate	Confirming Peak	9162073	
2LM031276	Unknown		M1J0981-01	1:1	Perchlorate	Target Compound	1915	1.642367067
2LM031276	Unknown		M1J0981-01	1:1	Perchlorate	Confirming Peak	1166	
2LM031277	Unknown		M1J0981-02	1:1	Perchlorate	Target Compound	10222	3.204388715
2LM031277	Unknown		M1J0981-02	1:1	Perchlorate	Confirming Peak	3190	
2LM031278	Unknown		M1J0981-03	1:1	Perchlorate	Target Compound	36247072	3.09734913
2LM031278	Unknown		M1J0981-03	1:1	Perchlorate	Confirming Peak	11702611	
2LM031279	Unknown		M1J0981-04	1:1	Perchlorate	Target Compound	30204867	3.076859693
2LM031279	Unknown		M1J0981-04	1:1	Perchlorate	Confirming Peak	9816784	

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	Ion Ratio (2.31-3.85)
2LM031280	Unknown		M1J0981-05	1:1	Perchlorate	Target Compound	47035	3.161379218
2LM031280	Unknown		M1J0981-05	1:1	Perchlorate	Confirming Peak	14878	
2LM031281	Unknown		M1J0981-06	1:1	Perchlorate	Target Compound	N/F	#VALUE!
2LM031281	Unknown		M1J0981-06	1:1	Perchlorate	Confirming Peak	N/F	
2LM031282	Unknown		M1J0981-07	1:1	Perchlorate	Target Compound	3594	#VALUE!
2LM031282	Unknown		M1J0981-07	1:1	Perchlorate	Confirming Peak	N/F	
2LM031283	Unknown		M1J0981-08	1:1	Perchlorate	Target Compound	2059	#VALUE!
2LM031283	Unknown		M1J0981-08	1:1	Perchlorate	Confirming Peak	N/F	
2LM031284	Chk Std	CCV	S1J0510-CCV5	1:1	Perchlorate	Target Compound	184711	3.131915832
2LM031284	Chk Std	CCV	S1J0510-CCV5	1:1	Perchlorate	Confirming Peak	58977	
2LM031285	Chk Std	QCMRL	S1J0510-CRL5	1:1	Perchlorate	Target Compound	38863	3.344780102
2LM031285	Chk Std	QCMRL	S1J0510-CRL5	1:1	Perchlorate	Confirming Peak	11619	
2LM031286	Unknown		S1J0510-CCB5	1:1	Perchlorate	Target Compound	3274	#VALUE!
2LM031286	Unknown		S1J0510-CCB5	1:1	Perchlorate	Confirming Peak	N/F	
2LM031287	Unknown		M1J1014-03	1:1	Perchlorate	Target Compound	145152	3.158843115
2LM031287	Unknown		M1J1014-03	1:1	Perchlorate	Confirming Peak	45951	
2LM031288	Unknown		M1J1014-04	1:1	Perchlorate	Target Compound	248135	3.090292048
2LM031288	Unknown		M1J1014-04	1:1	Perchlorate	Confirming Peak	80295	
2LM031289	Unknown		M1J1014-05	1:1	Perchlorate	Target Compound	304799	3.088354797
2LM031289	Unknown		M1J1014-05	1:1	Perchlorate	Confirming Peak	98693	
2LM031290	Unknown		M1J1014-06	1:1	Perchlorate	Target Compound	304512	3.061191254
2LM031290	Unknown		M1J1014-06	1:1	Perchlorate	Confirming Peak	99475	
2LM031291	Unknown		M1J1014-07	1:1	Perchlorate	Target Compound	1191	#VALUE!
2LM031291	Unknown		M1J1014-07	1:1	Perchlorate	Confirming Peak	N/F	
2LM031292	Unknown		M1J1014-08	1:1	Perchlorate	Target Compound	2147209	3.170056146
2LM031292	Unknown		M1J1014-08	1:1	Perchlorate	Confirming Peak	677341	
2LM031293	Unknown		B1J1574-MS1	1:1	Perchlorate	Target Compound	2211532	3.180810991
2LM031293	Unknown		B1J1574-MS1	1:1	Perchlorate	Confirming Peak	695273	
2LM031294	Unknown		B1J1574-MSD1	1:1	Perchlorate	Target Compound	2222935	3.137717798
2LM031294	Unknown		B1J1574-MSD1	1:1	Perchlorate	Confirming Peak	708456	
2LM031295	Chk Std	CCV	S1J0510-CCV6	1:1	Perchlorate	Target Compound	225475	3.085106383
2LM031295	Chk Std	CCV	S1J0510-CCV6	1:1	Perchlorate	Confirming Peak	73085	
2LM031296	Chk Std	QCMRL	S1J0510-CRL6	1:1	Perchlorate	Target Compound	49914	3.152131355
2LM031296	Chk Std	QCMRL	S1J0510-CRL6	1:1	Perchlorate	Confirming Peak	15835	
2LM031297	Unknown		S1J0510-CCB6	1:1	Perchlorate	Target Compound	4077	7.293381038
2LM031297	Unknown		S1J0510-CCB6	1:1	Perchlorate	Confirming Peak	559	

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	IS Rec (50-150 Avg. ICAL)
2LM031223	Unknown		S1J0510-ICB1	1:1	O18LP	Internal Standard	1680592	
2LM031224	Cal Std	1	S1J0510-CAL1	1:1 0012469	O18LP	Internal Standard	1661900	
2LM031225	Cal Std	2	S1J0510-CAL2	1:1 0012468	O18LP	Internal Standard	1670033	
2LM031226	Cal Std	3	S1J0510-CAL3	1:1 0012467	O18LP	Internal Standard	1708009	
2LM031227	Cal Std	4	S1J0510-CAL4	1:1 0012466	O18LP	Internal Standard	1730800	1644264.143
2LM031228	Cal Std	5	S1J0510-CAL5	1:1 0012465	O18LP	Internal Standard	1711825	
2LM031229	Cal Std	6	S1J0510-CAL6	1:1 0012464	O18LP	Internal Standard	1609989	
2LM031230	Cal Std	7	S1J0510-CAL7	1:1 0012463	O18LP	Internal Standard	1417293	
2LM031231	Chk Std	ICV	S1J0510-ICV1	1:1 0012475	O18LP	Internal Standard	1674312	101.8274349
2LM031232	Unknown		S1J0510-CCB1	1:1	O18LP	Internal Standard	1742679	105.9853435
2LM031233	Chk Std	CCV	S1J0510-CCV1	1:1 0012466	O18LP	Internal Standard	1651234	100.4238891
2LM031234	Chk Std	QCMRL	S1J0510-CRL1	1:1 0012468	O18LP	Internal Standard	1672014	101.6876764
2LM031235	Unknown		S1J0510-IFA1	1:1 0012477	O18LP	Internal Standard	1633945	99.37241575
2LM031236	Unknown		B1J1573-BLK1	1:1	O18LP	Internal Standard	1719059	104.5488347
2LM031237	Unknown		B1J1573-BS1	1:1 0012474	O18LP	Internal Standard	1717089	104.4290242
2LM031238	Unknown		B1J1573-MRL1	1:1	O18LP	Internal Standard	1782991	108.4370177
2LM031239	Unknown		M1J0723-01	1:1	O18LP	Internal Standard	992389	60.35459718
2LM031240	Unknown		M1J0723-02	1:1	O18LP	Internal Standard	1012348	61.56845324
2LM031241	Unknown		B1J1573-MS1	1:1	O18LP	Internal Standard	1042843	63.42308227
2LM031242	Unknown		B1J1573-MSD1	1:1	O18LP	Internal Standard	1075862	65.43121461
2LM031243	Unknown		M1J0723-04	1:1	O18LP	Internal Standard	1018160	61.92192443
2LM031244	Unknown		M1J0723-06	1:1	O18LP	Internal Standard	1043550	63.46608022
2LM031245	Chk Std	CCV	S1J0510-CCV2	1:1 0012466	O18LP	Internal Standard	1739535	105.7941334
2LM031246	Chk Std	QCMRL	S1J0510-CRL2	1:1 0012468	O18LP	Internal Standard	1701939	103.5076394
2LM031247	Unknown		S1J0510-CCB2	1:1	O18LP	Internal Standard	1766918	107.4594984
2LM031248	Unknown		M1J0723-08	1:1	O18LP	Internal Standard	1023250	62.2314854
2LM031249	Unknown		M1J0723-10	1:1	O18LP	Internal Standard	993066	60.39577061
2LM031250	Unknown		M1J0723-12	1:1	O18LP	Internal Standard	1063240	64.66357639
2LM031251	Unknown		M1J0723-14	1:1	O18LP	Internal Standard	1029542	62.61414898
2LM031252	Unknown		M1J0726-01	1:1	O18LP	Internal Standard	1058284	64.36216496
2LM031253	Unknown		M1J0726-02	1:1	O18LP	Internal Standard	380915	23.16629002
2LM031254	Unknown		M1J0726-03	1:1	O18LP	Internal Standard	960457	58.41257344
2LM031255	Unknown		M1J0726-04	1:1	O18LP	Internal Standard	1040402	63.2746268
2LM031256	Unknown		M1J0726-05	1:1	O18LP	Internal Standard	992981	60.39060113
2LM031257	Unknown		M1J0726-06	1:1	O18LP	Internal Standard	1534277	93.31085925
2LM031258	Chk Std	CCV	S1J0510-CCV3	1:1 0012466	O18LP	Internal Standard	1623988	98.76685611
2LM031259	Chk Std	QCMRL	S1J0510-CRL3	1:1 0012468	O18LP	Internal Standard	1575526	95.81951944
2LM031260	Unknown		S1J0510-CCB3	1:1	O18LP	Internal Standard	1650476	100.3777895
2LM031261	Unknown		M1J0726-07	1:1	O18LP	Internal Standard	1371981	83.44042567
2LM031262	Unknown		M1J0726-08	1:1	O18LP	Internal Standard	977669	59.45936389
2LM031263	Unknown		M1J0825-11	1:1	O18LP	Internal Standard	1574817	95.77639985
2LM031264	Unknown		M1J0978-01	1:1	O18LP	Internal Standard	865157	52.61666769
2LM031265	Unknown		B1J1574-BLK1	1:1	O18LP	Internal Standard	1289719	78.43745822
2LM031266	Unknown		B1J1574-BS1	1:1	O18LP	Internal Standard	1329597	80.86273764
2LM031267	Unknown		M1J0978-02	1:1	O18LP	Internal Standard	908960	55.28065572
2LM031268	Unknown		M1J0978-03	1:1	O18LP	Internal Standard	1049328	63.81748362
2LM031269	Unknown		M1J0978-04	1:1	O18LP	Internal Standard	805385	48.98148533
2LM031270	Unknown		M1J0978-05	1:1	O18LP	Internal Standard	850358	51.71662982
2LM031271	Chk Std	CCV	S1J0510-CCV4	1:1	O18LP	Internal Standard	1214280	73.84944842
2LM031272	Chk Std	QCMRL	S1J0510-CRL4	1:1	O18LP	Internal Standard	1241809	75.5236928
2LM031273	Unknown		S1J0510-CCB4	1:1	O18LP	Internal Standard	1344678	81.77992604
2LM031274	Unknown		M1J0978-06	1:1	O18LP	Internal Standard	875033	53.21730111
2LM031275	Unknown		M1J0978-07	1:1	O18LP	Internal Standard	381033	23.17346648
2LM031276	Unknown		M1J0981-01	1:1	O18LP	Internal Standard	815110	49.57293532
2LM031277	Unknown		M1J0981-02	1:1	O18LP	Internal Standard	711765	43.28775295
2LM031278	Unknown		M1J0981-03	1:1	O18LP	Internal Standard	313582	19.0712667
2LM031279	Unknown		M1J0981-04	1:1	O18LP	Internal Standard	358875	21.82587278

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	IS Rec (50-150 Avg. ICAL)
2LM031280	Unknown		M1J0981-05	1:1	O18LP	Internal Standard	972045	59.11732639
2LM031281	Unknown		M1J0981-06	1:1	O18LP	Internal Standard	779616	47.41427972
2LM031282	Unknown		M1J0981-07	1:1	O18LP	Internal Standard	842922	51.26439104
2LM031283	Unknown		M1J0981-08	1:1	O18LP	Internal Standard	878882	53.45138759
2LM031284	Chk Std	CCV	S1J0510-CCV5	1:1	O18LP	Internal Standard	1115711	67.85473033
2LM031285	Chk Std	QCMRL	S1J0510-CRL5	1:1	O18LP	Internal Standard	1192196	72.50635521
2LM031286	Unknown		S1J0510-CCB5	1:1	O18LP	Internal Standard	1248933	75.95695652
2LM031287	Unknown		M1J1014-03	1:1	O18LP	Internal Standard	884920	53.81860353
2LM031288	Unknown		M1J1014-04	1:1	O18LP	Internal Standard	1002188	60.95054766
2LM031289	Unknown		M1J1014-05	1:1	O18LP	Internal Standard	911437	55.43130062
2LM031290	Unknown		M1J1014-06	1:1	O18LP	Internal Standard	926602	56.35359769
2LM031291	Unknown		M1J1014-07	1:1	O18LP	Internal Standard	1026192	62.41041042
2LM031292	Unknown		M1J1014-08	1:1	O18LP	Internal Standard	885756	53.86944694
2LM031293	Unknown		B1J1574-MS1	1:1	O18LP	Internal Standard	943268	57.36718179
2LM031294	Unknown		B1J1574-MSD1	1:1	O18LP	Internal Standard	941514	57.26050794
2LM031295	Chk Std	CCV	S1J0510-CCV6	1:1	O18LP	Internal Standard	1377847	83.79718101
2LM031296	Chk Std	QCMRL	S1J0510-CRL6	1:1	O18LP	Internal Standard	1512320	91.97548986
2LM031297	Unknown		S1J0510-CCB6	1:1	O18LP	Internal Standard	1446848	87.99364787

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	Ion Ratio (2.31-3.85)
2LM031298	Unknown		S1J0523-CCB1	1:1	Perchlorate	Target Compound	3420	#VALUE!
2LM031298	Unknown		S1J0523-CCB1	1:1	Perchlorate	Confirming Peak	N/F	
2LM031299	Chk Std	CCV	S1J0523-CCV1	1:1 0012466	Perchlorate	Target Compound	214302	3.076090545
2LM031299	Chk Std	CCV	S1J0523-CCV1	1:1 0012466	Perchlorate	Confirming Peak	69667	
2LM031300	Chk Std	QCMRL	S1J0523-CRL1	1:1 0012468	Perchlorate	Target Compound	43732	3.283429687
2LM031300	Chk Std	QCMRL	S1J0523-CRL1	1:1 0012468	Perchlorate	Confirming Peak	13319	
2LM031301	Unknown		M1J0726-02@1000	1:1000	Perchlorate	Target Compound	158059	3.050389841
2LM031301	Unknown		M1J0726-02@1000	1:1000	Perchlorate	Confirming Peak	51816	
2LM031302	Unknown		M1J0978-07@100	1:100	Perchlorate	Target Compound	711521	3.108178002
2LM031302	Unknown		M1J0978-07@100	1:100	Perchlorate	Confirming Peak	228919	
2LM031303	Unknown		M1J0981-03@1000	1:1000	Perchlorate	Target Compound	124686	3.204636579
2LM031303	Unknown		M1J0981-03@1000	1:1000	Perchlorate	Confirming Peak	38908	
2LM031304	Unknown		M1J1014-08@10	1:10	Perchlorate	Target Compound	212461	3.042154097
2LM031304	Unknown		M1J1014-08@10	1:10	Perchlorate	Confirming Peak	69839	
2LM031305	Unknown		B1J1574-MS1@10	1:10	Perchlorate	Target Compound	215286	3.184515709
2LM031305	Unknown		B1J1574-MS1@10	1:10	Perchlorate	Confirming Peak	67604	
2LM031306	Unknown		B1J1574-MSD1@10	1:10	Perchlorate	Target Compound	224671	3.033430095
2LM031306	Unknown		B1J1574-MSD1@10	1:10	Perchlorate	Confirming Peak	74065	
2LM031307	Chk Std	CCV	S1J0523-CCV2	1:1 0012466	Perchlorate	Target Compound	221754	3.061040252
2LM031307	Chk Std	CCV	S1J0523-CCV2	1:1 0012466	Perchlorate	Confirming Peak	72444	
2LM031308	Chk Std	QCMRL	S1J0523-CRL2	1:1 0012468	Perchlorate	Target Compound	46431	3.092513654
2LM031308	Chk Std	QCMRL	S1J0523-CRL2	1:1 0012468	Perchlorate	Confirming Peak	15014	
2LM031309	Unknown		S1J0523-CCB2	1:1	Perchlorate	Target Compound	3298	#VALUE!
2LM031309	Unknown		S1J0523-CCB2	1:1	Perchlorate	Confirming Peak	N/F	

Filename	Sample Type	Level	Sample ID	Comments	Compound	Type	Area	IS Rec (50-150 Avg. ICAL)
2LM031224	Cal Std	1	S1J0510-CAL1	1:1 0012469	O18LP	Internal Standard	1661900	
2LM031225	Cal Std	2	S1J0510-CAL2	1:1 0012468	O18LP	Internal Standard	1670033	
2LM031226	Cal Std	3	S1J0510-CAL3	1:1 0012467	O18LP	Internal Standard	1708009	
2LM031227	Cal Std	4	S1J0510-CAL4	1:1 0012466	O18LP	Internal Standard	1730800	1644264.143
2LM031228	Cal Std	5	S1J0510-CAL5	1:1 0012465	O18LP	Internal Standard	1711825	
2LM031229	Cal Std	6	S1J0510-CAL6	1:1 0012464	O18LP	Internal Standard	1609989	
2LM031230	Cal Std	7	S1J0510-CAL7	1:1 0012463	O18LP	Internal Standard	1417293	
2LM031298	Unknown		S1J0523-CCB1	1:1	O18LP	Internal Standard	1238370	75.31454148
2LM031299	Chk Std	CCV	S1J0523-CCV1	1:1 0012466	O18LP	Internal Standard	1320355	80.3006625
2LM031300	Chk Std	QCMRL	S1J0523-CRL1	1:1 0012468	O18LP	Internal Standard	1326434	80.67037195
2LM031301	Unknown		M1J0726-02@1000	1:1000	O18LP	Internal Standard	1357428	82.55534889
2LM031302	Unknown		M1J0978-07@100	1:100	O18LP	Internal Standard	1128188	68.61355001
2LM031303	Unknown		M1J0981-03@1000	1:1000	O18LP	Internal Standard	1321403	80.36439921
2LM031304	Unknown		M1J1014-08@10	1:10	O18LP	Internal Standard	954249	58.03501853
2LM031305	Unknown		B1J1574-MS1@10	1:10	O18LP	Internal Standard	961979	58.50513764
2LM031306	Unknown		B1J1574-MSD1@10	1:10	O18LP	Internal Standard	1013761	61.65438834
2LM031307	Chk Std	CCV	S1J0523-CCV2	1:1 0012466	O18LP	Internal Standard	1361915	82.82823692
2LM031308	Chk Std	QCMRL	S1J0523-CRL2	1:1 0012468	O18LP	Internal Standard	1445889	87.9353239
2LM031309	Unknown		S1J0523-CCB2	1:1	O18LP	Internal Standard	1428653	86.88707384

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Laboratory Report Number: M1J0726

Client Project ID: LHAAP

BATCH LOG SUMMARY
SECTION A1

Batch: B1J1573
Matrix: Aqueous
Method: EPA 6850

Prepared: 10/28/2021 2:19:00PM
Prepared By: CAS

Laboratory ID	Client / Source ID	Initial	Final						Spike(s)
B1J1573-BLK1		10.0 mL	10.0 mL						
B1J1573-BS1		10.0 mL	10.0 mL						1006965 200µL
B1J1573-MRL1		10.0 mL	10.0 mL						1006965 200µL
M1J0726-01	50WW09-211011	10.0 mL	10.0 mL						
M1J0726-03	50WW22-211011	10.0 mL	10.0 mL						
M1J0726-04	50WW23-211011	10.0 mL	10.0 mL						
M1J0726-05	50WW15-211011	10.0 mL	10.0 mL						
M1J0726-06	50WW16-211011	10.0 mL	10.0 mL						
M1J0726-07	50WW16-211011-FD	10.0 mL	10.0 mL						
M1J0726-08	50WW18-211011	10.0 mL	10.0 mL						
M1J0726-02	50WW08-211011	10.0 mL	10.0 mL						

Standards used in the batch:

Standard ID	Description	Date Prepared	Prepared By
1006965	6850/331 Perchlorate Alternate Solution (10 ppb)	8/11/2021 5:13:38PM	John Richards

Reagents used in the batch:

Reagent ID	Description	Prepared	Prepared By
1000181	6850/331 Column	1/8/2021 2:36:22PM	** Vendor **
1008665	0.45 um PTFE Syringe Filter	10/11/2021 10:46:38AM	Asa Timmons
1009215	0.1% Acetic Acid in Water	10/26/2021 8:46:45AM	Craig Smith
1009216	0.1% Acetic Acid in Acetonitrile	10/26/2021 8:48:32AM	Craig Smith

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

SEQUENCE LOG SUMMARY
SECTION A2

Sequence: S1J0510
Instrument: LCMS2
Calibration: 21J0034

Analyst 1: CAS
Method: EPA 6850
SOP: HPLC06

#	File ID	Laboratory ID	Client ID	Analyzed	Reference	Standard
1	2LM031223	S1J0510-ICB1	Initial Cal Blank	10/28/21 15:10		
2	2LM031224	S1J0510-CAL1	Cal Standard	10/28/21 15:24		1007584
3	2LM031225	S1J0510-CAL2	Cal Standard	10/28/21 15:37		1007583
4	2LM031226	S1J0510-CAL3	Cal Standard	10/28/21 15:50		1007582
5	2LM031227	S1J0510-CAL4	Cal Standard	10/28/21 16:03		1007581
6	2LM031228	S1J0510-CAL5	Cal Standard	10/28/21 16:17		1007580
7	2LM031229	S1J0510-CAL6	Cal Standard	10/28/21 16:30		1007579
8	2LM031230	S1J0510-CAL7	Cal Standard	10/28/21 16:43		1007578
9	2LM031231	S1J0510-ICV1	Initial Cal Check	10/28/21 16:56		1006966
10	2LM031232	S1J0510-CCB1	Calibration Blank	10/28/21 17:10		
11	2LM031233	S1J0510-CCV1	Calibration Check	10/28/21 17:23		1007581
12	2LM031234	S1J0510-CRL1	Instrument RL Check	10/28/21 17:36		1007583
13	2LM031235	S1J0510-IFA1	Interference Check A	10/28/21 17:49		1006967
14	2LM031236	B1J1573-BLK1	Blank	10/28/21 18:03		
15	2LM031237	B1J1573-BS1	LCS	10/28/21 18:16		
16	2LM031238	B1J1573-MRL1	MRL Check	10/28/21 18:29		
24	2LM031245	S1J0510-CCV2	Calibration Check	10/28/21 20:02		1007581
25	2LM031246	S1J0510-CRL2	Instrument RL Check	10/28/21 20:15		1007583
26	2LM031247	S1J0510-CCB2	Calibration Blank	10/28/21 20:28		
31	2LM031252	M1J0726-01	50WW09-211011	10/28/21 21:35		
32	2LM031254	M1J0726-03	50WW22-211011	10/28/21 22:01		
33	2LM031255	M1J0726-04	50WW23-211011	10/28/21 22:14		
34	2LM031256	M1J0726-05	50WW15-211011	10/28/21 22:28		
35	2LM031257	M1J0726-06	50WW16-211011	10/28/21 22:41		
36	2LM031258	S1J0510-CCV3	Calibration Check	10/28/21 22:54		1007581
37	2LM031259	S1J0510-CRL3	Instrument RL Check	10/28/21 23:07		1007583
38	2LM031260	S1J0510-CCB3	Calibration Blank	10/28/21 23:21		
39	2LM031261	M1J0726-07	50WW16-211011-FD	10/28/21 23:34		
40	2LM031262	M1J0726-08	50WW18-211011	10/28/21 23:47		
49	2LM031271	S1J0510-CCV4	Calibration Check	10/29/21 01:46		1007581
50	2LM031272	S1J0510-CRL4	Instrument RL Check	10/29/21 02:00		1007583
51	2LM031273	S1J0510-CCB4	Calibration Blank	10/29/21 02:13		
59	2LM031284	S1J0510-CCV5	Calibration Check	10/29/21 04:39		1007581

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

SEQUENCE LOG SUMMARY
SECTION A2

Sequence: S1J0510 **Analyst 1:** CAS
Instrument: LCMS2 **Method:** EPA 6850
Calibration: 21J0034 **SOP:** HPLC06

#	File ID	Laboratory ID	Client ID	Analyzed	Reference	Standard
60	2LM031285	S1J0510-CRL5	Instrument RL Check	10/29/21 04:52		1007583
61	2LM031286	S1J0510-CCB5	Calibration Blank	10/29/21 05:05		
67	2LM031295	S1J0510-CCV6	Calibration Check	10/29/21 07:04		1007581
68	2LM031296	S1J0510-CRL6	Instrument RL Check	10/29/21 07:18		1007583
69	2LM031297	S1J0510-CCB6	Calibration Blank	10/29/21 07:31		

Sequence Standards

Standard ID	Description	Prepared	PreparedBy	Expires
1006966	6850/331 Perchlorate ICV (1 ppb)	08/11/2021	John Richards	08/11/2022
1006967	6850 Perchlorate Alternate 0.2 ppb MCT	08/11/2021	John Richards	08/11/2022
1007578	6850/331 ICAL STD @ 10 ppb	09/07/2021	Craig Smith	09/07/2022
1007579	6850/331 ICAL STD @ 5 ppb	09/07/2021	Craig Smith	09/07/2022
1007580	6850/331 ICAL STD @ 2 ppb	09/07/2021	Craig Smith	09/07/2022
1007581	6850/331 ICAL STD-CCV @ 1 ppb	09/07/2021	Craig Smith	09/07/2022
1007582	6850/331 ICAL STD @ 0.5 ppb	09/07/2021	Craig Smith	09/07/2022
1007583	6850/331 ICAL STD-MRL @ 0.2 ppb	09/07/2021	Craig Smith	09/07/2022
1007584	6850/331 ICAL STD @ 0.1 ppb	09/07/2021	Craig Smith	09/07/2022

Sequence Internal Standard

Standard ID	Description	Prepared	PreparedBy	Expires
1000597	6850/331 IS Working (5.0 ppb)	01/20/2021	Craig Smith	01/20/2022

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Laboratory Report Number: M1J0726
Client Project ID: LHAAP

SEQUENCE LOG SUMMARY
SECTION A2

Sequence: S1J0523
Instrument: LCMS2
Calibration: 21J0034
Analyst 1: CAS
Method: EPA 6850
SOP: HPLC06

#	File ID	Laboratory ID	Client ID	Analyzed	Reference	Standard
1	2LM031298	S1J0523-CCB1	Calibration Blank	10/29/21 11:09		
2	2LM031299	S1J0523-CCV1	Calibration Check	10/29/21 11:22		1007581
3	2LM031300	S1J0523-CRL1	Instrument RL Check	10/29/21 11:36		1007583
4	2LM031301	M1J0726-02	50WW08-211011	10/29/21 11:49		
10	2LM031307	S1J0523-CCV2	Calibration Check	10/29/21 13:08		1007581
11	2LM031308	S1J0523-CRL2	Instrument RL Check	10/29/21 13:22		1007583
12	2LM031309	S1J0523-CCB2	Calibration Blank	10/29/21 13:35		

Sequence Standards

Standard ID	Description	Prepared	PreparedBy	Expires
1007581	6850/331 ICAL STD-CCV @ 1 ppb	09/07/2021	Craig Smith	09/07/2022
1007583	6850/331 ICAL STD-MRL @ 0.2 ppb	09/07/2021	Craig Smith	09/07/2022

Sequence Internal Standard

Standard ID	Description	Prepared	PreparedBy	Expires
1000597	6850/331 IS Working (5.0 ppb)	01/20/2021	Craig Smith	01/20/2022

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Section B:
HPLC Organics
EPA 6850
Sample Raw Data

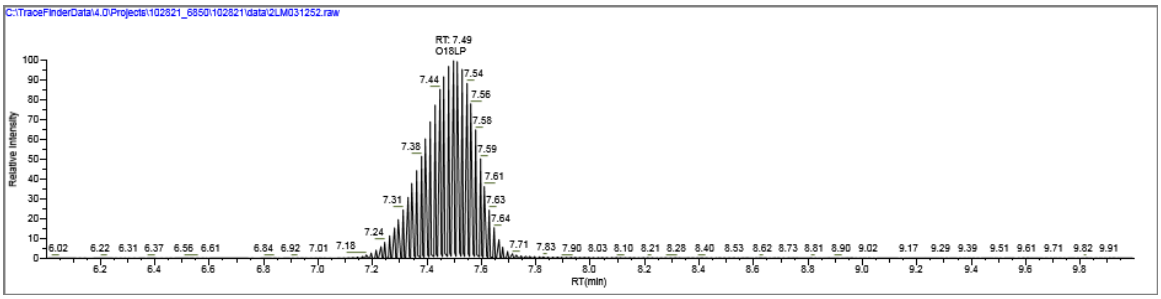
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:C6	M1J0726-01	2LM031252	N/A	M1J0726-01	10/28/2021 9:35:09 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.49	89	1058284			5.000	ug/L	5.000	ug/L	

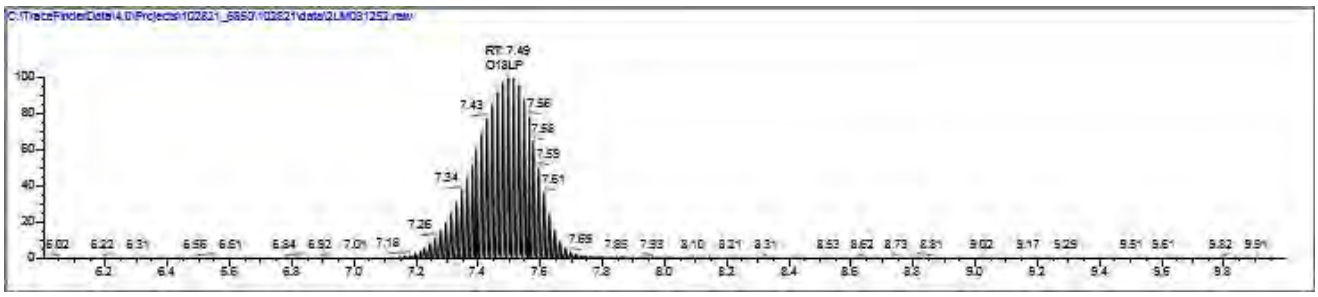
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.5	83	28170	Linear	0.027	0.167	ug/L	0.167	ug/L	

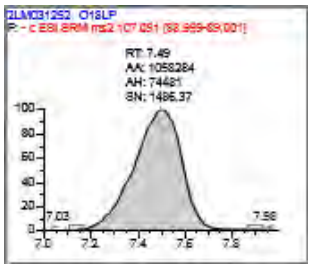
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

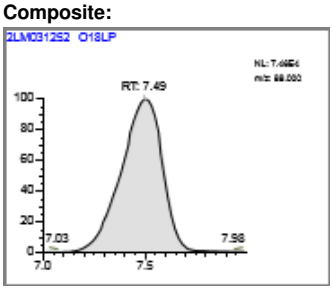
Data File:	2LM031252	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 9:35:09 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	M1J0726-01	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:C6
Comments:	1:01		



m/z 89.000



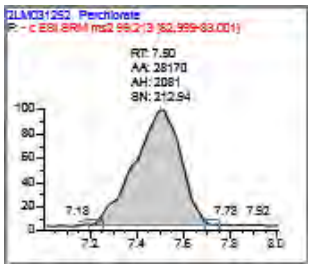
Composite:



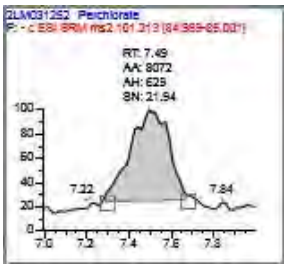
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.49	m/z 89.000	1058284	5.000		N/A

m/z 83.000



m/z 85.000



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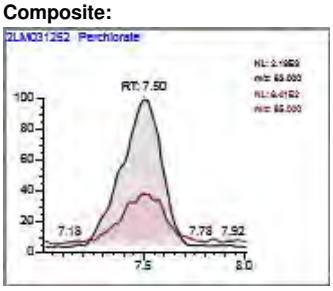


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.50	m/z 83.000	28170	0.167		N/A
7.49	m/z 85.000	8072		26.30 - 39.45	28.66

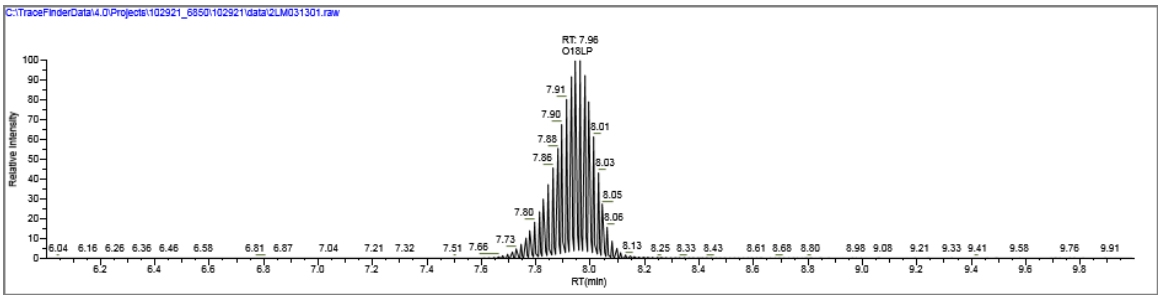
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: TSQ_Quantiva
Batch: 102921

Method: 102921_Perchlorate 6850
Perchlorate 6850
Cali File: 102821_102921.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
G:F1	M1J0726-02@1000	2LM031301	N/A	M1J0726-02@1000	10/29/2021 11:49:25 AM	1:1000



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.96	89	1357428			5.000	ug/L	5.000	ug/L	

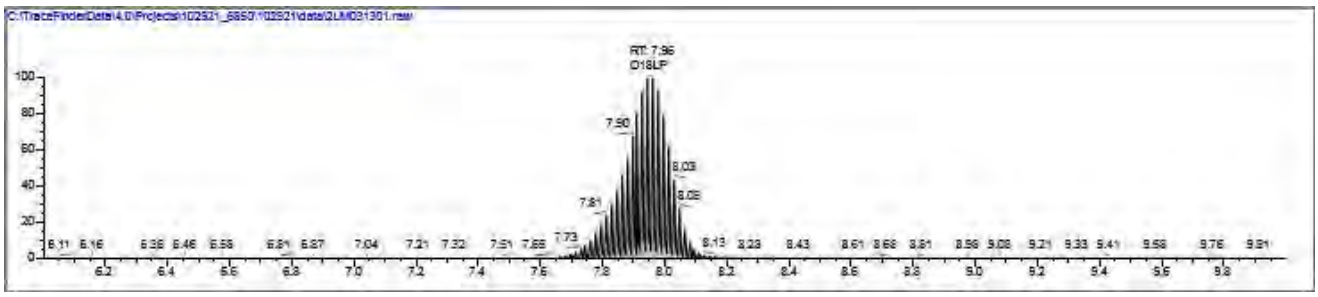
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	158059	Linear	0.116	0.682	ug/L	0.682	ug/L	

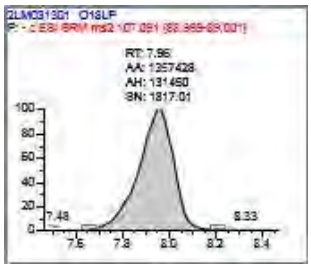
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031301	Tune Report Date:	Tune report not found
Method:	102921_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 11:49:25 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821_102921.calx	Operator ID:	TSQ_Quantiva
Sample ID:	M1J0726-02@1000	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	G:F1
Comments:	1:1000		



m/z 89.000



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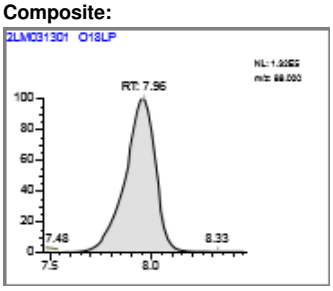
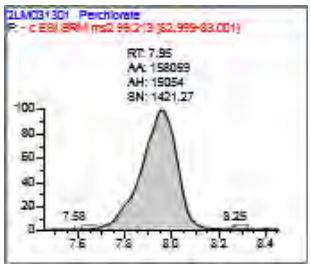


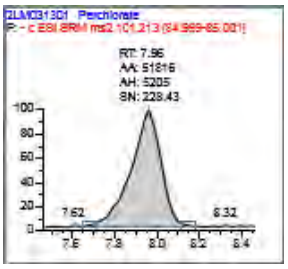
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.96	m/z 89.000	1357428	5.000		N/A

m/z 83.000



m/z 85.000



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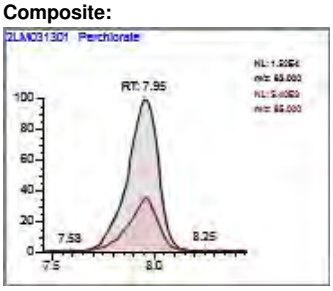


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.95	m/z 83.000	158059	0.682		N/A
7.96	m/z 85.000	51816		25.89 - 38.83	32.78

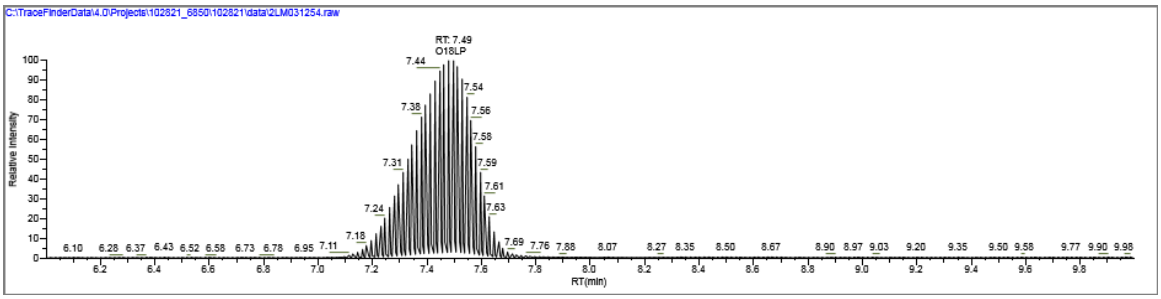
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:C8	M1J0726-03	2LM031254	N/A	M1J0726-03	10/28/2021 10:01:39 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.49	89	960457			5.000	ug/L	5.000	ug/L	

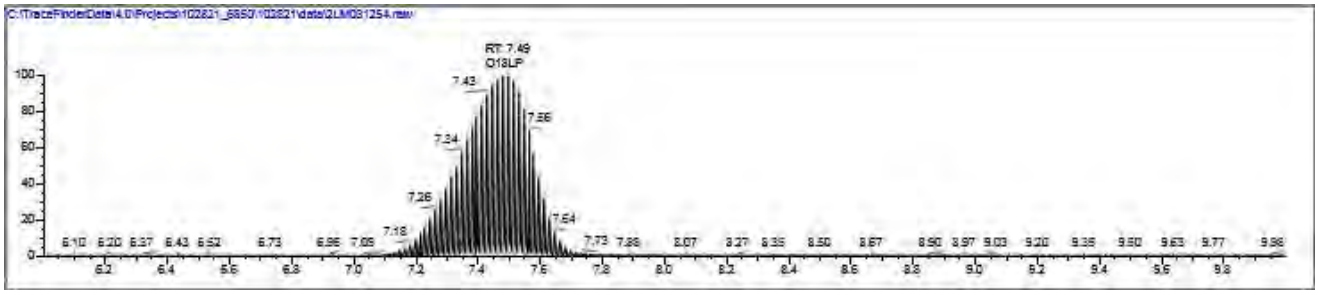
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.5	83	75462	Linear	0.079	0.464	ug/L	0.464	ug/L	

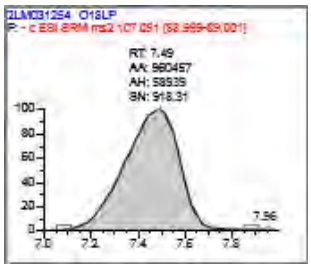
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031254	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 10:01:39 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	M1J0726-03	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:C8
Comments:	1:01		



m/z 89.000



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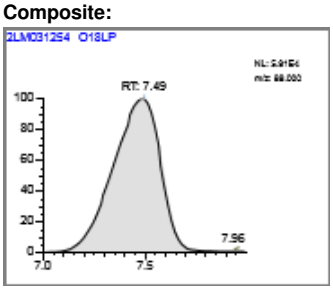
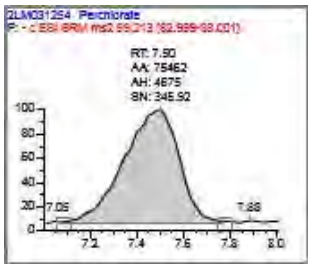


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.49	m/z 89.000	960457	5.000		N/A

m/z 83.000



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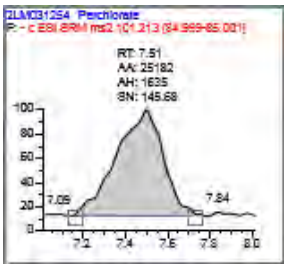

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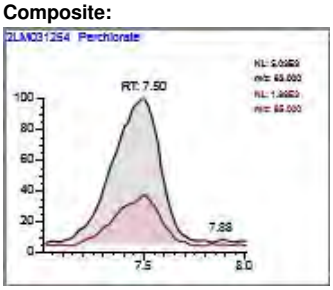


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.50	m/z 83.000	75462	0.464		N/A
7.51	m/z 85.000	25182		26.30 - 39.45	33.37

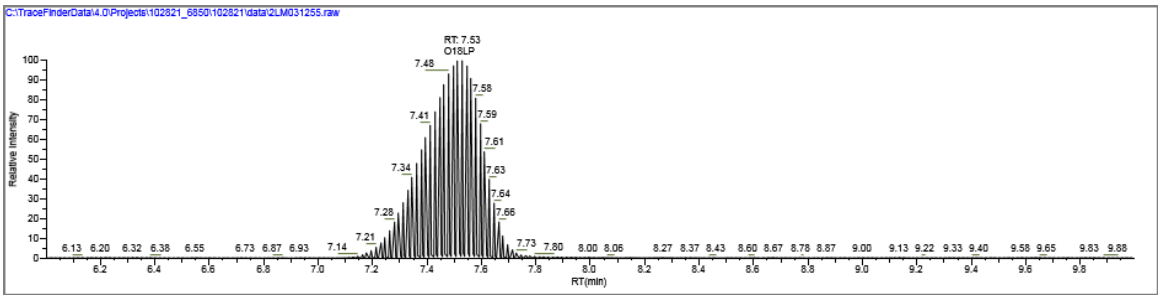
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:C9	M1J0726-04	2LM031255	N/A	M1J0726-04	10/28/2021 10:14:54 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.53	89	1040402			5.000	ug/L	5.000	ug/L	

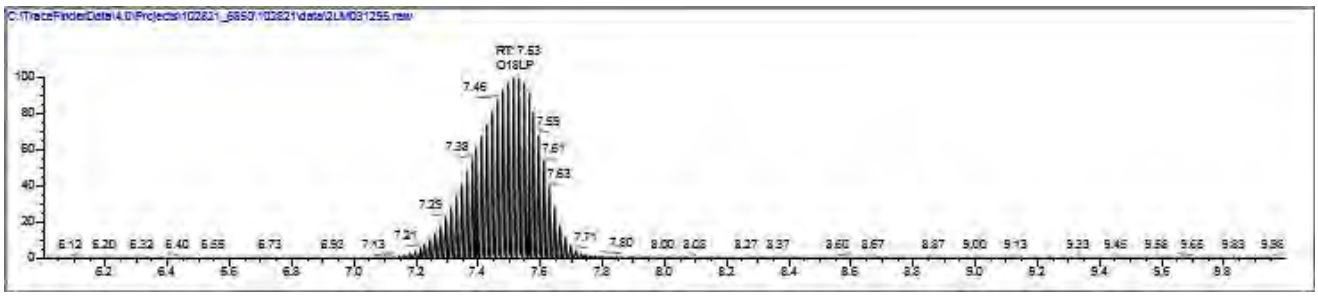
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.53	83	22679	Linear	0.022	0.139	ug/L	0.139	ug/L	

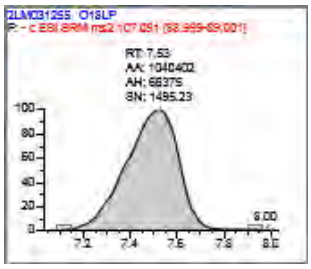
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031255	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 10:14:54 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	M1J0726-04	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:C9
Comments:	1:01		



m/z 89.000



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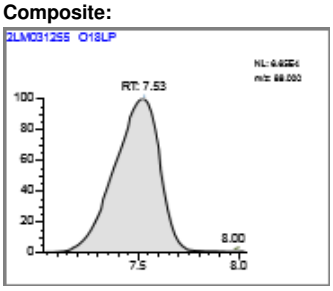
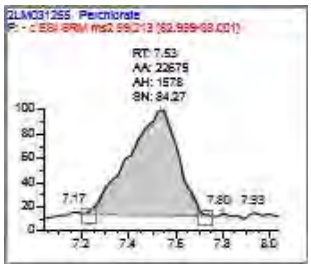


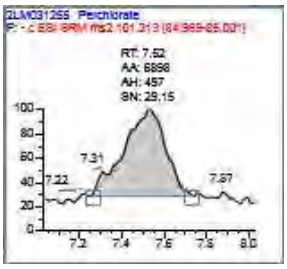
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.53	m/z 89.000	1040402	5.000		N/A

m/z 83.000



m/z 85.000



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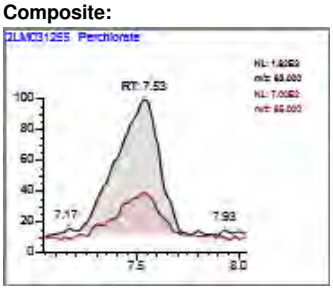


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.53	m/z 83.000	22679	0.139		N/A
7.52	m/z 85.000	6898		26.30 - 39.45	30.41

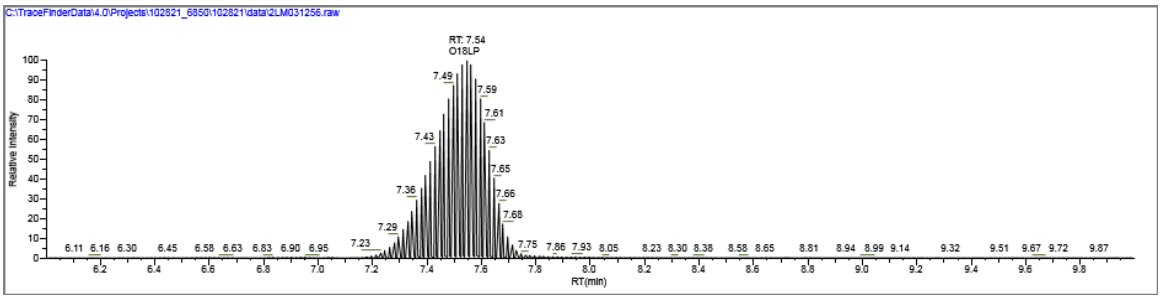
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D1	M1J0726-05	2LM031256	N/A	M1J0726-05	10/28/2021 10:28:09 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.54	89	992981			5.000	ug/L	5.000	ug/L	

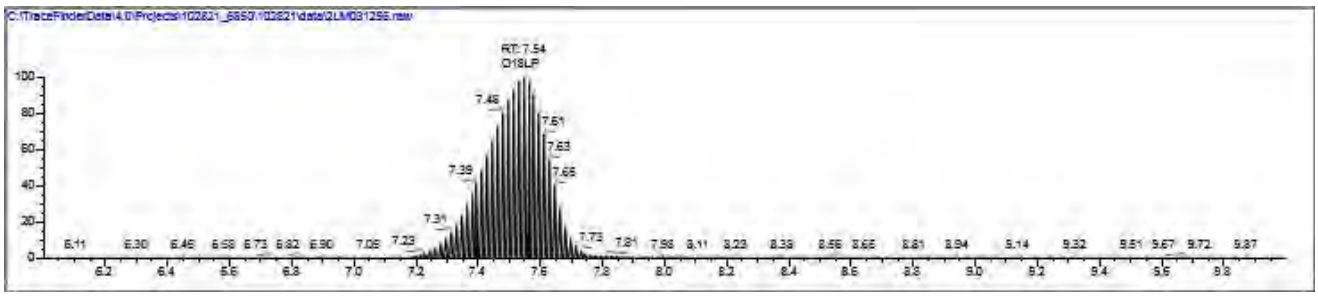
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.55	83	14391	Linear	0.014	0.097	ug/L	0.097	ug/L	I

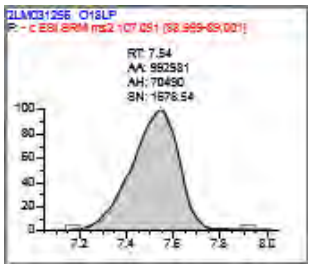
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031256	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 10:28:09 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	M1J0726-05	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D1
Comments:	1:01		



m/z 89.000



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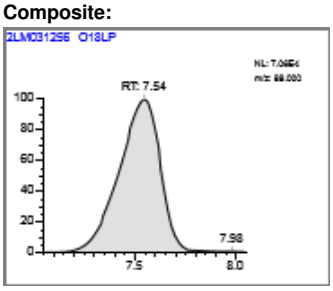
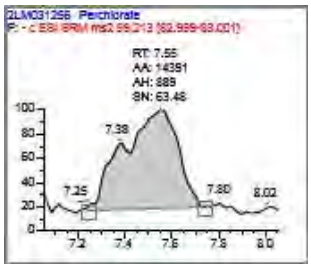


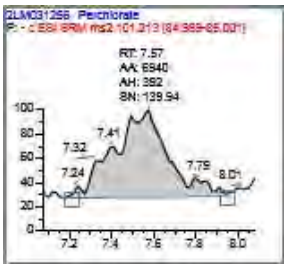
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.54	m/z 89.000	992981	5.000		N/A	

m/z 83.000



m/z 85.000



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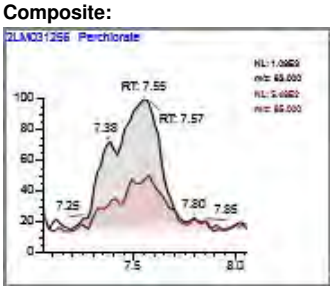


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.55	m/z 83.000	14391	0.097		N/A	I
7.57	m/z 85.000	6940		26.30 - 39.45	48.23 *	

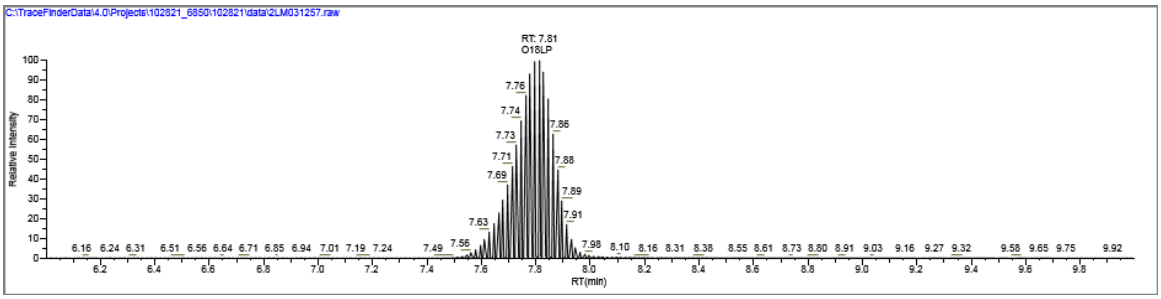
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D2	M1J0726-06	2LM031257	N/A	M1J0726-06	10/28/2021 10:41:23 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.81	89	1534277			5.000	ug/L	5.000	ug/L	

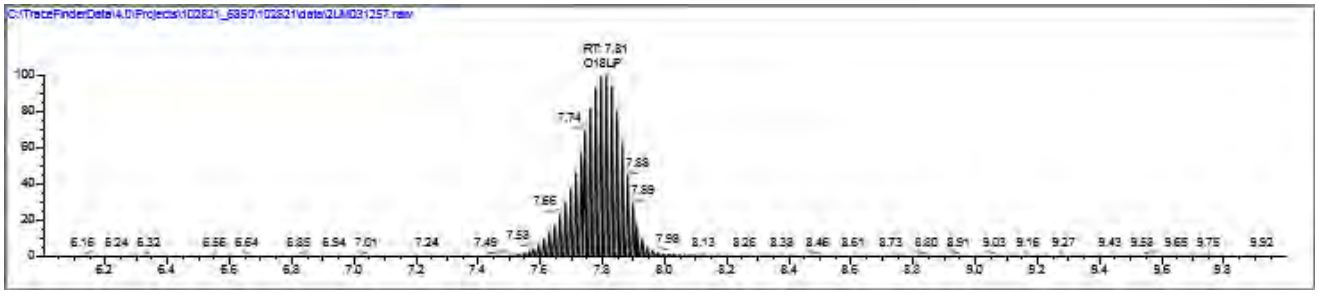
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.82	83	11935	Linear	0.008	0.059	ug/L	0.059	ug/L	

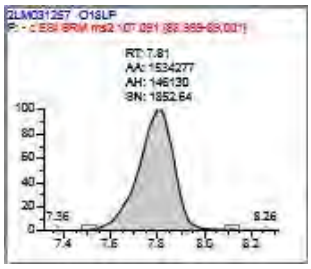
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031257	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 10:41:23 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	M1J0726-06	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D2
Comments:	1:01		



m/z 89.000



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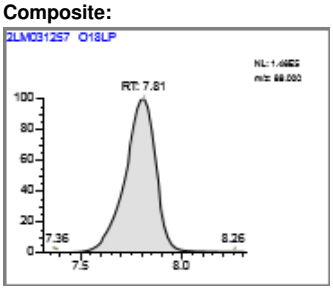
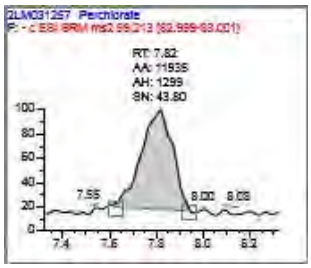


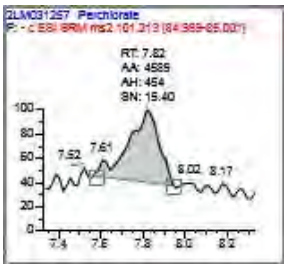
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.81	m/z 89.000	1534277	5.000		N/A

m/z 83.000



m/z 85.000



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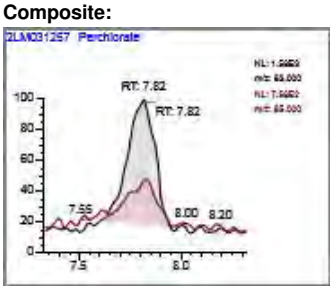


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.82	m/z 83.000	11935	0.059		N/A
7.82	m/z 85.000	4589		26.30 - 39.45	38.45

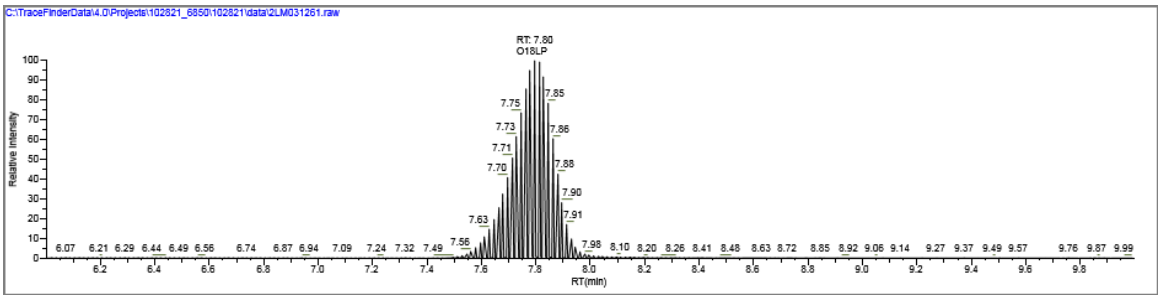
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D3	M1J0726-07	2LM031261	N/A	M1J0726-07	10/28/2021 11:34:23 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.80	89	1371981			5.000	ug/L	5.000	ug/L	

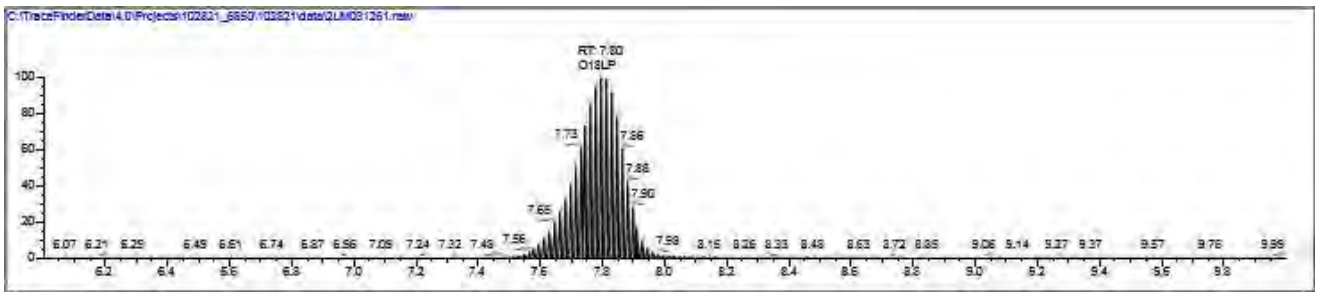
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.8	83	8645	Linear	0.006	0.05	ug/L	0.05	ug/L	

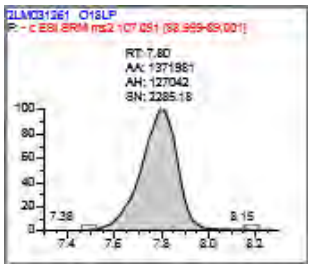
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031261	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 11:34:23 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	M1J0726-07	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D3
Comments:	1:01		



m/z 89.000



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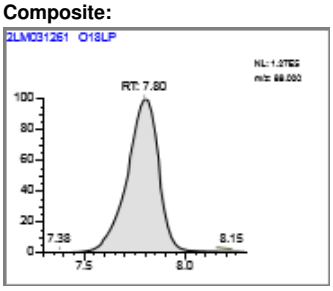
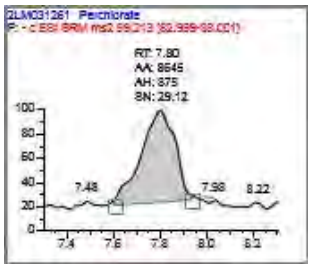


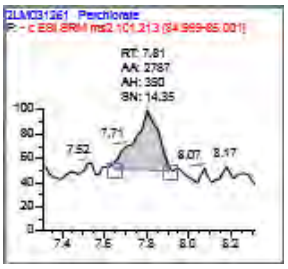
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.80	m/z 89.000	1371981	5.000		N/A

m/z 83.000



m/z 85.000



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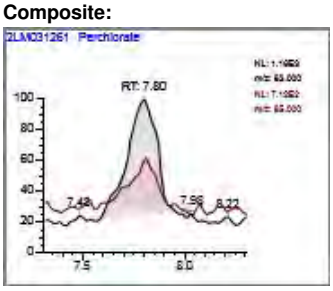


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.80	m/z 83.000	8645	0.050		N/A
7.81	m/z 85.000	2787		26.30 - 39.45	32.24

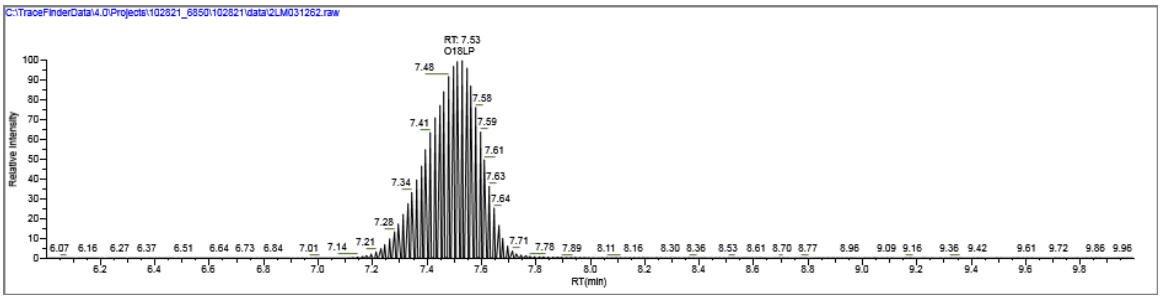
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:D4	M1J0726-08	2LM031262	N/A	M1J0726-08	10/28/2021 11:47:38 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.53	89	977669			5.000	ug/L	5.000	ug/L	

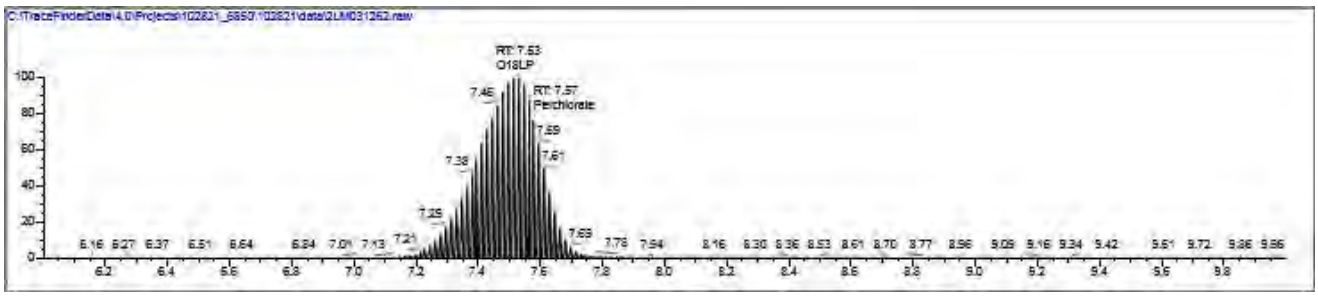
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.57	83	3359	Linear	0.003	0.034	ug/L	0.034	ug/L	I

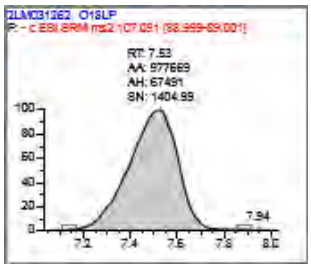
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031262	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 11:47:38 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	M1J0726-08	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:D4
Comments:	1:01		



m/z 89.000



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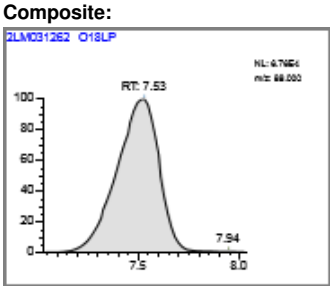
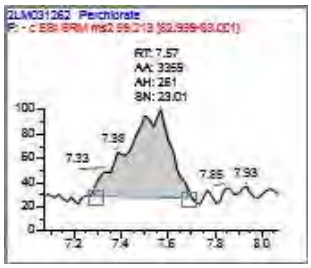


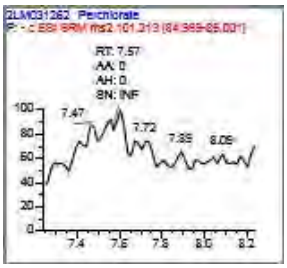
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.53	m/z 89.000	977669	5.000		N/A

m/z 83.000



m/z 85.000



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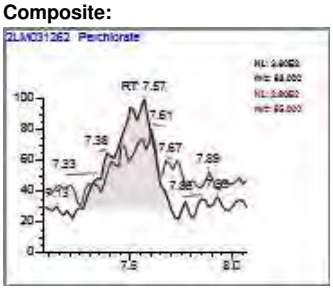


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.57	m/z 83.000	3359	0.034		N/A	I
7.57	m/z 85.000			26.30 - 39.45		*

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

MICROBAC®

Section C:
HPLC Organics
EPA 6850
QC Sample Raw Data

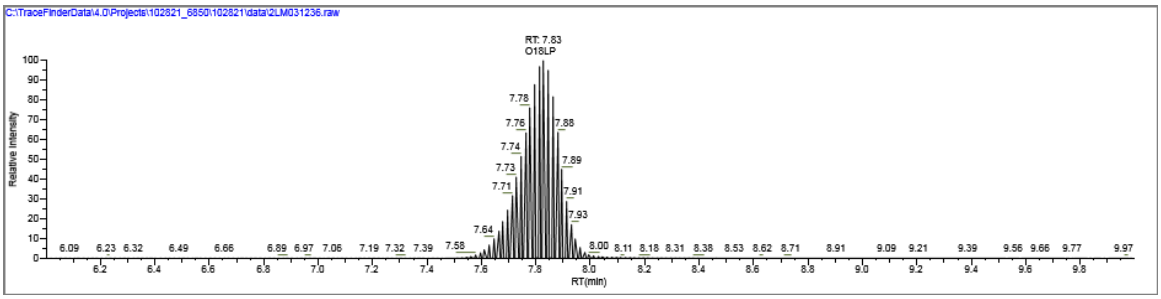
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B2	B1J1573-BLK1	2LM031236	N/A	BLANK	10/28/2021 6:03:09 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.83	89	1719059			5.000	ug/L	5.000	ug/L	

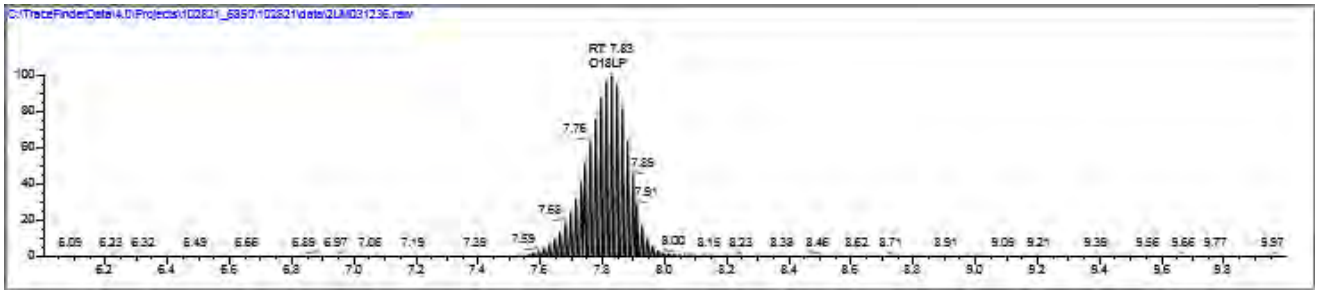
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.82	83	5196	Linear	0.003	0.031	ug/L	0.031	ug/L	

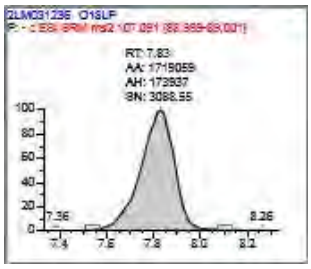
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031236	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 6:03:09 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	B1J1573-BLK1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B2
Comments:	1:01		



m/z 89.000



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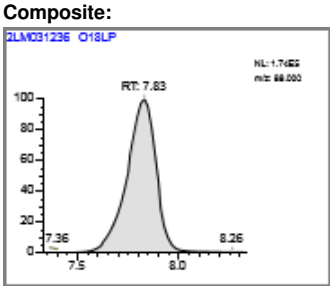
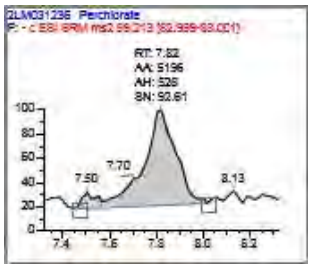


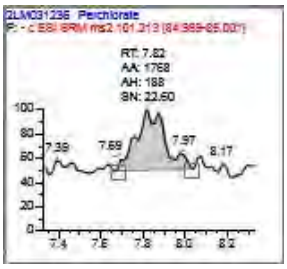
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.83	m/z 89.000	1719059	5.000		N/A

m/z 83.000



m/z 85.000



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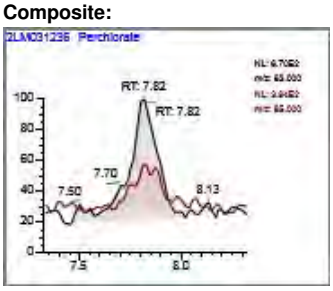


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.82	m/z 83.000	5196	0.031		N/A
7.82	m/z 85.000	1768		26.30 - 39.45	34.03

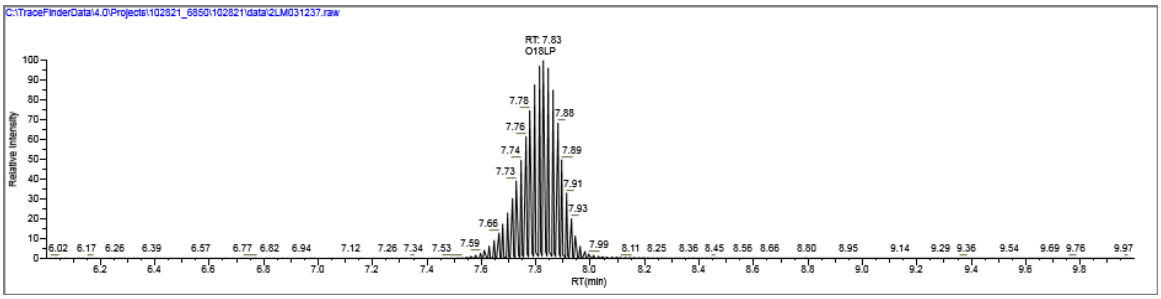
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B3	B1J1573-BS1	2LM031237	N/A	LCS (0.2ug/L)	10/28/2021 6:16:23 PM	1:1 0012474



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.83	89	1717089			5.000	ug/L	5.000	ug/L	

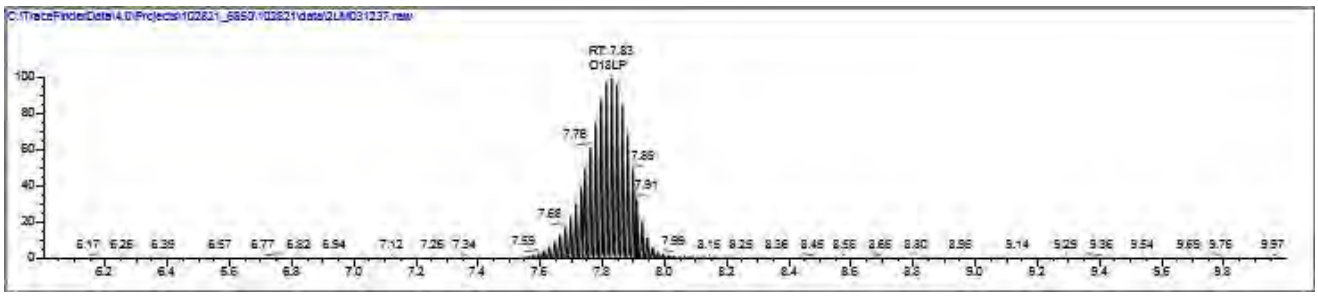
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.83	83	57586	Linear	0.034	0.206	ug/L	0.206	ug/L	

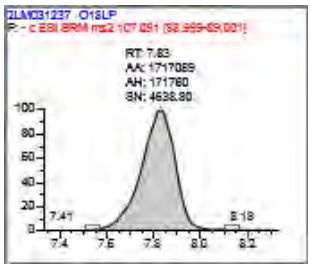
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031237	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 6:16:23 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	B1J1573-BS1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B3
Comments:	1:1 0012474		



m/z 89.000



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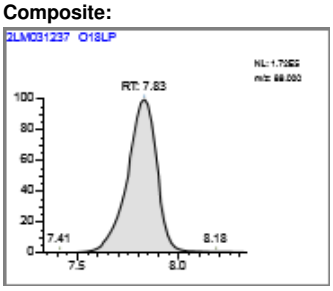
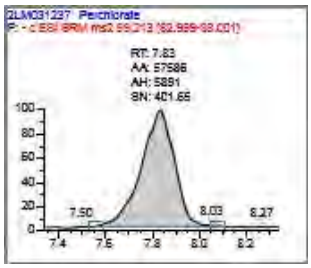


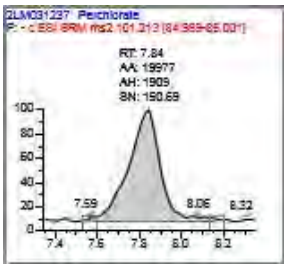
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.83	m/z 89.000	1717089	5.000		N/A

m/z 83.000



m/z 85.000



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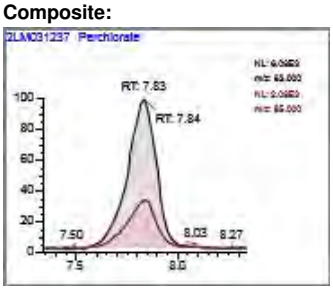


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.83	m/z 83.000	57586	0.206		N/A
7.84	m/z 85.000	19977		26.30 - 39.45	34.69

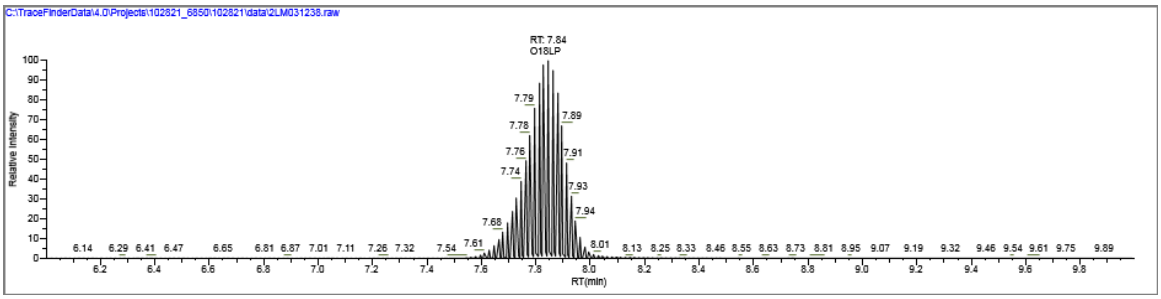
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B4	B1J1573-MRL1	2LM031238	N/A	LOQ (0.2ug/L)	10/28/2021 6:29:38 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.84	89	1782991			5.000	ug/L	5.000	ug/L	

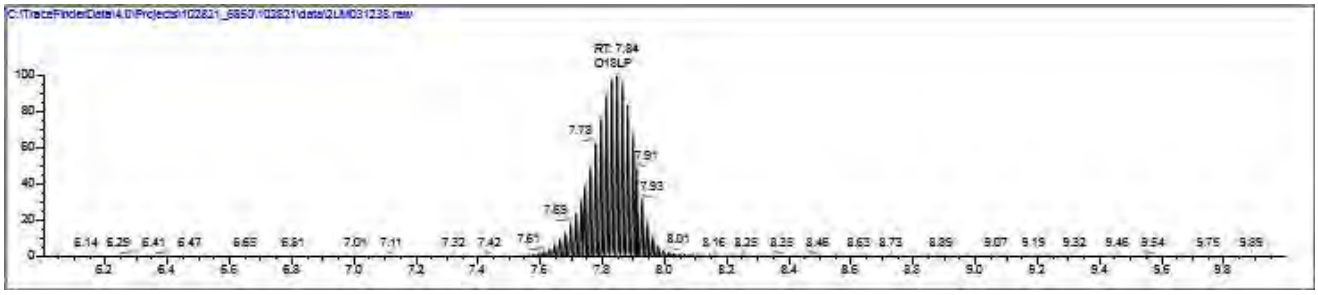
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.85	83	60164	Linear	0.034	0.208	ug/L	0.208	ug/L	

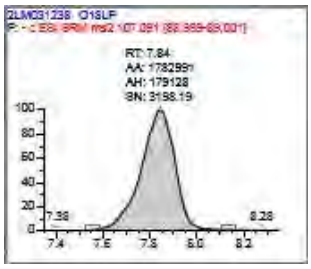
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031238	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 6:29:38 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	B1J1573-MRL1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B4
Comments:	1:01		



m/z 89.000



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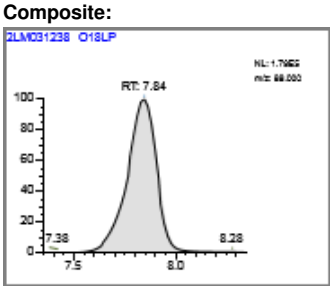
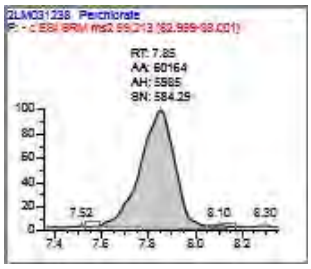


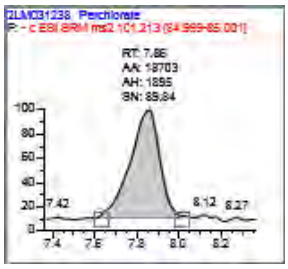
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.84	m/z 89.000	1782991	5.000		N/A

m/z 83.000



m/z 85.000



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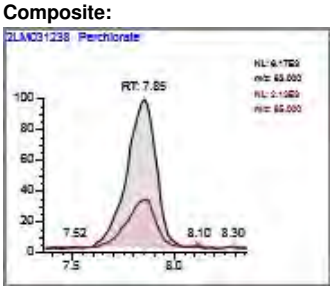

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.85	m/z 83.000	60164	0.208		N/A
7.86	m/z 85.000	18703		26.30 - 39.45	31.09

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

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Section D:
HPLC Organics
EPA 6850
Calibration Raw Data

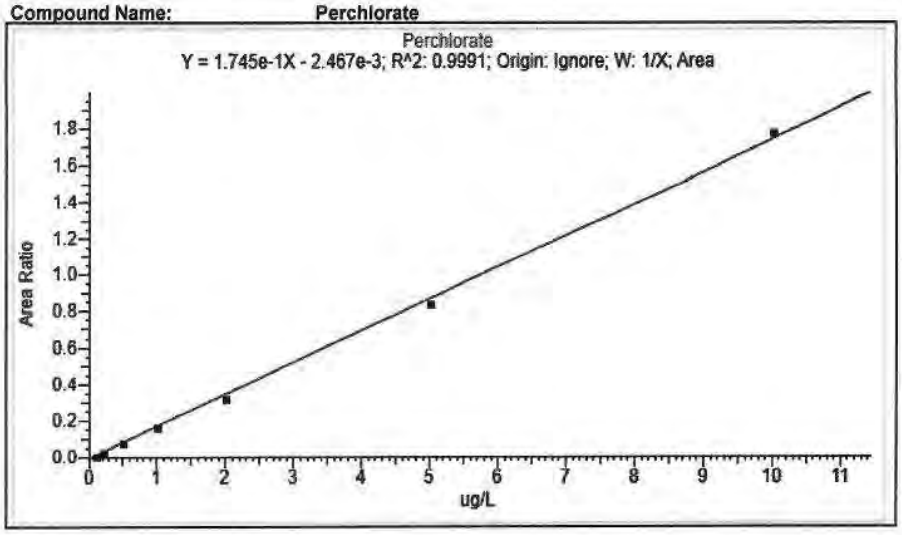
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Compound Calibration Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821.00

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Compound Name: **Perchlorate**



Linear
Pass

Level	Std Amount	Std Area	IS Amount	IS Area	Resp factor/ ratio	Calc Amount	Units	% CV	% RSD
1	0.1	26495	5	1661900	0.016	0.106	ug/L	N/A	N/A
2	0.2	55643	5	1670033	0.033	0.205	ug/L	N/A	N/A
3	0.5	141805	5	1708009	0.083	0.49	ug/L	N/A	N/A
4	1	295153	5	1730800	0.171	0.992	ug/L	N/A	N/A
5	2	563232	5	1711825	0.329	1.9	ug/L	N/A	N/A
6	5	1363180	5	1609989	0.847	4.867	ug/L	N/A	N/A
7	10	2528538	5	1417293	1.784	10.24	ug/L	N/A	N/A

Bordered cell = Manually integrated; Calibration flags: D=RSD; F=Response factor; R=R Squared; A=Amount.

Compound Calibration Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821.00

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A2	S1J0510-CAL1	2LM031224	1	CAL STD 1	10/28/2021 3:24:10 PM	1:1 0012469
R:A3	S1J0510-CAL2	2LM031225	2	CAL STD 2	10/28/2021 3:37:25 PM	1:1 0012468
R:A4	S1J0510-CAL3	2LM031226	3	CAL STD 3	10/28/2021 3:50:39 PM	1:1 0012467
R:A5	S1J0510-CAL4	2LM031227	4	CAL STD 4	10/28/2021 4:03:55 PM	1:1 0012466
R:A6	S1J0510-CAL5	2LM031228	5	CAL STD 5	10/28/2021 4:17:10 PM	1:1 0012465
R:A7	S1J0510-CAL6	2LM031229	6	CAL STD 6	10/28/2021 4:30:25 PM	1:1 0012464
R:A8	S1J0510-CAL7	2LM031230	7	CAL STD 7	10/28/2021 4:43:40 PM	1:1 0012463

Bordered cell = Manually Integrated; Calibration flags: D=RSD; F=Response factor; R=R Squared; A=Amount.

Data Review Report

Printed: 10/29/2021 11:28 am

Analysis	Analyte	CalResult	True Value	% D	% Rec
Lab ID: S1J0510-CAL1 Cal Standard					
6850 Perchlorate	Perchlorate	0.11	0.10000	5.52	105.52
6850 Perchlorate DOD	Perchlorate	0.11	0.10000	5.52	105.52
Lab ID: S1J0510-CAL2 Cal Standard					
6850 Perchlorate	Perchlorate	0.21	0.20000	2.56	102.56
6850 Perchlorate DOD	Perchlorate	0.21	0.20000	2.56	102.56
Lab ID: S1J0510-CAL3 Cal Standard					
6850 Perchlorate	Perchlorate	0.49	0.50000	-2.00	98.01
6850 Perchlorate DOD	Perchlorate	0.49	0.50000	-2.00	98.01
Lab ID: S1J0510-CAL4 Cal Standard					
6850 Perchlorate	Perchlorate	0.99	1.0000	-0.84	99.16
6850 Perchlorate DOD	Perchlorate	0.99	1.0000	-0.84	99.16
Lab ID: S1J0510-CAL5 Cal Standard					
6850 Perchlorate	Perchlorate	1.90	2.0000	-5.00	95.00
6850 Perchlorate DOD	Perchlorate	1.90	2.0000	-5.00	95.00
Lab ID: S1J0510-CAL6 Cal Standard					
6850 Perchlorate	Perchlorate	4.87	5.0000	-2.65	97.35
6850 Perchlorate DOD	Perchlorate	4.87	5.0000	-2.65	97.35
Lab ID: S1J0510-CAL7 Cal Standard					
6850 Perchlorate	Perchlorate	10.24	10.000	2.40	102.40
6850 Perchlorate DOD	Perchlorate	10.24	10.000	2.40	102.40

MICROBAC®

Section E:
HPLC Organics
EPA 6850
Sequence QC Sample Raw Data

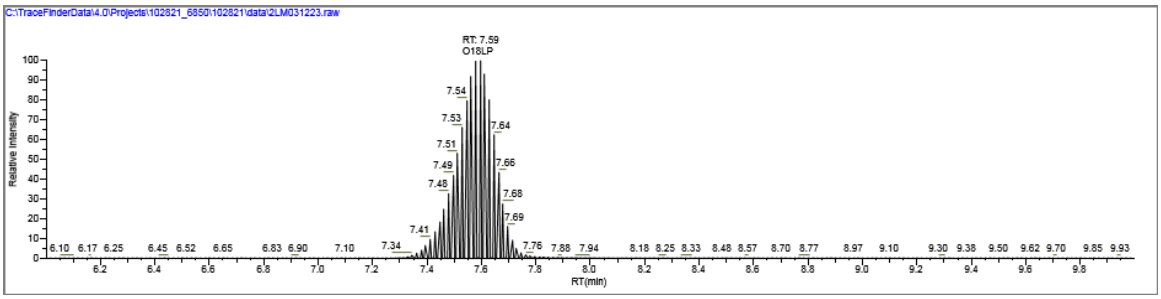
Microbac Laboratories, Inc.
158 Starlite Drive | Marietta, OH 45750 | 800.373.4071 | www.microbac.com

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0510-ICB1	2LM031223	N/A	CCB	10/28/2021 3:10:56 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.59	89	1680592			5.000	ug/L	5.000	ug/L	

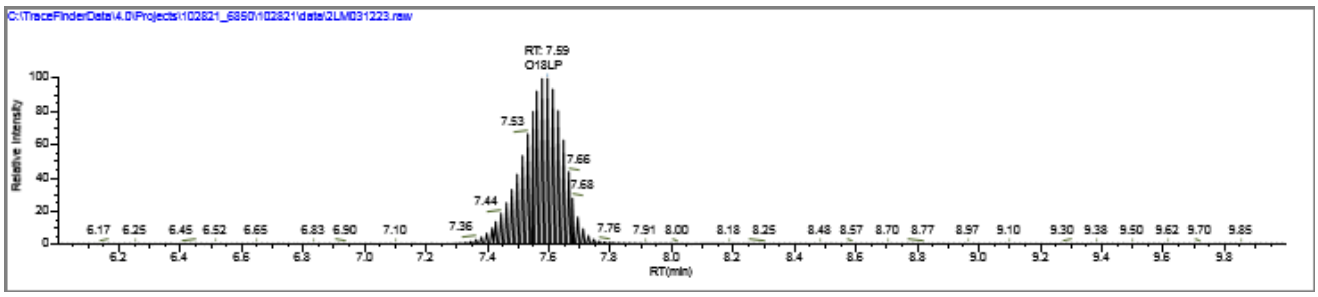
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.6	83	3111	Linear	0.002	0.025	ug/L	0.025	ug/L	

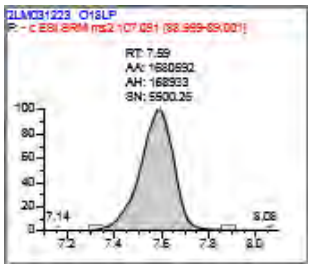
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031223	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 3:10:56 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-ICB1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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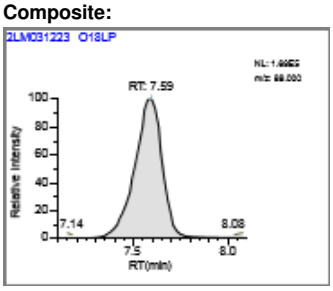
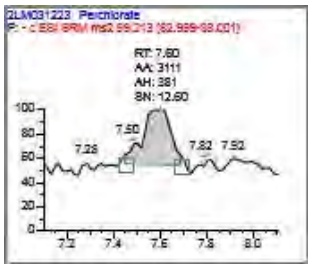


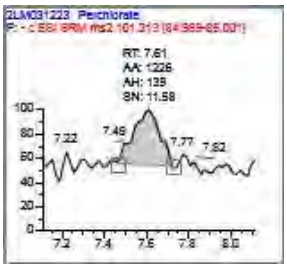
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.59	m/z 89.000	1680592	5.000		N/A

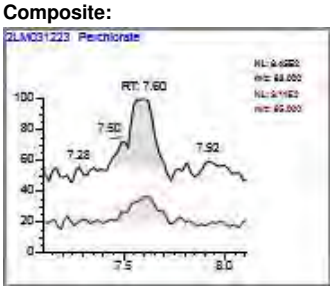
m/z 83.000



m/z 85.000



Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.60	m/z 83.000	3111	0.025		N/A
7.61	m/z 85.000	1226		26.30 - 39.45	39.41

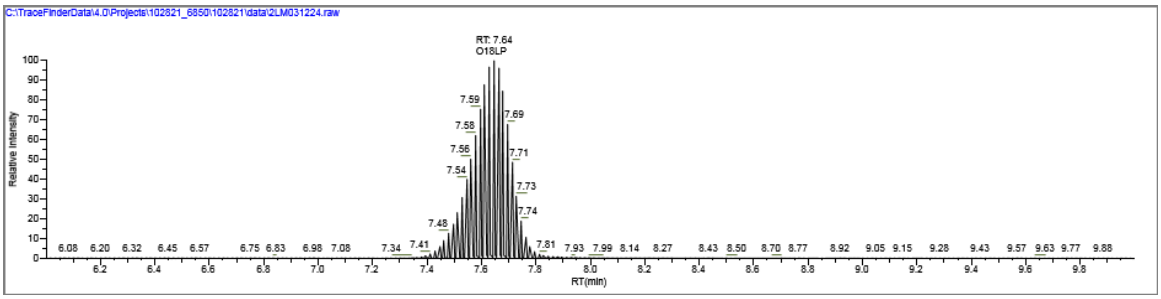
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A2	S1J0510-CAL1	2LM031224	1	CAL STD 1	10/28/2021 3:24:10 PM	1:1 0012469



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.64	89	1661900			5.000	ug/L	5.000	ug/L	

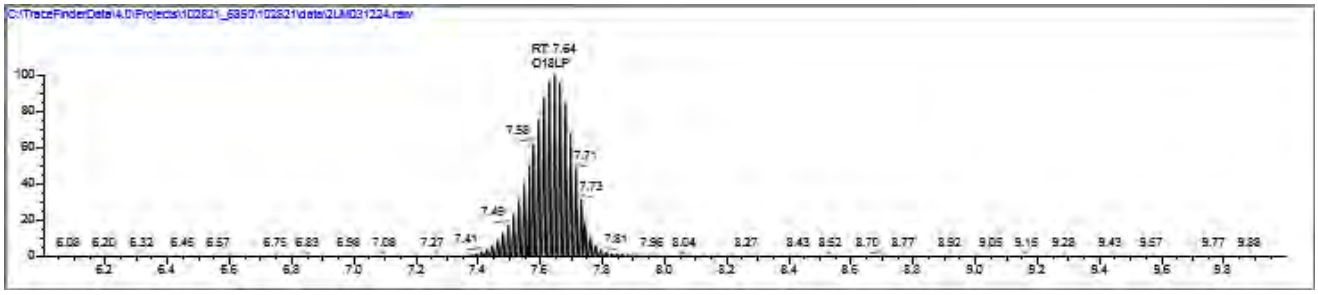
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.63	83	26495	Linear	0.016	0.106	ug/L	0.106	ug/L	

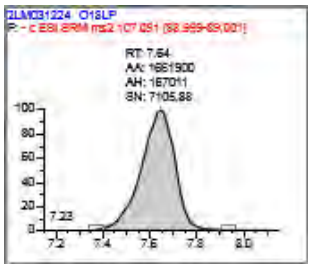
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031224	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 3:24:10 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CAL1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A2
Comments:	1:1 0012469		



m/z 89.000



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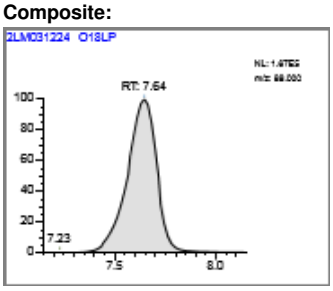
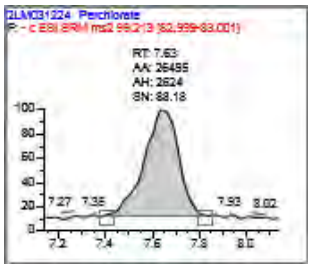


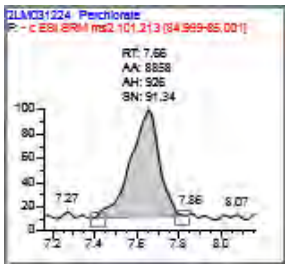
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.64	m/z 89.000	1661900	5.000		N/A

m/z 83.000



m/z 85.000



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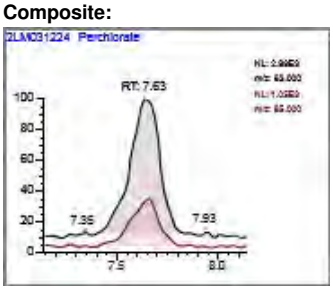


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.100	0.080 - 2.100	
7.63	m/z 83.000	26495	0.106		N/A
7.66	m/z 85.000	8858		26.30 - 39.45	33.43

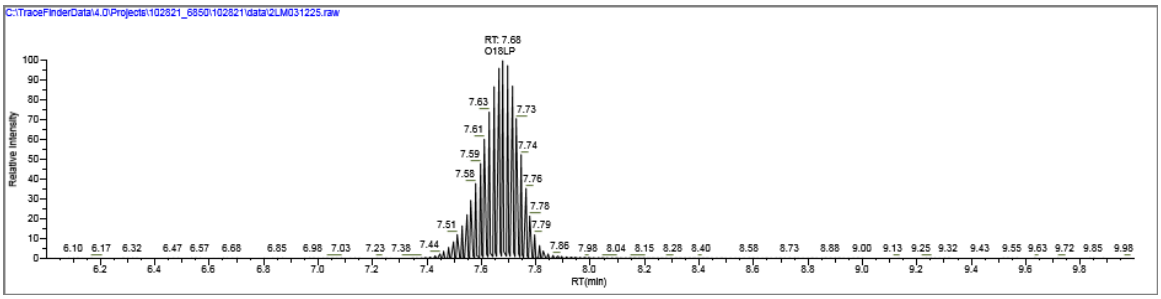
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0510-CAL2	2LM031225	2	CAL STD 2	10/28/2021 3:37:25 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.68	89	1670033			5.000	ug/L	5.000	ug/L	

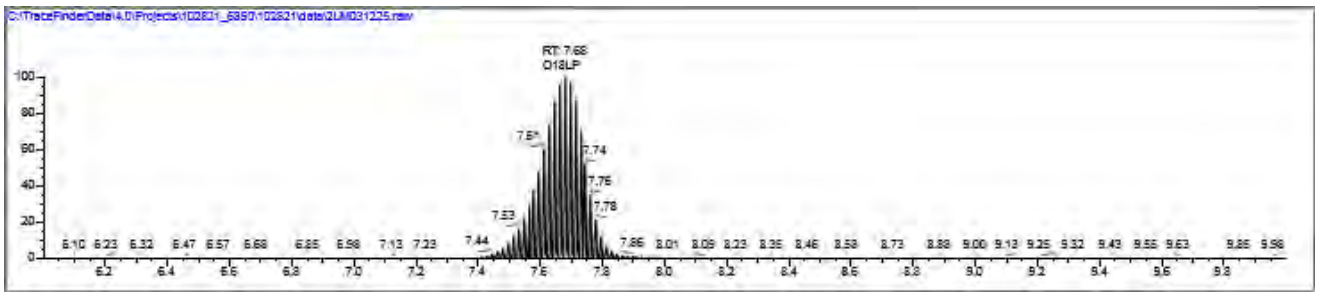
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.68	83	55643	Linear	0.033	0.205	ug/L	0.205	ug/L	

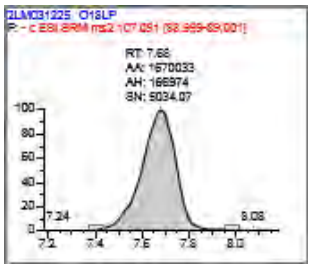
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031225	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 3:37:25 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CAL2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 89.000



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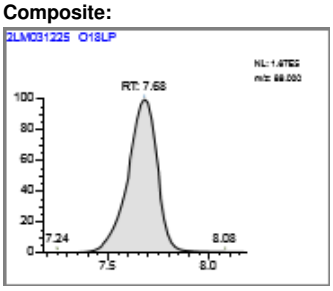
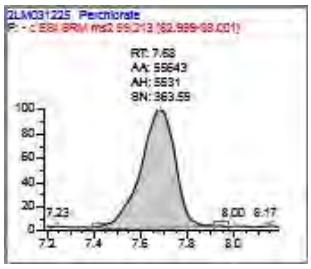


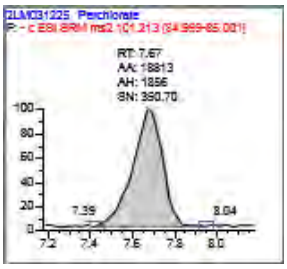
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.68	m/z 89.000	1670033	5.000		N/A

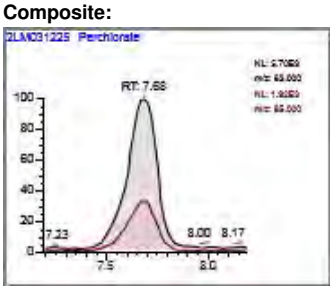
m/z 83.000



m/z 85.000



Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.200	0.160 - 4.200	
7.68	m/z 83.000	55643	0.205		N/A
7.67	m/z 85.000	18813		26.30 - 39.45	33.81

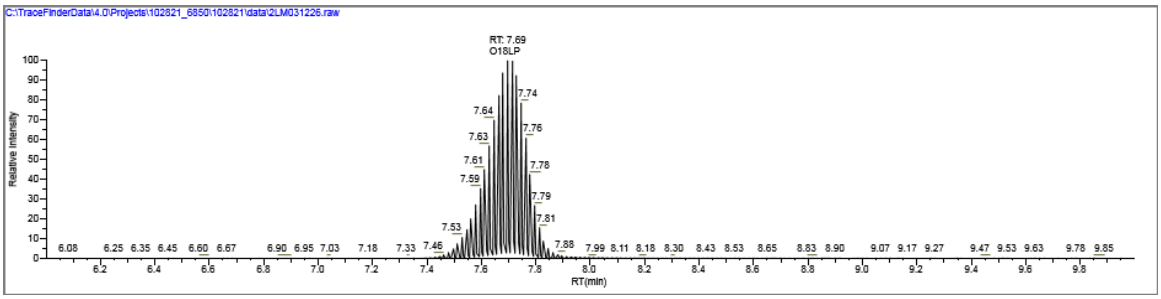
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A4	S1J0510-CAL3	2LM031226	3	CAL STD 3	10/28/2021 3:50:39 PM	1:1 0012467



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.69	89	1708009			5.000	ug/L	5.000	ug/L	

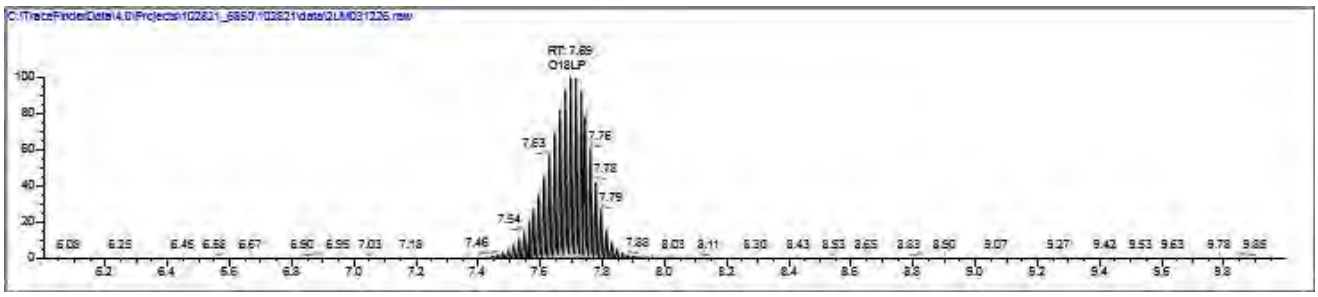
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.72	83	141805	Linear	0.083	0.49	ug/L	0.49	ug/L	

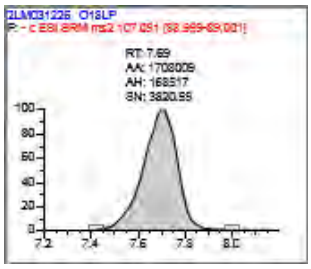
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031226	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 3:50:39 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CAL3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A4
Comments:	1:1 0012467		



m/z 89.000



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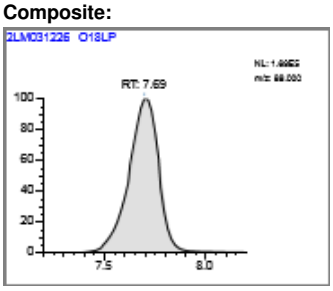
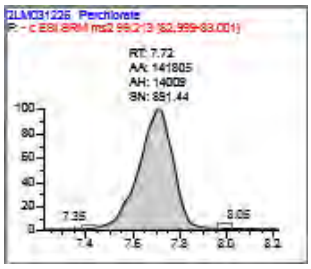


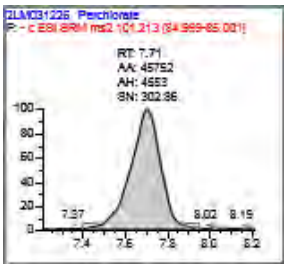
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.69	m/z 89.000	1708009	5.000		N/A

m/z 83.000



m/z 85.000



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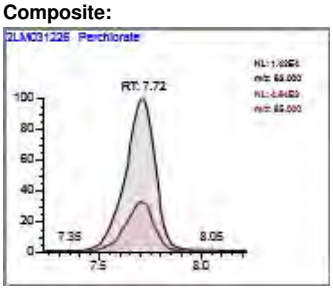


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 0.500	0.400 - 10.500	
7.72	m/z 83.000	141805	0.490		N/A
7.71	m/z 85.000	45752		26.30 - 39.45	32.26

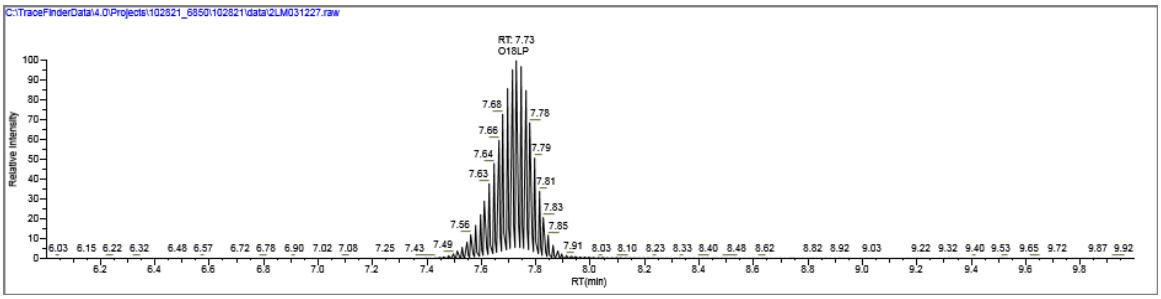
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0510-CAL4	2LM031227	4	CAL STD 4	10/28/2021 4:03:55 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.73	89	1730800			5.000	ug/L	5.000	ug/L	

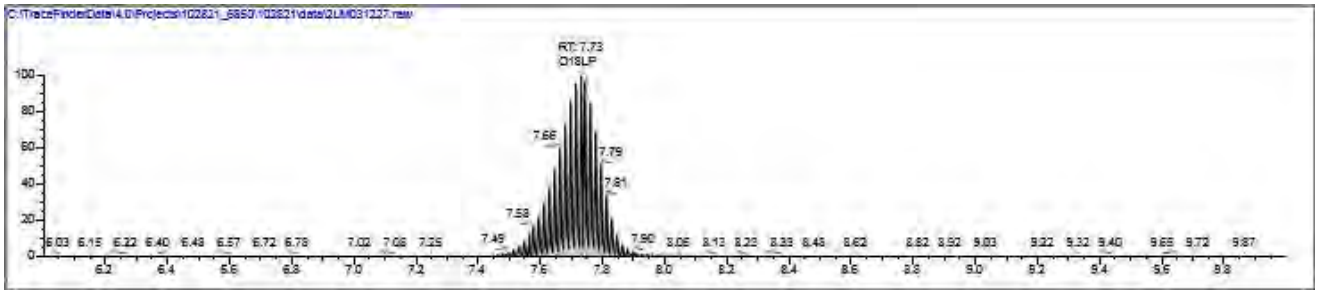
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.73	83	295153	Linear	0.171	0.992	ug/L	0.992	ug/L	

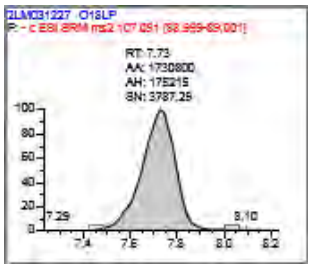
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031227	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 4:03:55 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CAL4	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



m/z 89.000



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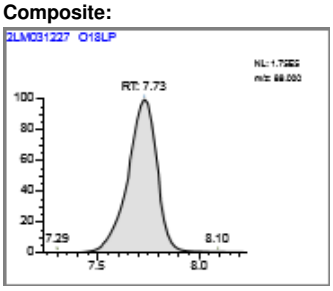
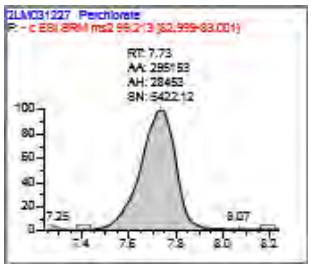


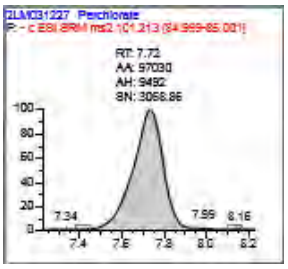
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.73	m/z 89.000	1730800	5.000		N/A

m/z 83.000



m/z 85.000



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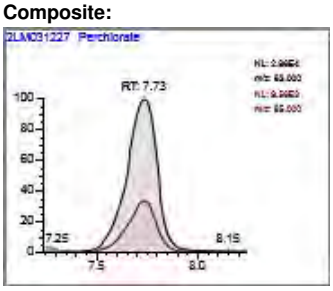


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 1.000	0.800 - 21.000	
7.73	m/z 83.000	295153	0.992		N/A
7.72	m/z 85.000	97030		26.30 - 39.45	32.87

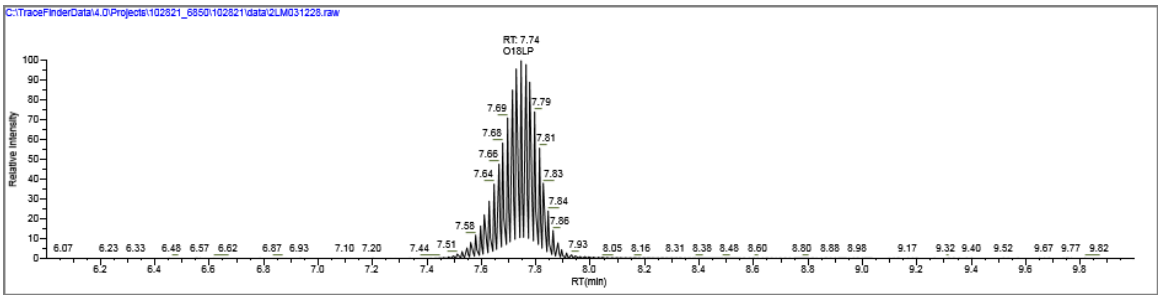
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A6	S1J0510-CAL5	2LM031228	5	CAL STD 5	10/28/2021 4:17:10 PM	1:1 0012465



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.74	89	1711825			5.000	ug/L	5.000	ug/L	

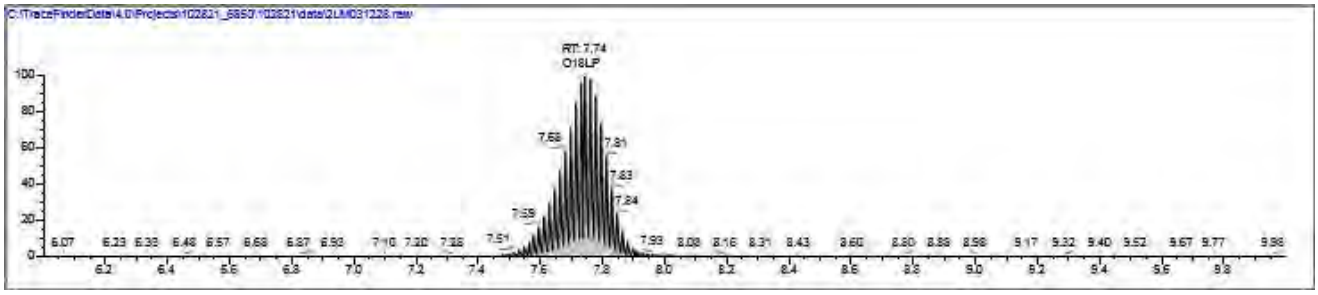
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.75	83	563232	Linear	0.329	1.9	ug/L	1.9	ug/L	

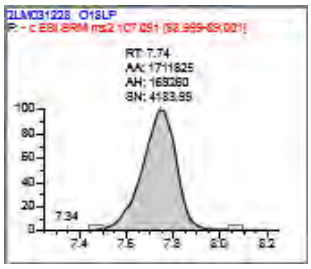
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031228	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 4:17:10 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CAL5	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A6
Comments:	1:1 0012465		



m/z 89.000



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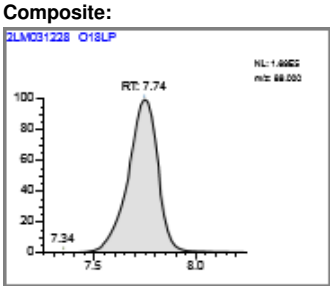
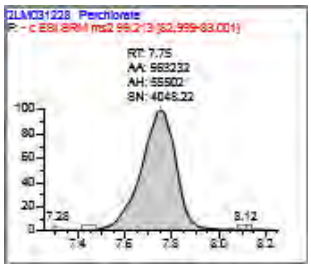


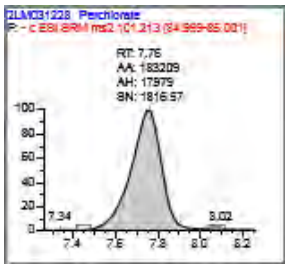
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.74	m/z 89.000	1711825	5.000		N/A

m/z 83.000



m/z 85.000



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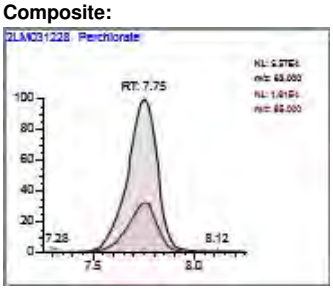

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 2.000	1.600 - 42.000	
7.75	m/z 83.000	563232	1.900		N/A
7.76	m/z 85.000	183209		26.30 - 39.45	32.53

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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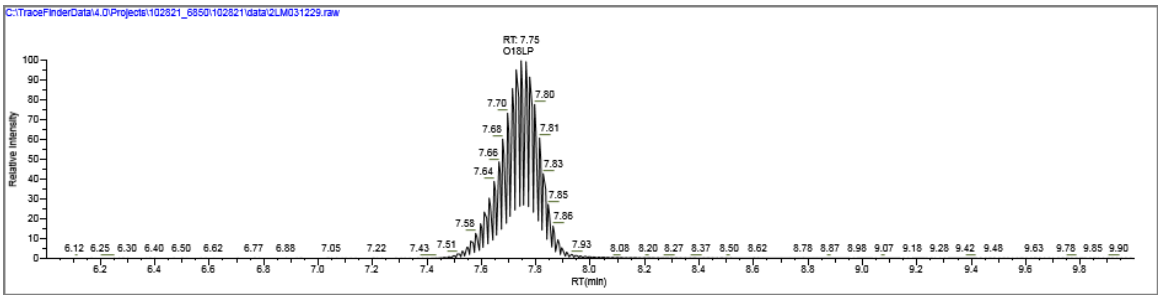


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.75	89	1609989			5.000	ug/L	5.000	ug/L	

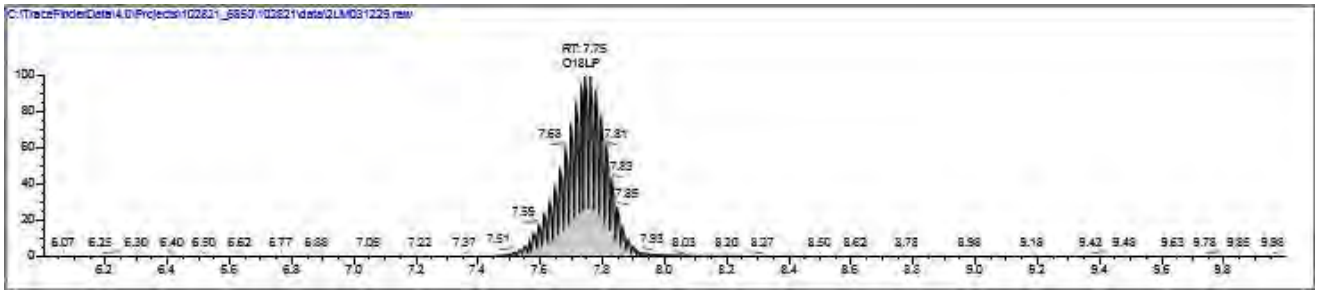
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.75	83	1363180	Linear	0.847	4.867	ug/L	4.867	ug/L	

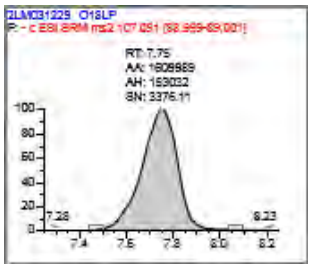
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031229	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 4:30:25 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CAL6	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A7
Comments:	1:1 0012464		



m/z 89.000



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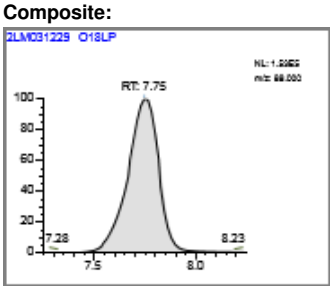
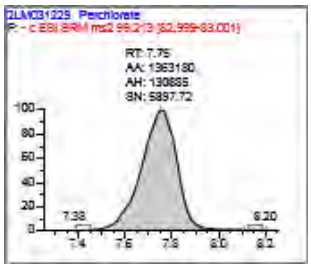


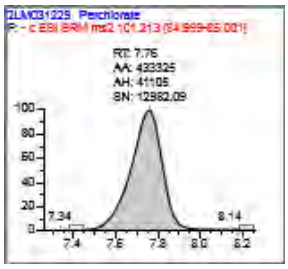
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.75	m/z 89.000	1609989	5.000		N/A

m/z 83.000



m/z 85.000



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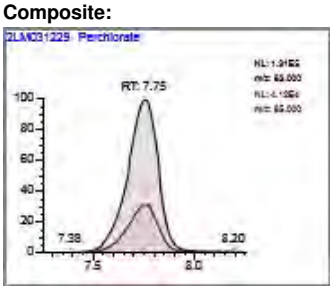

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 5.000	4.000 - 105.000	
7.75	m/z 83.000	1363180	4.867		N/A
7.76	m/z 85.000	433325		26.30 - 39.45	31.79

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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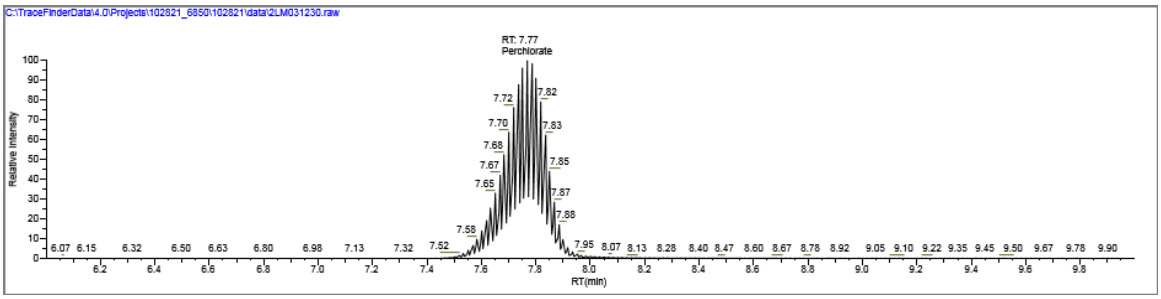


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.76	89	1417293			5.000	ug/L	5.000	ug/L	

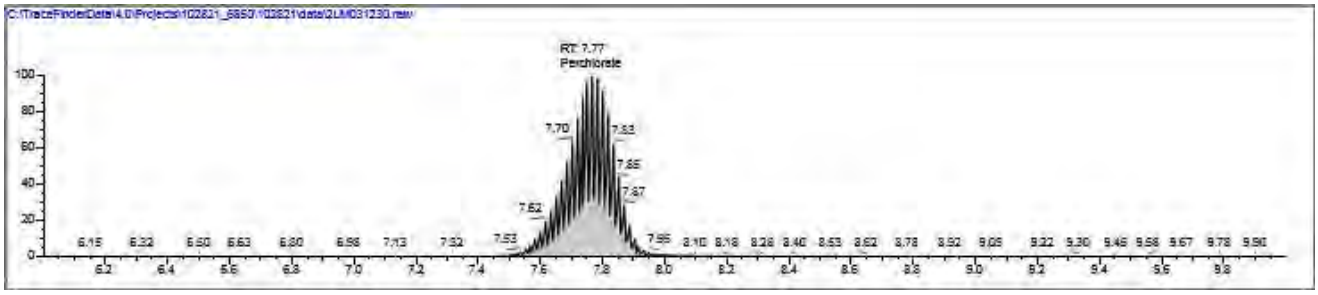
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.77	83	2528538	Linear	1.784	10.24	ug/L	10.24	ug/L	

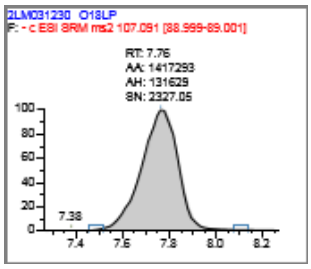
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031230	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 4:43:40 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CAL7	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A8
Comments:	1:1 0012463		



m/z 89.000



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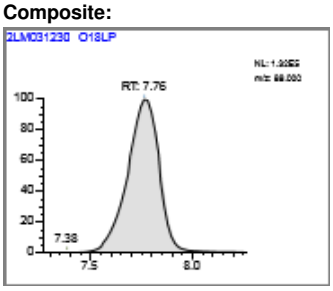
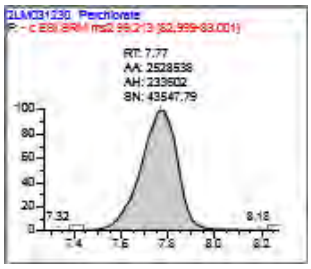


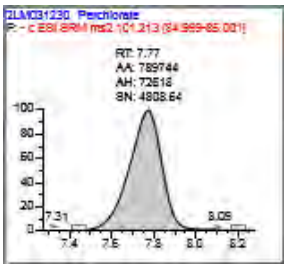
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.76	m/z 89.000	1417293	5.000		N/A

m/z 83.000



m/z 85.000



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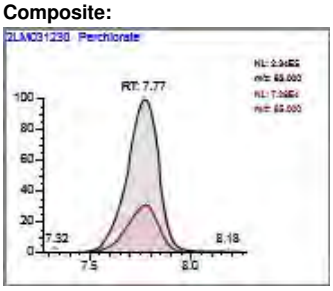


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			Cal: 10.000	8.000 - 210.000	
7.77	m/z 83.000	2528538	10.240		N/A
7.77	m/z 85.000	789744		26.30 - 39.45	31.23

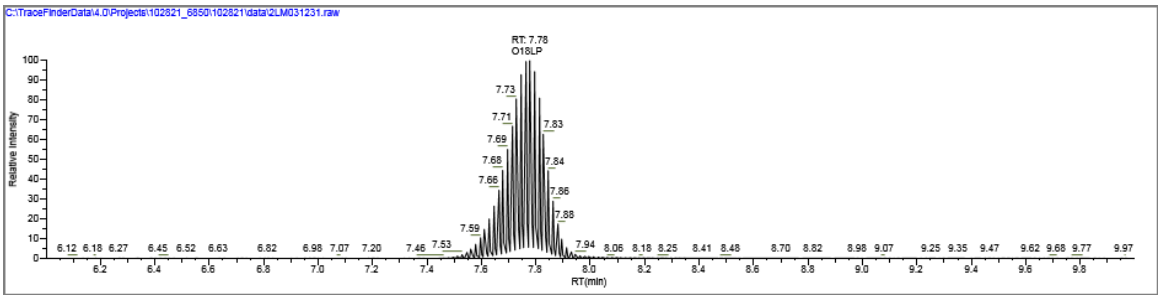
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A9	S1J0510-ICV1	2LM031231	ICV	ICV	10/28/2021 4:56:55 PM	1:1 0012475



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.78	89	1674312			5.000	ug/L	5.000	ug/L	

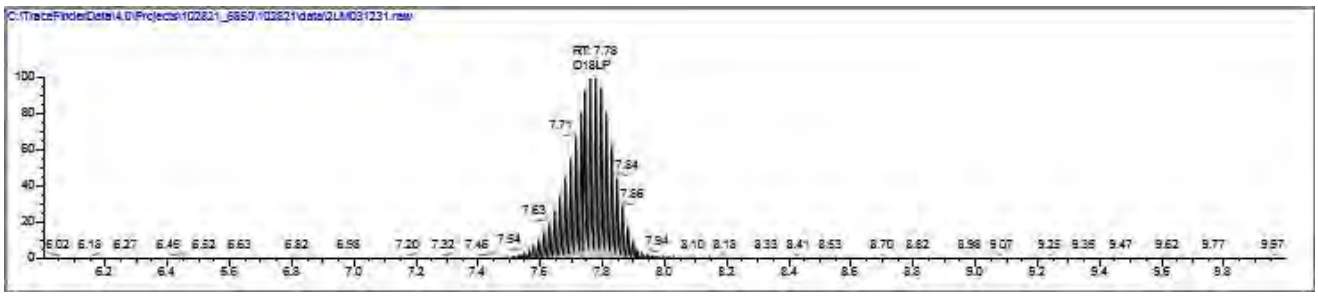
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.77	83	285048	Linear	0.170	0.99	ug/L	0.99	ug/L	

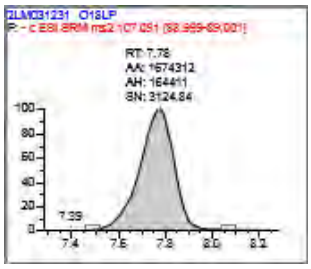
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031231	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 4:56:55 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-ICV1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A9
Comments:	1:1 0012475		



m/z 89.000



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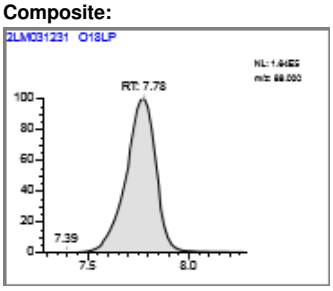
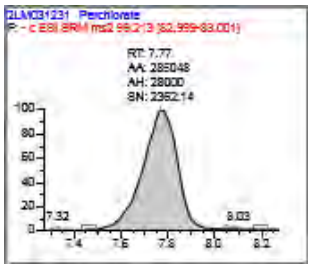


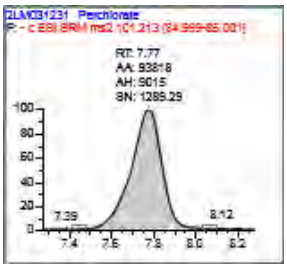
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.78	m/z 89.000	1674312	5.000		N/A

m/z 83.000



m/z 85.000



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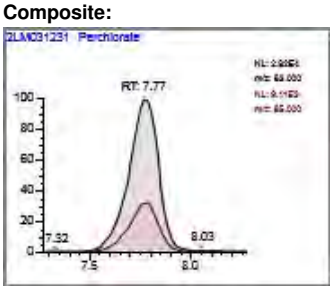


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.77	m/z 83.000	285048	0.990		N/A
7.77	m/z 85.000	93818		26.30 - 39.45	32.91

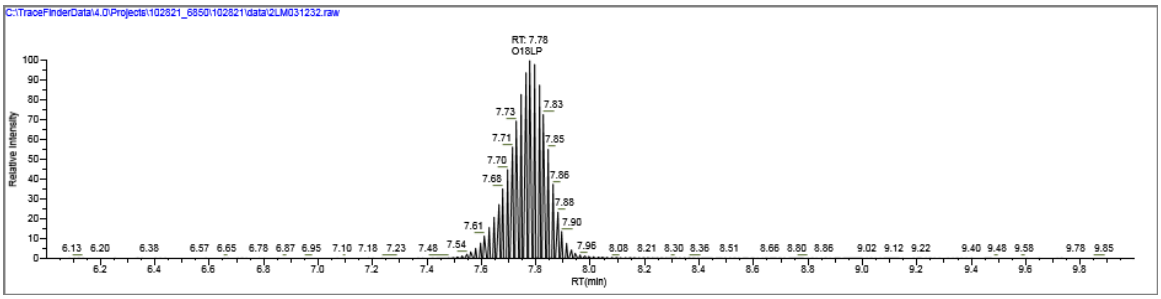
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0510-CCB1	2LM031232	N/A	CCB	10/28/2021 5:10:09 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.78	89	1742679			5.000	ug/L	5.000	ug/L	

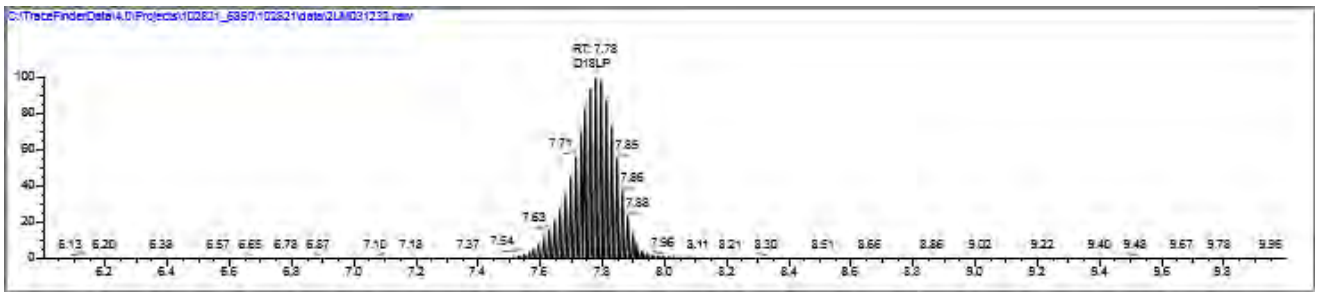
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.78	83	4617	Linear	0.003	0.029	ug/L	0.029	ug/L	

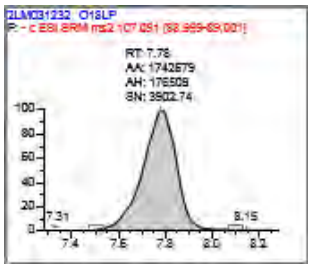
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031232	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 5:10:09 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCB1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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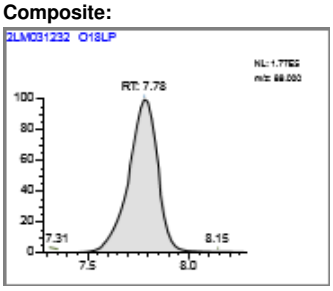
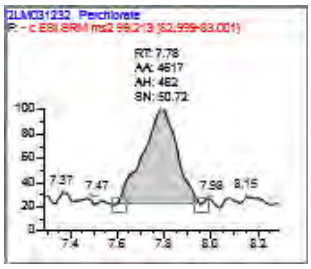


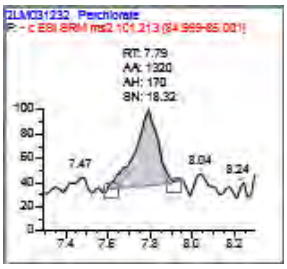
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.78	m/z 89.000	1742679	5.000		N/A

m/z 83.000



m/z 85.000



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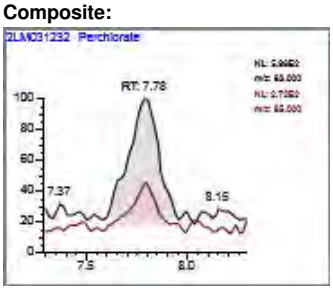

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.78	m/z 83.000	4617	0.029		N/A
7.79	m/z 85.000	1320		26.30 - 39.45	28.59

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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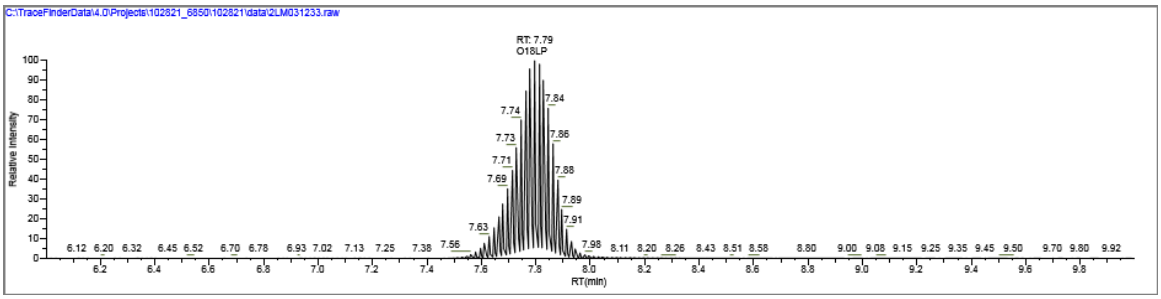


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.79	89	1651234			5.000	ug/L	5.000	ug/L	

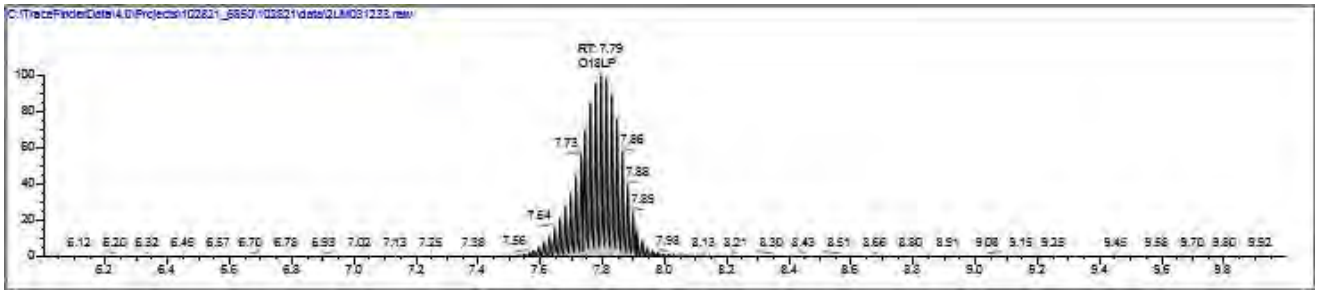
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.8	83	271003	Linear	0.164	0.955	ug/L	0.955	ug/L	

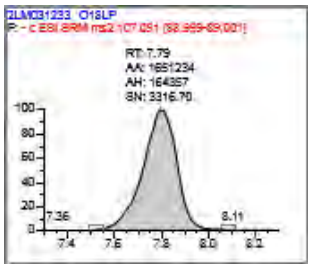
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031233	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 5:23:24 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCV1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



m/z 89.000



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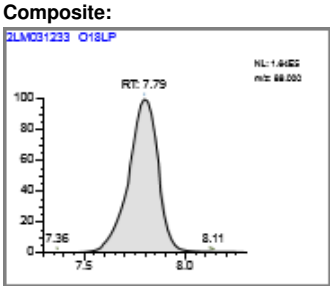
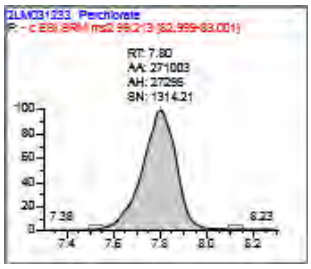


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.79	m/z 89.000	1651234	5.000		N/A

m/z 83.000



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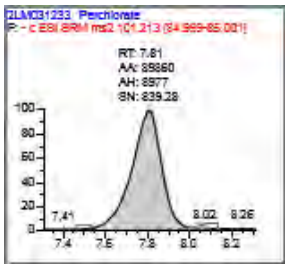

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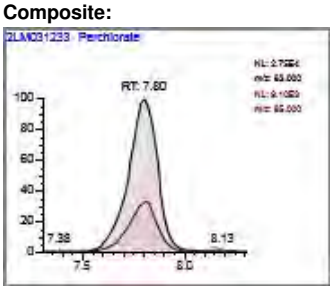

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.80	m/z 83.000	271003	0.955		N/A
7.81	m/z 85.000	89860		26.30 - 39.45	33.16

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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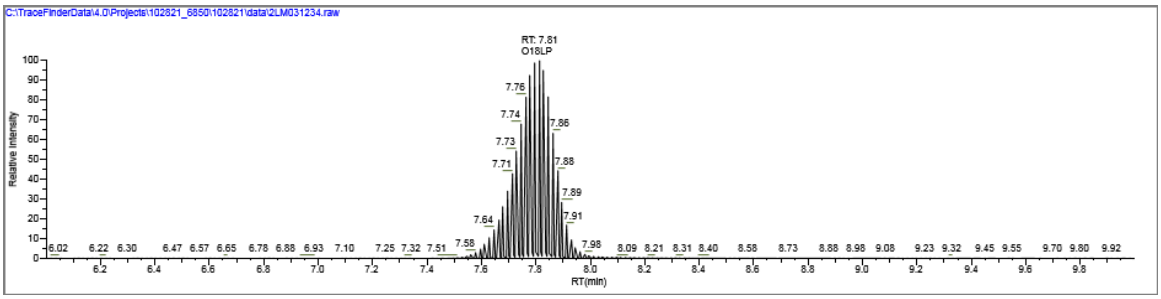


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.81	89	1672014			5.000	ug/L	5.000	ug/L	

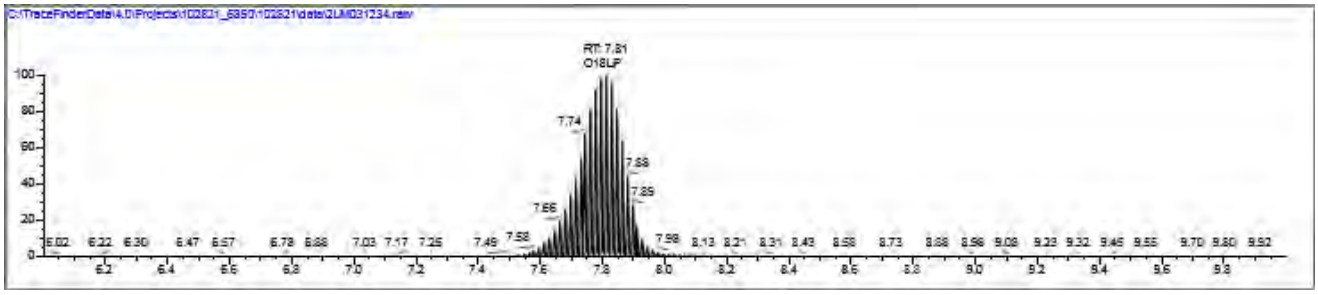
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.82	83	54161	Linear	0.032	0.2	ug/L	0.2	ug/L	

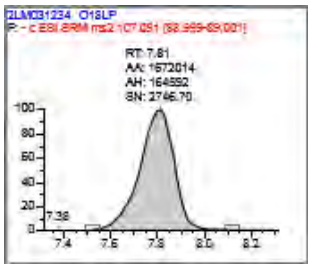
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031234	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 5:36:39 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CRL1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 89.000



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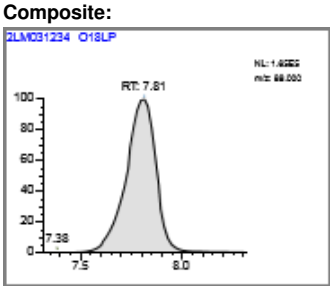
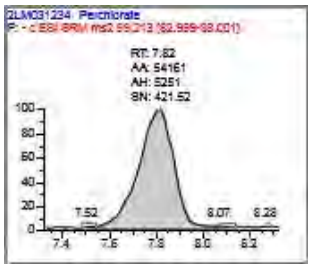


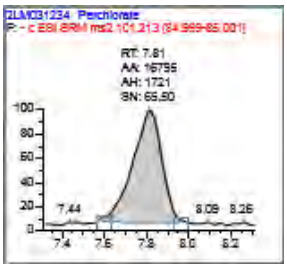
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.81	m/z 89.000	1672014	5.000		N/A

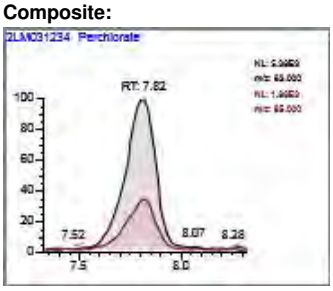
m/z 83.000



m/z 85.000



Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.82	m/z 83.000	54161	0.200		N/A
7.81	m/z 85.000	16795		26.30 - 39.45	31.01

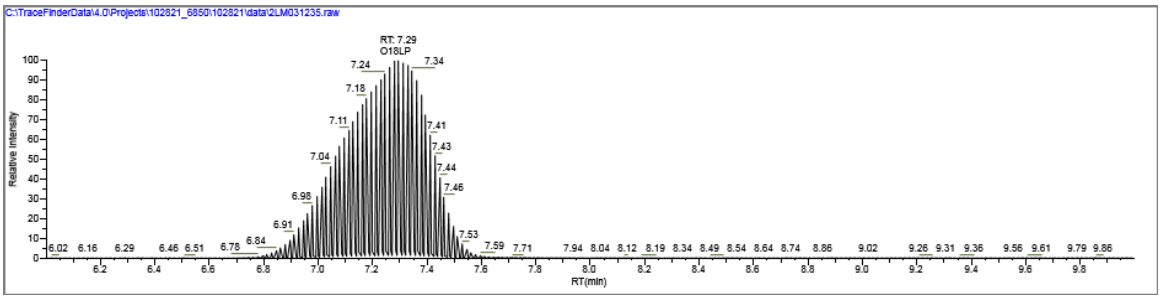
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:B1	S1J0510-IFA1	2LM031235	N/A	MCT 0.2 ug/L	10/28/2021 5:49:54 PM	1:1 0012477



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.29	89	1633945			5.000	ug/L	5.000	ug/L	

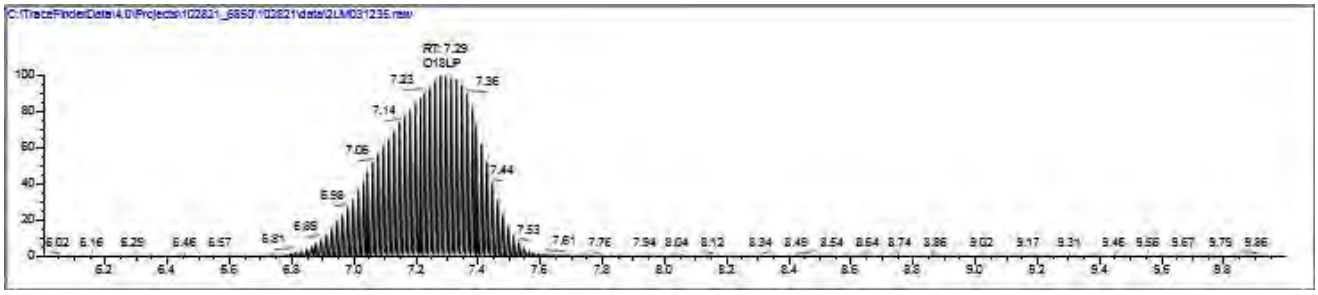
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.3	83	61825	Linear	0.038	0.231	ug/L	0.231	ug/L	

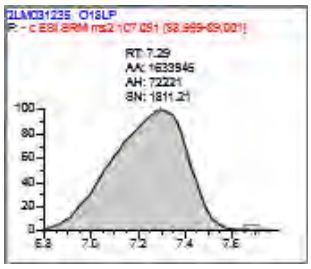
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031235	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 5:49:54 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-IFA1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:B1
Comments:	1:1 0012477		



m/z 89.000



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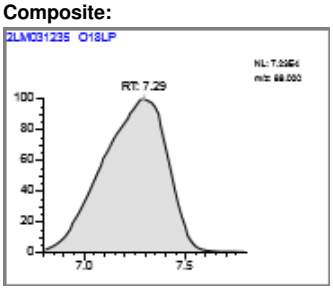
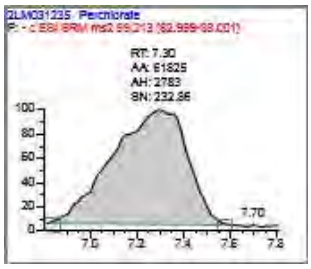


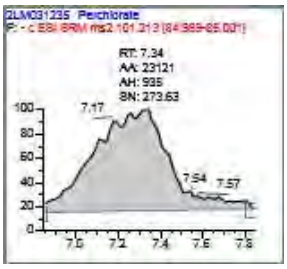
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.29	m/z 89.000	1633945	5.000		N/A

m/z 83.000



m/z 85.000



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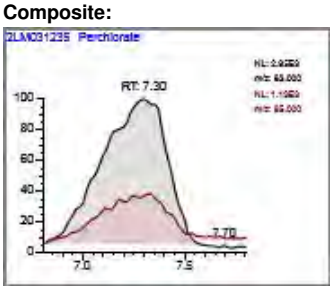


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.30	m/z 83.000	61825	0.231		N/A
7.34	m/z 85.000	23121		26.30 - 39.45	37.4

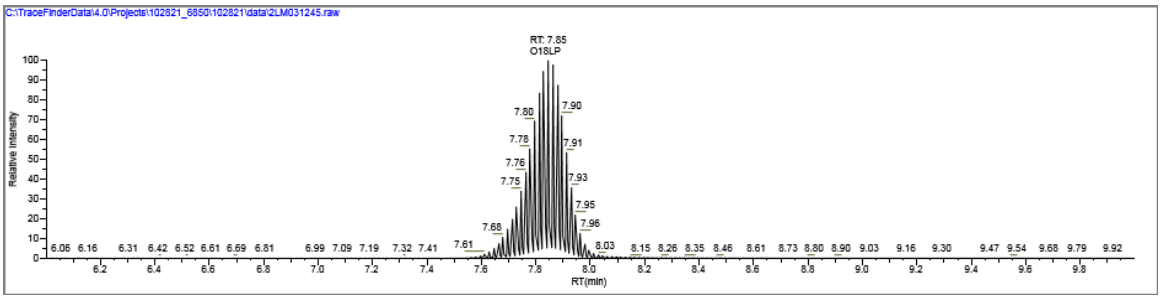
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0510-CCV2	2LM031245	CCV	CCV 1.0 ug/L	10/28/2021 8:02:23 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.85	89	1739535			5.000	ug/L	5.000	ug/L	

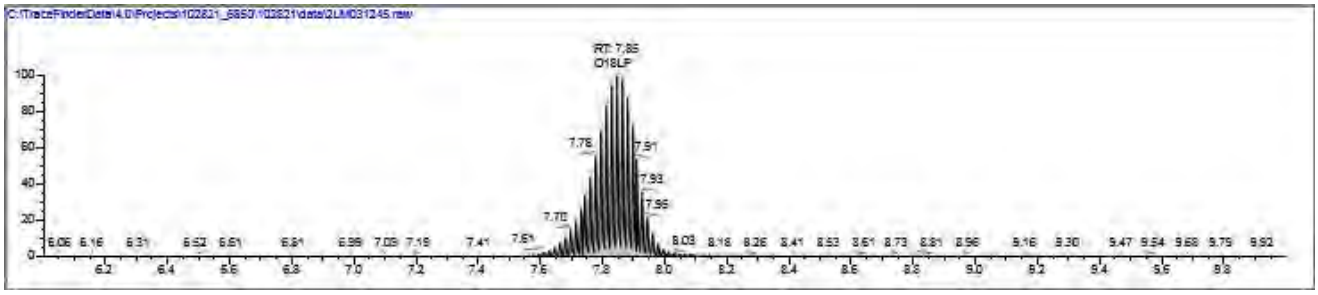
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.85	83	284572	Linear	0.164	0.952	ug/L	0.952	ug/L	

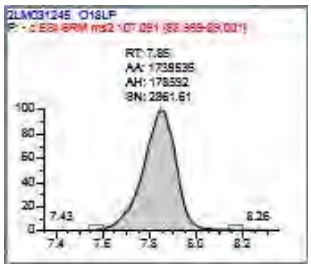
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031245	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 8:02:23 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCV2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



m/z 89.000



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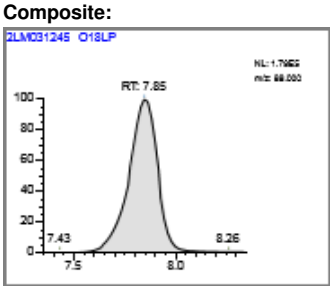
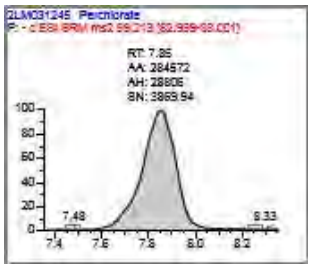


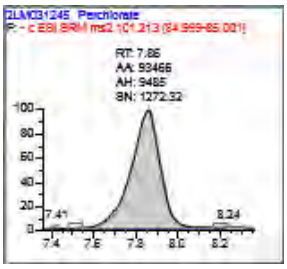
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.85	m/z 89.000	1739535	5.000		N/A

m/z 83.000



m/z 85.000



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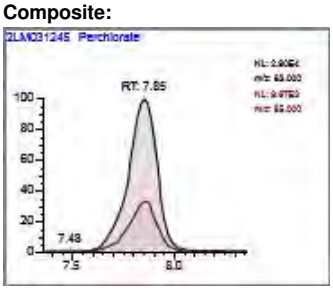


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.85	m/z 83.000	284572	0.952		N/A
7.86	m/z 85.000	93466		26.30 - 39.45	32.84

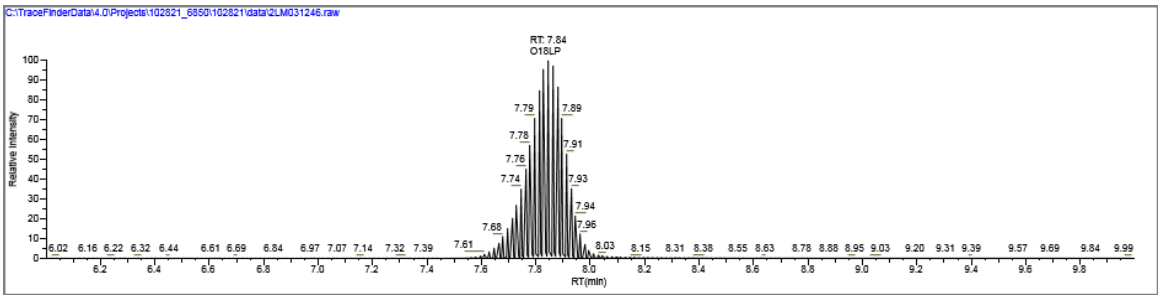
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0510-CRL2	2LM031246	QCMRL	QCMRL 0.2 ug/L	10/28/2021 8:15:38 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.84	89	1701939			5.000	ug/L	5.000	ug/L	

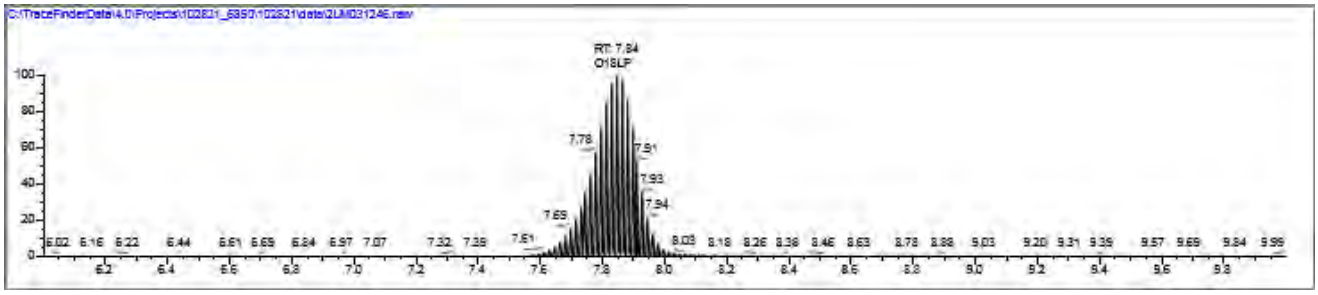
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.85	83	55330	Linear	0.033	0.2	ug/L	0.2	ug/L	

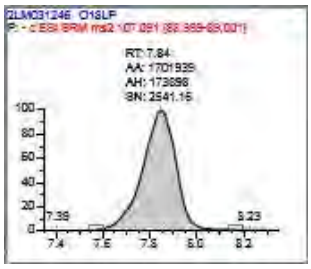
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031246	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 8:15:38 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CRL2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 89.000



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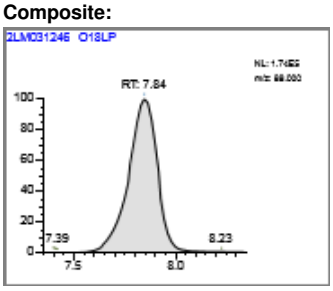
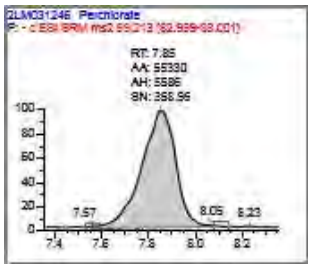


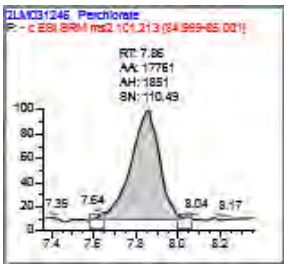
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.84	m/z 89.000	1701939	5.000		N/A

m/z 83.000



m/z 85.000



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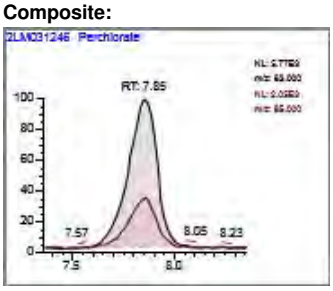

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.85	m/z 83.000	55330	0.200		N/A
7.86	m/z 85.000	17761		26.30 - 39.45	32.1

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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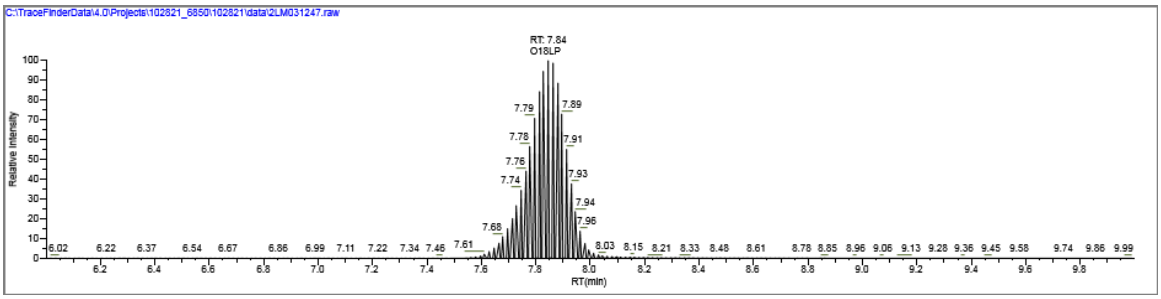


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.84	89	1766918			5.000	ug/L	5.000	ug/L	

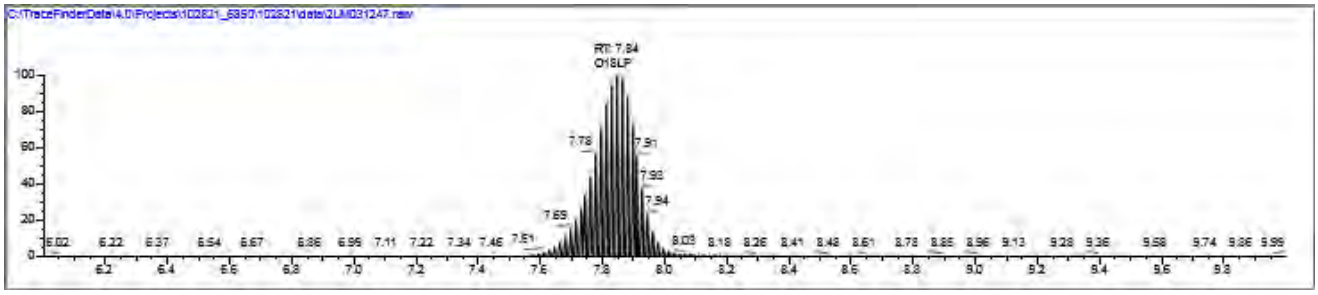
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.83	83	3895	Linear	0.002	0.027	ug/L	0.027	ug/L	

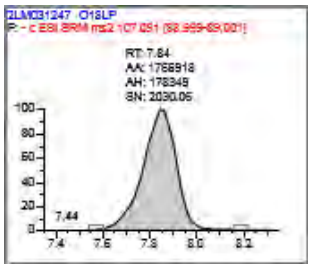
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031247	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 8:28:52 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCB2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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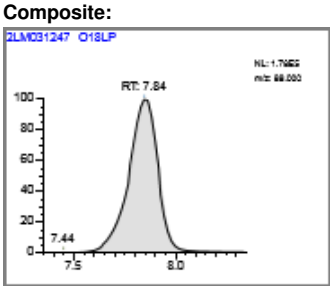
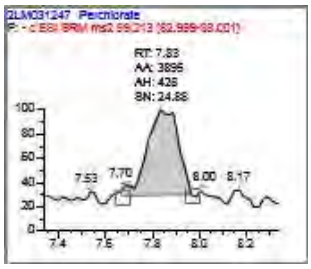


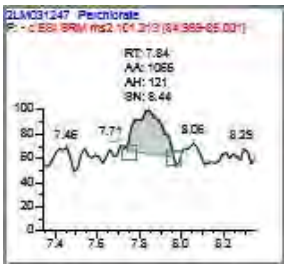
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.84	m/z 89.000	1766918	5.000		N/A

m/z 83.000



m/z 85.000



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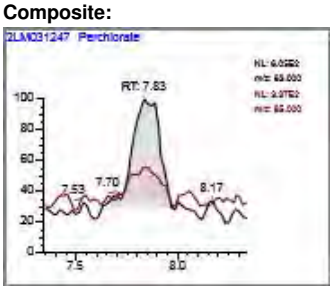


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.83	m/z 83.000	3895	0.027		N/A
7.84	m/z 85.000	1066		26.30 - 39.45	27.37

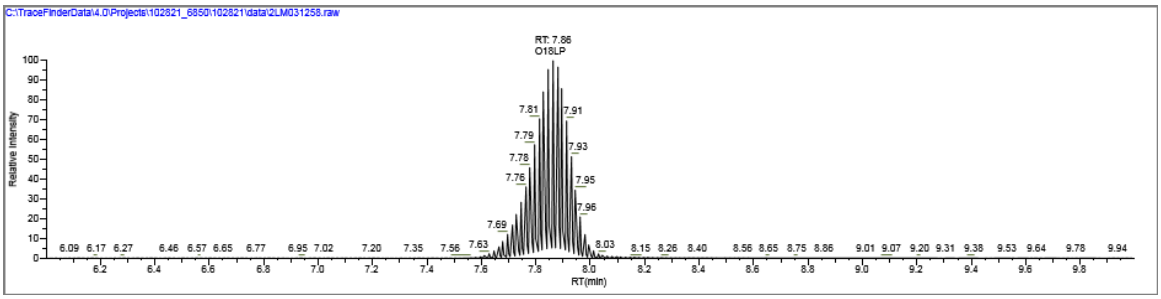
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0510-CCV3	2LM031258	CCV	CCV 1.0 ug/L	10/28/2021 10:54:39 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.86	89	1623988			5.000	ug/L	5.000	ug/L	

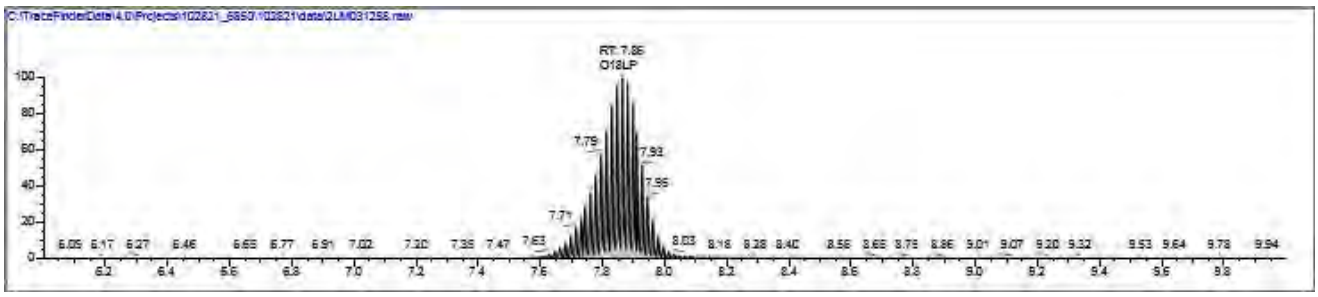
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.87	83	262915	Linear	0.162	0.942	ug/L	0.942	ug/L	

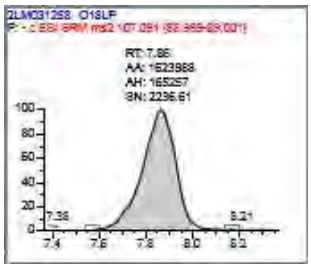
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031258	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 10:54:39 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCV3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



m/z 89.000



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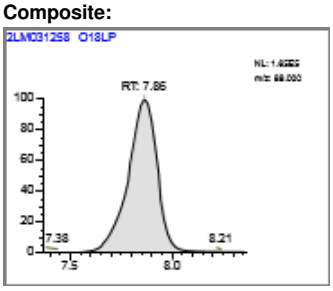
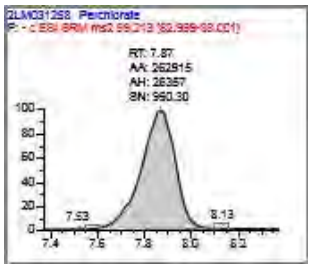


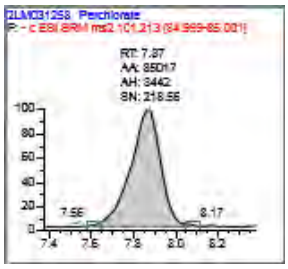
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.86	m/z 89.000	1623988	5.000		N/A

m/z 83.000



m/z 85.000



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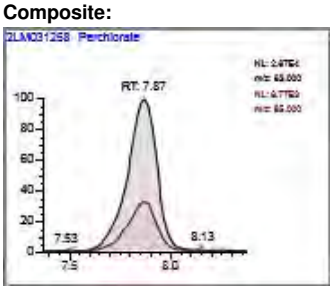


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.87	m/z 83.000	262915	0.942		N/A
7.87	m/z 85.000	85017		26.30 - 39.45	32.34

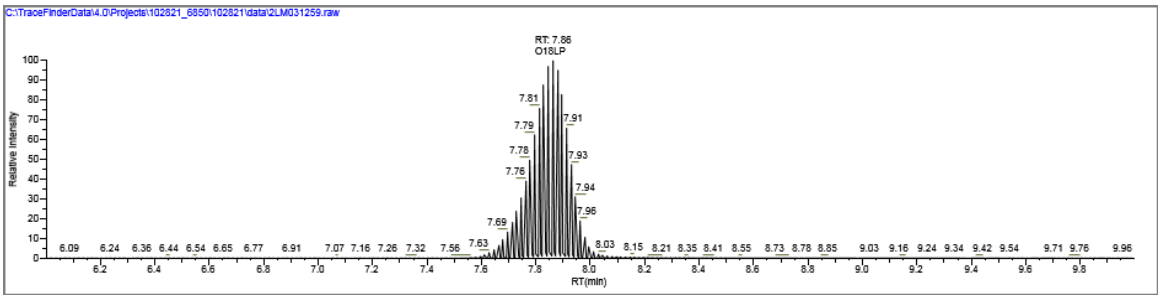
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0510-CRL3	2LM031259	QCMRL	QCMRL 0.2 ug/L	10/28/2021 11:07:53 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.86	89	1575526			5.000	ug/L	5.000	ug/L	

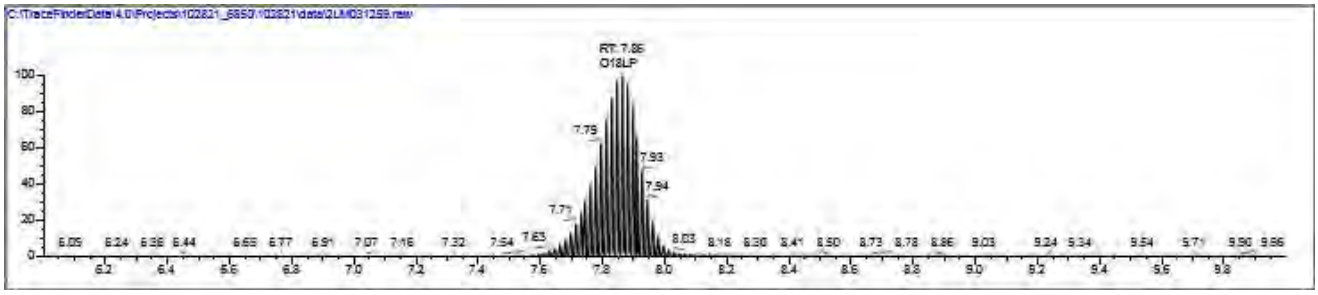
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.87	83	50485	Linear	0.032	0.198	ug/L	0.198	ug/L	

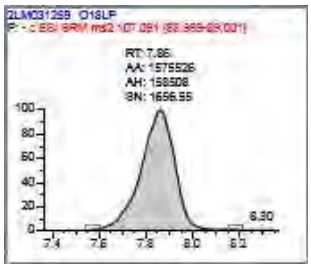
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031259	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 11:07:53 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CRL3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 89.000



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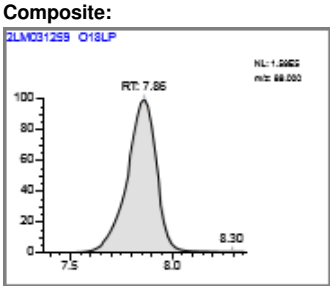
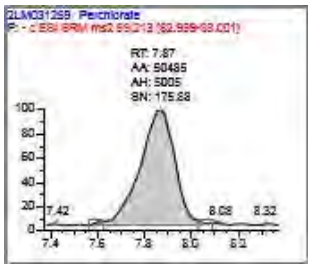


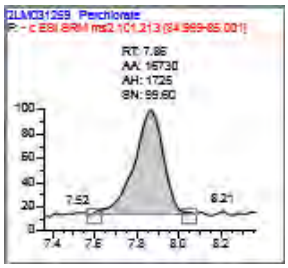
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.86	m/z 89.000	1575526	5.000		N/A

m/z 83.000



m/z 85.000



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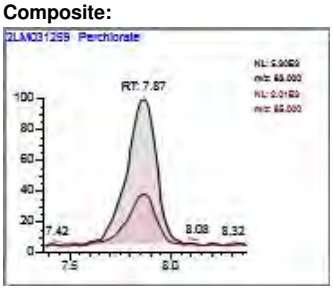


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.87	m/z 83.000	50485	0.198		N/A
7.86	m/z 85.000	16730		26.30 - 39.45	33.14

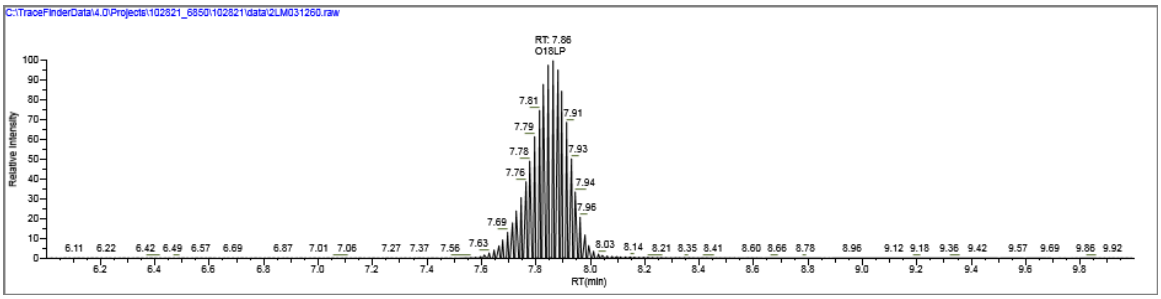
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0510-CCB3	2LM031260	N/A	CCB	10/28/2021 11:21:08 PM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.86	89	1650476			5.000	ug/L	5.000	ug/L	

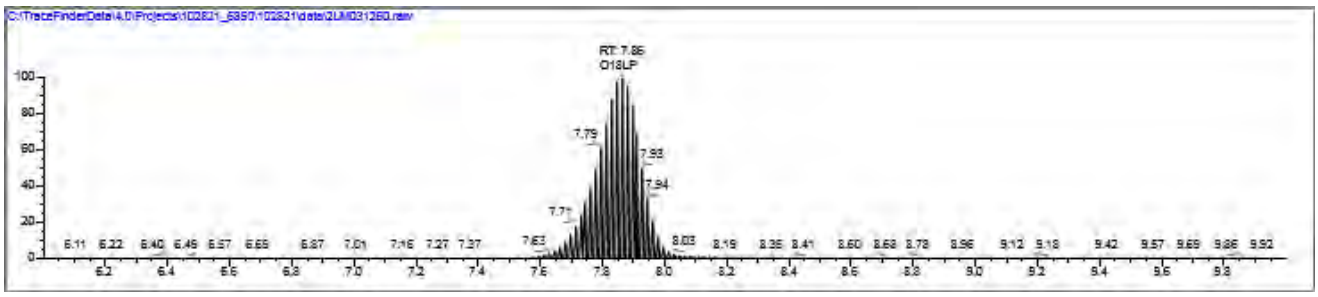
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.88	83	3257	Linear	0.002	0.025	ug/L	0.025	ug/L	

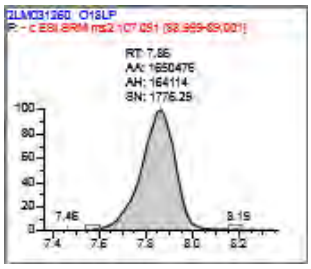
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031260	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/28/2021 11:21:08 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCB3	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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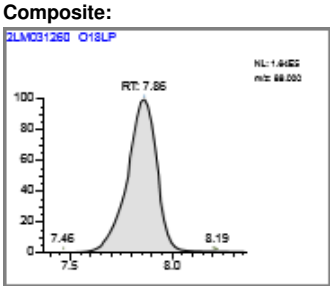
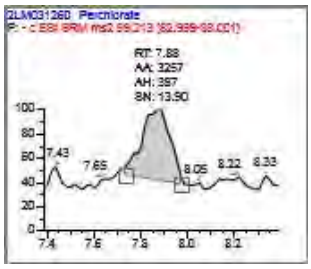


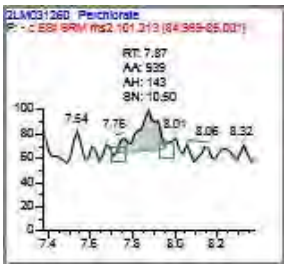
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.86	m/z 89.000	1650476	5.000		N/A

m/z 83.000



m/z 85.000



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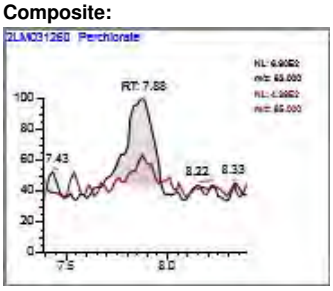

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.88	m/z 83.000	3257	0.025		N/A
7.87	m/z 85.000	939		26.30 - 39.45	28.85

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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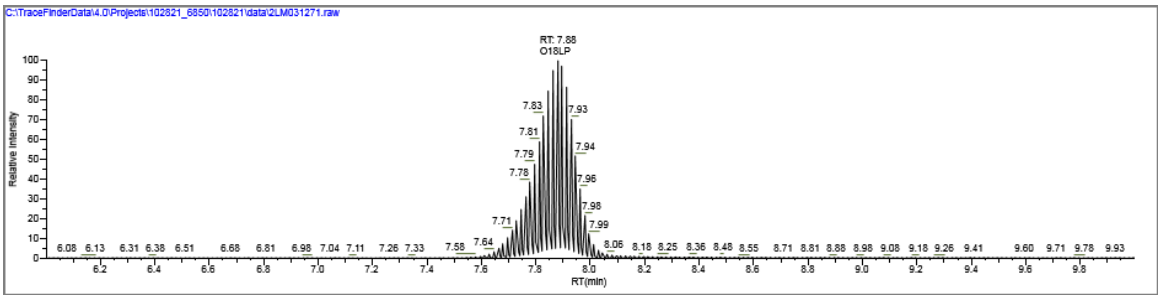


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.88	89	1214280			5.000	ug/L	5.000	ug/L	

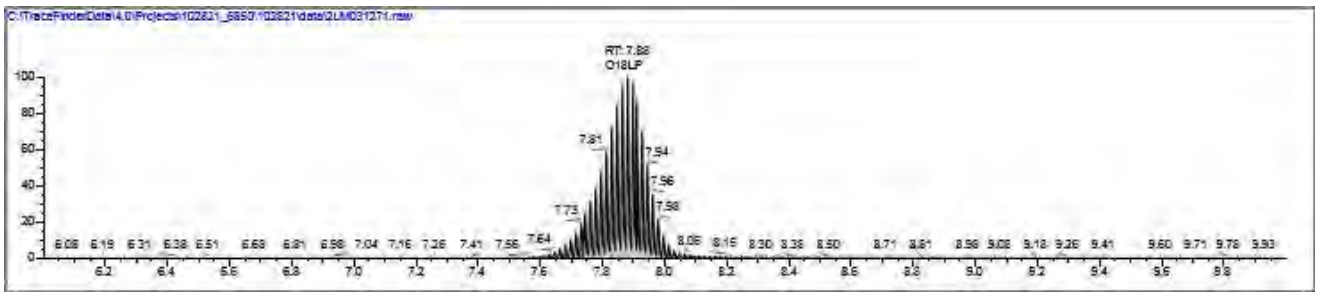
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.88	83	198543	Linear	0.164	0.951	ug/L	0.951	ug/L	

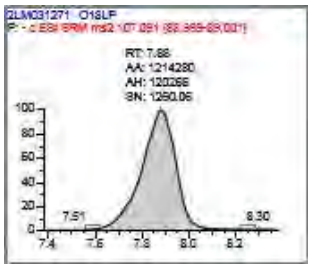
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031271	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 1:46:52 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCV4	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:01		



m/z 89.000



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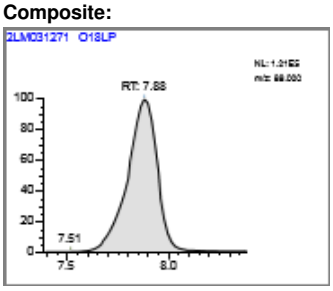
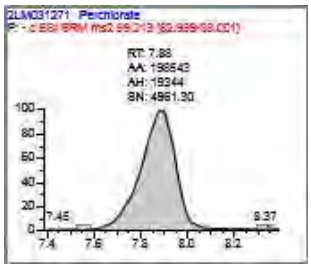


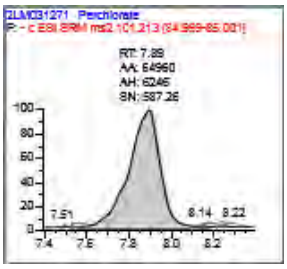
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.88	m/z 89.000	1214280	5.000		N/A

m/z 83.000



m/z 85.000



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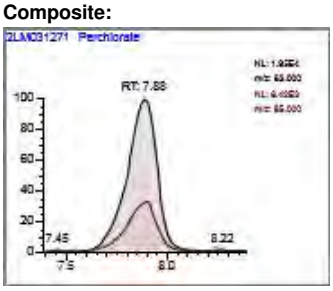

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.88	m/z 83.000	198543	0.951		N/A
7.89	m/z 85.000	64960		26.30 - 39.45	32.72

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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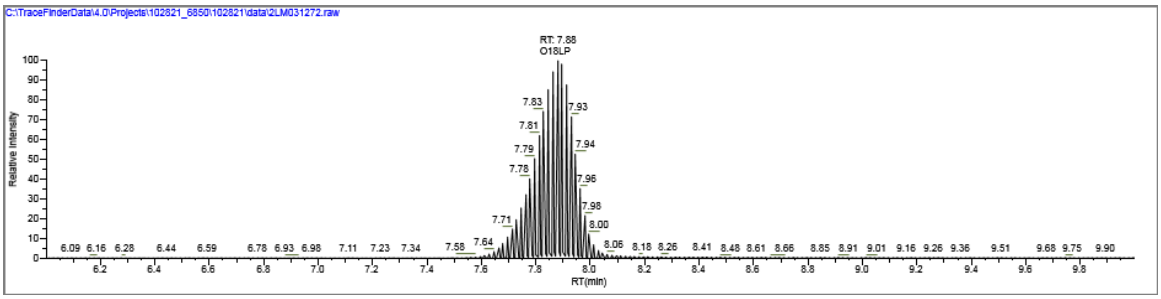


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.88	89	1241809			5.000	ug/L	5.000	ug/L	

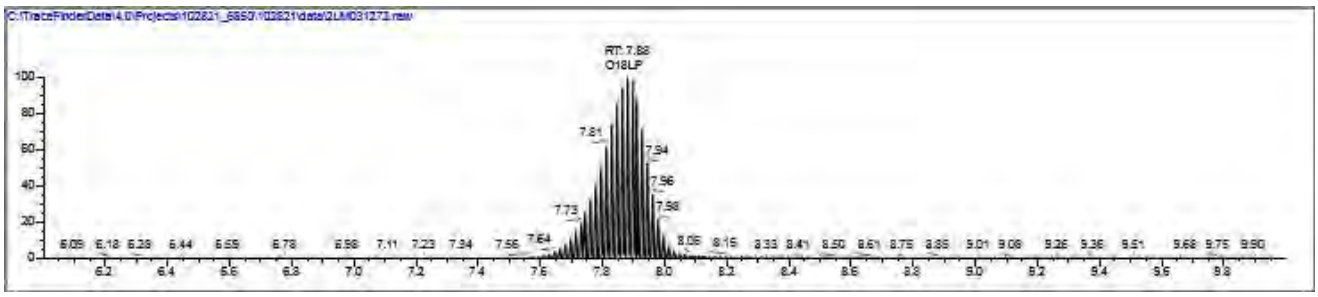
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.88	83	41087	Linear	0.033	0.204	ug/L	0.204	ug/L	

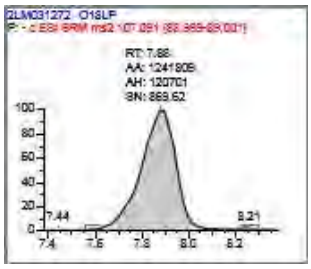
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031272	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 2:00:07 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CRL4	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:01		



m/z 89.000



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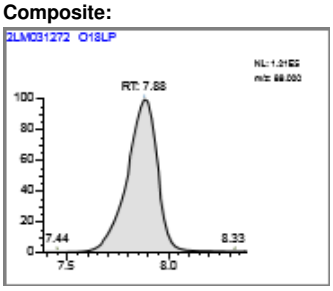
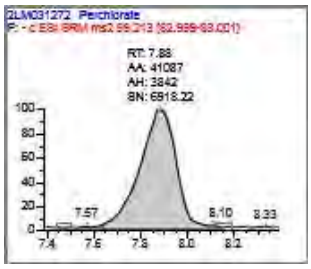


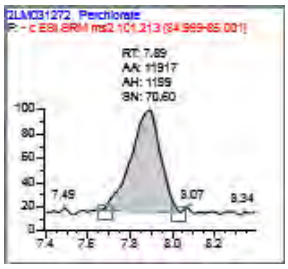
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.88	m/z 89.000	1241809	5.000		N/A

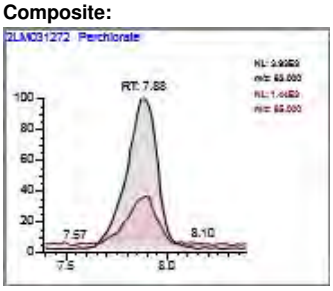
m/z 83.000



m/z 85.000



Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.88	m/z 83.000	41087	0.204		N/A
7.89	m/z 85.000	11917		26.30 - 39.45	29

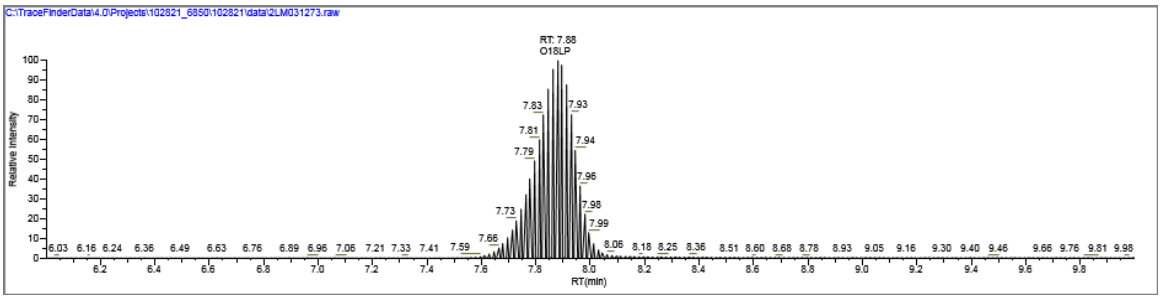
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0510-CCB4	2LM031273	N/A	CCB	10/29/2021 2:13:22 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.88	89	1344678			5.000	ug/L	5.000	ug/L	

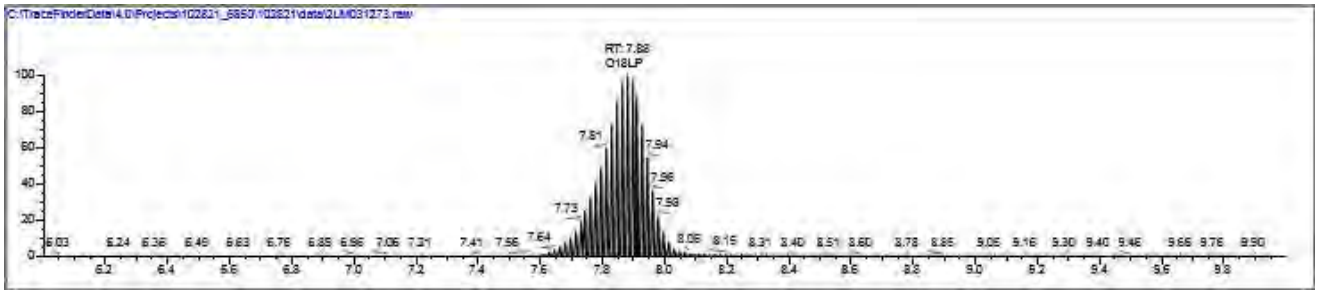
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.87	83	3202	Linear	0.002	0.028	ug/L	0.028	ug/L	I

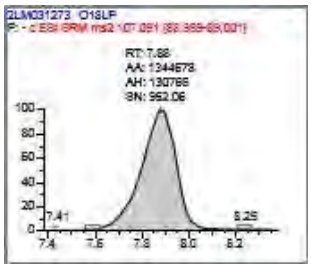
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031273	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 2:13:22 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCB4	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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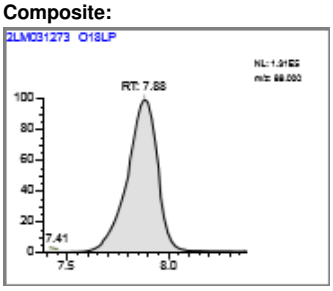
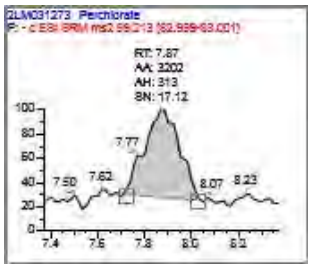


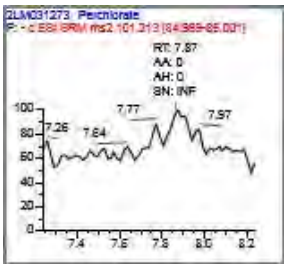
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.88	m/z 89.000	1344678	5.000		N/A	

m/z 83.000



m/z 85.000



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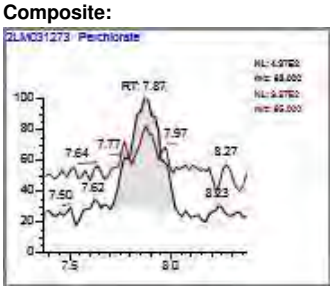


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.87	m/z 83.000	3202	0.028		N/A	I
7.87	m/z 85.000			26.30 - 39.45	*	

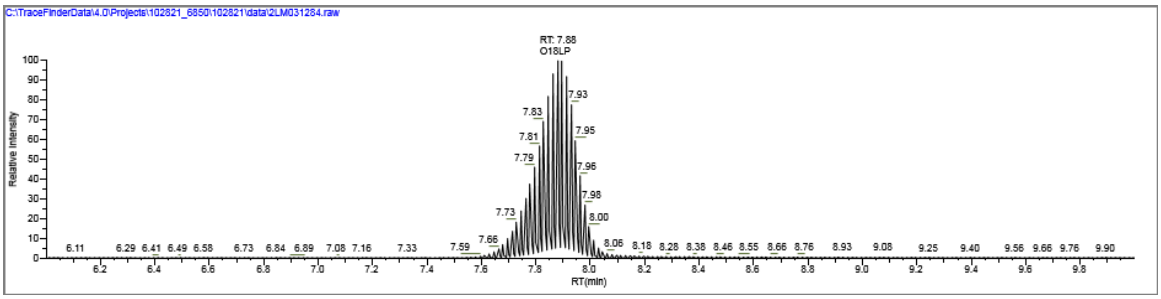
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850
Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0510-CCV5	2LM031284	CCV	CCV 1.0 ug/L	10/29/2021 4:39:14 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.88	89	1115711			5.000	ug/L	5.000	ug/L	

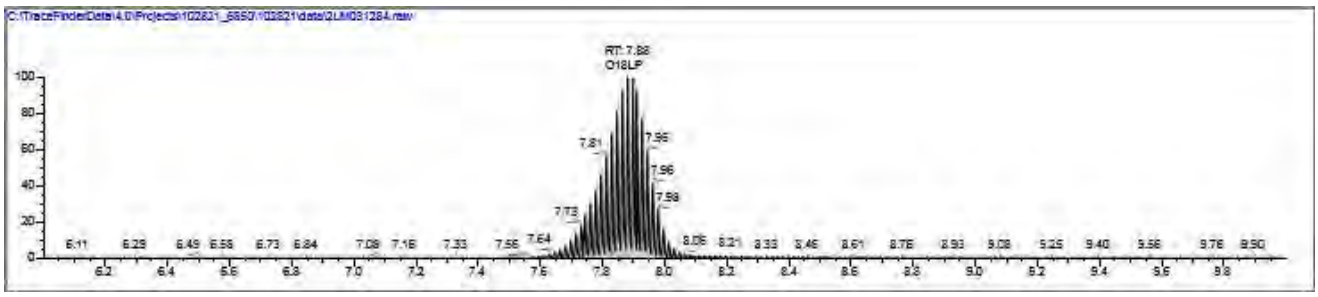
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.88	83	184711	Linear	0.166	0.963	ug/L	0.963	ug/L	

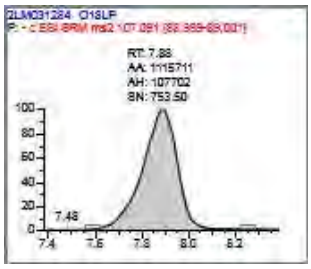
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

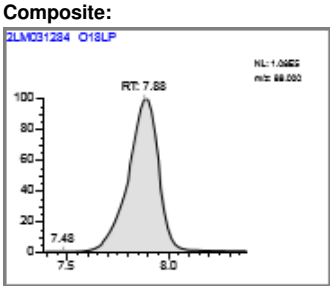
Data File:	2LM031284	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 4:39:14 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCV5	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:01		



m/z 89.000



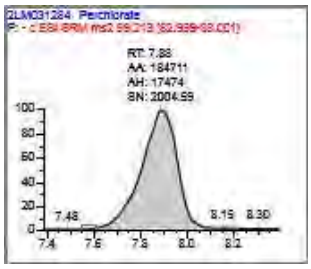
Composite:



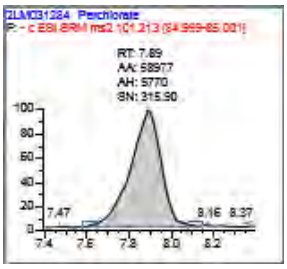
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.88	m/z 89.000	1115711	5.000		N/A

m/z 83.000



m/z 85.000



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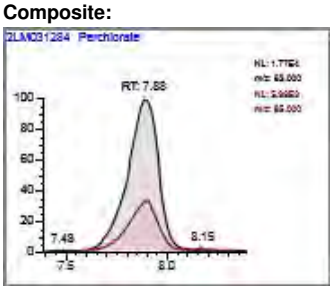


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.88	m/z 83.000	184711	0.963		N/A
7.89	m/z 85.000	58977		26.30 - 39.45	31.93

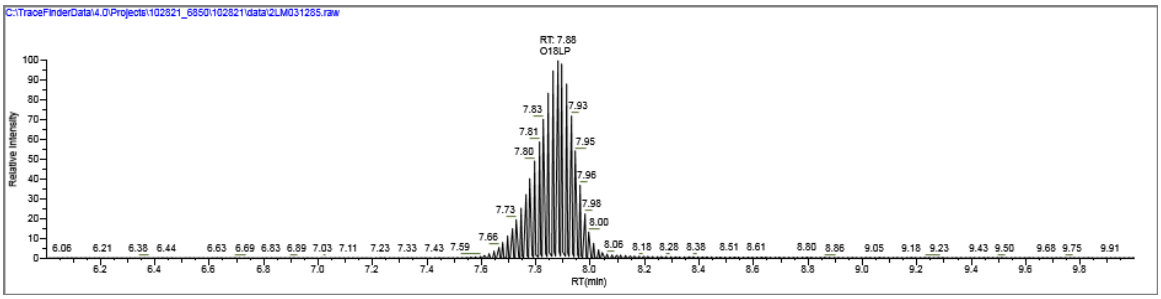
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0510-CRL5	2LM031285	QCMRL	QCMRL 0.2 ug/L	10/29/2021 4:52:29 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.88	89	1192196			5.000	ug/L	5.000	ug/L	

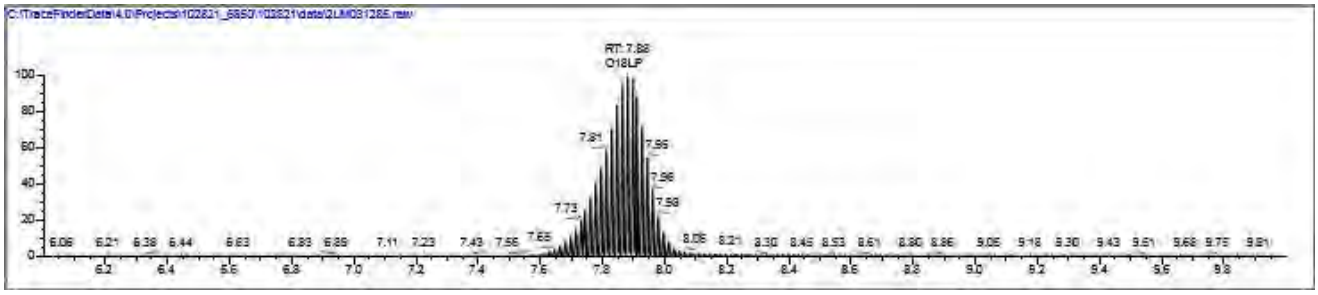
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.88	83	38863	Linear	0.033	0.201	ug/L	0.201	ug/L	

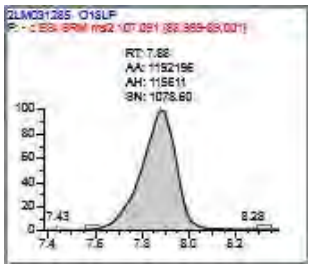
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031285	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 4:52:29 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CRL5	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:01		



m/z 89.000



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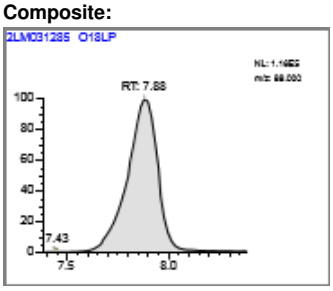
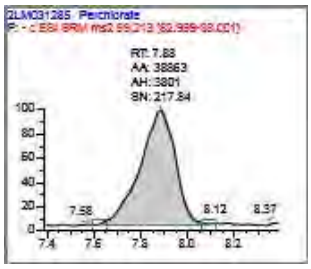


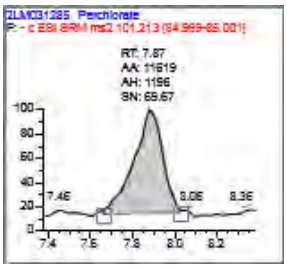
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.88	m/z 89.000	1192196	5.000		N/A

m/z 83.000



m/z 85.000



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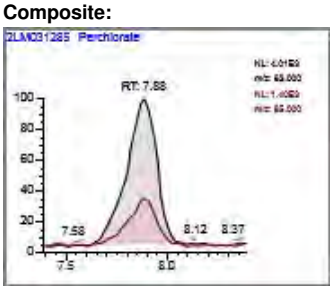


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.88	m/z 83.000	38863	0.201		N/A
7.87	m/z 85.000	11619		26.30 - 39.45	29.9

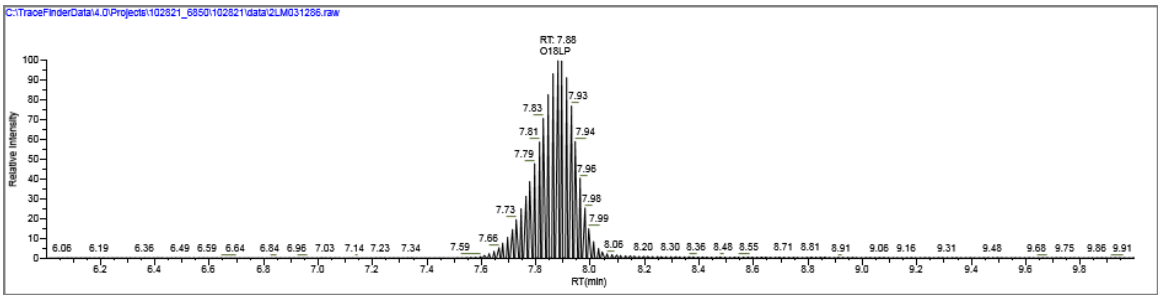
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0510-CCB5	2LM031286	N/A	CCB	10/29/2021 5:05:44 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.88	89	1248933			5.000	ug/L	5.000	ug/L	

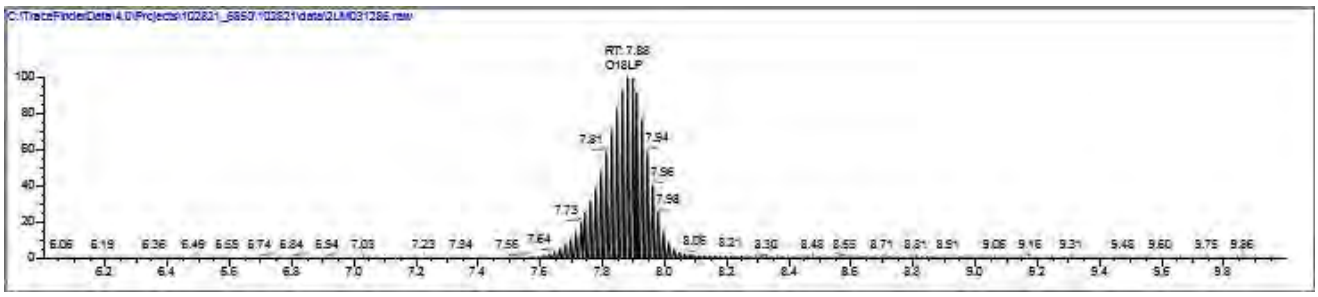
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.88	83	3274	Linear	0.003	0.029	ug/L	0.029	ug/L	I

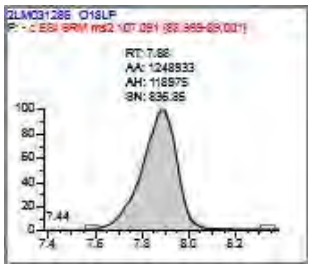
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031286	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 5:05:44 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCB5	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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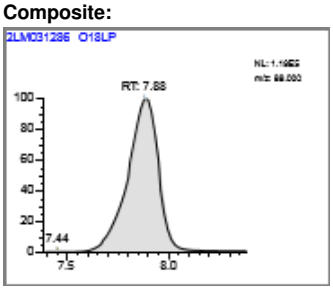
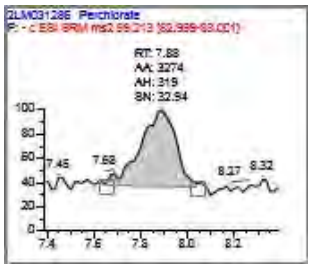


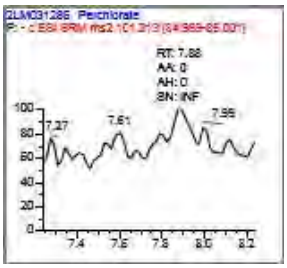
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.88	m/z 89.000	1248933	5.000		N/A

m/z 83.000



m/z 85.000



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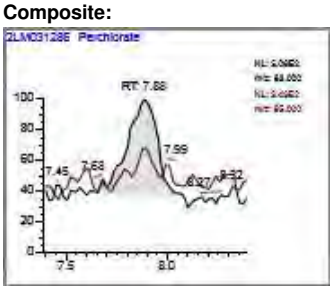


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.88	m/z 83.000	3274	0.029		N/A	I
7.88	m/z 85.000			26.30 - 39.45		*

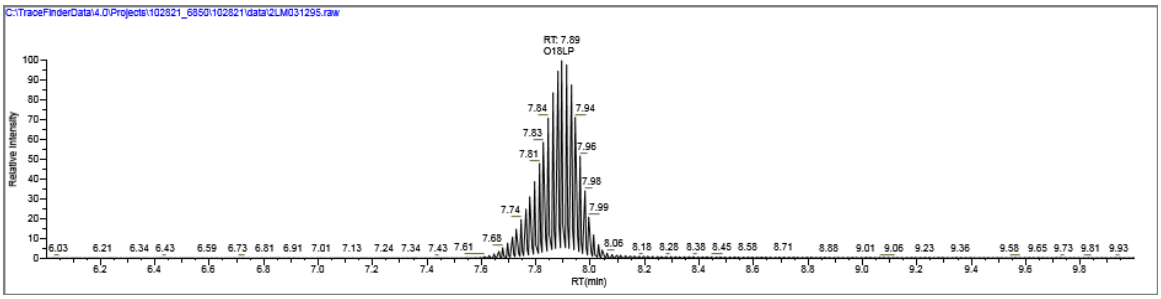
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0510-CCV6	2LM031295	CCV	CCV 1.0 ug/L	10/29/2021 7:04:59 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.89	89	1377847			5.000	ug/L	5.000	ug/L	

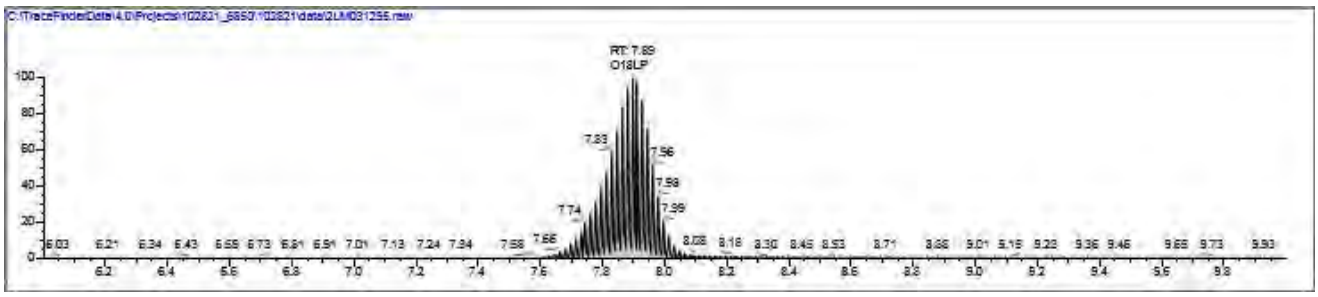
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.9	83	225475	Linear	0.164	0.952	ug/L	0.952	ug/L	

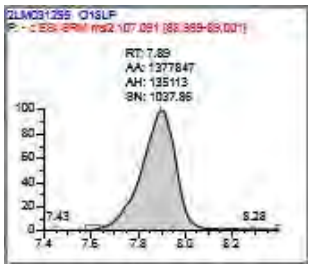
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031295	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 7:04:59 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCV6	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:01		



m/z 89.000



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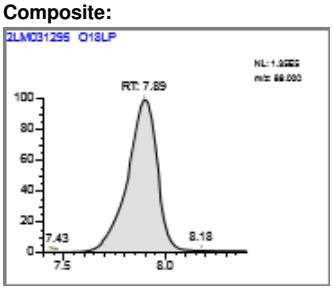
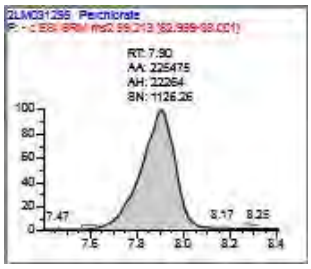


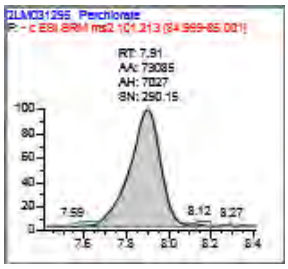
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.89	m/z 89.000	1377847	5.000		N/A

m/z 83.000



m/z 85.000



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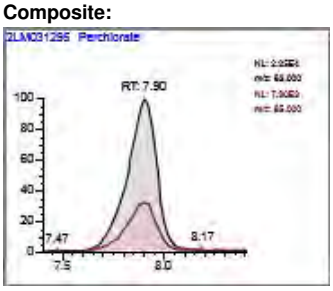


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.90	m/z 83.000	225475	0.952		N/A
7.91	m/z 85.000	73085		26.30 - 39.45	32.41

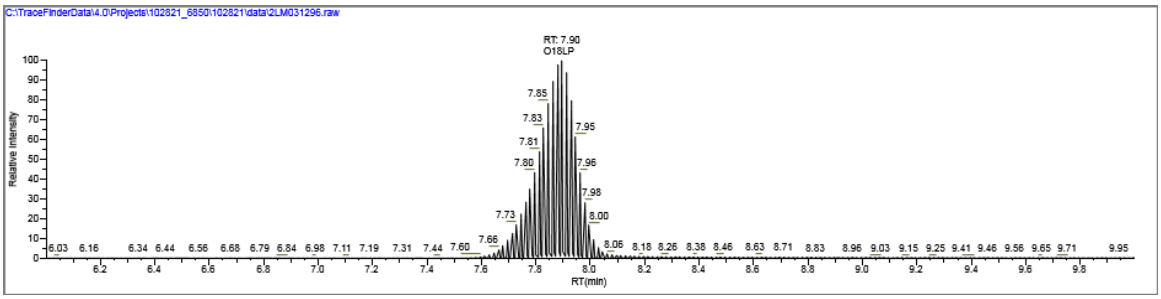
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0510-CRL6	2LM031296	QCMRL	QCMRL 0.2 ug/L	10/29/2021 7:18:13 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.90	89	1512320			5.000	ug/L	5.000	ug/L	

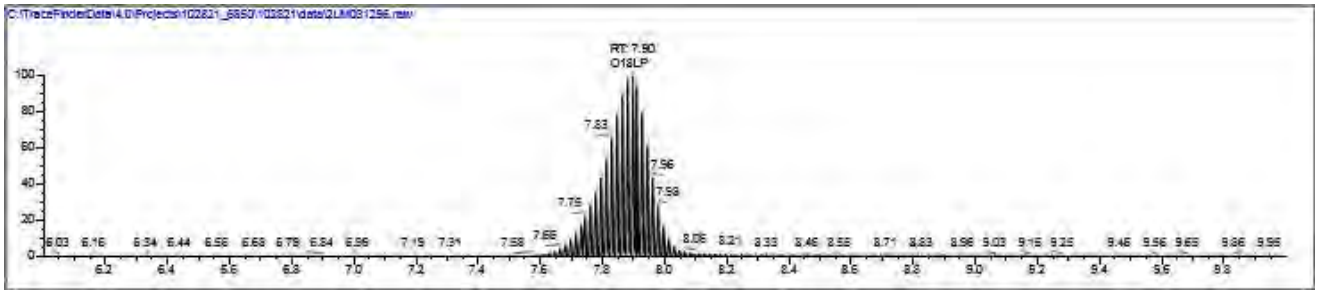
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.9	83	49914	Linear	0.033	0.203	ug/L	0.203	ug/L	

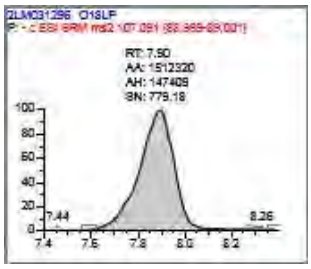
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031296	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 7:18:13 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CRL6	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:01		



m/z 89.000



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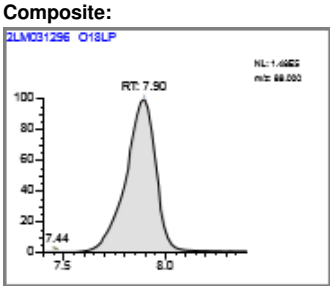
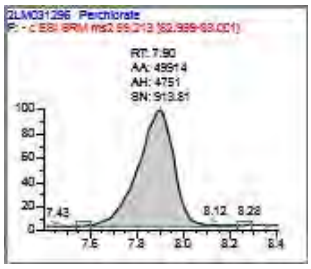


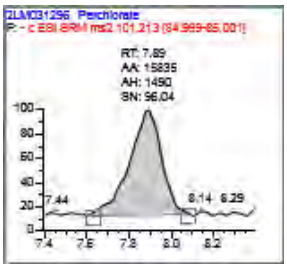
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.90	m/z 89.000	1512320	5.000		N/A

m/z 83.000



m/z 85.000



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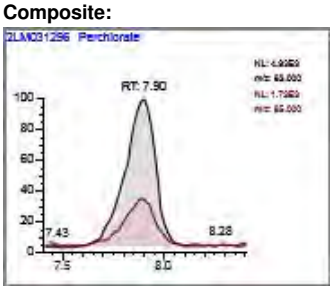


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.90	m/z 83.000	49914	0.203		N/A
7.89	m/z 85.000	15835		26.30 - 39.45	31.72

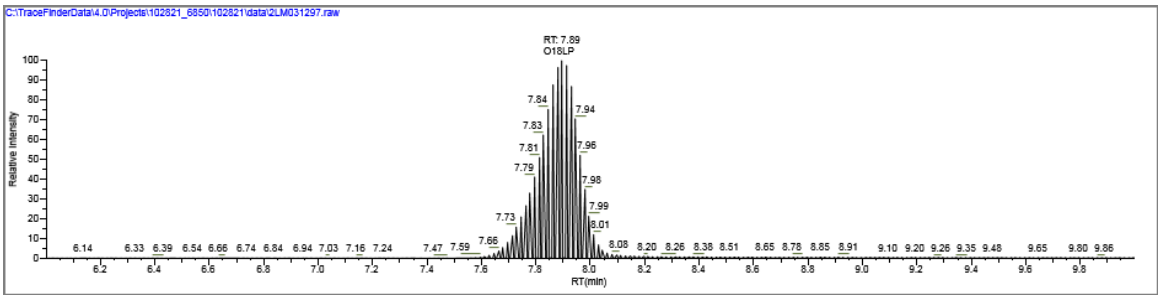
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: CAS
Batch: 102821

Method: 102821_Perchlorate 6850 Perchlorate 6850
Cali File: 102821.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A1	S1J0510-CCB6	2LM031297	N/A	CCB	10/29/2021 7:31:28 AM	1:01



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.89	89	1446848			5.000	ug/L	5.000	ug/L	

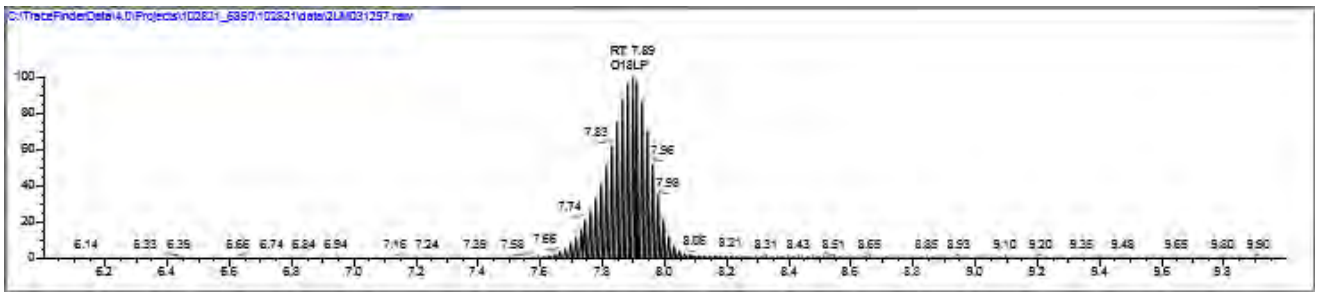
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.9	83	4077	Linear	0.003	0.03	ug/L	0.03	ug/L	I

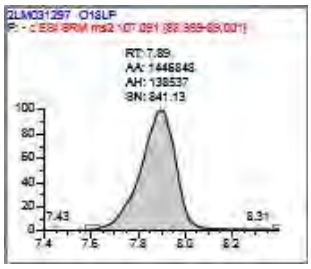
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031297	Tune Report Date:	Tune report not found
Method:	102821_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 7:31:28 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821.calx	Operator ID:	CAS
Sample ID:	S1J0510-CCB6	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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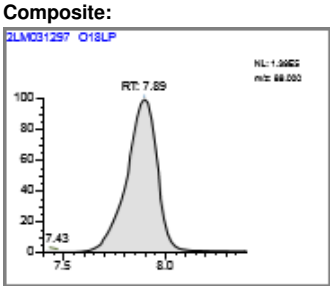
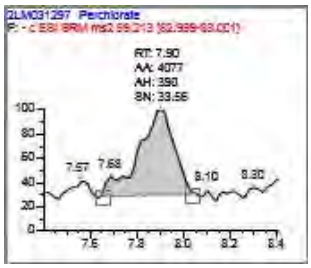


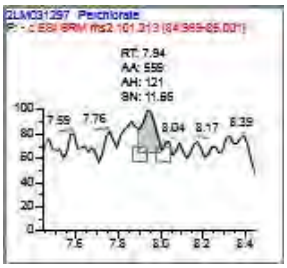
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.89	m/z 89.000	1446848	5.000		N/A

m/z 83.000



m/z 85.000



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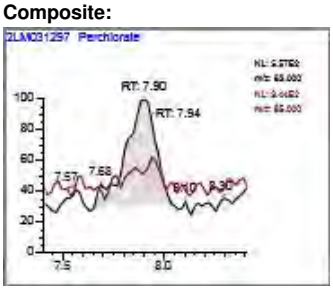

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.90	m/z 83.000	4077	0.030		N/A	I
7.94	m/z 85.000	559		26.30 - 39.45	13.7 *	

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: TSQ_Quantiva
Batch: 102921

Method: 102921_Perchlorate 6850 Perchlorate 6850
Cali File: 102821_102921.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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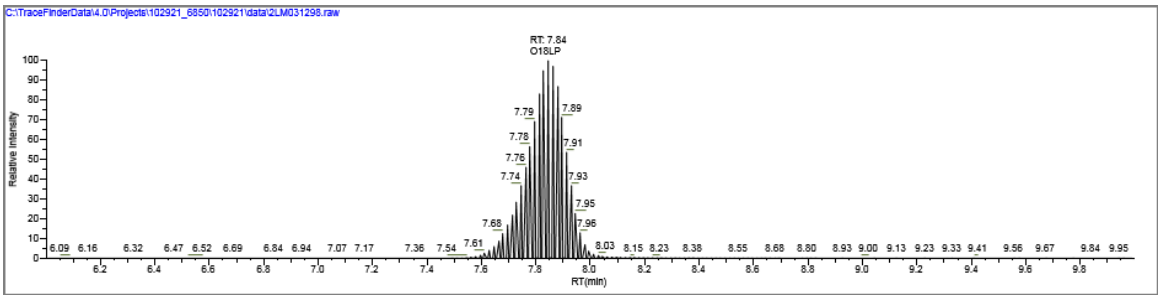


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.84	89	1238370			5.000	ug/L	5.000	ug/L	

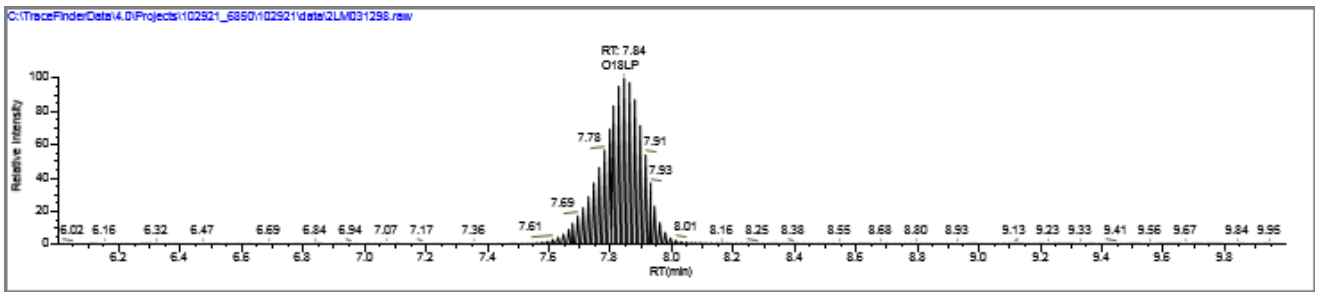
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.83	83	3420	Linear	0.003	0.03	ug/L	0.03	ug/L	I

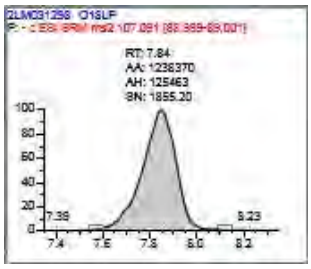
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031298	Tune Report Date:	Tune report not found
Method:	102921_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 11:09:36 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821_102921.calx	Operator ID:	TSQ_Quantiva
Sample ID:	S1J0523-CCB1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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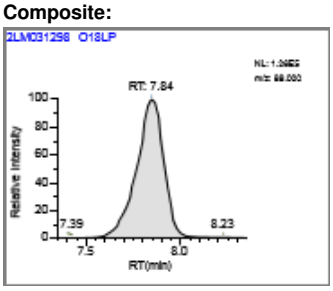
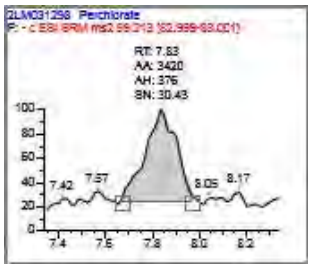


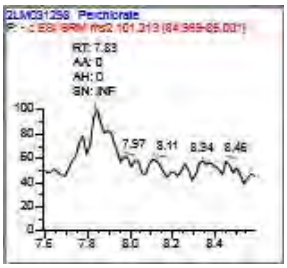
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.84	m/z 89.000	1238370	5.000		N/A

m/z 83.000



m/z 85.000



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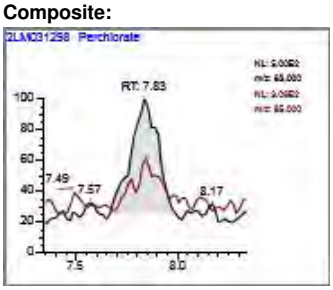


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.83	m/z 83.000	3420	0.030		N/A	I
7.83	m/z 85.000			25.89 - 38.83		*

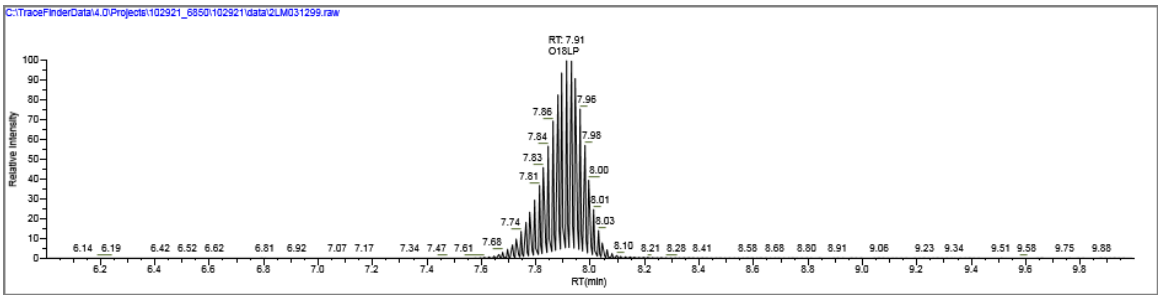
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: TSQ_Quantiva
Batch: 102921

Method: 102921_Perchlorate 6850 Perchlorate 6850
Cali File: 102821_102921.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0523-CCV1	2LM031299	CCV	CCV 1.0 ug/L	10/29/2021 11:22:52 AM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.91	89	1320355			5.000	ug/L	5.000	ug/L	

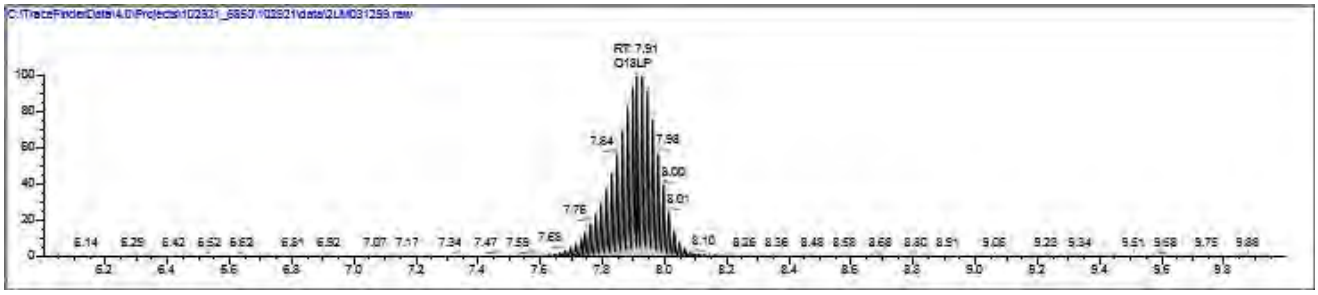
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.92	83	214302	Linear	0.162	0.944	ug/L	0.944	ug/L	

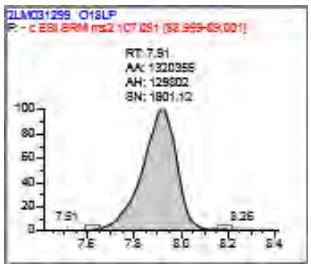
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031299	Tune Report Date:	Tune report not found
Method:	102921_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 11:22:52 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821_102921.calx	Operator ID:	TSQ_Quantiva
Sample ID:	S1J0523-CCV1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A5
Comments:	1:1 0012466		



m/z 89.000



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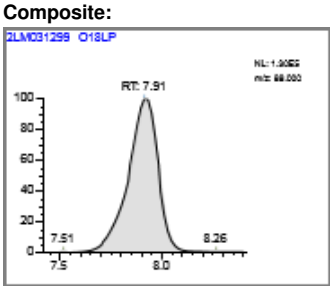
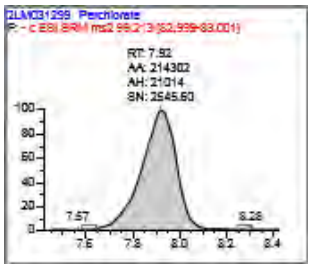


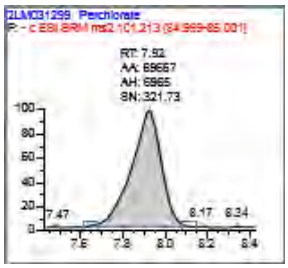
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.91	m/z 89.000	1320355	5.000		N/A

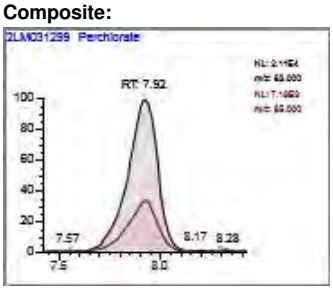
m/z 83.000



m/z 85.000



Composite:



Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.92	m/z 83.000	214302	0.944		N/A
7.92	m/z 85.000	69667		25.89 - 38.83	32.51

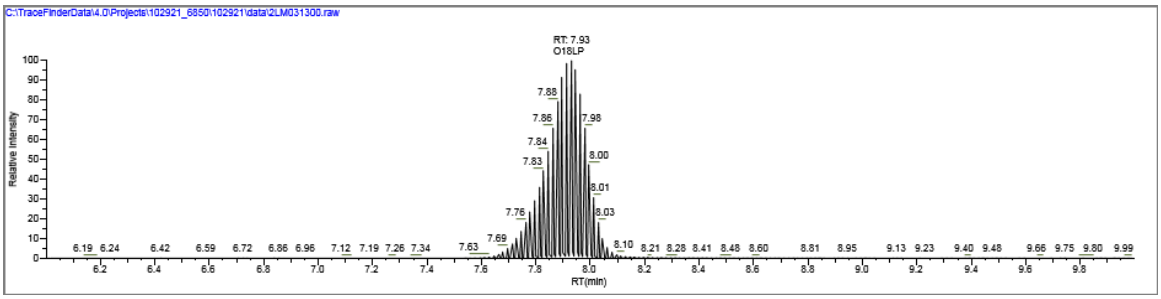
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: TSQ_Quantiva
Batch: 102921

Method: 102921_Perchlorate 6850
Perchlorate 6850
Cali File: 102821_102921.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0523-CRL1	2LM031300	QCMRL	QCMRL 0.2 ug/L	10/29/2021 11:36:06 AM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.93	89	1326434			5.000	ug/L	5.000	ug/L	

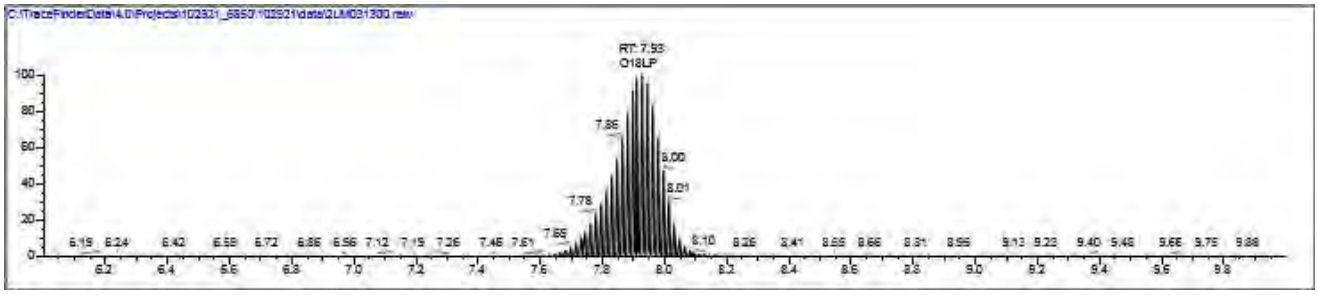
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.93	83	43732	Linear	0.033	0.203	ug/L	0.203	ug/L	

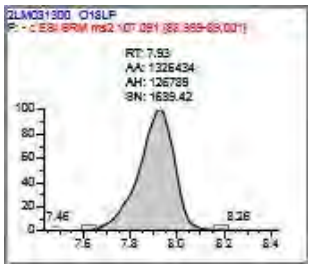
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031300	Tune Report Date:	Tune report not found
Method:	102921_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 11:36:06 AM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821_102921.calx	Operator ID:	TSQ_Quantiva
Sample ID:	S1J0523-CRL1	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 89.000



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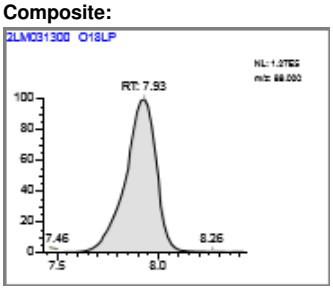
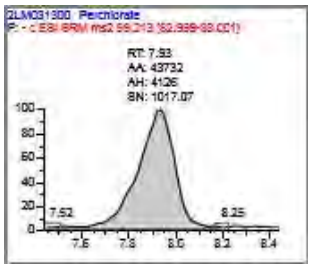


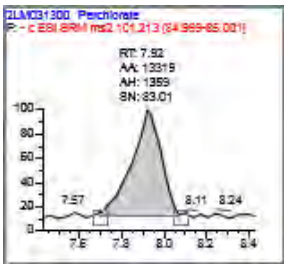
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.93	m/z 89.000	1326434	5.000		N/A

m/z 83.000



m/z 85.000



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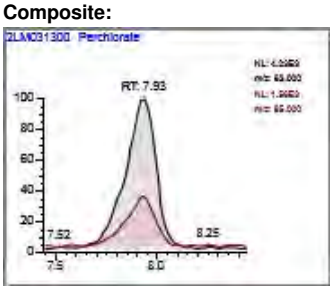


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.93	m/z 83.000	43732	0.203		N/A
7.92	m/z 85.000	13319		25.89 - 38.83	30.46

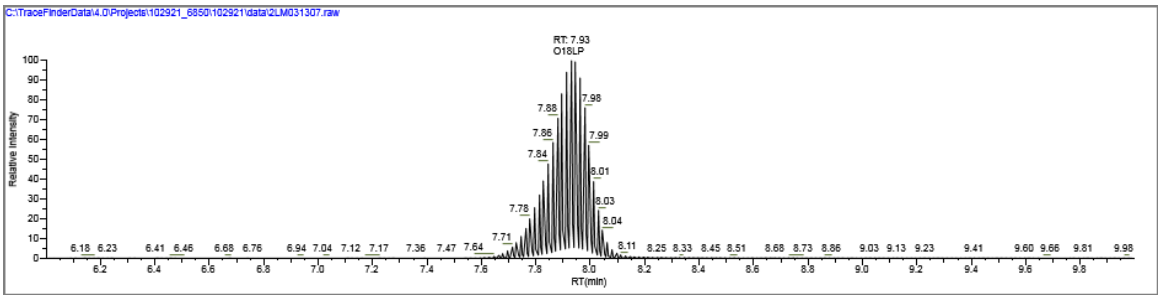
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: TSQ_Quantiva
Batch: 102921

Method: 102921_Perchlorate 6850 Perchlorate 6850
Cali File: 102821_102921.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A5	S1J0523-CCV2	2LM031307	CCV	CCV 1.0 ug/L	10/29/2021 1:08:59 PM	1:1 0012466



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.93	89	1361915			5.000	ug/L	5.000	ug/L	

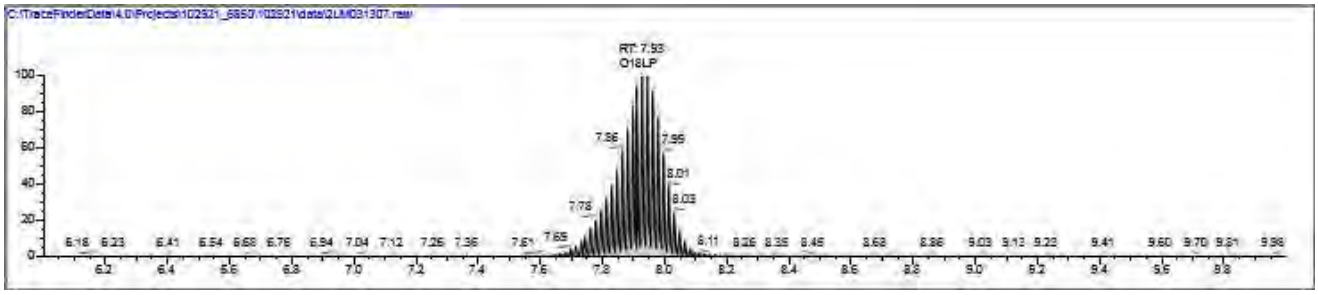
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.93	83	221754	Linear	0.163	0.947	ug/L	0.947	ug/L	

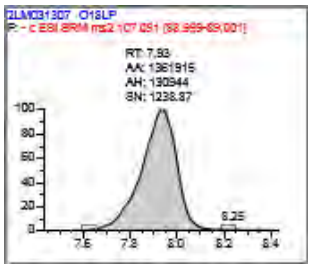
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031307	Tune Report Date:	Tune report not found
Method:	102921_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 1:08:59 PM
Cali File:	102821_102921.calx	Cali File Date:	10/29/2021 9:06:35 AM
Sample ID:	S1J0523-CCV2	Operator ID:	TSQ_Quantiva
Diln Factor:	1.00	Instrument ID:	LCMS2
Comments:	1:1 0012466	Vial Number:	R:A5



m/z 89.000



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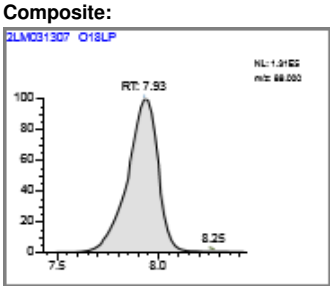
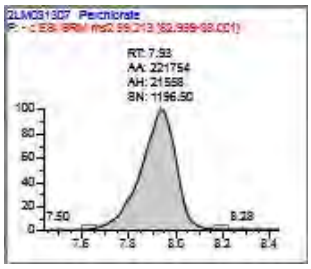


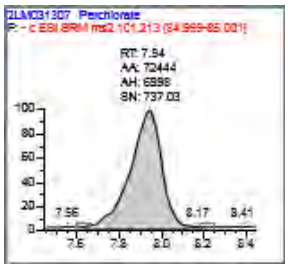
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.93	m/z 89.000	1361915	5.000		N/A

m/z 83.000



m/z 85.000



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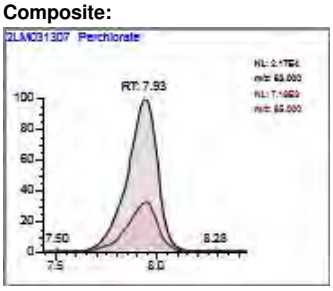


Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 1.000	0.850 - 1.150	
7.93	m/z 83.000	221754	0.947		N/A
7.94	m/z 85.000	72444		25.89 - 38.83	32.67

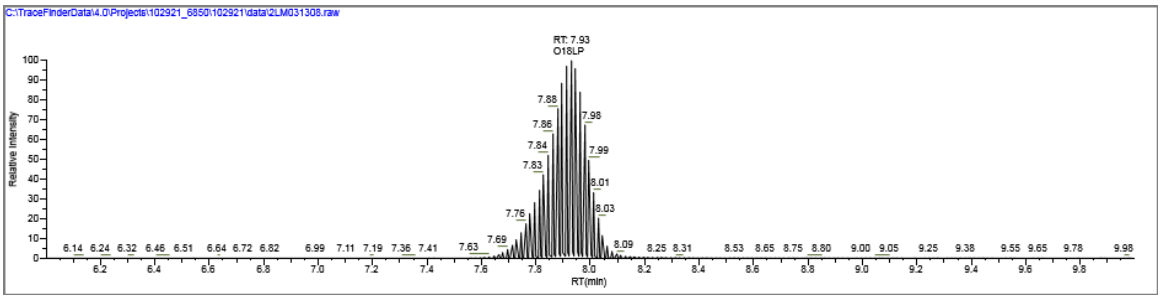
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: TSQ_Quantiva
Batch: 102921

Method: 102921_Perchlorate 6850 Perchlorate 6850
Cali File: 102821_102921.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
R:A3	S1J0523-CRL2	2LM031308	QCMRL	QCMRL 0.2 ug/L	10/29/2021 1:22:13 PM	1:1 0012468



Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.93	89	1445889			5.000	ug/L	5.000	ug/L	

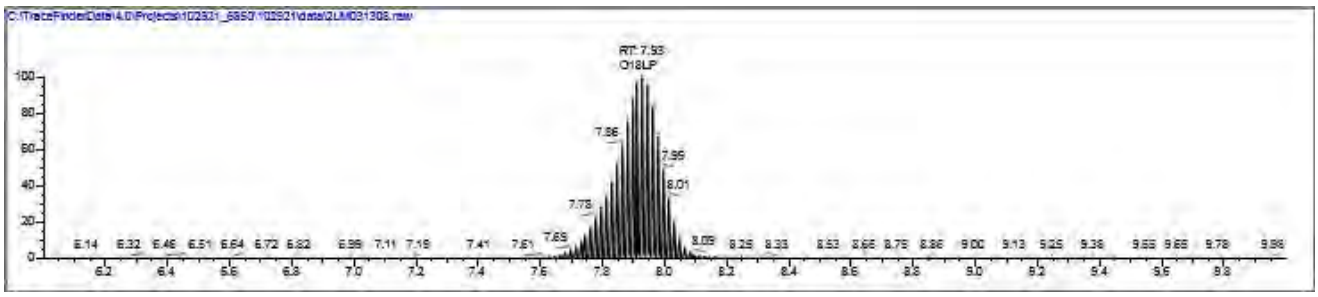
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.95	83	46431	Linear	0.032	0.198	ug/L	0.198	ug/L	

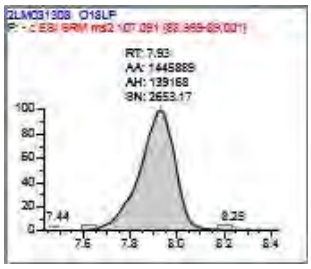
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031308	Tune Report Date:	Tune report not found
Method:	102921_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 1:22:13 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821_102921.calx	Operator ID:	TSQ_Quantiva
Sample ID:	S1J0523-CRL2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A3
Comments:	1:1 0012468		



m/z 89.000



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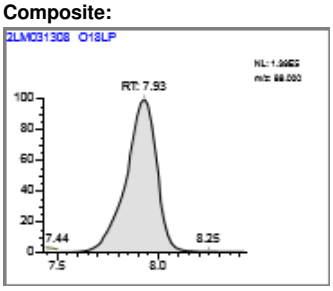
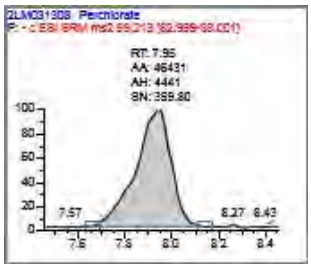


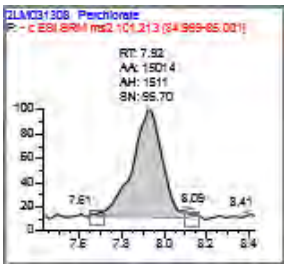
O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio
			N/A		
7.93	m/z 89.000	1445889	5.000		N/A

m/z 83.000



m/z 85.000



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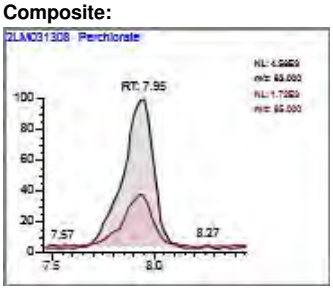

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio
			QC: 0.200	0.140 - 0.260	
7.95	m/z 83.000	46431	0.198		N/A
7.92	m/z 85.000	15014		25.89 - 38.83	32.34

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Quantitation Report

Lab Name: Microbac OVD
Instrument: LCMS2
User: TSQ_Quantiva
Batch: 102921

Method: 102921_Perchlorate 6850
Perchlorate 6850
Cali File: 102821_102921.calx

Vial Pos	Sample ID	File Name	Level	Sample Name	File Date	Comment
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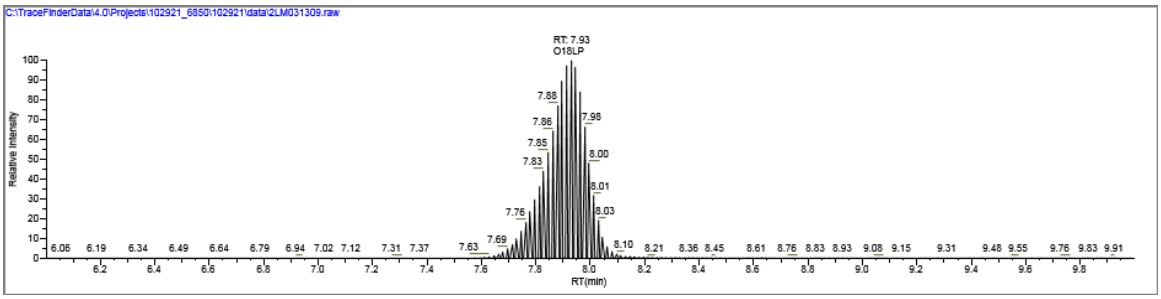


Internal Standards	RT	Quan Peak	Response			Injected Conc	Units	Calculated Conc	Units	Flags
O18LP	7.93	89	1428653			5.000	ug/L	5.000	ug/L	

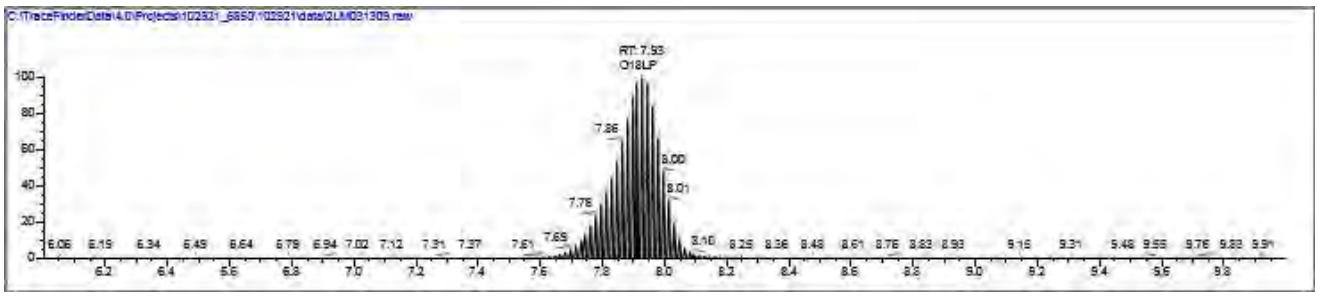
Surrogates	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags

Target Compounds	RT	Quan Peak	Response	Curve Type	Average RF/ Response Ratio	Injected Conc	Units	Calculated Conc	Units	Flags
Perchlorate	7.92	83	3298	Linear	0.002	0.027	ug/L	0.027	ug/L	I

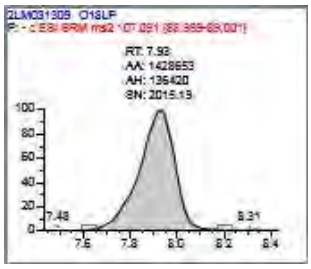
Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

Sample Report

Data File:	2LM031309	Tune Report Date:	Tune report not found
Method:	102921_Perchlorate 6850 Perchlorate 6850	Acquisition Date:	10/29/2021 1:35:28 PM
		Cali File Date:	10/29/2021 9:06:35 AM
Cali File:	102821_102921.calx	Operator ID:	TSQ_Quantiva
Sample ID:	S1J0523-CCB2	Instrument ID:	LCMS2
Diln Factor:	1.00	Vial Number:	R:A1
Comments:	1:01		



m/z 89.000



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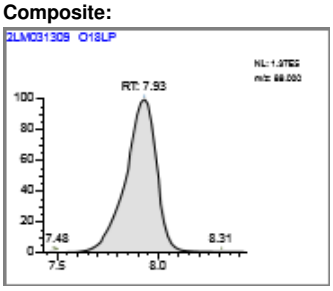
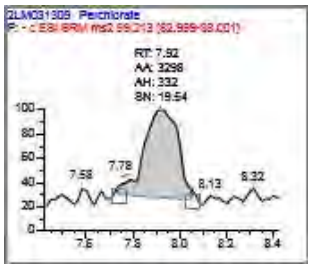


O18LP

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.93	m/z 89.000	1428653	5.000		N/A	

m/z 83.000



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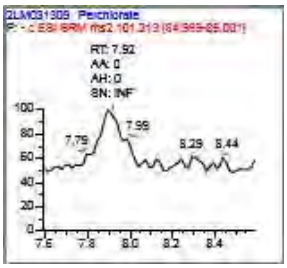

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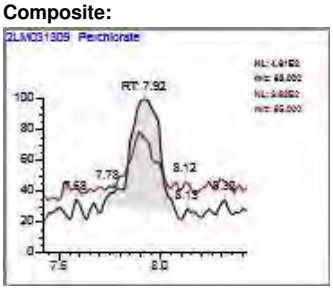

Perchlorate

RT (min)	Ion	Response	Amount	Target Range	Ratio	
			N/A			
7.92	m/z 83.000	3298	0.027		N/A	I
7.92	m/z 85.000			25.89 - 38.83		*

Flag Legend: LOD<J<LOQ;I=Ion Ratio Failure; C=Carryover; ?=Upper Limit Of Linearity; D=Limit Of Detection; Q=Limit Of Quantitation; POS=Limit Of Reporting; b=Blank; s=Solvent flag; est=Estimated; Bordered cell = Manually integrated.

CHAIN OF CUSTODY

Name Of Lab Shipping To: Microbac 158 Starlite Drive Marietta, OH, 45750 (304) 299-4976 Cell (740)-373-4071 Office ATTN: Stephanie Mossburg

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 50 October 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
SOWW09-211011	WG	10/11/21/0755		1	X		
SOWW08-211011	WG	10/11/21/0835		1	X		
SOWW22-211011	WG	10/11/21/0920		1	X		
SOWW23-211011	WG	10/11/21/1015		1	X		
SOWW15-211011	WG	10/11/21/1100		1	X		
SOWW16-211011	WG	10/11/21/1145		1	X		
SOWW16-211011-FD	WG	10/11/21/1145		1	X		
SOWW18-211011	WG	10/11/21/1235		1	X		

M1J0726
APTIM Tennessee
Rec'd: 10/12/2021 10:10
By: Stephanie Murphy Temp: 5.6 (Signature)

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/11/21	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
Stephanie Murphy	10/12/21	10:10							

Remarks:

MICROBAC®

Work Order # M1507-b

COOLER TEMP >6° C LOG

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

10/12/2021 SM

pH Lot # HC157842

pH Exceptions

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

10/12/2021 SM

PRESERVATIVE EXCEPTIONS

✓ NONE

__ AS NOTED

10/12/2021 SM

Document Control # 1957
Last 04-10-2019

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microbialinsights
10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Client: Vicki Graves
APTIM
2410 Cherahala Blvd
Knoxville, TN 37932
US

Phone: 865-560-7818

Fax:

Identifier: 009TA **Date Rec:** 01/07/2022 **Report Date:** 01/12/2022

Client Project #: 501032 **Client Project Name:** LHAAP 50 January 2022

Purchase Order #: 204818 CO-05

Test results provided for: CENSUS

Reviewed By:

Charles Slater

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Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **APTIM**
Project: LHAAP 50 January 2022

MI Project Number: **009TA**
Date Received: 01/07/2022

Sample Information

Client Sample ID:		**50WW14-220106**	**50WW13-220106**	**50WW11-220106**	**50WW06-220106**	**50WW12-220106**
Sample Date:		01/06/2022	01/06/2022	01/06/2022	01/06/2022	01/06/2022
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		BB/CS	BB/CS	BB/CS	BB/CS	BB/CS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.04E+01**	**2.60E+00**	**2.00E+00**	**7.00E-01**	**4.00E-01 (J)**

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 **1/7/2022**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/07/2022	01/12/2022	0 °C	112%	non-detect	non-detect

SGS

Orlando, FL

01/17/22

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

APTIM

Longhorn Army Ammunition Plant (GWTP); Karnack, TX

501032

SGS Job Number: FA92191

Sampling Dates: 01/05/22 - 01/06/22

Report to:

APTIM
11400 Parkside Dr Suite 400
Knoxville, TN 37934
vicki.graves@aptim.com

ATTN: Vicki Graves

Total number of pages in report: **112**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Kelly Blanchard 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AL, AK, AR, CT, IA, KY, MA, MI. MS, ND, NH, NV, OK, OR, IL, UT, VT, WA, WI, WV

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Test results relate only to samples analyzed.

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EHS.US.CustomerCare@sgs.com

Sections: 1 2 3 4 5 6 7

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SGS North America Inc.

Sample Summary

APTIM

Job No: FA92191

Longhorn Army Ammunition Plant (GWTP); Karnack, TX
Project No: 501032

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA92191-1	01/05/22	10:55	SB	01/07/22	AQ	Ground Water	50WW29-220105
FA92191-2	01/05/22	11:35	SB	01/07/22	AQ	Ground Water	50WW05-220105
FA92191-3	01/05/22	12:15	SB	01/07/22	AQ	Ground Water	50WW08-220105
FA92191-4	01/06/22	07:40	SB	01/07/22	AQ	Ground Water	50WW14-220106
FA92191-4D	01/06/22	07:40	SB	01/07/22	AQ	Water Dup/MSD	50WW14-220106
FA92191-4S	01/06/22	07:40	SB	01/07/22	AQ	Water Matrix Spike	50WW14-220106
FA92191-7	01/06/22	08:40	SB	01/07/22	AQ	Ground Water	50WW13-220106
FA92191-8	01/06/22	08:40	SB	01/07/22	AQ	Ground Water	50WW13-220106-FD

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: APTIM **Job No:** FA92191

Site: Longhorn Army Ammunition Plant (GWTP); Karnack, TX **Report Date:** 1/17/2022 5:04:34

On 01/07/2022, 6 Sample(s), 0 Trip Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.4 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of FA92191 was Assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages

MS Semi-volatiles By Method SW846 6850

Matrix: AQ **Batch ID:** OP89224

Sample(s) FA92191-4MS, FA92191-4MSD were used as the QC samples indicated.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted. Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria. SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety.

Narrative prepared by:

_____

Kim Benham, Client Services *(Signature on File)*

Summary of Hits

Job Number: FA92191
Account: APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX
Collected: 01/05/22 thru 01/06/22

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA92191-1	**50WW29-220105**					
Perchlorate		0.075 J	0.20	0.10	ug/l	SW846 6850
FA92191-2	**50WW05-220105**					
No hits reported in this sample.						
FA92191-3	**50WW08-220105**					
Perchlorate		178	2.0	1.0	ug/l	SW846 6850
FA92191-4	**50WW14-220106**					
No hits reported in this sample.						
FA92191-7	**50WW13-220106**					
Perchlorate		2500	200	100	ug/l	SW846 6850
FA92191-8	**50WW13-220106-FD**					
Perchlorate		3220	200	100	ug/l	SW846 6850

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID:	50WW29-220105		
Lab Sample ID:	FA92191-1	**Date Sampled:**	01/05/22
Matrix:	AQ - Ground Water	**Date Received:**	01/07/22
Method:	SW846 6850 IN HOUSE	**Percent Solids:**	n/a
Project:	Longhorn Army Ammunition Plant (GWTP); Karnack, TX		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88365.D	1	01/13/22 15:48	NG	01/13/22 12:00	OP89224	SQ1912
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	0.075	0.20	0.10	0.050	ug/l	J

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID: 50WW05-220105
Lab Sample ID: FA92191-2 **Date Sampled:** 01/05/22
Matrix: AQ - Ground Water **Date Received:** 01/07/22
Method: SW846 6850 IN HOUSE **Percent Solids:** n/a
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88369.D	1	01/13/22 16:22	NG	01/13/22 12:00	OP89224	SQ1912
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	0.10 U	0.20	0.10	0.050	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID:	50WW08-220105		
Lab Sample ID:	FA92191-3	**Date Sampled:**	01/05/22
Matrix:	AQ - Ground Water	**Date Received:**	01/07/22
Method:	SW846 6850 IN HOUSE	**Percent Solids:**	n/a
Project:	Longhorn Army Ammunition Plant (GWTP); Karnack, TX		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88392.D	10	01/14/22 12:20	NG	01/13/22 12:00	OP89224	SQ1913
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	178	2.0	1.0	0.50	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID:	50WW14-220106		
Lab Sample ID:	FA92191-4	**Date Sampled:**	01/06/22
Matrix:	AQ - Ground Water	**Date Received:**	01/07/22
Method:	SW846 6850 IN HOUSE	**Percent Solids:**	n/a
Project:	Longhorn Army Ammunition Plant (GWTP); Karnack, TX		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88371.D	1	01/13/22 16:38	NG	01/13/22 12:00	OP89224	SQ1912
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	0.10 U	0.20	0.10	0.050	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value

LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID: 50WW13-220106
Lab Sample ID: FA92191-7 **Date Sampled:** 01/06/22
Matrix: AQ - Ground Water **Date Received:** 01/07/22
Method: SW846 6850 IN HOUSE **Percent Solids:** n/a
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88393.D	1000	01/14/22 12:28	NG	01/13/22 12:00	OP89224	SQ1913
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	2500	200	100	50	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID:	50WW13-220106-FD		
Lab Sample ID:	FA92191-8	**Date Sampled:**	01/06/22
Matrix:	AQ - Ground Water	**Date Received:**	01/07/22
Method:	SW846 6850 IN HOUSE	**Percent Solids:**	n/a
Project:	Longhorn Army Ammunition Plant (GWTP); Karnack, TX		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88394.D	1000	01/14/22 12:36	NG	01/13/22 12:00	OP89224	SQ1913
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	3220	200	100	50	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

5

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

FA92191

CHAIN OF CUSTODY

Name Of Lab Shipping To: SGS 4405 Vineland Orlando, FL 32811 (407) 615-0447 Cell (407)-425-6700 Office ATTN: Jean Dent-Smith

Page 1 of 1

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 50 January 2022**	
Prepared By: Scott Beesinger	P.O. Number

	Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
1	SDWW24-220105	WG	1/5/22 1055		1	X		
2	SDWW05-220105	WG	1/5/22 1135		1	X		
3	SDWW08-220105	WG	1/5/22 1215		1	X		
4	SDWW14-220106	WG	1/6/22 0740		1	X	SM	
4S	SDWW14-220106-MS	WG	1/6/22 0740		1	X	INITIAL ASSESSMENT	
4D	SDWW14-220106-MSD	WG	1/6/22 0740		1	X	LABEL VERIFICATION	
7	SDWW13-220106	WG	1/6/22 0840		1	X		
8	SDWW13-220106-FD	WG	1/6/22 0840		1	X	2.4CIR1	

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	1/6/22	1430		1/7/22	1100						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

SGS Sample Receipt Summary

Job Number: FA92191 **Client:** APTIM **Project:** LONGHORN ARMY AMMN. PLANT

Date / Time Received: 1/7/2022 11:00:00 AM **Delivery Method:** FX **Airbill #'s:** 5061 4514 4252

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.2);

Cooler Temps (Corrected) °C: Cooler 1: (2.4);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: STEPHENP Date: 1/7/2022 11:00:00 AM Reviewer: _____ Date: _____

QC Evaluation: DOD QSM5.x Limits

Job Number: FA92191
Account: APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX
Collected: 01/05/22 thru 01/06/22

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP89224	SW846 6850						
OP89224-BS	14797-73-0	Perchlorate	BSP	REC	85	%	84-119
OP89224-MS	14797-73-0	Perchlorate	MS	REC	90	%	84-119
OP89224-MSD	14797-73-0	Perchlorate	MSD	REC	100	%	84-119
OP89224-MSD	14797-73-0	Perchlorate	MSD	RPD	11	%	15

* Sample used for QC is not from job FA92191

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Initial and Continuing Calibration Summaries
- Run Sequence Reports

Instrument Blank

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
SQ1912-IBLK	Q88385.D	1	01/13/22	NG	n/a	n/a	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92191-1, FA92191-2, FA92191-4

CAS No.	Compound	Result	RL	MDL	Units	Q
14797-73-0	Perchlorate	ND	0.20	0.050	ug/l	

Instrument Blank

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
SQ1913-IBLK	Q88401.D	1	01/14/22	NG	n/a	n/a	SQ1913

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92191-3, FA92191-7, FA92191-8

CAS No.	Compound	Result	RL	MDL	Units	Q
14797-73-0	Perchlorate	ND	0.20	0.050	ug/l	

Method Blank Summary

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89224-MB	Q88357.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92191-1, FA92191-2, FA92191-3, FA92191-4, FA92191-7, FA92191-8

CAS No.	Compound	Result	RL	MDL	Units	Q
14797-73-0	Perchlorate	ND	0.20	0.050	ug/l	

Blank Spike Summary

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89224-BS	Q88356.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92191-1, FA92191-2, FA92191-3, FA92191-4, FA92191-7, FA92191-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
14797-73-0	Perchlorate	0.2	0.17	85	80-120

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89224-MS	Q88372.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912
OP89224-MSD	Q88373.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912
FA92191-4	Q88371.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92191-1, FA92191-2, FA92191-3, FA92191-4, FA92191-7, FA92191-8

CAS No.	Compound	FA92191-4 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
14797-73-0	Perchlorate	0.20	U	0.2	0.18	90	0.2	0.20	100	11	80-120/15

* = Outside of Control Limits.

Internal Standard Area Summary

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Check Std:	SQ1912-CC1911	**Injection Date:**	01/13/22
Lab File ID:	Q88354.D	**Injection Time:**	14:15
Instrument ID:	GCMSQ	**Method:**	SW846 6850

	IS 1 AREA	RT
Initial Cal [a]	198713	5.31
Check Std [b]	210357	5.31
Upper Limit [c]	298070	7.31
Lower Limit [d]	99357	3.31

Lab Sample ID	IS 1 AREA	RT
OP89224-BS	202716	5.29
OP89224-MB	208796	5.29
ZZZZZZ	156492	4.86
ZZZZZZ	143651	4.78
ZZZZZZ	133615	4.72
ZZZZZZ	132833	4.83
ZZZZZZ	128090	4.67
ZZZZZZ	132722	4.70
ZZZZZZ	136691	4.81
FA92191-1	122964	4.47

IS 1 = Cl18O4 (ISTD)

(a) Initial Cal is: SQ1911-ICC1911 Q88324.D 01/12/22 12:55. Area is AVERAGE of initial cal points.
(b) Check Std Limit = -50 to + 50% of initial cal area.
(c) Upper Limit = + 50% of initial standard area; Retention time + 2 minutes of check standard.
(d) Lower Limit = -50% of initial standard area; Retention time -2 minutes of check standard.

Internal Standard Area Summary

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Check Std:	SQ1912-CC1911	**Injection Date:**	01/13/22
Lab File ID:	Q88366.D	**Injection Time:**	15:56
Instrument ID:	GCMSQ	**Method:**	SW846 6850

	IS 1 AREA	RT
Initial Cal [a]	198713	5.31
Check Std [b]	182078	5.24
Upper Limit [c]	298070	7.24
Lower Limit [d]	99357	3.24

Lab Sample ID	IS 1 AREA	RT
FA92191-2	165444	4.81
FA92191-4	139128	4.64
OP89224-MS	137009	4.64
OP89224-MSD	142614	4.63

IS 1 = Cl18O4 (ISTD)

(a) Initial Cal is: SQ1911-ICC1911 Q88324.D 01/12/22 12:55. Area is AVERAGE of initial cal points.
(b) Check Std Limit = -50 to + 50% of initial cal area.
(c) Upper Limit = + 50% of initial standard area; Retention time + 2 minutes of check standard.
(d) Lower Limit = -50% of initial standard area; Retention time -2 minutes of check standard.

Internal Standard Area Summary

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Check Std:	SQ1913-CC1911	**Injection Date:**	01/14/22
Lab File ID:	Q88390.D	**Injection Time:**	12:03
Instrument ID:	GCMSQ	**Method:**	SW846 6850

	IS 1 AREA	RT
Initial Cal [a]	198713	5.31
Check Std [b]	223567	5.17
Upper Limit [c]	298070	7.17
Lower Limit [d]	99357	3.17

Lab Sample ID	IS 1 AREA	RT
FA92191-3	195618	5.11
FA92191-7	205890	5.18
FA92191-8	200165	5.19
ZZZZZZ	208309	5.20
ZZZZZZ	190374	5.09
ZZZZZZ	165622	5.17
ZZZZZZ	158923	5.17

IS 1 = Cl18O4 (ISTD)

(a) Initial Cal is: SQ1911-ICC1911 Q88324.D 01/12/22 12:55. Area is AVERAGE of initial cal points.
(b) Check Std Limit = -50 to + 50% of initial cal area.
(c) Upper Limit = + 50% of initial standard area; Retention time + 2 minutes of check standard.
(d) Lower Limit = -50% of initial standard area; Retention time -2 minutes of check standard.

Initial Calibration Summary

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample: SQ1911-ICC1911
Lab FileID: Q88324.D

Initial Calibration Report

Method Path	D:\MassHunter\Methods
Method File	6850_011222_SQ1911.quantmethod.xml
Batch Name	D:\MassHunter\Data\011222_6850_SQ1911\QuantResults\sq1911.batch.bin
Last Calib Update	1/12/2022 2:07:32 PM

Level Name	Calibration Files	Acq. Date-Time	Level Last Update Time
1	D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d	1/12/2022 12:30:42 PM	1/12/2022 2:07:32 PM
2	D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d	1/12/2022 12:39:06 PM	1/12/2022 2:07:32 PM
3	D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d	1/12/2022 12:47:30 PM	1/12/2022 2:07:32 PM
4	D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d	1/12/2022 12:55:55 PM	1/12/2022 2:07:32 PM
5	D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d	1/12/2022 1:04:19 PM	1/12/2022 2:07:32 PM
6	D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d	1/12/2022 1:12:43 PM	1/12/2022 2:07:32 PM
7	D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d	1/12/2022 1:21:13 PM	1/12/2022 2:07:32 PM
8	D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d	1/12/2022 1:29:36 PM	1/12/2022 2:07:32 PM

Compound	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD
I Cl18O4				---------- ISTD ----------							
T Perchlorate	Avg RF	1.1028	1.0633	1.1304	1.1800	1.2216	1.2733	1.3423	1.3522	1.2082	8.963

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Generated at 2:07 PM on 1/12/2022

Initial Calibration Verification

Job Number: FA92191 **Sample:** SQ1911-ICV1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88329.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011222_6850_SQ1911\sq1911.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88329
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.808	-9.6	90.4

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88354.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88354
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.937	-3.2	96.8

CC Criteria: +/- 15%

6.5.3

6

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88355.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88355
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.193	-3.7	96.3

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88366.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88366
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.968	-1.6	98.4

CC Criteria: +/- 15%

6.5.5

6

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88367.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88367
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.192	-3.9	96.1

CC Criteria: +/- 15%

6.5.6

6

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88376.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88376
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.937	-3.2	96.8

CC Criteria: +/- 15%

6.5.7

6

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88377.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88377
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.183	-8.7	91.3

CC Criteria: +/- 15%

6.5.8

6

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88383.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88383
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.950	-2.5	97.5

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1913-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88390.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011422_6850_SQ1913\sq1913.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88390
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.926	-3.7	96.3

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1913-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88391.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011422_6850_SQ1913\sq1913.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88391
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.176	-11.8	88.2

CC Criteria: +/- 30%

Continuing Calibration Summary

Job Number: FA92191 **Sample:** SQ1913-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88399.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011422_6850_SQ1913\sq1913.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88399
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.938	-3.1	96.9

CC Criteria: +/- 15%

Run Sequence Report

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Run ID: SQ1911	**Method:** SW846 6850	**Instrument ID:** GCMSQ

Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
SQ1911-IC1911	Q88320.D	01/12/22 12:22	n/a	Mass Calibration Verification
SQ1911-IC1911	Q88321.D	01/12/22 12:30	n/a	Initial cal 0.2
SQ1911-IC1911	Q88322.D	01/12/22 12:39	n/a	Initial cal 0.5
SQ1911-IC1911	Q88323.D	01/12/22 12:47	n/a	Initial cal 1.0
SQ1911-ICC1911	Q88324.D	01/12/22 12:55	n/a	Initial cal 2.0
SQ1911-IC1911	Q88325.D	01/12/22 13:04	n/a	Initial cal 5.0
SQ1911-IC1911	Q88326.D	01/12/22 13:12	n/a	Initial cal 10
SQ1911-IC1911	Q88327.D	01/12/22 13:21	n/a	Initial cal 25
SQ1911-IC1911	Q88328.D	01/12/22 13:29	n/a	Initial cal 50
SQ1911-ICV1911	Q88329.D	01/12/22 13:38	n/a	Initial cal verification 2
FA91899-2	Q88331.D	01/12/22 13:54	OP89193	(used for QC only; not part of job FA92191)
OP89193-MS	Q88332.D	01/12/22 14:03	OP89193	Matrix Spike
OP89193-MSD	Q88333.D	01/12/22 14:11	OP89193	Matrix Spike Duplicate
ZZZZZZ	Q88334.D	01/12/22 14:20	OP89193	(unrelated sample)
ZZZZZZ	Q88335.D	01/12/22 14:28	OP89193	(unrelated sample)
ZZZZZZ	Q88336.D	01/12/22 14:36	OP89193	(unrelated sample)
ZZZZZZ	Q88337.D	01/12/22 14:45	OP89193	(unrelated sample)
SQ1911-CC1911	Q88338.D	01/12/22 14:53	n/a	Continuing cal 2.0
SQ1911-CC1911	Q88339.D	01/12/22 15:01	n/a	Continuing cal 0.2
JD37364-1A	Q88341.D	01/12/22 15:18	OP89192	(used for QC only; not part of job FA92191)
OP89192-MS	Q88342.D	01/12/22 15:27	OP89192	Matrix Spike
OP89192-MSD	Q88343.D	01/12/22 15:35	OP89192	Matrix Spike Duplicate
ZZZZZZ	Q88344.D	01/12/22 15:43	OP89192	(unrelated sample)
ZZZZZZ	Q88345.D	01/12/22 15:52	OP89192	(unrelated sample)
SQ1911-CC1911	Q88346.D	01/12/22 16:00	n/a	Continuing cal 2.0
SQ1911-ECC1911	Q88347.D	01/12/22 16:09	n/a	Ending cal 0.2
SQ1911-IBLK	Q88348.D	01/12/22 16:17	n/a	Instrument Blank
SQ1911-IBLK	Q88348.D	01/12/22 16:17	n/a	Instrument Blank

Run Sequence Report

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Run ID: SQ1912 **Method:** SW846 6850 **Instrument ID:** GCMSQ

Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
SQ1912-CC1911	Q88354.D	01/13/22 14:15	n/a	Continuing cal 2.0
SQ1912-CC1911	Q88355.D	01/13/22 14:24	n/a	Continuing cal 0.2
OP89224-BS	Q88356.D	01/13/22 14:32	OP89224	Blank Spike
OP89224-MB	Q88357.D	01/13/22 14:41	OP89224	Method Blank
ZZZZZZ	Q88358.D	01/13/22 14:49	OP89224	(unrelated sample)
ZZZZZZ	Q88359.D	01/13/22 14:58	OP89224	(unrelated sample)
ZZZZZZ	Q88360.D	01/13/22 15:06	OP89224	(unrelated sample)
ZZZZZZ	Q88361.D	01/13/22 15:14	OP89224	(unrelated sample)
ZZZZZZ	Q88362.D	01/13/22 15:23	OP89224	(unrelated sample)
ZZZZZZ	Q88363.D	01/13/22 15:31	OP89224	(unrelated sample)
ZZZZZZ	Q88364.D	01/13/22 15:40	OP89224	(unrelated sample)
FA92191-1	Q88365.D	01/13/22 15:48	OP89224	50WW29-220105
SQ1912-CC1911	Q88366.D	01/13/22 15:56	n/a	Continuing cal 2.0
SQ1912-CC1911	Q88367.D	01/13/22 16:05	n/a	Continuing cal 0.2
FA92191-2	Q88369.D	01/13/22 16:22	OP89224	50WW05-220105
FA92191-4	Q88371.D	01/13/22 16:38	OP89224	50WW14-220106
OP89224-MS	Q88372.D	01/13/22 16:47	OP89224	Matrix Spike
OP89224-MSD	Q88373.D	01/13/22 16:55	OP89224	Matrix Spike Duplicate
SQ1912-CC1911	Q88376.D	01/13/22 17:20	n/a	Continuing cal 2.0
SQ1912-CC1911	Q88377.D	01/13/22 17:29	n/a	Continuing cal 0.2
SQ1912-CC1911	Q88383.D	01/13/22 18:19	n/a	Continuing cal 2.0
SQ1912-ECC1911	Q88384.D	01/13/22 18:28	n/a	Ending cal 0.2
SQ1912-IBLK	Q88385.D	01/13/22 18:36	n/a	Instrument Blank

Run Sequence Report

Job Number: FA92191
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Run ID: SQ1913	**Method:** SW846 6850	**Instrument ID:** GCMSQ

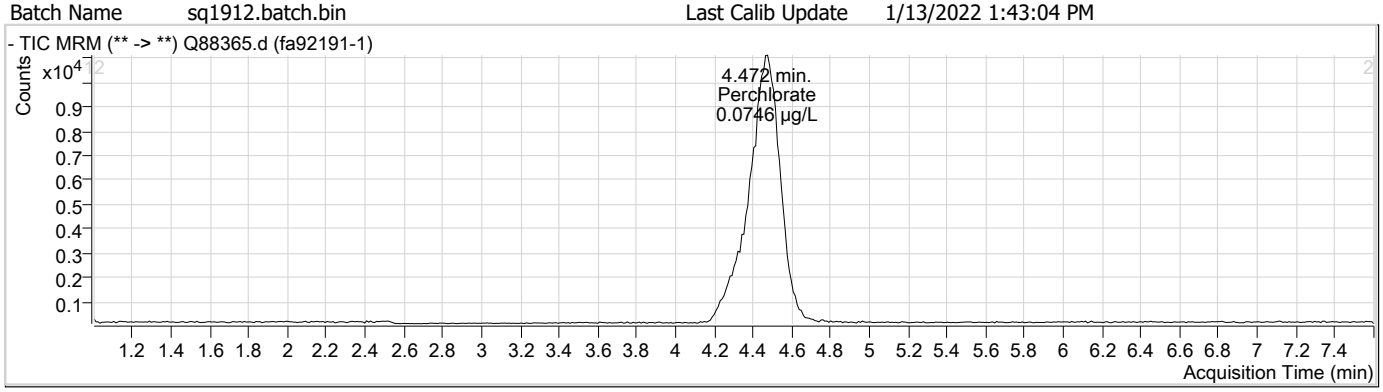
Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
SQ1913-CC1911	Q88390.D	01/14/22 12:03	n/a	Continuing cal 2.0
SQ1913-CC1911	Q88391.D	01/14/22 12:11	n/a	Continuing cal 0.2
FA92191-3	Q88392.D	01/14/22 12:20	OP89224	50WW08-220105
FA92191-7	Q88393.D	01/14/22 12:28	OP89224	50WW13-220106
FA92191-8	Q88394.D	01/14/22 12:36	OP89224	50WW13-220106-FD
ZZZZZZ	Q88395.D	01/14/22 12:45	OP89224	(unrelated sample)
ZZZZZZ	Q88396.D	01/14/22 12:53	OP89224	(unrelated sample)
ZZZZZZ	Q88397.D	01/14/22 13:02	OP89224	(unrelated sample)
ZZZZZZ	Q88398.D	01/14/22 13:10	OP89224	(unrelated sample)
SQ1913-CC1911	Q88399.D	01/14/22 13:26	n/a	Continuing cal 2.0
SQ1913-ECC1911	Q88400.D	01/14/22 13:34	n/a	Ending cal 0.2
SQ1913-IBLK	Q88401.D	01/14/22 13:43	n/a	Instrument Blank

MS Semi-volatiles

Raw Data

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88365.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 3:48:29 PM
Sample Name	fa92191-1	Instrument	Instrument 1
Vial	P1-C3	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

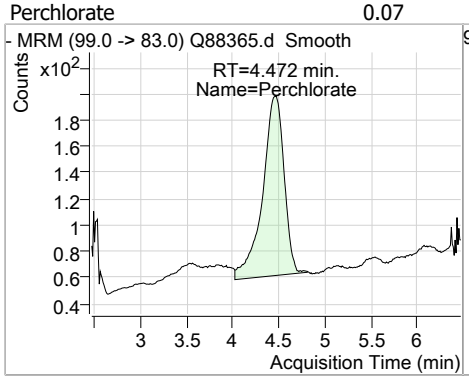


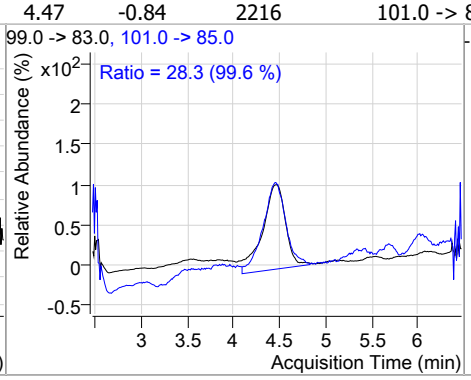
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	4.475	107.0 -> 89.0	122964	NoQ	5.00	µg/L	-0.835
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	4.472	99.0 -> 83.0	2216	3.5	0.07	µg/L	100

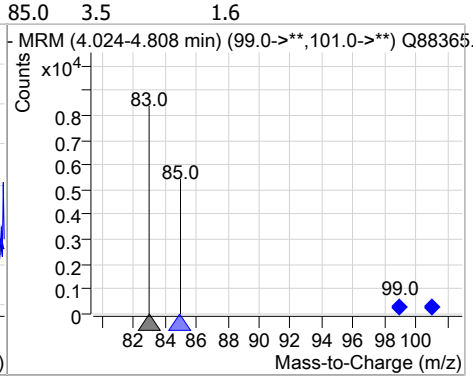
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.07	4.47	-0.84	2216	101.0 -> 85.0	3.5	1.6	



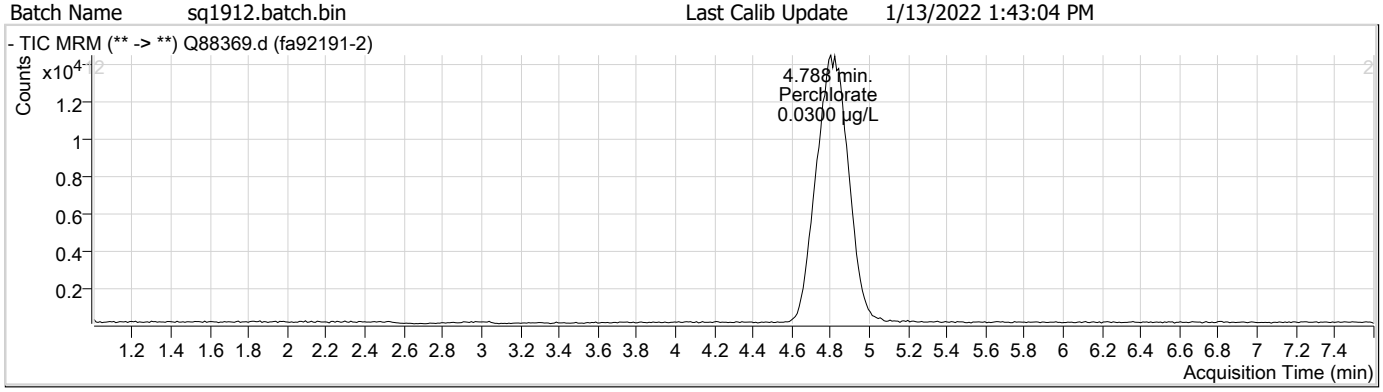




Quantitative Analysis Report for Perchlorate by 6850

Mike Eger
01/14/22 13:17

Data File	: Q88369.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:22:05 PM
Sample Name	fa92191-2	Instrument	Instrument 1
Vial	P1-C4	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



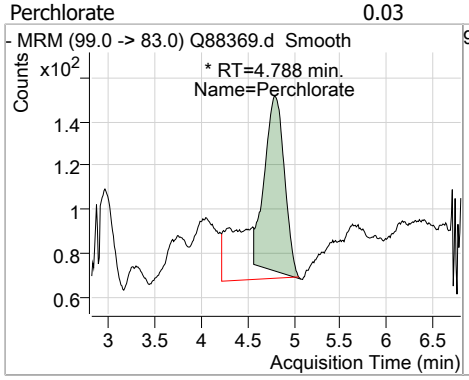
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units		Dev(Min)
Internal Standards								
Cl18O4	4.811	107.0 -> 89.0	165444	NoQ	5.00	µg/L		-0.499
System Monitoring Compounds								
Target Compounds								QValue
Perchlorate	4.788	99.0 -> 83.0	1198	2.3	0.03	µg/L	m	72

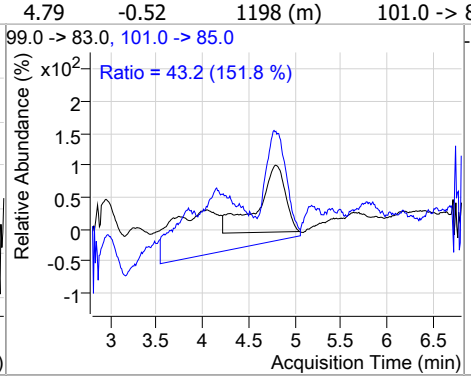
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

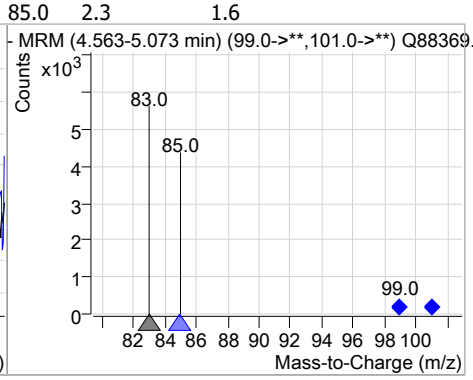
Manual Integrations APPROVED (compounds with "m" flag)

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.03	4.79	-0.52	1198 (m)	101.0 -> 85.0	2.3	1.6	







7.1.2

7

Manual Integration Approval Summary

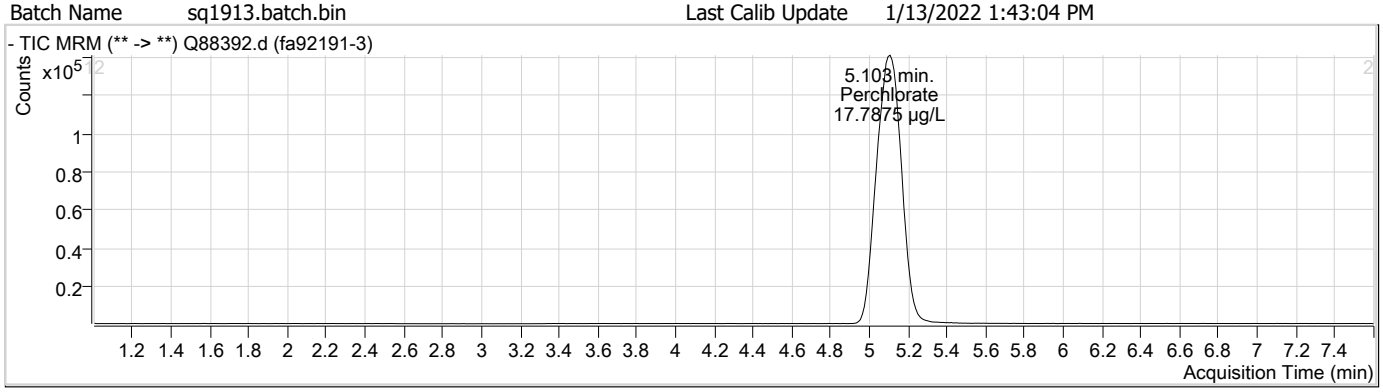
Sample Number: FA92191-2
Lab FileID: Q88369.D
Injection Time: 01/13/22 16:22

Method: SW846 6850
Analyst approved: 01/14/22 11:08 Natasha Gumtie
Supervisor approved: 01/14/22 13:17 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perchlorate	14797-73-0		4.79	Poor instrument integration

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88392.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:20:03 PM
Sample Name	fa92191-3	Instrument	Instrument 1
Vial	P1-E1	Sample Information	OP89224,SQ1913,10.0,,,10.0,10,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	10x
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

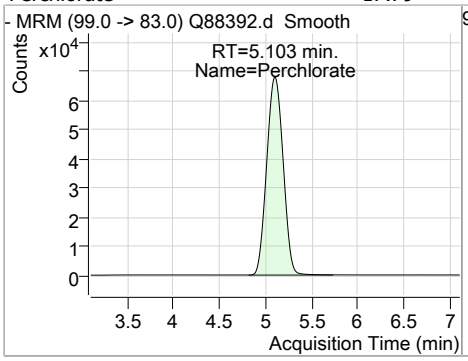


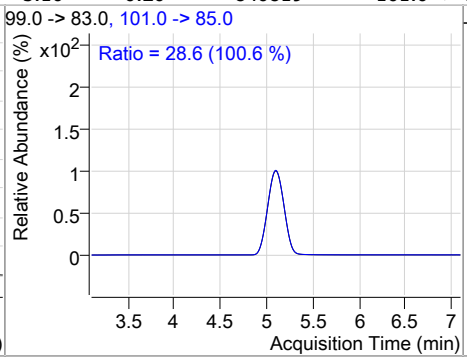
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.107	107.0 -> 89.0	195618	NoQ	5.00	µg/L	-0.204
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.103	99.0 -> 83.0	840819	3.5	17.79	µg/L	100

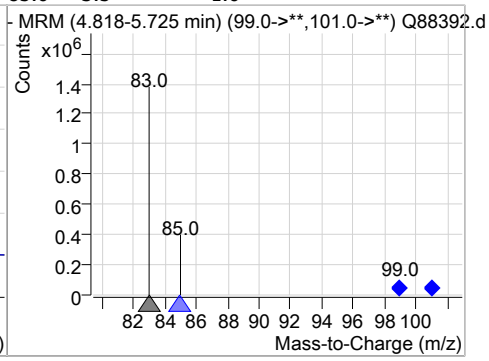
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	17.79	5.10	-0.20	840819	101.0 -> 85.0	3.5	1.6	

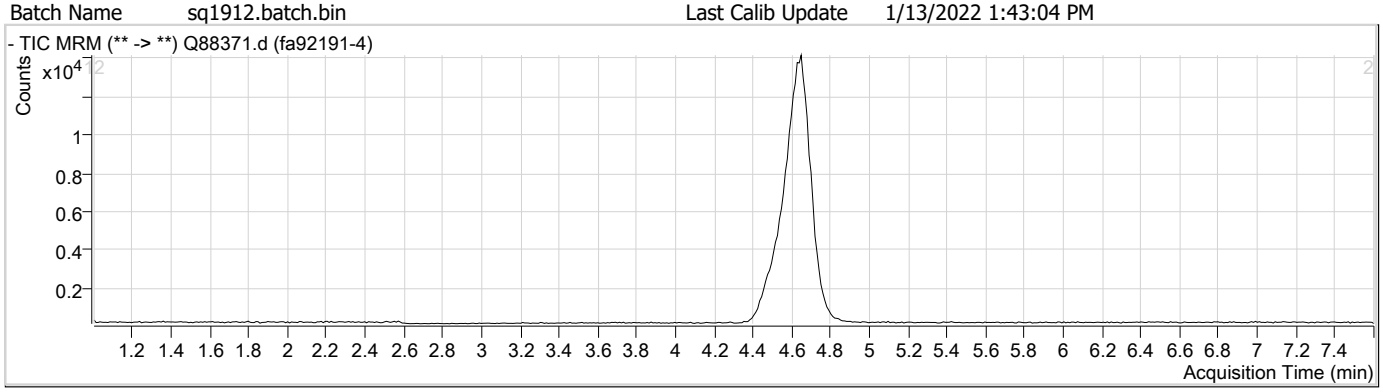






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88371.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:38:53 PM
Sample Name	fa92191-4	Instrument	Instrument 1
Vial	P1-C6	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

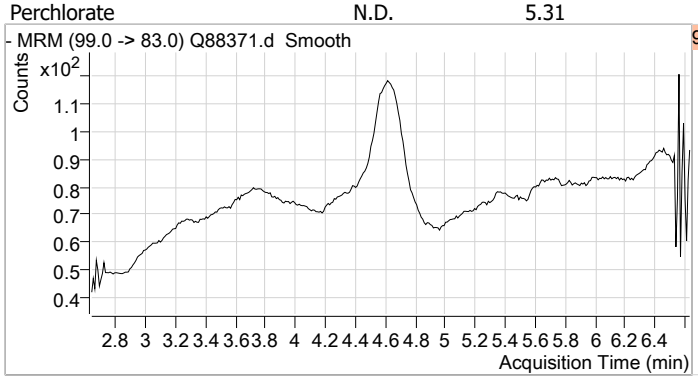


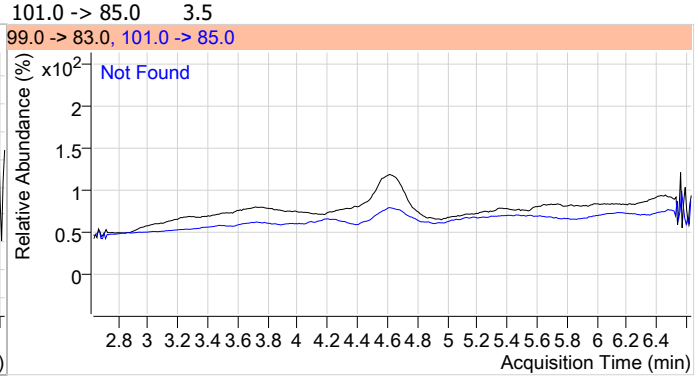
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	4.638	107.0 -> 89.0	139128	NoQ	5.00	µg/L	-0.672
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	-	99.0 -> 83.0		-	N.D.		

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

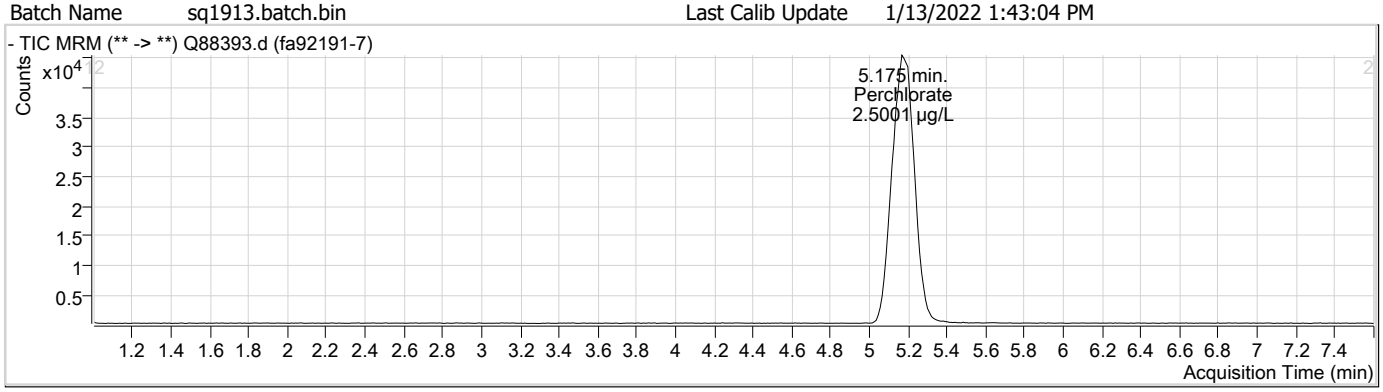
Compound	Conc.	Exp RT	QIon	Exp Ratio
Perchlorate	N.D.	5.31	101.0 -> 85.0	3.5





Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88393.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:28:27 PM
Sample Name	fa92191-7	Instrument	Instrument 1
Vial	P1-E2	Sample Information	OP89224,SQ1913,10.0,,,10.0,1000,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	1000x
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

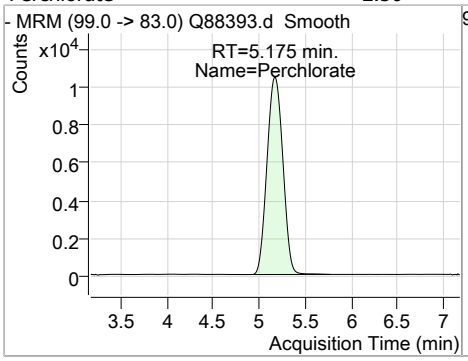


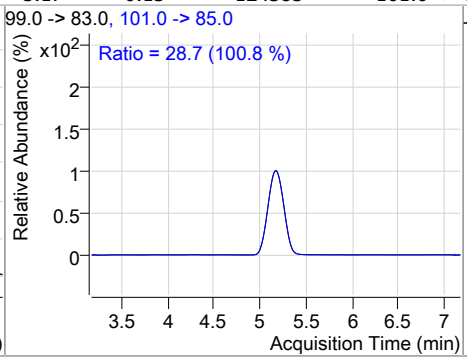
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.178	107.0 -> 89.0	205890	NoQ	5.00	µg/L	-0.132
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.175	99.0 -> 83.0	124385	3.5	2.50	µg/L	100

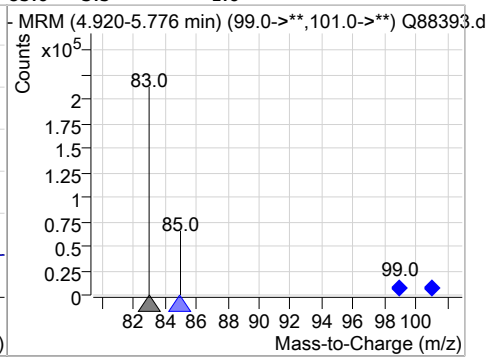
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	2.50	5.17	-0.13	124385	101.0 -> 85.0	3.5	1.6	





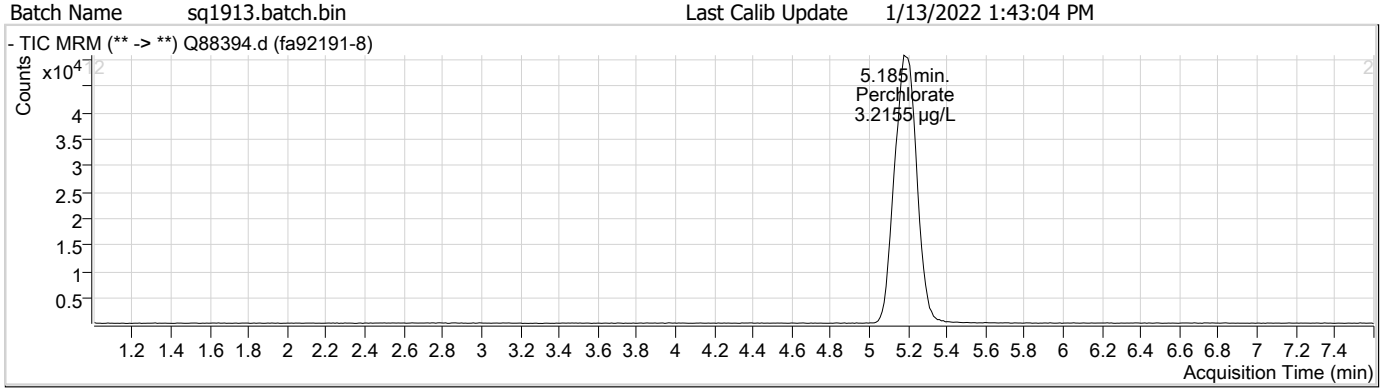


7.1.5

7

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88394.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:36:52 PM
Sample Name	fa92191-8	Instrument	Instrument 1
Vial	P1-E3	Sample Information	OP89224,SQ1913,10.0,,,10.0,1000,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	1000x
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

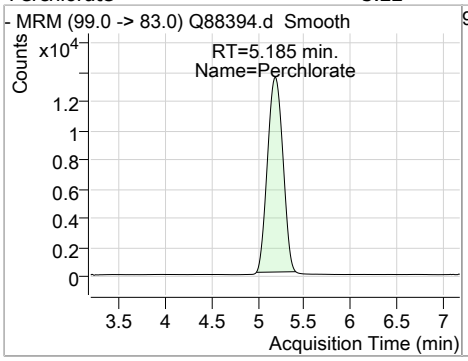


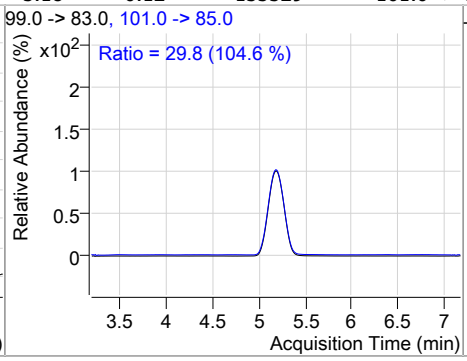
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.188	107.0 -> 89.0	200165	NoQ	5.00 µg/L	-0.122
System Monitoring Compounds						
Target Compounds						QValue
Perchlorate	5.185	99.0 -> 83.0	155529	3.4	3.22 µg/L	98

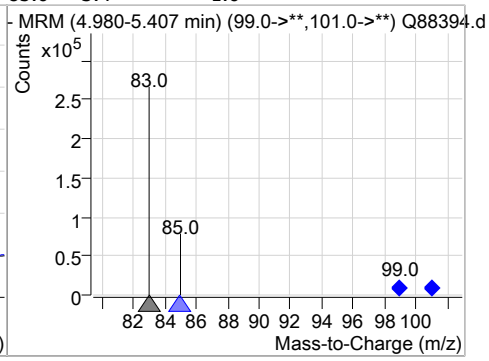
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	3.22	5.18	-0.12	155529	101.0 -> 85.0	3.4	1.6	

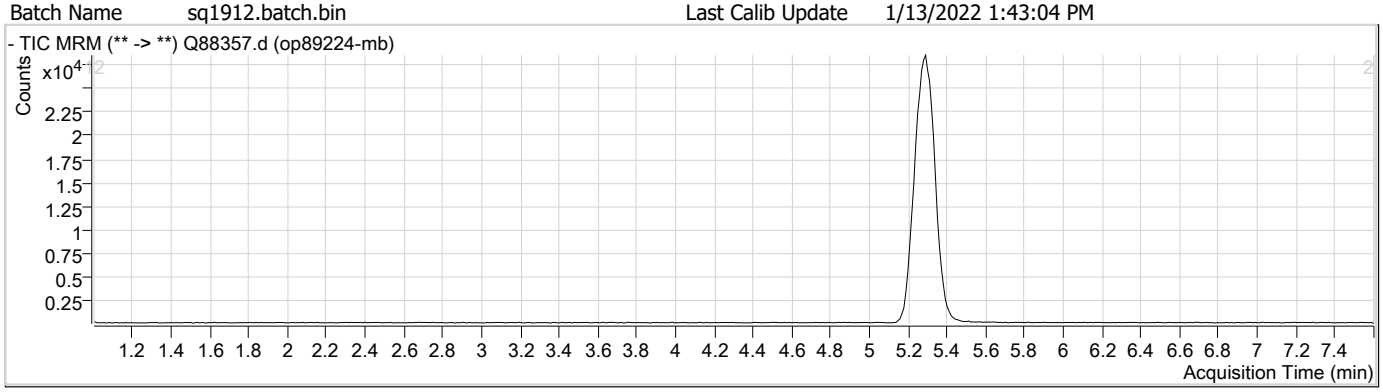






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88357.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:41:13 PM
Sample Name	op89224-mb	Instrument	Instrument 1
Vial	P1-B4	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



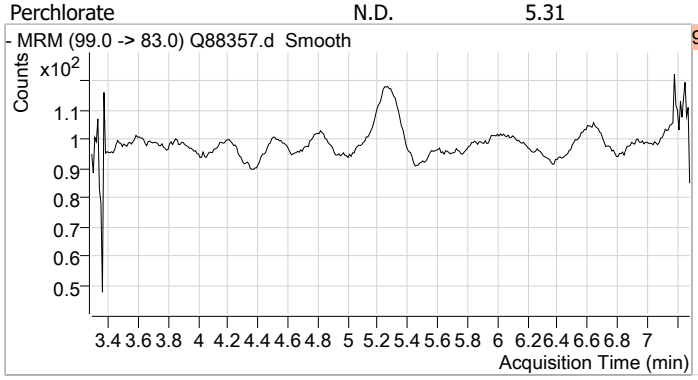
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.290	107.0 -> 89.0	208796	NoQ	5.00 µg/L	-0.020
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	-	99.0 -> 83.0		-	N.D.	

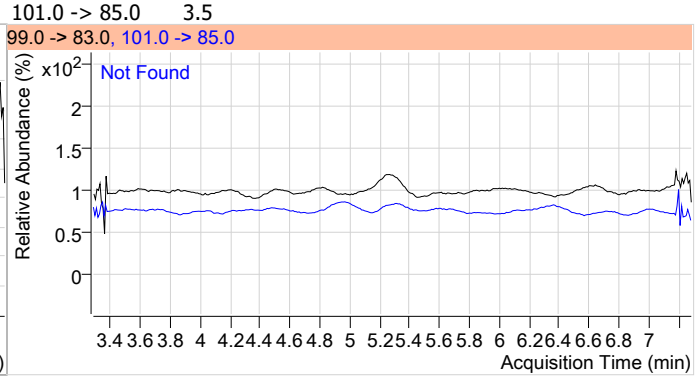
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

01152548

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	Exp RT	QIon	Exp Ratio
Perchlorate	N.D.	5.31	101.0 -> 85.0	3.5



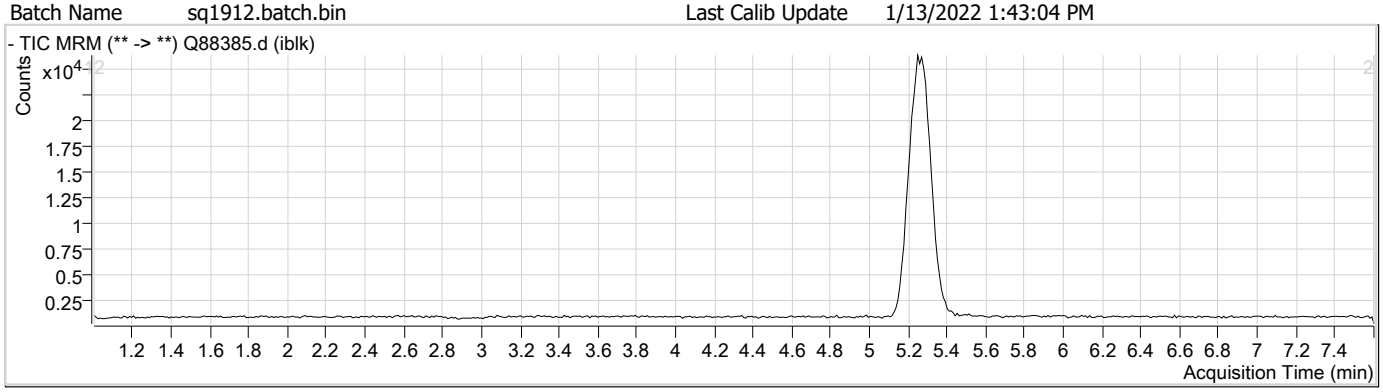


7.2.1

7

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88385.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 6:36:31 PM
Sample Name	iblk	Instrument	Instrument 1
Vial	P1-A1	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

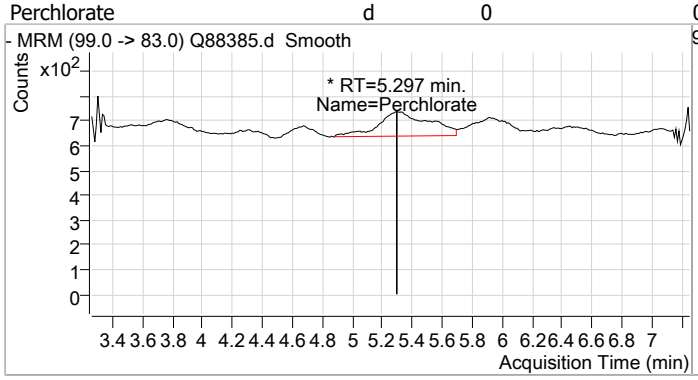


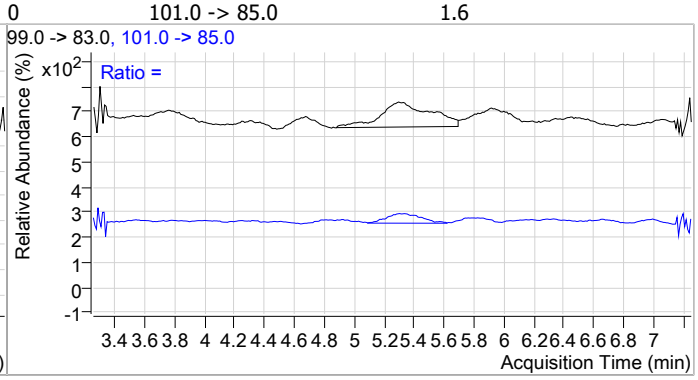
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units		Dev(Min)
Internal Standards								
Cl18O4	5.259	107.0 -> 89.0	202117	NoQ	5.00	µg/L		-0.051
System Monitoring Compounds								
Target Compounds								QValue
Perchlorate	5.297	99.0 -> 83.0	0		0.00	µg/L	md	1

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	d	0		0	101.0 -> 85.0		1.6	





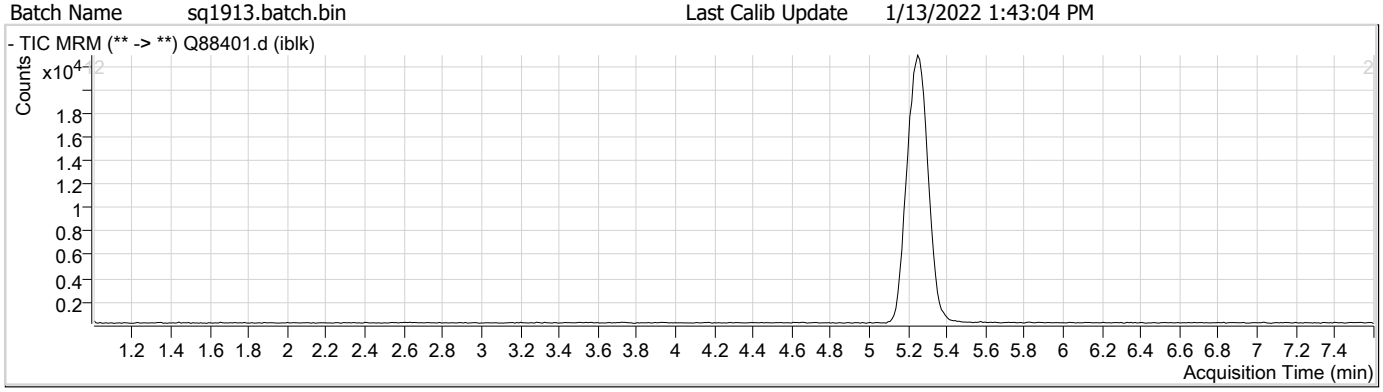
7.2.2

7

01152551

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88401.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 1:43:04 PM
Sample Name	iblk	Instrument	Instrument 1
Vial	P1-A1	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

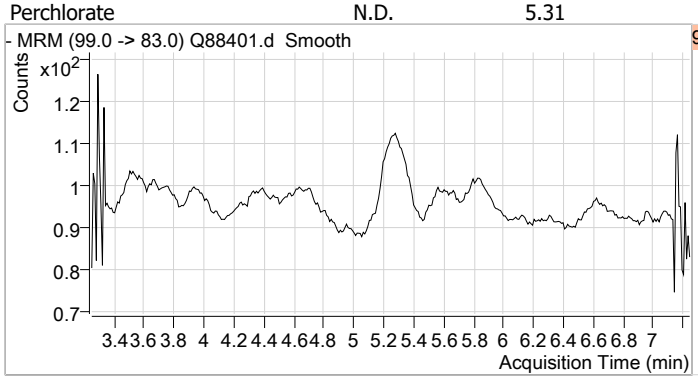


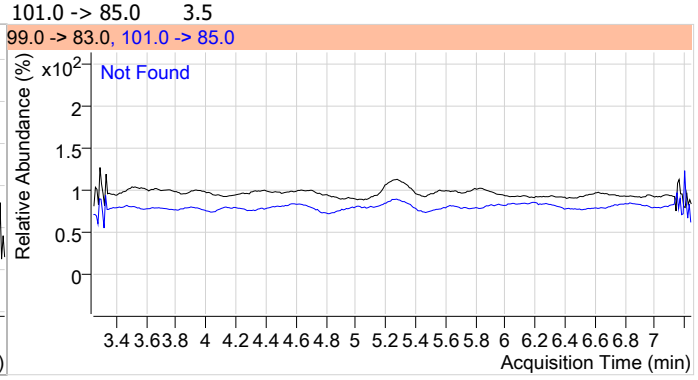
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.249	107.0 -> 89.0	174064	NoQ	5.00 µg/L	-0.061
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	-	99.0 -> 83.0		-	N.D.	

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

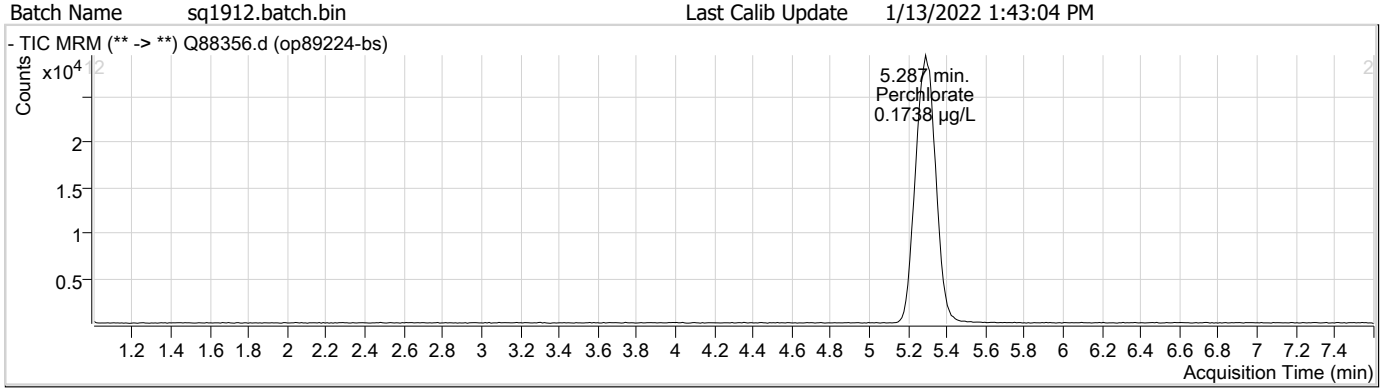
Compound	Conc.	Exp RT	QIon	Exp Ratio
Perchlorate	N.D.	5.31	101.0 -> 85.0	3.5





Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88356.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:32:44 PM
Sample Name	op89224-bs	Instrument	Instrument 1
Vial	P1-B3	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

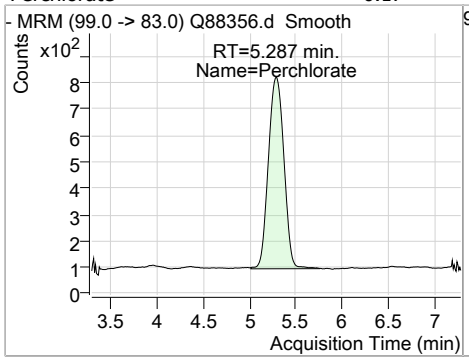


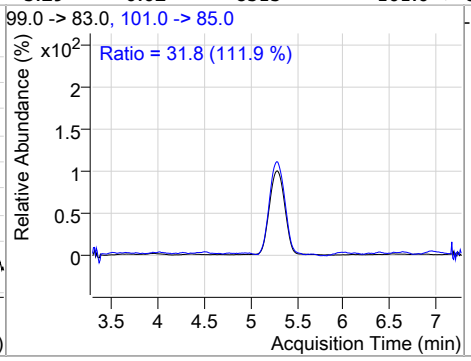
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.290	107.0 -> 89.0	202716	NoQ	5.00 µg/L	-0.020
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.287	99.0 -> 83.0	8515	3.1	0.17 µg/L	94

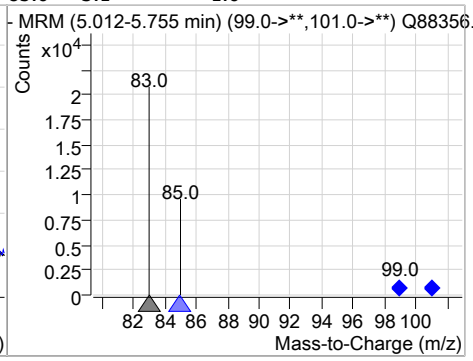
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.17	5.29	-0.02	8515	101.0 -> 85.0	3.1	1.6	

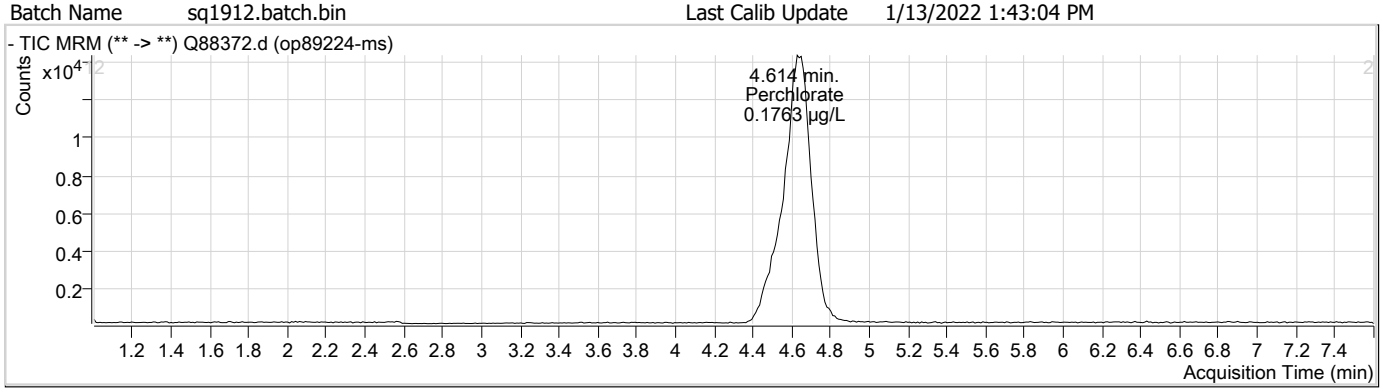






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88372.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:47:19 PM
Sample Name	op89224-ms	Instrument	Instrument 1
Vial	P1-C7	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

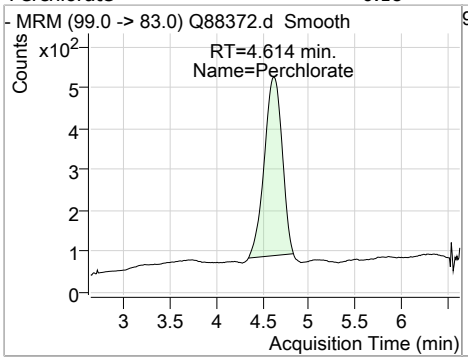


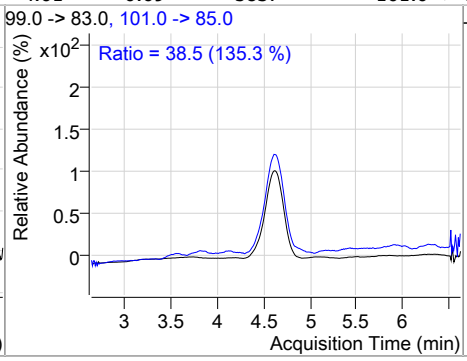
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	4.638	107.0 -> 89.0	137009	NoQ	5.00 µg/L	-0.672
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	4.614	99.0 -> 83.0	5837	2.6	0.18 µg/L	81

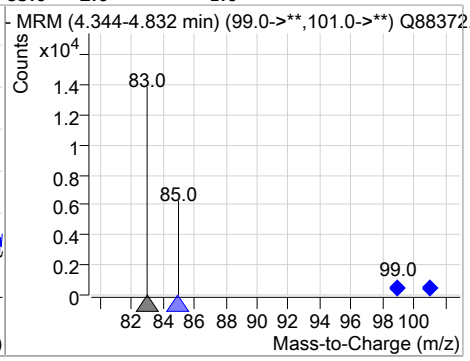
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	4.61	-0.69	5837	101.0 -> 85.0	2.6	1.6	

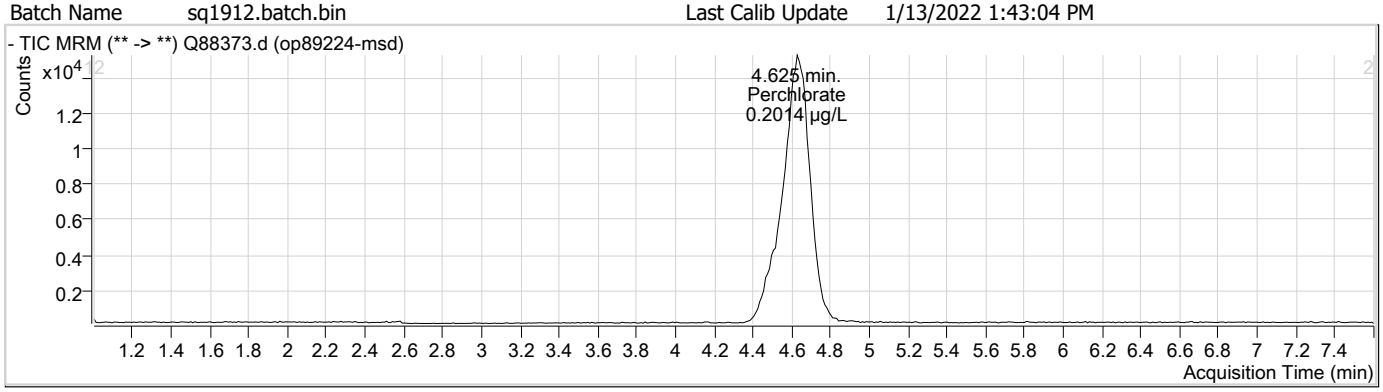






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88373.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:55:44 PM
Sample Name	op89224-msd	Instrument	Instrument 1
Vial	P1-C8	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

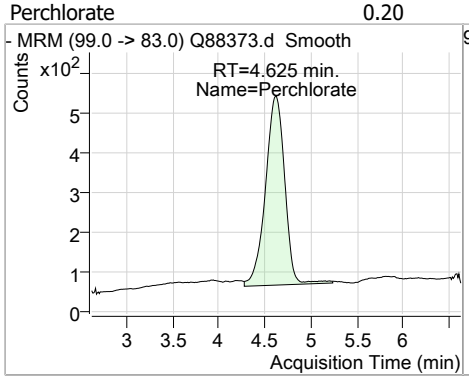


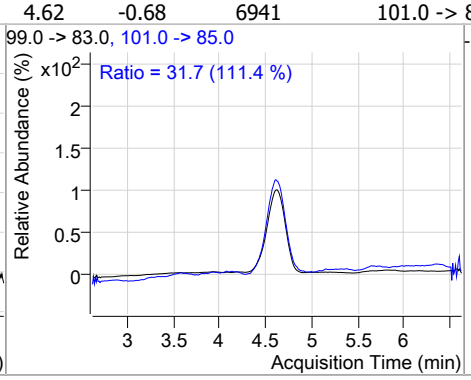
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	4.628	107.0 -> 89.0	142614	NoQ	5.00 µg/L	-0.682
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	4.625	99.0 -> 83.0	6941	3.2	0.20 µg/L	94

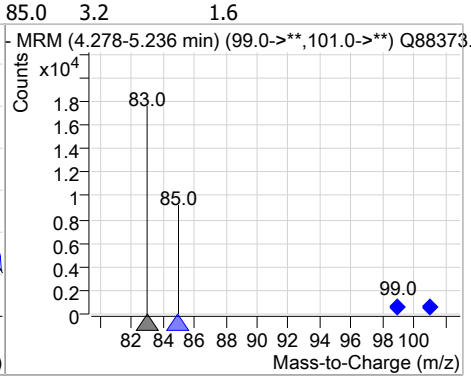
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.20	4.62	-0.68	6941	101.0 -> 85.0	3.2	1.6	







7.4.2

7

01152559

QQQ Check Tune Report

Agilent Technologies

Instrument Name	Instrument 1
MS Model	G6460A
MS Instrument Serial	SG10447001
Software_Firmware Version	B.08.02.B8260.0, FW: A.00.08.62
Tune Date & Time	11 January 2022 08:01:39
Data Path	D:\MassHunter\Tune\QQQ\G6460A\atunes.TUNE.XML
Ion Source	AJS ESI
Ionization Mode	AJS ESI
Tuned Resolution	All
Vacuum Pressure	1.66E+0[R]; 2.51E-5[H]

Source Parameters

Parameter	Value
Gas Temp	300
Gas Flow	10
Nebulizer	15
Capillary	4000
Nozzle Voltage	1500
Sheath Gas Temp	250
Sheath Gas Flow	7

7.5.1

7

QQQ Check Tune Report

Agilent Technologies

Negative Results

Analyzer: MS1 Polarity: Negative Width: Unit

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	112.95	-0.04	Pass	0.70	0.67	-0.03	Pass	164320
302.00	302.02	0.02	Pass	0.70	0.68	-0.02	Pass	69801
601.98	602.05	0.07	Pass	0.70	0.61	-0.09	Pass	79178
1033.99	1033.97	-0.02	Pass	0.70	0.63	-0.07	Pass	267423
1633.95	1633.79	-0.16	Pass	0.70	0.70	0.00	Pass	508633
2233.91	2233.61	-0.30	Pass	0.70	0.79	0.09	Pass	333638

Analyzer: MS2 Polarity: Negative Width: Unit

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	69.00	0.00	Pass	0.70	0.74	0.04	Pass	52544
112.99	112.95	-0.04	Pass	0.70	0.72	0.02	Pass	364001
302.00	301.87	-0.13	Pass	0.70	0.79	0.09	Pass	110580
601.98	601.84	-0.14	Pass	0.70	0.78	0.08	Pass	143379
1033.99	1033.79	-0.20	Pass	0.70	0.81	0.11	Pass	430459
1633.95	1633.75	-0.20	Pass	0.70	0.83	0.13	Pass	638401
2233.91	2233.66	-0.25	Pass	0.70	0.63	-0.07	Pass	121276

Analyzer: MS1 Polarity: Negative Width: Wide

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	112.89	-0.10	Pass	1.20	1.08	-0.12	Pass	244736
302.00	301.99	-0.01	Pass	1.20	1.38	0.18	Pass	106589
601.98	601.98	0.00	Pass	1.20	1.42	0.22	Pass	144720
1033.99	1033.85	-0.14	Pass	1.20	1.51	0.31	Pass	529381
1633.95	1633.75	-0.20	Pass	1.20	1.41	0.21	Pass	1203150
2233.91	2233.61	-0.30	Pass	1.20	1.29	0.09	Pass	739240

Analyzer: MS2 Polarity: Negative Width: Wide

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	68.99	-0.01	Pass	1.20	1.25	0.05	Pass	67877
112.99	112.91	-0.08	Pass	1.20	1.30	0.10	Pass	424641
302.00	301.85	-0.15	Pass	1.20	1.39	0.19	Pass	158231
601.98	601.79	-0.19	Pass	1.20	1.33	0.13	Pass	199357
1033.99	1033.73	-0.26	Pass	1.20	1.13	-0.07	Pass	624691
1633.95	1633.63	-0.32	Pass	1.20	1.13	-0.07	Pass	1583735
2233.91	2233.61	-0.30	Pass	1.20	1.27	0.07	Pass	1450519

Analyzer: MS1 Polarity: Negative Width: Widest

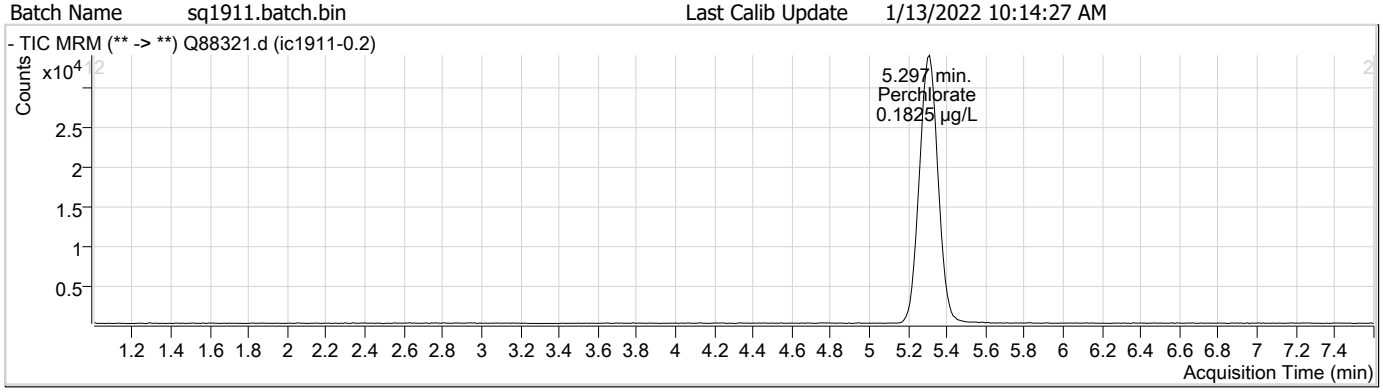
m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	112.61	-0.38	Pass	2.50	2.58	0.08	Pass	357627
302.00	301.97	-0.03	Pass	2.50	2.90	0.40	Pass	127663
601.98	601.96	-0.02	Pass	2.50	2.92	0.42	Pass	183236
1033.99	1033.87	-0.12	Pass	2.50	2.92	0.42	Pass	794803
1633.95	1633.65	-0.30	Pass	2.50	2.77	0.27	Pass	1964604
2233.91	2233.49	-0.42	Pass	2.50	2.68	0.18	Pass	1297152

Analyzer: MS2 Polarity: Negative Width: Widest

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	69.01	0.01	Pass	2.50	2.52	0.02	Pass	81328
112.99	112.96	-0.03	Pass	2.50	2.59	0.09	Pass	493168
302.00	301.83	-0.17	Pass	2.50	2.65	0.15	Pass	182366
601.98	601.76	-0.22	Pass	2.50	2.62	0.12	Pass	259455
1033.99	1033.75	-0.24	Pass	2.50	2.35	-0.15	Pass	1141479
1633.95	1633.68	-0.27	Pass	2.50	2.35	-0.15	Pass	3541857
2233.91	2233.56	-0.35	Pass	2.50	2.48	-0.02	Pass	3689915

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88321.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:30:42 PM
Sample Name	ic1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

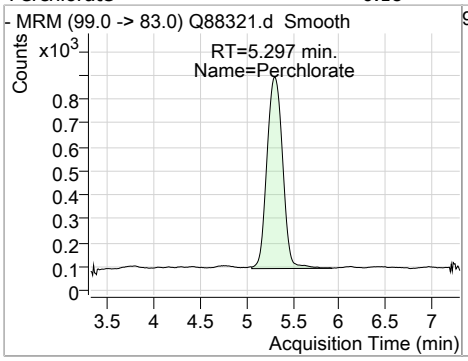


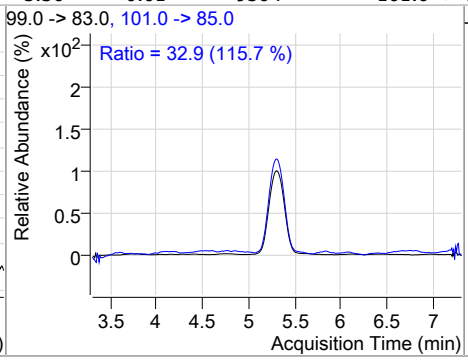
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.310	107.0 -> 89.0	215450	NoQ	5.00	µg/L	0.000
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.297	99.0 -> 83.0	9504	3.0	0.18	µg/L	92

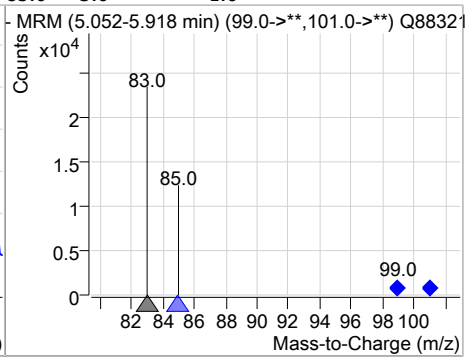
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	5.30	-0.01	9504	101.0 -> 85.0	3.0	1.6	

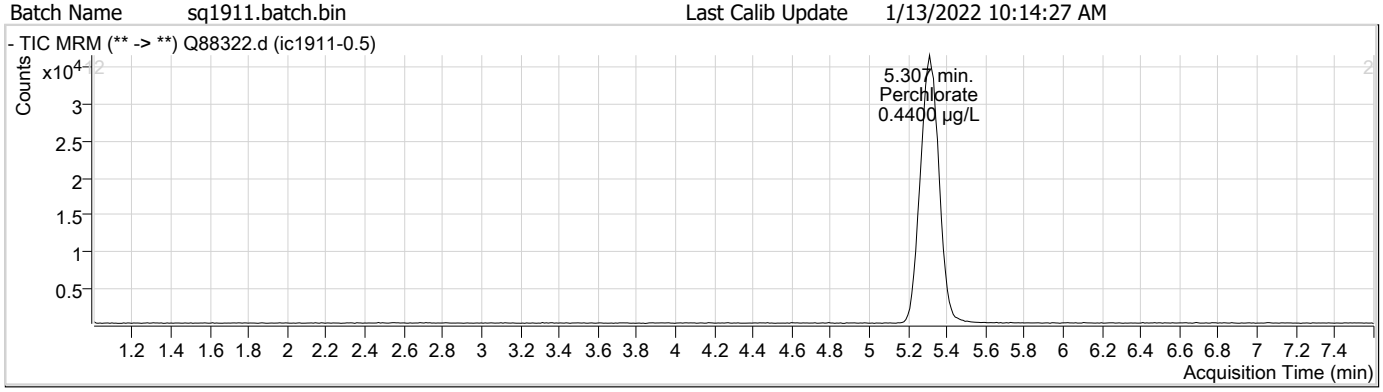






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88322.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:39:06 PM
Sample Name	ic1911-0.5	Instrument	Instrument 1
Vial	P1-A3	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

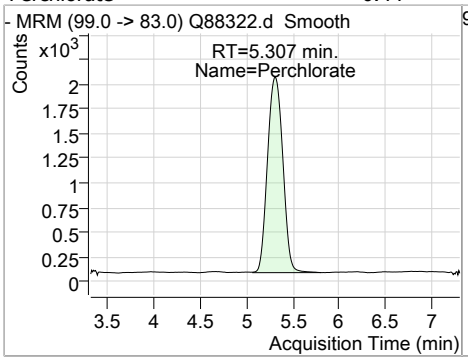


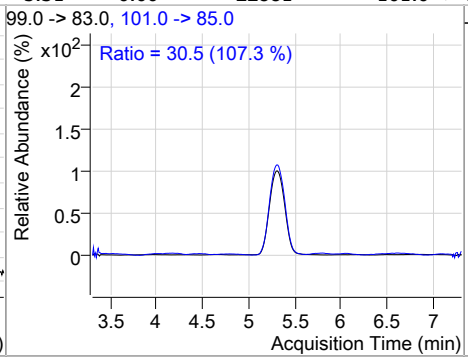
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	215195	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	22881	3.3	0.44 µg/L	96

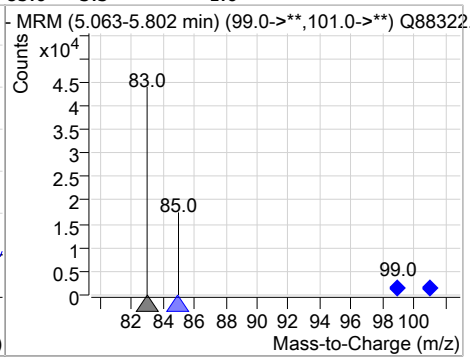
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.44	5.31	0.00	22881	101.0 -> 85.0	3.3	1.6	







7.5.3

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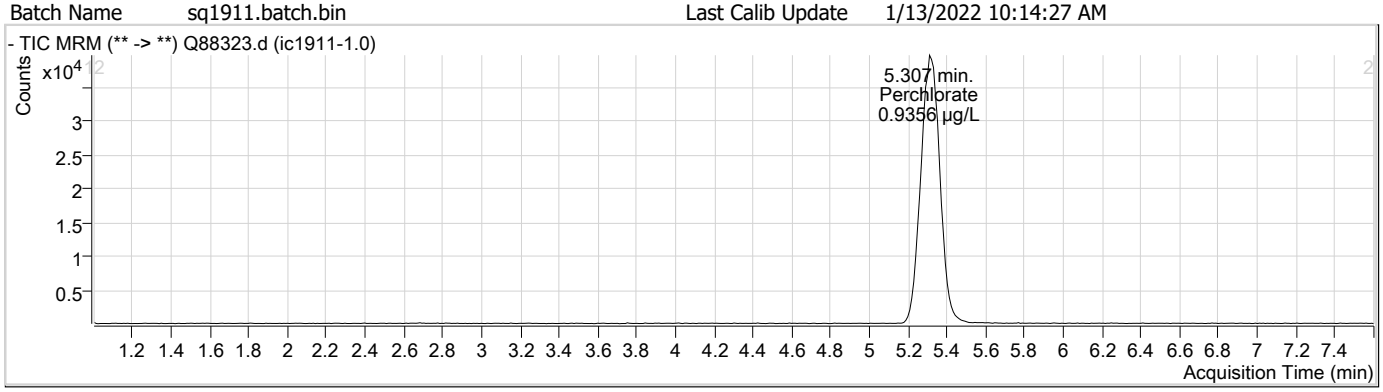
Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88323.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:47:30 PM
Sample Name	ic1911-1.0	Instrument	Instrument 1
Vial	P1-A4	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

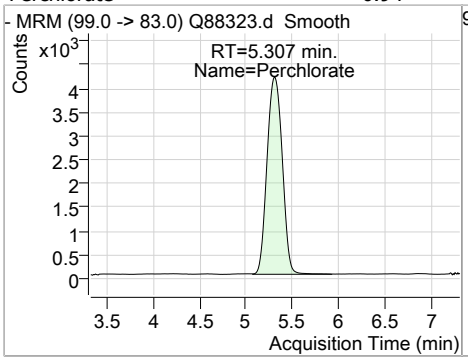


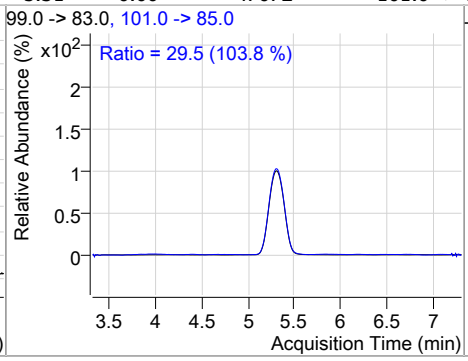
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.321	107.0 -> 89.0	210857	NoQ	5.00 µg/L	0.010
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	47672	3.4	0.94 µg/L	98

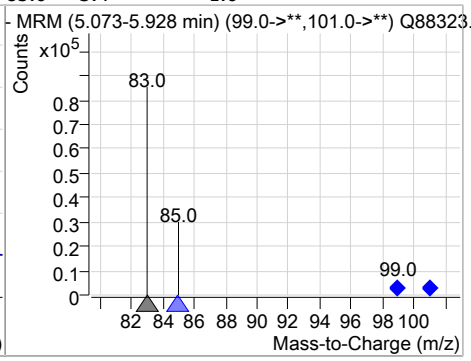
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.94	5.31	0.00	47672	101.0 -> 85.0	3.4	1.6	

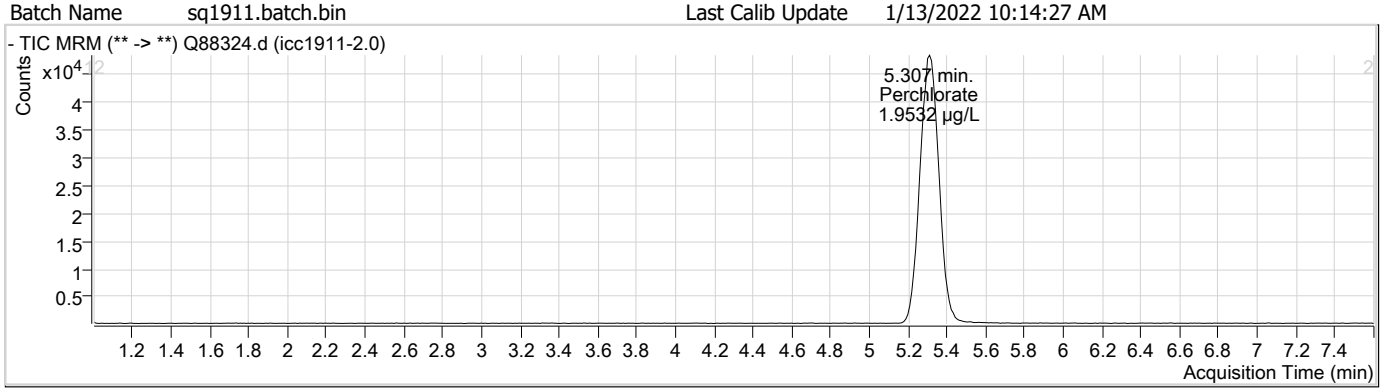






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88324.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:55:55 PM
Sample Name	icc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

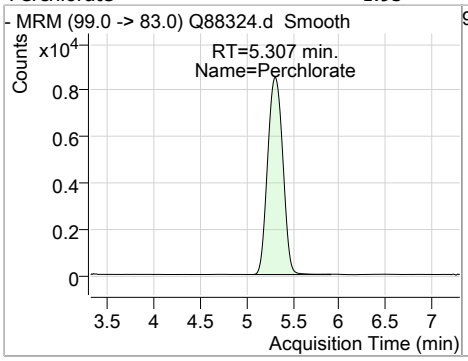


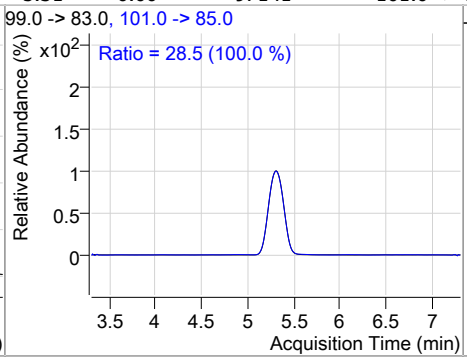
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	205811	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	97141	3.5	1.95 µg/L	100

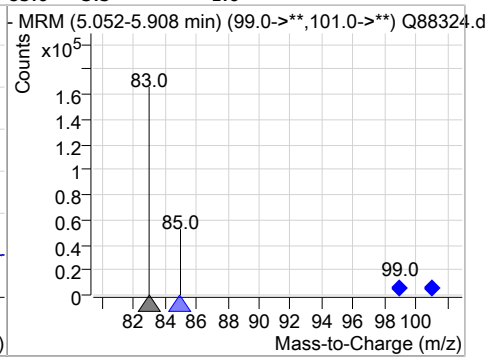
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.95	5.31	0.00	97141	101.0 -> 85.0	3.5	1.6	







7.5.5

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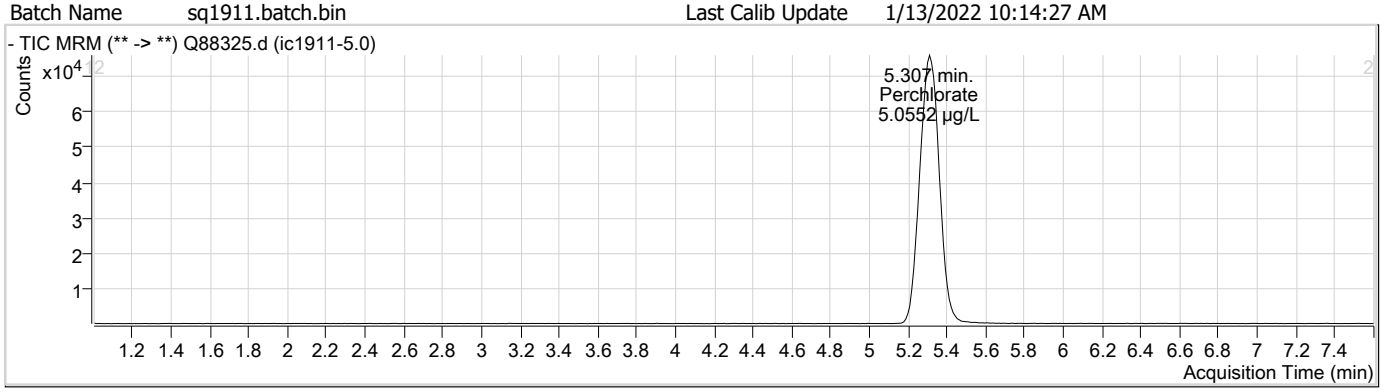
Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88325.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:04:19 PM
Sample Name	ic1911-5.0	Instrument	Instrument 1
Vial	P1-A6	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

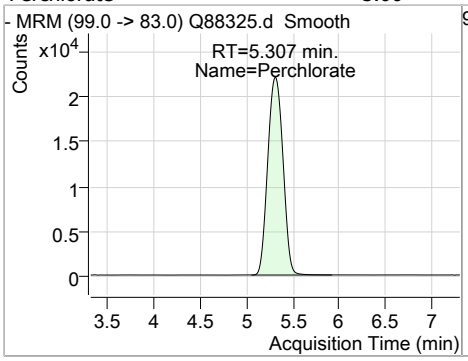


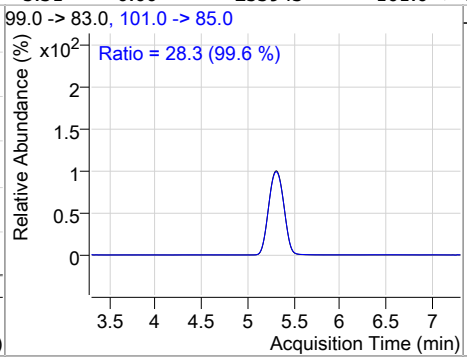
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.310	107.0 -> 89.0	207882	NoQ	5.00	µg/L	0.000
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.307	99.0 -> 83.0	253943	3.5	5.06	µg/L	100

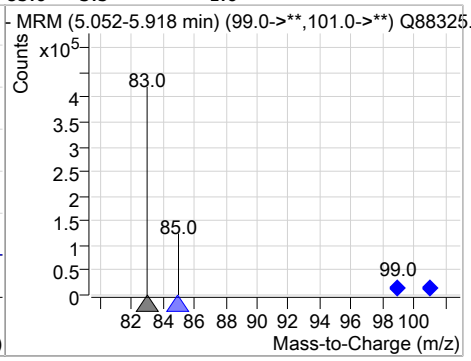
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	5.06	5.31	0.00	253943	101.0 -> 85.0	3.5	1.6	

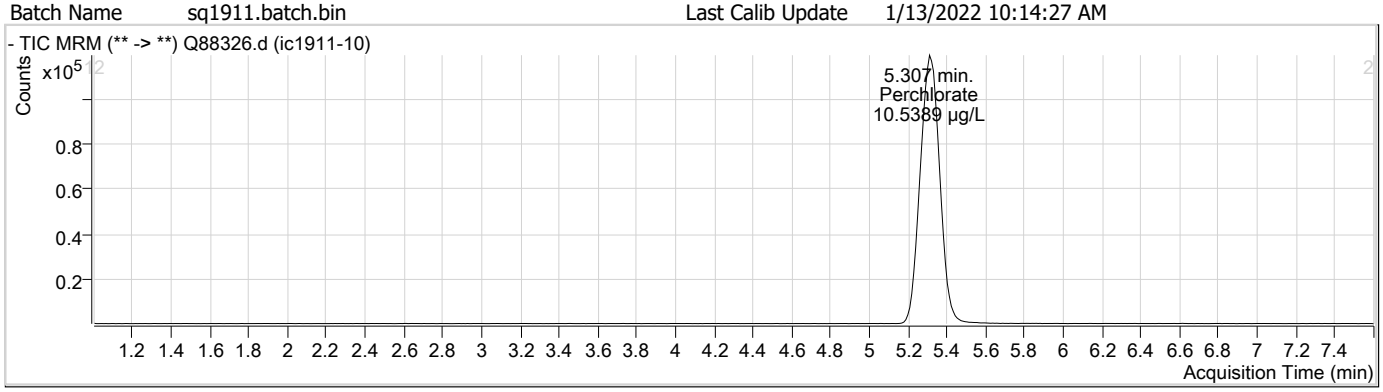






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88326.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:12:43 PM
Sample Name	ic1911-10	Instrument	Instrument 1
Vial	P1-A7	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

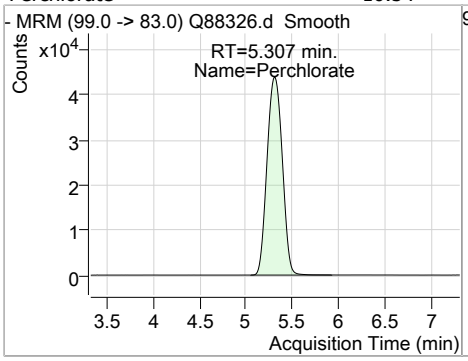


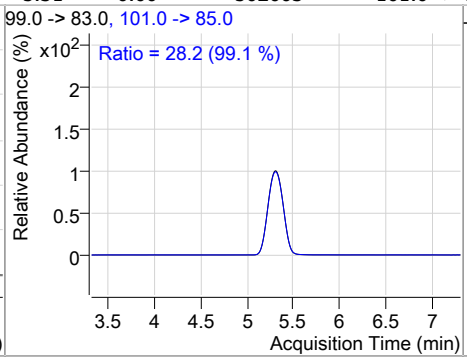
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.321	107.0 -> 89.0	197380	NoQ	5.00	µg/L	0.010
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.307	99.0 -> 83.0	502663	3.5	10.54	µg/L	99

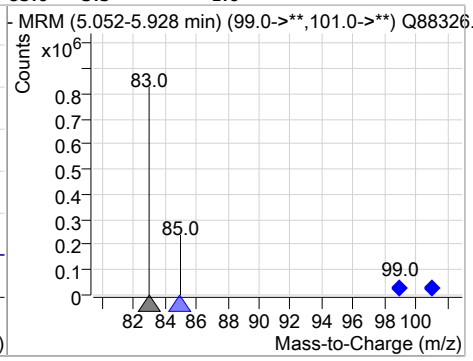
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	10.54	5.31	0.00	502663	101.0 -> 85.0	3.5	1.6	

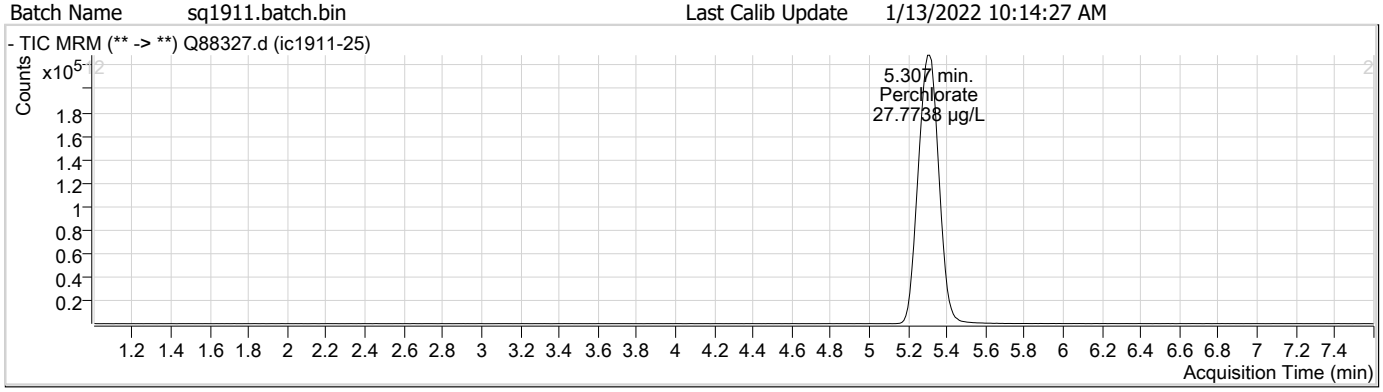






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88327.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:21:13 PM
Sample Name	ic1911-25	Instrument	Instrument 1
Vial	P1-A8	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

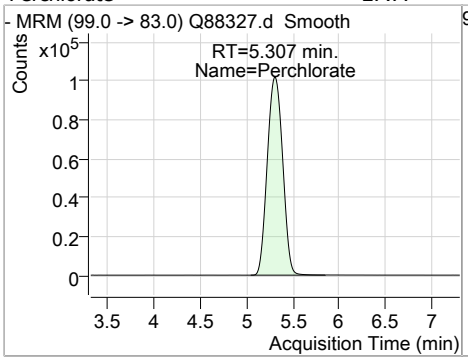


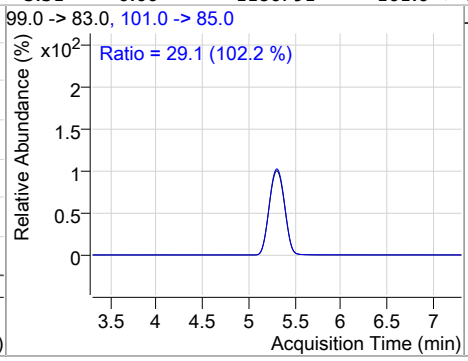
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	175938	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	1180791	3.4	27.77 µg/L	99

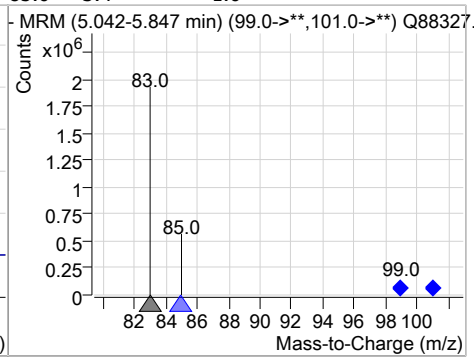
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	27.77	5.31	0.00	1180791	101.0 -> 85.0	3.4	1.6	



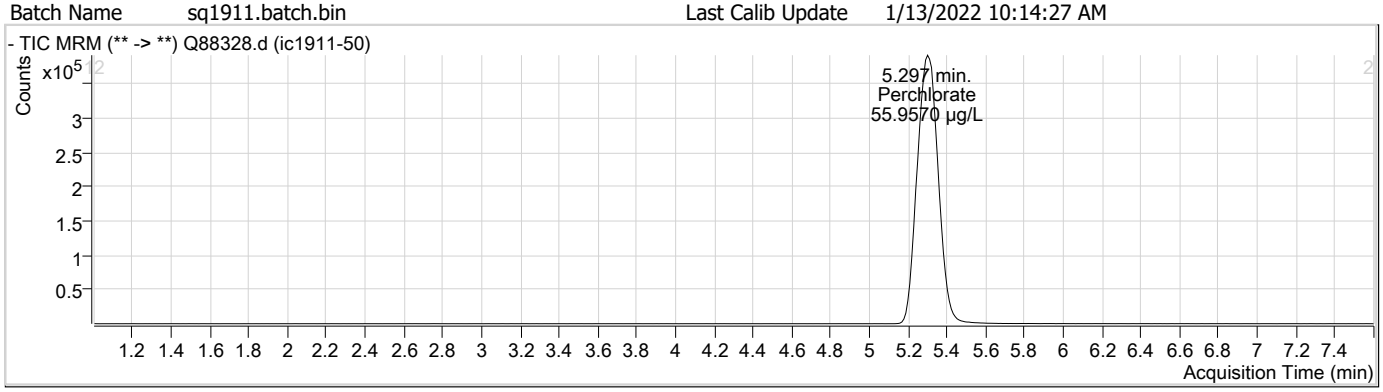




01152575

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88328.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:29:36 PM
Sample Name	ic1911-50	Instrument	Instrument 1
Vial	P1-A9	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM



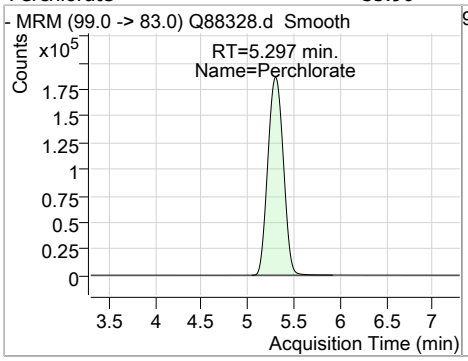
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.300	107.0 -> 89.0	161193	NoQ	5.00	µg/L	-0.010
System Monitoring Compounds							
Target Compounds							**QValue**
Perchlorate	5.297	99.0 -> 83.0	2179606	3.4	55.96	µg/L	98

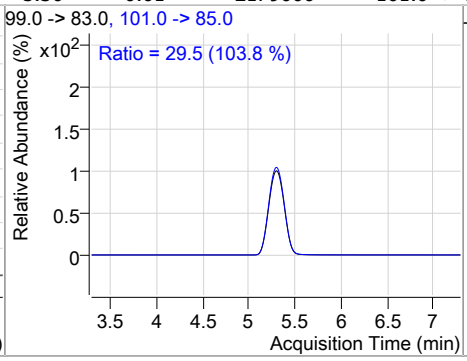
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

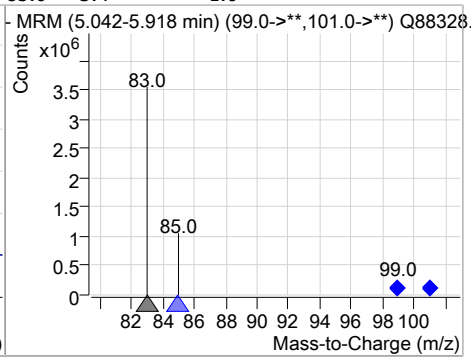
01152576

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	55.96	5.30	-0.01	2179606	101.0 -> 85.0	3.4	1.6	







7.5.9

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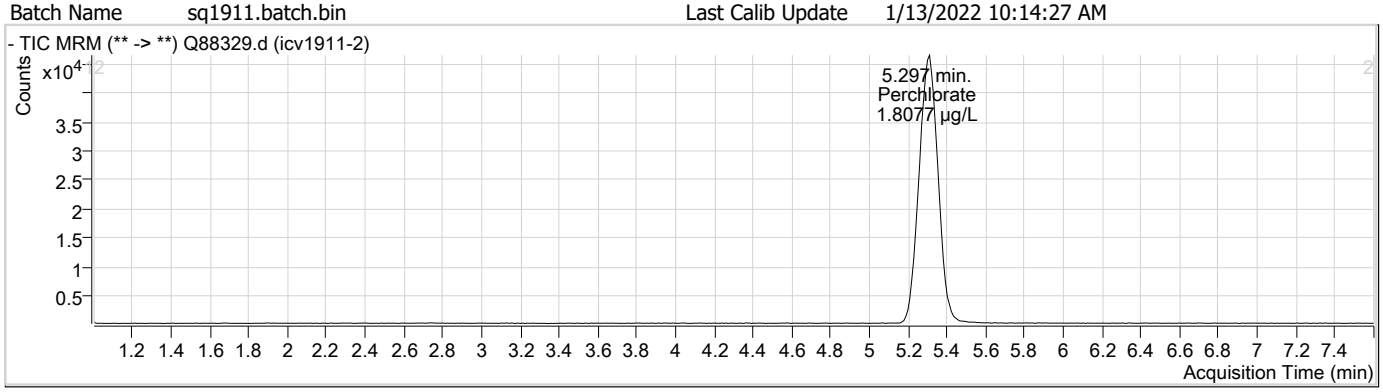
01152577

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88329.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:38:01 PM
Sample Name	icv1911-2	Instrument	Instrument 1
Vial	P1-B1	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM



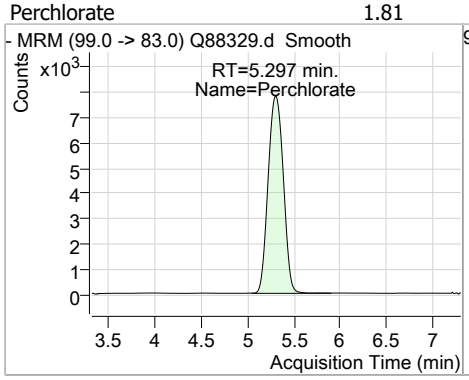
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	203122	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						QValue
Perchlorate	5.297	99.0 -> 83.0	88728	3.4	1.81 µg/L	99

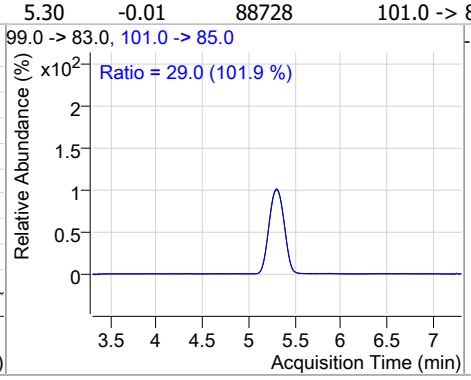
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

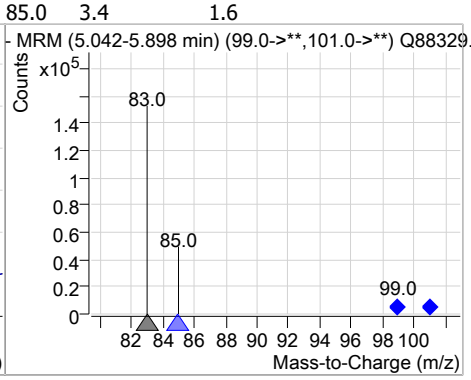
01152578

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.81	5.30	-0.01	88728	101.0 -> 85.0	3.4	1.6	







7.5.10

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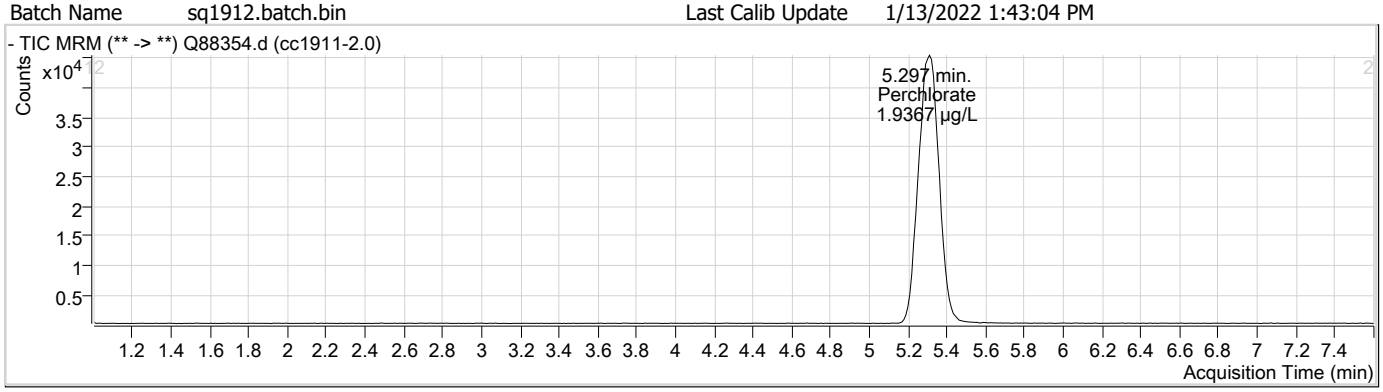
01152579

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88354.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:15:55 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



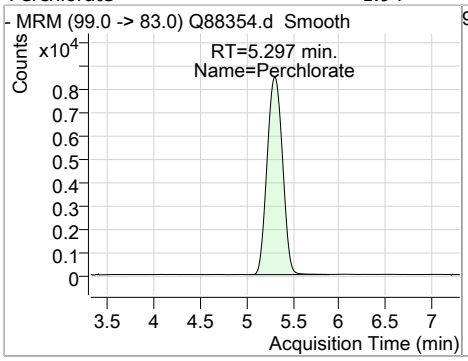
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	210357	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.297	99.0 -> 83.0	98448	3.4	1.94 µg/L	99

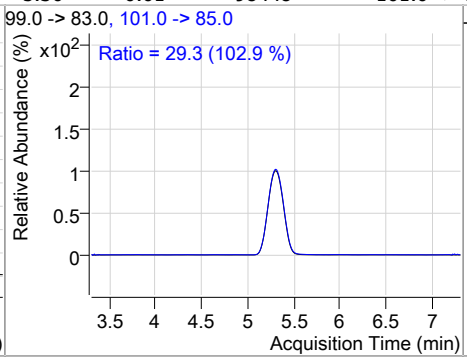
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

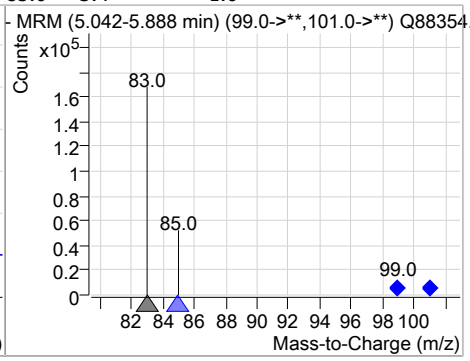
01152580

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.94	5.30	-0.01	98448	101.0 -> 85.0	3.4	1.6	

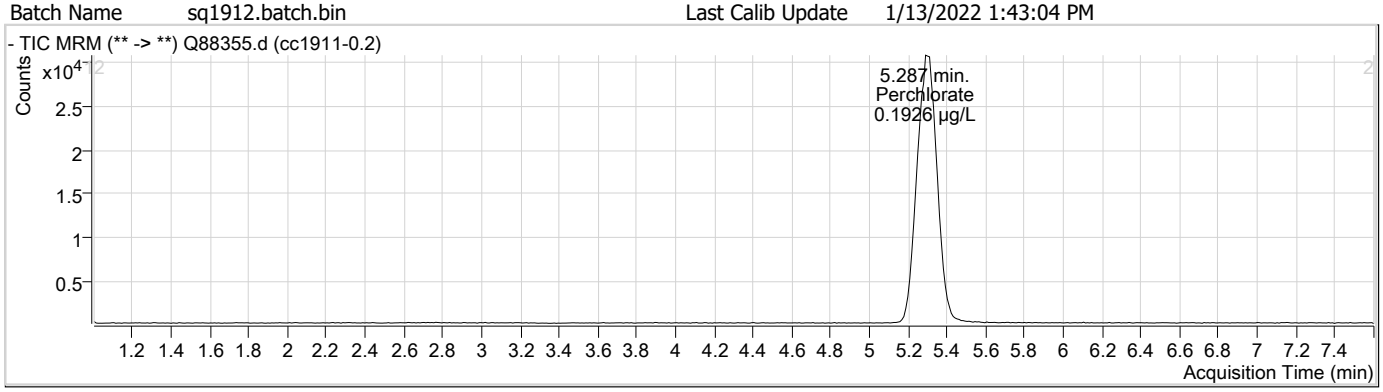






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88355.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:24:19 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

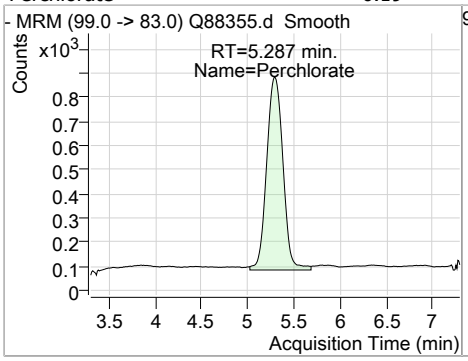


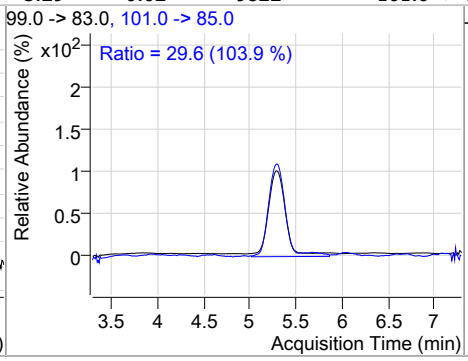
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.300	107.0 -> 89.0	211047	NoQ	5.00 µg/L	-0.010
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.287	99.0 -> 83.0	9822	3.4	0.19 µg/L	98

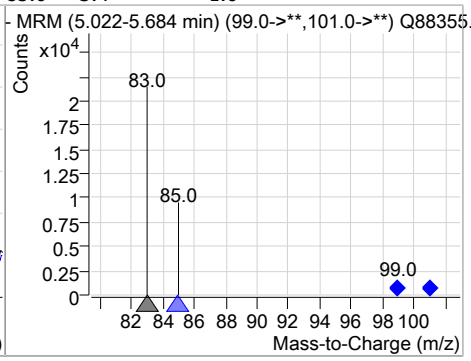
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.19	5.29	-0.02	9822	101.0 -> 85.0	3.4	1.6	

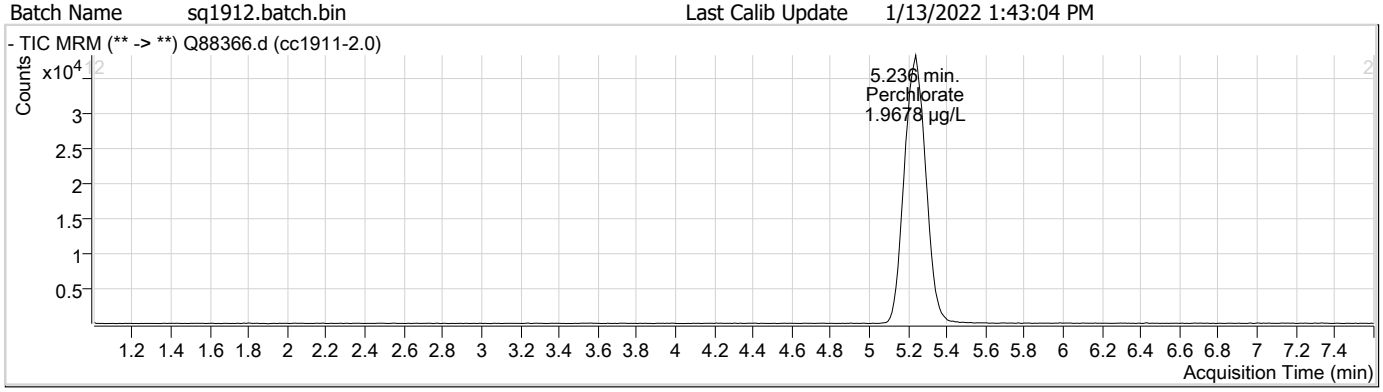






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88366.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 3:56:53 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

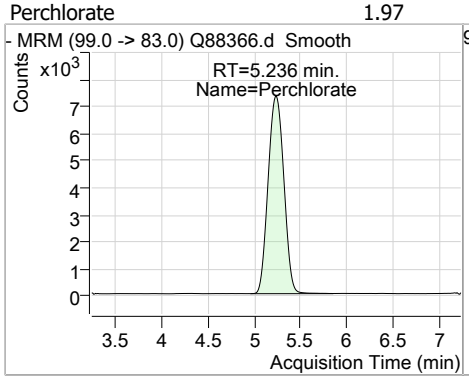


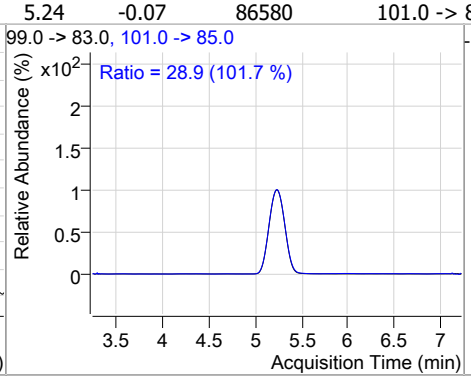
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.239	107.0 -> 89.0	182078	NoQ	5.00 µg/L	-0.071
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.236	99.0 -> 83.0	86580	3.5	1.97 µg/L	99

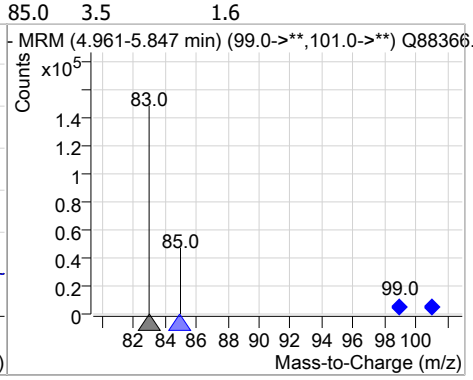
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.97	5.24	-0.07	86580	101.0 -> 85.0	3.5	1.6	



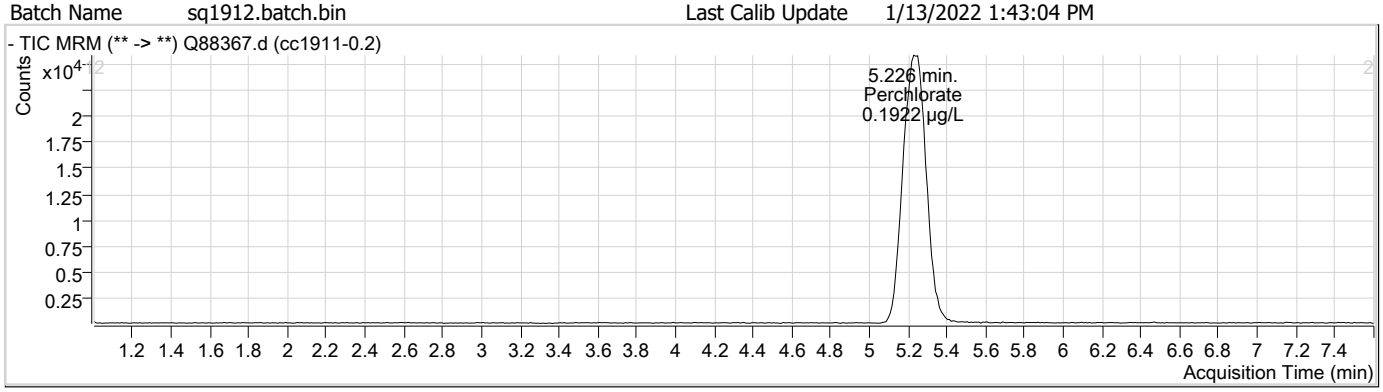




01152585

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88367.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:05:17 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



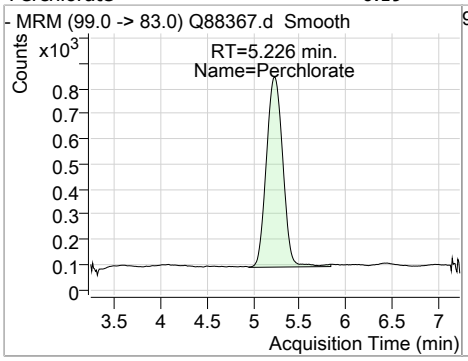
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.239	107.0 -> 89.0	202087	NoQ	5.00 µg/L	-0.071
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.226	99.0 -> 83.0	9384	3.3	0.19 µg/L	96

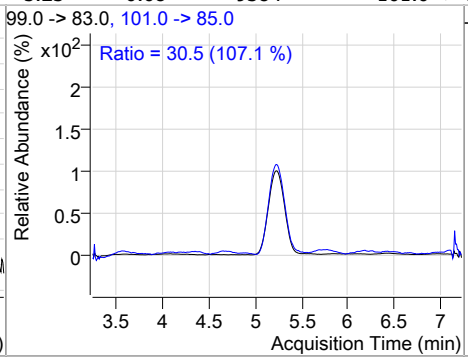
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

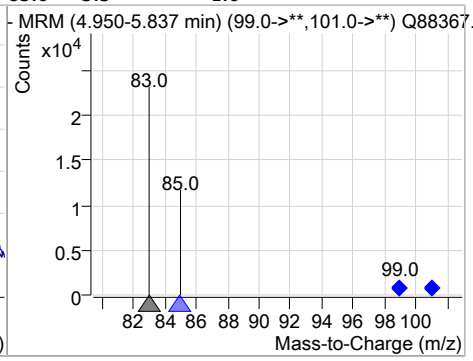
01152586

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.19	5.23	-0.08	9384	101.0 -> 85.0	3.3	1.6	





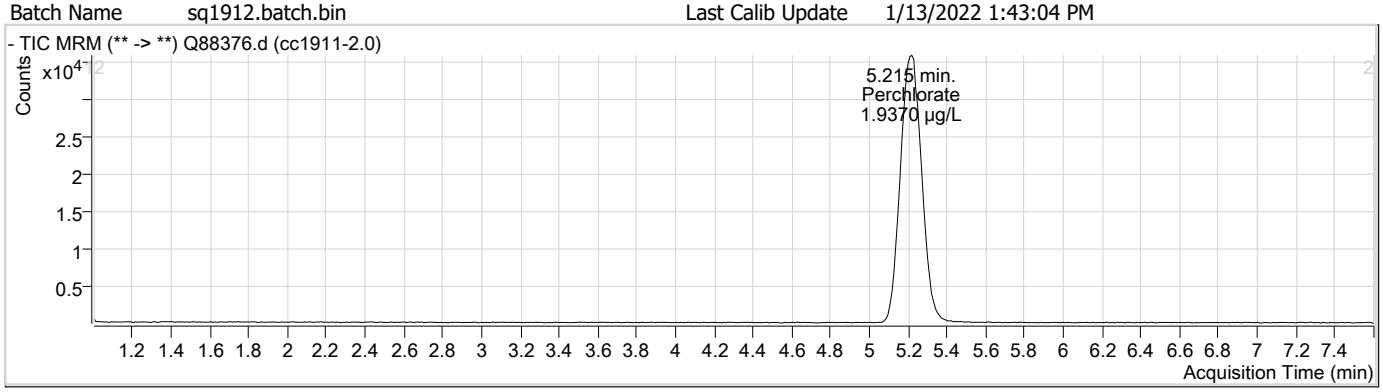


7.5.14

7

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88376.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 5:20:57 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

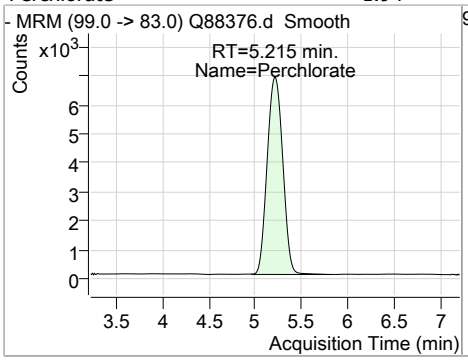


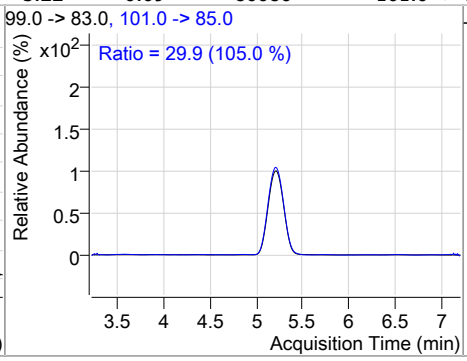
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.219	107.0 -> 89.0	171103	NoQ	5.00	µg/L	-0.092
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.215	99.0 -> 83.0	80086	3.3	1.94	µg/L	97

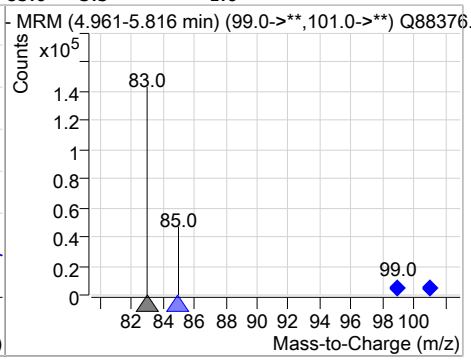
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.94	5.22	-0.09	80086	101.0 -> 85.0	3.3	1.6	



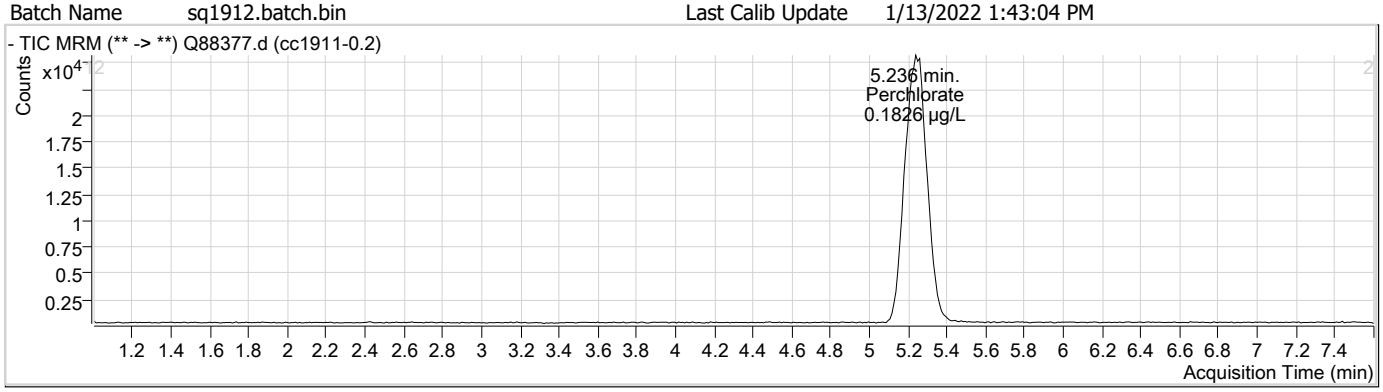




01152589

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88377.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 5:29:20 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



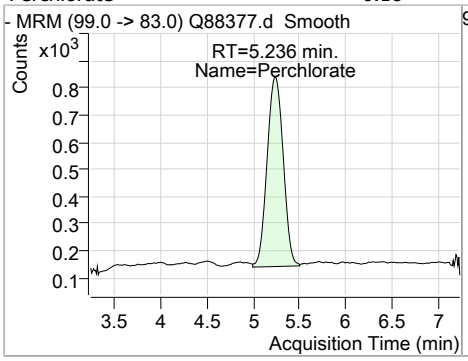
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.239	107.0 -> 89.0	192064	NoQ	5.00	µg/L	-0.071
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.236	99.0 -> 83.0	8476	3.1	0.18	µg/L	92

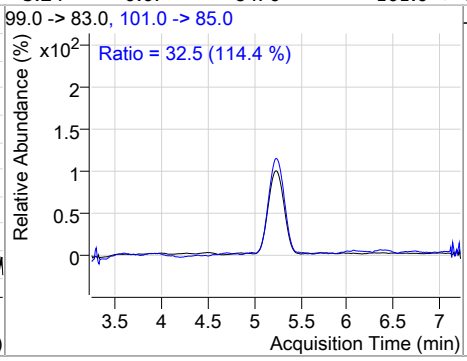
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

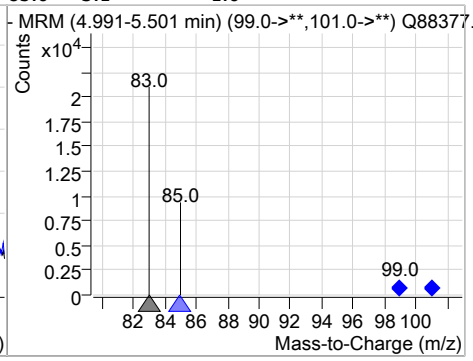
01152590

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	5.24	-0.07	8476	101.0 -> 85.0	3.1	1.6	

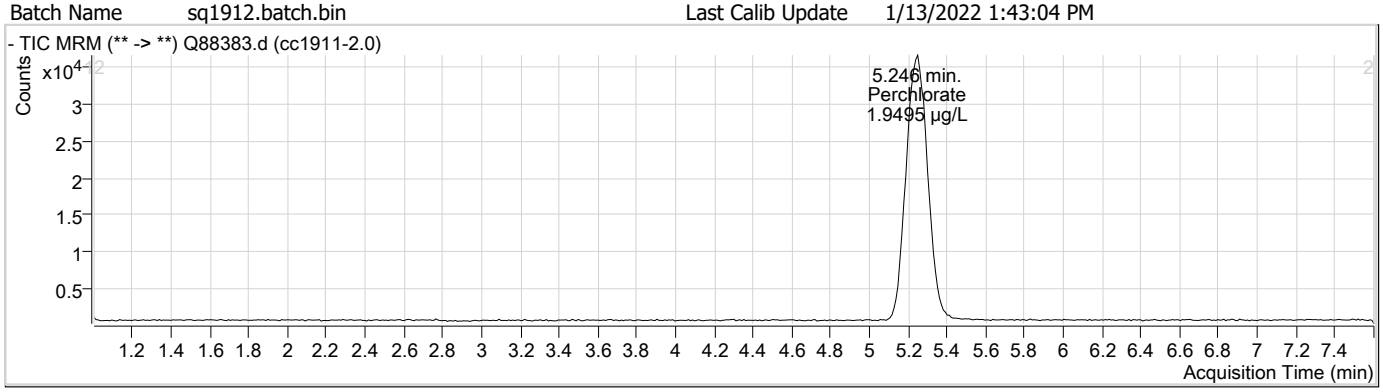






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88383.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 6:19:44 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

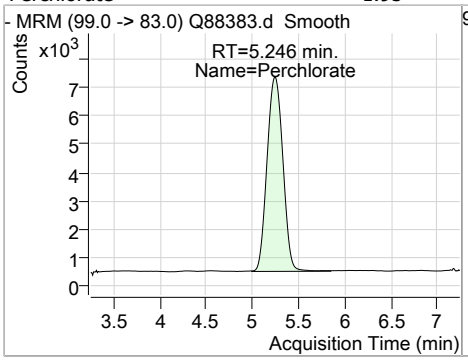


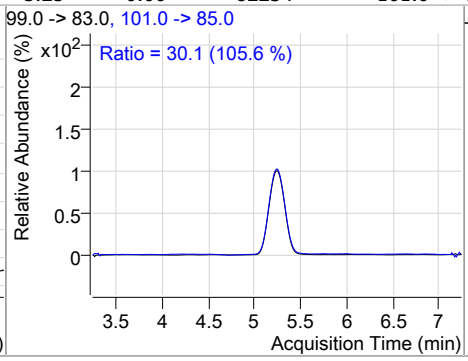
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.249	107.0 -> 89.0	174558	NoQ	5.00 µg/L	-0.061
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.246	99.0 -> 83.0	82234	3.3	1.95 µg/L	97

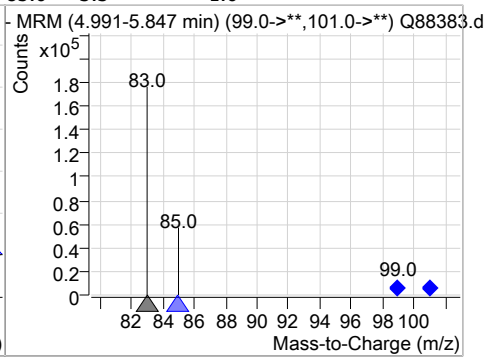
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.95	5.25	-0.06	82234	101.0 -> 85.0	3.3	1.6	



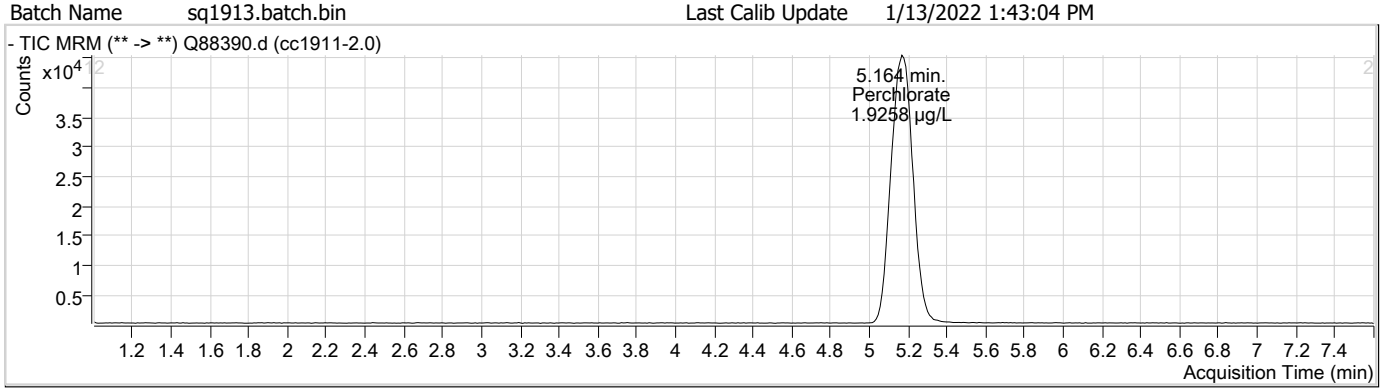




01152593

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88390.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:03:16 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

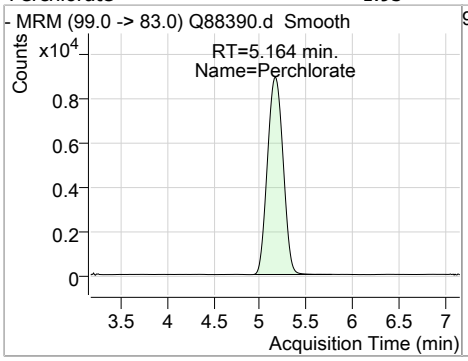


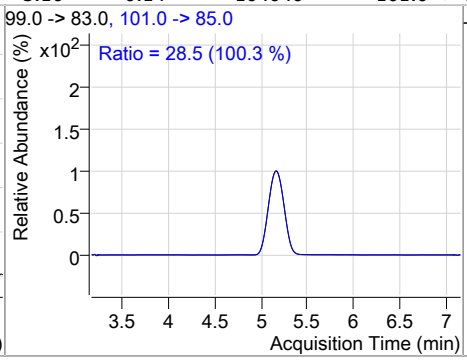
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.168	107.0 -> 89.0	223567	NoQ	5.00 µg/L	-0.143
System Monitoring Compounds						
Target Compounds						QValue
Perchlorate	5.164	99.0 -> 83.0	104040	3.5	1.93 µg/L	100

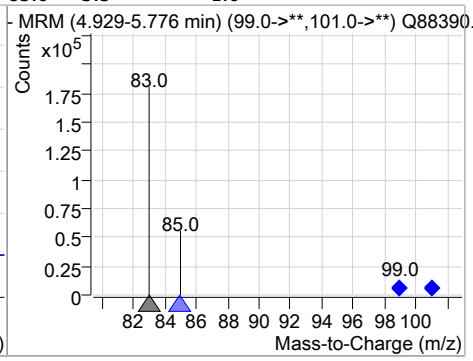
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.93	5.16	-0.14	104040	101.0 -> 85.0	3.5	1.6	





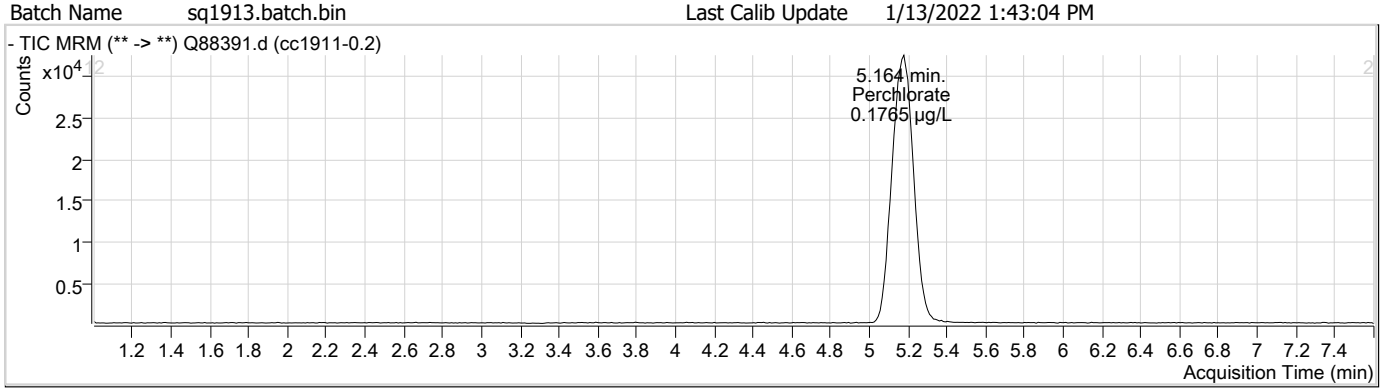


01152595

Quantitative Analysis Report for Perchlorate by 6850

Mike Eger
01/14/22 14:17

Data File	: Q88391.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:11:40 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units		Dev(Min)
Internal Standards								
Cl18O4	5.178	107.0 -> 89.0	238331	NoQ	5.00	µg/L		-0.132
System Monitoring Compounds								
Target Compounds								QValue
Perchlorate	5.164	99.0 -> 83.0	10164	3.1	0.18	µg/L	m	92

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Manual Integrations APPROVED (compounds with "m" flag)

7.5.19

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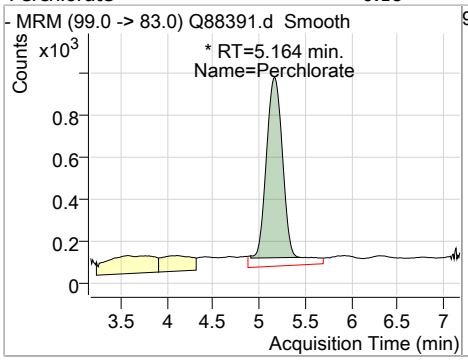
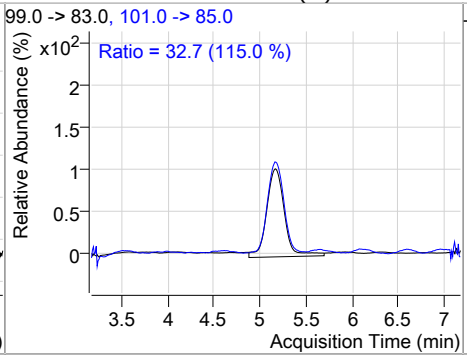
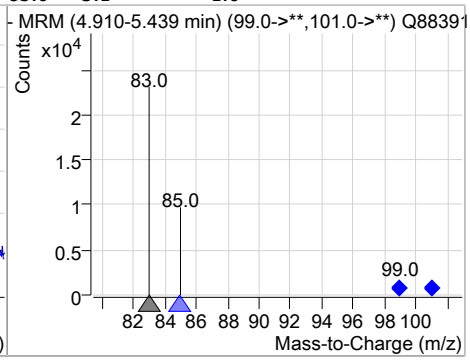
01152596

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	5.16	-0.14	10164 (m)	101.0 -> 85.0	3.1	1.6	







Manual Integration Approval Summary

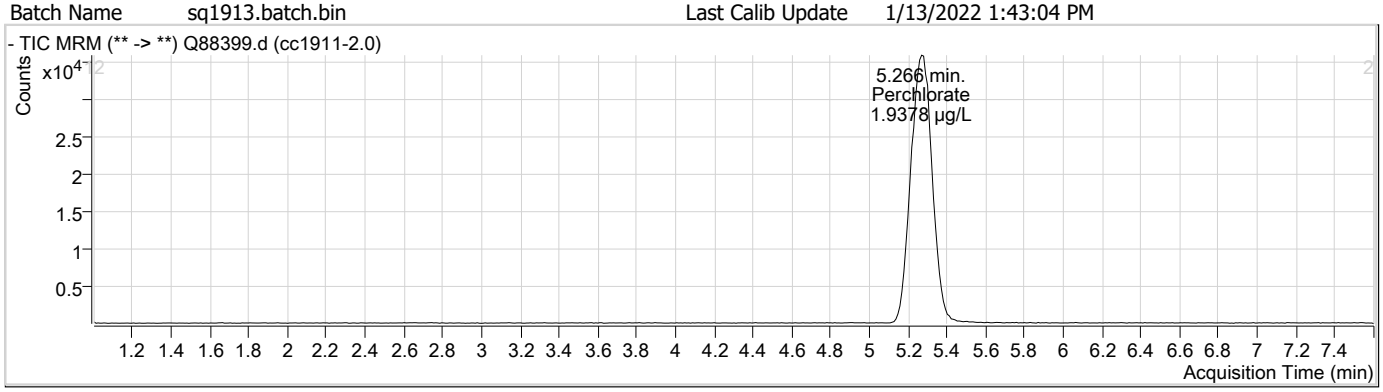
Sample Number: SQ1913-CC1911
Lab FileID: Q88391.D
Injection Time: 01/14/22 12:11
Method: SW846 6850
Analyst approved: 01/14/22 14:00 Natasha Gumtie
Supervisor approved: 01/14/22 14:17 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perchlorate	14797-73-0		5.16	Poorly defined baseline

01152598

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88399.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 1:26:17 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



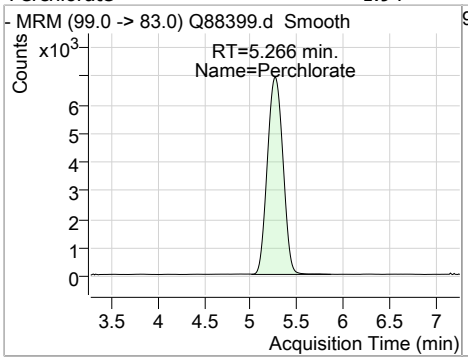
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.270	107.0 -> 89.0	173020	NoQ	5.00 µg/L	-0.041
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.266	99.0 -> 83.0	81017	3.4	1.94 µg/L	99

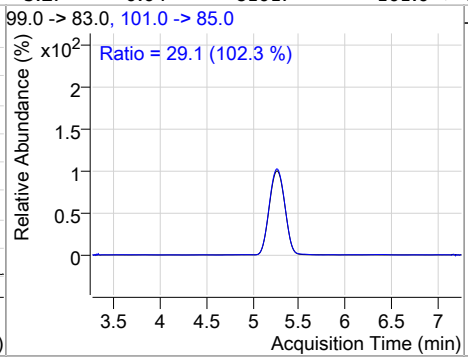
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

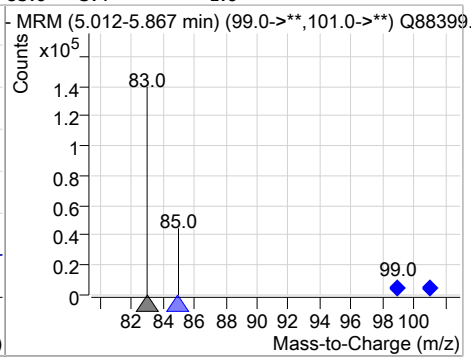
01152599

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.94	5.27	-0.04	81017	101.0 -> 85.0	3.4	1.6	







7.5.20

7

SGS ORLANDO

LCMS1-Q ANALYSIS LOG

DATE:	01/12/22
COLUMN TYPE:	K PRIME
AMOUNT INJ:	7.5 ul
INSTRUMENT:	LCMS1-Q

METHODS:	SW846 6850
PROC. METH:	6850_011222_SQ1911
CAL DATE:	01/12/22
ANALYST:	NG
RUN BATCH:	SQ1911

ELUENT A LOT #:	216038 W/0.1% AA 194003
ELUENT B LOT #:	214785 W/0.1% AA 194003
IC/CC STD LOT #:	LCMS1736
ICV STD LOT #:	LCMS1751
ISTD/ID STD LOT #:	10954A

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	Q88315.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
2	Q88316.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
3	Q88317.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
4	Q88318.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
5	Q88319.d	P1-A5	cc1910-2.0	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	Re-calibrate, istds went high
6	Q88320.d	P1-A1	ic1911-0	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	Check Tune File
7	Q88321.d	P1-A2	ic1911-0.2	Perchlorate2.m	Calibration	500x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
8	Q88322.d	P1-A3	ic1911-0.5	Perchlorate2.m	Calibration	200x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
9	Q88323.d	P1-A4	ic1911-1.0	Perchlorate2.m	Calibration	100x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
10	Q88324.d	P1-A5	icc1911-2.0	Perchlorate2.m	Calibration	50x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
11	Q88325.d	P1-A6	ic1911-5.0	Perchlorate2.m	Calibration	20x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
12	Q88326.d	P1-A7	ic1911-10	Perchlorate2.m	Calibration	10x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
13	Q88327.d	P1-A8	ic1911-25	Perchlorate2.m	Calibration	4x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
14	Q88328.d	P1-A9	ic1911-50	Perchlorate2.m	Calibration	2x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
15	Q88329.d	P1-B1	icv1911-2	Perchlorate2.m	QC	50x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
16	Q88330.d	P1-B2	ics	Perchlorate2.m	Sample	500x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
17	Q88331.d	P1-E8	fa91899-2	Perchlorate2.m	Sample	2ml/10	OP89193,SQ1911,1.00,,,10.0,5,soil	✓
18	Q88332.d	P1-E9	op89193-ms	Perchlorate2.m	Sample	2ml/10	OP89193,SQ1911,0.97,,,10.0,5,soil	✓
19	Q88333.d	P1-F1	op89193-msd	Perchlorate2.m	Sample	2ml/10	OP89193,SQ1911,1.00,,,10.0,5,soil	✓
20	Q88334.d	P1-B9	fa92247-1	Perchlorate2.m	Sample		OP89193,SQ1911,1.00,,,10.0,1,soil	✓
21	Q88335.d	P1-F2	fa92247-4	Perchlorate2.m	Sample	1ml/10	OP89193,SQ1911,0.98,,,10.0,10,soil	✓
22	Q88336.d	P1-F3	fa92247-7	Perchlorate2.m	Sample	1ml/10	OP89193,SQ1911,0.99,,,10.0,10,soil	✓
23	Q88337.d	P1-F4	fa92247-8	Perchlorate2.m	Sample	1ml/10	OP89193,SQ1911,1.02,,,10.0,10,soil	✓
24	Q88338.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
25	Q88339.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
26	Q88340.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
27	Q88341.d	P1-F5	jd37364-1A	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	✓
28	Q88342.d	P1-F6	op89192-ms	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	✓
29	Q88343.d	P1-F7	op89192-msd	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	✓
30	Q88344.d	P1-E4	jd37364-23A	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	✓
31	Q88345.d	P1-F8	fa91704-1	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	OOH, ✓
32	Q88346.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
33	Q88347.d	P1-A2	ecc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
34	Q88348.d	P1-A1	iblk	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND

SGS ORLANDO

DATE:	01/13/22
COLUMN TYPE:	K PRIME
AMOUNT INJ:	7.5 ul
INSTRUMENT:	LCMS1-Q

LCMS1-Q ANALYSIS LOG

METHODS:	SW846 6850
PROC. METH:	6850_011222_SQ1911
CAL DATE:	01/12/22
ANALYST:	NG
RUN BATCH:	SQ1912

ELUENT A LOT #:	216038 W/0.1% AA 194003
ELUENT B LOT #:	214785 W/0.1% AA 194003
IC/CC STD LOT #:	LCMS1736
ICV STD LOT #:	LCMS1751
ISTD/ID STD LOT #:	10954A

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	Q88349.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
2	Q88350.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
3	Q88351.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
4	Q88352.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
5	Q88353.d	P1-B2	ics	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
6	Q88354.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
7	Q88355.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
8	Q88356.d	P1-B3	op89224-bs	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	BS PASS
9	Q88357.d	P1-B4	op89224-mb	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	ND
10	Q88358.d	P1-B5	fa91902-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
11	Q88359.d	P1-B6	fa91902-3	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
12	Q88360.d	P1-B7	fa91902-4	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
13	Q88361.d	P1-B8	fa91902-5	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
14	Q88362.d	P1-B9	fa91902-6	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
15	Q88363.d	P1-C1	fa91902-7	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
16	Q88364.d	P1-C2	fa91902-8	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
17	Q88365.d	P1-C3	fa92191-1	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
18	Q88366.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
19	Q88367.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
20	Q88368.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
21	Q88369.d	P1-C4	fa92191-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
22	Q88370.d	P1-C5	fa92191-3	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 10x
23	Q88371.d	P1-C6	fa92191-4	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
24	Q88372.d	P1-C7	op89224-ms	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
25	Q88373.d	P1-C8	op89224-msd	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
26	Q88374.d	P1-C9	fa92191-7	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1000x
27	Q88375.d	P1-D1	fa92191-8	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1000x
28	Q88376.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
29	Q88377.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
30	Q88378.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
31	Q88379.d	P1-D2	fa92192-1	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1000x
32	Q88380.d	P1-D3	fa92192-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1x c/o
33	Q88381.d	P1-D4	fa92192-3	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 10000x
34	Q88382.d	P1-D5	fa92250-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1x c/o
35	Q88383.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS

SGS ORLANDO LCMS1-Q ANALYSIS LOG

36	Q88384.d	P1-A2	ecc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
37	Q88385.d	P1-A1	iblk	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND

SGS ORLANDO

LCMS1-Q ANALYSIS LOG

DATE:	01/14/22
COLUMN TYPE:	K PRIME
AMOUNT INJ:	7.5 ul
INSTRUMENT:	LCMS1-Q

METHODS:	SW846 6850
PROC. METH:	6850_011222_SQ1911
CAL DATE:	01/12/22
ANALYST:	NG
RUN BATCH:	SQ1913

ELUENT A LOT #:	216038 W/0.1% AA 194003
ELUENT B LOT #:	214785 W/0.1% AA 194003
IC/CC STD LOT #:	LCMS1736
ICV STD LOT #:	LCMS1751
ISTD/ID STD LOT #:	10954A

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	Q88386.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND
2	Q88387.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND
3	Q88388.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND
4	Q88389.d	P1-B2	ics	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	✓
5	Q88390.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
6	Q88391.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
7	Q88392.d	P1-E1	fa92191-3	Perchlorate2.m	Sample	1ml/10	OP89224,SQ1913,10.0,,,10.0,10,water	✓
8	Q88393.d	P1-E2	fa92191-7	Perchlorate2.m	Sample	10ul/10	OP89224,SQ1913,10.0,,,10.0,1000,water	✓
9	Q88394.d	P1-E3	fa92191-8	Perchlorate2.m	Sample	10ul/10	OP89224,SQ1913,10.0,,,10.0,1000,water	✓
10	Q88395.d	P1-E4	fa92192-1	Perchlorate2.m	Sample	10ul/10	OP89224,SQ1913,10.0,,,10.0,1000,water	✓
11	Q88396.d	P1-E5	fa92192-2	Perchlorate2.m	Sample		OP89224,SQ1913,10.0,,,10.0,1,water	✓
12	Q88397.d	P1-E6	fa92192-3	Perchlorate2.m	Sample	1ul/10	OP89224,SQ1913,10.0,,,10.0,10000,water	✓
13	Q88398.d	P1-E7	fa92250-2	Perchlorate2.m	Sample		OP89224,SQ1913,10.0,,,10.0,1,water	✓
14	Q88399.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
15	Q88400.d	P1-A2	ecc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
16	Q88401.d	P1-A1	iblk	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND

SGS - ORLANDO

LIQUID SAMPLE PREP REPORT

Date/Time: Started 01/13/22 12:00 {mm/dd/yy 24:00}

Date/Time: Finished 01/13/22 13:00 {mm/dd/yy 24:00}

Prep Method: 3510C 3580A or (Method (circle))

Analytical Method: 6850

Batch#: OP89224 Ext. By: NG Conc. By: — Vialed By: NG

Sample ID	Bottle Number	Amount Extracted (ml)	Initial pH	Adjusted pH	Surrogate Amount	Spike Amount	Final Volume (ml)	Comments
OP89224 MB	X	10.0					10.0	
OP89224 BS	X	↓				20uL	↓	
FA91902-2	1							
-3	1							
-4	1							
-5	1							
-6	1							
-7	1							
-8	1							
FA92191-1	1							
-2	1							
-3	1							
-4	1							MS/MSD
-7	1							
-8	1							
FA92192-1	1							
-2	1							
-3	1							
FA92250-2	10	↓					↓	
OP89224-MS	2	10.0				20uL	10.0	FA92191-4
OP89224-MSD	3	↓				20uL	10.0	↓
DUP								

Comments: 10954A 1.0mg/L EXP: 12/13/22

Surr. ID: — Conc: — Exp. Date: — Inj. By: — Ver. By —

Spk. ID: LCMS175 Conc: 100ppb Exp. Date: 03/23/22 Inj. By: NG Ver. By MRE

Initial Bath Temp (Therm ID): — Exchange Bath/N-Evap Temp (Therm ID): —

Observed Temp °C: — Corr. Temp °C: — Observed Temp °C: — Corr. Temp °C: —

CH2CL2 Lot #: — Hexane Lot #: — Na2SO4 Lot#: —

Acetonitrile Lot #: — Methanol Lot #: — Acetone Lot#: —

Syringe Filter Lot# P25236-0927 pH Paper #: — Reagent # HPLCwater:216038

Copper Lot #: — If Sulfur Cleaning is performed in Extractions (3660B)

Relinquished By: [signature] Date: 01/13/22

Accepted By: [signature] Date: 01/13/22

ORLD-EXT-0001-1-06-FORM-extwater.xls 032718

SGS

Orlando, FL

01/17/22

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

APTIM

Longhorn Army Ammunition Plant (GWTP); Karnack, TX

501032

SGS Job Number: FA92192

Sampling Date: 01/06/22

Report to:

APTIM
11400 Parkside Dr Suite 400
Knoxville, TN 37934
vicki.graves@aptim.com

ATTN: Vicki Graves

Total number of pages in report: **102**

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Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Kelly Blanchard 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AL, AK, AR, CT, IA, KY, MA, MI. MS, ND, NH, NV, OK, OR, IL, UT, VT, WA, WI, WV

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EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

APTIM

Job No: FA92192

Longhorn Army Ammunition Plant (GWTP); Karnack, TX
Project No: 501032

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA92192-1	01/06/22	09:35	SB	01/07/22	AQ	Ground Water	50WW11-220106
FA92192-2	01/06/22	10:30	SB	01/07/22	AQ	Ground Water	50WW06-220106
FA92192-3	01/06/22	11:20	SB	01/07/22	AQ	Ground Water	50WW12-220106

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: APTIM **Job No:** FA92192

Site: Longhorn Army Ammunition Plant (GWTP); Karnack, TX **Report Date:** 1/17/2022 5:04:04

On 01/07/2022, 3 Sample(s), 0 Trip Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.4 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of FA92192 was Assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

MS Semi-volatiles By Method SW846 6850

Matrix: AQ **Batch ID:** OP89224

Sample(s) FA92191-4MS, FA92191-4MSD were used as the QC samples indicated.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted. Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria. SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety.

Narrative prepared by:

_____

Kim Benham, Client Services *(Signature on File)*

Summary of Hits

Job Number: FA92192
Account: APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX
Collected: 01/06/22

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA92192-1	**50WW11-220106**					
Perchlorate		4200	200	100	ug/l	SW846 6850
FA92192-2	**50WW06-220106**					
Perchlorate		0.39	0.20	0.10	ug/l	SW846 6850
FA92192-3	**50WW12-220106**					
Perchlorate		68100	2000	1000	ug/l	SW846 6850

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID: 50WW11-220106
Lab Sample ID: FA92192-1 **Date Sampled:** 01/06/22
Matrix: AQ - Ground Water **Date Received:** 01/07/22
Method: SW846 6850 IN HOUSE **Percent Solids:** n/a
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88395.D	1000	01/14/22 12:45	NG	01/13/22 12:00	OP89224	SQ1913
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	4200	200	100	50	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID: 50WW06-220106
Lab Sample ID: FA92192-2 **Date Sampled:** 01/06/22
Matrix: AQ - Ground Water **Date Received:** 01/07/22
Method: SW846 6850 IN HOUSE **Percent Solids:** n/a
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88396.D	1	01/14/22 12:53	NG	01/13/22 12:00	OP89224	SQ1913
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	0.39	0.20	0.10	0.050	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Client Sample ID:	50WW12-220106		
Lab Sample ID:	FA92192-3	**Date Sampled:**	01/06/22
Matrix:	AQ - Ground Water	**Date Received:**	01/07/22
Method:	SW846 6850 IN HOUSE	**Percent Solids:**	n/a
Project:	Longhorn Army Ammunition Plant (GWTP); Karnack, TX		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Q88397.D	10000	01/14/22 13:02	NG	01/13/22 12:00	OP89224	SQ1913
Run #2							

	Initial Volume	Final Volume
Run #1	10.0 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
14797-73-0	Perchlorate	68100	2000	1000	500	ug/l	

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

5

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

FA92192

CHAIN OF CUSTODY

Name Of Lab Shipping To: SGS 4405 Vineland Orlando, FL 32811 (407) 615-0447 Cell (407)-425-6700 Office ATTN: Jean Dent-Smith

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: LHAAP 50 January 2022

Prepared By: Scott Beesinger

P.O. Number

	Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: Perchlorate by SW6850	Remarks (Preservatives, etc.)	Lab I.D.#
1	50WW11-220106	WG	1/6/22 0935		1	X		
2	50WW06-220106	WG	1/6/22 1030		1	X		
3	50WW12-220106	WG	1/6/22 1120		1	X		
							INITIAL ASSESSMENT SM	
							LABEL VERIFICATION	
							2,4CIR1	

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	1/6/22	1430		1/7/22	1110						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

SGS Sample Receipt Summary

Job Number: FA92192 **Client:** APTIM **Project:** LONGHORN ARMY AMMN. PLANT

Date / Time Received: 1/7/2022 11:00:00 AM **Delivery Method:** FX **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.2);

Cooler Temps (Corrected) °C: Cooler 1: (2.4);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: STEPHENP Date: 1/7/2022 11:00:00 AM Reviewer: _____ Date: _____

QC Evaluation: DOD QSM5.x Limits

Job Number: FA92192
Account: APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX
Collected: 01/06/22

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP89224	SW846 6850						
OP89224-BS	14797-73-0	Perchlorate	BSP	REC	85	%	84-119
OP89224-MS*	14797-73-0	Perchlorate	MS	REC	90	%	84-119
OP89224-MSD*	14797-73-0	Perchlorate	MSD	REC	100	%	84-119
OP89224-MSD*	14797-73-0	Perchlorate	MSD	RPD	11	%	15

* Sample used for QC is not from job FA92192

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Initial and Continuing Calibration Summaries
- Run Sequence Reports

Instrument Blank

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
SQ1913-IBLK	Q88401.D	1	01/14/22	NG	n/a	n/a	SQ1913

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92192-1, FA92192-2, FA92192-3

CAS No.	Compound	Result	RL	MDL	Units	Q
14797-73-0	Perchlorate	ND	0.20	0.050	ug/l	

Method Blank Summary

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89224-MB	Q88357.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92192-1, FA92192-2, FA92192-3

CAS No.	Compound	Result	RL	MDL	Units	Q
14797-73-0	Perchlorate	ND	0.20	0.050	ug/l	

Instrument Blank

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
SQ1912-IBLK	Q88385.D	1	01/13/22	NG	n/a	n/a	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

OP89224-BS, OP89224-MS, OP89224-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
14797-73-0	Perchlorate	ND	0.20	0.050	ug/l	

Blank Spike Summary

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89224-BS	Q88356.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92192-1, FA92192-2, FA92192-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
14797-73-0	Perchlorate	0.2	0.17	85	80-120

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89224-MS	Q88372.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912
OP89224-MSD	Q88373.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912
FA92191-4	Q88371.D	1	01/13/22	NG	01/13/22	OP89224	SQ1912

The QC reported here applies to the following samples: **Method:** SW846 6850

FA92192-1, FA92192-2, FA92192-3

CAS No.	Compound	FA92191-4 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
14797-73-0	Perchlorate	0.20	U	0.2	0.18	90	0.2	0.20	100	11	80-120/15

* = Outside of Control Limits.

Internal Standard Area Summary

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Check Std:	SQ1912-CC1911	**Injection Date:**	01/13/22
Lab File ID:	Q88354.D	**Injection Time:**	14:15
Instrument ID:	GCMSQ	**Method:**	SW846 6850

	IS 1 AREA	RT
Initial Cal [a]	198713	5.31
Check Std [b]	210357	5.31
Upper Limit [c]	298070	7.31
Lower Limit [d]	99357	3.31

Lab Sample ID	IS 1 AREA	RT
OP89224-BS	202716	5.29
OP89224-MB	208796	5.29
ZZZZZZ	156492	4.86
ZZZZZZ	143651	4.78
ZZZZZZ	133615	4.72
ZZZZZZ	132833	4.83
ZZZZZZ	128090	4.67
ZZZZZZ	132722	4.70
ZZZZZZ	136691	4.81
ZZZZZZ	122964	4.47

IS 1 = Cl18O4 (ISTD)

(a) Initial Cal is: SQ1911-ICC1911 Q88324.D 01/12/22 12:55. Area is AVERAGE of initial cal points.
(b) Check Std Limit = -50 to + 50% of initial cal area.
(c) Upper Limit = + 50% of initial standard area; Retention time + 2 minutes of check standard.
(d) Lower Limit = -50% of initial standard area; Retention time -2 minutes of check standard.

Internal Standard Area Summary

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Check Std:	SQ1912-CC1911	**Injection Date:**	01/13/22
Lab File ID:	Q88366.D	**Injection Time:**	15:56
Instrument ID:	GCMSQ	**Method:**	SW846 6850

	IS 1 AREA	RT
Initial Cal [a]	198713	5.31
Check Std [b]	182078	5.24
Upper Limit [c]	298070	7.24
Lower Limit [d]	99357	3.24

Lab Sample ID	IS 1 AREA	RT
ZZZZZZ	165444	4.81
FA92191-4	139128	4.64
OP89224-MS	137009	4.64
OP89224-MSD	142614	4.63

IS 1 = Cl18O4 (ISTD)

(a) Initial Cal is: SQ1911-ICC1911 Q88324.D 01/12/22 12:55. Area is AVERAGE of initial cal points.
(b) Check Std Limit = -50 to + 50% of initial cal area.
(c) Upper Limit = + 50% of initial standard area; Retention time + 2 minutes of check standard.
(d) Lower Limit = -50% of initial standard area; Retention time -2 minutes of check standard.

Internal Standard Area Summary

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Check Std:	SQ1913-CC1911	**Injection Date:**	01/14/22
Lab File ID:	Q88390.D	**Injection Time:**	12:03
Instrument ID:	GCMSQ	**Method:**	SW846 6850

	IS 1 AREA	RT
Initial Cal [a]	198713	5.31
Check Std [b]	223567	5.17
Upper Limit [c]	298070	7.17
Lower Limit [d]	99357	3.17

Lab Sample ID	IS 1 AREA	RT
ZZZZZZ	195618	5.11
ZZZZZZ	205890	5.18
ZZZZZZ	200165	5.19
FA92192-1	208309	5.20
FA92192-2	190374	5.09
FA92192-3	165622	5.17
ZZZZZZ	158923	5.17

IS 1 = Cl18O4 (ISTD)

(a) Initial Cal is: SQ1911-ICC1911 Q88324.D 01/12/22 12:55. Area is AVERAGE of initial cal points.
(b) Check Std Limit = -50 to + 50% of initial cal area.
(c) Upper Limit = + 50% of initial standard area; Retention time + 2 minutes of check standard.
(d) Lower Limit = -50% of initial standard area; Retention time -2 minutes of check standard.

Initial Calibration Summary

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Sample: SQ1911-ICC1911
Lab FileID: Q88324.D

Initial Calibration Report

Method Path	D:\MassHunter\Methods
Method File	6850_011222_SQ1911.quantmethod.xml
Batch Name	D:\MassHunter\Data\011222_6850_SQ1911\QuantResults\sq1911.batch.bin
Last Calib Update	1/12/2022 2:07:32 PM

Level Name	Calibration Files	Acq. Date-Time	Level Last Update Time
1	D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d	1/12/2022 12:30:42 PM	1/12/2022 2:07:32 PM
2	D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d	1/12/2022 12:39:06 PM	1/12/2022 2:07:32 PM
3	D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d	1/12/2022 12:47:30 PM	1/12/2022 2:07:32 PM
4	D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d	1/12/2022 12:55:55 PM	1/12/2022 2:07:32 PM
5	D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d	1/12/2022 1:04:19 PM	1/12/2022 2:07:32 PM
6	D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d	1/12/2022 1:12:43 PM	1/12/2022 2:07:32 PM
7	D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d	1/12/2022 1:21:13 PM	1/12/2022 2:07:32 PM
8	D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d	1/12/2022 1:29:36 PM	1/12/2022 2:07:32 PM

Compound	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD
I Cl18O4	---------- ISTD ----------										
T Perchlorate	Avg RF	1.1028	1.0633	1.1304	1.1800	1.2216	1.2733	1.3423	1.3522	1.2082	8.963

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Initial Calibration Verification

Job Number: FA92192 **Sample:** SQ1911-ICV1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88329.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011222_6850_SQ1911\sq1911.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88329
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.808	-9.6	90.4

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88354.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88354
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.937	-3.2	96.8

CC Criteria: +/- 15%

6.5.3

6

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88355.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88355
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.193	-3.7	96.3

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88366.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88366
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.968	-1.6	98.4

CC Criteria: +/- 15%

6.5.5

6

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88367.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88367
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.192	-3.9	96.1

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88376.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88376
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.937	-3.2	96.8

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88377.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88377
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.183	-8.7	91.3

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1912-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88383.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011322_6850_SQ1912\sq1912.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88383
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.950	-2.5	97.5

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1913-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88390.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011422_6850_SQ1913\sq1913.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88390
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.926	-3.7	96.3

CC Criteria: +/- 15%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1913-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88391.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011422_6850_SQ1913\sq1913.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88391
Type : QC
Level : 1

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	0.200	0.176	-11.8	88.2

CC Criteria: +/- 30%

Continuing Calibration Summary

Job Number: FA92192 **Sample:** SQ1913-CC1911
Account: ITTNKNOX APTIM **Lab FileID:** Q88399.D
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Continuing Calibration Report

Batch: D:\MassHunter\Data\011422_6850_SQ1913\sq1913.batch.bin

Level ID:Calibration File
1:D:\MassHunter\Data\011222_6850_SQ1911\Q88321.d
2:D:\MassHunter\Data\011222_6850_SQ1911\Q88322.d
3:D:\MassHunter\Data\011222_6850_SQ1911\Q88323.d
4:D:\MassHunter\Data\011222_6850_SQ1911\Q88324.d
5:D:\MassHunter\Data\011222_6850_SQ1911\Q88325.d
6:D:\MassHunter\Data\011222_6850_SQ1911\Q88326.d
7:D:\MassHunter\Data\011222_6850_SQ1911\Q88327.d
8:D:\MassHunter\Data\011222_6850_SQ1911\Q88328.d

Data File: Q88399
Type : QC
Level : 4

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
Cl18O4	---	--ISTD--		
Perchlorate	2.000	1.938	-3.1	96.9

CC Criteria: +/- 15%

Run Sequence Report

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Run ID: SQ1911 **Method:** SW846 6850 **Instrument ID:** GCMSQ

Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
SQ1911-IC1911	Q88320.D	01/12/22 12:22	n/a	Mass Calibration Verification
SQ1911-IC1911	Q88321.D	01/12/22 12:30	n/a	Initial cal 0.2
SQ1911-IC1911	Q88322.D	01/12/22 12:39	n/a	Initial cal 0.5
SQ1911-IC1911	Q88323.D	01/12/22 12:47	n/a	Initial cal 1.0
SQ1911-ICC1911	Q88324.D	01/12/22 12:55	n/a	Initial cal 2.0
SQ1911-IC1911	Q88325.D	01/12/22 13:04	n/a	Initial cal 5.0
SQ1911-IC1911	Q88326.D	01/12/22 13:12	n/a	Initial cal 10
SQ1911-IC1911	Q88327.D	01/12/22 13:21	n/a	Initial cal 25
SQ1911-IC1911	Q88328.D	01/12/22 13:29	n/a	Initial cal 50
SQ1911-ICV1911	Q88329.D	01/12/22 13:38	n/a	Initial cal verification 2
FA91899-2	Q88331.D	01/12/22 13:54	OP89193	(used for QC only; not part of job FA92192)
OP89193-MS	Q88332.D	01/12/22 14:03	OP89193	Matrix Spike
OP89193-MSD	Q88333.D	01/12/22 14:11	OP89193	Matrix Spike Duplicate
ZZZZZZ	Q88334.D	01/12/22 14:20	OP89193	(unrelated sample)
ZZZZZZ	Q88335.D	01/12/22 14:28	OP89193	(unrelated sample)
ZZZZZZ	Q88336.D	01/12/22 14:36	OP89193	(unrelated sample)
ZZZZZZ	Q88337.D	01/12/22 14:45	OP89193	(unrelated sample)
SQ1911-CC1911	Q88338.D	01/12/22 14:53	n/a	Continuing cal 2.0
SQ1911-CC1911	Q88339.D	01/12/22 15:01	n/a	Continuing cal 0.2
JD37364-1A	Q88341.D	01/12/22 15:18	OP89192	(used for QC only; not part of job FA92192)
OP89192-MS	Q88342.D	01/12/22 15:27	OP89192	Matrix Spike
OP89192-MSD	Q88343.D	01/12/22 15:35	OP89192	Matrix Spike Duplicate
ZZZZZZ	Q88344.D	01/12/22 15:43	OP89192	(unrelated sample)
ZZZZZZ	Q88345.D	01/12/22 15:52	OP89192	(unrelated sample)
SQ1911-CC1911	Q88346.D	01/12/22 16:00	n/a	Continuing cal 2.0
SQ1911-ECC1911	Q88347.D	01/12/22 16:09	n/a	Ending cal 0.2
SQ1911-IBLK	Q88348.D	01/12/22 16:17	n/a	Instrument Blank
SQ1911-IBLK	Q88348.D	01/12/22 16:17	n/a	Instrument Blank

Run Sequence Report

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Run ID: SQ1912 **Method:** SW846 6850 **Instrument ID:** GCMSQ

Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
SQ1912-CC1911	Q88354.D	01/13/22 14:15	n/a	Continuing cal 2.0
SQ1912-CC1911	Q88355.D	01/13/22 14:24	n/a	Continuing cal 0.2
OP89224-BS	Q88356.D	01/13/22 14:32	OP89224	Blank Spike
OP89224-MB	Q88357.D	01/13/22 14:41	OP89224	Method Blank
ZZZZZZ	Q88358.D	01/13/22 14:49	OP89224	(unrelated sample)
ZZZZZZ	Q88359.D	01/13/22 14:58	OP89224	(unrelated sample)
ZZZZZZ	Q88360.D	01/13/22 15:06	OP89224	(unrelated sample)
ZZZZZZ	Q88361.D	01/13/22 15:14	OP89224	(unrelated sample)
ZZZZZZ	Q88362.D	01/13/22 15:23	OP89224	(unrelated sample)
ZZZZZZ	Q88363.D	01/13/22 15:31	OP89224	(unrelated sample)
ZZZZZZ	Q88364.D	01/13/22 15:40	OP89224	(unrelated sample)
ZZZZZZ	Q88365.D	01/13/22 15:48	OP89224	(unrelated sample)
SQ1912-CC1911	Q88366.D	01/13/22 15:56	n/a	Continuing cal 2.0
SQ1912-CC1911	Q88367.D	01/13/22 16:05	n/a	Continuing cal 0.2
ZZZZZZ	Q88369.D	01/13/22 16:22	OP89224	(unrelated sample)
FA92191-4	Q88371.D	01/13/22 16:38	OP89224	(used for QC only; not part of job FA92192)
OP89224-MS	Q88372.D	01/13/22 16:47	OP89224	Matrix Spike
OP89224-MSD	Q88373.D	01/13/22 16:55	OP89224	Matrix Spike Duplicate
SQ1912-CC1911	Q88376.D	01/13/22 17:20	n/a	Continuing cal 2.0
SQ1912-CC1911	Q88377.D	01/13/22 17:29	n/a	Continuing cal 0.2
SQ1912-CC1911	Q88383.D	01/13/22 18:19	n/a	Continuing cal 2.0
SQ1912-ECC1911	Q88384.D	01/13/22 18:28	n/a	Ending cal 0.2
SQ1912-IBLK	Q88385.D	01/13/22 18:36	n/a	Instrument Blank

Run Sequence Report

Job Number: FA92192
Account: ITTNKNOX APTIM
Project: Longhorn Army Ammunition Plant (GWTP); Karnack, TX

Run ID: SQ1913	**Method:** SW846 6850	**Instrument ID:** GCMSQ

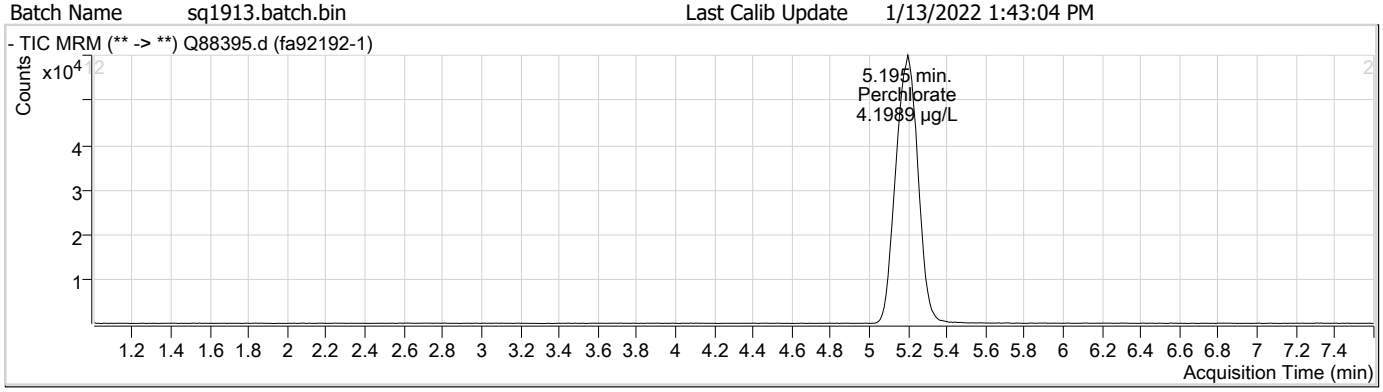
Lab Sample ID	Lab File ID	Date/Time Analyzed	Prep QC Batch	Client Sample ID
SQ1913-CC1911	Q88390.D	01/14/22 12:03	n/a	Continuing cal 2.0
SQ1913-CC1911	Q88391.D	01/14/22 12:11	n/a	Continuing cal 0.2
ZZZZZZ	Q88392.D	01/14/22 12:20	OP89224	(unrelated sample)
ZZZZZZ	Q88393.D	01/14/22 12:28	OP89224	(unrelated sample)
ZZZZZZ	Q88394.D	01/14/22 12:36	OP89224	(unrelated sample)
FA92192-1	Q88395.D	01/14/22 12:45	OP89224	50WW11-220106
FA92192-2	Q88396.D	01/14/22 12:53	OP89224	50WW06-220106
FA92192-3	Q88397.D	01/14/22 13:02	OP89224	50WW12-220106
ZZZZZZ	Q88398.D	01/14/22 13:10	OP89224	(unrelated sample)
SQ1913-CC1911	Q88399.D	01/14/22 13:26	n/a	Continuing cal 2.0
SQ1913-ECC1911	Q88400.D	01/14/22 13:34	n/a	Ending cal 0.2
SQ1913-IBLK	Q88401.D	01/14/22 13:43	n/a	Instrument Blank

MS Semi-volatiles

Raw Data

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88395.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:45:15 PM
Sample Name	fa92192-1	Instrument	Instrument 1
Vial	P1-E4	Sample Information	OP89224,SQ1913,10.0,,,10.0,1000,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	1000x
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

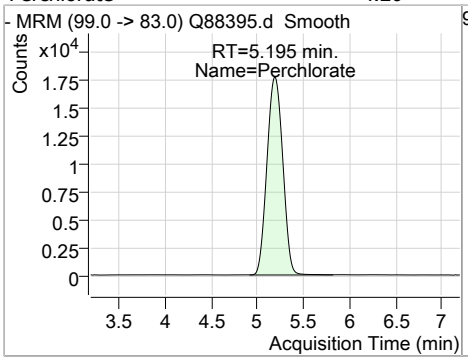


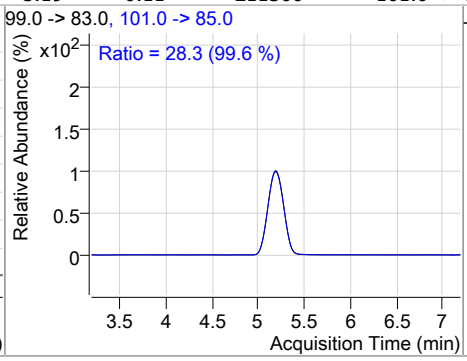
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.198	107.0 -> 89.0	208309	NoQ	5.00 µg/L	-0.112
System Monitoring Compounds						
Target Compounds						QValue
Perchlorate	5.195	99.0 -> 83.0	211360	3.5	4.20 µg/L	100

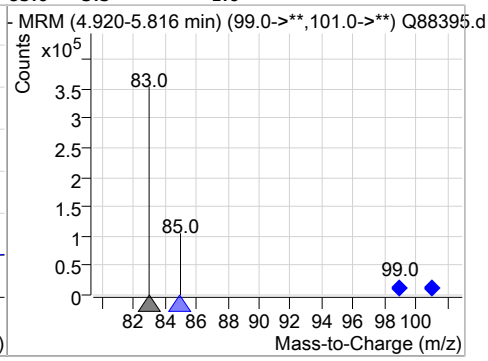
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	4.20	5.19	-0.11	211360	101.0 -> 85.0	3.5	1.6	

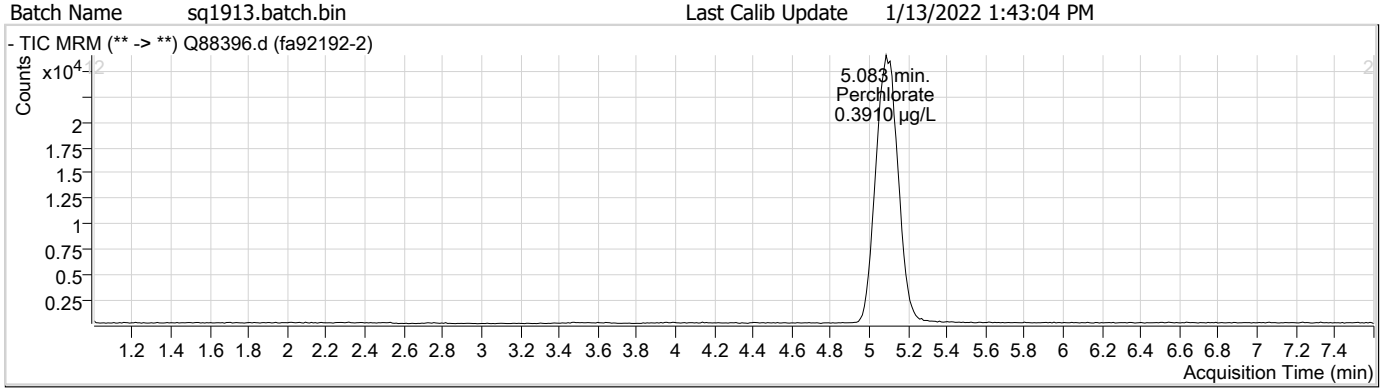






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88396.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:53:39 PM
Sample Name	fa92192-2	Instrument	Instrument 1
Vial	P1-E5	Sample Information	OP89224,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	1x
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

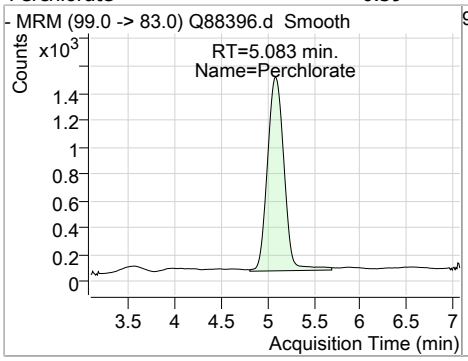


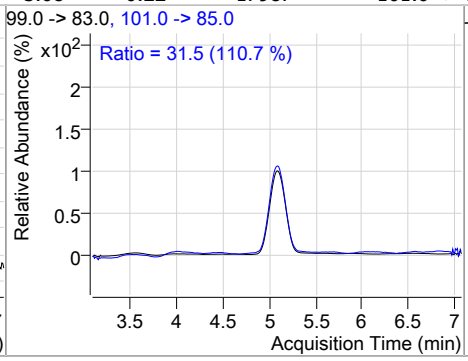
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.086	107.0 -> 89.0	190374	NoQ	5.00	µg/L	-0.224
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.083	99.0 -> 83.0	17987	3.2	0.39	µg/L	94

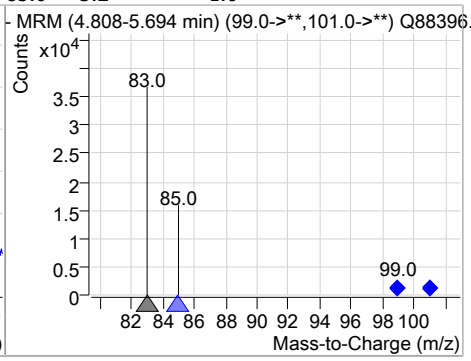
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.39	5.08	-0.22	17987	101.0 -> 85.0	3.2	1.6	

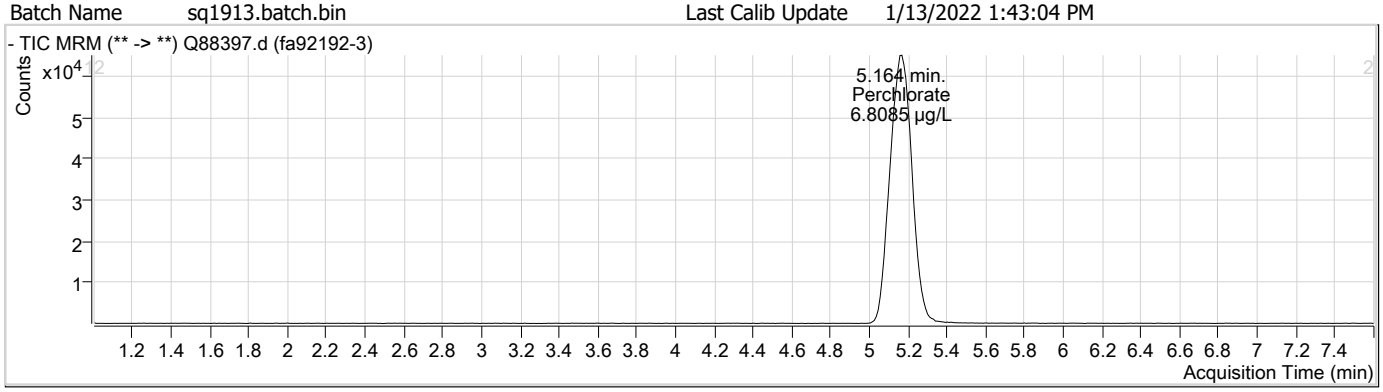






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88397.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 1:02:04 PM
Sample Name	fa92192-3	Instrument	Instrument 1
Vial	P1-E6	Sample Information	OP89224,SQ1913,10.0,,,10.0,10000,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	10000x
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

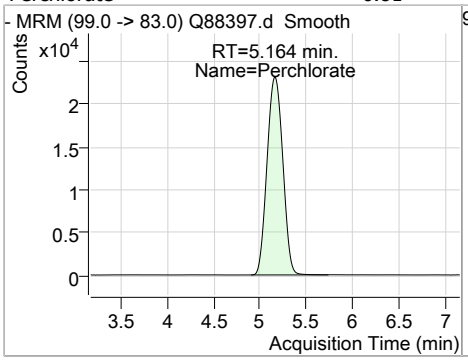


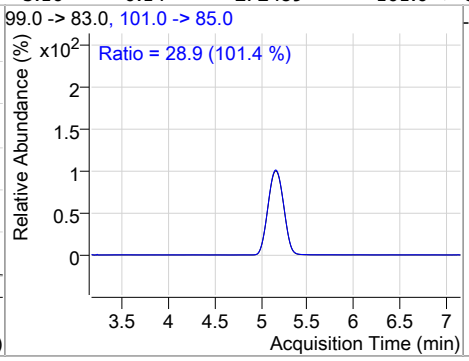
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.168	107.0 -> 89.0	165622	NoQ	5.00	µg/L	-0.143
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.164	99.0 -> 83.0	272489	3.5	6.81	µg/L	99

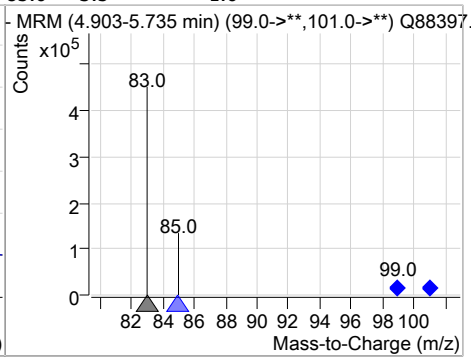
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	6.81	5.16	-0.14	272489	101.0 -> 85.0	3.5	1.6	







7.1.3

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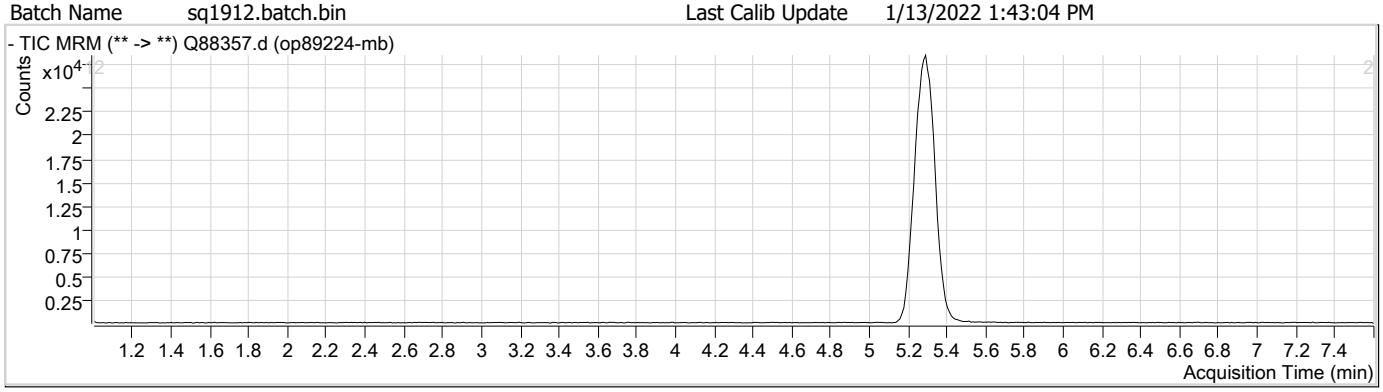
01152649

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88357.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:41:13 PM
Sample Name	op89224-mb	Instrument	Instrument 1
Vial	P1-B4	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

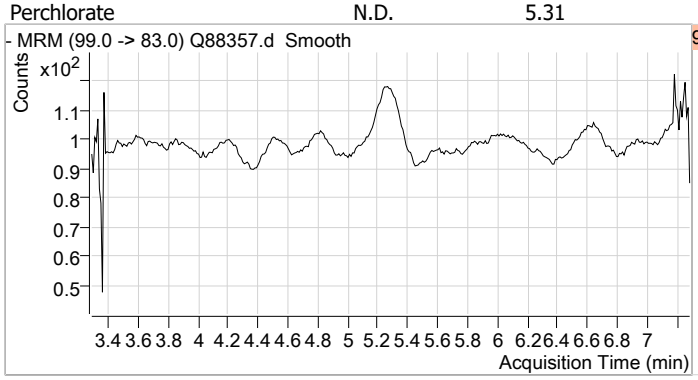


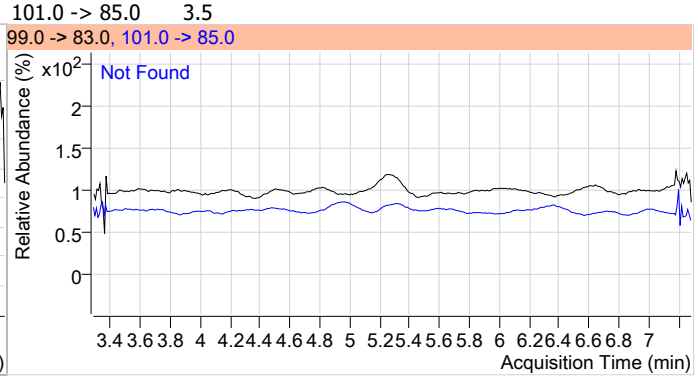
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.290	107.0 -> 89.0	208796	NoQ	5.00	µg/L	-0.020
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	-	99.0 -> 83.0		-	N.D.		

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	Exp RT	QIon	Exp Ratio
Perchlorate	N.D.	5.31	101.0 -> 85.0	3.5





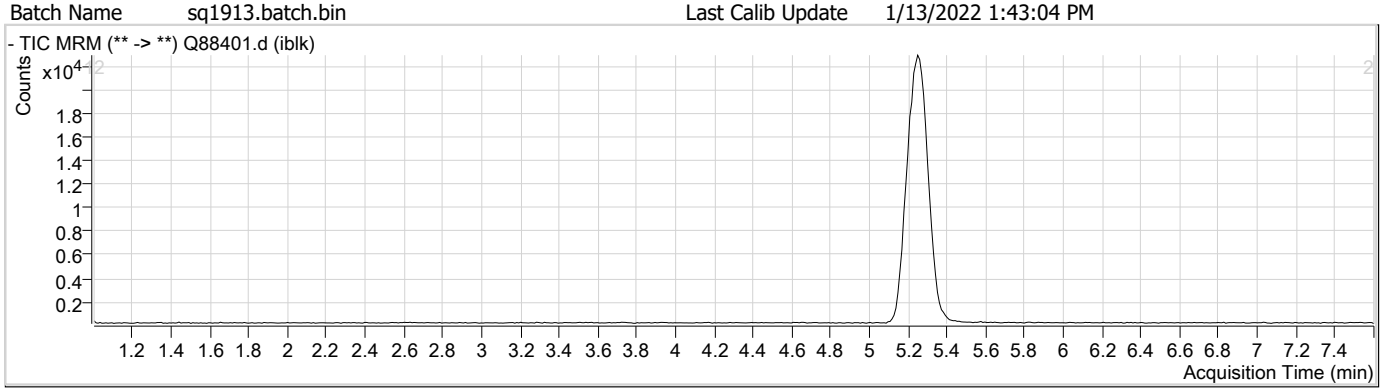
7.2.1

7

01152651

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88401.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 1:43:04 PM
Sample Name	iblk	Instrument	Instrument 1
Vial	P1-A1	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

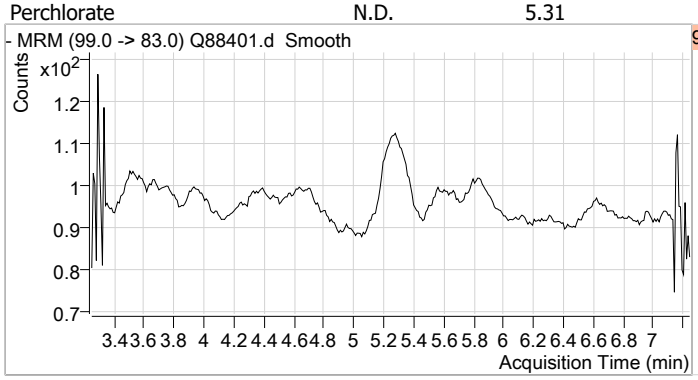


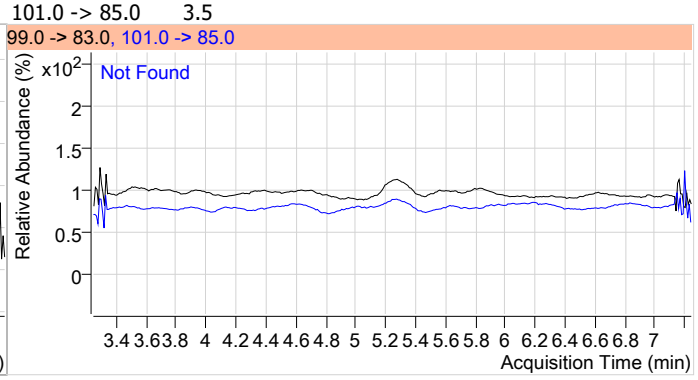
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.249	107.0 -> 89.0	174064	NoQ	5.00 µg/L	-0.061
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	-	99.0 -> 83.0		-	N.D.	

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

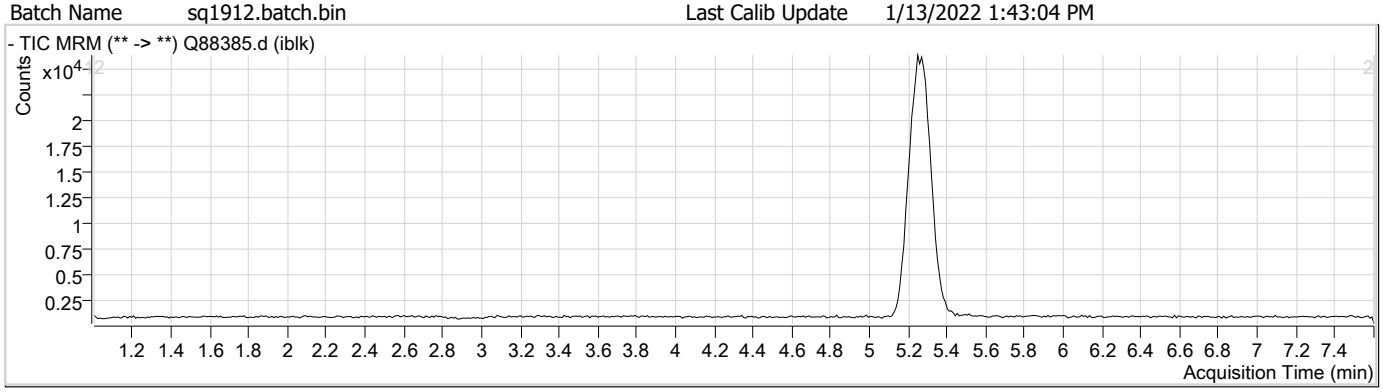
Compound	Conc.	Exp RT	QIon	Exp Ratio
Perchlorate	N.D.	5.31	101.0 -> 85.0	3.5





Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88385.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 6:36:31 PM
Sample Name	iblk	Instrument	Instrument 1
Vial	P1-A1	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

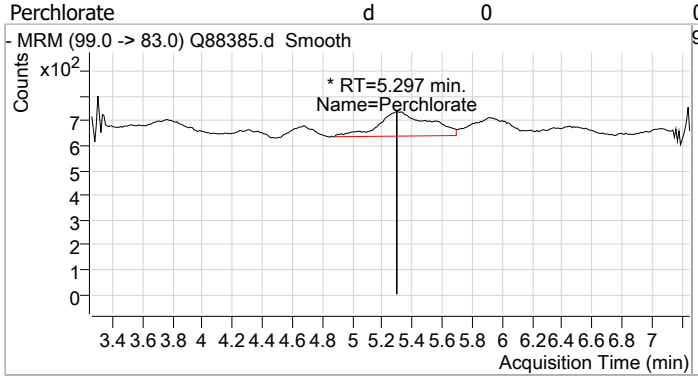


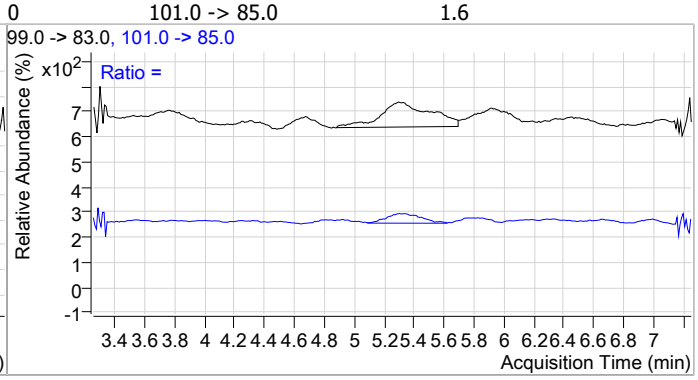
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units		Dev(Min)
Internal Standards								
Cl18O4	5.259	107.0 -> 89.0	202117	NoQ	5.00	µg/L		-0.051
System Monitoring Compounds								
Target Compounds								QValue
Perchlorate	5.297	99.0 -> 83.0	0		0.00	µg/L	md	1

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	d	0		0	101.0 -> 85.0		1.6	





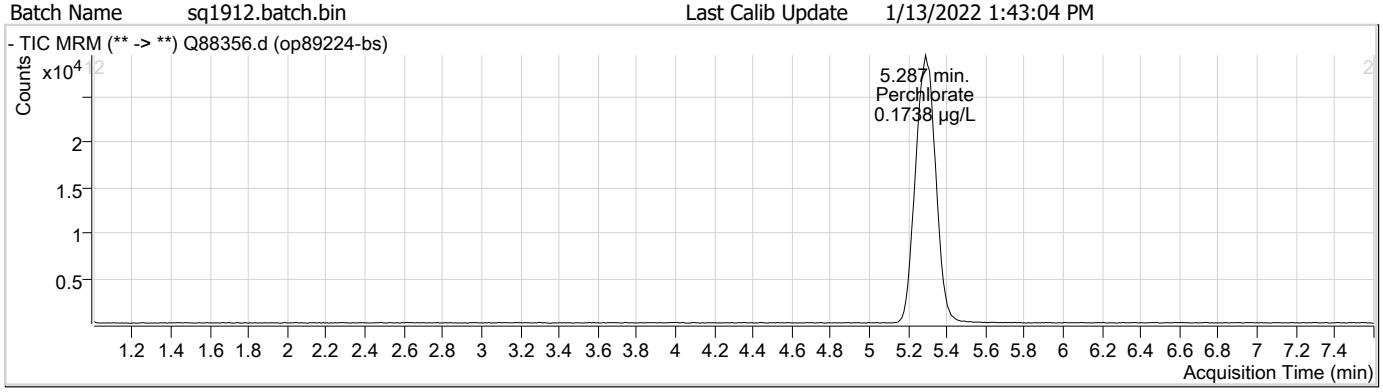
7.2.3

7

01152655

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88356.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:32:44 PM
Sample Name	op89224-bs	Instrument	Instrument 1
Vial	P1-B3	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

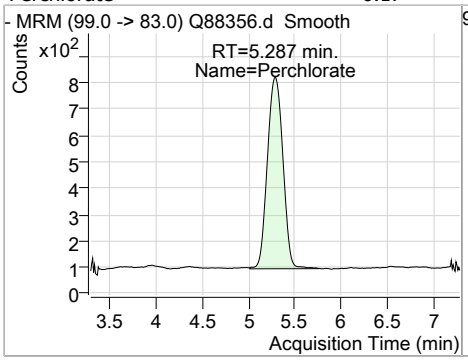


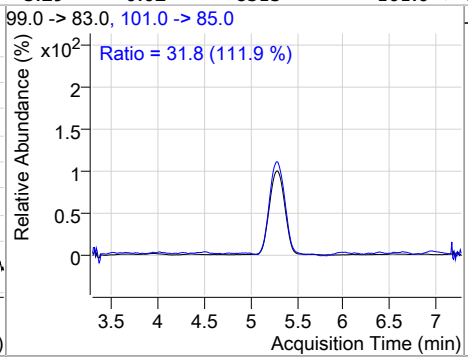
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.290	107.0 -> 89.0	202716	NoQ	5.00 µg/L	-0.020
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.287	99.0 -> 83.0	8515	3.1	0.17 µg/L	94

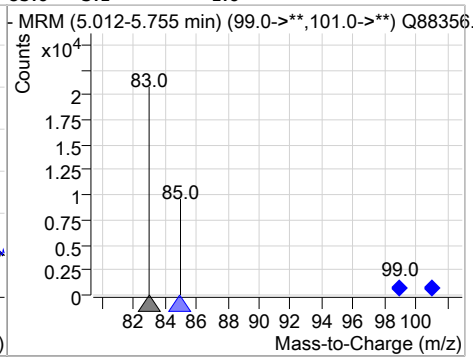
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.17	5.29	-0.02	8515	101.0 -> 85.0	3.1	1.6	



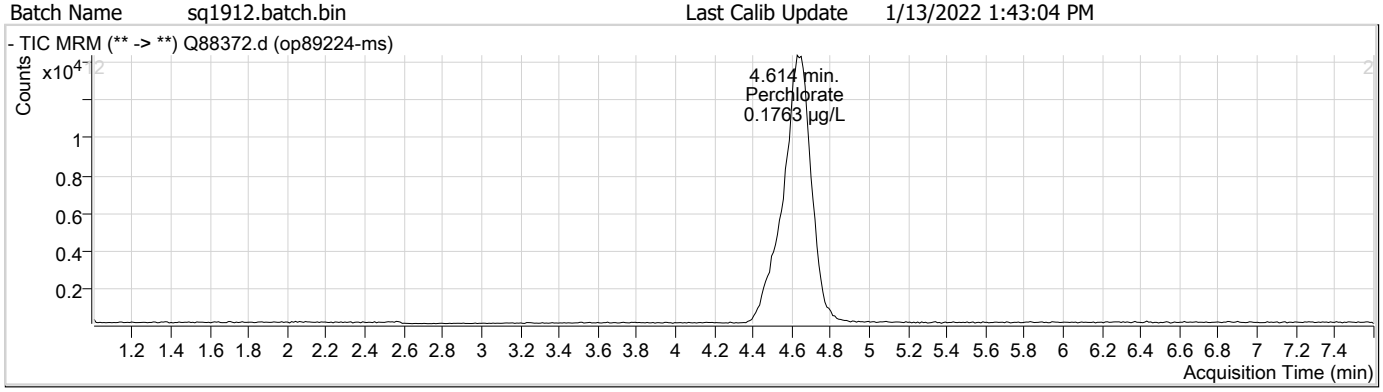




01152657

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88372.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:47:19 PM
Sample Name	op89224-ms	Instrument	Instrument 1
Vial	P1-C7	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



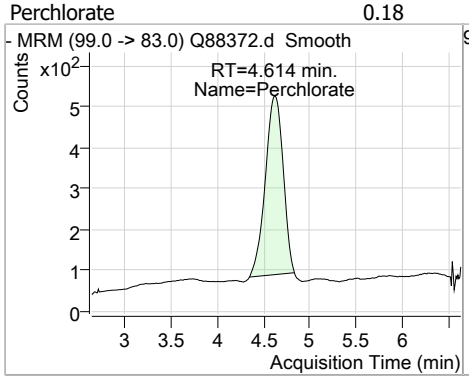
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	4.638	107.0 -> 89.0	137009	NoQ	5.00 µg/L	-0.672
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	4.614	99.0 -> 83.0	5837	2.6	0.18 µg/L	81

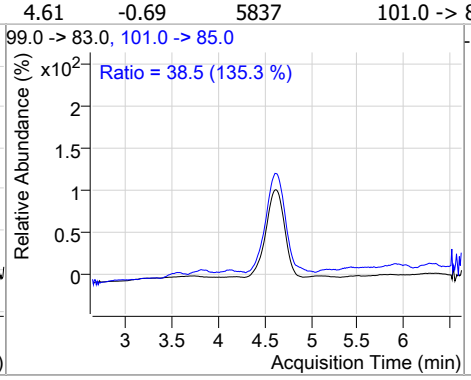
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

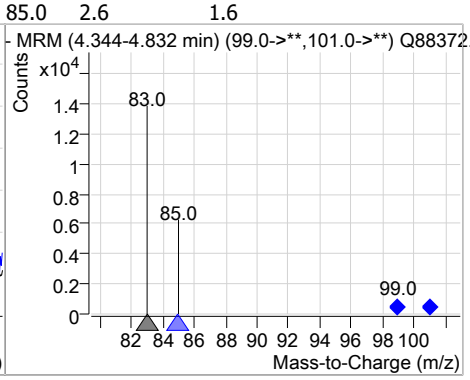
01152658

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	4.61	-0.69	5837	101.0 -> 85.0	2.6	1.6	





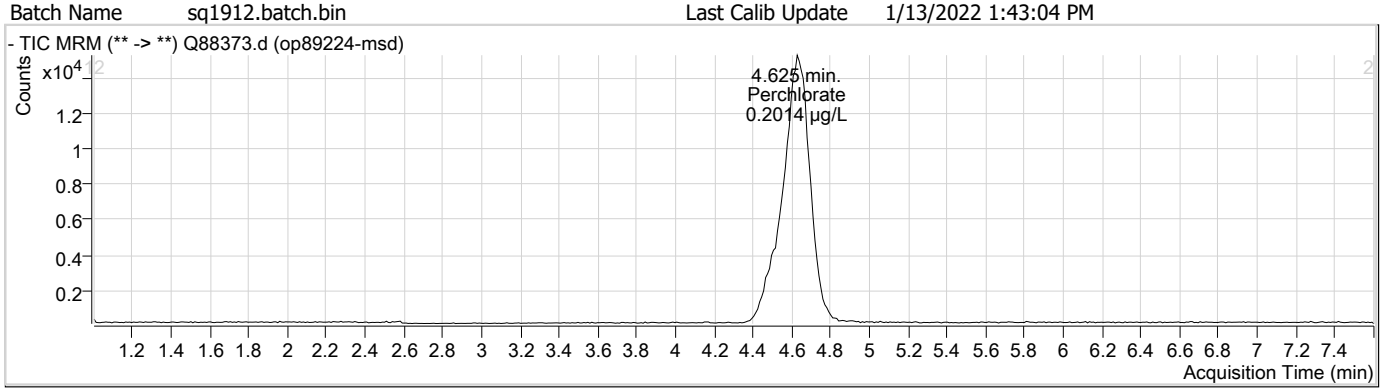


7.4.1

7

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88373.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:55:44 PM
Sample Name	op89224-msd	Instrument	Instrument 1
Vial	P1-C8	Sample Information	OP89224,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

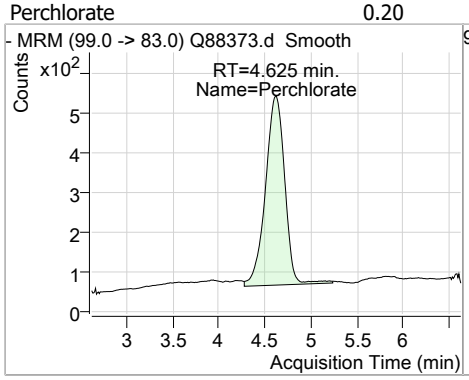


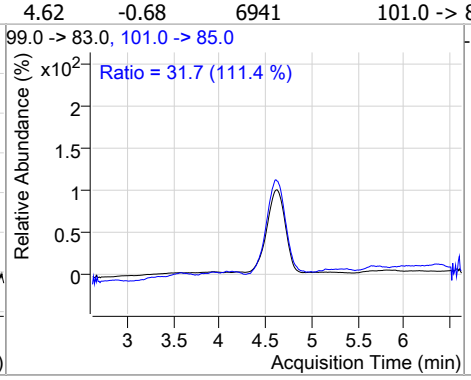
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	4.628	107.0 -> 89.0	142614	NoQ	5.00 µg/L	-0.682
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	4.625	99.0 -> 83.0	6941	3.2	0.20 µg/L	94

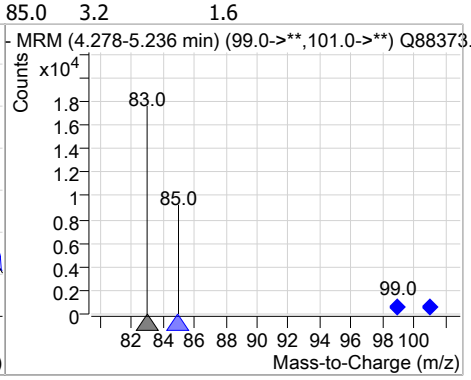
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.20	4.62	-0.68	6941	101.0 -> 85.0	3.2	1.6	







7.4.2

7

01152661

QQQ Check Tune Report

Agilent Technologies

Instrument Name	Instrument 1
MS Model	G6460A
MS Instrument Serial	SG10447001
Software_Firmware Version	B.08.02.B8260.0, FW: A.00.08.62
Tune Date & Time	11 January 2022 08:01:39
Data Path	D:\MassHunter\Tune\QQQ\G6460A\atunes.TUNE.XML
Ion Source	AJS ESI
Ionization Mode	AJS ESI
Tuned Resolution	All
Vacuum Pressure	1.66E+0[R]; 2.51E-5[H]

Source Parameters

Parameter	Value
Gas Temp	300
Gas Flow	10
Nebulizer	15
Capillary	4000
Nozzle Voltage	1500
Sheath Gas Temp	250
Sheath Gas Flow	7

7.5.1

7

QQQ Check Tune Report

Agilent Technologies

Negative Results

Analyzer: MS1 Polarity: Negative Width: Unit

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	112.95	-0.04	Pass	0.70	0.67	-0.03	Pass	164320
302.00	302.02	0.02	Pass	0.70	0.68	-0.02	Pass	69801
601.98	602.05	0.07	Pass	0.70	0.61	-0.09	Pass	79178
1033.99	1033.97	-0.02	Pass	0.70	0.63	-0.07	Pass	267423
1633.95	1633.79	-0.16	Pass	0.70	0.70	0.00	Pass	508633
2233.91	2233.61	-0.30	Pass	0.70	0.79	0.09	Pass	333638

Analyzer: MS2 Polarity: Negative Width: Unit

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	69.00	0.00	Pass	0.70	0.74	0.04	Pass	52544
112.99	112.95	-0.04	Pass	0.70	0.72	0.02	Pass	364001
302.00	301.87	-0.13	Pass	0.70	0.79	0.09	Pass	110580
601.98	601.84	-0.14	Pass	0.70	0.78	0.08	Pass	143379
1033.99	1033.79	-0.20	Pass	0.70	0.81	0.11	Pass	430459
1633.95	1633.75	-0.20	Pass	0.70	0.83	0.13	Pass	638401
2233.91	2233.66	-0.25	Pass	0.70	0.63	-0.07	Pass	121276

Analyzer: MS1 Polarity: Negative Width: Wide

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	112.89	-0.10	Pass	1.20	1.08	-0.12	Pass	244736
302.00	301.99	-0.01	Pass	1.20	1.38	0.18	Pass	106589
601.98	601.98	0.00	Pass	1.20	1.42	0.22	Pass	144720
1033.99	1033.85	-0.14	Pass	1.20	1.51	0.31	Pass	529381
1633.95	1633.75	-0.20	Pass	1.20	1.41	0.21	Pass	1203150
2233.91	2233.61	-0.30	Pass	1.20	1.29	0.09	Pass	739240

Analyzer: MS2 Polarity: Negative Width: Wide

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	68.99	-0.01	Pass	1.20	1.25	0.05	Pass	67877
112.99	112.91	-0.08	Pass	1.20	1.30	0.10	Pass	424641
302.00	301.85	-0.15	Pass	1.20	1.39	0.19	Pass	158231
601.98	601.79	-0.19	Pass	1.20	1.33	0.13	Pass	199357
1033.99	1033.73	-0.26	Pass	1.20	1.13	-0.07	Pass	624691
1633.95	1633.63	-0.32	Pass	1.20	1.13	-0.07	Pass	1583735
2233.91	2233.61	-0.30	Pass	1.20	1.27	0.07	Pass	1450519

Analyzer: MS1 Polarity: Negative Width: Widest

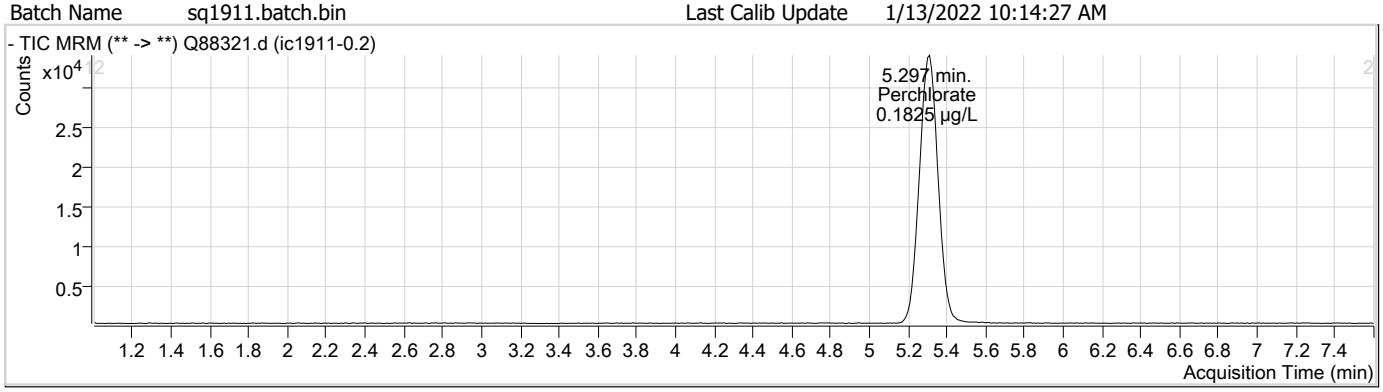
m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
112.99	112.61	-0.38	Pass	2.50	2.58	0.08	Pass	357627
302.00	301.97	-0.03	Pass	2.50	2.90	0.40	Pass	127663
601.98	601.96	-0.02	Pass	2.50	2.92	0.42	Pass	183236
1033.99	1033.87	-0.12	Pass	2.50	2.92	0.42	Pass	794803
1633.95	1633.65	-0.30	Pass	2.50	2.77	0.27	Pass	1964604
2233.91	2233.49	-0.42	Pass	2.50	2.68	0.18	Pass	1297152

Analyzer: MS2 Polarity: Negative Width: Widest

m/z Expected	m/z Measured	Delta	Result	FWHM Expected	FWHM Measured	Delta	Result	Abundance
69.00	69.01	0.01	Pass	2.50	2.52	0.02	Pass	81328
112.99	112.96	-0.03	Pass	2.50	2.59	0.09	Pass	493168
302.00	301.83	-0.17	Pass	2.50	2.65	0.15	Pass	182366
601.98	601.76	-0.22	Pass	2.50	2.62	0.12	Pass	259455
1033.99	1033.75	-0.24	Pass	2.50	2.35	-0.15	Pass	1141479
1633.95	1633.68	-0.27	Pass	2.50	2.35	-0.15	Pass	3541857
2233.91	2233.56	-0.35	Pass	2.50	2.48	-0.02	Pass	3689915

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88321.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:30:42 PM
Sample Name	ic1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

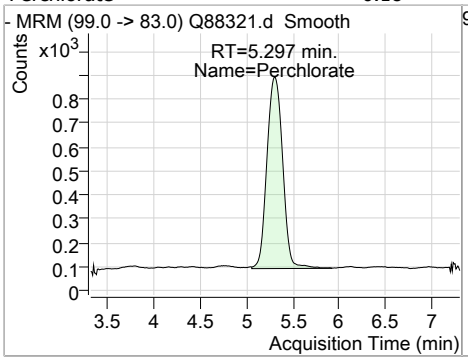


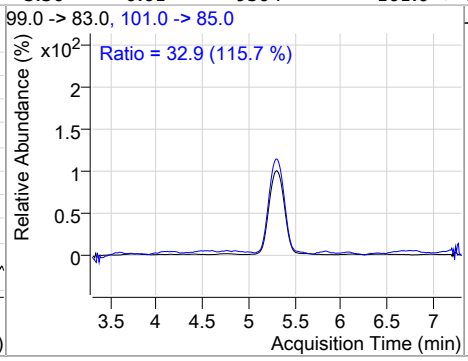
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.310	107.0 -> 89.0	215450	NoQ	5.00	µg/L	0.000
System Monitoring Compounds							
Target Compounds							**QValue**
Perchlorate	5.297	99.0 -> 83.0	9504	3.0	0.18	µg/L	92

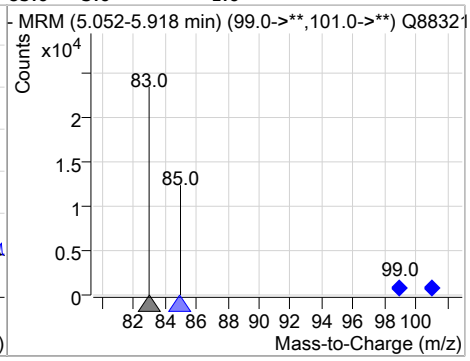
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	5.30	-0.01	9504	101.0 -> 85.0	3.0	1.6	

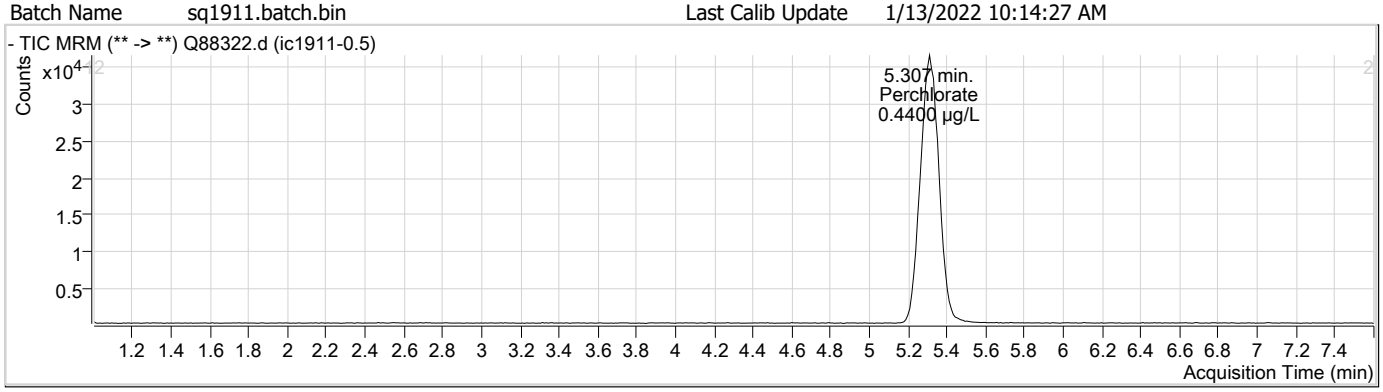






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88322.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:39:06 PM
Sample Name	ic1911-0.5	Instrument	Instrument 1
Vial	P1-A3	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

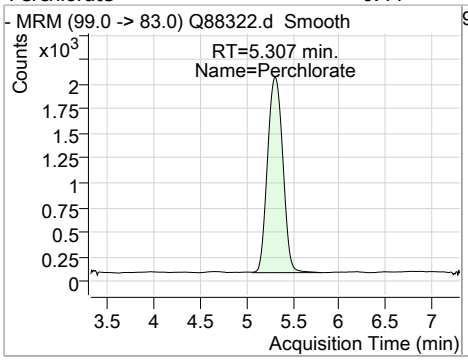


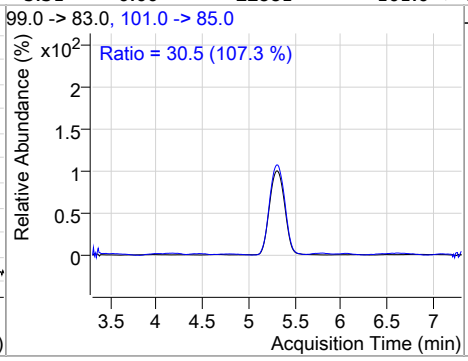
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	215195	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	22881	3.3	0.44 µg/L	96

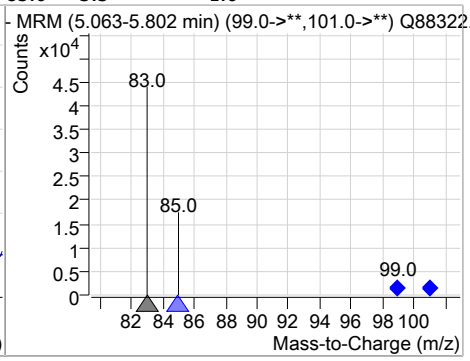
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.44	5.31	0.00	22881	101.0 -> 85.0	3.3	1.6	

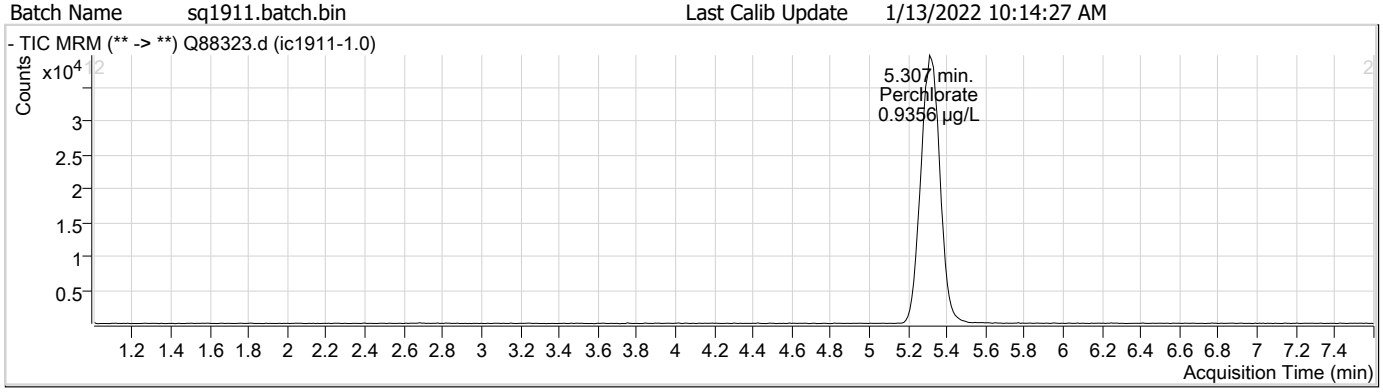






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88323.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:47:30 PM
Sample Name	ic1911-1.0	Instrument	Instrument 1
Vial	P1-A4	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

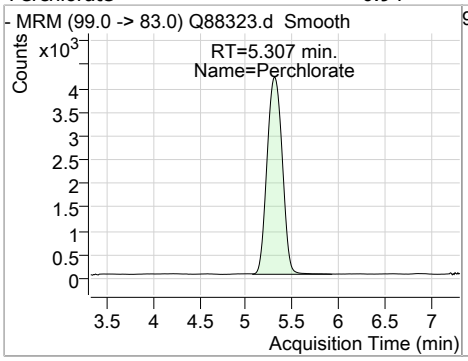


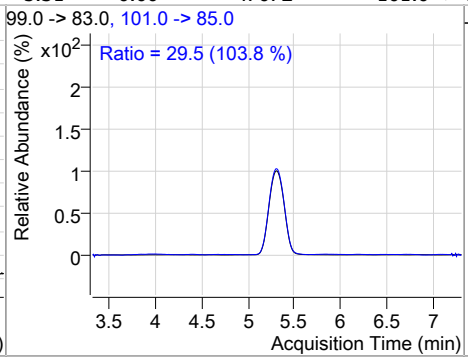
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.321	107.0 -> 89.0	210857	NoQ	5.00 µg/L	0.010
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	47672	3.4	0.94 µg/L	98

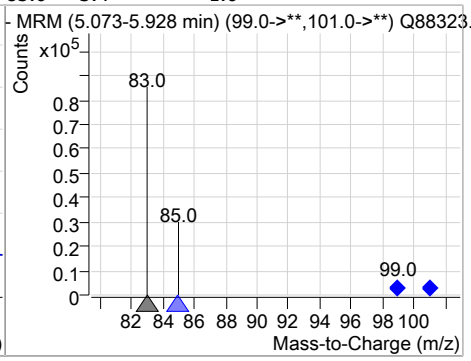
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.94	5.31	0.00	47672	101.0 -> 85.0	3.4	1.6	

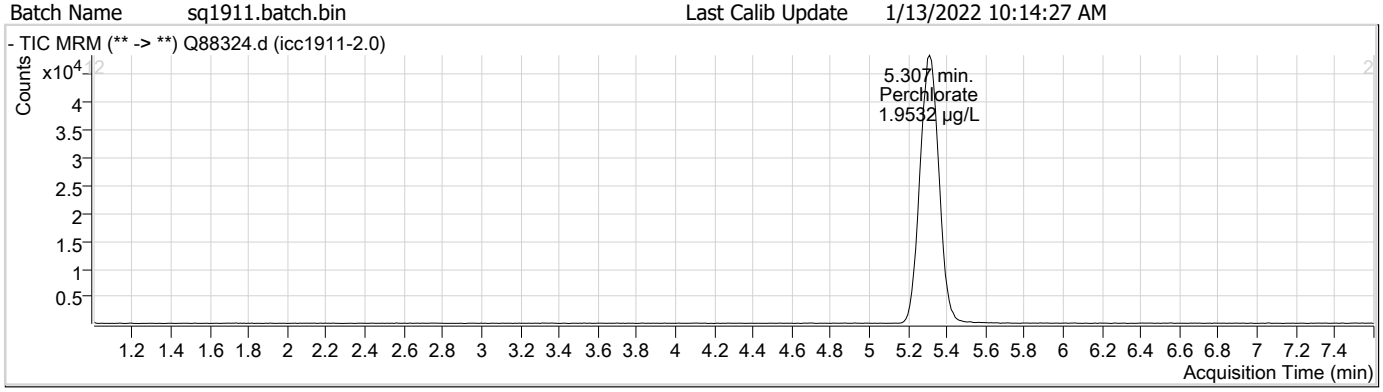






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88324.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 12:55:55 PM
Sample Name	icc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

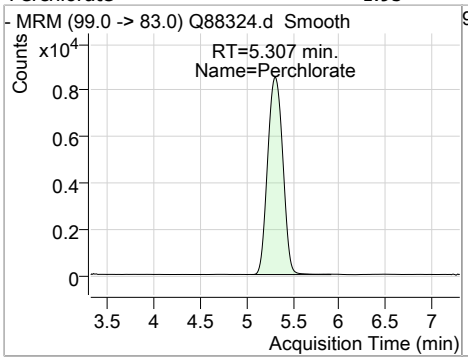


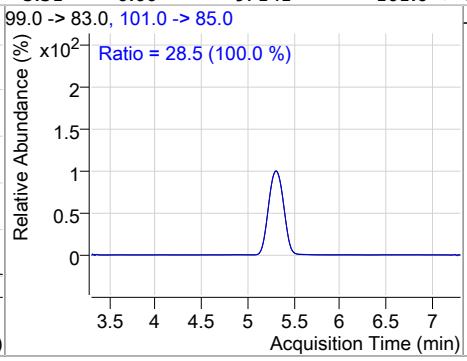
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	205811	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	97141	3.5	1.95 µg/L	100

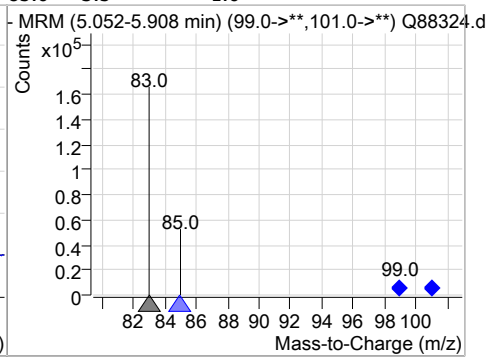
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.95	5.31	0.00	97141	101.0 -> 85.0	3.5	1.6	

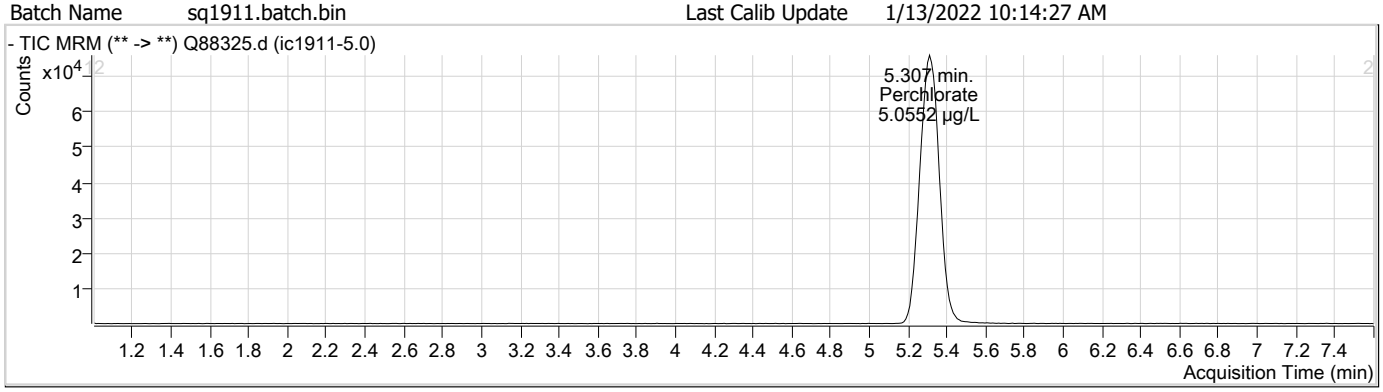






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88325.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:04:19 PM
Sample Name	ic1911-5.0	Instrument	Instrument 1
Vial	P1-A6	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

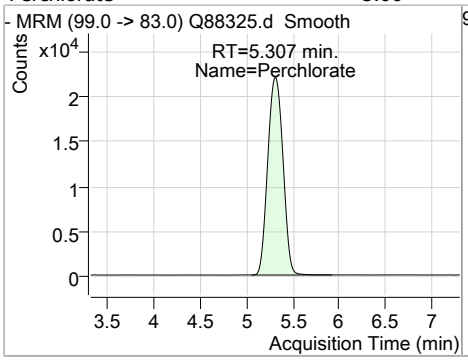


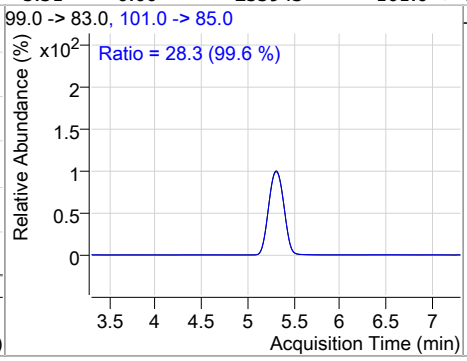
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	207882	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	253943	3.5	5.06 µg/L	100

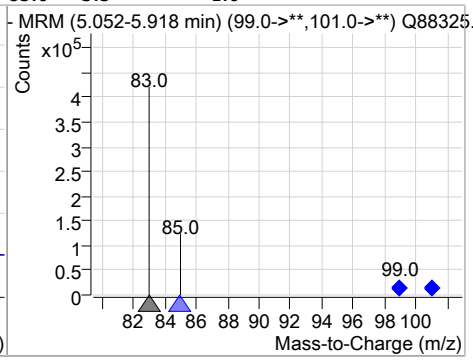
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	5.06	5.31	0.00	253943	101.0 -> 85.0	3.5	1.6	

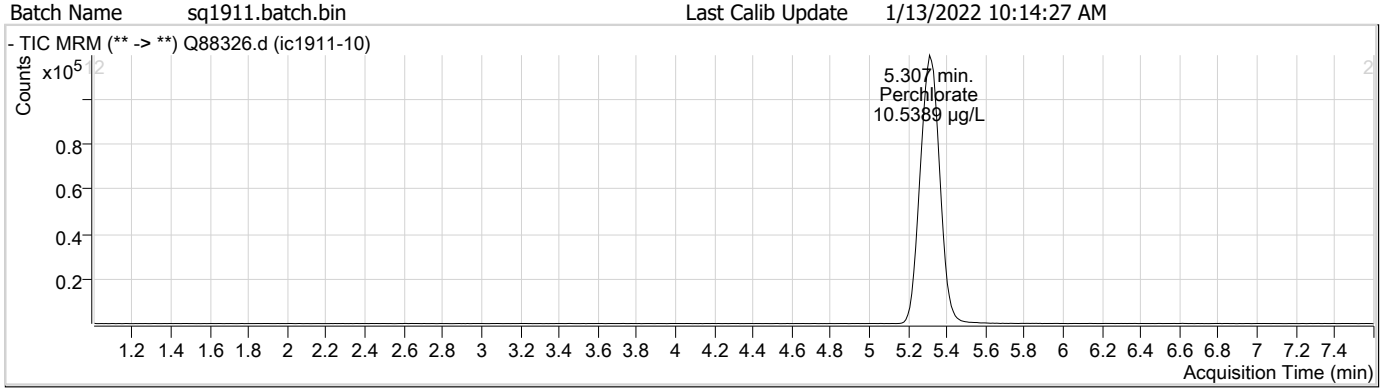






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88326.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:12:43 PM
Sample Name	ic1911-10	Instrument	Instrument 1
Vial	P1-A7	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

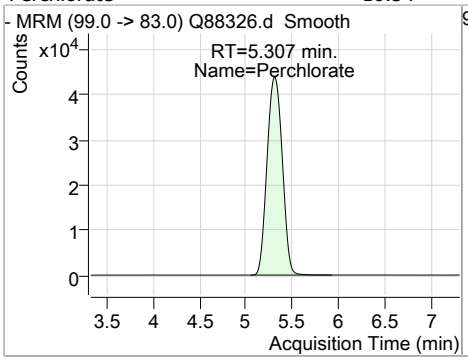


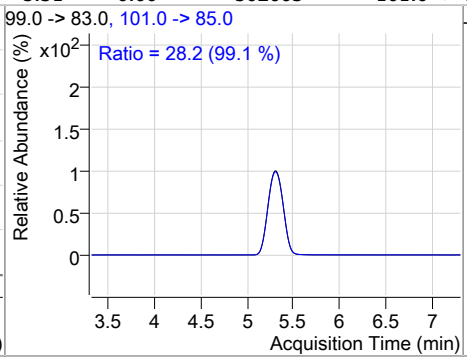
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.321	107.0 -> 89.0	197380	NoQ	5.00	µg/L	0.010
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.307	99.0 -> 83.0	502663	3.5	10.54	µg/L	99

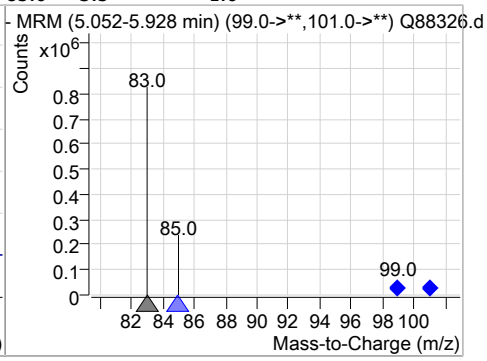
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	10.54	5.31	0.00	502663	101.0 -> 85.0	3.5	1.6	

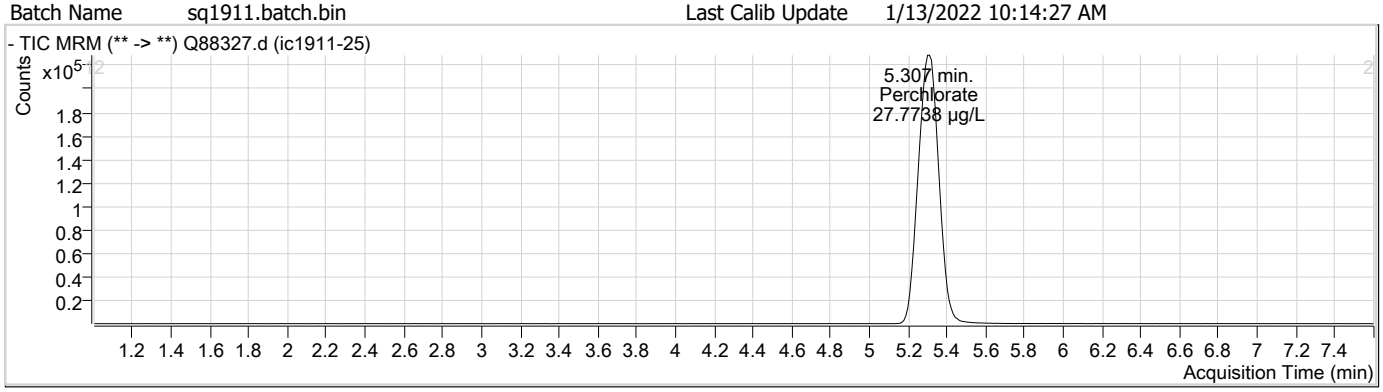






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88327.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:21:13 PM
Sample Name	ic1911-25	Instrument	Instrument 1
Vial	P1-A8	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM

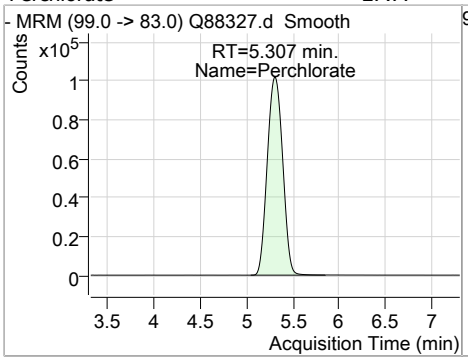


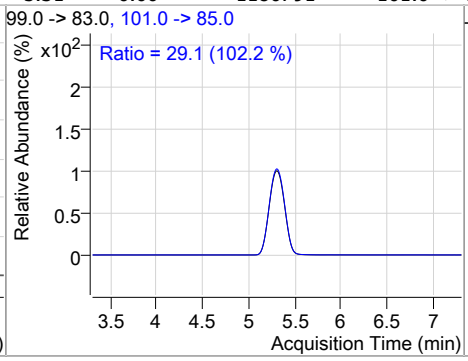
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	175938	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.307	99.0 -> 83.0	1180791	3.4	27.77 µg/L	99

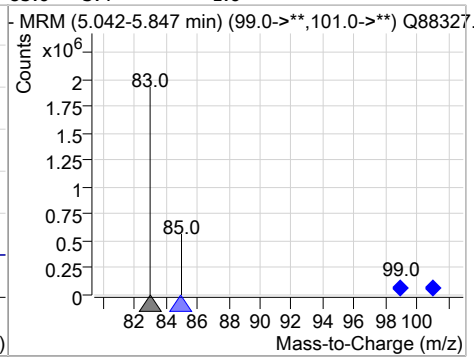
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	27.77	5.31	0.00	1180791	101.0 -> 85.0	3.4	1.6	



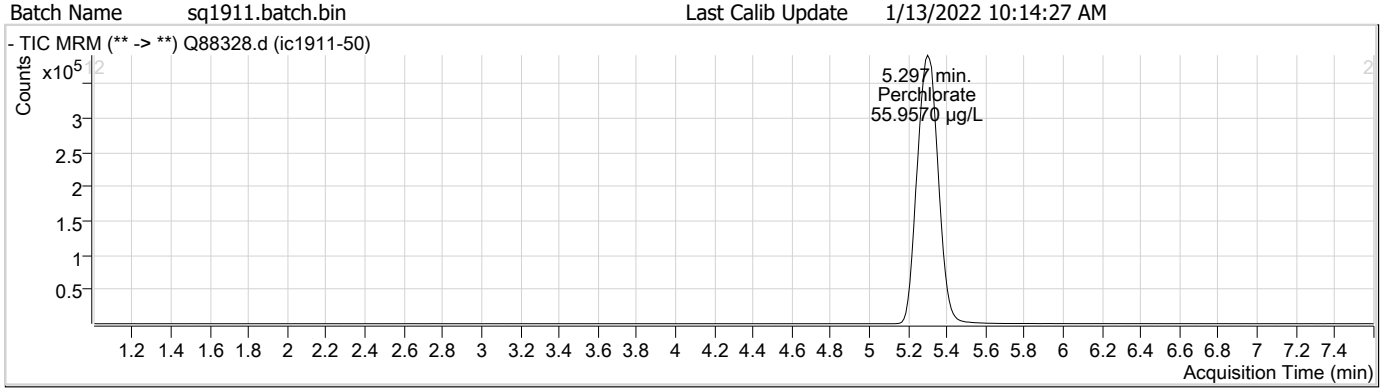




01152677

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88328.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:29:36 PM
Sample Name	ic1911-50	Instrument	Instrument 1
Vial	P1-A9	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM



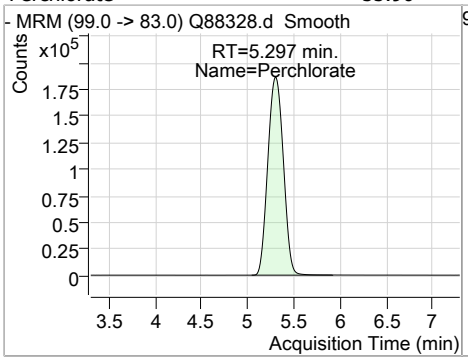
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.300	107.0 -> 89.0	161193	NoQ	5.00	µg/L	-0.010
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.297	99.0 -> 83.0	2179606	3.4	55.96	µg/L	98

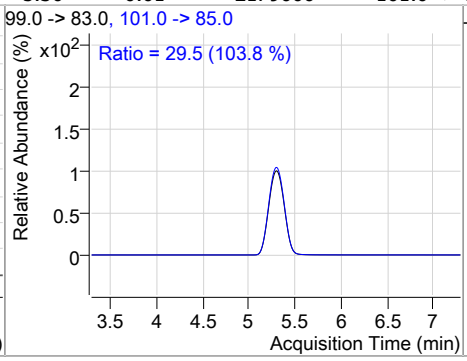
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

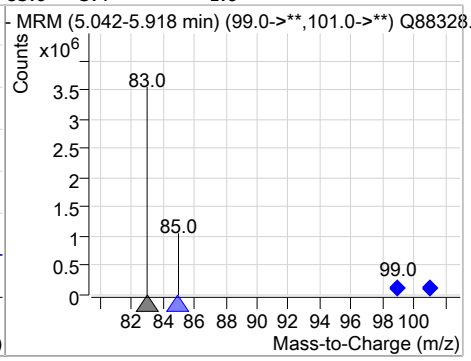
01152678

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	55.96	5.30	-0.01	2179606	101.0 -> 85.0	3.4	1.6	







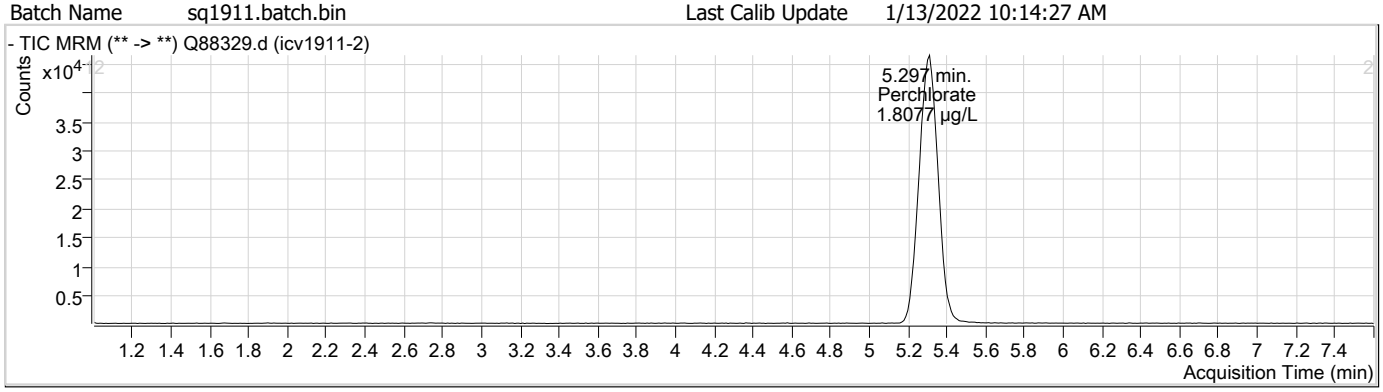
7.5.9

7

01152679

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88329.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/12/2022 1:38:01 PM
Sample Name	icv1911-2	Instrument	Instrument 1
Vial	P1-B1	Sample Information	OP89192,SQ1911,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1911.batch.bin	Last Calib Update	1/13/2022 10:14:27 AM



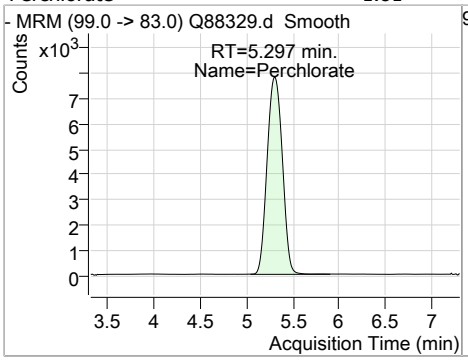
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	203122	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.297	99.0 -> 83.0	88728	3.4	1.81 µg/L	99

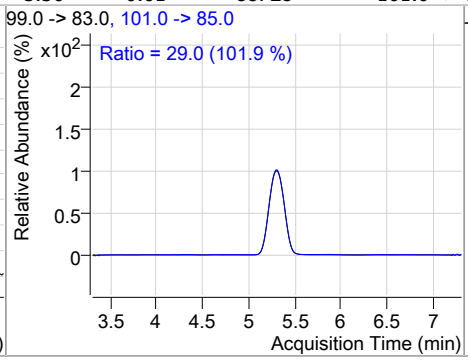
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

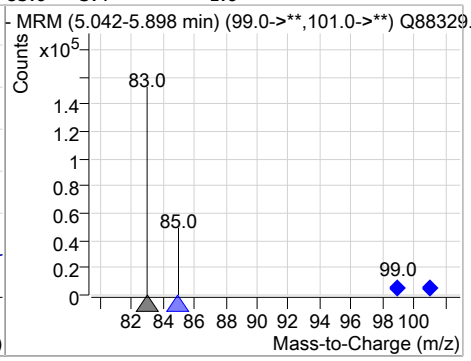
01152680

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.81	5.30	-0.01	88728	101.0 -> 85.0	3.4	1.6	







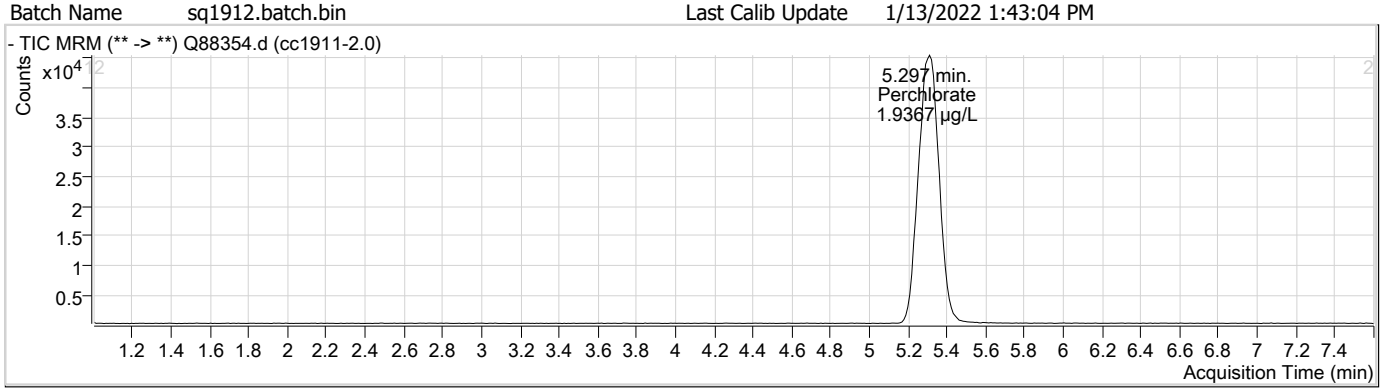
7.5.10

7

01152681

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88354.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:15:55 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

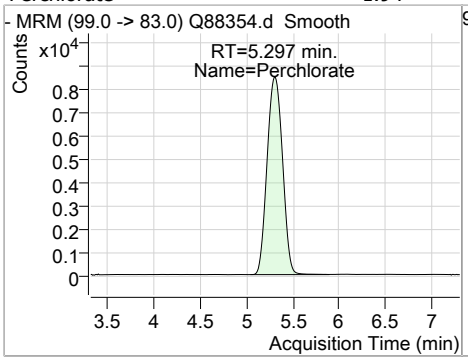


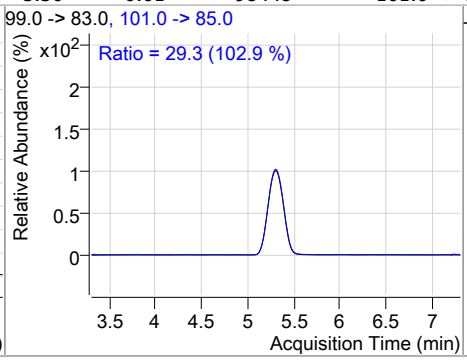
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.310	107.0 -> 89.0	210357	NoQ	5.00 µg/L	0.000
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.297	99.0 -> 83.0	98448	3.4	1.94 µg/L	99

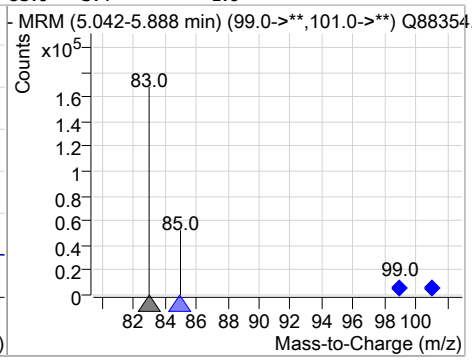
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.94	5.30	-0.01	98448	101.0 -> 85.0	3.4	1.6	



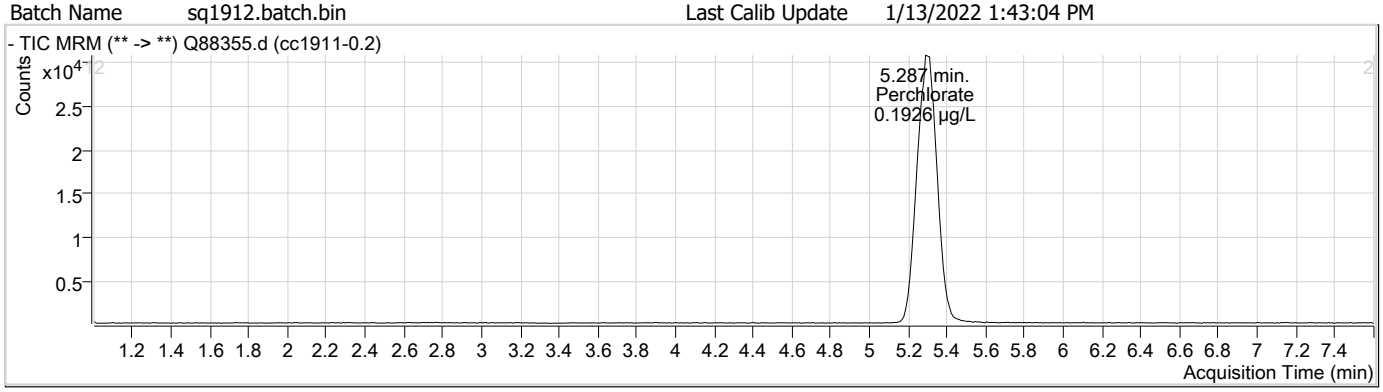




01152683

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88355.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 2:24:19 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

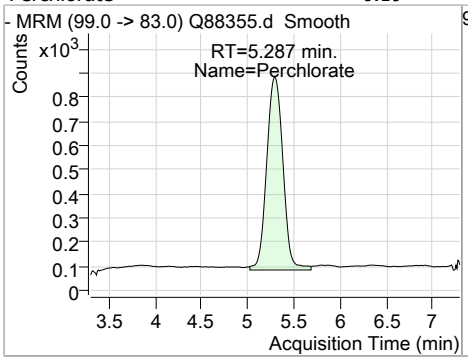


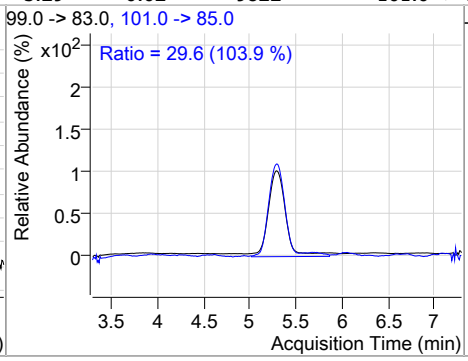
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.300	107.0 -> 89.0	211047	NoQ	5.00	µg/L	-0.010
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.287	99.0 -> 83.0	9822	3.4	0.19	µg/L	98

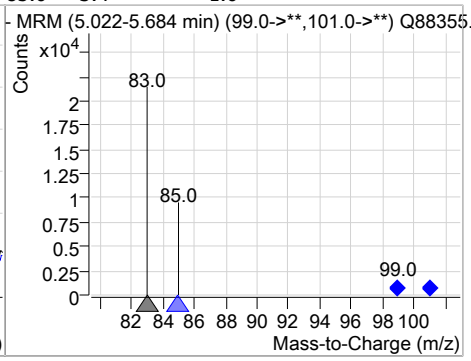
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.19	5.29	-0.02	9822	101.0 -> 85.0	3.4	1.6	

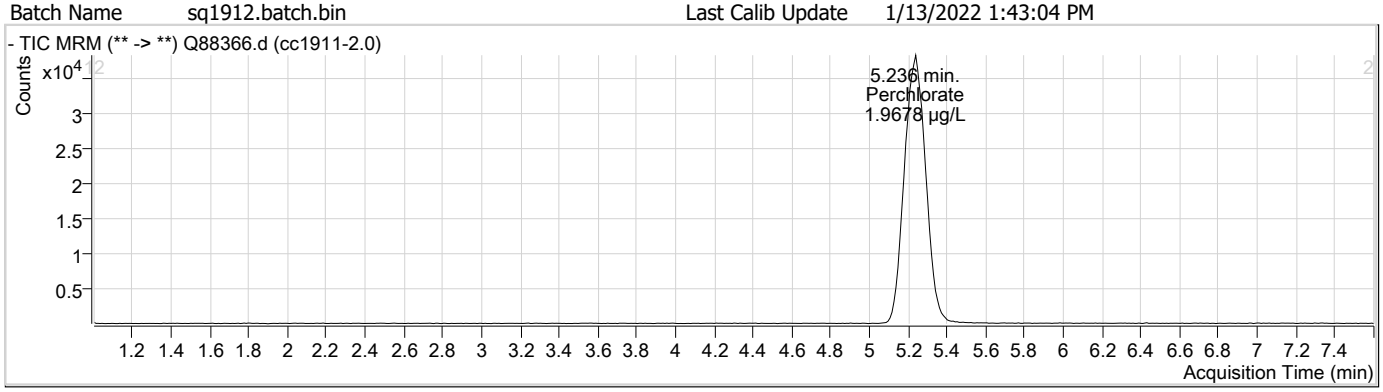






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88366.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 3:56:53 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



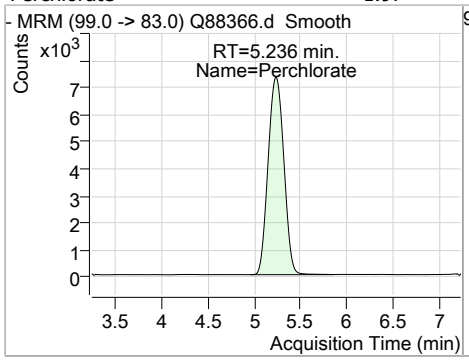
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.239	107.0 -> 89.0	182078	NoQ	5.00 µg/L	-0.071
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.236	99.0 -> 83.0	86580	3.5	1.97 µg/L	99

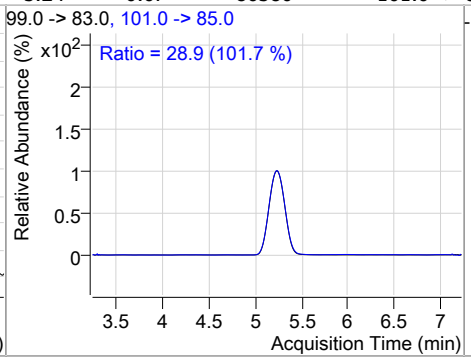
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

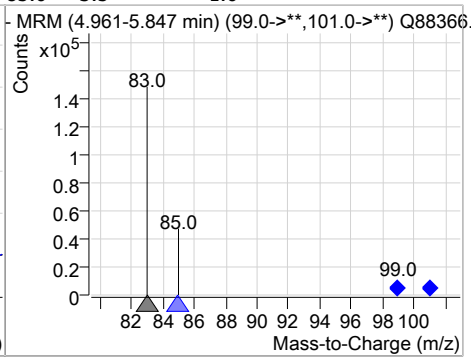
01152686

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.97	5.24	-0.07	86580	101.0 -> 85.0	3.5	1.6	







7.5.13

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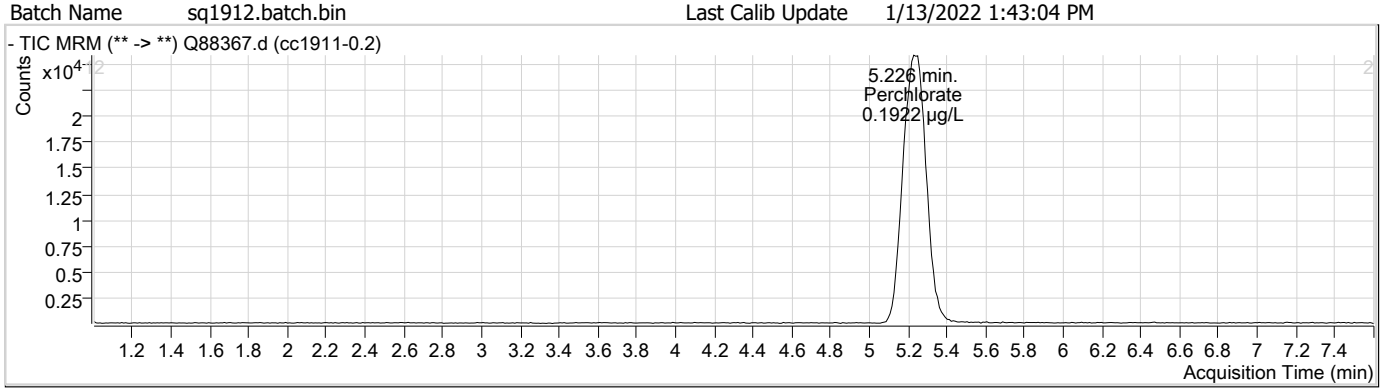
Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88367.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 4:05:17 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

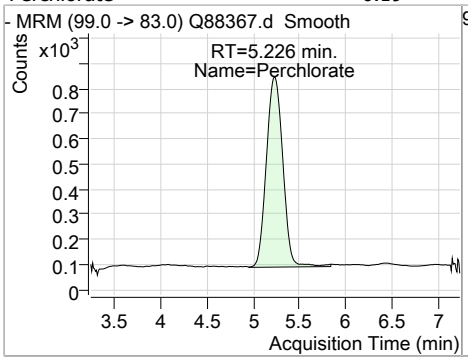


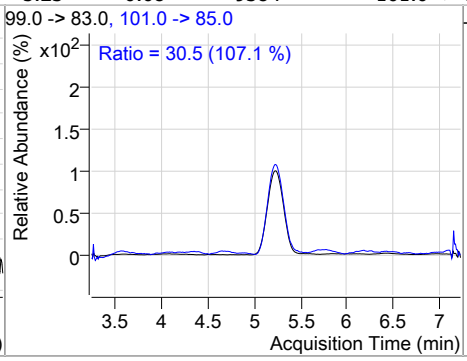
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.239	107.0 -> 89.0	202087	NoQ	5.00	µg/L	-0.071
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.226	99.0 -> 83.0	9384	3.3	0.19	µg/L	96

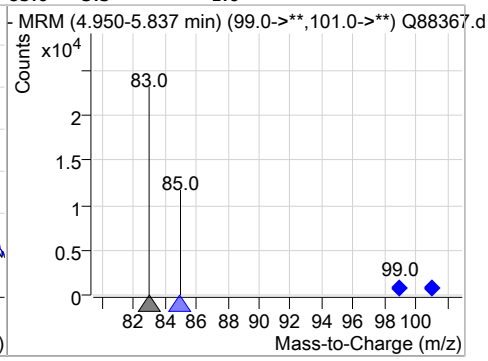
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.19	5.23	-0.08	9384	101.0 -> 85.0	3.3	1.6	

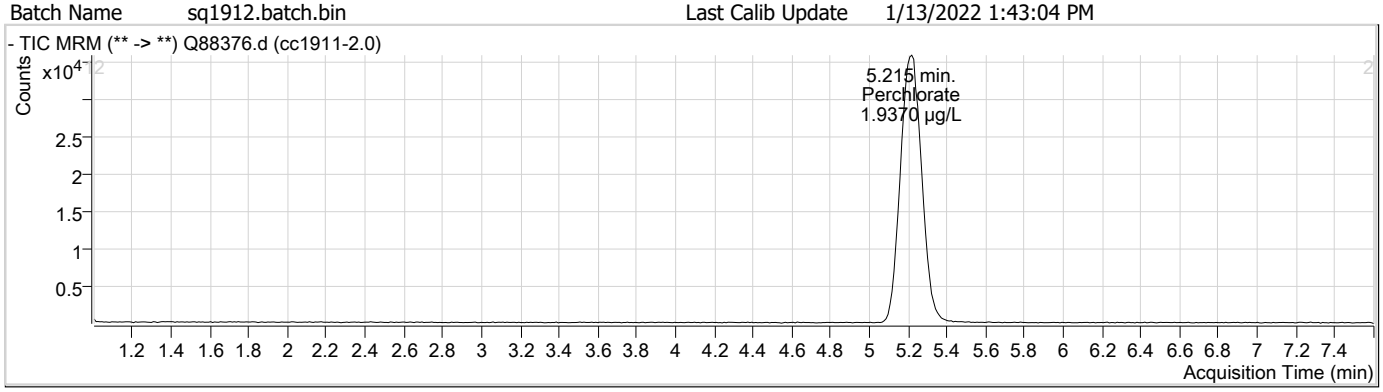






Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88376.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 5:20:57 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

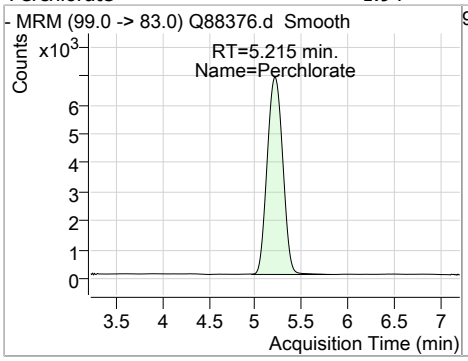


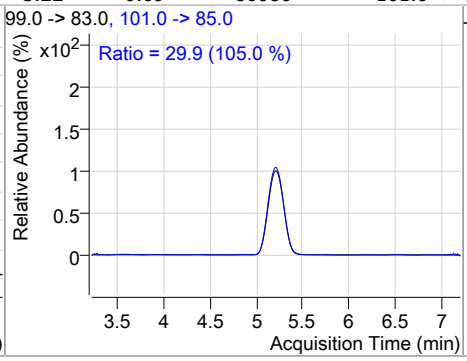
Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units	Dev(Min)
Internal Standards							
Cl18O4	5.219	107.0 -> 89.0	171103	NoQ	5.00	µg/L	-0.092
System Monitoring Compounds							
Target Compounds							QValue
Perchlorate	5.215	99.0 -> 83.0	80086	3.3	1.94	µg/L	97

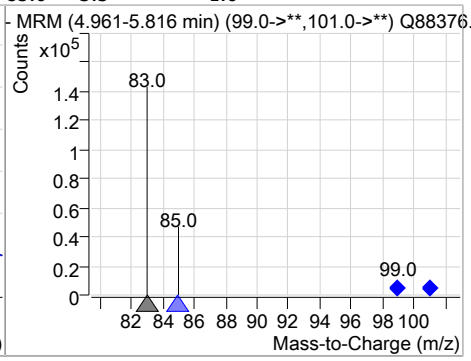
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.94	5.22	-0.09	80086	101.0 -> 85.0	3.3	1.6	







7.5.15

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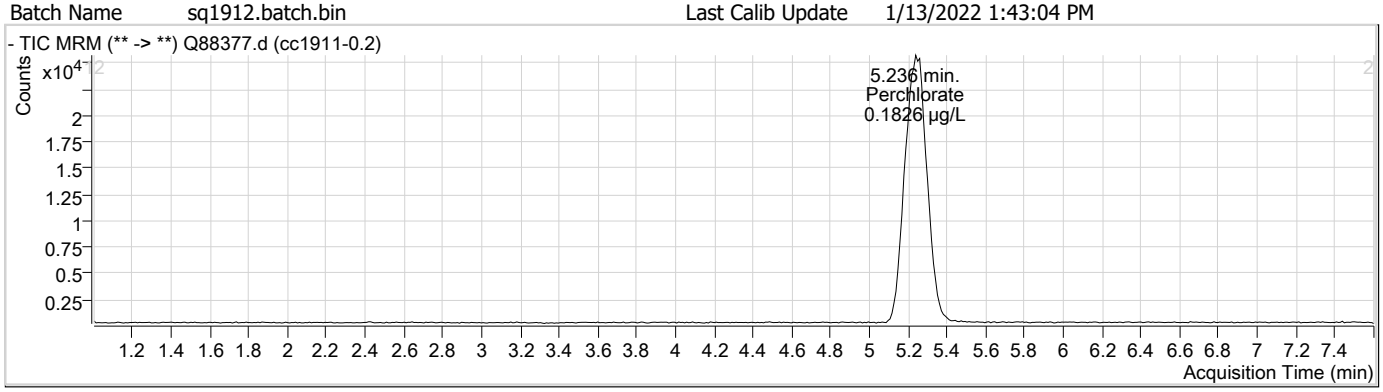
01152691

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88377.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 5:29:20 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



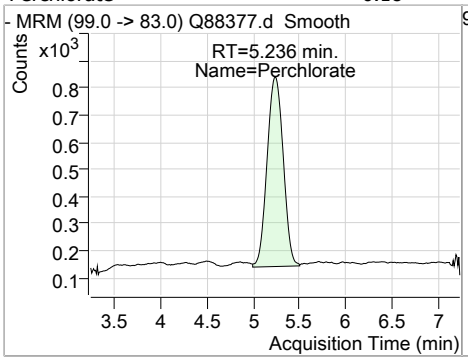
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.239	107.0 -> 89.0	192064	NoQ	5.00 µg/L	-0.071
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.236	99.0 -> 83.0	8476	3.1	0.18 µg/L	92

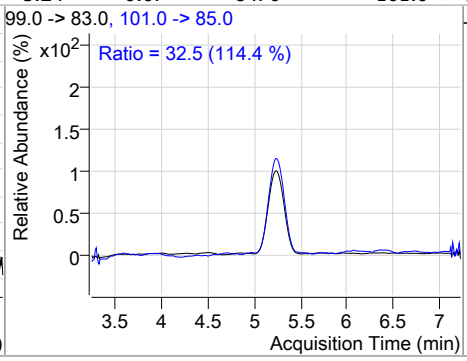
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

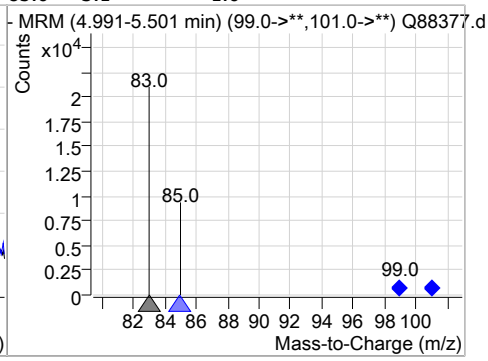
01152692

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	5.24	-0.07	8476	101.0 -> 85.0	3.1	1.6	







7.5.16

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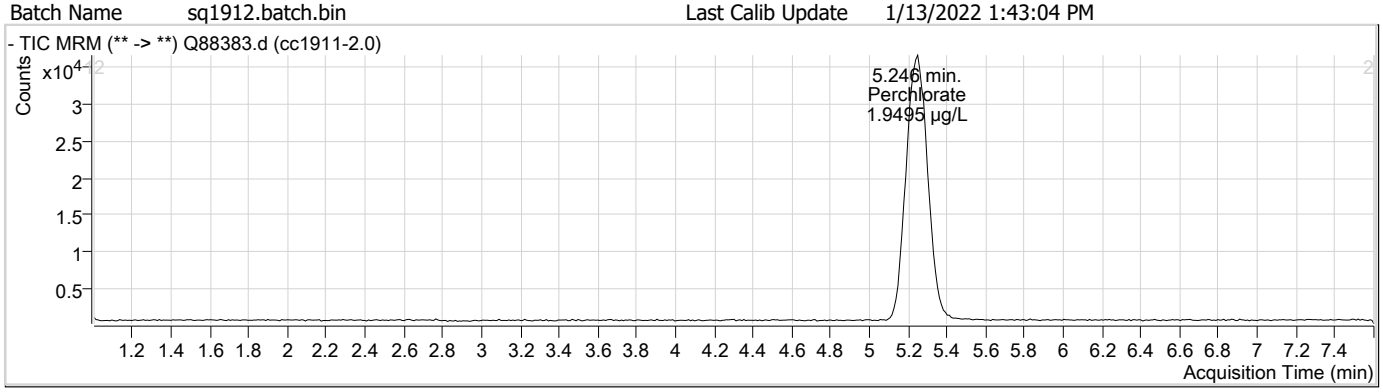
01152693

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88383.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/13/2022 6:19:44 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1912,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1912.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



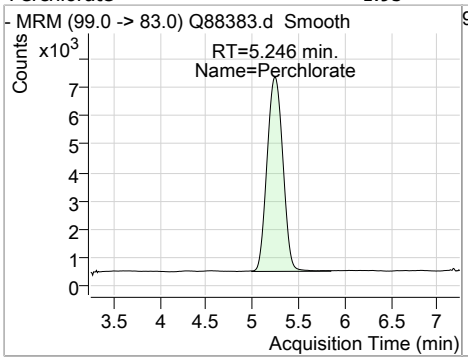
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.249	107.0 -> 89.0	174558	NoQ	5.00 µg/L	-0.061
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.246	99.0 -> 83.0	82234	3.3	1.95 µg/L	97

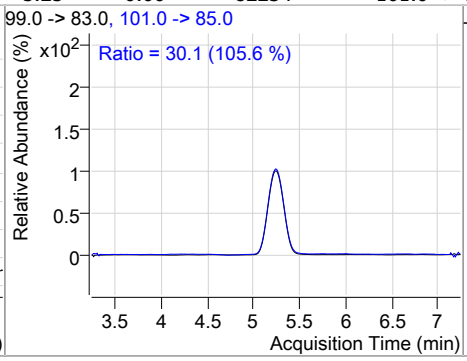
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

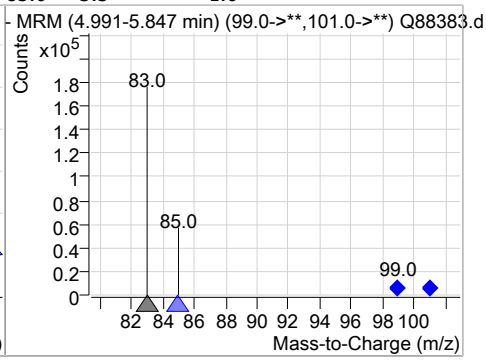
01152694

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.95	5.25	-0.06	82234	101.0 -> 85.0	3.3	1.6	







7.5.17

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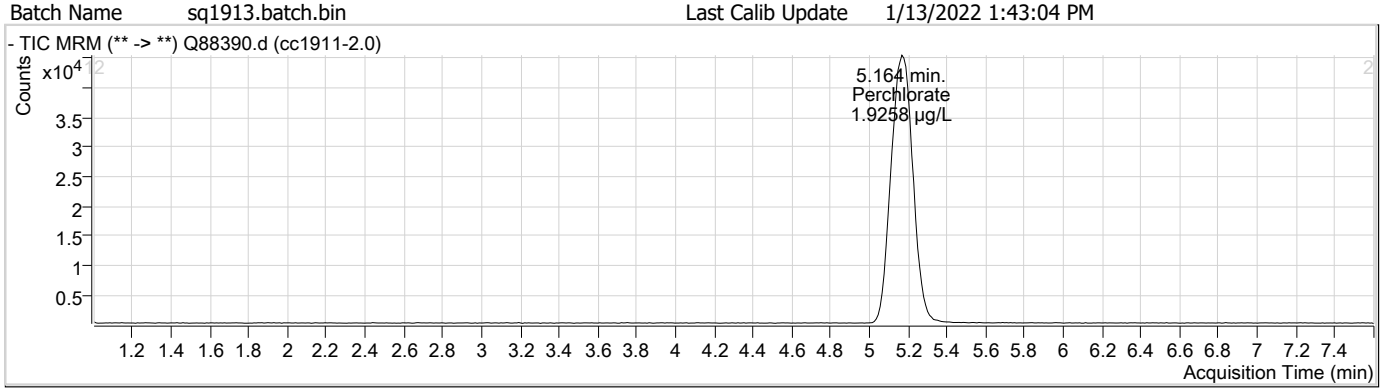
01152695

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88390.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:03:16 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

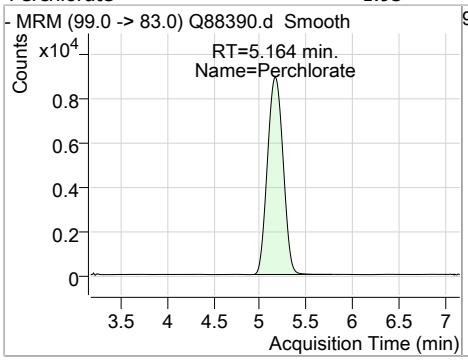


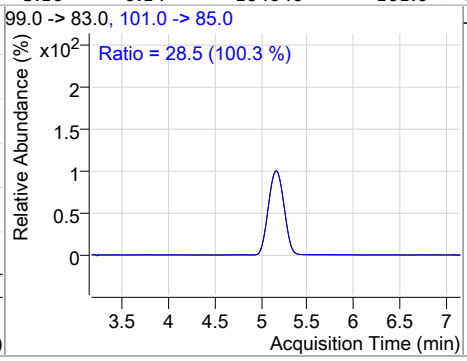
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.168	107.0 -> 89.0	223567	NoQ	5.00 µg/L	-0.143
System Monitoring Compounds						
Target Compounds						QValue
Perchlorate	5.164	99.0 -> 83.0	104040	3.5	1.93 µg/L	100

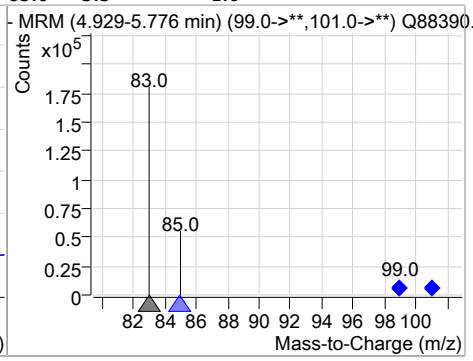
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.93	5.16	-0.14	104040	101.0 -> 85.0	3.5	1.6	





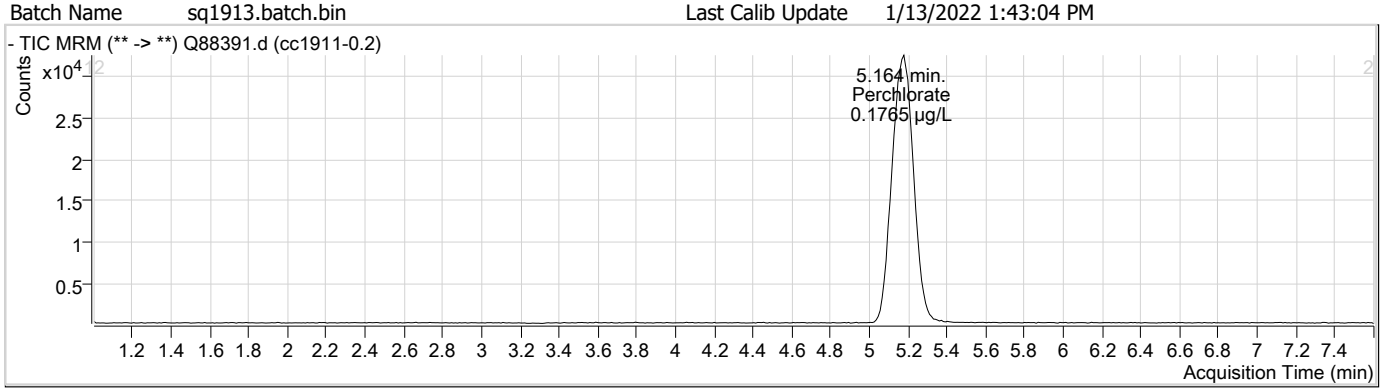


01152697

Quantitative Analysis Report for Perchlorate by 6850

Mike Eger
01/14/22 14:17

Data File	: Q88391.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 12:11:40 PM
Sample Name	cc1911-0.2	Instrument	Instrument 1
Vial	P1-A2	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM



Compound	RT	QIon	Resp.	Q-ratio	Conc.	Units		Dev(Min)
Internal Standards								
Cl18O4	5.178	107.0 -> 89.0	238331	NoQ	5.00	µg/L		-0.132
System Monitoring Compounds								
Target Compounds								QValue
Perchlorate	5.164	99.0 -> 83.0	10164	3.1	0.18	µg/L	m	92

(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Manual Integrations APPROVED (compounds with "m" flag)

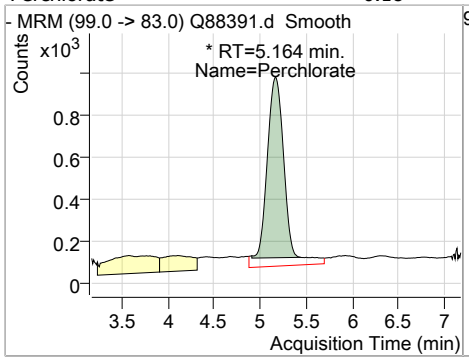
7.5.19

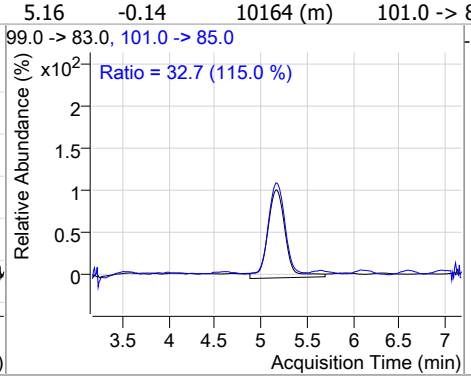
7

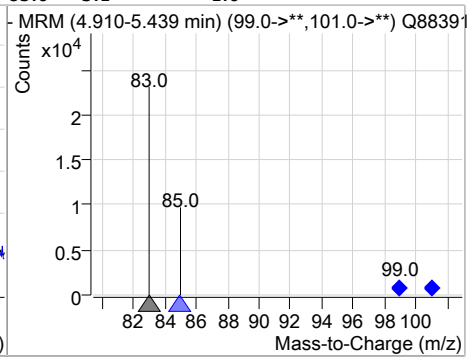
01152698

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	0.18	5.16	-0.14	10164 (m)	101.0 -> 85.0	3.1	1.6	







Manual Integration Approval Summary

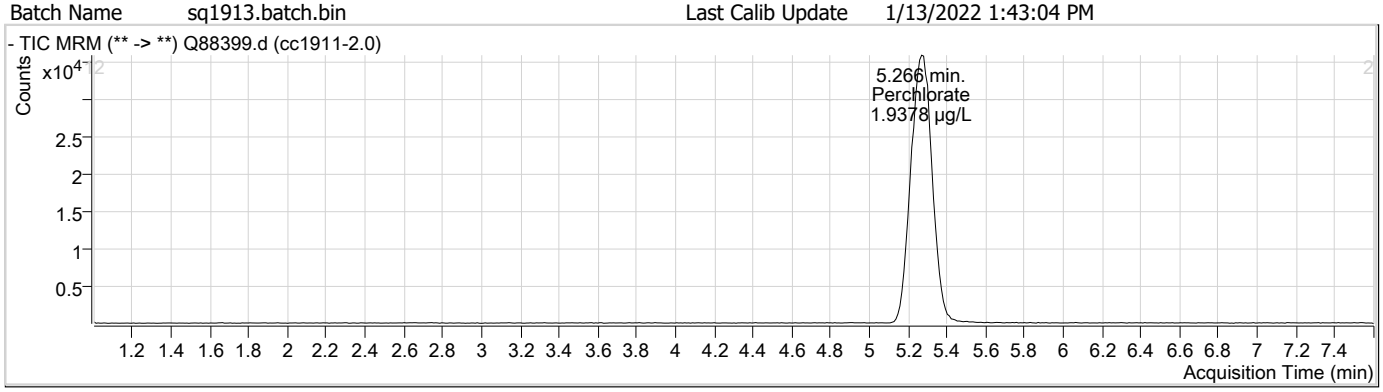
Sample Number:	SQ1913-CC1911	**Method:**	SW846 6850
Lab FileID:	Q88391.D	**Analyst approved:**	01/14/22 14:00 Natasha Gumtie
Injection Time:	01/14/22 12:11	**Supervisor approved:**	01/14/22 14:17 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perchlorate	14797-73-0		5.16	Poorly defined baseline

01152700

Quantitative Analysis Report for Perchlorate by 6850

Data File	: Q88399.d	Operator	natashag
Acq. Method	Perchlorate2.m	Acq. Date-Time	1/14/2022 1:26:17 PM
Sample Name	cc1911-2.0	Instrument	Instrument 1
Vial	P1-A5	Sample Information	OP89192,SQ1913,10.0,,,10.0,1,water
DA Method File	6850_011222_SQ1911.quantmethod.xml	Comment	
Batch Name	sq1913.batch.bin	Last Calib Update	1/13/2022 1:43:04 PM

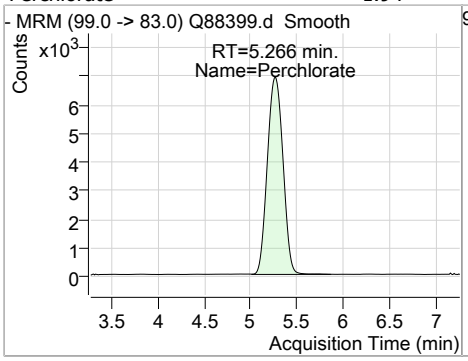


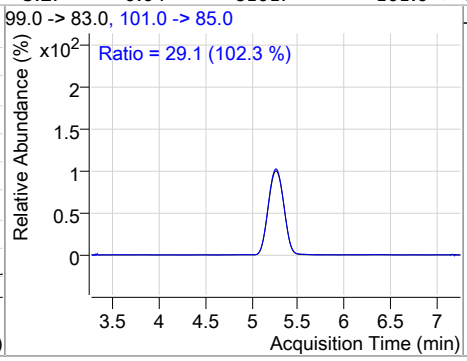
Compound	RT	QIon	Resp.	Q-ratio	Conc. Units	Dev(Min)
Internal Standards						
Cl18O4	5.270	107.0 -> 89.0	173020	NoQ	5.00 µg/L	-0.041
System Monitoring Compounds						
Target Compounds						**QValue**
Perchlorate	5.266	99.0 -> 83.0	81017	3.4	1.94 µg/L	99

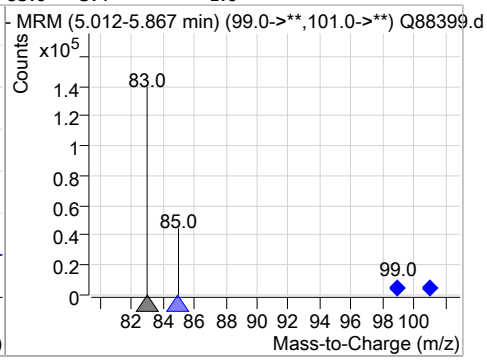
(#) = Qualifier Out of Range; (m) = Manual Integration; (+) = Area Summed; (*) = Surrogate Percent Recovery Out of Range; (d): Zeroed Peak

Quantitative Analysis Report for Perchlorate by 6850

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
Perchlorate	1.94	5.27	-0.04	81017	101.0 -> 85.0	3.4	1.6	







SGS ORLANDO

LCMS1-Q ANALYSIS LOG

DATE:	01/12/22
COLUMN TYPE:	K PRIME
AMOUNT INJ:	7.5 ul
INSTRUMENT:	LCMS1-Q

METHODS:	SW846 6850
PROC. METH:	6850_011222_SQ1911
CAL DATE:	01/12/22
ANALYST:	NG
RUN BATCH:	SQ1911

ELUENT A LOT #:	216038 W/0.1% AA 194003
ELUENT B LOT #:	214785 W/0.1% AA 194003
IC/CC STD LOT #:	LCMS1736
ICV STD LOT #:	LCMS1751
ISTD/ID STD LOT #:	10954A

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	Q88315.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
2	Q88316.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
3	Q88317.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
4	Q88318.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
5	Q88319.d	P1-A5	cc1910-2.0	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	Re-calibrate, istds went high
6	Q88320.d	P1-A1	ic1911-0	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	Check Tune File
7	Q88321.d	P1-A2	ic1911-0.2	Perchlorate2.m	Calibration	500x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
8	Q88322.d	P1-A3	ic1911-0.5	Perchlorate2.m	Calibration	200x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
9	Q88323.d	P1-A4	ic1911-1.0	Perchlorate2.m	Calibration	100x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
10	Q88324.d	P1-A5	icc1911-2.0	Perchlorate2.m	Calibration	50x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
11	Q88325.d	P1-A6	ic1911-5.0	Perchlorate2.m	Calibration	20x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
12	Q88326.d	P1-A7	ic1911-10	Perchlorate2.m	Calibration	10x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
13	Q88327.d	P1-A8	ic1911-25	Perchlorate2.m	Calibration	4x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
14	Q88328.d	P1-A9	ic1911-50	Perchlorate2.m	Calibration	2x	OP89192,SQ1911,10.0,,,10.0,1,water	Updated, Pass
15	Q88329.d	P1-B1	icv1911-2	Perchlorate2.m	QC	50x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
16	Q88330.d	P1-B2	ics	Perchlorate2.m	Sample	500x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
17	Q88331.d	P1-E8	fa91899-2	Perchlorate2.m	Sample	2ml/10	OP89193,SQ1911,1.00,,,10.0,5,soil	✓
18	Q88332.d	P1-E9	op89193-ms	Perchlorate2.m	Sample	2ml/10	OP89193,SQ1911,0.97,,,10.0,5,soil	✓
19	Q88333.d	P1-F1	op89193-msd	Perchlorate2.m	Sample	2ml/10	OP89193,SQ1911,1.00,,,10.0,5,soil	✓
20	Q88334.d	P1-B9	fa92247-1	Perchlorate2.m	Sample		OP89193,SQ1911,1.00,,,10.0,1,soil	✓
21	Q88335.d	P1-F2	fa92247-4	Perchlorate2.m	Sample	1ml/10	OP89193,SQ1911,0.98,,,10.0,10,soil	✓
22	Q88336.d	P1-F3	fa92247-7	Perchlorate2.m	Sample	1ml/10	OP89193,SQ1911,0.99,,,10.0,10,soil	✓
23	Q88337.d	P1-F4	fa92247-8	Perchlorate2.m	Sample	1ml/10	OP89193,SQ1911,1.02,,,10.0,10,soil	✓
24	Q88338.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
25	Q88339.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
26	Q88340.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND
27	Q88341.d	P1-F5	jd37364-1A	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	✓
28	Q88342.d	P1-F6	op89192-ms	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	✓
29	Q88343.d	P1-F7	op89192-msd	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	✓
30	Q88344.d	P1-E4	jd37364-23A	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	✓
31	Q88345.d	P1-F8	fa91704-1	Perchlorate2.m	Sample	5ml/10	OP89192,SQ1911,10.0,,,10.0,2,water	OOH, ✓
32	Q88346.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
33	Q88347.d	P1-A2	ecc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1911,10.0,,,10.0,1,water	PASS
34	Q88348.d	P1-A1	iblk	Perchlorate2.m	Sample		OP89192,SQ1911,10.0,,,10.0,1,water	ND

SGS ORLANDO

DATE:	01/13/22
COLUMN TYPE:	K PRIME
AMOUNT INJ:	7.5 ul
INSTRUMENT:	LCMS1-Q

LCMS1-Q ANALYSIS LOG

METHODS:	SW846 6850
PROC. METH:	6850_011222_SQ1911
CAL DATE:	01/12/22
ANALYST:	NG
RUN BATCH:	SQ1912

ELUENT A LOT #:	216038 W/0.1% AA 194003
ELUENT B LOT #:	214785 W/0.1% AA 194003
IC/CC STD LOT #:	LCMS1736
ICV STD LOT #:	LCMS1751
ISTD/ID STD LOT #:	10954A

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	Q88349.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
2	Q88350.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
3	Q88351.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
4	Q88352.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
5	Q88353.d	P1-B2	ics	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
6	Q88354.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
7	Q88355.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
8	Q88356.d	P1-B3	op89224-bs	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	BS PASS
9	Q88357.d	P1-B4	op89224-mb	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	ND
10	Q88358.d	P1-B5	fa91902-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
11	Q88359.d	P1-B6	fa91902-3	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
12	Q88360.d	P1-B7	fa91902-4	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
13	Q88361.d	P1-B8	fa91902-5	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
14	Q88362.d	P1-B9	fa91902-6	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
15	Q88363.d	P1-C1	fa91902-7	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
16	Q88364.d	P1-C2	fa91902-8	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
17	Q88365.d	P1-C3	fa92191-1	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
18	Q88366.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
19	Q88367.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
20	Q88368.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
21	Q88369.d	P1-C4	fa92191-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
22	Q88370.d	P1-C5	fa92191-3	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 10x
23	Q88371.d	P1-C6	fa92191-4	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
24	Q88372.d	P1-C7	op89224-ms	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
25	Q88373.d	P1-C8	op89224-msd	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	✓
26	Q88374.d	P1-C9	fa92191-7	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1000x
27	Q88375.d	P1-D1	fa92191-8	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1000x
28	Q88376.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
29	Q88377.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
30	Q88378.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND
31	Q88379.d	P1-D2	fa92192-1	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1000x
32	Q88380.d	P1-D3	fa92192-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1x c/o
33	Q88381.d	P1-D4	fa92192-3	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 10000x
34	Q88382.d	P1-D5	fa92250-2	Perchlorate2.m	Sample		OP89224,SQ1912,10.0,,,10.0,1,water	rr 1x c/o
35	Q88383.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS

SGS ORLANDO LCMS1-Q ANALYSIS LOG

36	Q88384.d	P1-A2	ecc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1912,10.0,,,10.0,1,water	PASS
37	Q88385.d	P1-A1	iblk	Perchlorate2.m	Sample		OP89192,SQ1912,10.0,,,10.0,1,water	ND

SGS ORLANDO

LCMS1-Q ANALYSIS LOG

DATE:	01/14/22
COLUMN TYPE:	K PRIME
AMOUNT INJ:	7.5 ul
INSTRUMENT:	LCMS1-Q

METHODS:	SW846 6850
PROC. METH:	6850_011222_SQ1911
CAL DATE:	01/12/22
ANALYST:	NG
RUN BATCH:	SQ1913

ELUENT A LOT #:	216038 W/0.1% AA 194003
ELUENT B LOT #:	214785 W/0.1% AA 194003
IC/CC STD LOT #:	LCMS1736
ICV STD LOT #:	LCMS1751
ISTD/ID STD LOT #:	10954A

	Data File	Sample	Sample Name	Method	Sample Type	Level	Misc. Info	Comments
1	Q88386.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND
2	Q88387.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND
3	Q88388.d	P1-A1	ccb	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND
4	Q88389.d	P1-B2	ics	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	✓
5	Q88390.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
6	Q88391.d	P1-A2	cc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
7	Q88392.d	P1-E1	fa92191-3	Perchlorate2.m	Sample	1ml/10	OP89224,SQ1913,10.0,,,10.0,10,water	✓
8	Q88393.d	P1-E2	fa92191-7	Perchlorate2.m	Sample	10ul/10	OP89224,SQ1913,10.0,,,10.0,1000,water	✓
9	Q88394.d	P1-E3	fa92191-8	Perchlorate2.m	Sample	10ul/10	OP89224,SQ1913,10.0,,,10.0,1000,water	✓
10	Q88395.d	P1-E4	fa92192-1	Perchlorate2.m	Sample	10ul/10	OP89224,SQ1913,10.0,,,10.0,1000,water	✓
11	Q88396.d	P1-E5	fa92192-2	Perchlorate2.m	Sample		OP89224,SQ1913,10.0,,,10.0,1,water	✓
12	Q88397.d	P1-E6	fa92192-3	Perchlorate2.m	Sample	1ul/10	OP89224,SQ1913,10.0,,,10.0,10000,water	✓
13	Q88398.d	P1-E7	fa92250-2	Perchlorate2.m	Sample		OP89224,SQ1913,10.0,,,10.0,1,water	✓
14	Q88399.d	P1-A5	cc1911-2.0	Perchlorate2.m	QC	50x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
15	Q88400.d	P1-A2	ecc1911-0.2	Perchlorate2.m	QC	500x	OP89192,SQ1913,10.0,,,10.0,1,water	PASS
16	Q88401.d	P1-A1	iblk	Perchlorate2.m	Sample		OP89192,SQ1913,10.0,,,10.0,1,water	ND

SGS - ORLANDO

LIQUID SAMPLE PREP REPORT

Date/Time Started: 01/13/22 12:00 {mm/dd/yy 24:00}

Date/Time Finished: 01/13/22 13:00 {mm/dd/yy 24:00}

Prep Method: 3510C 3580A or Method (circle)

Analytical Method: 6850

Batch#: OP89224 Ext. By: NG Conc. By: — Vialed By: NG

Sample ID	Bottle Number	Amount Extracted (ml)	Initial pH	Adjusted pH	Surrogate Amount	Spike Amount	Final Volume (ml)	Comments
OP89224 MB	X	10.0					10.0	
OP89224 BS	X	↓				20uL	↓	
FA91902-2	1							
-3	1							
-4	1							
-5	1							
-6	1							
-7	1							
-8	1							
FA92191-1	1							
-2	1							
-3	1							
-4	1							MS/MSD
-7	1							
-8	1							
FA92192-1	1							
-2	1							
-3	1							
FA92250-2	10	↓					↓	
OP89224-MS	2	10.0				20uL	10.0	FA92191-4
OP89224-MSD	3	↓				20uL	10.0	↓
DUP								

Comments: 109541A 1.0mg/L EXP: 12/13/22

Surr. ID: — Conc: — Exp. Date: — Inj. By: — Ver. By —

Spk. ID: LCMS175 Conc: 100ppb Exp. Date: 03/23/22 Inj. By: NG Ver. By MRE

Initial Bath Temp (Therm ID): — Observed Temp °C: — Corr. Temp °C: —

Exchange Bath/N-Evap Temp (Therm ID): — Observed Temp °C: — Corr. Temp °C: —

CH2CL2 Lot #: — Hexane Lot #: — Na2SO4 Lot#: —

Acetonitrile Lot #: — Methanol Lot #: — Acetone Lot#: —

Syringe Filter Lot#: P25236-0927 pH Paper #: — Reagent #: HPLCWater:216038

Copper Lot #: — If Sulfur Cleaning is performed in Extractions (3660B)

Relinquished By: [signature] Date: 01/13/22

Accepted By: [signature] Date: 01/13/22

ORLD-EXT-0001-1-06-FORM-extwater.xls 032718

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 07, 2022

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS22010250**

Laboratory Results for: **LHAAP50 January 2022**

Dear Vicki Graves ,

ALS Environmental received 10 sample(s) on Jan 07, 2022 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Work Order: HS22010250

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22010250-01	50WW29-220105	Groundwater		05-Jan-2022 10:55	07-Jan-2022 10:45	☐
HS22010250-02	50WW05-220105	Groundwater		05-Jan-2022 11:35	07-Jan-2022 10:45	☐
HS22010250-03	50WW08-220105	Groundwater		05-Jan-2022 12:15	07-Jan-2022 10:45	☐
HS22010250-04	50WW14-220106	Groundwater		06-Jan-2022 07:40	07-Jan-2022 10:45	☐
HS22010250-05	50WW13-220106	Groundwater		06-Jan-2022 08:40	07-Jan-2022 10:45	☐
HS22010250-06	50WW13-220106-FD	Groundwater		06-Jan-2022 08:40	07-Jan-2022 10:45	☐
HS22010250-07	50WW11-220106	Groundwater		06-Jan-2022 09:35	07-Jan-2022 10:45	☐
HS22010250-08	50WW06-220106	Groundwater		06-Jan-2022 10:30	07-Jan-2022 10:45	☐
HS22010250-09	50WW12-220106	Groundwater		06-Jan-2022 11:20	07-Jan-2022 10:45	☐
HS22010250-10	Trip Blank-220106	Water	CG-121321-19	06-Jan-2022 00:00	07-Jan-2022 10:45	☐

Revision:1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 January 2022
Work Order: HS22010250

Work Order Comments

- Revision 01:

  Report revised to report the listed compounds:
  LHAAP-50 only request a limited list of VOCs not the full TCL. Below are the compounds which have been reported for previously for LHAAP-50:
  1,1-Dichloroethene
  1,2-Dichloroethane
  Cis-1,2-Dichloroethene
  Tetrachloroethene
  Trichloroethene
  Vinyl Chloride

- The analysis for Carbon Dioxide (CO2) by RSK175 was subcontracted to Pace Analytical Gulf Coast Baton Rouge LA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R400375

Sample ID: 50WW14-220106 (HS22010250-04MS)

- 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.

Sample ID: 50WW14-220106 (HS22010250-04MSD)

- 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.

GCMS Volatiles by Method SW8260

Batch ID: R400450

Sample ID: 50WW05-220105 (HS22010250-02)

- Lowest practical dilution for sample HS22010250-02 due to matrix.

Sample ID: 50WW14-220106 (HS22010250-04MSD)

- MSD is for an unrelated sample

Sample ID: CCV

- 1,2,3_Trichlorobenzene and Naphthalene exceeded %D limits for CCV .Samples are ND for these compounds.

Sample ID: VLCSW-220111

- Naphthalene is also high for LCS. Sample is ND for the compound.

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 January 2022
Work Order: HS22010250

WetChemistry by Method SM5310B

Batch ID: R400524

Sample ID: 50WW14-220106 (HS22010250-04MS)

- 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.

Batch ID: R400526

Sample ID: 50WW13-220106-FD (HS22010250-06MS)

- 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: R399100

Sample ID: 50WW14-220106 (HS22010250-04MS)

- 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,Sulfate)

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW29-220105
Collection Date: 05-Jan-2022 10:55

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: ZQM
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 13:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 13:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 13:08
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Jan-2022 13:08
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 13:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 13:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW05-220105
Collection Date: 05-Jan-2022 11:35

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: ZQM
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 17:00
1,2-Dichloroethane	**2.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 17:00
cis-1,2-Dichloroethene	**150**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 17:00
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Jan-2022 17:00
Trichloroethene	**200**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 17:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 17:00

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW08-220105
Collection Date: 05-Jan-2022 12:15

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: ZQM
1,1-Dichloroethane	**0.95**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 17:42
1,2-Dichloroethane	**1.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 17:42
cis-1,2-Dichloroethene	**63**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 17:42
Tetrachloroethene	**1.2**		**0.30**	**1.0**	**1.0**	**ug/L**	1	14-Jan-2022 17:42
Trichloroethene	**590**		**2.0**	**5.0**	**10**	**ug/L**	10	14-Jan-2022 18:03
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 17:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW14-220106
Collection Date: 06-Jan-2022 07:40

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: ZQM
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:47
cis-1,2-Dichloroethene	**9.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 12:47
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Jan-2022 12:47
Trichloroethene	**14**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 12:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:47
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	12-Jan-2022 11:50
Ethene	**0.00232**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	12-Jan-2022 11:50
Methane	**0.00448**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	12-Jan-2022 11:50
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**1.47**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jan-2022 00:44
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**444**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:06
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	07-Jan-2022 16:44
Sulfate	**398**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:06
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	07-Feb-2022 09:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW13-220106
Collection Date: 06-Jan-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: ZQM
1,1-Dichloroethane	**5.8**		**1.0**	**2.5**	**5.0**	**ug/L**	5	14-Jan-2022 18:24
1,2-Dichloroethane	**37**		**1.0**	**2.5**	**5.0**	**ug/L**	5	14-Jan-2022 18:24
cis-1,2-Dichloroethene	**210**		**1.0**	**2.5**	**5.0**	**ug/L**	5	14-Jan-2022 18:24
Tetrachloroethene	**5.8**		**1.5**	**5.0**	**5.0**	**ug/L**	5	14-Jan-2022 18:24
Trichloroethene	**5,800**		**10**	**25**	**50**	**ug/L**	50	14-Jan-2022 18:45
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	14-Jan-2022 18:24
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	12-Jan-2022 12:15
Ethene	**0.000901**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	12-Jan-2022 12:15
Methane	**0.00759**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	12-Jan-2022 12:15
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**3.39**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jan-2022 01:10
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**312**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:21
Nitrogen, Nitrate (As N)	**0.0380**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	07-Jan-2022 17:14
Sulfate	**324**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:21
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	07-Feb-2022 09:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW13-220106-FD
Collection Date: 06-Jan-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: ZQM
1,1-Dichloroethane	**5.1**		**1.0**	**2.5**	**5.0**	**ug/L**	5	14-Jan-2022 19:06
1,2-Dichloroethane	**33**		**1.0**	**2.5**	**5.0**	**ug/L**	5	14-Jan-2022 19:06
cis-1,2-Dichloroethene	**200**		**1.0**	**2.5**	**5.0**	**ug/L**	5	14-Jan-2022 19:06
Tetrachloroethene	**6.9**		**1.5**	**5.0**	**5.0**	**ug/L**	5	14-Jan-2022 19:06
Trichloroethene	**5,700**		**10**	**25**	**50**	**ug/L**	50	14-Jan-2022 19:27
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	14-Jan-2022 19:06
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	12-Jan-2022 12:24
Ethene	**0.00225**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	12-Jan-2022 12:24
Methane	**0.00838**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	12-Jan-2022 12:24
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.12**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jan-2022 02:41
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**300**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:36
Nitrogen, Nitrate (As N)	**0.0382**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	07-Jan-2022 17:29
Sulfate	**309**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:36
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	07-Feb-2022 09:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW11-220106
Collection Date: 06-Jan-2022 09:35

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: ZQM
1,1-Dichloroethane	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 16:18
1,2-Dichloroethane	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 16:18
cis-1,2-Dichloroethene	**29**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 16:18
Tetrachloroethene	**2.4**		**0.30**	**1.0**	**1.0**	**ug/L**	1	14-Jan-2022 16:18
Trichloroethene	**1,300**		**5.0**	**12**	**25**	**ug/L**	25	14-Jan-2022 16:39
Vinyl chloride	**0.98**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 16:18
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	12-Jan-2022 12:32
Ethene	**0.00121**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	12-Jan-2022 12:32
Methane	**0.00467**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	12-Jan-2022 12:32
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.82**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jan-2022 03:08
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**274**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:51
Nitrogen, Nitrate (As N)	**0.0439**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	07-Jan-2022 17:44
Sulfate	**354**		**2.00**	**5.00**	**5.00**	**mg/L**	10	07-Jan-2022 17:51
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	07-Feb-2022 09:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW06-220106
Collection Date: 06-Jan-2022 10:30

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: ZQM
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 14:54
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 14:54
cis-1,2-Dichloroethene	**0.74**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 14:54
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Jan-2022 14:54
Trichloroethene	**4.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 14:54
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 14:54
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	12-Jan-2022 12:42
Ethene	**0.000992**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	12-Jan-2022 12:42
Methane	**0.0276**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	12-Jan-2022 12:42
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**7.96**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jan-2022 03:21
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**69.2**		**0.200**	**0.500**	**0.500**	**mg/L**	1	07-Jan-2022 18:14
Nitrogen, Nitrate (As N)	**0.0881**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	07-Jan-2022 18:14
Sulfate	**30.4**		**0.200**	**0.500**	**0.500**	**mg/L**	1	07-Jan-2022 18:14
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	07-Feb-2022 09:35

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: 50WW12-220106
Collection Date: 06-Jan-2022 11:20

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: ZQM
1,1-Dichloroethane	**3.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 15:36
1,2-Dichloroethane	**9.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 15:36
cis-1,2-Dichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	14-Jan-2022 15:36
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Jan-2022 15:36
Trichloroethene	**1,100**		**5.0**	**12**	**25**	**ug/L**	25	14-Jan-2022 15:57
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 15:36
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	12-Jan-2022 13:03
Ethene	**0.00119**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	12-Jan-2022 13:18
Methane	**0.0234**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	12-Jan-2022 13:18
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**5.59**		**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Jan-2022 03:34
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**1,020**		**20.0**	**50.0**	**50.0**	**mg/L**	100	07-Jan-2022 18:37
Nitrogen, Nitrate (As N)	**0.108**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	07-Jan-2022 18:29
Sulfate	**634**		**20.0**	**50.0**	**50.0**	**mg/L**	100	07-Jan-2022 18:37
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	07-Feb-2022 09:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
Sample ID: Trip Blank-220106
Collection Date: 06-Jan-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22010250
Lab ID:HS22010250-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: ZQM
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:26
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	14-Jan-2022 12:26
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	14-Jan-2022 12:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R399100 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS22010250-04	50WW14-220106	06 Jan 2022 07:40			07 Jan 2022 17:06	10
HS22010250-04	50WW14-220106	06 Jan 2022 07:40			07 Jan 2022 16:44	1
HS22010250-05	50WW13-220106	06 Jan 2022 08:40			07 Jan 2022 17:21	10
HS22010250-05	50WW13-220106	06 Jan 2022 08:40			07 Jan 2022 17:14	1
HS22010250-06	50WW13-220106-FD	06 Jan 2022 08:40			07 Jan 2022 17:36	10
HS22010250-06	50WW13-220106-FD	06 Jan 2022 08:40			07 Jan 2022 17:29	1
HS22010250-07	50WW11-220106	06 Jan 2022 09:35			07 Jan 2022 17:51	10
HS22010250-07	50WW11-220106	06 Jan 2022 09:35			07 Jan 2022 17:44	1
HS22010250-08	50WW06-220106	06 Jan 2022 10:30			07 Jan 2022 18:14	1
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			07 Jan 2022 18:37	100
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			07 Jan 2022 18:29	2
Batch ID: R400375 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS22010250-04	50WW14-220106	06 Jan 2022 07:40			12 Jan 2022 11:50	1
HS22010250-05	50WW13-220106	06 Jan 2022 08:40			12 Jan 2022 12:15	1
HS22010250-06	50WW13-220106-FD	06 Jan 2022 08:40			12 Jan 2022 12:24	1
HS22010250-07	50WW11-220106	06 Jan 2022 09:35			12 Jan 2022 12:32	1
HS22010250-08	50WW06-220106	06 Jan 2022 10:30			12 Jan 2022 12:42	1
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			12 Jan 2022 13:18	1
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			12 Jan 2022 13:03	1
Batch ID: R400450 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22010250-10	Trip Blank-220106	06 Jan 2022 00:00			14 Jan 2022 12:26	1
Batch ID: R400450 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22010250-01	50WW29-220105	05 Jan 2022 10:55			14 Jan 2022 13:08	1
HS22010250-02	50WW05-220105	05 Jan 2022 11:35			14 Jan 2022 17:00	1
HS22010250-03	50WW08-220105	05 Jan 2022 12:15			14 Jan 2022 18:03	10
HS22010250-03	50WW08-220105	05 Jan 2022 12:15			14 Jan 2022 17:42	1
HS22010250-04	50WW14-220106	06 Jan 2022 07:40			14 Jan 2022 12:47	1
HS22010250-05	50WW13-220106	06 Jan 2022 08:40			14 Jan 2022 18:45	50
HS22010250-05	50WW13-220106	06 Jan 2022 08:40			14 Jan 2022 18:24	5
HS22010250-06	50WW13-220106-FD	06 Jan 2022 08:40			14 Jan 2022 19:27	50
HS22010250-06	50WW13-220106-FD	06 Jan 2022 08:40			14 Jan 2022 19:06	5
HS22010250-07	50WW11-220106	06 Jan 2022 09:35			14 Jan 2022 16:39	25
HS22010250-07	50WW11-220106	06 Jan 2022 09:35			14 Jan 2022 16:18	1
HS22010250-08	50WW06-220106	06 Jan 2022 10:30			14 Jan 2022 14:54	1
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			14 Jan 2022 15:57	25
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			14 Jan 2022 15:36	1

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R400524 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Groundwater	
HS22010250-04	50WW14-220106	06 Jan 2022 07:40			18 Jan 2022 00:44	1
HS22010250-05	50WW13-220106	06 Jan 2022 08:40			18 Jan 2022 01:10	1
Batch ID: R400526 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Groundwater	
HS22010250-06	50WW13-220106-FD	06 Jan 2022 08:40			18 Jan 2022 02:41	1
HS22010250-07	50WW11-220106	06 Jan 2022 09:35			18 Jan 2022 03:08	1
HS22010250-08	50WW06-220106	06 Jan 2022 10:30			18 Jan 2022 03:21	1
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			18 Jan 2022 03:34	1
Batch ID: R401694 (0)	**Test Name :** SUBCONTRACTED ANALYSIS				**Matrix:** Groundwater	
HS22010250-04	50WW14-220106	06 Jan 2022 07:40			07 Feb 2022 09:35	1
HS22010250-05	50WW13-220106	06 Jan 2022 08:40			07 Feb 2022 09:35	1
HS22010250-06	50WW13-220106-FD	06 Jan 2022 08:40			07 Feb 2022 09:35	1
HS22010250-07	50WW11-220106	06 Jan 2022 09:35			07 Feb 2022 09:35	1
HS22010250-08	50WW06-220106	06 Jan 2022 10:30			07 Feb 2022 09:35	1
HS22010250-09	50WW12-220106	06 Jan 2022 11:20			07 Feb 2022 09:35	1

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

QC BATCH REPORT

Batch ID: R400375 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-220112** Units: **mg/L** Analysis Date: **12-Jan-2022 08:56**
Client ID: Run ID: **FID-4_400375** SeqNo: **6463582** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-220112** Units: **mg/L** Analysis Date: **12-Jan-2022 09:11**
Client ID: Run ID: **FID-4_400375** SeqNo: **6463583** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0161	0.00100	0.01804	0	89.1	75 - 125				
Ethene	0.0150	0.00100	0.0168	0	89.3	75 - 125				
Methane	0.00818	0.000500	0.009647	0	84.8	75 - 125				

MS Sample ID: **HS22010250-04MS** Units: **mg/L** Analysis Date: **12-Jan-2022 11:58**
Client ID: **50WW14-220106** Run ID: **FID-4_400375** SeqNo: **6463596** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0140	0.00100	0.01804	0	77.8	75 - 125				
Ethene	0.0128	0.00100	0.0168	0.002317	62.2	75 - 125				S
Methane	0.0101	0.000500	0.009647	0.004476	58.0	75 - 125				S

MSD Sample ID: **HS22010250-04MSD** Units: **mg/L** Analysis Date: **12-Jan-2022 12:06**
Client ID: **50WW14-220106** Run ID: **FID-4_400375** SeqNo: **6463597** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0146	0.00100	0.01804	0	81.2	75 - 125	0.01403	4.28	30	
Ethene	0.0143	0.00100	0.0168	0.002317	71.5	75 - 125	0.01277	11.6	30	S
Methane	0.00964	0.000500	0.009647	0.004476	53.5	75 - 125	0.01007	4.41	30	S

The following samples were analyzed in this batch: HS22010250-04 HS22010250-05 HS22010250-06 HS22010250-07 HS22010250-08 HS22010250-09

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

QC BATCH REPORT

Batch ID: R400450 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-220111** Units: **ug/L** Analysis Date: **14-Jan-2022 12:00**
Client ID: Run ID: **VOA6_400450** SeqNo: **6465363** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethane	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U

LCS Sample ID: **VLCSW-220111** Units: **ug/L** Analysis Date: **14-Jan-2022 11:18**
Client ID: Run ID: **VOA6_400450** SeqNo: **6465361** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethane	19.79	1.0	20	0	99.0	77 - 125				
1,2-Dichloroethane	22.5	1.0	20	0	113	73 - 128				
cis-1,2-Dichloroethene	20.2	1.0	20	0	101	78 - 123				
Tetrachloroethene	22.45	1.0	20	0	112	74 - 129				
Trichloroethene	22.37	1.0	20	0	112	79 - 123				
Vinyl chloride	22.19	1.0	20	0	111	58 - 137				

MS Sample ID: **HS22010250-04MS** Units: **ug/L** Analysis Date: **14-Jan-2022 13:29**
Client ID: **50WW14-220106** Run ID: **VOA6_400450** SeqNo: **6465367** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethane	16.81	1.0	20	0	84.1	77 - 125				
1,2-Dichloroethane	18.69	1.0	20	0	93.4	73 - 128				
cis-1,2-Dichloroethene	27.13	1.0	20	9.584	87.7	78 - 123				
Tetrachloroethene	20.27	1.0	20	0	101	74 - 129				
Trichloroethene	31.1	1.0	20	13.69	87.0	79 - 123				
Vinyl chloride	19.06	1.0	20	0	95.3	58 - 137				

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

QC BATCH REPORT

Batch ID: R400450 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22010250-04MSD** Units: **ug/L** Analysis Date: **14-Jan-2022 13:50**
Client ID: **50WW14-220106** Run ID: **VOA6_400450** SeqNo: **6465368** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethane	17.62	1.0	20	0	88.1	77 - 125	16.81	4.67	20	
1,2-Dichloroethane	19.65	1.0	20	0	98.3	73 - 128	18.69	5.02	20	
cis-1,2-Dichloroethene	27.2	1.0	20	9.584	88.1	78 - 123	27.13	0.261	20	
Tetrachloroethene	21.17	1.0	20	0	106	74 - 129	20.27	4.32	20	
Trichloroethene	30.53	1.0	20	13.69	84.2	79 - 123	31.1	1.85	20	
Vinyl chloride	19.22	1.0	20	0	96.1	58 - 137	19.06	0.836	20	

The following samples were analyzed in this batch:

HS22010250-01	HS22010250-02	HS22010250-03	HS22010250-04
HS22010250-05	HS22010250-06	HS22010250-07	HS22010250-08
HS22010250-09	HS22010250-10		

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

QC BATCH REPORT

Batch ID: R399100 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **07-Jan-2022 15:21**
Client ID: Run ID: **ICS-Integrion_399100** SeqNo: **6457033** 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
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **07-Jan-2022 15:28**
Client ID: Run ID: **ICS-Integrion_399100** SeqNo: **6457034** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.72	0.500	20	0	98.6	80 - 120				
Nitrogen, Nitrate (As N)	3.93	0.100	4	0	98.3	80 - 120				
Sulfate	19.69	0.500	20	0	98.5	80 - 120				

MS Sample ID: **HS22010250-04MS** Units: **mg/L** Analysis Date: **07-Jan-2022 16:51**
Client ID: **50WW14-220106** Run ID: **ICS-Integrion_399100** SeqNo: **6457038** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	436.2	0.500	10	467.2	-310	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.076	0.100	2	0	104	80 - 120				
Sulfate	380	0.500	10	402.3	-224	80 - 120				SEO

MSD Sample ID: **HS22010250-04MSD** Units: **mg/L** Analysis Date: **07-Jan-2022 16:59**
Client ID: **50WW14-220106** Run ID: **ICS-Integrion_399100** SeqNo: **6457039** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	428.9	0.500	10	467.2	-383	80 - 120	436.2	1.7	20	SEO
Nitrogen, Nitrate (As N)	2.043	0.100	2	0	102	80 - 120	2.076	1.6	20	
Sulfate	373.9	0.500	10	402.3	-284	80 - 120	380	1.6	20	SEO

The following samples were analyzed in this batch: HS22010250-04 HS22010250-05 HS22010250-06 HS22010250-07 HS22010250-08 HS22010250-09

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

QC BATCH REPORT

Batch ID: R400524 (0) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON - SM5310B-2011

MBLK Sample ID: **MBLK-01172022** Units: **mg/L** Analysis Date: **17-Jan-2022 21:37**
Client ID: Run ID: **TOC_04_400524** SeqNo: **6467130** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-01172022** Units: **mg/L** Analysis Date: **17-Jan-2022 21:51**
Client ID: Run ID: **TOC_04_400524** SeqNo: **6467131** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.23	1.00	10	0	102	85 - 115				

LCSD Sample ID: **LCSD-01172022** Units: **mg/L** Analysis Date: **17-Jan-2022 22:04**
Client ID: Run ID: **TOC_04_400524** SeqNo: **6467132** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.29	1.00	10	0	103	85 - 115	10.23	0.585	20	

MS Sample ID: **HS22010250-04MS** Units: **mg/L** Analysis Date: **18-Jan-2022 00:58**
Client ID: **50WW14-220106** Run ID: **TOC_04_400524** SeqNo: **6467144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	13.5	1.00	10	1.471	120	80 - 120				S

The following samples were analyzed in this batch: HS22010250-04 HS22010250-05

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: HS22010250

QC BATCH REPORT

Batch ID: R400526 (0) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON - SM5310B-2011

MBLK Sample ID: **MBLK-01172022** Units: **mg/L** Analysis Date: **18-Jan-2022 02:02**
Client ID: Run ID: **TOC_04_400526** SeqNo: **6467155** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-01172022** Units: **mg/L** Analysis Date: **18-Jan-2022 02:15**
Client ID: Run ID: **TOC_04_400526** SeqNo: **6467156** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.23	1.00	10	0	102	85 - 115				

LCSD Sample ID: **LCSD-01172022** Units: **mg/L** Analysis Date: **18-Jan-2022 02:29**
Client ID: Run ID: **TOC_04_400526** SeqNo: **6467157** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.26	1.00	10	0	103	85 - 115	10.23	0.293	20	

MS Sample ID: **HS22010250-06MS** Units: **mg/L** Analysis Date: **18-Jan-2022 02:55**
Client ID: **50WW13-220106-FD** Run ID: **TOC_04_400526** SeqNo: **6467159** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	14.17	1.00	10	2.119	121	80 - 120				S

The following samples were analyzed in this batch: HS22010250-06 HS22010250-07 HS22010250-08 HS22010250-09

Revision: 1

ALS Houston, US Date: 07-Mar-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 January 2022
WorkOrder: **HS22010250**

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	21-022-0	26-Mar-2022
Florida	E87611-34	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
Texas	T104704231-21-28	30-Apr-2022

ALS Houston, US Date: 07-Mar-22

Sample Receipt Checklist

Work Order ID: HS22010250 **Date/Time Received:** **07-Jan-2022 10:45**

Client Name: CBI-Houston **Received by:** **Eric Widjaja**

Completed By:	/S/ Nilesh D. Ranchod	07-Jan-2022 14:04	**Reviewed by:**	/S/ Ragen Giga	08-Jan-2022 13:47
	eSignature	Date/Time		eSignature	Date/Time

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 ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:CLIENT
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
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):	0.3°C UC/C	IR 31
Cooler(s)/Kit(s):	42639	
Date/Time sample(s) sent to storage:	01/07/2022 14:30	

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:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Page 1 of 1

HS22010250

Aptim Environmental & Infrastucture, Inc.

LHAAP50 January 2022

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 January 2022**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Remarks (Preservatives, etc.)	Lab I.D.#
SDww29-220105	wG	1/5/22 1055		3	X						
SDww05-220105	wG	1/5/22 1135		3	X						
SDww08-220105	wG	1/5/22 1215		3	X						
SDww14-220106	wG	1/6/22 0740		12	X	X	X	X	X		
SDww14-220106-MS	wG	1/6/22 0740		12	X	X	X	X	X		
SDww14-220106-MSD	wG	1/6/22 0740		12	X	X	X	X	X		
SDww13-220106	wG	1/6/22 0840		12	X	X	X	X	X		
SDww13-220106-FD	wG	1/6/22 0840		12	X	X	X	X	X		

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	1/6/22	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
	01/07/22	10:45							

Remarks: 426391 0.3°C
UIC
CF 0.0
IR#31

(Word) S:\M-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

HS22010250

Aptim Environmental & Infrastucture, Inc.
LHAAP50 January 2022

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 January 2022**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Remarks (Preservatives, etc.)	Lab I.D.#
SDwww11-220106	wb	1/6/22 0935		12	X	X	X	X	X		
SDwww06-220106	wb	1/6/22 1030		12	X	X	X	X	X		
SDwww12-220106	wb	1/6/22 1120		12	X	X	X	X	X		
TRip Blank-220106	w	1/6/22		2	X						

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	1/6/22	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
	01/07/22	10:45							

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

42639

CUSTODY SEAL

Date: 1/6/22 Time: 1430
Name: Scott Beesinger
Company: BHFTS

Seal Broken By: SM
Date: 01107122

42639 JAN 07 2022

JAN 07 2022

42639

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 20DEC21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3502
DIMS: 19x16x13 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-50-B0 82486-RG

RMA:

FedEx Express

7738 5300 5226 2865

PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

4738674 06Jan2022 SGGA 5670C2/81EF/1093

Pace Analytical®

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 02/06/2022

Report # 222011493

Project HS22010250

Samples Collected 1/6/22

Deliver To	***Additional Recipients***
Ragen Giga ALS Houston 10450 Stancliff Rd Suite 210 Houston, TX 77099 281-530-5656	Jumoke Lawal, ALS Houston

PJLA Testing DoD ELAP

ISO 17025

NELAP ACCREDITED TNI LABORATORY

Pace Analytical

Report#: 222011493
Project ID: HS22010250 **Report Date:** 02/06/2022

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
Pace Gulf Coast Report 222011493

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ALS Environmental - Houston, TX **Report:** 222011493

Pace Analytical Gulf Coast received and analyzed the sample(s) listed
on the Report Sample Summary page of this report. Receipt of the sample(s) is documented
by the attached chain of custody. This applies only to the sample(s) listed in this report.
No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.3 as specified in the contract.

VOLATILES GAS CHROMATOGRAPHY

In the RSK-175 analysis, Carbon Dioxide was analyzed outside holding time. The samples were originally analyzed within holding time but required re-analysis sue to instrument issues and QC failures.

Pace Analytical

Report#: 222011493
Project ID: HS22010250 **Report Date:** 02/06/2022

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22201149301	HS22010250-04	Water	1/06/22 07:40	1/14/22 10:00
22201149302	HS22010250-05	Water	1/06/22 08:40	1/14/22 10:00
22201149303	HS22010250-06	Water	1/06/22 08:40	1/14/22 10:00
22201149304	HS22010250-07	Water	1/06/22 09:35	1/14/22 10:00
22201149305	HS22010250-08	Water	1/06/22 10:30	1/14/22 10:00
22201149306	HS22010250-09	Water	1/06/22 11:20	1/14/22 10:00
22201149307	HS22010250-04 MS	Water	1/06/22 07:40	1/14/22 10:00
22201149308	HS22010250-04 MSD	Water	1/06/22 07:40	1/14/22 10:00

Pace Analytical

Report#: 222011493
Project ID: HS22010250 **Report Date:** 02/06/2022

Test Summary

EPA RSK-175					
Lab ID	**Client ID**	**Matrix**	**Batch**	**Instru**	**RunDate**
22201149301	HS22010250-04	Water	731767	GCV8B	1/25/22 17:51
22201149302	HS22010250-05	Water	732643	GCV8B	1/28/22 17:05
22201149303	HS22010250-06	Water	732643	GCV8B	1/28/22 17:13
22201149304	HS22010250-07	Water	732643	GCV8B	1/28/22 17:20
22201149305	HS22010250-08	Water	732643	GCV8B	1/28/22 17:35
22201149306	HS22010250-09	Water	731767	GCV8B	1/25/22 18:39
22201149307	HS22010250-04 MS	Water	731767	GCV8B	1/25/22 18:47
22201149308	HS22010250-04 MSD	Water	731767	GCV8B	1/25/22 18:53

Manual Integrations

Lab ID	Client ID	Matrix	Method	Parameter
22201149305	HS22010250-08	Water	EPA RSK-175	Carbon Dioxide
22201149306	HS22010250-09	Water	EPA RSK-175	Carbon Dioxide
22201149307	HS22010250-04 MS	Water	EPA RSK-175	Carbon Dioxide
22201149308	HS22010250-04 MSD	Water	EPA RSK-175	Carbon Dioxide

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

EPA RSK-175						
Lab ID	**Client ID**	**Parameter**	**Units**	**Result**	**Dil.**	**%Moist**
22201149301	HS22010250-04	Carbon Dioxide	ug/L	634000J	100	NA
22201149302	HS22010250-05	Carbon Dioxide	ug/L	288000	100	NA
22201149303	HS22010250-06	Carbon Dioxide	ug/L	220000	50	NA
22201149304	HS22010250-07	Carbon Dioxide	ug/L	150000	50	NA
22201149305	HS22010250-08	Carbon Dioxide	ug/L	44500J	50	NA
22201149306	HS22010250-09	Carbon Dioxide	ug/L	326000	50	NA

Pace Analytical

Report#: 222011493
Project ID: HS22010250 **Report Date:** 02/06/2022

Sample Results

HS22010250-04

Collect Date 01/06/2022 07:40 **Lab ID** 22201149301
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	01/25/22 17:51	731767	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	634000J	12700	38600	90000	ug/L

HS22010250-05

Collect Date 01/06/2022 08:40 **Lab ID** 22201149302
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	100	01/28/22 17:05	732643	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	288000	12700	38600	90000	ug/L

HS22010250-06

Collect Date 01/06/2022 08:40 **Lab ID** 22201149303
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	01/28/22 17:13	732643	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	220000	6350	19300	45000	ug/L

HS22010250-07

Collect Date 01/06/2022 09:35 **Lab ID** 22201149304
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	01/28/22 17:20	732643	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	150000	6350	19300	45000	ug/L

Pace Analytical

Report#: 222011493
Project ID: HS22010250 **Report Date:** 02/06/2022

Sample Results

HS22010250-08

Collect Date 01/06/2022 10:30 **Lab ID** 22201149305
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	01/28/22 17:35	732643	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	44500J	6350	19300	45000	ug/L

HS22010250-09

Collect Date 01/06/2022 11:20 **Lab ID** 22201149306
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	01/25/22 18:39	731767	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	326000	6350	19300	45000	ug/L

HS22010250-04 MS

Collect Date 01/06/2022 07:40 **Lab ID** 22201149307
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	01/25/22 18:47	731767	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	303000	6350	19300	45000	ug/L

HS22010250-04 MSD

Collect Date 01/06/2022 07:40 **Lab ID** 22201149308
Receive Date 01/14/2022 10:00 **Matrix** Water

EPA RSK-175 *Results And limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	01/25/22 18:53	731767	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	277000	6350	19300	45000	ug/L

Pace Analytical

Report#: 222011493
Project ID: HS22010250 **Report Date:** 02/06/2022

GC Volatiles QC Summary

Analytical Batch	Client ID	MB731767		LCS731767				LCSD731767				
731767	Lab ID	2297692		2297693				2297694				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	01/25/22 11:19		01/25/22 10:18				01/25/22 10:26				
	Matrix	Water		Water				Water				
EPA RSK-175		Units Result	ug/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Carbon Dioxide	124-38-9	386U	386	5800	7250	125	38 - 147	5800	7230	125	0	40

Analytical Batch	Client ID	MB732643		LCS732643				LCSD732643				
732643	Lab ID	2302387		2302388				2302389				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	01/28/22 15:56		01/28/22 15:41				01/28/22 15:48				
	Matrix	Water		Water				Water				
EPA RSK-175		Units Result	ug/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Carbon Dioxide	124-38-9	386U	386	5800	7550	130	38 - 147	5800	7400	128	2	40

Analytical Batch	Client ID	HS22010250-04		HS22010250-04 MS				HS22010250-04 MSD				
731767	Lab ID	22201149301		22201149307				22201149308				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	01/25/2022 17:51		01/25/22 18:47				01/25/22 18:53				
	Matrix	Water		Water				Water				
EPA RSK-175		Units Result	ug/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Carbon Dioxide	124-38-9	634000	38600	5800	303000	**-5710***	38 - 147	5800	277000	**-6160***	9	40

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

SAMPLING STATE: **Dept of Defense** **COC ID:** **17863**

SUBCONTRACT TO:

Pace Analytical
7979 Innovation Park Drive
Baton Rouge, LA 70820

Phone: +1 225 769 4900

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS22010250
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS22010250-04**	**50WW14-220106**	**Groundwater**	**06 Jan 2022 07:40**
	XXX SUB			21 Jan 2022
2.	**HS22010250-05**	**50WW13-220106**	**Groundwater**	**06 Jan 2022 08:40**
	XXX SUB			21 Jan 2022
3.	**HS22010250-06**	**50WW13-220106-FD**	**Groundwater**	**06 Jan 2022 08:40**
	XXX SUB			21 Jan 2022
4.	**HS22010250-07**	**50WW11-220106**	**Groundwater**	**06 Jan 2022 09:35**
	XXX SUB			21 Jan 2022
5.	**HS22010250-08**	**50WW06-220106**	**Groundwater**	**06 Jan 2022 10:30**
	XXX SUB			21 Jan 2022
6.	**HS22010250-09**	**50WW12-220106**	**Groundwater**	**06 Jan 2022 11:20**
	XXX SUB			21 Jan 2022

1, 7, 8
2
3
4
5
6

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
RSK 175 CO2
MS/MSD HS22010250-04

QC Level: DOD IV (DoD Data Package)

RIGHT SOLUTIONS | RIGHT

Client ID: ALS Houston - ALS Environmental - Houston, TX
SDG: 222011493
PM: RWe

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 17863

Relinquished By: NM

Date/Time: 1.10.22 18.0

Received By:

Date/Time:

Cooler ID(s):

Temperature(s): 0.7 E34

Relinquished by: Fed Ex

Date/Time: 1/14/22 1000

Received by: Cameron Kelley

Date/Time: 1/14/22 1000

5300 5226 7948

Client ID: ALS Houston - ALS Environmental - Houston, TX

SDG: 222011493

PM: RWe

Pace Analytical®

SAMPLE RECEIVING CHECKLIST

2220114 93

SAMPLE DELIVERY GROUP 222011493	
Client **PM** RWe ALS Houston - ALS Environmental - Houston, TX	**Transport Method** FEDEX
Profile Number 294458	**Received By** Roberts, George S.
Line Item(s) 1 - CO2	**Receive Date(s)** 01/14/22

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E34	Temp °C
530052267948		0.7

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 08, 2022

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS22040457**

Laboratory Results for: **LHAAP50 April 2022**

Dear Vicki Graves ,

ALS Environmental received 3 sample(s) on Apr 06, 2022 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 April 2022
Work Order: HS22040457

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22040457-01	Trip Blank	Water		05-Apr-2022 14:26	06-Apr-2022 09:40	☐
HS22040457-02	50WW05-220405	Groundwater		05-Apr-2022 15:31	06-Apr-2022 09:40	☐
HS22040457-03	50WW29-220405	Groundwater		05-Apr-2022 14:26	06-Apr-2022 09:40	☐

Revision:2

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP50 April 2022
Work Order: HS22040457

Work Order Comments

- Repot Revision #2:

  Report Revised to report to only include the requested "6" VOC compounds for LHAAP 50

  Revision #1:
  Report Revised to Update Sample ID - "Remove Underscore and replace with Dash"

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R406685

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 April 2022
Sample ID: Trip Blank
Collection Date: 05-Apr-2022 14:26

ANALYTICAL REPORT
WorkOrder:HS22040457
Lab ID:HS22040457-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:14
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:14
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2022 13:14
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:14
Surr: 1,2-Dichloroethane-d4	*91.6*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2022 13:14*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2022 13:14*
Surr: Dibromofluoromethane	*90.7*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2022 13:14*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2022 13:14*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 April 2022 WorkOrder:HS22040457
Sample ID: 50WW05-220405 Lab ID:HS22040457-02
Collection Date: 05-Apr-2022 15:31 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**3.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Apr-2022 14:17
1,2-Dichloroethane	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Apr-2022 14:17
cis-1,2-Dichloroethene	**150**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Apr-2022 14:17
Tetrachloroethene	**0.67**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	16-Apr-2022 14:17
Trichloroethene	**220**		**1.0**	**2.5**	**5.0**	**ug/L**	5	16-Apr-2022 16:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 14:17
Surr: 1,2-Dichloroethane-d4	*92.7*			**0**	*81-118*	*%REC*	*5*	*16-Apr-2022 16:24*
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2022 14:17*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2022 14:17*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*5*	*16-Apr-2022 16:24*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2022 14:17*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*5*	*16-Apr-2022 16:24*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*5*	*16-Apr-2022 16:24*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2022 14:17*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	13-Apr-2022 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP50 April 2022 WorkOrder:HS22040457
Sample ID: 50WW29-220405 Lab ID:HS22040457-03
Collection Date: 05-Apr-2022 14:26 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:56
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	16-Apr-2022 13:56
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Apr-2022 13:56
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*81-118*	*%REC*	*1*	*16-Apr-2022 13:56*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*16-Apr-2022 13:56*
Surr: Dibromofluoromethane	*91.7*			**0**	*80-119*	*%REC*	*1*	*16-Apr-2022 13:56*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*16-Apr-2022 13:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	13-Apr-2022 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 April 2022
WorkOrder: HS22040457

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R406415 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS22040457-02	50WW05-220405	05 Apr 2022 15:31			13 Apr 2022 16:12	1
HS22040457-03	50WW29-220405	05 Apr 2022 14:26			13 Apr 2022 16:12	1
Batch ID: R406685 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22040457-02	50WW05-220405	05 Apr 2022 15:31			16 Apr 2022 16:24	5
HS22040457-02	50WW05-220405	05 Apr 2022 15:31			16 Apr 2022 14:17	1
HS22040457-03	50WW29-220405	05 Apr 2022 14:26			16 Apr 2022 13:56	1
Batch ID: R406685 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22040457-01	Trip Blank	05 Apr 2022 14:26			16 Apr 2022 13:14	1

Revision: 2

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 April 2022
WorkOrder: HS22040457

QC BATCH REPORT

Batch ID: R406685 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220416** Units: **ug/L** Analysis Date: **16-Apr-2022 12:32**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603307** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.67*	*1.0*	*50*	*0*	*89.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.83*	*1.0*	*50*	*0*	*97.7*	*85 - 114*				
Surr: Dibromofluoromethane	*44.89*	*1.0*	*50*	*0*	*89.8*	*80 - 119*				
Surr: Toluene-d8	*53.44*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-220416** Units: **ug/L** Analysis Date: **16-Apr-2022 11:50**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603306** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.79	1.0	20	0	99.0	71 - 131				
1,2-Dichloroethane	20.61	1.0	20	0	103	73 - 128				
cis-1,2-Dichloroethene	21.23	1.0	20	0	106	78 - 123				
Tetrachloroethene	21.64	1.0	20	0	108	74 - 129				
Trichloroethene	20.93	1.0	20	0	105	79 - 123				
Vinyl chloride	20.84	1.0	20	0	104	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.18*	*1.0*	*50*	*0*	*100*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.61*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.72*	*1.0*	*50*	*0*	*95.4*	*80 - 119*				
Surr: Toluene-d8	*51.03*	*1.0*	*50*	*0*	*102*	*89 - 112*				

Revision: 2

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 April 2022
WorkOrder: HS22040457

QC BATCH REPORT

Batch ID: R406685 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22040627-01MS** Units: **ug/L** Analysis Date: **16-Apr-2022 14:39**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603313** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	17.71	1.0	20	0	88.6	71 - 131				
1,2-Dichloroethane	18.2	1.0	20	0	91.0	73 - 128				
cis-1,2-Dichloroethene	20.59	1.0	20	1.969	93.1	78 - 123				
Tetrachloroethene	21.19	1.0	20	0	106	74 - 129				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Vinyl chloride	19.31	1.0	20	0	96.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.49*	*1.0*	*50*	*0*	*93.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.27*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.74*	*1.0*	*50*	*0*	*91.5*	*80 - 119*				
Surr: Toluene-d8	*53.7*	*1.0*	*50*	*0*	*107*	*89 - 112*				

MSD Sample ID: **HS22040627-01MSD** Units: **ug/L** Analysis Date: **16-Apr-2022 15:00**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603314** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	17.88	1.0	20	0	89.4	71 - 131	17.71	0.922	20	
1,2-Dichloroethane	18.39	1.0	20	0	91.9	73 - 128	18.2	1.03	20	
cis-1,2-Dichloroethene	20.27	1.0	20	1.969	91.5	78 - 123	20.59	1.54	20	
Tetrachloroethene	19.43	1.0	20	0	97.1	74 - 129	21.19	8.66	20	
Trichloroethene	19.23	1.0	20	0	96.1	79 - 123	19.92	3.52	20	
Vinyl chloride	18.68	1.0	20	0	93.4	58 - 137	19.31	3.36	20	
Surr: 1,2-Dichloroethane-d4	*46.16*	*1.0*	*50*	*0*	*92.3*	*81 - 118*	*46.49*	*0.706*	*20*	
Surr: 4-Bromofluorobenzene	*51.15*	*1.0*	*50*	*0*	*102*	*85 - 114*	*50.27*	*1.72*	*20*	
Surr: Dibromofluoromethane	*46.35*	*1.0*	*50*	*0*	*92.7*	*80 - 119*	*45.74*	*1.34*	*20*	
Surr: Toluene-d8	*52.45*	*1.0*	*50*	*0*	*105*	*89 - 112*	*53.7*	*2.34*	*20*	

The following samples were analyzed in this batch: HS22040457-01 HS22040457-02 HS22040457-03

Revision: 2

ALS Houston, US Date: 08-Jun-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP50 April 2022
WorkOrder: **HS22040457**

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-34	30-Jun-2022
Illinois	2000322022-9	09-May-2023
Kansas	E-10352 2021-2022	31-Jul-2022
Louisiana	03087, 2021-2022	30-Jun-2022
Maryland	343, 2021-2022	30-Jun-2022
North Carolina	624-2022	31-Dec-2022
Oklahoma	2021-080	31-Aug-2022
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932021-12	30-Jul-2022

ALS Houston, US Date: 08-Jun-22

Sample Receipt Checklist

Work Order ID: HS22040457 **Date/Time Received:** **06-Apr-2022 09:40**

Client Name: CBI-Houston **Received by:** **Nelson D. Dusara**

Completed By:	/S/ Nilesh D. Ranchod	08-Apr-2022 19:50	**Reviewed by:**	/S/ Corey Grandits	12-Apr-2022 13:46
	eSignature	Date/Time		eSignature	Date/Time

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 ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
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):	1.2C/1.7C UC/C	IR #31
Cooler(s)/Kit(s):	48477	
Date/Time sample(s) sent to storage:	04/06/2022 20:00	

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:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS, 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281)530-5656, ATTN: Raggi Giga

Page 1 of 1

Project: APTIM
ARMY AMMN PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS
LONGHORN

Project No.
501032

Job:
LHAAP50 April 2022

Prepared By:
Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. of CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW 8330	Remarks (Preservatives, etc.)	Lab I.D.#
Trip Blank	WQ	4-5-22/1426		1	X							
SOWN05-220405	WG	4-5-22/1531		4	X					X		
SOWN29-220405	WG	4-5-22/1426		4	X					X		

Analyses

REVISED
04/06/2022

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	4-5-22	1717	Nelson	04/06/22	9:40						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

L84177
1.2
I R31
CIF +0.5

HS2040457
Aptim Environmental & Infrastucture, Inc.
LHAAP50 April 2022

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Giga

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 April 2022**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW 6850					Remarks (Preservatives, etc.)	Lab I.D.#
Trip Blank	WQ	4-5-22/1426		1	X											
50WW05-2204	WG	4-5-22/1531		4	X					X						
50WW29-2204	WG	4-5-22/1426		4	X					X						

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	4-5-22	1717		04/06/22	9:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

48477

1.2

IR 31

CF +0.5

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

48477

CUSTODY SEAL

Date: 4-6-22 Time: 1603
Name: [illegible]
Company: Bhate

Seal Broken By:

Date: 4/8/22

48477 APR 0 6 2022

48477

ORIGIN ID:SGRA (903) 930-8193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 07MAR22
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3509
DIMS: 26x14x14 IN

TO **SHIPPING DEPT**
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: GWTP-BD 040901-CG

RMA:

FedEx Express

FedEx
TRK# (0221) 5300 5228 7090

WED - 06 APR 4:30P
STANDARD OVERNIGHT

AB SGRA

77099
TX-US IAH

April 18, 2022 Service Request No:E2200304

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS22040457

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory April 11, 2022
For your reference, these analyses have been assigned our service request number **E2200304.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS-Houston	**Service Request No.:**	E2200304
Project:	HS22040457	**Date Received:**	04/11/22
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two samples were received for analysis at ALS Environmental in Houston on 04/11/22.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2200142: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria. MS/MSD was performed on an unrelated sample.

DoD Certification is held for the method/matrix/analytes provided in this report.

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 group USA Corp dba 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.

Client: ALS Environmental - US **Service Request:**E2200304
Project: HS22040457

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2200304-001	50WW05-220405	4/5/2022	1531
E2200304-002	50WW29-220405	4/5/2022	1426

Service Request Summary

Folder #: **E2200304**
Client Name: ALS Environmental - US
Project Name: HS22040457
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/11/22
Internal Due Date: 4/20/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22040457
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2200304-001	50WW05-220405	Water	04/05/22 1531	**IV**
E2200304-002	50WW29-220405	Water	04/05/22 1426	**IV**

Service Request Summary

Folder #: **E2200304**
Client Name: ALS Environmental - US
Project Name: HS22040457
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/11/22
Internal Due Date: 4/20/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
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Merged?: Y
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P.O. Number: HS22040457
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	2	IV Due 4/27

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of 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.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	(Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
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.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.

Data Qualifiers

Lab Standard

N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793-2022	5/27/2022
California Department of Health Services	2919	4/30/2022
California Department of Health Services	2919-2022	4/30/2022
Florida Department of Health	E87611-34	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Illinois Environmental Protection Agency	2000322021-7	5/9/2022
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Environmental Quality	03087-2020	6/30/2022
Louisiana Department of Health and Hospitals	LA028	12/31/2022
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343	6/30/2022
Michigan Depratment of Environmental Quality	9971	4/30/2022
Minnesota Department of Health	2228443	12/31/2022
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2022
Nevada Department of Concervation and Natural Resources	TX026932022-1	7/31/2022
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2022
New York Department of Health	11707	3/31/2023
Oklahoma Department of Environmental Quality	2021-080	8/31/2022
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016	4/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-28	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932021-12	7/31/2022
Washington Department of Health	C819-2022	11/14/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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

SAMPLING STATE: **Dept of Defense** **COC ID:** **18542**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS22040457
TSR:	Ron Martino

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS22040457-02**	**50WW05_220405**	**Groundwater**	**05 Apr 2022 15:31**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			20 Apr 2022
2.	**HS22040457-03**	**50WW29_220405**	**Groundwater**	**05 Apr 2022 14:26**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			20 Apr 2022

Comments: Please analyze for the analysis listed above. Send report to the emails shown above.

PERCHLORATE

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: LOREY G Date/Time: 4/11/22 0818

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CG

Client/Project ALS-HI

Thermometer ID IR51

Date/Time Received: 4-11-22 Initials: CG

Date/Time Logged in: 4-11-22 Initials CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Air Courier ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☒ No

If yes, how many and where?

Were they intact? ○ Yes ○ No ☒ N/A

Were they signed and dated? ○ Yes ○ No ☒ N/A

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ○ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		4-11-22	0810	CG	5.1	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No

10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 397884 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/12/22 09:51

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2200304-001	50WW05-220405	.01	6850/ClO4 DOD			Water	10mL	
2	E2200304-002	50WW29-220405	.01	6850/ClO4 DOD			Water	10mL	
3	E2200313-001	17WW01_220408	.01	6850/ClO4 DOD			Water	10mL	
4	E2200313-002	17WW02_220408	.01	6850/ClO4 DOD			Water	10mL	
5	E2200313-003	17WW03_220408	.01	6850/ClO4 DOD			Water	10mL	
6	E2200313-004	17WW03_220408-A	.01	6850/ClO4 DOD			Water	10mL	
7	E2200313-005	17WW06_220408	.01	6850/ClO4 DOD			Water	10mL	
8	E2200313-006	17WW130_220408	.01	6850/ClO4 DOD			Water	10mL	
9	EQ2200142-01	MB		6850/ClO4 DOD			Liquid	10mL	
10	EQ2200142-02	LCS		6850/ClO4 DOD			Liquid	10mL	
11	EQ2200142-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
12	EQ2200142-04	17WW130_220408 MS	.01	6850/ClO4 DOD			Liquid	10mL	
13	EQ2200142-05	17WW130_220408 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

E2200304-001	100.00µL	E2200304-002	100.00µL	E2200313-001	100.00µL	E2200313-002	100.00µL	E2200313-003	100.00µL	E2200313-004	100.00µL
E2200313-005	100.00µL	E2200313-006	100.00µL	EQ2200142-01	100.00µL	EQ2200142-02	100.00µL	EQ2200142-03	100.00µL	EQ2200142-04	100.00µL
EQ2200142-05	100.00µL										

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

EQ2200142-02	1.00µL	EQ2200142-03	1.00µL	EQ2200142-04	1.00µL	EQ2200142-05	1.00µL

Preparation Materials

Water HPLC Grade	08/03/2021 Water (218532)	6850 Amber Glass screw vial	2mL Screw Top Vial (221894)	537M Glass Culture Tubes	537M Glass Tubes (218064)
6850 0.45um syringe filters	6850 Syringe Filters (219639)	6850 Luer-Lok Syringes	Luer-Lok Syringes (221305)	6850 Pipette Tips 50-1000 uL	6850 Pipette Tips (221929)

Preparation Steps

Step: Preparation
Started: 4/12/22 09:51
Finished: 4/12/22 10:46
By: GRIVERA
Comments

Preparation Information Benchsheet

Prep Run#: 397884
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 4/12/22 09:51

Comments:

Reviewed By: GR Date: 4/12/22

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200304
Project:	HS22040457	**Date Collected:**	4/ 5/22 1531
Sample Matrix:	Water	**Date Received:**	4/11/22
Sample Name:	50WW05-220405	**Units:**	µg/L
Lab Code:	E2200304-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/12/22	4/12/22 17:21	397884	760388	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200304
Project:	HS22040457	**Date Collected:**	4/ 5/22 1426
Sample Matrix:	Water	**Date Received:**	4/11/22
Sample Name:	50WW29-220405	**Units:**	µg/L
Lab Code:	E2200304-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0655**	J	0.100	0.0500	0.0250	1	4/12/22	4/12/22 17:28	397884	760388	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200304
Project:	HS22040457	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2200142-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/12/22	4/12/22 14:58	397884	760388	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS22040457
Sample Matrix: Water

Service Request: E2200304
Date Analyzed: 4/12/22

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 397884

	Lab Control Sample EQ2200142-02			Duplicate Lab Control Sample EQ2200142-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.113	0.100	113	0.118	0.100	118	84 - 119	4	15

Results flagged with an asterisk (*) indicate values outside control criteria.

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

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200304
Project:	HS22040457	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2200142-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.113**		0.100	0.0500	0.0250	1	4/12/22	4/12/22 16:09	397884	760388	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200304
Project:	HS22040457	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2200142-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.118**		0.100	0.0500	0.0250	1	4/12/22	4/12/22 16:41	397884	760388	

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

May 03, 2022

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS22040354**

Laboratory Results for: **Longhorn Army Ammunition Plant 50 April 2022**

Dear Vicki Graves ,

ALS Environmental received 8 sample(s) on Apr 07, 2022 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: JUMOKE.LAWAL
Ragen Giga
Project Manager

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
Work Order: HS22040354

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22040354-01	Trip Blank	Water	CG-020822-277	06-Apr-2022 10:51	07-Apr-2022 09:45	☐
HS22040354-02	50WW06-220406	Groundwater		06-Apr-2022 14:11	07-Apr-2022 09:45	☐
HS22040354-03	50WW08-220406	Groundwater		06-Apr-2022 10:51	07-Apr-2022 09:45	☐
HS22040354-04	50WW11-220406	Groundwater		06-Apr-2022 15:16	07-Apr-2022 09:45	☐
HS22040354-05	50WW12-220406	Groundwater		06-Apr-2022 12:26	07-Apr-2022 09:45	☐
HS22040354-06	50WW12-220406-FD	Groundwater		06-Apr-2022 12:26	07-Apr-2022 09:45	☐
HS22040354-07	50WW14-220406	Groundwater		06-Apr-2022 15:56	07-Apr-2022 09:45	☐
HS22040354-08	50WW13-220406	Groundwater		06-Apr-2022 16:46	07-Apr-2022 09:45	☐

Revision:1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant 50 April 2022
Work Order: HS22040354

Work Order Comments

- Report Revised - for Sub Contract Lab Pace Gulf Coast) to have sample IDs updated to client specific sample ID`s, for applicable report and to regenerate Sub Contract Lab "EDD" in the correct format.

  The analysis for CO2 by RSK175 was subcontracted to A Pace Analytical Gulf Coast in Baton Rouge LA. Final report attached.

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

Work Order Comments

- 50WW08-220406 - Received VOC vials
  & a Perchlorate bottle. COC (13) checked off for all analyses. client contacted, confirmed sample containers (4) count received is applicable to sample analyses required

GC Semivolatiles by Method RSK-175

Batch ID: R406932

Sample ID: 50WW14-220406 (HS22040354-07MS)

- 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.

Sample ID: 50WW14-220406 (HS22040354-07MSD)

- 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.

GCMS Volatiles by Method SW8260

Batch ID: R406659,R406685

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R406503,R406504

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R406043

Sample ID: 50WW14-220406 (HS22040354-07MS)

- 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,Sulfate)

Batch ID: R406190

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: Trip Blank Lab ID:HS22040354-01
Collection Date: 06-Apr-2022 10:51 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 12:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 12:47
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 12:47
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2022 12:47
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 12:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 12:47
Surr: 1,2-Dichloroethane-d4	*91.4*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 12:47*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 12:47*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 12:47*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 12:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: 50WW06-220406 Lab ID:HS22040354-02
Collection Date: 06-Apr-2022 14:11 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 13:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 13:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 13:08
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2022 13:08
Trichloroethene	**23**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 13:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 13:08
Surr: 1,2-Dichloroethane-d4	*84.1*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 13:08*
Surr: 4-Bromofluorobenzene	*94.9*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 13:08*
Surr: Dibromofluoromethane	*88.5*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 13:08*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 13:08*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.00209**		**0.000144**	**0.000500**	**0.00100**	**mg/L**	1	18-Apr-2022 10:59
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	18-Apr-2022 10:59
Methane	**0.00310**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	18-Apr-2022 10:59
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**1.61**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Apr-2022 04:31
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**10.4**		**0.200**	**0.500**	**0.500**	**mg/L**	1	07-Apr-2022 16:31
Nitrogen, Nitrate (As N)	**0.460**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	07-Apr-2022 16:31
Sulfate	**11.8**		**0.200**	**0.500**	**0.500**	**mg/L**	1	07-Apr-2022 16:31
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2022 10:58
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	27-Apr-2022 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: 50WW08-220406 Lab ID:HS22040354-03
Collection Date: 06-Apr-2022 10:51 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 16:18
1,2-Dichloroethane	**1.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 16:18
cis-1,2-Dichloroethene	**91**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 16:18
Tetrachloroethene	**1.7**		**0.30**	**1.0**	**1.0**	**ug/L**	1	15-Apr-2022 16:18
Trichloroethene	**720**		**5.0**	**12**	**25**	**ug/L**	25	16-Apr-2022 15:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 16:18
Surr: 1,2-Dichloroethane-d4	*89.4*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 16:18*
Surr: 1,2-Dichloroethane-d4	*93.2*			**0**	*81-118*	*%REC*	*25*	*16-Apr-2022 15:21*
Surr: 4-Bromofluorobenzene	*98.6*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 16:18*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*25*	*16-Apr-2022 15:21*
Surr: Dibromofluoromethane	*90.1*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 16:18*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*25*	*16-Apr-2022 15:21*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 16:18*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*25*	*16-Apr-2022 15:21*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2022 10:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: 50WW11-220406 Lab ID:HS22040354-04
Collection Date: 06-Apr-2022 15:16 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**3.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 16:39
1,2-Dichloroethane	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 16:39
cis-1,2-Dichloroethene	**19**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 16:39
Tetrachloroethene	**1.8**		**0.30**	**1.0**	**1.0**	**ug/L**	1	15-Apr-2022 16:39
Trichloroethene	**530**		**2.0**	**5.0**	**10**	**ug/L**	10	16-Apr-2022 15:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 16:39
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 16:39*
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*81-118*	*%REC*	*10*	*16-Apr-2022 15:42*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 16:39*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*10*	*16-Apr-2022 15:42*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 16:39*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*10*	*16-Apr-2022 15:42*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 16:39*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*10*	*16-Apr-2022 15:42*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	18-Apr-2022 11:12
Ethene	**0.00340**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	18-Apr-2022 11:12
Methane	**0.00529**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	18-Apr-2022 11:12
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**0.896**	J	**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Apr-2022 04:58
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**294**		**2.00**	**5.00**	**5.00**	**mg/L**	10	08-Apr-2022 18:20
Nitrogen, Nitrate (As N)	**0.0429**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	07-Apr-2022 16:36
Sulfate	**302**		**2.00**	**5.00**	**5.00**	**mg/L**	10	08-Apr-2022 18:20
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2022 10:58
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	27-Apr-2022 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: 50WW12-220406 Lab ID:HS22040354-05
Collection Date: 06-Apr-2022 12:26 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**20**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 14:11
1,2-Dichloroethane	**10.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 14:11
cis-1,2-Dichloroethene	**3.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 14:11
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2022 14:11
Trichloroethene	**1,400**		**10**	**25**	**50**	**ug/L**	50	15-Apr-2022 15:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 14:11
Surr: 1,2-Dichloroethane-d4	*89.1*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 14:11*
Surr: 1,2-Dichloroethane-d4	*91.6*			**0**	*81-118*	*%REC*	*50*	*15-Apr-2022 15:36*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 14:11*
Surr: 4-Bromofluorobenzene	*99.9*			**0**	*85-114*	*%REC*	*50*	*15-Apr-2022 15:36*
Surr: Dibromofluoromethane	*89.7*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 14:11*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*50*	*15-Apr-2022 15:36*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 14:11*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*50*	*15-Apr-2022 15:36*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	18-Apr-2022 11:20
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	18-Apr-2022 11:20
Methane	**3.38**		**0.0535**	**0.250**	**0.250**	**mg/L**	500	18-Apr-2022 12:27
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**1.84**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Apr-2022 05:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**1,010**		**4.00**	**10.0**	**10.0**	**mg/L**	20	08-Apr-2022 18:25
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	07-Apr-2022 16:41
Sulfate	**574**		**4.00**	**10.0**	**10.0**	**mg/L**	20	08-Apr-2022 18:25
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2022 10:58
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	27-Apr-2022 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: 50WW12-220406-FD Lab ID:HS22040354-06
Collection Date: 06-Apr-2022 12:26 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**19**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 14:32
1,2-Dichloroethane	**10**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 14:32
cis-1,2-Dichloroethene	**4.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 14:32
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2022 14:32
Trichloroethene	**1,400**		**10**	**25**	**50**	**ug/L**	50	15-Apr-2022 15:57
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 14:32
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*81-118*	*%REC*	*50*	*15-Apr-2022 15:57*
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 14:32*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 14:32*
Surr: 4-Bromofluorobenzene	*99.4*			**0**	*85-114*	*%REC*	*50*	*15-Apr-2022 15:57*
Surr: Dibromofluoromethane	*90.1*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 14:32*
Surr: Dibromofluoromethane	*92.8*			**0**	*80-119*	*%REC*	*50*	*15-Apr-2022 15:57*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 14:32*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*50*	*15-Apr-2022 15:57*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	18-Apr-2022 11:30
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	18-Apr-2022 11:30
Methane	**3.22**		**0.0214**	**0.100**	**0.100**	**mg/L**	200	18-Apr-2022 12:37
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**1.41**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Apr-2022 06:52
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**1,020**		**4.00**	**10.0**	**10.0**	**mg/L**	20	08-Apr-2022 18:30
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	07-Apr-2022 16:47
Sulfate	**576**		**4.00**	**10.0**	**10.0**	**mg/L**	20	08-Apr-2022 18:30
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2022 10:58
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	27-Apr-2022 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: 50WW14-220406 Lab ID:HS22040354-07
Collection Date: 06-Apr-2022 15:56 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 13:29
1,2-Dichloroethane	**0.51**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 13:29
cis-1,2-Dichloroethene	**14**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 13:29
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Apr-2022 13:29
Trichloroethene	**48**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 13:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Apr-2022 13:29
Surr: 1,2-Dichloroethane-d4	*89.3*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 13:29*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 13:29*
Surr: Dibromofluoromethane	*91.1*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 13:29*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 13:29*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	18-Apr-2022 11:38
Ethene	**0.00228**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	18-Apr-2022 11:38
Methane	**0.00321**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	18-Apr-2022 11:38
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**3.11**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Apr-2022 07:05
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**405**		**2.00**	**5.00**	**5.00**	**mg/L**	10	08-Apr-2022 18:36
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	07-Apr-2022 16:52
Sulfate	**380**		**2.00**	**5.00**	**5.00**	**mg/L**	10	08-Apr-2022 18:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2022 10:58
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	27-Apr-2022 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant 50 April 2022 WorkOrder:HS22040354
Sample ID: 50WW13-220406 Lab ID:HS22040354-08
Collection Date: 06-Apr-2022 16:46 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1-Dichloroethene	**3.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 17:00
1,2-Dichloroethane	**7.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 17:00
cis-1,2-Dichloroethene	**72**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 17:00
Tetrachloroethene	**7.2**		**0.30**	**1.0**	**1.0**	**ug/L**	1	15-Apr-2022 17:00
Trichloroethene	**2,100**		**10**	**25**	**50**	**ug/L**	50	16-Apr-2022 16:03
Vinyl chloride	**0.54**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Apr-2022 17:00
Surr: 1,2-Dichloroethane-d4	*90.4*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2022 17:00*
Surr: 1,2-Dichloroethane-d4	*92.6*			**0**	*81-118*	*%REC*	*50*	*16-Apr-2022 16:03*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2022 17:00*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*50*	*16-Apr-2022 16:03*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2022 17:00*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*50*	*16-Apr-2022 16:03*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2022 17:00*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*50*	*16-Apr-2022 16:03*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	**0.00156**		**0.000144**	**0.000500**	**0.00100**	**mg/L**	1	18-Apr-2022 12:16
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	18-Apr-2022 12:16
Methane	**0.00281**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	18-Apr-2022 12:16
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**1.89**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Apr-2022 07:33
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Chloride	**372**		**2.00**	**5.00**	**5.00**	**mg/L**	10	08-Apr-2022 18:41
Nitrogen, Nitrate (As N)	**0.0314**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	07-Apr-2022 17:08
Sulfate	**349**		**2.00**	**5.00**	**5.00**	**mg/L**	10	08-Apr-2022 18:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2022 10:58
SUBCONTRACTED ANALYSIS		**Method:NA**						Analyst: SUB
Miscellaneous Analysis	See Attached		0	0		NA	1	27-Apr-2022 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R406043 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS22040354-02	50WW06-220406	06 Apr 2022 14:11			07 Apr 2022 16:31	1
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			07 Apr 2022 16:36	1
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			07 Apr 2022 16:41	2
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			07 Apr 2022 16:47	2
HS22040354-07	50WW14-220406	06 Apr 2022 15:56			07 Apr 2022 16:52	1
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			07 Apr 2022 17:08	1
Batch ID: R406190 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			08 Apr 2022 18:20	10
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			08 Apr 2022 18:25	20
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			08 Apr 2022 18:30	20
HS22040354-07	50WW14-220406	06 Apr 2022 15:56			08 Apr 2022 18:36	10
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			08 Apr 2022 18:41	10
Batch ID: R406253 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS22040354-02	50WW06-220406	06 Apr 2022 14:11			12 Apr 2022 10:58	1
HS22040354-03	50WW08-220406	06 Apr 2022 10:51			12 Apr 2022 10:58	1
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			12 Apr 2022 10:58	1
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			12 Apr 2022 10:58	1
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			12 Apr 2022 10:58	1
HS22040354-07	50WW14-220406	06 Apr 2022 15:56			12 Apr 2022 10:58	1
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			12 Apr 2022 10:58	1
Batch ID: R406503 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Groundwater	
HS22040354-02	50WW06-220406	06 Apr 2022 14:11			14 Apr 2022 04:31	1
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			14 Apr 2022 04:58	1
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			14 Apr 2022 05:11	1
Batch ID: R406504 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Groundwater	
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			14 Apr 2022 06:52	1
HS22040354-07	50WW14-220406	06 Apr 2022 15:56			14 Apr 2022 07:05	1
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			14 Apr 2022 07:33	1

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R406659 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22040354-02	50WW06-220406	06 Apr 2022 14:11			15 Apr 2022 13:08	1
HS22040354-03	50WW08-220406	06 Apr 2022 10:51			15 Apr 2022 16:18	1
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			15 Apr 2022 16:39	1
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			15 Apr 2022 15:36	50
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			15 Apr 2022 14:11	1
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			15 Apr 2022 15:57	50
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			15 Apr 2022 14:32	1
HS22040354-07	50WW14-220406	06 Apr 2022 15:56			15 Apr 2022 13:29	1
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			15 Apr 2022 17:00	1
Batch ID: R406659 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22040354-01	Trip Blank	06 Apr 2022 10:51			15 Apr 2022 12:47	1
Batch ID: R406685 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22040354-03	50WW08-220406	06 Apr 2022 10:51			16 Apr 2022 15:21	25
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			16 Apr 2022 15:42	10
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			16 Apr 2022 16:03	50
Batch ID: R406932 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS22040354-02	50WW06-220406	06 Apr 2022 14:11			18 Apr 2022 10:59	1
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			18 Apr 2022 11:12	1
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			18 Apr 2022 12:27	500
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			18 Apr 2022 11:20	1
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			18 Apr 2022 12:37	200
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			18 Apr 2022 11:30	1
HS22040354-07	50WW14-220406	06 Apr 2022 15:56			18 Apr 2022 11:38	1
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			18 Apr 2022 12:16	1
Batch ID: R407462 (0)	**Test Name :** SUBCONTRACTED ANALYSIS				**Matrix:** Groundwater	
HS22040354-02	50WW06-220406	06 Apr 2022 14:11			27 Apr 2022 15:49	1
HS22040354-04	50WW11-220406	06 Apr 2022 15:16			27 Apr 2022 15:49	1
HS22040354-05	50WW12-220406	06 Apr 2022 12:26			27 Apr 2022 15:49	1
HS22040354-06	50WW12-220406-FD	06 Apr 2022 12:26			27 Apr 2022 15:49	1
HS22040354-07	50WW14-220406	06 Apr 2022 15:56			27 Apr 2022 15:49	1
HS22040354-08	50WW13-220406	06 Apr 2022 16:46			27 Apr 2022 15:49	1

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406932 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-220418** Units: **mg/L** Analysis Date: **18-Apr-2022 10:40**
Client ID: Run ID: **FID-4_406932** SeqNo: **6608832** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-220418** Units: **mg/L** Analysis Date: **18-Apr-2022 10:49**
Client ID: Run ID: **FID-4_406932** SeqNo: **6608833** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0190	0.00100	0.01804	0	105	75 - 125				
Ethene	0.0187	0.00100	0.0168	0	111	75 - 125				
Methane	0.0102	0.000500	0.009647	0	106	75 - 125				

MS Sample ID: **HS22040354-07MS** Units: **mg/L** Analysis Date: **18-Apr-2022 11:51**
Client ID: **50WW14-220406** Run ID: **FID-4_406932** SeqNo: **6608839** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0162	0.00100	0.01804	0	89.7	75 - 125				
Ethene	0.0156	0.00100	0.0168	0.002284	79.2	75 - 125				
Methane	0.00936	0.000500	0.009647	0.003205	63.8	75 - 125				S

MSD Sample ID: **HS22040354-07MSD** Units: **mg/L** Analysis Date: **18-Apr-2022 12:00**
Client ID: **50WW14-220406** Run ID: **FID-4_406932** SeqNo: **6608840** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0157	0.00100	0.01804	0	86.9	75 - 125	0.01619	3.17	30	
Ethene	0.0162	0.00100	0.0168	0.002284	82.6	75 - 125	0.01559	3.57	30	
Methane	0.00905	0.000500	0.009647	0.003205	60.6	75 - 125	0.009362	3.36	30	S

The following samples were analyzed in this batch: HS22040354-02 HS22040354-04 HS22040354-05 HS22040354-06 HS22040354-07 HS22040354-08

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220415** Units: **ug/L** Analysis Date: **15-Apr-2022 12:26**
Client ID: Run ID: **VOA6_406659** SeqNo: **6602816** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Tetrachloroethene	1.0	1.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.25*	*1.0*	*50*	*0*	*88.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.61*	*1.0*	*50*	*0*	*97.2*	*85 - 114*				
Surr: Dibromofluoromethane	*46.3*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*52.03*	*1.0*	*50*	*0*	*104*	*89 - 112*				

LCS Sample ID: **VLCSW-220415** Units: **ug/L** Analysis Date: **15-Apr-2022 11:23**
Client ID: Run ID: **VOA6_406659** SeqNo: **6602815** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	19.53	1.0	20	0	97.7	71 - 131				
1,2-Dichloroethane	19.04	1.0	20	0	95.2	73 - 128				
cis-1,2-Dichloroethene	20.65	1.0	20	0	103	78 - 123				
Tetrachloroethene	20.6	1.0	20	0	103	74 - 129				
Trichloroethene	19.75	1.0	20	0	98.8	79 - 123				
Vinyl chloride	20.39	1.0	20	0	102	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.39*	*1.0*	*50*	*0*	*98.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.26*	*1.0*	*50*	*0*	*98.5*	*85 - 114*				
Surr: Dibromofluoromethane	*47.87*	*1.0*	*50*	*0*	*95.7*	*80 - 119*				
Surr: Toluene-d8	*48.71*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22040354-07MS** Units: **ug/L** Analysis Date: **15-Apr-2022 14:54**
Client ID: **50WW14-220406** Run ID: **VOA6_406659** SeqNo: **6602822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	18.66	1.0	20	0	93.3	71 - 131				
1,2-Dichloroethane	18.67	1.0	20	0.5083	90.8	73 - 128				
cis-1,2-Dichloroethene	33.53	1.0	20	13.92	98.0	78 - 123				
Tetrachloroethene	20.41	1.0	20	0	102	74 - 129				
Trichloroethene	69.78	1.0	20	48.44	107	79 - 123				
Vinyl chloride	19.66	1.0	20	0	98.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.29*	*1.0*	*50*	*0*	*92.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.36*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.19*	*1.0*	*50*	*0*	*92.4*	*80 - 119*				
Surr: Toluene-d8	*53.84*	*1.0*	*50*	*0*	*108*	*89 - 112*				

MSD Sample ID: **HS22040354-07MSD** Units: **ug/L** Analysis Date: **15-Apr-2022 15:15**
Client ID: **50WW14-220406** Run ID: **VOA6_406659** SeqNo: **6602823** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	17.41	1.0	20	0	87.0	71 - 131	18.66	6.93	20	
1,2-Dichloroethane	17.71	1.0	20	0.5083	86.0	73 - 128	18.67	5.26	20	
cis-1,2-Dichloroethene	32.12	1.0	20	13.92	91.0	78 - 123	33.53	4.3	20	
Tetrachloroethene	19.25	1.0	20	0	96.3	74 - 129	20.41	5.83	20	
Trichloroethene	64.63	1.0	20	48.44	80.9	79 - 123	69.78	7.67	20	
Vinyl chloride	18.67	1.0	20	0	93.3	58 - 137	19.66	5.15	20	
Surr: 1,2-Dichloroethane-d4	*46.51*	*1.0*	*50*	*0*	*93.0*	*81 - 118*	*46.29*	*0.472*	*20*	
Surr: 4-Bromofluorobenzene	*49.28*	*1.0*	*50*	*0*	*98.6*	*85 - 114*	*49.36*	*0.16*	*20*	
Surr: Dibromofluoromethane	*45.35*	*1.0*	*50*	*0*	*90.7*	*80 - 119*	*46.19*	*1.84*	*20*	
Surr: Toluene-d8	*51.99*	*1.0*	*50*	*0*	*104*	*89 - 112*	*53.84*	*3.5*	*20*	

The following samples were analyzed in this batch:

HS22040354-01	HS22040354-02	HS22040354-03	HS22040354-04
HS22040354-05	HS22040354-06	HS22040354-07	HS22040354-08

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406685 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-220416** Units: **ug/L** Analysis Date: **16-Apr-2022 12:32**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603307** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.67*	*1.0*	*50*	*0*	*89.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.83*	*1.0*	*50*	*0*	*97.7*	*85 - 114*				
Surr: Dibromofluoromethane	*44.89*	*1.0*	*50*	*0*	*89.8*	*80 - 119*				
Surr: Toluene-d8	*53.44*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-220416** Units: **ug/L** Analysis Date: **16-Apr-2022 11:50**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603306** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	20.93	1.0	20	0	105	79 - 123				
Surr: 1,2-Dichloroethane-d4	*50.18*	*1.0*	*50*	*0*	*100*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.61*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.72*	*1.0*	*50*	*0*	*95.4*	*80 - 119*				
Surr: Toluene-d8	*51.03*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MS Sample ID: **HS22040627-01MS** Units: **ug/L** Analysis Date: **16-Apr-2022 14:39**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603313** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Surr: 1,2-Dichloroethane-d4	*46.49*	*1.0*	*50*	*0*	*93.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.27*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.74*	*1.0*	*50*	*0*	*91.5*	*80 - 119*				
Surr: Toluene-d8	*53.7*	*1.0*	*50*	*0*	*107*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406685 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22040627-01MSD** Units: **ug/L** Analysis Date: **16-Apr-2022 15:00**
Client ID: Run ID: **VOA6_406685** SeqNo: **6603314** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	19.23	1.0	20	0	96.1	79 - 123	19.92	3.52	20	
Surr: 1,2-Dichloroethane-d4	*46.16*	*1.0*	*50*	*0*	*92.3*	*81 - 118*	*46.49*	*0.706*	*20*	
Surr: 4-Bromofluorobenzene	*51.15*	*1.0*	*50*	*0*	*102*	*85 - 114*	*50.27*	*1.72*	*20*	
Surr: Dibromofluoromethane	*46.35*	*1.0*	*50*	*0*	*92.7*	*80 - 119*	*45.74*	*1.34*	*20*	
Surr: Toluene-d8	*52.45*	*1.0*	*50*	*0*	*105*	*89 - 112*	*53.7*	*2.34*	*20*	

The following samples were analyzed in this batch: HS22040354-03 HS22040354-04 HS22040354-08

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406043 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **07-Apr-2022 22:30**
Client ID: Run ID: **ICS-Integrion_406043** SeqNo: **6588387** 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
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **07-Apr-2022 22:35**
Client ID: Run ID: **ICS-Integrion_406043** SeqNo: **6588388** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	18.42	0.500	20	0	92.1	80 - 120				
Nitrogen, Nitrate (As N)	3.708	0.100	4	0	92.7	80 - 120				
Sulfate	18.66	0.500	20	0	93.3	80 - 120				

MS Sample ID: **HS22040354-07MS** Units: **mg/L** Analysis Date: **07-Apr-2022 16:57**
Client ID: **50WW14-220406** Run ID: **ICS-Integrion_406043** SeqNo: **6588380** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	413	0.500	10	411.8	12.0	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.092	0.100	2	0.0174	104	80 - 120				
Sulfate	366.7	0.500	10	364.7	20.7	80 - 120				SEO

MSD Sample ID: **HS22040354-07MSD** Units: **mg/L** Analysis Date: **07-Apr-2022 17:02**
Client ID: **50WW14-220406** Run ID: **ICS-Integrion_406043** SeqNo: **6588381** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	412.9	0.500	10	411.8	10.2	80 - 120	413	0.0421	20	SEO
Nitrogen, Nitrate (As N)	2.1	0.100	2	0.0174	104	80 - 120	2.092	0.396	20	
Sulfate	367	0.500	10	364.7	23.8	80 - 120	366.7	0.086	20	SEO

The following samples were analyzed in this batch: HS22040354-02 HS22040354-04 HS22040354-05 HS22040354-06 HS22040354-07 HS22040354-08

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406190 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **08-Apr-2022 19:28**
Client ID: Run ID: **ICS-Integrion_406190** SeqNo: **6591820** 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: **LCS** Units: **mg/L** Analysis Date: **08-Apr-2022 19:34**
Client ID: Run ID: **ICS-Integrion_406190** SeqNo: **6591821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.08	0.500	20	0	100	80 - 120				
Sulfate	19.98	0.500	20	0	99.9	80 - 120				

MS Sample ID: **HS22040373-01MS** Units: **mg/L** Analysis Date: **08-Apr-2022 17:53**
Client ID: Run ID: **ICS-Integrion_406190** SeqNo: **6591809** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1477	25.0	500	977	99.9	80 - 120				
Sulfate	1397	25.0	500	907.1	97.9	80 - 120				

MSD Sample ID: **HS22040373-01MSD** Units: **mg/L** Analysis Date: **08-Apr-2022 17:59**
Client ID: Run ID: **ICS-Integrion_406190** SeqNo: **6591810** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1474	25.0	500	977	99.4	80 - 120	1477	0.176	20	
Sulfate	1394	25.0	500	907.1	97.4	80 - 120	1397	0.203	20	

The following samples were analyzed in this batch: HS22040354-04 HS22040354-05 HS22040354-06 HS22040354-07 HS22040354-08

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406503 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-04132022** Units: **mg/L** Analysis Date: **14-Apr-2022 01:38**
Client ID: Run ID: **TOC_04_406503** SeqNo: **6598949** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-04132022** Units: **mg/L** Analysis Date: **14-Apr-2022 01:53**
Client ID: Run ID: **TOC_04_406503** SeqNo: **6598950** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.24	1.00	10	0	102	85 - 115				

LCSD Sample ID: **LCSD-04132022** Units: **mg/L** Analysis Date: **14-Apr-2022 02:08**
Client ID: Run ID: **TOC_04_406503** SeqNo: **6598951** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.21	1.00	10	0	102	85 - 115	10.24	0.293	20	

MS Sample ID: **HS22040354-02MS** Units: **mg/L** Analysis Date: **14-Apr-2022 04:45**
Client ID: **50WW06-220406** Run ID: **TOC_04_406503** SeqNo: **6598962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	12.3	1.00	10	1.611	107	80 - 120				

The following samples were analyzed in this batch: HS22040354-02 HS22040354-04 HS22040354-05

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: HS22040354

QC BATCH REPORT

Batch ID: R406504 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-04132022** Units: **mg/L** Analysis Date: **14-Apr-2022 06:08**
Client ID: Run ID: **TOC_04_406504** SeqNo: **6598969** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-04132022** Units: **mg/L** Analysis Date: **14-Apr-2022 06:24**
Client ID: Run ID: **TOC_04_406504** SeqNo: **6598970** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.35	1.00	10	0	104	85 - 115				

LCSD Sample ID: **LCSD-04132022** Units: **mg/L** Analysis Date: **14-Apr-2022 06:39**
Client ID: Run ID: **TOC_04_406504** SeqNo: **6598971** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.38	1.00	10	0	104	85 - 115	10.35	0.289	20	

MS Sample ID: **HS22040354-07MS** Units: **mg/L** Analysis Date: **14-Apr-2022 07:20**
Client ID: **50WW14-220406** Run ID: **TOC_04_406504** SeqNo: **6598974** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	13.41	1.00	10	3.109	103	80 - 120				

The following samples were analyzed in this batch: HS22040354-06 HS22040354-07 HS22040354-08

Revision: 1

ALS Houston, US Date: 03-May-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 50 April 2022
WorkOrder: **HS22040354**

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
Florida	E87611-34	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Louisiana	03087, 2021-2022	30-Jun-2022

ALS Houston, US Date: 03-May-22

Sample Receipt Checklist

Work Order ID: HS22040354 **Date/Time Received:** **07-Apr-2022 09:45**

Client Name: CBI-Houston **Received by:** **Desmond Wacasey**

Completed By: */S/ Paresh M. Giga* (eSignature) 07-Apr-2022 16:22 (Date/Time) **Reviewed by:** */S/ Ragen Giga* (eSignature) 08-Apr-2022 13:51 (Date/Time)

Matrices: **GW/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 ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:none
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
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):	1.9C/2.4C U/c	IR31
Cooler(s)/Kit(s):	47136	
Date/Time sample(s) sent to storage:	4/7/2022 16:40	

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: 50WW08-220406 - Received VOC vials
& a Perchlorate bottle. COC (13) checked off for all analyses. client contacted, confirmed sample containers (4) count received is applicable to sample analyses required

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

REVISED
04/11/2022

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Giga

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 April 2022**

Prepared By: Scott Beesinger

P.O. Number

HS22040354

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 50 April 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW 6850	Remarks (Preservatives, etc.)	Lab I.D.#
TRIP Blank	WQ	4-6-22/1051		1	X							
50WW06-2204 06	WG	4-6-22/1411		13	X	X	X	X	X	X		
50WW08-2204 06	WG	4-6-22/1051		13	X	X	X	X	X	X	Only VOC and perchlorate	
50WW11-2204 06	WG	4-6-22/1516		13	X	X	X	X	X	X		
50WW12-2204 06	WG	4-6-22/1226		12	X	X	X	X	X	X		
50WW12-2204-AFD-06	FD	4-6-22/1226		13	X	X	X	X	X	X	Should be -FD not -A	
50WW14-2204 06	WG	4-6-22/1550		13	X	X	X	X	X	X		
50WW14-2204 06 MS	MS	4-6-22/1550	X	13	X	X	X	X	X	X		

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	4-6-22	1800		4/7	9:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

47136 1.9C

IR 31 CF=0.5

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

REVISED
04/11/2022

CHAIN OF CUSTODY

Name Of Lab Shipping To: Microbial Insights, 10515 Research Drive, Knoxville TN 37932 (865) 573-8118 ATTN: Kate Clark

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 50 April 2022**	
Prepared By: Scott Beesinger	P.O. Number

HS22040354

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 50 April 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: BHC by qPCR VOCs	TOC	MEE	Anions	6020 by ICPMS	Perchlorate	Remarks (Preservatives, etc.)	Lab I.D.#
SOWW14-220406MSD	WG	4-6-22/1500	X	13	X	X	X	X	X	X		
SOWW13-220406	WG	4-6-22/1646		13	X	X	X	X	X	X		

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	4-6-22	1800	DW	04/07/22	09:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Giga

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP50 April 2022**

Prepared By: Scott Beesinger

P.O. Number

HS22040354

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 50 April 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Perchlorate by SW 6850	Remarks (Preservatives, etc.)	Lab I.D.#
TRIP Blank	WQ	4-6-22/1051		1	X							
50WW06-2204	WG	4-6-22/1411		13	X	X	X	X	X	X		
50WW08-2204	WG	4-6-22/1051		13	X	X	X	X	X	X		
50WW11-2204	WG	4-6-22/1516		13	X	X	X	X	X	X		
50WW12-2204	WG	4-6-22/1226		12	X	X	X	X	X	X		
50WW12-2204-A	FD	4-6-22/1226		13	X	X	X	X	X	X		
50WW14-2204	WG	4-6-22/1556		13	X	X	X	X	X	X		
50WW14-2204-MS	MS	4-6-22/1556	X	13	X	X	X	X	X	X		

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	4-6-22	1800		4/7	9:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

47136 1.9C ac
IR 31 CF=0.5

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: Microbial Insights, 10515 Research Drive, Knoxville TN 37932 (865) 573-8118 ATTN: Kate Clark

HS22040354

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 50 April 2022

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 50 April 2022**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	Analyses: ~~DHC by qPCR~~ VOCs	TOC	MEE	Anions	6020 by RSK175	Perchlorate	Remarks (Preservatives, etc.)	Lab I.D.#
SOWW14-2204-MSD	WG	4-6-22/1550	X	13	X	X	X	X	X	X		
SOWW13-2204	WG	4-6-22/1646		13	X	X	X	X	X	X		

Additional Remarks: Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	4-6-22	1800	DW	04/07/22	09:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

COC	Correct
50WW06-2204	50WW06-220406
50WW08-2204	50WW08-220406
50WW11-2204	50WW11-220406
50WW12-2204	50WW12-220406
50WW12-2204-A	50WW12-220406-FD
50WW14-2204	50WW14-220406
50WW14-2204-MS	50WW14-220406-MS
50WW14-2204-MSD	50WW14-220406-MSD
50WW13-2204	50WW13-220406

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

47136

CUSTODY SEAL

Date: 4-7-22 Time: 1532
Name: Derek Ben
Company: Bhate

Seal Broken By: GM
Date: 04/07/22

47136 APR 07 2022

47136

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 23MAR22
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3512
DIMS: 18x16x13 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530- 5656
REF: LHAAP - 60 84324 - RG

RMA:

FedEx Express

FedEx
TRK# 0221 5300 5229 3393

THU - 07 APR 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

April 12, 2022 Service Request No:E2200297

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: HS22040354

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory April 07, 2022
For your reference, these analyses have been assigned our service request number **E2200297.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2200297
Project:	HS22040354	**Date Received:**	04/07/22
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seven samples were received for analysis at ALS Environmental in Houston on 4/07/22.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2200138: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for these extraction batches. The LCS and DLCS recoveries are within QC limits. MS/MSD parent sample E2200297-006 result 1.48 ug/L, MS/MSD spike at LOQ level 0.1 ug/L.

DoD certification is held for the method/matrix/analytes provided in this report.

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 group USA Corp dba 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.

Client: ALS Environmental - US **Service Request:**E2200297
Project: HS22040354

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2200297-001	50WW06-200406	4/6/2022	1411
E2200297-002	50WW08-220406	4/6/2022	1051
E2200297-003	50WW11-200406	4/6/2022	1516
E2200297-004	50WW12-200406	4/6/2022	1226
E2200297-005	50WW12-200406-A	4/6/2022	1226
E2200297-006	50WW14-200406	4/6/2022	1556
E2200297-007	50WW13-200406	4/6/2022	1646

Service Request Summary

Folder #: **E2200297**
Client Name: ALS Environmental - US
Project Name: HS22040354
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/07/22
Internal Due Date: 4/21/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22040354
EDD: No EDD Specified

9 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2200297-001	50WW06-200406	Water	04/06/22 1411	**IV**
E2200297-002	50WW08-220406	Water	04/06/22 1051	**IV**
E2200297-003	50WW11-200406	Water	04/06/22 1516	**IV**
E2200297-004	50WW12-200406	Water	04/06/22 1226	**IV**
E2200297-005	50WW12-200406-A	Water	04/06/22 1226	**IV**
E2200297-006	50WW14-200406	Water	04/06/22 1556	**IV**
E2200297-007	50WW13-200406	Water	04/06/22 1646	**IV**

Service Request Summary

Folder #: **E2200297**
Client Name: ALS Environmental - US
Project Name: HS22040354
Project Number:

Report To: Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 04/07/22
Internal Due Date: 4/21/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22040354
EDD: No EDD Specified

9 120 mL-Plastic Bottle Natural WM Unpreserved
Location: EHRMS-AirArch 1
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of 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.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	(Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
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.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.

Data Qualifiers

Lab Standard

N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793-2022	5/27/2022
California Department of Health Services	2919	4/30/2022
California Department of Health Services	2919-2022	4/30/2022
Florida Department of Health	E87611-34	6/30/2022
Hawaii Department of Health	2021-2022	4/30/2022
Illinois Environmental Protection Agency	2000322021-7	5/9/2022
Kansas Department of Health and Environment	E-10352 2022	7/31/2022
Louisiana Department of Environmental Quality	03087-2021	6/30/2022
Louisiana Department of Environmental Quality	03087-2020	6/30/2022
Louisiana Department of Health and Hospitals	LA028	12/31/2022
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343	6/30/2022
Michigan Depratment of Environmental Quality	9971	4/30/2022
Minnesota Department of Health	2228443	12/31/2022
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2022
Nevada Department of Concervation and Natural Resources	TX026932022-1	7/31/2022
New Hampshire Environmental Laboratory Accreditation Program	209421	4/24/2022
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2022
New Jersey Department of Environmental Protection	TX008	6/30/2022
New York Department of Health	11707	3/31/2023
Oklahoma Department of Environmental Quality	2021-080	8/31/2022
Pennsylvania Department of Environmental Protection	68-03441-015	6/30/2022
Tennessee Department of Environment and Concervation	04016	4/30/2022
Tennessee Department of Environment and Concervation	04016-2021	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-28	4/30/2022
Texas Commision on Environmental Quality	T104704231-21-27	4/30/2022
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932021-12	7/31/2022
Washington Department of Health	C819-2022	11/14/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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

SAMPLING STATE: **Dept of Defense** **COC ID: 18533**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS22040354
TSR:	Ron Martino

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS22040354-02**	**50WW06-200406**	**Groundwater**	**06 Apr 2022 14:11**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			21 Apr 2022
2.	**HS22040354-03**	**50WW08-220406**	**Groundwater**	**06 Apr 2022 10:51**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			21 Apr 2022
3.	**HS22040354-04**	**50WW11-200406**	**Groundwater**	**06 Apr 2022 15:16**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			21 Apr 2022
4.	**HS22040354-05**	**50WW12-200406**	**Groundwater**	**06 Apr 2022 12:26**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			21 Apr 2022
5.	**HS22040354-06**	**50WW12-200406-A**	**Groundwater**	**06 Apr 2022 12:26**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			21 Apr 2022
6.	**HS22040354-07**	**50WW14-200406**	**Groundwater**	**06 Apr 2022 15:56**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			21 Apr 2022
7.	**HS22040354-08**	**50WW13-200406**	**Groundwater**	**06 Apr 2022 16:46**
	Level II and Level IV reports on a seperate pdf. Send WOA to Vicki Graves.			21 Apr 2022

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **18533**

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS22040354-07 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 4/7/22 1511

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist: LH

Client/Project: ALS-H

Thermometer ID: IR#1

Date/Time Received: 4-7-22 Initials: LH

Date/Time Logged in: 4-7-22 Initials: LH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other _____

3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other _____

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling: _____

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		4-7-22	1311	LH	3.3	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 397793 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 4/8/22 08:50

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2200293-001	M114MW002-S	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2200297-001	50WW06-200406	.01	6850/ClO4 DOD			Water	10mL	
3	E2200297-002	50WW08-220406	.01	6850/ClO4 DOD			Water	10mL	
4	E2200297-003	50WW11-200406	.01	6850/ClO4 DOD			Water	10mL	
5	E2200297-004	50WW12-200406	.01	6850/ClO4 DOD			Water	10mL	
6	E2200297-005	50WW12-200406-A	.01	6850/ClO4 DOD			Water	10mL	
7	E2200297-006	50WW14-200406	.01	6850/ClO4 DOD			Water	10mL	
8	E2200297-007	50WW13-200406	.01	6850/ClO4 DOD			Water	10mL	
9	EQ2200138-01	MB		6850/ClO4 DOD			Liquid	10mL	
10	EQ2200138-02	LCS		6850/ClO4 DOD			Liquid	10mL	
11	EQ2200138-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
12	EQ2200138-04	M114MW002-S MS	.02	6850/ClO4 DOD			Liquid	10mL	
13	EQ2200138-05	M114MW002-S DMS	.02	6850/ClO4 DOD			Liquid	10mL	
14	EQ2200138-06	50WW14-200406 MS	.02	6850/ClO4 DOD			Liquid	10mL	
15	EQ2200138-07	50WW14-200406 DMS	.02	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

E2200293-001	100.00µL	E2200297-001	100.00µL	E2200297-002	100.00µL	E2200297-003	100.00µL	E2200297-004	100.00µL	E2200297-005	100.00µL
E2200297-006	100.00µL	E2200297-007	100.00µL	EQ2200138-01	100.00µL	EQ2200138-02	100.00µL	EQ2200138-03	100.00µL	EQ2200138-04	100.00µL
EQ2200138-05	100.00µL	EQ2200138-06	100.00µL	EQ2200138-07	100.00µL						

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

EQ2200138-02	1.00µL	EQ2200138-03	1.00µL	EQ2200138-04	1.00µL	EQ2200138-05	1.00µL	EQ2200138-06	1.00µL	EQ2200138-07	1.00µL

Preparation Materials

Water HPLC Grade	08/03/2021 Water (218532)	6850 Amber Glass screw vial	2mL Screw Top Vial (221894)	537M Glass Culture Tubes	537M Glass Tubes (218064)
6850 0.45um syringe filters	6850 Syringe Filters (219639)	6850 Pipette Tips 50-1000 uL	6850 Pipette Tips (221929)	6850 Luer-Lok Syringes	Luer-Lok Syringes (221305)

Preparation Steps

Step: Preparation
Started: 4/8/22 08:50
Finished: 4/8/22 13:45
By: GRIVERA
Comments

Preparation Information Benchsheet

Prep Run#: 397793
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 4/8/22 08:50

Comments:

Reviewed By: GGR Date: 4/8/22

Chain of Custody

Relinquished By:		Date:		Extracts Examined
Received By:		Date:		Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1411
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW06-200406	**Units:**	µg/L
Lab Code:	E2200297-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**24.7**		0.100	0.0500	0.0250	1	4/ 8/22	4/8/22 14:46	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1051
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW08-220406	**Units:**	µg/L
Lab Code:	E2200297-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**83.4**		1.00	0.500	0.250	10	4/ 8/22	4/8/22 16:30	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1516
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW11-200406	**Units:**	µg/L
Lab Code:	E2200297-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1020**		5.00	2.50	1.25	50	4/ 8/22	4/8/22 16:38	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1226
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW12-200406	**Units:**	µg/L
Lab Code:	E2200297-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**141000**		500	250	125	5000	4/ 8/22	4/8/22 16:45	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1226
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW12-200406-A	**Units:**	µg/L
Lab Code:	E2200297-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**101000**		500	250	125	5000	4/ 8/22	4/8/22 16:53	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1556
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW14-200406	**Units:**	µg/L
Lab Code:	E2200297-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.48**		0.100	0.0500	0.0250	1	4/ 8/22	4/8/22 15:50	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1646
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW13-200406	**Units:**	µg/L
Lab Code:	E2200297-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**514**		2.00	1.00	0.500	20	4/ 8/22	4/8/22 17:01	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2200138-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	4/ 8/22	4/8/22 14:38	397793	760120	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS22040354
Sample Matrix: Water

Service Request: E2200297
Date Analyzed: 4/ 8/22

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 397793

	Lab Control Sample EQ2200138-02			Duplicate Lab Control Sample EQ2200138-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.113	0.100	113	0.110	0.100	110	84 - 119	3	15

Results flagged with an asterisk (*) indicate values outside control criteria.

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

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2200138-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.113**		0.100	0.0500	0.0250	1	4/ 8/22	4/8/22 14:22	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2200138-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.110**		0.100	0.0500	0.0250	1	4/ 8/22	4/8/22 13:59	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/6/22
Sample Matrix:	Water	**Date Received:**	4/7/22
		Date Analyzed:	4/ 8/22

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	50WW14-200406	**Units:**	µg/L
Lab Code:	E2200297-006	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		50WW14-200406MS				50WW14-200406DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2200138-06				EQ2200138-07					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.48	1.33	0.100	-152	#	1.24	0.100	-239	#	84 - 119	7	15

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

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1556
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW14-200406	**Units:**	µg/L
Lab Code:	EQ2200138-06	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.33**		0.100	0.0500	0.0250	1	4/ 8/22	4/8/22 16:06	397793	760120	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2200297
Project:	HS22040354	**Date Collected:**	4/ 6/22 1556
Sample Matrix:	Water	**Date Received:**	4/ 7/22
Sample Name:	50WW14-200406	**Units:**	µg/L
Lab Code:	EQ2200138-07	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.24**		0.100	0.0500	0.0250	1	4/ 8/22	4/8/22 16:14	397793	760120	

Pace Analytical®

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 05/03/2022

Report # 222040926

Project HS22040354

Samples Collected 4/6/22

Deliver To	***Additional Recipients***
Ragen Giga ALS Houston 10450 Stancliff Rd Suite 210 Houston, TX 77099 281-530-5656	Jumoke Lawal, ALS Houston

PJLA Testing DoD ELAP

ISO 17025

NELAP ACCREDITED TNI LABORATORY

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

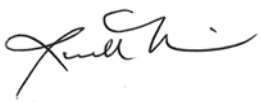
J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.



Authorized Signature
Pace Gulf Coast Report 222040926

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ALS Environmental - Houston, TX **Report:** 222040926

Pace Analytical Gulf Coast received and analyzed the sample(s) listed
on the Report Sample Summary page of this report. Receipt of the sample(s) is documented
by the attached chain of custody. This applies only to the sample(s) listed in this report.
No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.3 as specified in the contract.

This report is being revised to update the sample IDs to the client identifications rather than the lab IDs.

No anomalies were found for the analyzed sample(s).

Pace Analytical

Report#: 222040926
Project ID: HS22040354 **Report Date:** 05/03/2022

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22204092601	50WW06-200406	Water	4/06/22 14:11	4/08/22 09:45
22204092602	50WW11-200406	Water	4/06/22 15:16	4/08/22 09:45
22204092603	50WW12-200406	Water	4/06/22 12:26	4/08/22 09:45
22204092604	50WW12-200406-A	Water	4/06/22 12:26	4/08/22 09:45
22204092605	50WW14-200406	Water	4/06/22 15:56	4/08/22 09:45
22204092606	50WW14-200406	Water	4/06/22 15:56	4/08/22 09:45
22204092607	50WW14-200406	Water	4/06/22 15:56	4/08/22 09:45
22204092608	50WW13-200406	Water	4/06/22 16:46	4/08/22 09:45

Pace Analytical

Report#: 222040926
Project ID: HS22040354 **Report Date:** 05/03/2022

Test Summary

EPA RSK-175					
Lab ID	**Client ID**	**Matrix**	**Batch**	**Instru**	**RunDate**
22204092601	50WW06-200406	Water	738688	GCV8B	4/19/22 10:25
22204092602	50WW11-200406	Water	738688	GCV8B	4/19/22 10:34
22204092603	50WW12-200406	Water	738688	GCV8B	4/19/22 10:47
22204092604	50WW12-200406-A	Water	738688	GCV8B	4/19/22 11:10
22204092605	50WW14-200406	Water	738688	GCV8B	4/19/22 11:17
22204092606	50WW14-200406	Water	738688	GCV8B	4/19/22 11:25
22204092607	50WW14-200406	Water	738688	GCV8B	4/19/22 11:35
22204092608	50WW13-200406	Water	738688	GCV8B	4/19/22 11:48

Manual Integrations

Manual Integrations for LC and IC (if performed) are documented in the raw data.
No other manual integrations were performed by Pace Gulf Coast.

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

EPA RSK-175						
Lab ID	**Client ID**	**Parameter**	**Units**	**Result**	**Dil.**	**%Moist**
22204092601	50WW06-200406	Carbon Dioxide	ug/L	36400	5	NA
22204092602	50WW11-200406	Carbon Dioxide	ug/L	61400	5	NA
22204092603	50WW12-200406	Carbon Dioxide	ug/L	83700	5	NA
22204092604	50WW12-200406-A	Carbon Dioxide	ug/L	96000	50	NA
22204092605	50WW14-200406	Carbon Dioxide	ug/L	65700	50	NA
22204092608	50WW13-200406	Carbon Dioxide	ug/L	50100	50	NA

Pace Analytical

Report#: 222040926
Project ID: HS22040354 **Report Date:** 05/03/2022

Sample Results

50WW06-200406

Collect Date	04/06/2022 14:11	**Lab ID**	22204092601
Receive Date	04/08/2022 09:45	**Matrix**	Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	5	04/19/22 10:25	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	36400	635	1930	4500	ug/L

50WW11-200406

Collect Date	04/06/2022 15:16	**Lab ID**	22204092602
Receive Date	04/08/2022 09:45	**Matrix**	Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	5	04/19/22 10:34	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	61400	635	1930	4500	ug/L

50WW12-200406

Collect Date	04/06/2022 12:26	**Lab ID**	22204092603
Receive Date	04/08/2022 09:45	**Matrix**	Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	5	04/19/22 10:47	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	83700	635	1930	4500	ug/L

50WW12-200406-A

Collect Date	04/06/2022 12:26	**Lab ID**	22204092604
Receive Date	04/08/2022 09:45	**Matrix**	Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	04/19/22 11:10	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	96000	6350	19300	45000	ug/L

Pace Analytical

Report#: 222040926
Project ID: HS22040354 **Report Date:** 05/03/2022

Sample Results

50WW14-200406

Collect Date 04/06/2022 15:56 **Lab ID** 22204092605
Receive Date 04/08/2022 09:45 **Matrix** Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	04/19/22 11:17	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	65700	6350	19300	45000	ug/L

50WW14-200406

Collect Date 04/06/2022 15:56 **Lab ID** 22204092606
Receive Date 04/08/2022 09:45 **Matrix** Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	04/19/22 11:25	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	70100	6350	19300	45000	ug/L

50WW14-200406

Collect Date 04/06/2022 15:56 **Lab ID** 22204092607
Receive Date 04/08/2022 09:45 **Matrix** Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	04/19/22 11:35	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	73500	6350	19300	45000	ug/L

50WW13-200406

Collect Date 04/06/2022 16:46 **Lab ID** 22204092608
Receive Date 04/08/2022 09:45 **Matrix** Water

EPA RSK-175

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	50	04/19/22 11:48	738688	AWE	NA

CAS#	Parameter	Result	DL	LOD	LOQ	Units
124-38-9	Carbon Dioxide	50100	6350	19300	45000	ug/L

Pace Analytical

Report#: 222040926
Project ID: HS22040354 **Report Date:** 05/03/2022

GC Volatiles QC Summary

Analytical Batch 738688	Client ID	MB738688		LCS738688				LCSD738688				
	Lab ID	2334220		2334221				2334222				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	04/19/22 10:06		04/19/22 09:41				04/19/22 09:49				
	Matrix	Water		Water				Water				
EPA RSK-175		Units Result	ug/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Carbon Dioxide	124-38-9	386U	386	5800	5830	101	38 - 147	5800	7420	128	24	40

Analytical Batch 738688	Client ID	50WW14-200406		50WW14-200406				50WW14-200406				
	Lab ID	22204092605		22204092606				22204092607				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	04/19/2022 11:17		04/19/22 11:25				04/19/22 11:35				
	Matrix	Water		Water				Water				
EPA RSK-175		Units Result	ug/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Carbon Dioxide	124-38-9	65700	19300	5800	70100	76	38 - 147	5800	73500	134	5	40

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

SAMPLING STATE: **Dept of Defense** **COC ID:** **18532**

SUBCONTRACT TO:

Pace Analytical
7979 Innovation Park Drive
Baton Rouge, LA 70820

Phone: +1 225 769 4900

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS22040354
TSR:	Ron Martino

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE	
1.	**HS22040354-02**	**50WW06-200406**	**Groundwater**	**06 Apr 2022 14:11**	1
	SUB to Pace Baton Rouge RSK 175 CO2			21 Apr 2022	
2.	**HS22040354-04**	**50WW11-200406**	**Groundwater**	**06 Apr 2022 15:16**	2
	SUB to Pace Baton Rouge RSK 175 CO2			21 Apr 2022	
3.	**HS22040354-05**	**50WW12-200406**	**Groundwater**	**06 Apr 2022 12:26**	3
	SUB to Pace Baton Rouge RSK 175 CO2			21 Apr 2022	
4.	**HS22040354-06**	**50WW12-200406-A**	**Groundwater**	**06 Apr 2022 12:26**	4
	SUB to Pace Baton Rouge RSK 175 CO2			21 Apr 2022	
5.	**HS22040354-07**	**50WW14-200406**	**Groundwater**	**06 Apr 2022 15:56**	5, 6, 7
	SUB to Pace Baton Rouge RSK 175 CO2			21 Apr 2022	
6.	**HS22040354-08**	**50WW13-200406**	**Groundwater**	**06 Apr 2022 16:46**	8
	SUB to Pace Baton Rouge RSK 175 CO2			21 Apr 2022	

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS22040354-07 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Client ID: ALS Houston - ALS Environmental - Houston, TX
SDG: 222040926
PM: RWe

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense **COC ID:** 18532

Relinquished By: FedEx Date/Time: 4/8/22 9.45

Received By: Date/Time: 4/8/22 9.45

Cooler ID(s): 5300 5230 1590 Temperature(s): 3.2 E3Y

Client ID: ALS Houston - ALS Environmental - Houston, TX

SDG: 222040926

PM: RWe

Pace Analytical®

SAMPLE RECEIVING CHECKLIST

222040926

SAMPLE DELIVERY GROUP 222040926	
Client **PM** RWe ALS Houston - ALS Environmental - Houston, TX	**Transport Method** FEDEX
Profile Number 294458	**Received By** Roberts, George S.
Line Item(s) 1 - CO2	**Receive Date(s)** 04/08/22

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☐	☑

COOLERS

Airbill	Thermometer ID: E34	Temp °C
530052301590		3.2

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

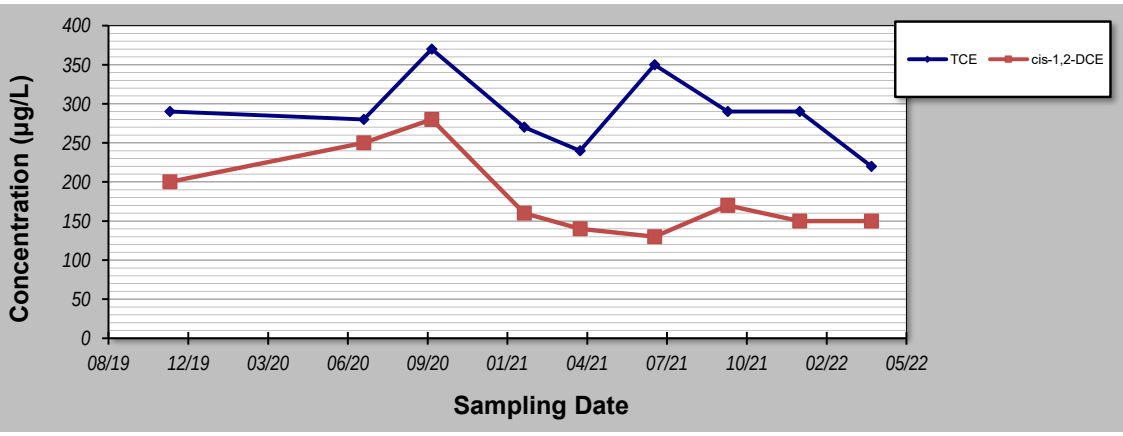
Appendix E

Mann-Kendall Trend Test Results

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	2-Aug-22	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW05
Conducted By:	Sowmya Suryanarayanan	Concentration Units:	µg/L

Sampling Point ID:	TCE	cis-1,2-DCE					
Sampling Event	Sampling Date	50WW05 CONCENTRATION (µg/L)					
1	8-Nov-19	290	200				
2	8-Jul-20	280	250				
3	1-Oct-20	370	280				
4	25-Jan-21	270	160				
5	5-Apr-21	240	140				
6	7-Jul-21	350	130				
7	7-Oct-21	290	170				
8	5-Jan-22	290	150				
9	5-Apr-22	220	150				
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Coefficient of Variation:		0.18	0.26				
Mann-Kendall Statistic (S):		-25	-21				
Confidence Factor:		95.0%	91.3%				
Concentration Trend:		Prob. Decreasing	Prob. Decreasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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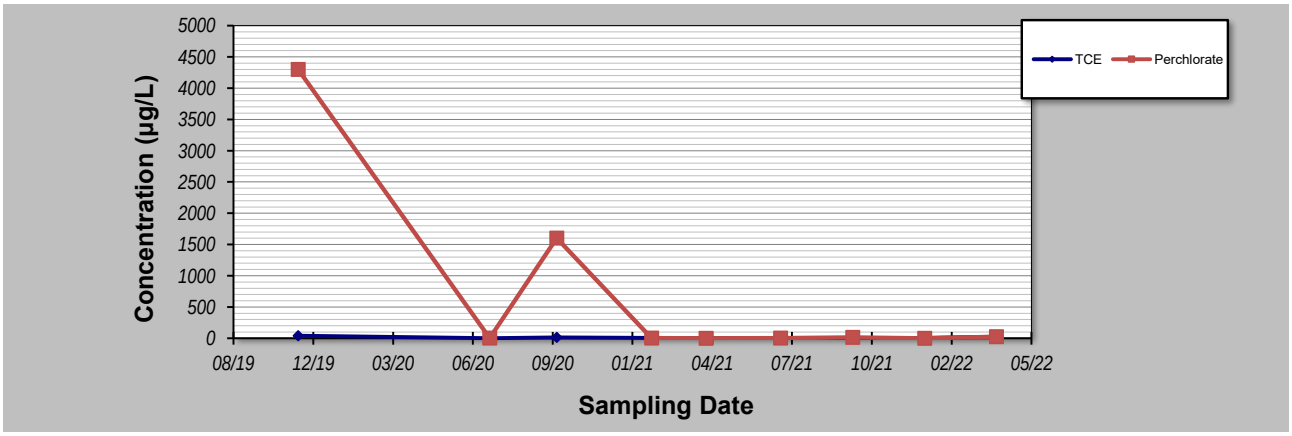
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	2-Aug-22	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW06
Conducted By:	Sowmya Suryanarayanan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate					
Sampling Event	Sampling Date	50WW06 CONCENTRATION (µg/L)					
1	12-Nov-19	41	4300				
2	9-Jul-20	1.3	1.69				
3	1-Oct-20	14	1600				
4	28-Jan-21	4.8	2.78				
5	6-Apr-21	3.1	0.032				
6	8-Jul-21	4.2	1.89				
7	7-Oct-21	2.8	15				
8	5-Jan-22	4.3	0.39				
9	5-Apr-22	23	24.70				
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Coefficient of Variation:		1.15	2.57				
Mann-Kendall Statistic (S):		1	-5				
Confidence Factor:		50.0%	60.6%				
Concentration Trend:		No Trend	No Trend				



Notes:

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2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
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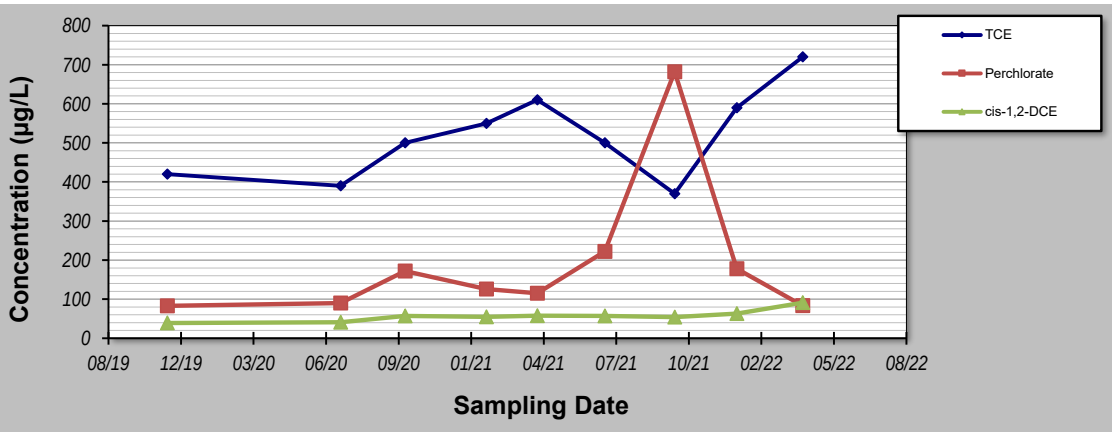
for Constituent Trend Analysis

Evaluation Date: 2-Aug-22
Facility Name: LHAAP-50
Conducted By: Sowmya Suryanarayanan

Job ID: 501032
Constituent: 50WW08
Concentration Units: µg/L

Sampling Point ID:	TCE	Perchlorate	cis-1,2-DCE				
Sampling Event	Sampling Date	50WW08 CONCENTRATION (µg/L)						
1	12-Nov-19	420	83	39				
2	8-Jul-20	390	89.8	41				
3	5-Oct-20	500	172	57				
4	25-Jan-21	550	126	55				
5	5-Apr-21	610	115	58				
6	7-Jul-21	500	222	57				
7	11-Oct-21	370	682	54				
8	5-Jan-22	590	178	63				
9	6-Apr-22	720	83.4	91				
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.22	0.94	0.26				
Mann-Kendall Statistic (S):		28	9	23				
Confidence Factor:		98.4%	72.9%	99.1%				
Concentration Trend:		Increasing	No Trend	Increasing				



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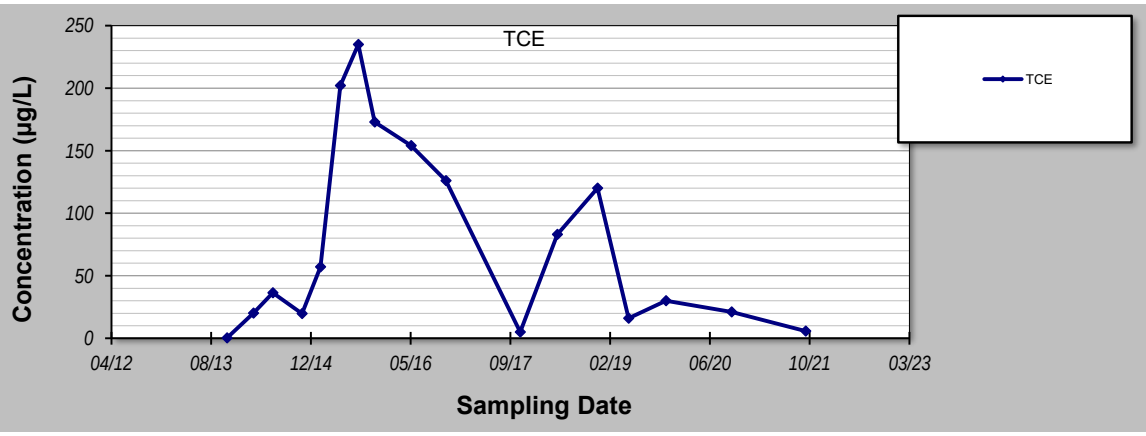
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 2-Aug-22
Facility Name: LHAAP-50
Conducted By: Sowmya Suryanarayanan

Job ID: 501032
Constituent: 50WW09
Concentration Units: µg/L

Sampling Point ID: TCE

Sampling Event	Sampling Date	50WW09 CONCENTRATION (µg/L)
1	1-Nov-13	0.26
2	14-Mar-14	20.2
3	19-Jun-14	36.3
4	12-Nov-14	19.8
5	13-Feb-15	57
6	23-May-15	202
7	21-Aug-15	235
8	11-Nov-15	173
9	12-May-16	154
10	3-Nov-16	126
11	10-Nov-17	4.9
12	15-May-18	83
13	3-Dec-18	120
14	7-May-19	16
15	11-Nov-19	30
16	5-Oct-20	21
17	11-Oct-21	5.7
18		
19		
20		
Coefficient of Variation:		1.00
Mann-Kendall Statistic (S):		-12
Confidence Factor:		67.2%
Concentration Trend:		Stable



Notes:

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GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	2-Aug-22	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW11
Conducted By:	Sowmya Suryanarayanan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate	cis-1,2-DCE	1,1-DCE	1,2-DCA		
Sampling Event	Sampling Date	50WW11 CONCENTRATION (µg/L)						
1	12-Nov-19	3000	8000	58	26	28		
2	9-Jul-20	1600	4880	29	15	13		
3	1-Oct-20	3300	6630	74	35	26		
4	28-Jan-21	250	651	6.7	2.1	2.4		
5	6-Apr-21	200	421	5.3	2	1.8		
6	8-Jul-21	1100	2670	20	9.9	0.5		
7	7-Oct-21	1200	4500	33	9.3	15		
8	6-Jan-22	1300	4200	29	9.5	12		
9	6-Apr-22	530	1020	19	3.3	3.1		
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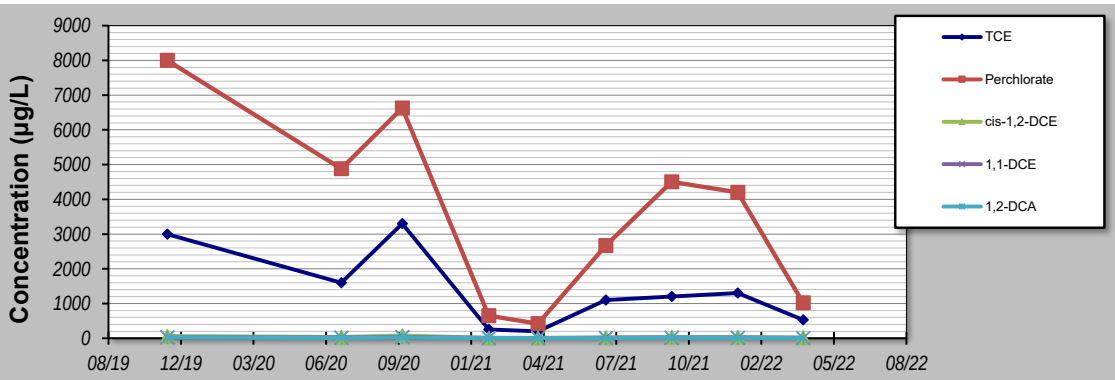
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.80	0.73	0.74	0.91	0.92		
Mann-Kendall Statistic (S):		-10	-14	-9	-14	-14		
Confidence Factor:		82.1%	91.0%	79.2%	91.0%	91.0%		
Concentration Trend:		Stable	Prob. Decreasing	Stable	Prob. Decreasing	Prob. Decreasing		



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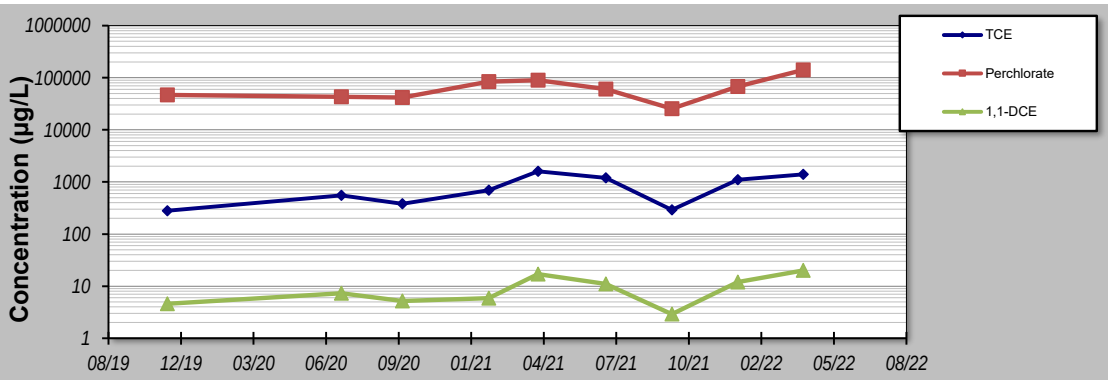
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 2-Aug-22
Facility Name: LHAAP-50
Conducted By: Sowmya Suryanarayanan

Job ID: 501032
Constituent: 50WW12
Concentration Units: µg/L

Sampling Point ID:	TCE	Perchlorate	1,1-DCE	1,2-DCA			
Sampling Event	Sampling Date	50WW12 CONCENTRATION (µg/L)						
1	12-Nov-19	280	47000	4.6	2.7			
2	9-Jul-20	550	43000	7.3	4.4			
3	1-Oct-20	380	41600	5.2	3			
4	28-Jan-21	690	83800	5.9	5.8			
5	6-Apr-21	1600	90000	17	11			
6	8-Jul-21	1200	60300	11	0.5			
7	7-Oct-21	290	25500	2.9	2.5			
8	6-Jan-22	1100	68100	12	9.3			
9	6-Apr-22	1400	141000	20	10			
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.60	0.52	0.62	0.69			
Mann-Kendall Statistic (S):		16	10	16	10			
Confidence Factor:		94.0%	82.1%	94.0%	82.1%			
Concentration Trend:		Prob. Increasing	No Trend	Prob. Increasing	No Trend			



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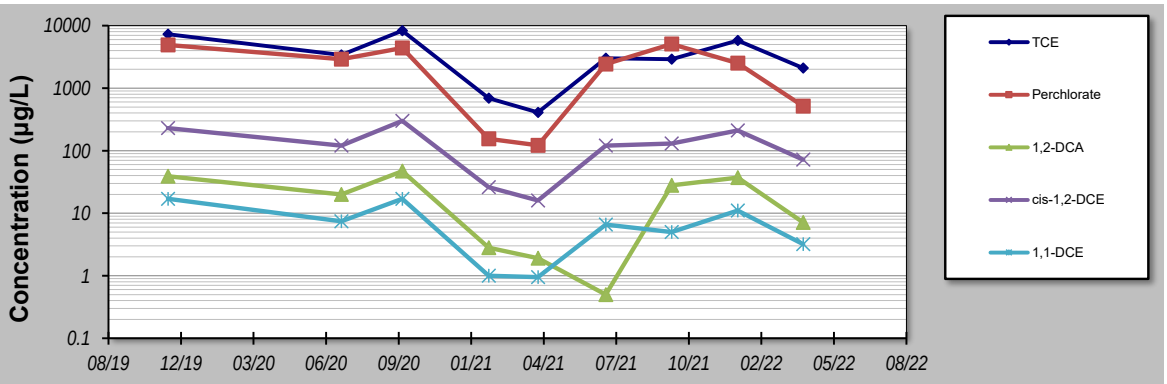
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	2-Aug-22	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW13
Conducted By:	Sowmya Suryanarayanan	Concentration Units:	µg/L

Sampling Point ID:	TCE	Perchlorate	1,2-DCA	cis-1,2-DCE	1,1-DCE		
Sampling Event	Sampling Date	50WW13 CONCENTRATION (µg/L)						
1	13-Nov-19	7300	4900	39	230	17		
2	9-Jul-20	3400	2900	20	120	7.4		
3	1-Oct-20	8300	4390	47	300	17		
4	28-Jan-21	690	155	2.8	26	1		
5	6-Apr-21	410	122	1.9	16	0.95		
6	8-Jul-21	3000	2420	0.5	120	6.6		
7	7-Oct-21	2900	5080	28	130	5		
8	6-Jan-22	5800	2500	37	210	11		
9	6-Apr-22	2100	514	7.1	72	3.2		
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.74	0.77	0.89	0.70	0.80		
Mann-Kendall Statistic (S):		-10	-8	-8	-5	-11		
Confidence Factor:		82.1%	76.2%	76.2%	65.7%	84.6%		
Concentration Trend:		Stable	Stable	Stable	Stable	Stable		



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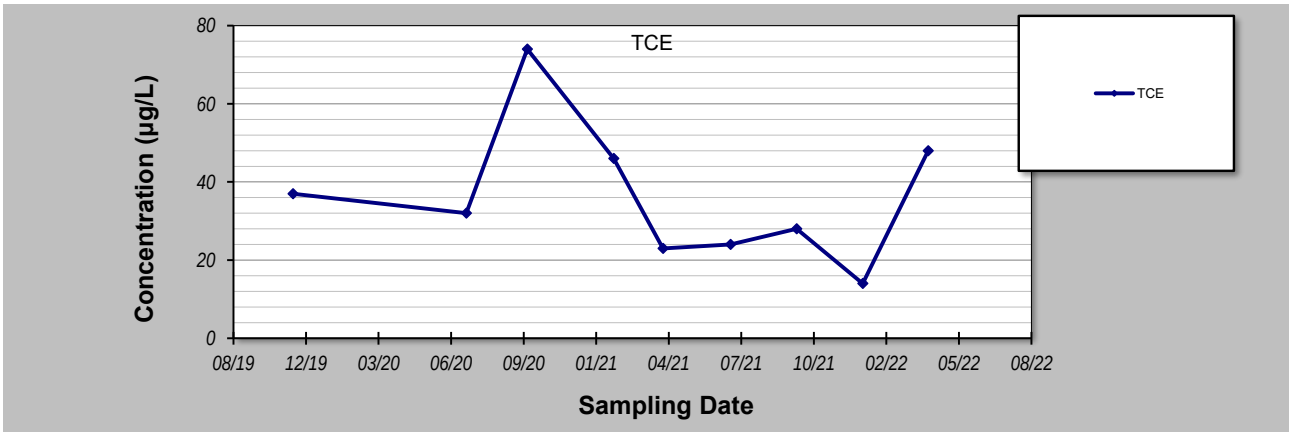
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	2-Aug-22	Job ID:	501032
Facility Name:	LHAAP-50	Constituent:	50WW14
Conducted By:	Sowmya Suryanarayanan	Concentration Units:	µg/L

Sampling Point ID: TCE

Sampling Event	Sampling Date	50WW14 CONCENTRATION (µg/L)
1	13-Nov-19	37
2	9-Jul-20	32
3	1-Oct-20	74
4	28-Jan-21	46
5	6-Apr-21	23
6	8-Jul-21	24
7	7-Oct-21	28
8	6-Jan-22	14
9	6-Apr-22	48
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
Coefficient of Variation:		0.49
Mann-Kendall Statistic (S):		-8
Confidence Factor:		76.2%
Concentration Trend:		Stable



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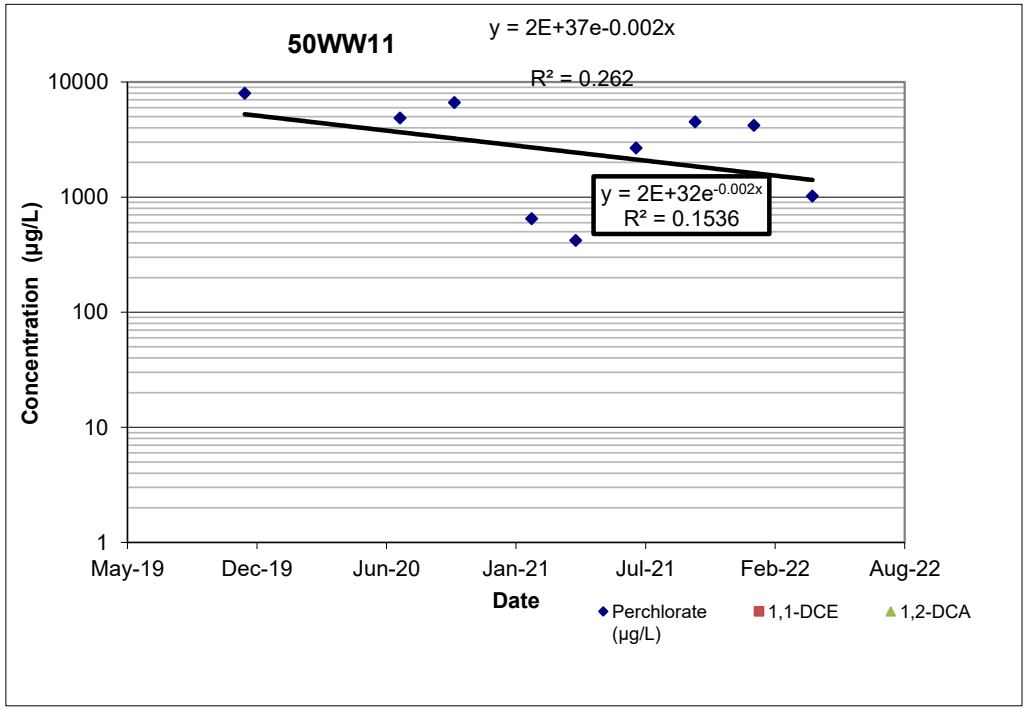
Appendix F

Degradation Rates

Time-Dependent Attenuation Rate Constant and Estimated Cleanup Time

50WW11

Date	Perchlorate (µg/L)		
12-Nov-19	8000		
9-Jul-20	4880		
1-Oct-20	6630		
28-Jan-21	651		
6-Apr-21	421		
8-Jul-21	2670		
7-Oct-21	4500		
6-Jan-22	4200		
6-Apr-22	1020		



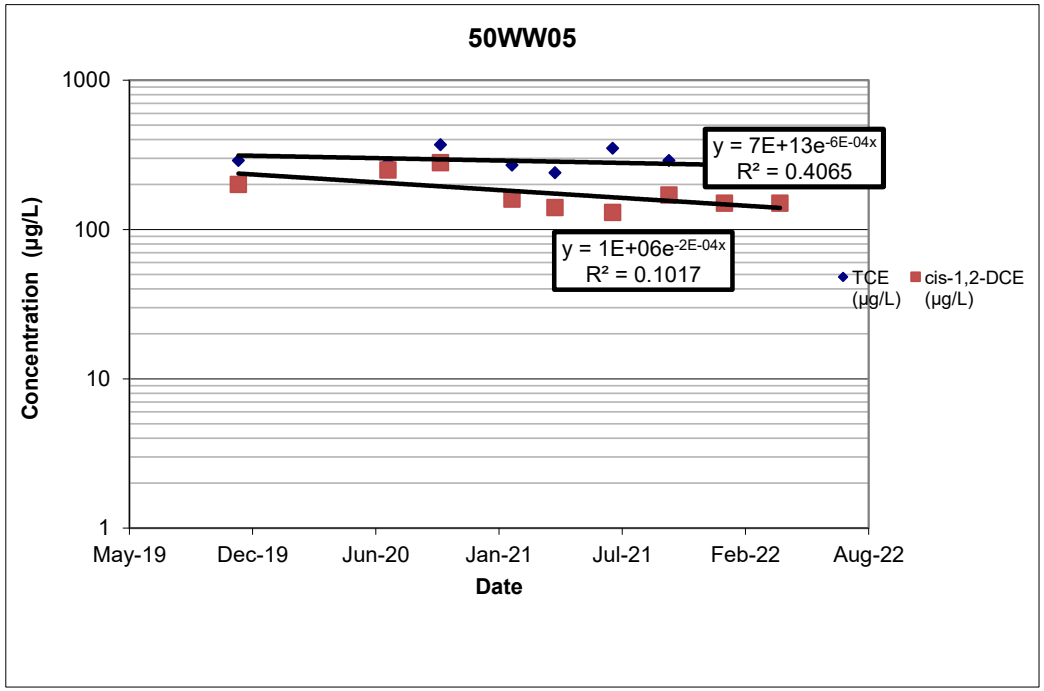
Chemical	Attenuation Rate Constant (day^{-1})	Attenuation Half-life (days)	Attenuation Half-life (years)	Current Conc. (µg/L)	Target Concentration (µg/L)	Estimated Cleanup Time (years)
Perchlorate	0.00200	346.6	0.9	1020	17	5.6

Notes:

The estimated cleanup time was calculated as the time it would take the most recent detected PCE concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.
µg/L - micrograms per liter
MCL - maximum contaminant level
TCE - trichloroethene

Time-Dependent Attenuation Rate Constant and Estimated Cleanup Time
50WW05

Date	TCE (µg/L)	cis-1,2-DCE (µg/L)	
8-Nov-19	290	200	
8-Jul-20	280	250	
1-Oct-20	370	280	
25-Jan-21	270	160	
5-Apr-21	240	140	
7-Jul-21	350	130	
7-Oct-21	290	170	
5-Jan-22	290	150	
5-Apr-22	220	150	



Chemical	Attenuation Rate Constant (day^{-1})	Attenuation Half-life (days)	Attenuation Half-life (years)	Current Conc. (µg/L)	Target Concentration (µg/L)	Estimated Cleanup Time (years)
TCE	0.00060	1155.2	3.2	220	5	17.3
cis-1,2-DCE	0.00020	3465.7	9.5	150	70	10.4

Notes:

The estimated cleanup time was calculated as the time it would take the most recent detected PCE concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.
µg/L - micrograms per liter
MCL - maximum contaminant level
TCE - trichloroethene

Subject: **Final Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting: **WebEx meeting**
Date of Meeting: **18 January 2023 – 10:00 AM Central Standard Time (CST)**

Attendees:

Army BRAC:	Rose M. Zeiler (RMZ)
USEPA:	Brian Follin (BF); Tim Bartos and Chris Braun with United States Geological Survey (USGS) in support of the United States Environmental Protection Agency (USEPA)
USACE:	Chelsea Montoya and Aaron Williams
TCEQ:	April Palmie (ABP)
USFWS:	Paul Bruckwicki (PB)
Bhate:	Kim Nemmers (KN), Scott Beesinger (SB) and Zachary Beck (ZB)
APTIM:	William Foss (WF) and Praveen Srivastav (PS)
TLI:	Jon Tatman (JT)
HDR:	Amita Patel, Gregory Kelly (GK) and Phil Werner (PW)

Defense Environmental Restoration Program (DERP) Performance-Based Remediation Update

There were no outstanding action items to discuss**.**

Groundwater Treatment Plant (GWTP) – ZB stated that pipes and fittings failed due to freezing conditions in December 2022, despite efforts to protect the system. ZB said that the system was operating in recycle. SB said that all repairs were completed for the most part. SB said that Tank 630 needs to be full to discharge. SB said the fluidized bed reactor (FBR) appears to have recovered based on the observed oxidation reduction potential readings. SB then clarified that the analytical results were needed to be sure that the bacteria was properly treating the perchlorate. SB said that the GWTP is being operated multiple times a week to fill up the system to allow treatment. SB said that further repairs to the pretreatment system will be completed the following week and is expected to take several days. SB plans to purchase a plumbing snake to aid in clearing out the piping. ZB clarified that Tank 630 is the FBR feed tank to which SB confirmed. RMZ asked to add an action item for Bhate to notify the Regulators and Army when the FBR is able to come out of recycle mode. ZB then added that the repairs to the pretreatment system will allow increased flow within the GWTP system.

Field Work – SB said that he had completed groundwater sampling at LHAAP-18/24, -58, -12 and -17 had been completed to date. Groundwater sampling at LHAAP-16 was commencing on 19 January 2023. PS added that groundwater sampling was planned for February 2023 at LHAAP-04 and LHAAP-46.

ZB asked everyone to refer to the Document and Issues (DI) Tracking Table dated 18 January 2023.

- **Task 1** (Project Management) – ZB said that the November 2022 Monthly Manager's Meeting (MMM) minutes were issued final on 12 December 2022. He also noted that there was no December 2022 MMM but that a DI tracking table and validated data had been sent out via electronic mail. ZB reminded everyone that the next Restoration Advisory Board (RAB) meeting was planned for 15 February 2022 and that the draft meeting minutes from the November 2022 RAB were under regulatory review.
- **Task 4** (LHAAP-04) – PS stated that the Year 3 Remedial Action-Operation (RA-O) Report is in progress with an estimated delivery to the Regulators in January 2023.

- **Task 5** (LHAAP-12) – PS said that the 2022 annual sampling event was completed in January 2023 as SB had discussed such that the validated data deliverable would be presented at the February 2023 MMM.
- **Task 6** (LHAAP-16) – PS said that the Year 3, Semiannual Event 2 groundwater sampling would be completed in late January 2023. Validated data would be available for the March 2023 MMM. PS noted that comments were received on the Year 2 RA-O Report and that responses were being prepared.
- **Task 9** (LHAAP-37) – PS said that the Year 6 RA-O annual sampling event was completed in November 2022 with the validated data deliverable was included in the package for the January 2023 MMM. PS noted that regulatory comments were received on the Draft Year 5 RA-O Report and that responses were being prepared for submittal this month.
- **Task 10** (LHAAP-46) – PS stated that Year 8 RA-O report is in progress and planned to be submitted in January.
- **Task 11** (LHAAP-50) **–** PS said that the Year 8 RA-O Report response to regulatory comments was being prepared. He said that a notification would be provided if the responses would be issued later than the end of January 2023. PS said that the performance sampling Year 3 (Year 9 RA-O), 1st semiannual sampling event was completed in October 2022 and that the validated data was provided for the meeting. WF then discussed the analytical results. WF stated that the three key wells are 50WW11, 50WW12, 50WW13, which are all upper shallow monitoring wells. WF then pointed out the location of the wells on the figure. WF said that large fluctuations with groundwater elevations are being observed in these wells, particularly in 50WW12. WF said that a 90 percent reduction in trichloroethylene (TCE) and perchlorate at 50WW12 correlates to a 2 feet drop in the water table. Over at 50WW11 and 50WW13 there was an increase in both TCE and perchlorate due to the water table drop. WF said there may be an east-west component to this observation but not a shallow-deep well issue. WF explained that 50WW14 is a deep well that is basically co-located with 50WW13 shows only minor detections. RMZ asked if the direction of groundwater flow had changed. WF said he had not assessed the groundwater flow for October 2022 yet. RMZ said that the drop in groundwater could have also affected groundwater flow that could explain this data. RMZ asked if there was any indication of plume migration to which WF said there was not. WF said that perchlorate is being detected in 50WW29 but below screening values and there are downgradient wells. RMZ asked if 50MWW29 had previously exceeded for perchlorate to which WF clarified that the groundwater from the well has not had exceedances for perchlorate although perchlorate is currently detected. WF added that there are additional downgradient wells that provide delineation. PS said that low level detections of perchlorate had been reported previously in 50MWW29.
- **Task 12** (LHAAP-58) – ZB stated that the Year 8 RA-O Report was submitted to the Regulators on 9 January 2023 and was currently under regulatory review. He said that the Year 9 RA-O sampling was completed in January 2023.
- **Task 13** (LHAAP-67) – PS stated that Year 9 annual sampling event was completed in November 2022 and the validated data would be provided for discussion at the February 2023 MMM.
- **Task 14** (LHAAP-001-R-01 and LHAAP-003-R-01) – ZB said that land use control (LUC) Report for LHAAP-001-R-01 and LHAAP-003-R-01 is awaiting EPA input and that a TCEQ email indicating no comments was received on 22 November 2022. ZB said that he would follow up with an email to BF.

- **Task 16** (GWTP) **–** ZB said that 3rd Quarter GWTP was submitted 6 January 2023. ZB said that the 4th quarter report is being prepared.
- **Task 17** (LHAAP-18/24) – ZB said that the 2nd semiannual sampling event was completed in January 2023.
- **Task 18** (Surface Water) – ZB said that the surface water samples were collected in December 2022 and that the validated data is included in the data package. ZB said that the annual Surface Water Data Transmittal was also provided.
- **Task 19** (2022 LUC Management Plan) – ZB stated that all signatures were received and was confirming who needed hard copies. ZB indicated that RMZ, PB and BF had received hard copies in previous years. BF said that EPA does not need a hard copy. RMZ indicated she was good with the receipt of the hard copy.
- **Administrative Record (AR) –** PS said that the July – September 2022 AR is currently being printed. Following the quality control process review of the hard copies, the AR will ship late January or early February 2023. PS said that the October to December 2023 AR list is currently being prepared.

Update on other DERP Sites:

- **LHAAP 18/24 –** PW stated that the 90 percent (%) remedial design (RD) is being prepared and would include the Regulator comments on the 60% RD. RTCs on the 60% RD are also being prepared.
- **LHAAP-29** – PW stated that the 90% RD is being prepared and will include the Regulator comments on the 60% RD. RTCs on the 60% RD are also being prepared. PW said that the 90% RD will be sent to the Regulators in April 2023.
- **LHAAP-47** – PW introduced GK as the lead for LHAAP-47 RD. GK said that the Draft Pre-Design Investigation (PDI) Work Plan is in the review process, with a tentatively delivery date of the end of January 2023 to the Regulators. The PDI field work is planned for Spring 2023.
- **LHAAP-17** –JT said that the Army had provided comments on the Interim Remedial Action Completion Report (RACR) and that TLI-MMG- JV was currently addressing. ZB stated that LHAAP-17 monthly performance monitoring was completed in January 2023 and would be discussed at the February 2023 MMM. ZB added that the LHAAP-17 extraction system performance discussion would be included in the February RAB. ABP asked when the Draft RACR would go to the Regulators. JT stated that the Draft RACR will be submitted to the Regulators in late February 2023 or early March 2023.

Community Implementation Plan:

RMZ noted that the next step is interviews and that the public notice has been completed. BF asked which newspaper the notice was published. RMZ said it was the Marshall News Messenger but that she would confirm.

Five-Year Review:

RMZ stated that a Five-Year Review (FYR) Site Inspection will be completed on 14 February 2023. RMZ said information will be sent out upon confirmation of the schedule.

PFAS Update: RMZ said that there were some sample issues requiring resampling, which has been completed. The contractor is awaiting the analytical data at this time.

Transfer Update. RMZ said that TCEQ and EPA have provided no comment/approval of the Environmental Condition of Property. PB had no updates.

Schedule Next Managers' Meeting: The next MMM will be held on Wednesday, 15 February 2023 at 3:00 pm CST at the LHAAP trailer.

Meeting concluded at approximately 10:45 am CST.

Action Items

1. ZB to provide notice when the GWTP is out of recycle to the Regulators.
2. RMZ to provide FYR schedule.
3. RMZ to provide EPA documentation of community implementation plan notice to Marshall News Messenger.

ACRONYM LIST

%	percent
µg/L	micrograms per liter
ABP	April Palmie
APTIM	APTIM Federal Services, LLC
AR	Administrative Record
AW	Aaron Williams
BF	Brian Follin
Bhate	Bhate Environmental Associates, Inc.
BRAC	Base Realignment and Closure
CST	Central Standard Time
DERP	Defense Environmental Restoration Program
DI	Documents and Issues
FBR	Fluidized Bed Reactor
FYR	Five Year Review
GK	Gregory Kelly
GWTP	Groundwater Treatment Plant
JT	Jon Tatman
LHAAP	Longhorn Army Ammunition Plant
LUC	Land Use Control
MMM	Monthly Managers' Meeting
PB	Paul Bruckwicki
PDI	Pre-Design Investigation
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RA-O	Remedial Action – Operation
RD	Remedial Design
RMZ	Rose M. Zeiler
SB	Scott Beesinger
TCE	Trichloroethylene
TCEQ	Texas Commission on Environmental Quality
TCRA	Time Critical Removal Action
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WF	William (Bill) Foss
ZB	Zachary Beck

LHAAP Validated Data
January 2023 Monthly Managers Meeting

LHAAP Surface Water	*Quarterly Perchlorate Sampling - December 2022 and January 2023* Perchlorate (6850)
GWTP Effluent	*Weekly Perchlorate Sampling – December 2022* Perchlorate (6850)
LHAAP-50	*Remedial Action Operation Monitoring (Year 3, Semiannual 1)-October 2022* Volatile Organic Compounds (8260C) Perchlorate (EPA 6850) Chloride, Nitrate, Nitrite, and Sulfate (SW9056A) Total Organic Carbon (SM5310B) Methane, Ethane, Ethene, and Carbon Dioxide (RSK-175) Field Measurements (Dissolved Oxygen, Oxidation Reduction Potential, Ferrous Iron, and pH)

LHAAP-Quarterly Surface Water Sampling

December 2022 (Quarter 4)

Location ID: / Sample Date:	Units	PCL	HBW7_121422 12/14/22	HBW7_121422_a 12/14/22	HBW10_121422 12/14/22	HBW1_121422 12/14/22	GPW1_121422 12/14/22	GPW3_121422 12/14/22
Perchlorate (6850)			Harrison Bayou				Goose Prairie Creek	
Perchlorate	µg/L	17	**0.125**	**0.117**	**1.39**	**1.58**	**1.30**	**0.938**

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

LHAAP-Quarterly Surface Water Sampling

January 2023 (Quarter 1)

Location ID: / Sample Date:	Units	PCL	HBW7_010523 01/05/23	HBW10_010523 01/05/23	HBW10_010523_a 01/05/23	HBW1_010523 01/05/23	GPW1_010523 01/05/23	GPW3_010523 01/05/23
Perchlorate (6850)			Harrison Bayou				Goose Prairie Creek	
Perchlorate	µg/L	17	**0.133**	**0.0594 J**	**0.0654 J**	**0.0568 J**	**0.153**	**0.137**

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

J - estimated value between the detection limit and limit of quanitation

GWTP Weekly/Effluent Perchlorate Sampling - December 2022

Location ID: / Sample Date:	Units	Daily Maximum Conc	PCL	LH18/24-SP650_121322_BIX 12/13/22	LH18/24-SP650_121322_AIX 12/13/22
Location Description					
				Weekly	Weekly
Perchlorate (6850)					
Perchlorate	µg/L	589	17	< 0.0500 U	**1.41**

µg/L - micrograms per liter

BIX - before ion exchange/AIX - after ion exchange

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

LHAAP-50 Year 3 Semiannual Sampling Event #1
October 2022

		Sample Location	50WW05		50WW06		50WW08		50WW09		50WW11		50WW12			
		Sample ID	50WW05-221010		50WW06-221011		50WW08-221010		50WW09-221010		50WW11-221011		50WW12-221011		50WW12-221011-FD	
		Sample Date	10/10/2022		10/11/2022		10/10/2022		10/10/2022		10/11/2022		10/11/2022		10/11/2022	
		Sample Purpose	REG		REG		REG		REG		REG		REG		FD	
		Location Description	Site 50 - NE, lower shallow, outside site boundary		Site 50 - ENE, outside site boundary		Site 50 - E, upper shallow, inside site boundary		Site 50 - E, lower shallow, inside site boundary		Site 50 - ENE, upper shallow, outside site boundary		Site 50 - ENE, upper shallow, outside site boundary			
Analyte	Units	MCL/PCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Field Measurements																
Dissolved oxygen	mg/L	NV	0.34		0.08		0.2		0.27		0.37		0.35		0.35	
Ferrous Iron	NA	NV	NM		0.4		NM		NM		0.83		0.4		0.4	
Oxidation Reduction Potential	mV	NV	20		166		109		1		64		61		61	
pH	Std units	NV	7.36		6.51		7.56		7.32		7.31		7.25		7.25	
Dissolved Gases (RSK-175)																
Carbon dioxide	µg/L	NV	NA		72,000		NA		NA		74,000		80,000		78,000	
Ethane	µg/L	NV	NA		< 0.5	UJ	NA		NA		< 0.5	UJ	< 0.5	UJ	< 0.5	UJ
Ethylene	µg/L	NV	NA		3.13	J	NA		NA		103	J	< 0.5	UJ	< 0.5	UJ
Methane	µg/L	NV	NA		49.1		NA		NA		484		9860		8290	
General Chemistry (SM5310B/SW9056A)																
Chloride	mg/L	NV	NA		72.7		NA		NA		308		1,160		1,150	
Nitrate	mg/L	NV	NA		0.133		NA		NA		0.0498	J	< 0.5	U	< 0.5	U
Sulfate	mg/L	NV	NA		31.5		NA		NA		389		563		568	
Total organic carbon	mg/L	NV	NA		2.42		NA		NA		1.78		1.69		1.66	
Perchlorate (EPA 6850)																
Perchlorate	µg/L	17	0.109		257		31.1		0.118		6,280		17,600		17,900	
Volatile Organic Compounds (8260C)																
1,1-Dichloroethene	µg/L	7	3.3		< 1	U	1		< 1	U	22		4.5		4.5	
1,2-Dichloroethane	µg/L	5	1.7		< 1	U	1.1		< 1	U	25		0.79	J	0.82	J
cis-1,2-Dichloroethene	µg/L	70	77		1		73		0.54	J	65		< 1	U	< 1	U
Tetrachloroethene	µg/L	5	1.2		< 1	U	1.8		< 1	U	6.5	J	< 1	U	< 1	U
Trichloroethene	µg/L	5	290		20		720		5.8		3,100		180		180	
Vinyl chloride	µg/L	2	< 1	U	< 1	U	< 1	U	< 1	U	< 10	U	< 1	U	< 1	U

Notes:
Blue Highlighting Indicates the concentration exceeds the MCL/PCL
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.
UJ – Undetected estimated. The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.
MCL - Maximum Contaminant Limit
PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level (used for perchlorate,where no MCL has been established)
mg/L - milligrams per liter
µg/L - micrograms per liter
ID - Identification
REG - Regular sample
FD - Field duplicate sample
< - The analyte was not detected above the concentration shown
NV - No MCL/PCL is shown for analytes that are not contaminants of concern
NA - not analyzed
NM - not measured
Std Units - Standard pH Units
mV - millivolts
Val Qual - validation qualifier

LHAAP-50 Year 3 Semiannual Sampling Event #1
October 2022

		Sample Location	50WW13		50WW14		50WW15		50WW16				50WW18		50WW22	
		Sample ID	50WW13-221011		50WW14-221011		50WW15-221010		50WW16-221010		50WW16-221010-FD		50WW18-221010		50WW22-221010	
		Sample Date	10/11/2022		10/11/2022		10/10/2022		10/10/2022		10/10/2022		10/10/2022		10/10/2022	
		Sample Purpose	REG		REG		REG		REG		FD		REG		REG	
		Location Description	Site 50 - E, upper shallow, outside site boundary		Site 50 - E, lower shallow, outside site boundary		Site 50 - NNE, upper shallow, outside site boundary, along Goose Prairie Creek		Site 50 - NE, upper shallow, outside site boundary, along Goose Prairie Creek				Site 50 - NE, upper shallow, outside site boundary, along Goose Prairie Creek		Site 50 - SE, upper shallow, outside site boundary	
Analyte	Units	MCL/PCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Field Measurements																
Dissolved oxygen	mg/L	NV	0.3		0.17		0.46		0.39		0.39		0.09		0.29	
Ferrous Iron	NA	NV	0.54		3.89		NM		NM		NM				NM	
Oxidation Reduction Potential	mV	NV	38		-39		23		52		52		73		129	
pH	Std units	NV	7.38		7.19		7.62		7.36		7.36		7.18		7.43	
Dissolved Gases (RSK-175)																
Carbon dioxide	µg/L	NV	67,000		75,000		NA		NA		NA		NA		NA	
Ethane	µg/L	NV	< 0.5	UJ	1.43	J	NA		NA		NA		NA		NA	
Ethylene	µg/L	NV	1.87	J	< 0.5	UJ	NA		NA		NA		NA		NA	
Methane	µg/L	NV	21.9		5.67		NA		NA		NA		NA		NA	
General Chemistry (SM5310B/SW9056A)																
Chloride	mg/L	NV	291		418		NA		NA		NA		NA		NA	
Nitrate	mg/L	NV	< 0.1	U	< 0.1	U	NA		NA		NA		NA		NA	
Sulfate	mg/L	NV	332		394		NA		NA		NA		NA		NA	
Total organic carbon	mg/L	NV	2.07		1.23		NA		NA		NA		NA		NA	
Perchlorate (EPA 6850)																
Perchlorate	µg/L	17	5,310		0.101		0.0301		< 0.05		< 0.05		< 0.05		0.269	
Volatile Organic Compounds (8260C)																
1,1-Dichloroethene	µg/L	7	14	J	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	46		< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
cis-1,2-Dichloroethene	µg/L	70	280		2.4		2.7		< 1	U	< 1	U	< 1	U	< 1	U
Tetrachloroethene	µg/L	5	< 25	U	< 1	U	1		< 1	U	< 1	U	< 1	U	< 1	U
Trichloroethene	µg/L	5	8,600		33		4.9		< 1	U	< 1	U	< 1	U	< 1	U
Vinyl chloride	µg/L	2	< 25	U	< 1	U	0.56	J	< 1	U	< 1	U	< 1	U	< 1	U

Notes:
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PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level (used for perchlorate,where no MCL has been established)
mg/L - milligrams per liter
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ID - Identification
REG - Regular sample
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< - The analyte was not detected above the concentration shown
NV - No MCL/PCL is shown for analytes that are not contaminants of concern
NA - not analyzed
NM - not measured
Std Units - Standard pH Units
mV - millivolts
Val Qual - validation qualifier

LHAAP-50 Year 3 Semiannual Sampling Event #1
October 2022

		Sample Location	50WW23		50WW29	
		Sample ID	50WW23-221010		50WW29-221011	
		Sample Date	10/10/2022		10/11/2022	
		Sample Purpose	REG		REG	
		Location Description	Site 50 - E, upper shallow, outside site boundary		Site 50 - ENE, upper shallow, outside site boundary	
Analyte	Units	MCL/PCL	Result	Val Qual	Result	Val Qual
Field Measurements						
Dissolved oxygen	mg/L	NV	0.37		0.18	
Ferrous Iron	NA	NV	NM		NM	
Oxidation Reduction Potential	mV	NV	173		34	
pH	Std units	NV	6.82		7.21	
Dissolved Gases (RSK-175)						
Carbon dioxide	µg/L	NV	NA		NA	
Ethane	µg/L	NV	NA		NA	
Ethylene	µg/L	NV	NA		NA	
Methane	µg/L	NV	NA		NA	
General Chemistry (SM5310B/SW9056A)						
Chloride	mg/L	NV	NA		NA	
Nitrate	mg/L	NV	NA		NA	
Sulfate	mg/L	NV	NA		NA	
Total organic carbon	mg/L	NV	NA		NA	
Perchlorate (EPA 6850)						
Perchlorate	µg/L	17	0.142		0.138	
Volatile Organic Compounds (8260C)						
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	< 1	U	< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	< 1	U
Tetrachloroethene	µg/L	5	< 1	U	< 1	U
Trichloroethene	µg/L	5	< 1	U	< 1	U
Vinyl chloride	µg/L	2	< 1	U	< 1	U

Notes:
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J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
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Val Qual - validation qualifier

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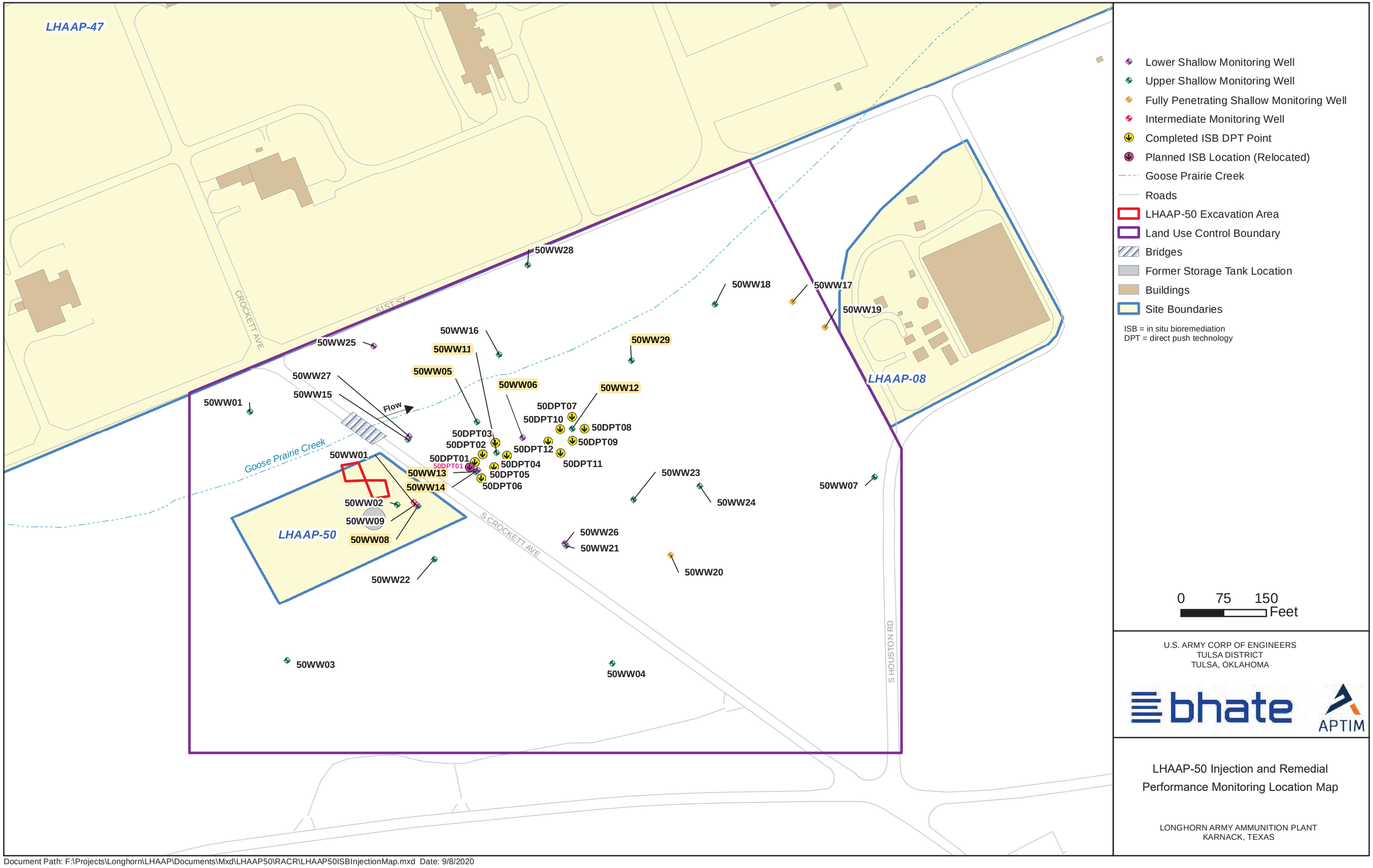

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

LHAAP-50 Injection and Remedial Performance Monitoring Location Map

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP50\RACR\LHAAP50ISBInjectionMap.mxd Date: 9/8/2020

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY ENVIRONMENTAL COMMAND
2455 REYNOLDS ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-7588

March 2, 2023

SUBJECT: Year 8 Annual Remedial Action Operation Report (September 2021 - August 2022), LHAAP-35A (58) Shops Area, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, March 2023

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Dear Ms. Palmie,

An electronic copy of the subject document has been added to the project portal's "Documents" folder at the following address for your review: (https://docs.cbifederalservices.com/sites/501032/regulators/Shared%20Documents/Forms/AllItems.aspx). An electronic copy of this letter and download instructions for the electronic file have been sent via email. The document includes revisions based upon the Environmental Protection Agency's (EPA) comments on the draft version received on February 7, 2023, and the Texas Commission on Environmental Quality's (TCEQ) comments received on January 26, 2023. Tables of responses to the EPA and TCEQ comments on the draft version are included with this draft final document. In accordance with the Federal Facility Agreement, this draft final will be considered final after 30 days without further comment.

The document was prepared by the 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 (726) 999-0505, or by email at lena.j.sierocinski.civ@army.mil.

Sincerely,

Lena Sierocinski

Lena Sierocinski
LHAAP Environmental Support Manager
U.S. Army Environmental Command

Electronic copies furnished:
B. Follin, USEPA Region 6, Dallas, TX
P. Bruckwicki, USFWS, Caddo Lake NWR, TX (1 hard copy and 1 CD)
C. Montoya USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Bowlby, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

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March 2, 2023

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Mr. Brian Follin
U.S. Environmental Protection Agency
1201 Elm Street, Suite 500
Dallas, TX 75270-2002

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U.S. Army Environmental Command

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K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

Response to Comments on
Draft Year 8 RA-O Report, LHAPP-35A (58)
Date: January 26, 2023

Reviewers: April Palmie, TCEQ
Respondent: Lena Sierocinski - USAEC

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/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
1	Section 3, pg. 3-1	Please update reference to remove "draft" from technical memorandum.	C	Concur. Draft will be removed from this reference to the technical memorandum.	
2	Section 3.8, pg. 3-8	TCEQ agrees with the need for additional monitoring wells and the general proposed locations.	C	Noted.	
3	Section 4.1.3.2, pg. 4-7	Please correct this sentence "eastern" to "western" as shown below: No detections of COCs have been observed at boundary area wells 35AWW15, 35AWW16, and 35AWW17; therefore, plume expansion is not occurring along the western extent of the western plume.	C	Concur. The text will be revised as suggested in the comment.	
4	Section 5.2	TCEQ agrees with the recommendations.	C	Noted.	

Response to Comments on
Draft Year 8 Annual Remedial Action Operation Report (September 2021-August 2022) LHAAP-35A (58) Shops Area
Longhorn Army Ammunition Plant Karnack Texas

Document Date: January 6, 2023
Comment Date: February 7, 2023

Reviewers: Brian Follin - USEPA
Respondent: Lena Sierocinski - USAEC

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/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
1	1.3, p. 1-3; 1st paragraph, last sentence	Goose Prairie Creek cited in text but is not shown in figs. 1 or 2.	C	Concur. Goose Prairie Creek will be identified on **Figures 1** and **2**.	
2	Fig. 1	Scales are not provided for the two figs. on the left part of page.	C	Concur. Scale bar and north arrows will be added to smaller inserts.	
3	Fig. 1	The type of shading selected to "surround" the various yellow- and blue-colored geographic names/features renders the names illegible on printed pages (in combination with the small font size).	C	Concur. Alternative image will be used in figure with different text labels applied.	
4	1.3, p. 1-4, 2nd bulleted list	Reference is made to "LHAAP-60"—site is identified as "LHAAP-60**D**" in fig. 2.	C	Figure will be revised to remove "D" after the LHAAP-60.	
5	1.4, p. 1-6, 1st complete paragraph, 2nd sentence (begins with "Upon implementation")	1st sentence of the paragraph indicates this paragraph is referring to the eastern plume. Thus, presume "LHSMW06" should be "LHSMW05" or some other well in the eastern plume — LHSMW06 is located in the western plume.	C	Text will be revised to change LHSMW06 with 35AWW08.	
6	1.3, p. 1-6, 4th complete paragraph	Other concentration values throughout report are reported in micrograms per liter, so it is unclear why arsenic concentrations are reported in milligrams per liter here and	E	Clarification. Laboratory analysis for inorganics is reported in mg/L. While we understand the comment, reporting as presented in **Appendix F** eliminates confusion with the difference in the	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		elsewhere in report, where arsenic is discussed. Would be preferable to present constituent concentration values consistently throughout report.		units in the laboratory reports and avoids consistency issues.	
7	1.3, p. 1-6, 4th complete paragraph, last complete sentence (begins with "Background concentrations"	Reference is made to "perimeter well 110," but well is not shown in any report figures.	C	Perimeter well 110 is located on the southern perimeter/boundary of LHAAP and will be added to Figure 1. A reference to Figure 1 will be add to the text in Section 1.3, at the end of page 1-6.	
8	2.2.4.1, p. 2-3, 1st paragraph, 2nd sentence	To reflect hydrogeologic unit nomenclature elsewhere in this report and usage in other LHAAP reports, "shallow water bearing *unit*" should be changed to "shallow water-bearing *zone*." Also note hyphen between "water" and "bearing."	C	Correction will be made as suggested.	
9	2.2.4.1, p. 2-3, 1st paragraph, 2nd sentence	Description of groundwater flow in relation to potentiometric-surface contour map shown in fig. 5 does not describe the northeastern flow direction indicated by the contours in the southeastern portion of the contour map.	C	The text will be revised as follows to indicate the change in flow direction in the southeast portion of the site: "In the southeast corner of the site groundwater flows in the east-northeast direction (see **Figures 4 and 5**)." Additional text will also be added to Section 2.2.4.1 to discuss the groundwater flow noted in December 2021 in the northern portion of the site as follows: "It should be noted that the water levels collected from 35AWW20 and LHSMW06 in December 2021 appear to represent a high point from which portions of the shallow groundwater zone may flow north, northwesterly (**Figure 4**). However, the lack of wells to the north does not allow for further evaluation of a northerly groundwater flow.	
10	2.2.4.1, p. 2-4, 1st complete	Per information presented in table 1, text indicating well 35AWW19 is 1 of 3 wells without increased groundwater-level elevations is	C.	Concur. Revisions will be made as suggested.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	paragraph, 1st sentence	incorrect—should be well 35AWW23 instead of 35AWW19. Also recommend replacing "decreased" with "lower."			
11	2.2.5, p. 2-4, 1st paragraph, 1st sentence	Would be helpful to cite appropriate fig. at the end of the 1st sentence of this section to indicate well locations for the reader.	C	The following sentence will be added: "**Figure 2** presents the location of these co-located wells."	
12	2.2.5, p. 2-4, 1st paragraph, last sentence	For internal consistency, would be preferable to use "groundwater elevations" instead of "potentiometric level" or "potentiometric levels" when referencing/discussing differences in hydraulic head between water-bearing zones and/or among wells.	C	The sentence will be revised to state: "Because the shallow zone groundwater elevations are higher than the intermediate zone groundwater elevations, a downward vertical gradient appears to exist at this site.	
13	2.3.1, p. 2-5, 2nd paragraph, 1st sentence	The part of the sentence, "listed above reported," is unnecessary — could revise to "… had one or more COCs at concentrations above…".	C	Sentence will be revised to state" During the June 2022 event, monitoring wells 03WW01, 35AWW06, 35AWW08, 35AWW09, 35AWW14, 35AWW18, 35AWW19, 35AWW20, 35AWW23, LHSMW06, and LHSMW07 had one or more COCs at concentrations above laboratory detection limits."	
14	Fig. 6	"Limit" in "Maximum Contaminant Limit" should be "Level." Comment applies to other figs., where applicable, and will not be repeated.	C.	Figure will be revised to match the definition by the EPA and in the text.	
15	3, p. 3-1, 2nd paragraph, 4th sentence	Monitoring well 35AWW15 is considered an upgradient well to western plume, but note that hydraulic head in December 2021 and June 2022 is lower than hydraulic head in "downgradient wells" 35AWW20 and LHSMW06. Table 1 indicates this is always the case. Interestingly, head in the well is higher than well 35AWW16 in June 2022 (no measurement available for December 2021) and all other times listed in table 1.	C	The following text will be added: "As noted in Section 2.2.4.1, it is possible that monitoring well 35AWW15 may be more correctly considered a downgradient clean well. Regardless, the western groundwater plume is bound."	
16	3.1.1, p. 3-2, 2nd paragraph, 4th sentence	Sentence refers to December 2021 and July 2022 samples, but no such samples are listed in	C	Reference to July 2022 will be corrected to June 2022 for groundwater sampling.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		table 4. Presume July 2022 should be June 2022 per page 11 of table 4.			
17	3.1.1, p. 3-2, 4th paragraph, 1st sentence, beginning with "TCE"	Should indicate in this 1st sentence of paragraph that discussion in paragraph is for well 03WW01 instead of in the 2nd sentence of this paragraph.	C	The first sentence will be revised to state: "TCE, a degradation product of PCE, initially decreased in monitoring well 03WW01 between August 2013 and October 2013 (following EISB injections),…" The second sentence will be revised to state:" TCE detected in monitoring well 03WW01 dropped below the MCL of 5 µg/L in October 2016 and …"	
18	3.1.2, p. 3-3, 2nd paragraph, 1st sentence, beginning with "TCE"	Per table 3, one other constituent in well 35AWW20 exceeded an MCL—1,1,2-TCA.	C	1,1,2-TCA will be added to the sentence.	
19	3.1.2, p. 3-3, 2nd paragraph, last sentence	Because a given "reporting period" can vary for a given constituent/well/ analysis, should explicitly define the time period being discussed every time.	C	This text will be added, as appropriate, at the request of the EPA. Of note, once discussed in a section, it will not be repeated again in that section as it has been defined.	
20	3.1.2, p. 3-3, 3rd paragraph, 2nd sentence	Per page 41 of table 4, TCE concentration of "21" should be "20."	E	The primary sample is 21; duplicate is 20. Sentence will be revised to state: "TCE was detected above the MCL in LHSMW06 in December 2021 and June 2022 at concentrations of 21 µg/L (primary sample) and 13 µg/L, respectively."	
21	3.1.2, p. 3-3, 4th paragraph, 3rd sentence	Per page 32 of table 4, there should be a "J" after the "54" and "2,800" vinyl chloride concentration values.	C	Estimated "J" flag will be added to the text values.	
22	3.1.2, p. 3-3, 5th paragraph, 3rd sentence (begins with "The only")	Should cite both tables 3 and 4 after the sentence in a parenthetical because table 3 does not have the June 2021 sample.	C	Sentence will be revised to include the tables in parenthesis.	
23	3.1.2, p. 3-4, 1st paragraph, 2nd	Should cite both tables 3 and 4 after the sentence in a parenthetical because table 3 does not have the September 2019 sample.	C	Sentence will be revised to include the tables in parenthesis.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
	sentence (begins with "1,1-DCE")				
24	3.2, p. 3-4, 1st paragraph, 1st sentence	Formal rather than informal definition of pH would be preferable in a technical report if it is going to be defined—pH is typically defined as the "negative log of the hydrogen ion concentration."	C	Text will be revised as suggested.	
25	3.2, p. 3-4, 1st paragraph, 3rd complete sentence	Because a given "reporting period" can vary for a given constituent/well/ analysis, should explicitly define the time period being discussed—in this case, the pH values for 35AWW08 are only for June 2022, not December 2021. Thus, should simply replace "reporting period" with "June 2022."	C	Text will be revised to state "In June 2022…"	
26	3.2, p. 3-4, 1st paragraph, 4th complete sentence	See previous comment. Can reconcile by simply adding "in June 2022" after 5.95 s.u.	C	Sentence will be revised as suggested.	
27	3.2, p. 3-4,1st paragraph, 5th sentence (begins with "The pH in these")	As constructed, sentence is correct only for well 03WW01; per table, pH in well 35AWW08 decreased until May 2014, then increased until November 2014.	C	The sentence will be revised to state: "The pH in these two wells were generally more acidic following EISB treatment performed in September 2013, potentially related to substrate fermentation and organic acid production."	
28	3.2, p. 3-4, 1st paragraph, 2nd to last sentence (begins with "Beginning October 2014")	Supporting information for this statement is in tables 2 and 3, so recommend citing them as a parenthetical after "increased."	C	The following sentences will be removed: Beginning October 2014 and continuing through June 2020, the pH in wells within both the eastern and western plumes has generally increased, indicating a self-buffering capacity of the aquifer. However, pH declined to 5.95 s.u. in 03WW01 in June 2022.	
29	3.3, p. 3-5, 1st paragraph, 1st sentence	Should cite source of information indicating background TOC levels typically are less than 10 mg/L.	C	Reference to Year 2 RA-O Report will be added from which this is generalized. The text in the Year 8 RAO Report will be revised to state: "The level of TOC is typically less than 10 mg/L in areas outside of the EISB treatment area (AECOM, May 2016). Therefore, TOC present above the 10 mg/L	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				is indicative of the presence of substrates in groundwater near the sampled monitoring well."	
30	3.4.1, p. 3-5, 1st paragraph, 1st sentence	Cannot locate sulfate concentrations for these 2 wells for 10/14 to 11/16. Cite source of information.	C	References to the reports with this data will be added in parenthesis at the end of the sentence.	
31	3.5.2, p. 3-6, 1st paragraph, 1st sentence	Statement indicates CO_2 levels have remained relatively consistent—doesn't necessarily seem that way. For example, at well LHSMW07 concentration was 820,000 mg/L on 12/21 and 173,000 mg/L on 6/22.	C	Sentences will be revised to state: "Carbon dioxide levels generally increased in monitoring wells influenced by the EISB treatment (Table 6). However, fluctuating trends in carbon dioxide levels have been observed since December 2018 in the western plume monitoring wells."	
32	3.6.1, p. 3-7, 1st paragraph, 5th sentence	Seems there should be a brief description of DHBt in this section in a manner similar to the next report section (western plume).	C	The following text will be added: "The DHBt population increased significantly, within 3 to 6 months, after injection in the eastern plume in the two monitoring wells influenced by the EISB treatment. DHBt population in the eastern plume peaked in October 2014 in groundwater collected from monitoring well 35AWW08 and in May 2014 in groundwater collected from monitoring well 03WW01. As of June 2021, the DHBt population in the eastern plume was less than 5,000 cells per mL in either monitoring well and was not evaluated in June 2022."	
33	3.8, p. 3-8, Entire Section	Installation of a third monitoring well should be considered. The downgradient "extent" of the plume(s) in the vicinity of well 35AWW14 is currently undefined (per fig. 9). Collected data (fig. 9) indicate areal extent of the plume(s) upgradient of the well decreased between October 2016 and June 2022, but data needed to evaluate change downgradient of the well are unavailable because of the lack of one or more downgradient monitoring wells. Based on the information in this report, it appears extent	C	An additional well downgradient of well 35AWW14 will be proposed and shown on **Figure 10**.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		of the plume downgradient of well 35AWW14 has never been determined.			
34	4, p. 4-1, Entire Section	To maintain consistent terminology/nomenclature, "shallow aquifer" should be "shallow zone."	C	Text will be revised as suggested.	
35	4.1, p. 4-2, Mann-Kendall trend summary table	Seems there should be an asterisk after the "Decreasing" for TCE in well 35AWW08.	C	Asterisk will be added.	
36	4.1.1, p. 4-2, Well 03WW01 section, 2nd paragraph, 1st sentence	Statement is misleading because the analysis periods for Mann-Kendall analyses during 2008–June 2022 varied by constituent. For example, trend analysis period for PCE and TCE in well 03WW01 was 2008–22, whereas the trend analysis period for cis-1,2-DCE was 2011–22. This can be clarified by simply using parentheticals for the trend analysis after a given constituent. Note: This comment applies to rest of report where applicable and will not be repeated.	C	Text revised to clearly present when the Mann-Kendall analysis time periods vary by analysis. It should be noted that the use of the Mann-Kendall analysis is not discussed in the same manner as the LHAAP-16 RA(O) Report such that putting the years used for the analysis into parentheticals is unnecessary and will not be completed.	
37	4.1.1, p. 4-3, Well 03WW01 section, 1st paragraph, 1st complete sentence (begins with "TCE"	Per appendix G, the confidence factor for TCE in well 03WW01 should be 99.9% instead of 99.7%.	C	Text will be revised as suggested.	
38	4.1.1, p. 4-3, Well 35AWW08 section, 3rd paragraph, 2nd to last sentence (begins with although TCE")	A ">" is missing before "99.9 percent confidence factor" at end of sentence.	C	Text will be revised as suggested.	
39	4.1.1, p. 4-3, Well 35AWW09 section, 2nd paragraph, 1st sentence	Per appendix G, the trend analysis period for these constituents in well 35AWW09 was 2013–June 2022. Consequently, "2008" should be replaced with "2013." Comment applies to all sections discussing trends results—should	C	Text will be revised as suggested.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
		reverify/crosscheck these trend analysis periods for each well discussion.			
40	4.1.1, p. 4-3, Well 35AWW09 section, 2nd paragraph, last sentence	Should add "in June 2022" at end of sentence (after "MCL").	C	Text will be revised as suggested.	
41	4.1.1, p. 4-4, Well 35AWW09 section, 1st paragraph, 3rd sentence	Based on paragraph, seems like "Concentrations" at beginning of sentence should be changed to "COCs"?	C	Text will be revised as suggested.	
42	4.1.2, p. 4-4, Well 35AWW20 section, 2nd paragraph	Examination of appendix G indicates both the normal environmental sample and the replicate sample were used for trend analyses for this well. This is statistically inappropriate—a single sample should be utilized for that sampling event in the trend analysis. Note this applies to all constituents associated with this well's trend analyses where this approach was used.	C	Duplicate results have been removed from the Mann-Kendall analysis for 35AWW20 and LHSMW06. The greater of the primary and duplicate samples was used in the analysis, where appropriate. There were no changes in the concentration trends noted.	
43	4.1.2, p. 4-4, Well 35AWW20 section, 2nd paragraph, 1st sentence	Per appendix G, the trend analysis period for these constituents in well 35AWW20 was 2013–June 2022. Consequently, "2008" should be replaced with "2013."	C	Text will be revised as suggested.	
44	4.1.2, p. 4-5, Well LHSMW06 section, 2nd sentence	The COC cis-1,2-DCE also exceeded the MCL in the sampling events, so believe it should be added to list the constituents in this sentence as well?	C	Text will be revised as suggested.	
45	4.1.2, p. 4-5, Well LHSMW07 section, 1st paragraph	The 2nd to last sentence indicates only one constituent, 1,1-DCE, exceeded an MCL in the year 8 RA(O). This is incorrect because vinyl chloride exceeded the MCL on 12/21.	C	Text will be revised to state: "However, during the Year 8 RA(O) sampling events completed in December 2021 and June 2022, 1,1-DCE exceeded its MCL of 7 ug/L with concentrations of 22 µg/L and 8.8 µg/L, respectively. TCE remained below the MCL of 5 µg/L. VC was detected at 35 ug/L, above the MCL of 2 ug/L, in December 2021 but was not detected at monitoring well LHSMW07 in June 2022."	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
46	4.1.2, p. 4-5, Well LHSMW07 section, 3rd paragraph, 1st sentence	These analytical results are not shown in table 3. In addition, "Table 3" should be bolded.	C	Reference to table will be removed. Reference to previous reports presenting the data will be added.	
47	4.1.2, p. 4-5, Well LHSMW07 section, 3rd paragraph, last sentence	Sentence indicates 1,1-DCA was not detected in December 2021 or June 2022—page 3 of table 3 indicates this is incorrect. The constituent was detected at 5.1 micrograms per liter in December 2021 and at 9.8 micrograms per liter in June 2022. Perhaps what was intended was to indicate the constituent was not detected at concentrations above the MCL? Revise sentence accordingly.	C	Text will be revised to state: "The daughter product of 1,1,2-TCA, 1,1-DCA, remained below the MCL during the Year 8 RA(O) sampling events, at concentrations between 5.1 µg/L in December 2021 and 9.8 µg/L in June 2022."	
48	4.1.3.1, p. 4-6, 1st paragraph	Need to cite table 4 somewhere in this paragraph to introduce readers to source of information presented in this section.	C	The following sentence will be added at the end of the 1st paragraph: "Table 4 presents historical monitoring well COC concentrations for these monitoring wells."	
49	4.1.3.1, p. 4-6, 2nd paragraph, 3rd sentence	Sentence indicating there is no trend in cis-1,2-DCE concentrations is incorrect. Summary table on page 4-2 indicates probably increasing trend for the constituent.	C	The sentence will be revised to match the summary table information.	
50	4.1.3.1, p. 4-6, 3rd paragraph, 1st sentence	Well 35AWW09 trend testing indicated statistically significant increase in cis-1,2-DCE concentrations as well.	C	The sentence will be revised to match the summary table information.	
51	4.1.3.1, p. 4-6, 3rd paragraph, 2nd sentence	The word "of" is missing between "from areas" and "higher concentration."	C	The word "of" will be added as suggested.	
52	4.1.3.1, p. 4-6, 3rd paragraph, last sentence	Although subtle, fig. 8 seems to provide visual evidence of a relation between constituents and groundwater elevations.		Noted. No change in the text.	
53	4.1.3.1, p. 4-6. 4th paragraph, last sentence	There is an extraneous "therefore" for part of sentence after the semicolon.	C	The extra word will be removed.	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
54	4.1.3.2, p. 4-6, 1st paragraph	Description of groundwater-flow directions/flowpaths is confusing and misleading in places. For example, 1st sentence indicates there is a "less dominant southerly component" of flow from LHSMW07 and 35AWW06 to 35AWW17 in comparison with the groundwater-flow direction described in the earlier part of the sentence. However, examination of fig. 5 indicates the flowpath between these wells is actually more southerly and less easterly. Use of continuous flow lines perpendicular to the potentiometric-surface contours rather than discrete flow arrows on the contour maps would show (and thus, could be used to describe) groundwater movement along a particular flowpath in a better manner. Thus, should revise groundwater-flow discussion to improve clarity.	C	Flow direction in western plume area has been revised to state a more southerly flow direction. Considering localized variations in groundwater flow direction, as most likely influenced by surface water drainage features, application of one flow direction to the entire site would not be applicable.	
55	4.2.2, p. 4-8, Chloride section, 1st paragraph, last sentence	Table 6 indicates "NA" (not analyzed), not "below 120 mg/L."	C	Text will be revised to state: "Although, chloride was not analyzed for in any wells outside the treatment area in Year 8, these December 2021 and June 2022 chloride levels can be compared to background chloride concentrations in downgradient wells such as 35AWW24, which had chloride concentrations below 120 mg/L in March 2018 through June 2019."	
56	4.2.2, p. 4-10. Total Organic Carbon section, 1st paragraph, last sentence	Should cite table 6 after "groundwater flow path."	C	Table 6 will be cited.	
57	5.1, p. 5-1, 4th paragraph, 1st sentence	As noted previously, well 35AWW09 trend testing indicated a statistically significant increase in cis-1,2-DCE concentrations as well.	C	The text will be revised to state: "Concentrations of COCs downgradient of monitoring wells, 35AWW08 and 03WW01, have exhibited no increase in COC concentrations or new detections of COCs. PCE and TCE concentrations are	

Comment #	Section/ Page/ Paragraph	Comment	C, D, E, or X[1]	Response	A or D[2]
				indicating a statically significant increasing trend in monitoring well 35AWW09. Daughter product, cis-1,2-DCE concentrations in downgradient wells 03WW01 and 35AWW09 did demonstrate increasing (or probably increasing) trends."	
58	5.2, p. 5-3, Recommendations section	As noted in earlier comment, should also consider installation of a monitoring well downgradient of well 35AWW14 because downgradient portion of plume in vicinity of well is currently undefined.	C	The following text will be added to Section 5.2:" Install one additional monitoring well downgradient of 35AWW14 to determine extent (35AWW27) as presented on **Figure 10**."	

DRAFT FINAL
YEAR 8 ANNUAL REMEDIAL ACTION OPERATION REPORT (SEPTEMBER 2021 - AUGUST 2022)
LHAAP-35A (58) SHOPS AREA
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

March 2023

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U.S. Army Corps of Engineers
Tulsa District
1645 S 101 E Avenue
Tulsa, Oklahoma 74128-4609

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Prepared By:

bhate
1608 13th Avenue South, Suite 300
Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com

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YEAR 8 ANNUAL REMEDIAL ACTION OPERATION REPORT (SEPTEMBER 2021 - AUGUST 2022) LHAAP-35A (58) SHOPS AREA LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

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ACRONYMS AND ABBREVIATIONS

<	Less than
>	Greater than
%	Percent
AECOM	AECOM Technical Services, Inc.
Amsl	Above mean sea level
APTIM	APTIM Federal Services, LLC
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
COC(s)	Contaminant(s) of concern
CSM	Conceptual site model
CVOC	Chlorinated volatile organic compounds
DCA	Dichloroethane
DCE	Dichloroethene
DHBt	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(s)	Land Use Control(s)
MC	Methylene chloride
MCL(s)	Maximum contaminant level(s)
µg/L	Micrograms per liter
mg/L	Milligrams per liter

mL	Milliliter
MNA	Monitored Natural Attenuation
MSC	Medium-specific concentration
mV	Millivolts
No.	Number
ORP	Oxidation-reduction potential
PCE	Tetrachloroethene
pH	Negative log of the hydrogen ion concentration
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
s.u.	Standard units
Shaw	Shaw Environmental, Inc.
SVOC(s)	Semi-volatile Organic Compound(s)
TCA	Trichloroethane
TCE	Trichloroethene
TM	Technical Memorandum
TOC	Total Organic Carbon
U	Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.
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 Operation (RA[O]) 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 conducted 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 semiannual. The contingency remedy within the western plume required that quarterly sampling be completed in select performance monitoring wells for 2 years which was completed in March 2020. Therefore, as with the eastern plume, groundwater monitoring is now completed semi-annually in the western plume. This RA(O) report documents Year 8 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 completed in December 2021 and June 2022; and an evaluation of EISB and MNA based on those two sampling events.

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) plume and LUC boundaries, will be captured under LHAAP-35A (58). The 2018 ESD (Bhate/APTIM, July 2018) specified 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 presented in the Final ESD ROD (Bhate, March 2018) and documented in the RACR for the Western Plume Contingency Remedy at LHAAP-35A (58) Shops Area (Bhate, August 2018). EISB was previously conducted 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 are 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 8 RA(O) activities consisted of two semi-annual groundwater sampling events, one conducted in December 2021 (Western Plume only) and one conducted in June 2022 as specified in the Eastern Plume RAWP (AECOM, August 2013) and the Western Plume RAWP (Bhate, January 2018). Semiannual surface water sampling at 35ASW03, located adjacent to the western groundwater plume in a ditch that runs parallel to 4th Street, was not performed in December 2021 or June 2022, as groundwater elevations, in the nearest upgradient monitoring well 35AWW18, were below the elevation of the ditch.

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 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).

The following sites were located 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; and

- LHAAP-66, 405-L Transformer Yard.

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.

The current site boundary for 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; and
- LHAAP-69, service station with underground storage tanks.

The following sites are located within the LUC boundary (groundwater use restrictions area) 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, Building 411;
- LHAAP-60, Former Storage Building 714;
- LHAAP-65, Former Building 209 (flammable materials storehouse);
- LHAAP-68, a mobile storage tank parking area; and
- LHAAP-69, service station with underground storage tanks.

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) 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). 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), groundwater elevations in the shallow zone in October 2013 ranged from 184.21 ft above mean sea level (amsl) to 202.32 ft amsl.

Data from boring log 35AWW02, which was drilled in the deep zone to a depth of 140 ft bgs (75.06 ft amsl), and 35AWW05, which was drilled in the intermediate zone to a depth of 72 ft bgs (147.01 ft amsl), 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 level measurements obtained in October 2013, groundwater elevation for the intermediate zone was approximately 178 ft above amsl, and the elevation of deep zone groundwater was 175.75 ft above amsl.

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); therefore, 1,1-DCA is not considered a groundwater COC at this site. No COCs were detected in samples collected from the intermediate and deep groundwater zones.

Within the eastern plume, EISB was performed in September 2013. Upon implementation of EISB upgradient of wells 03WW01 and 35AWW08, PCE concentrations decreased while concentrations of daughter products increased, indicating reductive dechlorination had occurred. Meanwhile, PCE concentrations increased at 35AWW09, which is located 75 to 150 ft downgradient of the EISB injection points and beyond the radius of influence of the injected reagents. TCE concentrations increased to a lesser degree, indicating some natural attenuation occurs in the eastern plume.

The MNA remedy for the western plume at this site, as presented in the ROD, called for an evaluation of the MNA remedy after 2 years of implementation. After 2 years of MNA, the Year 2 RA(O) report (AECOM, May 2016) 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 RACR (Bhate, August 2018). Immediately after EISB injections, concentrations of TCE and 1,1-DCE declined in 35AWW20, followed by a transitory increase in TCE that demonstrates the biosurfactant properties of EISB results in desorption of TCE from the soil to the dissolved phase. Shortly thereafter, reductive dechlorination occurs as TCE degrades into daughter products 1,1-DCE and VC. At LHSMW07, the concentration of 1,1-DCE is reduced, with no increase in TCE or VC. This is likely indicative that no TCE was sorbed to the soil in this area and VC was reduced quickly. As of June 2022, COCs persist at concentrations that exceed MCLs at wells 35AWW18, 35AWW20, LHSMW06, and LHSMW07 in the western plume and wells 03WW01, 35AWW09, 35AWW14 in the eastern plume.

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). 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), arsenic monitoring was recommended for additional wells located 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.

Arsenic was reported at concentrations above the MCL of 0.010 milligrams per liter (mg/L) 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 0.0621 mg/L for perimeter well 110 in a filtered sample that was collected on December 16, 2004 (Shaw, June 2007). The location of perimeter well 110 is displayed on **Figure**

1. Since implementation of EISB, arsenic has exceeded the background concentration one time, at 35AWW08 (0.148 mg/L) in November 2017. In June 2022, arsenic exceeded the MCL in only one well, 35AWW09 (0.0314 mg/L).

As presented in Section 1.1, sampling at well 03WW01 will continue to be conducted per the ESD for LHAAP-35A (58) that requires the groundwater underlying LHAAP-03 be included with the LHAAP-35A (58) groundwater remedy. Based on historical arsenic results and the ESD (Bhate/APTIM, July 2018), the Year 4 RA(O) Report (Bhate/APTIM, October 2018) recommended to continue monitoring arsenic in eastern plume monitoring wells 03WW01, 35AWW08, and 35AWW09 and western plume monitoring wells 35AWW20 and LHSMW06.

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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 shown 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 LUCs are presented in the RACR (AECOM, October 2015).

The annual LUC compliance inspection was conducted for LHAAP-35A (58) on July 21, 2022. The Annual Land Use Control Compliance Certification Documentation form for the Year 8 RA(O) period is presented in **Appendix A**. No compliance issues or concerns were noted during the July 2022 annual inspection.

2.1.2 Well Field Operation & Maintenance

Inspections of the conditions/integrity of monitoring wells were conducted in June 2022 and were documented in a photographic log (**Appendix B**) and during each sampling event with the information recorded on the field sampling forms. No significant maintenance items were observed during the June 2022 inspection. However, similar to the previous Year 7 inspection, there are hinges on several monitoring wells noted to have rust observed at varying degrees (35AWW10, 35AWW12, 35AWW17, 35AWW19, and 35AWW21). The hinges have not worsened since Year 7. The hinges will continue to be watched to see if they continue to worsen, which will require replacement or repair. In addition, it is recommended to paint monitoring well LHSMW06 during the next reporting period (September 2022 through August 2023). During the Year 8 annual reporting period (September 2021 through August 2022), mowing was conducted prior to the groundwater sampling events in December 2021 and June 2022. **Appendix B** provides photos of the June 2022 monitoring well conditions and **Appendix C** provides the Well Inspection Forms, which contain information about the individual well surface conditions observed during each of the Year 8 sampling events conducted in December 2021 and June 2022.

2.2 Groundwater Monitoring for RA(O)

Groundwater monitoring at LHAAP-35A (58) was conducted quarterly following EISB injections at the eastern plume for 2 years, then semi-annually, but is now conducted on an annual basis. The contingency remedy was implemented within the western plume in March 2018 and required that quarterly sampling be conducted at select performance monitoring wells for 2 years, which was completed in March 2020. Groundwater monitoring is now conducted semi-annually at the western plume. During the Year 8 RA(O), groundwater sampling was completed annually for the eastern plume in June 2022 and semi-annually for the western plume in December 2021 and June 2022.

2.2.1 Eastern Plume Monitoring

In accordance with the RAWP (AECOM, August 2013), the following shallow zone wells located within the eastern and western plumes are sampled annually in June 2022: 03WW01, 35AWW08, 35AWW09, 35AWW10, 35AWW12, 35AWW13, 35AWW14, 35AWW15, 35AWW16, 35AWW17, 35AWW18, 35AWW21, 35AWW22, 35AWW24, and LHSMW06. Several of these wells also help define the western plume.

Monitoring well LHSMW04 was dry in both December 2021 and June 2022 and, therefore, was not sampled during the Year 8 RA(O). LHSMW04 was also dry in October 2016, November 2017, July 2018, December 2018, December 2019, June 2020, December 2020, and June 2021. Intermediate groundwater zone well 35AWW01 was also sampled in June 2022. Monitoring well 35AWW02 (**Figure 2**), which is the only well screened in the deep groundwater zone, was not included in the sampling program, in accordance with the RAWP (AECOM, August 2013). Therefore, this monitoring well was not gauged or sampled during the Year 8 RA(O) sampling events.

2.2.2 Western Plume Monitoring

Six shallow wells located within the western plume were required to be sampled quarterly for 2 years post injection. Per the Western Plume RAWP (Bhate, January 2018), the wells include 35AWW06, 35AWW11, 35AWW19, 35AWW20, 35AWW23, and LHSMW07. The eighth and final quarterly event was completed in March 2020. Therefore, western plume monitoring only is required to be sampled semi-annually during the Year 8 RA(O). Although not considered performance monitoring wells for the Western Plume RAWP, LHSMW06, 35AWW14, 35AWW15, 35AWW16, 35AWW17, 35AWW18, and 35AWW24 which are sampled as part of the eastern plume monitoring, also help define the western plume. Additionally, monitoring well 35AWW04 was dry in both December 2021 and June 2022 and was not sampled during the Year 8 RA(O). Intermediate groundwater zone well 35AWW05 was also sampled in December 2021 and June 2022.

2.2.3 Sampling Procedures and Analysis

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. During the Year 8 RA(O) period, 25 monitoring wells were gauged for depth to water in December 2021 and June

2022. 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.

The MNA analyte list was modified for the Year 8 sampling events 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 Year 8 RA(O) sampling events were alkalinity; nitrite; sulfide; total iron; dissolved iron and manganese; and total phosphorous. For the eastern plume only, chloride, nitrate, sulfate, dissolved gases, total organic carbon (TOC), dechlorinating bacteria, and volatile fatty acids (VFAs) were also eliminated. Groundwater samples collected from each well during Year 8 (December 2021 and June 2022) were analyzed by ALS Environmental for VOCs (SW8260C). Select wells were also analyzed by ALS Environmental for dissolved gases (RSK-175); TOC (SM5310C); total arsenic (SW6020A); chloride, nitrate, and sulfate (SW9056A); VFAs (High Performance Liquid Chromatography [HPLC]-METACIDS); and/or dechlorinating bacteria (dehalococcoides [DHC]/dehalobacter [DHBt]) (CENSUS). A Hach kit was used to complete ferrous iron screening in the field.

The LHAAP-35A (58) monitoring wells are shown on **Figure 2**. **Table 1** presents the monitoring wells that were gauged during the Year 8 RA(O) period. Each of the monitoring wells were secure and sampled with no technical issues encountered.

During the Year 8 RA(O) sampling, two monitoring wells (LHSMW04 and 35AWW04) were noted as dry. 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 sampling results for these two wells provide ample data to evaluate this area. Monitoring well 35AWW04, located downgradient of the western plume has been dry dating back to April 2016. Monitoring well 35AWW04 is a key location in the western plume downgradient of monitoring well 35AWW18.

Groundwater Sample Collection Forms are presented in **Appendix E**. Chain of custody forms, laboratory reports, and quality control summary reports are presented with the laboratory results in **Appendix F**.

2.2.4 Groundwater Elevation and Flow Direction

2.2.4.1 Shallow Groundwater Zone

Groundwater levels for the Year 8 RA(O) were measured in December 2021 and June 2022. The groundwater flow direction in the shallow water-bearing zone during the Year 8 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. In the southeast corner of the site groundwater flows in the east-northeast direction (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. It should be noted that the water levels collected from 35AWW20 and LHSMW06 in December 2021 appear to represent a high point from which portions of the shallow groundwater zone may flow north, northwesterly (**Figure 4**). However, the lack of wells to the north does not allow for further evaluation of a northerly groundwater flow. Groundwater elevation data are presented in **Table 1**.

The shallow zone groundwater elevations increased across the site in the shallow wells between December 2021 and June 2022, with the exception of 35AWW06, 35AWW23, and 35AWW24, which had slightly lower groundwater elevations. The greatest elevation increase, 4.83 ft, occurred in shallow monitoring well 35AWW15.

2.2.4.2 Intermediate Groundwater Zone

Monitoring well 35AWW01 was measured in June 2022 and 35AWW05 was measured in December 2021 and June 2022. Monitoring well 35AWW05 (**Figure 2**), which is completed in the intermediate groundwater zone, had groundwater elevations increased between December 2021 and June 2022, by 1.60 ft. A potentiometric surface map cannot be constructed to determine the groundwater flow direction based upon two monitoring wells. The groundwater elevations are presented in **Table 1**.

2.2.5 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). **Figure 2** presents the location of these co-located wells. During the Year 8 RA(O) monitoring period, the elevation difference between wells 35AWW08 and 35AWW01 was 14.25 ft in June 2022. During the Year 8 RA(O) monitoring period, the elevation differences between wells LHSMW07 and 35AWW05 was 29.54 ft in December 2021 and 28.04 ft in June 2022. These elevation differences are consistent with those observed in the first 7 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 shallow zone groundwater elevations are higher than the intermediate zone groundwater elevations, a downward vertical gradient appears to exist at this site.

2.3 Groundwater Analytical Results

2.3.1 Shallow Zone

The COCs for shallow zone groundwater are PCE, TCE, cis-1,2-DCE; trans-1,2-DCE; MC; VC; 1,1,2-TCA; 1,2-DCA; 1,1-DCE; and benzene (AECOM, May 2016). Analytical results for the June 2022 annual sampling event in the eastern plume are presented in **Table 2**. The analytical results for the December 2021 and June 2022 sampling events from the western plume are presented in **Table 3**. **Figure 6** presents the analytical data for COCs that exceeded MCLs during December 2021 and/or June 2022.

Twenty-three shallow zone wells were sampled for COCs during the Year 8 RA(O), not including wells LHSMW04 and 35AWW04, which were dry during the December 2021 and June 2022 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 2021 western plume semi-annual sampling event, wells 35AWW06, 35AWW11, 35AWW19, 35AWW20, 35AWW23, LHSMW06, and LHSMW07 had one or more COCs reported at concentrations above the laboratory detection limits. Monitoring wells 35AWW20, LHSMW06, and LHSMW07 had concentrations of COCs exceeding the MCLs, which are shown on **Figure 6**.

During the June 2022 event, monitoring wells 03WW01, 35AWW06, 35AWW08, 35AWW09, 35AWW14, 35AWW18, 35AWW19, 35AWW20, 35AWW23, LHSMW06, and LHSMW07 had one or more COCs at concentrations above laboratory detection limits. Monitoring wells 03WW01, 35AWW09, 35AWW14, 35AWW18, 35AWW20, LHSMW06, and LHSMW07 had concentrations of COCs exceeding the MCLs, which are posted on **Figure 6**.

Groundwater monitoring well sampling forms were completed for each well sampled and are included in **Appendix E**. The laboratory analytical results are included in **Appendix F**.

2.3.2 Intermediate Zone

Wells 35AWW01 (eastern plume) and 35AWW05 (western plume) (**Figure 7**), which are completed in the intermediate groundwater zone, were sampled during the Year 8 RA(O) monitoring period. Analytical results for both intermediate groundwater zone wells were below laboratory detection limits for all analytes. The laboratory analytical results are shown in **Table 2** (35AWW01) and **Table 3** (35AWW05). Groundwater monitoring well sampling forms were completed for each well sampled and are included in **Appendix E**. The laboratory analytical reports are included in **Appendix F**. **Figure 7** shows that neither well had concentrations of COCs exceeding the MCLs.

2.3.3 Arsenic Monitoring

During the Year 8 RA(O) monitoring period, arsenic analysis was completed in select monitoring wells 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); the 2013 RAWP (AECOM, August 2013); and the 4th Annual RA (O) Report (Bhate/APTIM, October 2018). The 4th Annual RA (O) Report recommended continued arsenic monitoring in eastern plume monitoring wells 03WW01, 35AWW08, and 35AWW09 and western plume monitoring wells 35AWW20 and LHSMW06. 03WW01 is included as outlined in the ESD for LHAAP-03 (Bhate/APTIM, July 2018). In December 2021, groundwater from monitoring wells 35AWW20 and LHSMW06 was analyzed for arsenic. In June 2022, groundwater from the following monitoring wells was analyzed for arsenic: 03WW01, 35AWW01, 35AWW08, 35AWW09, 35AWW20, and LHSMW06. Monitoring of arsenic at 35AWW01 is included as this well is an intermediate groundwater well evaluated for MNA. Analytical results for the June 2022 sampling event in the eastern plume are presented in **Table 2**. The analytical results for the

December 2021 and June 2022 sampling events from the western plume are presented in **Table 3**.

In December 2021, arsenic was not detected in the groundwater above the MCL of 0.010 mg/L in 35AWW20 or LHSMW06. In June 2022, arsenic was detected above the MCL in 35AWW08 (0.0314 mg/L) but below the site background level of 0.0621 mg/L (Shaw, June 2007). However, since June 2019 arsenic detected at 35AWW08 has decreased by 73 percent (%) from 0.116 mg/L (June 2019) to 0.0314 mg/L (June 2022). The other five wells sampled for arsenic in June 2022 had concentrations below the MCL and the site background level. Arsenic in groundwater has generally been declining over the last 4 years at 35AWW08, 35AWW20, and LHSMW06 within the EISB remedy area of influence. The declining arsenic detections indicate the presence of arsenic is transitory; as the aquifer recovers from the reducing conditions caused by the EISB remedy, arsenic concentrations recover to background levels. The laboratory analytical reports are included in **Appendix F**.

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-DCA; benzene; cis-1,2-DCE; TCE; PCE; and VC) be performed at surface water sample location 35ASW03, which is located in a ditch that runs parallel to 4th Street, on the western boundary of the site, adjacent to the western groundwater plume. **Figure 2** shows the surface water sampling location.

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 35ASW03*." The surveyed bottom of the ditch at the lowest point is 213.58 ft amsl. The gauged water level in the nearest upgradient monitoring well 35AWW18 in June 2022 was 198.48 ft amsl.

Surface water samples are collected to evaluate the potential effect of the plume on surface water. However, no surface water was present at location 35ASW03 in December 2021 or June 2022. 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 abandonment 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.

3 PERFORMANCE MONITORING OF EISB

The EISB target area within the eastern groundwater plume is located within the vicinity of wells 03WW01 and 35AWW08. **Figure 6** presents the 2013 injection locations 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 eastern groundwater plume. Groundwater monitoring was performed in August 2013 prior to EISB implementation (baseline event), in October 2013 after the EISB injections, quarterly for 2 years and has been semiannual since October 2016. The EISB performance in the eastern groundwater plume and key parameters are discussed below and much of the information is provided in **Tables 2, 4, and 5**.

The EISB target area within the western groundwater plume is located within the vicinity of wells 35AWW06, 35AWW20, and LHSMW07 (Bhate, January 2018). EISB injections were also implemented near monitoring wells 35AWW11, 35AWW14, and 35AWW23. **Figure 6** presents the EISB injection point locations within the western groundwater plume. Monitoring well 35AWW15 is considered an upgradient clean well and 35AWW24 is located downgradient of the EISB treatment area and defines the downgradient edge of the western groundwater plume. As noted in Section 2.2.4.1, it is possible that monitoring well 35AWW15 may be more correctly considered a downgradient clean well. Regardless, the western groundwater plume is bound. Within the western groundwater plume, a total of six monitoring wells (LHSMW07, 35AWW06, 35AWW11, 35AWW19, 35AWW20, 35AWW23) have been evaluated via a total of 8 quarterly performance monitoring events, over the 2 years following injections, to assess the EISB in the western plume (Bhate, January 2018). The quarterly groundwater performance monitoring was completed in March 2020 when monitoring was reduced to semiannual. The first semiannual sampling event was completed in June 2020 in the Year 6 monitoring period. This Year 8 RA(O) report presents the results of the semi-annual sampling events conducted in December 2021 and June 2022. The EISB performance in the western groundwater plume and key parameters are discussed below. Information pertinent to the discussion is provided in **Tables 3, 4, 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 Final TM – MNA Parameters (Bhate/APTIM, February 2019), were alkalinity; nitrite; sulfide; total iron; dissolved iron and manganese; and total phosphorous. For the eastern plume only, chloride, nitrate, sulfate, dissolved gases, TOC, dechlorinating bacteria, and VFAs were also eliminated.

3.1 Analysis of VOCs

VOCs that exceeded the MCL during the December 2021 or June 2022 sampling event in the shallow groundwater are posted on **Figure 6**. No VOCs exceeded the MCL during the reporting period of September 2021 through August 2022, in the intermediate groundwater, as indicated on **Figure 7**. **Figure 8** includes COC concentration over time trend graphs at key monitoring wells within the EISB treatment zone.

3.1.1 Eastern Plume

Major reductions in PCE concentration have been observed 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 2022, PCE concentrations reported for well 35AWW08 have decreased from 1,640 micrograms per liter (µg/L) to non-detect, with concentrations below the MCL during July 2018, December 2018, June 2019, December 2019, December 2020, June 2021, December 2021, and June 2022; PCE was non-detect at an elevated limit of detection (less than [<] 5.0 µg/L) in June 2022 (**Table 4**). The elevated limit of detection was a result of a dilution due to the foamy nature of the sample. The foamy nature of the 35AWW08 sample is likely due to the reaction of the hydrochloric acid (HCl) preservative and the unique geochemistry at the site. Each VOC groundwater sample is preserved with HCl, to extend the hold time and prevent microbial degradation. However, in certain situations the HCl preservative may react with the groundwater sample causing bubbles or foam such as in the presence of high carbonate levels or dissolved gases. This difference in PCE concentrations in well 35AWW08 have decreased approximately 99.7 percent (%) since the remedy was implemented. PCE concentrations in well 35AWW08 remained below the MCL of 5 µg/L in 7 of the past 8 sampling events, with a concentration of 6.7 µg/L detected in June 2020. PCE concentrations in well 35AWW08 has remained below the MCL of 5 µg/L in the three sampling events following June 2020.

From August 2013 to June 2022, PCE concentrations in well 03WW01 decreased from 368 µg/L to 9.9 µg/L (**Table 4**). This is a decrease of approximately 97.3% of PCE in well 03WW01. PCE concentrations in well 03WW01 were below the MCL of 5 µg/L between October 2016 and December 2020, except for reported concentrations above the MCL of 15 µg/L in December 2018. During the last two sampling events, PCE was detected above the MCL at 11 µg/L in June 2021 and 9.9 µg/L in June 2022.

TCE, a degradation product of PCE, initially decreased in monitoring well 03WW01 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 (**Table 4** and **Figure 8**). TCE detected in monitoring well 03WW01 dropped below the MCL of 5 µg/L in October 2016 and has remained below the MCL through June 2021, except for reported concentrations above the MCL of 5.7 µg/L in December 2018, 24 µg/L in December 2020, and 10 µg/L in June 2022.

The maximum detected TCE concentration in both the December 2021 and June 2022 sampling events was in well 35AWW09 at a concentration of 140 µg/L in June 2022. Over the last four sampling events, TCE at 35AWW09 has remained relatively consistent from December 2019 (160 µg/L) through June 2022 (140 µg/L) (**Table 4** and **Figure 8**).

The concentrations of cis-1,2-DCE remained below the MCL of 70 µg/L in the eastern plume monitoring wells (**Table 4**) during the June 2022 sampling event. VC was not detected in any of the wells in June 2022. In part, the low to no concentrations of degradation daughter products

cis-1,2-DCE and VC present during the reporting period of September 2021 through August 2022 are a result of the minimal amount of parent compounds remaining at the site.

3.1.2 Western Plume

PCE was not detected above the MCL of 5 µg/L in the western plume wells during the Year 8 RA(O) sampling events (**Table 3**). PCE has not been detected above the MCL in the western plume since December 2008 when it was detected at monitoring 35AWW06 (**Table 4**).

In December 2021 and June 2022, well 35AWW20 had reported concentrations of TCE; 1,1-DCE VC; 1,2-DCA; 1,1,2-TCA, cis-1,2-DCE; and benzene above MCLs (**Table 3**). During Year 8, TCE increased at 35AWW20 from 91 µg/L in December 2020 to 100 µg/L in December 2021 but decreased from 190 µg/L in June 2021 to 150 µg/L in June 2022. The TCE concentrations fluctuate seasonally and with changes in groundwater elevation over the same time period. Although there was an increase in TCE during the reporting period (September 2021 through August 2022) at 35AWW20, there is an overall decrease of 73.7% in TCE from 570 µg/L in December 2018 to 150 µg/L in June 2022.

TCE has remained below the MCL in well 35AWW23 since June 2019 and was not detected in June 2022. TCE was detected above the MCL in LHSMW06 in December 2021 and June 2022 at concentrations of 21 µg/L (primary sample) and 13 µg/L, respectively. LHSMW06 is outside the treatment area and cross gradient of 35AWW20; TCE concentrations in December 2021 were the highest recorded in this well. A new monitoring well upgradient of LHSMW06 and 35AWW20 is necessary to understand why chlorinated VOC (CVOC) concentrations at LHSMW06 appear to be increasing.

The TCE daughter product cis-1,2-DCE was detected in well 35AWW20 above the MCL in September 2019 (110 µg/L), December 2019 (70 J µg/L), March 2020 (71 µg/L), June 2021 (87 µg/L), December 2021 (86 µg/L), and June 2022 (89 µg/L) (**Table 4**). The daughter product VC has remained elevated at well 35AWW20 with concentrations during the Year 8 RA(O) of 650 µg/L in December 2021 and 840 µg/L in June 2022. Note that VC increased between March 2019 (54 J µg/L) to as high as 2,800 J µg/L in December 2019 (**Figure 8**). This significant increase and then decrease in VC could be a result of the degradation of cis-1,2-DCE and/or 1,1-DCE. VC was also detected above the MCL of 2 µg/L in well LHSMW06 in the December 2021 sampling event at 4.2 µg/L and at 2.3 µg/L in the June 2022 sampling event. The TCE and 1,1-DCE concentrations in monitoring well 35AWW14, located in an area downgradient of LHSMW06, have increased from below the respective MCLs in October 2013 to above the MCLs in October 2016, and remained above the MCLs through June 2022.

In December 2021 and June 2022, 1,1,2-TCA was detected above the MCL (5 µg/L) in well 35AWW20 with a concentration of 75 µg/L and 62 µg/L; 1,1,2-TCA was not detected in any other western plume wells sampled during the Year 8 RA(O) (**Table 3**). 1,1-DCE, which is a daughter product of both 1,1,2-TCA and TCE, was detected above the MCL (7 µg/L) in four wells (35AWW18, 35AWW20, LHSMW06, and LHSMW07) during the Year 8 RA(O) reporting period (September 2021 through August 2022). The only VOC detected in 30AWW18 was 1,1-DCE; concentrations were reported at 20 µg/L in June 2021 and 15 µg/L in June 2022 (**Tables 3 and 4**).

Historically, neither potential parent compound (1,1,2-TCA or TCE) have been detected in 30AWW18 and the well is not within the zone of influence of active EISB. Therefore, the presence of 1,1-DCE represents migration of this daughter product from upgradient areas where degradation occurred. Concentrations of 1,1-DCE in western plume well 35AWW20 remained elevated during the Year 8 RA(O) reporting period (September 2021 through August 2022) with a concentration of 1,100 µg/L in December 2021 and 1,600 µg/L in June 2022. 1,1-DCE has decreased 59% at 35AWW20 from 3,900 µg/L in September 2019 to 1,600 µg/L in June 2022 (**Tables 3 and 4**). Concentrations of 1,1-DCE in western plume well LHSMW06 exceeded the MCL (7 µg/L) during each sampling event while exhibiting a slight decrease during the reporting period from 12 µg/L in December 2021 to 9.1 µg/L in June 2022.

Concentrations of 1,1-DCE at LHSMW07 also exceeded the MCL (7 µg/L) during each sampling event while exhibiting a decrease during the reporting period from 22 µg/L in December 2021 to 8.8 µg/L in June 2022. Detections of 1,1-DCE at LHSMW07 during the reporting period may be attributable to the reduction of parent compounds TCE and 1,1,2-TCA in the western plume near LHSMW07 and upgradient well 35AWW20. 1,1-DCE has been detected at LHSMW07 at concentrations as high as 2,100 µg/L in July 2015. However, 1,1-DCE has decreased in LHSMW07 from 600 µg/L in November 2017, prior to the March 2018 western plume contingency implementation, as shown on **Figure 8** (**Table 4**).

All COCs remain below the respective MCLs in upgradient well 35AWW15 and downgradient wells 35AWW06, 35AWW11, 35AWW19, 35AWW23, and 35AWW24.

3.2 Analysis of Field Parameters

The field parameters (negative log of the hydrogen ion concentration [pH], dissolved oxygen [DO], oxidation-reduction potential [ORP], temperature, and specific conductivity) were measured in the LHAAP-35A (58) wells during the Year 8 RA(O) monitoring events. **Table 5** contains the Year 8 RA(O) field parameters for wells 03WW01 and 35AWW08, which are located in the eastern plume. In June 2022, pH at 35AWW08 was within the range of 6.0 to 8.5 standard units (s.u.) generally required to support microbial populations responsible for reductive dechlorination, but below the optimal range of 6.8 to 7.5 s.u. The pH at 03WW01 was 5.95 s.u. in June 2022. The pH in these two wells were generally more acidic following EISB treatment performed in September 2013, potentially related to substrate fermentation and organic acid production. Anaerobic conditions were observed in both wells, with DO <0.5 mg/L and negative ORP.

Table 6 contains the Year 8 RA(O) field parameters for wells located in the western plume. During the reporting period(September 2021 through August 2022), pH was within the range of 6.0 to 8.5 s.u. generally required to support microbial populations responsible for reductive dechlorination, with the exception of wells 35AWW11, 35AWW19, and 35AWW24 where COCs remain below MCLs. While DO was <0.5 mg/L for all wells located within the EISB treatment area, ORP was 73 and 27 millivolts (mV) in 35AWW20 where the highest concentrations of COCs were observed during December 2021 and June 2022, respectively. Downgradient of 35AWW20, the ORP was negative in wells 35AWW23 (-71 mV) and LHSMW07 (-90 mV) in June 2022.

3.3 TOC Levels

TOC is an indicator of the presence of carbon substrate. The level of TOC is typically less than 10 mg/L in areas outside of the EISB treatment area (AECOM, May 2016). Therefore, TOC present above 10 mg/L is indicative of the presence of substrates in groundwater near the sampled monitoring well.

3.3.1 Eastern Plume

After injection of the carbon substrate in October 2013, 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. Over the course of the first 7 years of monitoring, the TOC levels have decreased, 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 2021) of 103 mg/L in 03WW01 and 119 mg/L in 35AWW08 indicate that TOC remains at sufficiently high concentrations to support reductive dechlorination (i.e., greater than 100 mg/L), albeit at lower amounts compared to the period immediately after injection in October 2013 (**Table 5**). TOC analysis was not performed in 2022. Groundwater monitoring performed at the eastern plume was reduced to VOC analysis only on an annual basis during the Year 8 RA(O) in compliance with the Eastern Plume RAWP (AECOM, August 2013).

3.3.2 Western Plume

Within the western plume, TOC increased in the sampled monitoring wells following the March/April 2018 contingency EISB injections when compared to the baseline sampling results (March 2018), within the influence of the injection points with the exception of 35AWW19. The greatest increases were observed in 35AWW06 and 35AWW11. TOC was consumed and fell below the level generally required to support microbial growth (i.e., less than 100 mg/L) in all wells by June 2020. The June 2022 data indicate the highest TOC in the western plume is observed at well 35AWW20 at 17.7 mg/L (**Table 6**). Historically, EISB injections increased TOC in 35AWW20 to a maximum of 53 mg/L in September 2018, indicating distribution of electron donor in this area was successful but not ideal.

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. Nitrate is not naturally-occurring in either plume area; therefore, nitrate is also not observed as an artifact of reductive dechlorination.

3.4.1 Eastern Plume

Decreased sulfate concentrations in October 2014 through October 2016 in the two EISB wells (03WW01 and 35AWW08) relative to levels in nearby wells outside of the EISB treatment (35AWW09 and 35AWW10), indicate the development of reducing conditions conducive to reductive dechlorination occurred following initial injections (AECOM, November 2015; AECOM,

May 2016; Bhate, April 2018). Note that the largest reductions in COC concentrations occur at the same time the largest reductions in sulfate concentrations are observed. Sulfate concentrations in 03WW01 reduced from an August 2013 baseline concentration of 534 mg/L to non-detectable levels (<0.5 mg/L) in October 2016. Since then, sulfate concentrations increased in monitoring well 03WW01 to 180 mg/L in June 2021, which is likely due to untreated groundwater moving through the eastern plume. In monitoring well 35AWW08, data trends show that sulfate was reduced from an October 2013 baseline concentration of 1,480 mg/L to <10 mg/L in October 2016 as a result of EISB and remain low (**Table 5**). Sulfate analysis was not conducted in 2022. Groundwater monitoring performed at the eastern plume was reduced to VOC analysis only on an annual basis during the Year 8 RA(O) in compliance with the Eastern Plume RAWP (AECOM, August 2013).

3.4.2 Western Plume

Following the EISB injections, sulfate decreased in each of the wells influenced by the EISB injections by approximately 50%, with the exception of well 35AWW19 where sulfate reduction was observed to a lesser extent, presumably due to poor distribution of TOC in areas where COCs are historically below MCLs. In June 2022, sulfate concentrations at the center of the western plume in 35AWW20 remain depressed at 1,040 mg/L compared to pre-injection sulfate concentration of 2,150 mg/L in November 2017 (**Table 6**). Sulfate concentrations have returned to pre-injection levels in impacted well LHSMW07 (2,970 mg/L). While sulfate concentrations greater than (>) 20 mg/L can be a potential cause for concern for reductive dechlorination, there is evidence that it is not inhibitory at this site where cis-1,2-DCE and VC daughter products are generated.

3.5 Dissolved Gases

3.5.1 Eastern Plume

Dissolved gas analyses were not conducted in 2022. Groundwater monitoring performed at the eastern plume was reduced to VOC analysis only on an annual basis during the Year 8 RA(O) in compliance with the Eastern Plume RAWP (AECOM, August 2013). Historical concentrations of methane, ethane, and ethene are summarized in **Table 5**.

3.5.2 Western Plume

Methane following the EISB treatment of the western plume increased within 6 to 9 months of implementation. In 35AWW20, the well with the highest COC concentrations in the western plume, methane decreased from 1,500 µg/L in June 2021 to 714 µg/L in June 2022. The highest methane detected in the western plume during the reporting period (September 2021 through August 2022) was 3,170 µg/L in 35AWW23 in June 2022. Methane is one line of evidence that methanogenesis is occurring. Carbon dioxide levels generally increased in monitoring wells influenced by the EISB treatment (**Table 6**). However, fluctuating trends in carbon dioxide levels have been observed since December 2018 in the western plume monitoring wells. Ethene has increased in 35AWW20 from 1.3 µg/L in June 2019 to 16.1 µg/L in June 2022. Ethene production

is one line of evidence that complete reduction of the COCs is occurring, although ethene may volatilize quickly through the vadose zone and is not retained by groundwater for long periods.

3.6 Dechlorinating Bacteria

3.6.1 Eastern Plume

The DHBt population increased significantly, within 3 to 6 months, after injection in the eastern plume in the two monitoring wells influenced by the EISB treatment. DHBt population in the eastern plume peaked in October 2014 in groundwater collected from monitoring well 35AWW08 and in May 2014 in groundwater collected from monitoring well 03WW01. As of June 2021, the DHBt population in the eastern plume was less than 5,000 cells per mL in either monitoring well and was not evaluated in June 2022.

Bacterial cultures containing DHC species, the bacteria responsible for degrading cis-1,2-DCE to VC, were introduced during the bioaugmentation event in October 2013. During the Year 3 RA(O) sampling event (October 2016), DHC species spiked to the highest levels observed to 9,460,000 cells/milliliter (mL) in 03WW01 and to 25,600,000 cells/mL in 35AWW08, indicating effective distribution of the introduced culture within the eastern plume per the RAWP. Since the Year 3 RA(O) sampling event, DHC concentrations have generally decreased, which is anticipated as the concentration of CVOCs decreases to below 50 µg/L. Concentrations of DHC in the Year 7 RA(O) in June 2021 were 196 cells/mL in 03WW01 and 122,000 cells/mL in 35AWW08 (**Table 5**). DHC species counts were still adequate in June 2021 for the continued degradation of PCE/TCE to VC, however, DHC was not analyzed for during the current reporting period (September 2021 through August 2022).

Microbial analyses were not conducted in 2022. Groundwater monitoring performed at the eastern plume was reduced to VOC analysis only on an annual basis during the Year 8 RA(O) in compliance with the Eastern Plume RAWP (AECOM, August 2013).

3.6.2 Western Plume

The DHBt population increased significantly, within 3 to 6 months, after injection in the western plume in each of the monitoring wells influenced by the EISB treatment. DHC increased within 6 months to a year in most of the monitoring wells, but not to the degree DHBt populations increased. The critical performance monitoring well in the western plume, 35AWW20, indicated an increasing trend of DHC population to 115,000 cells/mL through June 2020. DHC population tapered off to 7,800 cells/mL in December 2020. However, DHC population was reported at 177,000 cells/mL in December 2021 and 70,400 cells mL in December 2022. DHBt populations have a decreasing trend at 35AWW20 from a maximum of 5,970,000 cells/mL in July 2018 to 18,400 cells/mL in June 2022 (**Table 6**). BAV1 vinyl chloride reductase populations have increased at 35AWW20 to 67,400 cells/mL in June 2022, which is the highest cell count to date.

The increase in dechlorinating bacteria populations corresponds with the reduction of TCE and increase in VC in well 35AWW20 over this period of time, indicating reductive dechlorination is not stalling at cis-1,2-DCE even though the observed concentrations of cis-1,2-DCE are relatively

stable. The DHC and the BAV1 vinyl chloride reductase populations at 35AWW20 are present at sufficient population to reduce TCE and VC to ethene completely via reductive dechlorination.

3.7 EISB Performance Monitoring Summary

In summary, the EISB treatment has been effective in reducing the VOC concentrations (PCE by as much as 100%) and the conditions are still conducive for continued reductive dechlorination. Although biologic activity has slowed and substrate mass is decreasing, the COC mass requiring treatment is also greatly diminished. Reductions of VOCs (**Figure 8**) and increases in carbon dioxide, methane, and ethene (**Tables 5** and **6**) have been observed throughout both the eastern and western plume areas. The individual COC lateral extents comparing October 2016 MCL exceedances and those documented in June 2022 show a greatly contracted plume footprint (**Figure 9**). Combining the reduction in maximum concentrations and the reduction in areal extent indicate significant remediation progress.

3.8 Proposed Well Installation

It is recommended to install two additional western plume monitoring wells (35AWW25 and 35AWW26) to define the downgradient and upgradient extent of the shallow western plume (**Figure 10**). As discussed in Section 2.2 downgradient monitoring well 35AWW04 has been dry for multiple sampling events. Therefore, to define the downgradient extent of CVOC contamination in the western plume a new monitoring well (35AWW25) screened within the saturated zone is necessary. A new monitoring well (35AWW26) upgradient of LHSMW06 and 35AWW20 is necessary to understand why CVOC concentrations at LHSMW06 appear to be increasing. Additionally, a new monitoring well (35AWW27) will be installed downgradient of monitoring well 35AWW14 to define the extent of CVOCs in this area. Each monitoring well will be advanced to approximately 40 feet bgs using hollow stem auger drilling methods. The monitoring wells will be installed as 2-inch diameter schedule 40 polyvinyl chloride wells with 10 ft of 0.010 inches" slot screen. The screened intervals will be selected based on the lithologic conditions observed during drilling at approximately 30 – 40 ft bgs.

Each monitoring well will be developed in accordance with the IWWP (Bhate, May 2018). Monitoring wells 35AWW25 and 35AWW26 should be added to the RA-O monitoring network for Year 9 and sampled for VOCs only.

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 RD (Shaw, September 2011) for LHAAP-35A (58) groundwater COCs. The discussion below pertains only to the shallow zone where COCs are detected above cleanup levels. Analytes eliminated from the sampling and analysis plan starting in 2019, per the Draft TM – MNA Parameters (Bhate/APTIM, February 2019) were alkalinity, nitrite, sulfide, total iron, dissolved manganese, total phosphorous, and dissolved iron (lab analysis). For the eastern plume only, chloride, nitrate, sulfate, dissolved gasses, TOC, dechlorinating bacteria, and VFAs were also eliminated.

Per the August 2013 RAWP (AECOM, August 2013), 18 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). Well 35AWW01 is the intermediate groundwater well evaluated for MNA. Note that LHSMW04 was not sampled because it was dry. Following the 2018 EISB treatment within the western plume, wells 35AWW20, LHSMW07, and 35AWW19 became performance monitoring wells for the contingency remedy.

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 8 RA(O) monitoring period are presented on **Figure 6**.

The only wells where COCs were detected above their respective MCLs during the Year 8 RA(O) groundwater sampling events are 03WW01, 35AWW09, 35AWW14, 35AWW18, 35AWW20, LHSMW06, and LHSMW07 (**Tables 2 and 3**). Organics that exceed their respective MCLs are posted on **Figure 6**.

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 represent the highest relative COC concentrations. Additionally, COCs exceeded MCLs in well 03WW01, located in the eastern plume, 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 8 RA(O) period (June 2022) was completed for various COCs for monitoring wells 03WW01, 35AWW08, 35AWW09, 35AWW20, LHSMW06, and LHSMW07. The

results are presented in **Appendix G** in tables and graphs with statistical results presented on the lower left-hand side of the table. The GSI Environmental, Inc., Mann-Kendall Toolkit, Version 1.0 software was used for this analysis. Data used to generate the Mann-Kendall analysis is presented in **Table 4.** 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	**Decreasing**	**Decreasing**	**Probably Increasing***	--	--
35AWW08	**Decreasing***	**Decreasing***	**Decreasing***	--	--
35AWW09	**Increasing**	**Increasing**	**Increasing***	--	--
35AWW20	--	**Decreasing**	**Decreasing**	**Decreasing**	**Increasing**
LHSMW06	--	**Increasing**	--	**Increasing**	**Increasing**
LHSMW07	--	**Decreasing***	--	**Decreasing**	**No Trend**

Note:
* Most recent concentrations are below MCLs

Of the analyzed parameters and wells using Mann-Kendall statistical analysis set, three monitoring wells, 03WW01 and 35AWW08 located within the eastern plume and 35AWW20 located in the western plume, showed a decreasing trend in parent compounds (PCE and/or TCE) concentrations over time.

4.1.1 Eastern Plume

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.

Well 03WW01

This well is located within the September 2013 EISB area. PCE concentration has decreased 97.3% between August 2013 (368 µg/L) and June 2022 (9.9 µg/L) and TCE has decreased 95.5% between October 2014 (223 µg/L) and June 2022 (10 µg/L). Degradation of TCE resulted in the maximum concentration of cis-1,2-DCE at 117 µg/L in April 2016, with a subsequent decline in the Year 8 RA(O) to 7.3 µg/L in June 2022.

The Mann-Kendall trend analysis in 03WW01 was conducted for PCE; TCE; and cis-1,2-DCE for analytical results from November 2008 through the end of the Year 8 RA(O) period (June 2022) (**Appendix G**). The Mann-Kendall results indicate statistical evidence of a decreasing trend in concentrations for PCE (confidence factor > 99.9%). PCE was below the MCL of 5 µg/L from June 2019 through December 2020 but was detected at 9.9 µg/L in June 2022. Since June 2019, TCE

in 03WW01 has been below the MCL of 5 µg/L with the exceptions of December 2020 (24 µg/L) and June 2022 (10 µg/L). TCE in 03WW01 shows a decreasing trend with a 99.9% confidence factor. The trend for daughter product cis-1,2-DCE is probably increasing with a 91.8% confidence factor, with concentrations below the MCL of 70 µg/L since July 2018 and a result of 7.3 µg/L in June 2022.

Well 35AWW08

This well is located within the September 2013 EISB area. PCE concentrations decreased rapidly after the introduction of the carbon substrate and bacterial augmentation, and the PCE concentration as of June 2022 was below the detection limit (5 U [undetected: The analyte was analyzed for, but not detected and reported to the limit of detection] µg/L). 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 below the detection limit (2.5 U µg/L) in June 2022. The initial increase in TCE concentrations is an indication 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. In June 2022, cis-1,2-DCE was below the detection limit (2.5 U µg/L).

The Mann-Kendall trend analysis in 35AWW08 was conducted for PCE; TCE; and cis-1,2-DCE for analytical results from November 2008 through the end of the Year 8 RA(O) period (June 2022) (**Appendix G**). The results provide statistical evidence of a decreasing trend in concentrations for PCE (confidence factor > 99.9%) and TCE (confidence factor of >99.9%). PCE in 35AWW08 shows a decreasing trend with a confidence factor > 99.9%. PCE is currently non-detect and below the MCL of 5 µg/L in June 2022. Although TCE was detected at 53 µg/L in June 2021, TCE was non-detect (2.5 U µg/L) in June 2022 and shows a decreasing trend with a >99.9% confidence factor. The trend for daughter product cis-1,2-DCE is decreasing with a 96.9% confidence factor, with concentrations below the MCL of 70 µg/L since April 2016 and non-detect (2.5 U µg/L) in June 2022.

Well 35AWW09

This well is located downgradient of the September 2013 EISB area. PCE and TCE were detected in this well at concentrations above their respective MCLs during the Year 8 RA(O) monitoring period. PCE concentrations increased from 57.6 J µg/L in October 2013 to 380 µg/L in June 2022. Similarly, TCE concentrations exhibited a significant increase from 8.97 J µg/L in October 2013 to 140 µg/L in June 2022. Daughter product cis-1,2-DCE was detected below the MCL at 1.1 µg/L in June 2022. VC was not detected during the Year 8 RA(O) period.

The Mann-Kendall trend analysis in 35AWW09 was conducted for PCE; TCE; and cis-1,2-DCE for analytical results from August 2013 through the end of the Year 8 RA(O) monitoring period (June 2022) (**Appendix G**). The results provide statistical evidence of an increasing trend in PCE (99.9% confidence factor) and TCE (99.8% confidence factor) concentrations. The cis-1,2-DCE results indicate an increasing trend with a confidence factor of 99.9%, however, concentrations are currently below the MCL in June 2022.

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 of contaminants downgradient of the EISB injection locations. COCs observed in well 35AWW09 in June 2022 are lower than pre-EISB concentrations observed in wells 03WW01 and 35AWW08. Decreasing trends were observed in wells 03WW01 and 35AWW08 prior to implementation of EISB, indicating natural attenuation processes, including dispersion and dilution, were already occurring. The influence of biodegradation associated with EISB appears to remain within the area targeted for EISB (immediately upgradient of monitoring wells 35AWW08 and 03WW01) with little to no influence observed in 35AWW09.

4.1.2 Western Plume

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.

Well 35AWW20

Well 35AWW20 is located downgradient of the March 2018 EISB area that included KB-1 Plus™ inoculation. The concentrations of TCE; cis-1,2-DCE; 1,1-DCE; and VC were detected in this well above their MCLs during the semi-annual Year 8 RA(O) monitoring events (**Table 3**). EISB injections were completed in the Western Plume in March and April 2018 (Bhate, August 2018). Concentrations of TCE have decreased by approximately 53.1% between November 2017 (320 µg/L) and June 2022 (150 µg/L), while the concentration of 1,1-DCE decreased by 31.6%, between November 2017 (1,900 µg/L) and June 2022 (1,600 µg/L). Conversely, as TCE has decreased, the TCE daughter product cis-1,2-DCE has slightly increased from November 2017 (53 µg/L) to June 2022 (89 µg/L), and the degradation product VC significantly increased between November 2017 and June 2022 from 78 µg/L to 840 µg/L.

The Mann-Kendall trend analysis in 35AWW20 was conducted for TCE; cis-1,2-DCE; 1,1-DCE; and VC for analytical results from October 2013 through the end of the Year 8 RA(O) period (June 2022) (**Appendix G**). The results indicate evidence of a decreasing trend over time at 35AWW20 for TCE (>99.9% confidence factor); cis-1,2-DCE (confidence factor of 96.7%); and 1,1-DCE (>99.9% confidence factor). Conversely, VC concentrations indicate an increasing trend over the same time period (confidence factor of 99.8%), supporting that reductive dechlorination is occurring in the vicinity of 35AWW20. PCE trends were not evaluated at 35AWW20 because it has been non-detect or below the MCL since 2013.

In addition to the above COCs, 1,1,2-TCA (75 µg/L [December 2021] / 62 µg/L [June 2022]) and 1,2-DCA (14 µg/L [December 2021]/ 13 µg/L [June 2022]) (the daughter product of 1,1,2-TCA through reductive dechlorination) concentrations exceed the MCLs (5 µg/L for 1,1,2-TCA and also for 1,2-DCA) in 35AWW20 during the Year 8 RA(O) monitoring events (**Table 3**). Prior to EISB treatment, 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. During the period following EISB treatment (March 2018 through June 2022), 1,1,2-TCA fluctuated between a minimum of 38 J µg/L in March 2019 and a maximum of 88 µg/L in December 2018, and 1,2-DCA fluctuated 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.

Well LHSMW06

This well is not located within an EISB injection area. The COCs TCE; cis-1,2-DCE, 1,1-DCE; and VC exceeded their respective MCLs in the December 2021 and June 2022 sampling events (**Table 3**). The Mann-Kendall trend analysis in LHSMW06 was conducted for TCE; 1,1-DCE; and VC for analytical results from December 1994 through the end of the Year 8 RA(O) period (June 2022). The results indicate increasing trends in concentrations (with confidence factors of > 99.9%) for TCE; 1,1-DCE; and VC over time; the maximum detected concentrations of these COCs during this reporting period (September 2021 through August 2022) were in December 2021 with concentrations of 21 µg/L, 12 µg/L, and 4.3 µg/L, respectively.

Well LHSMW07

Well LHSMW07 is located downgradient of the March 2018 EISB area that included KB-1 Plus™ inoculation. 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 Year 8 RA(O) sampling events completed in December 2021 and June 2022, 1,1-DCE exceeded its MCL of 7 ug/L with concentrations of 22 µg/L and 8.8 µg/L, respectively. TCE remained below the MCL of 5 µg/L. VC was detected at 35 ug/L, above the MCL of 2 ug/L, in December 2021 but was not detected at monitoring well LHSMW07 in June 2022.

The Mann-Kendall trend analysis in LHSMW07 was conducted for TCE; 1,1-DCE; and VC for analytical results from January 1996 through the end of the Year 8 RA(O) period (June 2022). The results indicate a decreasing trend in concentrations for TCE (confidence factor of 99.8%) and 1,1-DCE (confidence factor of 100.0%). There was no statistical evidence of a trend for VC (confidence factor of 78.1%).

For the first time in April 2014, 1,1,2-TCA was detected above the MCL of 5 µg/L at 5.68 µg/L and again in October 2016 at a concentration of 7.72 µg/L (Bhate, April 2018). It was detected at a concentration of 0.73 J µg/L in September 2018, below the MCL of 5 µg/L. However, 1,1,2-TCA was not detected during the Year 7 or Year 8 RA(O) periods. The daughter product of 1,1,2-TCA, 1,1-DCA, remained below the MCL during the Year 8 RA(O) sampling events, at concentrations between 5.1 µg/L in December 2021 and 9.8 µg/L in June 2022.

4.1.3 Plume Stability

Figure 8 shows trends associated with key wells located in the eastern and western plume cores and leading edges. **Figure 9** compares the extent of the plumes associated with each COC in October 2016 compared to June 2022. The stability of each plume with regards to these COCs is evaluated through these figures in conjunction with the analyses presented in the sections above.

4.1.3.1 Eastern Plume

Based on the southeasterly direction of groundwater flow over the 8-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, and the downgradient well, 35AWW21, remained below detection limits during the Year 8 RA(O) event. **Table 4** presents historical monitoring well COC concentrations for these monitoring wells.

Figure 8 provides plots of groundwater COC concentrations and groundwater elevation changes over time in wells 35AWW08, 03WW01, and 35AWW09. Monitoring well 35AWW08 has a Mann-Kendall decreasing trend for PCE, TCE, and cis-1,2-DCE and all of these COCs were below the detection limit in June 2022. Monitoring well 03WW01, which is hydraulically downgradient of 35AWW08 and upgradient of 35AWW09, has a Mann-Kendall decreasing trend for PCE and TCE and probably increasing trend for cis-1,2-DCE. PCE and TCE in 03WW01 were detected above the MCLs in June 2022 at 9.9 µg/L and 10 µg/L, respectively, while cis-1,2-DCE was below the MCL in June 2022. The TCE daughter product cis-1,2-DCE remained well below the MCL at 03WW01 since July 2018.

Monitoring well 35AWW09 is located approximately 75 ft downgradient from 03WW01. There is an increasing trend in concentrations of PCE, TCE, and cis-1,2-DCE in 35AWW09. The increase in concentrations in 35AWW09 is likely associated with downgradient dissolved phase migration from areas of higher concentration observed in 2008 and 2011 in wells 35AWW08 and 03WW01. A review of the historical data for 35AWW09 does not indicate any correlation between groundwater elevations and COC concentrations.

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, plume expansion is not occurring, and the extent of the eastern plume is stable.

4.1.3.2 Western Plume

Based on the southeasterly direction of groundwater flow, the following wells are considered to be along the groundwater flow path from 35AWW15, 35AWW20, 35AWW23, and 35AWW19, to 35AWW24, with a more southerly component from LHSMW07 and 35AWW06 to 35AWW17. Groundwater also flows southeasterly from LHSMW06 and 35AWW23 to 35AWW19 and from 35AWW11 to 35AWW14. The COC concentrations in upgradient well 35AWW15 have remained below detection limits throughout the Year 8 reporting period (September 2021 through August 2022). The in-plume well (35AWW20) exhibits the highest levels of COCs, which have, based on the Mann-Kendall analysis, shown decreasing trends for TCE; 1,1-DCE; and cis-1,2-DCE. Only VC is showing an increasing trend indicating ongoing reductive dechlorination at 35AWW20.

The 1,1-DCE concentration in monitoring well 35AWW19, located in a downgradient direction of the western plume, has decreased from above the MCL in January 2014 through December 2018, to below the MCL of 7 µg/L in March 2019. Detections of 1,1-DCE in monitoring well 35AWW19

remained below the MCLs in the Year 8 RA(O) sampling events suggesting that migration of the plume is no longer occurring in this portion of the western plume. However, 1,1-DCE detected at monitoring well 35AWW18 has recently increased from 4.1 µg/L in December 2019, to above the MCL in June 2020 (18 µg/L) and has remained above the MCL through June 2022 (15 µg/L) (**Table 4**). Monitoring well 35AWW18 is downgradient of 35AWW20 indicating plume migration in a southeasterly direction in this portion of the western plume. Monitoring well 35AWW04, which was not sampled during this reporting period because it was dry, is also downgradient of 35AWW18 along this flow path.

It should be noted that 1,1-DCE and VC were detected in cross-gradient well LHSMW06 above the MCLs (5 µg/L and 2 µg/L, respectively), in the June 2022 sampling event. Concentrations of 1,1-DCE were 12 µg/L in December 2021 and 9.1 µg/L in June 2022, and VC concentrations were 4.3 µg/L in December 2021 and 2.3 µg/L in June 2022. No detections of COCs have been observed at boundary area wells 35AWW15, 35AWW16, and 35AWW17; therefore, plume expansion is not occurring along the western extent of the western plume. However, along the southwest extent of the western plume 1,1-DCE exceeds the MCL at 35AWW18. Since 35AWW04 has been dry, there are no boundary wells delineating the downgradient extent of western plume.

4.2 Second Line of Evidence: Geochemical Indicators

Tables 2 and 3 include the geochemical indicator parameters that are useful for MNA evaluation. Some geochemical parameters are measured in the field and are recorded during sampling events. The field parameters for LHAAP-35A (58) wells include: DO, ORP, pH, conductivity, turbidity, and temperature. 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. Analytes eliminated in 2019 per the Draft TM – MNA Parameters (Bhate/APTIM, February 2019) were alkalinity, nitrite, sulfide, total iron, dissolved manganese, total phosphorous, and dissolved iron (lab analysis). For the eastern plume only, chloride, nitrate, sulfate, dissolved gases, TOC, dechlorinating bacteria, and VFAs were also eliminated. TOC continues to be evaluated due to the March/April 2018 EISB treatment with the western plume.

A summary of the geochemical aquifer conditions following ERD injections in each plume area is presented in **Tables 5 and 6**. The following discussion examines the geochemical indicators recorded during the Year 8 RA(O) monitoring period.

4.2.1 Eastern Plume

- pH – Neutral pH (6.0 to 8.5 standard units) is desirable for MNA. During the Year 8 RA(O) monitoring period, groundwater was observed below this range in 03WW01 (5.95 s.u.) and 35AWW09 (5.60 s.u.) and within the range in 35AWW08 (6.24 s.u.) and 35AWW14 (6.08 s.u.) throughout the impacted areas of the eastern plume. Outside the plume, the pH ranged from 4.61 s.u. in 35AWW21 to 5.75 s.u. in 35AWW13 in the shallow zone, indicating the decline in pH occurred site-wide and is not attributed to EISB. The pH was 6.03 s.u in intermediate well 35AWW01.

- 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 > 0.5 mg/L and hence, reductive dechlorination will not occur. In June 2022, eastern plume treatment area wells 03WW01, 35AWW08, and 35AWW09 had DO measurements ranging from 0.03 to 0.18 mg/L. The DO levels in the treatment area are conducive to reductive dechlorination. The DO levels observed in eastern plume wells outside the treatment area ranged from 0.02 to 0.20 mg/L in June 2022 (**Table 2**); DO at 35AWW14 (8.49 mg/L) and is an outlier and likely an instrument error. The DO levels are otherwise below the 0.5 mg/L threshold and support anaerobic conditions outside of 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. When ORP values are less than -50 mV, the anaerobic biodegradation pathway is considered possible in accordance with the biodegradation scoring criteria presented in the *Technical Protocol for Evaluating Attenuation of Chlorinated Solvents in Ground Water* (USEPA, 1998). In June 2022, ORP measurements at 03WW01 (-50 mV) and 35AWW08 (-74 mV) indicated anaerobic conditions are possible but not likely for reductive dechlorination within the treatment area (**Tables 2 and 5**); however, ORP is one of many lines of evidence of reductive dechlorination. The ORP measured outside of the EISB area in June 2022 was 277 mV at well 35AWW09 (**Table 2**). This strong positive ORP indicates that conditions in the eastern plume outside of the EISB treatment area (35AWW09) are generally aerobic and not supportive of anaerobic degradation.

The qualitative assessment of geochemical indicators in the shallow groundwater zone at LHAAP-35A (58) indicates naturally occurring geochemical conditions outside the EISB treatment zone are not supportive of MNA via the biodegradation process. However, the areas influenced by the EISB treatment continue to allow for MNA.

4.2.2 Western Plume

- pH – Neutral pH (6.0 to 8.5 standard units) is desirable for MNA. During the Year 8 RA(O) monitoring period, groundwater pH ranged from 5.26 s.u. (35AWW19) to 6.53 s.u. (35AWW06) throughout the impacted areas of the western plume. Outside the plume, the pH ranged from 4.53 s.u. (5AWW24) to 6.06 s.u. (35AWW15) in the shallow zone, indicating the decline in pH occurred site-wide and is not attributed to EISB.
- 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 (**Table 6**). Chloride levels in 35AWW11 were slightly lower in June 2022 than the pre-EISB injection results but still elevated (1,880 mg/L) (**Table 3**). Chloride

levels in the shallow zone were also elevated in LHSMW07 and remained stable over the Year 8 RA(O) sampling events from 1,560 mg/L in December 2021 to 1,960 mg/L in June 2022. Additionally, chloride levels within the other western plume EISB treatment area wells provide evidence of biodegradation in the western plume. Although, chloride was not analyzed for in any wells outside the treatment area in Year 8, these December 2021 and June 2022 chloride levels can be compared to background chloride concentrations in downgradient wells such as 35AWW24, which had chloride concentrations below 120 mg/L in March 2018 through June 2019 (**Table 6**).

- 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 > 0.5 mg/L and hence, reductive dechlorination will not occur. The DO levels observed in western plume wells 35AWW06, 35AWW11, 35AWW19, 35AWW20, 35AWW23, 35AWW24, and LHSMW07 were < 0.5 mg/L in June 2022 (**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 < 50 mV indicate that the aquifer is sulfate-reducing, and values < -200 mV are required before anaerobic conditions are favorable for the complete biological reductive dechlorination of chlorinated ethenes. During the monitoring period, wells located within proximity of the EISB treatment area (35AWW06, 35AWW11, 35AWW20, 35AWW23, and LHSMW07) exhibited ORP values ranging from -90 mV at LHSMW07 (June 2022) to 73 mV at 35AWW20 (December 2021) (**Table 3**). Areas outside of the treatment area (LHSMW06, 35AWW15 35AWW18, 35AWW19, and 35AWW24) continued to have positive ORPs which ranged from 62 mV at 35AWW15 (June 2022) to 318 mV at 35AWW24 (June 2022) (**Table 3**). These results indicate that conditions in the western plume outside of the EISB treatment area are 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 < 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 sampling events during the Year 8 RA(O) monitoring period (**Table 3**). Based on these observations, nitrate reduction in the shallow zone 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.
- 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 > 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). Concentrations have fluctuated within the plume. Sulfate concentrations decreased in 35AWW06 downgradient of the main plume from 1,560 mg/L in November 2017 to 197 mg/L in June 2021 and was most recently detected at 457 mg/L in June 2022 (**Table 6**). Concentrations decreased in 35AWW20 from 2,150 mg/L in November 2017 to 882 mg/L in July 2018, increased to 955 mg/L in June 2021, and was most recently detected at 1,040 mg/L in June 2022 (**Table 6**).

- 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). In June 2022, methane concentrations above 500 µg/L were present in wells 35AWW06, 35AWW11, 35AWW20, 35AWW23, and LHSMW07 (**Table 3**). Ethene was detected within the western plume in wells LHSMW07 (38.9 µg/L), 35AWW20 (16.1 µg/L), and 35AWW1 (6.59 µg/L) in June 2022. The presence of ethene 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 > 20 mg/L are considered adequate to support microbial activity (USEPA, September 1998). TOC concentrations in the western plume increased following EISB injections, which is to be expected. However, during the Year 8 reporting period (September 2021 through August 2022) wells in the western plume had TOC concentrations below 20 mg/L (**Table 3**). Although the TOC concentration reported in September 2018 after EISB injections was relatively low in 35AWW20 (53 mg/L) and has declined to 17.7 mg/L (June 2022), ethene was detected (16.1 µg/L), indicating that complete reductive dechlorination is occurring at some point along the groundwater flow path (**Table 6**).
- VFAs – The presence of VFAs (**Table 3**) confirms the fermentation of carbon substrates and should be observed coincident with elevated TOC. Acetic acid was detected in well 35AWW23 during the Year 8 reporting period at 3.9 mg/L (December 2021) and 2.0 J mg/L (June 2022), confirming that some fermentation is occurring even though COC concentrations were already below MCLs in this well. All other VFAs were non-detect, indicating fermentation was not occurring where remedial action was required.

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: 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 have been analyzed in wells within and outside the eastern and western plumes. Microbial population analyses were discontinued during the Year 7 reporting period (September 2020 through August 2021). at wells 35AWW09, 35AWW10 and 35AWW24, located outside of the EISB areas as recommended in the Year 5 RA(O) Report. It has been established that the microbial populations are limited and unaffected by the EISB injections in these areas. Microbial population analyses were eliminated for all eastern plume wells during the Year 8 reporting period (September 2021 through August 2022) per the Draft TM – MNA Parameters (Bhate/APTIM, February 2019).

4.3.1 Eastern Plume

Dechlorinating bacteria, DHC and DHBt, BAV1 VC reductase, and associated functional genes were analyzed in groundwater samples from wells 03WW01, 35AWW08, and 35AWW09, within and outside the eastern plume. Generally, the microbial population counts and the functional gene counts have been at or below the laboratory reporting limits in areas not influenced by bioaugmentation such as at 35AWW09, indicating a limited natural population of the bacteria and the absence of gene expression necessary for anaerobic biological degradation of the COCs. After the September 2013 EISB injection event, microbial populations increased; as COC concentrations declined to levels that no longer supported these specific bacteria, population counts also declined. Microbial analyses were not performed in Year 8 in the eastern plume; however, historical results for dechlorinating bacteria are summarized in **Table 5**.

4.3.2 Western Plume

Dechlorinating bacteria, DHC ethenogenes, DHBt, BAV1 VC reductase, and associated functional genes were analyzed in groundwater samples from wells within and outside the western plume in the Year 8 reporting period (September 2021 through August 2022). The highest microbial populations detected at the site were recorded during the Year 8 reporting period in 35AWW20. DHC was detected at 177,000 cells/mL in December 2021 and BAV1 VC reductase was detected at 67,000 cells/mL in June 2022. An increase in BAV1 VC reductase indicates that complete reductive dechlorination can occur to allow VC to reduce to ethene over time. DHBt increased from 1,120 cells/mL in March 2018 to 5,970,000 cells/mL in July 2018, then were non-detect in June 2019. Since then, DHBt has slowly increased in 35AWW20 to 18,400 cells/mL in June 2022. Increases in BAV1 VC reductase populations were also observed in 35AWW11 and 35AWW23 as indicated in **Table 6**.

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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 the 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.

5.1 Conclusions

Data for Year 8 RA(O) were collected in December 2021 and June 2022. 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 (**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 throughout most of the site. **Figure 8** presents the graphical depiction of the trends of the COCs of various monitoring wells within LHAAP-58. With the exception of 35AWW09, the trend plots display decreasing COC trends in both the eastern and western plumes. Furthermore, **Figure 9** presents the change in the plumes from October 2016 to June 2022, 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 the September 2013 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 as a direct result of biodegradation of TCE. PCE; TCE; cis-1,2-DCE; and VC which had reduced to non-detect at well 03WW01 by the end of the Year 3 RA(O) (October 2016). PCE concentration decreased at 03WW01 in June 2022 to 9.9 µg/L, while TCE concentration increased in 03WW01 to 10 µg/L over the same period, indicating reductive dechlorination is occurring while daughter products cis-1,2-DCE and VC remain below MCLs in June 2022. All COCs were below the respective MCLs in well 35AWW08 in June 2022 (**Table 5**).

Concentrations of PCE and TCE in 35AWW09, located within the eastern plume but outside the EISB area, have increasing concentration trends based on the Mann-Kendall analysis, with the December 2019 results being the highest reported. Due to aquifer geochemical conditions outside of the EISB area that are unfavorable to reductive dechlorination, additional treatment in the area of 35AWW09 may need to be considered. 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

(**Table 6**), COC levels are not migrating beyond the original plume boundaries. Since COCs have not appeared at 35AWW21, other natural attenuation properties such as dilution, dispersion, sorption, and volatilization appear to be occurring at a rate sufficient to mitigate off-site migration. Concentrations of COCs downgradient of monitoring wells, 35AWW08 and 03WW01, have exhibited no increase in COC concentrations or new detections of COCs. PCE and TCE concentrations are indicating a statically significant increasing trend in monitoring well 35AWW09. Daughter product, cis-1,2-DCE concentrations in downgradient wells 03WW01 and 35AWW09 did demonstrate increasing (or probably increasing) trends. 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, 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, and 35AWW17, which are located well away from the most impacted area, remain non-detect or below MCLs. Perimeter well 35AWW18 had concentrations of 1,1-DCE above the MCL during this monitoring period. It was recommended in the Year 7 Annual RA(O) Report to sample downgradient monitoring well 35AWW04; however, the well was dry. Therefore, a new shallow zone monitoring well should be installed to bound the downgradient extent of the 1,1-DCE groundwater plume. PCE concentrations in LHSMW07 and 35AWW20, wells within the influence of the EISB treatment, have remained well below the MCL (5 µg/L) since the EISB treatment and was not detected in either well during the June 2022 sampling event. While TCE, 1,1-DCE, and cis-1,2-DCE exceed their respective MCLs at 35AWW20 during the current reporting period (September 2021 through August 2022), there are strong decreasing trends based on the Mann-Kendall analyses. Conversely, VC has an increasing trend at 35AWW20 based on the Mann-Kendall analysis; however, VC decreased from 2,800 µg/L in December 2019 to 840 µg/L in June 2022. Over the same time period from December 2019 to June 2022 ethene has also increased at 35AWW20 from 6.3 µg/L to 16.1 µg/L, indicating complete reductive dichlorination occurring. Concentrations of TCE and cis-1,2-DCE have been non-detect or below MCLs since September 2018 in LHSMW07. LHSMW07 exhibits a decreasing trend for 1,1-DCE and the concentration detected in June 2022 (8.8 µg/L) is approaching the MCL of 7 µg/L. VC has fluctuated seasonal from non-detect in July 2018 to 35 µg/L in December 2021 in LHSMW07. VC concentrations were non-detect in June 2021 and June 2022.

Despite the decreasing trends observed within the western plume, 1,1-DCE, TCE, cis-1,2-DCE, and VC continue to exceed their respective MCLs at 35AWW20 and LHSMW06 in June 2022. As a result additional treatment upgradient of 35AWW20 and LHSMW06 may need to be considered to ensure complete degradation of TCE and the associated daughter products to ethene.

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.

A LUC compliance inspection was conducted on July 21, 2022. No change in land or groundwater use has occurred at the site, and current land use complies with the ROD (Bhate/APTIM, June 2018). No compliance issues or concerns were noted during the annual inspection (**Appendix A**). Based on the well inspection completed in June 2022 monitoring well LHSMW06 was identified as needing paint. Therefore, LHSMW06 was repainted in September 2022.

5.2 Recommendations

Based on the Year 8 RA(O) activities and evaluation, recommendations for the Year 9 RA(O) activities are as follows:

- Install two additional western plume monitoring wells (35AWW25 and 35AWW26) to define the downgradient and upgradient extent of the shallow western plume (**Figure 10**). Monitoring well 35AWW25 will be installed near dry monitoring well 35AWW04 to define the downgradient extent in the southwestern portion of the site. Monitoring well 35AWW26 will be installed upgradient of 35AWW20 in the northwestern portion of the site.
- Install one additional monitoring well downgradient of 35AWW14 to determine extent (35AWW27) as presented on **Figure 10**.
- The Year 9 RA(O) groundwater monitoring plan is presented in **Table 7**. The final semi-annual sampling event of the western plume will be completed in December 2022. Beginning in June 2023, groundwater monitoring to be performed on the western plume will be reduced to VOC analysis on an annual basis, in compliance with the RAWP Contingency Remedy for the Western Plume (Bhate, January 2018). Annual sampling of the western plume will align with annual sampling of the eastern plume in June 2023. Surface water sampling will be conducted in the Year 9 RA(O) when the groundwater elevation in 35AWW18 is at or above the surveyed ditch elevation. Additional arsenic sampling will continue on select wells.
- Optimize the western plume remedy based on an evaluation of the upgradient VOC concentrations at proposed well 35AWW26. Optimization in the western plume may include additional EISB injections upgradient of monitoring well 35AWW20 and LHSMW06.
- Optimize the eastern plume remedy based on increasing CVOC trends identified at monitoring well 35AWW09 which is downgradient of previous EISB injections. Groundwater geochemical conditions are unfavorable for MNA outside of the EISB treatment zone in the eastern plume. Therefore, addition EISB injections should be considered near 35AWW09.

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6 REFERENCES

AECOM. November 2012. *Revised Technical Memorandum, Steps to Remedy-in-Place for LHAAP-03/LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas*.

AECOM. August 2013. *Final Remedial Action Work Plan LHAAP-35A (58), Shops Area, Group 4 Longhorn Army Ammunition Plant, Karnack, Texas*.

AECOM. October 2015. *Draft Final Remedial Action Completion Report, LHAAP-35A (58), Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas*.

AECOM. November 2015. *Draft Final 1st Annual Remedial Action Operation Report (October 2013 – October 2014), LHAAP-35A (58) Shops Area, Longhorn Army Ammunition Plant, Karnack, Texas*.

AECOM. May 2016. *Draft Final 2nd Annual Remedial Action Operation Report (January 2015 – October 2015), LHAAP-35A (58) Shops Area, Longhorn Army Ammunition Plant, Karnack, Texas*.

Bhate. January 2018. *Revised Final Remedial Action Work Plan Contingency Remedy for Western Plume LHAAP-35A (58), Shops Area, Group 4 Longhorn Army Ammunition Plant, Karnack, Texas*.

Bhate. March 2018. *Final Explanation of Significant Differences Record of Decision (ROD) for Western Plume Contingency Remedy at LHAAP-35A(58), Shops Area, Longhorn Army Ammunition Plant Karnack, Texas.*

Bhate. April 2018. *Draft Final 3rd Annual Remedial Action Operation Report (March 2016 – October 2016), LHAAP-35A (58) Shops Area, Longhorn Army Ammunition Plant, Karnack, Texas*.

Bhate. May 2018. *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas.*

Bhate. August 2018. *Draft Final Remedial Action Completion Report, Contingency Remedy for Western Plume, LHAAP-35A (58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas*.

Bhate/APTIM. June 2018. *Final Record of Decision (ROD), LHAAP-03, Former Waste Collection Pad, Building 722-Paint Shop, Longhorn Army Ammunition Plant, Karnack, Texas.*

Bhate/APTIM. July 2018. *Final Explanation of Significant Differences, LHAAP-35A(58), Shops Area, Group 4 Record of Decision dated September 2010, Longhorn Army Ammunition Plant Karnack, Texas.*

Bhate/APTIM. October 2018. *Draft Final 4th Annual Remedial Action Operation Report (November 2017 and June/July 2018), LHAAP-35A (58) Shops Area, Longhorn Army Ammunition Plant, Karnack, Texas*.

Bhate/APTIM. February 2019. *Final Technical Memorandum - Monitored Natural Attenuation Monitoring Parameters, Longhorn Army Ammunition Plant, Karnack, Texas.*

Shaw. June 2007. *Evaluation of Perimeter Well Data for Use as Groundwater Background, Karnack, Texas*.

Shaw. September 2010. *Record of Decision, LHAAP-35A (58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas*.

Shaw. September 2011. *Final Remedial Design, LHAAP-35A (58), Shop Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas*.

USACE. June 2019. *Final Five-Year Review Report for Longhorn Army Ammunition Plant, Town of Karnack, Harrison County, Texas*.

USEPA. September 1998. *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater, EPA/600/R-98/128*.

FIGURES

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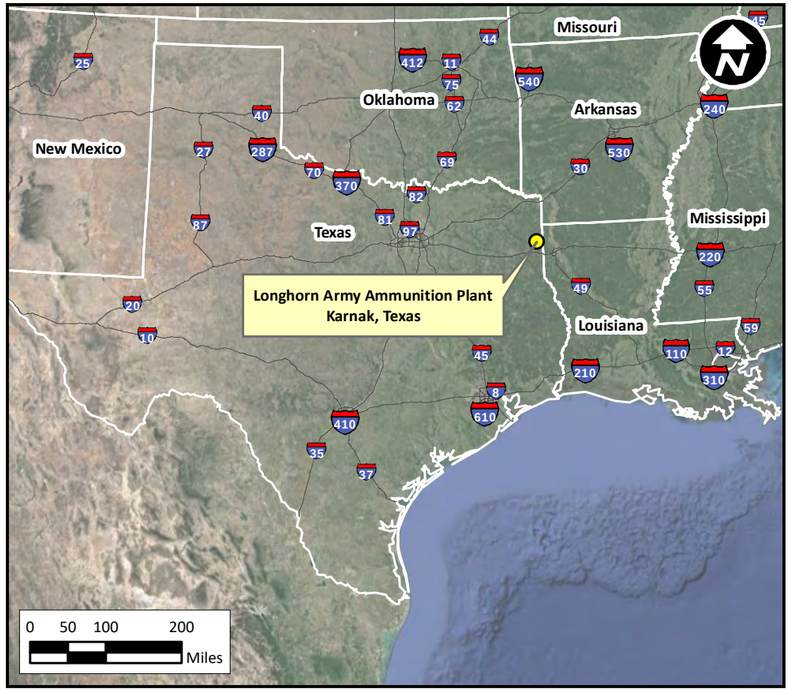

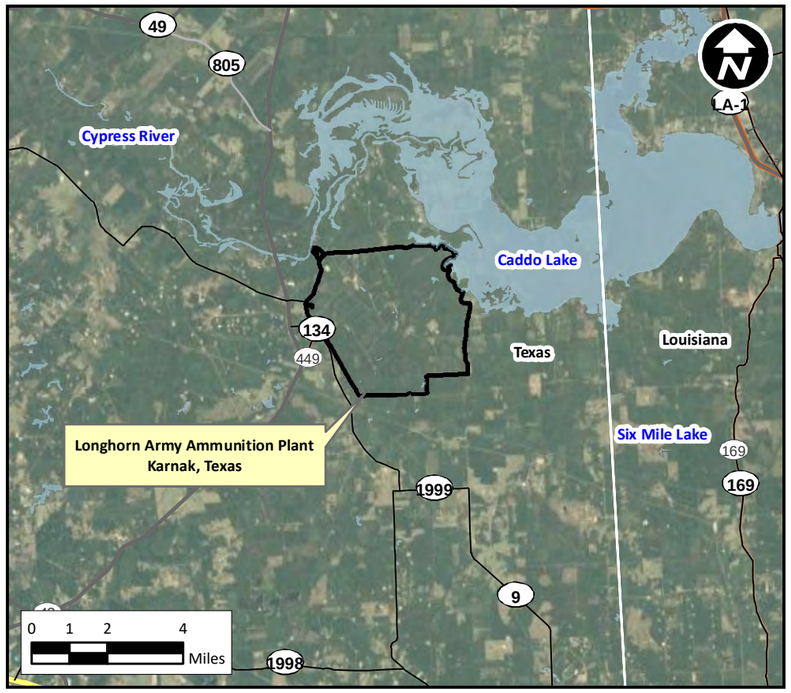

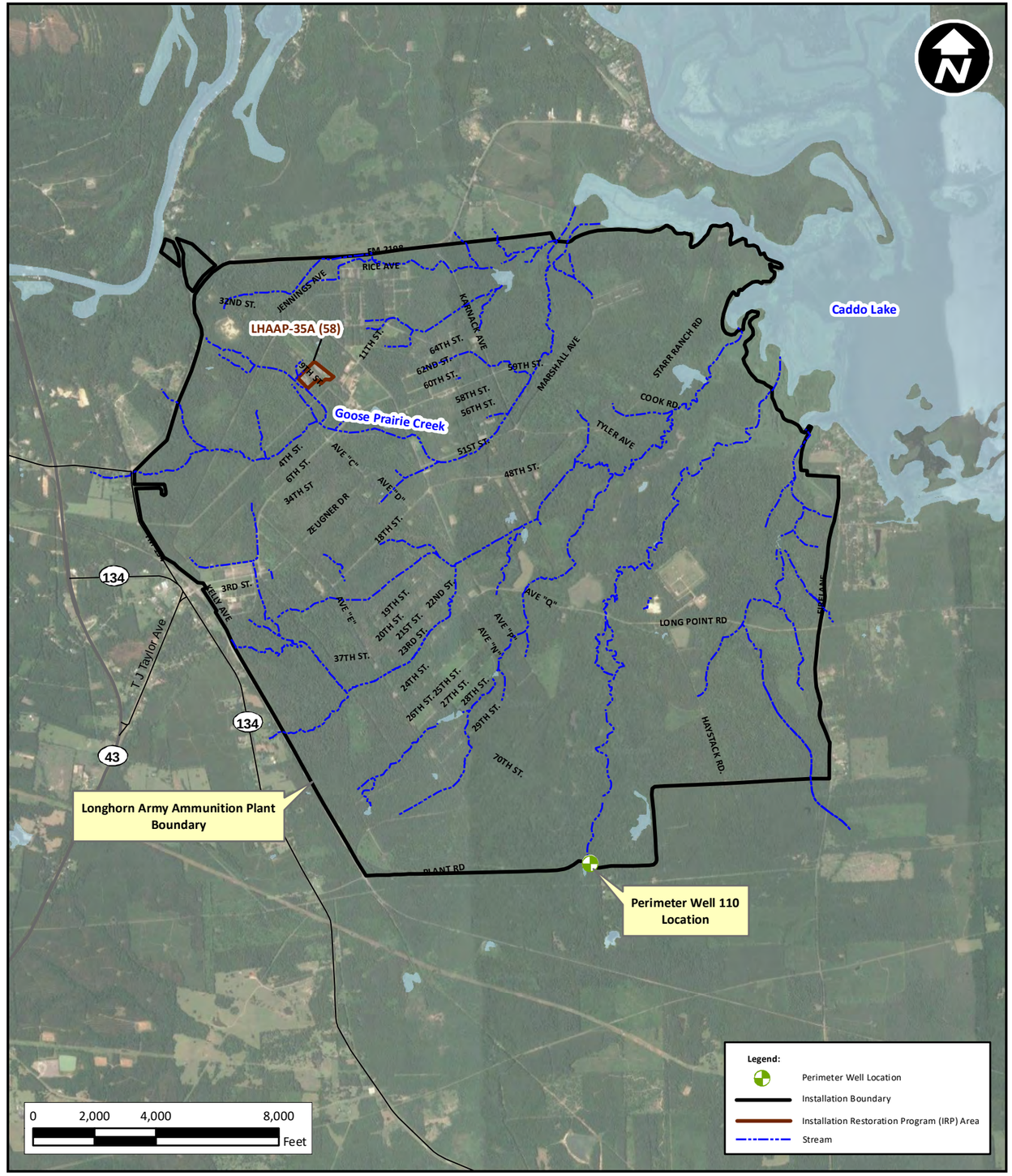

Longhorn Army Ammunition Plant
Location and Site Vicinity Map

Figure 1

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 2/27/2023

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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Figure 2

Monitoring Well Location Map

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 2/23/2023

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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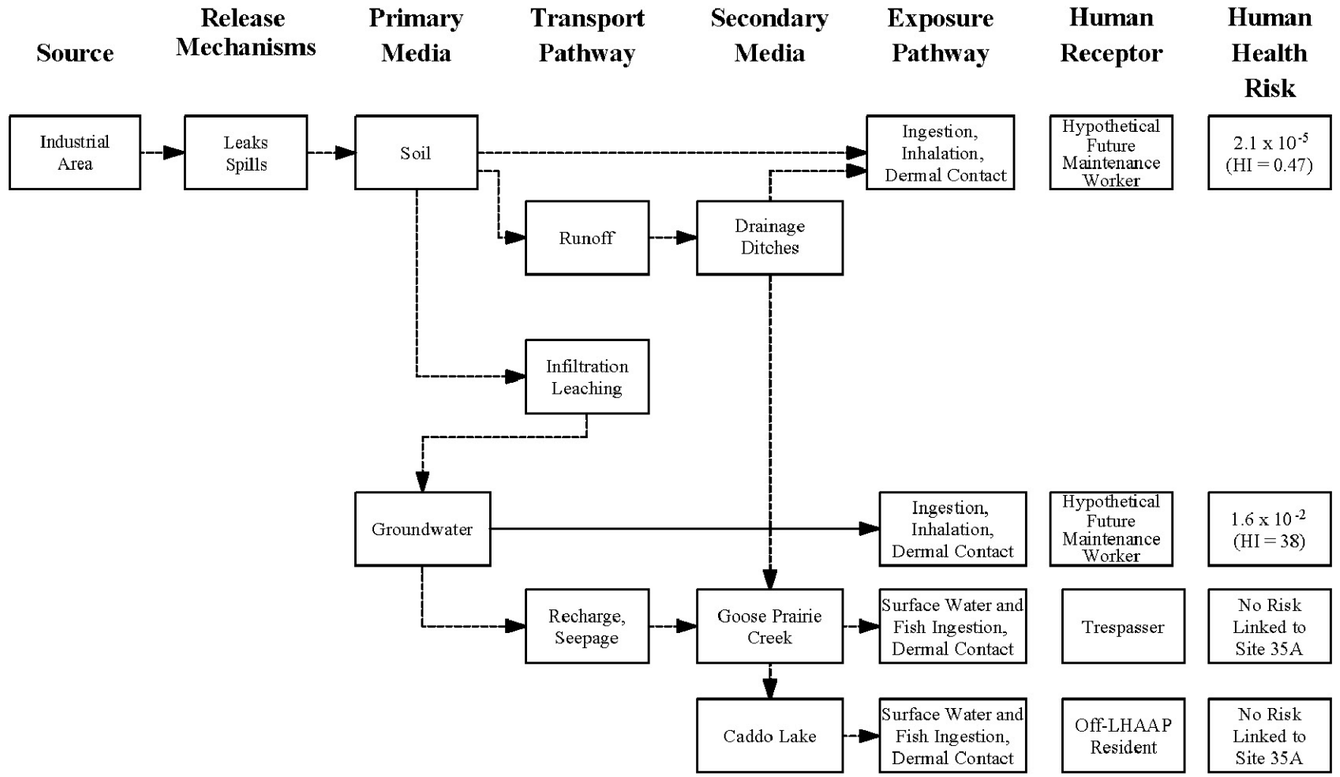
Aerial Photography Source: Google Earth, April 2018

0 75 150 300 Feet

Legend:

- 35AWW06 — Sampled Well Locations
- 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
- Direction of Groundwater Flow (June 2022)
- Stream
- *401* — Building Number

01152963



Pathway considered for remediation

Pathway *not* considered for remediation

Source: Shaw, May 2010

Conceptual Site Model

Figure 3

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

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DATE: 2/13/2023

SCALE: As Shown

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December 2021
Shallow Potentiometric Map

Figure 4

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 2/13/2023

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)
10TH ST.
9TH ST.
8TH ST.
7TH ST.
6TH ST.
4TH ST.
11TH ST.

35AWW03 (NM)
35AWW13 (NM)
35AWW22 (NM)
35AWW07R (NM)
35AWW15 (200.09)
35AWW10 (NM)
35AWW08 (NM)
LHSMW04 (Dry)
35AWW12 (NM)
LHSMW05 (NM)
03WW01 (NM)
35AWW09 (NM)
LHSMW06 (205.01)
35AWW11 (192.70)
1004TW001 (NM)
35AWW21 (NM)
35AWW20 (204.78)
1004TW006 (NM)
LHSMW03 (NM)
35AWW16 (NM)
35AWW14 (NM)
LHSMW07 (203.80)
35AWW23 (200.85)
35AWW06 (202.20)
35AWW18 (NM)
35AWW17 (NM)
35AWW19 (195.83)
35AWW24 (195.89)
35AWW04 (Dry)

202.00
204.00
200.00
198.00
196.00
194.00

Aerial Photography Source: Google Earth, April 2018

0 75 150 300 Feet

Legend:

- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- (195.89) 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

01152965

32ND ST.
HARRELL ST
TACKET DR
AVE "F"
AVE "G"
LHAAP-35A (58)
10TH ST.
9TH ST.
8TH ST.
6TH ST.
4TH ST.
11TH ST.

35AWW03 (NM)
35AWW13 (195.49)
35AWW22 (187.06)
35AWW07R (NM)
35AWW15 (204.92)
35AWW10 (203.42)
LHSMW05 (NM)
LHSMW04 (Dry)
35AWW12 (186.77)
03WW01 (187.67)
35AWW09 (186.65)
LHSMW06 (205.41)
35AWW08 (188.95)
35AWW21 (186.35)
1004TW006 (NM)
35AWW20 (204.98)
1004TW001 (NM)
LHSMW03 (NM)
204.00
35AWW16 (204.00)
35AWW11 (192.97)
35AWW14 (189.00)
LHSMW07 (203.90)
35AWW23 (200.54)
188.00
202.00
35AWW06 (201.93)
35AWW18 (198.48)
190.00
200.00
35AWW17 (198.83)
192.00
198.00
35AWW19 (195.91)
194.00
196.00
35AWW24 (195.77)
35AWW04 (Dry)

Aerial Photography Source: Google Earth, April 2018

0 75 150 300 Feet

Legend:

- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- (195.77) 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

June 2022
Shallow Potentiometric Map

Figure 5

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 2/13/2023

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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Legend
U = Result is less than the laboratory detection limit
< = less than
COC = Contaminant of Concern
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
FD = Field Duplicate
DCA = Dichloroethane
DCE = Dichloroethene
PCE = Tetrachloroethene
TCA = Trichloroethane
TCE = Trichloroethene
VC = Vinyl Chloride
Bold Red values exceed the USEPA MCL
All results and MCLs are reported in micrograms per liter (µg/L)

COCs shown on this figure	
COC	MCL
1,1-DCE	7
1,1,2-TCA	5
1,2-DCA	5
Benzene	5
cis-1,2-DCE	70
PCE	5
trans-1,2-DCE	100
TCE	5
VC	2

LHSMW06		12/2/2021	12/2/2021	6/9/2022
COC	MCL	Result	FD Result	Result
1,1-DCE	7	**12**	**12**	**9.1**
cis-1,2-DCE	70	**140**	**130**	**81**
TCE	5	**21**	**20**	**13**
VC	2	**4.2**	**4.3**	**2.3**

03WW01		6/6/2022
COC	MCL	Result
PCE	5	**9.9**
TCE	5	**10**

35AWW09		6/6/2022
COC	MCL	Result
PCE	5	**380**
TCE	5	**140**

35AWW20		12/1/2021	6/8/2022
COC	MCL	Result	Result
1,1,2-TCA	5	**75**	**62**
1,1-DCE	7	**1,100**	**1,600**
1,2-DCA	5	**14**	**13**
Benzene	5	**5.8**	**7.2**
cis-1,2-DCE	70	**86**	**89**
TCE	5	**100**	**150**
VC	2	**650**	**840**

LHSMW07		12/1/2021	6/8/2022
COC	MCL	Result	Result
1,1-DCE	7	**22**	**8.8**
VC	2	**35**	<0.50 U

35AWW14		6/6/2022
COC	MCL	Result
1,1-DCE	7	**9.6**
TCE	5	**13**

35AWW18		6/9/2022
COC	MCL	Result
1,1-DCE	7	**15**

LHAAP-35A (58)
HARRELL ST.
32ND ST.
TACKET DR
AVE "P"
AVE "G"
10TH ST.
9TH ST.
8TH ST.
11TH ST.
6TH ST.
8TH ST.
Goose Prairie Creek
35AWW03 (NS)
35AWW13
35AWW22
35AWW07R (NS)
35AWW10
35AWW15
LHSMW04 (NS, Dry)
35AWW12
LHSMW05 (NS)
35AWW08
35AWW21
1004TW001 (NS)
35AWW11
LHSMW03 (NS)
1004TW006 (NS)
35AWW16
35AWW23
35AWW06
35AWW17
35AWW19
35AWW04 (NS, Dry)
35AWW24
207
102
102
102-R
103
L-6
101
GH-1

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)
- Injection Locations (2013)
- (NS) Not Sampled
- Installation Restoration Program (IRP) Area
- Direction of Groundwater Flow (June 2022)
- Stream
- 401 Building Number

COC Exceedances in Shallow Groundwater (December 2021 - June 2022)

Figure 6

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM
DATE: 2/13/2023
SCALE: As Shown
PROJECT NO: NWO1312.0150.012.0001.03

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Legend
COC = Contaminant of Concern
MCL = Maximum Contaminant Level
DCA = Dichloroethane
DCE = Dichloroethane
PCE = Tetrachloroethene
TCA = Trichloroethane
TCE = Trichloroethane
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
1,1,2-TCA	5
1,2-DCA	5
Benzene	5
cis-1,2-DCE	70
PCE	5
trans-1,2-DCE	100
TCE	5
VC	2

HARRELL ST.
32ND ST.
TACKET DR
AVE "F"
AVE "G"
8TH ST.
9TH ST.
10TH ST.
11TH ST.
6TH ST.
4TH ST.
LHAAP-35A (58)
35AWW01
35AWW05
Goose Prairie Creek
207
102
102-R
103
AVE "P"
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 2021 and June 2022)

Figure 7

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM
DATE: 2/23/2023
SCALE: As Shown
PROJECT NO: NWO1312.0150.012.0001.03

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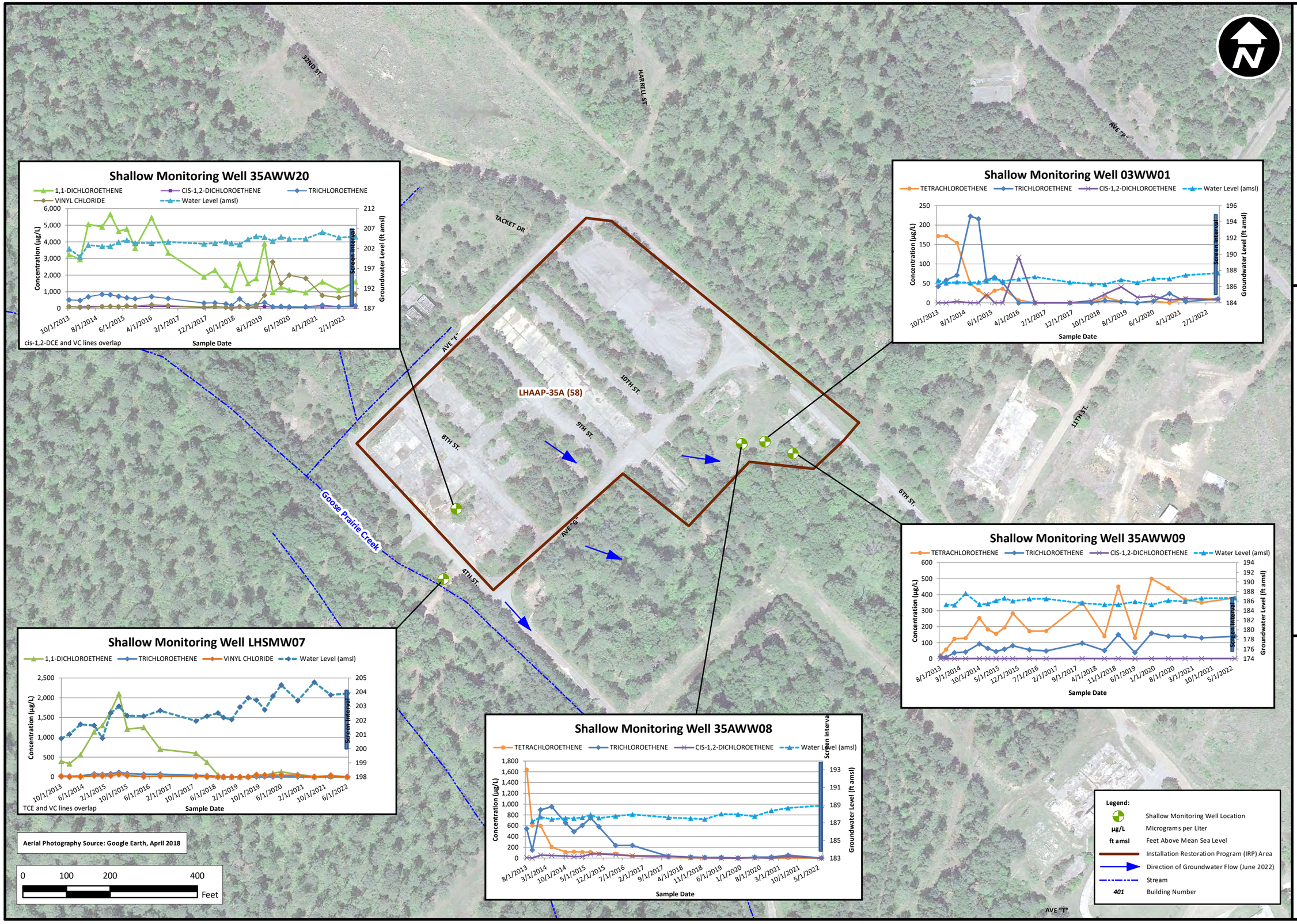
01152968



Shallow Monitoring Well 35AWW20

Shallow Monitoring Well 03WW01

Shallow Monitoring Well 35AWW09

Shallow Monitoring Well LHSMW07

Shallow Monitoring Well 35AWW08

Aerial Photography Source: Google Earth, April 2018

0 100 200 400 Feet

Legend:

- Shallow Monitoring Well Location
- µg/L — Micrograms per Liter
- ft amsl — Feet Above Mean Sea Level
- Installation Restoration Program (IRP) Area
- Direction of Groundwater Flow (June 2022)
- Stream
- *401* — Building Number

COC Concentration Trends

Figure 8

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 2/13/2023

SCALE: As Shown

PROJECT NO: NW01312.0150.012.0001.03

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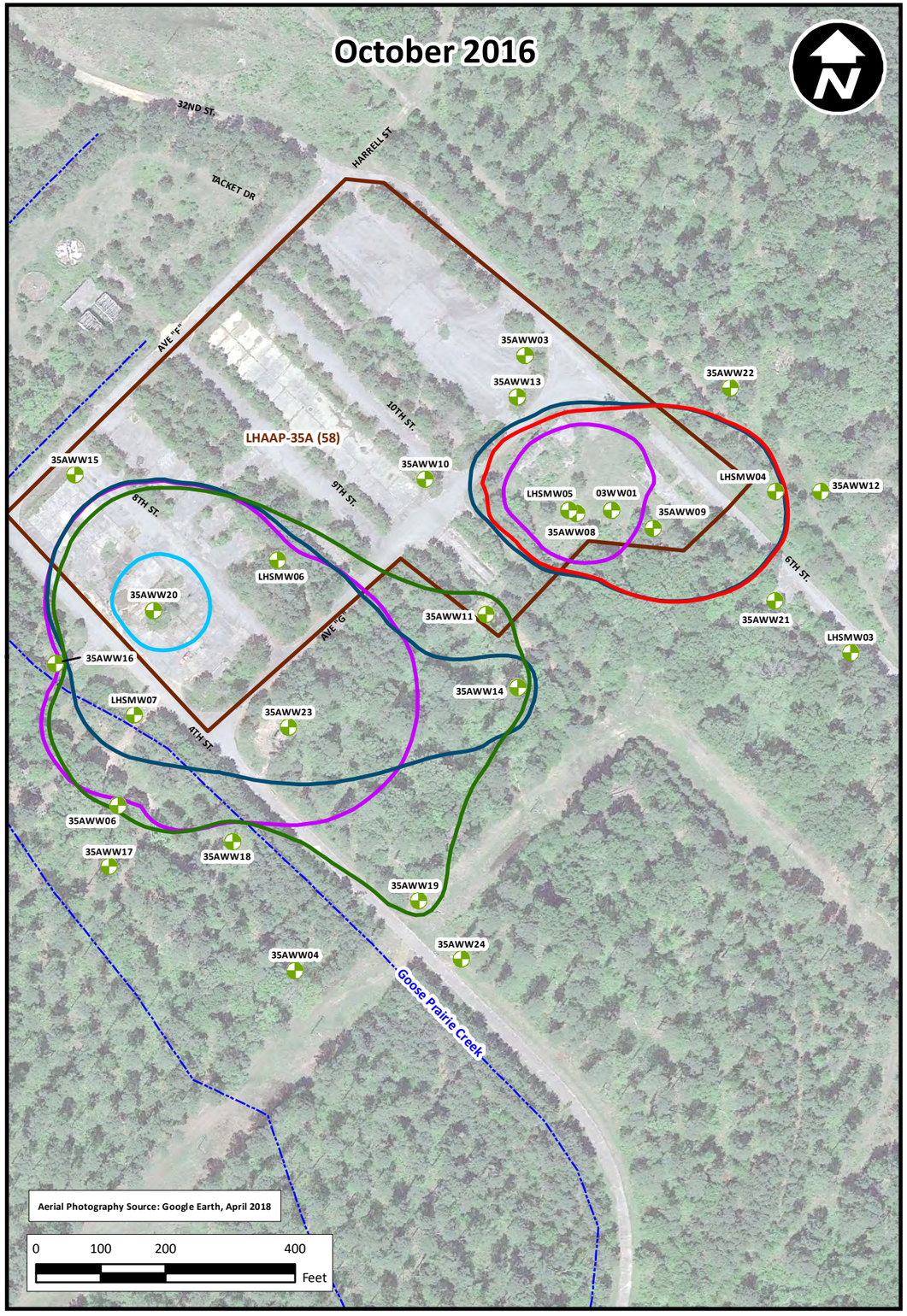

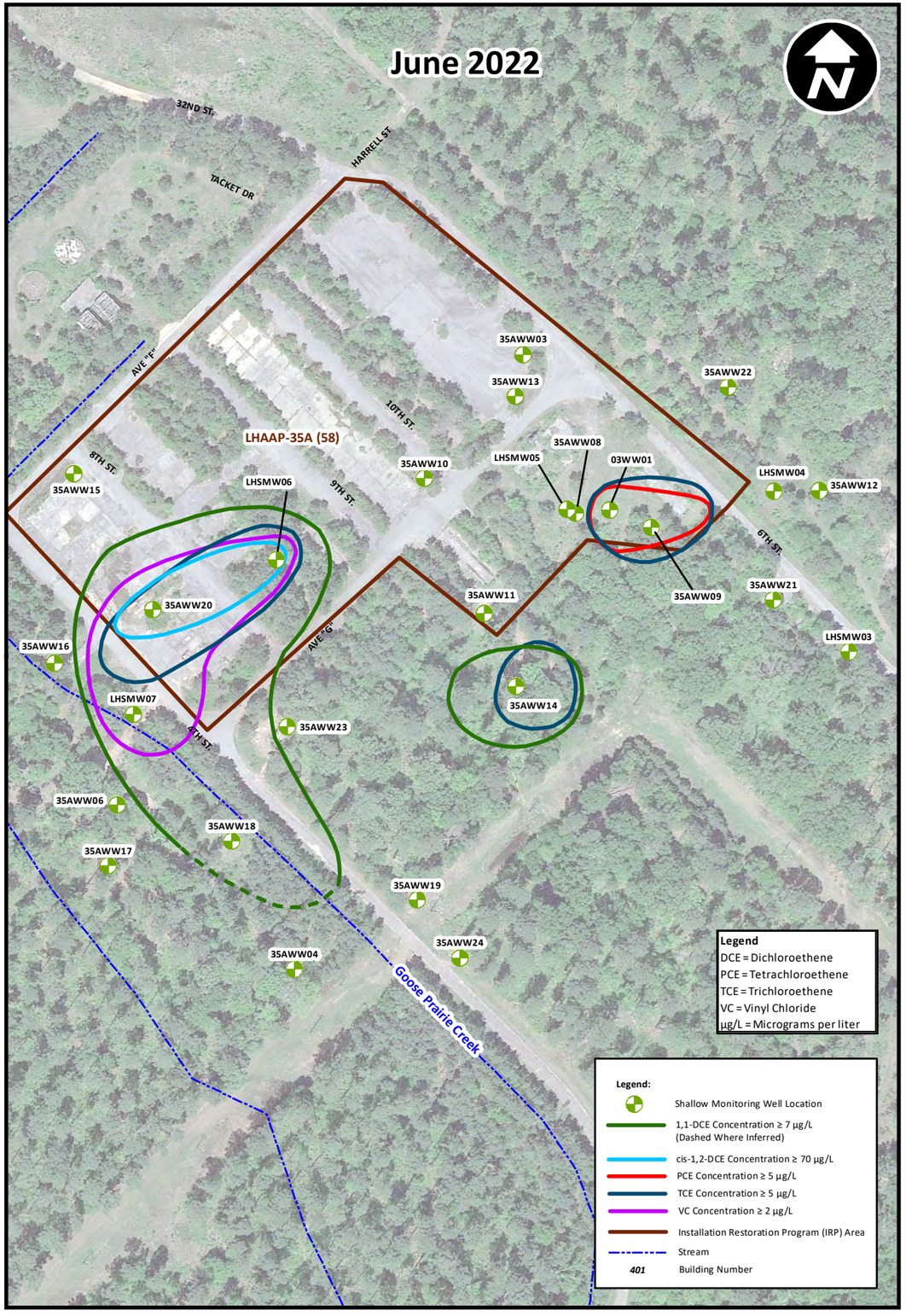

Lateral Extent of Plume Comparison (October 2016 and June 2022)

Figure 9

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 2/10/2023

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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Figure 10

Proposed Monitoring Well Installation Locations

Year 8 Annual Remedial Action Operation Report (December 2021 – June 2022)
LHAAP-35A (58), Shops Area
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 2/17/2023

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.03

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LHAAP-61
LHAAP-02
LHAAP-35A (58)
LHAAP-60D
LHAAP-68
LHAAP-69
LHAAP-56
LHAAP-03
LHAAP-59
LHAAP-65
TACKET DR
AVE "F"
AVE "G"
8TH ST.
9TH ST.
10TH ST.
11TH ST.
4TH ST.
6TH ST.
Goose Prairie Creek
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
35AWW25
35AWW26
35AWW27
03WW01
1004TW001
1004TW006
35ASW03
LHSMW03
LHSMW04
LHSMW05
LHSMW06
LHSMW07

Aerial Photography Source: Google Earth, April 2018

0 75 150 300 Feet

Legend:

- 35AWW26 Proposed Shallow Monitoring Well Location
- 35AWW06 Sampled Well Locations
- 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
- Direction of Groundwater Flow (June 2022)
- Stream
- 401 Building Number

TABLES

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Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 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	22.51-32.51	216.29	29.51	186.78
		1/29/2014	22.51-32.51	216.29	29.86	186.43
		5/20/2014	22.51-32.51	216.29	29.72	186.57
		10/27/2014	22.51-32.51	216.29	29.81	186.48
		1/20/2015	22.51-32.51	216.29	29.75	186.54
		4/14/2015	22.51-32.51	216.29	29.60	186.69
		7/7/2015	22.51-32.51	216.29	29.25	187.04
		10/7/2015	22.51-32.51	216.29	29.60	186.69
		4/12/2016	22.51-32.51	216.29	29.36	186.93
		10/3/2016	22.51-32.51	216.29	29.09	187.20
		12/18/2019	22.51-32.51	216.29	29.80	186.49
		7/18/2018	22.51-32.51	216.29	29.96	186.33
		12/11/2018	22.51-32.51	216.29	30.00	186.29
		6/3/2019	22.51-32.51	216.29	29.45	186.84
		12/18/2019	22.51-32.51	216.29	29.80	186.49
		6/23/2020	22.51-32.51	216.29	29.30	186.99
		12/1/2020	22.51-32.51	216.29	29.33	186.96
		6/2/2021	22.51-32.51	216.29	28.88	187.41
		6/8/2022	22.51-32.51	216.29	28.62	187.67
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	63.07-73.07	218.03	40.58	177.45
		1/31/2014	63.07-73.07	218.03	40.21	177.82
		5/29/2014	63.07-73.07	218.03	39.31	178.72
		10/31/2014	63.07-73.07	218.03	40.17	177.86
		1/27/2015	63.07-73.07	218.03	39.40	178.63
		4/10/2015	63.07-73.07	218.03	40.06	177.97
		7/10/2015	63.07-73.07	218.03	39.10	178.93
		10/6/2015	63.07-73.07	218.03	39.79	178.24
		4/12/2016	63.07-73.07	218.03	38.86	179.17
		10/5/2016	63.07-73.07	218.03	39.01	179.02
		12/20/2019	63.07-73.07	218.03	45.81	172.22
		7/2/2018	63.07-73.07	218.03	43.00	175.03
		12/13/2018	63.07-73.07	218.03	40.27	177.76
		6/10/2019	63.07-73.07	218.03	44.52	173.51
		12/18/2019	63.07-73.07	218.03	45.18	172.85
		6/25/2020	63.07-73.07	218.03	44.22	173.81
		12/7/2020	63.07-73.07	218.03	44.75	173.28
		6/1/2021	63.07-73.07	218.03	44.50	173.53
		6/6/2022	63.07-73.07	218.03	43.33	174.70
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

Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 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)
35AWW03	Shallow	2/1/2014	11.93 - 21.93	219.66	DRY	NC
		5/29/2014	11.93 - 21.93	219.66	DRY	NC
		10/30/2014	11.93 - 21.93	219.66	DRY	NC
		7/9/2015	11.93 - 21.93	219.66	DRY	NC
		4/13/2016	11.93 - 21.93	219.66	DRY	NC
		10/4/2016	11.93 - 21.93	219.66	DRY	NC
		11/16/2017	11.93 - 21.93	219.66	DRY	NC
35AWW04	Shallow	4/14/2016	16.51 - 26.51	220.66	DRY	NC
		10/4/2016	16.51 - 26.51	220.66	DRY	NC
		12/2/2001	16.51 - 26.51	220.66	DRY	NC
		6/8/2022	16.51 - 26.51	220.66	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
		12/3/2020	62.4 - 72.4	221.41	46.71	174.70
		6/2/2021	62.4 - 72.4	221.41	46.25	175.16
		12/2/2021	62.4 - 72.4	221.41	47.15	174.26
		6/9/2022	62.4 - 72.4	221.41	45.55	175.86
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
		9/11/2019	19.05 - 29.05	220.43	18.90	201.53
		12/19/2019	19.05 - 29.05	220.43	19.32	201.11
		3/24/2020	19.05 - 29.05	220.43	18.68	201.75
		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
		9/11/2019	19.05 - 29.05	220.43	18.90	201.53
		12/19/2019	19.05 - 29.05	220.43	19.32	201.11
		3/24/2020	19.05 - 29.05	220.43	18.68	201.75
		4/7/2020	19.05 - 29.05	220.43	18.77	201.66
		6/24/2020	19.05 - 29.05	220.43	18.45	201.98
		12/1/2020	19.05 - 29.05	220.43	18.55	201.88
		6/3/2021	19.05 - 29.05	220.43	18.16	202.27
		12/1/2021	19.05 - 29.05	220.43	18.23	202.20
		6/8/2022	19.05 - 29.05	220.43	18.50	201.93

Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 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)
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 - 31.25	212.11	26.55	185.56
		7/10/2015	21.55 - 31.25	212.11	24.08	188.03
		4/13/2016	21.55 - 31.25	212.11	24.34	187.77
		10/4/2016	21.55 - 31.25	212.11	24.82	187.29
		11/17/2017	21.55 - 31.25	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
		12/18/2019	21.83 - 31.83	216.95	29.00	187.95
		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
		12/18/2019	21.83 - 31.83	216.95	29.00	187.95
		6/23/2020	21.83 - 31.83	216.95	29.22	187.73
		12/1/2020	21.83 - 31.83	216.95	28.58	188.37
		6/2/2021	21.83 - 31.83	216.95	28.28	188.67
		6/8/2022	21.83 - 31.83	216.95	28.00	188.95
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
		12/18/2019	26.69 - 41.29	217.47	32.22	185.25
		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
		12/18/2019	26.69 - 41.29	217.47	32.22	185.25
		6/23/2020	26.69 - 41.29	217.47	31.35	186.12
		12/7/2020	26.69 - 41.29	217.47	31.55	185.92
		6/2/2021	26.69 - 41.29	217.47	30.88	186.59
		6/6/2022	26.69 - 41.29	217.47	30.82	186.65

Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 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)
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
		12/19/2019	18.16 - 32.76	220.76	19.72	201.04
		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
		12/19/2019	18.16 - 32.76	220.76	19.72	201.04
		6/29/2020	18.16 - 32.76	220.76	17.25	203.51
		12/7/2020	18.16 - 32.76	220.76	18.65	202.11
		6/1/2021	18.16 - 32.76	220.76	15.55	205.21
		6/6/2022	18.16 - 32.76	220.76	17.34	203.42
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
		9/11/2019	22.24 - 36.84	220.15	29.46	190.69
		12/18/2019	22.24 - 36.84	220.15	29.68	190.47
		3/24/2020	22.24 - 36.84	220.15	29.03	191.12
		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
		9/11/2019	22.24 - 36.84	221.15	29.46	191.69
		12/18/2019	22.24 - 36.84	220.15	29.68	190.47
		3/24/2020	22.24 - 36.84	221.15	29.03	192.12
		6/23/2020	22.24 - 36.84	221.15	29.11	192.04
		12/1/2020	22.24 - 36.84	221.15	28.95	192.20
		6/2/2021	22.24 - 36.84	221.15	28.30	192.85
		12/1/2021	22.24 - 36.84	221.15	28.45	192.70
		6/8/2022	22.24 - 36.84	221.15	28.18	192.97

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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)
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
		12/18/2019	22.17 - 36.77	215.99	30.33	185.66
		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
		12/18/2019	22.17 - 36.77	215.99	30.33	185.66
		6/25/2020	22.17 - 36.77	215.99	28.95	187.04
		12/7/2020	22.17 - 36.77	215.99	29.72	186.27
		6/2/2021	22.17 - 36.77	215.99	28.00	187.99
		6/6/2022	22.17 - 36.77	215.99	29.22	186.77
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
		12/18/2019	24.72 - 39.32	219.12	25.05	194.07
		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
		12/18/2019	24.72 - 39.32	219.12	25.05	194.07
		6/29/2020	24.72 - 39.32	219.12	23.32	195.80
		12/7/2020	24.72 - 39.32	219.12	24.61	194.51
		6/1/2021	24.72 - 39.32	219.12	22.95	196.17
		6/6/2022	24.72 - 39.32	219.12	23.63	195.49

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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
		12/19/2019	17.06 - 31.76	218.41	29.55	188.86
		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
		12/19/2019	17.06 - 31.76	218.41	29.55	188.86
		6/25/2020	17.06 - 31.76	218.41	28.77	189.64
		12/7/2020	17.06 - 31.76	218.41	30.75	187.66
		6/1/2021	17.06 - 31.76	218.41	27.80	190.61
		6/6/2022	17.06 - 31.76	218.41	29.41	189.00
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
		12/20/2019	25.67 - 40.37	222.97	19.87	203.10
		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
		12/20/2019	25.67 - 40.37	222.97	19.87	203.10
		6/25/2020	25.67 - 40.37	222.97	17.93	205.04
		12/7/2020	25.67 - 40.37	222.97	17.05	205.92
		6/1/2021	25.67 - 40.37	222.97	16.95	206.02
		12/2/2021	25.67 - 40.37	222.97	22.88	200.09
		6/9/2022	25.67 - 40.37	222.97	18.05	204.92
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
		12/19/2019	21.75 - 36.45	220.88	18.00	202.88
		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
		12/19/2019	21.75 - 36.45	220.88	18.00	202.88
		6/25/2020	21.75 - 36.45	220.88	16.68	204.20
		12/1/2020	21.75 - 36.45	220.88	17.25	203.63
		6/1/2021	21.75 - 36.45	220.88	16.28	204.60
		6/9/2022	21.75 - 36.45	220.88	16.88	204.00

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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
		12/18/2019	26.97 - 41.67	221.44	24.00	197.44
		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
		12/18/2019	26.97 - 41.67	221.44	24.00	197.44
		6/29/2020	26.97 - 41.67	221.44	23.40	198.04
		12/1/2020	26.97 - 41.67	221.44	23.12	198.32
		6/3/2021	26.97 - 41.67	221.44	23.02	198.42
		6/9/2022	26.97 - 41.67	221.44	22.61	198.83
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
		12/18/2019	26.85 - 41.55	221.75	24.82	196.93
		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
		12/18/2019	26.85 - 41.55	221.75	24.82	196.93
		6/25/2020	26.85 - 41.55	221.75	24.17	197.58
		12/1/2020	26.85 - 41.55	221.75	23.95	197.80
		6/1/2021	26.85 - 41.55	221.75	23.63	198.12
		6/9/2022	26.85 - 41.55	221.75	23.27	198.48
35AWW19	Shallow	10/22/2013	16.89 - 31.39	219.71	30.65	189.06
		1/31/2014	16.89 - 31.39	219.71	30.68	189.03
		5/28/2014	16.89 - 31.39	219.71	30.30	189.41
		10/29/2014	16.89 - 31.39	219.71	30.45	189.26
		1/20/2015	16.89 - 31.39	219.71	30.15	189.56
		4/7/2015	16.89 - 31.39	219.71	29.84	189.87
		7/8/2015	16.89 - 31.39	219.71	29.16	190.55
		10/1/2015	16.89 - 31.39	219.71	29.46	190.25
		4/12/2016	16.89 - 31.39	219.71	28.87	190.84
		10/5/2016	16.89 - 31.39	219.71	28.13	191.58
		9/11/2019	16.89 - 31.39	219.71	25.55	194.16
		12/18/2019	16.89 - 31.39	219.71	25.90	193.81
		3/24/2020	16.89 - 31.39	219.71	26.00	192.34
		9/27/2018	16.89 - 31.39	219.71	27.79	191.92
		12/10/2018	16.89 - 31.39	219.71	27.58	192.13
		3/19/2019	16.89 - 31.39	219.71	27.00	192.71
		6/3/2019	16.89 - 31.39	219.71	26.45	193.26
		9/11/2019	16.89 - 31.39	219.71	25.55	194.16
		12/18/2019	16.89 - 31.39	219.71	25.90	193.81
		3/24/2020	16.89 - 31.39	219.71	26.00	193.71
		6/24/2020	16.89 - 31.39	219.71	24.92	194.79
		12/3/2020	16.89 - 31.39	219.71	24.63	195.08
		6/3/2021	16.89 - 31.39	219.71	23.98	195.73
		12/1/2021	16.89 - 31.39	219.71	23.88	195.83
		6/8/2022	16.89 - 31.39	219.71	23.80	195.91

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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)
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
		9/11/2019	20.94 - 35.64	223.05	18.20	204.85
		12/19/2019	20.94 - 35.64	223.05	19.20	203.85
		3/24/2020	20.94 - 35.64	223.05	18.15	204.90
		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
		9/11/2019	20.94 - 35.64	223.05	18.20	204.85
		12/19/2019	20.94 - 35.64	223.05	19.20	203.85
		3/24/2020	20.94 - 35.64	223.05	18.15	204.90
		6/24/2020	20.94 - 35.64	223.05	18.65	204.40
		12/3/2020	20.94 - 35.64	223.05	18.58	204.47
		6/3/2021	20.94 - 35.64	223.05	16.95	206.10
		12/1/2021	20.94 - 35.64	223.05	18.27	204.78
		6/8/2022	20.94 - 35.64	223.05	18.07	204.98
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
		12/20/2019	27.56 - 42.26	219.05	34.18	184.87
		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
		12/20/2019	27.56 - 42.26	219.05	34.18	184.87
		6/29/2020	27.56 - 42.26	219.05	32.28	186.77
		12/7/2020	27.56 - 42.26	219.05	33.33	185.72
		6/1/2021	27.56 - 42.26	219.05	30.70	188.35
		6/9/2022	27.56 - 42.26	219.05	32.70	186.35

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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
		12/18/2019	22.27 - 36.77	219.14	32.87	186.27
		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
		12/18/2019	22.27 - 36.77	219.14	32.87	186.27
		6/24/2020	22.77 - 36.77	219.14	32.20	186.94
		12/7/2020	22.77 - 36.77	219.14	32.27	186.87
		6/2/2021	22.77 - 36.77	219.14	32.10	187.04
		6/6/2022	22.77 - 36.77	219.14	32.08	187.06
35AWW23	Shallow	7/17/2018	28.2 - 43.2	223.07	23.55	199.52
		12/10/2018	28.2 - 43.2	223.07	20.71	202.36
		6/3/2019	28.2 - 43.2	223.07	23.97	199.10
		9/11/2019	28.2 - 43.2	223.07	22.00	201.07
		12/18/2019	28.2 - 43.2	223.07	23.45	199.62
		3/24/2020	28.2 - 43.2	223.07	22.60	200.47
		6/24/2020	28.2 - 43.2	223.07	22.44	200.63
		12/3/2020	28.2 - 43.2	223.07	22.55	200.52
		6/3/2021	28.2 - 43.2	223.07	23.05	200.02
		12/1/2021	28.2 - 43.2	223.07	22.22	200.85
		6/8/2022	28.2 - 43.2	223.07	22.53	200.54
35AWW24	Shallow	7/17/2018	25.10 - 35.10	219.04	26.60	192.44
		9/27/2018	25.10 - 35.10	219.04	20.11	198.93
		12/10/2018	25.10 - 35.10	219.04	26.75	192.29
		3/19/2019	25.10 - 35.10	219.04	26.06	192.98
		6/3/2019	25.10 - 35.10	219.04	25.47	193.57
		12/19/2019	25.10 - 35.10	219.04	25.09	193.95
		6/25/2020	25.10 - 35.10	219.04	24.25	194.79
		12/3/2020	25.10 - 35.10	219.04	23.85	195.19
		6/1/2021	25.10 - 35.10	219.04	23.15	195.89
		12/2/2021	25.10 - 35.10	219.04	23.15	195.89
		6/8/2022	25.10 - 35.10	219.04	23.27	195.77
LHSMW03	Shallow	10/9/2013	24.82 - 34.82	217.26	DRY	NC
		2/3/2014	24.82 - 34.82	217.26	31.00	186.26
		5/28/2014	24.82 - 34.82	217.26	29.40	187.86
		10/29/2014	24.82 - 34.82	217.26	31.20	186.06
		7/8/2015	24.82 - 34.82	217.26	28.21	189.05
		4/13/2016	24.82 - 34.82	217.26	28.75	188.51
		10/4/2016	24.82 - 34.82	217.26	29.51	187.75
		11/17/2017	24.82 - 34.82	217.26	31.36	185.90

Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 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)
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
		12/19/2019	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
		12/19/2019	21.11 - 31.11	216.95	DRY	NC
		6/24/2020	21.11 - 31.11	216.95	DRY	NC
		12/3/2020	21.11 - 31.11	216.95	DRY	NC
		6/3/2021	21.11 - 31.11	216.95	DRY	NC
		12/2/2021	21.11 - 31.11	216.95	DRY	NC
		6/9/2022	21.11 - 31.11	216.95	DRY	NC
LHSMW05	Shallow	10/9/2013	14.32 - 24.32	217.59	DRY	NC
		1/31/2014	14.32 - 24.32	217.59	DRY	NC
		5/20/2014	14.32 - 24.32	217.59	DRY	NC
		10/30/2014	14.32 - 24.32	217.59	DRY	NC
		1/20/2015	14.32 - 24.32	217.59	DRY	NC
		4/7/2015	14.32 - 24.32	217.59	DRY	NC
		7/10/2015	14.32 - 24.32	217.59	DRY	NC
		10/1/2015	14.32 - 24.32	217.59	DRY	NC
		4/12/2016	14.32 - 24.32	217.59	DRY	NC
		10/4/2016	14.32 - 24.32	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
		11/16/2017	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
		12/20/2019	13.32 - 23.32	223.18	18.72	204.46
		6/25/2020	13.32 - 23.32	223.18	17.28	205.90
		12/3/2020	13.32 - 23.32	223.18	18.53	204.65
		6/3/2021	13.32 - 23.32	223.18	16.07	207.11
		12/2/2021	13.32 - 23.32	223.18	18.17	205.01
		6/9/2022	13.32 - 23.32	223.18	17.77	205.41

Table 1
Groundwater Elevation Data
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 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)
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
		9/11/2019	19.73 - 29.73	221.27	17.84	203.43
		12/19/2019	19.73 - 29.73	221.27	18.52	202.75
		3/24/2020	19.73 - 29.73	221.27	17.55	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
		9/11/2019	19.73 - 29.73	221.27	17.84	203.43
		12/19/2019	19.73 - 29.73	221.27	18.52	202.75
		3/24/2020	19.73 - 29.73	221.27	17.55	203.72
		6/24/2020	19.73 - 29.73	221.27	17.22	204.05
		12/3/2020	19.73 - 29.73	221.27	17.88	203.39
		6/2/2021	19.73 - 29.73	221.27	16.57	204.70
		12/1/2021	19.73 - 29.73	221.27	17.47	203.80
		6/8/2022	19.73 - 29.73	221.27	17.37	203.90

Notes:
ft - feet
msl = mean sea level
NA - Not available
NC - Not calculated
NM - Not measured

Table 2. Eastern Plume Semi-Annual Analytical Data, June 2022
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	03WW01_060622 6/06/22	35AWW01_060622 6/06/22	35AWW01_060622_a 6/06/22	35AWW08_060622 6/06/22	35AWW09_060622 6/06/22	35AWW10_060622 6/06/22	35AWW12_060622 6/6/22	35AWW12_060622_a 6/6/22	35AWW13_060622 6/06/22	35AWW14_060622 6/6/22	35AWW16_060922 6/9/22	35AWW17_060922 6/9/22	35AWW18_060922 6/9/22	35AWW21_060922 6/9/22	35AWW22_060622 6/06/22
			Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary. Field Duplicate.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - ESE, inside 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 - SW, outside site boundary, near Building 744-A.	Site 58 - SW, outside site boundary.	Site 58 - SSW, outside site boundary.	Site 58 - ESE, outside site boundary, beside Building 725.	Site 58 - ENE, outside site boundary.
		Location Depth	Shallow	Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
		Lab Package	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060604	HS22060604	HS22060604	HS22060604	HS22060438
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	NA
Volatile Organic Compounds (8260C)																	
1,1,1,2-Tetrachloroethane	µg/L	110	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	µg/L	200	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	µg/L	5	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	µg/L	10,000	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	**0.59 J**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**13**	< 0.50 U	< 0.50 U	**3.5**	< 0.50 U	< 0.50 U
1,1-Dichloroethene	µg/L	7	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**9.6**	< 0.50 U	< 0.50 U	**15**	< 0.50 U	< 0.50 U
1,1-Dichloropropene	µg/L	2.9	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	µg/L	310	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	µg/L	0.041	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	µg/L	70	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dibromoethane	µg/L	0.05	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-Dichlorobenzene	µg/L	600	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-Dichloropropane	µg/L	5	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichlorobenzene	µg/L	3,100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	µg/L	29	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	µg/L	75	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2,2-Dichloropropane	µg/L	42	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
2-Butanone	µg/L	61,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Hexanone	µg/L	6,100	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
4-Chlorotoluene	µg/L	2,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	µg/L	10,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	µg/L	8,200	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Acetone	µg/L	92,000	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Benzene	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromobenzene	µg/L	2,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromochloromethane	µg/L	4,100	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromodichloromethane	µg/L	4.6	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromoform	µg/L	36	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	µg/L	140	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon disulfide	µg/L	10,000	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon tetrachloride	µg/L	5	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	µg/L	100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	µg/L	41,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	µg/L	1,000	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Chloromethane	µg/L	220	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
cis-1,2-Dichloroethene	µg/L	70	**7.3**	< 0.50 U	< 0.50 U	< 2.5 U	**1.1**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**5.0**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dibromochloromethane	µg/L	34	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	µg/L	380	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dichlorodifluoromethane	µg/L	20,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylbenzene	µg/L	700	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	µg/L	20	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylene	µg/L	10,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
n-Butylbenzene	µg/L	4,100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	µg/L	4,100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	µg/L	10,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	µg/L	4,100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Table 2. Eastern Plume Semi-Annual Analytical Data, June 2022
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Location Identification: / Sample Date:	Units	MCL/MSC	03WW01_060622 6/06/22	35AWW01_060622 6/06/22	35AWW01_060622_a 6/06/22	35AWW08_060622 6/06/22	35AWW09_060622 6/06/22	35AWW10_060622 6/06/22	35AWW12_060622 6/6/22	35AWW12_060622_a 6/6/22	35AWW13_060622 6/06/22	35AWW14_060622 6/6/22	35AWW16_060922 6/9/22	35AWW17_060922 6/9/22	35AWW18_060922 6/9/22	35AWW21_060922 6/9/22	35AWW22_060622 6/06/22
			Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary. Field Duplicate.	Site 58 - E, inside site boundary.	Site 58 - E, inside site boundary.	Site 58 - ESE, inside 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 - SW, outside site boundary, near Building 744-A.	Site 58 - SW, outside site boundary.	Site 58 - SSW, outside site boundary.	Site 58 - ESE, outside site boundary, beside Building 725.	Site 58 - ENE, outside site boundary.
		Location Depth	Shallow	Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
		Lab Package	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060438	HS22060604	HS22060604	HS22060604	HS22060604	HS22060438
Styrene	µg/L	100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	µg/L	4,100	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	µg/L	5	**9.9**	< 1.0 U	< 1.0 U	< 5.0 U	**380**	< 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
Toluene	µg/L	1,000	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
trans-1,2-Dichloroethene	µg/L	100	**0.74 J**	< 0.50 U	< 0.50 U	**3.9 J**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
trans-1,3-Dichloropropene	µg/L	29	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Trichloroethene	µg/L	5	**10**	< 0.50 U	< 0.50 U	< 2.5 U	**140**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**13**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Trichlorofluoromethane	µg/L	31,000	< 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride		2	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 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	NA
Butyric Acid	mg/L	NV	NA	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	NA
Propionic Acid	mg/L	51	NA	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	NA
ICP-MS Metals (6020A)																	
Arsenic	mg/L	0.01	**0.00955**	**0.000828 J**	**0.000915 J**	**0.0314**	**0.000526 J**	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	NA
Nitrate	mg/L	10	NA	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	NA
Dissolved Gases (RSK-175)																	
Carbon Dioxide	µg/L	NV	NA	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	NA
Ethene	µg/L	NV	NA	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	NA
Dechlorinating Bacteria																	
BAV1 Vinyl Chloride Reductase	cells/mL	NV	NA	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	NA
Dehalococoides	cells/mL	NV	NA	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	NA
Vinyl Chloride Reductase	cells/mL	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Field Parameters																	
Temperature	^{0}C	NV	21.93	21.84		20.93	21.43	23.83	23.49		23.87	22.17	22.59	20.71	20.87	22.51	22.59
pH	s.u.	5-9	5.95	6.03		6.24	5.60	5.08	5.13		5.75	6.08	5.69	5.97	5.83	4.61	5.29
DO	mg/L	< 0.5	0.03	0.04		0.05	0.18	0.20	0.04		0.04	8.49	0.02	0.06	0.03	0.03	0.07
ORP	mV	< 0.0	-50	89		-74	277	504	332		217	221	69	55	134	353	318

Notes:

Detected concentrations above method detection limited are bolded.

Blue Highlighting Indicates concentrations above the MCL/MSC

DO - dissolved oxygen

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations

NA - Not Analyzed

ORP - oxidation reduction potential

pH = negative log of the hydrogen ion concentration

µg/L - micrograms per liter

Table 3. Western Plume Analytical Data, December 2021 and June 2022
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Location ID: / Sample Date:	Units	MCL/MSC	35AWW05_120221 12/2/21	35AWW05_060922 6/9/22	35AWW06_120121 12/1/21	35AWW06_060822 6/8/22	35AWW11_120121 12/01/21	35AWW11_060822 6/8/22	35AWW15_120221 12/2/21	35AWW15_060922 6/9/22	35AWW18_060922 6/9/22	35AWW19_120121 12/1/21	35AWW19_060822 6/8/22	35AWW20_120121 12/1/21	35AWW20_060822 6/8/22	35AWW23_120121 12/2/21
Location Description			Site 58 - E, inside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside 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.	Site 58 - SSW, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS21120243-02	HS22060604	HS21120103-06	HS22060453	HS21120103-01	HS22060453	HS21120243-03	HS22060604	HS22060604	HS21120103-03	HS22060453	HS21120103-05	HS22060453	HS21120103-02
Total Organic Carbon (415.1/SM5310C)																
Total Organic Carbon	mg/L	NV	NA	NA	**12.1**	**10.6**	**9.02**	**9.72**	NA	NA	NA	**7.05**	**2.43**	**19.3**	**17.7**	**21.2**
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	µg/L	110	< 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	< 5.0 U	< 1.0 U
1,1,1-Trichloroethane	µg/L	200	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 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	< 5.0 U	< 1.0 U
1,1,2-Trichloroethane	µg/L	5	< 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	**75**	**62**	< 1.0 U
1,1-Dichloroethane	µg/L	10,000	< 0.50 U	< 0.50 U	**0.42 J**	< 0.50 U	< 0.50 U	**0.51 J**	< 0.50 U	< 0.50 U	**3.5**	**0.70 J**	**0.63 J**	**440**	**520**	< 0.50 U
1,1-Dichloroethene	µg/L	7	< 0.50 U	< 0.50 U	**1.4**	**1.00 J**	**1.5**	**2.1**	< 0.50 U	< 0.50 U	**15**	**2.4**	**2.9**	**1,100**	**1,600**	< 0.50 U
1,1-Dichloropropene	µg/L	2.9	< 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	< 5.0 U	< 1.0 U
1,2,3-Trichlorobenzene	µg/L	310	< 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	< 5.0 U	< 1.0 U
1,2,3-Trichloropropane	µg/L	0.041	< 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	< 5.0 U	< 1.0 U
1,2,4-Trichlorobenzene	µg/L	70	< 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	< 5.0 U	< 1.0 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 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	< 5.0 U	< 1.0 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 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	< 5.0 U	< 1.0 U
1,2-Dibromoethane	µg/L	0.05	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
1,2-Dichlorobenzene	µg/L	600	< 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	**28**	**27**	< 1.0 U
1,2-Dichloroethane	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**0.93 J**	**0.98 J**	**14**	**13**	< 0.50 U
1,2-Dichloropropane	µg/L	5	< 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	< 5.0 U	< 1.0 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 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	< 5.0 U	< 1.0 U
1,3-Dichlorobenzene	µg/L	3,100	< 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	**1.1**	< 5.0 U	< 1.0 U
1,3-Dichloropropane	µg/L	29	< 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	< 5.0 U	< 1.0 U
1,4-Dichlorobenzene	µg/L	75	< 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	**4.5**	< 5.0 U	< 1.0 U
2,2-Dichloropropane	µg/L	42	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 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	< 5.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 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	< 5.0 U	< 1.0 U
2-Hexanone	µg/L	6,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U
4-Chlorotoluene	µg/L	2,000	< 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	< 5.0 U	< 1.0 U
4-Isopropyltoluene	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	< 5.0 U	< 1.0 U
4-Methyl-2-pentanone	µg/L	8,200	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U
Acetone	µg/L	92,000	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U
Benzene	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**5.8**	**7.2**	< 0.50 U
Bromobenzene	µg/L	2,000	< 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	< 5.0 U	< 1.0 U
Bromochloromethane	µg/L	4,100	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
Bromodichloromethane	µg/L	4.6	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
Bromoform	µg/L	36	< 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	< 5.0 U	< 1.0 U
Bromomethane	µg/L	140	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 UJ
Carbon disulfide	µg/L	10,000	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U
Carbon tetrachloride	µg/L	5	< 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	< 5.0 U	< 1.0 U
Chlorobenzene	µg/L	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	< 5.0 U	< 1.0 U
Chloroethane	µg/L	41,000	< 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	< 5.0 U	< 1.0 U
Chloroform	µg/L	1,000	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
Chloromethane	µg/L	220	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
cis-1,2-Dichloroethene	µg/L	70	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**86**	**89**	**0.63 J**
cis-1,3-Dichloropropene	µg/L	5.3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
Dibromochloromethane	µg/L	34	< 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	< 5.0 U	< 1.0 U
Dibromomethane	µg/L	380	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
Dichlorodifluoromethane	µg/L	20,000	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 UJ
Ethylbenzene	µg/L	700	< 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	< 5.0 U	< 1.0 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	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U
Isopropylbenzene	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	< 5.0 U	< 1.0 U
m,p-Xylene	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	< 5.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U
n-Butylbenzene	µg/L	4,100	< 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	< 5.0 U	< 1.0 U
n-Propylbenzene	µg/L	4,100	< 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	< 5.0 U	< 1.0 U
Naphthalene	µg/L	2,000	< 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	< 5.0 U	< 1.0 U
o-Xylene	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	< 5.0 U	< 1.0 U
sec-Butylbenzene	µg/L	4,100	< 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	< 5.0 U	< 1.0 U
Styrene	µg/L	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	< 5.0 U	< 1.0 U
tert-Butylbenzene	µg/L	4,100	< 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	< 5.0 U	< 1.0 U
Tetrachloroethene	µg/L	5	< 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	**0.66 J**	< 5.0 U	< 1.0 U

Table 3. Western Plume Analytical Data, December 2021 and June 2022
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Location ID: / Sample Date:	Units	MCL/MSC	35AWW05_120221 12/2/21	35AWW05_060922 6/9/22	35AWW06_120121 12/1/21	35AWW06_060822 6/8/22	35AWW11_120121 12/01/21	35AWW11_060822 6/8/22	35AWW15_120221 12/2/21	35AWW15_060922 6/9/22	35AWW18_060922 6/9/22	35AWW19_120121 12/1/21	35AWW19_060822 6/8/22	35AWW20_120121 12/1/21	35AWW20_060822 6/8/22	35AWW23_120121 12/2/21
Location Description			Site 58 - E, inside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside 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.	Site 58 - SSW, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS21120243-02	HS22060604	HS21120103-06	HS22060453	HS21120103-01	HS22060453	HS21120243-03	HS22060604	HS22060604	HS21120103-03	HS22060453	HS21120103-05	HS22060453	HS21120103-02
Total Organic Carbon (415.1/SM5310C)																
Total Organic Carbon	mg/L	NV	NA	NA	**12.1**	**10.6**	**9.02**	**9.72**	NA	NA	NA	**7.05**	**2.43**	**19.3**	**17.7**	**21.2**
Volatile Organic Compounds (8260C)																
Toluene	µg/L	1,000	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	**18**
trans-1,2-Dichloroethene	µg/L	100	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**4.9**	**6.4**	< 0.50 U
trans-1,3-Dichloropropene	µg/L	29	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 U	< 0.50 U
Trichloroethene	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**100**	**150**	< 0.50 U
Trichlorofluoromethane	µg/L	31,000	< 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	< 5.0 U	< 1.0 U
Vinyl chloride		2	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**650**	**840**	< 0.50 U
Volatile Fatty Acids (HPLC-METACIDS)																
Acetic Acid	mg/L	NV	NA	NA	ND	< 2.0 U	ND	< 2.0 U	NA	NA	NA	ND	< 2.0 U	ND	< 2.0 U	**3.9**
Butyric Acid	mg/L	NV	NA	NA	ND	< 1.0 U	ND	< 1.0 U	NA	NA	NA	ND	< 1.0 U	ND	< 1.0 U	ND
Lactic Acid	mg/L	NV	NA	NA	ND	< 1.0 U	ND	< 1.0 U	NA	NA	NA	ND	< 1.0 U	ND	< 1.0 U	ND
Propionic Acid	mg/L	51	NA	NA	ND	< 1.5 U	ND	< 1.5 U	NA	NA	NA	ND	< 1.5 U	ND	< 1.5 U	ND
Pyruvic Acid	mg/L	NV	NA	NA	ND	< 0.10 U	ND	< 0.10 U	NA	NA	NA	ND	< 0.10 U	ND	< 0.10 U	ND
ICP-MS Metals (6020A)																
Arsenic	mg/L	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.00246 J**	**0.00221 J**	NA
Anions (9056A)																
Chloride	mg/L	NV	NA	NA	**934**	**938**	**1,970**	**1,880**	NA	NA	NA	**625**	**529**	**606**	**668**	**849**
Nitrate	mg/L	10	NA	NA	**0.402 J**	**0.0666 J**	**0.814 J**	**0.198 J**	NA	NA	NA	**0.162 J**	**0.0352 J**	**0.164 J**	**0.0300 J**	**0.0811 J**
Sulfate	mg/L	NV	NA	NA	**343**	**457**	**536**	**485**	NA	NA	NA	**769**	**675**	**963**	**1,040**	**1.68**
Dissolved Gases (RSK-175)																
Carbon Dioxide	µg/L	NV	NA	NA	**423,000**	**391,000**	**778,000**	**622,000**	NA	NA	NA	**744,000**	**520,000**	**661,000**	**458,000**	**779,000**
Ethane	µg/L	NV	NA	NA	< 0.250 U	< 0.250 U	< 0.250 U	< 0.250 U	NA	NA	NA	< 0.250 U	**2.34**	< 0.250 U	< 0.250 U	< 0.250 U
Ethene	µg/L	NV	NA	NA	< 0.500 U	< 0.500 U	**6.59**	< 0.500 U	NA	NA	NA	**0.929 J**	< 0.500 U	**7.54**	**16.1**	< 0.500 U
Methane	µg/L	NV	NA	NA	**3,070**	**2,740**	**986**	**1,410**	NA	NA	NA	**2.40**	**2.91**	**531**	**714**	**2,270**
Dechlorinating Bacteria																
BAV1 Vinyl Chloride Reductase	cells/mL	NV	NA	NA	**2.00**	**0.400 J**	< 1.10 U	**1.90**	NA	NA	NA	< 0.50 U	**71.3**	**41,700**	**67,400**	< 0.60 U
Dehalobacter spp.	cells/mL	NV	NA	NA	**2,840**	**1,070**	**3,140**	**137,000**	NA	NA	NA	**13,400**	**2,960**	**21,400**	**18,400**	**208**
Dehalococoides	cells/mL	NV	NA	NA	**34.0**	**7.20**	**2.30**	**1,750**	NA	NA	NA	**276**	**138**	**177,000**	**70,400**	**1,030**
tceA Reductase	cells/mL	NV	NA	NA	< 1.30 U	**0.300 J**	**2.20**	**0.300 J**	NA	NA	NA	**0.50 J**	**51.2**	< 0.50 U	**1.00**	**27**
Vinyl Chloride Reductase	cells/mL	NV	NA	NA	**0.30 J**	< 0.700 U	**43.5**	**141**	NA	NA	NA	**42.6**	**13.4**	**20.0**	**1.80**	**134**
Field Parameters																
Temperature	°C	NV	17.37	22.94	19.40	22.19	16.07	24.44	18.29	25.41	20.87	18.33	21.92	21.17	25.07	18.10
pH	s.u.	5-9	5.57	5.85	6.53	6.50	5.92	5.71	5.25	6.06	5.83	5.26	5.52	6.01	6.16	6.14
DO	mg/L	< 0.5	1.33	0.02	0.06	0.02	0.09	0.04	0.17	0.64	0.03	0.07	0.04	0.05	0.02	0.08
ORP	mV	< 0.0	214	96	21	25	14	-8	209	62	134	181	112	73	27	-48

Notes:

Detected concentrations above method detection limited are bolded.

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.

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.

°C - Degrees Celsius

ND - Not detected

NV - No Value

Table 3. Western Plume Analytical Data, December 2021 and June 2022
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Location ID: / Sample Date:	Units	MCL/MSC	35AWW23_060822 6/8/22	35AWW24_120221 12/2/21	35AWW24_060822 6/8/22	35AWW24_060822_a 6/08/22	LHSMW06_120221 12/2/21	LHSMW06_120221_a 12/2/21	LHSMW06_060922 6/9/22	LHSMW07_120121 12/1/21	LHSMW07_060822 6/8/22
Location Description			Site 58 - SW, outside site boundary.	Downgradient Western Plume well	Downgradient Western Plume well	Downgradient Western Plume well Field Duplicate.	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS22060453	HS21120243-01	HS22060453	HS22060453	HS21120243-04	HS21120243-05	HS22060604	HS21120103-04	HS22060453
Total Organic Carbon (415.1/SM5310C)											
Total Organic Carbon	mg/L	NV	**14.2**	NA	NA	NA	NA	NA	NA	**10.8**	**6.23**
Volatile Organic Compounds (8260C)											
1,1,1,2-Tetrachloroethane	µg/L	110	< 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
1,1,1-Trichloroethane	µg/L	200	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 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
1,1,2-Trichloroethane	µg/L	5	< 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
1,1-Dichloroethane	µg/L	10,000	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**8.5**	**8.4**	**5.5**	**5.1**	**9.8**
1,1-Dichloroethene	µg/L	7	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**12**	**12**	**9.1**	**22**	**8.8**
1,1-Dichloropropene	µg/L	2.9	< 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
1,2,3-Trichlorobenzene	µg/L	310	< 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
1,2,3-Trichloropropane	µg/L	0.041	< 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
1,2,4-Trichlorobenzene	µg/L	70	< 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
1,2,4-Trimethylbenzene	µg/L	5,100	< 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
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 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
1,2-Dibromoethane	µg/L	0.05	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-Dichlorobenzene	µg/L	600	< 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
1,2-Dichloroethane	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-Dichloropropane	µg/L	5	< 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
1,3,5-Trimethylbenzene	µg/L	5,100	< 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
1,3-Dichlorobenzene	µg/L	3,100	< 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
1,3-Dichloropropane	µg/L	29	< 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
1,4-Dichlorobenzene	µg/L	75	< 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
2,2-Dichloropropane	µg/L	42	< 0.50 U	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 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
2-Chlorotoluene	µg/L	2,000	< 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
2-Hexanone	µg/L	6,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
4-Chlorotoluene	µg/L	2,000	< 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
4-Isopropyltoluene	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
4-Methyl-2-pentanone	µg/L	8,200	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Acetone	µg/L	92,000	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U
Benzene	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromobenzene	µg/L	2,000	< 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
Bromochloromethane	µg/L	4,100	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromodichloromethane	µg/L	4.6	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromoform	µg/L	36	< 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
Bromomethane	µg/L	140	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U
Carbon disulfide	µg/L	10,000	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon tetrachloride	µg/L	5	< 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
Chlorobenzene	µg/L	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
Chloroethane	µg/L	41,000	< 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
Chloroform	µg/L	1,000	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Chloromethane	µg/L	220	< 0.50 U	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U
cis-1,2-Dichloroethene	µg/L	70	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**140**	**130**	**81**	< 0.50 U	< 0.50 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dibromochloromethane	µg/L	34	< 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
Dibromomethane	µg/L	380	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dichlorodifluoromethane	µg/L	20,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U
Ethylbenzene	µg/L	700	< 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
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	< 1.0 U	< 1.0 U
Isopropylbenzene	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
m,p-Xylene	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
Methylene chloride	µg/L	5	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
n-Butylbenzene	µg/L	4,100	< 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
n-Propylbenzene	µg/L	4,100	< 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
Naphthalene	µg/L	2,000	< 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
o-Xylene	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
sec-Butylbenzene	µg/L	4,100	< 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
Styrene	µg/L	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
tert-Butylbenzene	µg/L	4,100	< 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
Tetrachloroethene	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.0**	**3.2**	**1.9**	< 1.0 U	< 1.0 U

Table 3. Western Plume Analytical Data, December 2021 and June 2022
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Location ID: / Sample Date:	Units	MCL/MSC	35AWW23_060822 6/8/22	35AWW24_120221 12/2/21	35AWW24_060822 6/8/22	35AWW24_060822_a 6/08/22	LHSMW06_120221 12/2/21	LHSMW06_120221_a 12/2/21	LHSMW06_060922 6/9/22	LHSMW07_120121 12/1/21	LHSMW07_060822 6/8/22
Location Description			Site 58 - SW, outside site boundary.	Downgradient Western Plume well	Downgradient Western Plume well	Downgradient Western Plume well Field Duplicate.	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, inside site boundary, beside Building 715.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS22060453	HS21120243-01	HS22060453	HS22060453	HS21120243-04	HS21120243-05	HS22060604	HS21120103-04	HS22060453
Total Organic Carbon (415.1/SM5310C)											
Total Organic Carbon	mg/L	NV	**14.2**	NA	NA	NA	NA	NA	NA	**10.8**	**6.23**
Volatile Organic Compounds (8260C)											
Toluene	µg/L	1,000	**1.4**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
trans-1,2-Dichloroethene	µg/L	100	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**1.9**	**1.9**	**1.3**	< 0.50 U	< 0.50 U
trans-1,3-Dichloropropene	µg/L	29	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Trichloroethene	µg/L	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**21**	**20**	**13**	**0.97 J**	**0.71 J**
Trichlorofluoromethane	µg/L	31,000	< 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
Vinyl chloride		2	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**4.2**	**4.3**	**2.3**	**35**	< 0.50 U
Volatile Fatty Acids (HPLC-METACIDS)											
Acetic Acid	mg/L	NV	**2.0 J**	NA	NA	NA	NA	NA	NA	ND	< 2.0 U
Butyric Acid	mg/L	NV	< 1.0 U	NA	NA	NA	NA	NA	NA	ND	< 1.0 U
Lactic Acid	mg/L	NV	< 1.0 U	NA	NA	NA	NA	NA	NA	ND	< 1.0 U
Propionic Acid	mg/L	51	< 1.5 U	NA	NA	NA	NA	NA	NA	ND	< 1.5 U
Pyruvic Acid	mg/L	NV	< 0.10 U	NA	NA	NA	NA	NA	NA	ND	< 0.10 U
ICP-MS Metals (6020A)											
Arsenic	mg/L	0.01	NA	NA	NA	NA	**0.000406 J**	**0.000530 J**	**0.000446 J**	NA	NA
Anions (9056A)											
Chloride	mg/L	NV	**807**	NA	NA	NA	NA	NA	NA	**1,560**	**1,960**
Nitrate	mg/L	10	**0.0720 J**	NA	NA	NA	NA	NA	NA	**0.407 J**	**0.262 J**
Sulfate	mg/L	NV	**1.47**	NA	NA	NA	NA	NA	NA	**2,720**	**2,970**
Dissolved Gases (RSK-175)											
Carbon Dioxide	µg/L	NV	**520,000**	NA	NA	NA	NA	NA	NA	**820,000**	**173,000**
Ethane	µg/L	NV	< 0.250 U	NA	NA	NA	NA	NA	NA	< 0.250 U	< 0.250 U
Ethene	µg/L	NV	< 0.500 U	NA	NA	NA	NA	NA	NA	**6.33**	**38.9**
Methane	µg/L	NV	**3,170**	NA	NA	NA	NA	NA	NA	**638**	**1,950**
Dechlorinating Bacteria											
BAV1 Vinyl Chloride Reductase	cells/mL	NV	**2.8**	NA	NA	NA	NA	NA	NA	**0.30 J**	**0.400 J**
Dehalobacter spp.	cells/mL	NV	**12,900**	NA	NA	NA	NA	NA	NA	**35400**	**2850**
Dehalococoides	cells/mL	NV	**158**	NA	NA	NA	NA	NA	NA	**5720**	**4680**
tceA Reductase	cells/mL	NV	**41.6**	NA	NA	NA	NA	NA	NA	**0.30 J**	**0.80**
Vinyl Chloride Reductase	cells/mL	NV	**63.9**	NA	NA	NA	NA	NA	NA	**7730.0**	**623.0**
Field Parameters											
Temperature	^{0}C	NV	22.10	18.67	23.07		19.38		22.09	18.72	23.99
pH	s.u.	5-9	6.33	4.68	4.53		5.77		5.58	5.99	6.48
DO	mg/L	< 0.5	0.05	0.08	0.04		0.05		0.04	0.04	0.03
ORP	mV	< 0.0	-71	292	318		167		232	62	-90

Notes:

Detected concentrations above method detection limited are bolded.

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 disc

UJ - The analyte was not detected; however, the result is estimated due to discrepancies

U - Undetected: The analyte was analyzed for, but not detected.

°C - Degrees Celsius

ND - Not detected

NV - No Value

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	03WW01-11/24/2008		03WW01-5/9/2011		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		03WW01-111517 11/15/2017	
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	<2.5	U
CIS-1,2-DICHLOROETHENE	µg/L	70	<20	U	1.1		0.978		<2.5	U	<5	U	3.3		<50	U	<50	U	21.4		<50	U	<50	U	117		<5	U	<2.5	U
TETRACHLOROETHENE	µg/L	5	2,570		418		368		172		172		154		48.6		32.8		15.9		31.4		36.4		6.49		<5	U	<2.5	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	<2.5	U
TRICHLOROETHENE	µg/L	5	196		69.1		94.8		42.1		58.4		71.2		223		216		131		65.6		51.8		<12.5	U	<5	U	<2.5	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	<2.5	U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
J - Estimated value; analyte concentration was less than the limit of quantification
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.

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	03WW01-071818 7/18/2018		03WW01_121218 12/12/2018		03WW01_060419 6/4/2019		03WW01_121819 12/18/2019		03WW01_062320 6/23/2020		03WW01_120120 12/1/20		03WW01_060221 6/02/21		03WW01_060622 6/06/22		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	
1,1-DICHLOROETHENE	µg/L	7	<0.5	U	<0.5	U	<2.5	U	<5.0	U	< 2.5	U	< 5.0	U	< 5.0	U	< 0.5	U	<1	U	<1	U	<1	U	<1	U	<1	U
CIS-1,2-DICHLOROETHENE	µg/L	70	5.3		22		41		14		17		7.2	J	11		7.3		<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U
TETRACHLOROETHENE	µg/L	5	<0.5	U	15		3.2		<5.0	U	4.5	J	< 5.0	U	11		9.9		<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	<2.5	U	<5.0	U	< 2.5	U	< 5.0	U	< 5.0	U	0.74	J	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U
TRICHLOROETHENE	µg/L	5	<0.5	U	5.7		2.9		<5.0	U	4.5	J	24		3.0		10		<0.5	U	<0.5	U	<0.5	U	<0.5	U	0.259	J
VINYL CHLORIDE	µg/L	2	4.8		7.6		11		5.4	J	7.2		< 5.0	U	1.6		<0.50	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
J - Estimated value; analyte concentration was less than the limit of quantification
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.

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35ASW03-041316 4/13/2016	35ASW03_060321 6/03/21	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	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
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<5 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	<1 U	<1 U	<5 U	<1 U	<1 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	<1 U	<1 U	<5 U	<1 U	<1 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	<1 U	<1 U	<5 U	<1 U	<1 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	<1 U	<1 U	<5 U	<1 U	<1 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	<1 U	<1 U	<5 U	<1 U	<1 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
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Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	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	35AWW01FD-041216 4/12/2016	35AWW01-100516 10/5/2016	35WW01-111617 11/16/2017	35AWW01-070218 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 UJ
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 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
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
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
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 UJ

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW01_121318 12/13/2018	35AWW01_061019 6/10/2019	35AWW01_122019 12/20/2019	35AWW01_062520 6/25/2020	35AWW01_062520-a 6/25/2020	35AWW01_120720 12/7/20	35AWW01_060121 6/01/21	35AWW01_060121-a 6/01/21	35AWW01_060622 6/06/22	35AWW01_060622-a 6/06/22	35AWW02-981108 11/8/1998	35AWW02-040910 9/10/2004	35AWW02-112608 11/26/2008	35AWW02-112608-FD 11/26/2008
1,1-DICHLOROETHENE	µg/L	7	<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	<0.5 U	<1 U	<5 U	<1 U	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<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	<0.5 U	<1 U	<5 U	<1 U	<1 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1 U	<5 U	<1 U	<1 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<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	<0.5 U	<1 U	<5 U	<1 U	<1 U
TRICHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<5 U	<1 U	<1 U
VINYL CHLORIDE	µg/L	2	<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	<0.5 U	<1 U	<5 U	<1 U	<1 U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
J - Estimated value; analyte concentration was less than the limit of quantification
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.

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	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	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
1,1-DICHLOROETHENE	µg/L	7	<1 U	<5 U	0.551 J	<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	<5 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
TETRACHLOROETHENE	µg/L	5	<0.5 U	<5 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
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.5 U	<5 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
TRICHLOROETHENE	µg/L	5	<0.5 U	<5 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
VINYL CHLORIDE	µg/L	2	<0.5 U	<5 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

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
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Table 4
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	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	35AWW05_121218 12/12/2018	35AWW05_061019 6/10/2019	35AWW05_120320 12/3/20	35AWW05_060221 6/02/21	35AWW05_120221 12/2/21	35AWW05_060922 6/09/22	35AWW06-120308 12/3/2008	35AWW06-110509 5/9/2011
1,1-DICHLOROETHENE	µg/L	7	<1 U	<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	57.6	21.3
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	0.37 J	<1 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	7.19	<1 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	<1 U	<1 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	0.811 J	<1 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	<1 U	<1 U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	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	35AWW06-71818 7/18/2018
1,1-DICHLOROETHENE	µg/L	7	15.8	14.2	12	16	13.5	4.17	18.6	12.8	13	7.48	3.9	<0.5 UJ
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 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 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 UJ
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 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 UJ

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	35AWW06_092 618 9/26/2018		35AWW06_121 118 12/11/2018		35AWW06_031 919 03/19/2019		35AWW06_031 919_a 03/19/2019		35AWW06_060 419 6/4/2019		35AWW06_091 119 9/11/2019		35AWW06_091 119_a 9/11/2019		35AWW06_121 919 12/19/2019		35AWW06_032 420 03/24/2020		35AWW06_062 420 6/24/2020		35AWW06_120 120 12/1/20		35AWW06_060 321 6/03/21		35AWW06_12 0121 12/1/21		35AWW06_06 0822 6/08/22		35AWW07R- 101613 10/16/2013	
1,1-DICHLOROETHENE	µg/L	7	<0.5	U	3.4		<0.5	U	1.4		<0.5	U	0.92	J	0.88	J	<0.5	UJ	0.78	J	0.99	J	0.78	J	0.9	J	1.4		1	J	<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	UJ	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	0.709	J
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	<0.5	U	0.586	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	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	<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	<0.5	U	1.03	
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	0.51	J	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	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	
1,1-DICHLOROETHENE	µg/L	7	<100	U	<25	U	<10	U	<10	U	<10	U	<10	U	<50	U	<50	U	<50	U	<100	U
CIS-1,2-DICHLOROETHENE	µg/L	70	<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
TETRACHLOROETHENE	µg/L	5	9,590		6,480		1,640		603	J	599		204		112		119		110		110	
TRANS-1,2-DICHLOROETHENE	µg/L	100	<100	U	<25	U	<5	U	<5	U	<5	U	2.82	J	<25	U	<25	U	<25	U	<50	U
TRICHLOROETHENE	µg/L	5	675		1,150		544		149	J	895		953		653		491		607		746	
VINYL CHLORIDE	µg/L	2	<100	U	<25	U	<5	U	<5	U	<5	U	<5	U	<25	U	<25	U	<25	U	<50	U

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	35AWW08-100815 10/8/2015		35AWW08-041316 4/13/2016		35AWW08-100416 10/4/2016		35AWW08-111517 11/15/2017		35AWW08-071818 7/18/2018		35AWW08-111517 12/12/2018		35AWW08-071818 6/4/2019		35AWW08_121819 12/18/2019		35AWW08_062320 6/23/2020		35AWW08_120120 12/1/20		35AWW08_060221 6/02/21		35AWW08_060622 6/06/22		35AWW09-082913 8/29/2013	
1,1-DICHLOROETHENE	µg/L	7	<25	U	<25	U	<10	U	<5	U	<2.5	UJ	<0.5	U	<2.5	U	< 5.0	U	< 2.5	U	< 5.0	U	< 12	U	< 2.5	U	<1	U
CIS-1,2-DICHLOROETHENE	µg/L	70	79.6		60.9		41.7		38		12	J	8.9	J	<2.5	U	< 5.0	U	7.3		18		30		< 2.5	U	<0.5	U
TETRACHLOROETHENE	µg/L	5	79		80.1		36.9		12		<2.5	UJ	< 5.0	U	4.8	J	< 5.0	U	6.7		< 5.0	U	< 25	U	< 5.0	U	21.9	
TRANS-1,2-DICHLOROETHENE	µg/L	100	<12.5	U	<12.5	U	<5	U	<5	U	<2.5	U	<0.5	U	<2.5	U	< 5.0	U	4.5	J	< 5.0	U	< 12	U	3.9	J	<0.5	U
TRICHLOROETHENE	µg/L	5	581		234		235		33		19	J	12		13		< 5.0	U	17		< 5.0	U	53		< 2.5	U	11.9	
VINYL CHLORIDE	µg/L	2	<12.5	U	14.2	J	7.46	J	<5	U	9.0	J	<0.5	U	<2.5	U	< 5.0	U	<2.5	U	6.1	J	24	J	< 2.5	U	<0.5	U

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Sample Identification: / Sample Date:	Units	MCL	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		35AWW09-041216 4/12/2016		35AWW09-100316 10/3/2016		35AWW09-111517 11/15/2017		35AWW09-071618 7/12/2018	
1,1-DICHLOROETHENE	µg/L	7	<1	UJ	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<0.5	U	2.7	
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5	UJ	0.317	J	0.502	J	0.703	J	0.486	J	0.483	J	0.622	J	0.717	J	0.515	J	0.437	J	0.78	J	0.94	J
TETRACHLOROETHENE	µg/L	5	57.6	J	125		128		254		183		155		194		283		172		173		450		130	
TRANS-1,2-DICHLOROETHENE	µg/L	100	<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	<0.5	U
TRICHLOROETHENE	µg/L	5	8.97	J	37.3		41.7		93		64.3		45		59.5		81.3		55.7		48.2		150		38	
VINYL CHLORIDE	µg/L	2	<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	<0.5	U

Notes:
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW09_121 118 12/11/2018		35AWW09_060 319 6/3/2019		35AWW09_121 819 12/18/2019		35AWW09_062 320 6/23/2020		35AWW09_120 720 12/7/20		35AWW09_060 221 6/02/21		35AWW09_060 221-a 6/02/21		35AWW09_06 0622 6/06/22		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	
1,1-DICHLOROETHENE	µg/L	7	<0.5	U	<0.5	U	<0.5	U	<0.5	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	<1	U	<1	U	<1	U	<1	U	<1	U
CIS-1,2-DICHLOROETHENE	µg/L	70	0.94	J	<0.5	U	1.1		1.1		1.1		0.88	J	0.89	J	1.1		<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U	<0.5	U
TETRACHLOROETHENE	µg/L	5	150		130		500		440		370		350		310		380		<0.5	U	<0.5	U	<0.5	U	0.401	J	<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	150		38		160		140		140		130	J	130	J	140		<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
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
J - Estimated value; analyte concentration was less than the limit of quantification
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.

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW10-012715 1/27/2015	35AWW10-041415 4/14/2015	35AWW10-070715 7/7/2015	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	35AWW10_121218 12/12/18	35AWW10_121218_a 12/12/2018	35AWW10_060419 6/4/2019	35AWW10_060419_a 6/4/2019
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 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	<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
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
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
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

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW10_121919 12/19/2019	35AWW10_121919-a 12/19/2019	35AWW10_062920 6/29/2020	35AWW10_120720 12/7/20	35AWW10_120720-a 12/7/20	35AWW10_060121 6/01/21	35AWW10_060622 6/06/22	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
1,1-DICHLOROETHENE	µg/L	7	<0.5 UJ	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	7.7	10.1	11.6	21.9	12.5	13.5
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 UJ	<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	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 UJ	<0.5 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 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 UJ	<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	<0.5 U
TRICHLOROETHENE	µg/L	5	<0.5 UJ	<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	<0.5 U
VINYL CHLORIDE	µg/L	2	<0.5 UJ	<0.5 UJ	<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

Notes:
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW11-070815 7/8/2015	35AWW11-100715 10/7/2015	35AWW11-041216 4/12/2016	35AWW11-100316 10/3/2016	35AWW11-111417 11/14/2017	35AWW11-071618 07/16/2018	35AWW11_092718 9/27/2018	35AWW11_121118 12/11/2018	35AWW11_031919 03/19/2019	35AWW11_060319 6/3/2019	35AWW11_091119 9/11/2019	35AWW11_121819 12/18/2019
1,1-DICHLOROETHENE	µg/L	7	16.8	14.7	21.3	16	12	9	2.3	1.6	<0.5 U	<0.5 U	<0.5 U	<0.5 U
CIS-1,2-DICHLOROETHENE	µg/L	70	0.292 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
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
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
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
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	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

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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW11_032420 03/24/2020	35AWW11_032420-a 03/24/2020	35AWW11_062320 6/23/2020	35AWW11_120120 12/1/20	35AWW11_120120_a 12/1/20	35AWW11_060221 6/02/21	35AWW11_120121 12/1/21	35AWW11_060822 6/08/22	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
1,1-DICHLOROETHENE	µg/L	7	<0.5 U	<0.5 U	<0.5 U	0.53 J	<0.5 U	0.62 J	1.5	2.1 J	<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 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	<1.0 U	<1.0 U	<1.0 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.343 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	<0.5 U
TRICHLOROETHENE	µg/L	5	1.4	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<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	<0.5 U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW12-012815 1/28/2015	35AWW12-040715 4/7/2015	35AWW12FD-040715 4/7/2015	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	35AWW12_121418 12/14/2018
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<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 UJ	<0.5 UJ	<0.5 U
TETRACHLOROETHENE	µg/L	5	0.326 J	0.279 J	0.251 J	<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
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 UJ	<0.5 UJ	<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 UJ	<0.5 UJ	<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

Notes:
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	35AWW12_121418 12/14/2018	35AWW12_061019a 6/10/2019	35AWW12_121819 12/18/2019	35AWW12_062520 6/25/2020	35AWW12_120720 12/7/20	35AWW12_060221 6/02/21	35AWW12_060622 06/06/22	35AWW12_060622-a 6/06/22	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	35AWW13FD-102114 10/21/2014
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	<0.5 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	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 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	<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
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	<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	<0.5 U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
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Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	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	35AWW13_121118 12/11/2018	35AWW13_060719 6/7/2019	35AWW13_121819 12/18/2019	35AWW13_062920 6/29/2020
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 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	<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
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
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
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

Notes:
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW13_120720 12/7/20	35AWW13_060121 6/01/21	35AWW13_060622 6/06/22	35AWW14-101813 10/18/2013	35AWW14-013114 1/31/2014	35AWW14-052814 5/28/2014	35AWW14FD-052814 5/28/2014	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
1,1-DICHLOROETHENE	µg/L	7	<0.5 U	<0.5 U	<0.5 U	1.63 J	1.63 J	1.22 J	1.07 J	1.57 J	1.8 J	1.78 J	1.7 J	2.47	3.25
CIS-1,2-DICHLOROETHENE	µg/L	70	<0.5 U	<0.5 U	<0.5 U	2.04	1.75	1.46	1.47	1.94	1.91	2.08	1.7	1.96	1.78
TETRACHLOROETHENE	µg/L	5	<0.5 U	<1.0 U	<1.0 U	<0.5 U	<0.5 U	<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	0.663 J	0.669 J	0.612 J	0.565 J	0.806 J	0.707 J	0.786 J	0.632 J	1.06	1.79
VINYL CHLORIDE	µg/L	2	<0.5 U	<0.5 U	<0.5 U	0.272 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

Notes:
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Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW14-100616 10/6/2016		35AWW14-111717 11/17/2017		35AWW14-071818 07/18/2018		35AWW14_121318 12/13/2018		35AWW14_060719 6/7/19		35AWW14_121919 12/19/2019		35AWW14_062520 6/25/2020		35AWW14_120720 12/7/20		35AWW14_060121 6/01/21		35AWW14_060622 6/06/22		35AWW15-101613 10/16/2013		35AWW15FD-101613 10/16/2013		35AWW15-020114 2/1/2014	
1,1-DICHLOROETHENE	µg/L	7	10.4		8.7		9.7	J	10		12		15	J	9.3		9.4		10		9.6		<1	U	<1	U	<1	U
CIS-1,2-DICHLOROETHENE	µg/L	70	5.09		3.5		4.0	J	4.6		5.2		3.7	J	4.6		4.5		5.0		5.0		<0.5	U	<0.5	U	<0.5	U
TETRACHLOROETHENE	µg/L	5	<0.5	U	<0.5	U	<0.5	UJ	<0.5	U	<0.5	U	<0.5	UJ	<1.0	U	<0.5	U	<1.0	U	<1.0	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	UJ	<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	<0.5	U
TRICHLOROETHENE	µg/L	5	10.2		7.4		8.4	J	9.4		12		11	J	11		11		14		13		<0.5	U	<0.5	U	<0.5	U
VINYL CHLORIDE	µg/L	2	0.303	J	0.303	J	<0.5	UJ	1.3		<0.5	U	0.75	J	<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
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
J - Estimated value; analyte concentration was less than the limit of quantification
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.

Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW15-052814 5/28/2014	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	35AWW15_121218 12/12/2018
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U	<0.5 UJ	<0.5 UJ	<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 UJ	<0.5 UJ	<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 UJ	<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	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 UJ	<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 UJ	<0.5 UJ	<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 UJ	<0.5 UJ	<0.5 U

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Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW15_060719 6/7/2019	35AWW15_122019 12/20/2019	35AWW15_062520 6/25/2020	35AWW15_120120 12/1/20	35AWW15_060121 6/01/21	35AWW15_120221 12/2/21	35AWW15_060922 6/09/22	35AWW16-102213 10/22/2013	35AWW16-013114 1/31/2014	35AWW16-052814 5/28/2014	35AWW16-103014 10/30/2014	35AWW16-012715 1/27/2015	35AWW16FD-012715 1/27/2015	35AWW16-040715 4/7/2015
1,1-DICHLOROETHENE	µg/L	7	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 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 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	<0.5 U	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 UJ	<1.0 U	<0.5 U	<1.0 U	<0.5 U	<1.0 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 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	<0.5 U	<0.5 U
TRICHLOROETHENE	µg/L	5	<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	<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 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	<0.5 U	<0.5 U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
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 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	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	35AWW16-062918_a 06/29/2018	35AWW16_121218 12/12/2018	35AWW16_061019 6/10/2019
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	1.4
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
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
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
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
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

Notes:
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Table 4
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW16_121919 12/19/2019	35AWW16_062520 6/25/2020	35AWW16_120120 12/1/20	35AWW16_060121 6/01/21	35AWW16_060922 6/09/22	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
1,1-DICHLOROETHENE	µg/L	7	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 U	<1 UJ	<1 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<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	<0.5 UJ	<0.5 U
TETRACHLOROETHENE	µg/L	5	<0.5 UJ	<1.0 U	<0.5 U	<1.0 U	<1.0 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
TRANS-1,2-DICHLOROETHENE	µg/L	100	<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	<0.5 UJ	<0.5 U
TRICHLOROETHENE	µg/L	5	<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	<0.5 UJ	<0.5 U
VINYL CHLORIDE	µg/L	2	<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	<0.5 UJ	<0.5 U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
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Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW17-041116 4/11/2016	35AWW17-100316 10/3/2016	35AWW17-111317 11/13/2017	35AWW17-062918 06/29/2018	35AWW17_121718 12/17/2018	35AWW17_061019 6/10/2019	35AWW17_121819 12/18/2019	35AWW17_062920 6/29/2020	35AWW17_120120 12/1/20	35AWW17_060321 6/03/21	35AWW17_060922 6/09/22	35AWW18-101813 10/18/2013	35AWW18-020114 2/1/2014
1,1-DICHLOROETHENE	µg/L	7	<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	<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	<1.0 U	<0.5 U	<1.0 U	<1.0 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:
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	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		35AWW18_121718 12/17/2018	
1,1-DICHLOROETHENE	µg/L	7	<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		2	
CIS-1,2-DICHLOROETHENE	µg/L	70	<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	<0.5	U
TETRACHLOROETHENE	µg/L	5	<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	<0.5	U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<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	<0.5	U
TRICHLOROETHENE	µg/L	5	<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	<0.5	U
VINYL CHLORIDE	µg/L	2	<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	<0.5	U

Notes:
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW18_121718_a 12/17/2018		35AWW18_060419 6/4/2019		35AWW18_121819 12/18/2019		35AWW18_062520 6/25/2020		35AWW18_120120 12/1/20		35AWW18_120120_a 12/1/20		35AWW18_060121 6/01/21		35AWW18_060922 6/09/22		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	
1,1-DICHLOROETHENE	µg/L	7	2.3		3.5		4.1		18		22		22		20		15		6.45		9.31		9.98		10.9		17.4		17.5	
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	<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	<1.0	U	<1.0	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
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	0.379	J	0.619	J	0.596	J	0.81	J	0.941	J	1.13	
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	<0.5	U

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
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Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	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		35AWW19_092718 9/27/2018		35AWW19_121018 12/10/2018		35AWW19_031919 03/19/2019		35AWW19_060319 6/3/2019		35AWW19_091119 9/11/2019	
1,1-DICHLOROETHENE	µg/L	7	13.4		11.7		14.7		13.5		12.9		7.7		13	J	8.8		7.5		3.6		2.6		5.3	
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
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
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
TRICHLOROETHENE	µg/L	5	0.807	J	0.751	J	0.939	J	0.899	J	0.754	J	<0.5	U	<0.5	UJ	0.59	J	0.59	J	<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

Notes:
Blue Highlighting Indicates Analyte Detected Above MCL
µg/L - micrograms per liter
MCL - Maximum Contaminant Level
NA - not analyzed
J - Estimated value; analyte concentration was less than the limit of quantification
U - Analyte was not detected.
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW19_121 819 12/18/2019		35AWW19_032 420 03/24/2020		35AWW19_062 420 6/24/2020		35AWW19_120 320 12/3/20		35AWW19_060 321 6/03/21		35AWW19_120 121 12/1/21		35AWW19_060 822 6/08/22		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	
1,1-DICHLOROETHENE	µg/L	7	4.5		4.4		4.6		3.2		2.9		2.4		2.9		3,230		2,950		5,060		4,910		5,660		4,640		4,780	
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	110		87.7		110		119		123		120		118	
TETRACHLOROETHENE	µg/L	5	<0.5	U	<0.5	U	<1.0	U	<0.5	U	<1.0	U	<0.5	U	<1.0	U	1.65		1.53		<10	U	<10	U	<10	U	<12.5	U	<12.5	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	3.77		3.52		<10	U	<10	U	<10	U	<12.5	U	<12.5	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	513		479		695		843		820		718		636	
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	105		62.4		65.7		102		122		90.6		151	

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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	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		35AWW20_092618 9/26/2018		35AWW20_092618-a 9/26/2018		35AWW20_12101 8 12/10/2018		35AWW20_031919 03/19/2019		35AWW20_060419 6/4/2019		35AWW20_091119 9/11/2019	
1,1-DICHLOROETHENE	µg/L	7	3,630		5,460		3,440		1,900		2,000		1,400		1,100		970		2,700		1,500		1,800		3,900	
CIS-1,2-DICHLOROETHENE	µg/L	70	105		126		115		53		50		69		45		40		120		49	J	79		110	
TETRACHLOROETHENE	µg/L	5	<12.5	U	<12.5	U	<10	U	0.80	J	0.77	J	<0.5	U	0.81	J	0.71	J	1.3		<0.5	UJ	<2.5	U	<0.5	U
TRANS-1,2-DICHLOROETHENE	µg/L	100	<12.5	U	5.16	J	<10	U	6.7		5.6		2.9		1.8		1.7		6.1		4.9	J	13		14	
TRICHLOROETHENE	µg/L	5	582		707		594		320		320		270		170		140		570		180		230		350	
VINYL CHLORIDE	µg/L	2	126		216		166		78		75		71		<0.5	U	<0.5	U	110		54	J	140		790	

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW20_121 919 12/19/2019		35AWW20_032 420 03/24/2020		35AWW20_062 420 6/24/2020		35AWW20_120 320 12/3/20		35AWW20_060 321 6/03/21		35AWW20_120 121 12/1/21		35AWW20_06 0822 6/08/22		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	
1,1-DICHLOROETHENE	µg/L	7	970	J	1,300		1,100		950		1,600		1,100		1,600		<1	U	<1	U	<1	U	<1	U	<1	U	<1	U	<1	U
CIS-1,2-DICHLOROETHENE	µg/L	70	70	J	71		63		63		87		86		89		<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	<5.0	UJ	<2.5	U	0.61	J	<0.5	U	<10	U	0.66	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
TRANS-1,2-DICHLOROETHENE	µg/L	100	9.1	J	6.6		7.2		6.7		<5.0	U	4.9		6.4	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	99	J	120		94		91		190		100		150		<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	2,800	J	1,500		2,000		1,800		780		650		840		<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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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	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	35AWW21-062918 06/29/2018	34AWW21_121318 12/13/2018	35AWW21_060419 6/4/2019	34AWW21_122019 12/20/2019	34AWW21_122019-a 12/20/2019	34AWW21_062920 6/29/2020
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<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
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
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	<1.0 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
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
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

Notes:
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: Sample Date:	Units	MCL	34AWW21_062920_a 6/29/2020	34AWW21_120720 12/7/20	34AWW21_060121 6/01/21	34AWW21_060922 6/09/22	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
1,1-DICHLOROETHENE	µg/L	7	<0.5 U	<0.5 U	<0.5 U	<0.5 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	<1.0 U	<0.5 U	<1.0 U	<1.0 U	<0.5 U	<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:
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Table 4
Historical Monitoring Well COC Concentrations
LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	35AWW22-100515 10/5/2015	35AWW22-041316 4/13/2016	35AWW22-100616 10/6/2016	35AWW22-111717 11/17/2017	35AWW22-071818 07/18/2018	35AWW22_121418 12/14/2018	35AWW22_061019 6/10/2019	35AWW22_121819 12/18/2019	35AWW22_062420 6/24/2020	35AWW22_120720 12/7/20	35AWW22_060221 6/02/21	35AWW22_060622 6/06/22	35AWW23-071718 07/17/2018
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 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	2.1
CIS-1,2-DICHLOROETHENE	µg/L	70	<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	<0.5 U	12
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ	<0.5 U	<0.5 U	<0.5 U	<1.0 U	<0.5 U	<1.0 U	<1.0 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 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
TRICHLOROETHENE	µg/L	5	<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	<0.5 U	2.6
VINYL CHLORIDE	µg/L	2	<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	<0.5 U	<0.5 U

Notes:
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Sample Identification: / Sample Date:	Units	MCL	35AWW23_121018 12/10/2018		35AWW23_060319 6/3/2019		35AWW23_091119 9/11/2019		35AWW23_121819 12/18/2019		35AWW23_032420 03/24/2020		35AWW23_062420 6/24/2020		35AWW23_120320 12/3/20		35AWW23_060321 6/03/21		35AWW23_120221 12/2/21		35AWW23_060822 6/08/22		35AWW24-071718 07/17/2018		35AWW24_092718 9/27/2018		35AWW24_121018 12/10/2018		35AWW24_031919 03/19/2019	
1,1-DICHLOROETHENE	µg/L	7	2.5		<0.5	U	0.7	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	0.81	J
CIS-1,2-DICHLOROETHENE	µg/L	70	20		4.3		7.8		7.6		6.5		5.0		2.7		1.0		0.63	J	<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	<1.0	U	<0.5	U	<1.0	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
TRICHLOROETHENE	µg/L	5	5.3		1.8		3.8		2.7		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	<0.5	U
VINYL CHLORIDE	µg/L	2	<0.5	U	<0.5	U	<0.5	U	1.1		<0.5	U	<0.5	U	<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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1,1-DICHLOROETHENE	µg/L	7	<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	<0.5 U	<5 U	<0.2 U	<1 U	<5 U	<2 U
CIS-1,2-DICHLOROETHENE	µg/L	70	<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	<0.5 U	NA	<0.2 U	<1 U	<5 U	<2 U
TETRACHLOROETHENE	µg/L	5	<0.5 U	<0.5 UJ	<1.0 U	<1.0 U	<0.5 U	<1.0 U	<1.0 U	<0.5 U	<1.0 U	<1.0 U	<5 U	<0.25 U	<1 U	<5 U	6.4
TRANS-1,2-DICHLOROETHENE	µg/L	100	<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	<0.5 U	NA	<0.29 U	<1 U	<5 U	<2 U
TRICHLOROETHENE	µg/L	5	<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	<0.5 U	<5 U	<0.25 U	<1 U	<5 U	4.6
VINYL CHLORIDE	µg/L	2	<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	<0.5 U	NA	<0.24 U	<1 U	<5 U	<2 U

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
Year 7 RA(O) Report

Sample Identification: / Sample Date:	Units	MCL	LHSMW04-013008 1/30/2008	LHSMW04-112508 11/25/2008	LHSMW04-032916 3/29/2016	LHSMW04-041316 4/13/2016	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
1,1-DICHLOROETHENE	µg/L	7	<1 U	<1 U	<1 U	<2.5 U	<5 U	<1 U	<0.2 U	<40 U	<5 U	<5 U	2	1.3
CIS-1,2-DICHLOROETHENE	µg/L	70	<1 U	0.292 J	0.666 J	0.851 J	NA	<1 U	0.21	<40 U	<5 U	NA	0.98	1.4
TETRACHLOROETHENE	µg/L	5	8.74	25.7	419	397	870	4,884	2,700	4,900	5,100 J	<5 U	0.27	0.69
TRANS-1,2-DICHLOROETHENE	µg/L	100	<1 U	<1 U	<0.5 U	<1.25 U	NA	<1 U	<0.29 U	<40 U	<5 U	NA	<0.29 U	<1 U
TRICHLOROETHENE	µg/L	5	5.74	11.3	106	86.1	49	99	39.7	160	230 J	<5 U	0.43	0.53
VINYL CHLORIDE	µg/L	2	<1 U	<1 U	<0.5 U	<1.25 U	NA	<1 U	<0.24 U	<40 U	<5 U	NA	0.62	<1 U

Notes:
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MCL - Maximum Contaminant Level
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J - Estimated value; analyte concentration was less than the limit of quantification
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.

Table 4
Historical Monitoring Well COC Concentrations
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Sample Identification: / Sample Date:	Units	MCL	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	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
1,1-DICHLOROETHENE	µg/L	7	<5 U	<2 U	<1 U	1.23 J	0.884 J	1.68 J	4.03	3.28	5.95	8.2	12.1	13.7
CIS-1,2-DICHLOROETHENE	µg/L	70	<5 U	5.1	2.26	4.01	1.85	2.59	5.2	3.25	5.52	7.24	10.4	11.9
TETRACHLOROETHENE	µg/L	5	2 J	<2 U	<1 U	0.663 J	<0.5 U	0.255 J	0.381 J	0.255 J	0.454 J	0.443 J	0.518 J	0.563 J
TRANS-1,2-DICHLOROETHENE	µg/L	100	<5 U	<2 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
TRICHLOROETHENE	µg/L	5	<5 U	0.77 J	0.486 J	1.87	0.751 J	1.41	2.77	1.75	3.02	3.23	5.66	6.5
VINYL CHLORIDE	µg/L	2	<5 U	<2 U	<1 U	0.627 J	0.5 J	0.597 J	1.15	0.924 J	0.967 J	1.36	2.1	2.38

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	LHSMW06-100616 10/6/2016	LHSMW06-111717 11/17/2017	LHSMW06-070218 07/02/2018	LHSMW06_121318 12/13/2018	LHSMW06_121318_a 12/13/2018	LHSMW06_060719 6/7/2019	LHSMW06_122019 12/20/2019	LHSMW06_122019_a 12/20/2019	LHSMW06_062520 6/25/2020	LHSMW06_120320 12/3/20	LHSMW06_060321 6/03/21	LHSMW06_120221 12/02/21	LHSMW06_120221-a 12/2/21	LHSMW06_060922 6/09/22	LHSMW07-941201 12/1/1994
1,1-DICHLOROETHENE	µg/L	7	19.2	12.0	2.3	19.0	20.0	4.3	19 J	20 J	22	14	11	12	12	9.1	750
CIS-1,2-DICHLOROETHENE	µg/L	70	19	14	12	55	55	29	68 J	68 J	65	62	71	140	130	81	NA
TETRACHLOROETHENE	µg/L	5	0.9 J	<0.5 U	1.6	1.5	1.4	<0.5 U	1.9 J	1.9 J	2.1	1.6	2.9	3	3.2	1.9	<5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	0.391 J	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	1.4 J	1.5 J	1.4	1.3	1.2	1.9	1.9	1.3	NA
TRICHLOROETHENE	µg/L	5	9.06	5.8	2.8	16.0	16.0	7.5	17 J	17 J	16	14	19	21	20	13	16
VINYL CHLORIDE	µg/L	2	2.94	2.2	<0.5 U	5.0	5.0	1.2	5.7 J	5.6 J	5.5	4.8	3.2	4.2	4.3	2.3	NA

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	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	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
1,1-DICHLOROETHENE	µg/L	7	660	1,341	311	950	590 J	394	576	669	396	334	558 J	1,140	1,300	1,660
CIS-1,2-DICHLOROETHENE	µg/L	70	NA	NA	2.5	11	6	3.6	7.96	10.1	6.1	4.66	7.17	21	19.3	31.4
TETRACHLOROETHENE	µg/L	5	<5 U	7	2.7	<1 U	<5 U	<2 U	<1 U	0.253 J	<0.5 U	<1 U	<0.5 U	<1 U	<2.5 U	<5 U
TRANS-1,2-DICHLOROETHENE	µg/L	100	NA	NA	<0.29 U	0.73	<5 U	<2 U	0.421 J	0.384 J	0.282 J	<1 U	0.296 J	1.06 J	<2.5 U	<5 U
TRICHLOROETHENE	µg/L	5	19	24	5.9	25	24	15.8	25	41.3	23.9	17.6	23.1	78.1	64.3	82.1
VINYL CHLORIDE	µg/L	2	NA	10	1.1	7.2	9	3	14.4	9.47	15.9	5.43	7.98	35.4	28.8	34.1

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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: / Sample Date:	Units	MCL	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	LHSMW07_092618 9/26/2018	LHSMW07_121018 12/10/2018	LHSMW07_031919 03/19/2019	LHSMW07_060319 6/3/2019	LHSMW07_091119 9/11/2019	LHSMW07_121919 12/19/2019
1,1-DICHLOROETHENE	µg/L	7	2,100	1,210	1,250	701	600	56	3.1	<0.5 U	<0.5 U	16	46	46 J
CIS-1,2-DICHLOROETHENE	µg/L	70	32.4	22.5	19.6	22.1	11	5.0	1.1	<0.5 U	<0.5 U	0.7 J	1.1	1.2 J
TETRACHLOROETHENE	µg/L	5	<2.5 U	<2.5 U	0.397 J	<2.5 U	<0.5 U	<0.5 U	0.397 J	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ
TRANS-1,2-DICHLOROETHENE	µg/L	100	1.29 J	<2.5 U	0.681 J	<2.5 U	<0.5 U	<0.5 U	0.681 J	<2.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 UJ
TRICHLOROETHENE	µg/L	5	118	84.9	67.5	71.6	39.0	12	2.4	<0.5 U	1.1	1.8	3.1	3.1 J
VINYL CHLORIDE	µg/L	2	69.4 J	37.1	10.8	21.8	15.0	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	49	42 J

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Table 4
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LHAAP-58, Longhorn Army Ammunition Plan, Karnack, Texas
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Sample Identification: Sample Date:	Units	MCL	LHSMW07_032420 03/24/2020		LHSMW07_062420 6/24/2020		LHSMW07_120320 12/3/20		LHSMW07_060221 6/02/21		LHSMW07_120121 12/01/21		LHSMW07_060822 6/08/22	
1,1-DICHLOROETHENE	µg/L	7	94		130		64		12		22		8.8	
CIS-1,2-DICHLOROETHENE	µg/L	70	1.0		1.0		<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	<1.0	U	<1.0	U	<1.0	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
TRICHLOROETHENE	µg/L	5	2.8		2.5		2.1		0.91	J	0.97	J	0.71	J
VINYL CHLORIDE	µg/L	2	46		44		42		<0.5	U	35	U	<0.5	U

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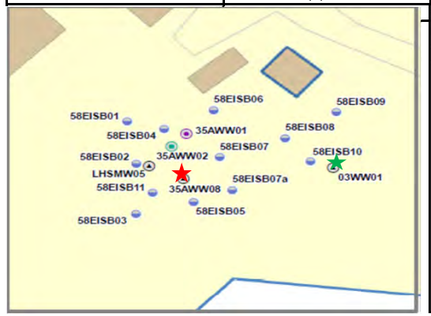
Table 5
Enhanced In-situ Bioremediation Performance Data Summary - Eastern Plume
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Monitoring Location	Sample Date	Field Parameters					Electron Donor [1]	cVOCs				Dissolved Gases				Wet Chemistry						Dechlorinating Bacteria [2]	
		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	2,000	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	2.03	0.219 J	NA	1.42 J	2,510	NA	3,790,000	139,000
	12/18/2019	6.65	0.04	-161	9.62	60.5	291	<5.0 U	<5.0 U	<5.0 U	<5.0 U	< 0.47 U	760	6.2	240,000	2.55	0.704	NA	<2.5 U	2,290	NA	NA	NA
	6/23/2020	6.77	0.07	-172	8.54	27.3	208	6.7	17	7.3	<2.5 U	< 0.47 U	1,500	12	230,000	NA	< 0.200 U	NA	15.5	2,510	NA	594,000	29,500
	12/1/2020	6.05	0.08	-25	9.67	63.2	165	< 5.0 U	< 5.0 U	18	6.1 J	< 0.47 U	320	5.6	830,000	NA	0.188 J	NA	63.0	2,480	NA	920,000	77,400
	6/2/2021	6.64	0.04	-144	9.29	3.2	119	< 25 U	53	30	24 J	< 0.47 U	1,600	33	430,000	NA	< 0.500 U	NA	148	2430	NA	122,000	4,500
	6/9/2022	6.24	0.05	-74	9.36	18.1	NA	< 5.0 U	< 2.5 U	<2.5 U	<2.5 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
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	0.84	0.196 J	NA	239	809	NA	6,040	292
	12/18/2019	6.41	0.05	-128	5.62	24.8	92	< 5 U	< 5 U	14	5.4 J	< 0.47 U	540	0.61 J	340,000	3.15	<0.500 U	NA	155	940	NA	22,240	2,480
	6/25/2020	6.44	0.04	-139	4.68	6.3	69.8	4.5 J	4.5 J	17	7.2	< 0.47 U	640	0.46	300,000	1.74	< 0.200 U	NA	231	965	NA	6,500	699
	12/1/2020	6.17	0.10	-50	4.89	10.7	99.9	< 5.0 U	24	7.2 J	< 5.0 U	< 0.47 U	1,700	1.1	460,000	NA	0.069 J	NA	82.7	870	NA	26,600	1,610
	6/2/2021	6.25	0.27	-99	5.24	158	103	11	3.0	11	1.6	< 0.47 U	420	< 0.55 U	830,000	NA	< 0.500 U	NA	180	945	NA	196	249
	6/6/2022	5.95	0.03	-50	4.72	18	NA	9.9	10	7.3	< 5.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



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 depleted.

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 electron 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.
-Elevated dechlorinating bacteria counts in 2016 indicated rapid proliferation.
-Since 2016 generally declining bacteria counts.

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 = negative log of the hydrogen ion concentration
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 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 8 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	BAV1 VC
		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	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	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	NA
	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	NA
	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	0.8 J
	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	<2.1 U
	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	0.67	< 0.500 U	NA	2,390	1,980	NA	10,000	61,400	3
	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	0.25	< 0.500 U	NA	2,470	1,780	NA	7,580	< 9.5 U	<1.0 U
	9/11/2019	6.65	0.05	-48	9.19	5.8	3.42	< 0.5 U	3.1	1.1	49	0.20 J	240	6.1	340,000	1.72	< 0.100 U	< 0.100 U	2,530	1,820	NA	49.8	1,320	<0.5 U
	12/19/2019	6.43	0.09	-47	9.59	6.6	3.48 J	< 0.5 UJ	3.1 J	1.2 J	42 J	< 0.47 U	100	2.8	250,000	1.85	< 0.500 U	NA	2,560	1,770	NA	949	5,230	3
	3/24/2020	6.65	0.06	-87	10.1	0	3.29 J	< 0.5 U	2.8	1.0	46	< 0.47 U	77	2.3	250,000	1.76	< 0.500 U	NA	2,750	1,960	NA	2,280	10,300	5
	6/24/2020	6.37	0.08	-43	9.24	0	3.00	< 1.0 U	2.5	1.0	44	< 0.47 U	140	2.2	250,000	2.07	< 0.100 U	< 0.100 U	3,000	2,010	NA	1,090	42,100	1
	12/3/2020	6.53	0.14	10	9.87	0	2.33	< 0.5 U	2.1	< 0.5 U	42	0.42 J	810	5.9	260,000 J	NA	< 0.200 U	NA	2,650	1,650	NA	7,580	17,500	1
	6/2/2021	6.52	0.13	-144	9.60	0.8	7.94	< 1.0 U	0.91 J	< 0.5 U	< 0.5 U	0.31 J	680	19	300,000	NA	< 0.500 U	NA	2,720	1,760	NA	4,430	3,640	< 0.60 U
	12/1/2021	5.99	0.04	62	9.19	2.1	10.8	< 1.0 U	0.97 J	< 0.5 U	35	<0.250 U	638	6.33	820,000	NA	0.407 J	NA	2,720	1,560	NA	5,720	35,400	0.30 J
	6/8/2022	6.48	0.03	-90	9.69	13.4	6.23	< 1.0 U	0.71 J	< 0.5 U	< 0.5 U	<0.250 U	1,950	38.9	173,000	NA	0.262 J	NA	2,970	1,960	NA	4,680	2,850	0.400 J
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	<1.8 U
	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	<3.8 U
	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	<0.5 U
	9/26-27/2018	4.75	0	78	4.95	55.5	2,860	< 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	<2.5 U
	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	<0.9 U
	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	0.44	< 0.500 U	NA	2.33 J	919	NA	12.3	21,200	<0.8 U
	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	0.65	0.180 J	NA	2.08 J	964	NA	26.8	159	0.8 J
	9/11/2019	6.99	0.06	-120	4.92	57.6	84.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	3,300	< 0.55 U	350,000	3.3	<0.100 U	<0.100 U	1.28 J	921	NA	28.6	<25.6 U	0.7 J
	12/19/2019	6.81	0.05	-152	4.97	86	13.8	<0.5 UJ	<0.5 UJ	<0.5 UJ	<0.5 UJ	< 0.47 U	1,500	< 0.55 U	270,000	3.3	<0.100 U	NA	0.845	935	NA	80.3	<10.2 U	30
	3/24/2020	6.83	0.07	-179	5.5	34	15.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	1,300	< 0.55 U	360,000	2.24	<0.100 U	NA	1.51	968	NA	9.6	1,220	5
	6/24/2020	6.65	0.08	-100	4.93	256	10.2	< 1.0 U	< 0.5 U	< 0.5 U	0.51 J	< 0.47 U	1,400	< 0.55 U	270,000	3.3	< 0.100 U	< 0.100 U	35.1	1,080	NA	3.5	1,990	<0.6 U
	12/1/2020	7.03	0.03	-55	5.33	277	8.67 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	3,300	< 0.55 U	270,000	NA	< 0.200 U	NA	45.6	937	NA	1,060	3,700	< 1.4 U
	6/3/2021	6.5	0.03	29	5.19	313	14.4	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	2,200	< 0.55 U	490,000	NA	< 0.200 U	NA	197	940	NA	15	4,170	1.50 J
	12/1/2021	6.53	0.06	21	5.16	204	12.1	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	<0.25 U	3,070	<0.50 U	423,000	NA	0.402 J	NA	343	934	NA	34	2,840	2
	6/8/2022	6.5	0.02	25	5.22	135	10.6	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	<0.25 U	2,740	<0.50 U	391,000	NA	0.0666 J	NA	457	938	NA	7.2	1,070	0.400 J
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	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	NA
	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	0.7 J
	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	<0.7 U
	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	<0.5 U
	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	0.43	< 0.500 U	NA	172	2,150	NA	231	818,000	<0.9 U
	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	1.33	< 0.500 U	NA	210	1,920	NA	2,100	2,570,000	<0.5 U
	9/11/2019	6.23	0.07	-100	7.15	39.6	28 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	1,300	< 0.55 U	690,000	2.05	< 0.100 U	< 0.100 U	259	1,990	NA	1,240	115,000	<0.9 U
	12/18/2019	6.28	0.09	-95	7.95	22.1	9.94	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	750	< 0.55 U	330,000	3.3	< 0.500 U	NA	192	2,080	NA	900	213,000	<0.6 U
	3/24/2020	6.08	0.08	-100	7.82	7.2	7.86	< 0.5 U	1.4	< 0.5 U	< 0.5 U	< 0.47 U	860	< 0.55 U	510,000	1.41	< 0.500 U	NA	282 J	2,110	NA	940	40,600	20
	6/23/2020	6.10	0.05	-46	6.65	5.4	7.28	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	1,000	< 0.55 U	390,000	2.45	< 0.100 U	NA	416	2,040	NA	382	41,100	<1.1 U
	12/1/2020	5.99	0.05	4	8.34	21.3	3.81	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	4,400 J	< 0.55 U	610,000	NA	0.284 J	NA	415 J	2,030	NA	368	52,700	< 1.1 U
	6/2/2021	5.96	0.06	-28	6.51	4.3	11.0	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	1,000	< 0.55 U	890,000	NA	< 0.500 U	NA	460	1,790	NA	170	5,830	< 1.0 U
	12/1/2021	5.92	0.09	14	7.45	10.5	9.02	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	<0.250 U	986	6.59	778,000	NA	0.814 J	NA	536	1,970	NA	2.3	3,140	<1.1 U
	6/8/2022	5.71	0.04	-8	6.53	21.2	9.72	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	<0.250 U	1,410	<0.50 U	622,000	NA	0.198 J	NA	485	1,880	NA	1,750	137,000	2
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	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	NA
	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	<0.5 U
	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	<0.5 U
	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	<0.5 U
	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	0.38	< 0.500 U	NA	994	1,140	NA	< 0.50 U	91.5	<0.5 U
	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	0	< 0.500 U	NA	966	1,080	NA	3.30	62,700	<0.5 U
	9/11/2019	6.1	0.19	77	4.91	8.8	1.19	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	3.0	<0.55 U	230,000	1.62	< 0.100 U	< 0.100 U	1,010	1,050	NA	18.4	23,600	<0.5 U
	12/18/2019	5.97	0.08	37	4.81	73.5	1.75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	2.0	<0.55 U	160,000	2.08	< 0.500 U	NA	997	979	NA	14.8	12,200	<0.5 U
	3/24/2020	5.97	0.04	46	4.61	25.5	1.79	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	3.1	<0.55 U	200,000	1.86	< 0.100 U	NA	989	922	NA	9.4	12,200	2
	6/24/2020	5.89	0.04	56	4.14	34	1.75	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	3.0	<0.55 U	160,000	1.97	< 0.100 U	< 0.100 U	1,020	934	NA	2.0	19,700	<0.5 U
	12/3/2020	5.64	0.11	65	4.00	4.5	1.63	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	4.2	<0.55 U	440,000 J	NA	< 0.100 U	NA	860	786	NA	40.2	30,100	5.5
	6/3/2021	5.32	0.11	122	3.92	10.4	2.38	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.47 U	2.2	<0.55 U	670,000	NA	< 0.200 U	NA	857	746	NA	16.1	24,900	<0.5 U
	12/1/2021	5.26	0.07	181	3.39	6.6	7.05	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	<0.25 U	2.4	0.929 J	744,000	NA	0.162 J	NA	769	625	NA	276	13,400	<0.5 U

Table 6
Enhanced In-situ Bioremediation Performance Data Summary-Western Plume
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 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	BAV1 VC
		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	cells/mL
	6/8/2022	5.52	0.04	112	3.10	30.4	2.43	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U	2.34	2.9	<0.50 U	520,000	NA	0.0352 J	NA	675	529	NA	138.0	2,960	71
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	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	NA
	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	<0.9 U
	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	<1.3 U
	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	<1.9 U
	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	0.17	< 0.500 U	NA	1,120	1,090	NA	< 1.50 U	14,000	<1.5 U
	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	0.09	0.194 J	NA	1,240	1,180	NA	15,500	< 21.7 U	2,370
	9/11/2019	6.67	0.03	-45	6.03	9.7	15.0	< 0.5 U	350	110	790	0.24 J	640 J	5.9	290,000 J	1.59	< 0.100 U	< 0.100 U	1,200	902	NA	16,000	386	10,300
	12/19/2019	6.4	0.08	-52	5.78	24.2	13.1	< 5.0 UJ	99 J	70 J	2,800 J	< 0.47 U	310	6.3	270,000	1.34	< 0.100 U	NA	1,170	821	NA	27,800	6,070	49,100
	3/24/2020	6.5	0.05	-94	5.45	7.8	18.3	< 2.5 U	120	71	1,500	< 0.47 U	410	6.0 J	260,000	2.29	< 0.100 UJ	NA	1,020 J	718 J	NA	13,000	954	19,800
	6/24/2020	6.33	0.07	-47	5.45	0	13.9	0.61 J	94	63	2,000	< 0.47 U	260	5.5	250,000	2.5	0.747	< 0.100 U	1,270	911	NA	115,000	3,830	18,400
	12/3/2020	6.37	0.61	94	5.14	5.1	12 J	< 0.5 U	91	63	1,800	< 0.47 U	1,000	11.0	370,000 J	NA	< 0.100 U	NA	1070	727	NA	7,800	436	6,550
	6/3/2021	6.25	0.11	84	5.00	13.3	20.5	< 1.0 U	190	87	780	< 0.47 U	1,500	11	690,000	NA	< 0.200 U	NA	955	615	NA	72,200	13,400	55,800
	12/1/2021	6.01	0.05	73	0.473	8.1	19.3	0.66 J	100	86	650	<0.25 U	531	7.5	661,000	NA	0.164 J	NA	963	606	NA	177,000	21,400	41,700
	6/8/2022	6.16	0.02	27	4.87	5.1	17.7	< 5.0 U	150	89	840	<0.25 U	714	16.1	458,000	NA	0.030 J	NA	1,040	668	NA	70,400	18,400	67,400

Table 7
Year 9 RA(O) Groundwater Monitoring Plan
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Well Identification	Well description	Year 6 RA(O)				Year 7 RA(O)		Year 8 RA(O)		Year 9 RA(O)	
		Sep-19	Dec-19	Mar-20	Jun-20	Dec-20	Jun-21	Dec-21	Jun-22	Dec-22	Jun-23
LHAAP-35A(58)		Western Plume Quarterly Performance Sampling	Western Plume Quarterly Performance Sampling/Eastern Plume Semi-Annual Sampling	Western Plume Quarterly Performance Sampling	Western Plume Quarterly Performance Sampling/Eastern Plume Semi-Annual Sampling	Eastern and Western Plume Semi-Annual Sampling	Eastern and Western Plume Semi-Annual Sampling	Western Plume Semi-Annual Sampling	Western Plume Semi-Annual/Eastern Plume Annual Sampling	Western Plume Semi-Annual Sampling	Western/Eastern Plume Annual Sampling
35ASW03	Surface Water Sample		Dry		Dry	Dry	VOCs		Dry		VOCs
03WW01	Shallow		VOCs, MNA, VFA, DHB/DHC, As		VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As		VOCs, As		VOCs, As
35AWW01	Intermediate		VOCs		VOCs	VOCs, As	VOCs, As		VOCs, As		VOCs, As
35AWW04	Shallow							Dry	Dry	VOCs, MNA, As	VOCs, As
35AWW05	Intermediate					VOCs	VOCs	VOCs	VOCs	VOCs	VOCs
35AWW06	Shallow	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs
35AWW08	Shallow		VOCs, MNA, VFA, As		VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As		VOCs, As		VOCs, As
35AWW09	Shallow		VOCs, MNA, VFA, DHB/DHC, As		VOCs, MNA, VFA, As	VOCs, MNA, VFA, As	VOCs, MNA, VFA, As		VOCs, As		VOCs, As
35AWW10	Shallow		VOCs, MNA, VFA		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW11	Shallow	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs
35AWW12	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW13	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW14	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW15	Shallow		VOCs		VOCs	VOCs	VOCs	VOCs	VOCs	VOCs	VOCs
35AWW16	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW17	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW18	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs

Table 7
Year 9 RA(O) Groundwater Monitoring Plan
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
Year 8 RA(O) Report

Well Identification	Well description	Year 6 RA(O)				Year 7 RA(O)		Year 8 RA(O)		Year 9 RA(O)	
		Sep-19	Dec-19	Mar-20	Jun-20	Dec-20	Jun-21	Dec-21	Jun-22	Dec-22	Jun-23
LHAAP-35A(58)		**Western Plume Quarterly Performance Sampling**	**Western Plume Quarterly Performance Sampling/Eastern Plume Semi-Annual Sampling**	**Western Plume Quarterly Performance Sampling**	**Western Plume Quarterly Performance Sampling/Eastern Plume Semi-Annual Sampling**	**Eastern and Western Plume Semi-Annual Sampling**	**Eastern and Western Plume Semi-Annual Sampling**	**Western Plume Semi-Annual Sampling**	**Western Plume Semi-Annual/Eastern Plume Annual Sampling**	**Western Plume Semi-Annual Sampling**	**Western/Eastern Plume Annual Sampling**
35AWW19	Shallow	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs
35AWW20	Shallow	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As	VOCs, MNA, VFA, DHB/DHC, As	VOCs, As
35AWW21	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW22	Shallow		VOCs		VOCs	VOCs	VOCs		VOCs		VOCs
35AWW23	Shallow, New Wells South of Avenue G in center of Western Plume	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs
35AWW24	Shallow, Downgradient Western Plume well		VOCs		VOCs	VOCs	VOCs	VOCs	VOCs	VOCs	VOCs
35AWW25	Proposed -Shallow, Downgradient Western Plume Well									VOCs	VOCs
35AWW26	Proposed-Shallow, Upgradient Western Plume Well									VOCs	VOCs
35AWW27	Proposed -Shallow, Downgradient Western Plume Well										VOCs
LHSMW04	Shallow		Dry		Dry	VOCs, MNA, As	VOCs, MNA, As	Dry	Dry	VOCs, MNA, As	VOCs, As
LHSMW06	Shallow		VOCs, As		VOCs, As	VOCs, As	VOCs, As	VOCs, As	VOCs, As	VOCs, As	VOCs, As
LHSMW07	Shallow	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs, MNA, VFA, DHB/DHC	VOCs

Notes:
VOCs - Volatile Organic Compounds
MNA - Monitored Natural Attenuation (parameters include: total organic carbon, anions [sulfate, chloride, nitrate, and nitrite], and dissolved gases [carbon dioxide, methane, ethane, and ethene])
VFA - Volatile Fatty Acids
DHB - Dehalobacter
DHC - Dehalococcoides
As - Arsenic

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 7/21/22.

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: July 21, 2022

Name/Title: Scott Beasinger / Senior Field Tech

Signature: Scott Beasinger

APPENDIX B
PHOTOGRAPHIC LOG

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Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 1: 03WW01 in good condition.

Photo 2: Surface water sampling location
35ASW03 dry in June 2021.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 3: 35AWW01 in good condition.

Photo 4: 35AWW04 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 5: 35AWW05 in good condition.

Photo 6: 35AWW06 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 7: 35AWW08 in good condition.

Photo 8: 35AWW09 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 9: 35AWW10 in good condition.

Photo 10: 35AWW11 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 11: 35AWW12 in good condition.

Photo 12: 35AWW34 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 13: 35AWW14 in good condition.

Photo 14: 35AWW15 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 15: 35AWW16 in good condition.

Photo 16: 35AWW17 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 17: 35AWW18 in good condition.

Photo 18: 35AWW19 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 19: 35AWW20 in good condition.

Photo 20: 35AWW21 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 21: 35AWW22 in good condition.

Photo 22: 35AWW23 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 23: 35AWW24 in good condition.

Photo 24: LHSMW04 in good condition.

Longhorn Army Ammunition Plant Site LHAAP-35A (58) Photograph Log June 2022

Photo 25: LHSMW06 needs paint.

Photo 26: LHSMW07 in good condition.

APPENDIX C
WELL INSPECTION FORMS

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01153060

WELL INSPECTION FORM

Job Name: LITAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW11
Inspection Date: 12/1/21
Well Completion Depth/ Measured Depth: 37.86
Inspector: Scott Beegs.NGR

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153061

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARmy
Site Name: 58
Well ID: 35AWW23
Inspection Date: 12/1/21
Well Completion Depth/ Measured Depth: 43.71
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153062

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARNG
Site Name: 58
Well ID: 35AWW19
Inspection Date: 12/1/21
Well Completion Depth/ Measured Depth: 32.41
Inspector: Scott Baggenger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153063

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.10150
Client: ARMY
Site Name: 58
Well ID: LHSMW07
Inspection Date: 12/1/21
Well Completion Depth/ Measured Depth: 30.40
Inspector: Scott Bassinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153064

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW20
Inspection Date: 12/1/21
Well Completion Depth/ Measured Depth: 36.05
Inspector: Scott Baggenger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153065

WELL INSPECTION FORM

Job Name: LTMAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW06
Inspection Date: 12/1/21
Well Completion Depth/ Measured Depth: 30.30
Inspector: Scott Bassinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging)

COMMENTS:

01153066

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: LHSMW04
Inspection Date: 12/2/21
Well Completion Depth/ Measured Depth: 30.98
Inspector: Scott Bessinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153067

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW04
Inspection Date: 12/2/21
Well Completion Depth/ Measured Depth: 25.42
Inspector: Scott Bussinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153068

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW24
Inspection Date: 12/2/21
Well Completion Depth/ Measured Depth: 35.01
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ ~~Yes~~ ☒ ~~No~~
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153069

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW05
Inspection Date: 12/2/21
Well Completion Depth/ Measured Depth: 72.08
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☒ Yes ☐ No
Is well open to completed depth? (complete when gauging)
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153070

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW15
Inspection Date: 12/2/21
Well Completion Depth/ Measured Depth: 40.21
Inspector: Scott Baggsinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: LHSMW06
Inspection Date: 12/2/21
Well Completion Depth/ Measured Depth: 23.40
Inspector: Scott Baessinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153072

WELL INSPECTION FORM

Job Name: LTAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW14
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 32.23
Inspector: Scott Beasinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 03WW01
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 33.38
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153074

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW08
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 33.31
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153075

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW01
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 72.33
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153076

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW09
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 42.13
Inspector: Scott Baggenger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153077

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW13
Inspection Date: 6/6/22
Well Completion Depth/Measured Depth: 42.19
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153078

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW10
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 33.65
Inspector: Scott Beesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153079

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW22
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 37.70
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153080

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW12
Inspection Date: 6/6/22
Well Completion Depth/ Measured Depth: 37.56
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153081

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW19
Inspection Date: 6/8/22
Well Completion Depth/ Measured Depth: 32.43
Inspector: Scott Baesinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARmy
Site Name: 58

Well ID: 35AWW23
Inspection Date: 6/8/22
Well Completion Depth/ Measured Depth: 43.71
Inspector: Scott Baas : N64R

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153083

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NWO 1312.0150
Client: ARMY
Site Name: 58

Well ID: 35AWW06
Inspection Date: 6/8/22
Well Completion Depth/ Measured Depth: 30.32
Inspector: Scott Beasinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: LHSMW07
Inspection Date: 6/18/22
Well Completion Depth/ Measured Depth: 30.40
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches) 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153085

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW20
Inspection Date: 6/8/22
Well Completion Depth/ Measured Depth: 36.05
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153086

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW11
Inspection Date: 6/8/22
Well Completion Depth/ Measured Depth: 37.87
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153087

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW24
Inspection Date: 6/8/22
Well Completion Depth/ Measured Depth: 34.98
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153088

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW04
Inspection Date: 6/8/22
Well Completion Depth/ Measured Depth: 25.40
Inspector: Scott Beasinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153089

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW17
Inspection Date: 6/9/22
Well Completion Depth/ Measured Depth: 42.31
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches) 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153090

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW18
Inspection Date: 6/9/22
Well Completion Depth/Measured Depth: 42.15
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153091

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW05
Inspection Date: 6/9/22
Well Completion Depth/ Measured Depth: 72.08
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153092

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW16
Inspection Date: 6/9/22
Well Completion Depth/ Measured Depth: 37.38
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153093

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: Army
Site Name: 58
Well ID: 35AWW15
Inspection Date: 6/9/22
Well Completion Depth/ Measured Depth: 41.34
Inspector: Scott Beasinger

☒ ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153094

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: LHSMW06
Inspection Date: 6/9/22
Well Completion Depth/ Measured Depth: 23.45
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? N/A ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153095

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: 35AWW21
Inspection Date: 6/9/22
Well Completion Depth/ Measured Depth: 42.77
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01153096

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: NW01312.0150
Client: ARMY
Site Name: 58
Well ID: LHSMW04
Inspection Date: 6/9/22
Well Completion Depth/ Measured Depth: 30.98
Inspector: Scott Bassinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

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.

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:
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
Tulsa, Oklahoma 74137-4290

Prepared by

bhate ENVIRONMENT & INFRASTRUCTURE

1608 13th Avenue south, Suite 300
Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com

Prepared by

APTIM

Aptim Federal Services, LLC
2500 CityWest, Suite 1700
Houston, Texas 77042

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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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
MONITORING WELL SAMPLE COLLECTION FORMS

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bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AMW04	Date: 12/2/21
	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): DRY
	Total Well Depth (ft) (C): 25.42	Water Column Thickness (ft) (C-B): NA	2nd Depth to Water(pre-purge): DRY
	Screened Interval: 16.51 - 26.51	Weather: CLEAR	Well Volume (gal) (A*(C-B)): NA
	Pump placement: NA	Well Condition: GOOD	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.)
12/2/21											
				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: DRY WELL				Sample Time:		

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW05	Date: 12/2/21
	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): 47.15
	Total Well Depth (ft) (C): 72.08	Water Column Thickness (ft) (C-B): 24.93	2nd Depth to Water(pre-purge): 47.15
	Screened Interval: 63.40 - 73.40	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 16.25
	Pump placement: 68.40	Well Condition: GOOD	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.)
12/2/21	0825	47.21	0.13	100	15.57	5.72	2.52	1.77	51.7	204	
	0830	47.25	0.26	100	16.31	5.93	2.62	1.51	45.5	179	
	0835	47.28	0.39	100	17.10	5.80	2.70	1.47	34.6	190	
	0840	47.30	0.52	100	17.20	5.60	2.71	1.37	36.7	211	
	0845	47.32	0.65	100	17.26	5.59	2.72	1.35	36.2	212	
	0850	47.33	0.78	100	17.32	5.58	2.73	1.34	35.8	213	
	0855	47.34	0.91	100	17.37	5.57	2.73	1.33	35.2	214	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	9	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: 35AWW05_120221 Sample Time: 0855

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW06	Date: 12/1/21
	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): 18.23
	Total Well Depth (ft) (C): 30.30	Water Column Thickness (ft) (C-B): 12.07	2nd Depth to Water(pre-purge): 18.23
	Screened Interval: 19.05 - 29.05	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 7.87
	Pump placement: 24.05	Well Condition: GOOD	Ferrous Iron: 3.10 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.)
12/1/21	1125	18.30	.13	100	20.37	6.83	5.00	0.80	237	[redacted]-1	
	1130	18.36	.26	100	19.87	6.82	5.05	0.41	227	[redacted]8	
	1135	18.39	.39	100	19.59	6.72	5.11	0.18	211	13	
	1140	18.41	.52	100	19.54	6.55	5.15	0.07	207	20	
	1145	18.43	.65	100	19.50	6.55	5.16	0.07	206	21	
	1150	18.44	.78	100	19.44	6.54	5.16	0.07	205	21	
	1155	18.45	.91	100	19.40	6.53	5.16	0.06	204	21	

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
3	40ml Glass	HCl	N		MEE
2	40ml Glass	NA	N		CO2
2	40ml Amber	H2SO4	N		TOC
1	250ml Plastic	NA	N		Anions
1	250ml Amber	H3PO4	N		VFA
1	1Liter Glass	NA	N		DHC/DHB

Sample ID: 35AWW06-120121 Sample Time: [redacted] 1155

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW11	Date: 12/1/21
	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): 28.45
	Total Well Depth (ft) (C): 37.86	Water Column Thickness (ft) (C-B): 9.41	2nd Depth to Water(pre-purge): 28.45
	Screened Interval: 22.24 - 36.84	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 1.51
	Pump placement: 29.54	Well Condition: GOOD	Ferrous Iron: 2.11 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.)
12/1/22	0710	28.52	0.13	100	15.63	6.34	7.02	0.66	13.1	20	
	0715	28.58	0.26	100	15.95	5.96	7.17	0.22	11.6	20	
	0720	28.62	0.39	100	15.97	5.93	7.43	0.10	11.2	15	
	0725	28.65	0.52	100	16.00	5.92	7.44	0.10	11.0	15	
	0730	28.68	0.65	100	16.04	5.92	7.45	0.10	10.8	14	
	0735	28.70	0.78	100	16.07	5.92	7.45	0.09	10.5	14	

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
3	40 ml Glass		HCL	N		meq
2	40ml Glass		NA	N		CO2
2	40ml AMBER		H2SO4	N		TOC
1	250ml Plastic		NA	N		Anions
1	250ml AMBER		H3PO4	N		VFA
1	1 Liter Glass		NA	N		DHC/DHB

Sample ID: 35AWW11.12012 Sample Time: 0735

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW15	Date: 12/2/21
	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): 22.88
	Total Well Depth (ft) (C): 40.21	Water Column Thickness (ft) (C-B): 17.33	2nd Depth to Water(pre-purge): 22.88
	Screened Interval: 25.67 - 40.37	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 2.77
	Pump placement: 33.02	Well Condition: ~~BROKEN~~ BROKEN HINGE	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.)
12/2/21	0910	22.95	.13	100	17.61	5.66	11.3	0.71	643	163	
	0915	23.01	.26	100	17.90	5.42	11.7	0.30	620	189	
	0920	23.04	.39	100	18.18	5.27	12.5	0.18	599	207	
	0925	23.06	.52	100	18.22	5.26	12.6	0.18	598	208	
	0930	23.08	.65	100	18.25	5.26	12.6	0.17	597	208	
	0935	23.09	.78	100	18.29	5.25	12.7	0.17	596	209	

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: 35AWW15_120221 Sample Time: 0935

01153124

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW19	Date: 12/1/21
	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): 23.88
	Total Well Depth (ft) (C): 32.41	Water Column Thickness (ft) (C-B): 8.53	2nd Depth to Water(pre-purge): 23.88
	Screened Interval: 16.89- 31.39	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 1.36
	Pump placement: 24.14	Well Condition: BROKEN HINGE	Ferrous Iron: 1.27 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.)
12/1/21	0855	23.95	0.13	100	16.83	5.65	3.40	0.63	13.7	122	
	0900	24.01	0.26	100	17.71	5.43	3.39	0.20	10.5	157	
	0905	24.05	0.39	100	18.19	5.28	3.39	0.08	8.8	179	
	0910	24.08	0.52	100	18.24	5.28	3.39	0.08	8.0	180	
	0915	24.11	0.65	100	18.29	5.27	3.39	0.07	7.2	180	
	0920	24.13	0.78	100	18.33	5.26	3.39	0.07	6.6	181	

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
3	40ml GLASS		HCL	N		MEE
2	40ml GLASS		NA	N		CO2
2	40ml AMBER		H2SO4	N		TOC
1	250ml PLASTIC		NA	N		ANIONS
1	250ml AMBER		H3PO4	N		VFA
1	1Liter GLASS		NA	N		DHC/DHB

Sample ID: 35AWW19_120121 Sample Time: 0920

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW20	Date: 12/1/21
	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): 18.27
	Total Well Depth (ft) (C): 36.05	Water Column Thickness (ft) (C-B): 17.78	2nd Depth to Water(pre-purge): 18.27
	Screened Interval: 20.94 - 35.64	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 2.84
	Pump placement: 28.29	Well Condition: GOOD	Ferrous Iron: 2.20 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.)
12/1/21	1035	18.35	0.13	100	18.79	6.47	5.02	0.61	8.5	40	
	1040	18.41	0.26	100	20.79	6.12	4.84	0.18	6.6	75	
	1045	18.45	0.39	100	20.99	6.03	4.75	0.06	6.9	74	
	1050	18.48	0.52	100	21.07	6.02	4.74	0.06	7.3	74	
	1055	18.51	0.65	100	21.13	6.01	4.73	0.05	7.8	73	
	1100	18.53	0.78	100	21.17	6.01	4.73	0.05	8.1	73	

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
3	40ml Glass	HCL	N		~~MEE~~ MEE
2	40 ml Glass	NA	N		CO2
2	40 ml Amber	H2SO4	N		TOC
1	250ml Plastic	NA	N		ANIONS
1	250ml Amber	H3PO4	N		VFA
1	1 Liter Glass	NA	N		DHC/DHB
1	125ml Plastic	HNO3	N		ARSENIC

Sample ID: 35AWW20_120121 Sample Time: 1100

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW23	Date: 12/1/21
	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): 22.22
	Total Well Depth (ft) (C): 43.71	Water Column Thickness (ft) (C-B): 21.49	2nd Depth to Water(pre-purge): 22.22
	Screened Interval: 28.20 - 43.20	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 3.44
	Pump placement: 35.70	Well Condition: GOOD	Ferrous Iron: 1.86 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.)
12/1/21	0800	22.30	0.13	100	16.91	6.53	4.70	0.71	31.1	-40	
	0805	22.35	0.26	100	17.40	6.20	4.55	0.25	33.5	-41	
	0810	22.39	0.39	100	17.93	6.15	4.45	0.09	33.7	-47	
	0815	22.42	0.52	100	17.98	6.15	4.44	0.09	33.9	-48	
	0820	22.44	0.65	100	18.04	6.14	4.44	0.08	34.0	-48	
	0825	22.46	0.78	100	18.10	6.14	4.43	0.08	34.1	-48	

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
3	40ml GLASS		HCl	N		MEE
2	40ml GLASS		NA	N		EDZ
2	40ml AMBER		H2SO4	N		TOC
1	250ml PLASTIC		NA	N		ANIONS
1	250ml AMBER		H3PO4	N		VFA
1	1 Liter GLASS		NA	N		DHC/DHB

Sample ID: 35AWW23-120121 Sample Time: 0825

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW24	Date: 12/2/21
	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): 23.15
	Total Well Depth (ft) (C): 35.01	Water Column Thickness (ft) (C-B): 11.86	2nd Depth to Water(pre-purge): 23.15
	Screened Interval: 25.10 - 35.10	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 1.90
	Pump placement: 30.10	Well Condition: GOOD	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.)
12/2/21	0740	23.22	.13	100	17.19	6.54	0.595	0.67	371	190	
	0745	23.28	.26	100	18.21	5.03	0.493	0.25	340	267	
	0750	23.32	.39	100	18.49	4.70	0.465	0.09	324	290	
	0755	23.35	.52	100	18.55	4.69	0.465	0.09	323	291	
	0800	23.37	.65	100	18.61	4.68	0.465	0.08	322	291	
	0805	23.39	.78	100	18.67	4.68	0.464	0.08	322	292	

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	HC	N		VOC

Sample ID: 35AWW24_120221 Sample Time: 0805

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW04	Date: 12/2/21
	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): 30.98	Water Column Thickness (ft) (C-B): NA	2nd Depth to Water(pre-purge): DRY
	Screened Interval: 21.11 - 31.11	Weather: CLEAR	Well Volume (gal) (A*(C-B)): NA
	Pump placement: NA	Well Condition: GOOD	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.)
12/2/21											
			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: DRY WELL				Sample Time:		

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: LHSMW06	Date: 12/2/21
	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): 18.17
	Total Well Depth (ft) (C): 23.40	Water Column Thickness (ft) (C-B): 5.23	2nd Depth to Water(pre-purge): 18.17
	Screened Interval: 13.32 - 23.32	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 3.41
	Pump placement: 19.00	Well Condition: ~~Good~~ BROKEN HINGE	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.)
12/2/21	0955	18.25	.13	100	16.70	6.31	3.58	0.69	18.7	125	
	1000	18.31	.26	100	18.59	6.12	2.70	0.18	14.9	130	
	1005	18.35	.39	100	19.20	5.79	2.39	0.06	13.6	165	
	1010	18.38	.52	100	19.27	5.78	2.38	0.05	13.2	166	
	1015	18.41	.65	100	19.34	5.78	2.37	0.05	12.5	166	
	1020	18.43	.78	100	19.38	5.77	2.37	0.05	12.1	167	
~~[illegible]~~	~~[illegible]~~		~~[illegible]~~	~~[illegible]~~	~~[illegible]~~						

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	40ml Glass		HCL	N		VOC
2	125ml Plastic		HNO3	N		ARSENIC

Sample ID: LHSMW06_120221 Sample Time: 1020

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW07	Date: 12/1/21
	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): 17.47
	Total Well Depth (ft) (C): 30.40	Water Column Thickness (ft) (C-B): 12.93	2nd Depth to Water(pre-purge): 17.47
	Screened Interval: 19.73 - 29.73	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 8.43
	Pump placement: 24.73	Well Condition: GOOD	Ferrous Iron: 0.91 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.)
12/1/21	0945	17.55	.13	100	16.86	6.10	9.20	0.68	4.2	40	
	0950	17.60	.26	100	18.27	6.14	9.18	0.23	2.9	50	
	0955	17.63	.39	100	18.57	6.01	9.18	0.05	2.7	60	
	1000	17.66	.52	100	18.63	6.00	9.19	0.04	2.5	61	
	1005	17.68	.65	100	18.68	6.00	9.19	0.04	2.3	61	
	1010	17.70	.78	100	18.72	5.99	9.19	0.04	2.1	62	

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
3	40ml Glass		HCl	N		MEE
2	40ml Glass		NA	N		CO2
2	40ml Amber		H2SO4	N		TOC
1	250ml Plastic		NA	N		Anions
1	250ml Amber		H3PO4	N		VFA
1	1 Liter Glass		NA	N		DRO/DRB

Sample ID: LHSMW07.120121 Sample Time: 1010

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 03WW01	Date: 6/6/22
	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): 28.62
	Total Well Depth (ft) (C): 33.38	Water Column Thickness (ft) (C-B): 4.76	2nd Depth to Water(pre-purge): 28.62
	Screened Interval: 22.51 - 32.51	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 0.76
	Pump placement: 30.00	Well Condition: GOOD	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.)
6/6/22	0710	30.07	0.13	100	24.51	6.61	4.97	0.71	23.1	-87	
	0715	30.13	0.26	100	22.10	6.18	4.81	0.25	21.5	-53	
	0720	30.18	0.39	100	22.05	5.97	4.74	0.04	19.6	-52	
	0725	30.22	0.52	100	22.00	5.96	4.73	0.04	19.1	-51	
	0730	30.25	0.65	100	21.96	5.95	4.73	0.04	18.5	-50	
↓	0735	30.28	0.78	100	21.93	5.95	4.72	0.03	18.0	-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	40ml GLASS	HCL	N		VOC
	1	125ml PLASTIC	HNO3	N		ARSENIC

Sample ID: 03WW01_060622

Sample Time: 0735

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GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58		Location ID: 35AWW01		Date: 6/6/22
	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): 43.33
	Total Well Depth (ft) (C): 72.33		Water Column Thickness (ft) (C-B): 29.00		2nd Depth to Water(pre-purge): 43.33
	Screened Interval: 63.07 - 73.07		Weather: CLEAR		Well Volume (gal) (A*(C-B)): 18.91
	Pump placement: 68.07		Well Condition: GOOD		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.)
6/6/22	0835	43.39	0.13	100	22.47	7.19	1.55	0.70	577	28	
	0840	43.44	0.26	100	22.08	6.44	0.851	0.20	541	55	
	0845	43.47	0.39	100	22.00	6.05	0.770	0.05	523	86	
	0850	43.49	0.52	100	21.94	6.05	0.770	0.05	522	87	
	0855	43.51	0.65	100	21.88	6.04	0.769	0.04	521	88	
	0900	43.52	0.78	100	21.84	6.03	0.769	0.04	520	89	

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
2	125 ml	Plastic	HNO3	N		Arsenic

Sample ID: 35AWW01_060622 Sample Time: 0900

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW04	Date: 6/8/22
	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): 25.36
	Total Well Depth (ft) (C): 25.40	Water Column Thickness (ft) (C-B): 0.04	2nd Depth to Water(pre-purge): 25.36
	Screened Interval: 16.51 - 26.51	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 0.026
	Pump placement: NA	Well Condition: GOOD	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)

NO SAMPLES COLLECTED

Sample ID: Sample Time:

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW05	Date: 6/9/22
	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): 45.55
	Total Well Depth (ft) (C): 72.08	Water Column Thickness (ft) (C-B): 26.53	2nd Depth to Water(pre-purge): 45.55
	Screened Interval: 63.40 - 73.40	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 17.30
	Pump placement: 68.40	Well Condition: GOOD	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.)
6/9/22	0835	45.61	0.13	100	23.42	7.06	3.26	0.61	53.1	33	
	0840	45.65	0.26	100	23.05	6.12	2.94	0.17	48.6	82	
	0845	45.68	0.39	100	23.02	5.87	2.79	0.03	46.1	94	
	0850	45.70	0.52	100	22.99	5.87	2.78	0.03	45.4	95	
	0855	45.71	0.65	100	22.96	5.86	2.77	0.02	44.7	95	
	0900	45.71	0.78	100	22.94	5.85	2.77	0.02	44.3	96	

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	40ml GLASS	HCL	N		VOC
Sample ID: 35AWW05_060922				Sample Time: 0900		

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW06	Date: 6/8/22
	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): 18.50
	Total Well Depth (ft) (C): 30.32	Water Column Thickness (ft) (C-B): 11.82	2nd Depth to Water(pre-purge): 18.50
	Screened Interval: 19.05-29.05	Weather: Clear	Well Volume (gal) (A*(C-B)): 7.71
	Pump placement: 24.05	Well Condition: Good	Ferrous Iron: 3.52 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.)
6/8/22	0835	18.58	0.13	100	23.77	6.85	5.14	0.63	149	-25	
	0840	18.64	0.26	100	22.31	6.60	5.20	0.18	141	10	
	0845	18.67	0.39	100	22.27	6.51	5.21	0.03	137	22	
	0850	18.70	0.52	100	22.24	6.51	5.22	0.03	136	23	
	0855	18.72	0.65	100	22.21	6.50	5.22	0.02	135	24	
	0900	18.74	0.78	100	22.19	6.50	5.22	0.02	135	25	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions

1 L = 0.26 gals

1 gal = 3.79 L

Stabilization Criteria

Temp	+/- 10%	DO	+/- 10%
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
3	40ml Glass	HCl	N		MEE
3	40ml Glass	NA	N		CO2
2	40ml Amber	H2SO4	N		TOC
1	250ml Amber	H3PO4	N		VFA
1	250ml Plastic	NA	N		Anions
1	1Liter Glass	NA	N		DHC/DHB

Sample ID: 35AWW06_060822

Sample Time: 0900

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW08	Date: 6/6/22
	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): 28.00
	Total Well Depth (ft) (C): 33.31	Water Column Thickness (ft) (C-B): 5.31	2nd Depth to Water(pre-purge): 28.00
	Screened Interval: 21.83 - 31.83	Weather: Clear	Well Volume (gal) (A*(C-B)): 0.85
	Pump placement: 29.00	Well Condition: Good	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.)
6/6/22	0750	28.08	0.13	100	22.45	6.70	8.26	0.63	22.7	-103	
	0755	28.15	0.26	100	21.20	6.50	9.38	0.22	21.0	-90	
	0800	28.21	0.39	100	21.13	6.26	9.36	0.06	19.6	-76	
	0805	28.25	0.52	100	21.03	6.25	9.36	0.06	19.2	-78	
	0810	28.28	0.65	100	20.97	6.24	9.36	0.05	18.7	-78	
	0815	28.31	0.78	100	20.93	6.24	9.36	0.05	18.1	-74	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

No. Containers/Volume/Type		Preserv.	Filter (Y/N)	Method	Parameter(s)
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: 35AWW08_060622 Sample Time: 0815

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW09	Date: 6/6/22
	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): 30.82
	Total Well Depth (ft) (C): 42.13	Water Column Thickness (ft) (C-B): 11.31	2nd Depth to Water(pre-purge): 30.82
	Screened Interval: 26.69 - 41.29	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 1.81
	Pump placement: 33.99	Well Condition: GOOD	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.)
6/6/22	0920	30.90	0.13	100	22.70	6.09	5.45	0.78	48.7	146	
	0925	30.96	0.26	100	21.62	5.77	5.60	0.27	41.2	223	
	0930	31.00	0.39	100	21.59	5.62	5.70	0.19	37.0	273	
	0935	31.03	0.52	100	21.52	5.61	5.71	0.19	36.4	275	
	0940	31.06	0.65	100	21.48	5.60	5.71	0.19	35.7	276	
	0945	31.08	0.78	100	21.43	5.60	5.71	0.18	35.1	277	

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
1	125ml PLASTIC		HNO3	N		ARSENIC

Sample ID: 35AWW09_060622 Sample Time: 0945

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW10	Date: 6/6/22
	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): 17.34
	Total Well Depth (ft) (C): 33.65	Water Column Thickness (ft) (C-B): 16.31	2nd Depth to Water(pre-purge): 17.34
	Screened Interval: 18.16 - 32.76	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 2.61
	Pump placement: 25.46	Well Condition: BROKEN HINGE	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.)
6/6/22	1050	17.42	0.13	100	24.92	5.72	0.320	0.81	17.8	235	
	1055	17.48	0.26	100	23.95	5.22	0.295	0.52	11.7	389	
	1100	17.51	0.39	100	23.92	5.10	0.282	0.21	9.8	498	
	1105	17.53	0.52	100	23.89	5.09	0.281	0.20	9.0	500	
	1110	17.54	0.65	100	23.86	5.08	0.281	0.20	8.5	502	
	1115	17.55	0.78	100	23.83	5.08	0.281	0.20	7.7	504	

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: 35AWW10_060622 Sample Time: 1115

01153139

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35AWW11	Date: 6/8/22
	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): 28.18
	Total Well Depth (ft) (C): 37.87	Water Column Thickness (ft) (C-B): 9.69	2nd Depth to Water(pre-purge): 28.18
	Screened Interval: 22.24 - 36.84	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 1.55
	Pump placement: 29.54	Well Condition: GOOD	Ferrous Iron: 2.07 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.)
6/8/22	1115	28.25	0.13	100	25.15	6.01	6.40	0.67	26.6	-5	
	1120	28.31	0.26	100	24.63	5.85	6.46	0.17	23.9	-7	
	1125	28.35	0.39	100	24.58	5.74	6.51	0.05	22.7	-8	
	1130	28.38	0.52	100	24.53	5.73	6.52	0.05	22.4	-8	
	1135	28.41	0.65	100	24.49	5.72	6.53	0.04	21.8	-8	
↓	1140	28.43	0.78	100	24.44	5.71	6.53	0.04	21.2	-8	

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
3	40ml Glass	HCL	N		MEK
3	40ml Glass	NA	N		CO2
2	40ml Amber	H2SO4	N		TOC
1	250ml Amber	H3PO4	N		VFA
1	250ml Plastic	NA	N		Anions
1	1 Liter Glass	NA	N		DRO/GRO

Sample ID: 35AWW11_060822 Sample Time: 1140

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW12	Date: 6/6/22
	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): 29.22
	Total Well Depth (ft) (C): 37.56	Water Column Thickness (ft) (C-B): 8.34	2nd Depth to Water(pre-purge): 29.22
	Screened Interval: 22.17 - 36.77	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 1.33
	Pump placement: 30.00	Well Condition: BROKEN HINGE	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.)
6/6/22	1220	29.30	0.13	100	24.22	5.95	2.24	0.68	13.3	250	
	1225	29.36	0.26	100	23.34	5.33	2.02	0.21	10.6	320	
	1230	29.40	0.39	100	23.37	5.14	1.95	0.05	7.1	330	
	1235	29.43	0.52	100	23.41	5.14	1.94	0.04	6.4	331	
	1240	29.45	0.65	100	23.46	5.13	1.94	0.04	5.2	331	
↓	1245	29.47	0.78	100	23.49	5.13	1.94	0.04	4.1	332	

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: 35AWW12.060622				Sample Time:		1245

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW13	Date: 6/6/22
	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): 23.63
	Total Well Depth (ft) (C): 40.19	Water Column Thickness (ft) (C-B): 16.56	2nd Depth to Water(pre-purge): 23.63
	Screened Interval: 24.72 - 39.32	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 2.65
	Pump placement: 32.02	Well Condition: GOOD	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.)
6/6/22	1010	23.70	0.13	100	23.36	6.46	1.56	0.62	53.6	178	
	1015	23.76	0.26	100	23.79	5.97	1.47	0.19	45.5	196	
	1020	23.80	0.39	100	23.89	5.78	1.41	0.05	43.6	214	
	1025	23.83	0.52	100	23.94	5.77	1.40	0.05	43.1	215	
	1030	23.85	0.65	100	23.98	5.76	1.39	0.04	42.5	216	
	1035	23.87	0.78	100	24.03	5.75	1.39	0.04	42.1	217	

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: 35AWW13-060622 Sample Time: 1035

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW14	Date: 6/6/22
	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): 29.41
	Total Well Depth (ft) (C): 32.23	Water Column Thickness (ft) (C-B): 2.82	2nd Depth to Water(pre-purge): 29.41
	Screened Interval: 17.06-31.76	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 0.45
	Pump placement: NA	Well Condition: GOOD	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.)
6/6/22	0645	29.41	NA	NA							BAILING WELL
6/6/22	0649	32.17	0.50	NA							BAILED 0.5 GALLONS DRY
6/6/22	1300	29.41	NA	NA	22.17	6.08	1.12	8.49	7.6	221	

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_060622 Sample Time: 1300

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW15	Date: 6/9/22
	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): 18.05
	Total Well Depth (ft) (C): 41.34	Water Column Thickness (ft) (C-B): 23.29	2nd Depth to Water(pre-purge): 18.05
	Screened Interval: 25.67 - 40.37	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 3.73
	Pump placement: 33.02	Well Condition: BROKEN HINGE	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.)
6/9/22	1005	18.12	0.13	100	25.78	6.27	11.8	0.93	35.1	39	
	1010	18.17	0.26	100	25.63	6.07	11.9	0.81	28.7	48	
	1015	18.21	0.39	100	25.58	6.07	12.2	0.66	24.6	60	
	1020	18.23	0.52	100	25.52	6.06	12.3	0.65	24.1	61	
	1025	18.25	0.65	100	25.46	6.06	12.4	0.65	23.4	62	
	1030	18.26	0.78	100	25.41	6.06	12.4	0.64	23.0	62	

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: 35AWW15_060922 Sample Time: 1030

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW16	Date: 6/9/22
	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): 16.88
	Total Well Depth (ft) (C): 37.38	Water Column Thickness (ft) (C-B): 20.50	2nd Depth to Water(pre-purge): 16.88
	Screened Interval: 21.75 - 36.45	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 3.28
	Pump placement: 29.10	Well Condition: GOOD	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.)
6/9/22	0920	16.95	0.13	100	24.75	6.24	8.98	0.72	691	32	
	0925	17.01	0.26	100	23.20	5.89	11.9	0.15	660	52	
	0930	17.05	0.34	100	22.75	5.71	11.9	0.03	650	67	
	0935	17.07	0.52	100	22.68	5.70	11.8	0.02	649	68	
	0940	17.09	0.65	100	22.63	5.70	11.7	0.02	648	69	
	0945	17.10	0.78	100	22.59	5.69	11.7	0.02	647	64	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units		9	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_060922 Sample Time: 0945

01153145

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35AWW17	Date: 6/9/22
	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): 22.61
	Total Well Depth (ft) (C): 42.31	Water Column Thickness (ft) (C-B): 19.70	2nd Depth to Water(pre-purge): 22.61
	Screened Interval: 26.97 - 41.67	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 3.15
	Pump placement: 34.32	Well Condition: BROKEN HINGE	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.)
6/9/22	0705	22.69	0.13	100	24.14	6.59	8.74	0.72	12.2	15	
	0710	22.75	0.26	100	20.95	6.17	9.33	0.25	10.8	35	
	0715	22.78	0.39	100	20.86	5.98	9.24	0.07	10.4	52	
	0720	22.80	0.52	100	20.81	5.98	9.23	0.07	10.0	53	
	0725	22.81	0.65	100	20.75	5.97	9.23	0.06	9.7	54	
	0730	22.82	0.78	100	20.71	5.97	9.22	0.06	9.4	55	

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: 35AWW17_060922 Sample Time: 0730

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW18	Date: 6/9/22
	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): 23.27
	Total Well Depth (ft) (C): 42.15	Water Column Thickness (ft) (C-B): 18.88	2nd Depth to Water(pre-purge): 23.27
	Screened Interval: 26.85 - 41.55	Weather: Clear	Well Volume (gal) (A*(C-B)): 3.02
	Pump placement: 34.20	Well Condition: Good	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.)
6/9/22	0750	23.35	0.13	100	23.02	6.82	9.22	0.66	207	85	
	0755	23.41	0.26	100	21.97	6.08	9.63	0.21	194	107	
	0800	23.45	0.39	100	20.99	5.86	9.70	0.04	187	130	
	0805	23.47	0.52	100	20.95	5.85	9.71	0.03	186	132	
	0810	23.49	0.65	100	20.90	5.84	9.71	0.03	186	133	
	0815	23.51	0.78	100	20.87	5.83	9.71	0.03	185	134	

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: 35AWW18_060922 Sample Time: 0815

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW19	Date: 6/8/22
	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): 23.80
	Total Well Depth (ft) (C): 32.43	Water Column Thickness (ft) (C-B): 8.63	2nd Depth to Water(pre-purge): 23.80
	Screened Interval: 16.89 - 31.39	Weather: Clear	Well Volume (gal) (A*(C-B)): 1.38
	Pump placement: 25.00	Well Condition: Broken Hinge	Ferrous Iron: 2.14 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.)
6/8/22	0650	23.88	0.13	100	22.73	6.02	2.73	0.65	45.7	109	
	0655	23.94	0.26	100	22.24	5.71	3.03	0.19	38.6	109	
	0700	23.98	0.39	100	22.10	5.54	3.08	0.05	32.1	110	
	0705	24.01	0.52	100	22.04	5.53	3.09	0.05	31.5	111	
	0710	24.03	0.65	100	21.98	5.53	3.10	0.04	30.9	112	
	0715	24.05	0.78	100	21.92	5.52	3.10	0.04	30.4	112	

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			VOC
	3	40 ml Glass	HCl			MEE
	3	40 ml Glass	NA			CO2
	2	40 ml Amber	H2SO4			TOC
	1	250 ml Amber	H3PO4			VFA
	1	250ml Plastic	NA			Anions
	1	1 Liter Glass	NA			DHC/DHB

Sample ID: 35AWW19_060822 Sample Time: 0715

01153148

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW20	Date: 6/8/22
	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): 18.07
	Total Well Depth (ft) (C): 36.05	Water Column Thickness (ft) (C-B): 17.98	2nd Depth to Water(pre-purge): 18.07
	Screened Interval: 20.94 ~ 35.64	Weather: Clear	Well Volume (gal) (A*(C-B)): 2.88
	Pump placement: 28.29	Well Condition: Good	Ferrous Iron: 2.15 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.)
6/8/22	1020	18.15	0.13	100	26.12	6.59	5.08	0.61	11.2	-34	
↓	1025	18.21	0.26	100	25.69	6.35	5.00	0.19	7.3	17	
	1030	18.25	0.39	100	25.22	6.18	4.90	0.03	6.9	25	
	1035	18.27	0.52	100	25.16	6.18	4.89	0.02	6.2	26	
	1040	18.29	0.65	100	25.11	6.17	4.88	0.02	5.5	26	
↓	1045	18.31	0.78	100	25.07	6.16	4.87	0.02	5.1	27	

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
3	40 ml GLASS	HCL	N		MEK
3	40 ml GLASS	NA	N		CO2
2	40ml AMBER	H2SO4	N		TOC
1	250ml AMBER	H3PO4	N		VFA
1	250ml PLASTIC	NA	N		Anions
1	1 Liter GLASS	NA	N		DHC/DHB
Sample ID: 35AWW20-060822			Sample Time: 1045		
1	125ml PLASTIC	HNO3	N		ARSENIC

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW21	Date: 6/9/22
	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): 32.70
	Total Well Depth (ft) (C): 42.77	Water Column Thickness (ft) (C-B): 10.07	2nd Depth to Water(pre-purge): 32.70
	Screened Interval: 27.56 - 42.26	Weather: Clear	Well Volume (gal) (A*(C-B)): 1.61
	Pump placement: 34.91	Well Condition: Broken Hinge	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.)
6/9/22	1135	32.78	0.13	100	24.81	5.21	2.77	0.65	32.8	265	
	1140	32.84	0.26	100	22.88	4.80	2.88	0.17	25.5	329	
	1145	32.88	0.39	100	22.67	4.63	2.94	0.04	22.8	350	
	1150	32.91	0.52	100	22.62	4.62	2.95	0.04	22.2	351	
	1155	32.94	0.65	100	22.56	4.61	2.96	0.03	21.6	352	
	1200	32.96	0.78	100	22.51	4.61	2.96	0.03	21.2	353	

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: 35AWW21-060922 Sample Time: 1200

01153150

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW22	Date: 6/6/22
	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): 32.08
	Total Well Depth (ft) (C): 37.70	Water Column Thickness (ft) (C-B): 5.62	2nd Depth to Water(pre-purge): 32.08
	Screened Interval: 22.27 - 36.77	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 0.90
	Pump placement: 33.50	Well Condition: BROKEN HINGE	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.)
6/6/22	1135	32.15	0.13	100	24.17	5.72	7.55	0.79	17.7	230	
	1140	32.21	0.26	100	22.87	5.34	8.05	0.23	11.3	300	
	1145	32.26	0.39	100	22.73	5.30	8.17	0.08	9.2	316	
	1150	32.30	0.52	100	22.66	5.29	8.18	0.08	8.4	317	
	1155	32.33	0.65	100	22.63	5.29	8.18	0.07	7.5	317	
	1200	32.36	0.78	100	22.59	5.29	8.19	0.07	6.7	318	

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: 35AWW22_060622 Sample Time: 1200

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

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LOCATION	Site: LHAAP - 58	Location ID: 35AWW23	Date: 6/8/22
	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): 22.53
	Total Well Depth (ft) (C): 43.71	Water Column Thickness (ft) (C-B): 21.18	2nd Depth to Water(pre-purge): 22.53
	Screened Interval: 28.20-43.20	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 3.39
	Pump placement: 35.70	Well Condition: GOOD	Ferrous Iron: 3.30 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.)
6/8/22	0740	22.60	0.13	100	23.04	6.55	4.41	0.70	33.2	-93	
	0745	22.66	0.26	100	22.30	6.44	4.45	0.21	29.7	-82	
	0750	22.70	0.39	100	22.24	6.34	4.45	0.06	27.7	-73	
	0755	22.72	0.52	100	22.19	6.33	4.46	0.06	27.3	-72	
	0800	22.74	0.65	100	22.14	6.33	4.46	0.06	26.6	-72	
	0805	22.75	0.78	100	22.10	6.33	4.46	0.05	26.2	-71	

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
3	40 ml GLASS	HCL	N		MEK
3	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 GLASS	NA	N		DHC/DHB

Sample ID: 35AWW23-060822 Sample Time: 0805

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW24	Date: 6/8/22
	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): 23.27
	Total Well Depth (ft) (C): 34.98	Water Column Thickness (ft) (C-B): 11.71	2nd Depth to Water(pre-purge): 23.27
	Screened Interval: 25.10 - 35.10	Weather: CLEAR	Well Volume (gal) (A*(C-B)): 1.87
	Pump placement: 30.10	Well Condition: GOOD	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.)
6/8/22	1210	23.35	0.13	100	24.55	5.34	0.793	0.70	42.7	224	
	1215	23.41	0.26	100	23.29	4.77	0.594	0.21	36.6	295	
	1220	23.45	0.39	100	23.24	4.55	0.574	0.05	34.8	315	
	1225	23.48	0.52	100	23.17	4.54	0.574	0.05	34.1	316	
	1230	23.51	0.65	100	23.12	4.54	0.573	0.04	33.6	317	
	1235	23.53	0.78	100	23.07	4.53	0.573	0.04	33.3	318	

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	40ml GLASS	HCL	N		VOC

Sample ID: 35AWW24.060822 Sample Time: 1235

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW04	Date: 6/9/22
	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 4in	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): DRY
	Total Well Depth (ft) (C): 30.98	Water Column Thickness (ft) (C-B):	2nd Depth to Water(pre-purge): DRY
	Screened Interval: 21.14-31.14	Weather: CLEAR	Well Volume (gal) (A*(C-B)):
	Pump placement: NA	Well Condition: GOOD	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.)
6/9/22											
				DRY WELL							

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units							
					NO Samples Collected						

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:

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: LHAAP - 58	Location ID: LHSmw06	Date: 6/9/22
	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): 17.77
	Total Well Depth (ft) (C): 23.45	Water Column Thickness (ft) (C-B): 5.68	2nd Depth to Water(pre-purge): 17.77
	Screened Interval: 13.32 - 23.32	Weather: Clear	Well Volume (gal) (A*(C-B)): 3.70
	Pump placement: 18.32	Well Condition: Good	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.)
6/9/22	1050	17.85	0.13	100	23.45	6.52	3.14	0.71	19.4	115	
	1055	17.91	0.26	100	22.70	6.03	2.71	0.19	19.7	192	
	1100	17.95	0.39	100	22.27	5.62	2.43	0.05	16.9	228	
	1105	17.91	0.52	100	22.21	5.60	2.43	0.05	16.5	230	
	1110	18.01	0.65	100	22.15	5.59	2.41	0.04	16.0	231	
	1115	18.03	0.78	100	22.09	5.58	2.40	0.04	15.7	232	

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
1	120ml Plastic		HNO3	N		ARSENIC

Sample ID: LHSmw06_060922 Sample Time: 1115

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW07	Date: 6/8/22
	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): 17.37
	Total Well Depth (ft) (C): 30.40	Water Column Thickness (ft) (C-B): 13.03	2nd Depth to Water(pre-purge): 17.37
	Screened Interval: 19.73 - 29.73	Weather: Clear	Well Volume (gal) (A*(C-B)): 8.50
	Pump placement: 24.73	Well Condition: Good	Ferrous Iron: 0.69 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.)
6/8/22	0925	17.44	.13	100	24.72	6.57	9.53	0.63	15.4	-58	
	0430	17.50	.26	100	23.81	6.50	9.60	0.17	13.6	-70	
	0935	17.53	.39	100	23.87	6.49	9.67	0.04	13.5	-88	
	0940	17.55	.52	100	23.92	6.48	9.68	0.04	13.5	-89	
	0945	17.57	.65	100	23.96	6.48	9.69	0.03	13.4	-90	
	0950	17.58	.78	100	23.99	6.48	9.69	0.03	13.4	-90	

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
3	40ml	Glass	HCl	N		MAH
3	40ml	Glass	NA	N		EDB
2	40ml	Amber	H2SO4	N		TOC
1	250ml	Amber	H3PO4	N		VFA
1	250ml	Plastic	NA	N		Anions
1	1Liter	Glass	NA	N		DHC/DHB

Sample ID: LHSMW07_060822 Sample Time: 0950

APPENDIX F
LABORATORY ANALYTICAL RESULTS
(PROVIDED ON CD)

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10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: RagenP Giga
ALS Laboratory Group
10450 Stancliff Rd
Suite 210
Houston, TX 77040

Phone:

Fax:

Identifier: 012SL **Date Rec:** 12/02/2021 **Report Date:** 12/08/2021

Client Project #: NWO1312.0150 **Client Project Name:** LHAAP / Site 58

Purchase Order #:

Test results provided for: CENSUS

Reviewed By:

Charles Slater

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Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP / Site 58

MI Project Number: **012SL**
Date Received: 12/02/2021

Sample Information

Client Sample ID:		**35AWW11_120121**	**35AWW23_120121**	**35AWW19_120121**	**LHSMW07_120121**	**35AWW20_120121**
Sample Date:		12/01/2021	12/01/2021	12/01/2021	12/01/2021	12/01/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		BB/CS	BB/CS	BB/CS	BB/CS	BB/CS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.30E+00**	**1.03E+03**	**2.76E+02**	**5.72E+03**	**1.77E+05**
tceA Reductase	TCE	**2.20E+00**	**2.70E+01**	**5.00E-01 (J)**	**3.00E-01 (J)**	<5.00E-01
BAV1 Vinyl Chloride Reductase	BVC	<1.10E+00	<6.00E-01	<5.00E-01	**3.00E-01 (J)**	**4.17E+04**
Vinyl Chloride Reductase	VCR	**4.35E+01**	**1.34E+02**	**4.26E+01**	**7.73E+03**	**2.00E+01**
Dehalobacter spp.	*DHBt*	**3.14E+03**	**2.08E+02**	**1.34E+04**	**3.54E+04**	**2.14E+04**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP / Site 58

MI Project Number: **012SL**
Date Received: 12/02/2021

Sample Information

Client Sample ID:	**35AWW06_120121**
Sample Date:	12/01/2021
Units:	cells/mL
Analyst/Reviewer:	BB/CS

Dechlorinating Bacteria

Dehalococcoides	*DHC*	**3.40E+01**
tceA Reductase	TCE	<1.30E+00
BAV1 Vinyl Chloride Reductase	BVC	**2.00E+00**
Vinyl Chloride Reductase	VCR	**3.00E-01 (J)**
Dehalobacter spp.	*DHBt*	**2.84E+03**

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 **12/2/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	12/02/2021	12/08/2021	0 °C	110%	non-detect	non-detect
BVC	12/02/2021	12/08/2021	0 °C	107%	non-detect	non-detect
DHBt	12/02/2021	12/08/2021	0 °C	104%	non-detect	non-detect
TCE	12/02/2021	12/08/2021	0 °C	106%	non-detect	non-detect
VCR	12/02/2021	12/08/2021	0 °C	105%	non-detect	non-detect

HS21120103 LHAAP58 Cover Page

ALS WO# HS21120103

ALS Environmental
ALS Group USA, Corp
10450 Stancliff Road, Suite 210
Houston, TX 77099
T : +1 281 530 5656
F : +1 281 530 5887
www.alsglobal.com

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

WorkOrder: HS21120103

LHAAP-58

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

20-Jan-2022

HS21120103 LHAAP58 Final

ALS WO# HS21120103

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 20, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS21120103**

Laboratory Results for: **LHAAP-58**

Dear Marcia Olive,

ALS Environmental received 7 sample(s) on Dec 02, 2021 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
Ragen Giga
Project Manager

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS21120103

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21120103-01	35AWW11_120121	Groundwater		01-Dec-2021 07:35	02-Dec-2021 10:50	☐
HS21120103-02	35AWW23_120121	Groundwater		01-Dec-2021 08:25	02-Dec-2021 10:50	☐
HS21120103-03	35AWW19_120121	Groundwater		01-Dec-2021 09:20	02-Dec-2021 10:50	☐
HS21120103-04	LHSMW07_120121	Groundwater		01-Dec-2021 10:10	02-Dec-2021 10:50	☐
HS21120103-05	35AWW20_120121	Groundwater		01-Dec-2021 11:00	02-Dec-2021 10:50	☐
HS21120103-06	35AWW06_120121	Groundwater		01-Dec-2021 11:55	02-Dec-2021 10:50	☐
HS21120103-07	Trip Blank	Groundwater	CG 111221-77	01-Dec-2021 00:00	02-Dec-2021 10:50	☐

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP-58
Work Order: HS21120103

Work Order Comments

- The analysis for CO2 by RSK175 was subcontracted to A Pace Analytical Gulf Coast in Baton Rouge LA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R397512

Sample ID: HS21120092-05MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R397355

Sample ID: VSTD050

- Bromomethane exceeded %D limits for CCV .Samples are ND for this compound.

Sample ID: 35AWW11_120121 (HS21120103-01MS)

- 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. Dichlorodifluoromethane

Sample ID: 35AWW11_120121 (HS21120103-01MSD)

- 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. Dichlorodifluoromethane

Metals by Method SW6020A

Batch ID: 173565

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E415.1

Batch ID: R397632

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R397739

Sample ID: 35AWW20_120121 (HS21120103-05MS)

- 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.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS21120103

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R397044

Sample ID: 35AWW23_120121 (HS21120103-02)

- Sample originally ran with in holding time at 10X, re-analyzed out of holding time at 1X.

Sample ID: HS21120178-01MS

- MS and MSD are for an unrelated sample (Sulfate)

Batch ID: R396874

Sample ID: 35AWW06_120121 (HS21120103-06)

- Nitrate and Nitrite reported at dilution due to high concentration Chloride and Sulfate.

Sample ID: 35AWW11_120121 (HS21120103-01)

- Nitrate and Nitrite reported at dilution due to high concentration Chloride.

Sample ID: 35AWW19_120121 (HS21120103-03)

- Nitrate and Nitrite reported at dilution due to high concentration Chloride and Sulfate.

Sample ID: 35AWW20_120121 (HS21120103-05)

- Nitrate and Nitrite reported at dilution due to high concentration Chloride and Sulfate.

Sample ID: HS21120092-05MS

- MS and MSD are for an unrelated sample (Sulfate)

Sample ID: LHSMW07_120121 (HS21120103-04)

- Nitrate and Nitrite reported at dilution due to high concentration Chloride and Sulfate.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_120121
Collection Date: 01-Dec-2021 07:35

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-01
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	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
1,1-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:13
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 13:13
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Dec-2021 13:13
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Dec-2021 13:13
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 13:13
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Dec-2021 13:13
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_120121
Collection Date: 01-Dec-2021 07:35

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-01
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	09-Dec-2021 13:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 13:13
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 13:13
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:13
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:13
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*1*	*09-Dec-2021 13:13*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*09-Dec-2021 13:13*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*1*	*09-Dec-2021 13:13*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*09-Dec-2021 13:13*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	13-Dec-2021 10:55
Ethene	**6.59**		**0.234**	**0.500**	**1.00**	**ug/L**	1	13-Dec-2021 10:55
Methane	**986**		**5.35**	**12.5**	**25.0**	**ug/L**	50	13-Dec-2021 14:32
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: JAC
Organic Carbon, Total	**9.02**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Dec-2021 22:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11_120121
Collection Date: 01-Dec-2021 07:35

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**1,970**		**10.0**	**25.0**	**25.0**	**mg/L**	50	02-Dec-2021 14:31
Nitrogen, Nitrate (As N)	**0.814**	J	**0.300**	**1.00**	**1.00**	**mg/L**	10	02-Dec-2021 14:24
Nitrogen, Nitrite (As N)	1.00	U	0.300	1.00	1.00	mg/L	10	02-Dec-2021 14:24
Sulfate	**536**		**2.00**	**5.00**	**5.00**	**mg/L**	10	02-Dec-2021 14:24
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Jan-2022 09:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_120121
Collection Date: 01-Dec-2021 08:25

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-02
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	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 13:35
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Dec-2021 13:35
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Dec-2021 13:35
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 13:35
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Dec-2021 13:35
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_120121
Collection Date: 01-Dec-2021 08:25

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-02
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	09-Dec-2021 13:35
cis-1,2-Dichloroethene	**0.63**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:35
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 13:35
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	09-Dec-2021 13:35
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:35
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Toluene	**18**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:35
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:35
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*1*	*09-Dec-2021 13:35*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*09-Dec-2021 13:35*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*1*	*09-Dec-2021 13:35*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*09-Dec-2021 13:35*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	13-Dec-2021 11:04
Ethene	0.500	U	0.234	0.500	1.00	ug/L	1	13-Dec-2021 11:04
Methane	**2,270**		**10.7**	**25.0**	**50.0**	**ug/L**	100	13-Dec-2021 14:40
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: JAC
Organic Carbon, Total	**21.2**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Dec-2021 23:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_120121
Collection Date: 01-Dec-2021 08:25

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**849**		**2.00**	**5.00**	**5.00**	**mg/L**	10	02-Dec-2021 14:39
Nitrogen, Nitrate (As N)	**0.0811**	JH	**0.0300**	**0.100**	**0.100**	**mg/L**	1	03-Dec-2021 11:44
Nitrogen, Nitrite (As N)	0.100	HU	0.0300	0.100	0.100	mg/L	1	03-Dec-2021 11:44
Sulfate	**1.68**		**0.200**	**0.500**	**0.500**	**mg/L**	1	03-Dec-2021 11:44
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Jan-2022 09:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_120121
Collection Date: 01-Dec-2021 09:20

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-03
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	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,1-Dichloroethane	**0.70**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:12
1,1-Dichloroethene	**2.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:12
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,2-Dichloroethane	**0.93**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:12
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 16:12
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Dec-2021 16:12
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Dec-2021 16:12
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 16:12
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Dec-2021 16:12
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_120121
Collection Date: 01-Dec-2021 09:20

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-03
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	09-Dec-2021 16:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 16:12
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 16:12
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:12
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:12
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*09-Dec-2021 16:12*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*09-Dec-2021 16:12*
Surr: Dibromofluoromethane	*100*			**0**	*80-119*	*%REC*	*1*	*09-Dec-2021 16:12*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*09-Dec-2021 16:12*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	13-Dec-2021 11:36
Ethene	**0.929**	J	**0.234**	**0.500**	**1.00**	**ug/L**	1	13-Dec-2021 11:36
Methane	**2.40**		**0.107**	**0.250**	**0.500**	**ug/L**	1	13-Dec-2021 11:36
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: JAC
Organic Carbon, Total	**7.05**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Dec-2021 23:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_120121
Collection Date: 01-Dec-2021 09:20

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**625**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Dec-2021 15:24
Nitrogen, Nitrate (As N)	**0.162**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	02-Dec-2021 15:17
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	02-Dec-2021 15:17
Sulfate	**769**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Dec-2021 15:24
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Jan-2022 09:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_120121
Collection Date: 01-Dec-2021 10:10

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-04
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	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,1-Dichloroethane	**5.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:34
1,1-Dichloroethene	**22**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:34
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 16:34
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Dec-2021 16:34
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Dec-2021 16:34
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 16:34
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Dec-2021 16:34
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_120121
Collection Date: 01-Dec-2021 10:10

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-04
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	09-Dec-2021 16:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 16:34
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	09-Dec-2021 16:34
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:34
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:34
Trichloroethene	**0.97**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:34
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:34
Vinyl chloride	**35**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:34
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*09-Dec-2021 16:34*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*09-Dec-2021 16:34*
Surr: Dibromofluoromethane	*99.6*			**0**	*80-119*	*%REC*	*1*	*09-Dec-2021 16:34*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*09-Dec-2021 16:34*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	13-Dec-2021 11:47
Ethene	**6.33**		**0.234**	**0.500**	**1.00**	**ug/L**	1	13-Dec-2021 11:47
Methane	**638**		**5.35**	**12.5**	**25.0**	**ug/L**	50	13-Dec-2021 15:00
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: JAC
Organic Carbon, Total	**10.8**		**0.500**	**1.00**	**1.00**	**mg/L**	1	14-Dec-2021 23:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07_120121
Collection Date: 01-Dec-2021 10:10

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**1,560**		**10.0**	**25.0**	**25.0**	**mg/L**	50	02-Dec-2021 15:39
Nitrogen, Nitrate (As N)	**0.407**	J	**0.150**	**0.500**	**0.500**	**mg/L**	5	02-Dec-2021 15:32
Nitrogen, Nitrite (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	02-Dec-2021 15:32
Sulfate	**2,720**		**10.0**	**25.0**	**25.0**	**mg/L**	50	02-Dec-2021 15:39
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Jan-2022 09:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_120121
Collection Date: 01-Dec-2021 11:00

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-05
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	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,1,2-Trichloroethane	**75**		**0.30**	**1.0**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
1,1-Dichloroethane	**440**		**2.0**	**5.0**	**10**	**ug/L**	10	09-Dec-2021 15:27
1,1-Dichloroethene	**1,100**		**2.0**	**5.0**	**10**	**ug/L**	10	09-Dec-2021 15:27
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
1,2-Dichlorobenzene	**28**		**0.50**	**1.0**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
1,2-Dichloroethane	**14**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,3-Dichlorobenzene	**1.1**		**0.40**	**1.0**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
1,4-Dichlorobenzene	**4.5**		**0.40**	**1.0**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 13:57
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Dec-2021 13:57
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:57
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Dec-2021 13:57
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 13:57
Benzene	**5.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Dec-2021 13:57
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_120121
Collection Date: 01-Dec-2021 11:00

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-05
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	09-Dec-2021 13:57
cis-1,2-Dichloroethene	**86**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 13:57
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 13:57
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 13:57
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Tetrachloroethene	**0.66**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
trans-1,2-Dichloroethene	**4.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 13:57
Trichloroethene	**100**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 13:57
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 13:57
Vinyl chloride	**650**		**2.0**	**5.0**	**10**	**ug/L**	10	09-Dec-2021 15:27
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*09-Dec-2021 13:57*
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*10*	*09-Dec-2021 15:27*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*09-Dec-2021 13:57*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*10*	*09-Dec-2021 15:27*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*1*	*09-Dec-2021 13:57*
Surr: Dibromofluoromethane	*99.4*			**0**	*80-119*	*%REC*	*10*	*09-Dec-2021 15:27*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*09-Dec-2021 13:57*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*09-Dec-2021 15:27*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	13-Dec-2021 11:55
Ethene	**7.54**		**0.234**	**0.500**	**1.00**	**ug/L**	1	13-Dec-2021 11:55
Methane	**531**		**5.35**	**12.5**	**25.0**	**ug/L**	50	13-Dec-2021 15:11
METALS BY ICPMS BY SW6020A		**Method:SW6020A**				Prep:SW3010A / 15-Dec-2021		Analyst: JHD
Arsenic	**0.00246**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	15-Dec-2021 21:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20_120121
Collection Date: 01-Dec-2021 11:00

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: JAC
Organic Carbon, Total	**19.3**		**0.500**	**1.00**	**1.00**	**mg/L**	1	15-Dec-2021 19:46
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**606**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Dec-2021 15:54
Nitrogen, Nitrate (As N)	**0.164**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	02-Dec-2021 15:47
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	02-Dec-2021 15:47
Sulfate	**963**		**4.00**	**10.0**	**10.0**	**mg/L**	20	02-Dec-2021 15:54
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Jan-2022 09:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_120121
Collection Date: 01-Dec-2021 11:55

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-06
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	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,1-Dichloroethane	**0.42**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:56
1,1-Dichloroethene	**1.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	09-Dec-2021 16:56
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 16:56
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Dec-2021 16:56
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Dec-2021 16:56
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 16:56
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Dec-2021 16:56
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_120121
Collection Date: 01-Dec-2021 11:55

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-06
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	09-Dec-2021 16:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 16:56
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	09-Dec-2021 16:56
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 16:56
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 16:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 16:56
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*09-Dec-2021 16:56*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*09-Dec-2021 16:56*
Surr: Dibromofluoromethane	*99.1*			**0**	*80-119*	*%REC*	*1*	*09-Dec-2021 16:56*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*09-Dec-2021 16:56*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PPM
Ethane	0.250	U	0.144	0.250	1.00	ug/L	1	13-Dec-2021 12:05
Ethene	0.500	U	0.234	0.500	1.00	ug/L	1	13-Dec-2021 12:05
Methane	**3,070**		**10.7**	**25.0**	**50.0**	**ug/L**	100	13-Dec-2021 15:22
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: JAC
Organic Carbon, Total	**12.1**		**0.500**	**1.00**	**1.00**	**mg/L**	1	15-Dec-2021 20:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_120121
Collection Date: 01-Dec-2021 11:55

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**934**		**10.0**	**25.0**	**25.0**	**mg/L**	50	02-Dec-2021 16:09
Nitrogen, Nitrate (As N)	**0.402**	J	**0.150**	**0.500**	**0.500**	**mg/L**	5	02-Dec-2021 16:02
Nitrogen, Nitrite (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	02-Dec-2021 16:02
Sulfate	**343**		**1.00**	**2.50**	**2.50**	**mg/L**	5	02-Dec-2021 16:02
SUBCONTRACT ANALYSIS - CO2		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Jan-2022 09:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 01-Dec-2021 00:00

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-07
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	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 15:49
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	09-Dec-2021 15:49
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	09-Dec-2021 15:49
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 15:49
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	09-Dec-2021 15:49
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 01-Dec-2021 00:00

ANALYTICAL REPORT
WorkOrder:HS21120103
Lab ID:HS21120103-07
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	09-Dec-2021 15:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	09-Dec-2021 15:49
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	09-Dec-2021 15:49
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	09-Dec-2021 15:49
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	09-Dec-2021 15:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	09-Dec-2021 15:49
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*09-Dec-2021 15:49*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*09-Dec-2021 15:49*
Surr: Dibromofluoromethane	*98.4*			**0**	*80-119*	*%REC*	*1*	*09-Dec-2021 15:49*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*09-Dec-2021 15:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

Batch ID: 173565 **Start Date:** 15 Dec 2021 09:30 **End Date:** 15 Dec 2021 13:30
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21120103-05		10 (mL)	10 (mL)	1	120 plastic HNO3

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 173565 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00		15 Dec 2021 13:30	15 Dec 2021 21:47	1
Batch ID: R396874 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21120103-01	35AWW11_120121	01 Dec 2021 07:35			02 Dec 2021 14:31	50
HS21120103-01	35AWW11_120121	01 Dec 2021 07:35			02 Dec 2021 14:24	10
HS21120103-02	35AWW23_120121	01 Dec 2021 08:25			02 Dec 2021 14:39	10
HS21120103-03	35AWW19_120121	01 Dec 2021 09:20			02 Dec 2021 15:24	20
HS21120103-03	35AWW19_120121	01 Dec 2021 09:20			02 Dec 2021 15:17	2
HS21120103-04	LHSMW07_120121	01 Dec 2021 10:10			02 Dec 2021 15:39	50
HS21120103-04	LHSMW07_120121	01 Dec 2021 10:10			02 Dec 2021 15:32	5
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			02 Dec 2021 15:54	20
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			02 Dec 2021 15:47	2
HS21120103-06	35AWW06_120121	01 Dec 2021 11:55			02 Dec 2021 16:09	50
HS21120103-06	35AWW06_120121	01 Dec 2021 11:55			02 Dec 2021 16:02	5
Batch ID: R397044 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21120103-02	35AWW23_120121	01 Dec 2021 08:25			03 Dec 2021 11:44	1
Batch ID: R397355 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21120103-01	35AWW11_120121	01 Dec 2021 07:35			09 Dec 2021 13:13	1
HS21120103-02	35AWW23_120121	01 Dec 2021 08:25			09 Dec 2021 13:35	1
HS21120103-03	35AWW19_120121	01 Dec 2021 09:20			09 Dec 2021 16:12	1
HS21120103-04	LHSMW07_120121	01 Dec 2021 10:10			09 Dec 2021 16:34	1
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			09 Dec 2021 15:27	10
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			09 Dec 2021 13:57	1
HS21120103-06	35AWW06_120121	01 Dec 2021 11:55			09 Dec 2021 16:56	1
HS21120103-07	Trip Blank	01 Dec 2021 00:00			09 Dec 2021 15:49	1
Batch ID: R397512 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS21120103-01	35AWW11_120121	01 Dec 2021 07:35			13 Dec 2021 14:32	50
HS21120103-01	35AWW11_120121	01 Dec 2021 07:35			13 Dec 2021 10:55	1
HS21120103-02	35AWW23_120121	01 Dec 2021 08:25			13 Dec 2021 14:40	100
HS21120103-02	35AWW23_120121	01 Dec 2021 08:25			13 Dec 2021 11:04	1
HS21120103-03	35AWW19_120121	01 Dec 2021 09:20			13 Dec 2021 11:36	1
HS21120103-04	LHSMW07_120121	01 Dec 2021 10:10			13 Dec 2021 15:00	50
HS21120103-04	LHSMW07_120121	01 Dec 2021 10:10			13 Dec 2021 11:47	1
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			13 Dec 2021 15:11	50
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			13 Dec 2021 11:55	1
HS21120103-06	35AWW06_120121	01 Dec 2021 11:55			13 Dec 2021 15:22	100
HS21120103-06	35AWW06_120121	01 Dec 2021 11:55			13 Dec 2021 12:05	1

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R397632 (0)	**Test Name :** TOTAL ORGANIC CARBON BY E415.1				**Matrix:** Groundwater	
HS21120103-01	35AWW11_120121	01 Dec 2021 07:35			14 Dec 2021 22:50	1
HS21120103-02	35AWW23_120121	01 Dec 2021 08:25			14 Dec 2021 23:06	1
HS21120103-03	35AWW19_120121	01 Dec 2021 09:20			14 Dec 2021 23:22	1
HS21120103-04	LHSMW07_120121	01 Dec 2021 10:10			14 Dec 2021 23:38	1
Batch ID: R397739 (0)	**Test Name :** TOTAL ORGANIC CARBON BY E415.1				**Matrix:** Groundwater	
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			15 Dec 2021 19:46	1
HS21120103-06	35AWW06_120121	01 Dec 2021 11:55			15 Dec 2021 20:19	1
Batch ID: R400655 (0)	**Test Name :** SUBCONTRACT ANALYSIS - CO2				**Matrix:** Groundwater	
HS21120103-01	35AWW11_120121	01 Dec 2021 07:35			20 Jan 2022 09:09	1
HS21120103-02	35AWW23_120121	01 Dec 2021 08:25			20 Jan 2022 09:09	1
HS21120103-03	35AWW19_120121	01 Dec 2021 09:20			20 Jan 2022 09:09	1
HS21120103-04	LHSMW07_120121	01 Dec 2021 10:10			20 Jan 2022 09:09	1
HS21120103-05	35AWW20_120121	01 Dec 2021 11:00			20 Jan 2022 09:09	1
HS21120103-06	35AWW06_120121	01 Dec 2021 11:55			20 Jan 2022 09:09	1

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397512 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-211213** Units: **ug/L** Analysis Date: **13-Dec-2021 09:39**
Client ID: Run ID: **FID-4_397512** SeqNo: **6421331** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.250	1.00								U
Ethene	0.500	1.00								U
Methane	0.250	0.500								U

LCS Sample ID: **LCS-211213** Units: **ug/L** Analysis Date: **13-Dec-2021 09:50**
Client ID: Run ID: **FID-4_397512** SeqNo: **6421332** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	17.25	1.00	18.04	0	95.6	74 - 131				
Ethene	14.87	1.00	16.8	0	88.5	72 - 133				
Methane	9.683	0.500	9.647	0	100	73 - 125				

MS Sample ID: **HS21120092-05MS** Units: **ug/L** Analysis Date: **13-Dec-2021 10:19**
Client ID: Run ID: **FID-4_397512** SeqNo: **6421334** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	13.9	1.00	18.04	0	77.0	74 - 131				
Ethene	13.38	1.00	16.8	1.251	72.2	72 - 133				
Methane	7.574	0.500	9.647	1.912	58.7	73 - 125				S

MSD Sample ID: **HS21120092-05MSD** Units: **ug/L** Analysis Date: **13-Dec-2021 10:28**
Client ID: Run ID: **FID-4_397512** SeqNo: **6421335** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	14.06	1.00	18.04	0	77.9	74 - 131	13.9	1.18	30	
Ethene	14.7	1.00	16.8	1.251	80.1	72 - 133	13.38	9.41	30	
Methane	7.303	0.500	9.647	1.912	55.9	73 - 125	7.574	3.65	30	S

The following samples were analyzed in this batch: HS21120103-01 HS21120103-02 HS21120103-03 HS21120103-04 HS21120103-05 HS21120103-06

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: 173565 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-173565** Units: **mg/L** Analysis Date: **15-Dec-2021 21:25**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424041** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00500								U

LCS Sample ID: **LCS-173565** Units: **mg/L** Analysis Date: **15-Dec-2021 21:27**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424042** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05307	0.00500	0.05	0	106	84 - 116				

MS Sample ID: **HS21120092-05MS** Units: **mg/L** Analysis Date: **15-Dec-2021 21:33**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424045** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05642	0.00500	0.05	0.001712	109	84 - 116				

MSD Sample ID: **HS21120092-05MSD** Units: **mg/L** Analysis Date: **15-Dec-2021 21:35**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424046** PrepDate: **15-Dec-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05688	0.00500	0.05	0.001712	110	84 - 116	0.05642	0.809	20	

SD Sample ID: **HS21120092-05SD** Units: **mg/L** Analysis Date: **15-Dec-2021 21:31**
Client ID: Run ID: **ICPMS06_397733** SeqNo: **6424044** PrepDate: **15-Dec-2021** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00500	0.0250					0.001712	0	10	U

The following samples were analyzed in this batch: HS21120103-05

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-211209** Units: **ug/L** Analysis Date: **09-Dec-2021 12:50**
Client ID: Run ID: **VOA9_397355** SeqNo: **6414914** 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	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U
Bromomethane	1.0	1.0								U

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-211209** Units: **ug/L** Analysis Date: **09-Dec-2021 12:50**
Client ID: Run ID: **VOA9_397355** SeqNo: **6414914** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	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	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	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	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*52.26*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.47*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*49.51*	*1.0*	*50*	*0*	*99.0*	*80 - 119*				
Surr: Toluene-d8	*51.59*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-211209** Units: **ug/L** Analysis Date: **09-Dec-2021 12:05**
Client ID: Run ID: **VOA9_397355** SeqNo: **6414913** 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	18.36	1.0	20	0	91.8	78 - 124				
1,1,1-Trichloroethane	20.53	1.0	20	0	103	74 - 131				
1,1,2,2-Tetrachloroethane	20.78	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	20.55	1.0	20	0	103	80 - 119				
1,1-Dichloroethane	22.19	1.0	20	0	111	77 - 125				
1,1-Dichloroethene	20.55	1.0	20	0	103	71 - 131				
1,1-Dichloropropene	20.11	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	19.05	1.0	20	0	95.2	69 - 129				
1,2,3-Trichloropropane	19.98	1.0	20	0	99.9	73 - 122				
1,2,4-Trichlorobenzene	19.53	1.0	20	0	97.7	69 - 130				
1,2,4-Trimethylbenzene	21.23	1.0	20	0	106	76 - 124				
1,2-Dibromo-3-chloropropane	16.06	1.0	20	0	80.3	62 - 128				
1,2-Dibromoethane	20.53	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.8	1.0	20	0	99.0	80 - 119				
1,2-Dichloroethane	20.55	1.0	20	0	103	73 - 128				
1,2-Dichloropropane	21.09	1.0	20	0	105	78 - 122				
1,3,5-Trimethylbenzene	20.69	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	19.67	1.0	20	0	98.3	80 - 119				
1,3-Dichloropropane	20.8	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	19.88	1.0	20	0	99.4	79 - 118				
2,2-Dichloropropane	20.67	1.0	20	0	103	60 - 139				
2-Butanone	39.33	2.0	40	0	98.3	56 - 143				
2-Chlorotoluene	20.61	1.0	20	0	103	79 - 122				
2-Hexanone	41.27	2.0	40	0	103	57 - 139				
4-Chlorotoluene	21.58	1.0	20	0	108	78 - 122				
4-Isopropyltoluene	20.82	1.0	20	0	104	77 - 127				
4-Methyl-2-pentanone	38.92	2.0	40	0	97.3	67 - 130				
Acetone	42.2	2.0	40	0	105	39 - 160				
Benzene	20.53	1.0	20	0	103	79 - 120				
Bromobenzene	19.4	1.0	20	0	97.0	80 - 120				
Bromochloromethane	21.02	1.0	20	0	105	78 - 123				
Bromodichloromethane	18.2	1.0	20	0	91.0	79 - 125				
Bromoform	15.03	1.0	20	0	75.2	66 - 130				
Bromomethane	26.46	1.0	20	0	132	53 - 141				

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-211209** Units: **ug/L** Analysis Date: **09-Dec-2021 12:05**
Client ID: Run ID: **VOA9_397355** SeqNo: **6414913** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	42.34	2.0	40	0	106	64 - 133				
Carbon tetrachloride	17.52	1.0	20	0	87.6	72 - 136				
Chlorobenzene	19.51	1.0	20	0	97.5	82 - 118				
Chloroethane	23.61	1.0	20	0	118	60 - 138				
Chloroform	21.95	1.0	20	0	110	79 - 124				
Chloromethane	23.44	1.0	20	0	117	50 - 139				
cis-1,2-Dichloroethene	20.9	1.0	20	0	105	78 - 123				
cis-1,3-Dichloropropene	17.97	1.0	20	0	89.9	75 - 124				
Dibromochloromethane	16.78	1.0	20	0	83.9	74 - 126				
Dibromomethane	20.05	1.0	20	0	100	79 - 123				
Dichlorodifluoromethane	17.23	1.0	20	0	86.2	32 - 152				
Ethylbenzene	20	1.0	20	0	100	79 - 121				
Hexachlorobutadiene	23.46	1.0	20	0	117	66 - 134				
Isopropylbenzene	20.11	1.0	20	0	101	72 - 131				
m,p-Xylene	40.99	2.0	40	0	102	80 - 121				
Methylene chloride	20.19	2.0	20	0	101	74 - 124				
Naphthalene	17.98	1.0	20	0	89.9	61 - 128				
n-Butylbenzene	22.4	1.0	20	0	112	75 - 128				
n-Propylbenzene	21.38	1.0	20	0	107	76 - 126				
o-Xylene	19.95	1.0	20	0	99.8	78 - 122				
sec-Butylbenzene	20.77	1.0	20	0	104	77 - 126				
Styrene	20.77	1.0	20	0	104	78 - 123				
tert-Butylbenzene	20.19	1.0	20	0	101	78 - 124				
Tetrachloroethene	17.94	1.0	20	0	89.7	74 - 129				
Toluene	20.13	1.0	20	0	101	80 - 121				
trans-1,2-Dichloroethene	20.69	1.0	20	0	103	75 - 124				
trans-1,3-Dichloropropene	17.33	1.0	20	0	86.6	73 - 127				
Trichloroethene	19.02	1.0	20	0	95.1	79 - 123				
Trichlorofluoromethane	20.52	1.0	20	0	103	65 - 141				
Vinyl chloride	20.81	1.0	20	0	104	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.39*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.26*	*1.0*	*50*	*0*	*96.5*	*85 - 114*				
Surr: Dibromofluoromethane	*50.42*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*46.68*	*1.0*	*50*	*0*	*93.4*	*89 - 112*				

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21120103-01MS** Units: **ug/L** Analysis Date: **09-Dec-2021 14:20**
Client ID: **35AWW11_120121** Run ID: **VOA9_397355** SeqNo: **6414918** 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	19.57	1.0	20	0	97.8	78 - 124				
1,1,1-Trichloroethane	20.3	1.0	20	0	101	74 - 131				
1,1,2,2-Tetrachloroethane	22.16	1.0	20	0	111	71 - 121				
1,1,2-Trichloroethane	22.2	1.0	20	0	111	80 - 119				
1,1-Dichloroethane	22.67	1.0	20	0	113	77 - 125				
1,1-Dichloroethene	21.64	1.0	20	1.497	101	71 - 131				
1,1-Dichloropropene	21.32	1.0	20	0	107	78 - 125				
1,2,3-Trichlorobenzene	17.67	1.0	20	0	88.3	69 - 129				
1,2,3-Trichloropropane	21.37	1.0	20	0	107	73 - 122				
1,2,4-Trichlorobenzene	18.1	1.0	20	0	90.5	69 - 130				
1,2,4-Trimethylbenzene	21.67	1.0	20	0	108	76 - 124				
1,2-Dibromo-3-chloropropane	16.13	1.0	20	0	80.7	62 - 128				
1,2-Dibromoethane	21.57	1.0	20	0	108	77 - 121				
1,2-Dichlorobenzene	20.4	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	21.4	1.0	20	0	107	73 - 128				
1,2-Dichloropropane	22.2	1.0	20	0	111	78 - 122				
1,3,5-Trimethylbenzene	21.23	1.0	20	0	106	75 - 124				
1,3-Dichlorobenzene	19.87	1.0	20	0	99.4	80 - 119				
1,3-Dichloropropane	22.2	1.0	20	0	111	80 - 119				
1,4-Dichlorobenzene	20.09	1.0	20	0	100	79 - 118				
2,2-Dichloropropane	20.49	1.0	20	0	102	60 - 139				
2-Butanone	37.91	2.0	40	0	94.8	56 - 143				
2-Chlorotoluene	22.09	1.0	20	0	110	79 - 122				
2-Hexanone	44.75	2.0	40	0	112	57 - 139				
4-Chlorotoluene	22.45	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	20.75	1.0	20	0	104	77 - 127				
4-Methyl-2-pentanone	41.53	2.0	40	0	104	67 - 130				
Acetone	39.09	2.0	40	0	97.7	39 - 160				
Benzene	21.7	1.0	20	0	108	79 - 120				
Bromobenzene	20.43	1.0	20	0	102	80 - 120				
Bromochloromethane	20.88	1.0	20	0	104	78 - 123				
Bromodichloromethane	19.33	1.0	20	0	96.6	79 - 125				
Bromoform	15.7	1.0	20	0	78.5	66 - 130				
Bromomethane	19.72	1.0	20	0	98.6	53 - 141				

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21120103-01MS** Units: **ug/L** Analysis Date: **09-Dec-2021 14:20**
Client ID: **35AWW11_120121** Run ID: **VOA9_397355** SeqNo: **6414918** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.27	2.0	40	0	93.2	64 - 133				
Carbon tetrachloride	18.71	1.0	20	0	93.5	72 - 136				
Chlorobenzene	20.57	1.0	20	0	103	82 - 118				
Chloroethane	16.1	1.0	20	0	80.5	60 - 138				
Chloroform	21.82	1.0	20	0	109	79 - 124				
Chloromethane	13.41	1.0	20	0	67.0	50 - 139				
cis-1,2-Dichloroethene	21.07	1.0	20	0	105	78 - 123				
cis-1,3-Dichloropropene	18.36	1.0	20	0	91.8	75 - 124				
Dibromochloromethane	17.66	1.0	20	0	88.3	74 - 126				
Dibromomethane	21.16	1.0	20	0	106	79 - 123				
Dichlorodifluoromethane	3.881	1.0	20	0	19.4	32 - 152				S
Ethylbenzene	21.07	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	18.75	1.0	20	0	93.7	66 - 134				
Isopropylbenzene	21.22	1.0	20	0	106	72 - 131				
m,p-Xylene	43.11	2.0	40	0	108	80 - 121				
Methylene chloride	19.75	2.0	20	0	98.8	74 - 124				
Naphthalene	18.07	1.0	20	0	90.4	61 - 128				
n-Butylbenzene	21.32	1.0	20	0	107	75 - 128				
n-Propylbenzene	22.49	1.0	20	0	112	76 - 126				
o-Xylene	21.18	1.0	20	0	106	78 - 122				
sec-Butylbenzene	21.13	1.0	20	0	106	77 - 126				
Styrene	21.74	1.0	20	0	109	78 - 123				
tert-Butylbenzene	20.8	1.0	20	0	104	78 - 124				
Tetrachloroethene	19.45	1.0	20	0	97.3	74 - 129				
Toluene	21.48	1.0	20	0	107	80 - 121				
trans-1,2-Dichloroethene	20.15	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	17.44	1.0	20	0	87.2	73 - 127				
Trichloroethene	20.34	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	17.69	1.0	20	0	88.4	65 - 141				
Vinyl chloride	15.32	1.0	20	0	76.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.88*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.09*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*50.05*	*1.0*	*50*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*52.26*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21120103-01MSD** Units: **ug/L** Analysis Date: **09-Dec-2021 14:42**
Client ID: **35AWW11_120121** Run ID: **VOA9_397355** SeqNo: **6414919** 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	19.4	1.0	20	0	97.0	78 - 124	19.57	0.869	20	
1,1,1-Trichloroethane	20.17	1.0	20	0	101	74 - 131	20.3	0.631	20	
1,1,2,2-Tetrachloroethane	22.6	1.0	20	0	113	71 - 121	22.16	1.98	20	
1,1,2-Trichloroethane	22.44	1.0	20	0	112	80 - 119	22.2	1.06	20	
1,1-Dichloroethane	22.36	1.0	20	0	112	77 - 125	22.67	1.39	20	
1,1-Dichloroethene	20.39	1.0	20	1.497	94.5	71 - 131	21.64	5.94	20	
1,1-Dichloropropene	21.16	1.0	20	0	106	78 - 125	21.32	0.77	20	
1,2,3-Trichlorobenzene	17.9	1.0	20	0	89.5	69 - 129	17.67	1.31	20	
1,2,3-Trichloropropane	21.89	1.0	20	0	109	73 - 122	21.37	2.41	20	
1,2,4-Trichlorobenzene	18.51	1.0	20	0	92.5	69 - 130	18.1	2.23	20	
1,2,4-Trimethylbenzene	22.28	1.0	20	0	111	76 - 124	21.67	2.75	20	
1,2-Dibromo-3-chloropropane	16.19	1.0	20	0	80.9	62 - 128	16.13	0.363	20	
1,2-Dibromoethane	21.98	1.0	20	0	110	77 - 121	21.57	1.89	20	
1,2-Dichlorobenzene	20.55	1.0	20	0	103	80 - 119	20.4	0.731	20	
1,2-Dichloroethane	21.62	1.0	20	0	108	73 - 128	21.4	1.02	20	
1,2-Dichloropropane	21.95	1.0	20	0	110	78 - 122	22.2	1.11	20	
1,3,5-Trimethylbenzene	21.13	1.0	20	0	106	75 - 124	21.23	0.497	20	
1,3-Dichlorobenzene	19.84	1.0	20	0	99.2	80 - 119	19.87	0.184	20	
1,3-Dichloropropane	22.44	1.0	20	0	112	80 - 119	22.2	1.12	20	
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118	20.09	0.405	20	
2,2-Dichloropropane	19.28	1.0	20	0	96.4	60 - 139	20.49	6.11	20	
2-Butanone	39.23	2.0	40	0	98.1	56 - 143	37.91	3.42	20	
2-Chlorotoluene	21.61	1.0	20	0	108	79 - 122	22.09	2.22	20	
2-Hexanone	47.1	2.0	40	0	118	57 - 139	44.75	5.12	20	
4-Chlorotoluene	22.19	1.0	20	0	111	78 - 122	22.45	1.15	20	
4-Isopropyltoluene	20.93	1.0	20	0	105	77 - 127	20.75	0.863	20	
4-Methyl-2-pentanone	42.83	2.0	40	0	107	67 - 130	41.53	3.1	20	
Acetone	40.17	2.0	40	0	100	39 - 160	39.09	2.74	20	
Benzene	21.44	1.0	20	0	107	79 - 120	21.7	1.22	20	
Bromobenzene	20.17	1.0	20	0	101	80 - 120	20.43	1.3	20	
Bromochloromethane	21.26	1.0	20	0	106	78 - 123	20.88	1.77	20	
Bromodichloromethane	19.24	1.0	20	0	96.2	79 - 125	19.33	0.463	20	
Bromoform	15.56	1.0	20	0	77.8	66 - 130	15.7	0.895	20	
Bromomethane	19.23	1.0	20	0	96.2	53 - 141	19.72	2.51	20	

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21120103-01MSD** Units: **ug/L** Analysis Date: **09-Dec-2021 14:42**
Client ID: **35AWW11_120121** Run ID: **VOA9_397355** SeqNo: **6414919** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.49	2.0	40	0	91.2	64 - 133	37.27	2.12	20	
Carbon tetrachloride	18.41	1.0	20	0	92.1	72 - 136	18.71	1.59	20	
Chlorobenzene	20.73	1.0	20	0	104	82 - 118	20.57	0.779	20	
Chloroethane	17.46	1.0	20	0	87.3	60 - 138	16.1	8.12	20	
Chloroform	21.57	1.0	20	0	108	79 - 124	21.82	1.16	20	
Chloromethane	13.68	1.0	20	0	68.4	50 - 139	13.41	1.98	20	
cis-1,2-Dichloroethene	20.67	1.0	20	0	103	78 - 123	21.07	1.89	20	
cis-1,3-Dichloropropene	18.12	1.0	20	0	90.6	75 - 124	18.36	1.27	20	
Dibromochloromethane	17.86	1.0	20	0	89.3	74 - 126	17.66	1.16	20	
Dibromomethane	21.3	1.0	20	0	106	79 - 123	21.16	0.663	20	
Dichlorodifluoromethane	3.909	1.0	20	0	19.5	32 - 152	3.881	0.739	20	S
Ethylbenzene	21.16	1.0	20	0	106	79 - 121	21.07	0.425	20	
Hexachlorobutadiene	18.62	1.0	20	0	93.1	66 - 134	18.75	0.692	20	
Isopropylbenzene	21.26	1.0	20	0	106	72 - 131	21.22	0.224	20	
m,p-Xylene	43.13	2.0	40	0	108	80 - 121	43.11	0.05	20	
Methylene chloride	19.75	2.0	20	0	98.7	74 - 124	19.75	0.00395	20	
Naphthalene	19.06	1.0	20	0	95.3	61 - 128	18.07	5.36	20	
n-Butylbenzene	21.27	1.0	20	0	106	75 - 128	21.32	0.243	20	
n-Propylbenzene	22	1.0	20	0	110	76 - 126	22.49	2.17	20	
o-Xylene	20.93	1.0	20	0	105	78 - 122	21.18	1.18	20	
sec-Butylbenzene	21.14	1.0	20	0	106	77 - 126	21.13	0.0294	20	
Styrene	21.96	1.0	20	0	110	78 - 123	21.74	1.02	20	
tert-Butylbenzene	20.86	1.0	20	0	104	78 - 124	20.8	0.266	20	
Tetrachloroethene	19.23	1.0	20	0	96.1	74 - 129	19.45	1.18	20	
Toluene	21.5	1.0	20	0	107	80 - 121	21.48	0.11	20	
trans-1,2-Dichloroethene	20.14	1.0	20	0	101	75 - 124	20.15	0.0334	20	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.7	73 - 127	17.44	1.64	20	
Trichloroethene	20.01	1.0	20	0	100	79 - 123	20.34	1.63	20	
Trichlorofluoromethane	17.32	1.0	20	0	86.6	65 - 141	17.69	2.1	20	
Vinyl chloride	14.78	1.0	20	0	73.9	58 - 137	15.32	3.56	20	
Surr: 1,2-Dichloroethane-d4	*51.09*	*1.0*	*50*	*0*	*102*	*81 - 118*	*50.88*	*0.425*	*20*	
Surr: 4-Bromofluorobenzene	*52.83*	*1.0*	*50*	*0*	*106*	*85 - 114*	*52.09*	*1.4*	*20*	
Surr: Dibromofluoromethane	*50.97*	*1.0*	*50*	*0*	*102*	*80 - 119*	*50.05*	*1.81*	*20*	
Surr: Toluene-d8	*52.29*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.26*	*0.0512*	*20*	

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397355 (0)	Instrument: VOA9	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS21120103-01	HS21120103-02	HS21120103-03	HS21120103-04
HS21120103-05	HS21120103-06	HS21120103-07	

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R396874 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **02-Dec-2021 07:24**
Client ID: Run ID: **ICS-Integrion_396874** SeqNo: **6403820** 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: **LCS** Units: **mg/L** Analysis Date: **02-Dec-2021 07:31**
Client ID: Run ID: **ICS-Integrion_396874** SeqNo: **6403821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.75	0.500	20	0	104	80 - 120				
Nitrogen, Nitrate (As N)	4.256	0.100	4	0	106	80 - 120				
Nitrogen, Nitrite (As N)	4.145	0.100	4	0	104	80 - 120				
Sulfate	21.09	0.500	20	0	105	80 - 120				

MS Sample ID: **HS21120092-05MS** Units: **mg/L** Analysis Date: **02-Dec-2021 13:54**
Client ID: Run ID: **ICS-Integrion_396874** SeqNo: **6403827** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	178.6	5.00	100	79.21	99.4	80 - 120				
Nitrogen, Nitrate (As N)	27.49	1.00	20	4.727	114	80 - 120				
Nitrogen, Nitrite (As N)	20.36	1.00	20	0.763	98.0	80 - 120				
Sulfate	2533	5.00	100	2598	-64.6	80 - 120				SEO

MSD Sample ID: **HS21120092-05MSD** Units: **mg/L** Analysis Date: **02-Dec-2021 14:01**
Client ID: Run ID: **ICS-Integrion_396874** SeqNo: **6403828** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	179	5.00	100	79.21	99.8	80 - 120	178.6	0.207	20	
Nitrogen, Nitrate (As N)	27.44	1.00	20	4.727	114	80 - 120	27.49	0.175	20	
Nitrogen, Nitrite (As N)	20.41	1.00	20	0.763	98.2	80 - 120	20.36	0.24	20	
Sulfate	2535	5.00	100	2598	-62.7	80 - 120	2533	0.0773	20	SEO

The following samples were analyzed in this batch: HS21120103-01 HS21120103-02 HS21120103-03 HS21120103-04 HS21120103-05 HS21120103-06

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397044 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **03-Dec-2021 07:36**
Client ID: Run ID: **ICS-Integrion_397044** SeqNo: **6407442** 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: **LCS** Units: **mg/L** Analysis Date: **03-Dec-2021 07:44**
Client ID: Run ID: **ICS-Integrion_397044** SeqNo: **6407443** 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)	4.247	0.100	4	0	106	80 - 120				
Nitrogen, Nitrite (As N)	4.12	0.100	4	0	103	80 - 120				
Sulfate	21.03	0.500	20	0	105	80 - 120				

MS Sample ID: **HS21120178-01MS** Units: **mg/L** Analysis Date: **03-Dec-2021 11:06**
Client ID: Run ID: **ICS-Integrion_397044** SeqNo: **6407449** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	118.7	5.00	100	4.195	115	80 - 120				
Nitrogen, Nitrite (As N)	100.9	5.00	100	0	101	80 - 120				
Sulfate	2665	25.0	500	2380	57.0	80 - 120				SO

MSD Sample ID: **HS21120178-01MSD** Units: **mg/L** Analysis Date: **03-Dec-2021 11:13**
Client ID: Run ID: **ICS-Integrion_397044** SeqNo: **6407450** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	117.8	5.00	100	4.195	114	80 - 120	118.7	0.761	20	
Nitrogen, Nitrite (As N)	100.6	5.00	100	0	101	80 - 120	100.9	0.323	20	
Sulfate	2652	25.0	500	2380	54.5	80 - 120	2665	0.484	20	SO

The following samples were analyzed in this batch: HS21120103-02

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397632 (0) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

MBLK Sample ID: **MBLK-12142021** Units: **mg/L** Analysis Date: **14-Dec-2021 19:18**
Client ID: Run ID: **TOC_04_397632** SeqNo: **6421506** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-12142021** Units: **mg/L** Analysis Date: **14-Dec-2021 19:34**
Client ID: Run ID: **TOC_04_397632** SeqNo: **6421507** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.89	1.00	10	0	109	85 - 115				

LCSD Sample ID: **LCSD-12142021** Units: **mg/L** Analysis Date: **14-Dec-2021 19:50**
Client ID: Run ID: **TOC_04_397632** SeqNo: **6421508** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.93	1.00	10	0	109	85 - 115	10.89	0.367	20	

MS Sample ID: **HS21120101-01MS** Units: **mg/L** Analysis Date: **14-Dec-2021 21:30**
Client ID: Run ID: **TOC_04_397632** SeqNo: **6421514** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	24.19	1.00	10	14.77	94.2	80 - 120				

The following samples were analyzed in this batch: HS21120103-01 HS21120103-02 HS21120103-03 HS21120103-04

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

QC BATCH REPORT

Batch ID: R397739 (0) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

MBLK Sample ID: **MBLK-12152021** Units: **mg/L** Analysis Date: **15-Dec-2021 18:58**
Client ID: Run ID: **TOC_04_397739** SeqNo: **6424180** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-12152021** Units: **mg/L** Analysis Date: **15-Dec-2021 19:14**
Client ID: Run ID: **TOC_04_397739** SeqNo: **6424181** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.77	1.00	10	0	108	85 - 115				

LCSD Sample ID: **LCSD-12152021** Units: **mg/L** Analysis Date: **15-Dec-2021 19:30**
Client ID: Run ID: **TOC_04_397739** SeqNo: **6424182** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.8	1.00	10	0	108	85 - 115	10.77	0.278	20	

MS Sample ID: **HS21120103-05MS** Units: **mg/L** Analysis Date: **15-Dec-2021 20:03**
Client ID: **35AWW20_120121** Run ID: **TOC_04_397739** SeqNo: **6424184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	33.77	1.00	10	19.31	145	80 - 120				S

The following samples were analyzed in this batch: HS21120103-05 HS21120103-06

ALS Houston, US Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS21120103**

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	21-022-0	26-Mar-2022
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
Texas	T104704231-21-28	30-Apr-2022

ALS Houston, US Date: 20-Jan-22

Sample Receipt Checklist

Work Order ID: HS21120103 **Date/Time Received:** 02-Dec-2021 10:50

Client Name: Bhate Environmental **Received by:** Eric Widjaja

Completed By:	/S/ Jared R. Makan	02-Dec-2021 14:11	**Reviewed by:**	/S/ Ragen Giga	08-Dec-2021 13:01
	eSignature	Date/Time		eSignature	Date/Time

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 ☑	
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑	
Chain of custody present?	Yes ☑	No ☐	1 Page(s)	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Samplers name present on COC?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
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):	0.9°C UC/C	IR31
Cooler(s)/Kit(s):	47571	
Date/Time sample(s) sent to storage:	12/02/2021 14:12	

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 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

Sample Analysis Requested [5] | Quality Assurance Samples [6]

Field Sample ID (30 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	Arsenic					Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW11_120121	01 Dec 2021	0735	-	N		WG	11	X	X	X	X	X									
35AWW23_120121	01 Dec 2021	0825	-	N		WG	11	X	X	X	X	X									
35AWW19_120121	01 Dec 2021	0920	-	N		WG	11	X	X	X	X	X									
LitSmw07_120121	01 Dec 2021	1010		N		WG	11	X	X	X	X	X									
35AWW20_120121	01 Dec 2021	1100		N		WG	12	X	X	X	X	X	X								
35AWW06_120121	01 Dec 2021	1155	-	N		WG	11	X	X	X	X	X									
TRIP BLANK	01 Dec 2021		-	TB		W	2	X													
			-																		
			-																		
			-																		
			-																		

HS21120103

Bhate Environmental Associates, Inc.

LHAAP-58

COMMENTS: STANDARD TAT

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
Scott Beesinger	12/1/21	1430	1.	12/02/21	10:50
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

Cooler # 47971
0.4°C
VOC
CF 0.0

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

47571

CUSTODY SEAL

Date: 12/1/21 Time: 1430
Name: Scott Beesiner
Company: BHATE

Seal Broken By:
Date: 12/02/21

47571

47571

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PM8202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 19NOV21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3507
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-50-BD 81895-RG

RMA:

FedEx Express

FedEx TRK# 0221 5300 5225 1412

THU - 02 DEC AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

417334 01Dec2021 GSGA 560G2/NDFS/1873

Pace Analytical®

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 01/19/2022

Report # 221120825

Project HS21120103

Samples Collected 12/1/21

Deliver To	***Additional Recipients***
Ragen Giga ALS Houston 10450 Stancliff Rd Suite 210 Houston, TX 77099 281-530-5656	Jumoke Lawal, ALS Houston

PJLA Testing DoD ELAP

ISO 17025

NELAP ACCREDITED TNI LABORATORY

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
Pace Gulf Coast Report 221120825

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ALS Environmental - Houston, TX **Report:** 221120825

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.3 as specified in the contract.

No anomalies were found for the analyzed sample(s).

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22112082501	HS211120103-01	Water	12/01/21 07:35	12/07/21 11:18
22112082502	HS211120103-02	Water	12/01/21 08:25	12/07/21 11:18
22112082503	HS211120103-03	Water	12/01/21 09:20	12/07/21 11:18
22112082504	HS211120103-04	Water	12/01/21 10:10	12/07/21 11:18
22112082505	HS211120103-05	Water	12/01/21 11:00	12/07/21 11:18
22112082506	HS211120103-06	Water	12/01/21 11:55	12/07/21 11:18

Test Summary

EPA RSK-175					
Lab ID	**Client ID**	**Matrix**	**Batch**	**Instru**	**RunDate**
22112082501	HS211120103-01	Water	729093	GCV8B	12/10/21 15:10
22112082502	HS211120103-02	Water	729093	GCV8B	12/10/21 15:16
22112082503	HS211120103-03	Water	729093	GCV8B	12/10/21 15:22
22112082504	HS211120103-04	Water	729093	GCV8B	12/10/21 15:31
22112082505	HS211120103-05	Water	729093	GCV8B	12/10/21 15:36
22112082506	HS211120103-06	Water	729093	GCV8B	12/10/21 15:42

Manual Integrations

Manual Integrations for LC and IC (if performed) are documented in the raw data.
No other manual integrations were performed by Pace Gulf Coast.

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

EPA RSK-175						
Lab ID	**Client ID**	**Parameter**	**Units**	**Result**	**Dil.**	**%Moist**
22112082501	HS211120103-01	Carbon Dioxide	ug/L	778000	100	NA
22112082502	HS211120103-02	Carbon Dioxide	ug/L	779000	100	NA
22112082503	HS211120103-03	Carbon Dioxide	ug/L	744000	100	NA
22112082504	HS211120103-04	Carbon Dioxide	ug/L	820000	100	NA
22112082505	HS211120103-05	Carbon Dioxide	ug/L	661000	100	NA
22112082506	HS211120103-06	Carbon Dioxide	ug/L	423000	100	NA

EPA RSK-175

Form 1D

Results

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-01
Collect Date:	12/01/21 Time: 0735	GCAL Sample ID:	22112082501
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8025
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1510
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	778000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8025.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8025.d
Lab Smp Id: 22112082501 Client Smp ID: 22112082501
Inj Date : 10-DEC-2021 15:10
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082501
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.362	1.383	-0.021	23163980	7777.14	778000

Data File: /var/chem/gcv8b.i/2211210.b/v8025.d

Page 1

Date : 10-DEC-2021 15:10

Client ID: 22112082501

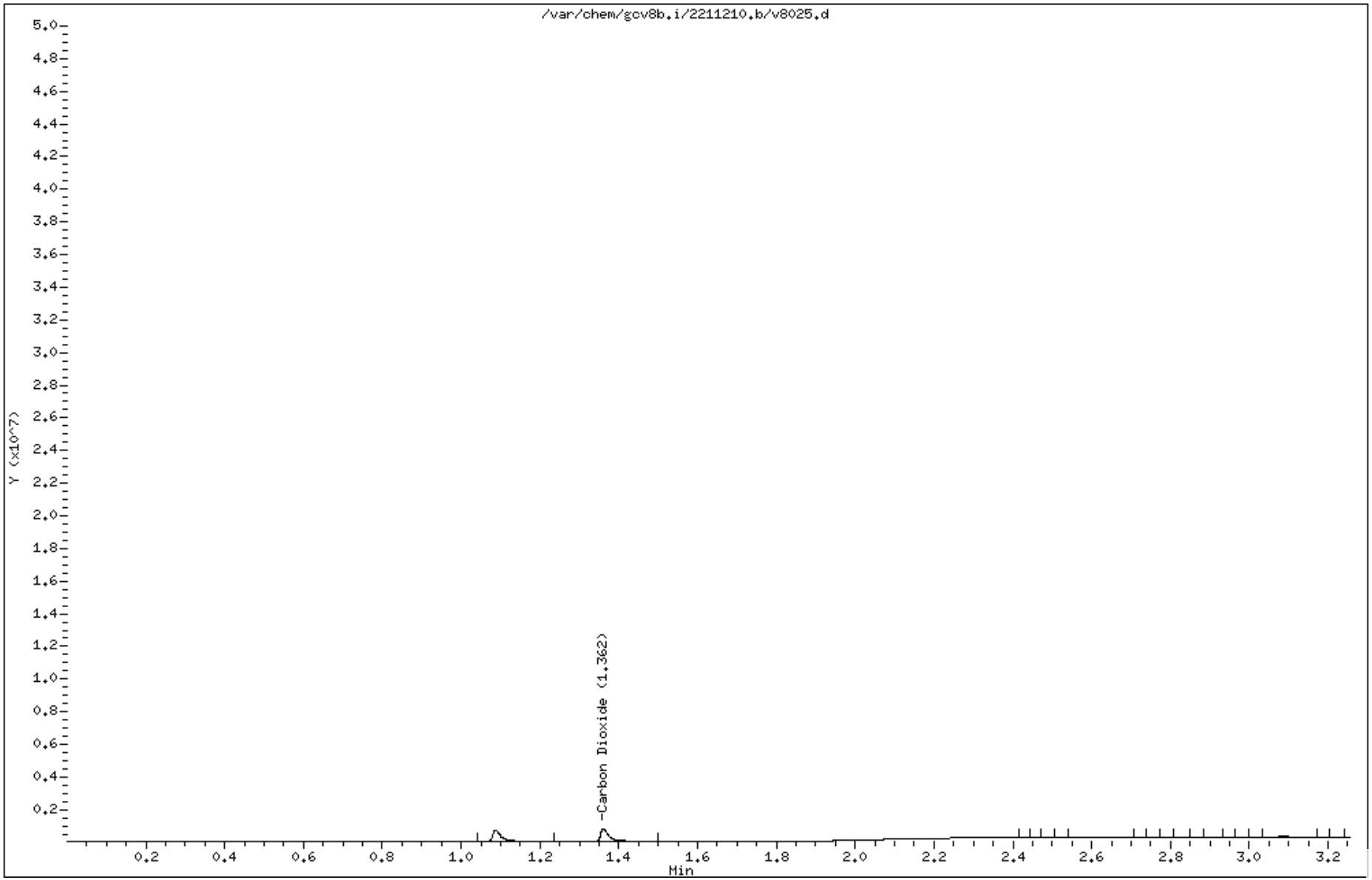
Instrument: gcv8b.i

Sample Info: 22112082501

Operator: BMR

Column phase: GS-Q-30

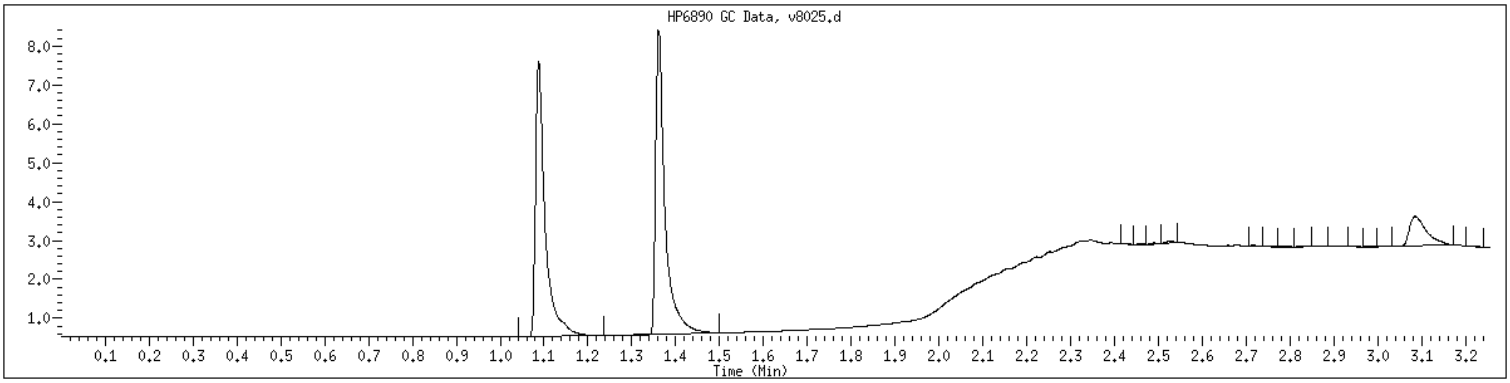
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8025.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 22112082501 SampleType : SAMPLE
Injection Date: 12/10/2021 15:10 Instrument : gcv8b.i
Operator : BMR
Sample Info : 22112082501
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Dilution : 100
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-02
Collect Date:	12/01/21 Time: 0825	GCAL Sample ID:	22112082502
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8026
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1516
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	779000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8026.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8026.d
Lab Smp Id: 22112082502 Client Smp ID: 22112082502
Inj Date : 10-DEC-2021 15:16
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082502
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.368	1.383	-0.015	23196513	7788.06	779000

Data File: /var/chem/gcv8b.i/2211210.b/v8026.d

Page 1

Date : 10-DEC-2021 15:16

Client ID: 22112082502

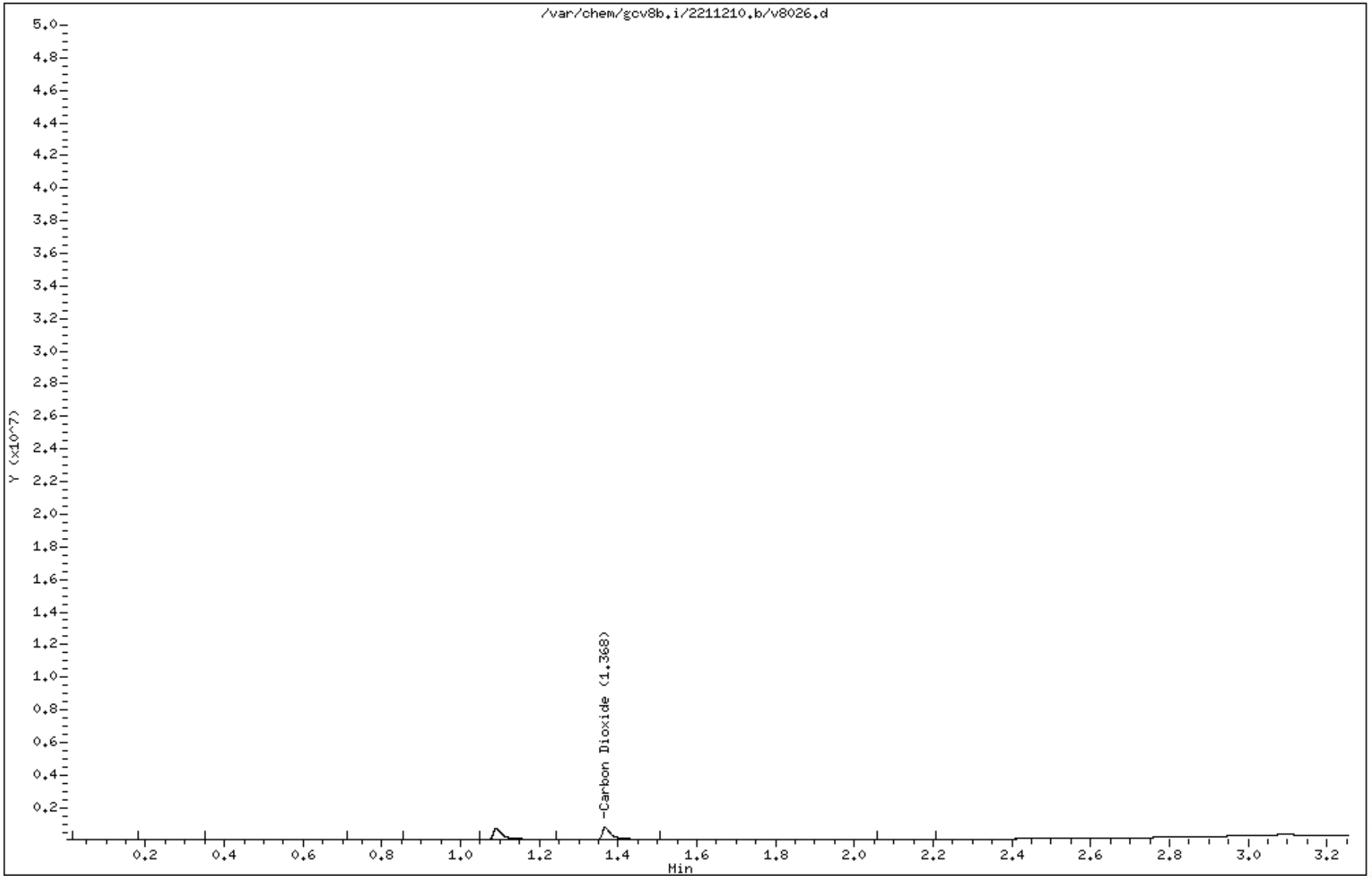
Instrument: gcv8b.i

Sample Info: 22112082502

Operator: BMR

Column phase: GS-Q-30

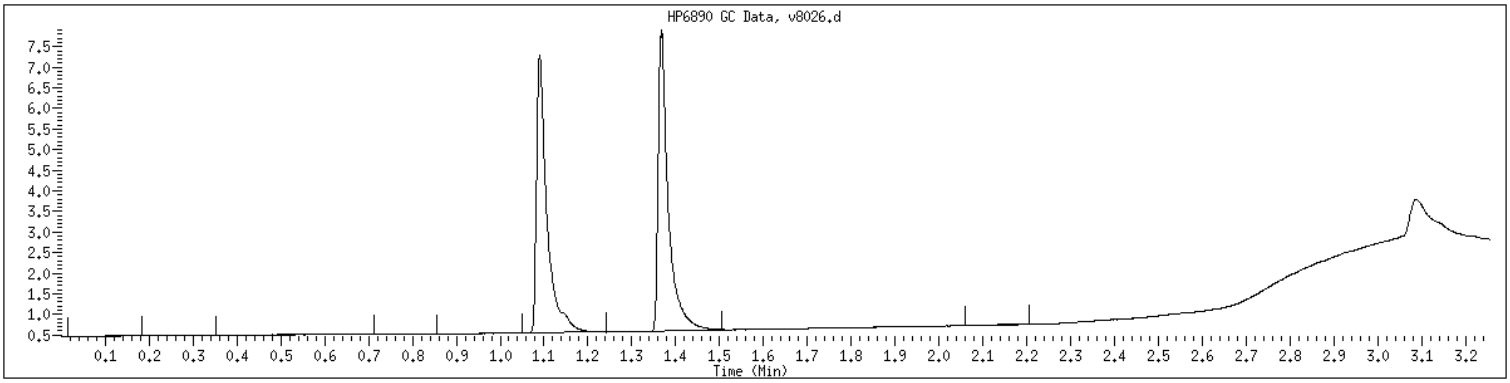
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8026.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22112082502	SampleType	: SAMPLE
Injection Date	: 12/10/2021 15:16	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 22112082502		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 100		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-03
Collect Date:	12/01/21 Time: 0920	GCAL Sample ID:	22112082503
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8027
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1522
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	744000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8027.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8027.d
Lab Smp Id: 22112082503 Client Smp ID: 22112082503
Inj Date : 10-DEC-2021 15:22
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082503
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.368	1.383	-0.015	22146805	7435.63	744000

Data File: /var/chem/gcv8b.i/2211210.b/v8027.d

Date : 10-DEC-2021 15:22

Client ID: 22112082503

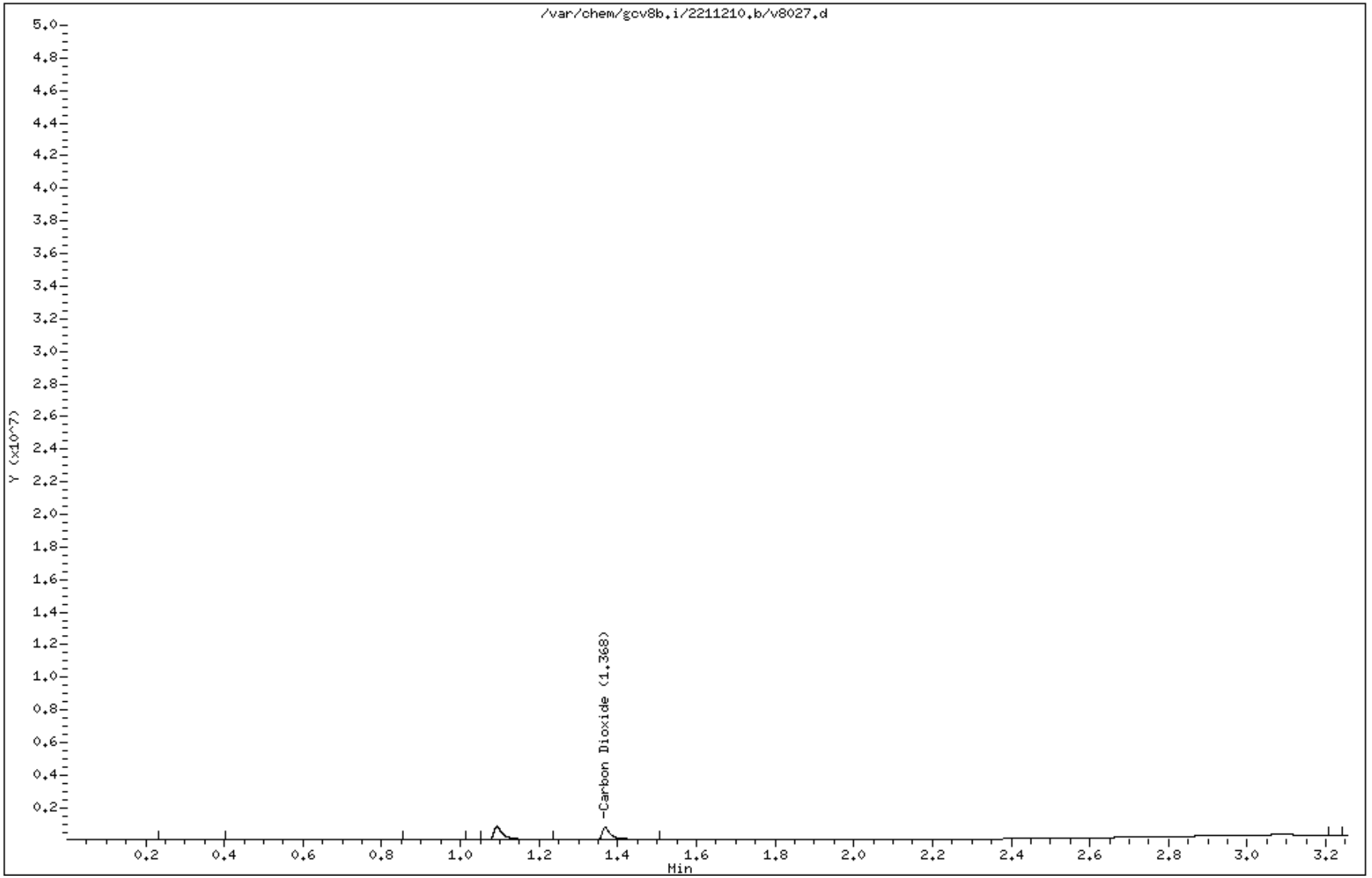
Instrument: gcv8b.i

Sample Info: 22112082503

Operator: BMR

Column phase: GS-Q-30

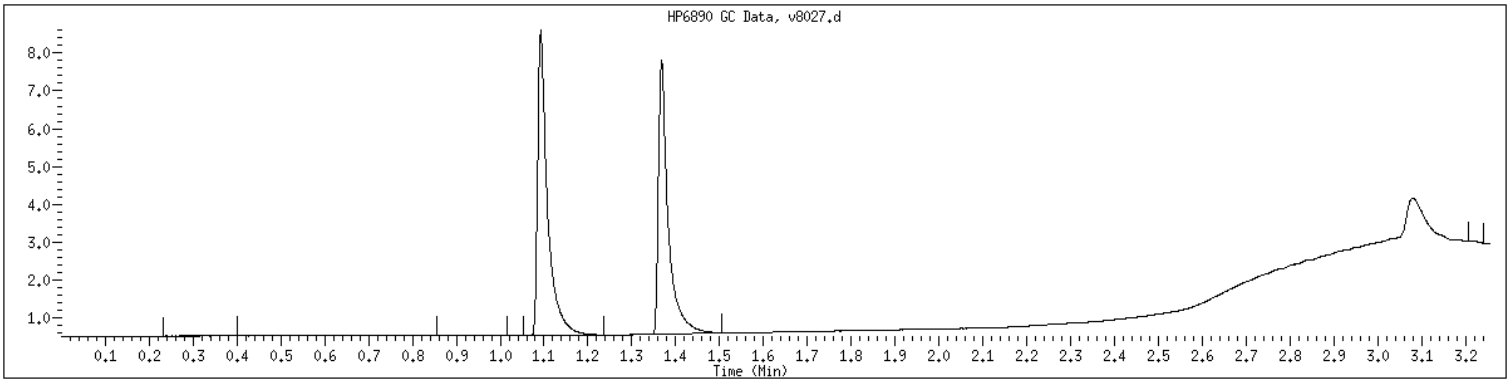
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8027.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22112082503	SampleType	: SAMPLE
Injection Date	: 12/10/2021 15:22	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 22112082503		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 100		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-04
Collect Date:	12/01/21 Time: 1010	GCAL Sample ID:	22112082504
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8028
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1531
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	820000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8028.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8028.d
Lab Smp Id: 22112082504 Client Smp ID: 22112082504
Inj Date : 10-DEC-2021 15:31
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082504
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.362	1.383	-0.021	24436786	8204.48	820000

Data File: /var/chem/gcv8b.i/2211210.b/v8028.d

Page 1

Date : 10-DEC-2021 15:31

Client ID: 22112082504

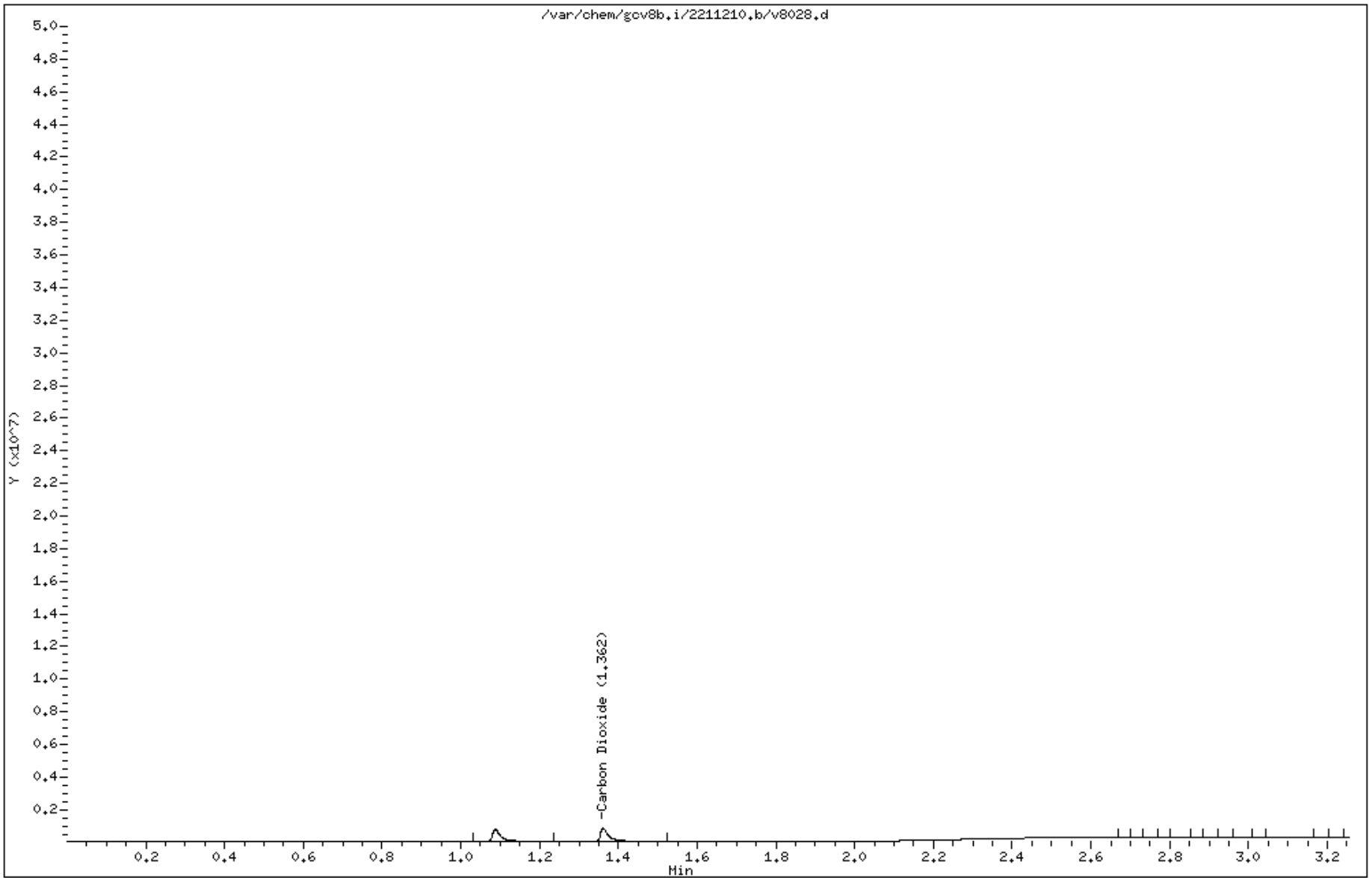
Instrument: gcv8b.i

Sample Info: 22112082504

Operator: BMR

Column phase: GS-Q-30

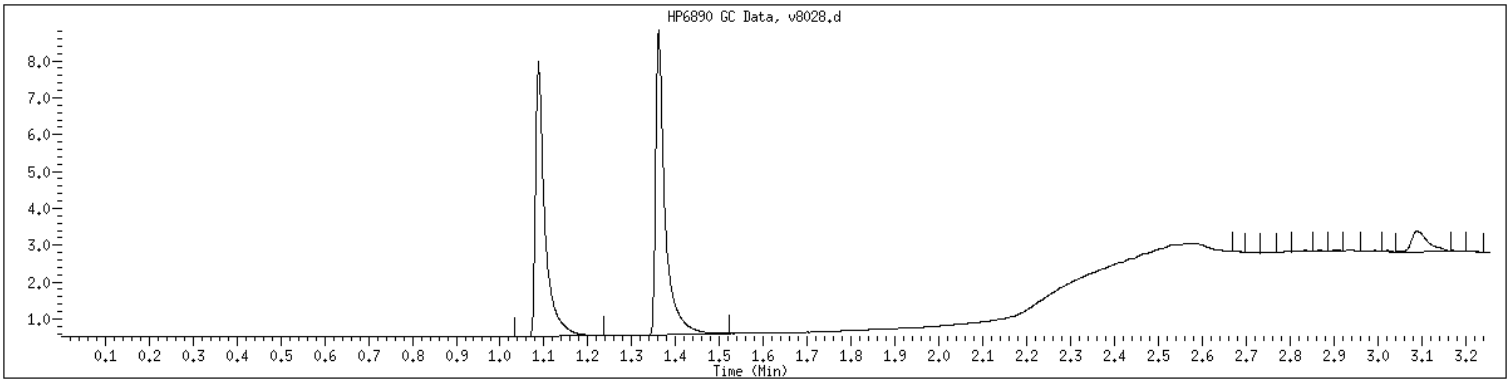
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8028.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22112082504	SampleType	: SAMPLE
Injection Date	: 12/10/2021 15:31	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 22112082504		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 100		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-05
Collect Date:	12/01/21 Time: 1100	GCAL Sample ID:	22112082505
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8029
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1536
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	661000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8029.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8029.d
Lab Smp Id: 22112082505 Client Smp ID: 22112082505
Inj Date : 10-DEC-2021 15:36
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082505
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.353	1.383	-0.030	19678366	6606.87	661000

Data File: /var/chem/gcv8b.i/2211210.b/v8029.d

Page 1

Date : 10-DEC-2021 15:36

Client ID: 22112082505

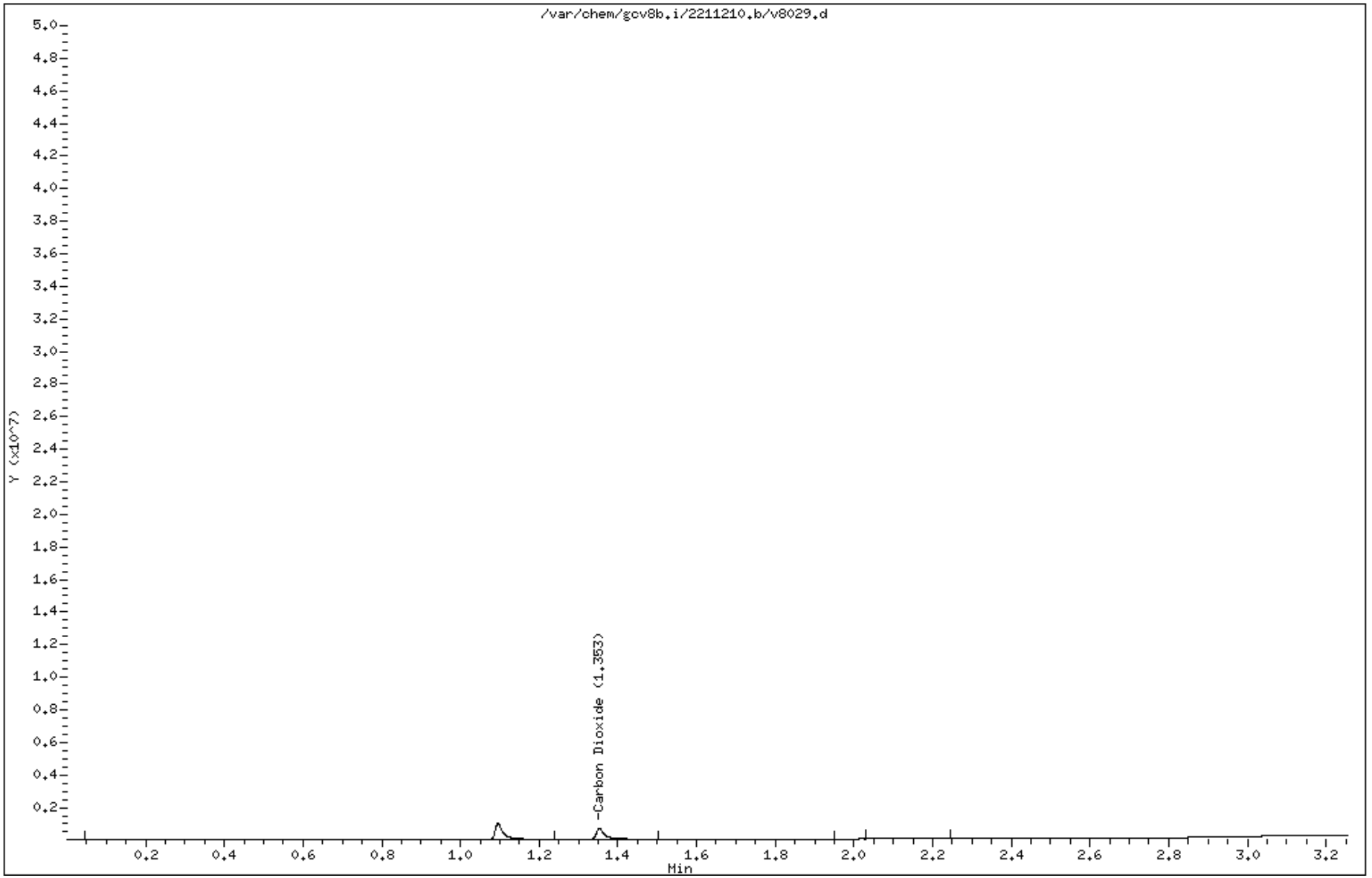
Instrument: gcv8b.i

Sample Info: 22112082505

Operator: BMR

Column phase: GS-Q-30

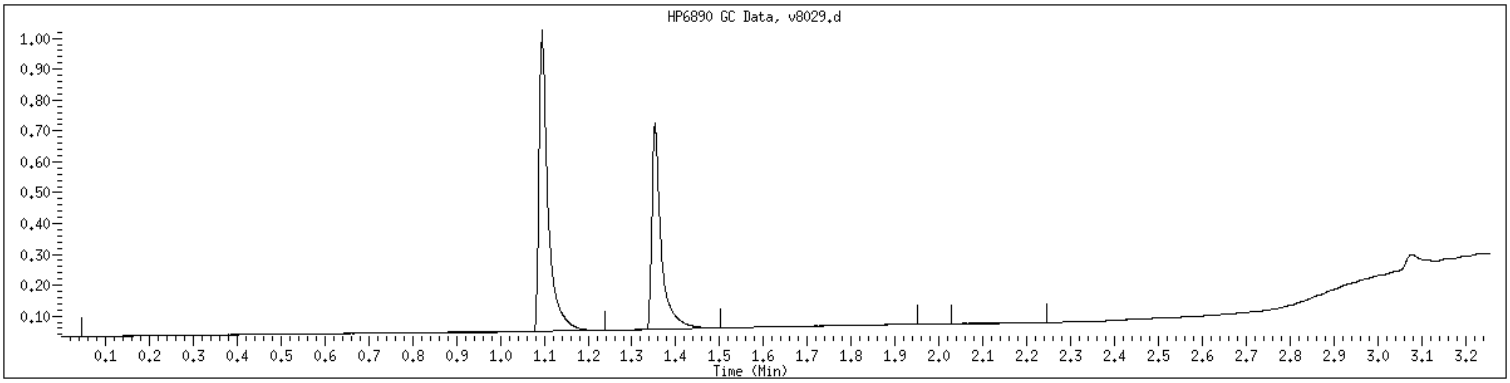
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8029.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 22112082505 SampleType : SAMPLE
Injection Date: 12/10/2021 15:36 Instrument : gcv8b.i
Operator : BMR
Sample Info : 22112082505
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Dilution : 100
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-06
Collect Date:	12/01/21 Time: 1155	GCAL Sample ID:	22112082506
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8030
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1542
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	423000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8030.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8030.d
Lab Smp Id: 22112082506 Client Smp ID: 22112082506
Inj Date : 10-DEC-2021 15:42
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082506
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.366	1.383	-0.017	12593882	4228.31	423000

Data File: /var/chem/gcv8b.i/2211210.b/v8030.d

Page 1

Date : 10-DEC-2021 15:42

Client ID: 22112082506

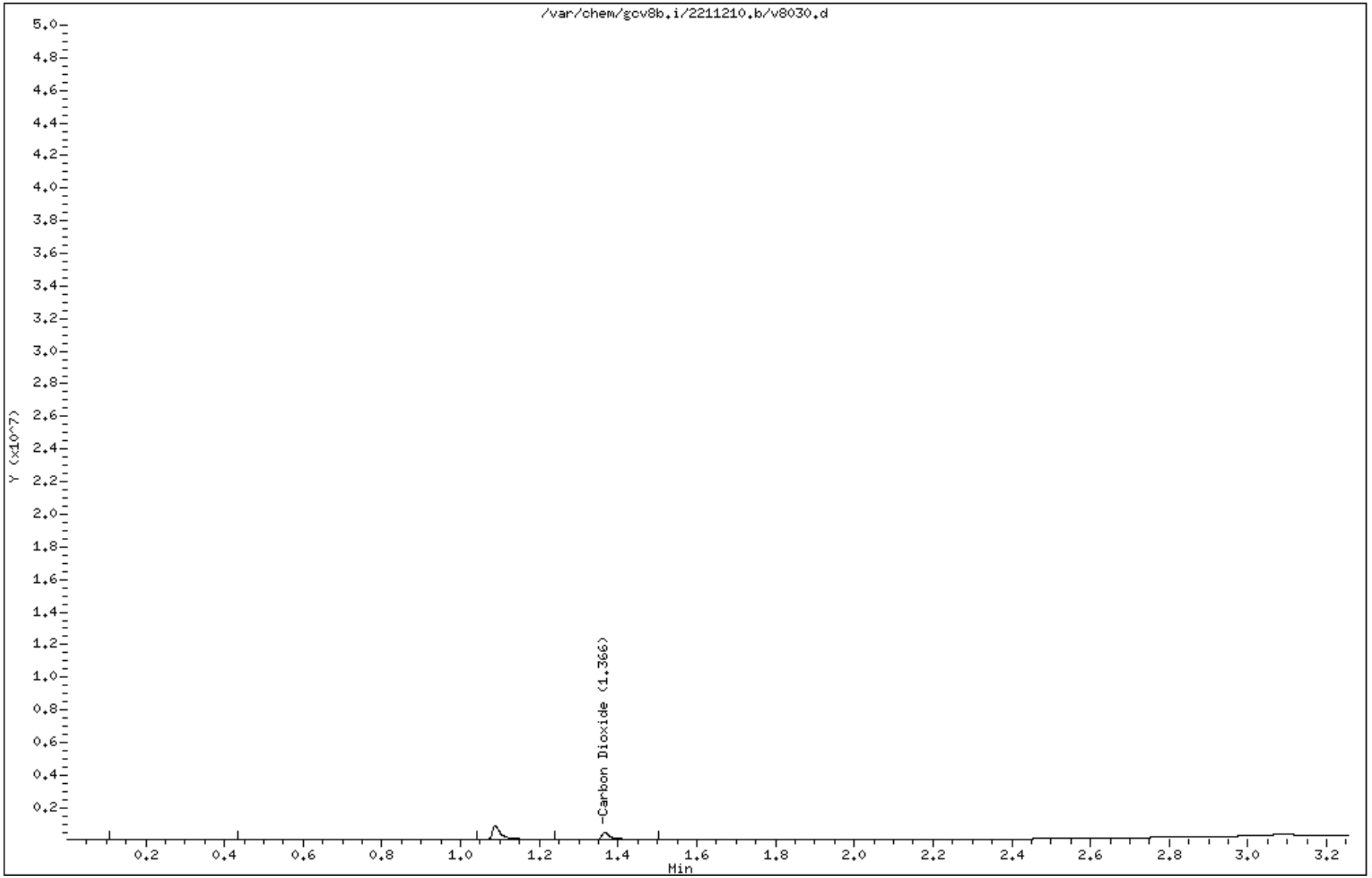
Instrument: gcv8b.i

Sample Info: 22112082506

Operator: BMR

Column phase: GS-Q-30

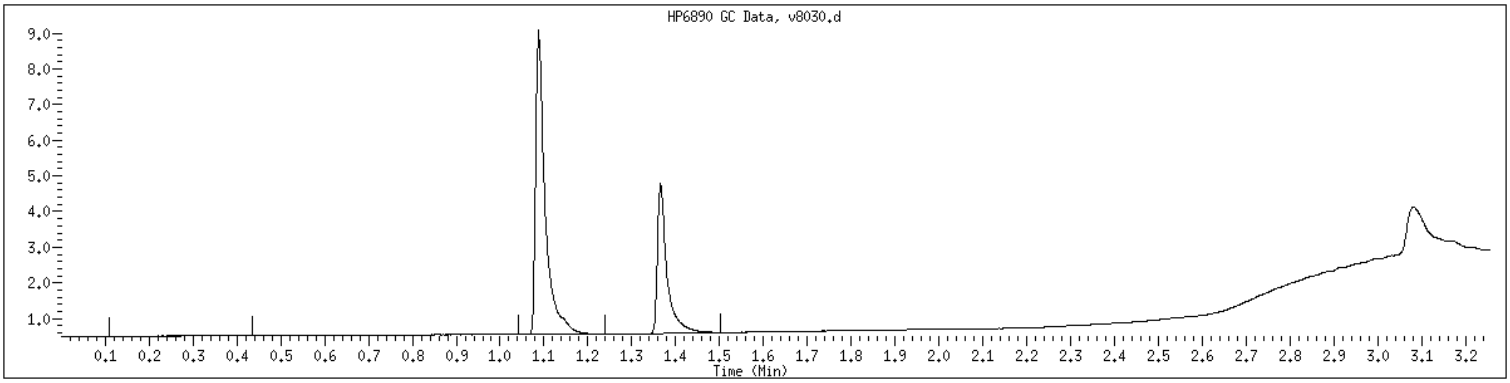
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8030.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22112082506	SampleType	: SAMPLE
Injection Date	: 12/10/2021 15:42	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 22112082506		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 100		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	MB2284464
Collect Date:	NA Time: NA	GCAL Sample ID:	2284464
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8002
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 0954
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	900	U	127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8002.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8002.d
Lab Smp Id: 2284464 Client Smp ID: 2284464
Inj Date : 10-DEC-2021 09:54
Operator : BMR Inst ID: gcv8b.i
Smp Info : 2284464
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)

Data File: /var/chem/gcv8b.i/2211210.b/v8002.d

Page 1

Date : 10-DEC-2021 09:54

Client ID: 2284464

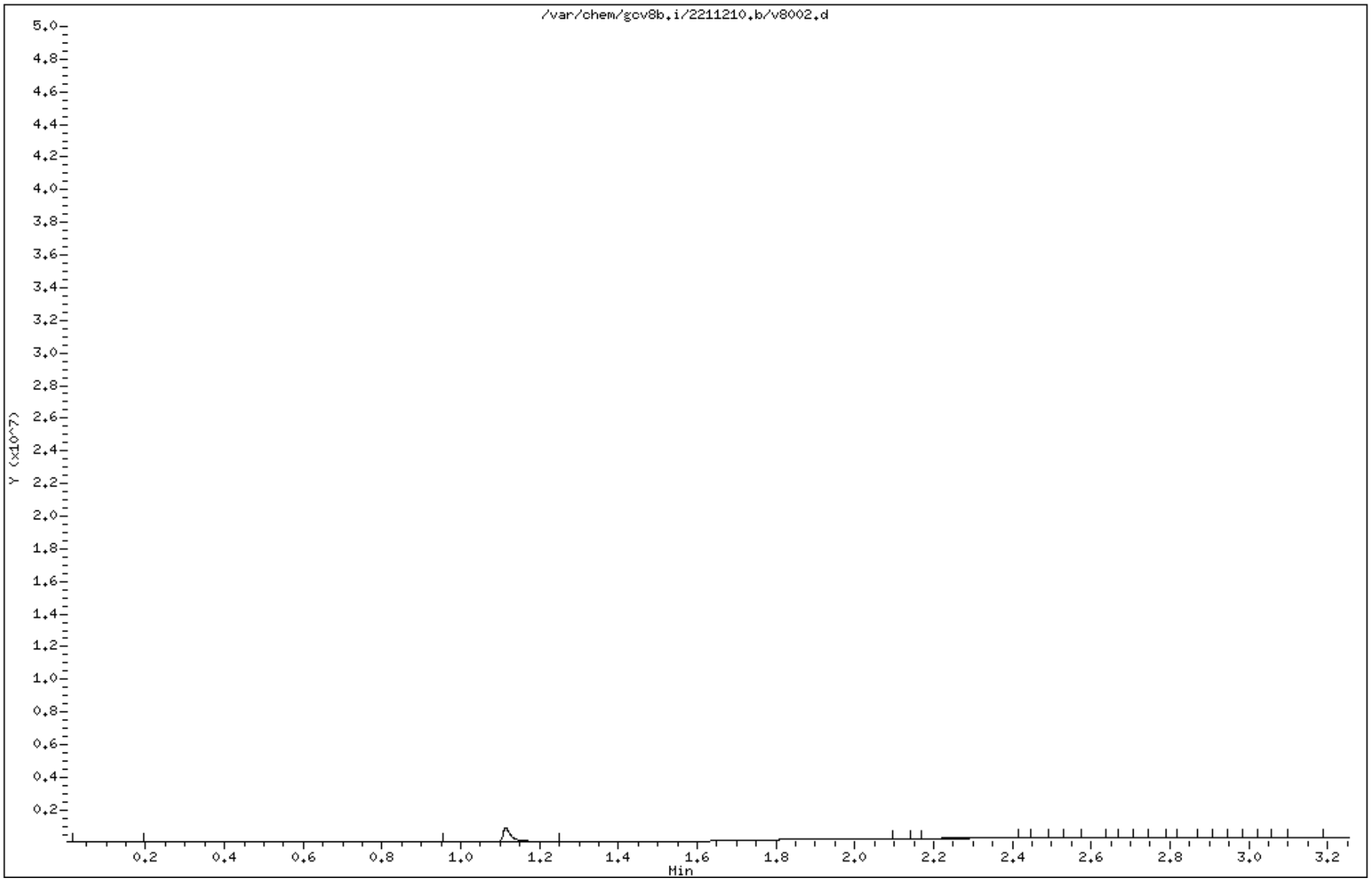
Instrument: gcv8b.i

Sample Info: 2284464

Operator: BMR

Column phase: GS-Q-30

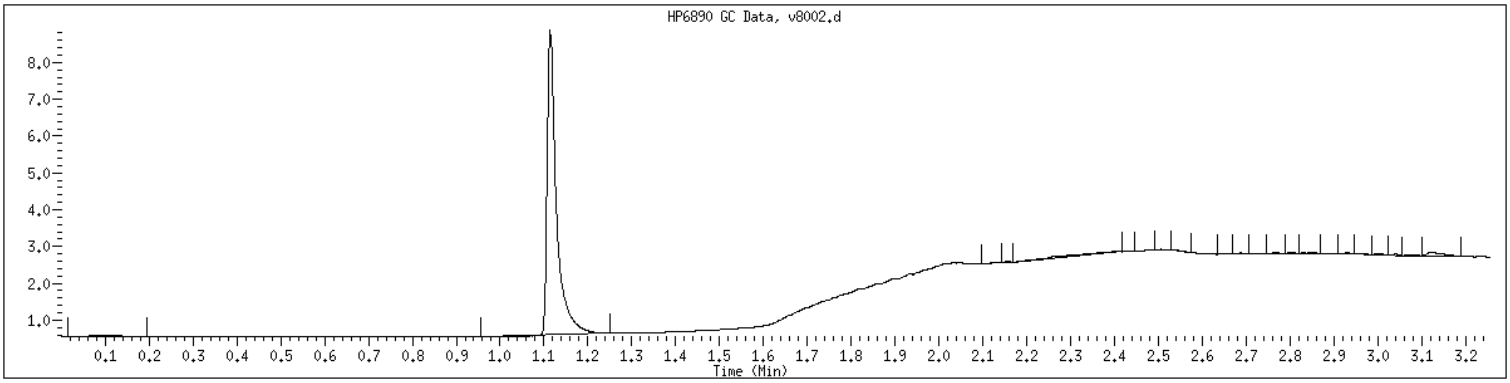
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8002.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2284464	SampleType	: BLANK
Injection Date	: 12/10/2021 09:54	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 2284464		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	LCS2284465
Collect Date:	NA Time: NA	GCAL Sample ID:	2284465
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8003
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1035
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	8630		127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8003.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8003.d
Lab Smp Id: 2284465 Client Smp ID: 2284465
Inj Date : 10-DEC-2021 10:35
Operator : BMR Inst ID: gcv8b.i
Smp Info : 2284465
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.383	1.383	0.000	25697296	8627.68	8630(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2211210.b/v8003.d

Date : 10-DEC-2021 10:35

Client ID: 2284465

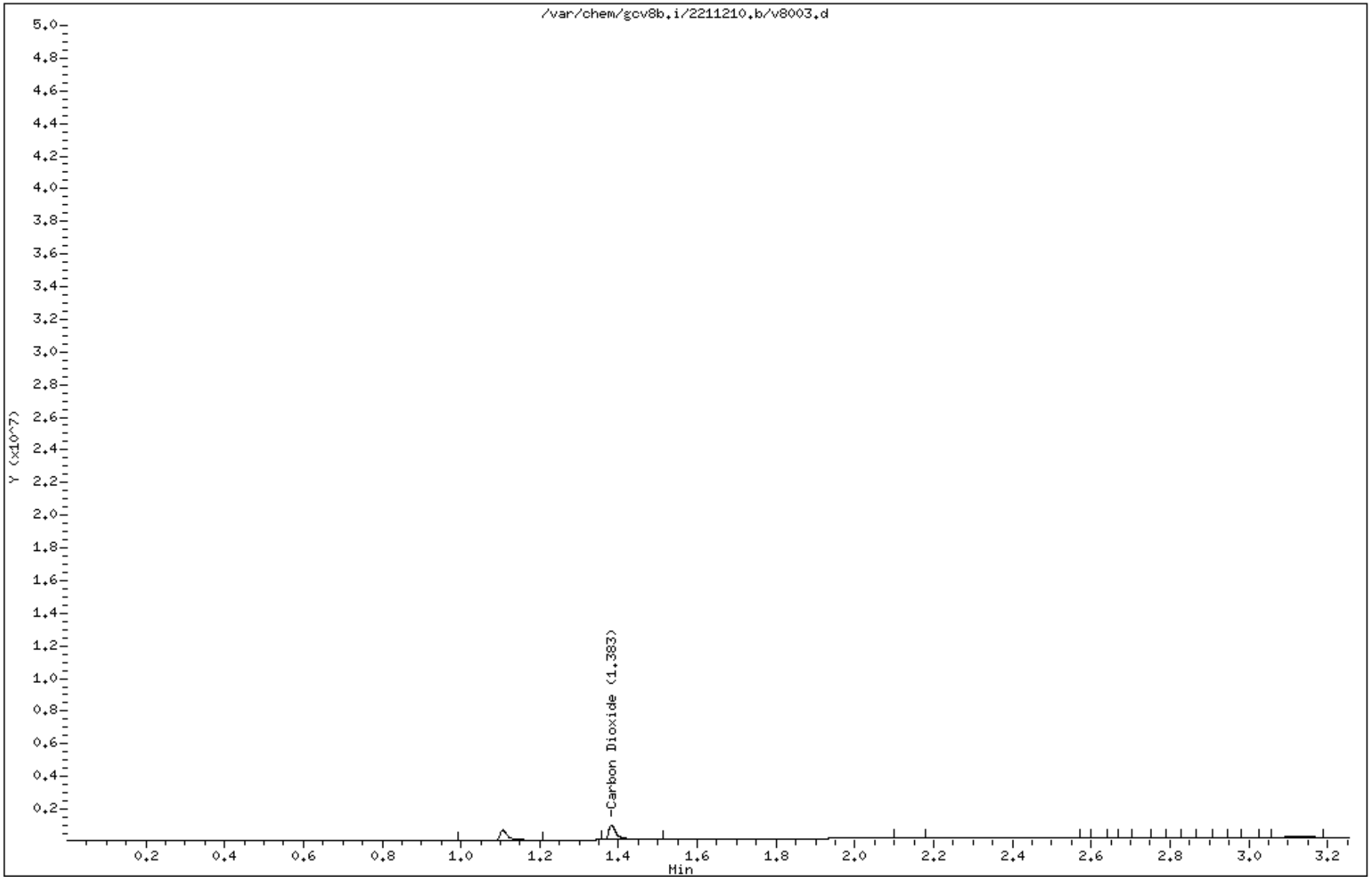
Instrument: gcv8b.i

Sample Info: 2284465

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

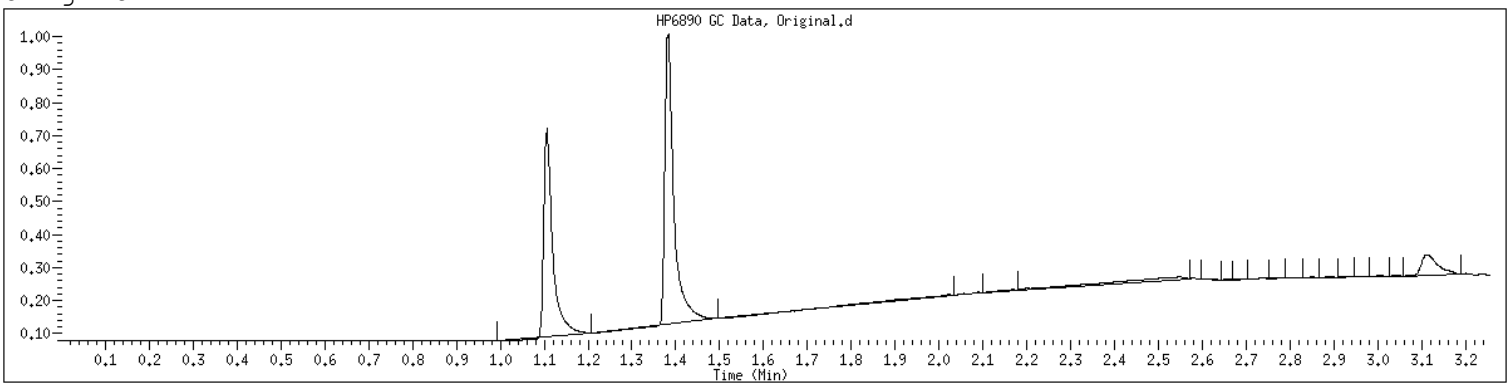


Data file : /var/chem/gcv8b.i/2211210.b/v8003.d Page: 1
Report Date: 12/10/2021 16:34

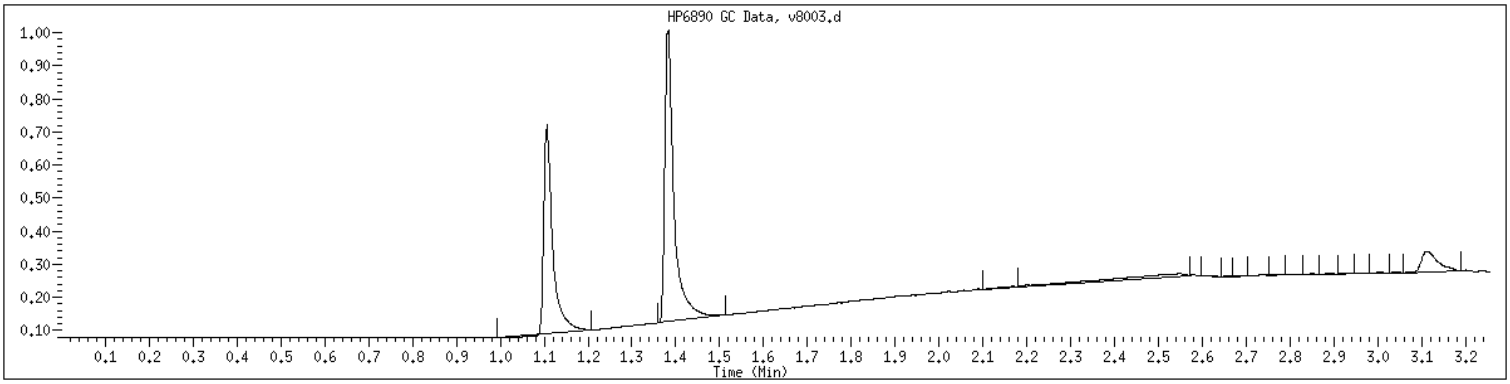
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2284465	SampleType	: LCS
Injection Date	: 12/10/2021 10:35	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 2284465		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	LCSD2284466
Collect Date:	NA Time: NA	GCAL Sample ID:	2284466
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8004
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1119
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	8130		127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8004.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8004.d
Lab Smp Id: 2284466 Client Smp ID: 2284466
Inj Date : 10-DEC-2021 11:19
Operator : BMR Inst ID: gcv8b.i
Smp Info : 2284466
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.379	1.383	-0.004	24229385	8134.84	8130(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2211210.b/v8004.d

Page 1

Date : 10-DEC-2021 11:19

Client ID: 2284466

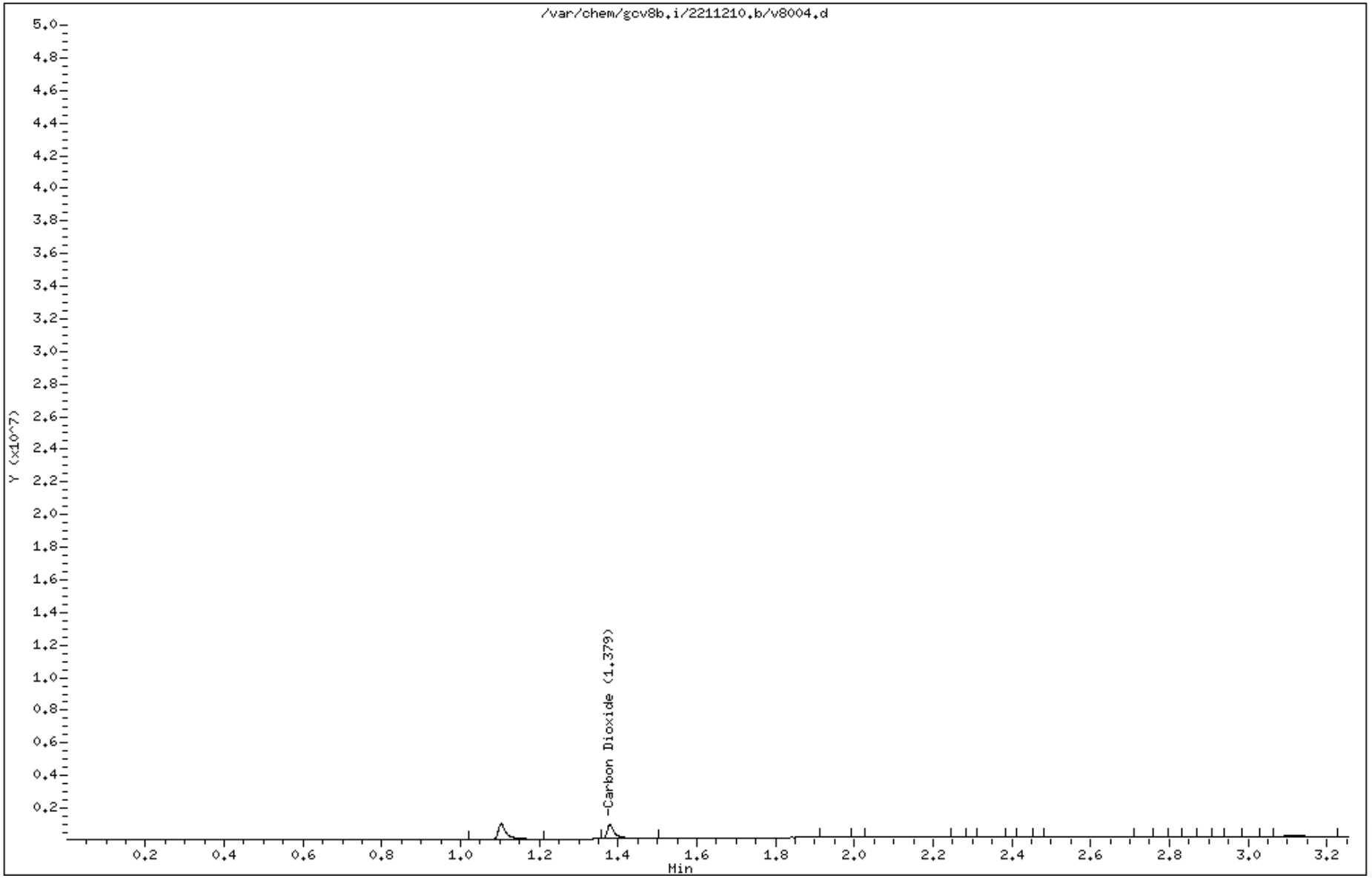
Instrument: gcv8b.i

Sample Info: 2284466

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

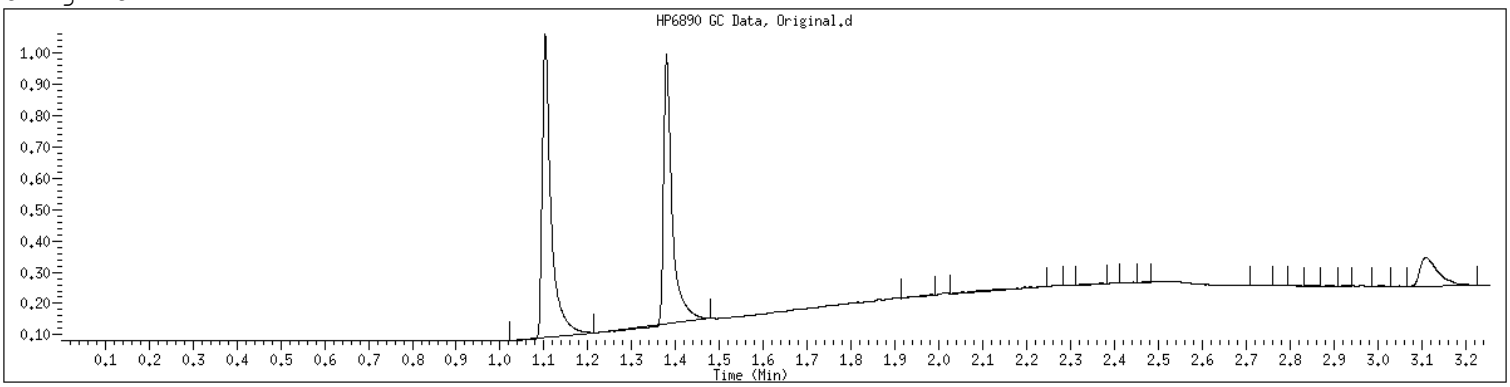


Data file : /var/chem/gcv8b.i/2211210.b/v8004.d Page: 1
Report Date: 12/10/2021 16:34

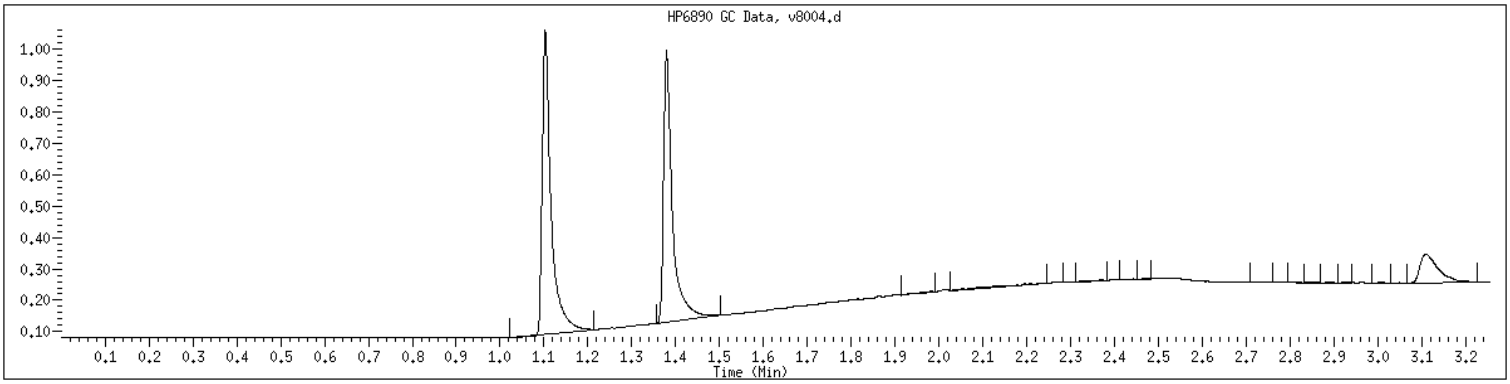
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2284466	SampleType	: LCSD
Injection Date	: 12/10/2021 11:19	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 2284466		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



EPA RSK-175

Form 3E

Spikes

3E

WATER ORGANICS LCS/LCSD RECOVERY

Report No:	221120825		
Prep Method:	NA	Prep Batch:	NA
Analytical Method:	RSK-175	Analytical Batch:	729093

GCAL QC ID: 2284465

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	LCS RESULT	LCS % REC	#	QC LIMITS
Carbon Dioxide	ug/L	8700	0	8630	99		38 - 147

GCAL QC ID: 2284466

ANALYTE	UNITS	SPIKE ADDED	LCSD RESULT	LCSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
Carbon Dioxide	ug/L	8700	8130	93		6		38 - 147	0 - 40

RPD : 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

EPA RSK-175

Form 4C

Method Blanks

4C

ORGANIC METHOD BLANK SUMMARY

Report No:	221120825	Method Blank ID:	2284464
Matrix:	Water	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8002
Injection Vol.:	(µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 0954
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	DATE ANALYZED	TIME ANALYZED	INSTRUMENT ID
1.	LCS2284465	2284465	12/10/21	1035	GCV8B
2.	LCSD2284466	2284466	12/10/21	1119	GCV8B
3.	HS211120103-01	22112082501	12/10/21	1510	GCV8B
4.	HS211120103-02	22112082502	12/10/21	1516	GCV8B
5.	HS211120103-03	22112082503	12/10/21	1522	GCV8B
6.	HS211120103-04	22112082504	12/10/21	1531	GCV8B
7.	HS211120103-05	22112082505	12/10/21	1536	GCV8B
8.	HS211120103-06	22112082506	12/10/21	1542	GCV8B

EPA RSK-175

Form 6E

Calibrations

6E

ORGANICS INITIAL CALIBRATION DATA

					LabQC ID - FileID - Conc	1201 ~ 2210921p/v8003 ~ mix	
Report No:	221120825		Instrument ID:	GCV8B	1202 ~ 2210921p/v8004 ~ mix	1203 ~ 2210921p/v8005 ~ mix	
GC Column:	GS-Q-30 ID .53 (mm)		Analyst:	BMR	1204 ~ 2210921p/v8006 ~ mix	1205 ~ 2210921p/v8007 ~ mix	
Calib. Date 1:	09/21/21	Time 1: 1153	Analytical Batch:	721348			
Calib. Date 2:	09/21/21	Time 2: 1218	Analytical Method:	RSK-175			

ANALYTE	*1201*	*1202*	*1203*	*1204*	*1205*	*1206*	*1207*	*1208*	*1209*	*RF̄ / m / A*	*b / B*	*C*	*FIT*	*TYPE*
Carbon Dioxide	2723	2646	3214	3161	3149					2978			9.107	A

FIT = %RSD for Average Curve and the Coefficient of Determination (r2) for Linear and Quadratic

Curve Types: A - Averaged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I SVOA

Data File: /var/chem/gcv8b.i/2210921p.b/v8003.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8003.d
Lab Smp Id: 1201
Inj Date : 21-SEP-2021 11:53
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1201
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 11:53 Cal File: v8003.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.637	1.637	0.000	2352285	864.000	790(M1)

QC Flag Legend

M1- Compound response manually integrated because
Target system did not integrate.

Data File: /var/chem/gcv8b.i/2210921p.b/v8003.d

Page 1

Date : 21-SEP-2021 11:53

Client ID:

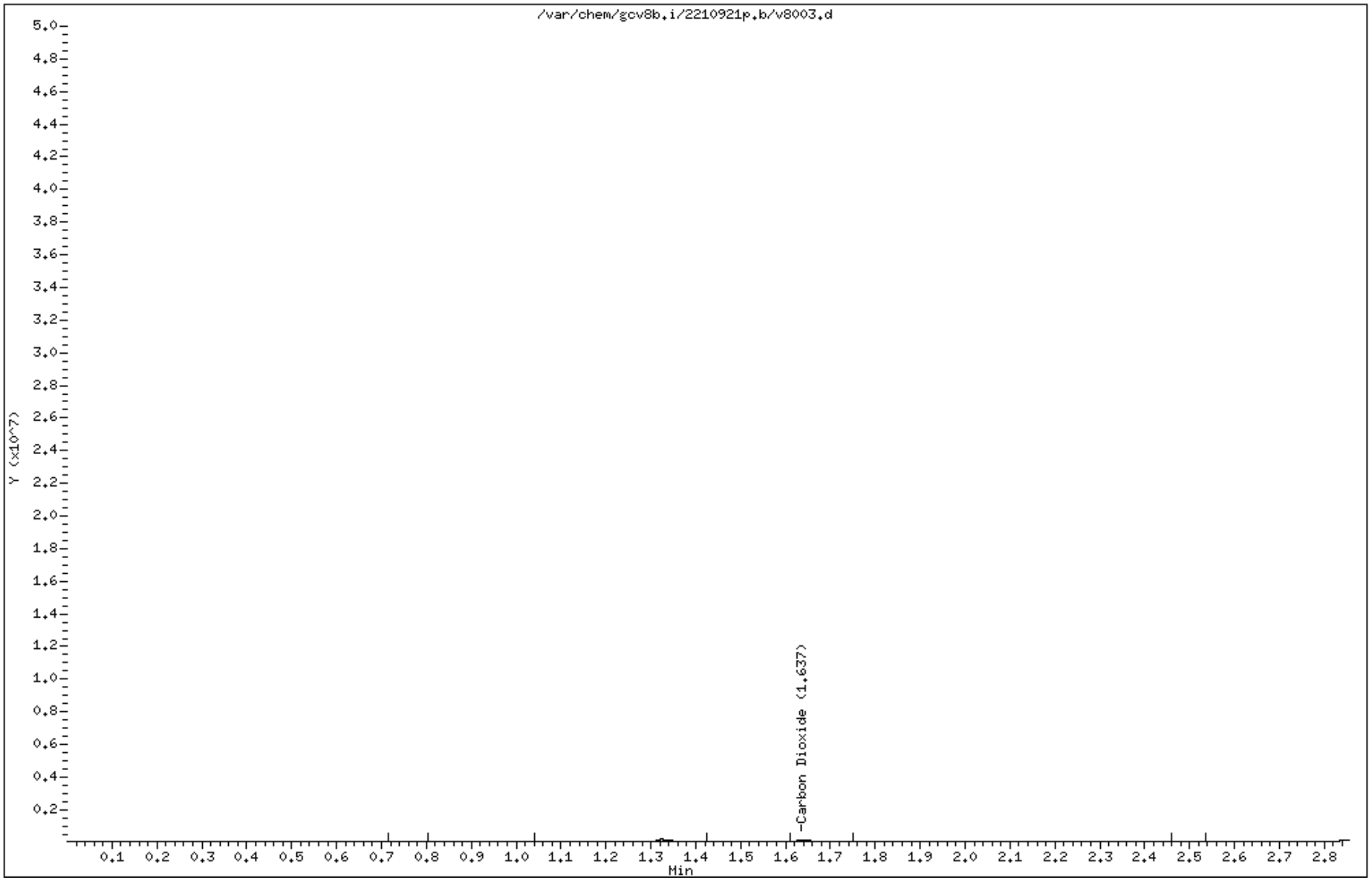
Instrument: gcv8b.i

Sample Info: 1201

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

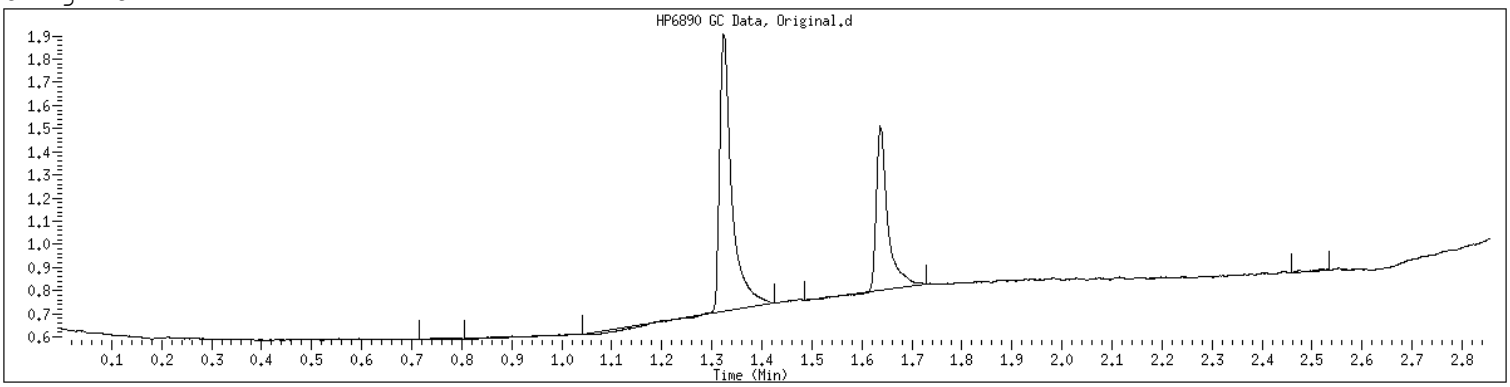


Data file : /var/chem/gcv8b.i/2210921p.b/v8003.d Page: 1
Report Date: 09/21/2021 15:58

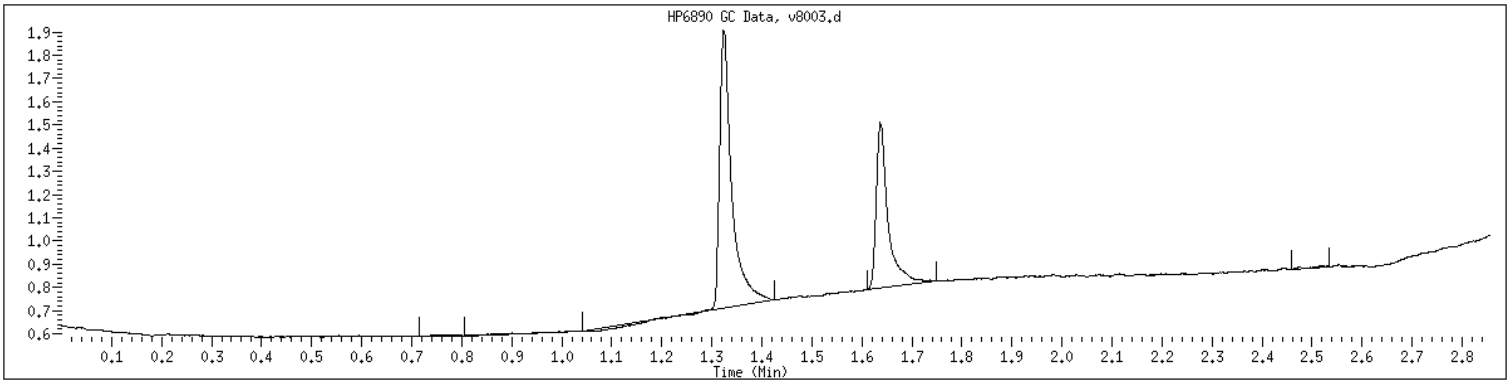
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1201	SampleType	: CALIB_1
Injection Date	: 09/21/2021 11:53	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1201		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



Data File: /var/chem/gcv8b.i/2210921p.b/v8004.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8004.d
Lab Smp Id: 1202
Inj Date : 21-SEP-2021 11:58
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1202
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 11:58 Cal File: v8004.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.634	1.634	0.000	4576744	1730.00	1540(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2210921p.b/v8004.d

Page 1

Date : 21-SEP-2021 11:58

Client ID:

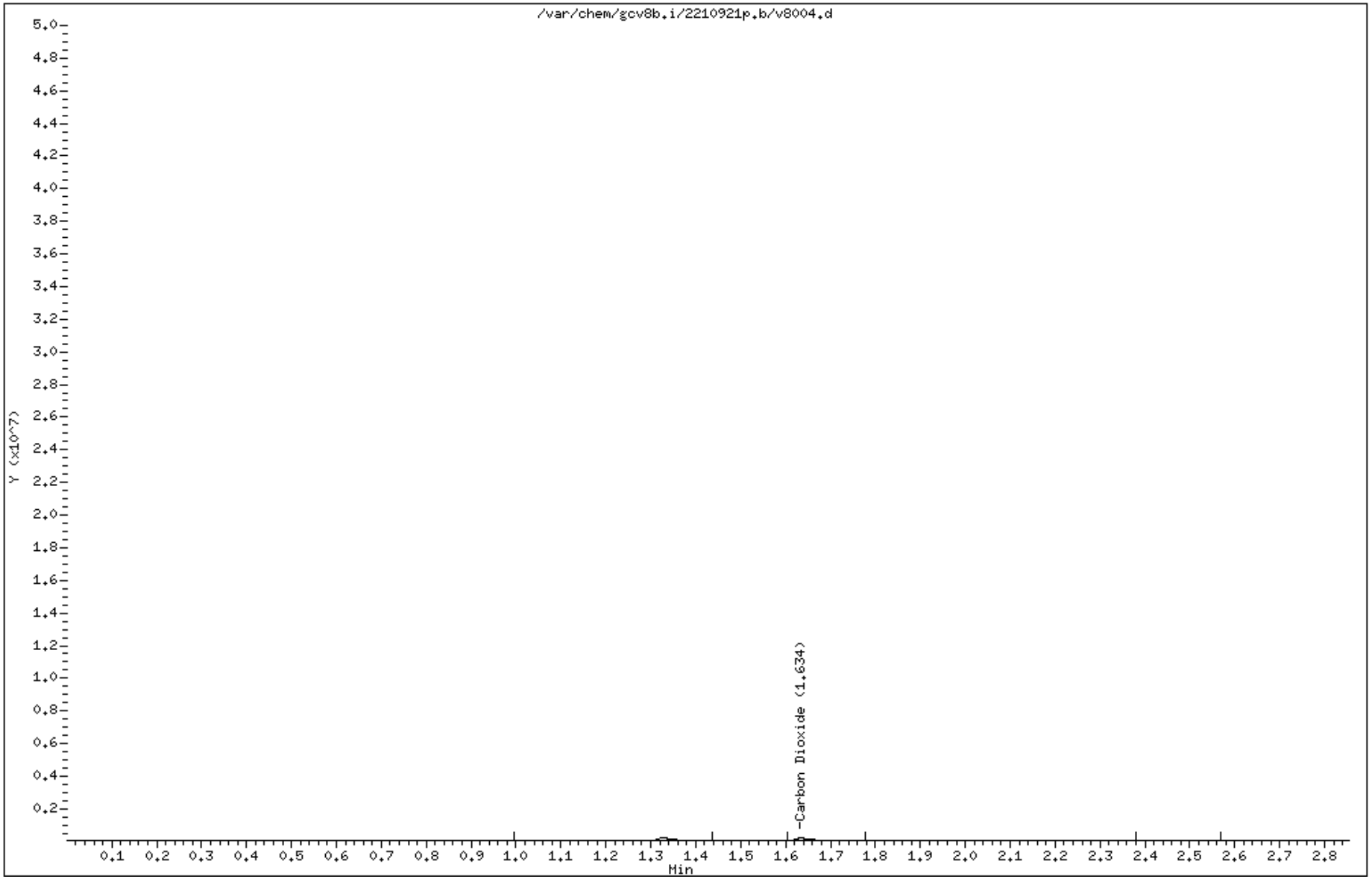
Instrument: gcv8b.i

Sample Info: 1202

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

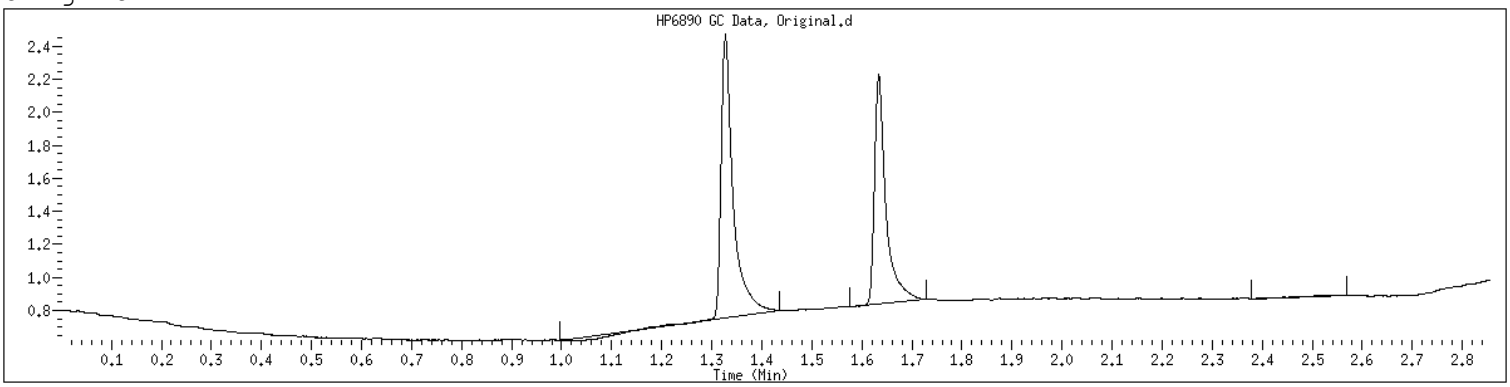


Data file : /var/chem/gcv8b.i/2210921p.b/v8004.d Page: 1
Report Date: 09/21/2021 15:58

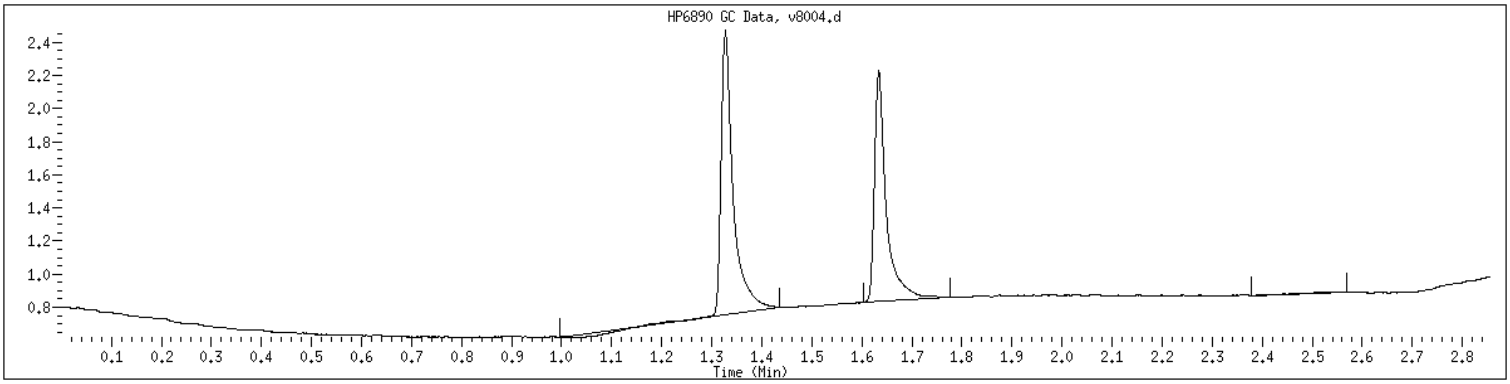
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1202	SampleType	: CALIB_2
Injection Date	: 09/21/2021 11:58	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1202		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



Data File: /var/chem/gcv8b.i/2210921p.b/v8005.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8005.d
Lab Smp Id: 1203
Inj Date : 21-SEP-2021 12:06
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1203
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:06 Cal File: v8005.d
Als bottle: 1 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.632	1.632	0.000	27769800	8640.00	9320(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2210921p.b/v8005.d

Page 1

Date : 21-SEP-2021 12:06

Client ID:

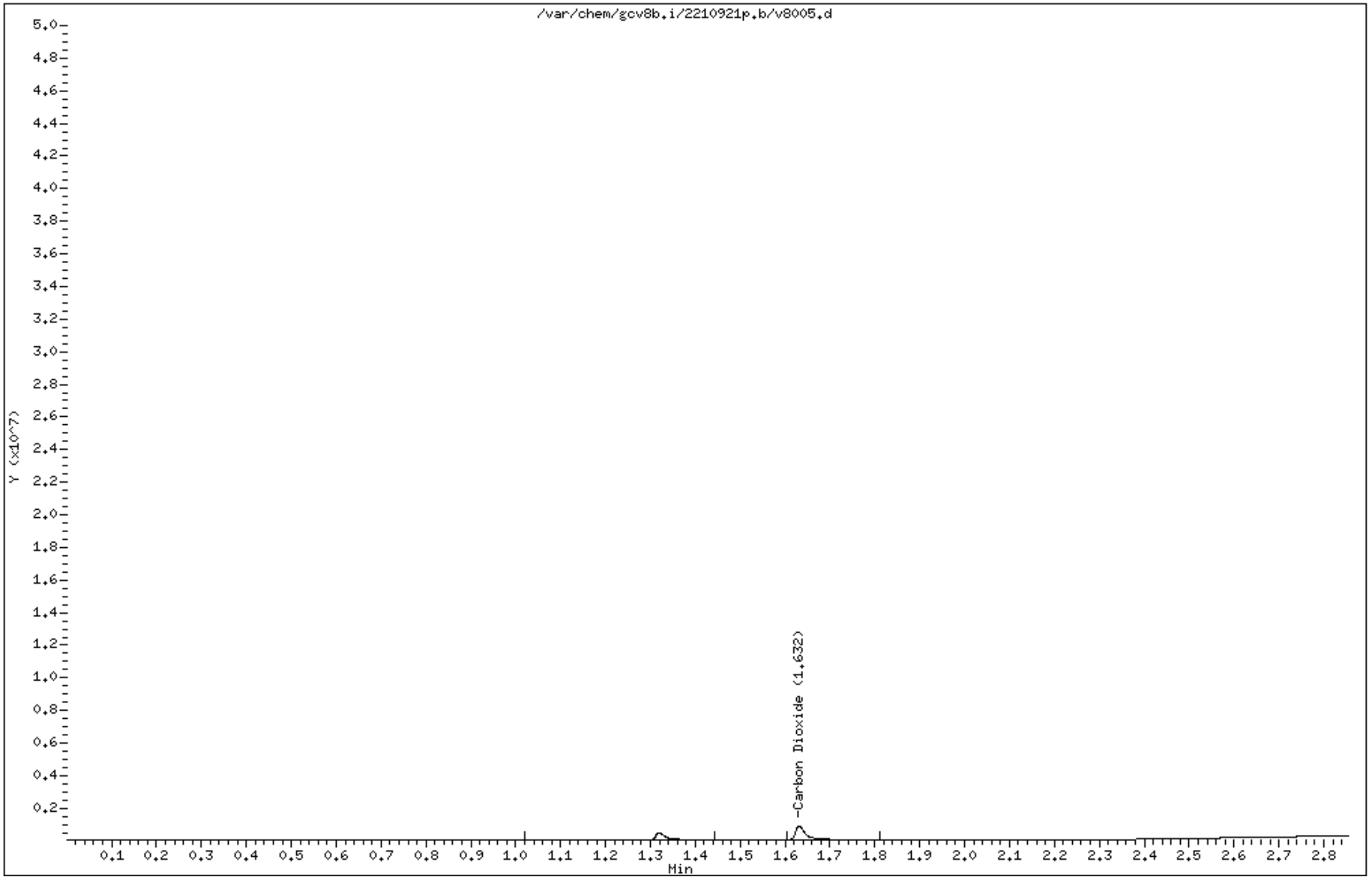
Instrument: gcv8b.i

Sample Info: 1203

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

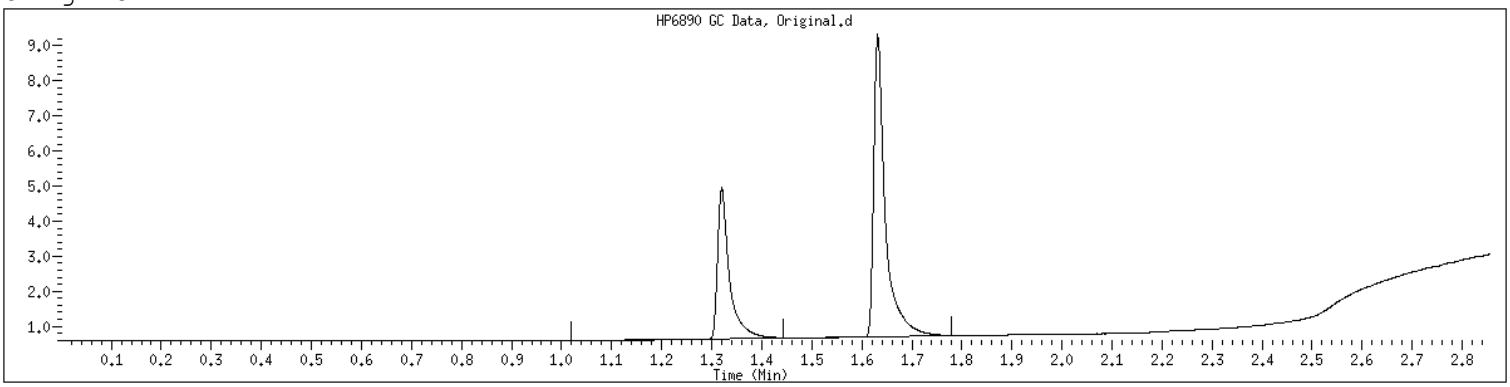


Data file : /var/chem/gcv8b.i/2210921p.b/v8005.d Page: 1
Report Date: 09/21/2021 15:58

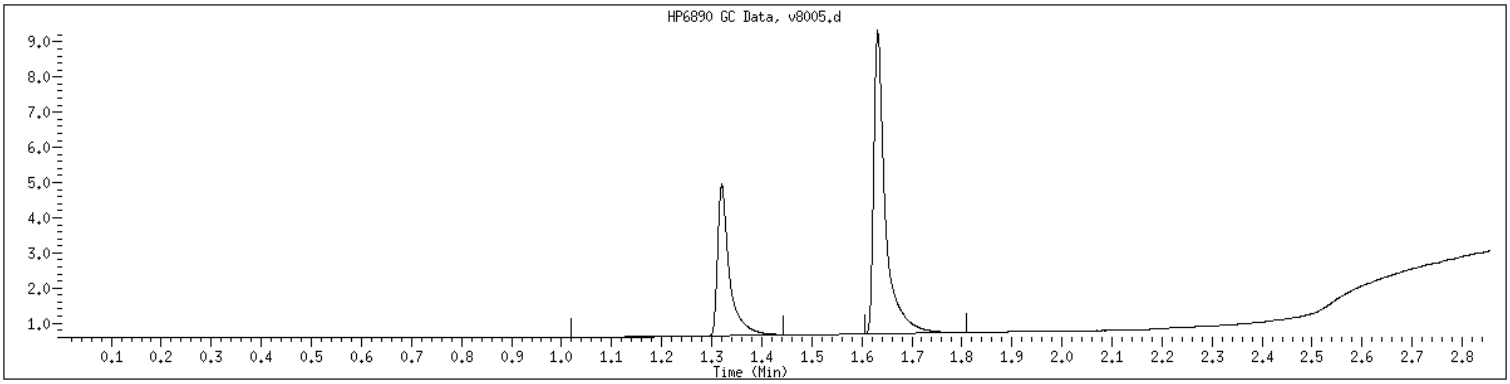
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1203	SampleType	: CALIB_3
Injection Date	: 09/21/2021 12:06	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1203		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



Data File: /var/chem/gcv8b.i/2210921p.b/v8006.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8006.d
Lab Smp Id: 1204
Inj Date : 21-SEP-2021 12:11
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1204
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:11 Cal File: v8006.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.629	1.629	0.000	43619426	13800.0	14600

Data File: /var/chem/gcv8b.i/2210921p.b/v8006.d

Date : 21-SEP-2021 12:11

Client ID:

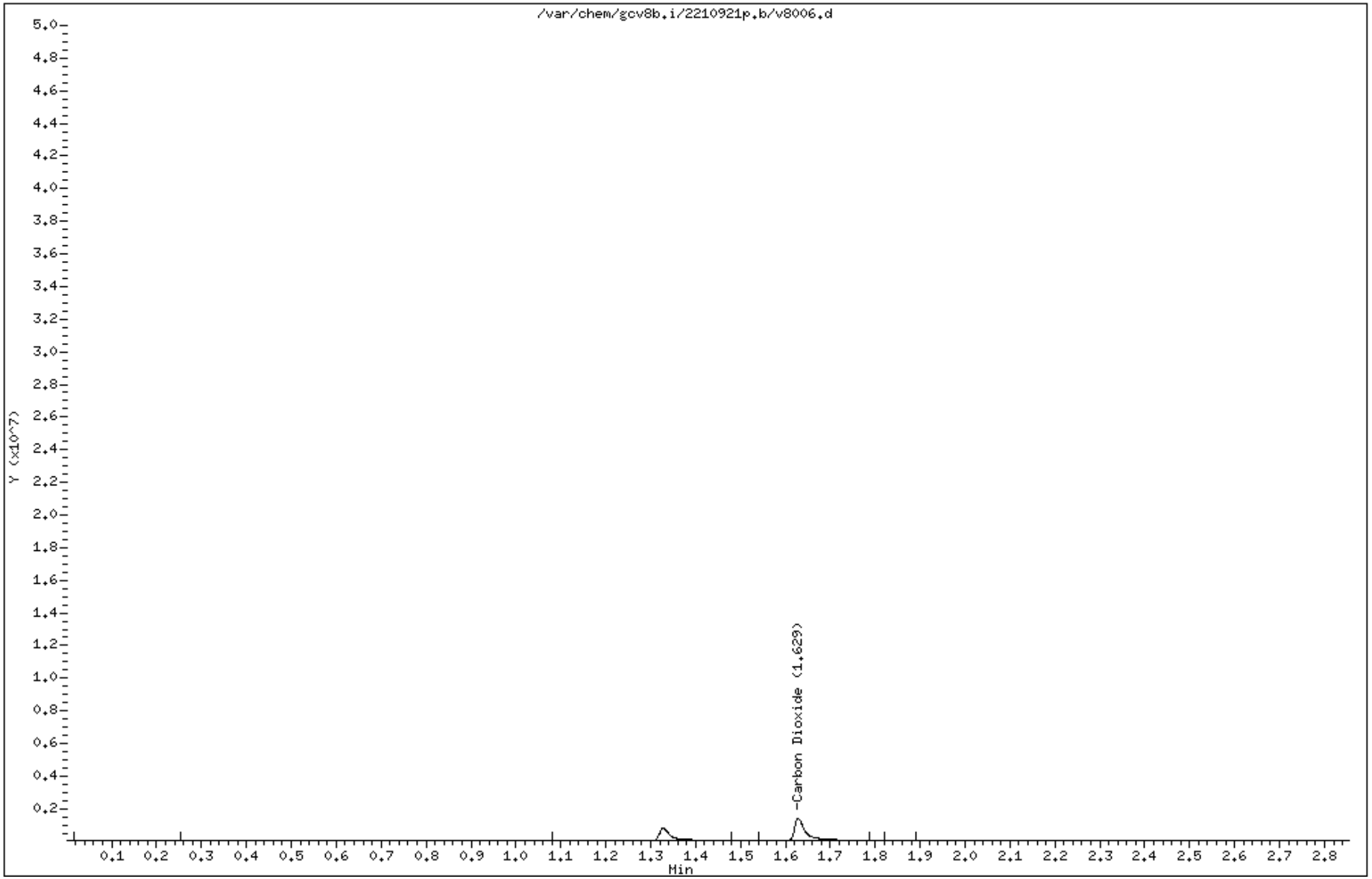
Instrument: gcv8b.i

Sample Info: 1204

Operator: BMR

Column phase: GS-Q-30

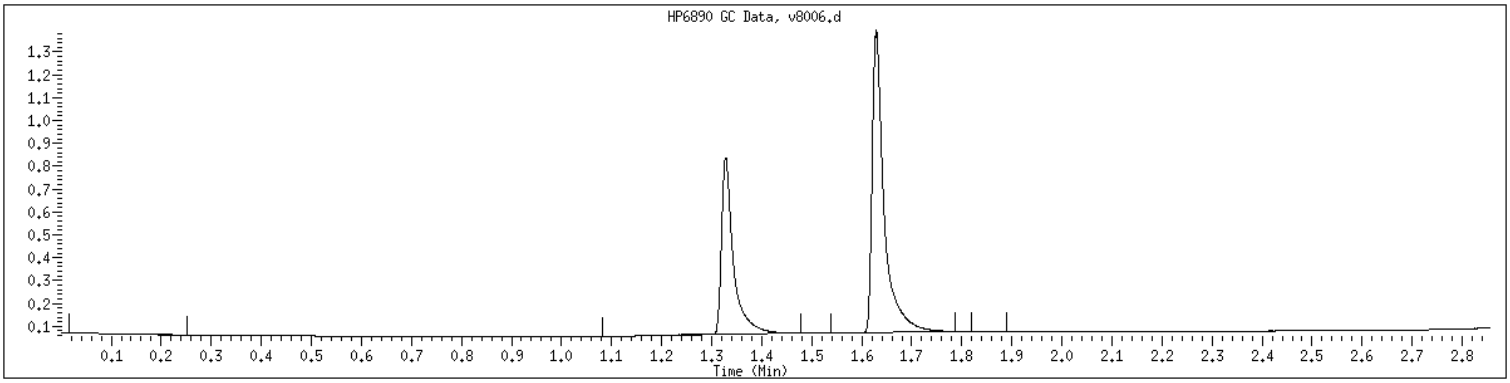
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2210921p.b/v8006.d Page: 1
Report Date: 09/21/2021 15:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1204	SampleType	: CALIB_4
Injection Date	: 09/21/2021 12:11	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1204		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

Data File: /var/chem/gcv8b.i/2210921p.b/v8007.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8007.d
Lab Smp Id: 1205
Inj Date : 21-SEP-2021 12:18
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1205
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.632	1.632	0.000	54483866	17300.0	18300

Data File: /var/chem/gcv8b.i/2210921p.b/v8007.d

Page 1

Date : 21-SEP-2021 12:18

Client ID:

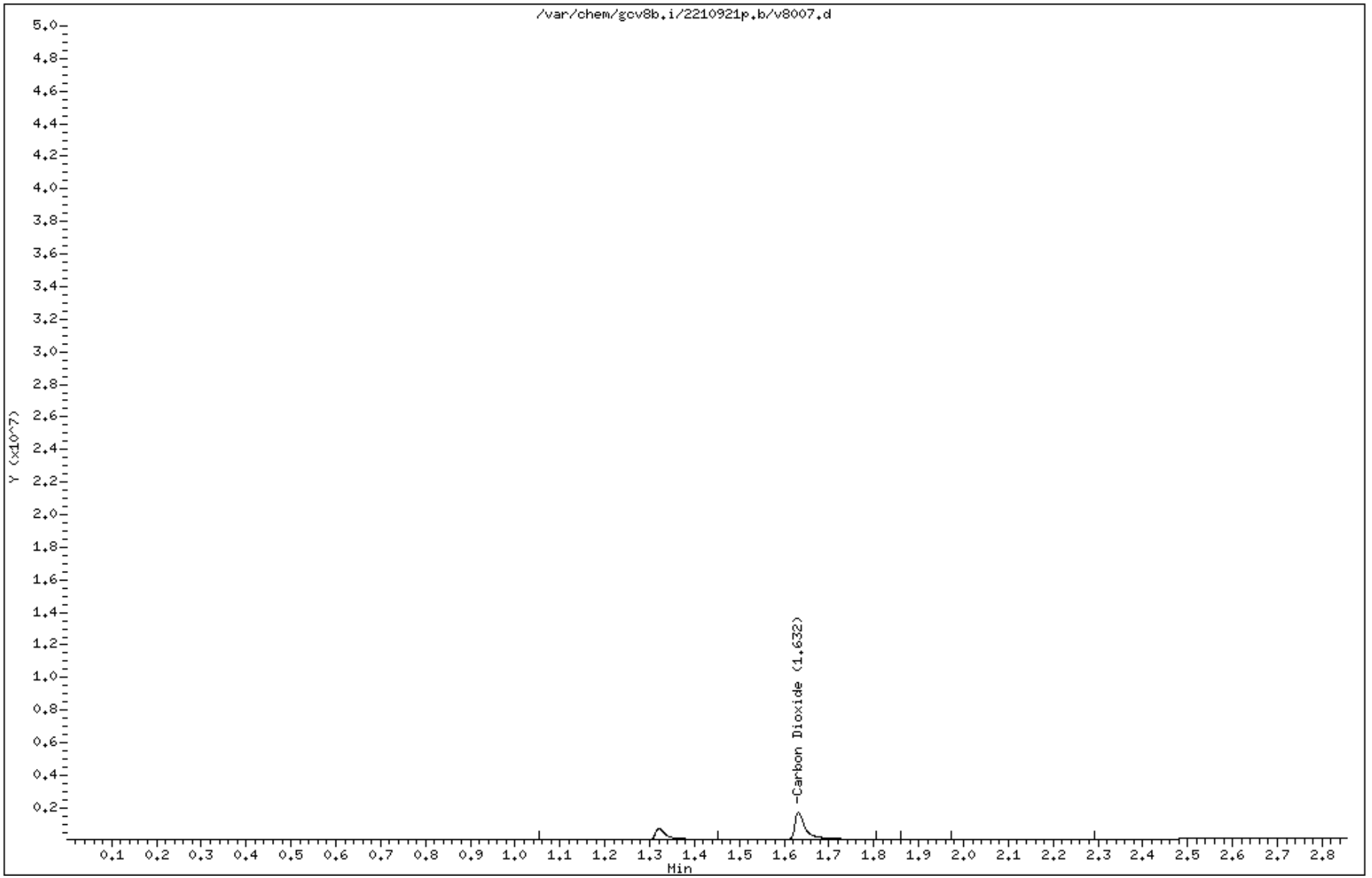
Instrument: gcv8b.i

Sample Info: 1205

Operator: BMR

Column phase: GS-Q-30

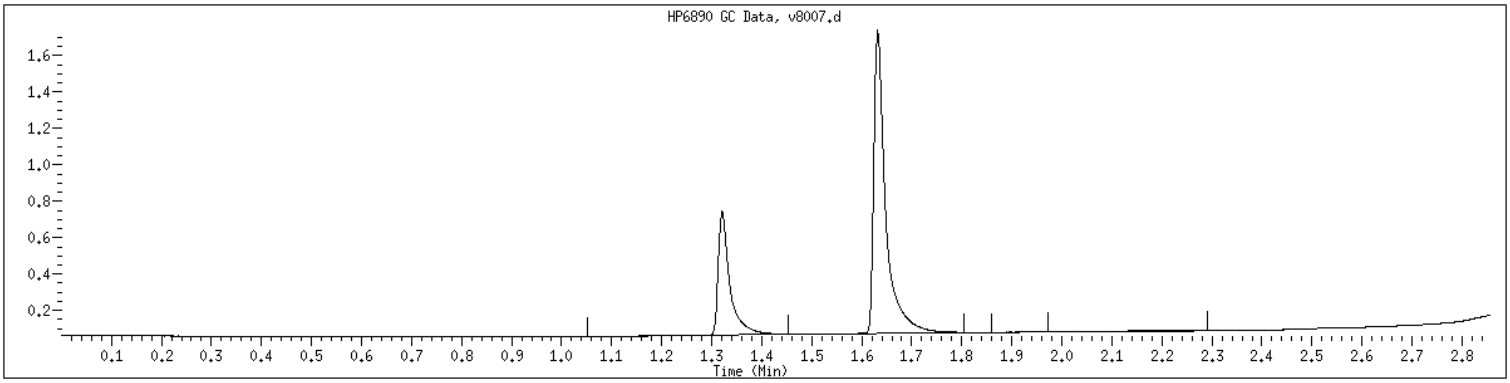
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2210921p.b/v8007.d Page: 1
Report Date: 09/21/2021 15:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1205 SampleType : CALIB_5
Injection Date: 09/21/2021 12:18 Instrument : gcv8b.i
Operator : BMR
Sample Info : 1205
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Dilution : 1.0
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

Form 6I

ICAL Verifications

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	221120825	Instrument ID:	GCV8B
Analysis Date:	09/21/21 1223	Lab File ID:	2210921p/v8008
Analytical Method:	EPA RSK-175	Analytical Batch:	721348

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*%REC*	*LCL*	*UCL*	*Q*
Carbon Dioxide	ug/L	8700	9200	106	80	120	

Data File: /var/chem/gcv8b.i/2210921p.b/v8008.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8008.d
Lab Smp Id: 1600
Inj Date : 21-SEP-2021 12:23
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1600
Misc Info : 2125156
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.641	1.632	0.009	27406998	9201.70	9200

Data File: /var/chem/gcv8b.i/2210921p.b/v8008.d

Date : 21-SEP-2021 12:23

Client ID:

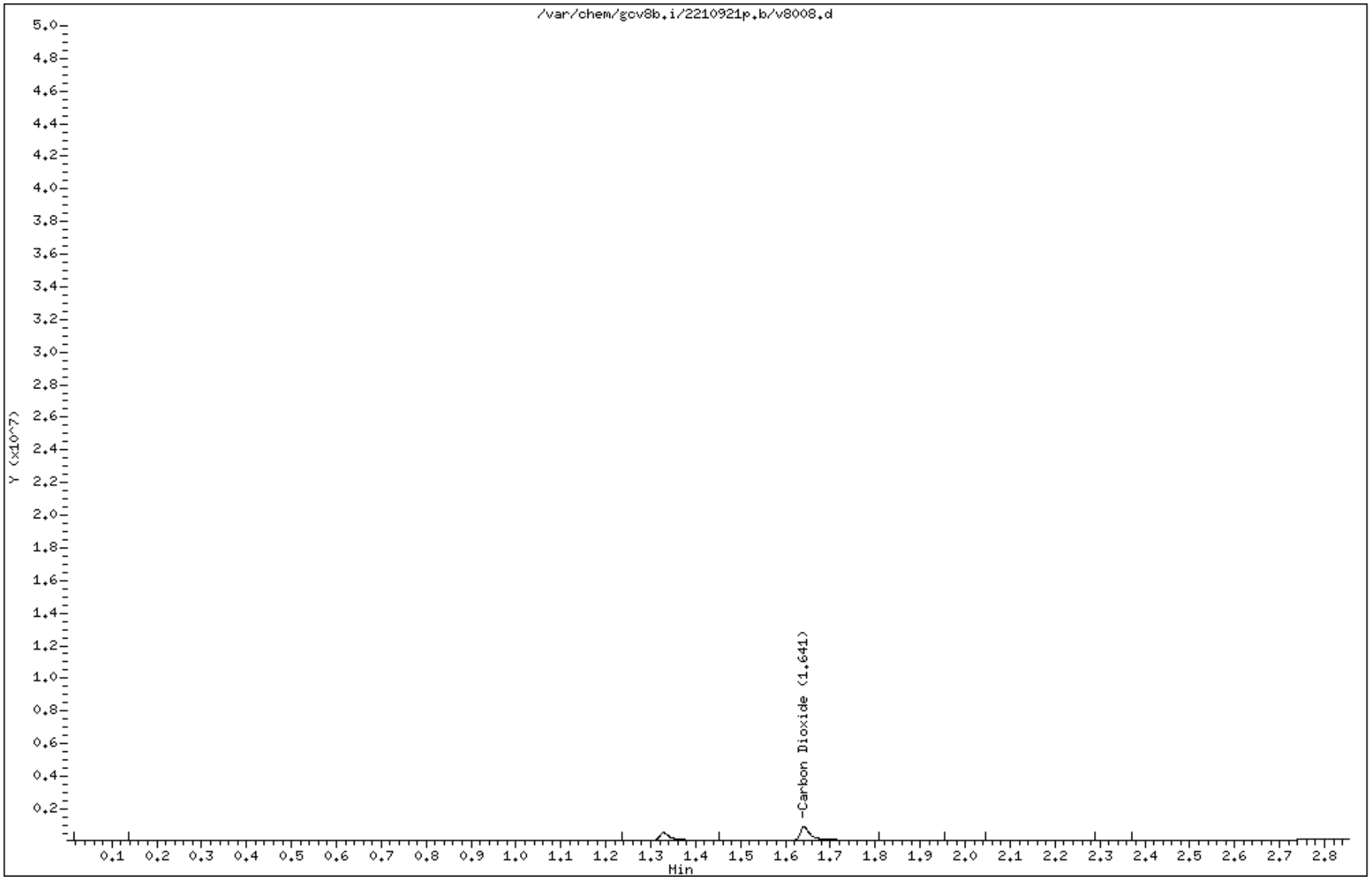
Instrument: gcv8b.i

Sample Info: 1600

Operator: BMR

Column phase: GS-Q-30

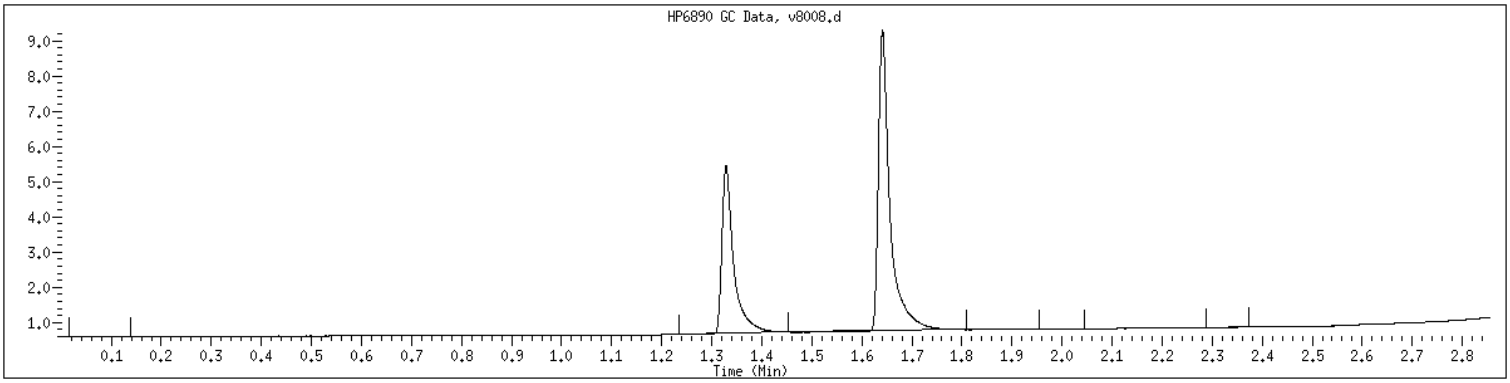
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2210921p.b/v8008.d Page: 1
Report Date: 09/21/2021 15:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1600	SampleType	: LCS
Injection Date	: 09/21/2021 12:23	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1600		
Misc Info	: 2125156		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

Form 7E

CCAL Verifications

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	221120825			CCAL ID:	1400
GC Column:	GS-Q-30	ID .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2211210/v8001
Init. Calib. Date 1:	09/21/21	Time 1: 1153		Analyst:	BMR
Init. Calib. Date 2:	09/21/21	Time 2: 1218		Analytical Batch:	729093
Analysis Date:	12/10/21	Time: 0942		Analytical Method:	RSK-175

ANALYTE	*RRF*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	2978	2999	-.68	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2211210.b/v8001.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8001.d
Lab Smp Id: 1400
Inj Date : 10-DEC-2021 09:42
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Carbon Dioxide	1.383	1.383	0.000	25908210	8640.00	8700

Data File: /var/chem/gcv8b.i/2211210.b/v8001.d

Page 1

Date : 10-DEC-2021 09:42

Client ID:

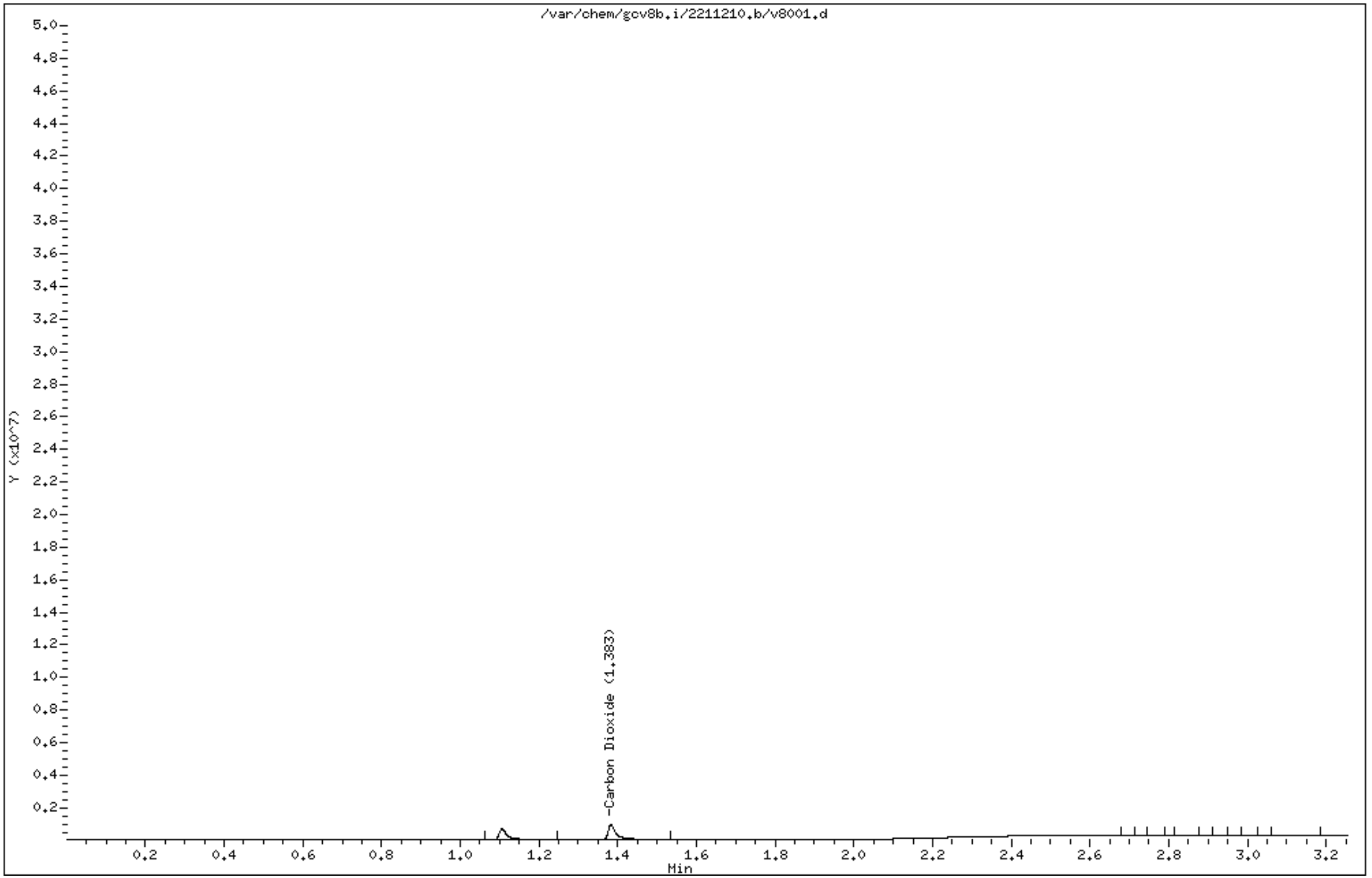
Instrument: gcv8b.i

Sample Info: 1400

Operator: BMR

Column phase: GS-Q-30

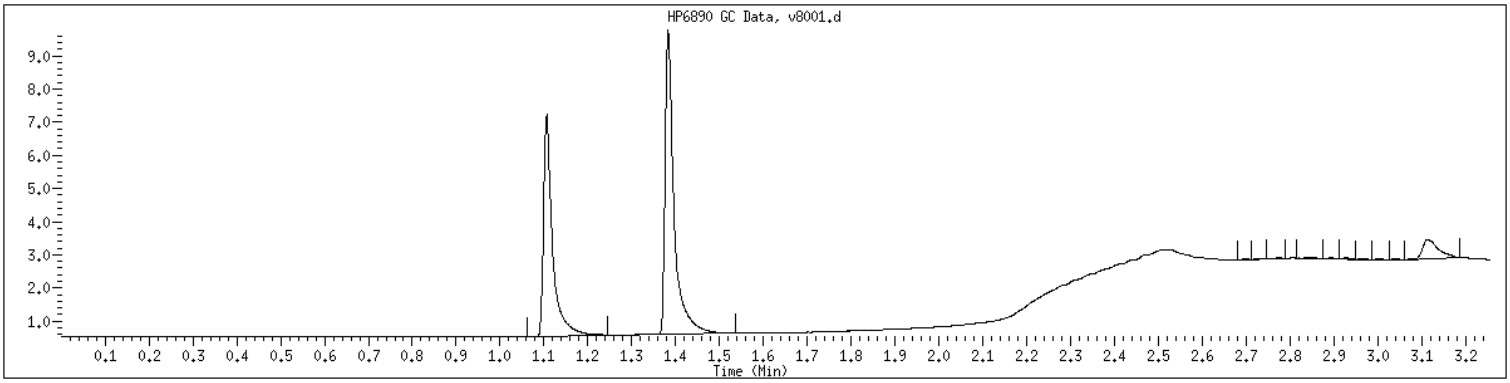
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8001.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1400 SampleType : CCALIB_3
Injection Date: 12/10/2021 09:42 Instrument : gcv8b.i
Operator : BMR
Sample Info : 1400
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Dilution : 1.0
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	221120825			CCAL ID:	1400
GC Column:	GS-Q-30	ID .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2211210/v8019
Init. Calib. Date 1:	09/21/21	Time 1: 1153		Analyst:	BMR
Init. Calib. Date 2:	09/21/21	Time 2: 1218		Analytical Batch:	729093
Analysis Date:	12/10/21	Time: 1345		Analytical Method:	RSK-175

ANALYTE	*RRF*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	2978	3072	-3.14	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2211210.b/v8019.d Page 1
Report Date: 10-Dec-2021 16:40

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8019.d
Lab Smp Id: 1400
Inj Date : 10-DEC-2021 13:45
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:40 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.360	1.360	0.000	26541758	8640.00	8910

Data File: /var/chem/gcv8b.i/2211210.b/v8019.d

Page 1

Date : 10-DEC-2021 13:45

Client ID:

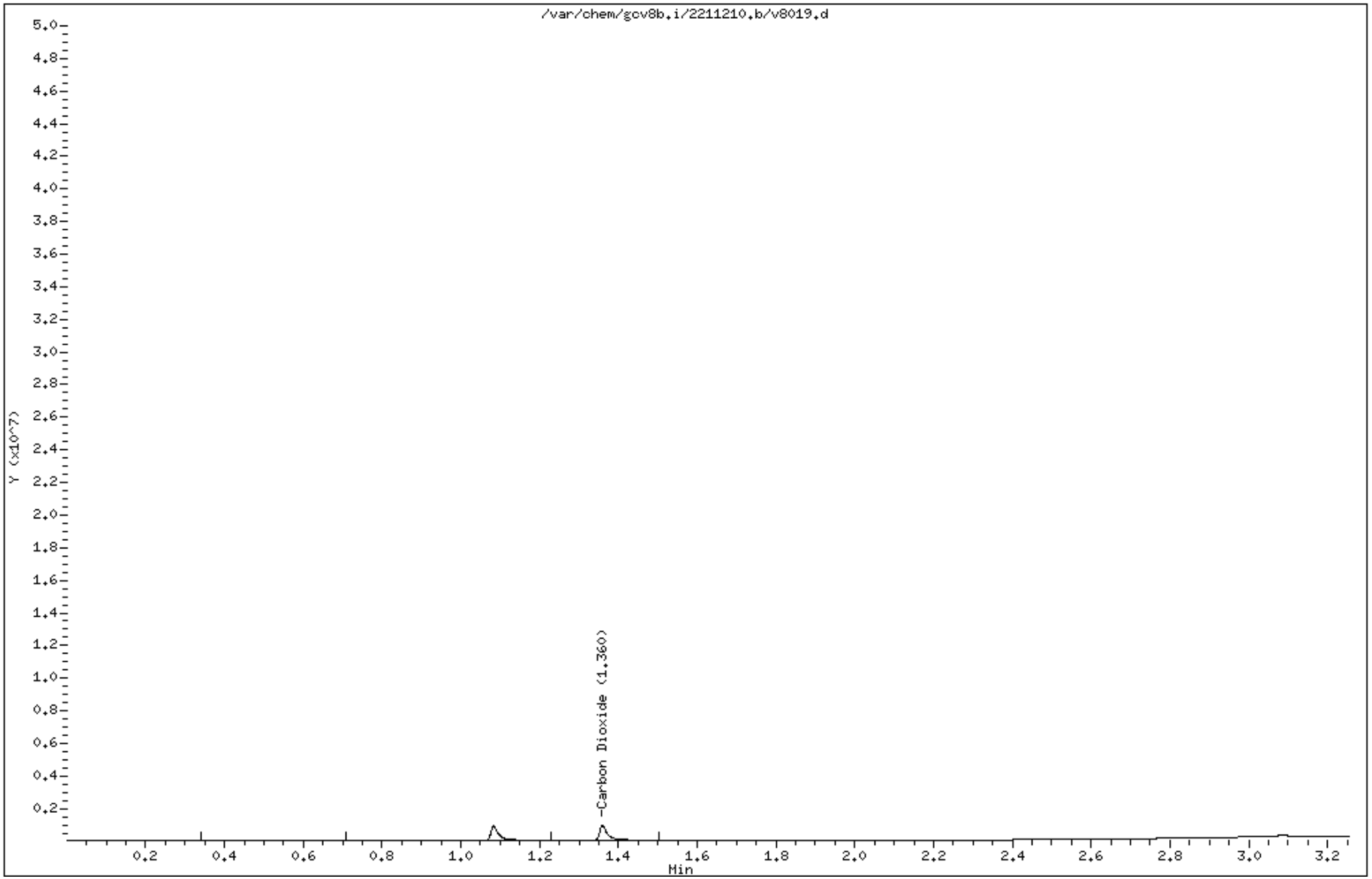
Instrument: gcv8b.i

Sample Info: 1400

Operator: BMR

Column phase: GS-Q-30

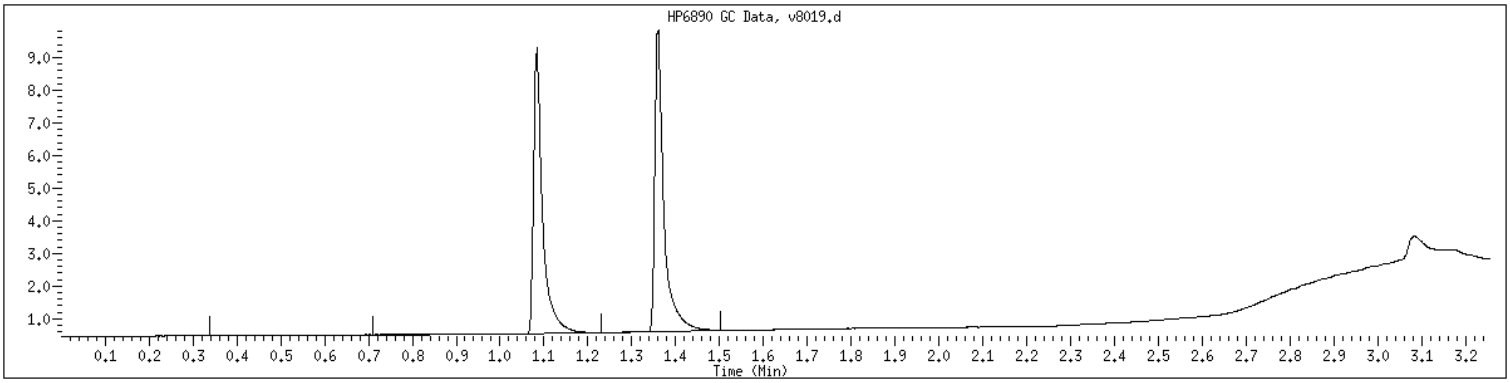
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8019.d Page: 1
Report Date: 12/10/2021 16:40

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 12/10/2021 13:45	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	221120825			CCAL ID:	1400
GC Column:	GS-Q-30	ID .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2211210/v8033
Init. Calib. Date 1:	09/21/21	Time 1: 1153		Analyst:	BMR
Init. Calib. Date 2:	09/21/21	Time 2: 1218		Analytical Batch:	729093
Analysis Date:	12/10/21	Time: 1613		Analytical Method:	RSK-175

ANALYTE	*RRF*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	2978	2524	15.3	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2211210.b/v8033.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8033.d
Lab Smp Id: 1400
Inj Date : 10-DEC-2021 16:13
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.355	1.355	0.000	21806467	8640.00	7320

Data File: /var/chem/gcv8b.i/2211210.b/v8033.d

Page 1

Date : 10-DEC-2021 16:13

Client ID:

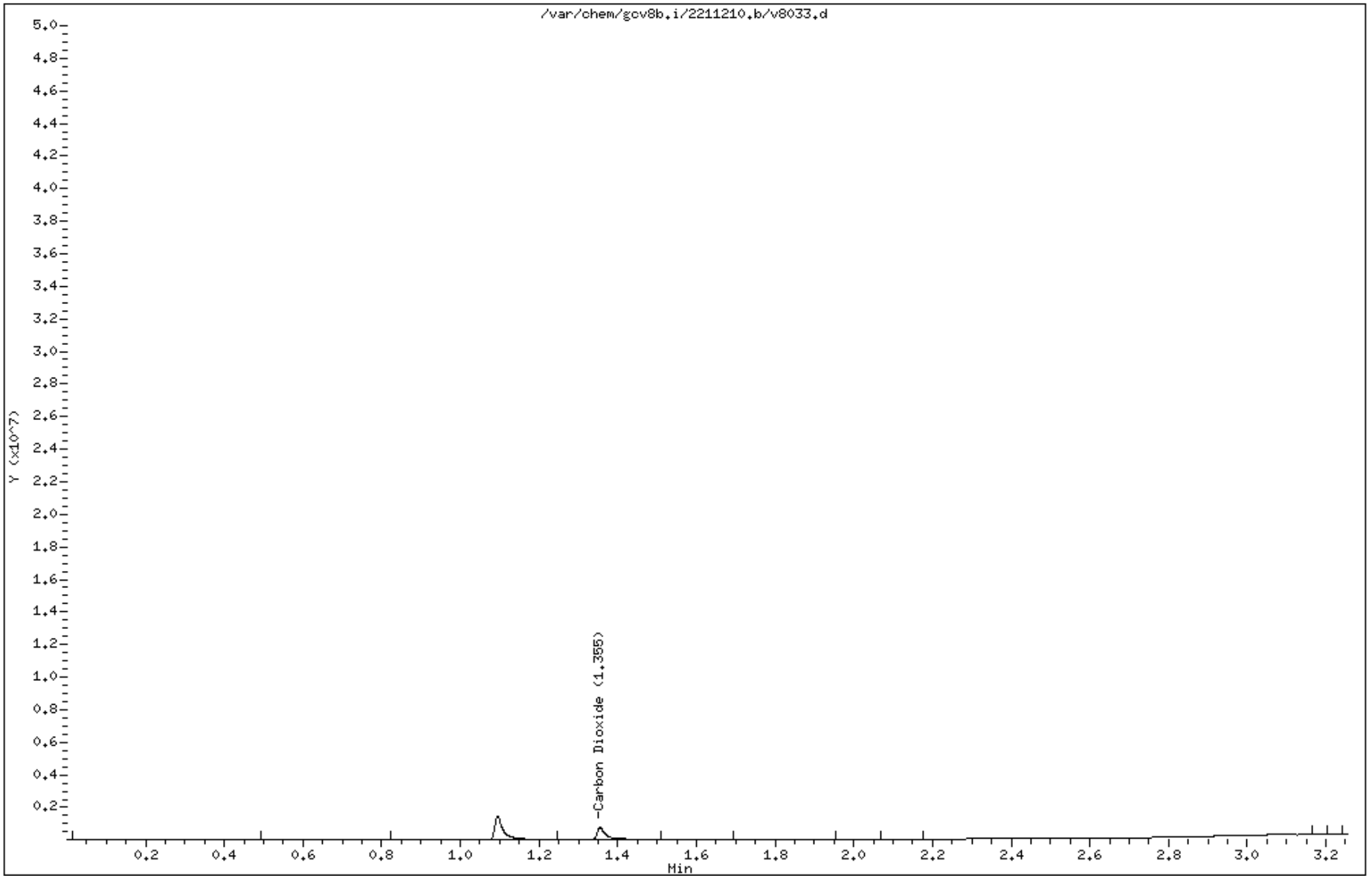
Instrument: gcv8b.i

Sample Info: 1400

Operator: BMR

Column phase: GS-Q-30

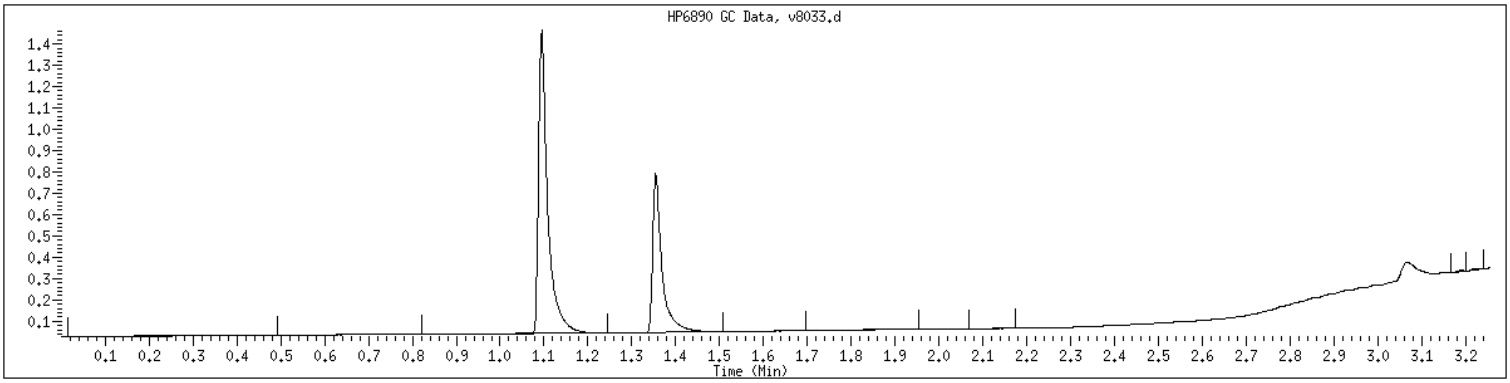
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8033.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 12/10/2021 16:13	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

RunLogs

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 09/21/2021
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2210921p.b/CO2h.m
Batch: /var/chem/gcv8b.i/2210921p.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1201	CO2h.m	v8001.d	0.00 ml	21-SEP-2021 11:44	1.0	BMR	1	co2
	CO2h.m	v8002.d	0.00 ml	21-SEP-2021 11:48	1.0	BMR	1	co2
1201	CO2h.m	v8003.d	0.00 ml	21-SEP-2021 11:53	1.0	BMR	1	co2
1202	CO2h.m	v8004.d	0.00 ml	21-SEP-2021 11:58	1.0	BMR	1	co2
1203	CO2h.m	v8005.d	0.00 ml	21-SEP-2021 12:06	1.0	BMR	1	co2
1204	CO2h.m	v8006.d	0.00 ml	21-SEP-2021 12:11	1.0	BMR	1	co2
1205	CO2h.m	v8007.d	0.00 ml	21-SEP-2021 12:18	1.0	BMR	1	co2
1600	CO2h.m	v8008.d	0.00 ml	21-SEP-2021 12:23	1.0	BMR	1	co2
2240651	CO2h.m	v8008L.d	0.00 ml	21-SEP-2021 12:23	1.0	BMR	1	co2
2240652	CO2h.m	v8009.d	0.00 ml	21-SEP-2021 12:30	1.0	BMR	1	co2
2240650	CO2h.m	v8010.d	0.00 ml	21-SEP-2021 12:43	1.0	BMR	1	co2
22109179001	CO2h.m	v8011.d	0.00 ml	21-SEP-2021 13:26	10.0	BMR	1	co2
22109179002	CO2h.m	v8012.d	0.00 ml	21-SEP-2021 13:33	10.0	BMR	1	co2
22109179003	CO2h.m	v8013.d	0.00 ml	21-SEP-2021 13:45	10.0	BMR	1	co2
22109179101	CO2h.m	v8014.d	0.00 ml	21-SEP-2021 13:53	10.0	BMR	1	co2
22109179102	CO2h.m	v8015.d	0.00 ml	21-SEP-2021 13:58	10.0	BMR	1	co2
22109179103	CO2h.m	v8016.d	0.00 ml	21-SEP-2021 14:04	10.0	BMR	1	co2
22109183001	CO2h.m	v8017.d	0.00 ml	21-SEP-2021 14:08	10.0	BMR	1	co2
22109183002	CO2h.m	v8018.d	0.00 ml	21-SEP-2021 14:13	10.0	BMR	1	co2
22109183003	CO2h.m	v8019.d	0.00 ml	21-SEP-2021 14:18	10.0	BMR	1	co2
22109183004	CO2h.m	v8020.d	0.00 ml	21-SEP-2021 14:23	10.0	BMR	1	co2
22109183005	CO2h.m	v8021.d	0.00 ml	21-SEP-2021 14:28	10.0	BMR	1	co2
22109190101	CO2h.m	v8022.d	0.00 ml	21-SEP-2021 14:33	10.0	BMR	1	co2
22109190102	CO2h.m	v8023.d	0.00 ml	21-SEP-2021 14:38	10.0	BMR	1	co2
22109190103	CO2h.m	v8024.d	0.00 ml	21-SEP-2021 14:43	10.0	BMR	1	co2
22109190104	CO2h.m	v8025.d	0.00 ml	21-SEP-2021 14:50	10.0	BMR	1	co2
22109190105	CO2h.m	v8026.d	0.00 ml	21-SEP-2021 14:54	10.0	BMR	1	co2
22109190106	CO2h.m	v8027.d	0.00 ml	21-SEP-2021 15:02	10.0	BMR	1	co2
1400	CO2h.m	v8028.d	0.00 ml	21-SEP-2021 15:07	1.0	BMR	1	co2

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 12/10/2021
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2211210.b/CO2_22.m
Batch: /var/chem/gcv8b.i/2211210.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1400	CO2_22.m	v8001B.d	0.00 ml	10-DEC-2021 09:42	1.0	BMR	1	co2
1400	CO2h.m	v8001.d	0.00 ml	10-DEC-2021 09:42	1.0	BMR	1	co2
2284693	CO2_22.m	v8002B.d	0.00 ml	10-DEC-2021 09:54	1.0	BMR	1	co2
2284464	CO2h.m	v8002.d	0.00 ml	10-DEC-2021 09:54	1.0	BMR	1	co2
2284694	CO2_22.m	v8003B.d	0.00 ml	10-DEC-2021 10:35	1.0	BMR	1	co2
2284465	CO2h.m	v8003.d	0.00 ml	10-DEC-2021 10:35	1.0	BMR	1	co2
2284695	CO2_22.m	v8004B.d	0.00 ml	10-DEC-2021 11:19	1.0	BMR	1	co2
2284466	CO2h.m	v8004.d	0.00 ml	10-DEC-2021 11:19	1.0	BMR	1	co2
22111293101	CO2_22.m	v8005.d	0.00 ml	10-DEC-2021 11:38	1.0	BMR	1	co2
22112037101	CO2h.m	v8006.d	0.00 ml	10-DEC-2021 11:57	10.0	BMR	1	co2
22112037101	CO2h.m	v8007.d	0.00 ml	10-DEC-2021 12:04	1.0	BMR	1	co2
22112037101	CO2h.m	v8008.d	0.00 ml	10-DEC-2021 12:09	10.0	BMR	1	co2
22112037101	CO2h.m	v8009.d	0.00 ml	10-DEC-2021 12:16	10.0	BMR	1	co2
22112037101	CO2h.m	v8010.d	0.00 ml	10-DEC-2021 12:29	50.0	BMR	1	co2
22112037102	CO2h.m	v8011.d	0.00 ml	10-DEC-2021 12:36	50.0	BMR	1	co2
22112037103	CO2h.m	v8012.d	0.00 ml	10-DEC-2021 12:41	50.0	BMR	1	co2
22112037104	CO2h.m	v8013.d	0.00 ml	10-DEC-2021 12:48	50.0	BMR	1	co2
22112037105	CO2h.m	v8014.d	0.00 ml	10-DEC-2021 12:57	50.0	BMR	1	co2
22112037106	CO2h.m	v8015.d	0.00 ml	10-DEC-2021 13:15	50.0	BMR	1	co2
22112061901	CO2h.m	v8016.d	0.00 ml	10-DEC-2021 13:28	50.0	BMR	1	co2
22112061902	CO2h.m	v8017.d	0.00 ml	10-DEC-2021 13:34	50.0	BMR	1	co2
22112061903	CO2h.m	v8018.d	0.00 ml	10-DEC-2021 13:39	50.0	BMR	1	co2
1400	CO2h.m	v8019.d	0.00 ml	10-DEC-2021 13:45	1.0	BMR	1	co2
22112061801	CO2h.m	v8020.d	0.00 ml	10-DEC-2021 13:56	5.0	BMR	1	co2
22112061801	CO2h.m	v8021.d	0.00 ml	10-DEC-2021 14:01	5.0	BMR	1	co2
22112061801	CO2h.m	v8022.d	0.00 ml	10-DEC-2021 14:06	20.0	BMR	1	co2
22112061802	CO2h.m	v8023.d	0.00 ml	10-DEC-2021 14:12	30.0	BMR	1	co2
22112082501	CO2h.m	v8024.d	0.00 ml	10-DEC-2021 15:00	20.0	BMR	1	co2
22112082501	CO2h.m	v8025.d	0.00 ml	10-DEC-2021 15:10	100.0	BMR	1	co2
22112082502	CO2h.m	v8026.d	0.00 ml	10-DEC-2021 15:16	100.0	BMR	1	co2
22112082503	CO2h.m	v8027.d	0.00 ml	10-DEC-2021 15:22	100.0	BMR	1	co2
22112082504	CO2h.m	v8028.d	0.00 ml	10-DEC-2021 15:31	100.0	BMR	1	co2
22112082505	CO2h.m	v8029.d	0.00 ml	10-DEC-2021 15:36	100.0	BMR	1	co2
22112082506	CO2h.m	v8030.d	0.00 ml	10-DEC-2021 15:42	100.0	BMR	1	co2
1400	CO2h.m	v8031.d	0.00 ml	10-DEC-2021 15:58	1.0	BMR	1	co2
1400	CO2h.m	v8032.d	0.00 ml	10-DEC-2021 16:08	1.0	BMR	1	co2

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 12/10/2021
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2211210.b/CO2_22.m
Batch: /var/chem/gcv8b.i/2211210.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1400	CO2h.m	v8033.d	0.00 ml	10-DEC-2021 16:13	1.0	BMR	1	co2

294458.1

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

25

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **17563**

SUBCONTRACT TO:

Pace Analytical
7979 Innovation Park Drive
Baton Rouge, LA 70820

Phone: +1 225 769 4900

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS21120103
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE	
	ANALYSIS REQUESTED			DUE DATE	
1.	**HS21120103-01**	**35AWWW11_120121**	**Groundwater**	**01 Dec 2021 07:35**	1
	SUB_CO2			16 Dec 2021	
2.	**HS21120103-02**	**35AWWW23_120121**	**Groundwater**	**01 Dec 2021 08:25**	2
	SUB_CO2			16 Dec 2021	
3.	**HS21120103-03**	**35AWWW19_120121**	**Groundwater**	**01 Dec 2021 09:20**	3
	SUB_CO2			16 Dec 2021	
4.	**HS21120103-04**	**35AWWW07_120121**	**Groundwater**	**01 Dec 2021 10:10**	4
	SUB_CO2			16 Dec 2021	
5.	**HS21120103-05**	**35AWWW20_120121**	**Groundwater**	**01 Dec 2021 11:00**	5
	SUB_CO2			16 Dec 2021	
6.	**HS21120103-06**	**35AWWW06_120121**	**Groundwater**	**01 Dec 2021 11:55**	6
	SUB_CO2			16 Dec 2021	

Comments: Please analyze for the analysis listed above. Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Client ID: ALS Houston - ALS Environmental - Houston, TX
SDG: 221120825
PM: RWe

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 17563

Relinquished By: NA

Date/Time: 12.6.21 13.00

Received By: FedEx 12-7-21 1118
JH 12-7-21 1148

Date/Time:

Cooler ID(s):

Temperature(s):

5300 5225 8954

6.0E24

Client ID: ALS Houston - ALS Environmental - Houston, TX

SDG: 221120825

PM: RWe

Pace Analytical®

SAMPLE RECEIVING CHECKLIST

221120825

SAMPLE DELIVERY GROUP 221120825	
Client **PM** RWe ALS Houston - ALS Environmental - Houston, TX	**Transport Method** FEDEX
Profile Number 294458	**Received By** Roberts, George S.
Line Item(s) 1 - CO2	**Receive Date(s)** 12/07/21

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E34	Temp °C
530052258954		6.0

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

HS21120103 8260

ALS WO# HS21120103

MSVOA09 -Logbook

Batch: 47180
Date: 11-15-2021
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	11-15-2021 01:30 pm	1.00	50 mL	50 mL	U111501.D	Liquid	Y	NA
2	VSTD000.25	ICAL1	11-15-2021 01:52 pm	1.00	50 mL	50 mL	U111502.D	Liquid	Y	NA
3	VSTD000.5	ICAL2	11-15-2021 02:36 pm	1.00	50 mL	50 mL	U111503.D	Liquid	Y	NA
4	VSTD001	ICAL3	11-15-2021 02:58 pm	1.00	50 mL	50 mL	U111504.D	Liquid	Y	NA
5	VSTD002	ICAL4	11-15-2021 03:20 pm	1.00	50 mL	50 mL	U111505.D	Liquid	Y	NA
6	VSTD005	ICAL5	11-15-2021 03:43 pm	1.00	50 mL	50 mL	U111506.D	Liquid	Y	NA
7	VSTD020	ICAL6	11-15-2021 04:05 pm	1.00	50 mL	50 mL	U111507.D	Liquid	Y	NA
8	VSTD050	ICAL7	11-15-2021 04:27 pm	1.00	50 mL	50 mL	U111508.D	Liquid	Y	NA
9	VSTD100	ICAL8	11-15-2021 04:49 pm	1.00	50 mL	50 mL	U111509.D	Liquid	Y	NA
10	VSTD150	ICAL9	11-15-2021 05:11 pm	1.00	50 mL	50 mL	U111510.D	Liquid	Y	NA
11	VSTD200	ICAL	11-15-2021 05:34 pm	1.00	50 mL	50 mL	U111511.D	Liquid	Y	NA
12	BLANK	SAMP	11-15-2021 05:56 pm	1.00	50 mL	50 mL	U111512.D	Liquid	Y	NA
13	VSTD050	CCV	11-15-2021 06:18 pm	1.00	50 mL	50 mL	U111513.D	Liquid	Y	NA
14	BLANK	SAMP	11-15-2021 06:40 pm	1.00	50 mL	50 mL	U111514.D	Liquid	Y	NA
15	CCB	SAMP	11-15-2021 07:03 pm	1.00	50 mL	50 mL	U111515.D	Liquid	Y	NA
16	VLCSW-211115	LCS	11-15-2021 07:25 pm	1.00	50 mL	50 mL	U111516.D	Liquid	Y	NA
17	BLANK	SAMP	11-15-2021 07:47 pm	1.00	50 mL	50 mL	U111517.D	Liquid	Y	NA
18	VBLKW-211115	MBLK	11-15-2021 08:10 pm	1.00	50 mL	50 mL	U111518.D	Liquid	Y	NA
19	HS21110151-02	SAMP	11-15-2021 08:32 pm	1.00	50 mL	50 mL	U111519.D	Liquid	Y	NA
20	HS21110151-01	SAMP	11-15-2021 08:54 pm	1.00	50 mL	50 mL	U111520.D	Liquid	Y	NA
21	HS21110314-20	SAMP	11-15-2021 09:17 pm	1.00	50 mL	50 mL	U111521.D	Liquid	Y	NA
22	HS21110387-04	SAMP	11-15-2021 09:39 pm	1.00	50 mL	50 mL	U111522.D	Liquid	Y	NA
23	HS21110387-10	SAMP	11-15-2021 10:01 pm	1.00	50 mL	50 mL	U111523.D	Liquid	Y	NA
24	HS21110426-01	SAMP	11-15-2021 10:23 pm	1.00	50 mL	50 mL	U111524.D	Liquid	Y	NA
25	HS21110449-01	SAMP	11-15-2021 10:46 pm	1.00	50 mL	50 mL	U111525.D	Liquid	Y	NA
26	HS21110450-03	SAMP	11-15-2021 11:08 pm	1.00	50 mL	50 mL	U111526.D	Liquid	Y	NA
27	HS21110349-01	SAMP	11-15-2021 11:30 pm	1.00	50 mL	50 mL	U111527.D	Liquid	Y	NA
28	HS21110572-01	SAMP	11-15-2021 11:53 pm	1000.0	50 µL	50 mL	U111528.D	Liquid	Y	NA
29	HS21110572-01MS	MS	11-16-2021 12:15 am	1000.0	50 µL	50 mL	U111529.D	Liquid	Y	NA
30	HS21110572-01MSD	MSD	11-16-2021 12:37 am	1000.0	50 µL	50 mL	U111530.D	Liquid	Y	NA
31	VSTD050-END	CCV	11-16-2021 12:59 am	1.00	50 mL	50 mL	U111531.D	Liquid	Y	NA
32	HS21110572-01	SAMP	11-16-2021 01:22 am	100.0(	500 µL	50 mL	U111532.D	Liquid	Y	NA
33	BFB	TUNE	11-16-2021 01:44 am	1.00	50 mL	50 mL	V111501.D	Liquid	Y	NA
34	VSTD050	CCV	11-16-2021 02:06 am	1.00	50 mL	50 mL	V111502.D	Liquid	Y	NA
35	VSTD050	CCV	11-16-2021 02:28 am	1.00	50 mL	50 mL	V111503.D	Liquid	Y	NA
36	CCB	SAMP	11-16-2021 02:51 am	1.00	50 mL	50 mL	V111504.D	Liquid	Y	NA
37	VLCSW-211115	LCS	11-16-2021 03:13 am	1.00	50 mL	50 mL	V111505.D	Liquid	Y	NA
38	BLANK	SAMP	11-16-2021 03:35 am	1.00	50 mL	50 mL	V111506.D	Liquid	Y	NA
39	VBLKW-211115	MBLK	11-16-2021 03:57 am	50.00	1 mL	50 mL	V111507.D	Liquid	Y	NA
40	HS21110426-02	SAMP	11-16-2021 04:20 am	5000.0	10 µL	50 mL	V111508.D	Liquid	Y	NA
41	HS21110426-02	SAMP	11-16-2021 04:42 am	500.0(	100 µL	50 mL	V111509.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
42	HS21110426-02MS	MS	11-16-2021 05:04 am	500.0(	100 µL	50 mL	V111510.D	Liquid	Y	N/
43	HS21110426-02MSD	MSD	11-16-2021 05:26 am	500.0(	100 µL	50 mL	V111511.D	Liquid	Y	N/
44	BLANK	SAMP	11-16-2021 05:49 am	1.00	50 mL	50 mL	V111512.D	Liquid	Y	N/
45	HS21110426-03	SAMP	11-16-2021 06:11 am	500.0(	100 µL	50 mL	V111513.D	Liquid	Y	N/
46	HS21110426-03	SAMP	11-16-2021 06:33 am	5000.0	10 µL	50 mL	V111514.D	Liquid	Y	N/
47	HS21110426-04	SAMP	11-16-2021 06:56 am	500.0(	100 µL	50 mL	V111515.D	Liquid	Y	N/
48	HS21110426-04	SAMP	11-16-2021 07:18 am	5000.0	10 µL	50 mL	V111516.D	Liquid	Y	N/
49	HS21110449-04	SAMP	11-16-2021 07:40 am	50.00	1 mL	50 mL	V111517.D	Liquid	Y	N/
50	HS21110449-04	SAMP	11-16-2021 08:03 am	500.0(	100 µL	50 mL	V111518.D	Liquid	Y	N/
51	HS21110450-01	SAMP	11-16-2021 08:25 am	250.0(	200 µL	50 mL	V111519.D	Liquid	Y	N/
52	HS21110450-01	SAMP	11-16-2021 08:47 am	2500.0	20 µL	50 mL	V111520.D	Liquid	Y	N/
53	HS21110450-02	SAMP	11-16-2021 09:10 am	1000.0	50 µL	50 mL	V111521.D	Liquid	Y	N/
54	HS21110450-02	SAMP	11-16-2021 09:32 am	10000.(	5 µL	50 mL	V111522.D	Liquid	Y	N/
55	HS21110450-08	SAMP	11-16-2021 09:54 am	500.0(	100 µL	50 mL	V111523.D	Liquid	Y	N/
56	HS21110450-08	SAMP	11-16-2021 10:17 am	5000.0	10 µL	50 mL	V111524.D	Liquid	Y	N/
57	HS21110450-09	SAMP	11-16-2021 10:39 am	2000.0	25 µL	50 mL	V111525.D	Liquid	Y	N/
58	HS21110450-09	SAMP	11-16-2021 11:01 am	20000.(	2.5 µL	50 mL	V111526.D	Liquid	Y	N/
59	HS21110450-10	SAMP	11-16-2021 11:24 am	500.0(	100 µL	50 mL	V111527.D	Liquid	Y	N/
60	HS21110450-10	SAMP	11-16-2021 11:46 am	5000.0	10 µL	50 mL	V111528.D	Liquid	Y	N/
61	BLANK	SAMP	11-16-2021 12:08 pm	1.00	50 mL	50 mL	V111529.D	Liquid	Y	N/
62	CCV-END	CCV	11-16-2021 12:31 pm	1.00	50 mL	50 mL	V111530.D	Liquid	Y	N/
63	BLANK	SAMP	11-16-2021 12:53 pm	1.00	50 mL	50 mL	V111531.D	Liquid	Y	N/

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	50.00	47.99	96	80-120
trans-1,3-Dichloroprope	50.00	47.48	95	80-120
1,3-Dichlorobenzene	50.00	48.12	96	80-120
2,2-Dichloropropane	50.00	52.44	105	80-120
1,1-Dichloropropene	50.00	49.02	98	80-120
Dibromomethane	50.00	51.27	102	80-120
1,2-Dibromoethane	50.00	52.96	106	80-120
trans-1,2-Dichloroethen	50.00	48.32	97	80-120
1,1,1,2-Tetrachloroetha	50.00	48.79	98	80-120
1,1,1-Trichloroethane	50.00	51.58	103	80-120
1,1,2,2-Tetrachloroetha	50.00	50.33	101	80-120
1,1,2-Trichloroethane	50.00	50.67	101	80-120
1,1-Dichloroethane	50.00	47.76	96	80-120
1,1-Dichloroethene	50.00	48.22	96	80-120
Trichloroethene	50.00	51.11	102	80-120
1,2,3-Trichlorobenzene	50.00	49.28	98	80-120
Trichlorofluoromethane	50.00	47.23	94	80-120
1,2,4-Trichlorobenzene	50.00	50.49	101	80-120
1,2,4-Trimethylbenzene	50.00	49.44	99	80-120
Tetrachloroethene	50.00	46.55	93	80-120
1,2-Dichlorobenzene	50.00	49.10	98	80-120
1,2-Dichloroethane	50.00	49.72	99	80-120
1,2-Dichloropropane	50.00	50.65	101	80-120
1,3,5-Trimethylbenzene	50.00	48.38	97	80-120
1,3-Dichloropropane	50.00	49.94	100	80-120
1,4-Dichlorobenzene	50.00	48.60	97	80-120
Toluene	50.00	48.78	98	80-120
2-Butanone	100.00	98.76	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: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
2-Chlorotoluene	50.00	48.19	96	80-120
2-Hexanone	100.00	112.63	113	80-120
4-Chlorotoluene	50.00	48.96	98	80-120
tert-Butylbenzene	50.00	47.53	95	80-120
4-Methyl-2-Pentanone	100.00	103.85	104	80-120
Acetone	100.00	102.63	103	80-120
Benzene	50.00	50.06	100	80-120
Bromobenzene	50.00	51.00	102	80-120
Bromochloromethane	50.00	52.43	105	80-120
Bromodichloromethane	50.00	47.32	95	80-120
Bromoform	50.00	48.31	97	80-120
Bromomethane	50.00	59.05	118	80-120
Carbon Disulfide	100.00	100.49	100	80-120
Carbon Tetrachloride	50.00	45.44	91	80-120
Chlorobenzene	50.00	48.60	97	80-120
Chloroethane	50.00	44.89	90	80-120
Chloroform	50.00	50.22	100	80-120
Chloromethane	50.00	50.93	102	80-120
cis-1,2-Dichloroethene	50.00	49.81	100	80-120
Dibromochloromethane	50.00	47.90	96	80-120
Dichlorodifluoromethane	50.00	47.62	95	80-120
Ethylbenzene	50.00	49.18	98	80-120
Hexachlorobutadiene	50.00	48.57	97	80-120
Isopropylbenzene	50.00	48.13	96	80-120
m,p-Xylenes	100.00	100.37	100	80-120
Methylene Chloride	50.00	45.36	91	80-120
n-Butylbenzene	50.00	46.76	94	80-120
n-Propylbenzene	50.00	48.47	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: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
Naphthalene	50.00	50.21	100	80-120
o-Xylene	50.00	49.55	99	80-120
sec-Butylbenzene	50.00	47.04	94	80-120
Styrene	50.00	51.92	104	80-120
Vinyl Chloride	50.00	47.53	95	80-120
1,2,3-Trichloropropane	50.00	52.94	106	80-120
p-Isopropyltoluene	50.00	48.68	97	80-120
1,2-Dibromo-3-Chloropro	50.00	47.07	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 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Lab File ID: U111501 BFB Injection Date: 11/15/21

Instrument ID: VOA9 BFB Injection Time: 1330

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	15.6
75	30.0 - 60.0% of mass 95	47.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	Greater than 50.0% of mass 95	79.5
175	5.0 - 9.0% of mass 174	6.2 (7.8)1
176	95.0 - 101.0% of mass 174	76.3 (96.0)1
177	5.0 - 9.0% of mass 176	4.9 (6.4)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	U111502	11/15/21	1352
02	VSTD000.5	VSTD000.5	U111503	11/15/21	1436
03	VSTD001	VSTD001	U111504	11/15/21	1458
04	VSTD002	VSTD002	U111505	11/15/21	1520
05	VSTD005	VSTD005	U111506	11/15/21	1543
06	VSTD020	VSTD020	U111507	11/15/21	1605
07	VSTD050	VSTD050	U111508	11/15/21	1627
08	VSTD100	VSTD100	U111509	11/15/21	1649
09	VSTD150	VSTD150	U111510	11/15/21	1711
10	VSTD200	VSTD200	U111511	11/15/21	1734
11	ICV	ICV	U111513	11/15/21	1818
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF0.25: U111502 RF0.5: U111503 RF1: U111504
RF2: U111505 RF5: U111506 RF20: U111507

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
cis-1,3-Dichloropropene		1095	2819	5706	15790	82868
trans-1,3-Dichloropropene		735	2070	4426	12599	66354
1,3-Dichlorobenzene		1.290	1.572	1.451	1.481	1.451
2,2-Dichloropropane		0.422	0.495	0.447	0.456	0.479
1,1-Dichloropropene		0.325	0.432	0.408	0.428	0.416
Dibromomethane		0.196	0.220	0.211	0.221	0.222
1,2-Dibromoethane		0.270	0.351	0.339	0.374	0.390
trans-1,2-Dichloroethene		0.513	0.537	0.503	0.507	0.502
1,1,1,2-Tetrachloroethane		803	2215	4304	11768	54596
1,1,1-Trichloroethane		0.545	0.680	0.652	0.673	0.733
1,1,2,2-Tetrachloroethane		0.852	1.090	1.126	1.105	1.113
1,1,2-Trichloroethane		0.253	0.314	0.290	0.320	0.306
1,1-Dichloroethane		0.768	0.957	0.950	0.950	0.919
1,1-Dichloroethene		0.374	0.476	0.474	0.450	0.445
Trichloroethene		0.274	0.339	0.332	0.330	0.324
1,2,3-Trichlorobenzene		0.686	0.955	0.932	0.895	0.895
Trichlorofluoromethane		0.648	0.893	0.820	0.805	0.816
1,2,4-Trichlorobenzene		0.792	0.915	0.919	0.902	0.905
1,2,4-Trimethylbenzene		1.982	2.556	2.475	2.550	2.640
Tetrachloroethene		0.265	0.313	0.289	0.285	0.276
1,2-Dichlorobenzene		1.126	1.515	1.479	1.481	1.450
1,2-Dichloroethane		0.373	0.512	0.448	0.489	0.468
1,2-Dichloropropane		0.247	0.330	0.319	0.335	0.328
1,3,5-Trimethylbenzene		2.126	2.512	2.442	2.481	2.526
1,3-Dichloropropane		0.503	0.662	0.628	0.698	0.664
1,4-Dichlorobenzene		1.237	1.642	1.503	1.560	1.495
Toluene		1.376	1.627	1.485	1.566	1.540
2-Butanone		0.290	0.263	0.236	0.263	0.271
2-Chlorotoluene		1.790	2.279	2.177	2.289	2.209
2-Hexanone		0.166	0.196	0.235	0.251	0.265
4-Chlorotoluene		2.122	2.544	2.497	2.655	2.594
tert-Butylbenzene		1.825	2.105	2.018	2.067	2.103
4-Methyl-2-Pentanone		0.308	0.363	0.341	0.357	0.380
Acetone		3031	4060	7509	12006	42250
Benzene		1.101	1.407	1.232	1.307	1.289
Bromobenzene		0.573	0.826	0.752	0.814	0.813
Bromochloromethane		0.222	0.288	0.297	0.301	0.309
Bromodichloromethane		1201	3055	5486	15337	68589
Bromoform		450	1090	2438	6778	32750
Bromomethane		935	2151	3804	9672	34362
Carbon Disulfide		1.032	1.308	1.211	1.225	1.245
Carbon Tetrachloride		1045	3053	5276	13108	61682
Chlorobenzene		0.917	1.063	0.976	1.013	0.985
Chloroethane		0.501	0.439	0.384	0.426	0.407

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF0.25: U111502 RF0.5: U111503 RF1: U111504
RF2: U111505 RF5: U111506 RF20: U111507

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Chloroform		0.758	1.012	0.944	1.039	1.013
Chloromethane		1429	3019	5164	13015	52032
cis-1,2-Dichloroethene		0.516	0.640	0.636	0.641	0.629
Dibromochloromethane		630	2071	3879	11164	55171
Dichlorodifluoromethane		1420	3384	6494	15309	63286
Ethylbenzene		0.405	0.512	0.490	0.502	0.492
Hexachlorobutadiene		0.281	0.322	0.303	0.305	0.327
Isopropylbenzene		1.180	1.525	1.469	1.488	1.497
m,p-Xylenes		0.471	0.620	0.596	0.633	0.626
Methylene Chloride		0.708	0.680	0.636	0.610	0.568
n-Butylbenzene		2.000	2.140	2.132	2.120	2.199
n-Propylbenzene		2.771	3.584	3.352	3.462	3.491
Naphthalene		2.420	2.700	2.813	2.633	2.728
o-Xylene		0.498	0.642	0.566	0.626	0.609
sec-Butylbenzene		2.300	2.816	2.739	2.762	2.809
Styrene		0.768	0.988	0.986	1.069	1.088
Vinyl Chloride		0.550	0.636	0.612	0.612	0.606
1,2,3-Trichloropropane		0.831	0.900	0.952	1.060	1.059
p-Isopropyltoluene		1.920	2.338	2.401	2.413	2.500
1,2-Dibromo-3-Chloropropane		40	360	886	2022	11576
1,2-Dichloroethane-d4		1948	3378	7830	19646	71255
Dibromofluoromethane		1516	2474	5867	15313	59371
Toluene-d8		1.503	1.155	1.348	1.440	1.329
4-Bromofluorobenzene		3705	6215	11258	23787	86314

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF50: U111508 RF100: U111509 RF150: U111510
RF200: U111511

COMPOUND	RF50	RF100	RF150	RF200
cis-1,3-Dichloropropene	238784	512945	784849	1067583
trans-1,3-Dichloropropene	203307	440168	679057	919660
1,3-Dichlorobenzene	1.439	1.434	1.426	1.415
2,2-Dichloropropane	0.528	0.560	0.564	0.580
1,1-Dichloropropene	0.431	0.426	0.417	0.411
Dibromomethane	0.216	0.219	0.212	0.212
1,2-Dibromoethane	0.382	0.383	0.367	0.364
trans-1,2-Dichloroethene	0.511	0.496	0.476	0.480
1,1,1,2-Tetrachloroethane	145929	305424	468015	631462
1,1,1-Trichloroethane	0.782	0.809	0.794	0.809
1,1,2,2-Tetrachloroethane	1.071	1.071	1.033	1.010
1,1,2-Trichloroethane	0.301	0.300	0.283	0.286
1,1-Dichloroethane	0.900	0.880	0.834	0.836
1,1-Dichloroethene	0.464	0.455	0.437	0.436
Trichloroethene	0.340	0.338	0.330	0.332
1,2,3-Trichlorobenzene	0.909	0.924	0.935	0.927
Trichlorofluoromethane	0.853	0.829	0.796	0.798
1,2,4-Trichlorobenzene	0.952	0.966	0.968	0.963
1,2,4-Trimethylbenzene	2.652	2.626	2.566	2.513
Tetrachloroethene	0.282	0.278	0.274	0.274
1,2-Dichlorobenzene	1.440	1.428	1.392	1.379
1,2-Dichloroethane	0.453	0.454	0.433	0.429
1,2-Dichloropropane	0.323	0.325	0.313	0.312
1,3,5-Trimethylbenzene	2.546	2.544	2.499	2.449
1,3-Dichloropropane	0.644	0.638	0.608	0.605
1,4-Dichlorobenzene	1.494	1.494	1.456	1.454
Toluene	1.517	1.490	1.436	1.426
2-Butanone	0.264	0.266	0.251	0.249
2-Chlorotoluene	2.201	2.187	2.135	2.110
2-Hexanone	0.267	0.243	0.258	0.254
4-Chlorotoluene	2.554	2.559	2.481	2.450
tert-Butylbenzene	2.152	2.160	2.127	2.093
4-Methyl-2-Pentanone	0.382	0.382	0.366	0.361
Acetone	102765	199248	287306	371722
Benzene	1.291	1.284	1.238	1.229
Bromobenzene	0.800	0.812	0.797	0.792
Bromochloromethane	0.294	0.285	0.271	0.271
Bromodichloromethane	187745	392803	600907	813877
Bromoform	96626	216725	341423	468271
Bromomethane	83889	170081		
Carbon Disulfide	1.314	1.299	1.254	1.248
Carbon Tetrachloride	182502	382517	595268	799370
Chlorobenzene	0.973	0.968	0.938	0.940
Chloroethane	0.400	0.401	0.392	0.374

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

LAB FILE ID: RF50: U111508 RF100: U111509 RF150: U111510
RF200: U111511

COMPOUND	RF50	RF100	RF150	RF200
Chloroform	0.999	0.993	0.952	0.959
Chloromethane	145589	274951	431092	557544
cis-1,2-Dichloroethene	0.628	0.617	0.592	0.600
Dibromochloromethane	155960	334001	509745	696655
Dichlorodifluoromethane	172970	337382	508351	667949
Ethylbenzene	0.508	0.501	0.492	0.488
Hexachlorobutadiene	0.362	0.382	0.394	0.384
Isopropylbenzene	1.551	1.531	1.488	1.492
m,p-Xylenes	0.633	0.629	0.609	0.608
Methylene Chloride	0.547	0.538	0.508	0.507
n-Butylbenzene	2.309	2.316	2.259	2.188
n-Propylbenzene	3.531	3.532	3.463	3.377
Naphthalene	2.851	2.911	2.898	2.839
o-Xylene	0.625	0.613	0.596	0.598
sec-Butylbenzene	2.948	2.958	2.930	2.848
Styrene	1.109	1.100	1.059	1.059
Vinyl Chloride	0.626	0.617	0.592	0.589
1,2,3-Trichloropropane	1.090	1.136	1.142	1.130
p-Isopropyltoluene	2.604	2.636	2.591	2.527
1,2-Dibromo-3-Chloropropane	34570	77043	120988	163858
1,2-Dichloroethane-d4	174378	347770	519537	675186
Dibromofluoromethane	146958	294099	451793	584069
Toluene-d8	1.272	1.254	1.230	1.180
4-Bromofluorobenzene	212217	425707	646932	842976

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
cis-1,3-Dichloropropene	LINR	3.487e-002	1.83134486		0.9996162	0.9900000
trans-1,3-Dichloropropene	LINR	4.225e-002	2.11997871		0.9994871	0.9900000
1,3-Dichlorobenzene	AVRG		1.44005923		5.076	20.000
2,2-Dichloropropane	AVRG		0.50343025		11.334	20.000
1,1-Dichloropropene	AVRG		0.41059421		8.131	20.000
Dibromomethane	AVRG		0.21458337		3.716	20.000
1,2-Dibromoethane	AVRG		0.35789930		10.224	20.000
trans-1,2-Dichloroethene	AVRG		0.50286983		3.614	20.000
1,1,1,2-Tetrachloroethane	LINR	1.65e-002	2.83730731		0.9998992	0.9900000
1,1,1-Trichloroethane	AVRG		0.71976811		12.476	20.000
1,1,2,2-Tetrachloroethane	AVRG		1.05239113		7.961	20.000
1,1,2-Trichloroethane	AVRG		0.29462567		6.763	20.000
1,1-Dichloroethane	AVRG		0.88828730		7.312	20.000
1,1-Dichloroethene	AVRG		0.44578296		6.832	20.000
Trichloroethene	AVRG		0.32664734		6.189	20.000
1,2,3-Trichlorobenzene	AVRG		0.89541206		9.048	20.000
Trichlorofluoromethane	AVRG		0.80634694		8.275	20.000
1,2,4-Trichlorobenzene	AVRG		0.92028728		6.006	20.000
1,2,4-Trimethylbenzene	AVRG		2.50663317		8.196	20.000
Tetrachloroethene	AVRG		0.28198562		4.841	20.000
1,2-Dichlorobenzene	AVRG		1.40999862		8.162	20.000
1,2-Dichloroethane	AVRG		0.45105608		8.724	20.000
1,2-Dichloropropane	AVRG		0.31462191		8.382	20.000
1,3,5-Trimethylbenzene	AVRG		2.45827404		5.294	20.000
1,3-Dichloropropane	AVRG		0.62780551		8.738	20.000
1,4-Dichlorobenzene	AVRG		1.48179325		7.318	20.000
Toluene	AVRG		1.49582459		5.150	20.000
2-Butanone	AVRG		0.26145057		5.850	20.000
2-Chlorotoluene	AVRG		2.15306767		6.882	20.000
2-Hexanone	AVRG		0.23735195		14.451	20.000
4-Chlorotoluene	AVRG		2.49516740		6.122	20.000
tert-Butylbenzene	AVRG		2.07221419		4.925	20.000
4-Methyl-2-Pentanone	AVRG		0.36009677		6.532	20.000
Acetone	LINR	-0.1327078	6.11155985		0.9980573	0.9900000
Benzene	AVRG		1.26430019		6.460	20.000
Bromobenzene	AVRG		0.77538721		10.169	20.000
Bromochloromethane	AVRG		0.28203061		9.198	20.000
Bromodichloromethane	LINR	2.074e-002	2.40666475		0.9998321	0.9900000
Bromoform	2ORDR	2.858e-002	4.22513840	-0.4148270	0.9996537	0.9900000
Bromomethane	LINR	-1.03e-002	3.27907024		0.9997756	0.9900000
Carbon Disulfide	AVRG		1.23725488		6.898	20.000
Carbon Tetrachloride	LINR	3.012e-002	2.44047659		0.9997197	0.9900000
Chlorobenzene	AVRG		0.97474921		4.490	20.000
Chloroethane	AVRG		0.41373377		9.243	20.000

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: VOA9 Calibration Date(s): 11/15/21 11/15/21

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1352 1734

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Chloroform	AVRG		0.96311174		8.652	20.000
Chloromethane	LINR	-1.17e-002	2.03080489		0.9996091	0.9900000
cis-1,2-Dichloroethene	AVRG		0.61087669		6.500	20.000
Dibromochloromethane	LINR	2.999e-002	2.57567744		0.9996307	0.9900000
Dichlorodifluoromethane	LINR	-1.42e-002	1.69951750		0.9995681	0.9900000
Ethylbenzene	AVRG		0.48784043		6.585	20.000
Hexachlorobutadiene	AVRG		0.34013347		12.120	20.000
Isopropylbenzene	AVRG		1.46892443		7.590	20.000
m,p-Xylenes	AVRG		0.60276579		8.439	20.000
Methylene Chloride	AVRG		0.58922292		12.471	20.000
n-Butylbenzene	AVRG		2.18473949		4.610	20.000
n-Propylbenzene	AVRG		3.39600934		7.236	20.000
Naphthalene	AVRG		2.75488767		5.678	20.000
o-Xylene	AVRG		0.59701249		7.174	20.000
sec-Butylbenzene	AVRG		2.79010830		7.172	20.000
Styrene	AVRG		1.02517757		10.329	20.000
Vinyl Chloride	AVRG		0.60470714		4.166	20.000
1,2,3-Trichloropropane	AVRG		1.03329000		10.902	20.000
p-Isopropyltoluene	AVRG		2.43660884		8.975	20.000
1,2-Dibromo-3-Chloropropane	LINR	4.869e-002	5.46522257		0.9992261	0.9900000
1,2-Dichloroethane-d4	LINR	-3.e-002	1.67917269		0.9992844	0.9900000
Dibromofluoromethane	LINR	-1.72e-002	1.93811970		0.9996464	0.9900000
Toluene-d8	AVRG		1.30132427		8.896	20.000
4-Bromofluorobenzene	LINR	-2.69e-002	2.11455518		0.9996403	0.9900000

FORM VI VOA

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111501.D

Date : 15-NOV-2021 13:30

Client ID: BFB

Instrument: VOA9.i

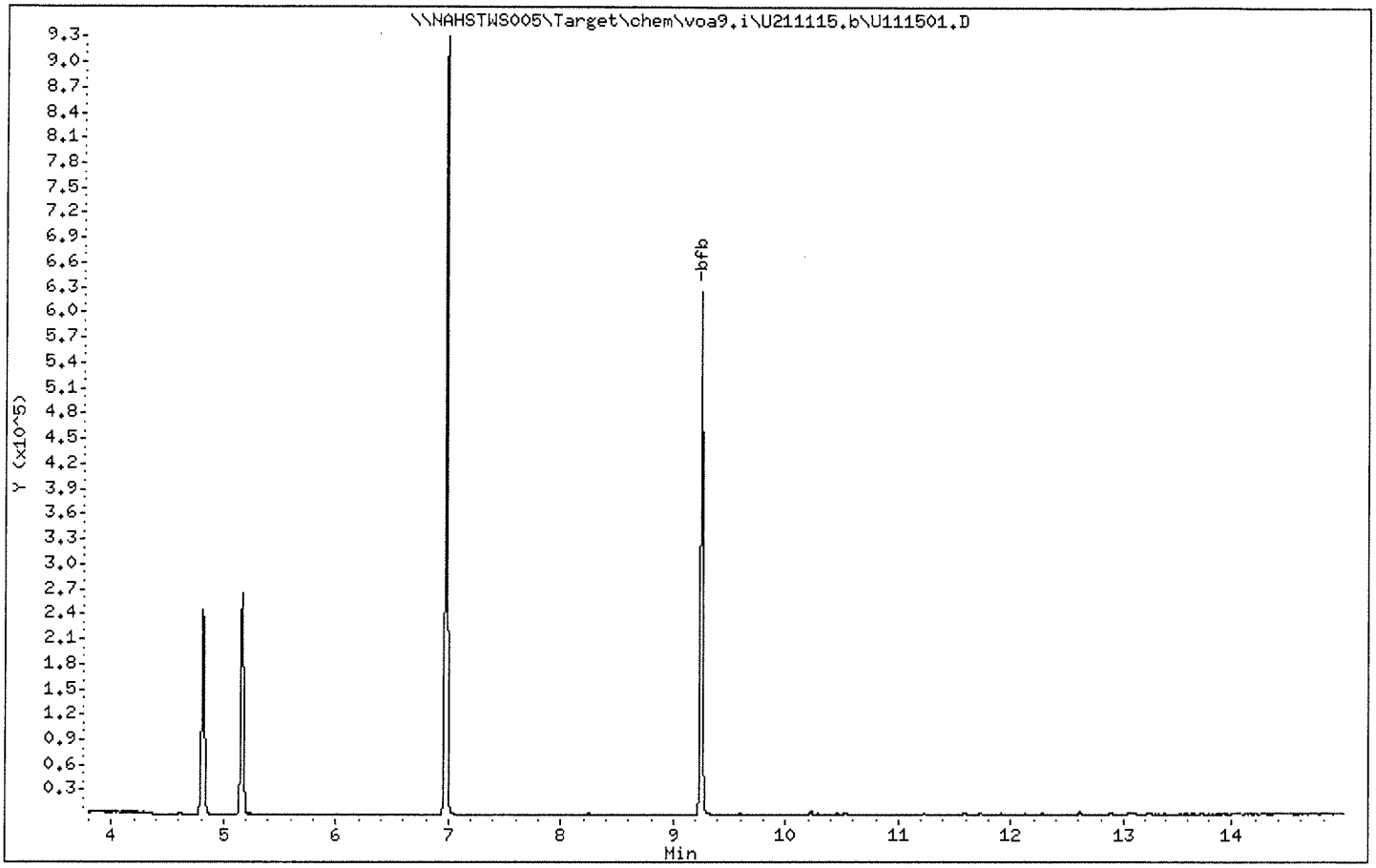
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111501.D

Date : 15-NOV-2021 13:30

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

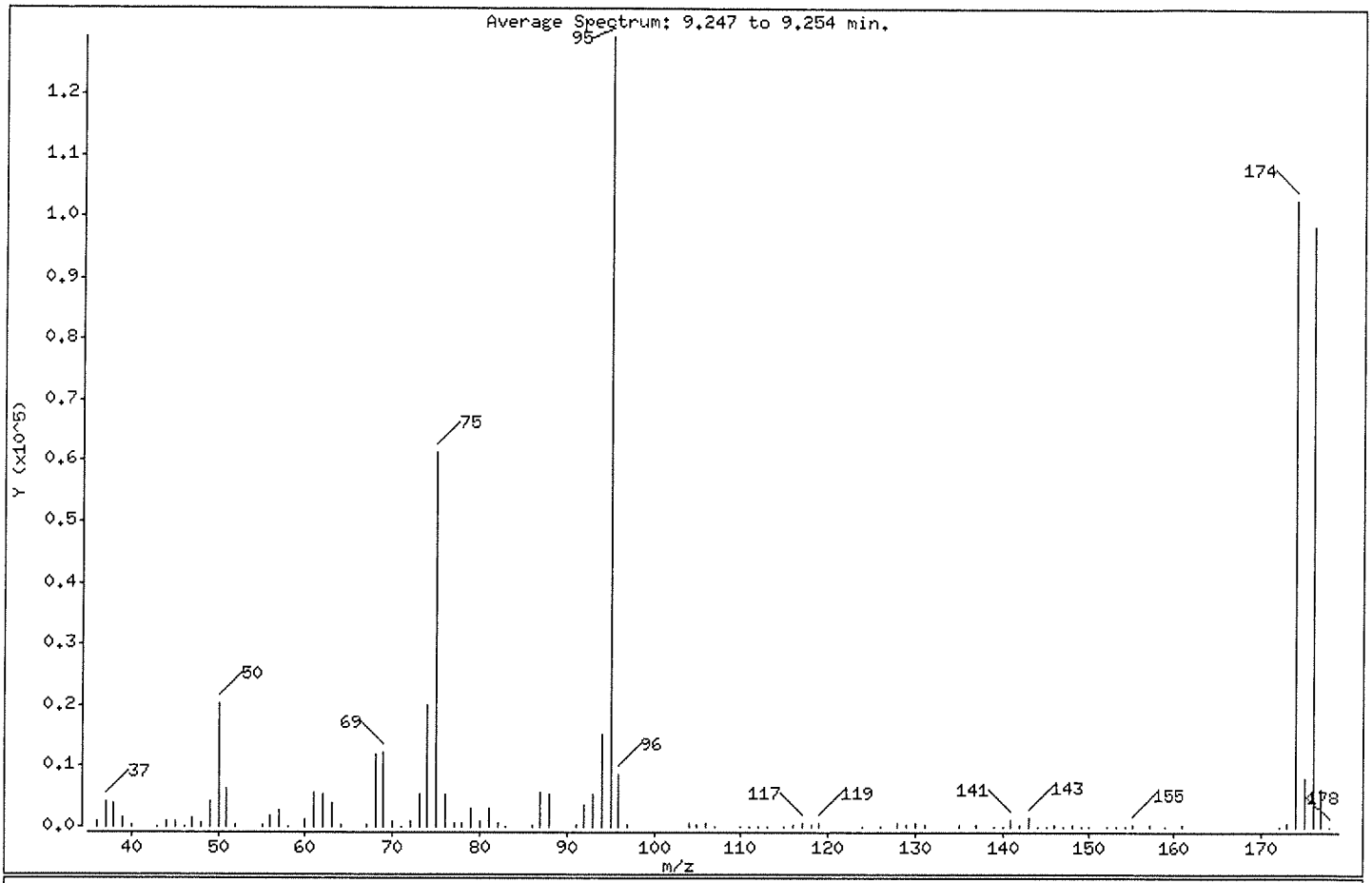
Volume Injected (uL): 2.0

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	15.55
75	30.00 - 60.00% of mass 95	47.37
96	5.00 - 9.00% of mass 95	6.69
173	Less than 2.00% of mass 174	0.38 (0.48)
174	Greater than 50.00% of mass 95	79.51
175	5.00 - 9.00% of mass 174	6.24 (7.85)
176	95.00 - 101.00% of mass 174	76.33 (96.00)
177	5.00 - 9.00% of mass 176	4.91 (6.44)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111501.D

Date : 15-NOV-2021 13:30

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: U111501.D

Spectrum: Average Spectrum: 9.247 to 9.254 min.

Location of Maximum: 95.00

Number of points: 98

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	941	68.00	11785	97.00	266	142.00	180
37.00	4243	69.00	12077	104.00	559	143.00	1387
38.00	3806	70.00	924	105.00	203	144.00	63
39.00	1546	71.00	37	106.00	485	145.00	121
40.00	316	72.00	753	107.00	107	146.00	201
43.00	109	73.00	5407	110.00	72	147.00	87
44.00	891	74.00	19864	111.00	23	148.00	284
45.00	980	75.00	61208	112.00	76	149.00	97
46.00	50	76.00	5285	113.00	60	150.00	102
47.00	1494	77.00	600	115.00	127	152.00	45
48.00	586	78.00	574	116.00	421	153.00	86
49.00	4230	79.00	3048	117.00	726	154.00	90
50.00	20096	80.00	898	118.00	405	155.00	302
51.00	6128	81.00	2855	119.00	658	157.00	257
52.00	336	82.00	628	124.00	99	159.00	130
55.00	350	83.00	36	126.00	83	161.00	171
56.00	1670	86.00	153	128.00	509	172.00	31
57.00	2712	87.00	5639	129.00	222	173.00	488
58.00	119	88.00	5327	130.00	489	174.00	102728
60.00	1096	91.00	437	131.00	196	175.00	8062
61.00	5540	92.00	3482	135.00	192	176.00	98616
62.00	5258	93.00	5420	137.00	195	177.00	6348
63.00	3781	94.00	15052	139.00	50	178.00	148
64.00	320	95.00	129208	140.00	92		
67.00	367	96.00	8638	141.00	1285		

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111502.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 15-NOV-2021 13:52
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:11 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 17:34 Cal File: U111511.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

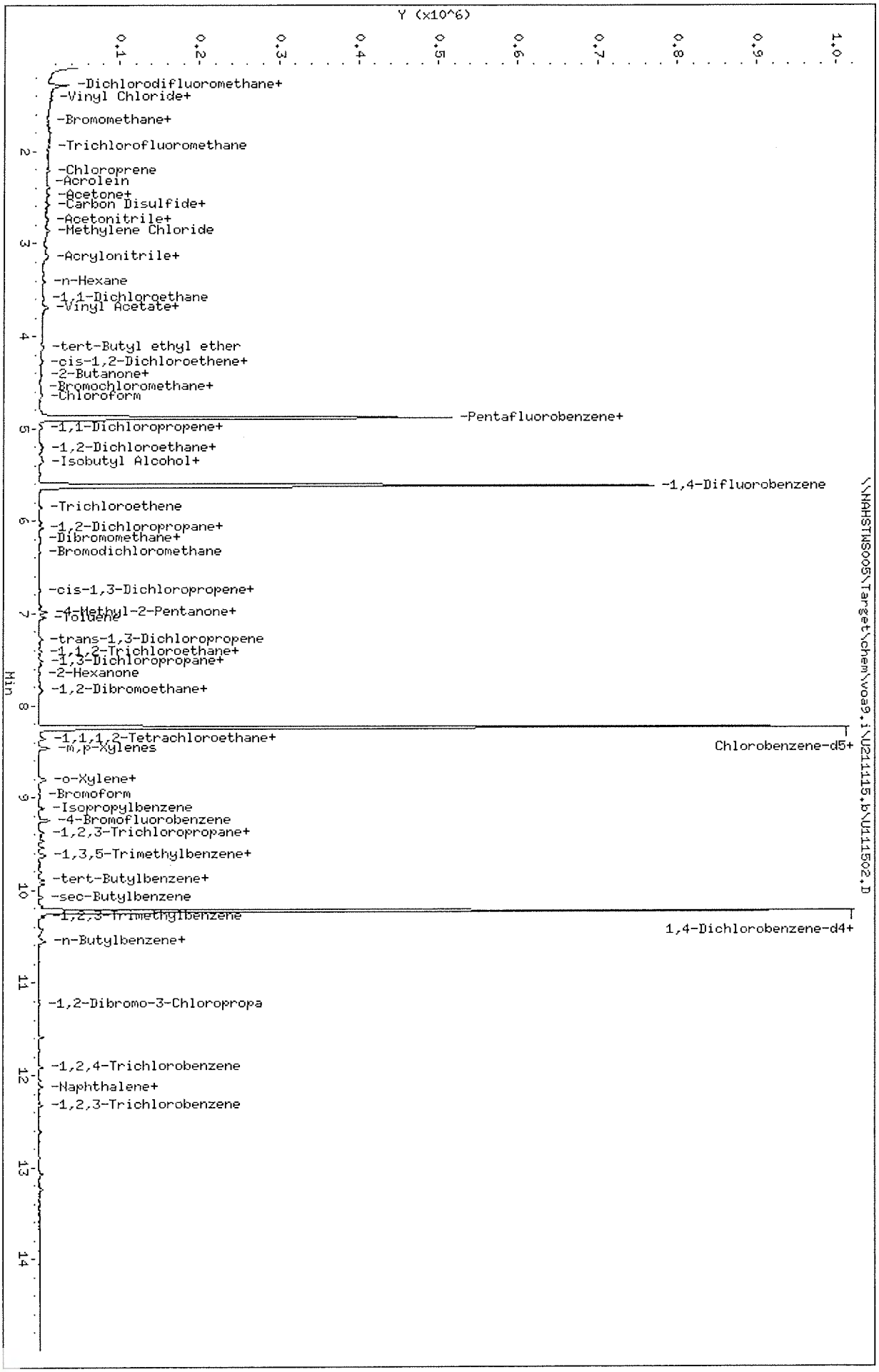
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.883	4.883	(1.000)	322381	50.0000	
*	36 1,4-Difluorobenzene	114	5.617	5.617	(1.000)	561409	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	505816	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	250052	50.0000	
$	30 Dibromofluoromethane	113	4.823	4.823	(0.988)	1512	0.25000	(a)
$	35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	1798	0.25000	(Ta)
$	48 Toluene-d8	98	6.982	6.982	(0.847)	5872	0.25000	0.44(a)
$	69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	4568	0.25000	(a)
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	632	0.25000	1.00(a)
	31 1,1,1-Trichloroethane	97	4.815	4.815	(0.986)	1167	0.25000	0.25(a)
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	1258	0.25000	0.23(aM)
	53 1,1,2-Trichloroethane	83	7.409	7.409	(0.899)	870	0.25000	0.29(a)
	22 1,1-Dichloroethane	63	3.589	3.589	(0.735)	1954	0.25000	0.34(aM)
	11 1,1-Dichloroethene	96	2.394	2.394	(0.490)	913	0.25000	0.31(aM)
	32 1,1-Dichloropropene	75	4.991	4.991	(0.889)	1396	0.25000	0.30(a)
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	1206	0.25000	0.26(aM)
	71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	1328	0.25000	0.25(a)
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	1396	0.25000	0.30(aM)
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	3727	0.25000	0.29(a)
	89 1,2-Dibromo-3-Chloropropane	155	11.225	11.225	(1.098)	68	0.25000	2.50(aM)
	57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	944	0.25000	0.26(a)
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	1995	0.25000	0.28(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.934)	1530	0.25000	0.30(aM)
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	966	0.25000	0.27(a)
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	3805	0.25000	0.30(a)
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	2005	0.25000	0.27(a)
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	2015	0.25000	0.31(a)
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	2212	0.25000	0.29(a)
26	2,2-Dichloropropane	77	4.260	4.260	(0.873)	1106	0.25000	0.34(aM)
24	2-Butanone	43	4.350	4.350	(0.891)	1658	0.50000	0.98(aM)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	3378	0.25000	0.31(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	1299	0.50000	0.54(TaH)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	3484	0.25000	0.27(a)
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	3158	0.25000	0.25(a)
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.839)	2324	0.50000	0.63(a)
10	Acetone	43	2.476	2.476	(0.507)	2903	0.50000	(a)
37	Benzene	78	5.205	5.205	(0.927)	4360	0.25000	0.30(a)
74	Bromobenzene	156	9.377	9.377	(0.917)	1019	0.25000	0.26(a)
29	Bromochloromethane	128	4.542	4.542	(0.930)	627	0.25000	0.34(a)
39	Bromodichloromethane	83	6.341	6.341	(1.129)	1011	0.25000	1.25(aM)
66	Bromoform	173	8.972	8.972	(1.089)	374	0.25000	1.58(aM)
6	Bromomethane	94	1.663	1.663	(0.341)	802	0.25000	(a)
19	Carbon Disulfide	76	2.581	2.581	(0.529)	4854	0.50000	0.60(a)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	989	0.25000	1.72(a)
59	Chlorobenzene	112	8.268	8.268	(1.003)	3108	0.25000	0.31(a)
7	Chloroethane	64	1.749	1.749	(0.358)	1007	0.25000	0.37(aM)
28	Chloroform	83	4.647	4.647	(0.952)	1934	0.25000	0.31(a)
3	Chloromethane	50	1.336	1.336	(0.274)	967	0.25000	(aM)
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	1143	0.25000	0.29(a)
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	1036	0.25000	1.91(aM)
55	Dibromochloromethane	129	7.750	7.750	(0.940)	615	0.25000	1.65(aM)
44	Dibromomethane	93	6.180	6.180	(1.100)	727	0.25000	0.30(a)
2	Dichlorodifluoromethane	85	1.198	1.198	(0.245)	1178	0.25000	(aM)
61	Ethylbenzene	106	8.361	8.361	(1.015)	1495	0.25000	0.30(a)
91	Hexachlorobutadiene	225	12.050	12.050	(1.179)	504	0.25000	0.29(aM)
67	Isopropylbenzene	105	9.115	9.115	(1.106)	4114	0.25000	0.27(a)
62	m,p-Xylenes	106	8.463	8.463	(1.027)	3523	0.50000	0.57(a)
17	Methylene Chloride	84	2.858	2.858	(0.585)	1637	0.25000	0.43(a)
87	n-Butylbenzene	91	10.547	10.547	(1.032)	3648	0.25000	0.33(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	5107	0.25000	0.30(a)
92	Naphthalene	128	12.125	12.125	(1.186)	4226	0.25000	0.30(a)
63	o-Xylene	106	8.804	8.804	(1.068)	1735	0.25000	0.28(a)
81	sec-Butylbenzene	105	10.075	10.075	(0.985)	3944	0.25000	0.28(a)
64	Styrene	104	8.819	8.819	(1.070)	2661	0.25000	0.25(a)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	2917	0.25000	0.28(a)
56	Tetrachloroethene	164	7.511	7.511	(0.911)	975	0.25000	0.34(a)
50	Toluene	91	7.038	7.038	(0.854)	4969	0.25000	0.32(a)
20	trans-1,2-Dichloroethene	96	3.128	3.128	(0.641)	992	0.25000	0.30(a)
51	trans-1,3-Dichloropropene	75	7.256	7.256	(1.292)	656	0.25000	2.23(aM)
38	Trichloroethene	130	5.850	5.850	(1.041)	1142	0.25000	0.31(a)
8	Trichlorofluoromethane	101	1.944	1.944	(0.398)	1441	0.25000	0.27(a)
5	Vinyl Chloride	62	1.411	1.411	(0.289)	1216	0.25000	0.31(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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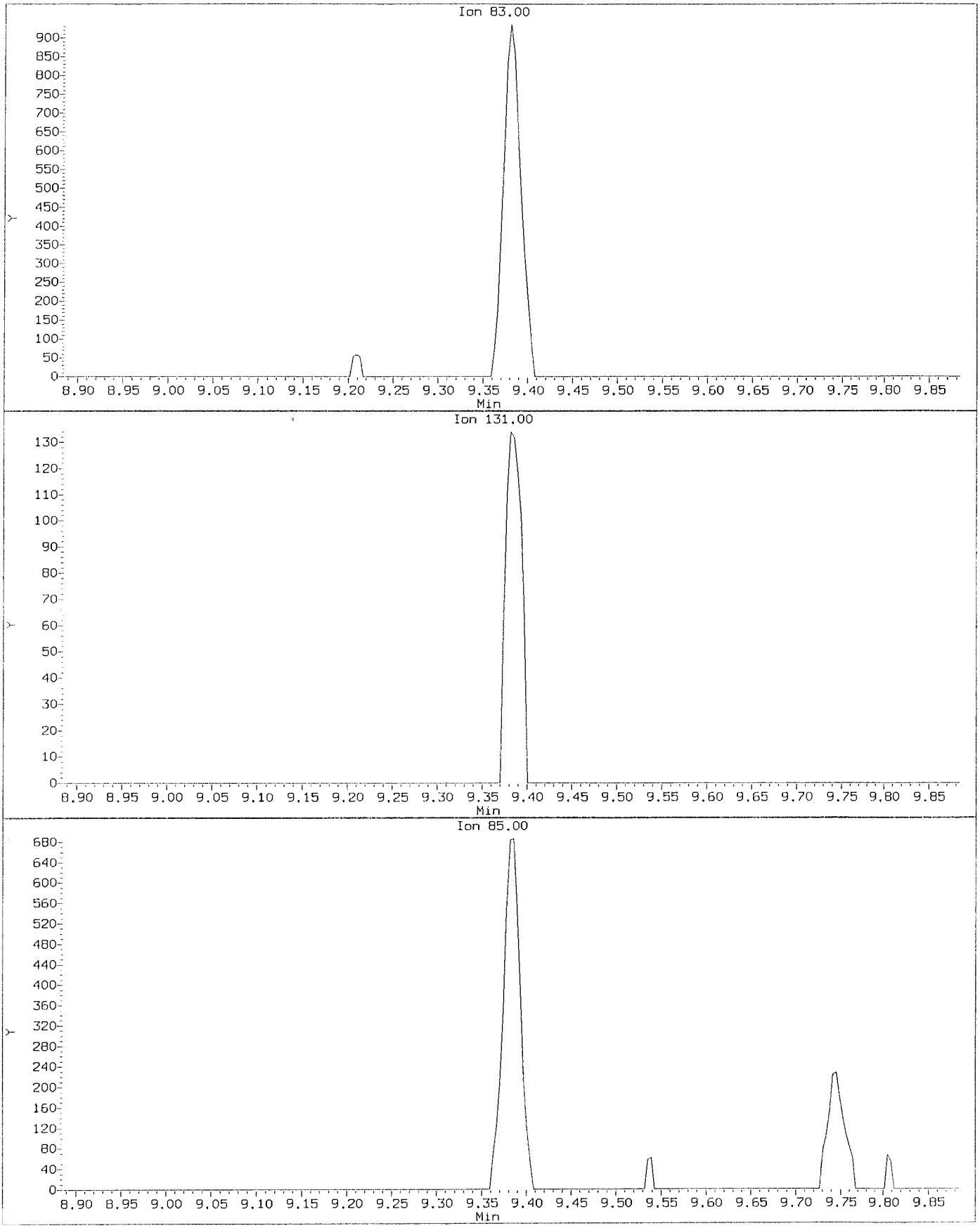
Date : 15-NOV-2021 13:52
Client ID: VSTD000.25
Sample Info: VSTD000.25;VSTD000.25;1;1;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111502.D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111502.D
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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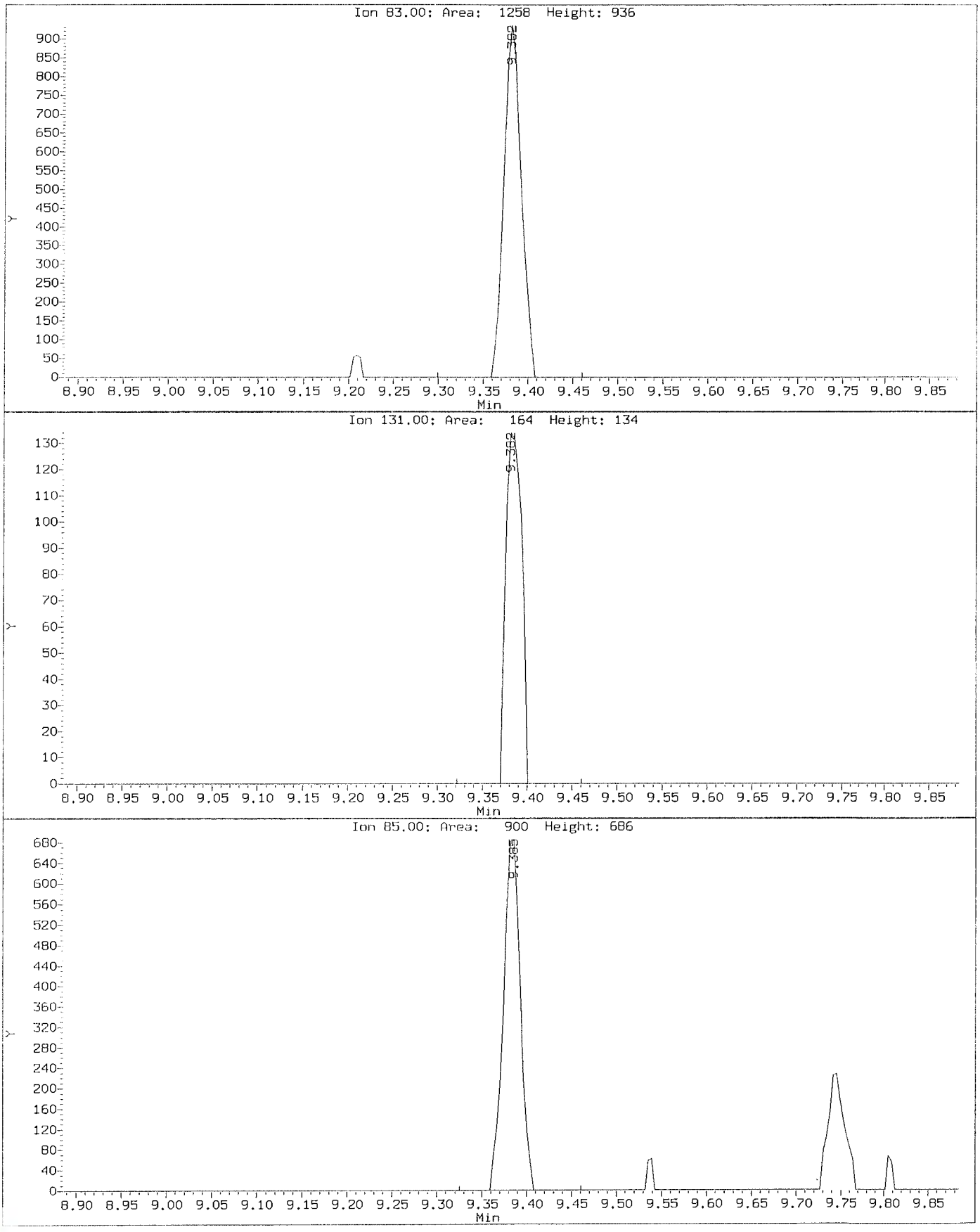
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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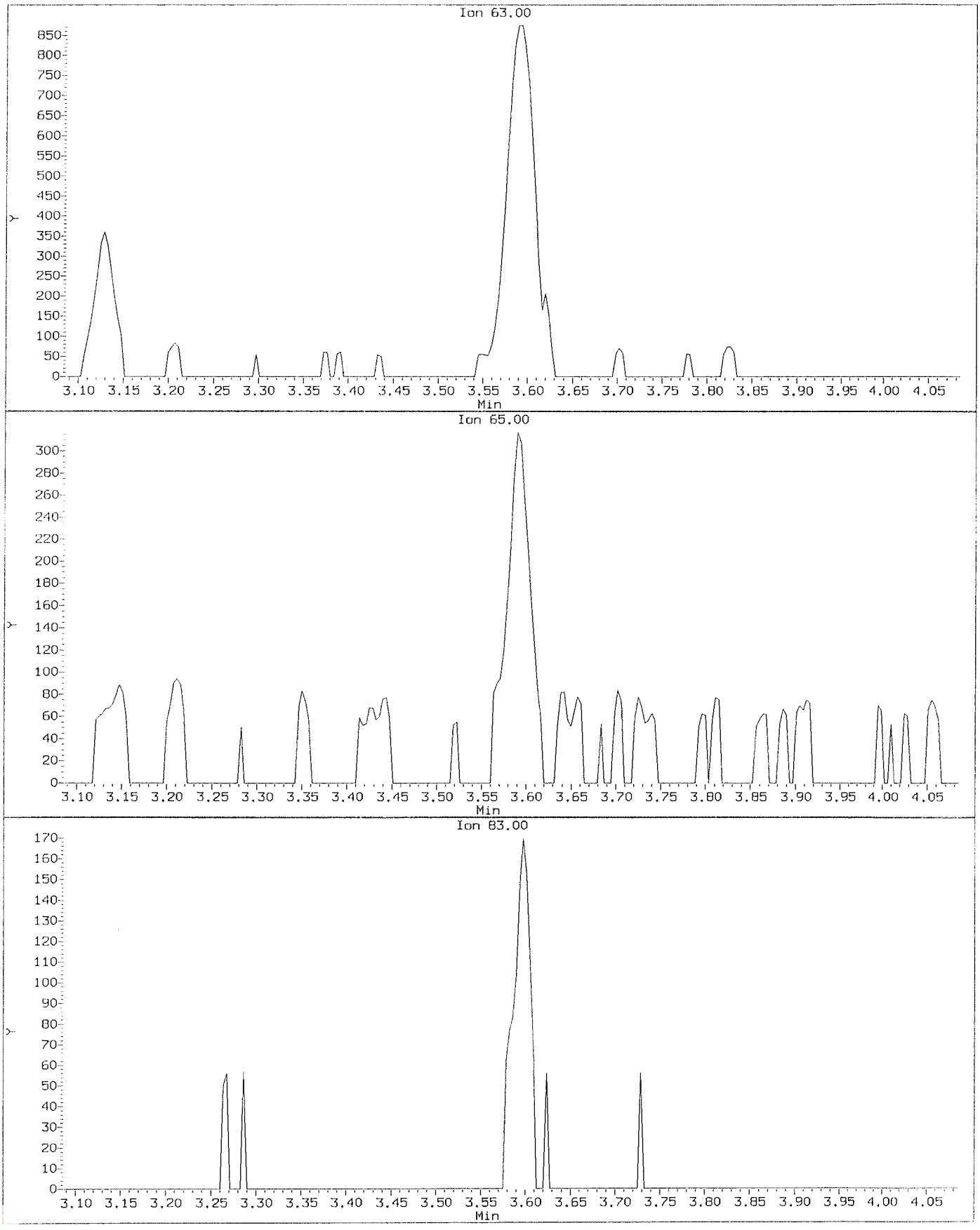
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1-Dichloroethane
CAS Number: 75-34-3



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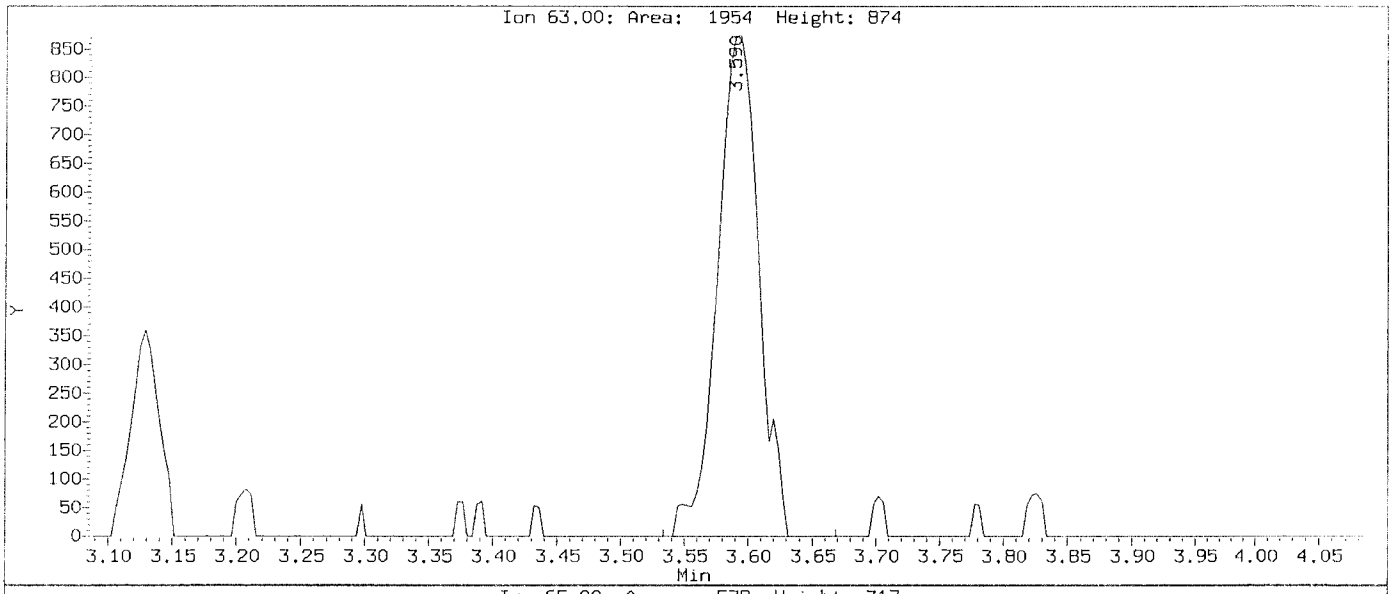
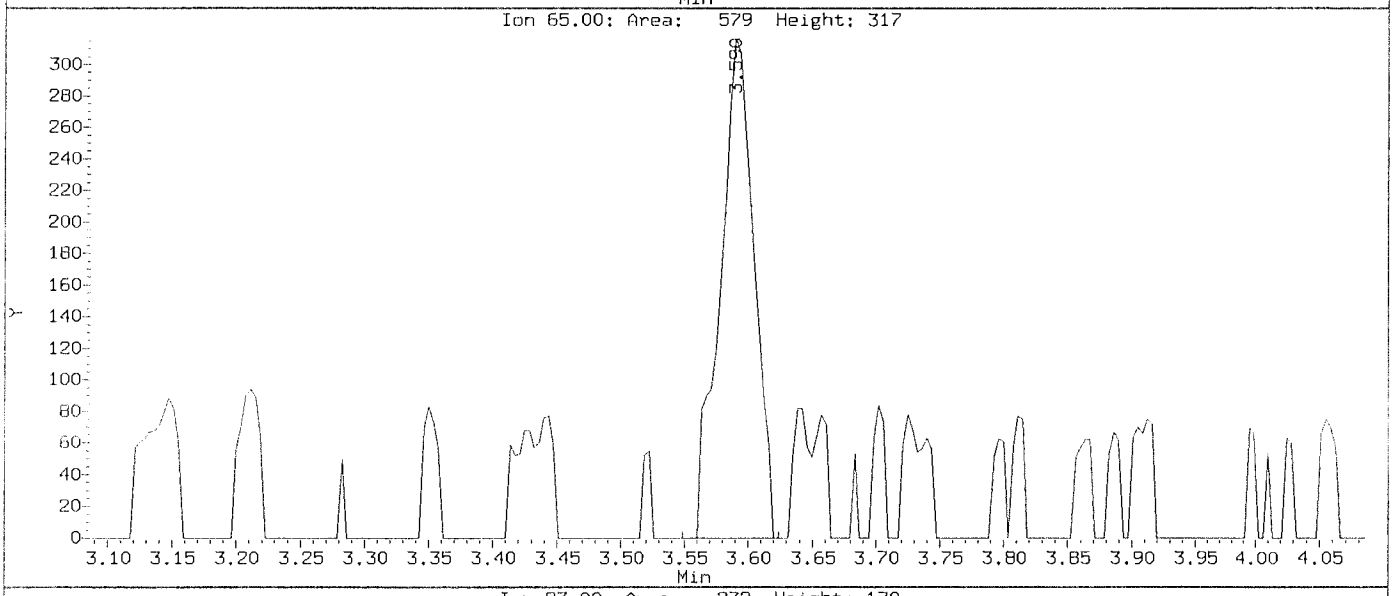
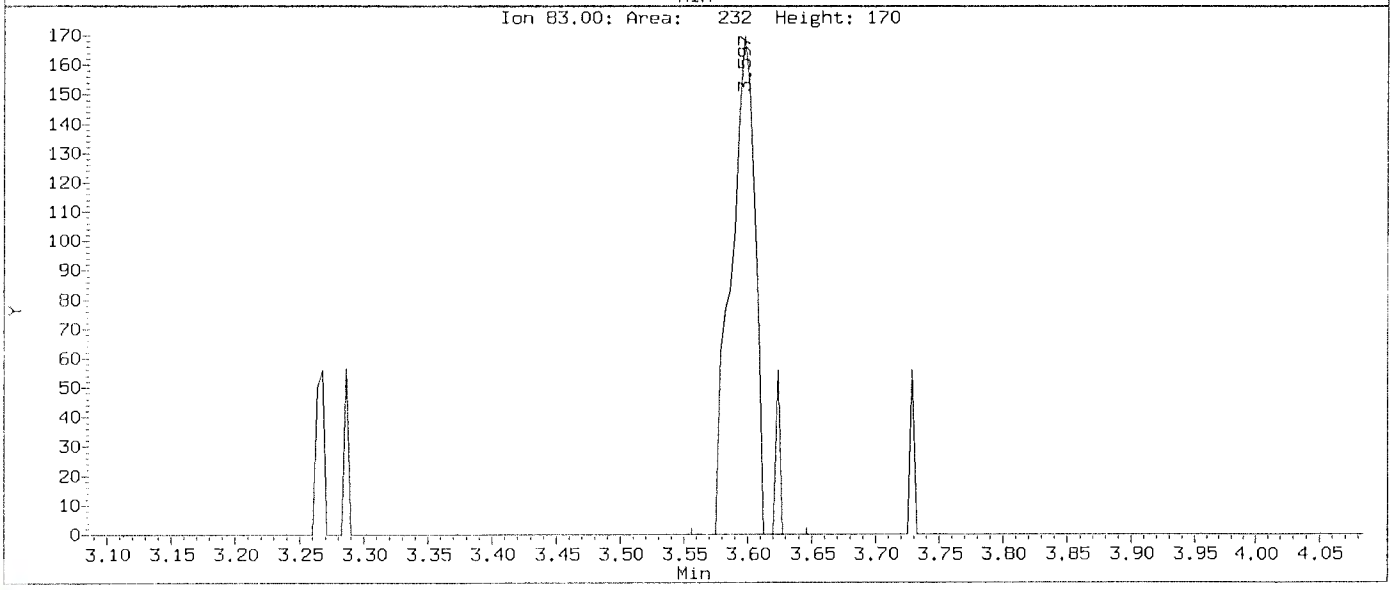
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1-Dichloroethane
CAS Number: 75-34-3







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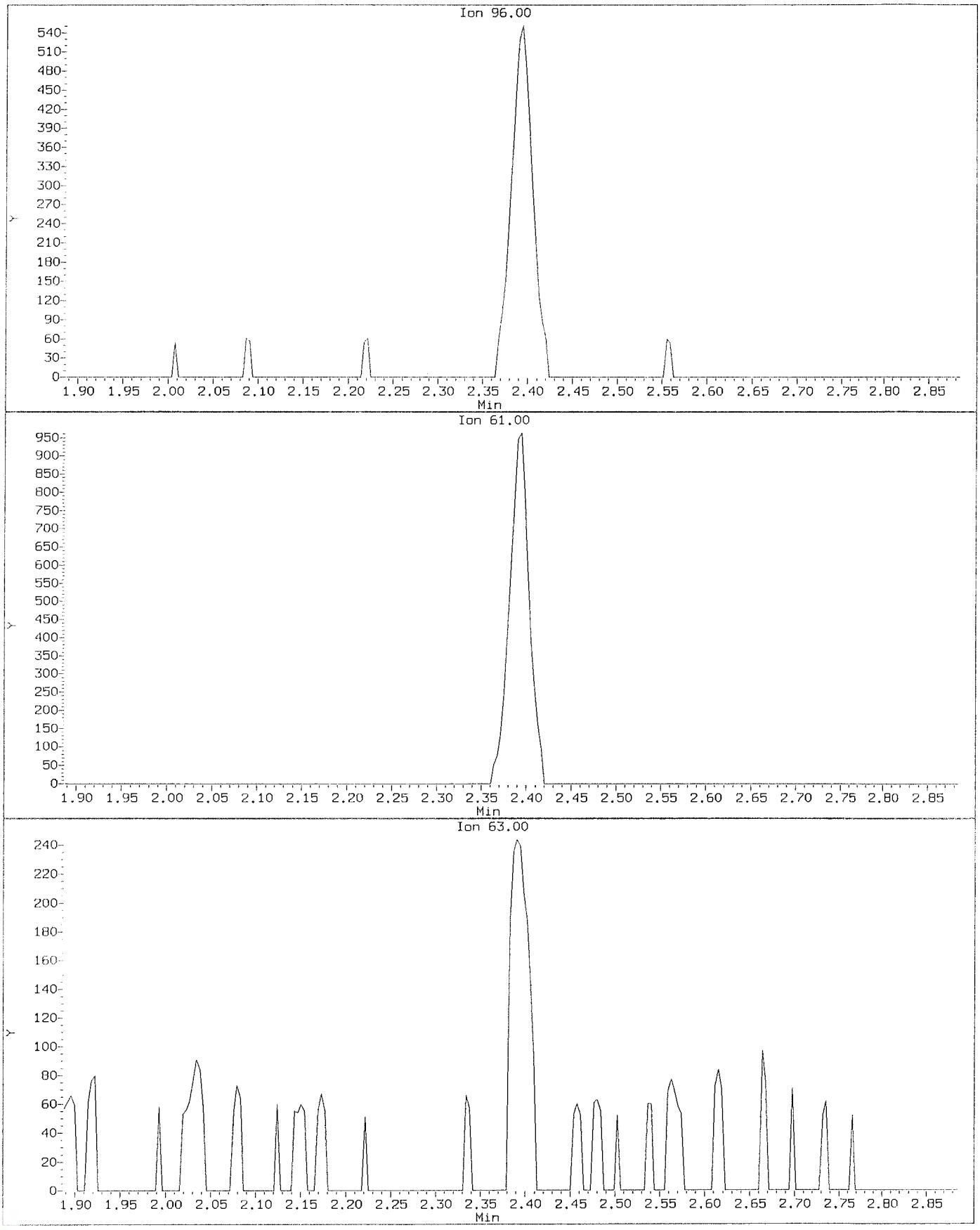
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



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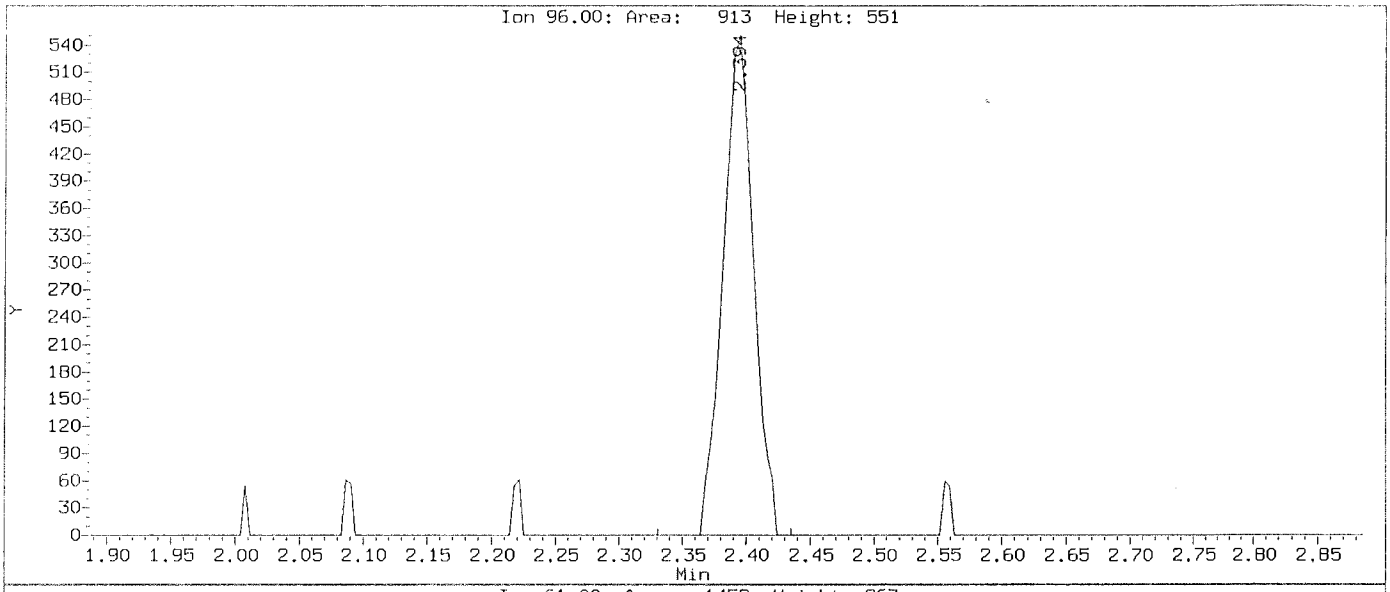
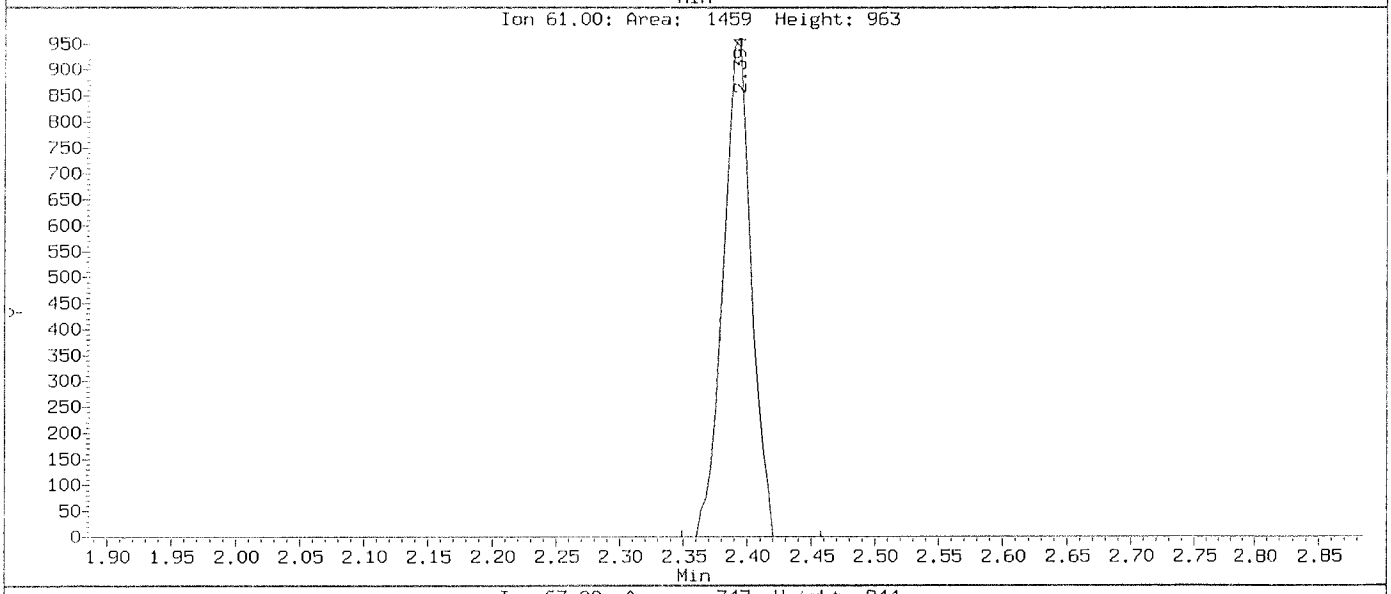
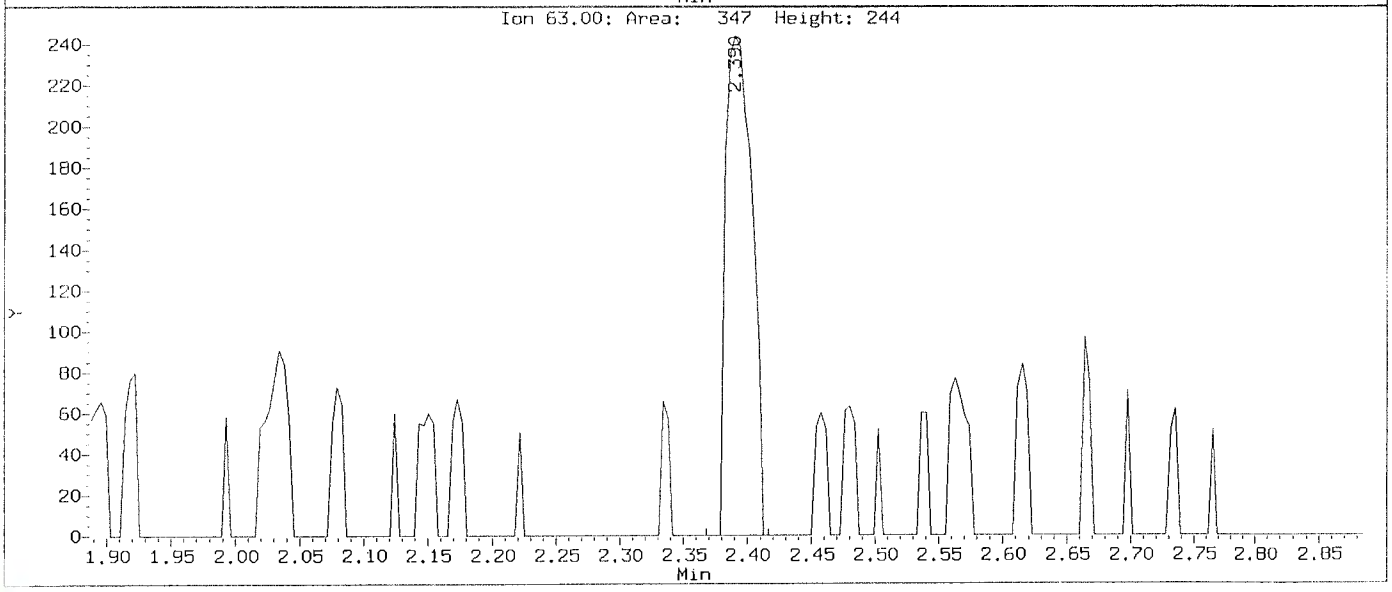
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4







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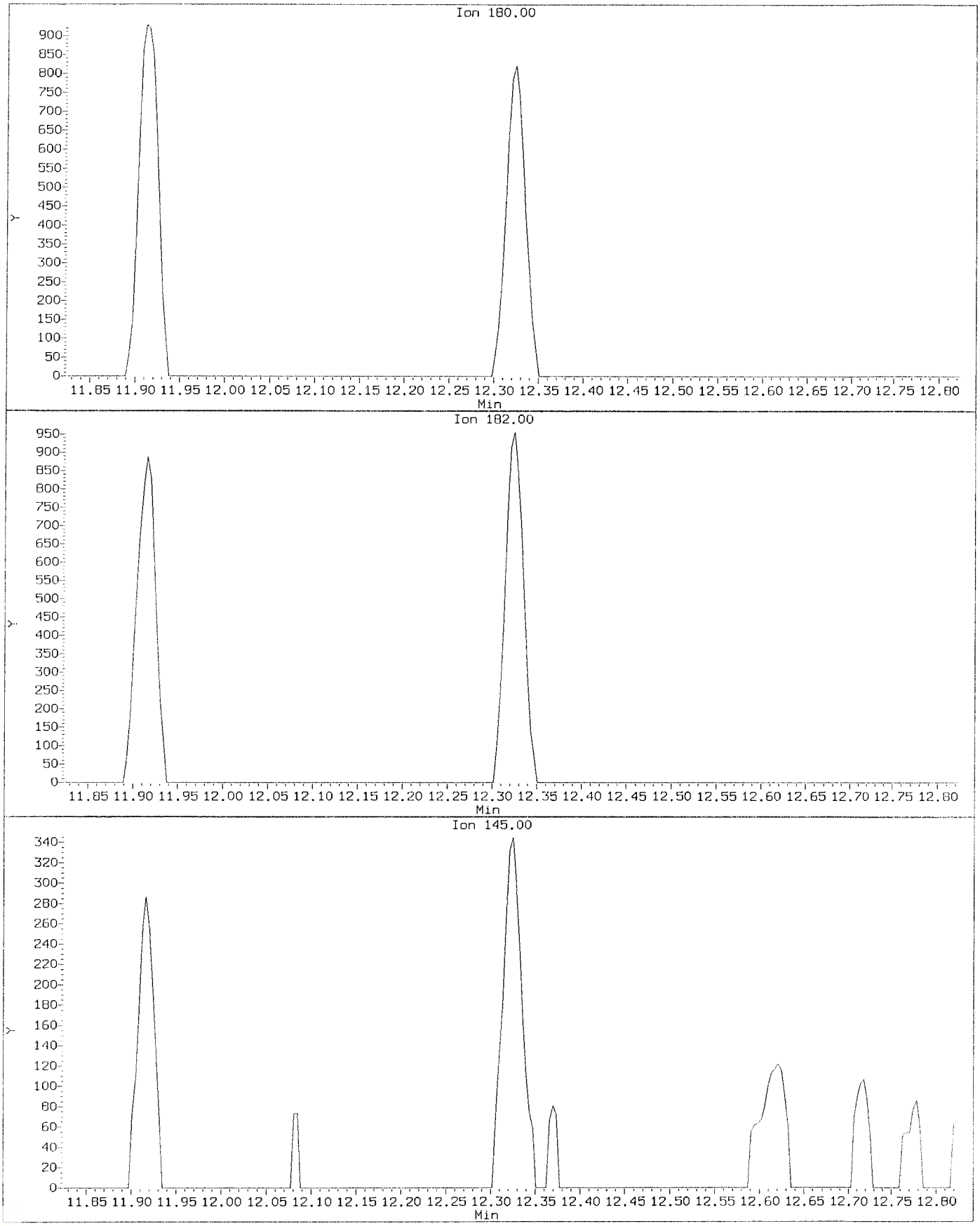
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6



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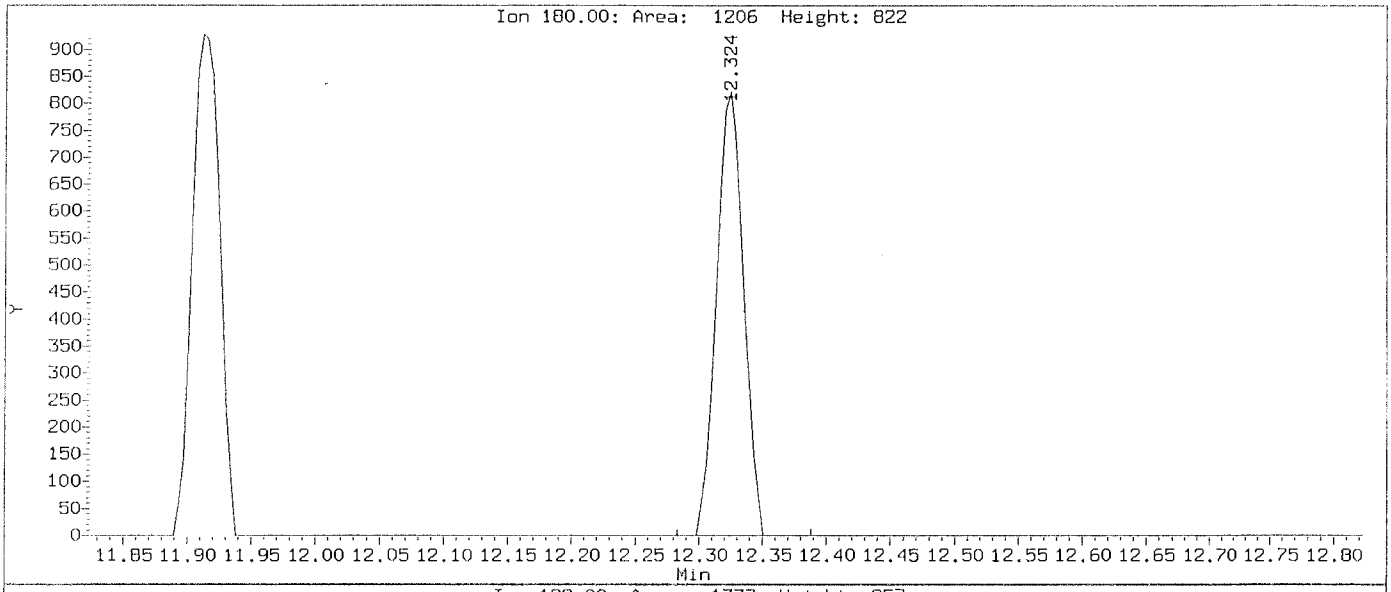
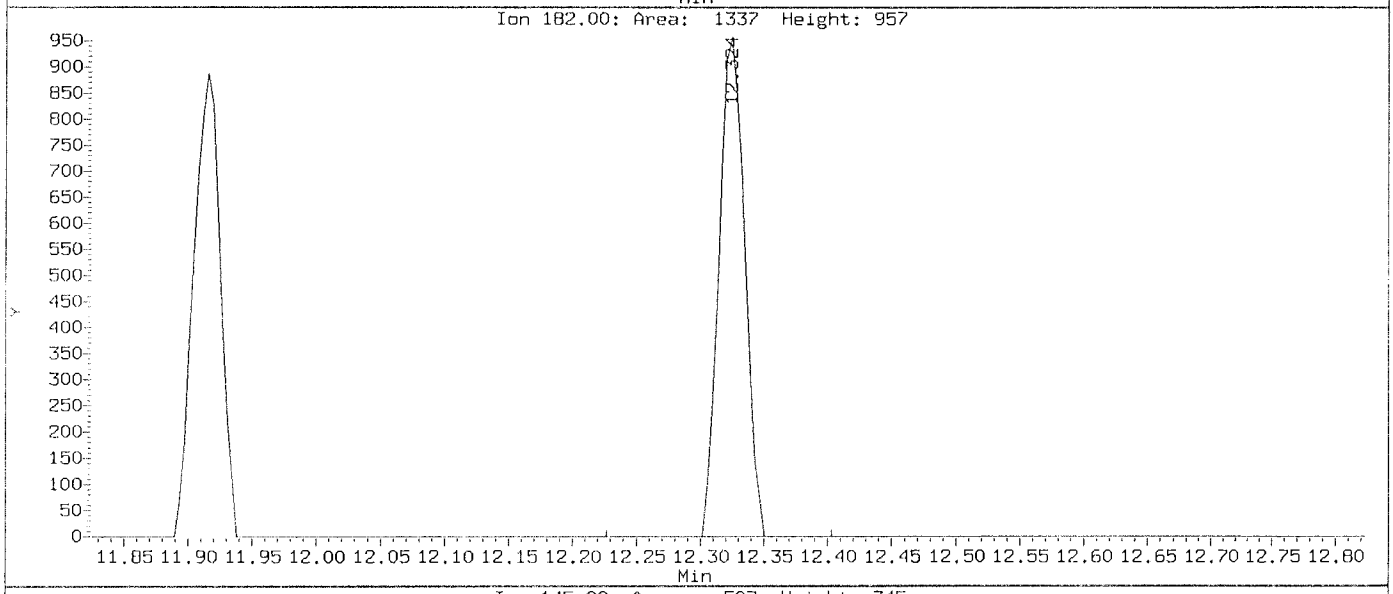
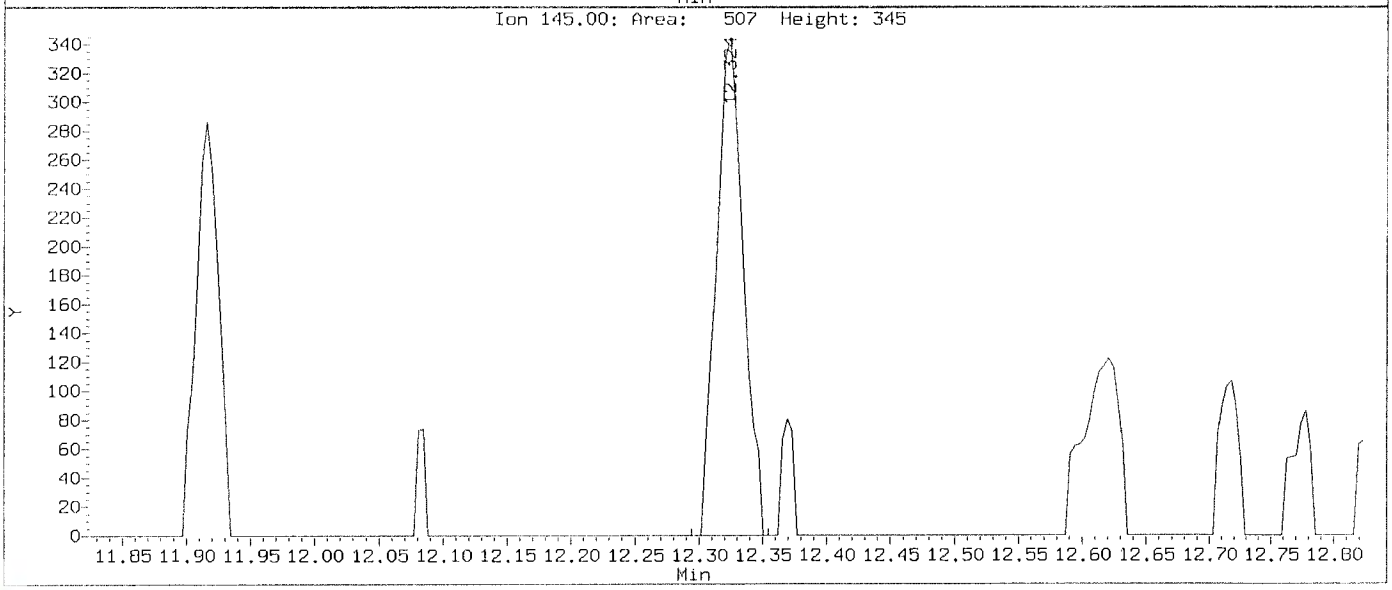
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6







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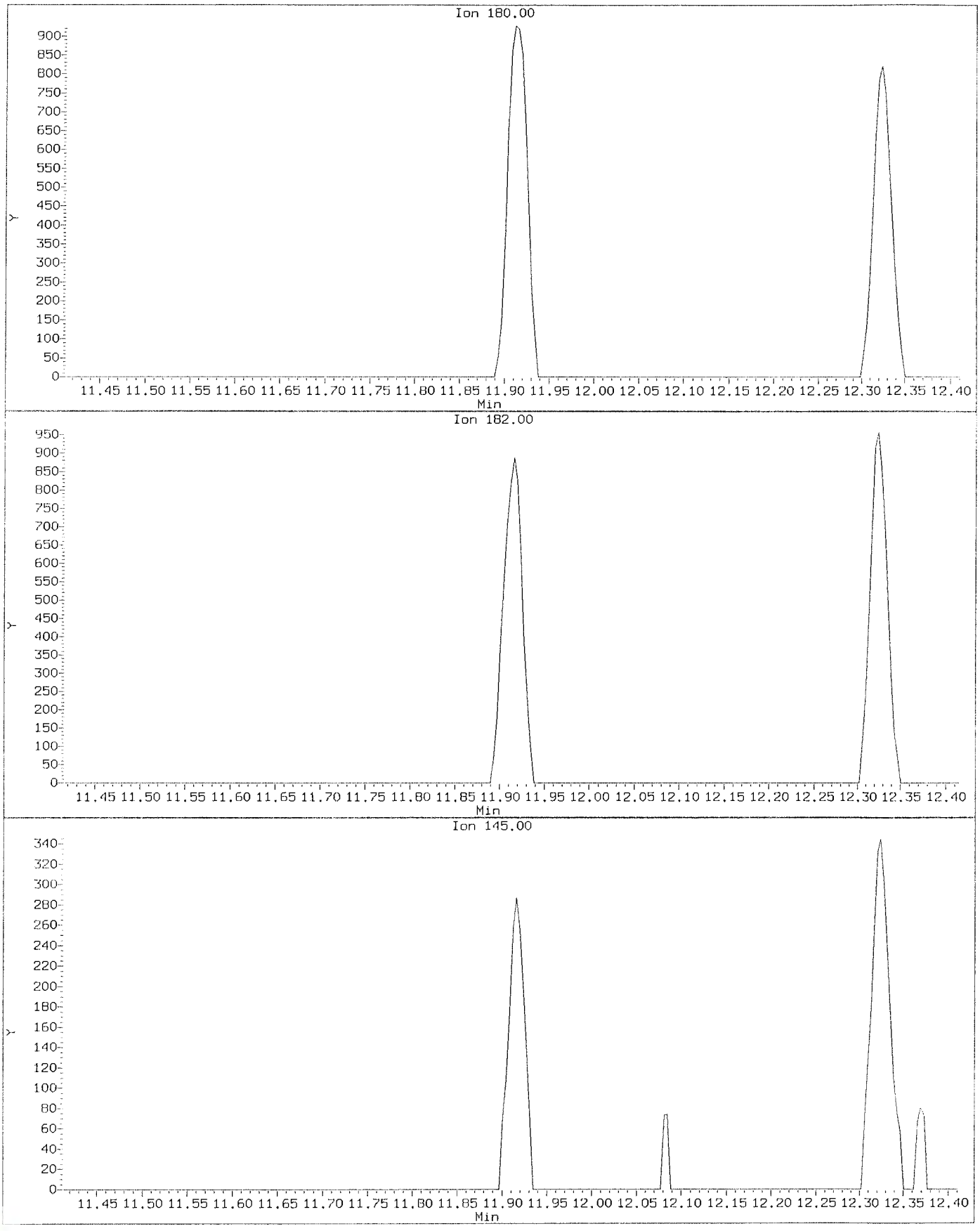
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1



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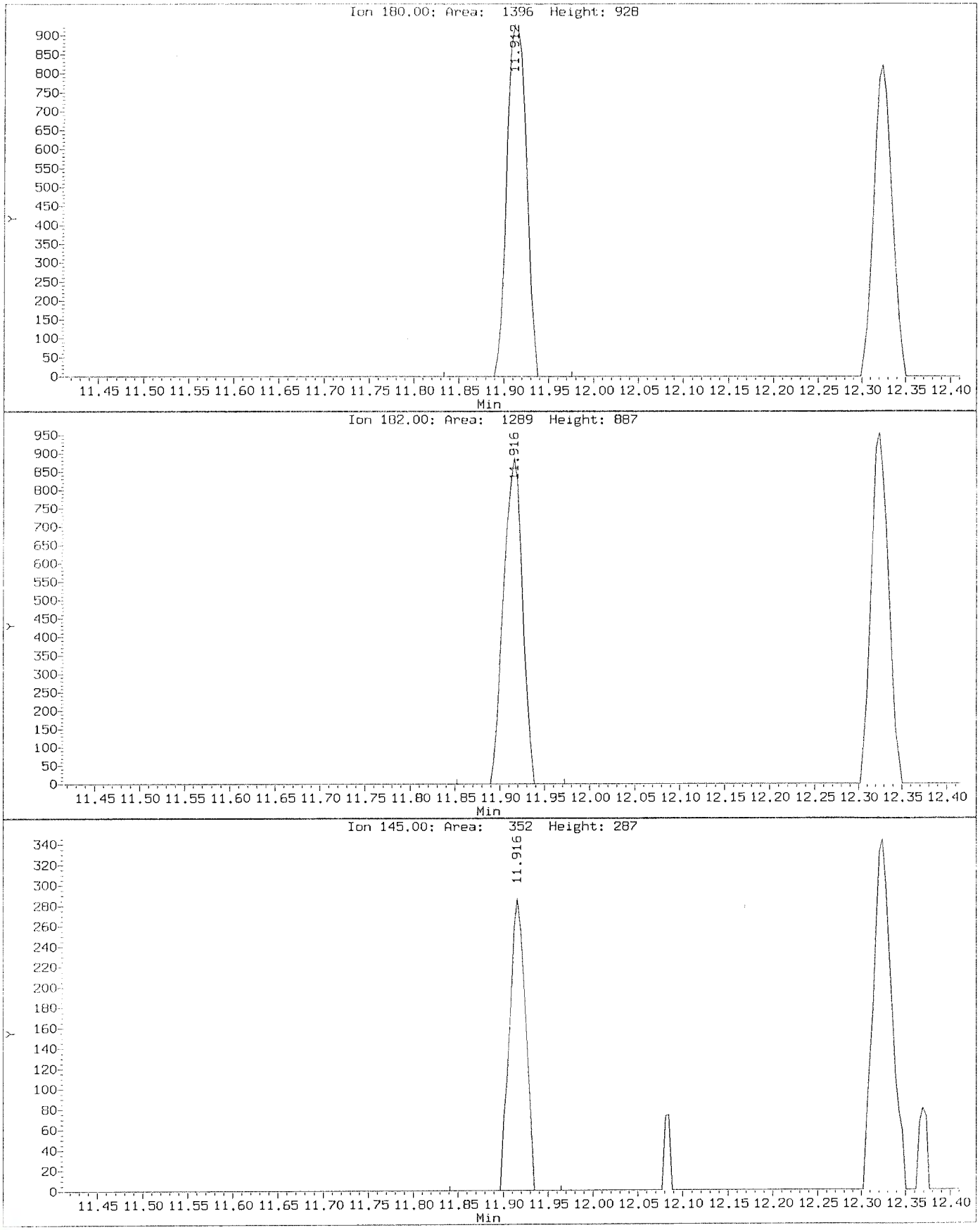
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1



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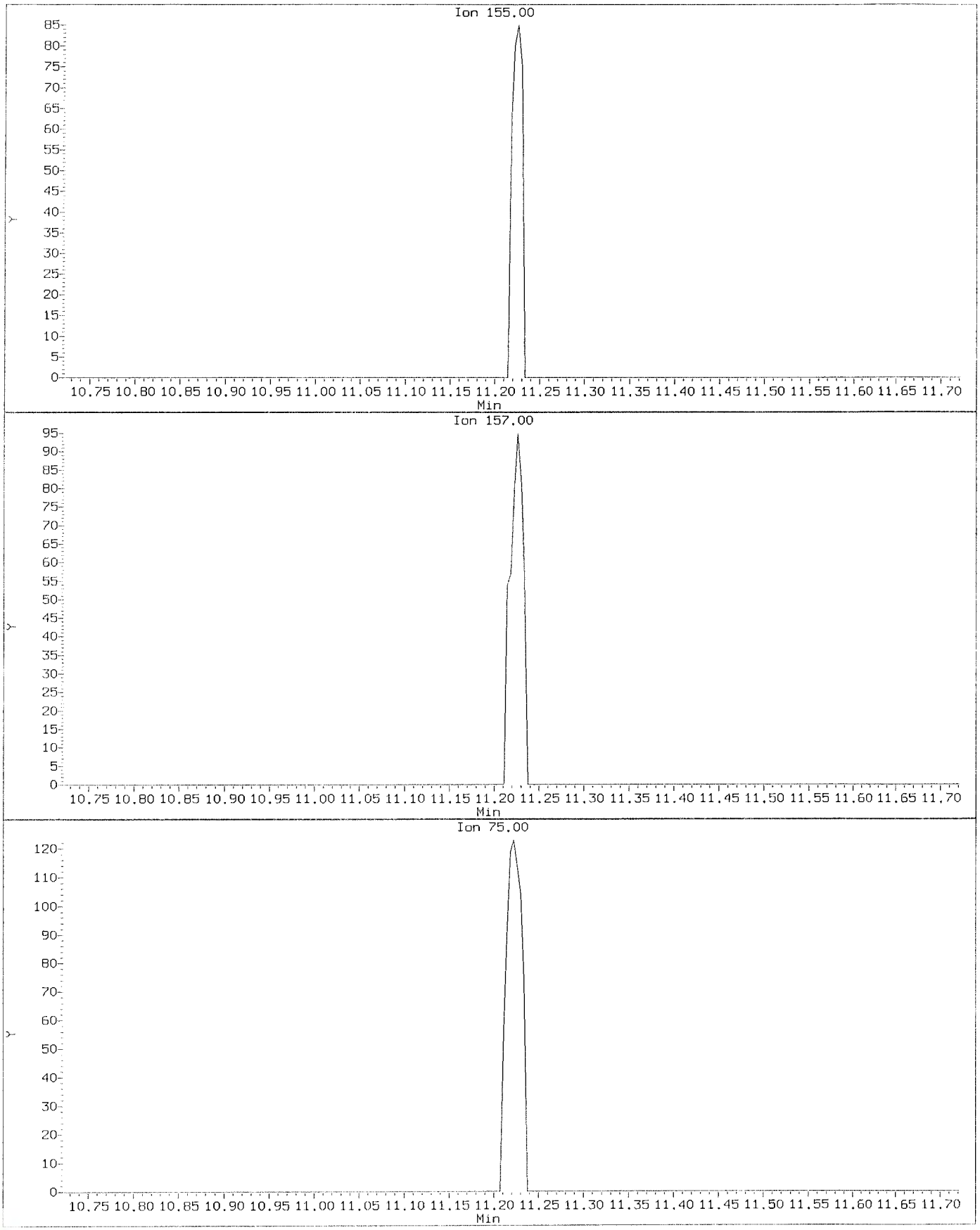
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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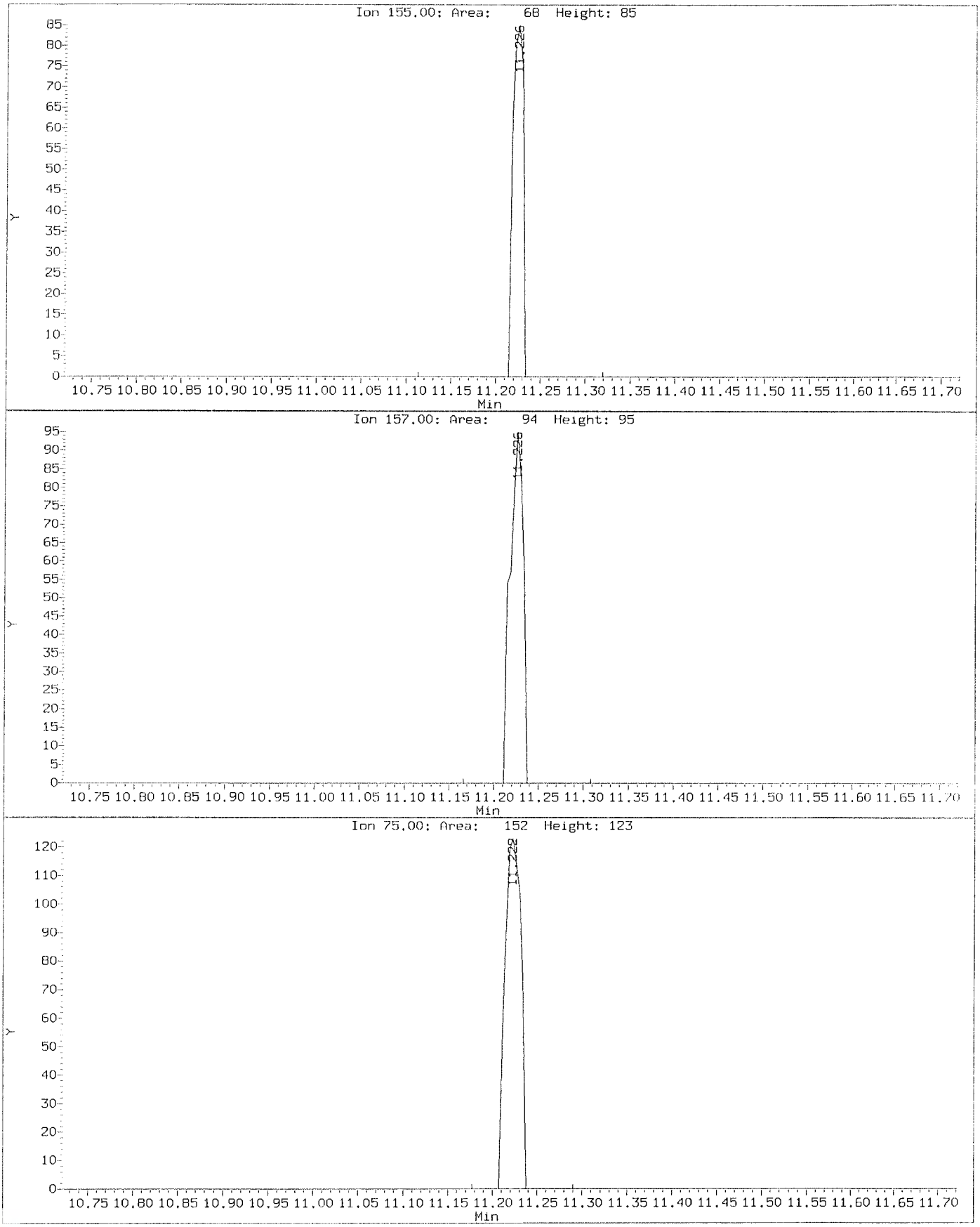
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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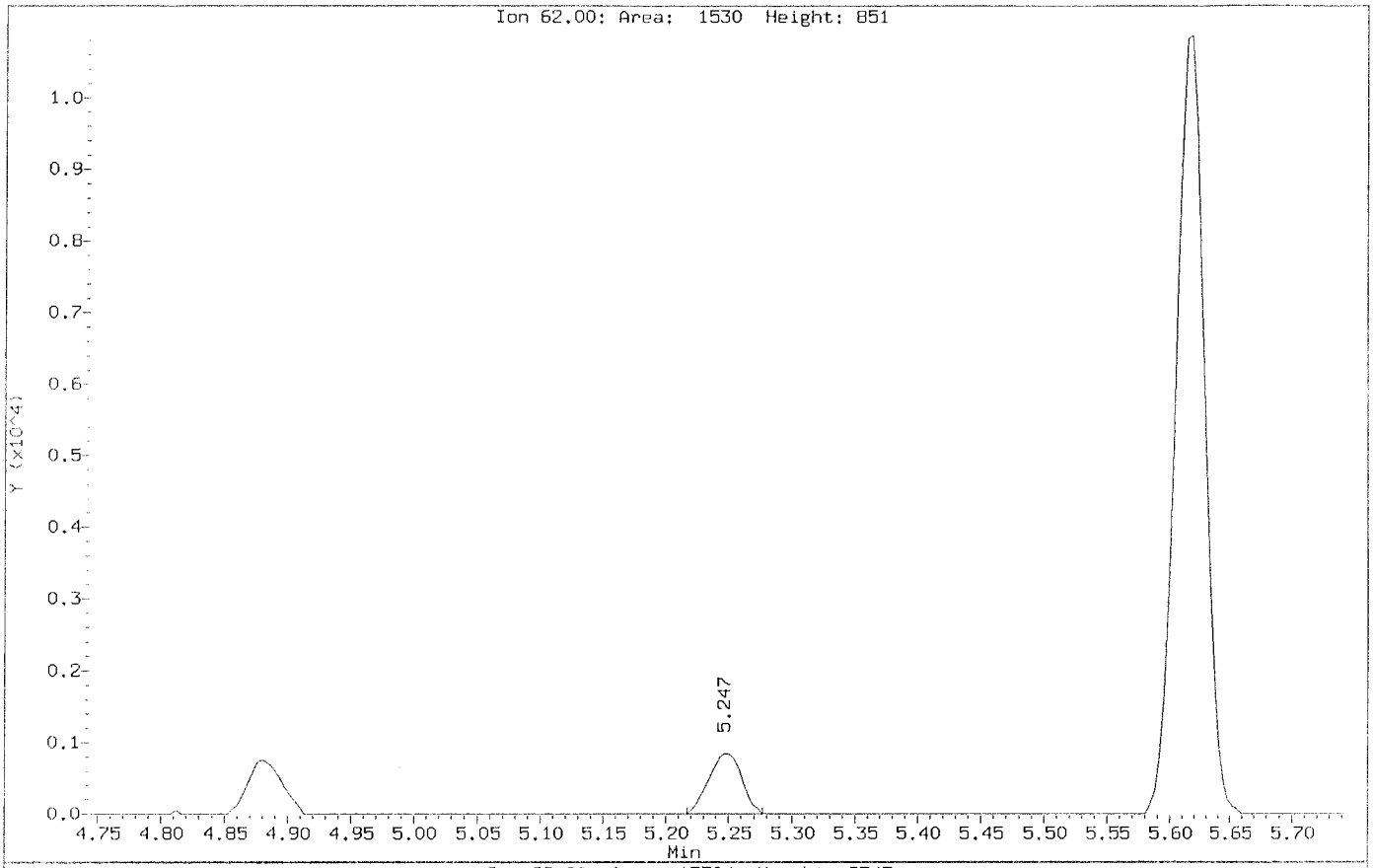
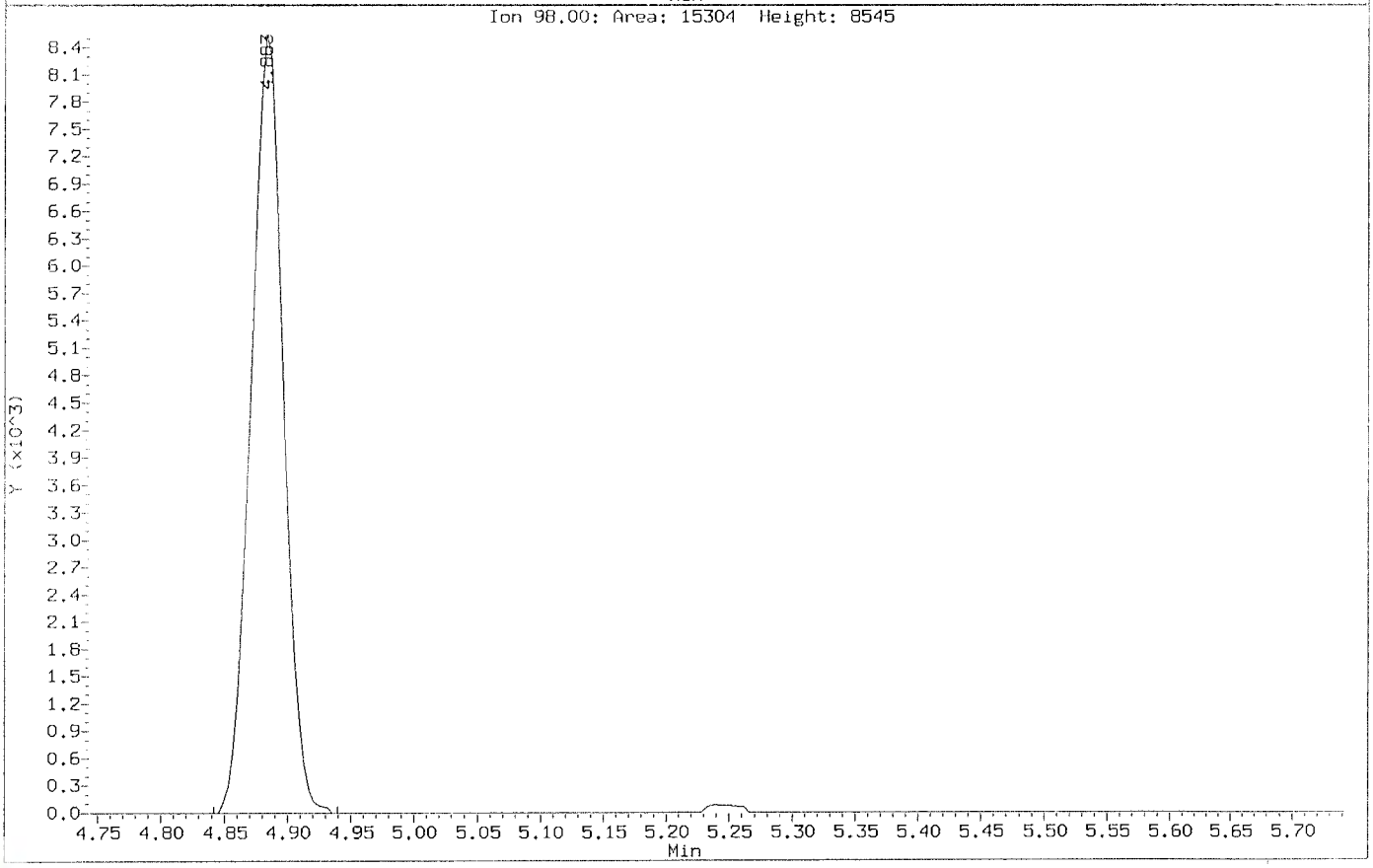
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2-Dichloroethane
CAS Number: 107-06-2





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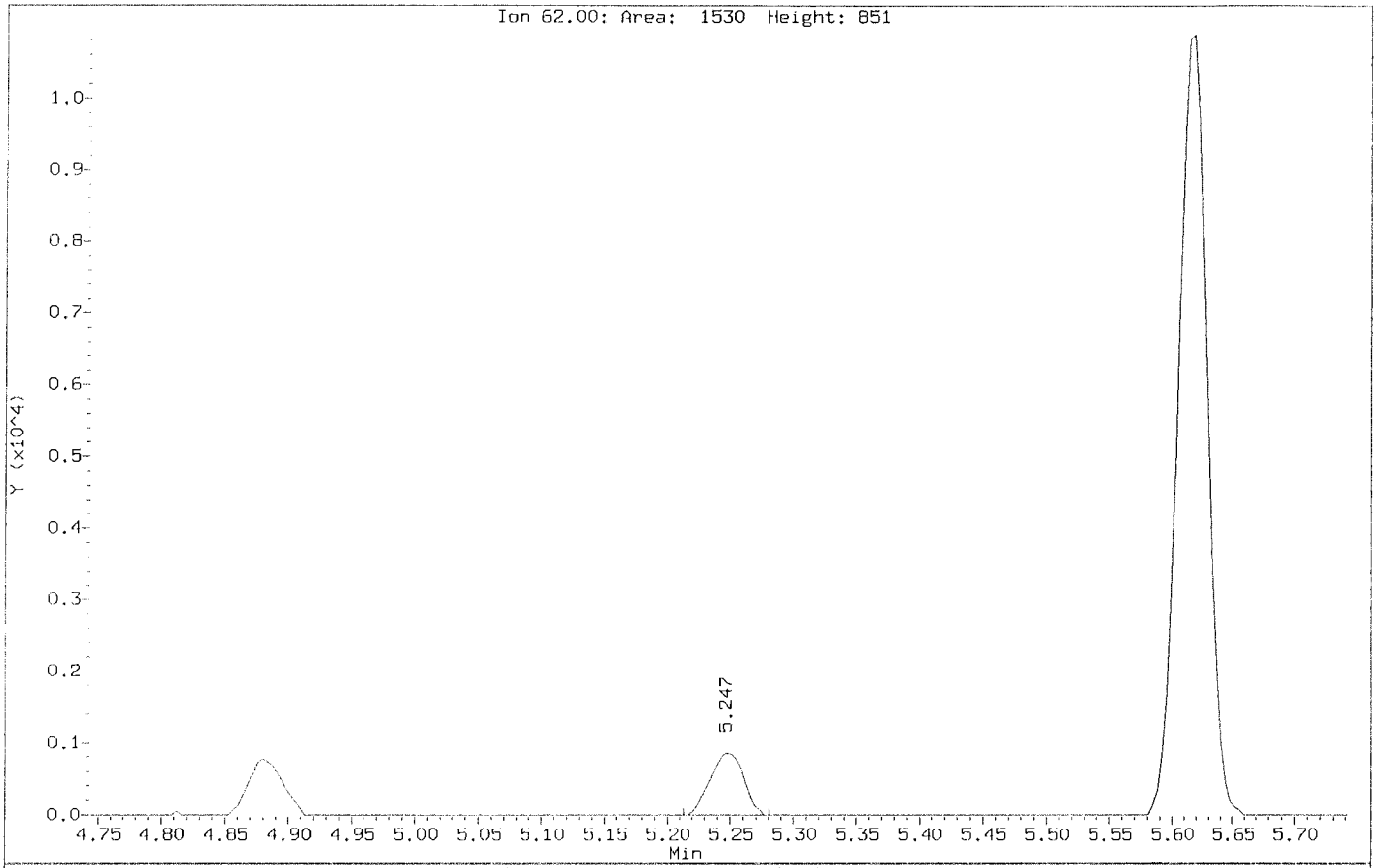
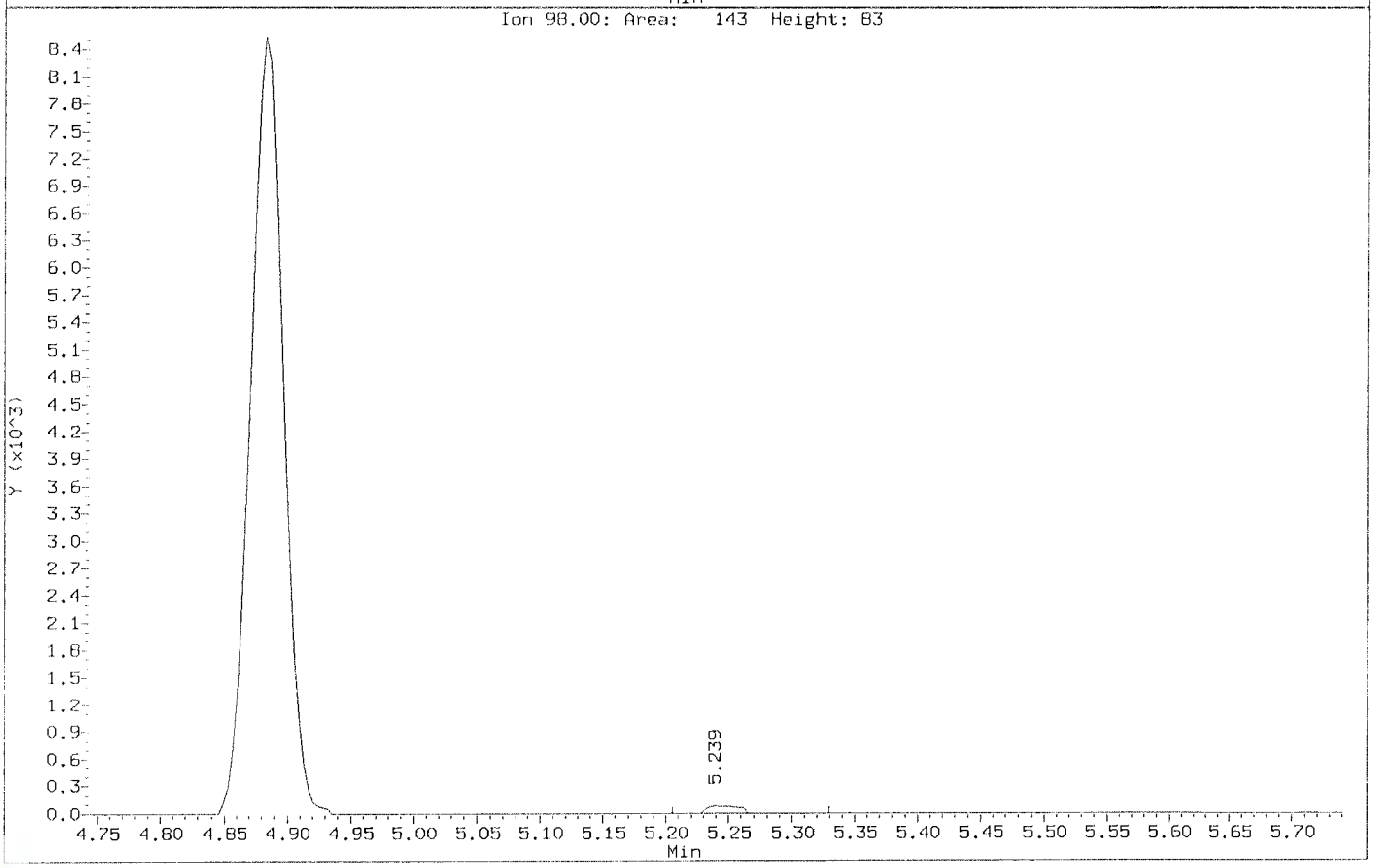
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 1,2-Dichloroethane
CAS Number: 107-06-2





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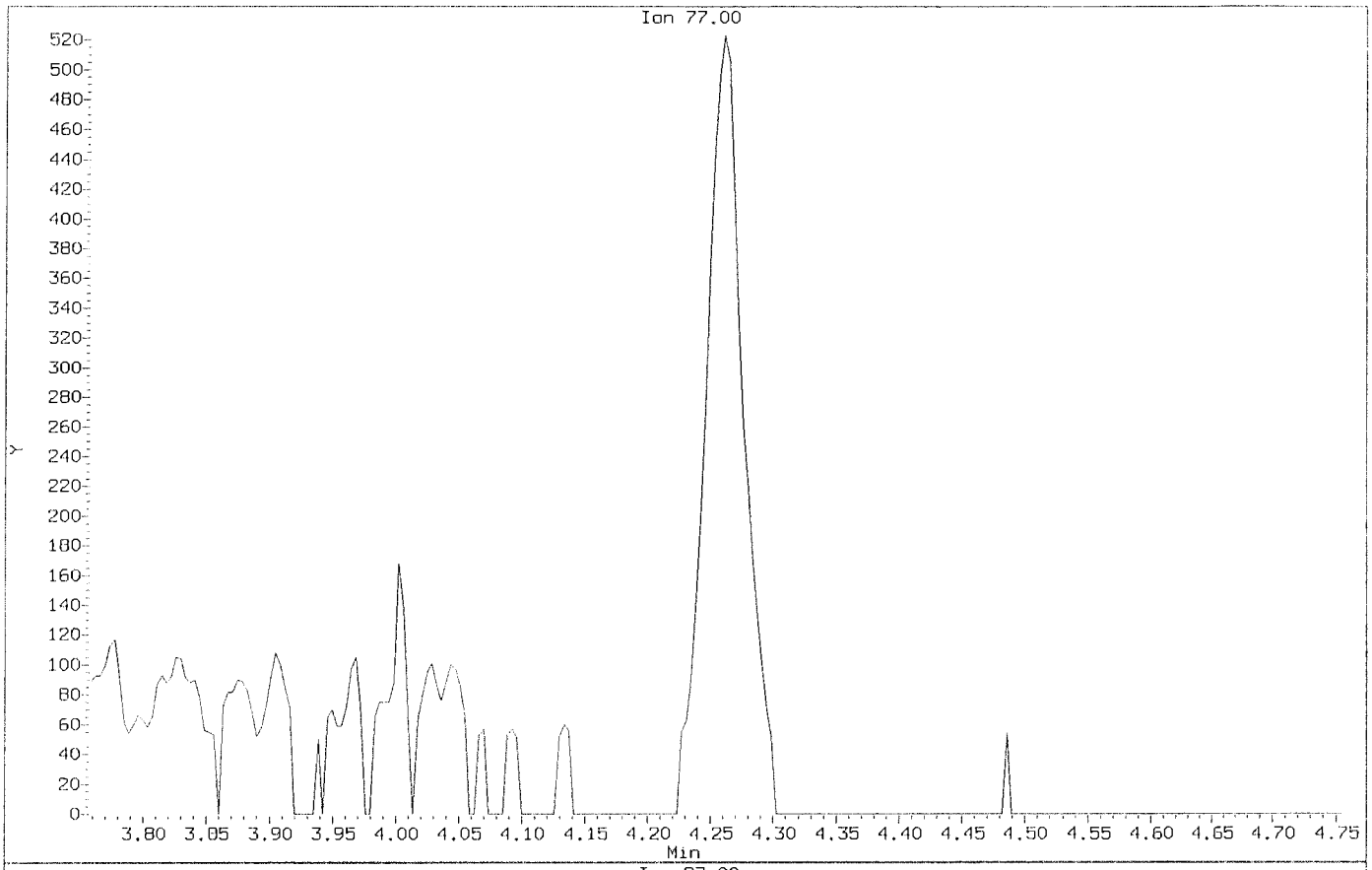
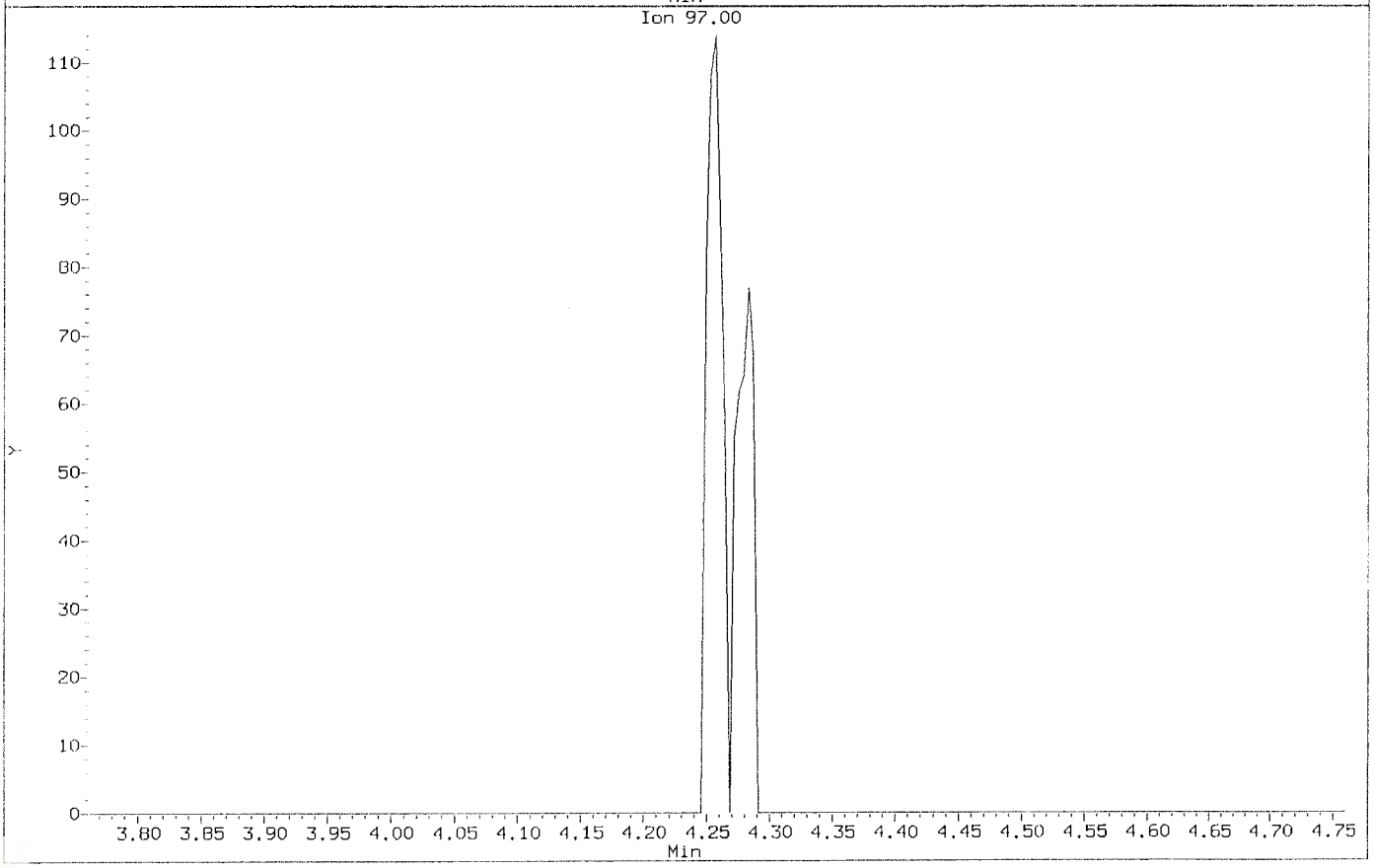
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





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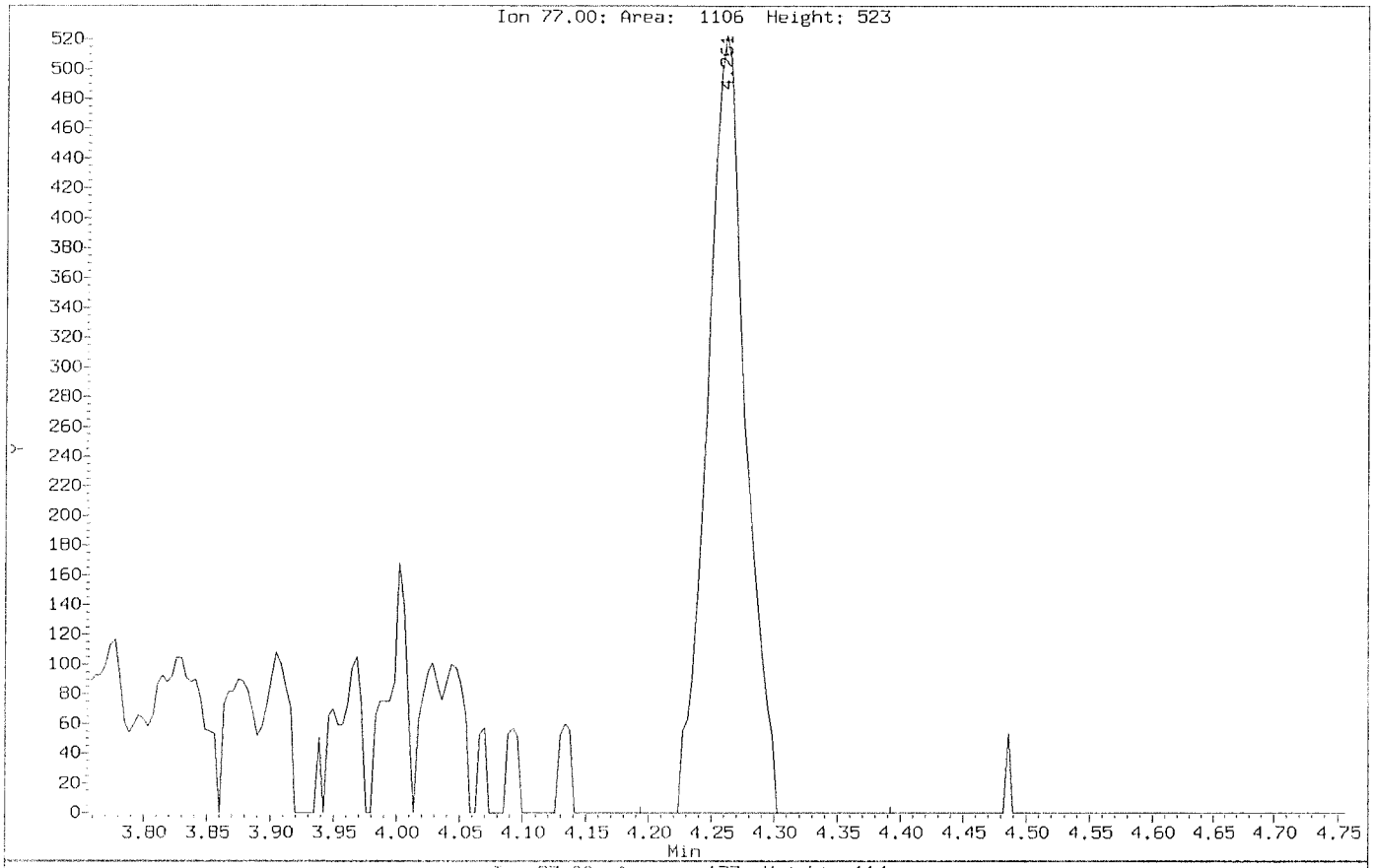
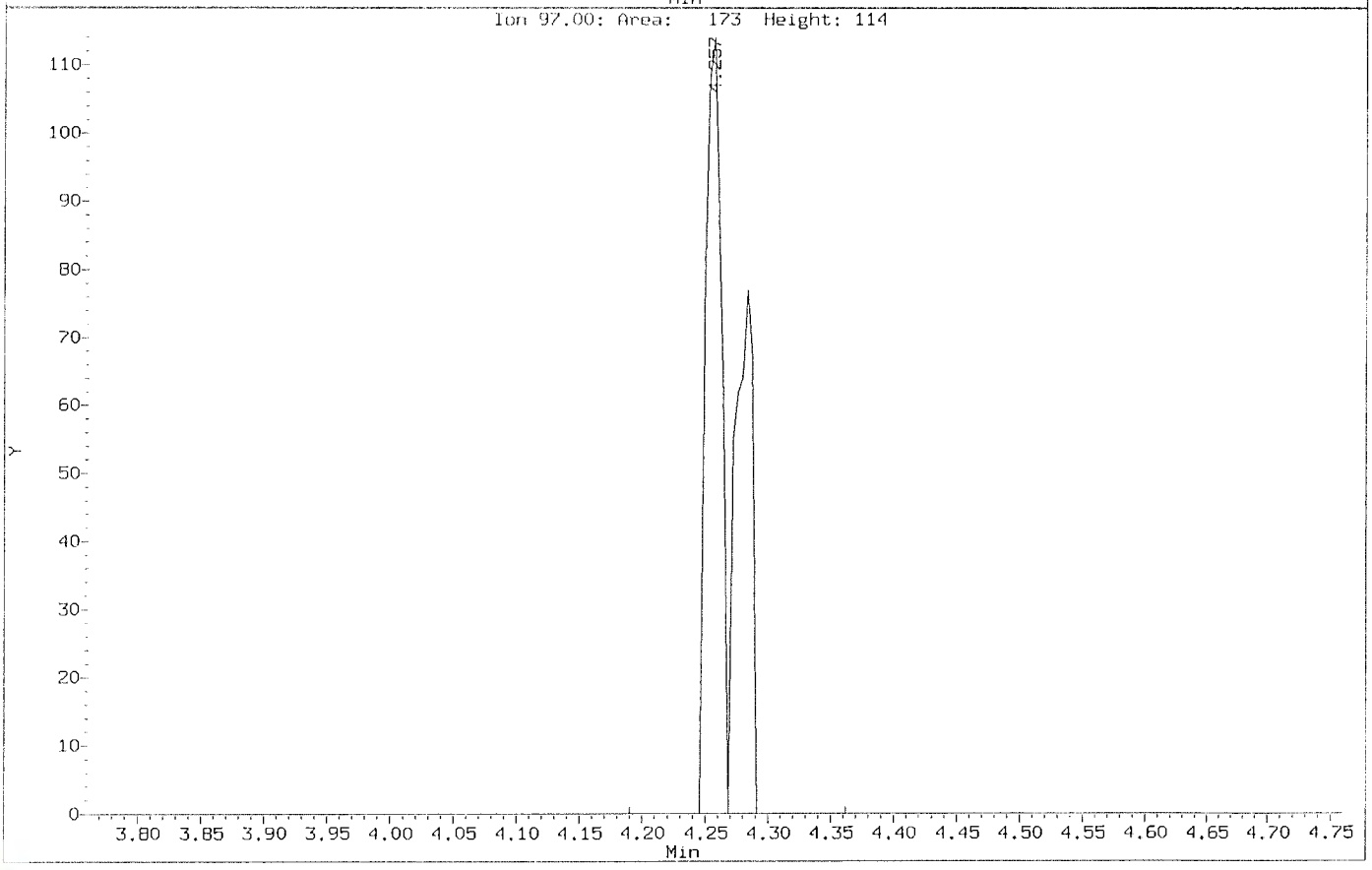
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





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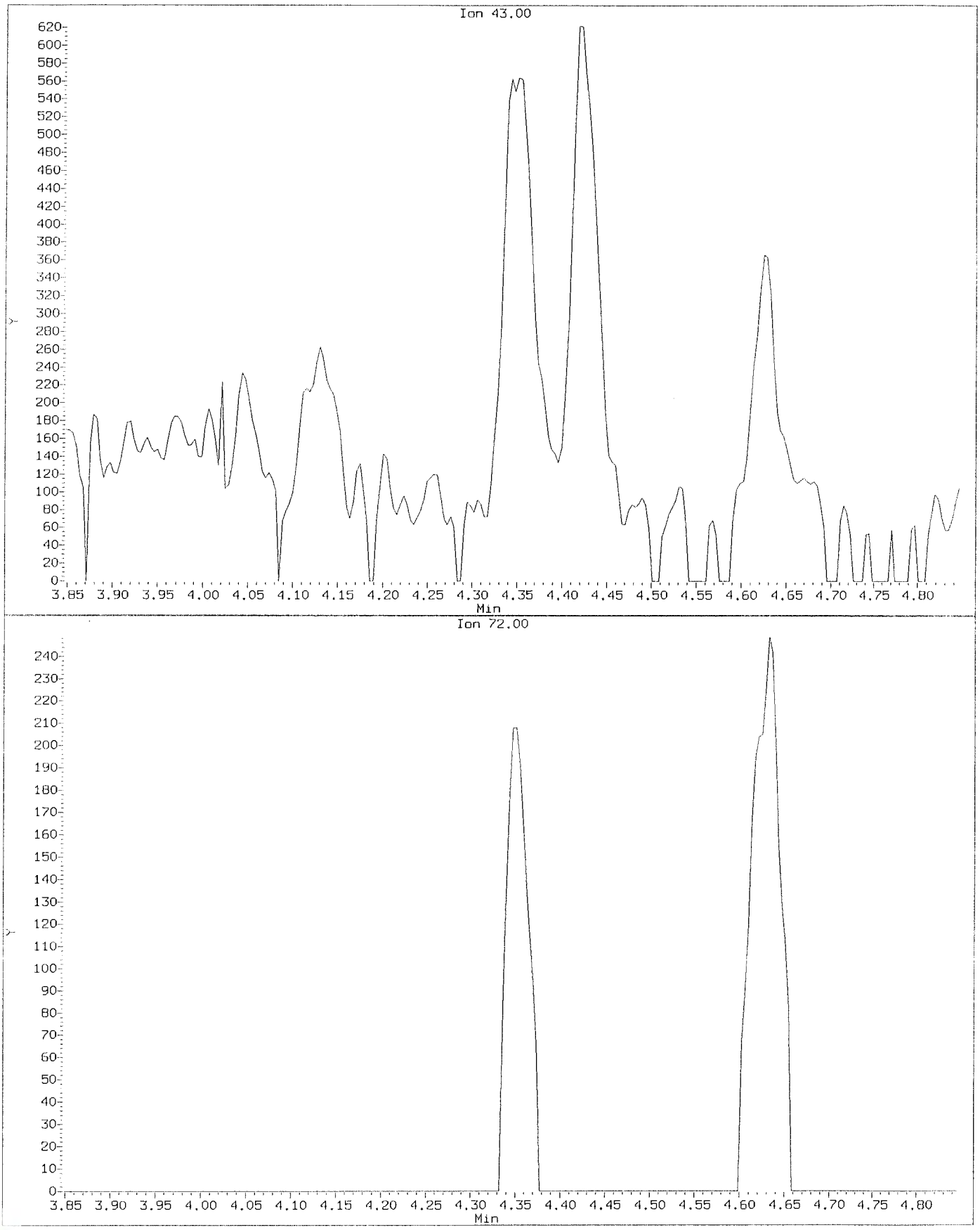
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 2-Butanone
CAS Number: 78-93-3



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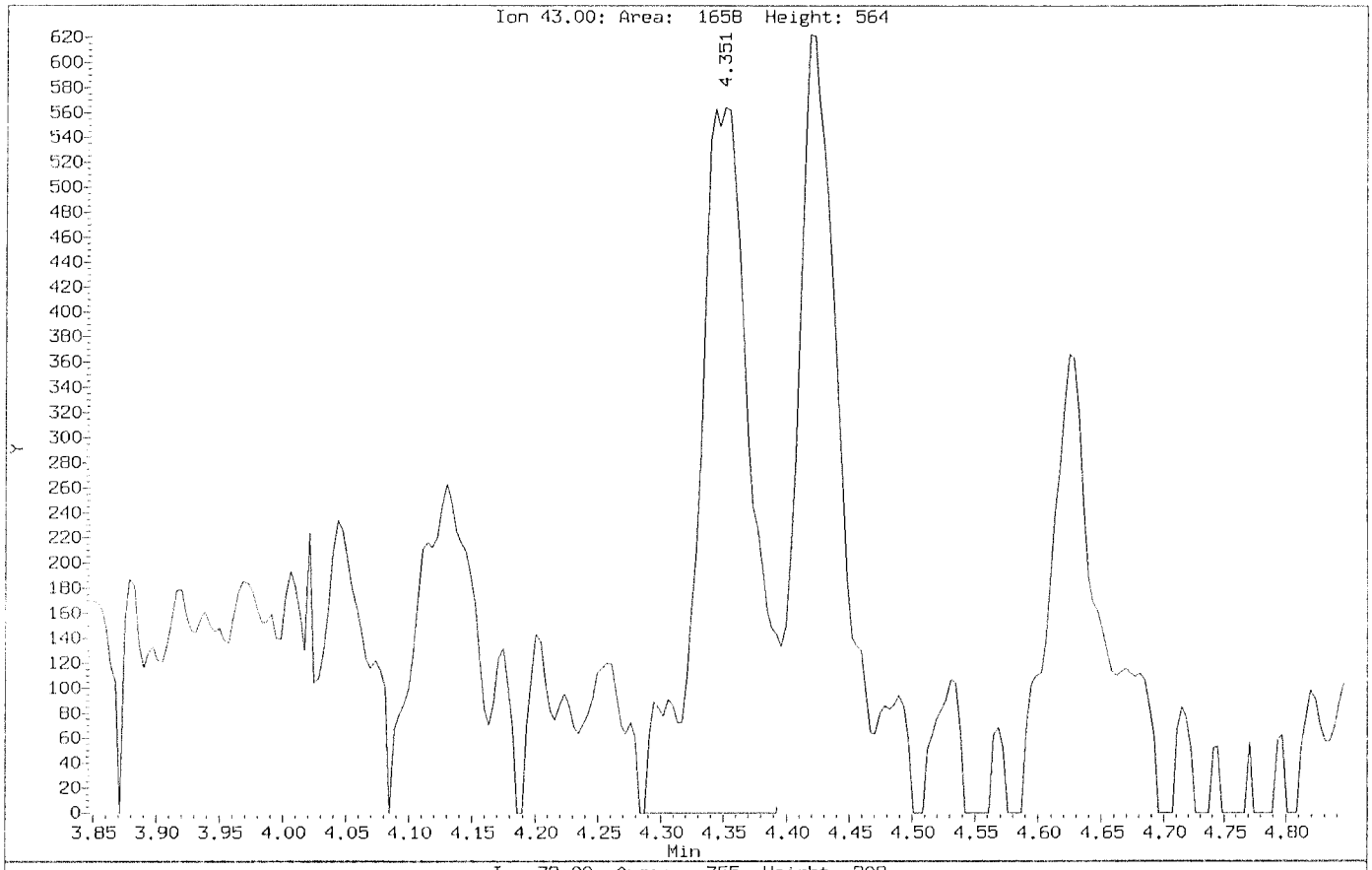
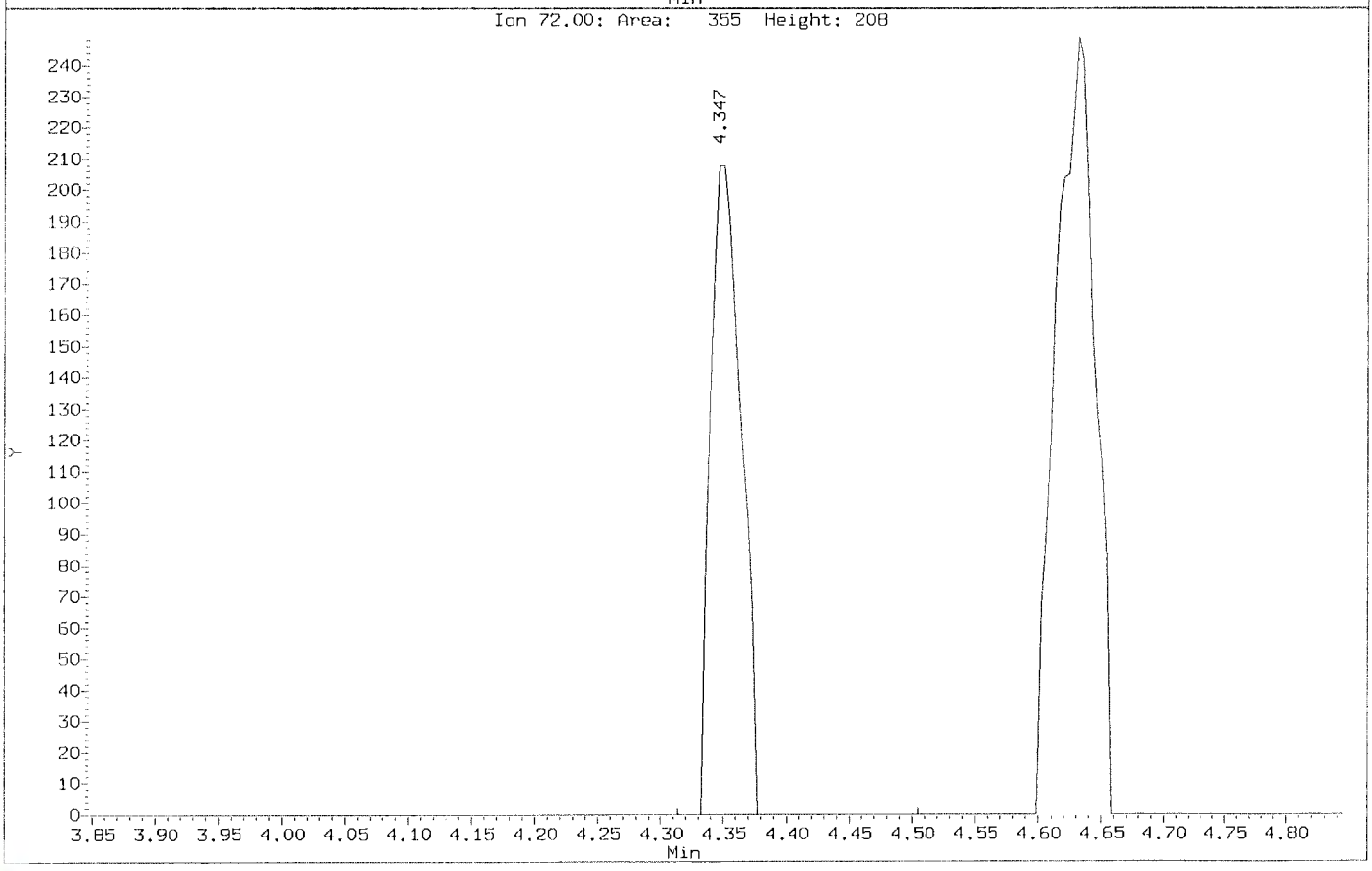
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: 2-Butanone
CAS Number: 78-93-3





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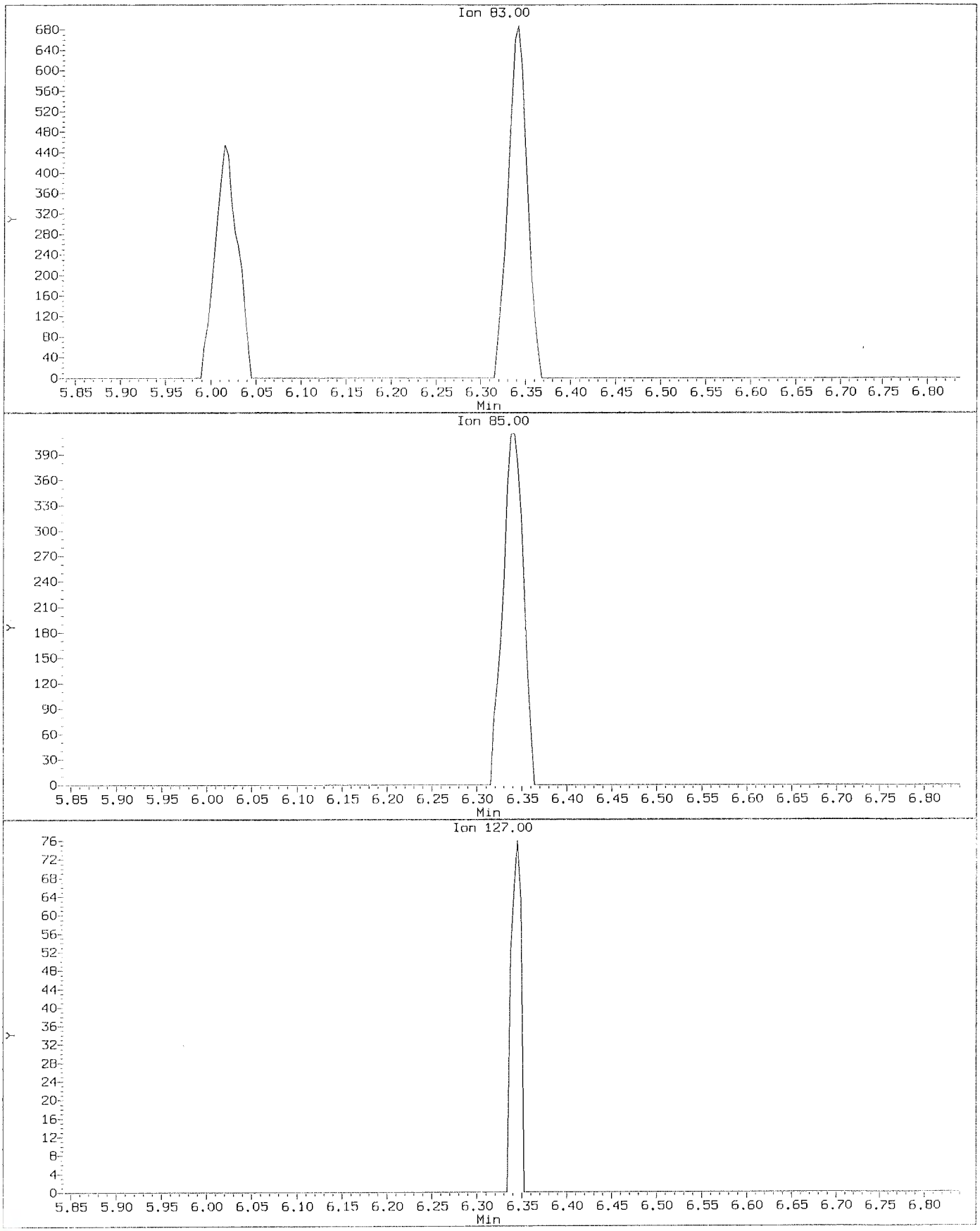
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Bromodichloromethane
CAS Number: 75-27-4



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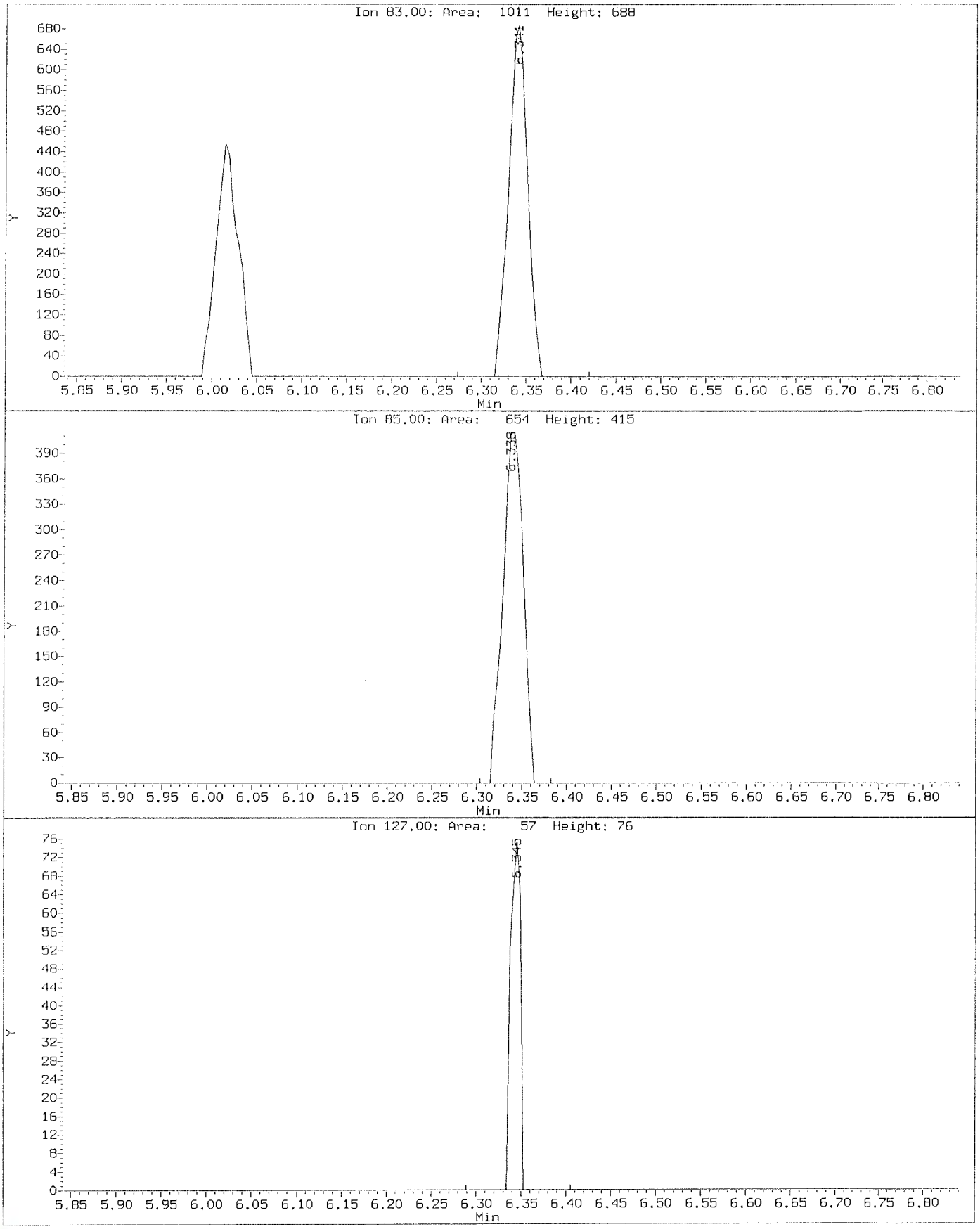
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Bromodichloromethane
CAS Number: 75-27-4



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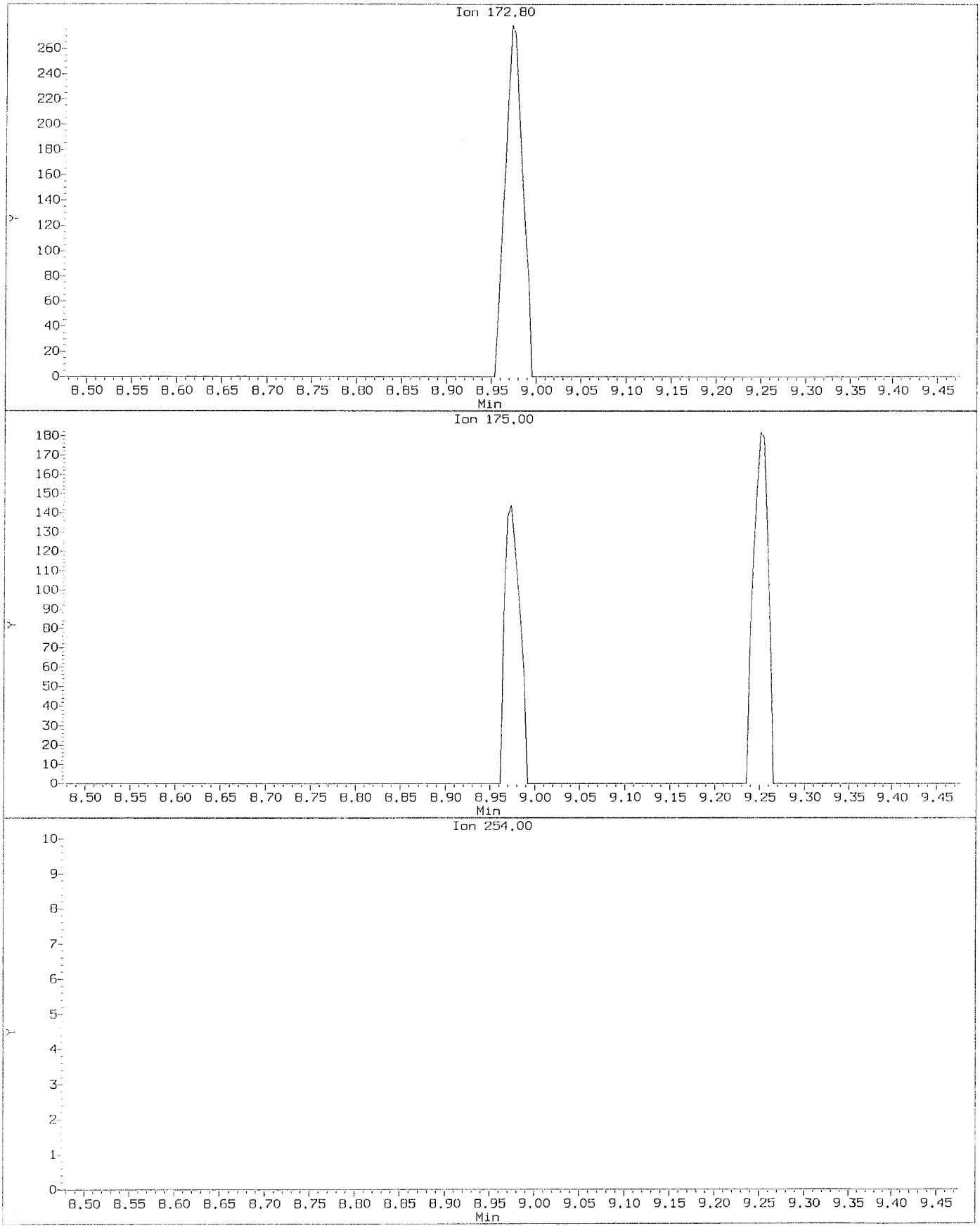
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Bromoform
CAS Number: 75-25-2



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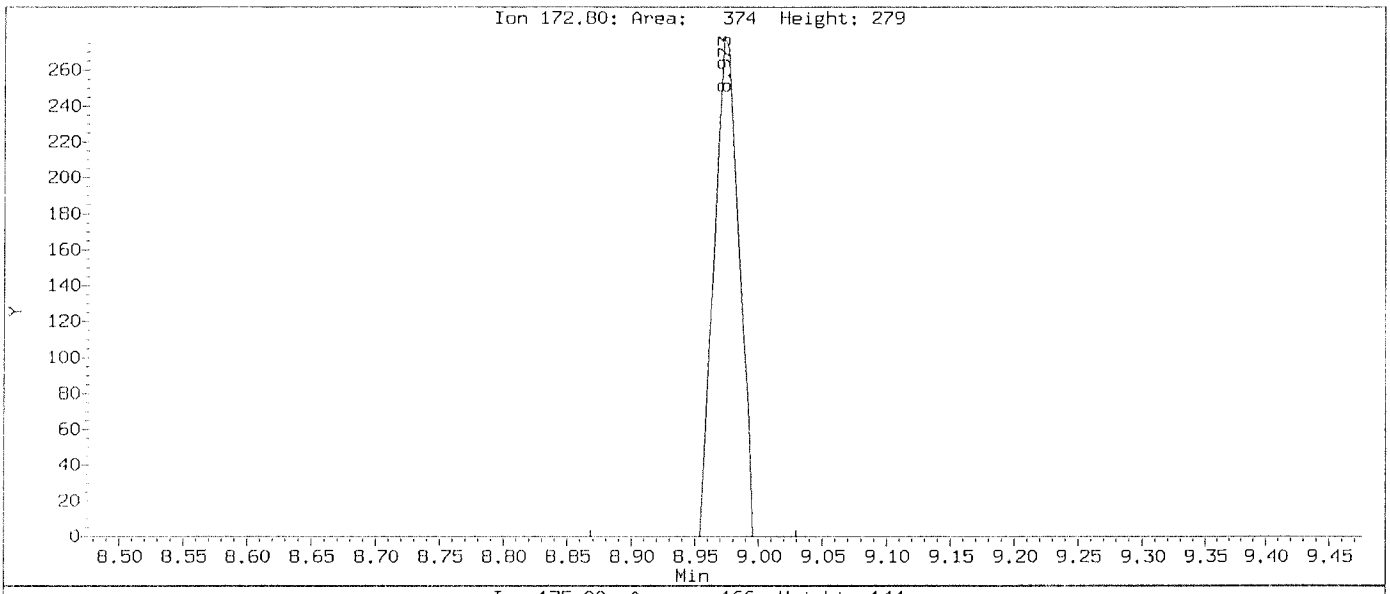
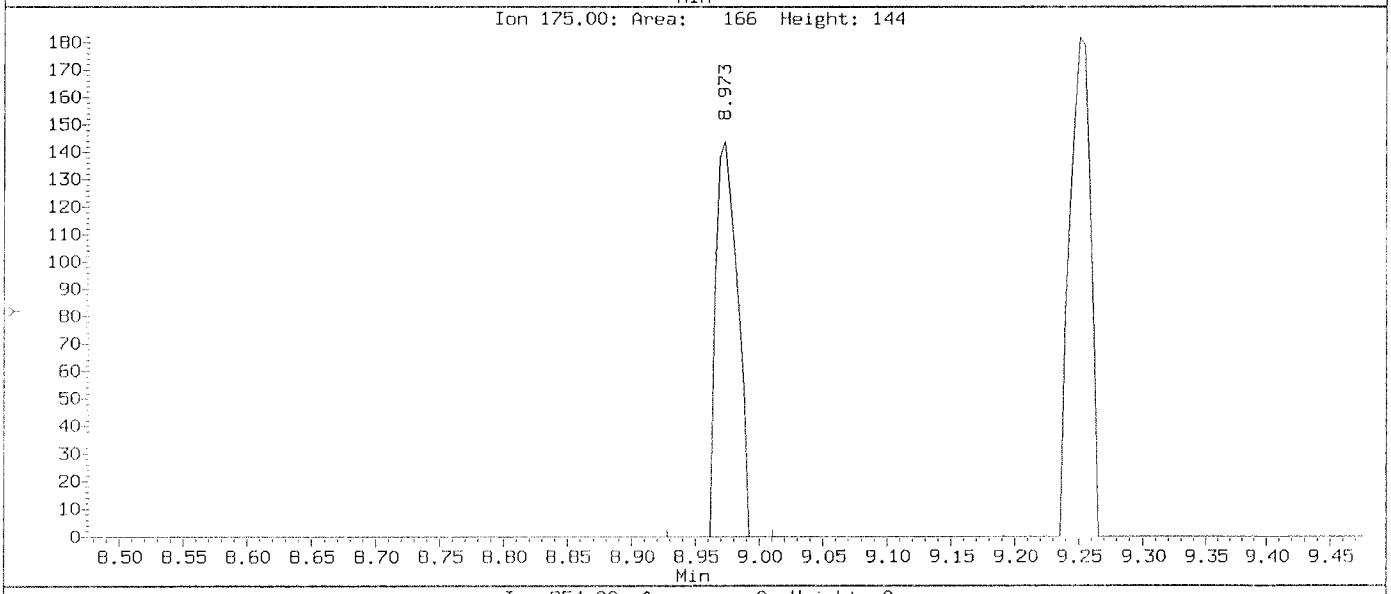
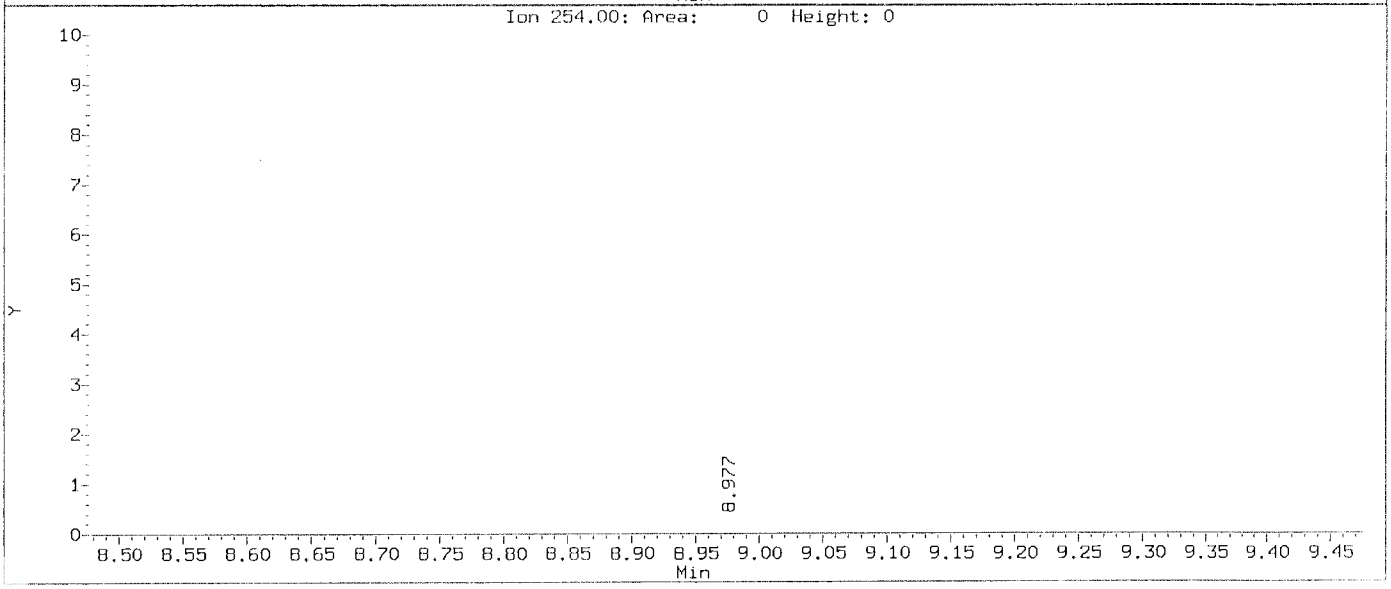
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Bromoform
CAS Number: 75-25-2

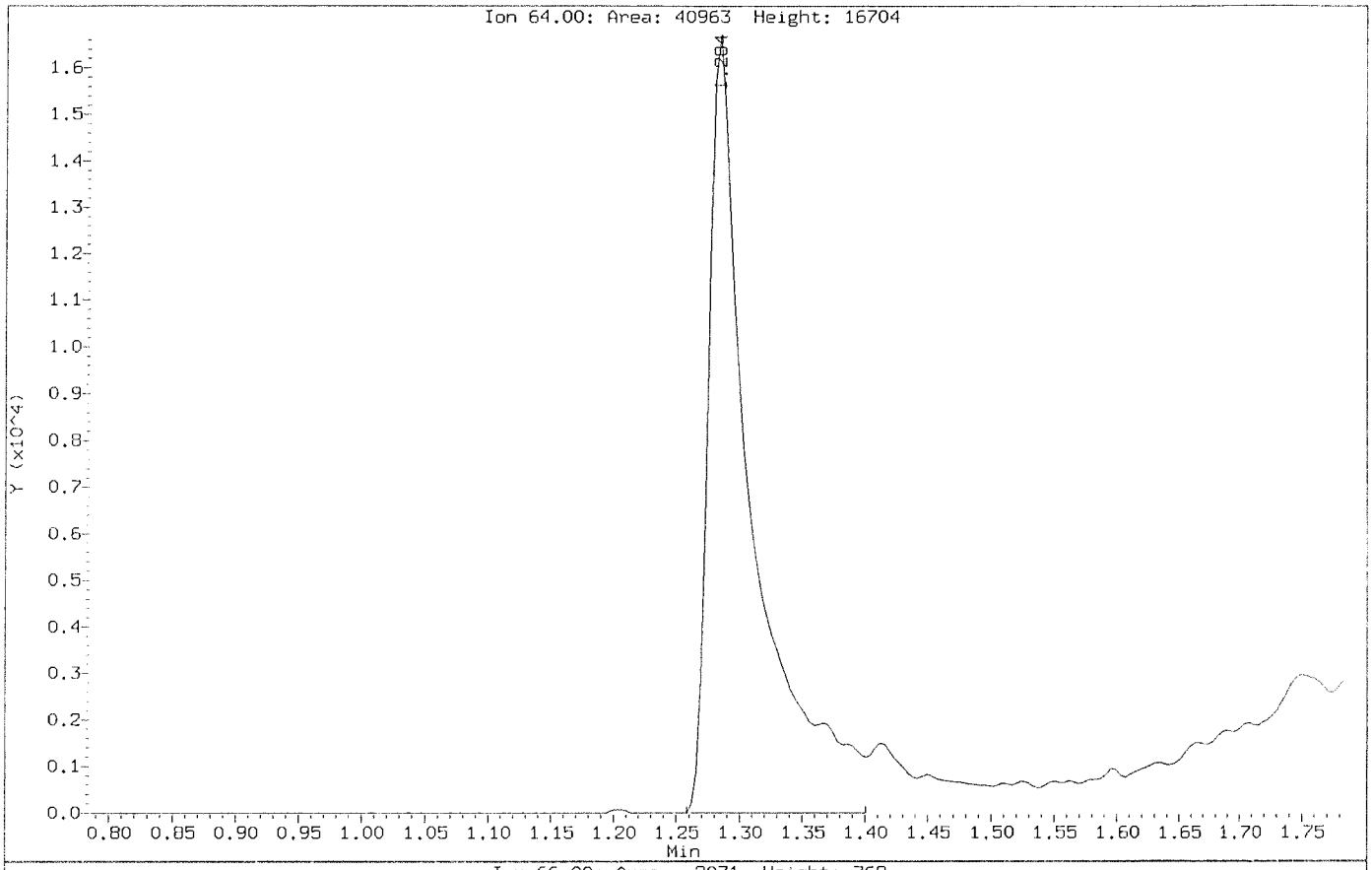


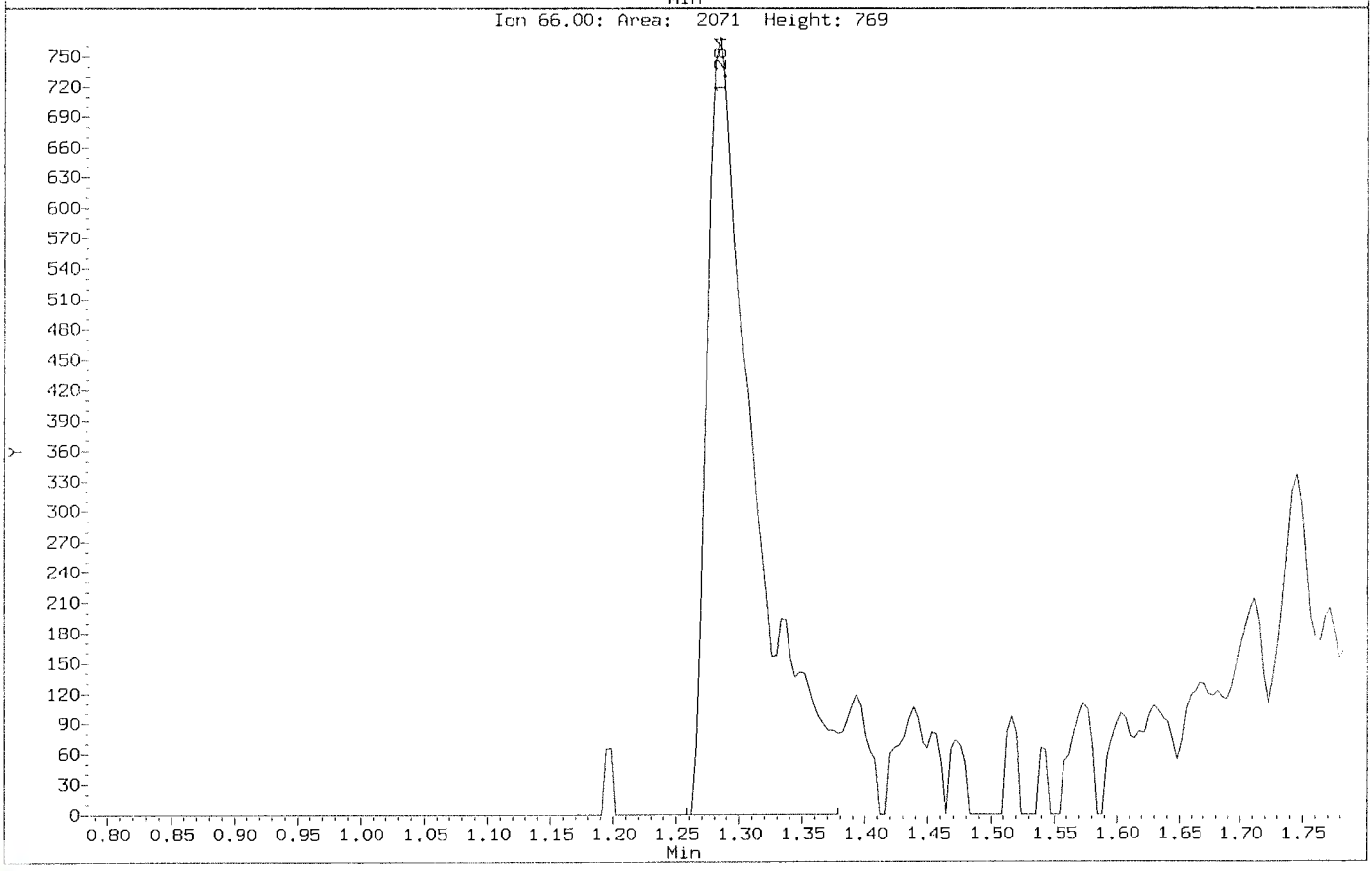




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111502.D
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Chloroethane
CAS Number: 75-00-3





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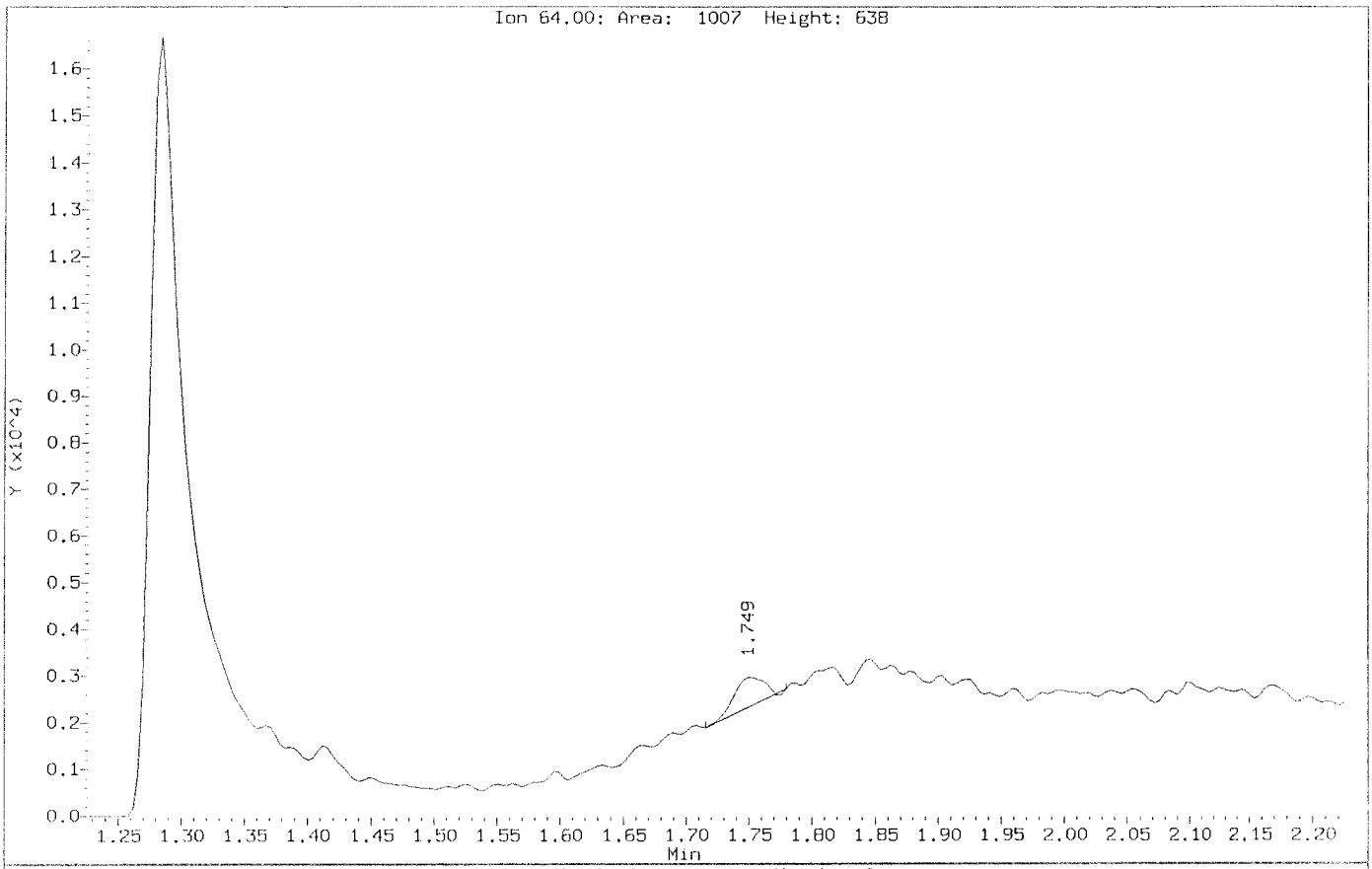
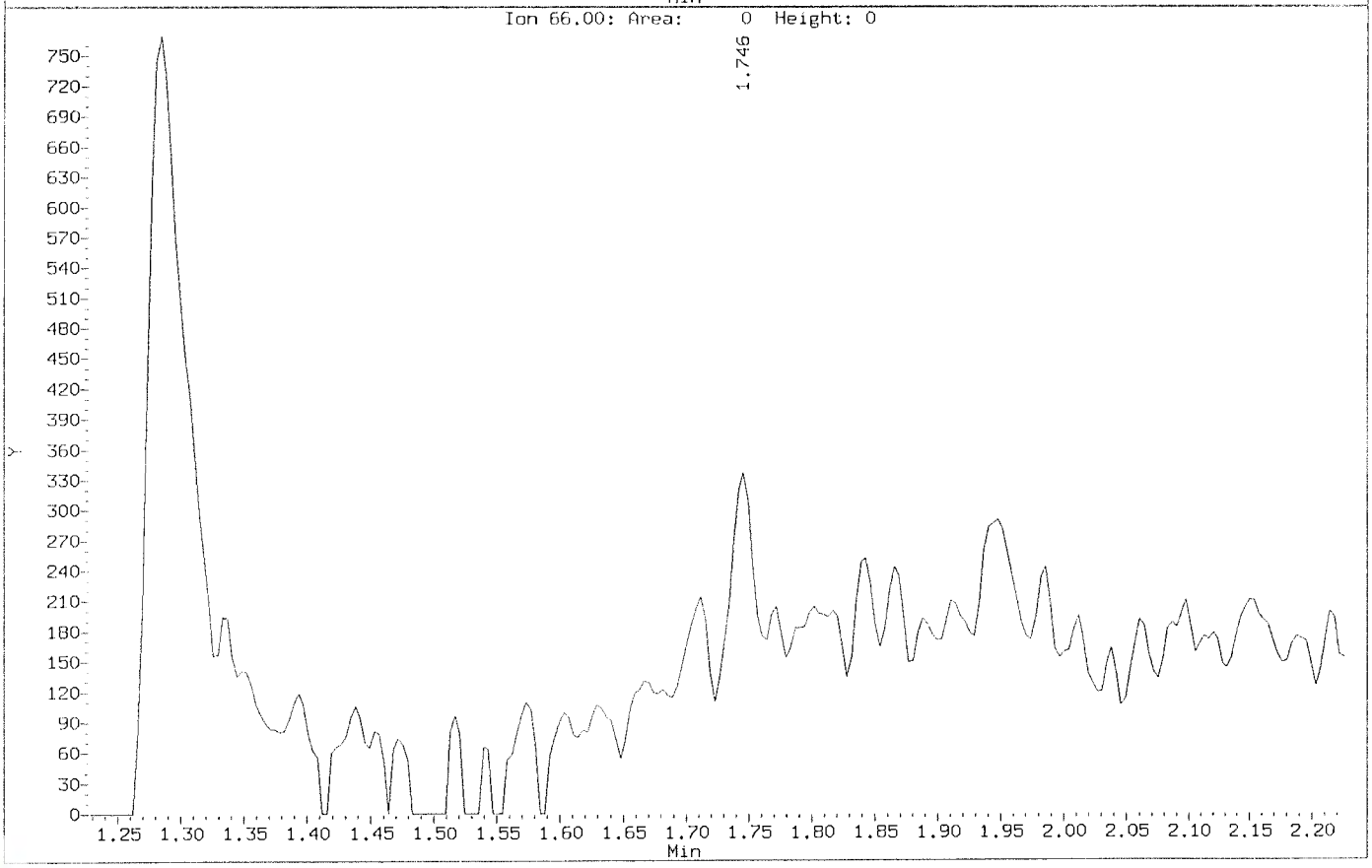
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Chloroethane
CAS Number: 75-00-3





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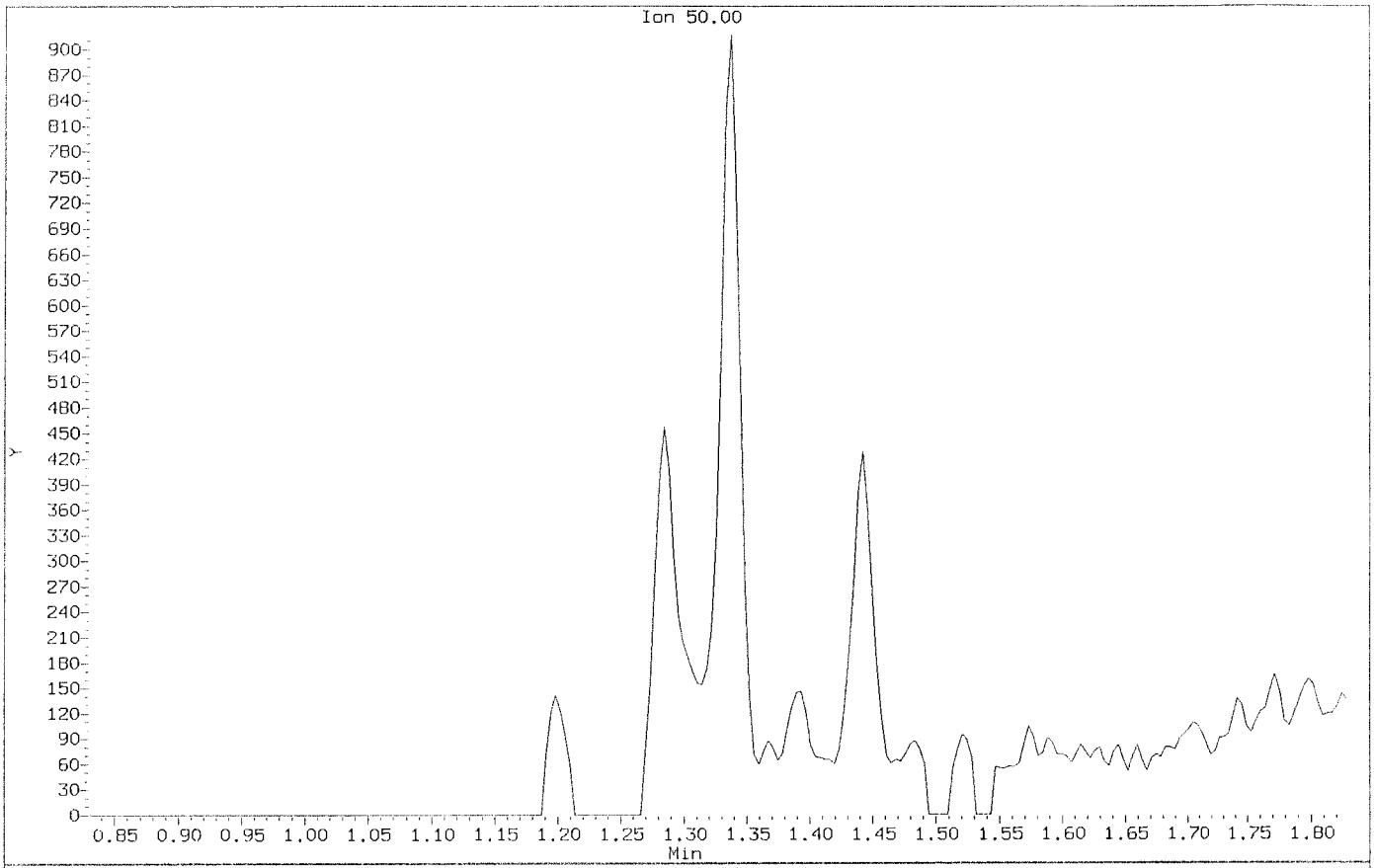
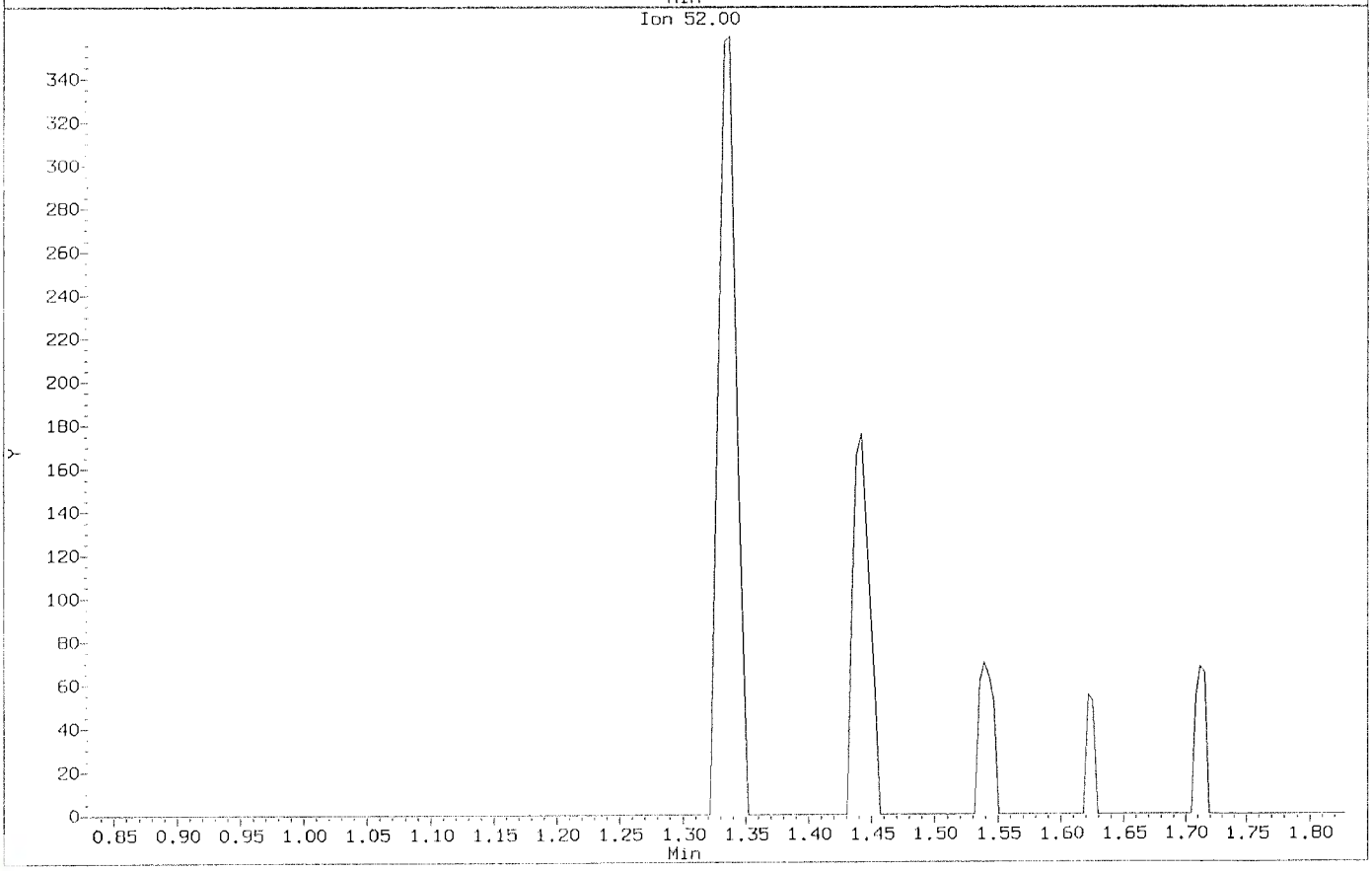
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Chloromethane
CAS Number: 74-87-3





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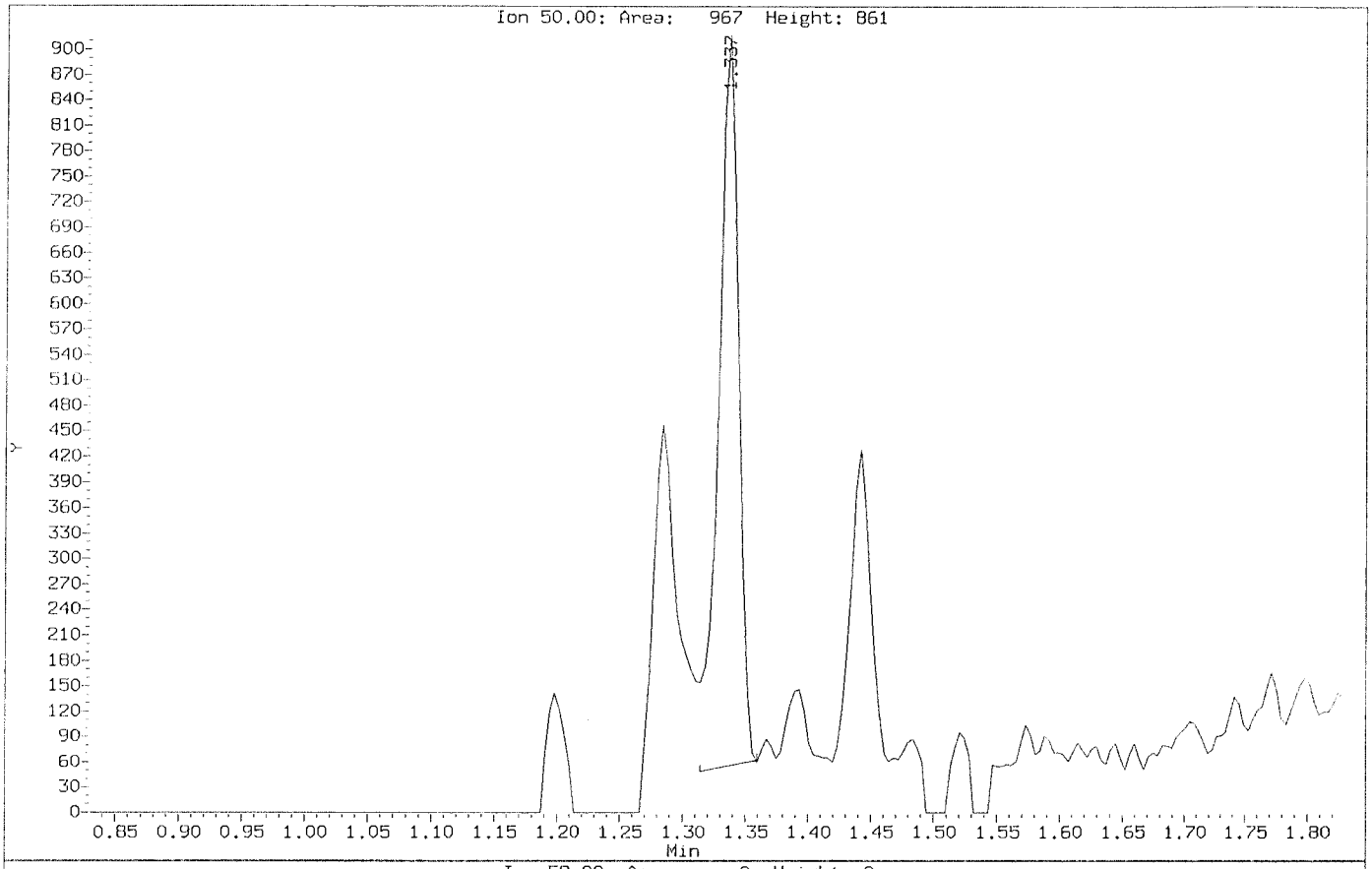
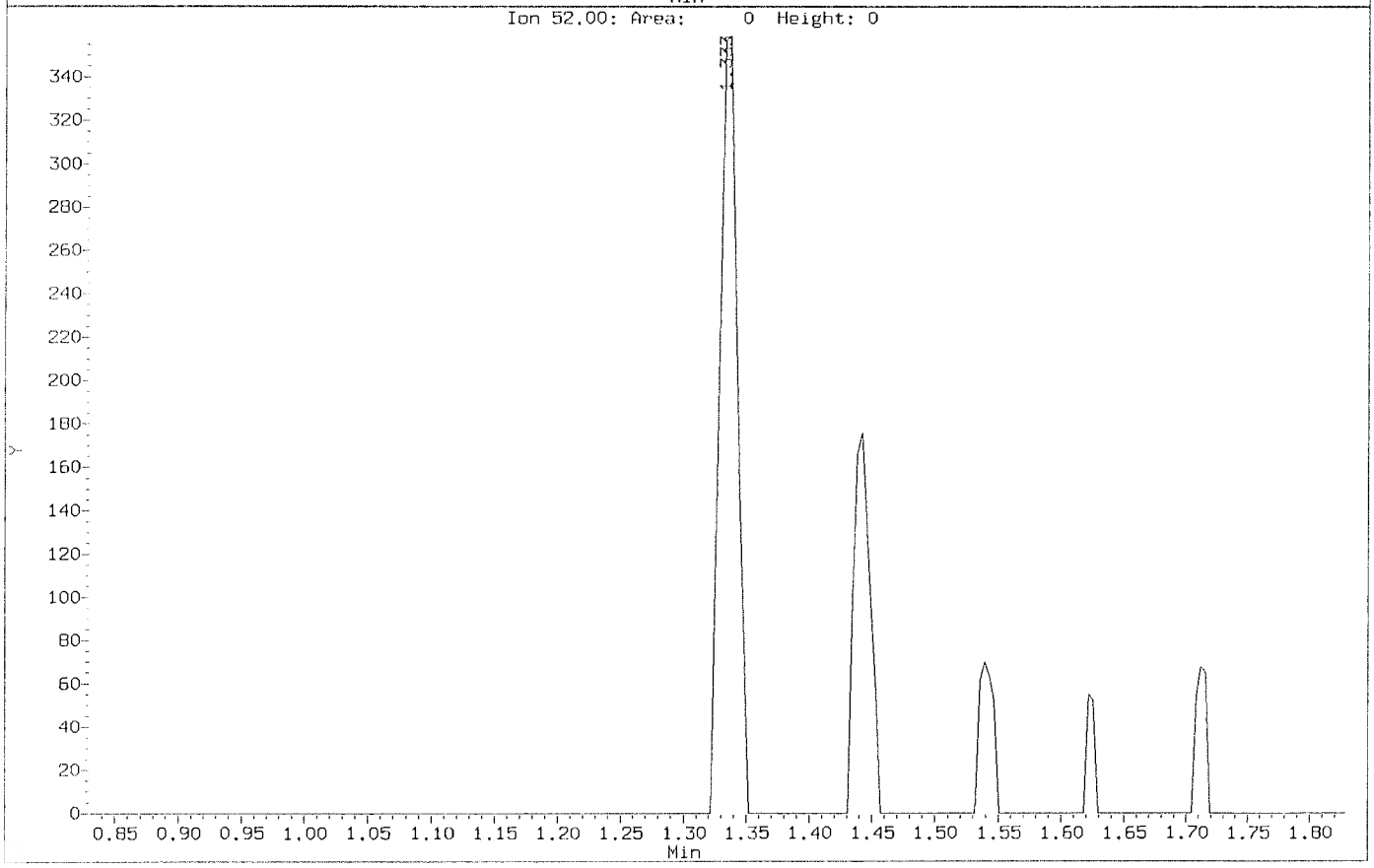
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Chloromethane
CAS Number: 74-87-3





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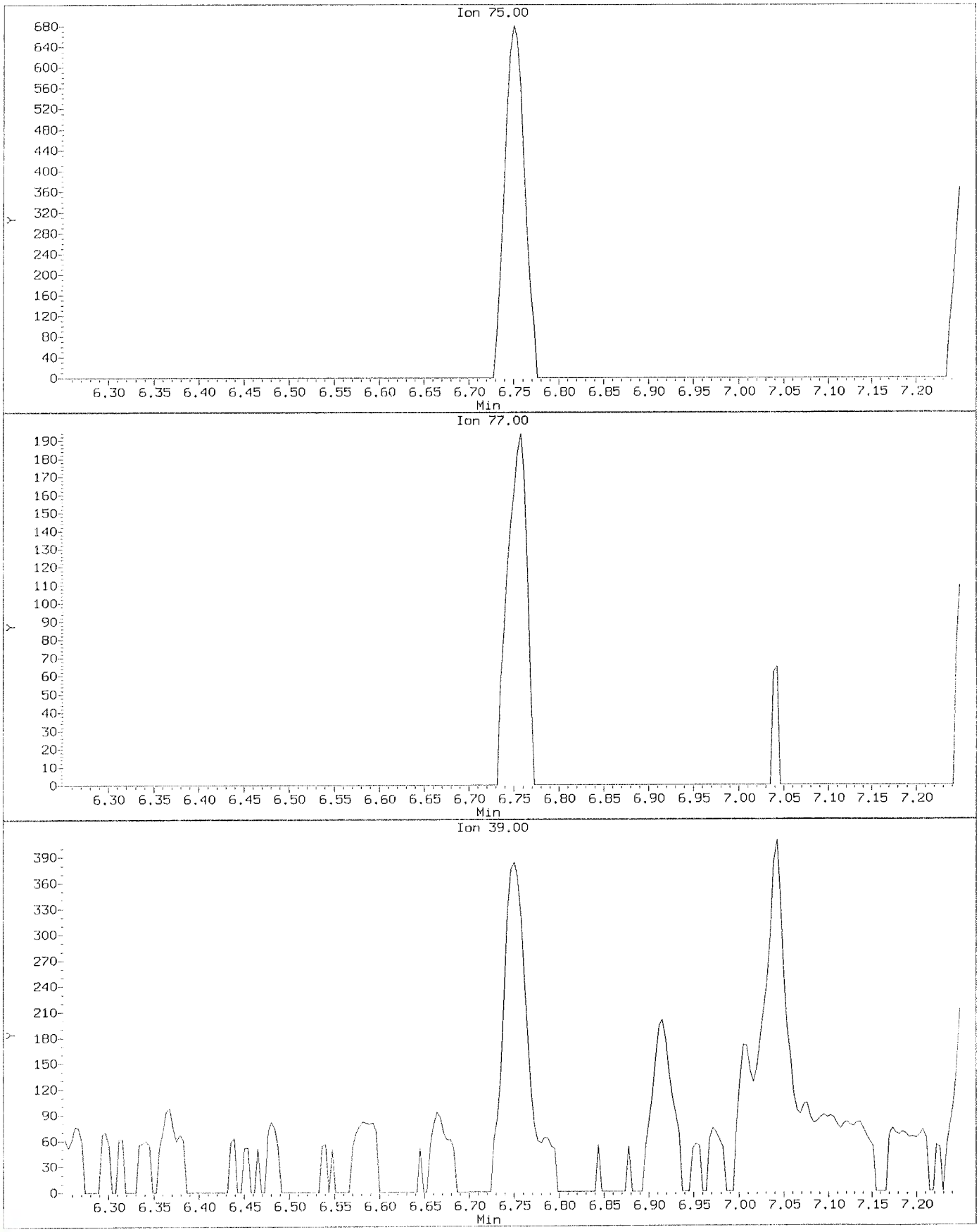
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5



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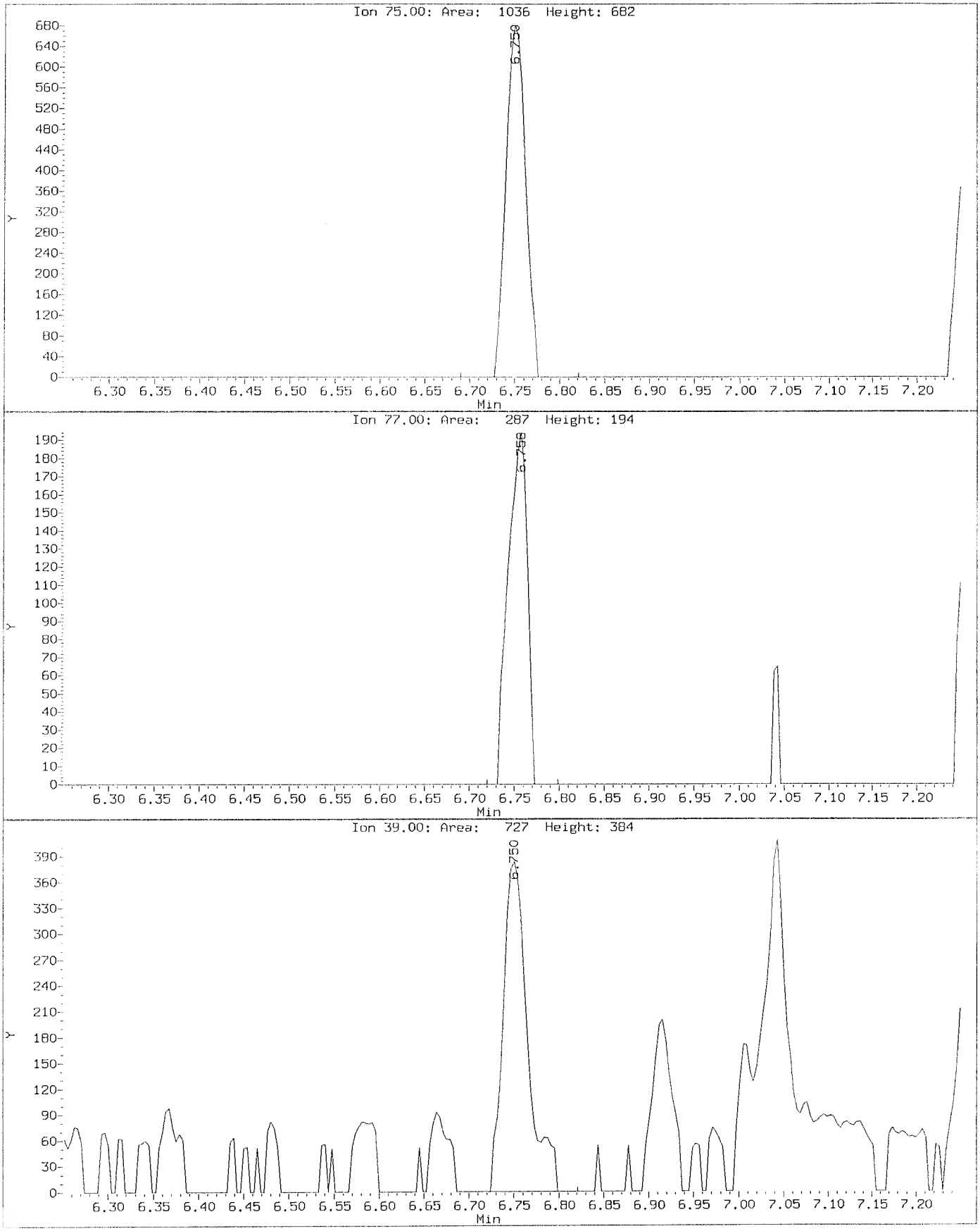
Client Sample ID: VSTD000.25

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5



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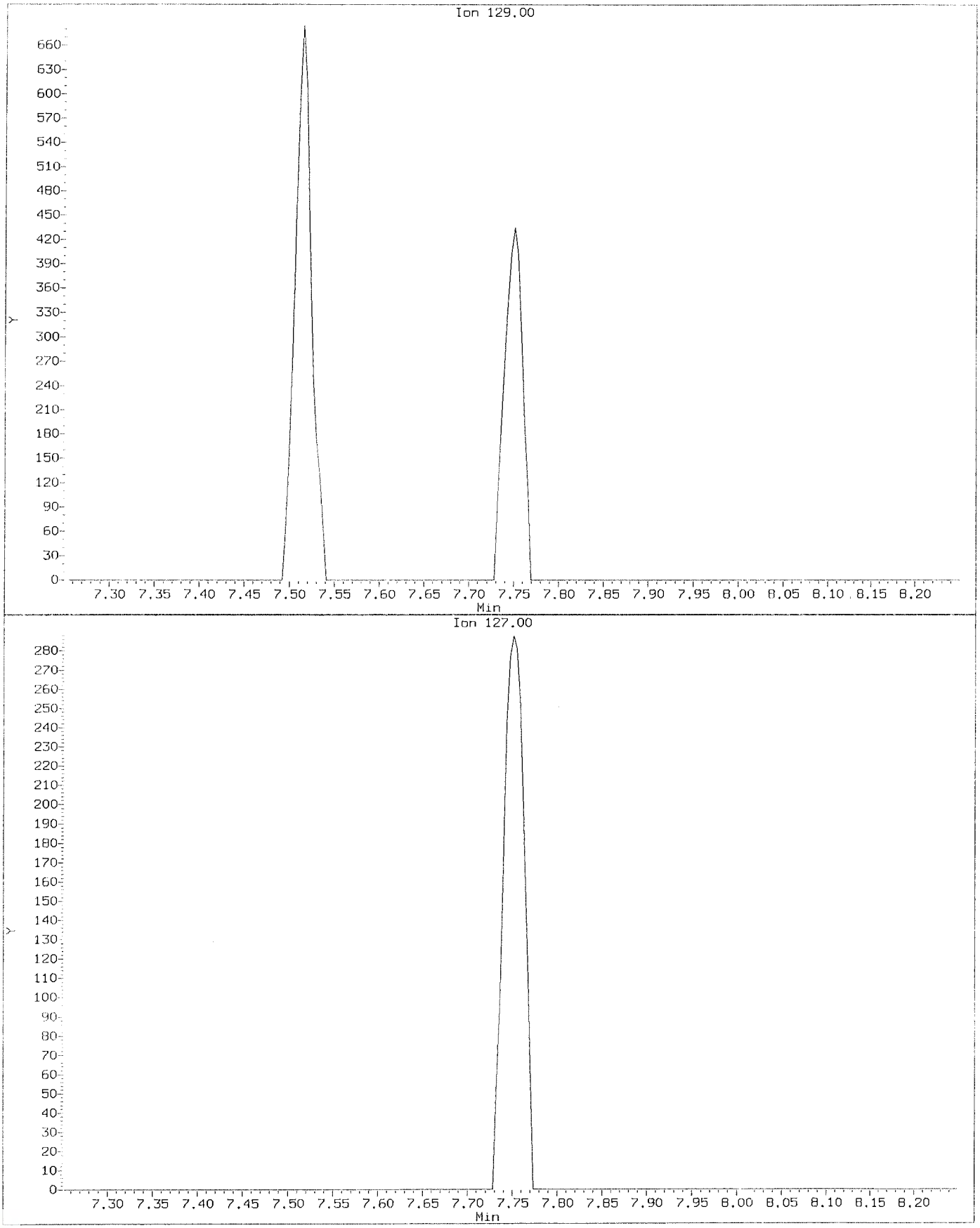
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Dibromochloromethane
CAS Number: 124-48-1



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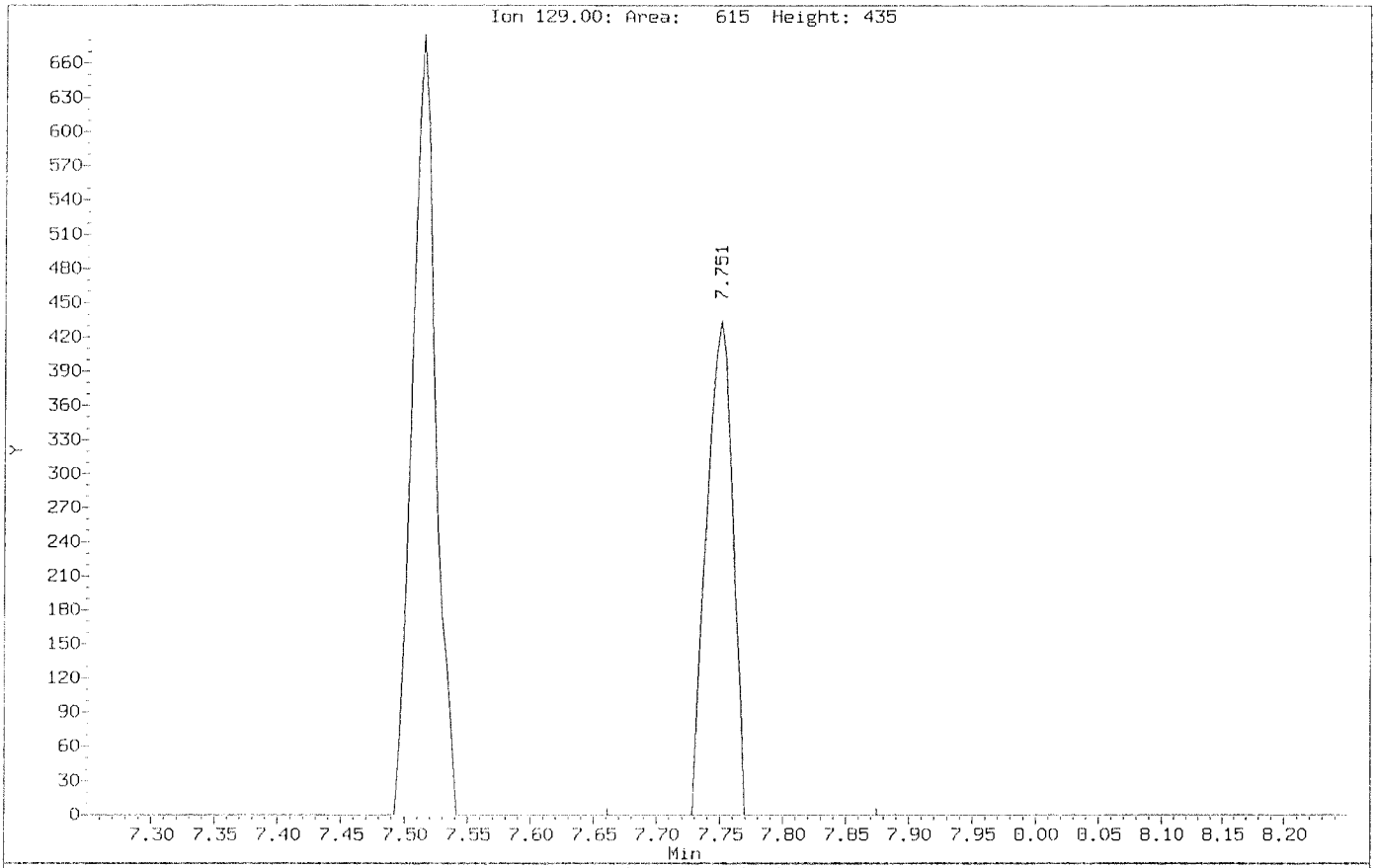
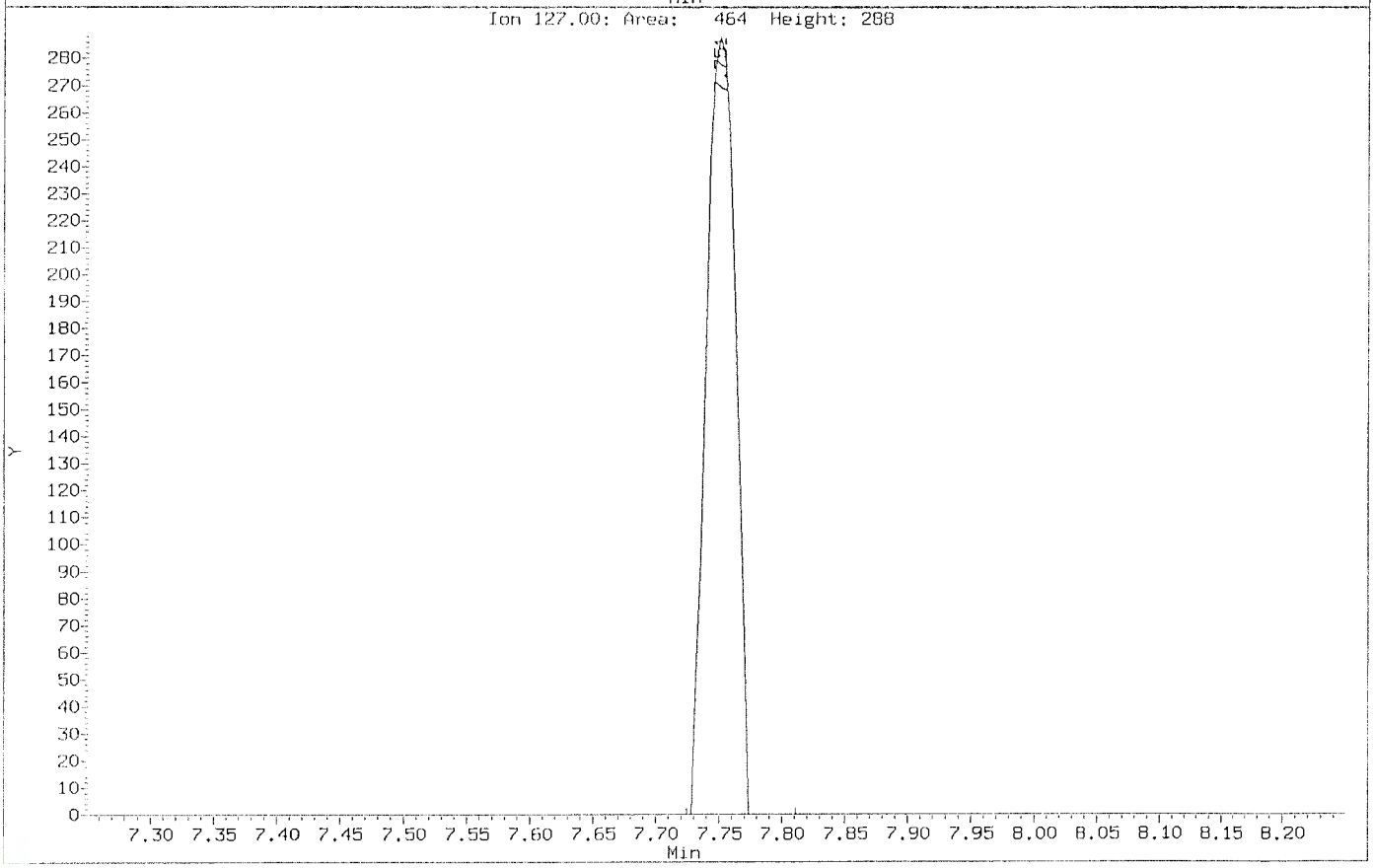
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Dibromochloromethane
CAS Number: 124-48-1





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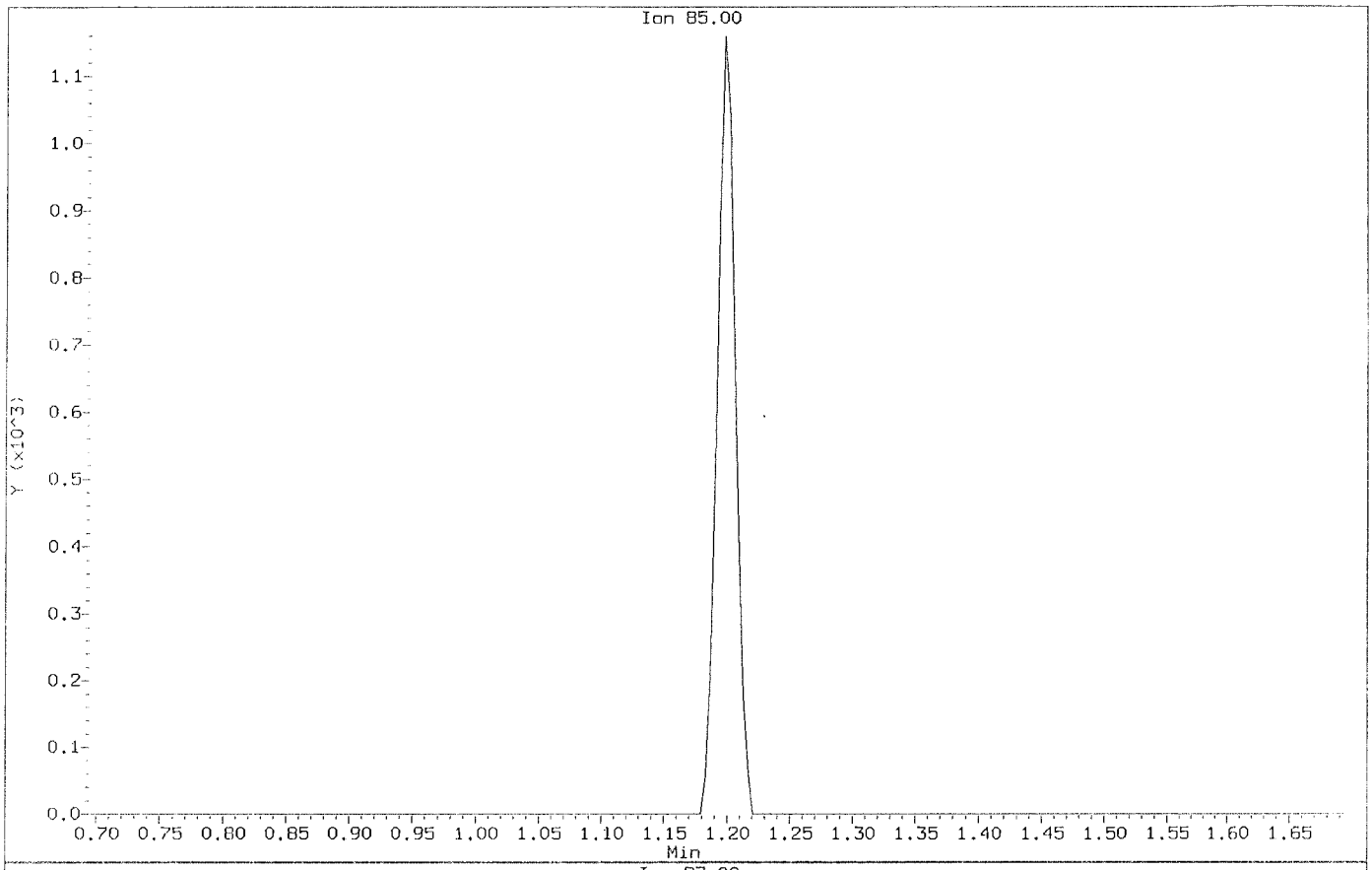
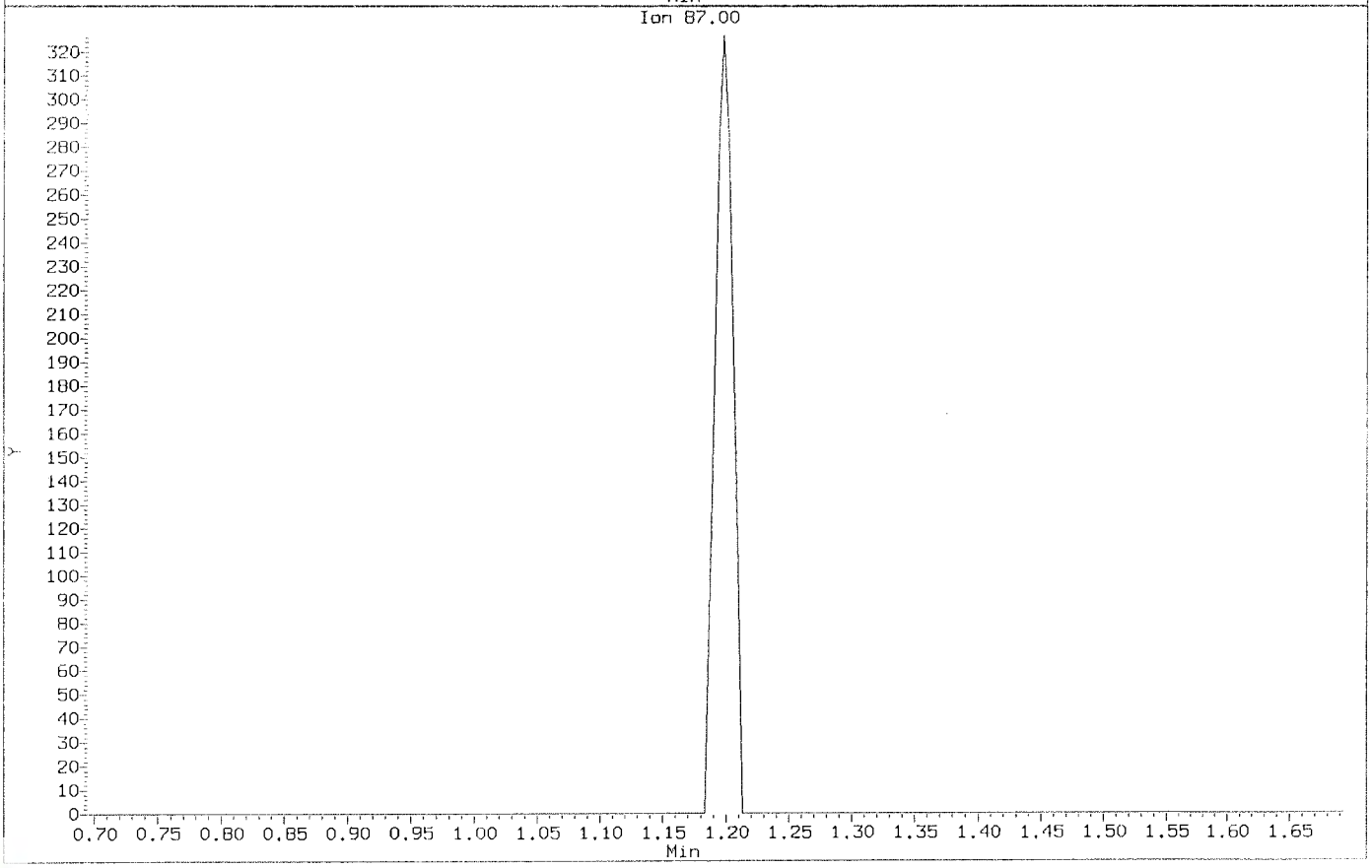
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





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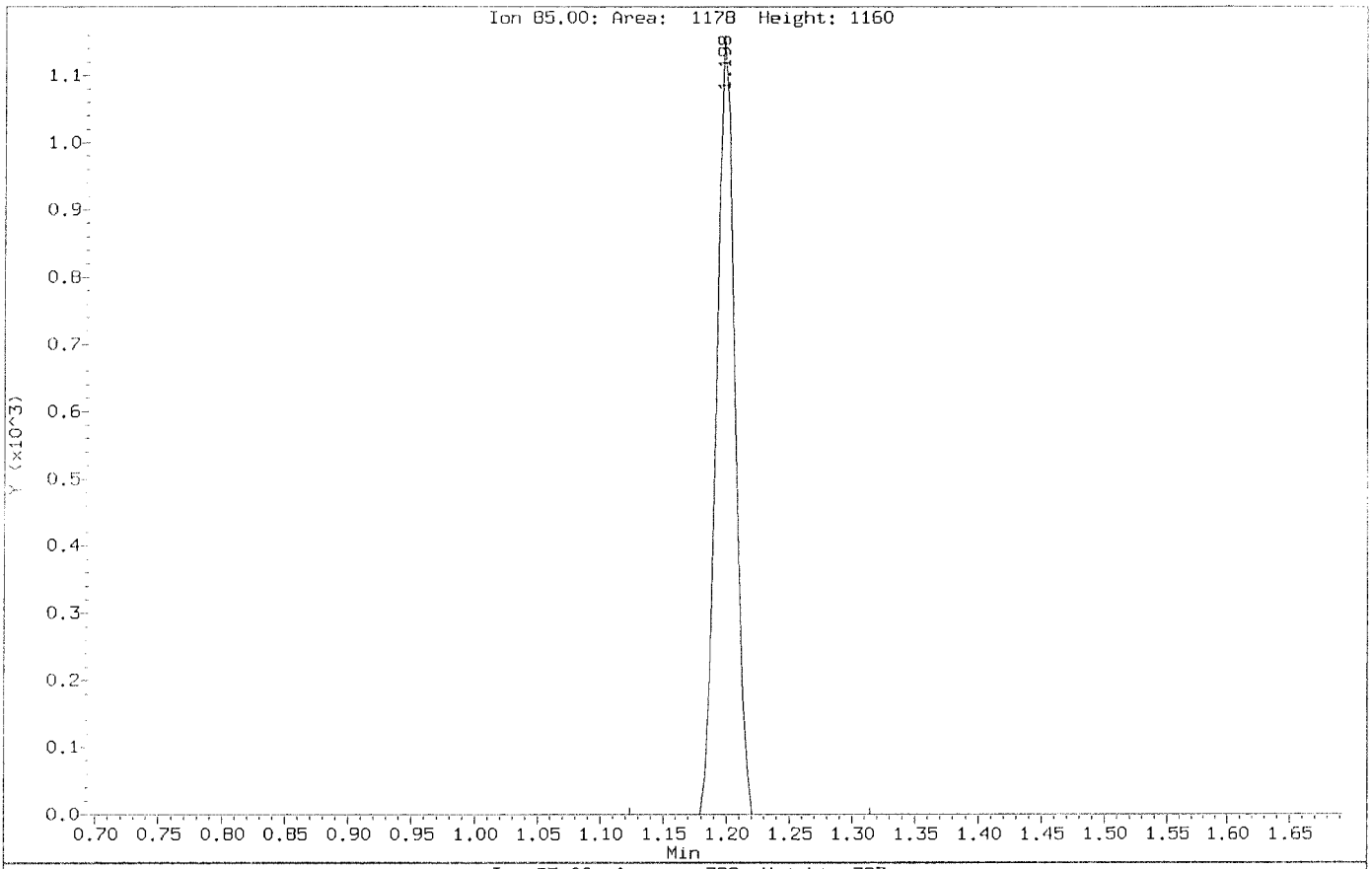
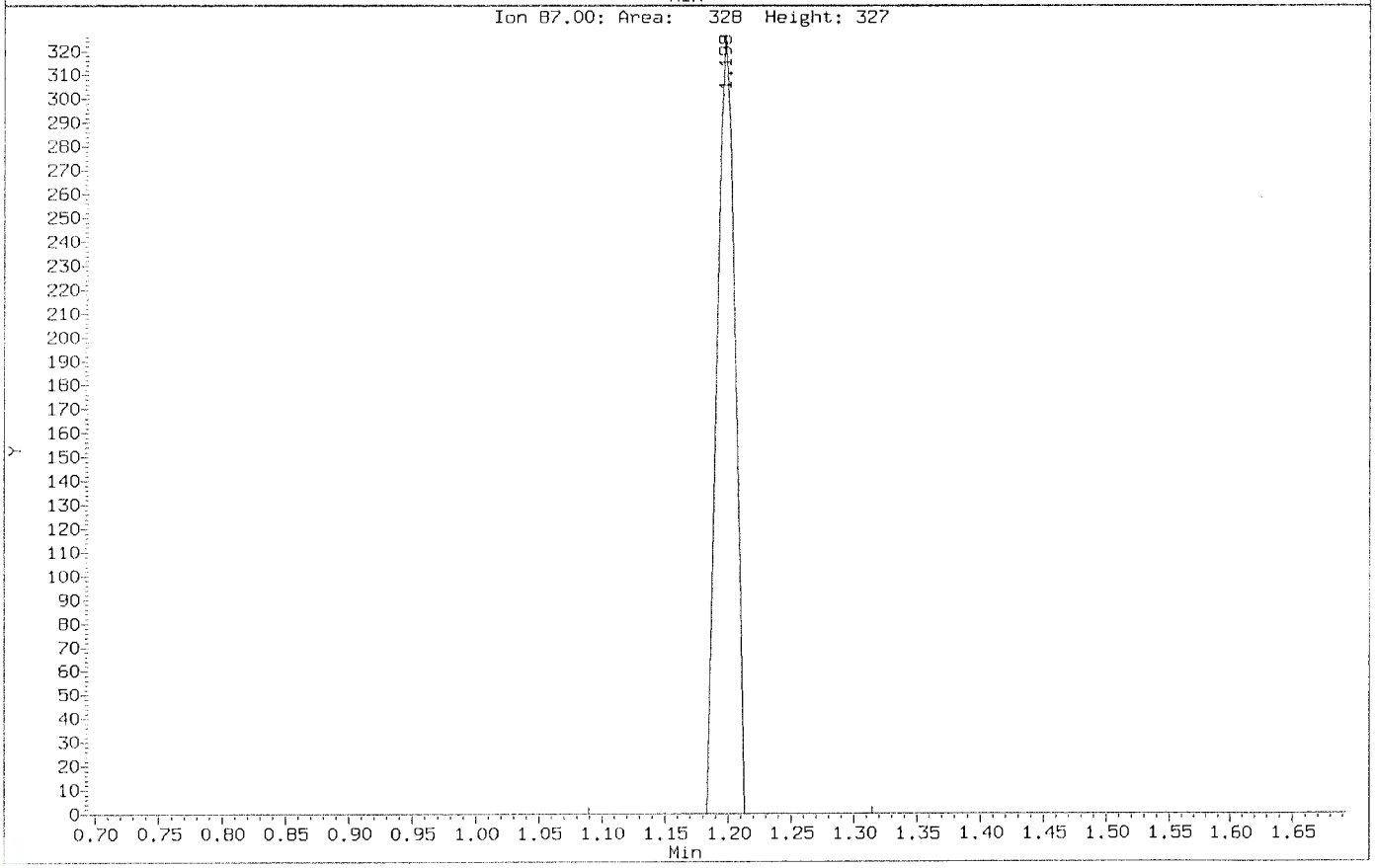
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





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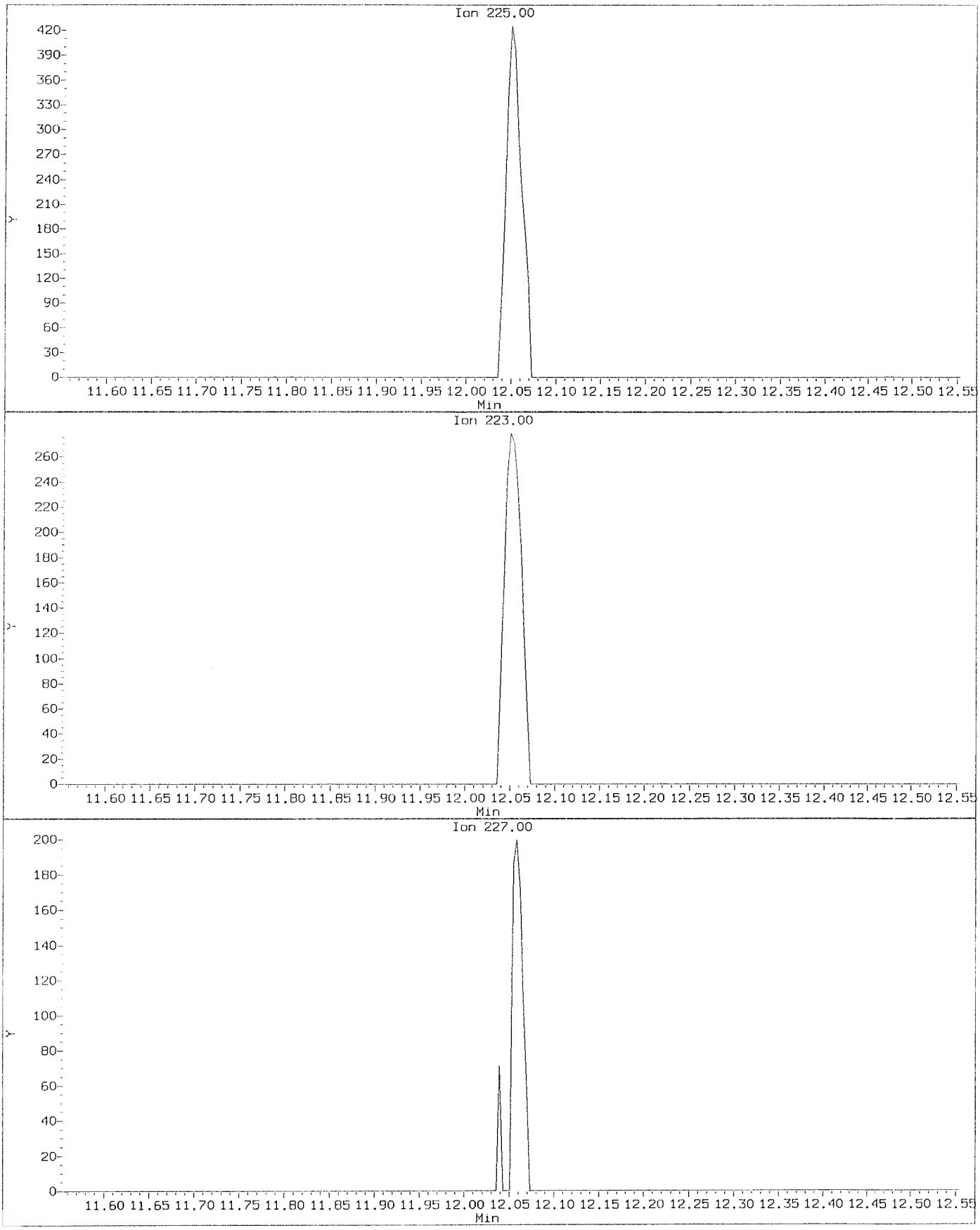
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



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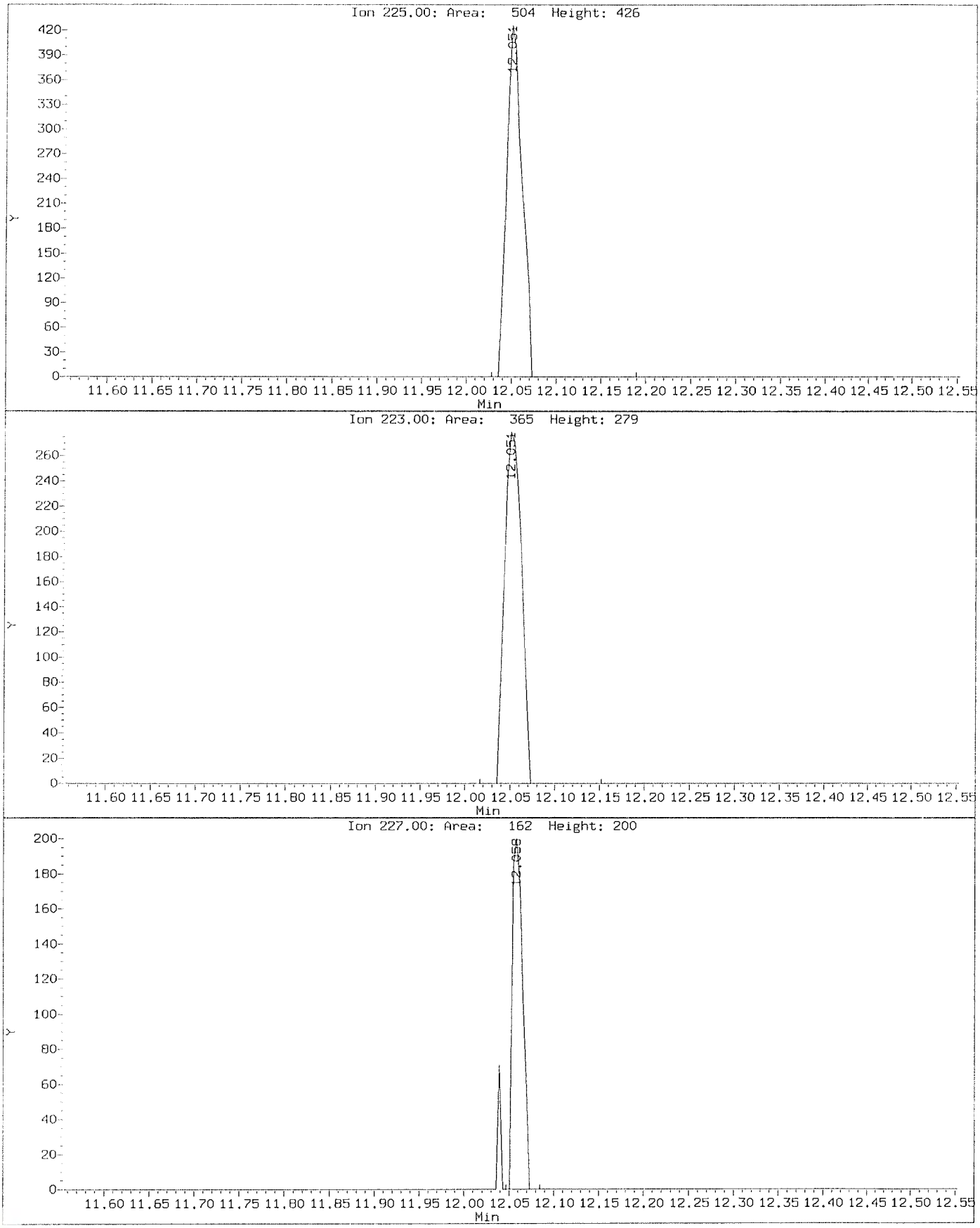
Client Sample ID: VSTD000.25

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



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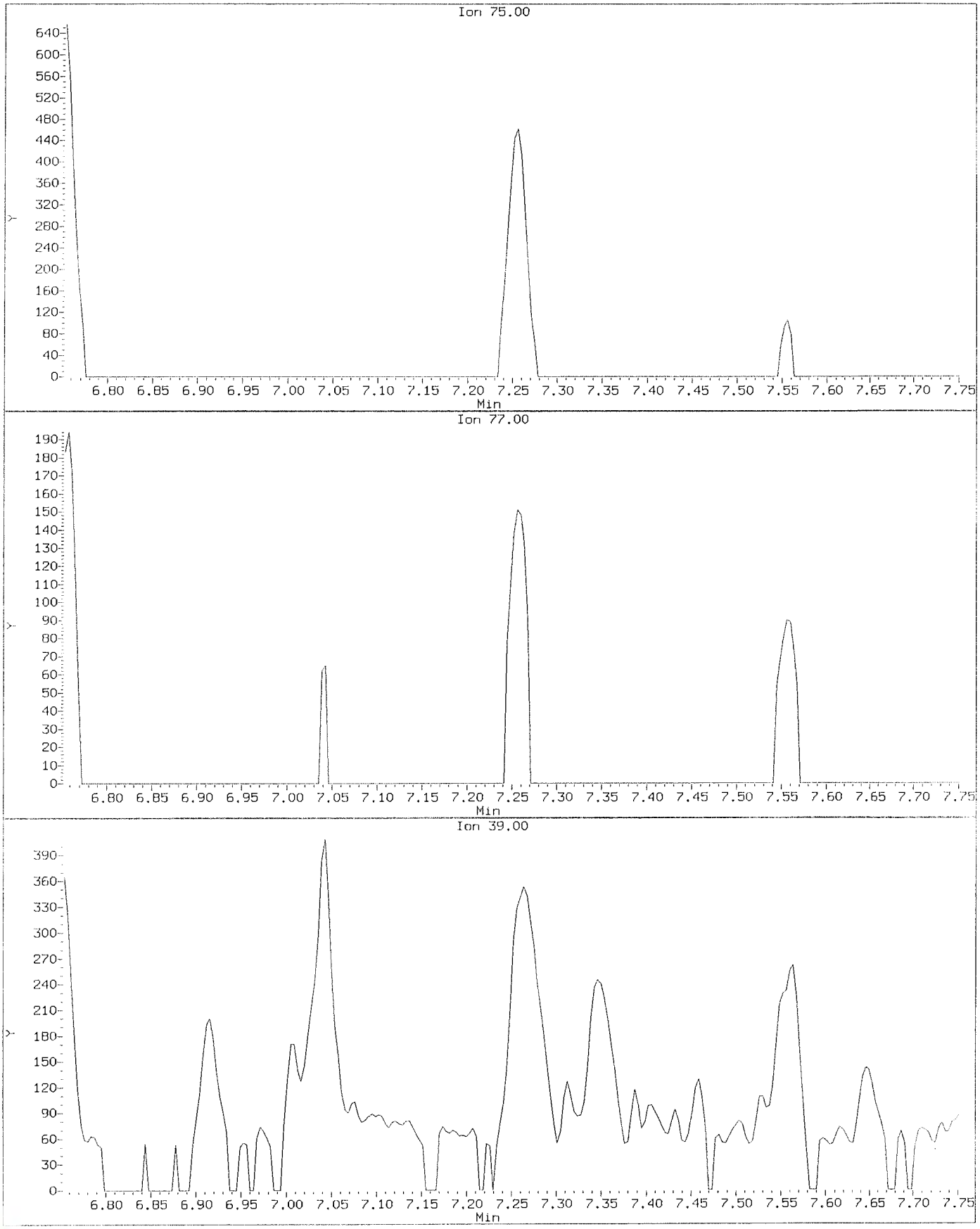
Injection Date: 15-NOV-2021 13:52
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



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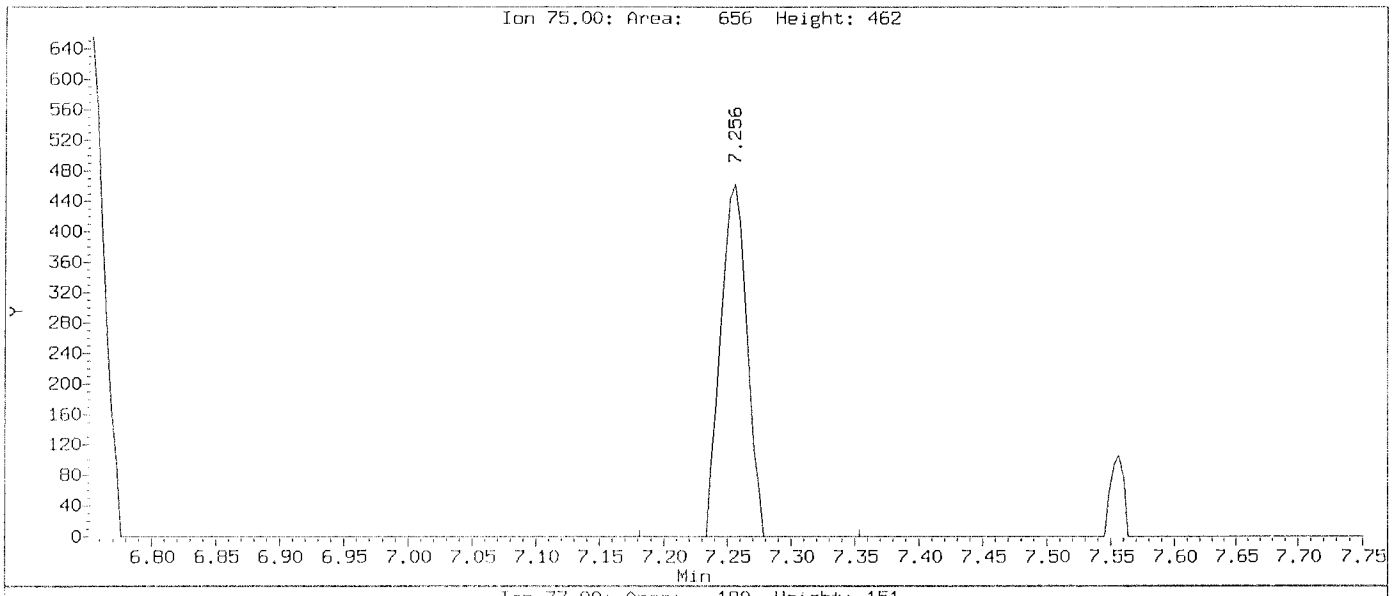
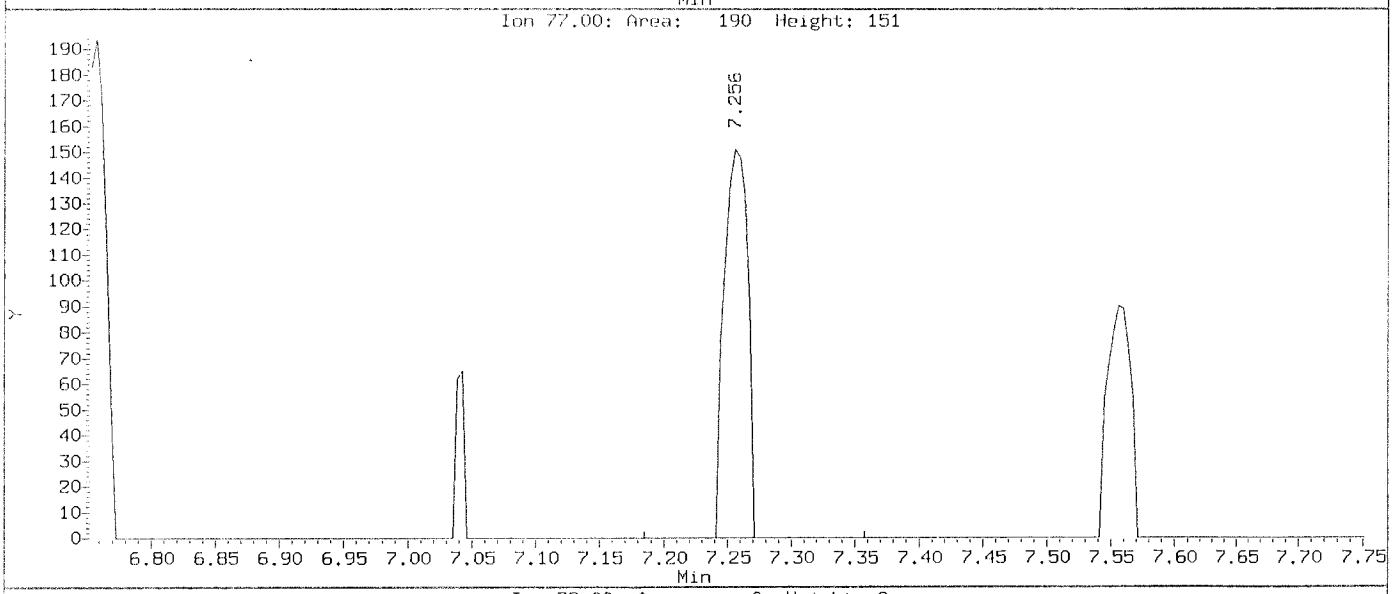
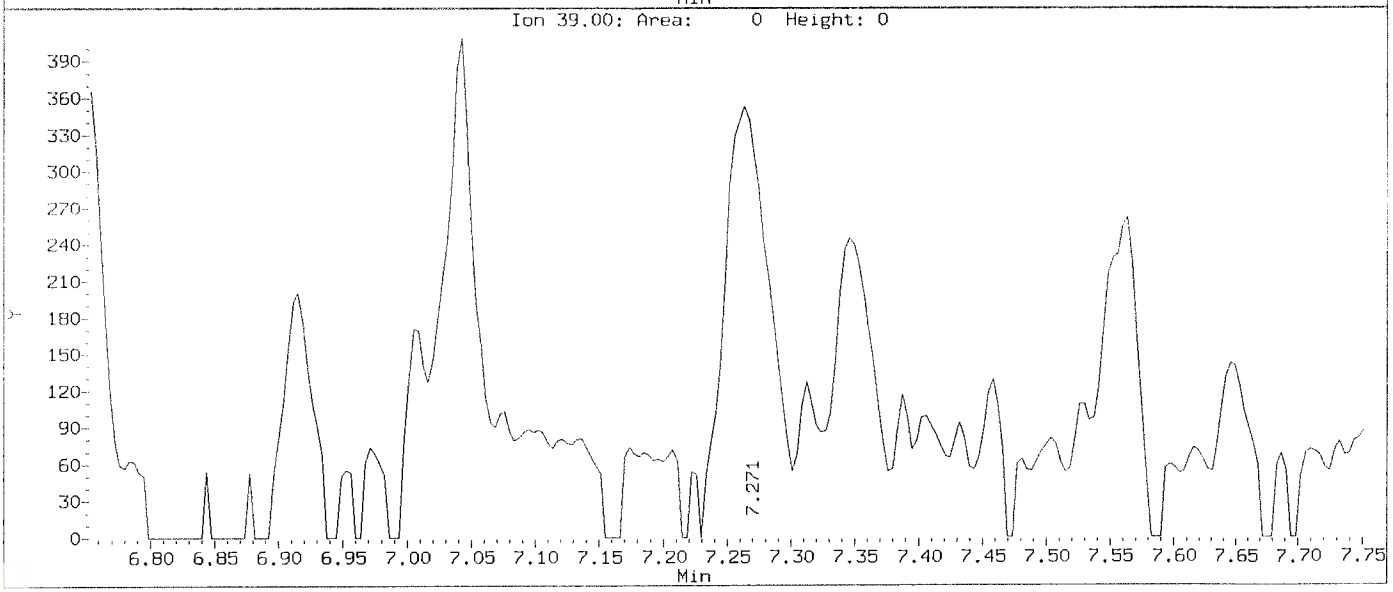
Instrument: VOA9.i
Client Sample ID: VSTD000.25

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6







ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 15-NOV-2021 14:36
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:11 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 13:52 Cal File: U111502.D
Als bottle: 4 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

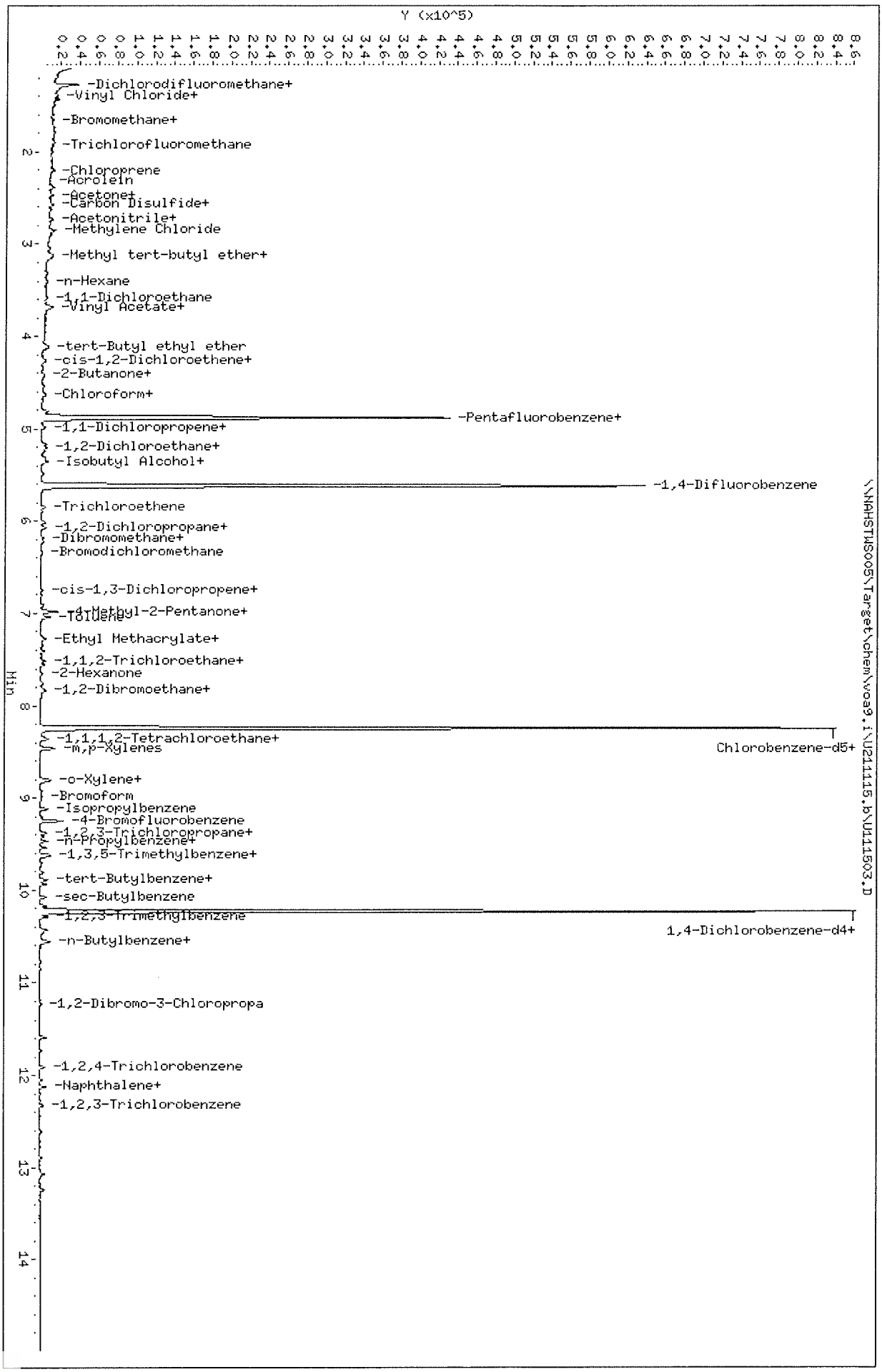
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.879	4.879	(1.000)	271182	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	470948	50.0000	
*	47 Chlorobenzene-d5	117	8.238	8.238	(1.000)	422791	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	207538	50.0000	
$	30 Dibromofluoromethane	113	4.815	4.815	(0.987)	1516	0.50000	(aM)
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	1948	0.50000	(aM)
$	48 Toluene-d8	98	6.978	6.978	(0.847)	6356	0.50000	0.57(aM)
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	3705	0.50000	(aM)
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	803	0.50000	1.09(a)
	31 1,1,1-Trichloroethane	97	4.808	4.808	(0.985)	1478	0.50000	0.37(a)
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	1769	0.50000	0.40(aM)
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.900)	1069	0.50000	0.42(a)
	22 1,1-Dichloroethane	63	3.582	3.582	(0.734)	2083	0.50000	0.43(Ta)
	11 1,1-Dichloroethene	96	2.382	2.382	(0.488)	1015	0.50000	0.41(aM)
	32 1,1-Dichloropropene	75	4.984	4.984	(0.888)	1529	0.50000	0.39(a)
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	1423	0.50000	0.38(aM)
	71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	1725	0.50000	0.40(a)
	90 1,2,4-Trichlorobenzene	180	11.915	11.915	(1.165)	1643	0.50000	0.43(aM)
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	4113	0.50000	0.39(a)
	89 1,2-Dibromo-3-Chloropropane	155	11.225	11.225	(1.098)	40	0.50000	2.48(aM)
	57 1,2-Dibromoethane	107	7.840	7.840	(0.952)	1142	0.50000	0.37(a)
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	2336	0.50000	0.39(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.935)	1755	0.50000	0.41(aM)
42	1,2-Dichloropropane	63	6.075	6.075	(1.082)	1164	0.50000	0.39(a)
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	4412	0.50000	0.43(a)
83	1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	2678	0.50000	0.44(a)
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	2128	0.50000	0.40(a)
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	2568	0.50000	0.41(a)
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	1144	0.50000	0.41(aM)
24	2-Butanone	43	4.350	4.350	(0.892)	1576	1.00000	1.11(aM)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	3715	0.50000	0.41(a)
52	2-Hexanone	43	7.653	7.653	(0.929)	1404	1.00000	0.69(aH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	4404	0.50000	0.42(a)
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	3984	0.50000	0.39(a)
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.839)	2609	1.00000	0.85(a)
10	Acetone	43	2.469	2.469	(0.506)	3031	1.00000	(a)
37	Benzene	78	5.201	5.201	(0.927)	5187	0.50000	0.43(a)
74	Bromobenzene	156	9.374	9.374	(0.917)	1189	0.50000	0.36(a)
29	Bromochloromethane	128	4.542	4.542	(0.931)	602	0.50000	0.39(a)
39	Bromodichloromethane	83	6.341	6.341	(1.130)	1201	0.50000	1.34(aM)
66	Bromoform	173	8.976	8.976	(1.090)	450	0.50000	1.65(aM)
6	Bromomethane	94	1.655	1.655	(0.339)	935	0.50000	0.05(a)
19	Carbon Disulfide	76	2.570	2.570	(0.527)	5595	1.00000	0.83(a)
34	Carbon Tetrachloride	117	4.973	4.973	(0.886)	1045	0.50000	1.77(aM)
59	Chlorobenzene	112	8.264	8.264	(1.003)	3879	0.50000	0.47(a)
7	Chloroethane	64	1.741	1.741	(0.357)	1358	0.50000	0.60(aM)
28	Chloroform	83	4.643	4.643	(0.952)	2055	0.50000	0.39(a)
3	Chloromethane	50	1.325	1.325	(0.272)	1429	0.50000	(aM)
27	cis-1,2-Dichloroethene	96	4.264	4.264	(0.874)	1398	0.50000	0.42(a)
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	1095	0.50000	1.95(aM)
55	Dibromochloromethane	129	7.747	7.747	(0.940)	630	0.50000	1.69(aM)
44	Dibromomethane	93	6.180	6.180	(1.101)	925	0.50000	0.45(a)
2	Dichlorodifluoromethane	85	1.186	1.186	(0.243)	1420	0.50000	(aM)
61	Ethylbenzene	106	8.361	8.361	(1.015)	1713	0.50000	0.41(a)
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	584	0.50000	0.41(aM)
67	Isopropylbenzene	105	9.119	9.119	(1.107)	4987	0.50000	0.40(a)
62	m,p-Xylenes	106	8.466	8.466	(1.028)	3986	1.00000	0.78(a)
17	Methylene Chloride	84	2.851	2.851	(0.584)	1919	0.50000	0.60(a)
87	n-Butylbenzene	91	10.547	10.547	(1.032)	4151	0.50000	0.45(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	5751	0.50000	0.40(a)
92	Naphthalene	128	12.121	12.121	(1.186)	5022	0.50000	0.43(a)
63	o-Xylene	106	8.804	8.804	(1.069)	2107	0.50000	0.41(a)
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	4774	0.50000	0.41(a)
64	Styrene	104	8.819	8.819	(1.071)	3248	0.50000	0.37(a)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	3788	0.50000	0.44(a)
56	Tetrachloroethene	164	7.511	7.511	(0.912)	1122	0.50000	0.47(a)
50	Toluene	91	7.038	7.038	(0.854)	5816	0.50000	0.45(a)
20	trans-1,2-Dichloroethene	96	3.121	3.121	(0.640)	1392	0.50000	0.51(a)
51	trans-1,3-Dichloropropene	75	7.256	7.256	(1.292)	735	0.50000	2.27(aM)
38	Trichloroethene	130	5.850	5.850	(1.042)	1292	0.50000	0.41(a)
8	Trichlorofluoromethane	101	1.932	1.932	(0.396)	1758	0.50000	0.40(a)
5	Vinyl Chloride	62	1.400	1.400	(0.287)	1493	0.50000	0.45(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.

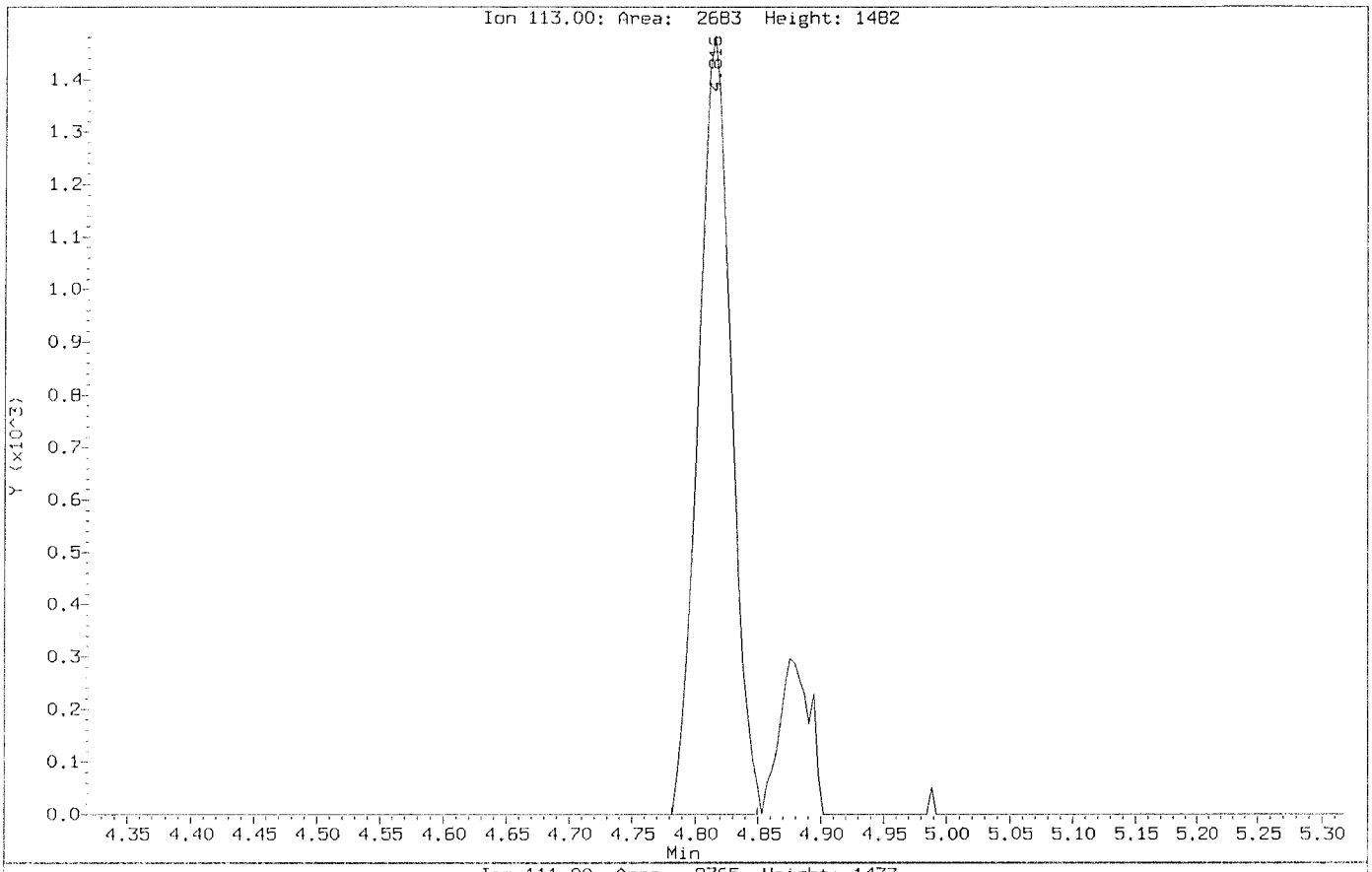


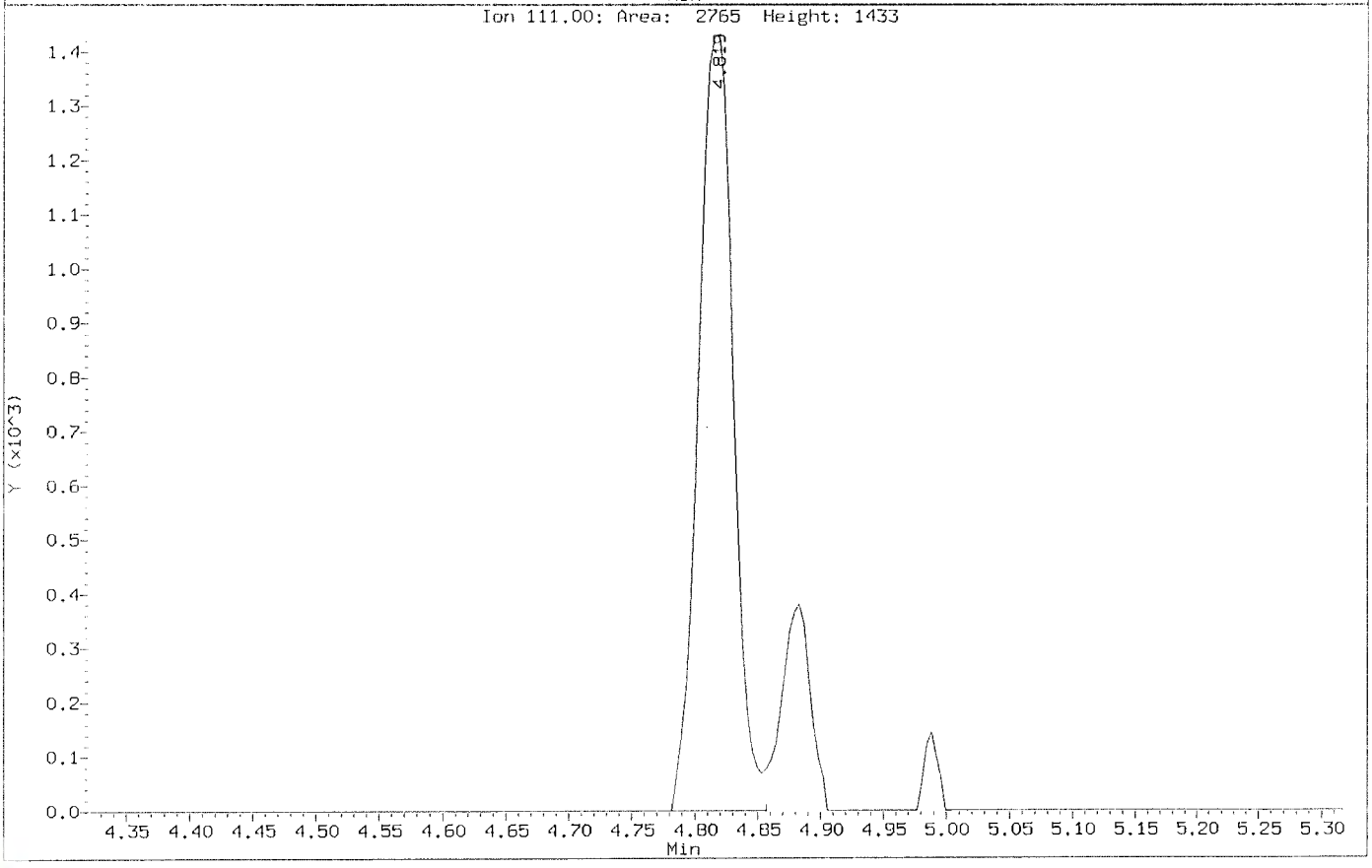
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Date : 15-NOV-2021 14:36
Client ID: VSTD000.5
Sample Info: VSTD000.5;VSTD000.5;1;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Dibromofluoromethane
CAS Number: 1868-53-7





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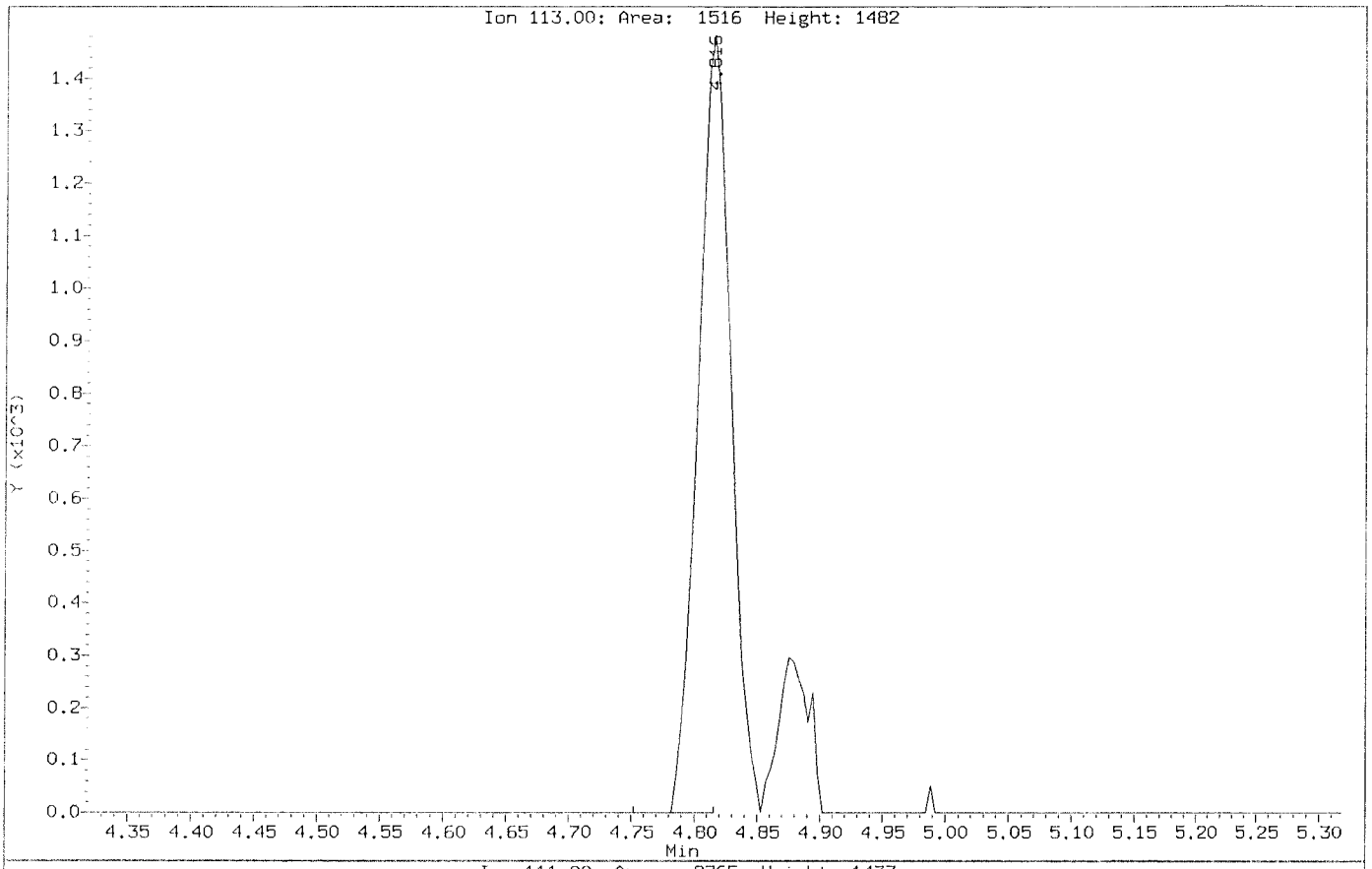
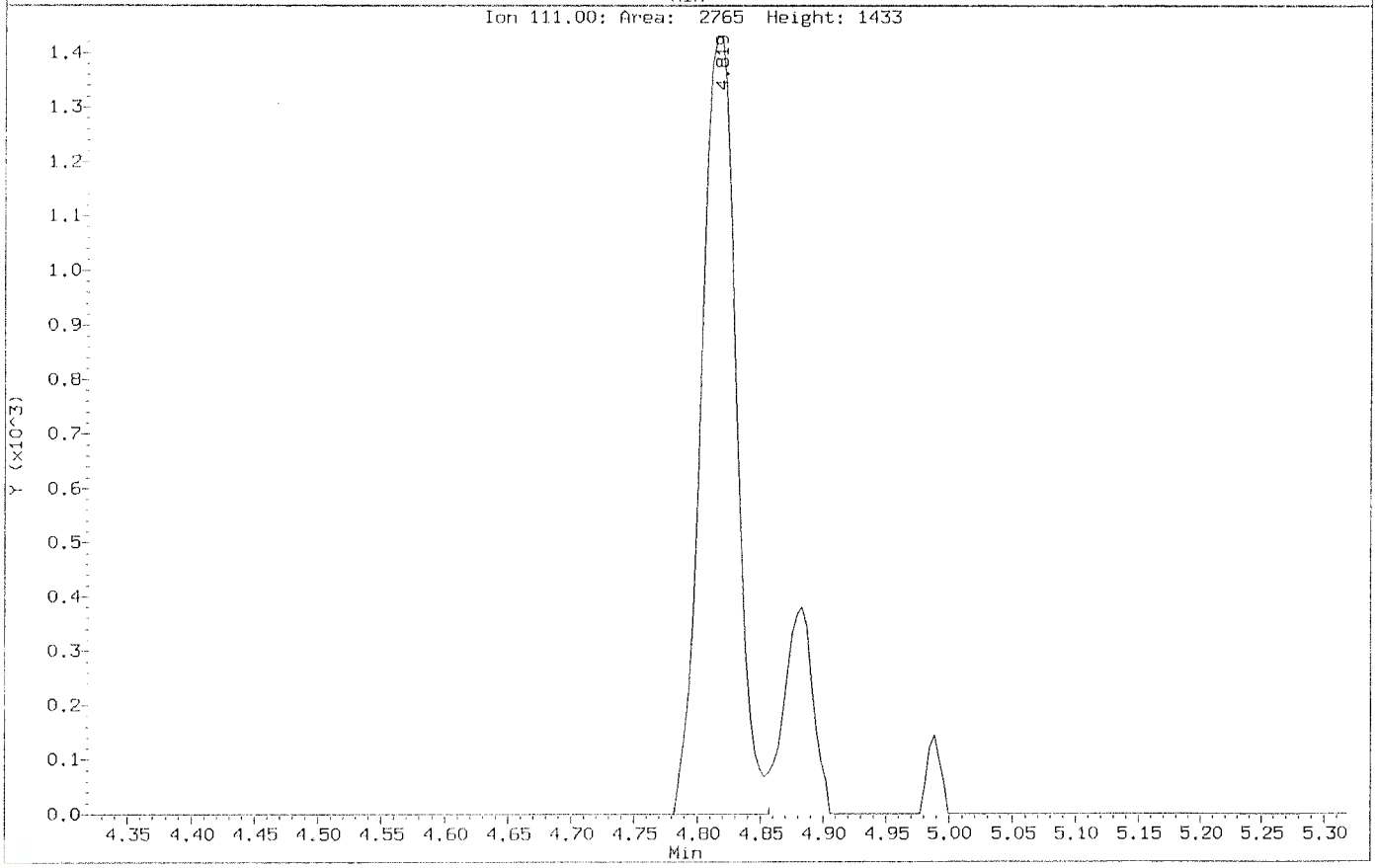
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

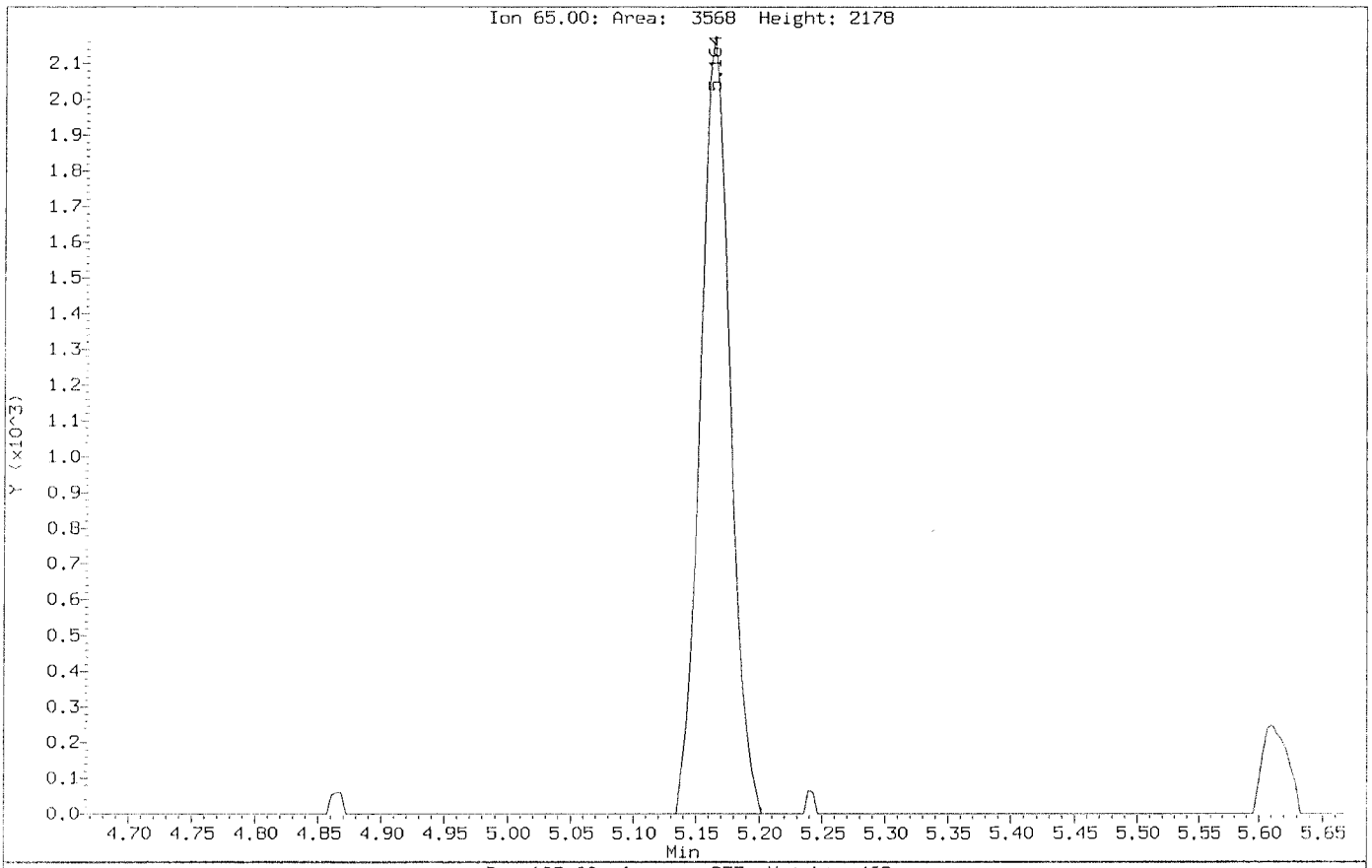
Compound: Dibromofluoromethane
CAS Number: 1868-53-7

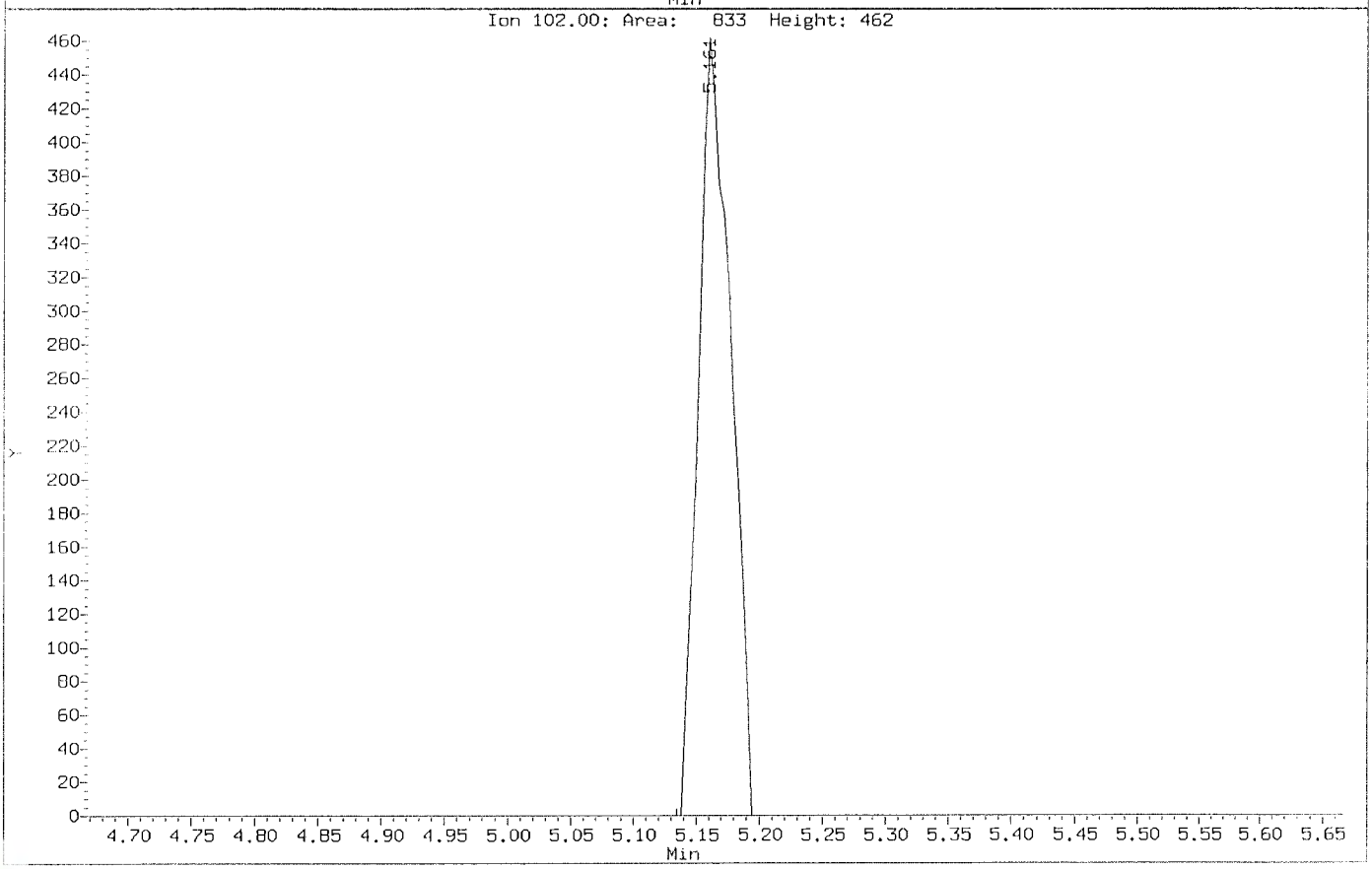




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dichloroethane-d4
CAS Number: 17060-07-0





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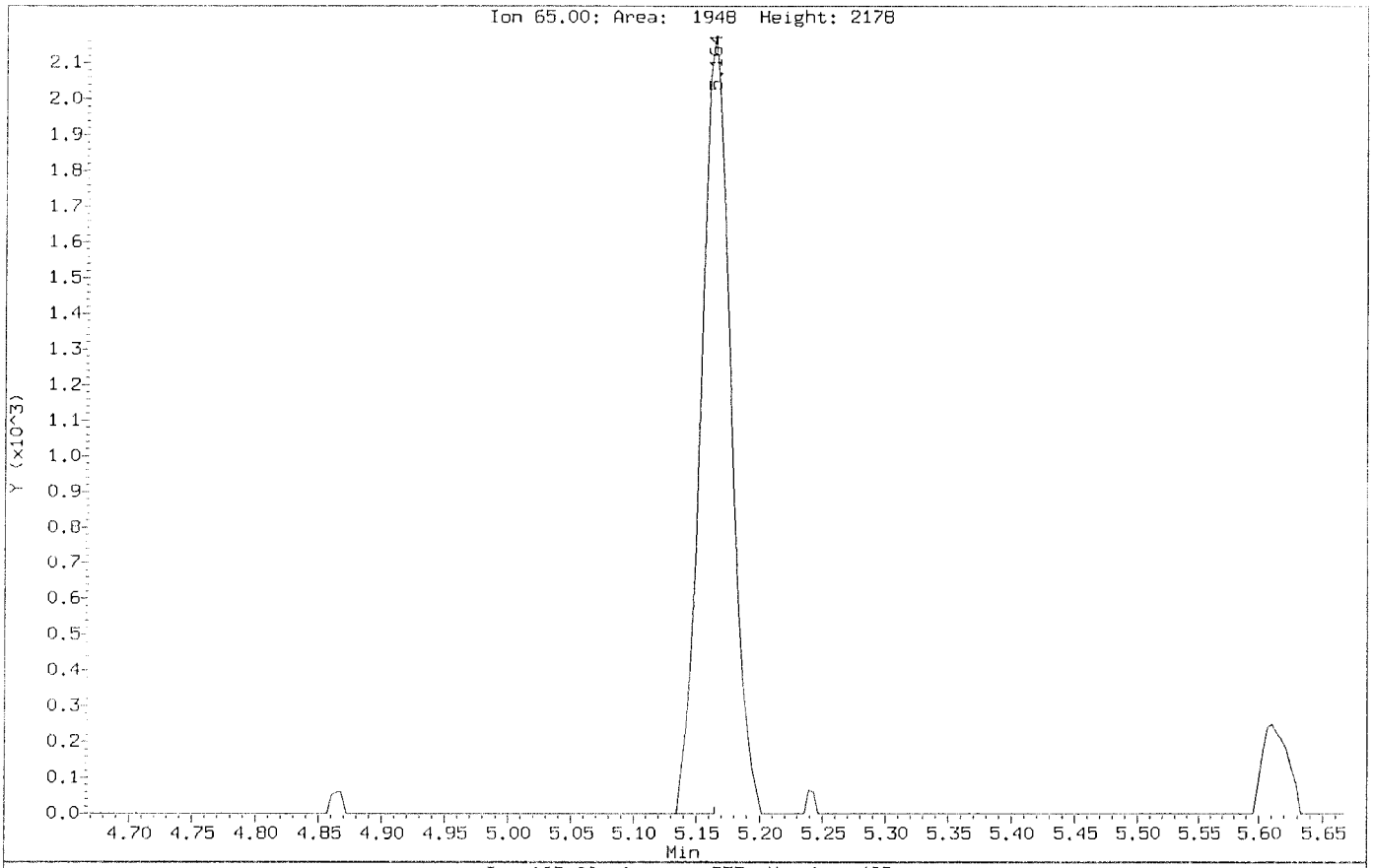
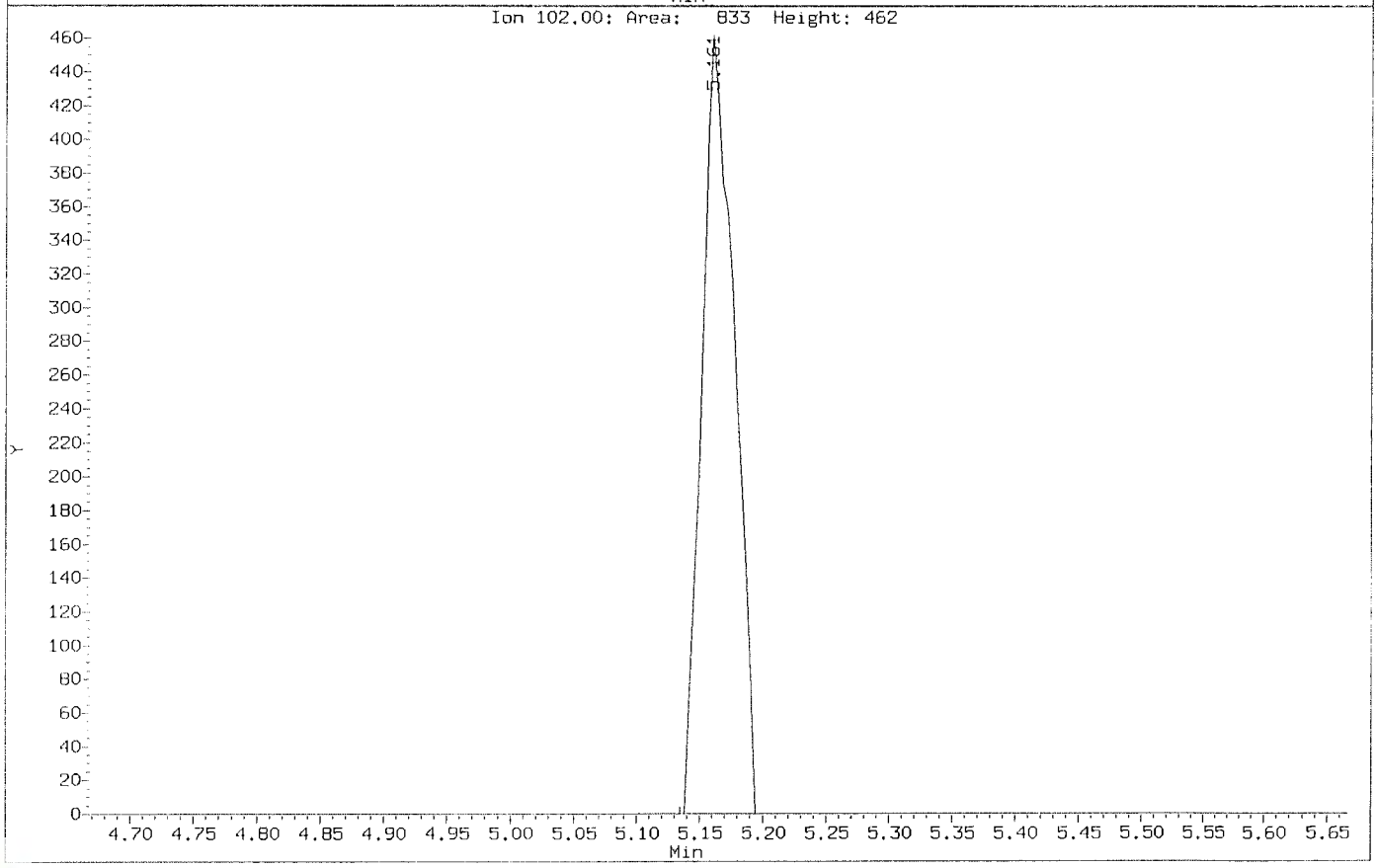
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dichloroethane-d4
CAS Number: 17060-07-0





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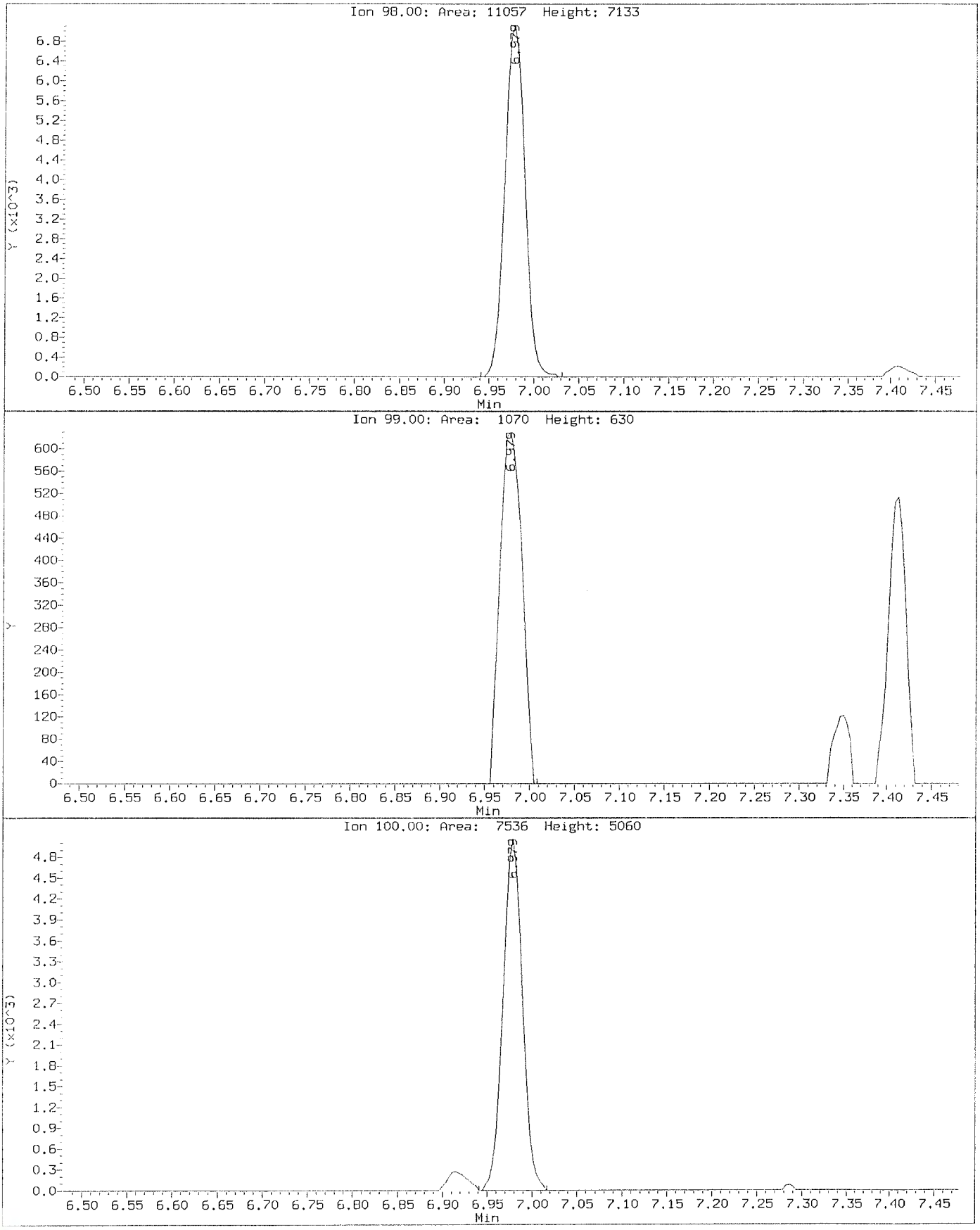
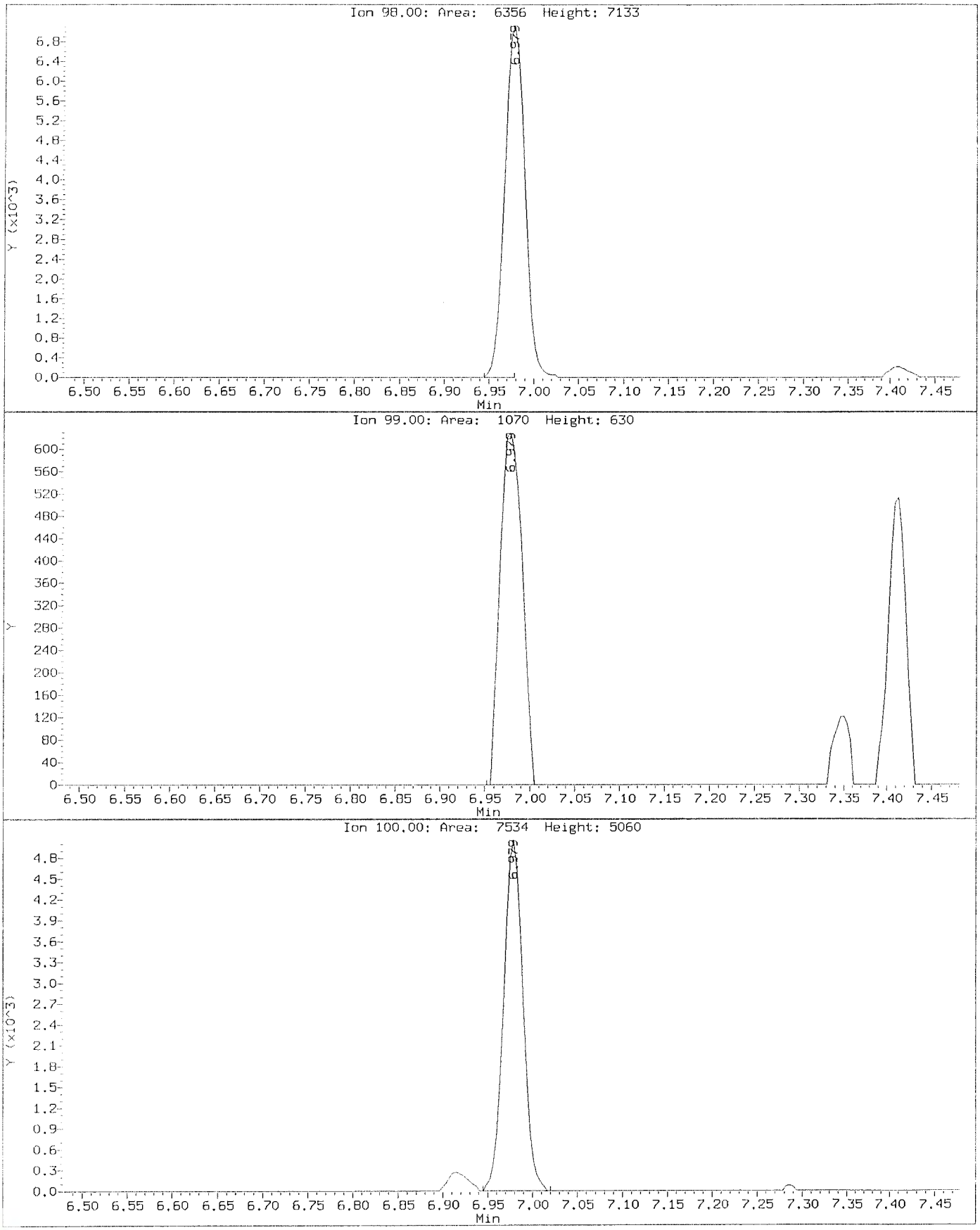
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Toluene-d8
CAS Number: 2037-26-5



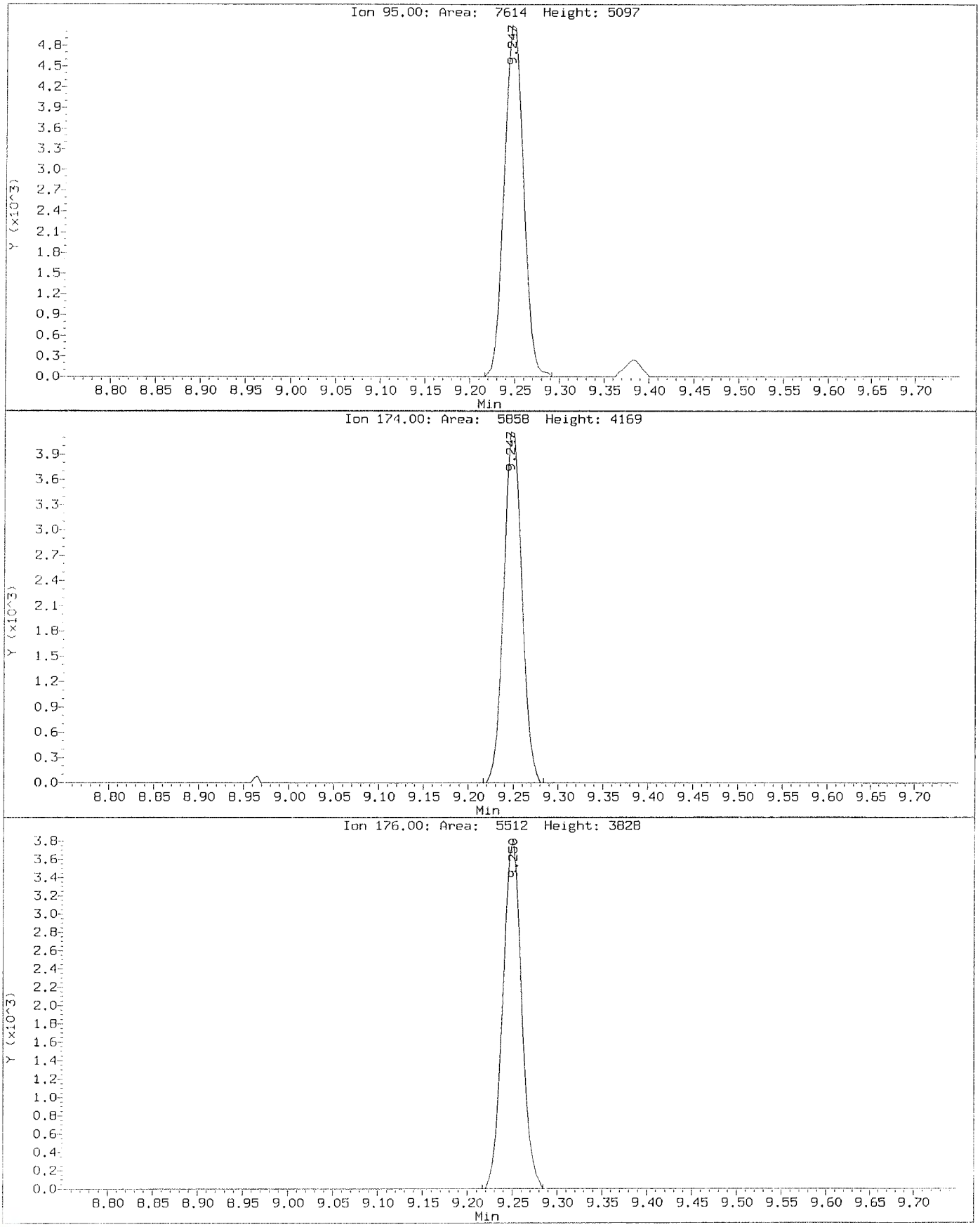
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Toluene-d8
CAS Number: 2037-26-5



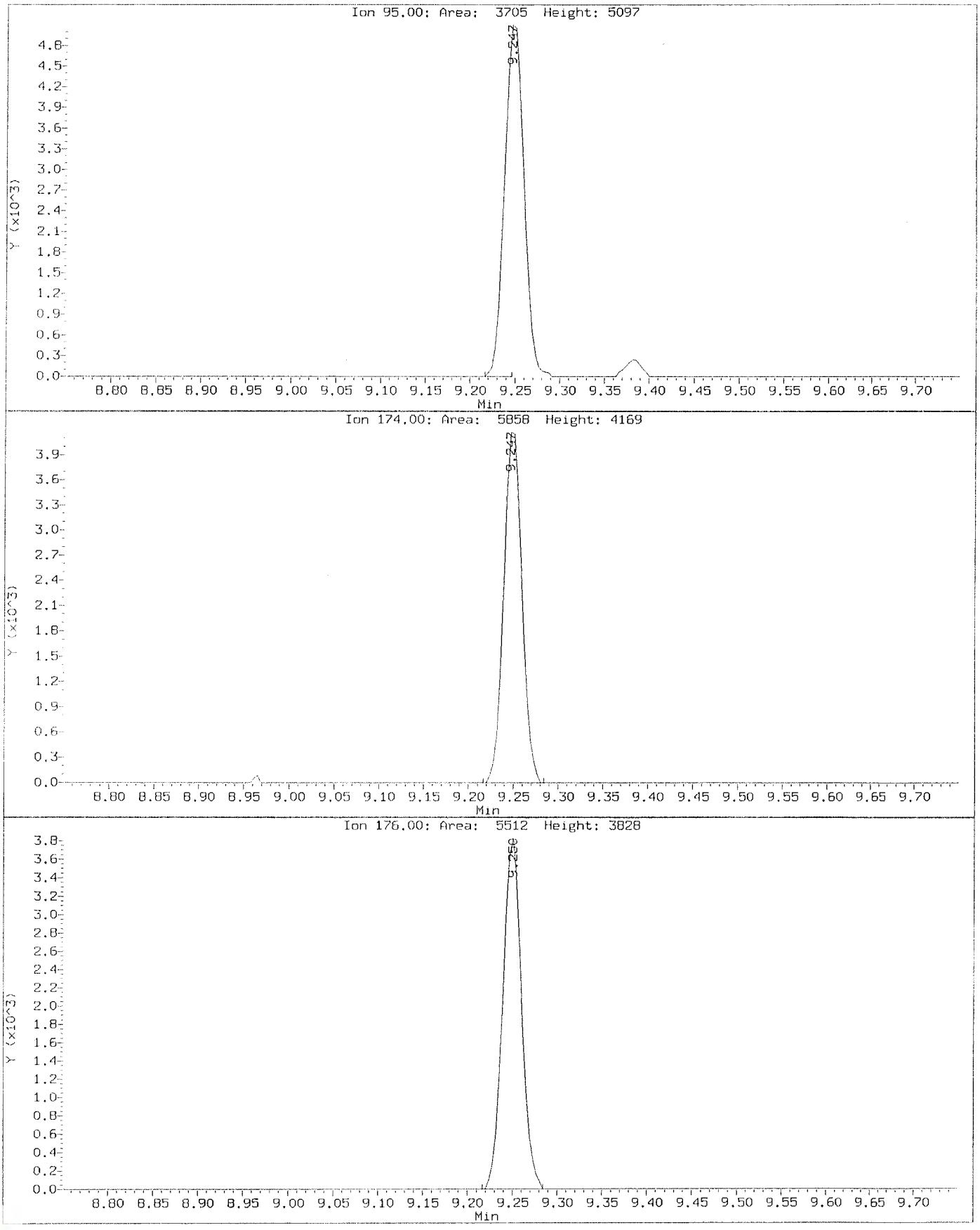
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 4-Bromofluorobenzene
CAS Number: 460-00-4



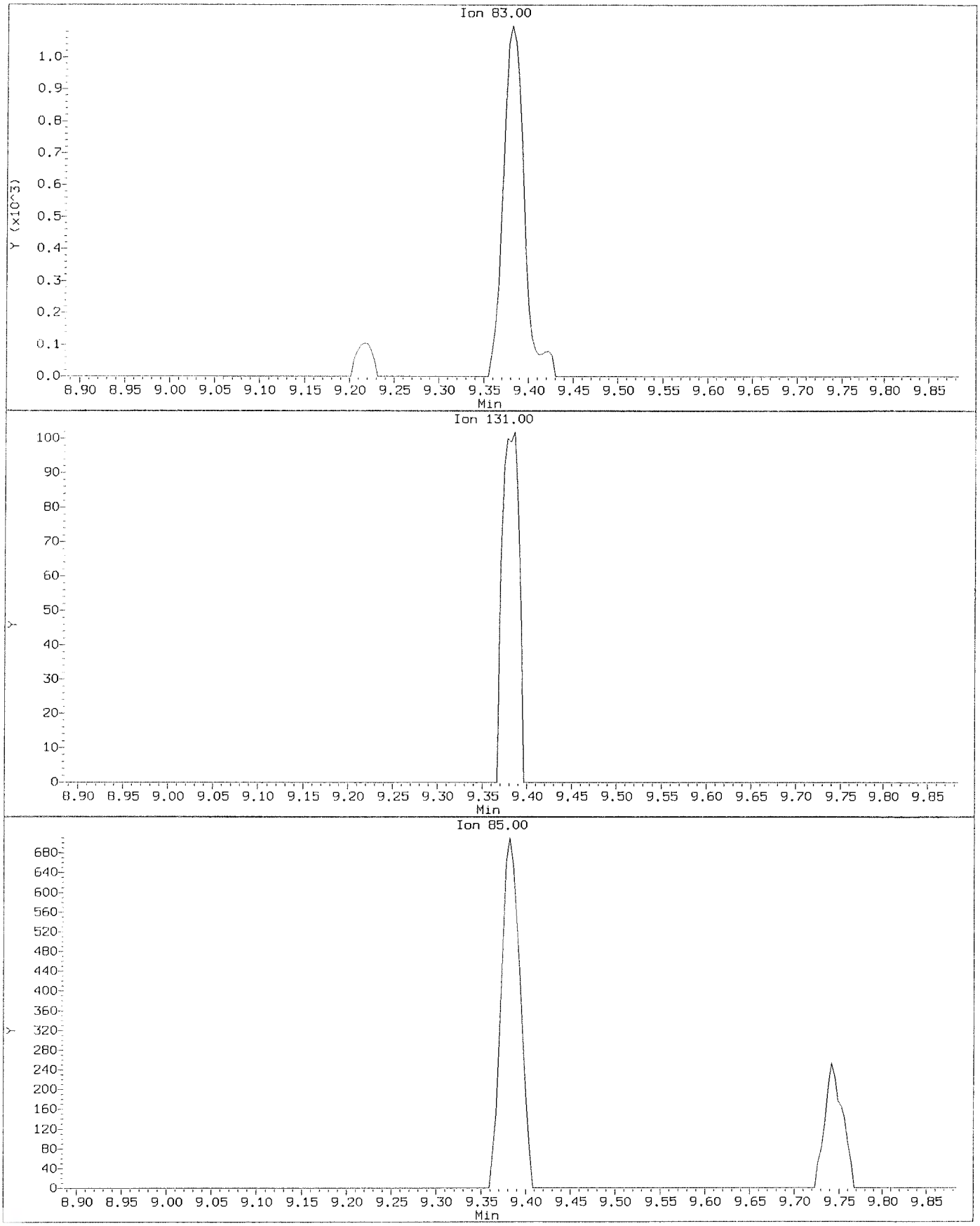
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 4-Bromofluorobenzene
CAS Number: 460-00-4



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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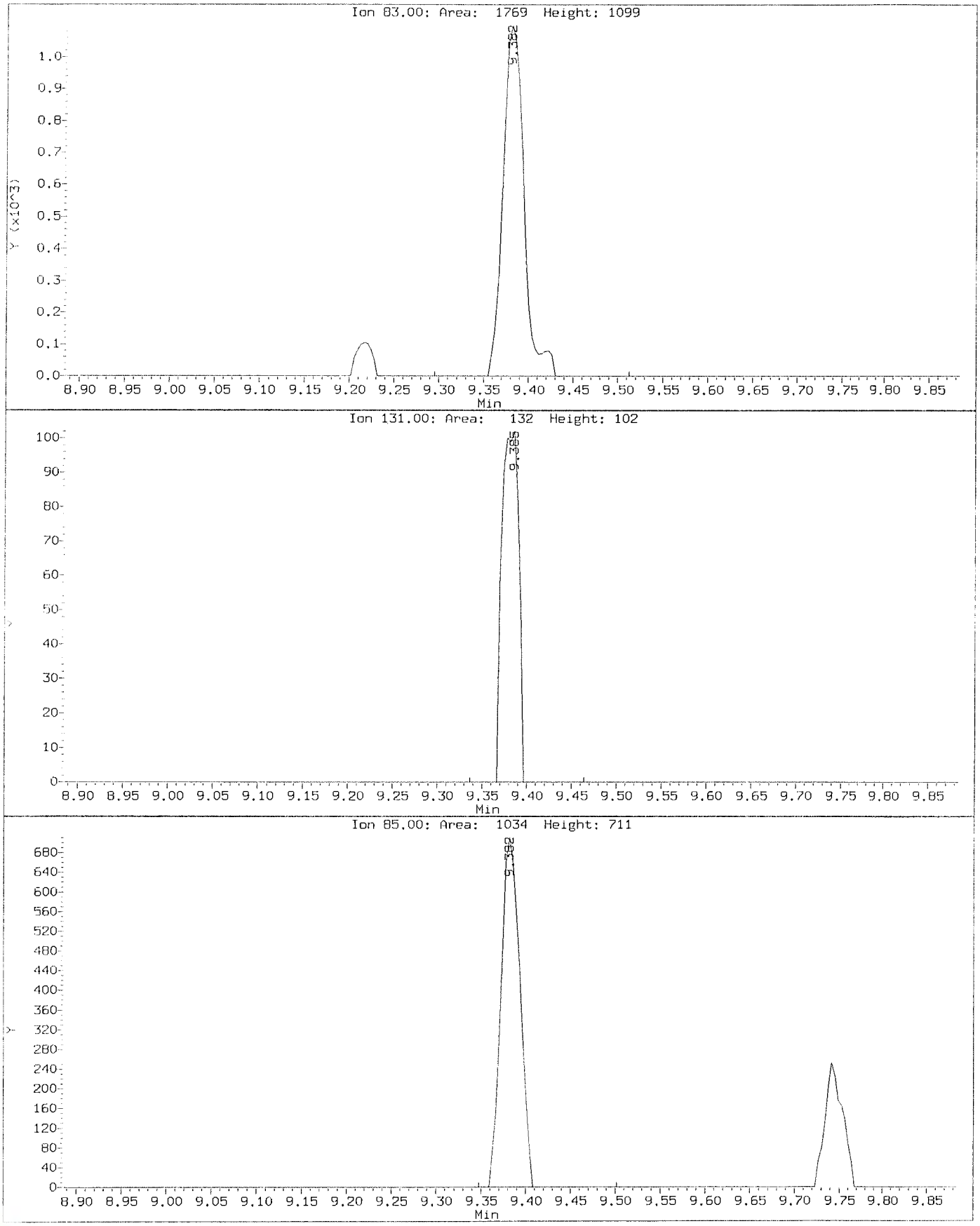
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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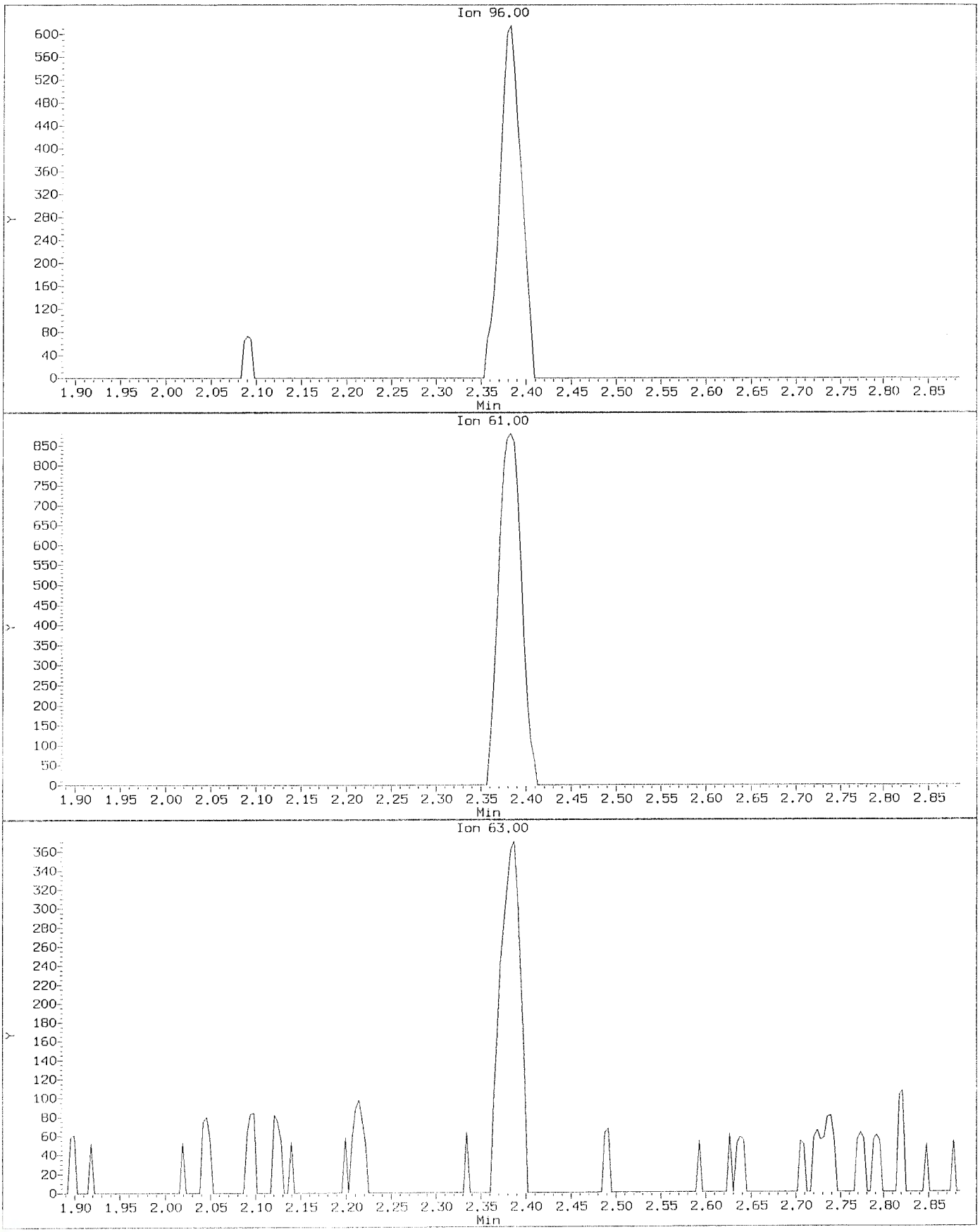
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



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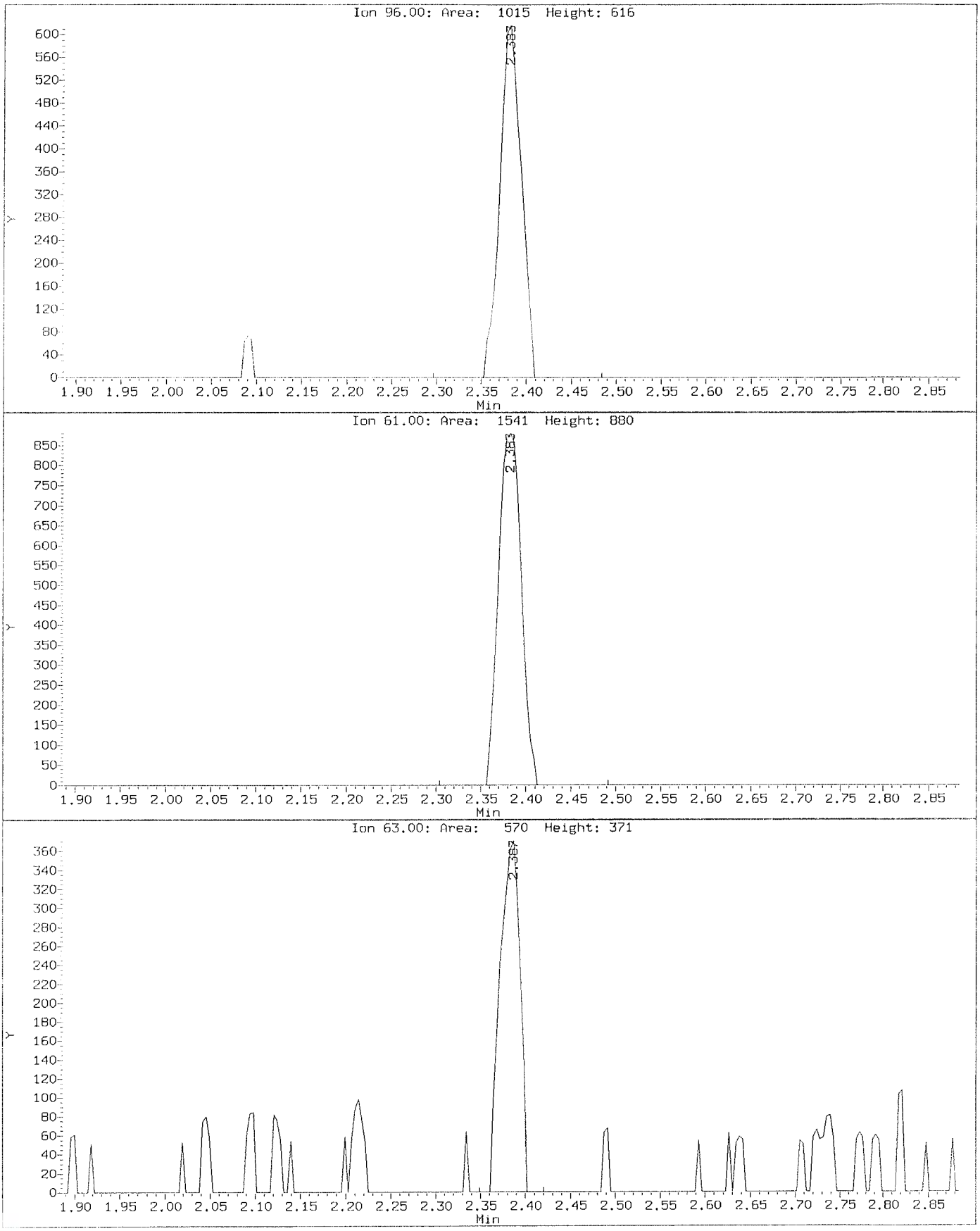
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



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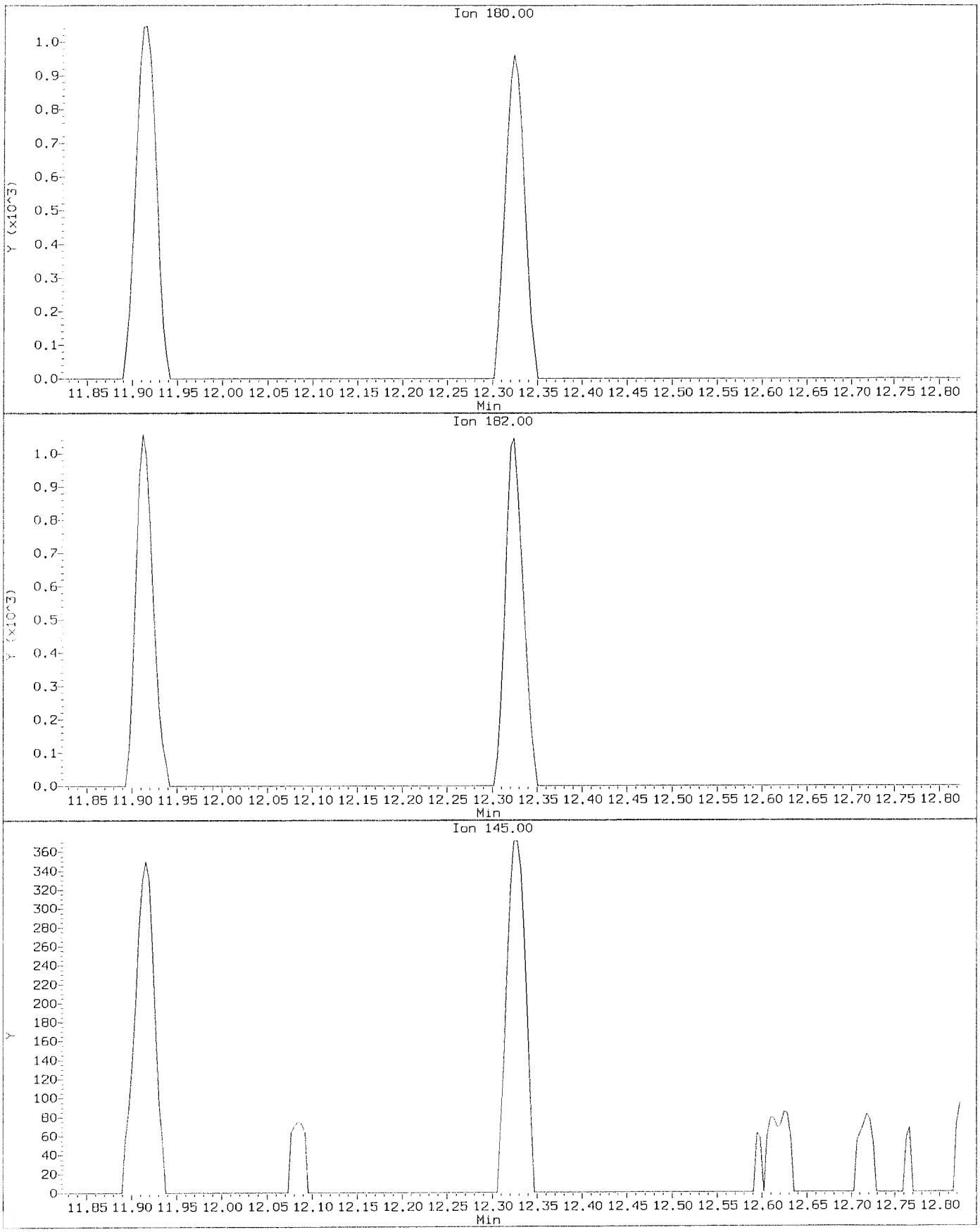
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6



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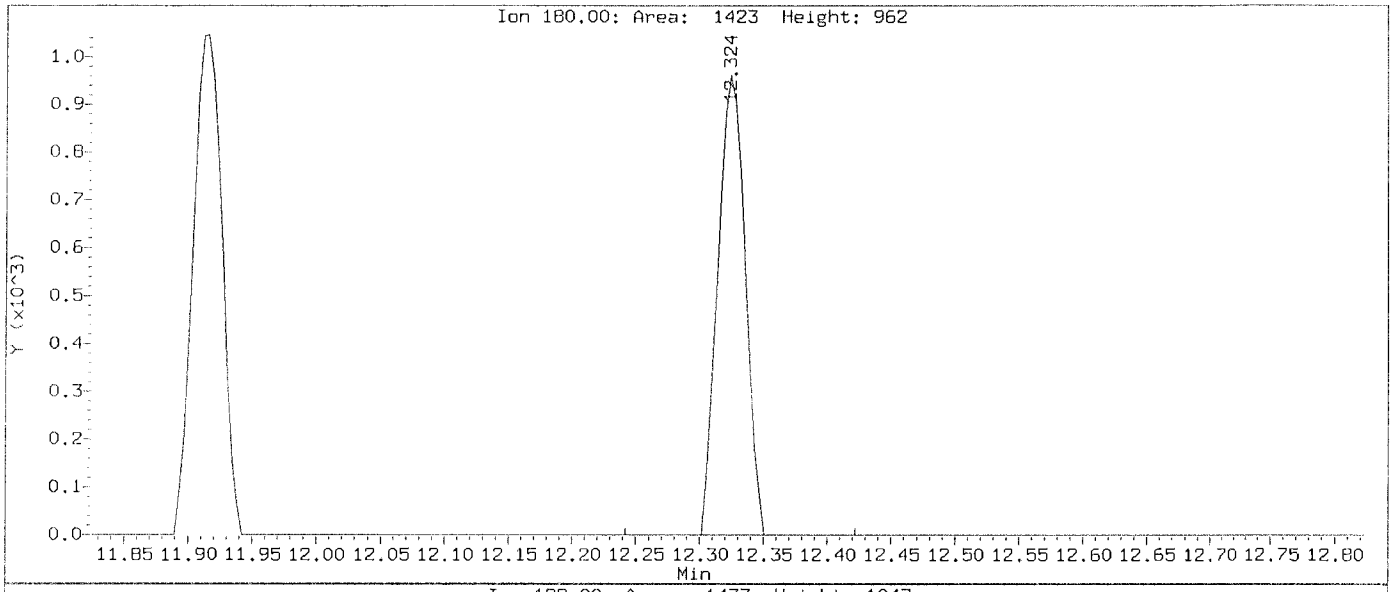
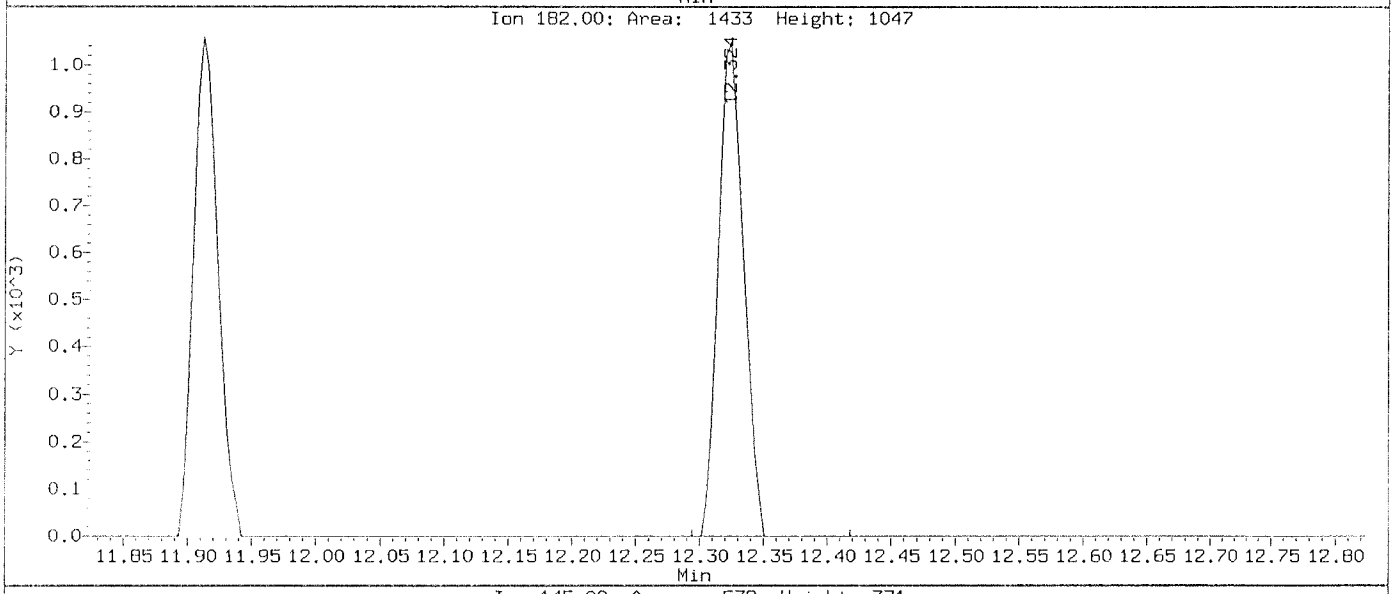
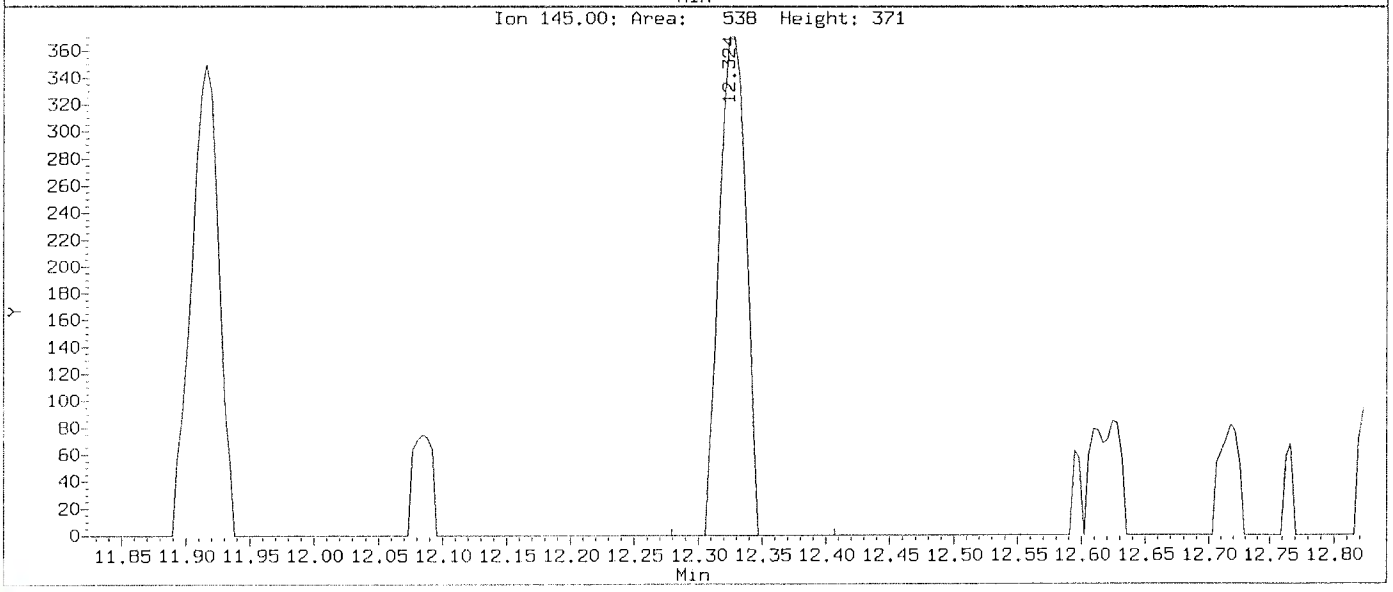
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

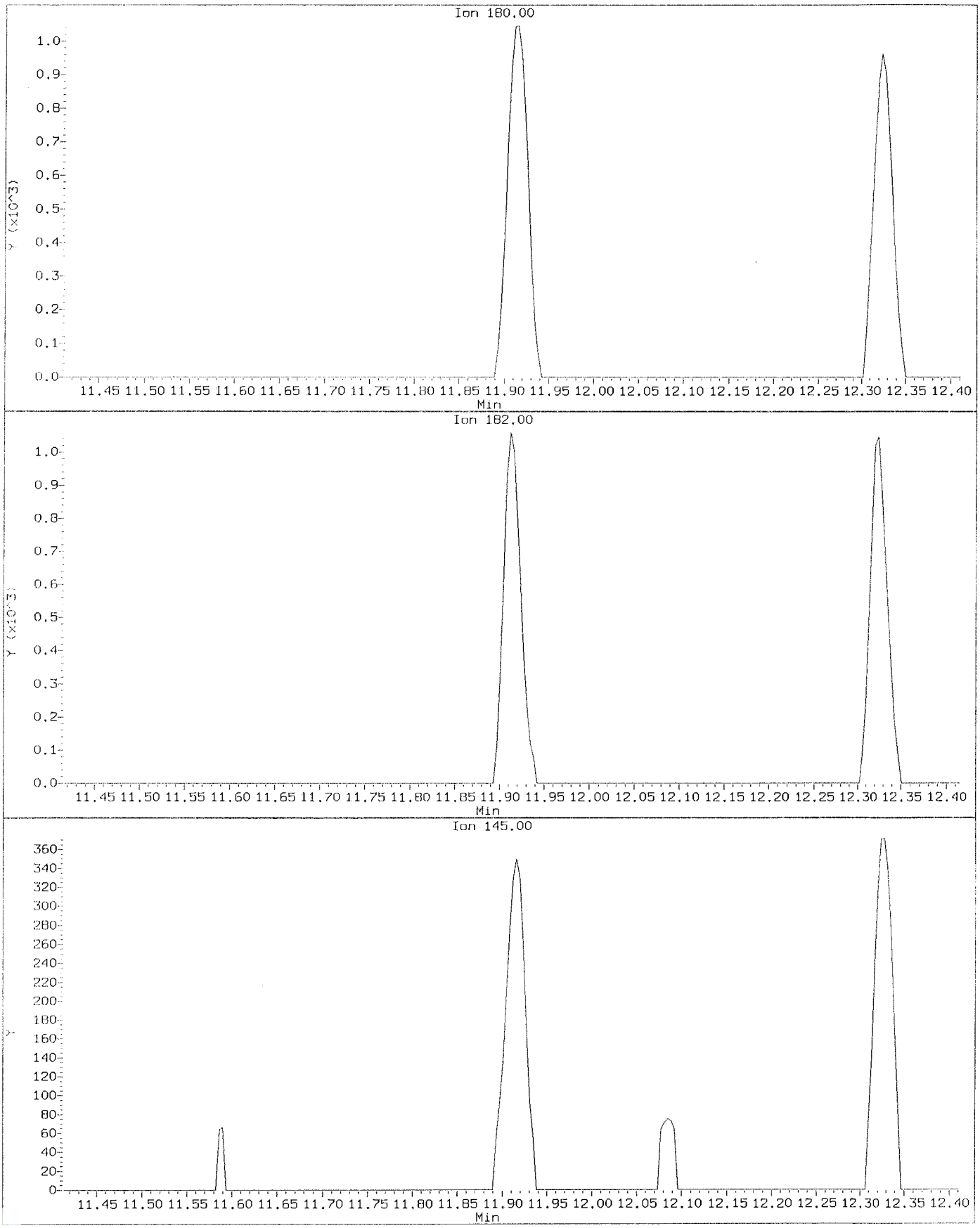






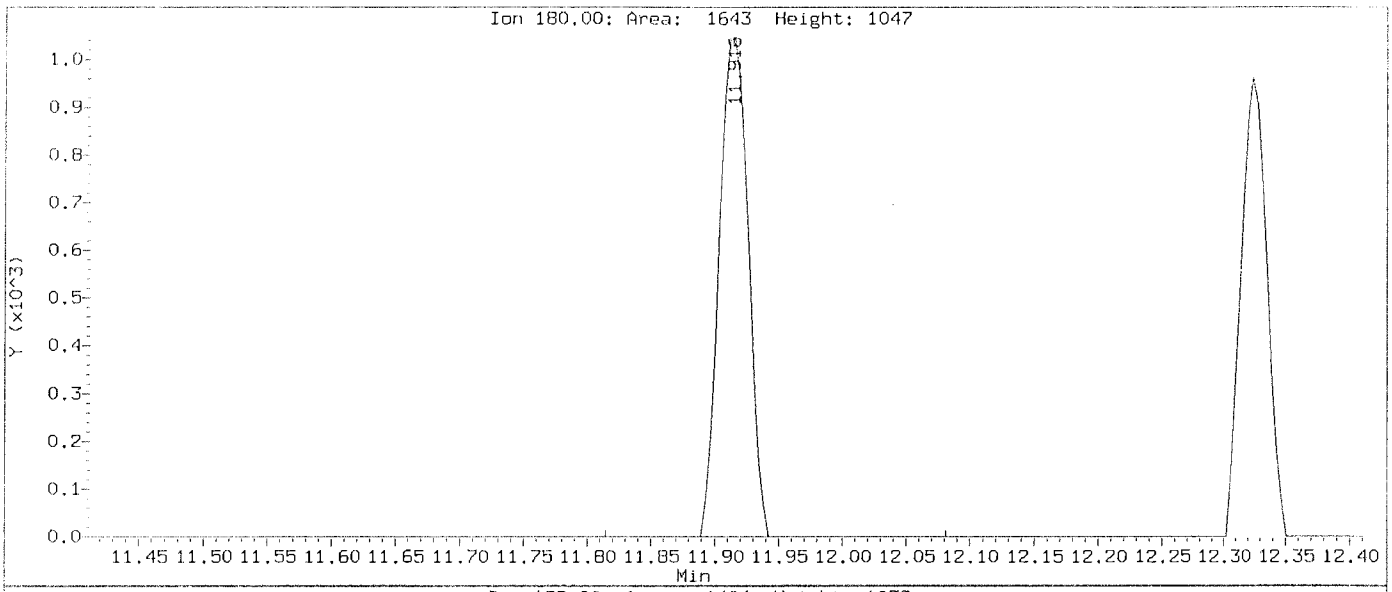
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

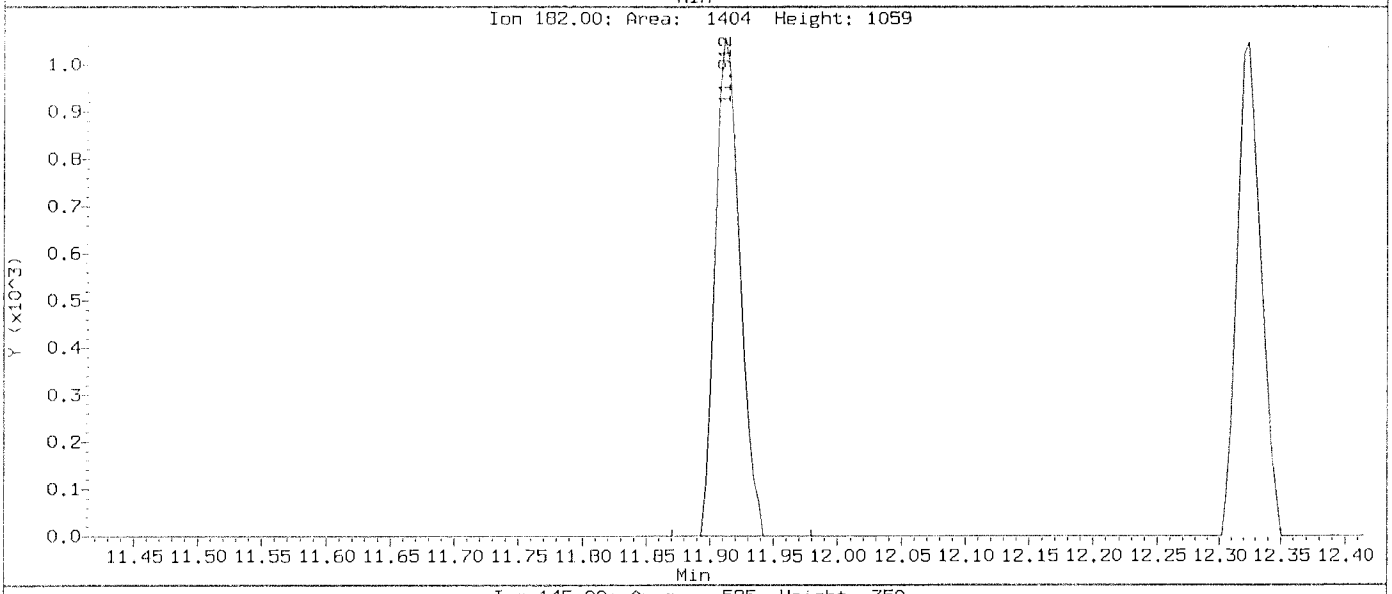
Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

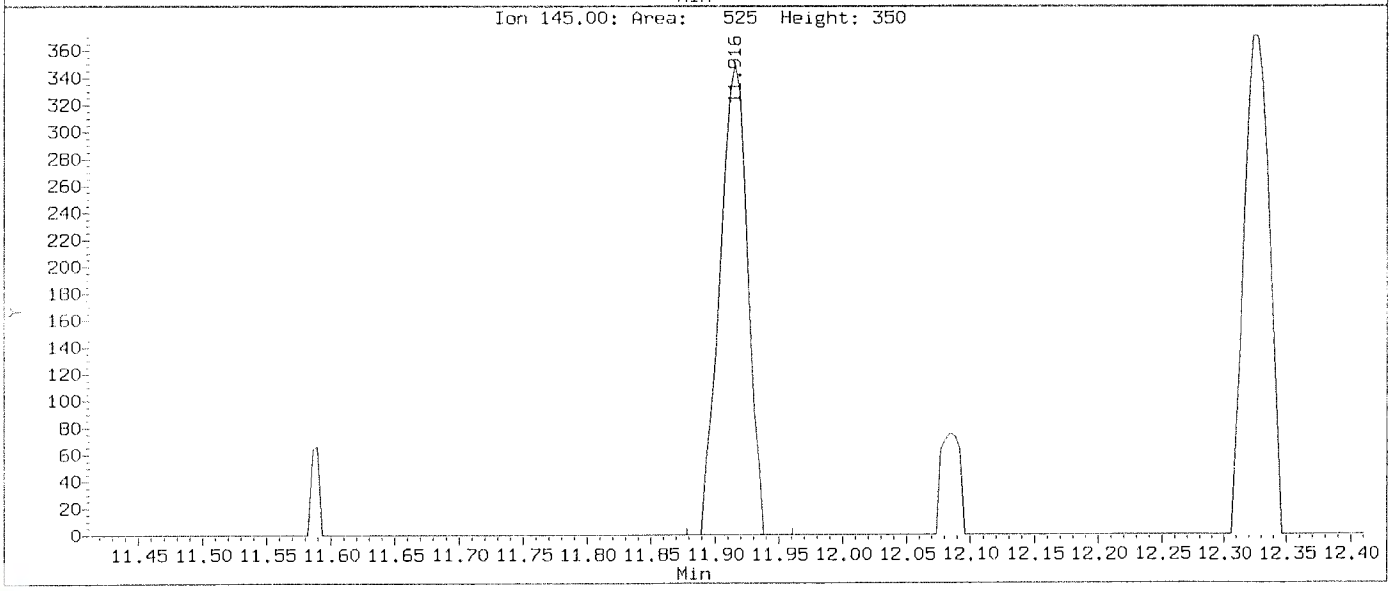


Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

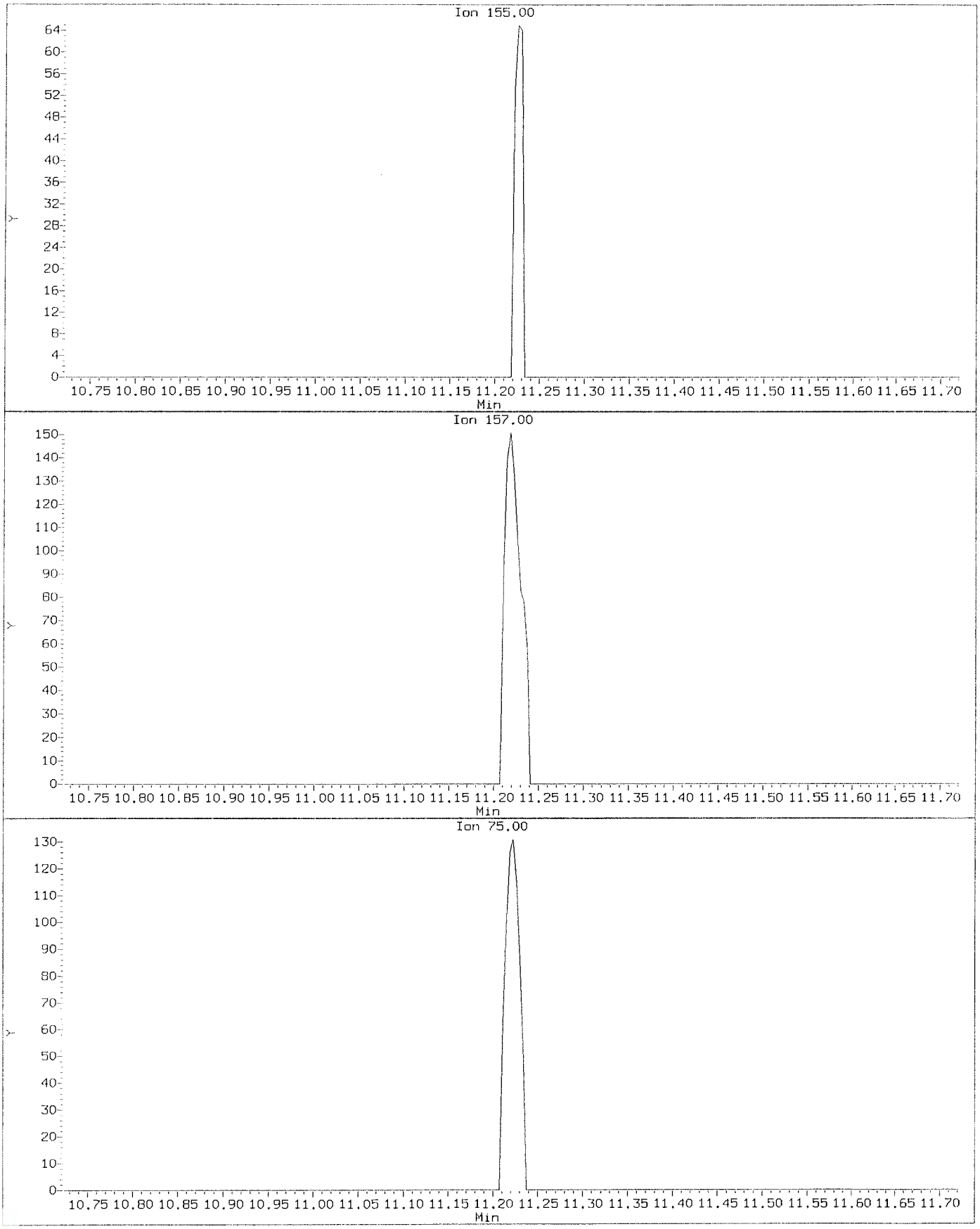






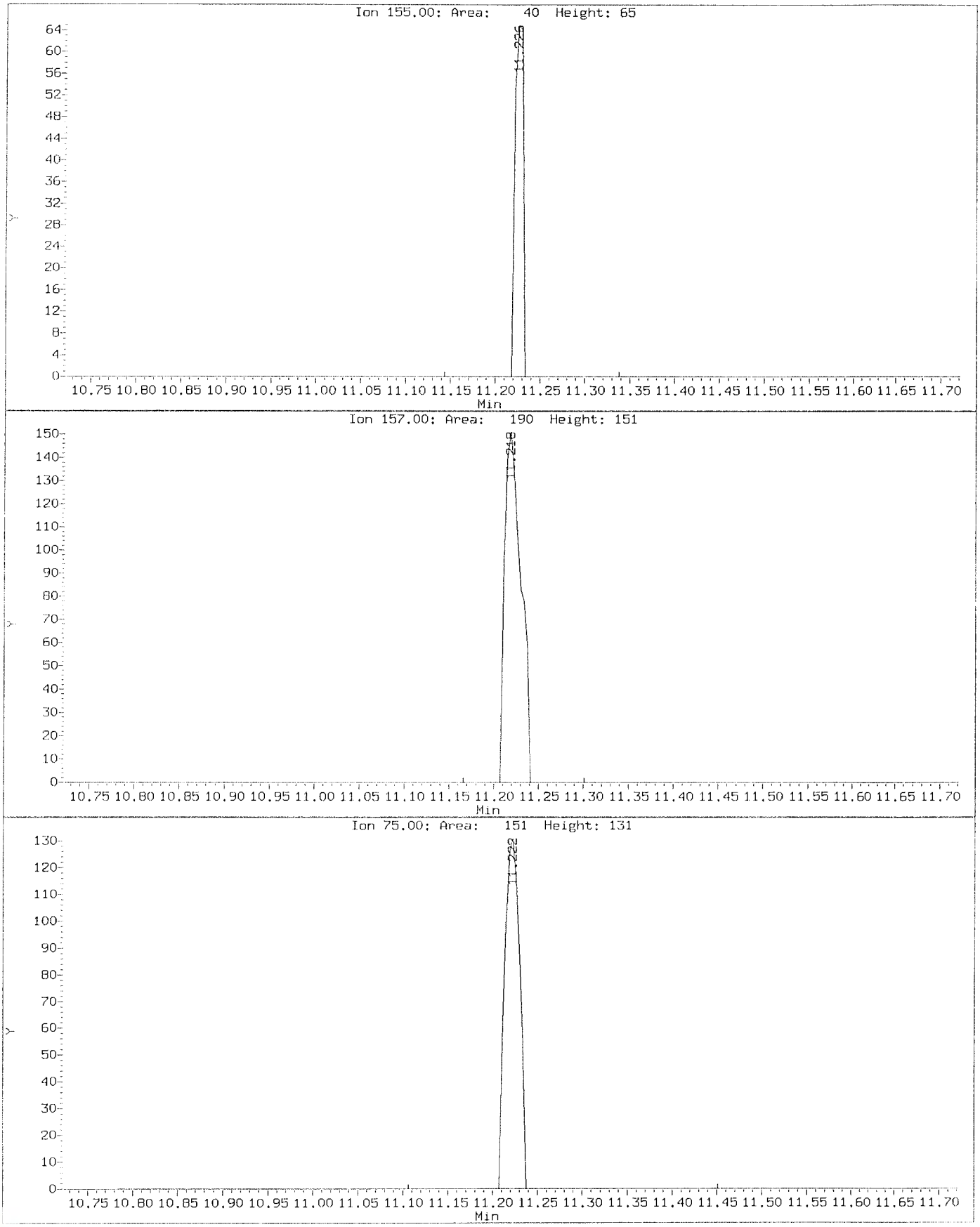
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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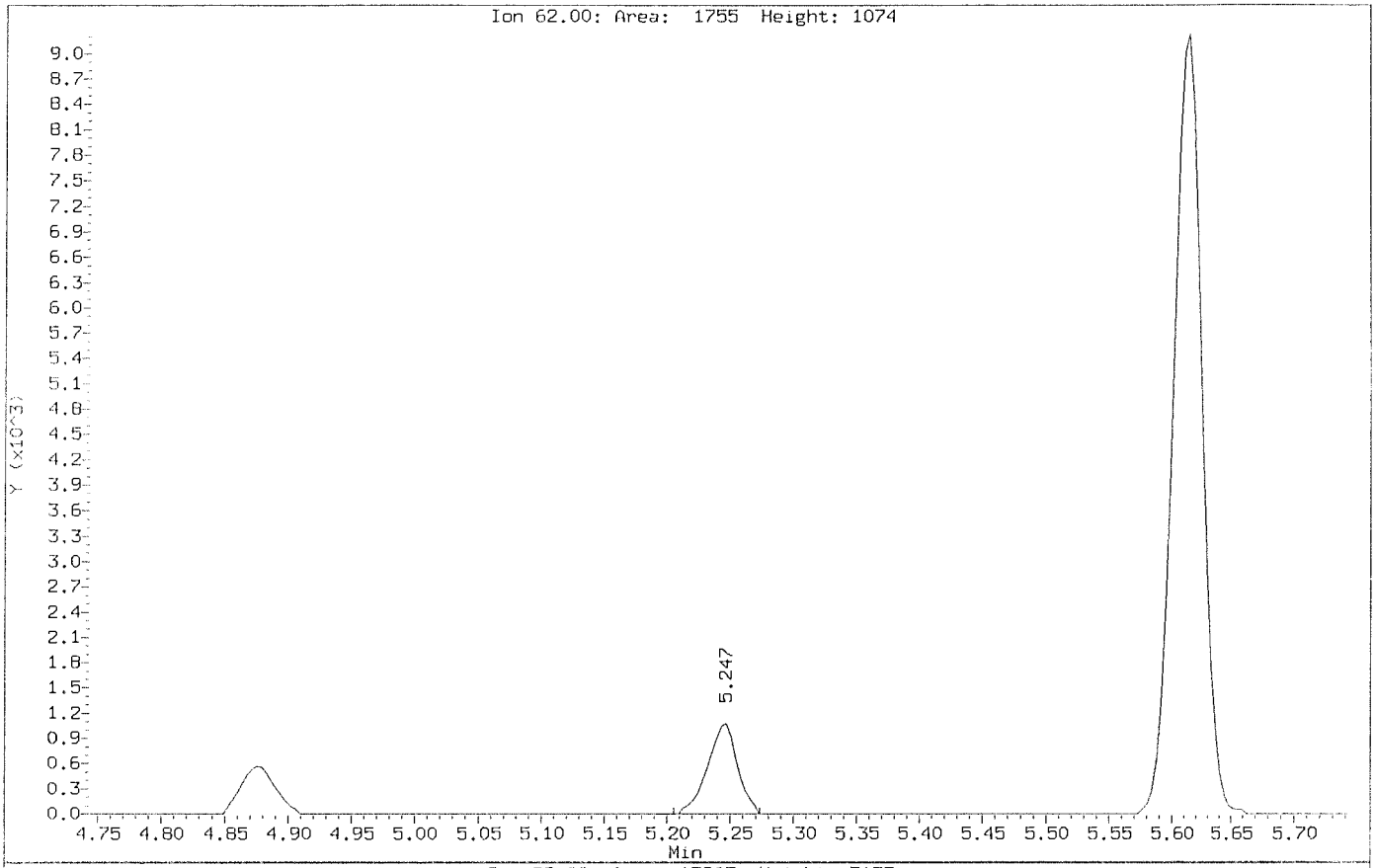
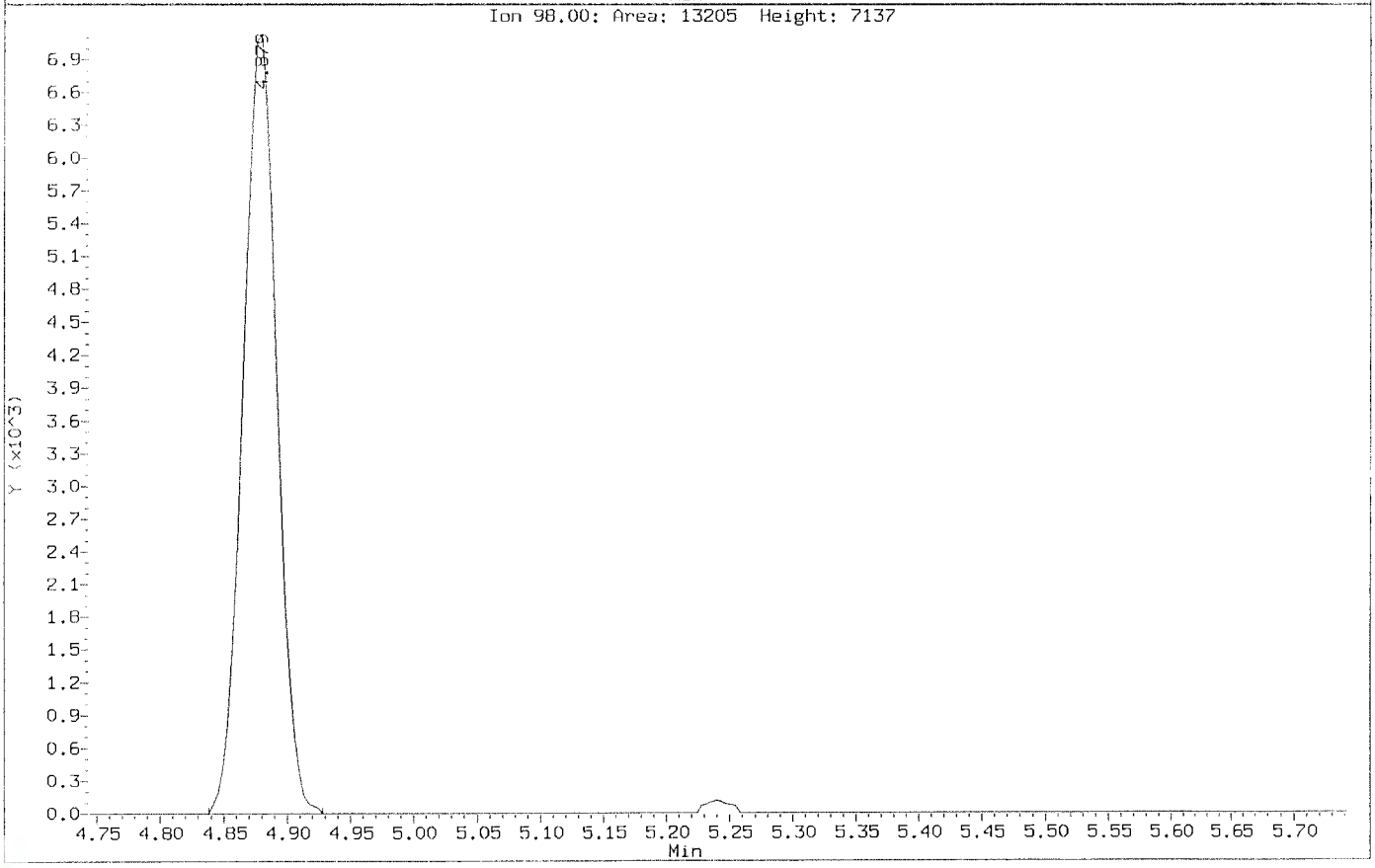
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

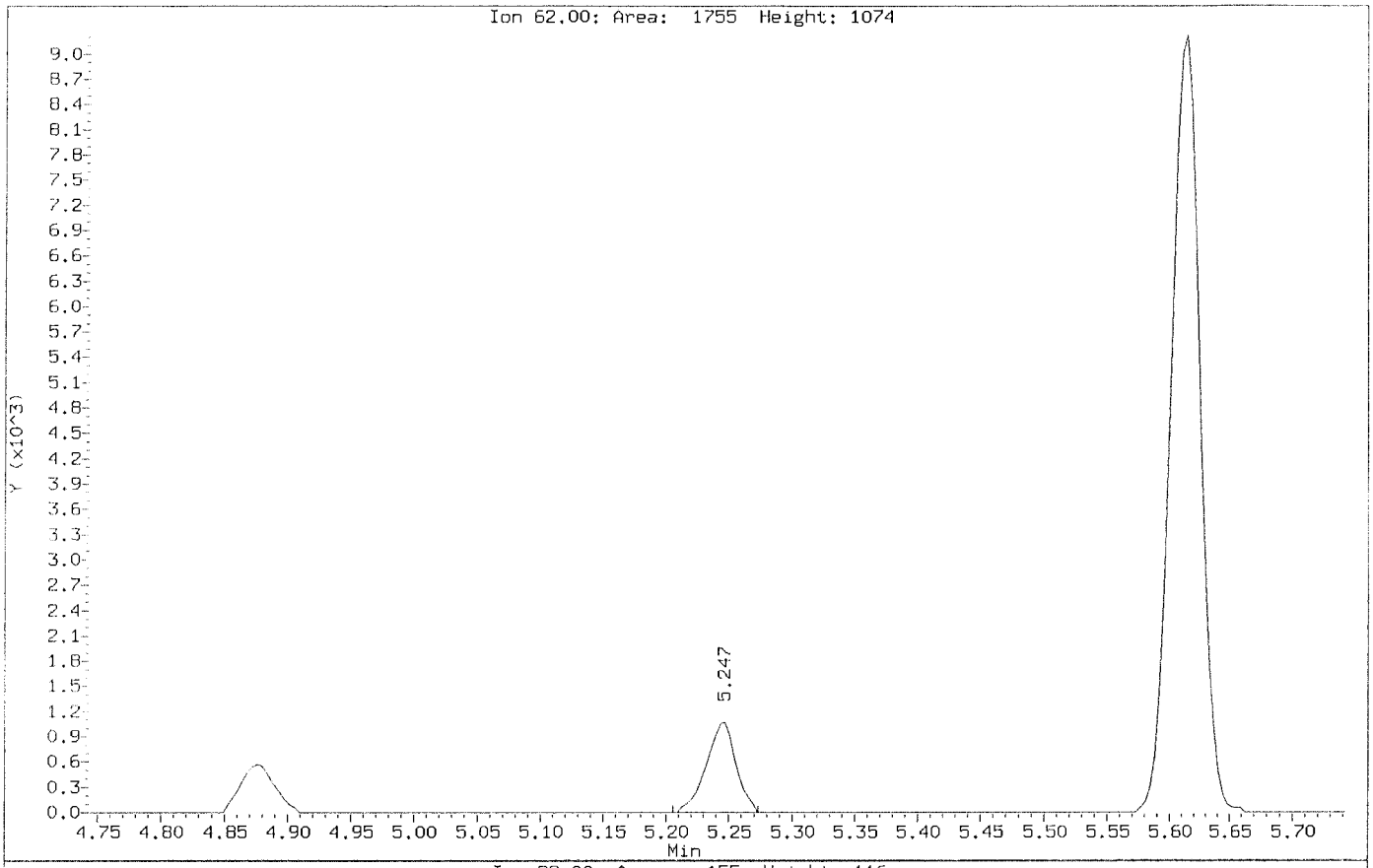
Compound: 1,2-Dichloroethane
CAS Number: 107-06-2

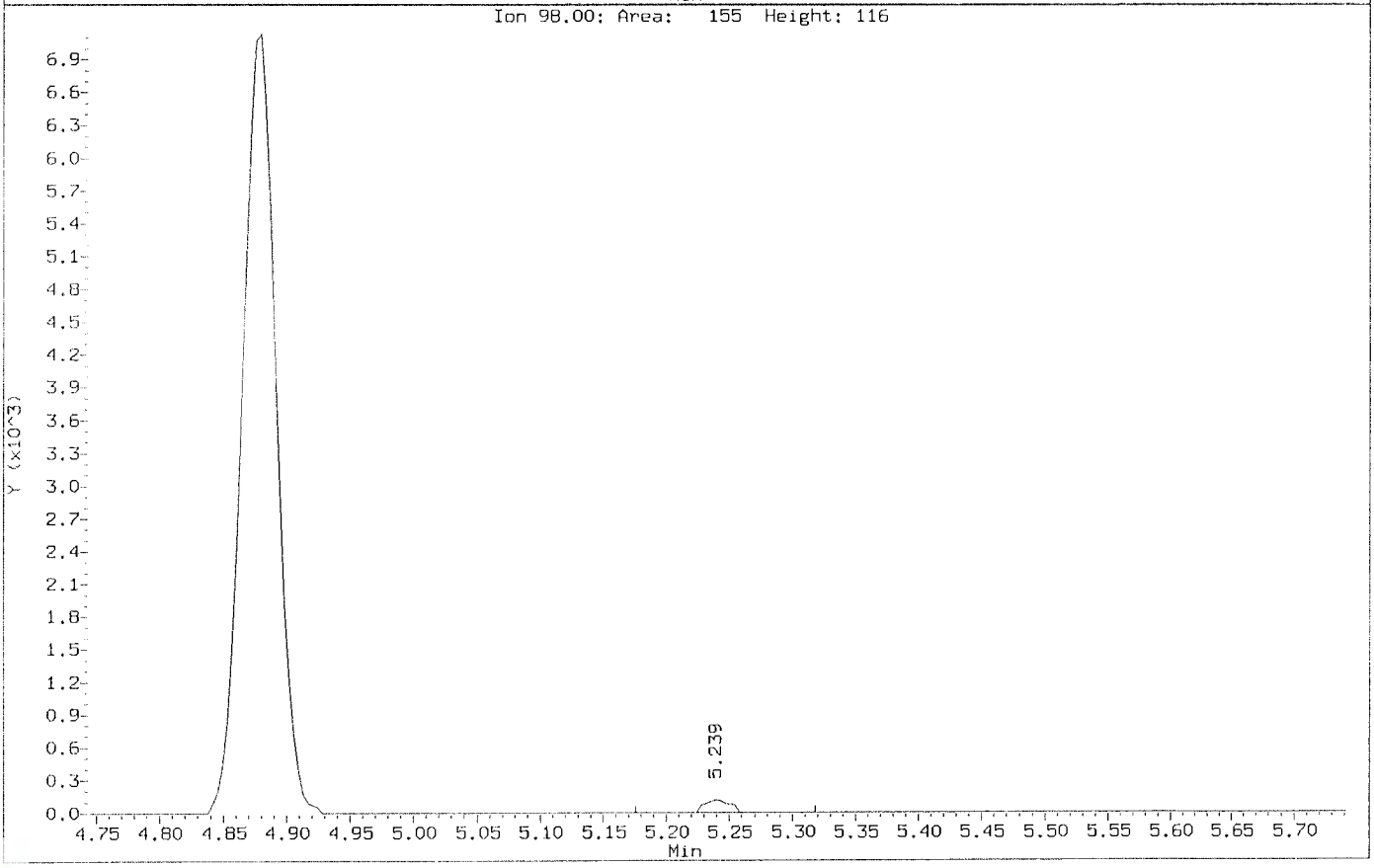




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dichloroethane
CAS Number: 107-06-2





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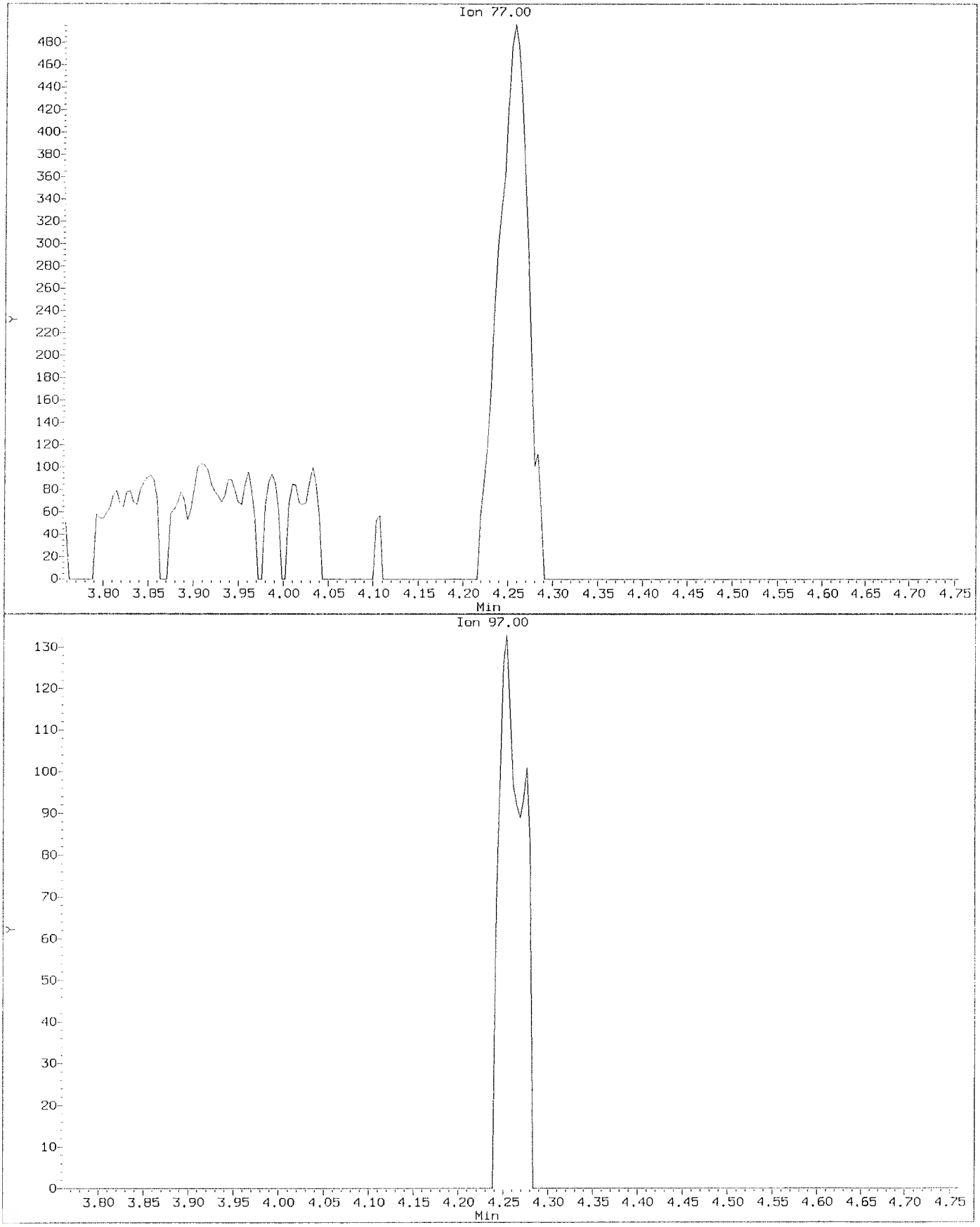
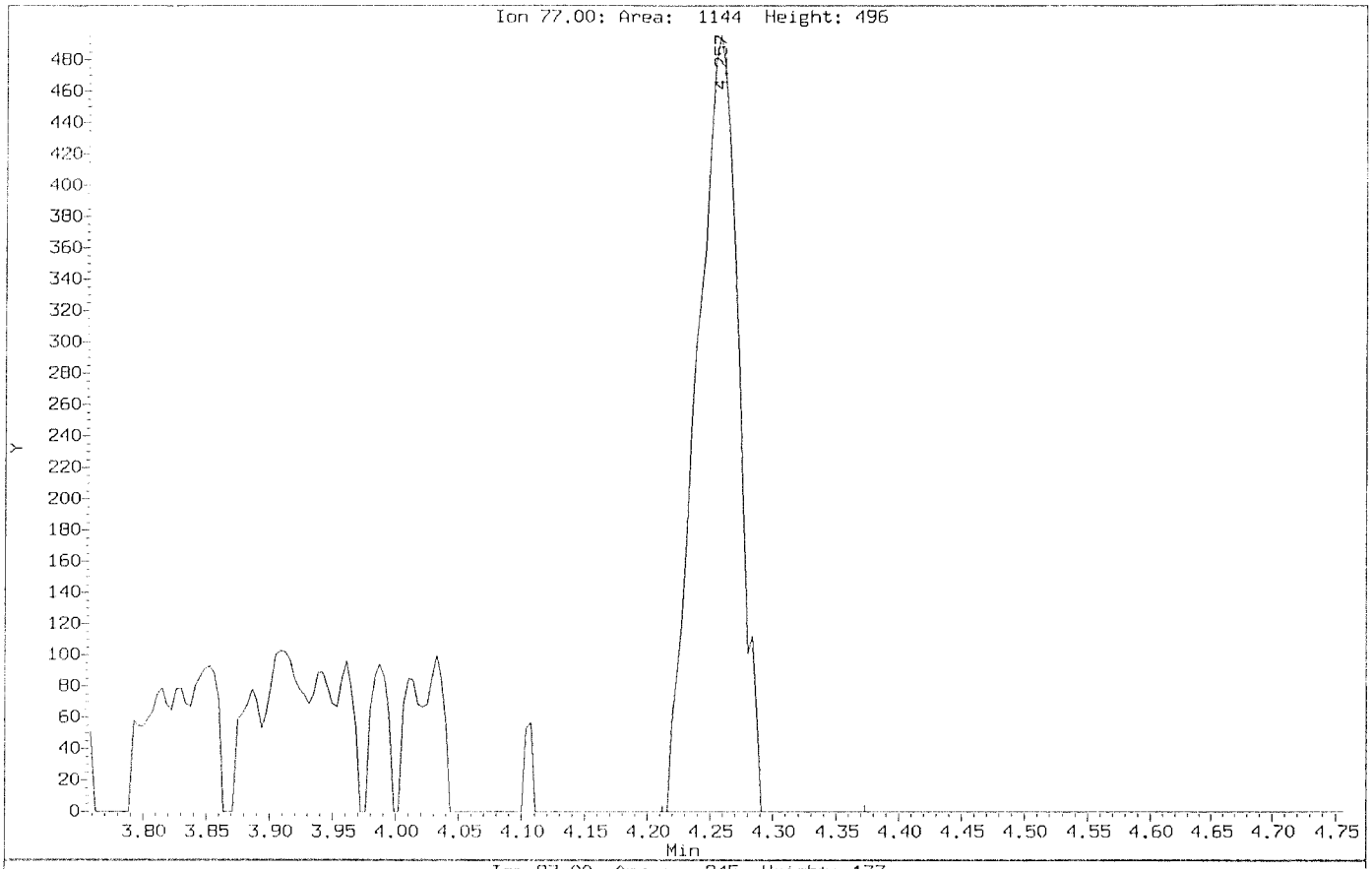
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

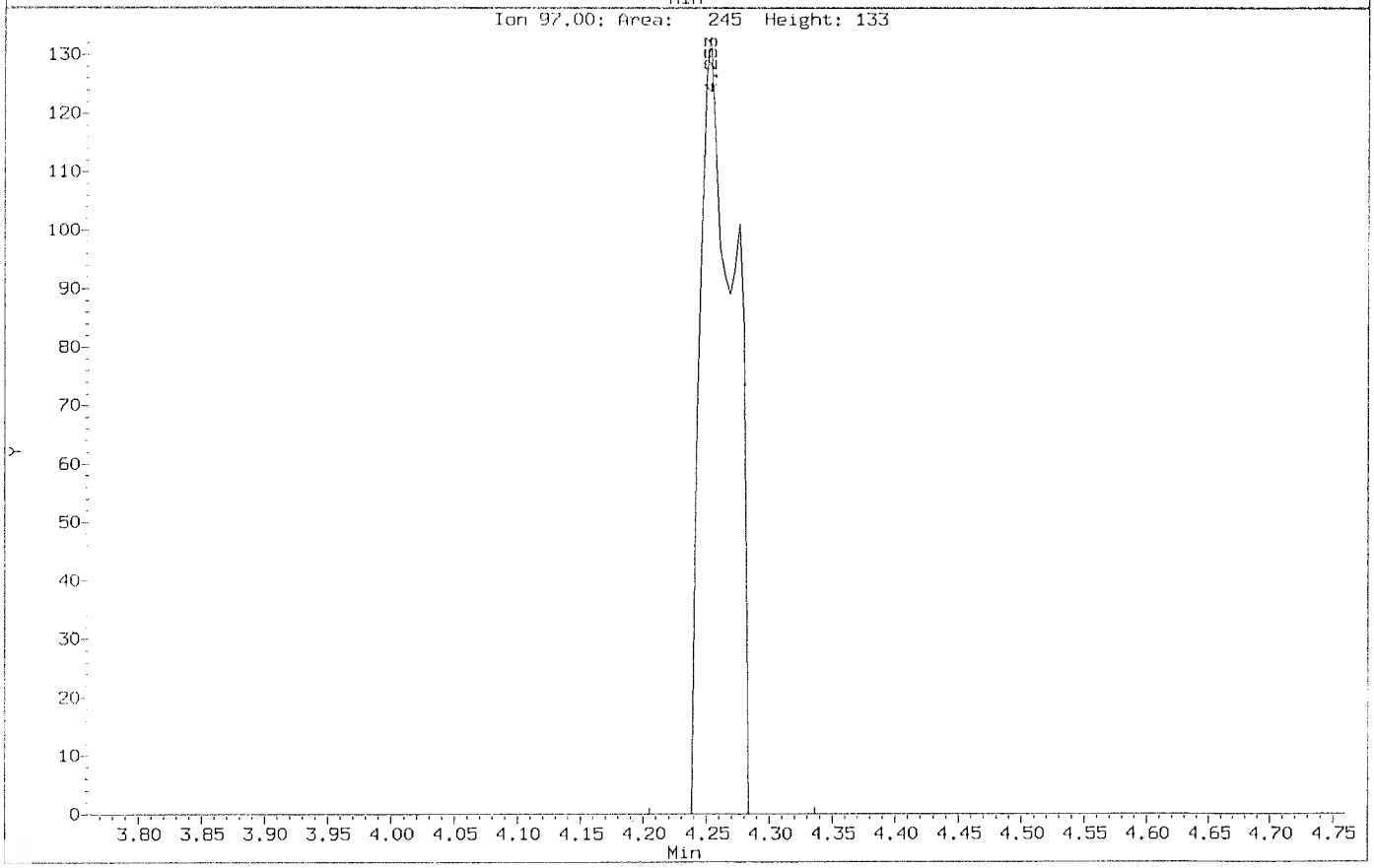
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

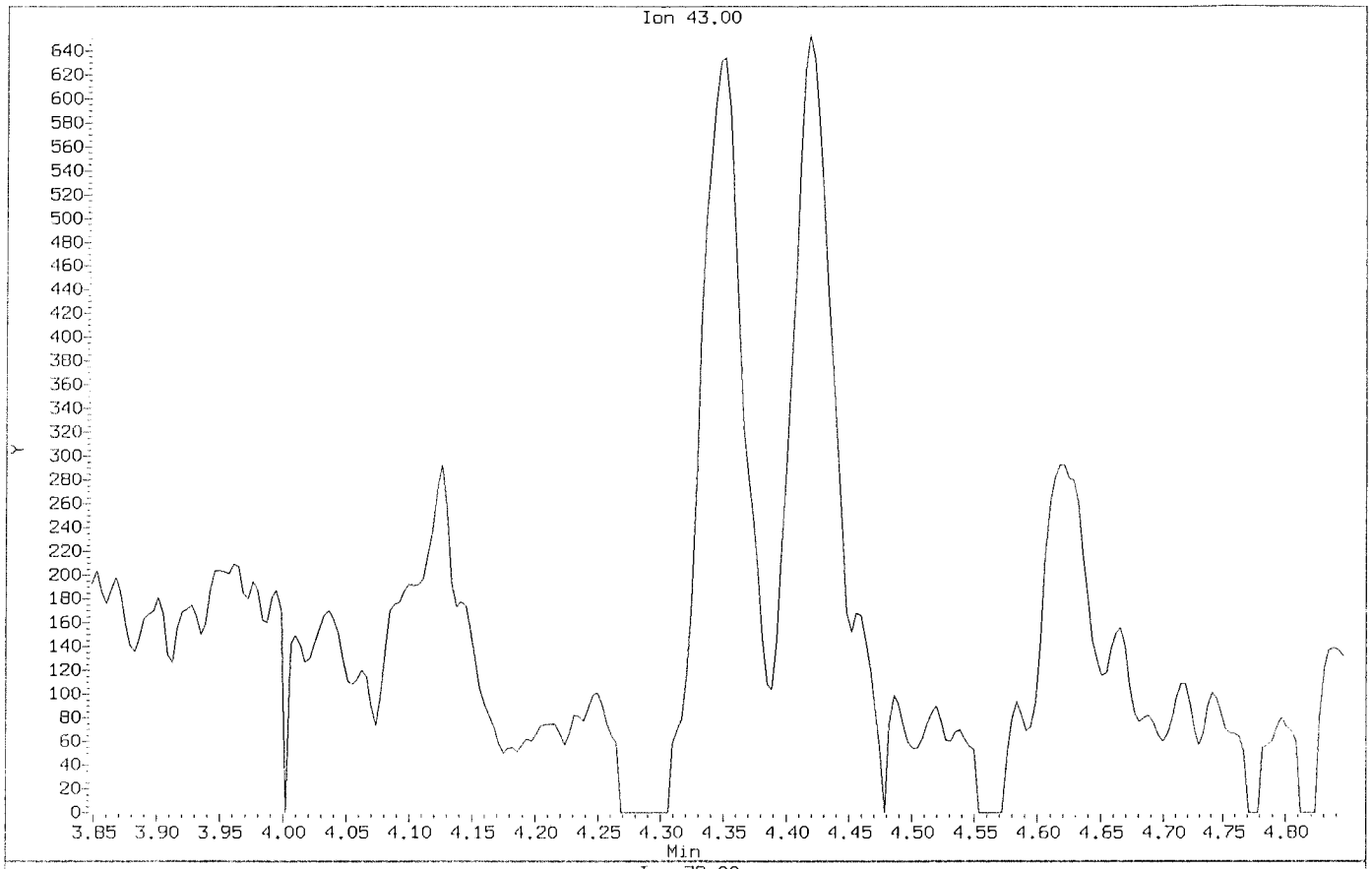
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7

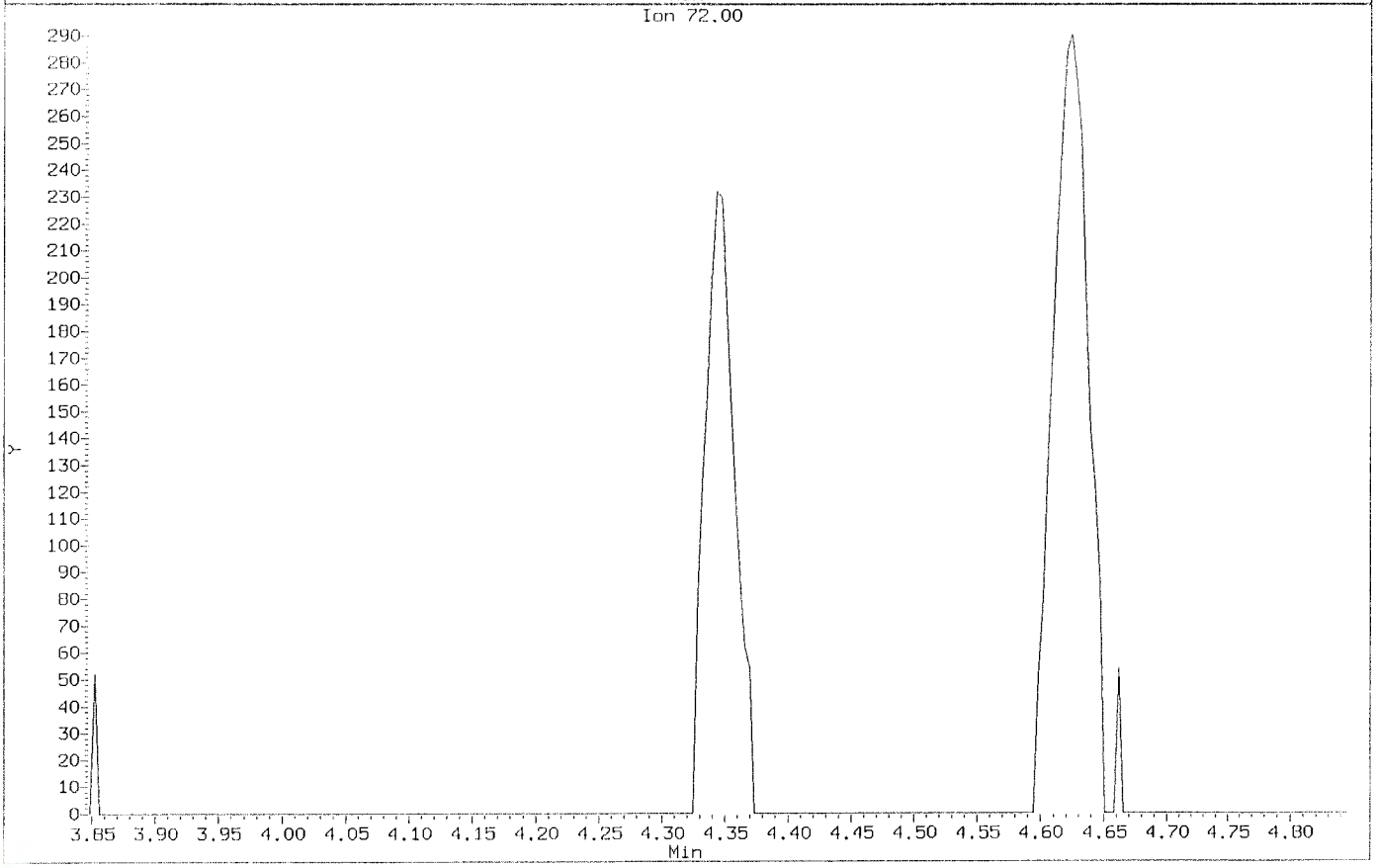




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

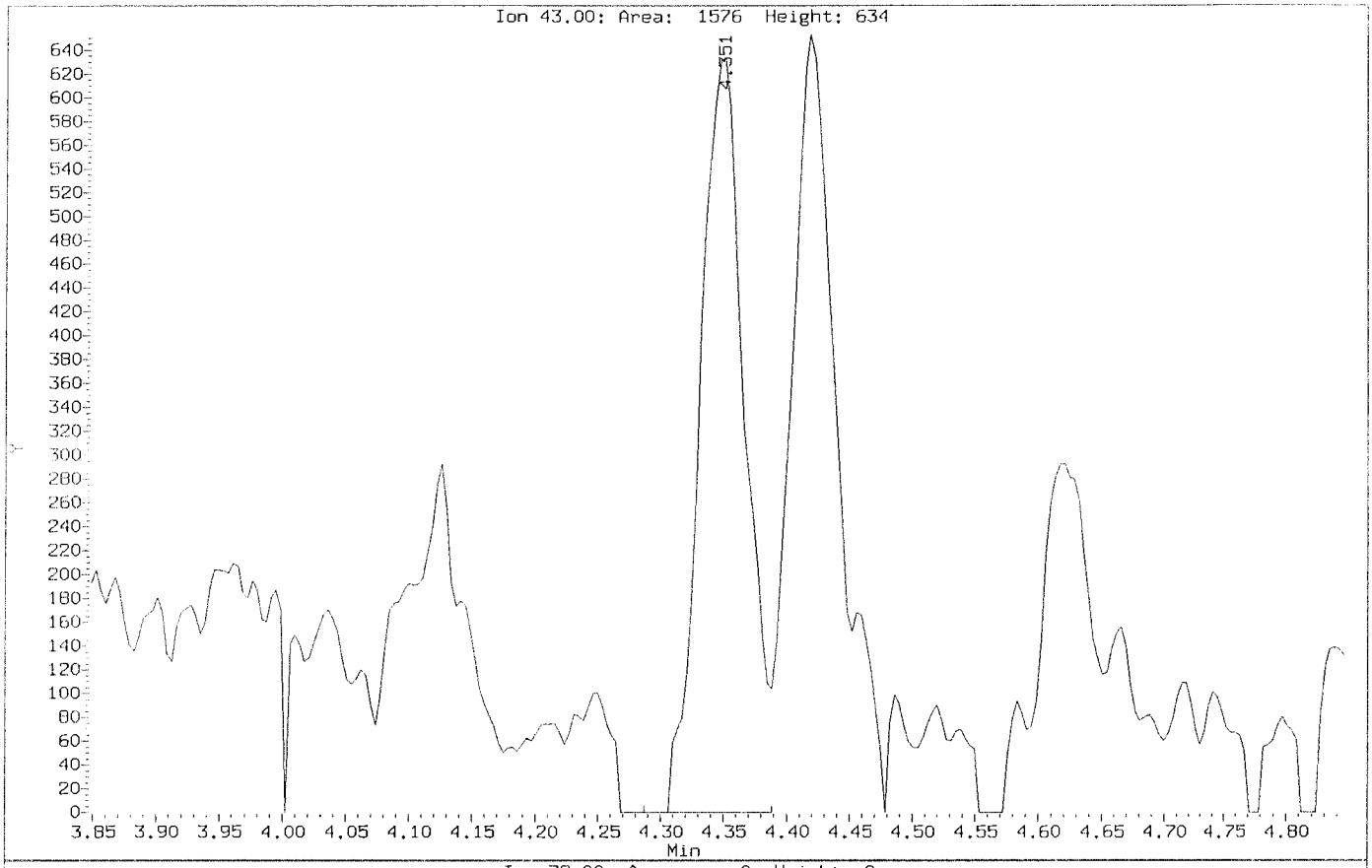
Compound: 2-Butanone
CAS Number: 78-93-3

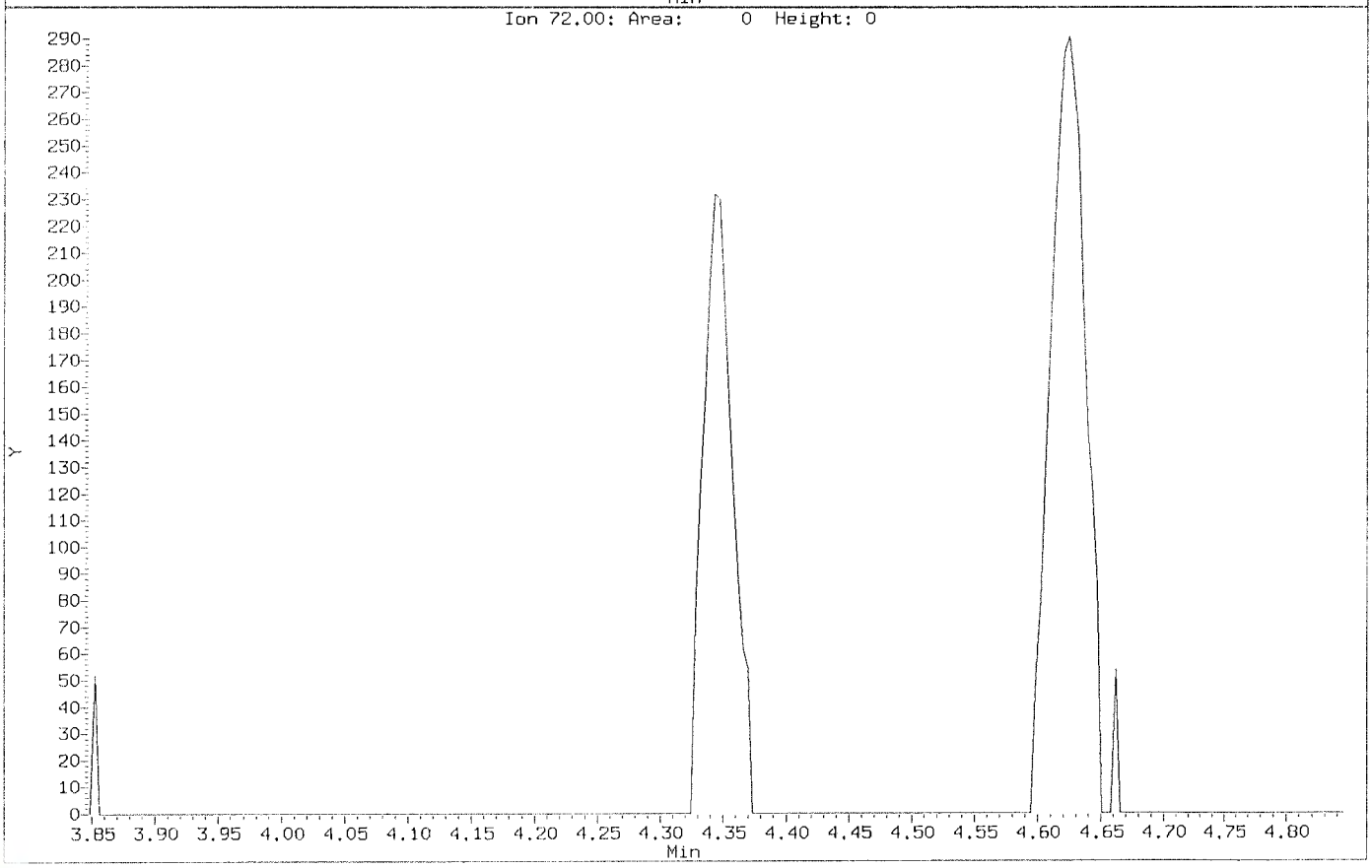




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

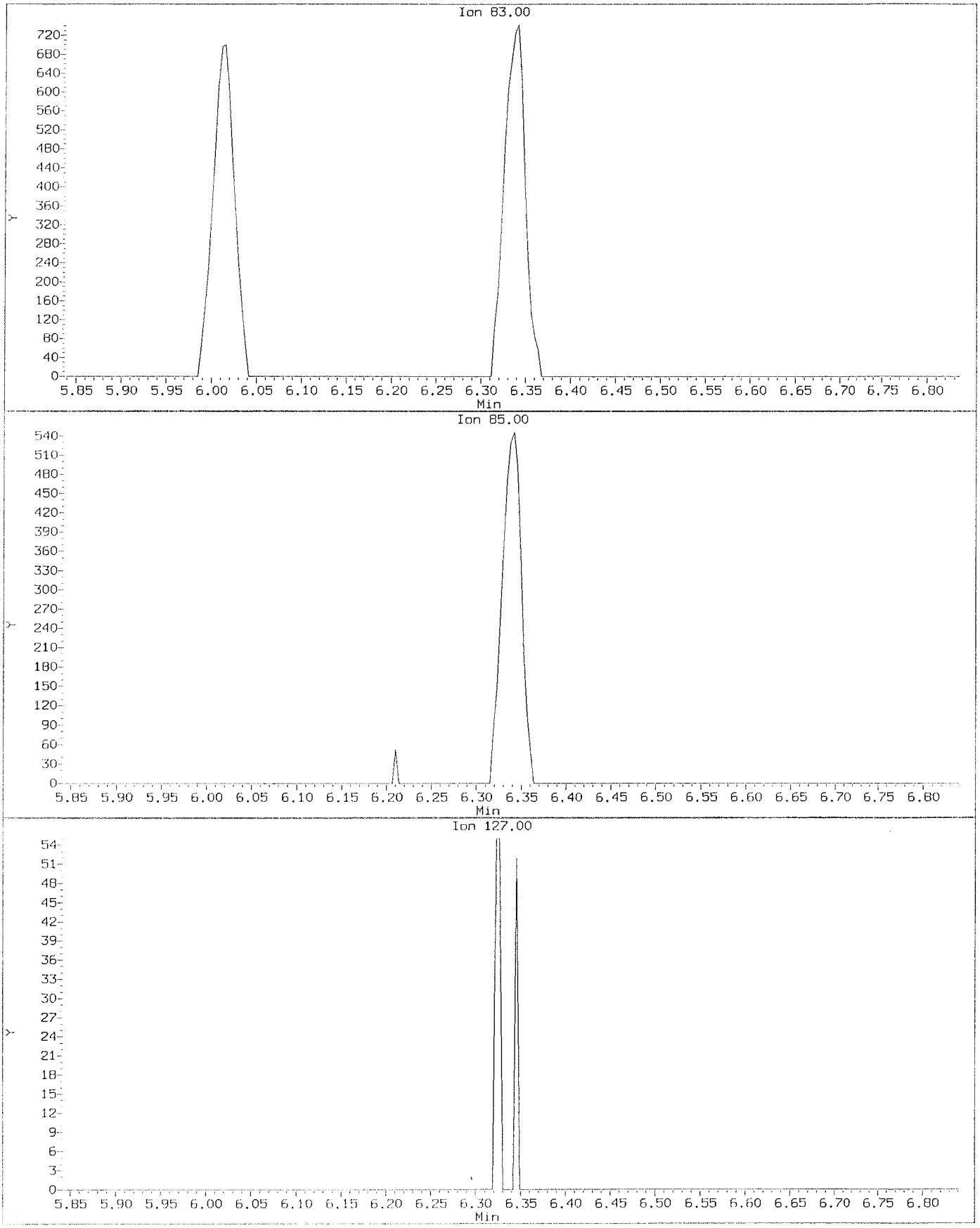
Compound: 2-Butanone
CAS Number: 78-93-3





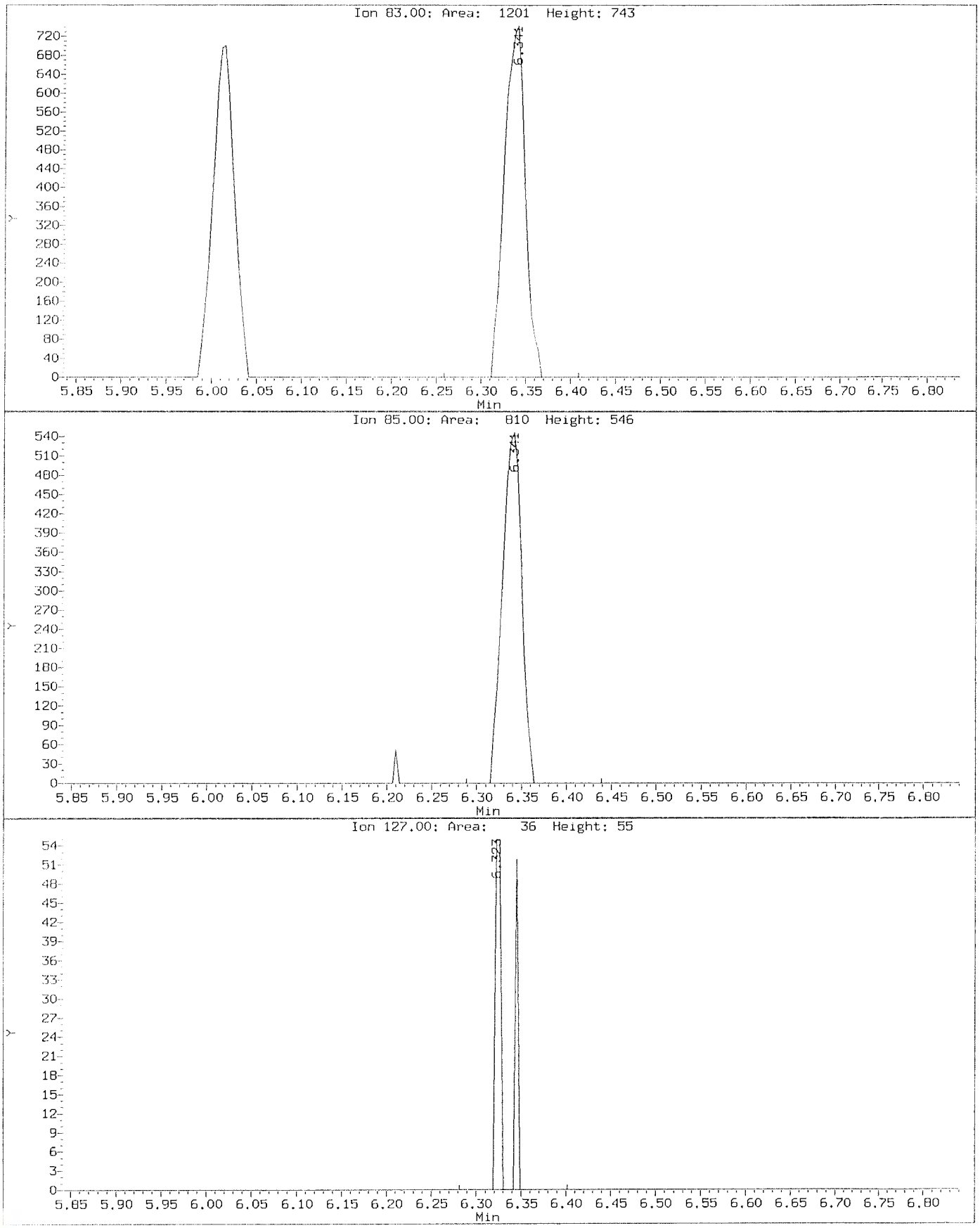
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



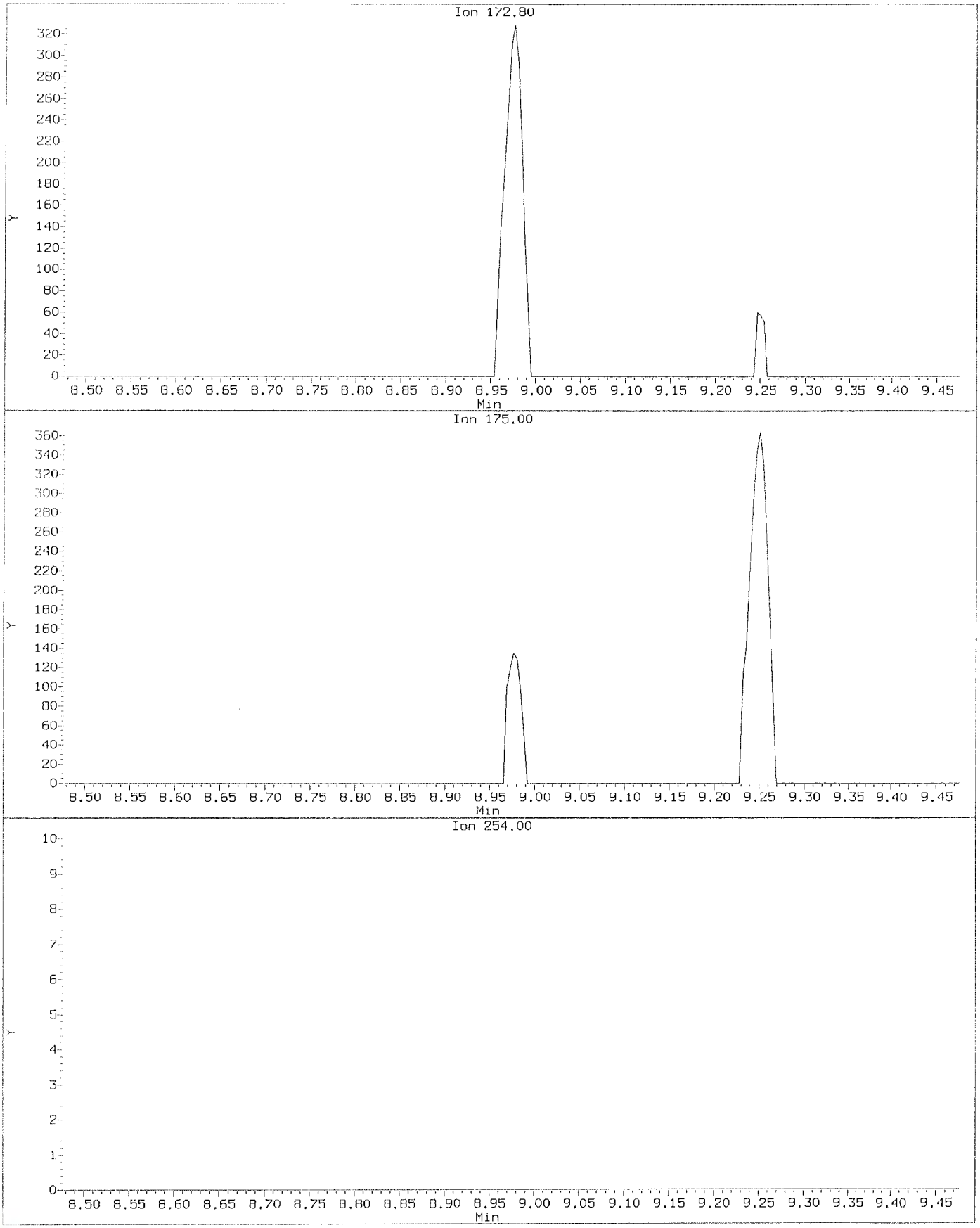
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



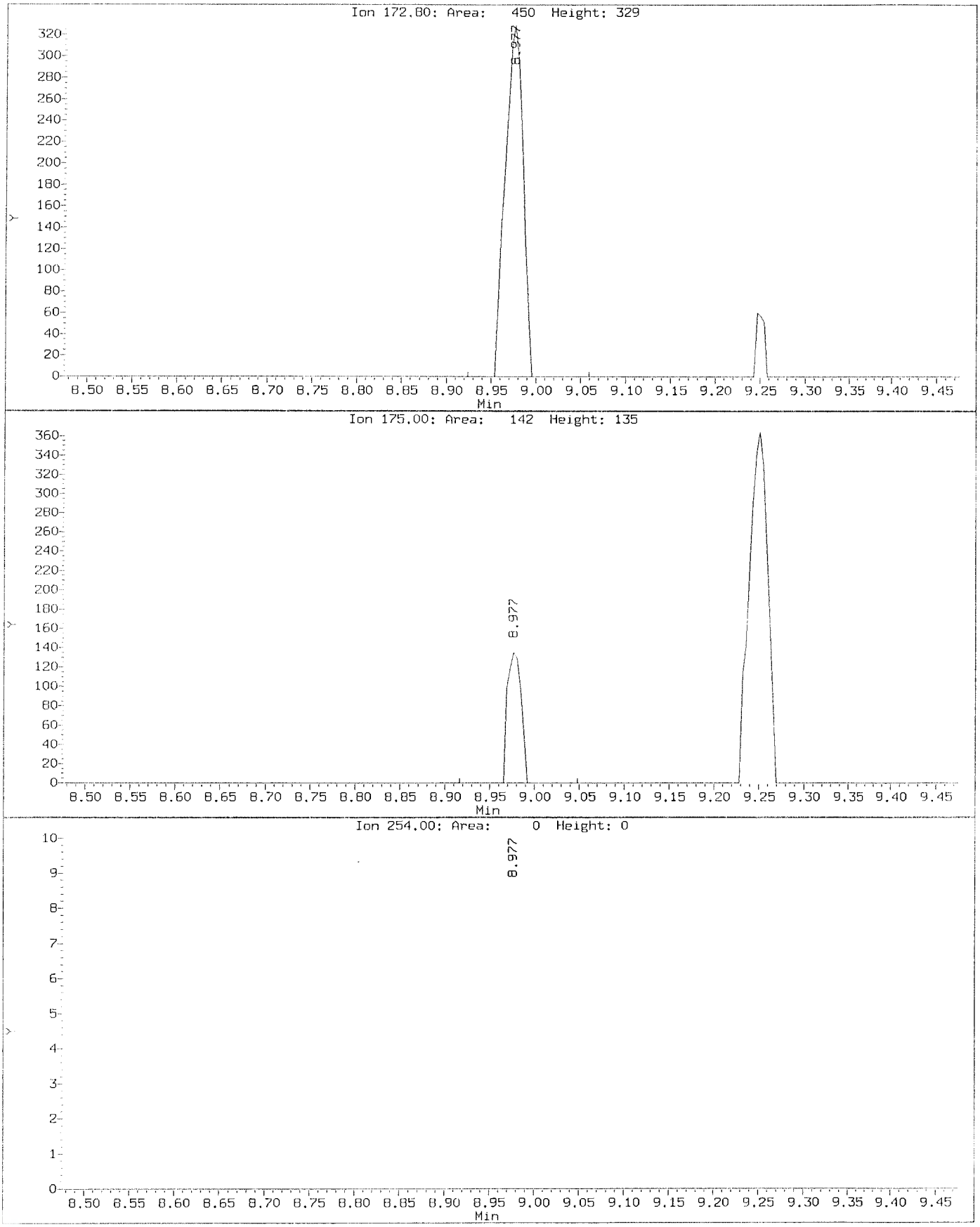
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromoform
CAS Number: 75-25-2



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111503.D
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromoform
CAS Number: 75-25-2



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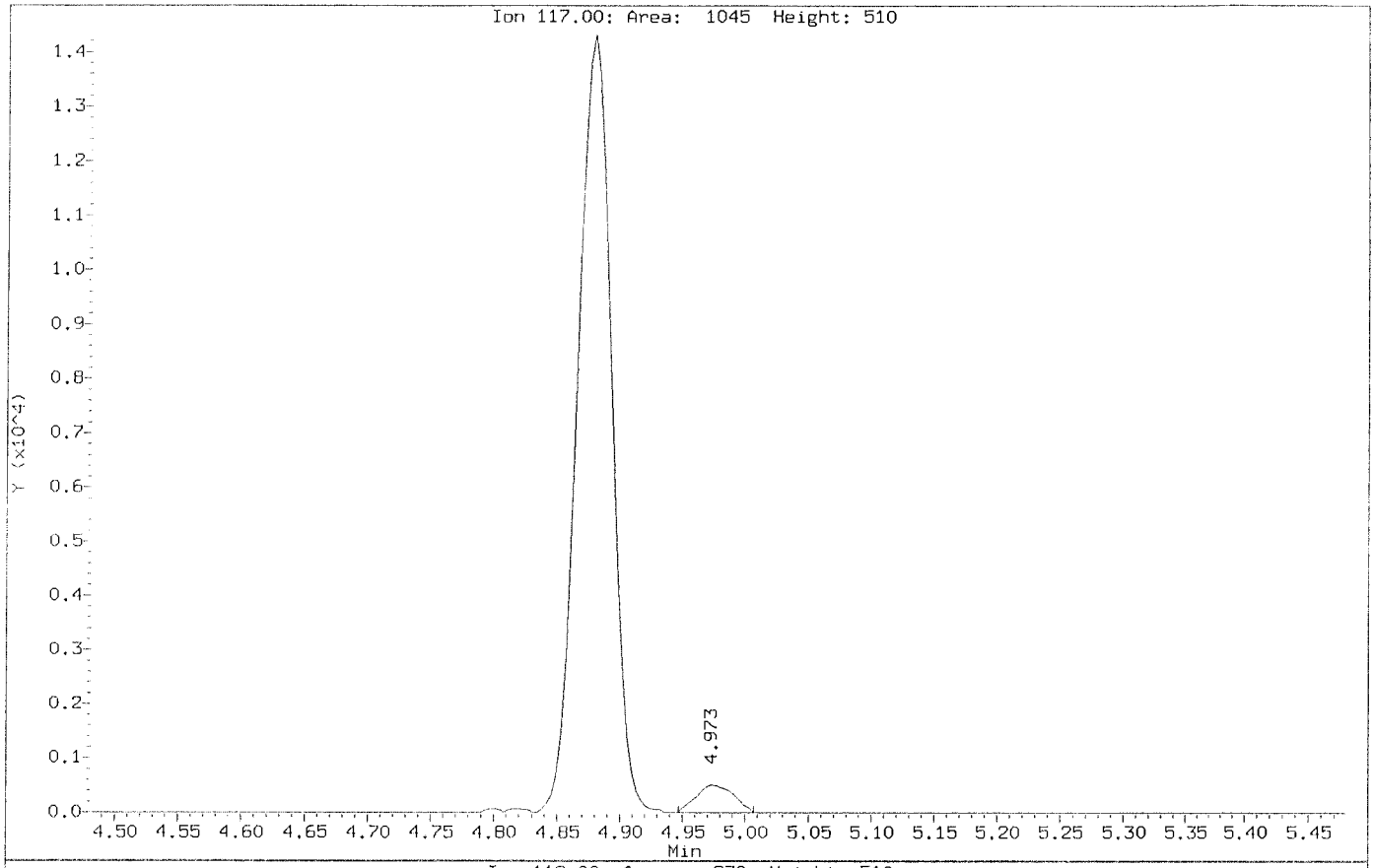
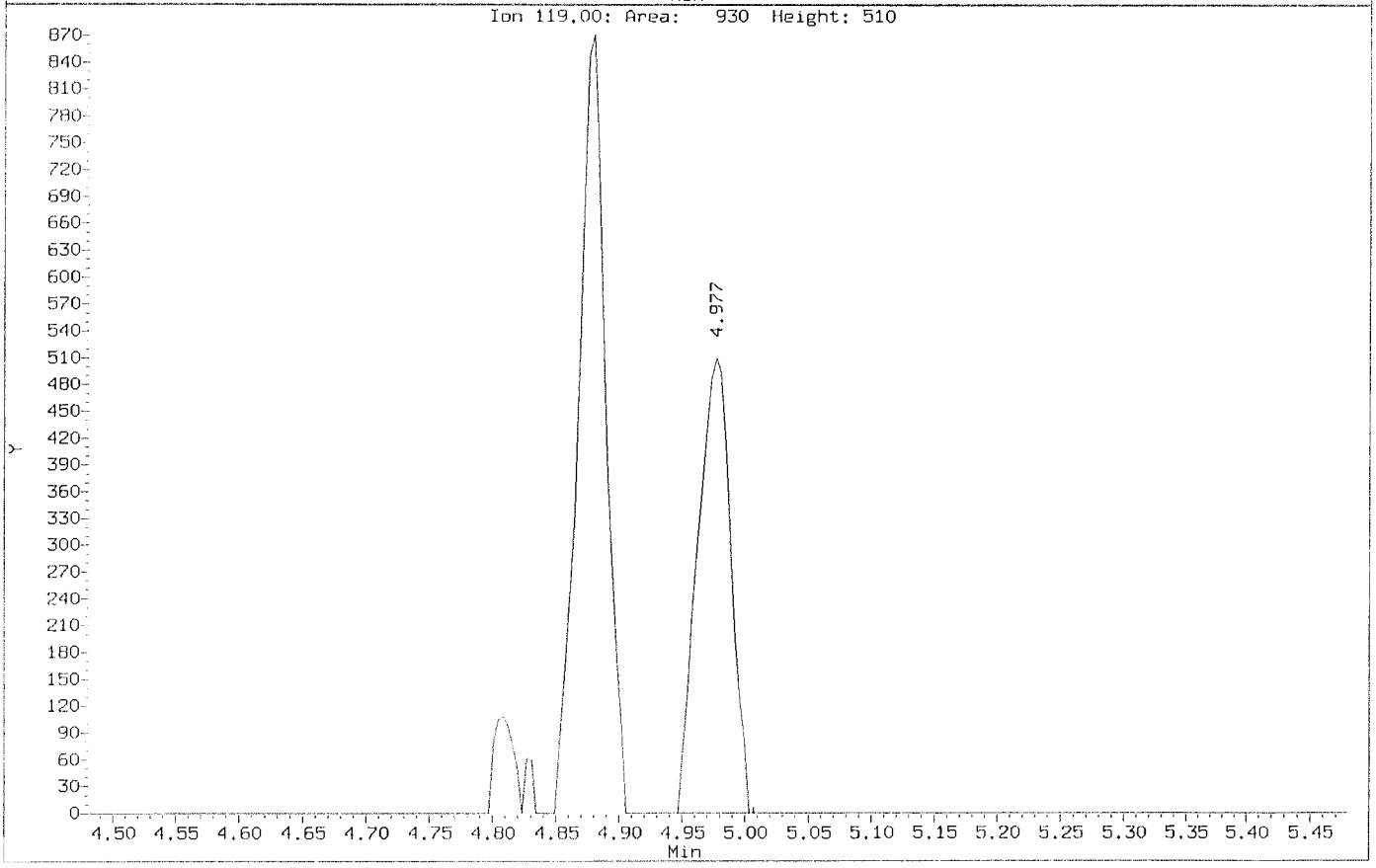
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





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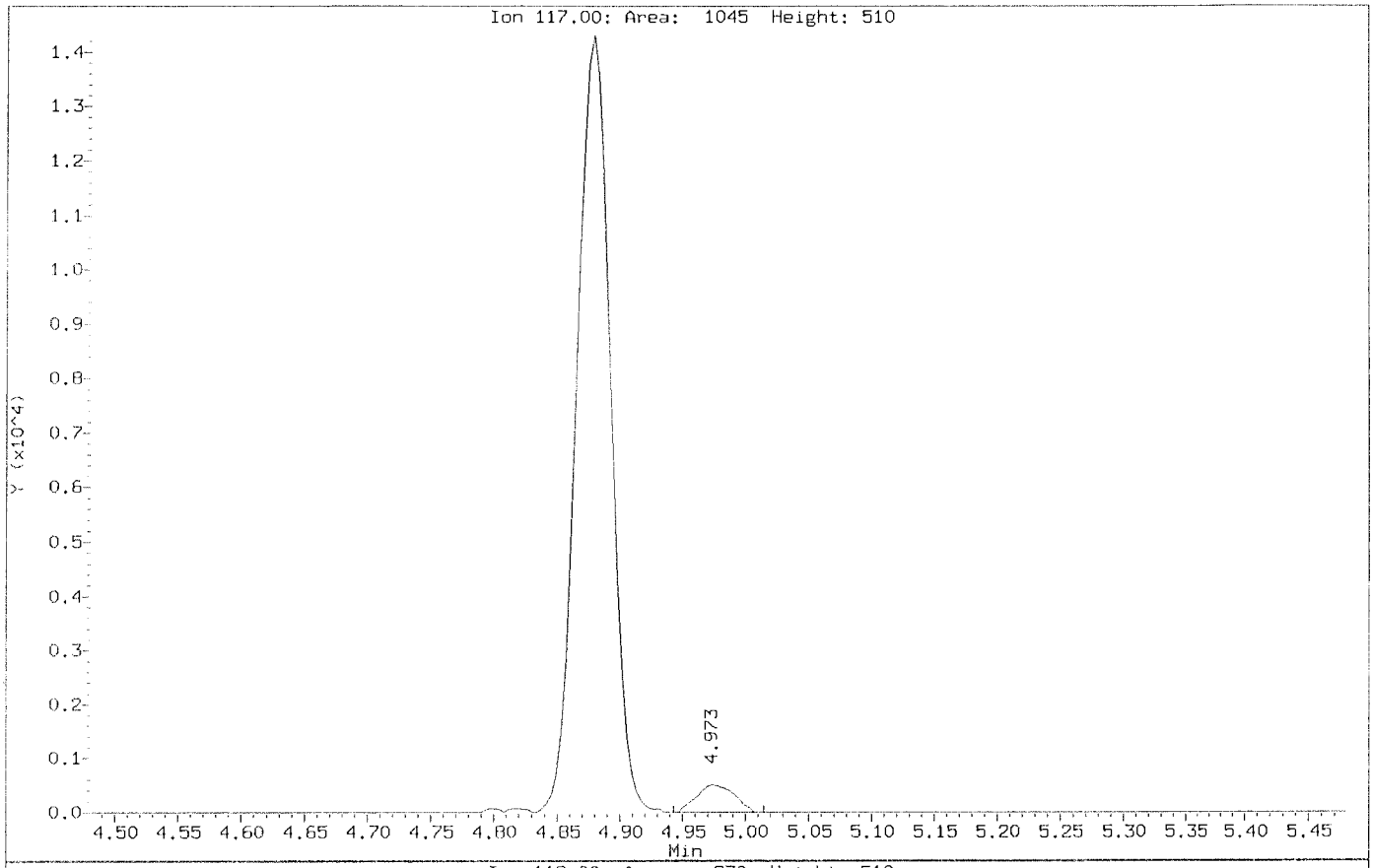
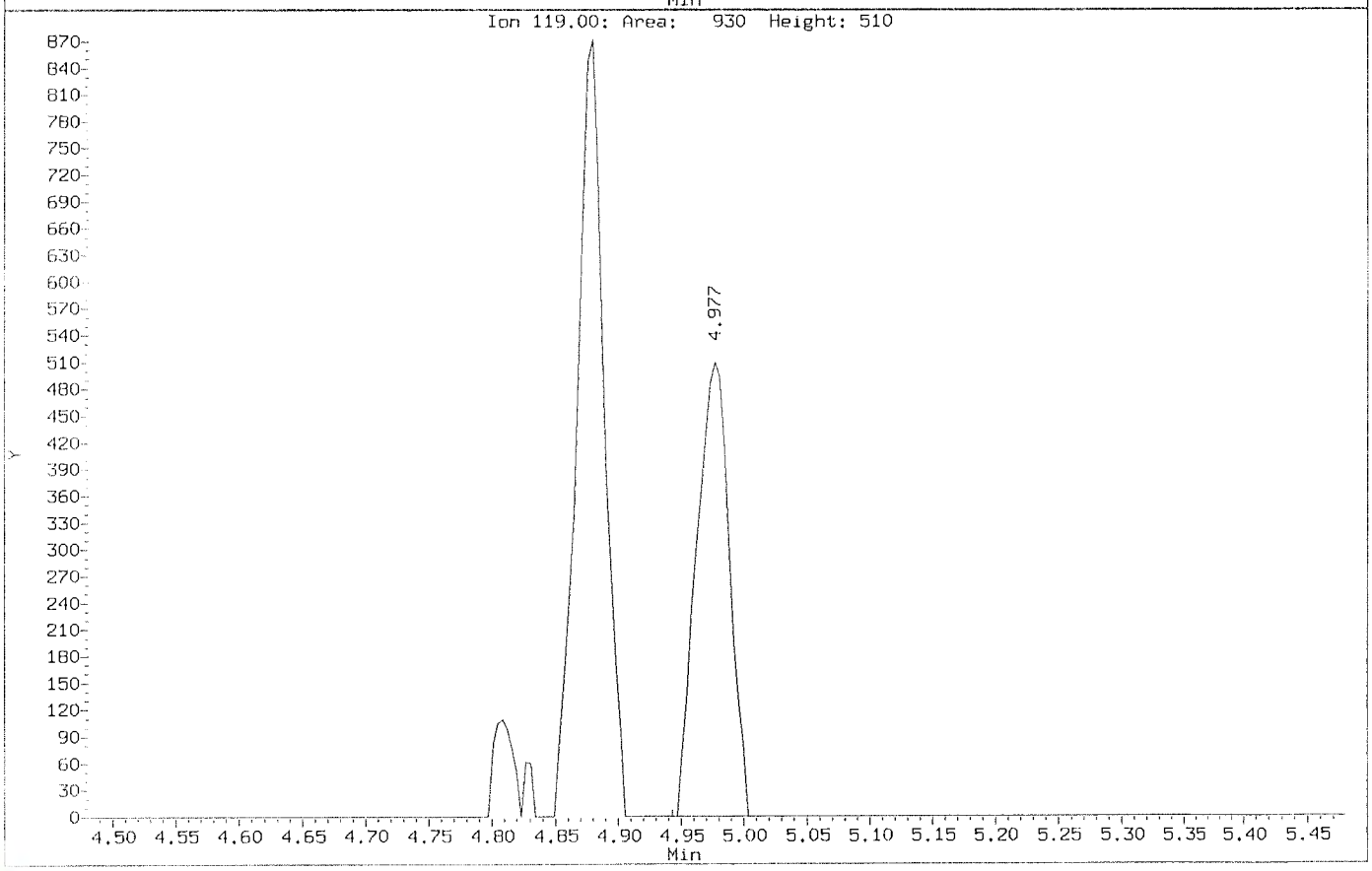
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





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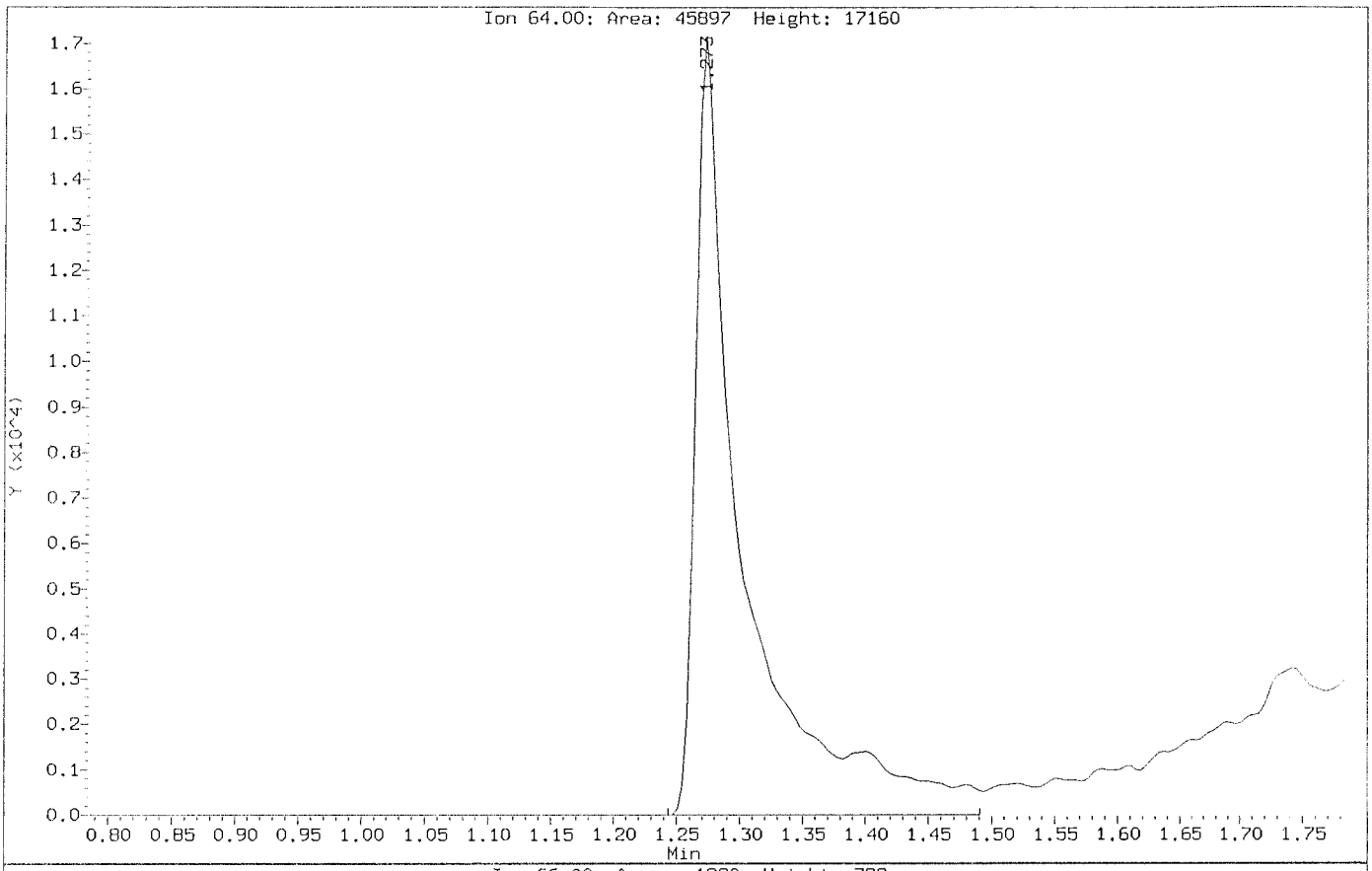
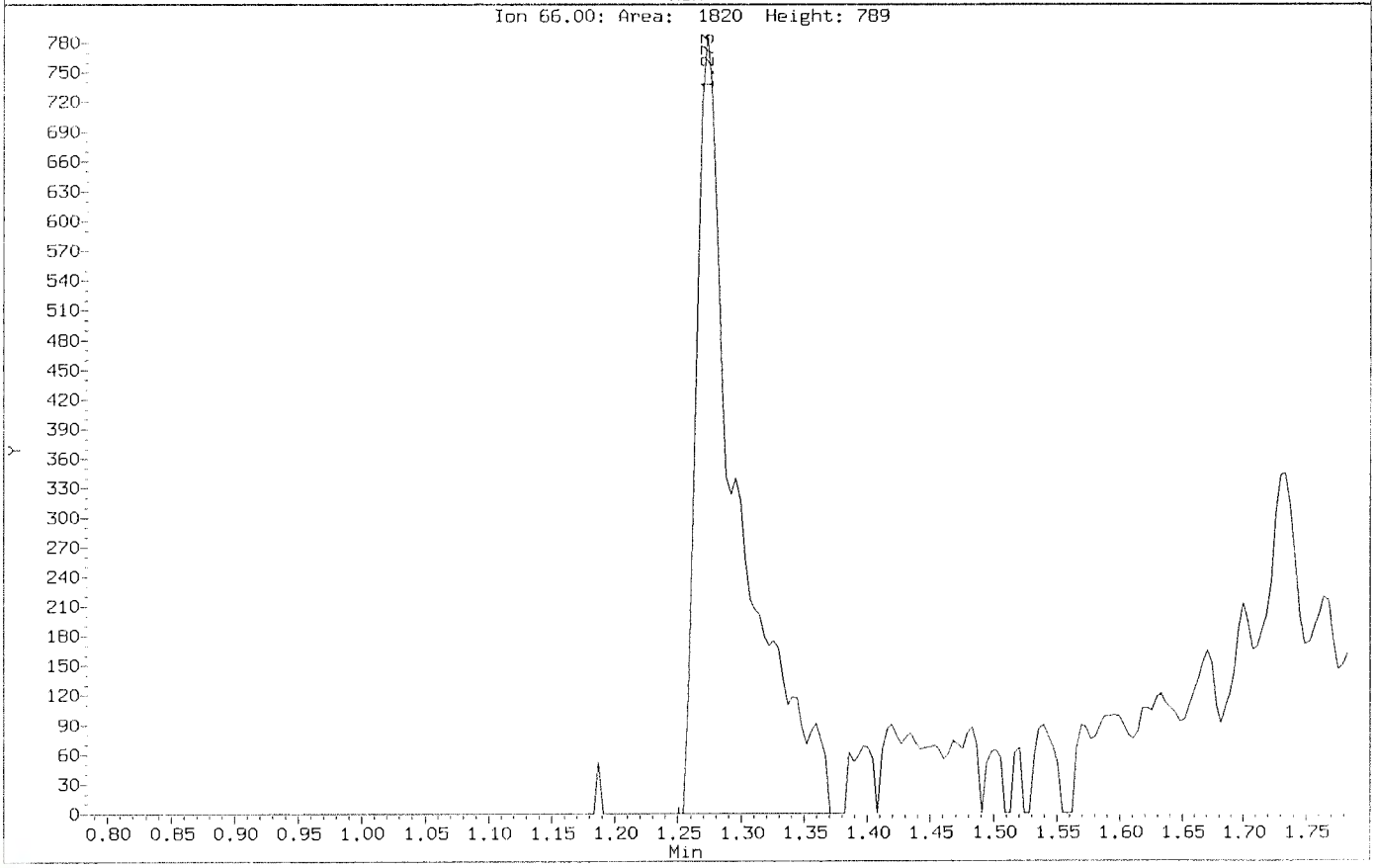
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Chloroethane
CAS Number: 75-00-3





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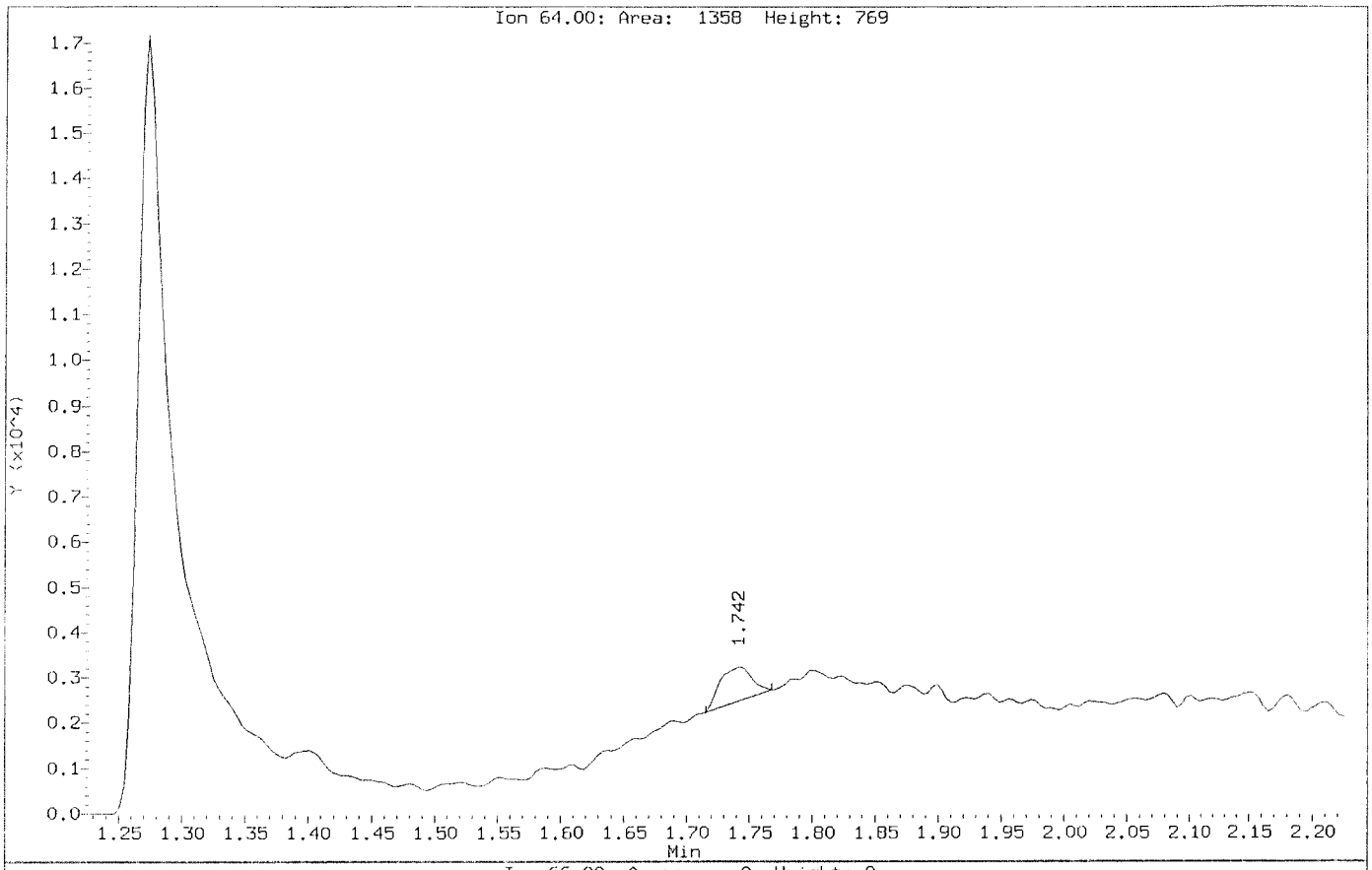
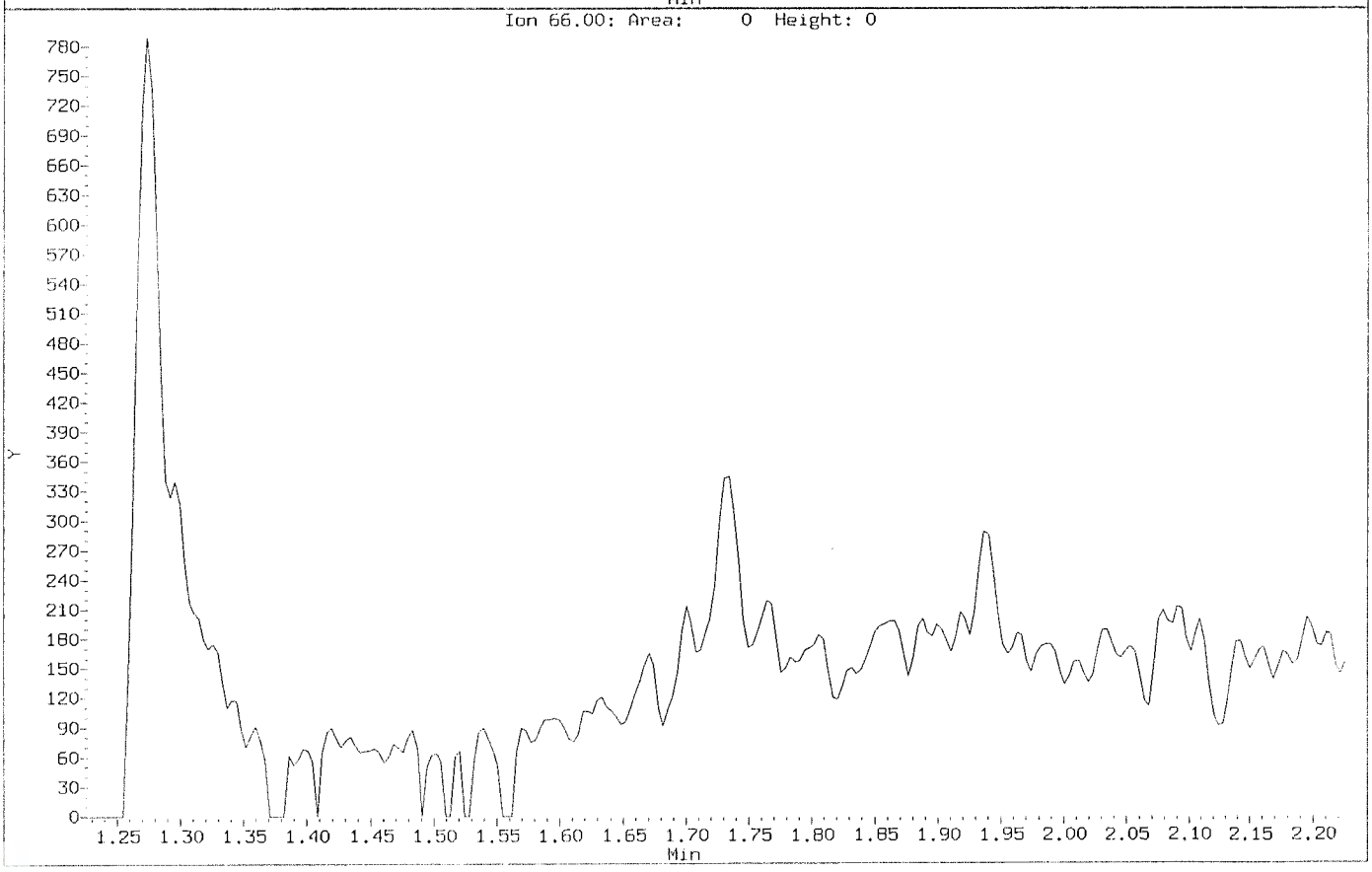
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Chloroethane
CAS Number: 75-00-3





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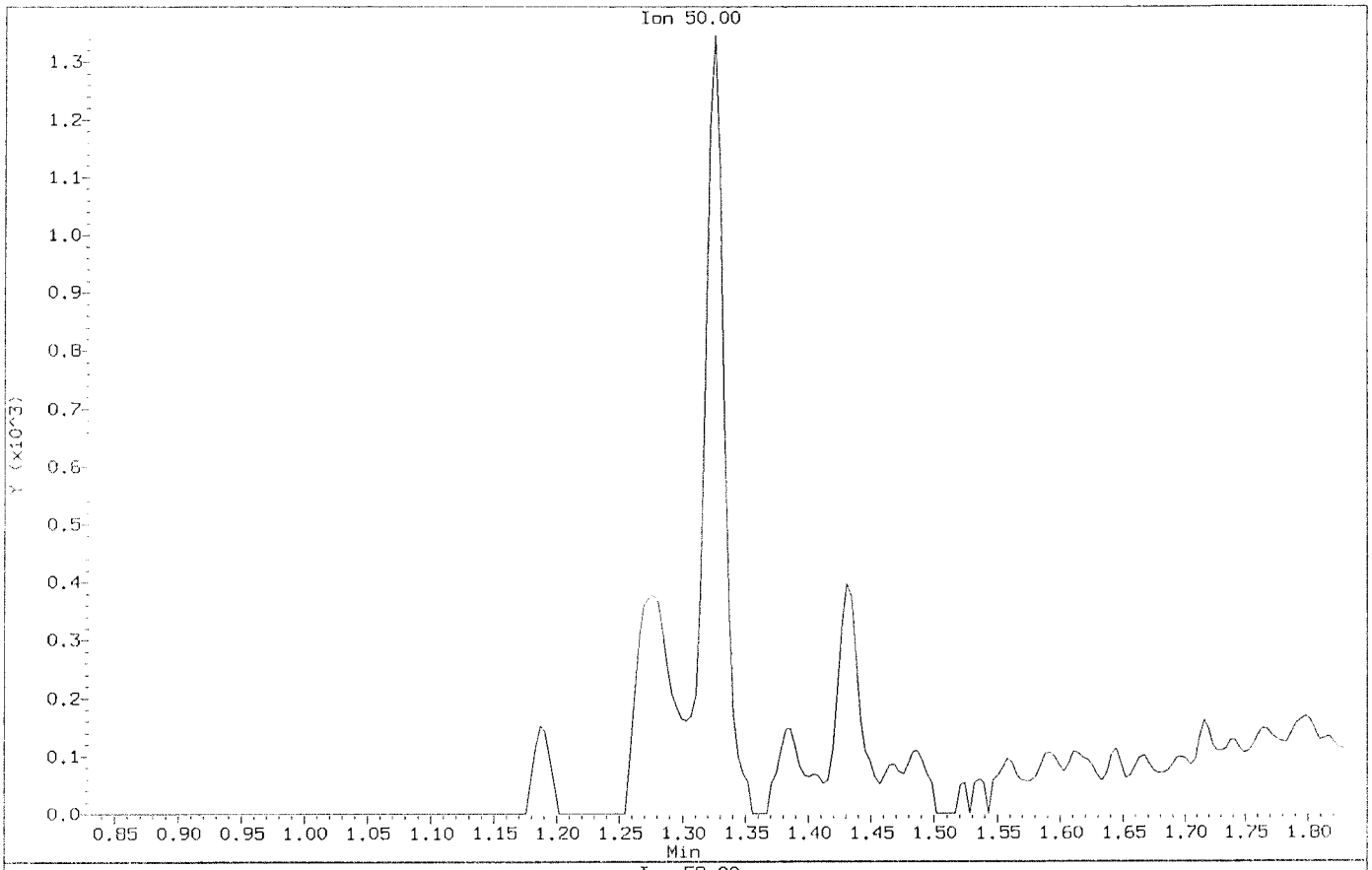
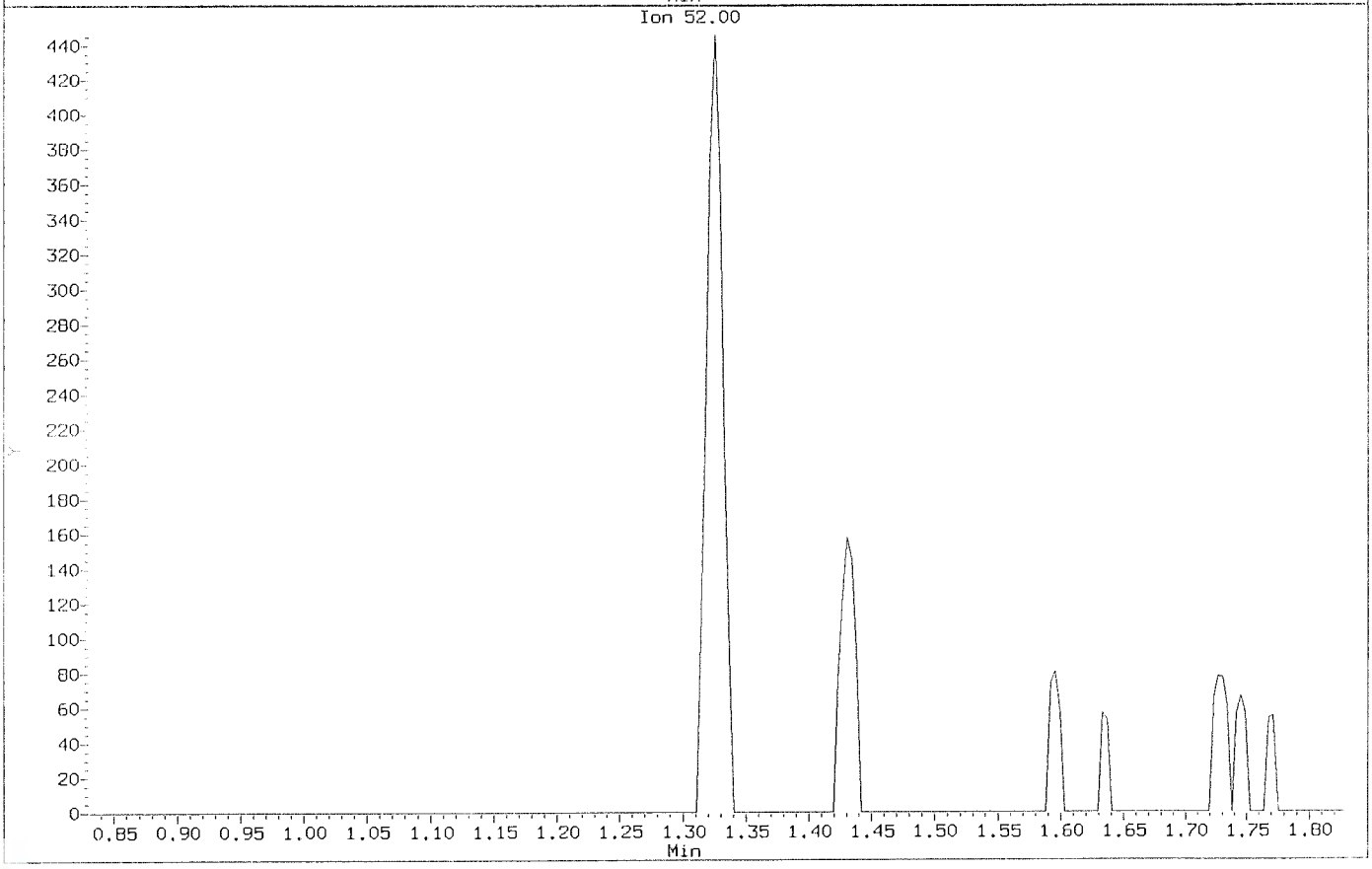
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Chloromethane
CAS Number: 74-87-3





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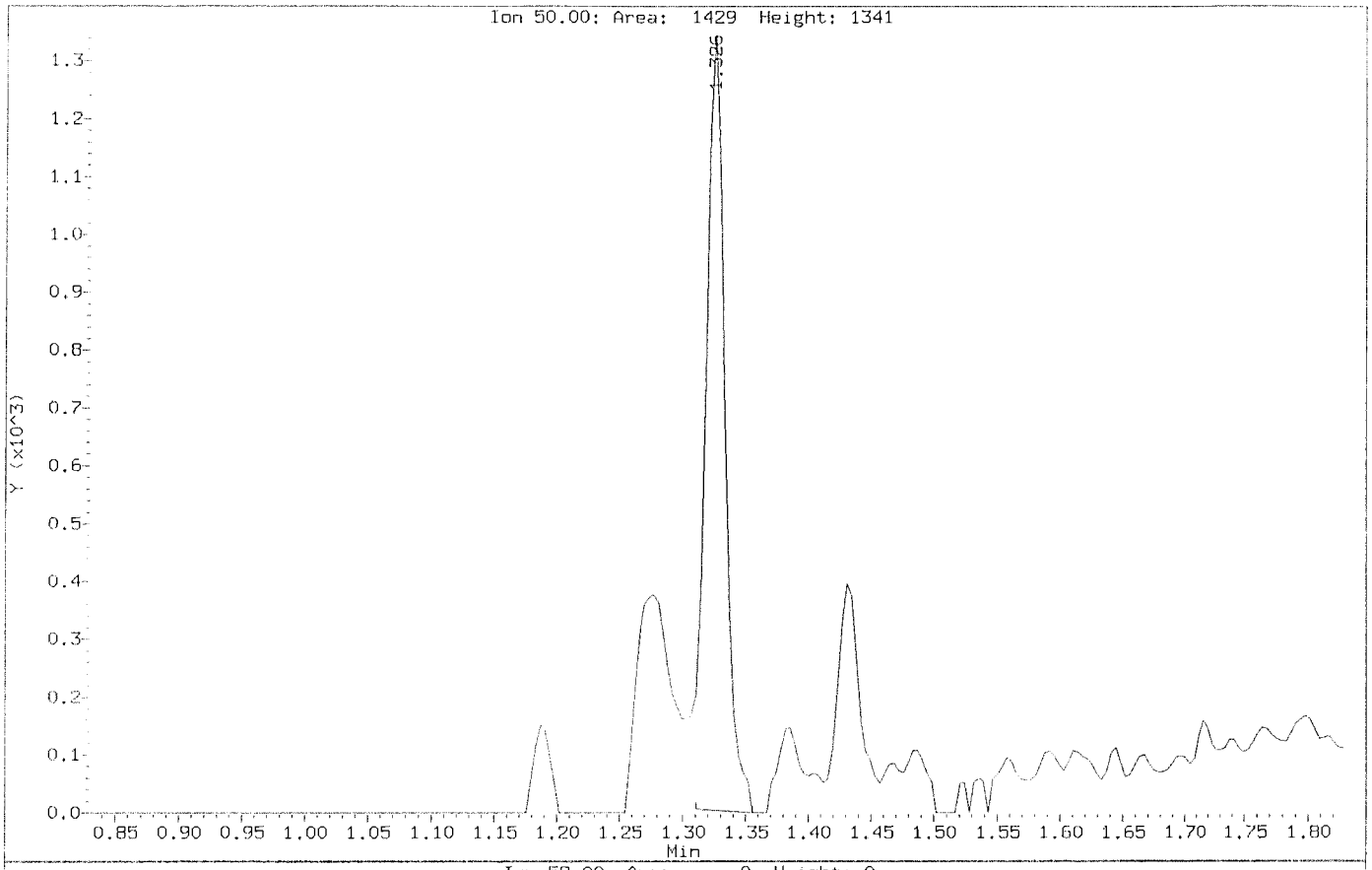
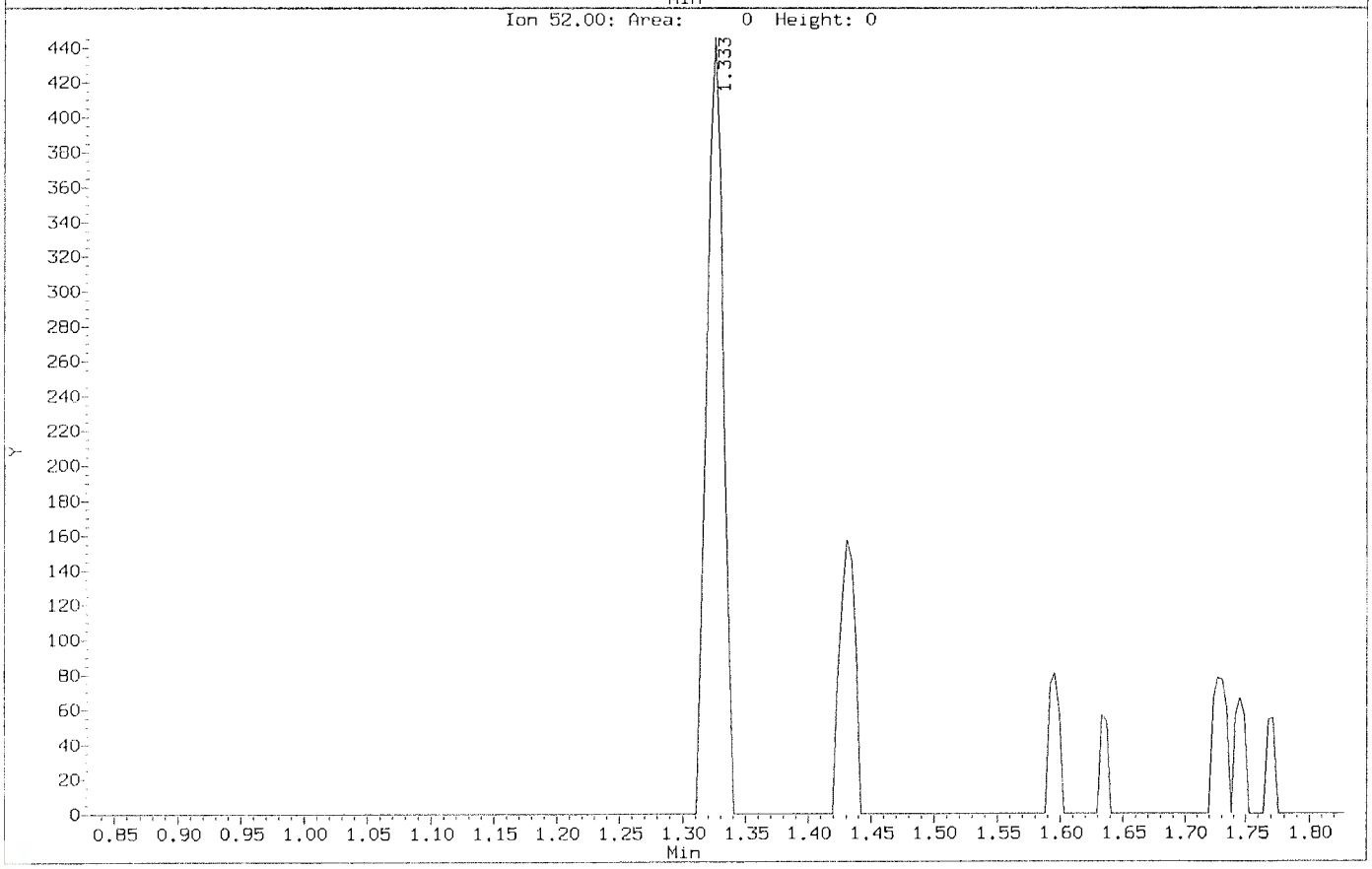
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Chloromethane
CAS Number: 74-87-3





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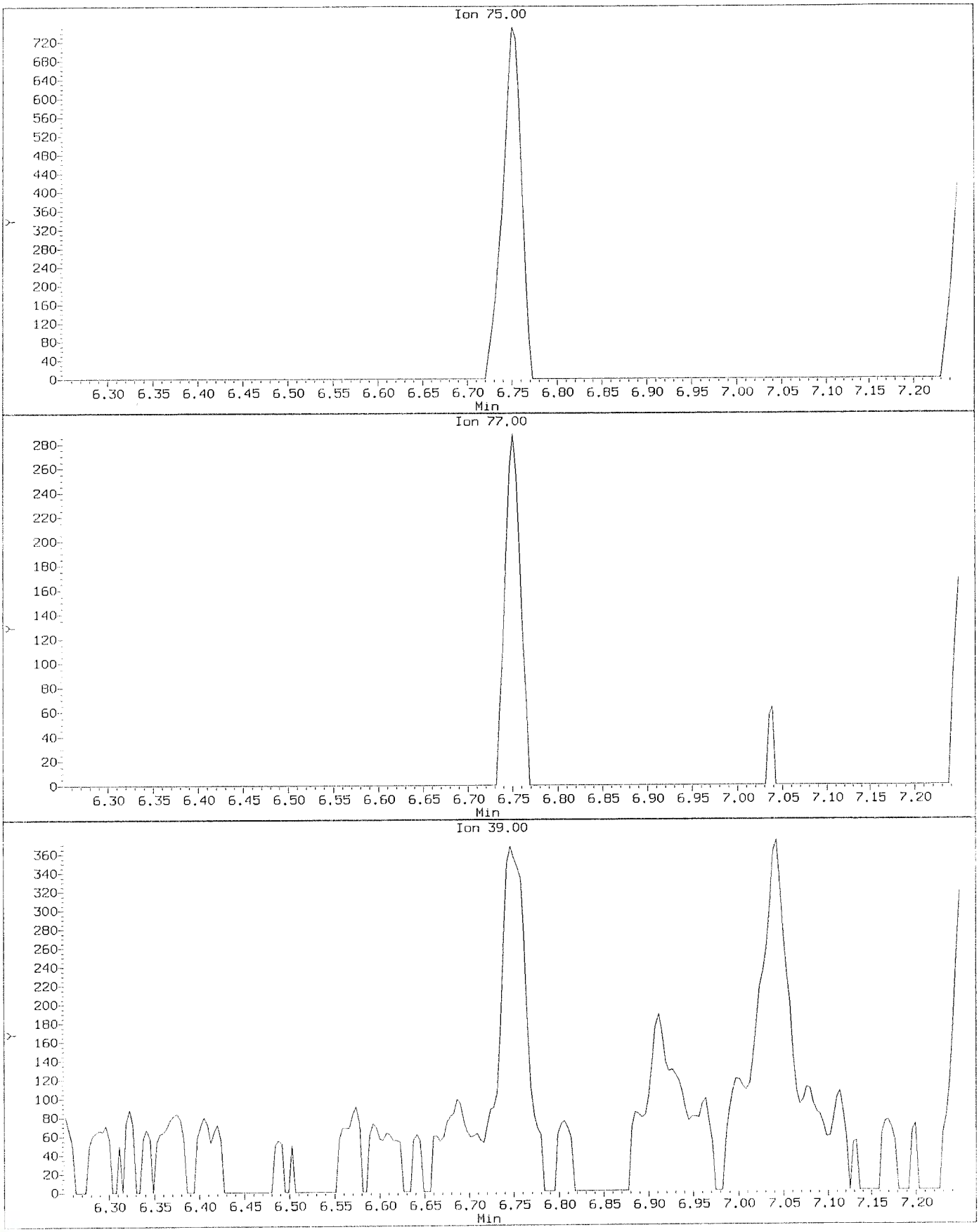
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5



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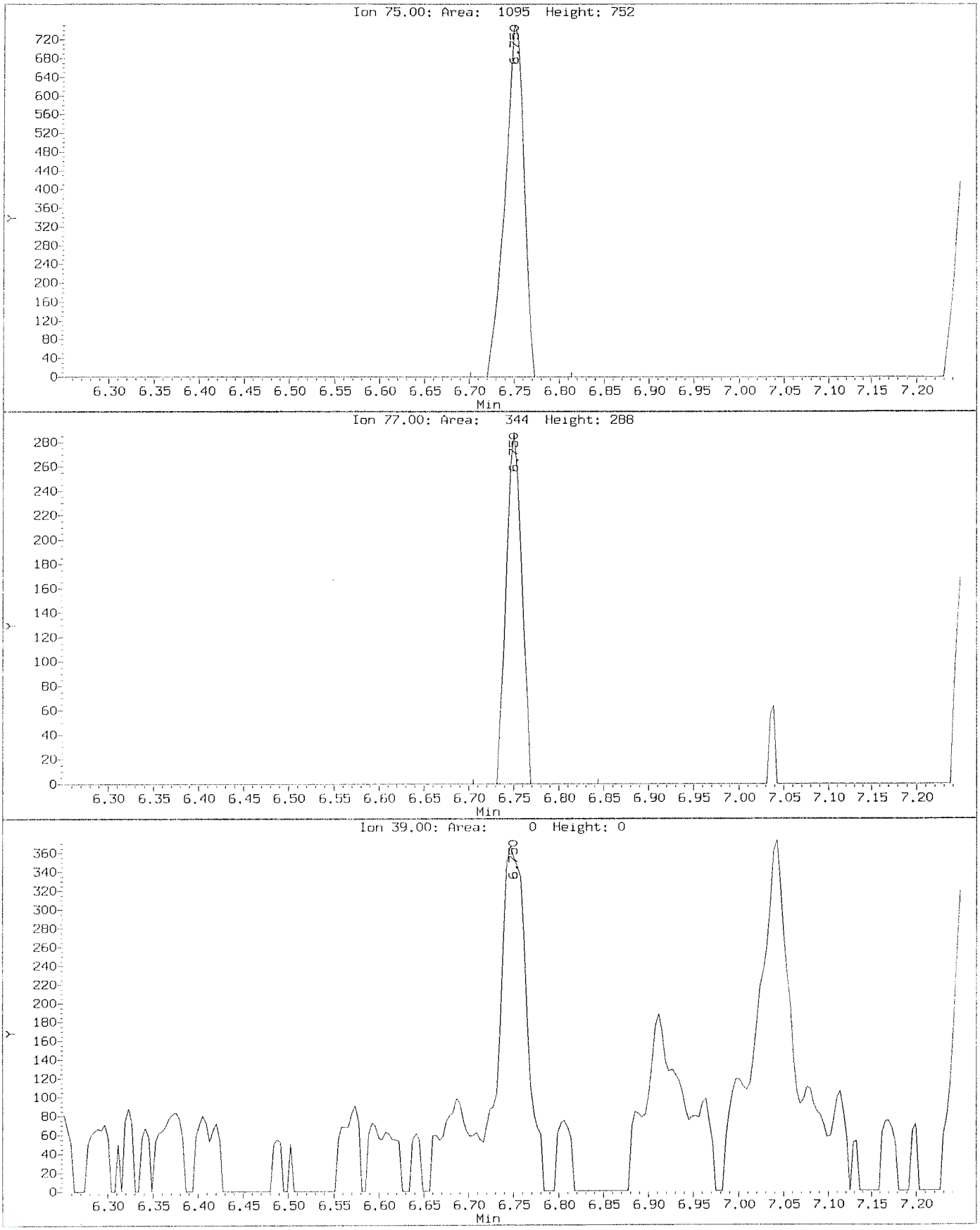
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5



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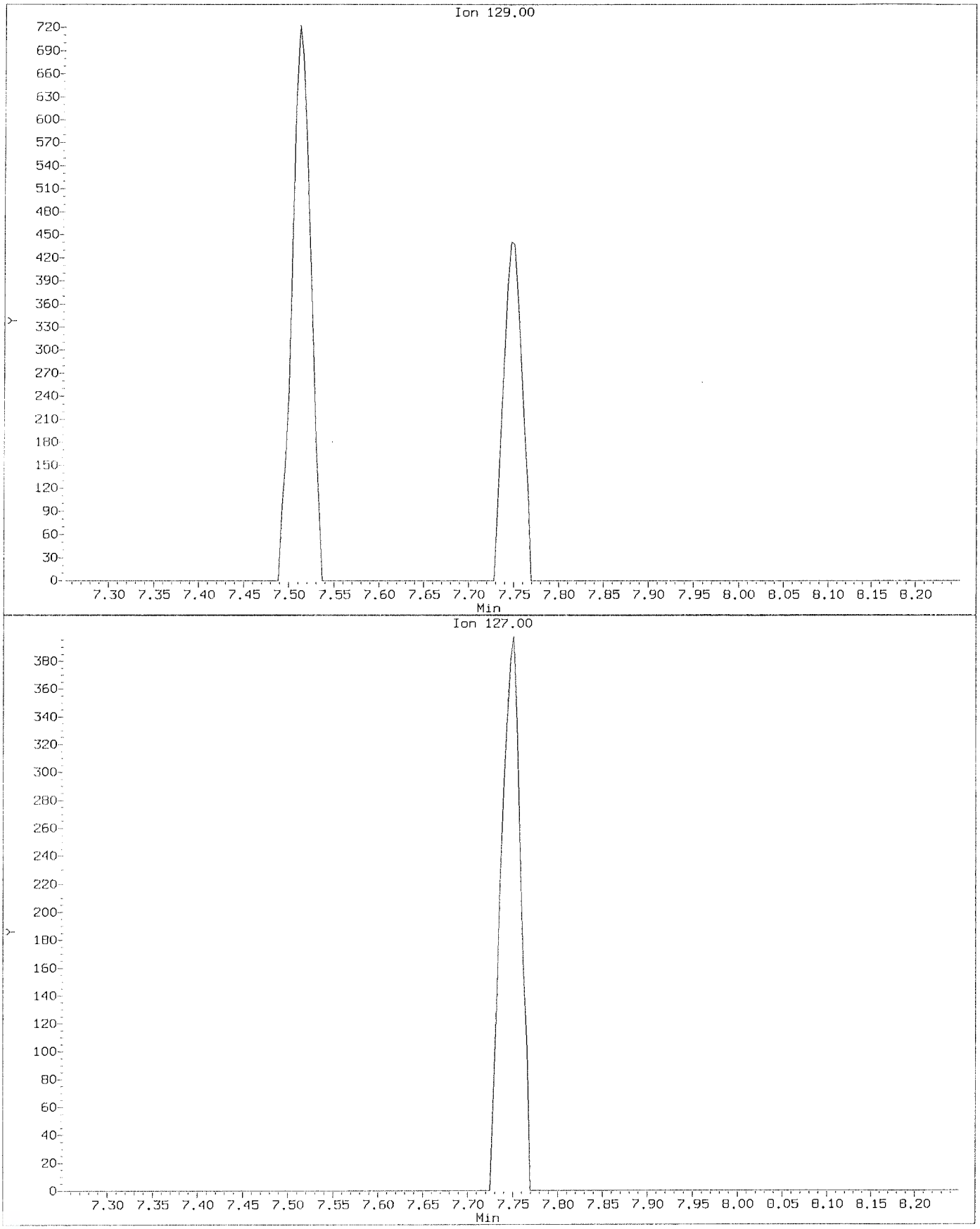
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Dibromochloromethane
CAS Number: 124-48-1



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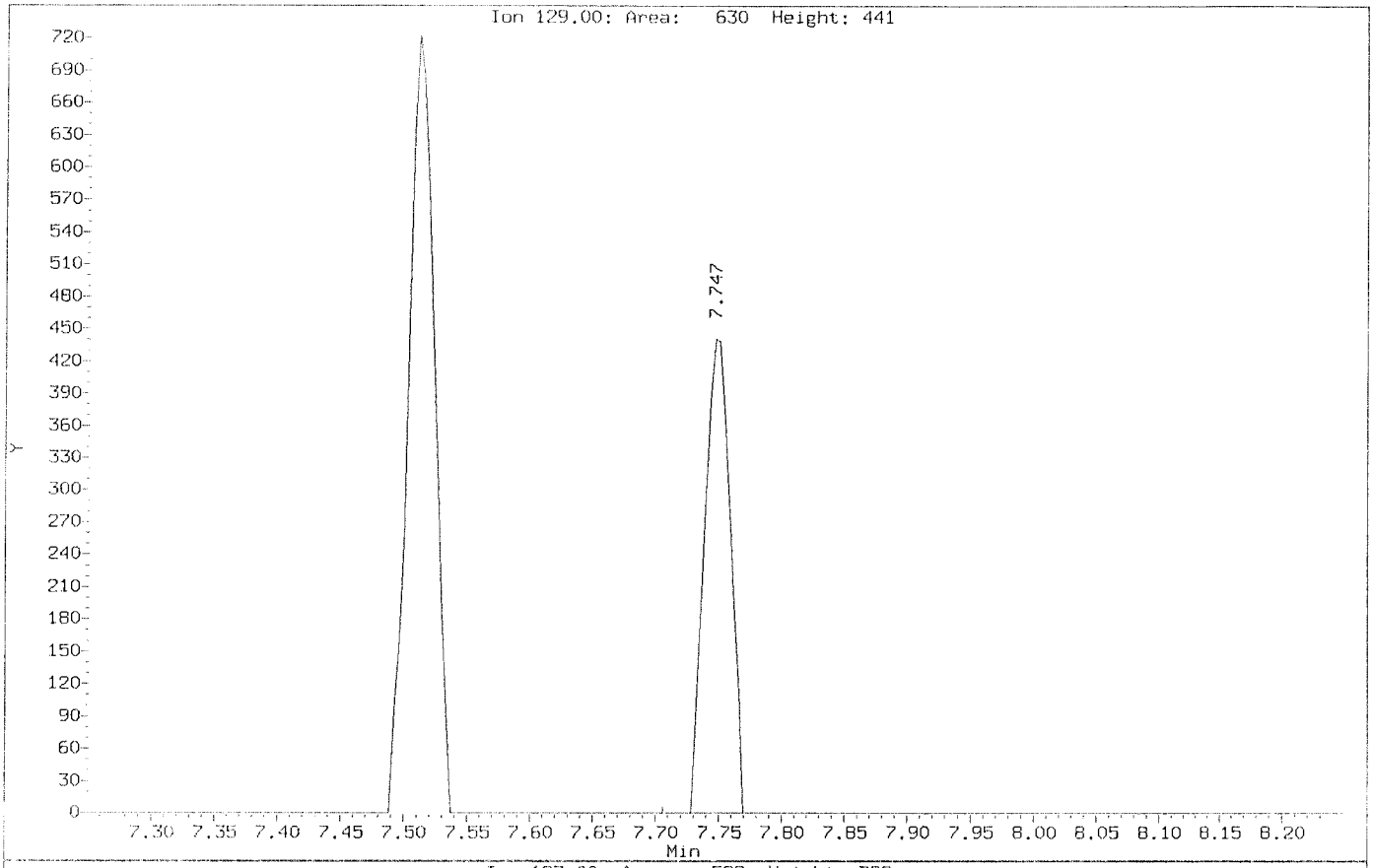
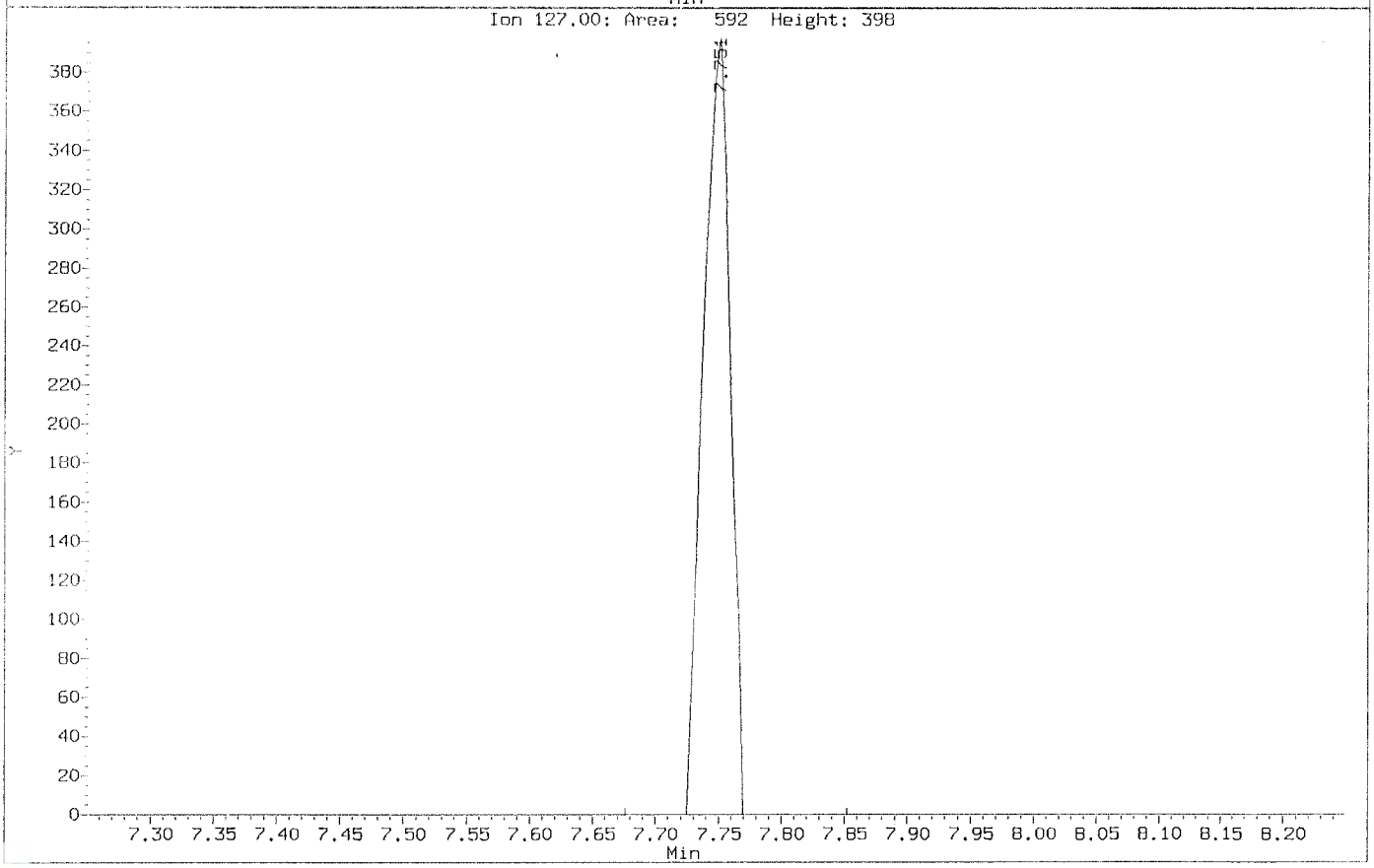
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Dibromochloromethane
CAS Number: 124-48-1





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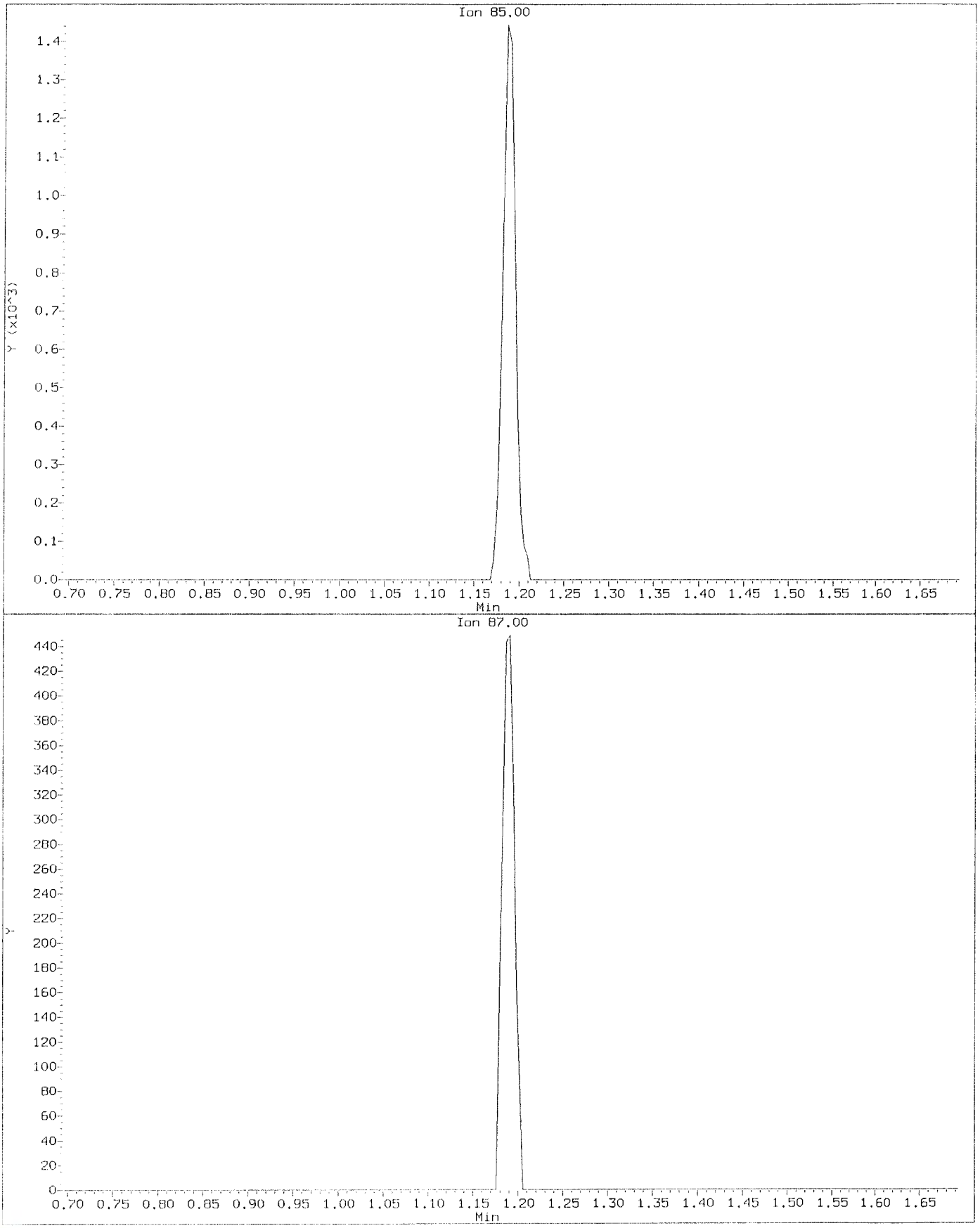
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Dichlorodifluoromethane
CAS Number: 75-71-8



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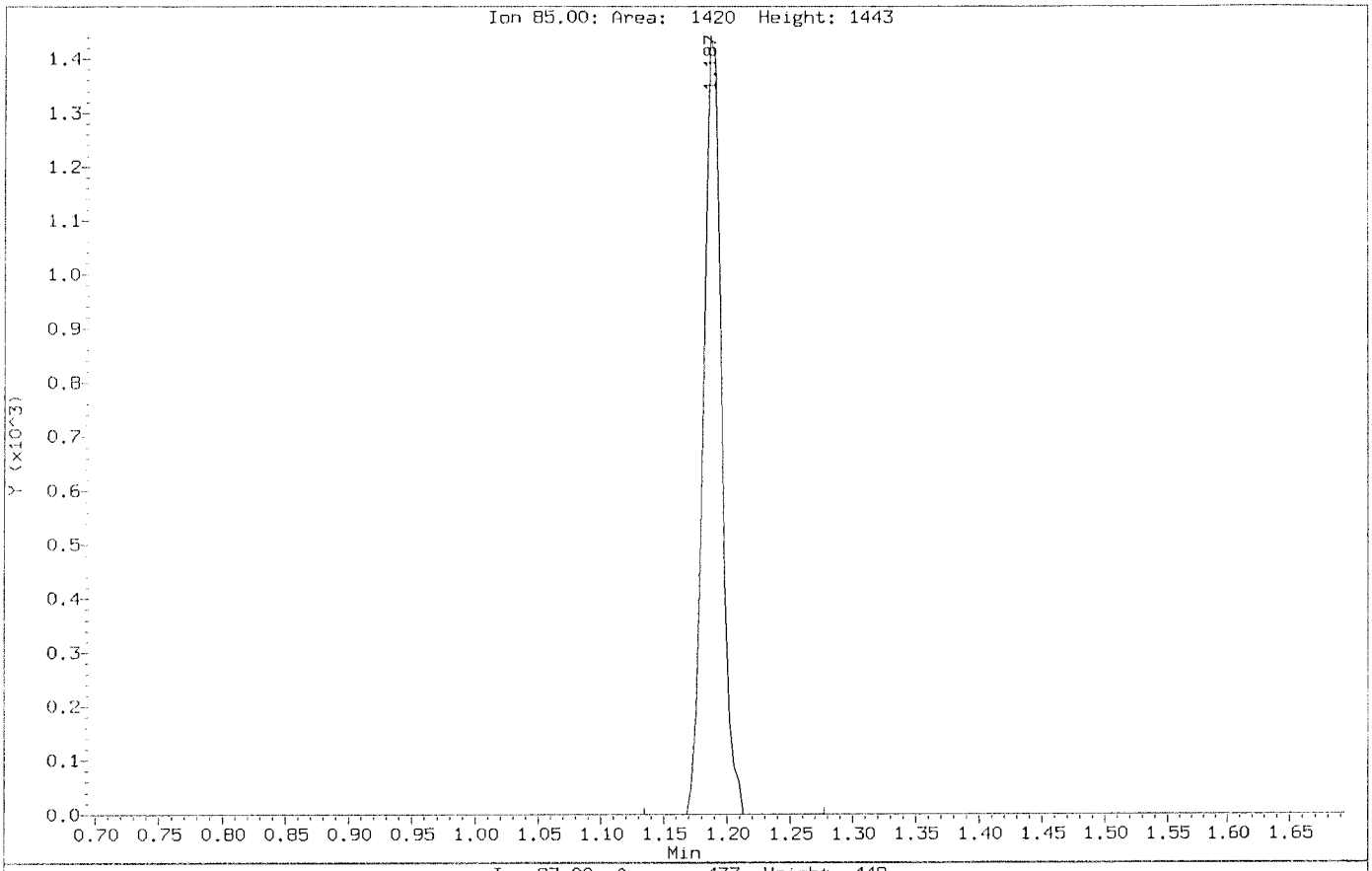
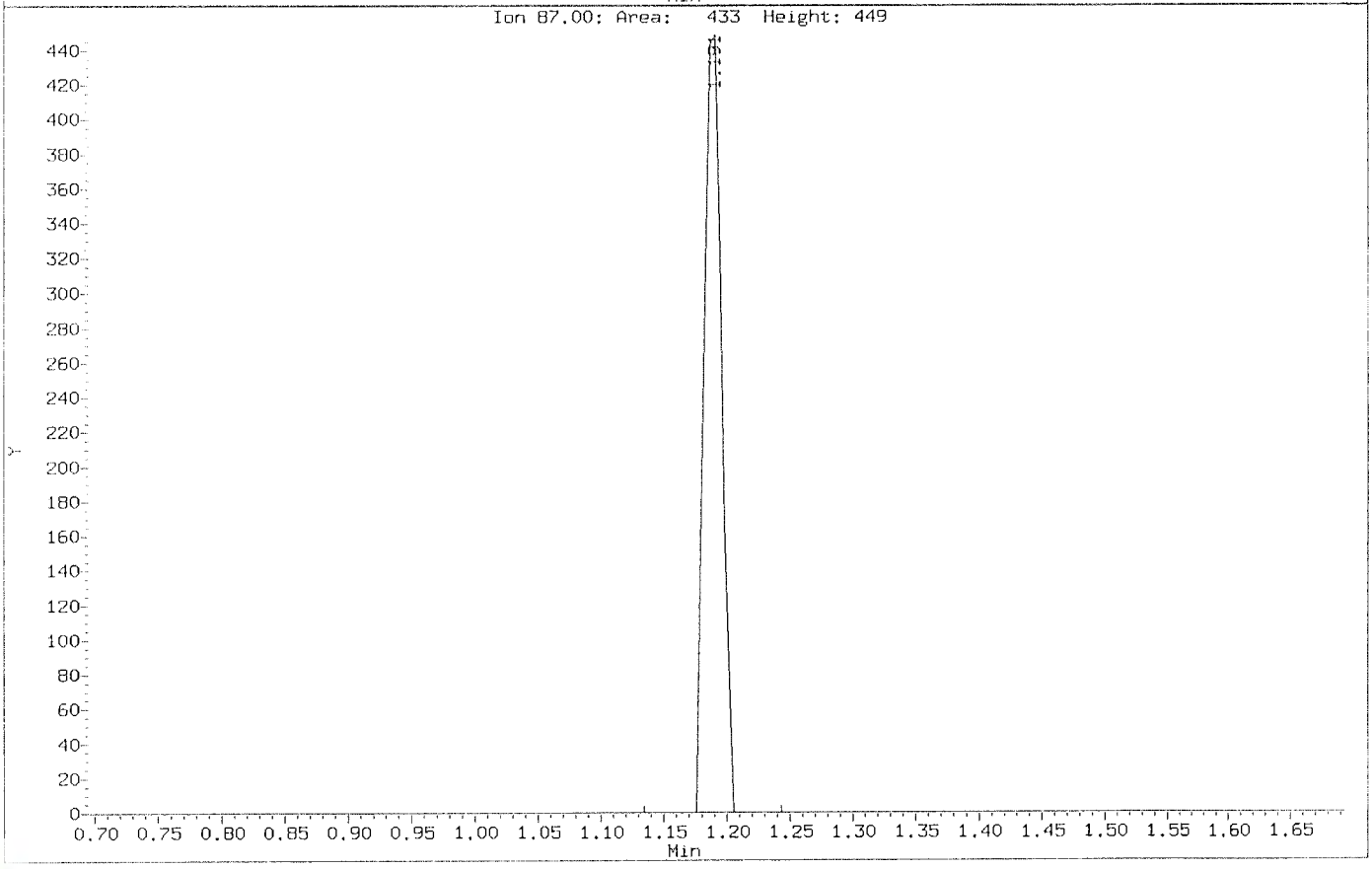
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





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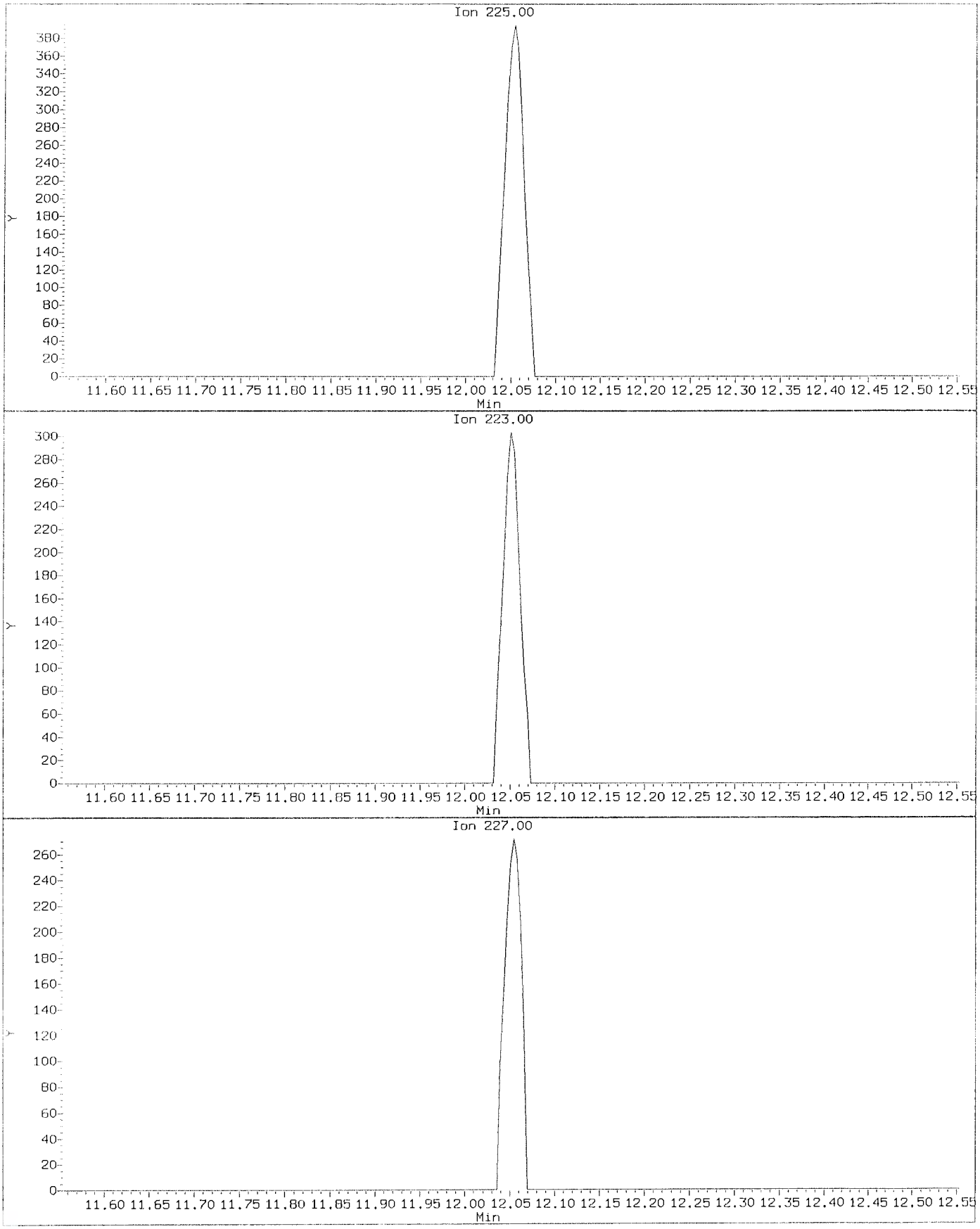
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



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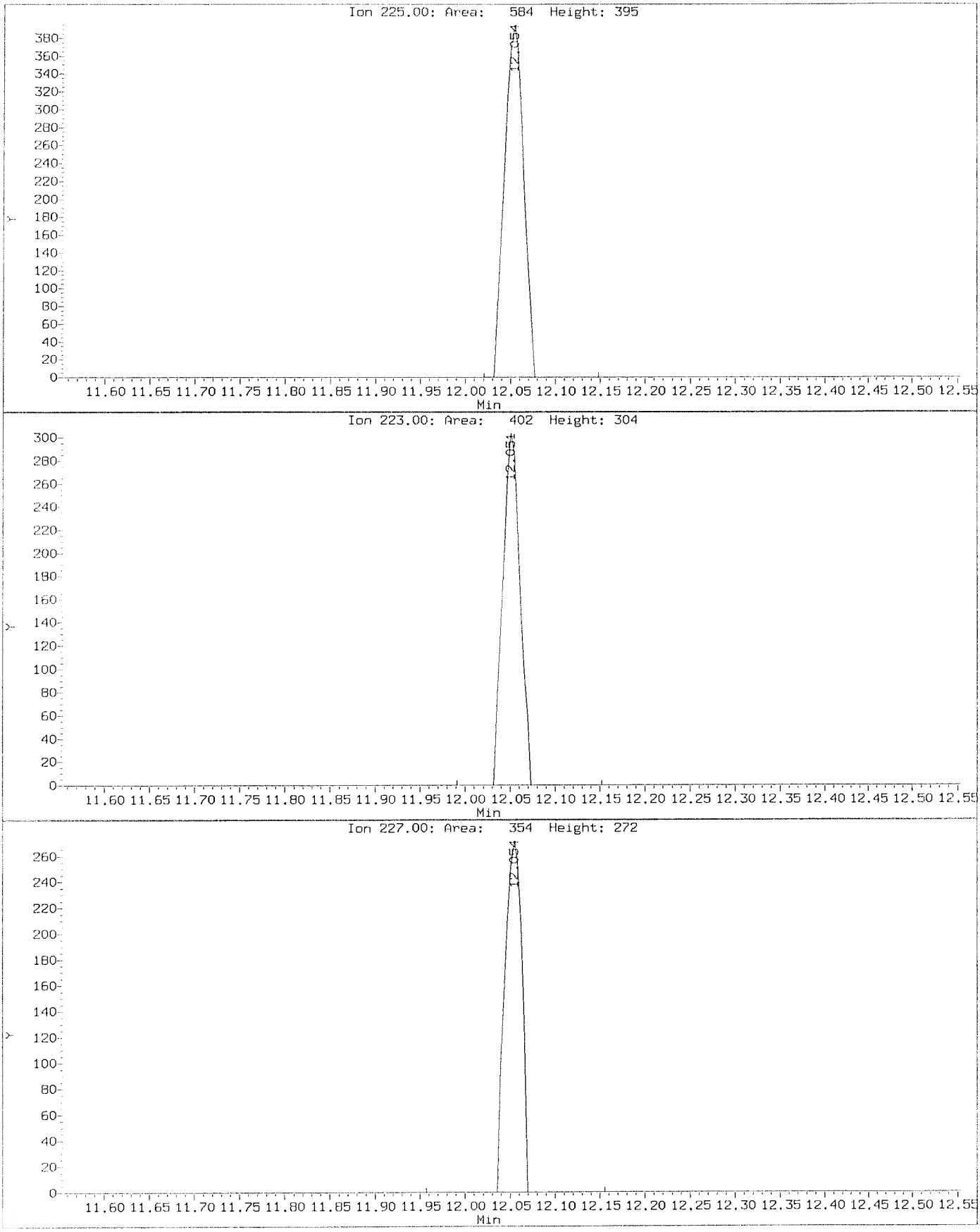
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



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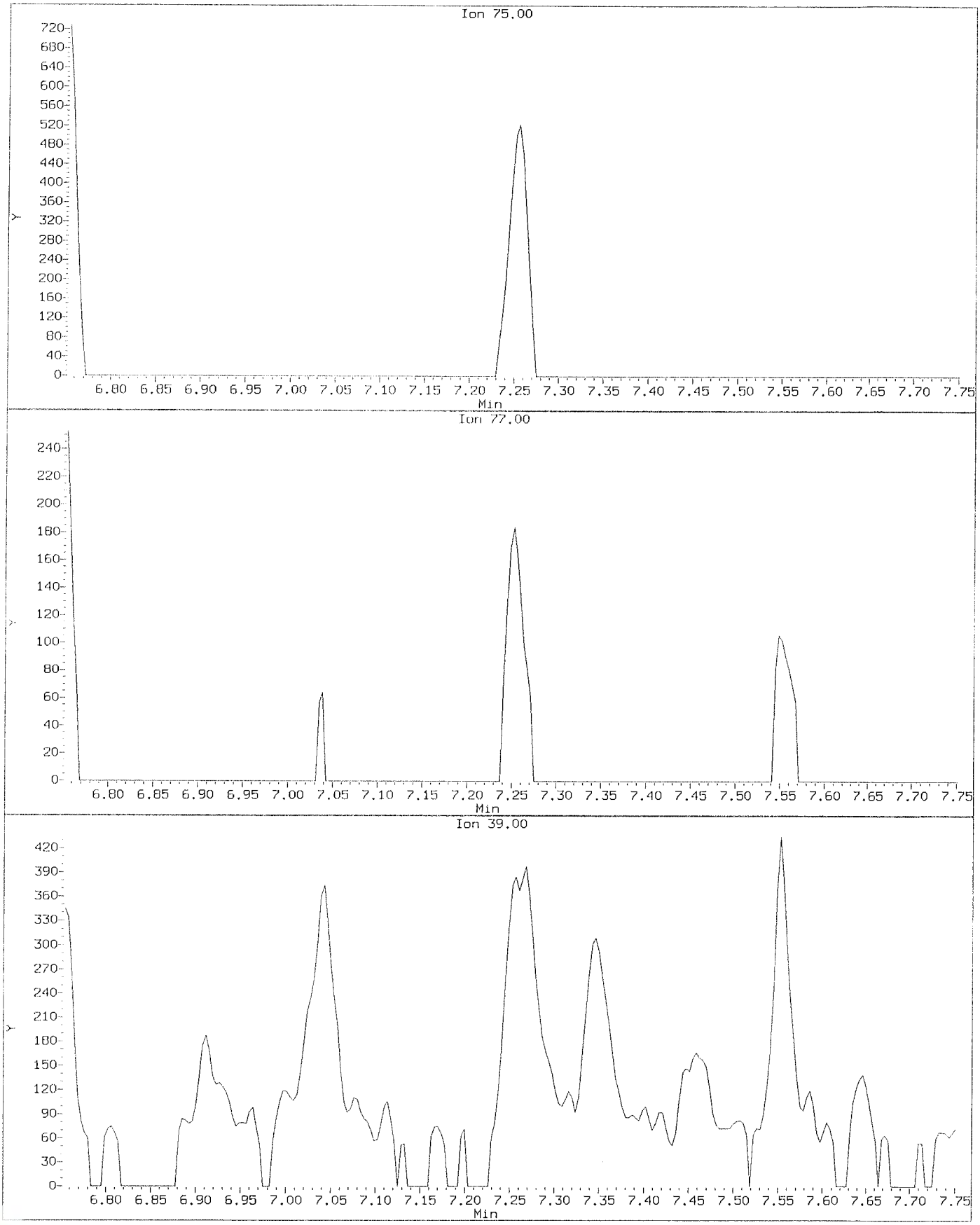
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



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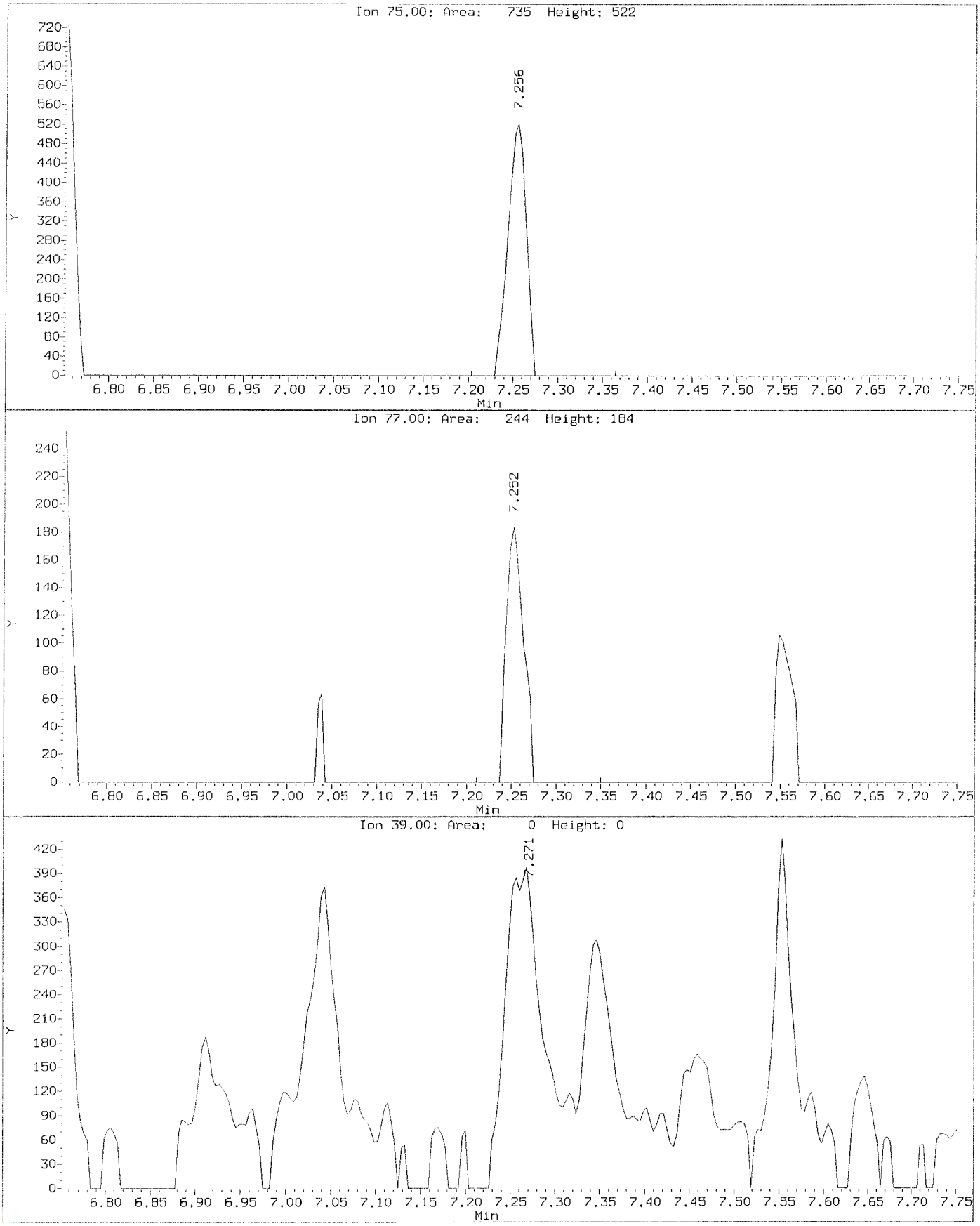
Injection Date: 15-NOV-2021 14:36
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: trans-1,3-Dichloropropene
CAS Number: 10061-02-6



ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111504.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 15-NOV-2021 14:58
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 14:36 Cal File: U111503.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

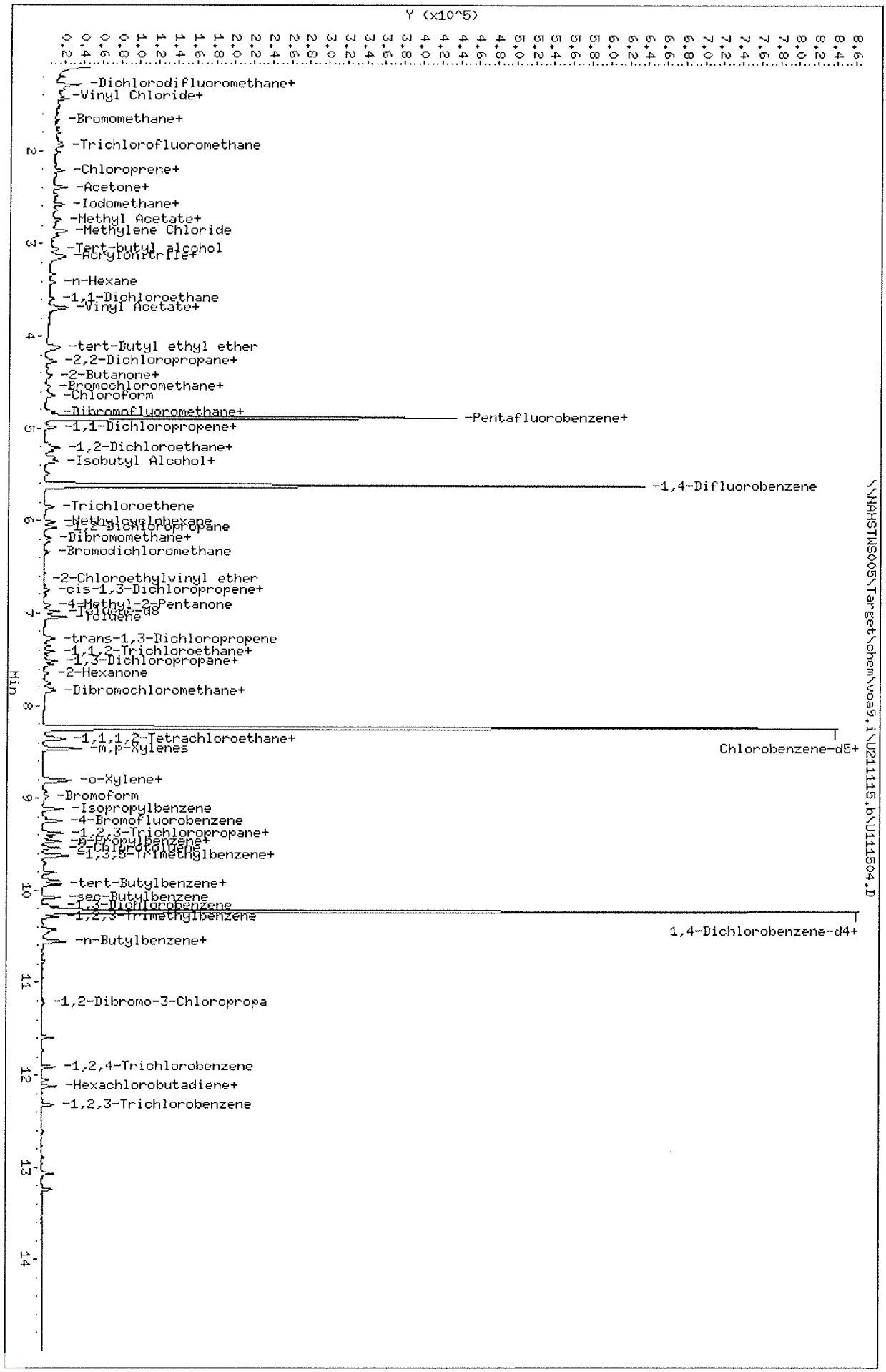
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	271018	50.0000	
* 36 1,4-Difluorobenzene	114	5.618	5.618	(1.000)	470773	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	421143	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	208819	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.823	(0.988)	2474	1.00000	0.02(a)
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	3378	1.00000	(a)
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	9726	1.00000	0.88(a)
$ 69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	6215	1.00000	0.21(a)
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	2215	1.00000	1.57(a)
31 1,1,1-Trichloroethane	97	4.815	4.815	(0.986)	3685	1.00000	0.94(a)
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	4554	1.00000	1.03(aM)
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	2641	1.00000	1.06(a)
22 1,1-Dichloroethane	63	3.590	3.590	(0.735)	5189	1.00000	1.07(a)
11 1,1-Dichloroethene	96	2.394	2.394	(0.490)	2581	1.00000	1.06(a)
32 1,1-Dichloropropene	75	4.992	4.992	(0.889)	4071	1.00000	1.05(a)
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	3989	1.00000	1.06(a)
71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	3759	1.00000	0.87(a)
90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	3820	1.00000	0.99(a)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	10675	1.00000	1.01(a)
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	360	1.00000	2.90(aM)
57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	2956	1.00000	0.98(a)
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	6329	1.00000	1.07(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.934)	4817	1.00000	1.13(aM)
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	3104	1.00000	1.04(a)
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	10492	1.00000	1.02(a)
83	1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	6567	1.00000	1.09(a)
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	5573	1.00000	1.05(a)
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	6860	1.00000	1.10(a)
26	2,2-Dichloropropane	77	4.264	4.264	(0.873)	2682	1.00000	0.98(a)
24	2-Butanone	43	4.350	4.350	(0.891)	2847	2.00000	2.00(a)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	9519	1.00000	1.05(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	3298	2.00000	1.64(TaH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	10627	1.00000	1.01(a)
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	9764	1.00000	0.95(a)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	6121	2.00000	2.01(a)
10	Acetone	43	2.476	2.476	(0.507)	4060	2.00000	(a)
37	Benzene	78	5.205	5.205	(0.927)	13246	1.00000	1.11(a)
74	Bromobenzene	156	9.374	9.374	(0.917)	3452	1.00000	1.06(a)
29	Bromochloromethane	128	4.545	4.545	(0.931)	1559	1.00000	1.01(a)
39	Bromodichloromethane	83	6.337	6.337	(1.128)	3055	1.00000	1.81(aM)
66	Bromoform	173	8.976	8.976	(1.089)	1090	1.00000	1.97(aM)
6	Bromomethane	94	1.663	1.663	(0.341)	2151	1.00000	0.78(a)
19	Carbon Disulfide	76	2.577	2.577	(0.528)	14181	2.00000	2.11(a)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	3053	1.00000	2.29(a)
59	Chlorobenzene	112	8.264	8.264	(1.003)	8952	1.00000	1.09(a)
7	Chloroethane	64	1.745	1.745	(0.357)	2379	1.00000	1.06(aM)
28	Chloroform	83	4.647	4.647	(0.952)	5488	1.00000	1.05(a)
3	Chloromethane	50	1.337	1.337	(0.274)	3019	1.00000	0.54(a)
27	cis-1,2-Dichloroethene	96	4.276	4.276	(0.876)	3470	1.00000	1.04(a)
46	cis-1,3-Dichloropropene	75	6.753	6.753	(1.202)	2819	1.00000	2.29(a)
55	Dibromochloromethane	129	7.751	7.751	(0.940)	2071	1.00000	2.13(a)
44	Dibromomethane	93	6.180	6.180	(1.100)	2075	1.00000	1.02(a)
2	Dichlorodifluoromethane	85	1.198	1.198	(0.245)	3384	1.00000	0.34(a)
61	Ethylbenzene	106	8.362	8.362	(1.015)	4316	1.00000	1.05(a)
91	Hexachlorobutadiene	225	12.050	12.050	(1.179)	1346	1.00000	0.94(a)
67	Isopropylbenzene	105	9.115	9.115	(1.106)	12845	1.00000	1.03(a)
62	m,p-Xylenes	106	8.463	8.463	(1.027)	10438	2.00000	2.05(a)
17	Methylene Chloride	84	2.859	2.859	(0.585)	3687	1.00000	1.15(a)
87	n-Butylbenzene	91	10.547	10.547	(1.032)	8937	1.00000	0.97(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	14969	1.00000	1.05(a)
92	Naphthalene	128	12.122	12.122	(1.186)	11275	1.00000	0.97(a)
63	o-Xylene	106	8.804	8.804	(1.068)	5404	1.00000	1.07(a)
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	11762	1.00000	1.00(a)
64	Styrene	104	8.819	8.819	(1.070)	8325	1.00000	0.96(a)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	8791	1.00000	1.01(a)
56	Tetrachloroethene	164	7.514	7.514	(0.912)	2638	1.00000	1.11(a)
50	Toluene	91	7.038	7.038	(0.854)	13702	1.00000	1.08(a)
20	trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	2912	1.00000	1.06(a)
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.291)	2070	1.00000	2.57(a)
38	Trichloroethene	130	5.854	5.854	(1.042)	3189	1.00000	1.03(a)
8	Trichlorofluoromethane	101	1.948	1.948	(0.399)	4839	1.00000	1.10(a)
5	Vinyl Chloride	62	1.412	1.412	(0.289)	3447	1.00000	1.05(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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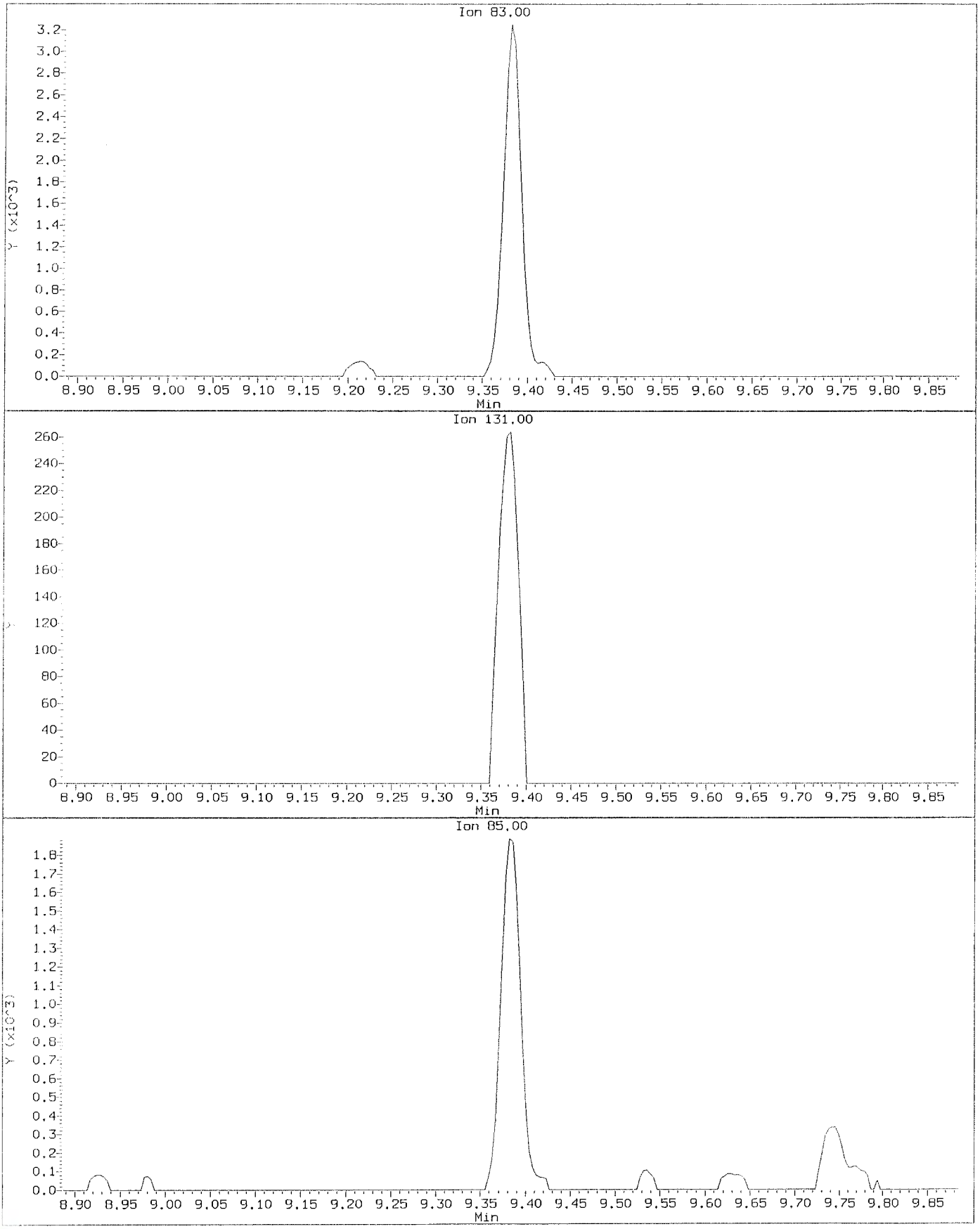
Date : 15-NOV-2021 14:58
Client ID: VSTD001
Sample Info: VSTD001,VSTD001,1,3,,
Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111504.D
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111504.D
Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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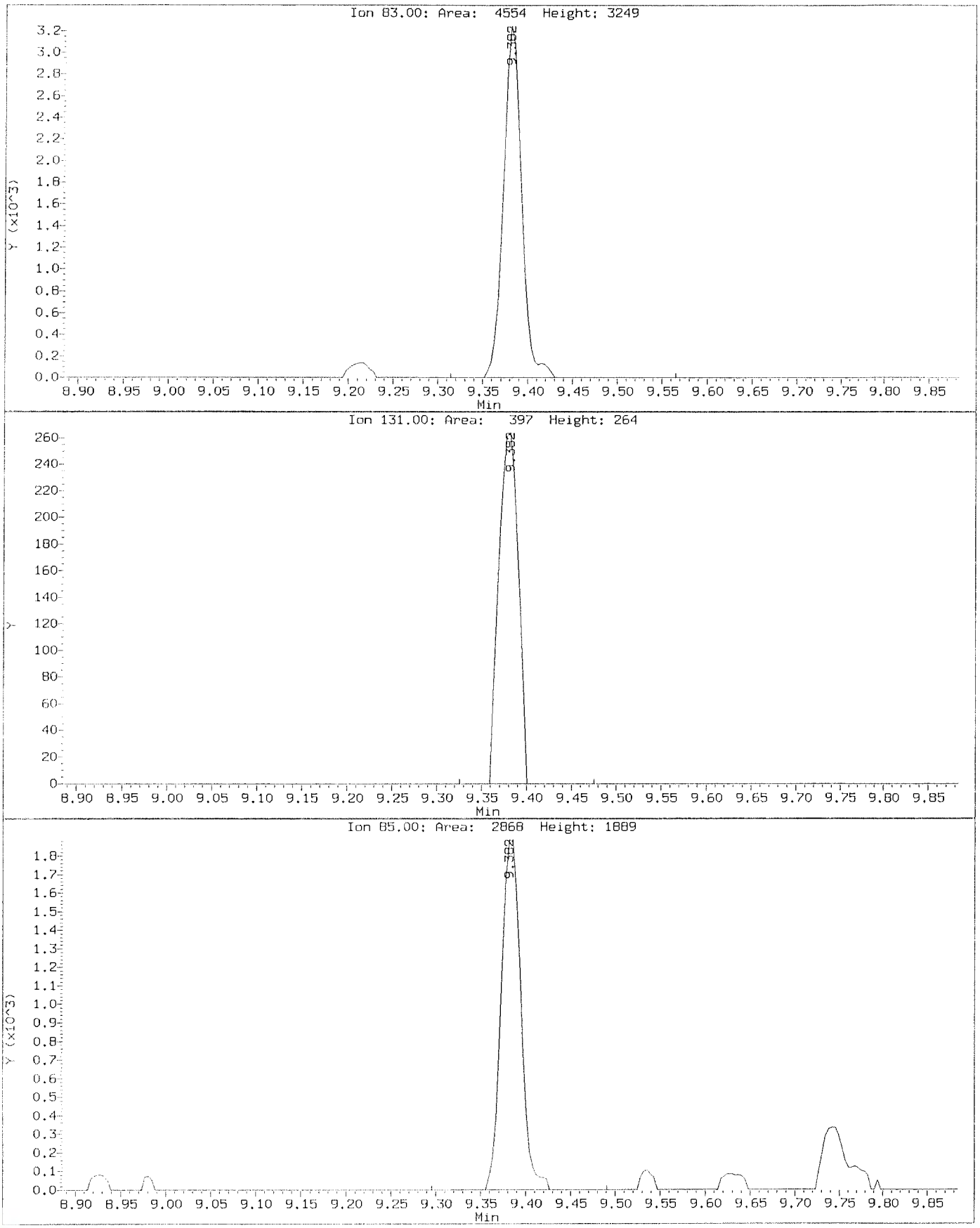
Client Sample ID: VSTD001

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



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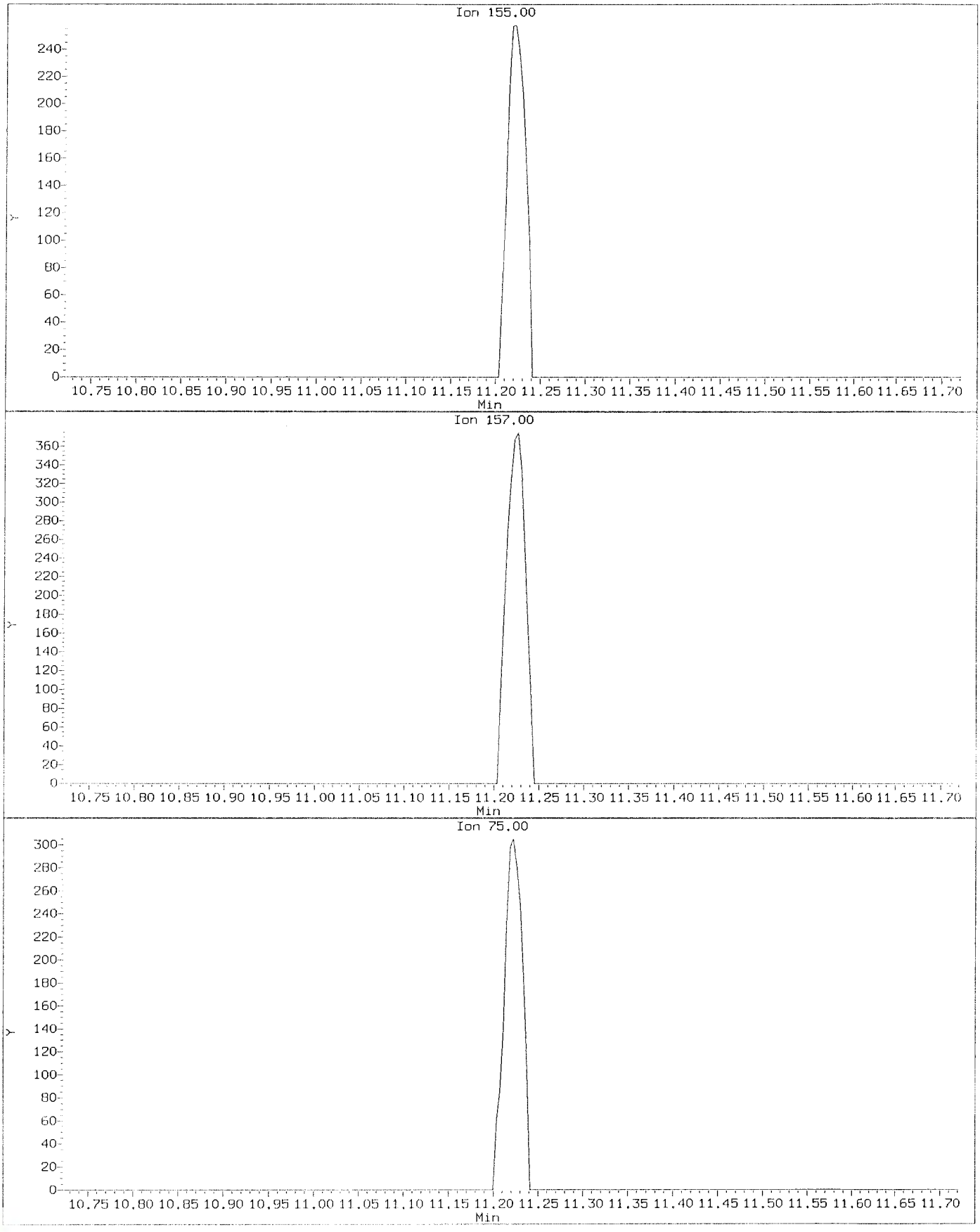
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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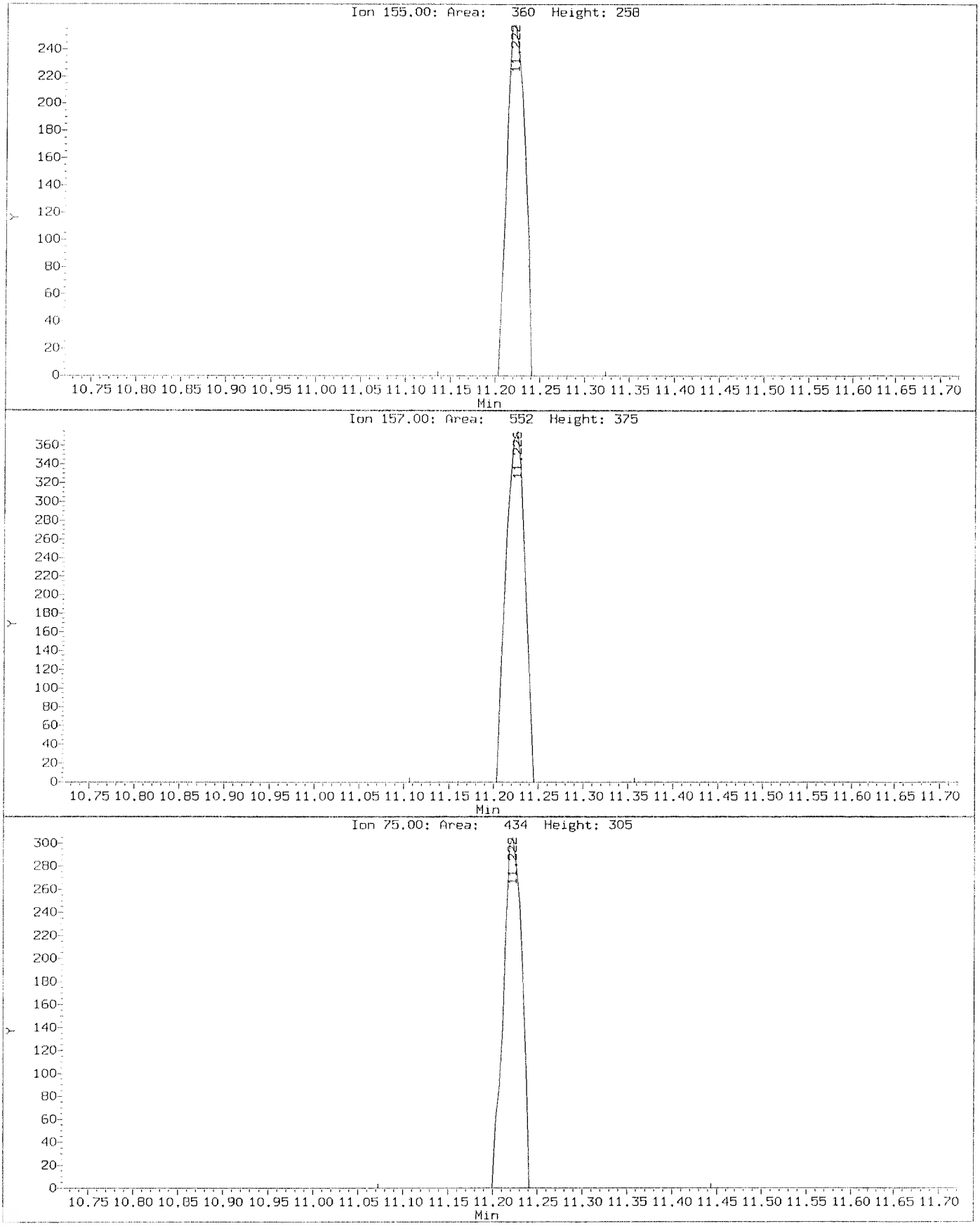
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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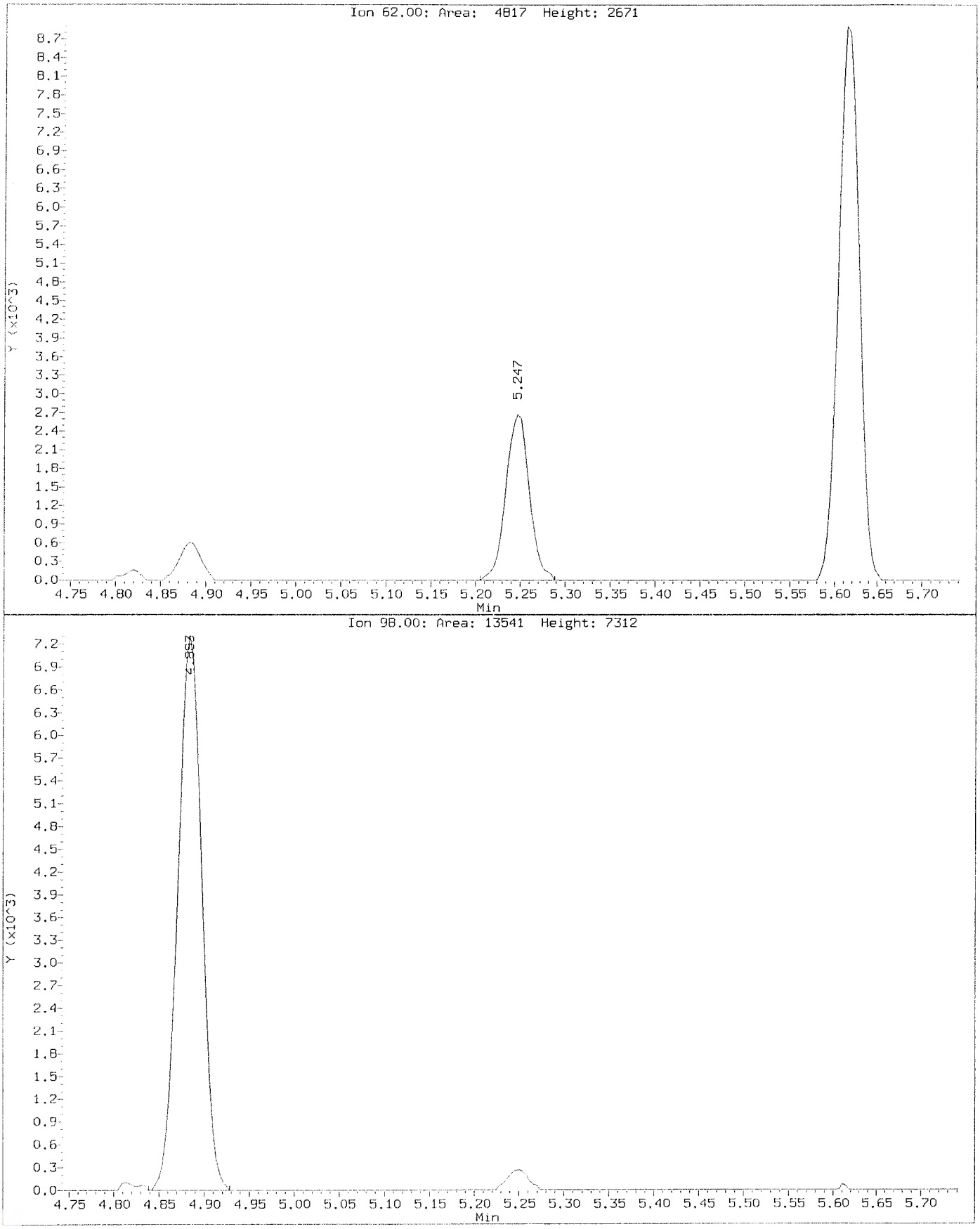
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,2-Dichloroethane
CAS Number: 107-06-2



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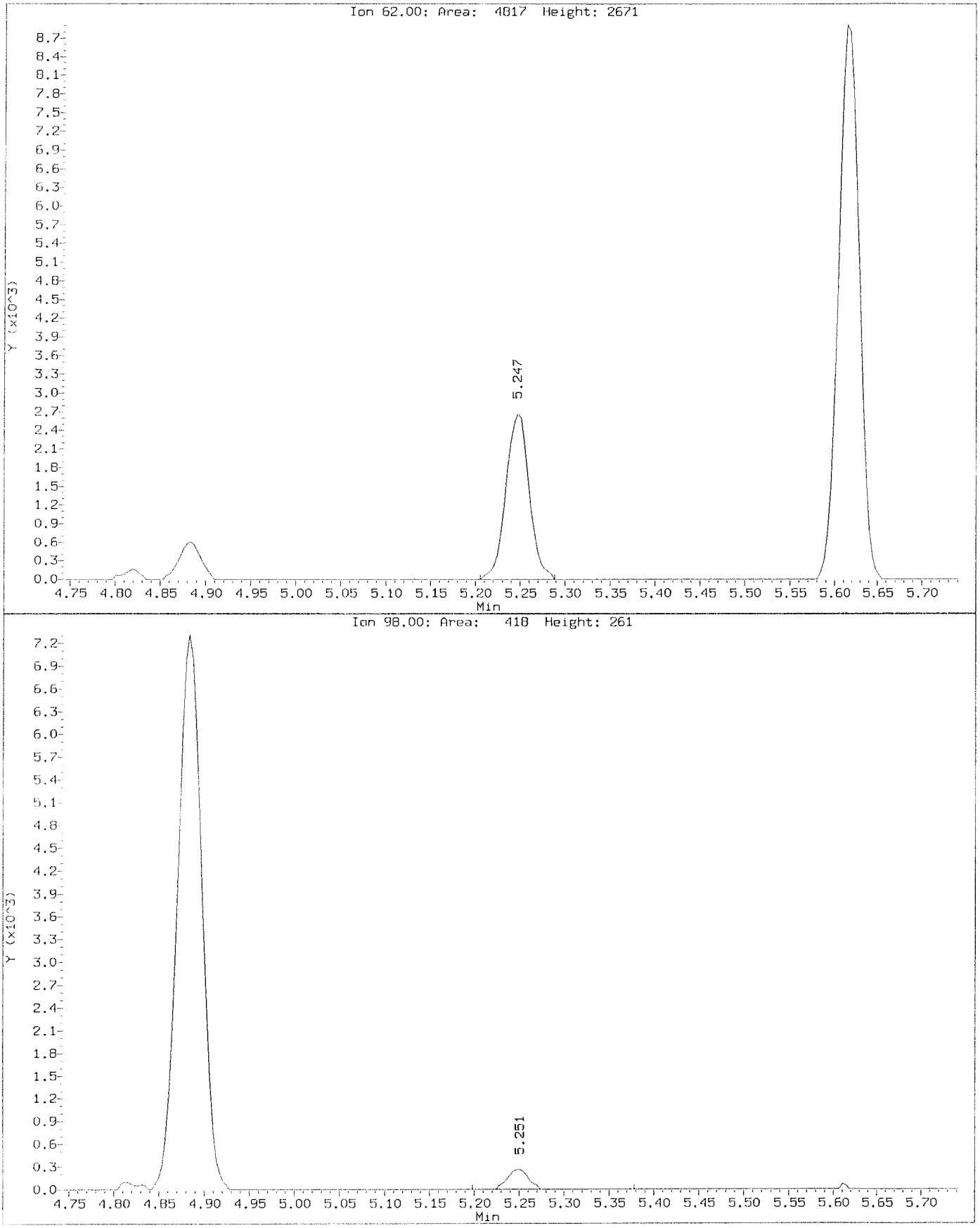
Client Sample ID: VSTD001

Compound: 1,2-Dichloroethane
CAS Number: 107-06-2



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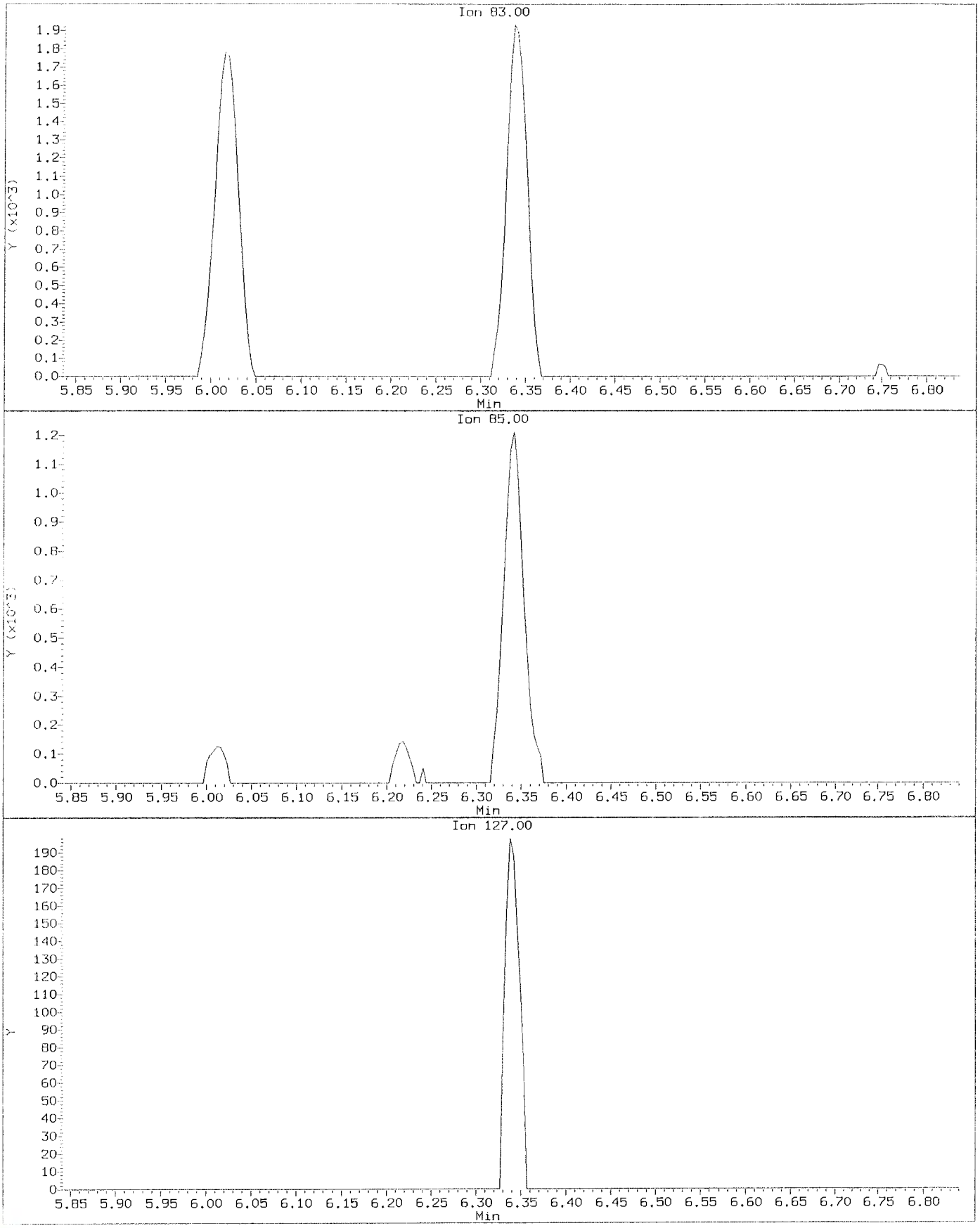
Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4



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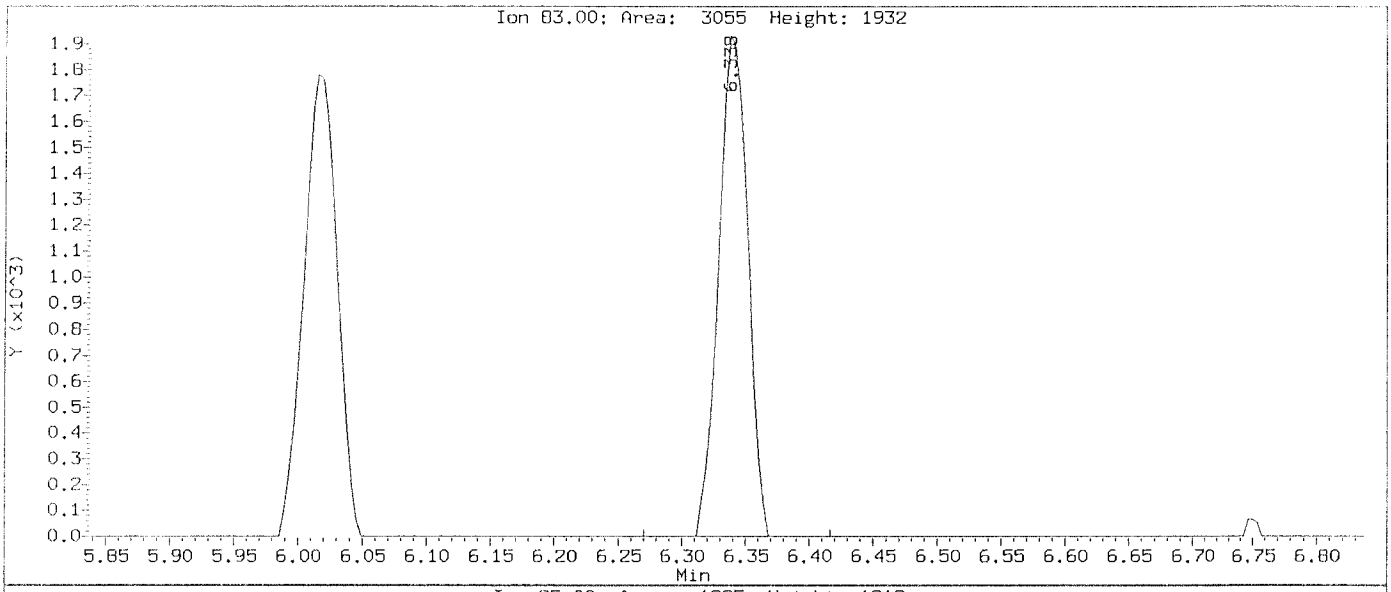
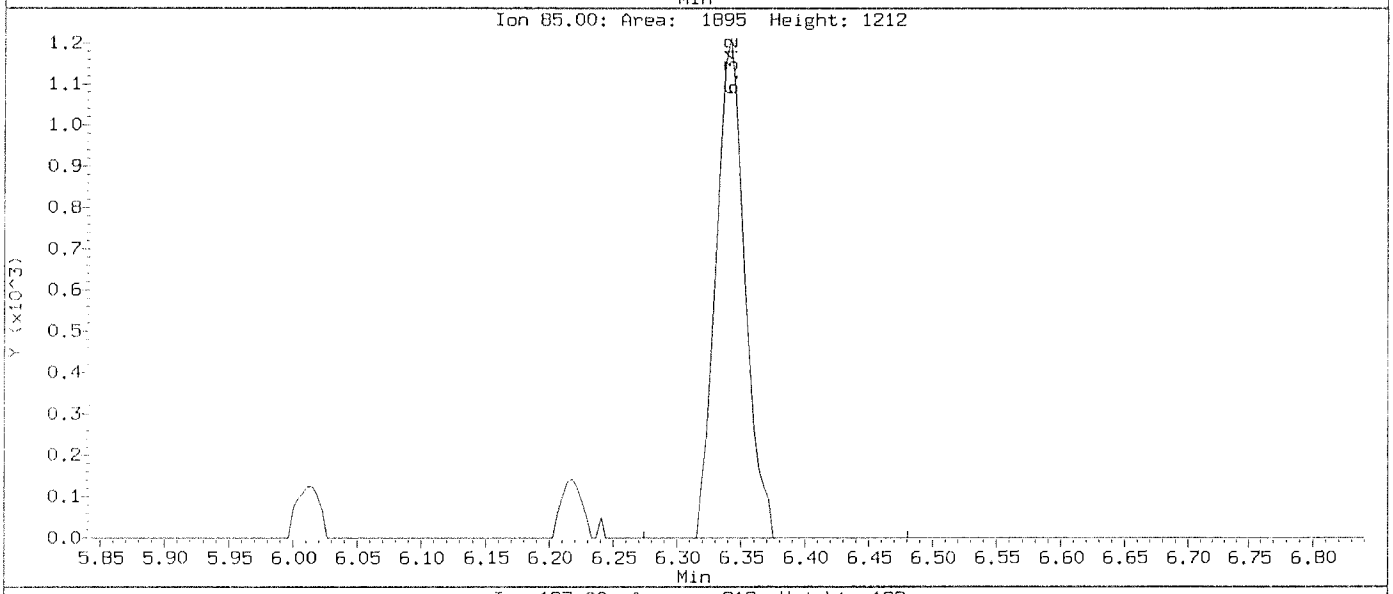
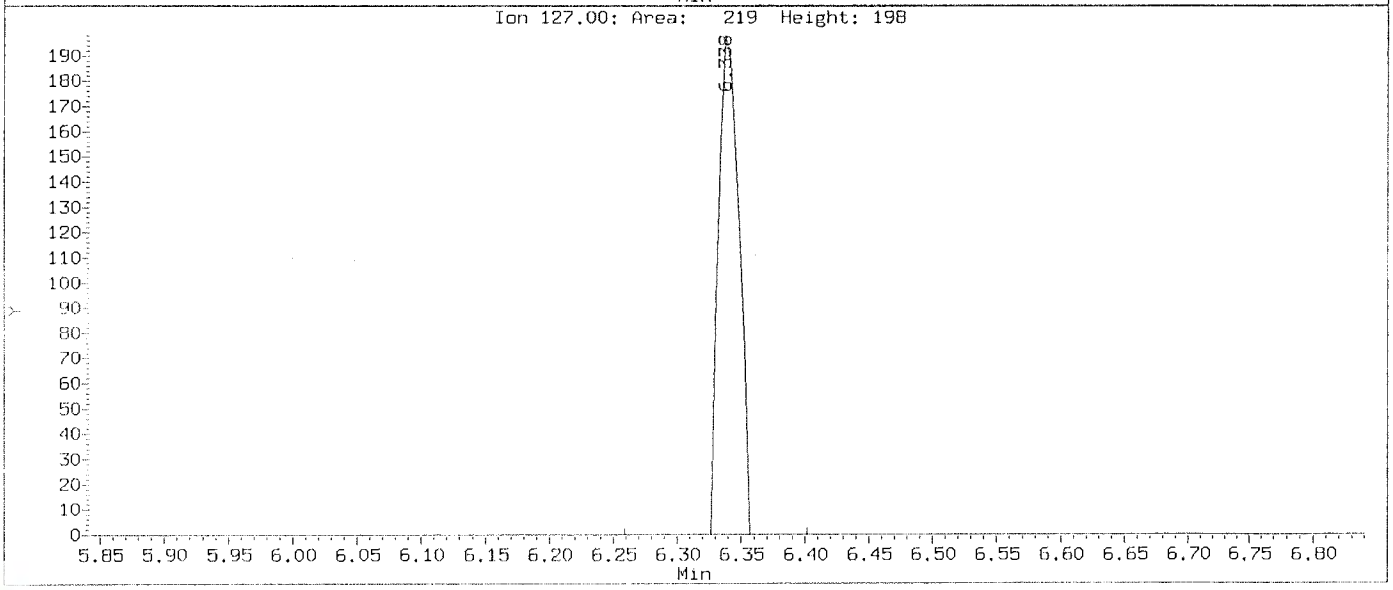
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4







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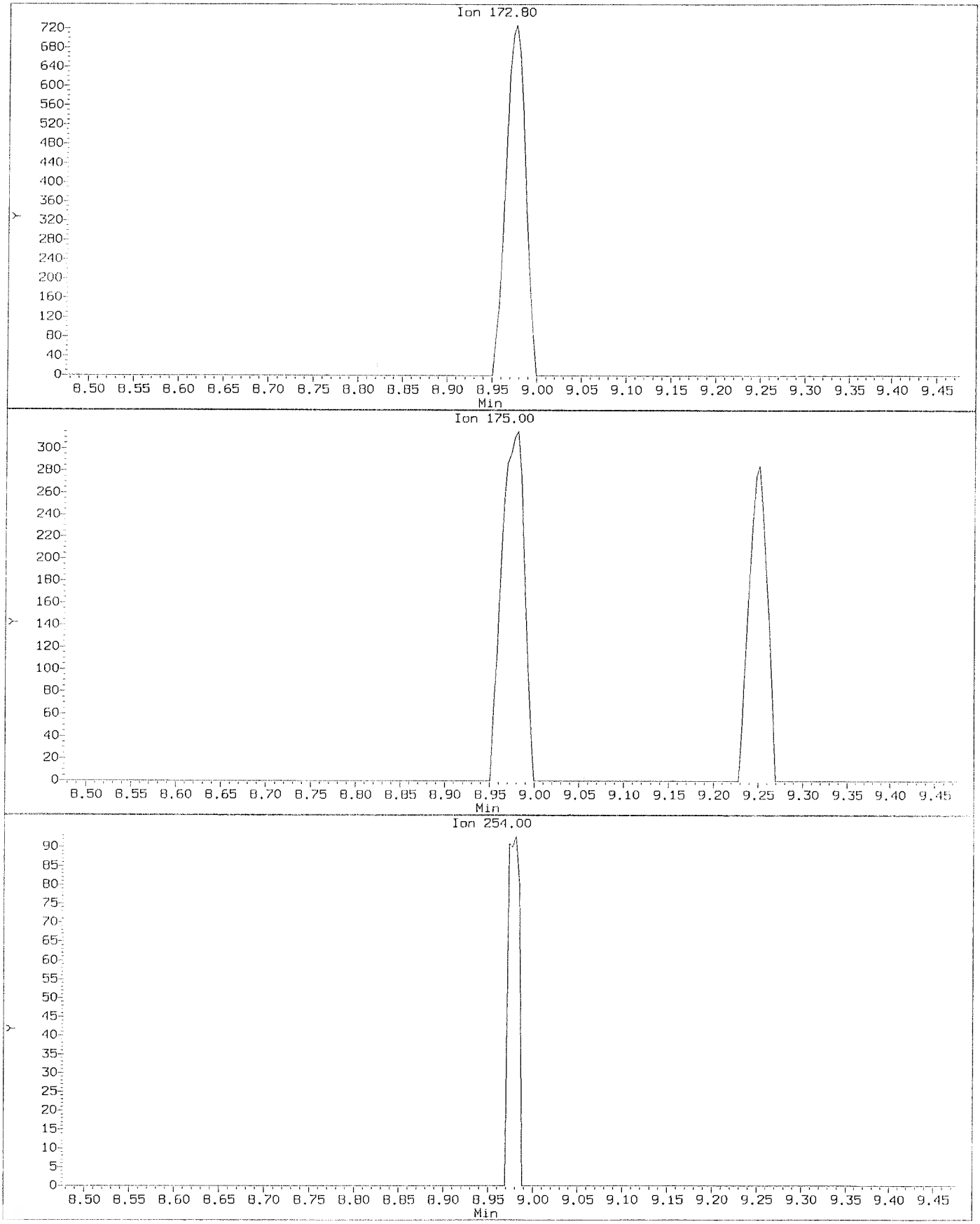
Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromoform
CAS Number: 75-25-2



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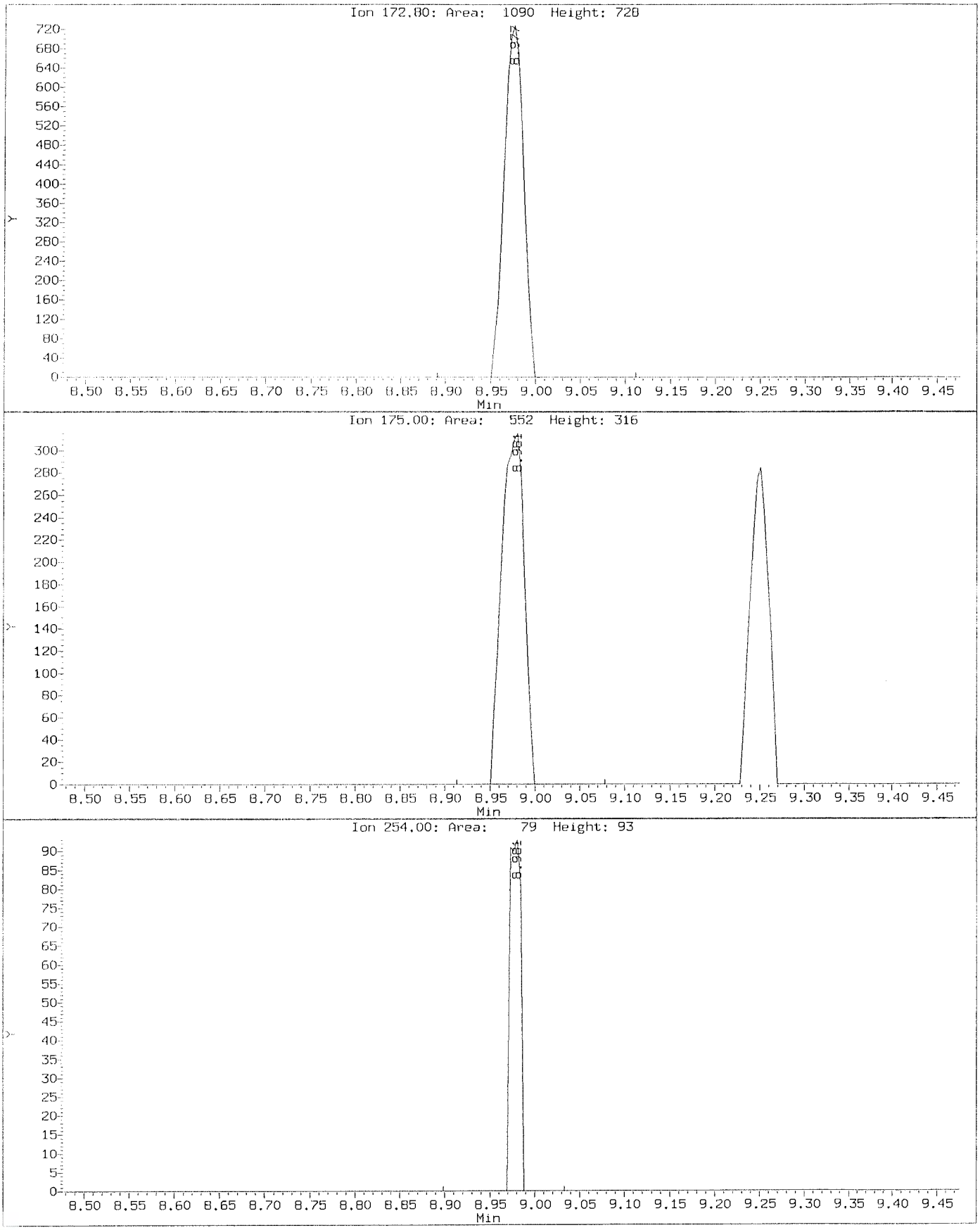
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromoform
CAS Number: 75-25-2



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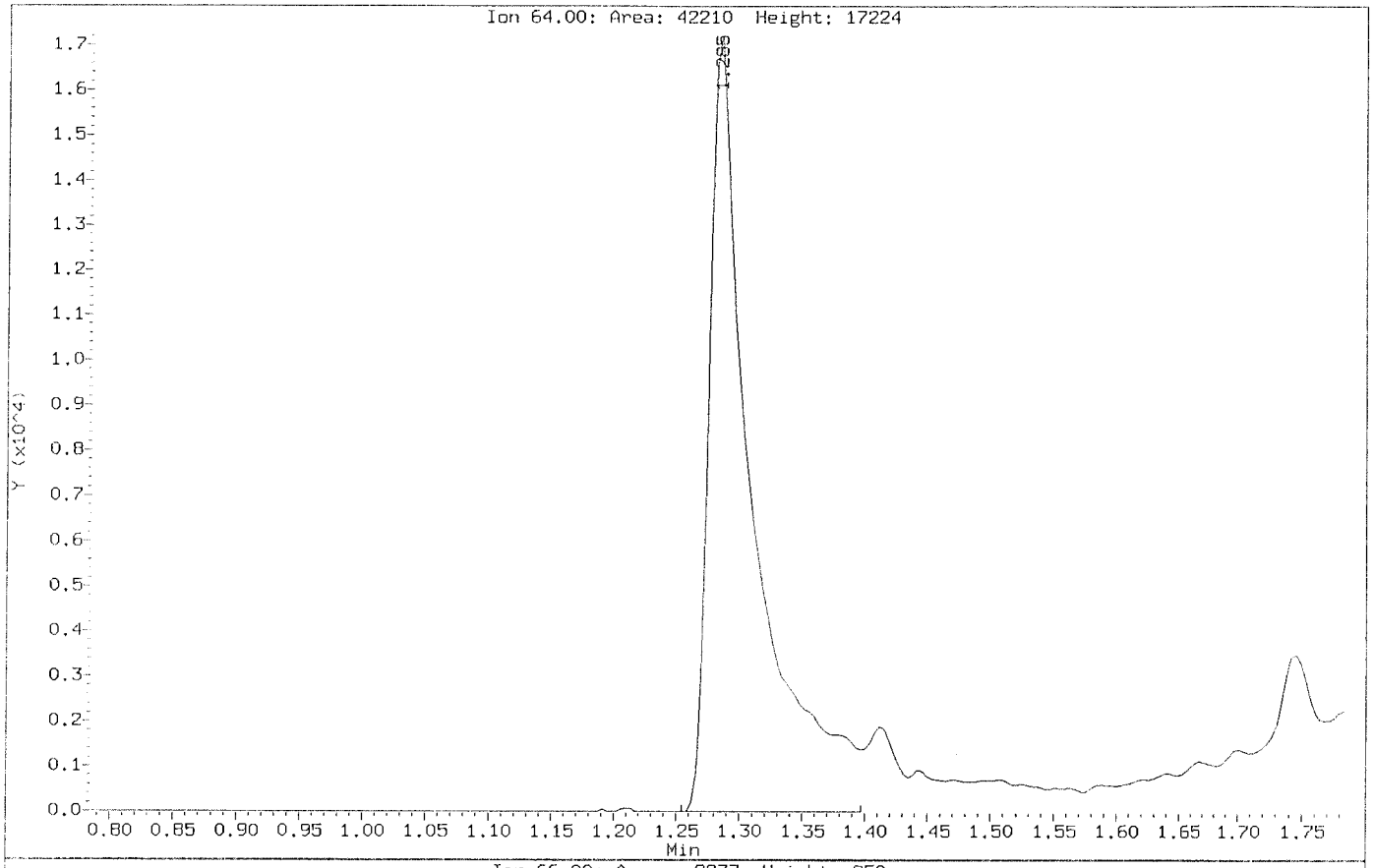
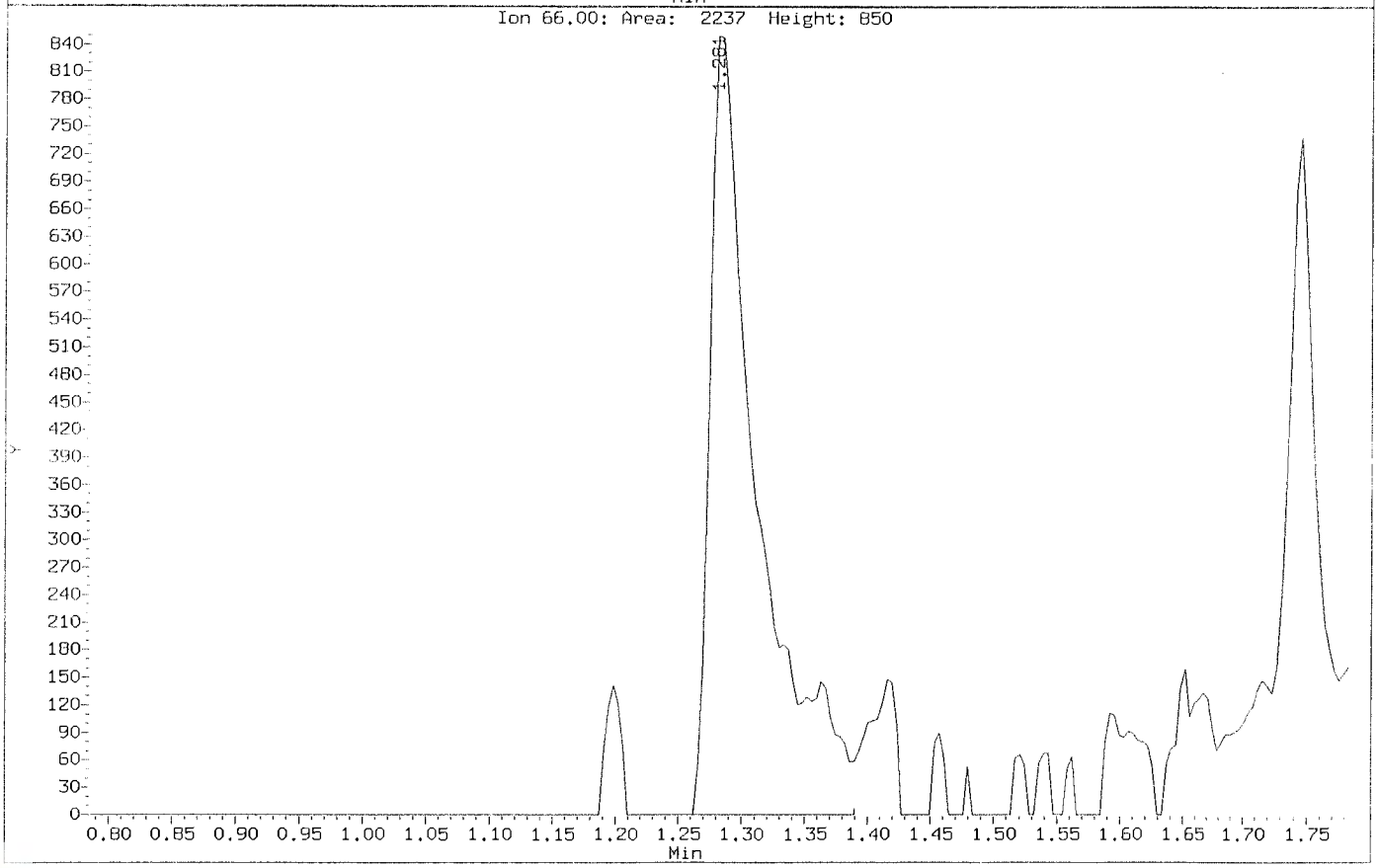
Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3





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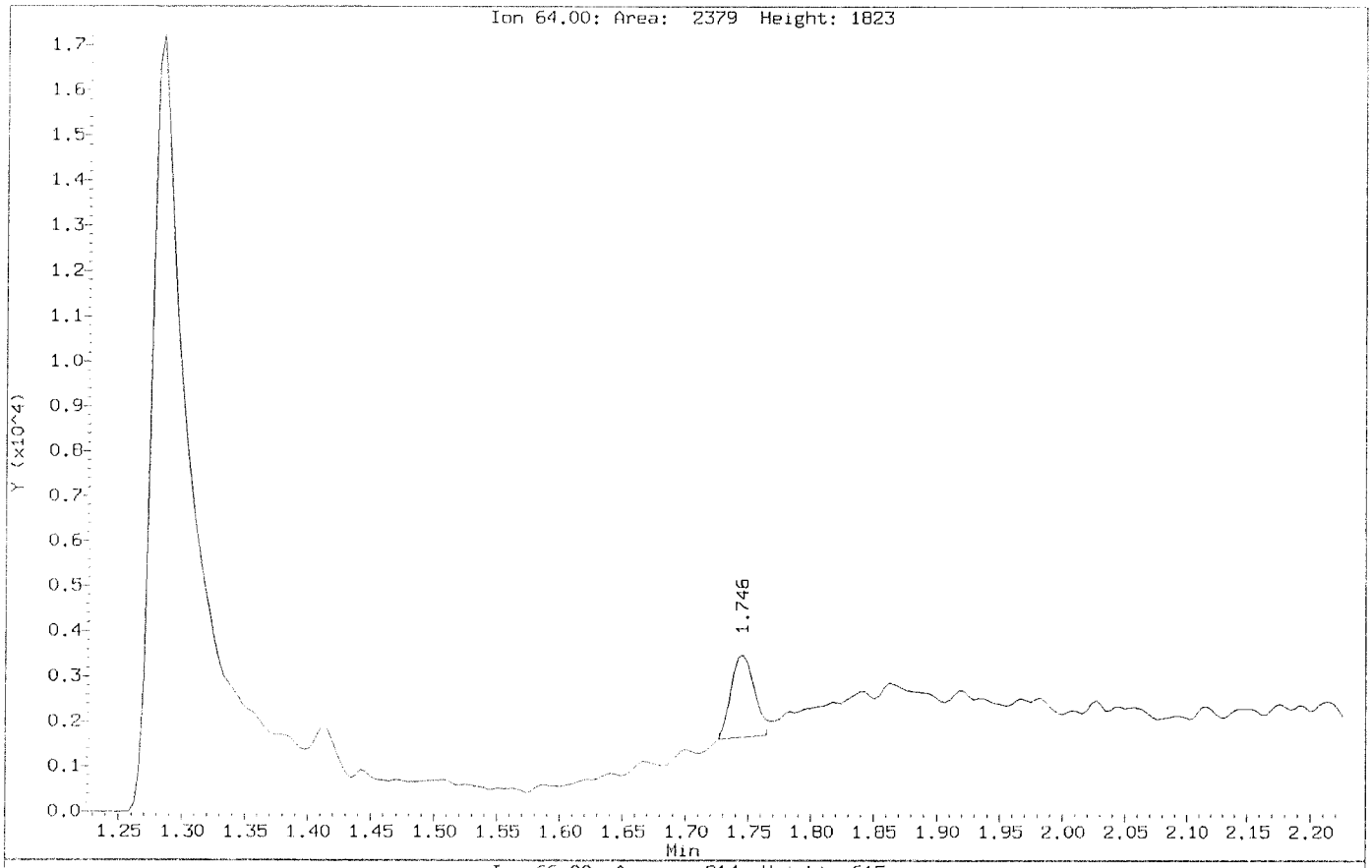
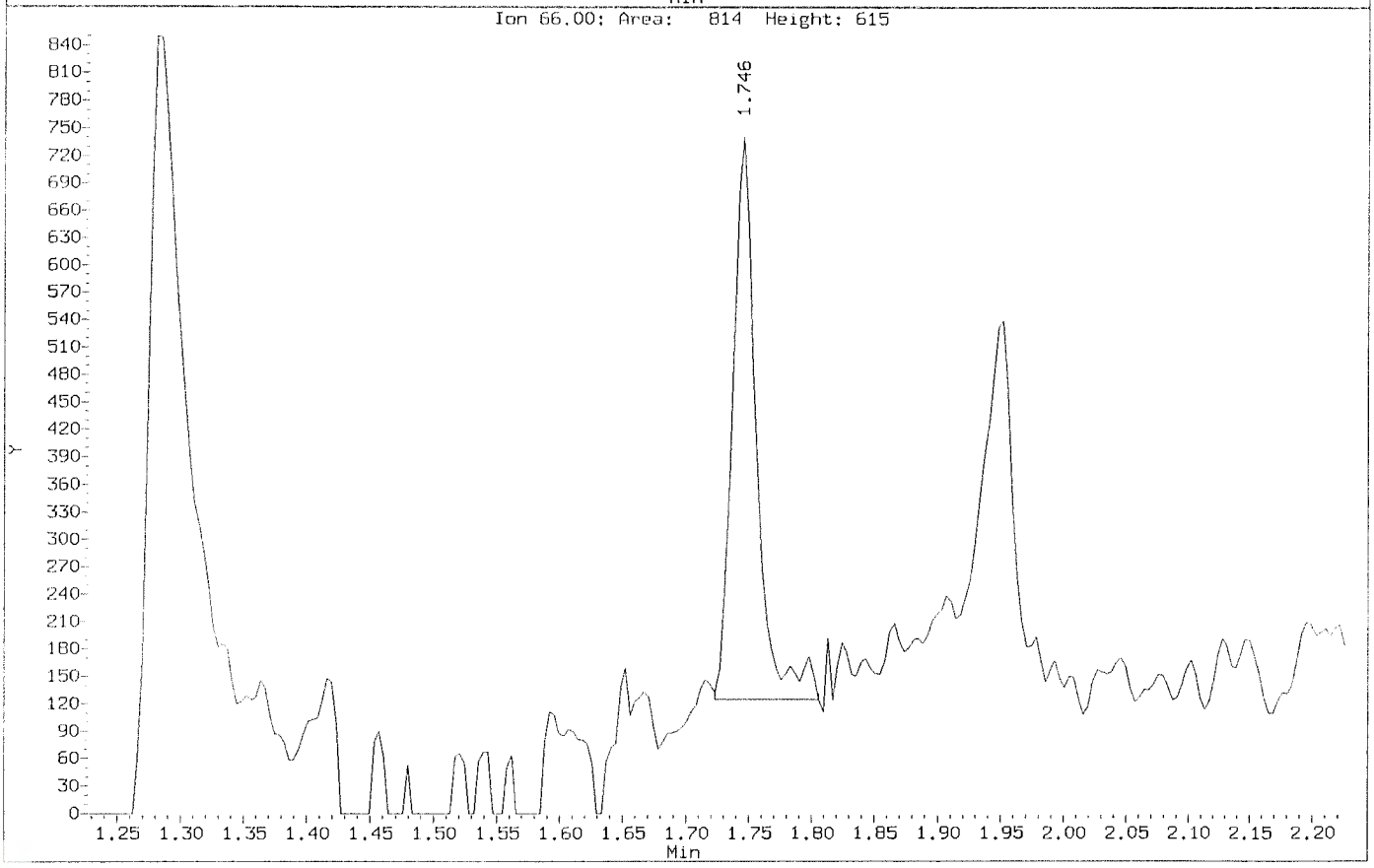
Injection Date: 15-NOV-2021 14:58
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111505.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 15-NOV-2021 15:20
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 14:58 Cal File: U111504.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

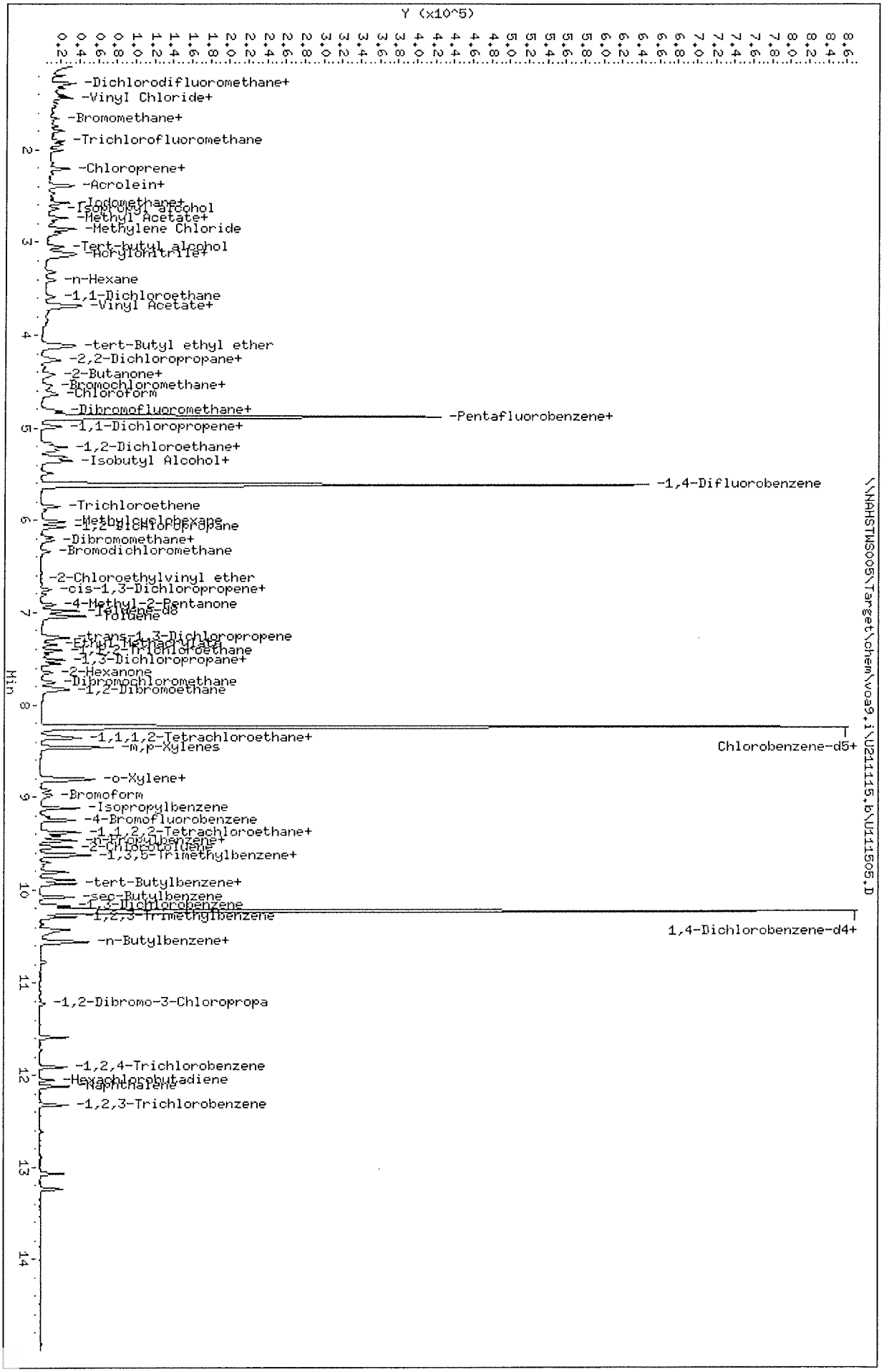
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	266816	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	472045	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	430733	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	210030	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	5867	2.00000	1.27(a)
$ 35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	7830	2.00000	0.96(a)
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	23234	2.00000	2.07(a)
$ 69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	11258	2.00000	1.41(a)
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	4304	2.00000	2.24(a)
31 1,1,1-Trichloroethane	97	4.812	4.812	(0.985)	6959	2.00000	1.81(a)
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	9463	2.00000	2.14(a)
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	5003	2.00000	1.97(a)
22 1,1-Dichloroethane	63	3.586	3.586	(0.734)	10144	2.00000	2.14(a)
11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	5060	2.00000	2.12(a)
32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	7710	2.00000	1.98(a)
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	7830	2.00000	2.08(a)
71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	7996	2.00000	1.84(a)
90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	7719	2.00000	1.99(a)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	20790	2.00000	1.97(a)
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	886	2.00000	3.58(a)
57 1,2-Dibromoethane	107	7.841	7.841	(0.951)	5849	2.00000	1.89(a)
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	12429	2.00000	2.09(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.243	5.243	(0.934)	8462	2.00000	1.98(a)
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	6025	2.00000	2.02(a)
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	20514	2.00000	1.98(a)
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	12191	2.00000	2.01(a)
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	10818	2.00000	2.00(a)
84	1,4-Dichlorobenzene	146	10.243	10.243	(1.002)	12630	2.00000	2.02(a)
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	4769	2.00000	1.77(a)
24	2-Butanone	43	4.347	4.347	(0.890)	5042	4.00000	3.61(a)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	18287	2.00000	2.02(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	8112	4.00000	3.96(aH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	20975	2.00000	2.00(a)
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	20170	2.00000	1.97(a)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	11742	4.00000	3.78(a)
10	Acetone	43	2.469	2.469	(0.506)	7509	4.00000	1.96(a)
37	Benzene	78	5.205	5.205	(0.927)	23270	2.00000	1.94(a)
74	Bromobenzene	156	9.374	9.374	(0.917)	6315	2.00000	1.93(a)
29	Bromochloromethane	128	4.542	4.542	(0.930)	3175	2.00000	2.10(a)
39	Bromodichloromethane	83	6.337	6.337	(1.129)	5486	2.00000	2.43(aM)
66	Bromoform	173	8.973	8.973	(1.089)	2438	2.00000	2.62(Ta)
6	Bromomethane	94	1.659	1.659	(0.340)	3804	2.00000	1.82(a)
19	Carbon Disulfide	76	2.574	2.574	(0.527)	25850	4.00000	3.91(a)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	5276	2.00000	2.86(a)
59	Chlorobenzene	112	8.264	8.264	(1.003)	16817	2.00000	2.00(a)
7	Chloroethane	64	1.741	1.741	(0.357)	4101	2.00000	1.85(aM)
28	Chloroform	83	4.643	4.643	(0.951)	10070	2.00000	1.95(a)
3	Chloromethane	50	1.329	1.329	(0.272)	5164	2.00000	1.37(a)
27	cis-1,2-Dichloroethene	96	4.268	4.268	(0.874)	6784	2.00000	2.08(a)
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	5706	2.00000	2.85(a)
55	Dibromochloromethane	129	7.747	7.747	(0.940)	3879	2.00000	2.65(a)
44	Dibromomethane	93	6.180	6.180	(1.101)	3989	2.00000	1.96(a)
2	Dichlorodifluoromethane	85	1.194	1.194	(0.245)	6494	2.00000	1.35(a)
61	Ethylbenzene	106	8.362	8.362	(1.015)	8437	2.00000	2.00(a)
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	2545	2.00000	1.78(a)
67	Isopropylbenzene	105	9.119	9.119	(1.106)	25310	2.00000	2.00(a)
62	m,p-Xylenes	106	8.463	8.463	(1.027)	20542	4.00000	3.95(a)
17	Methylene Chloride	84	2.855	2.855	(0.585)	6792	2.00000	2.16(a)
87	n-Butylbenzene	91	10.547	10.547	(1.032)	17916	2.00000	1.95(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	28162	2.00000	1.97(a)
92	Naphthalene	128	12.122	12.122	(1.186)	23636	2.00000	2.04(a)
63	o-Xylene	106	8.800	8.800	(1.068)	9754	2.00000	1.89(a)
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	23008	2.00000	1.96(a)
64	Styrene	104	8.815	8.815	(1.070)	16987	2.00000	1.92(a)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	16956	2.00000	1.94(a)
56	Tetrachloroethene	164	7.514	7.514	(0.912)	4981	2.00000	2.05(a)
50	Toluene	91	7.038	7.038	(0.854)	25594	2.00000	1.98(a)
20	trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	5365	2.00000	1.99(a)
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	4426	2.00000	3.10(a)
38	Trichloroethene	130	5.850	5.850	(1.042)	6273	2.00000	2.03(a)
8	Trichlorofluoromethane	101	1.940	1.940	(0.397)	8751	2.00000	2.03(a)
5	Vinyl Chloride	62	1.408	1.408	(0.288)	6538	2.00000	2.02(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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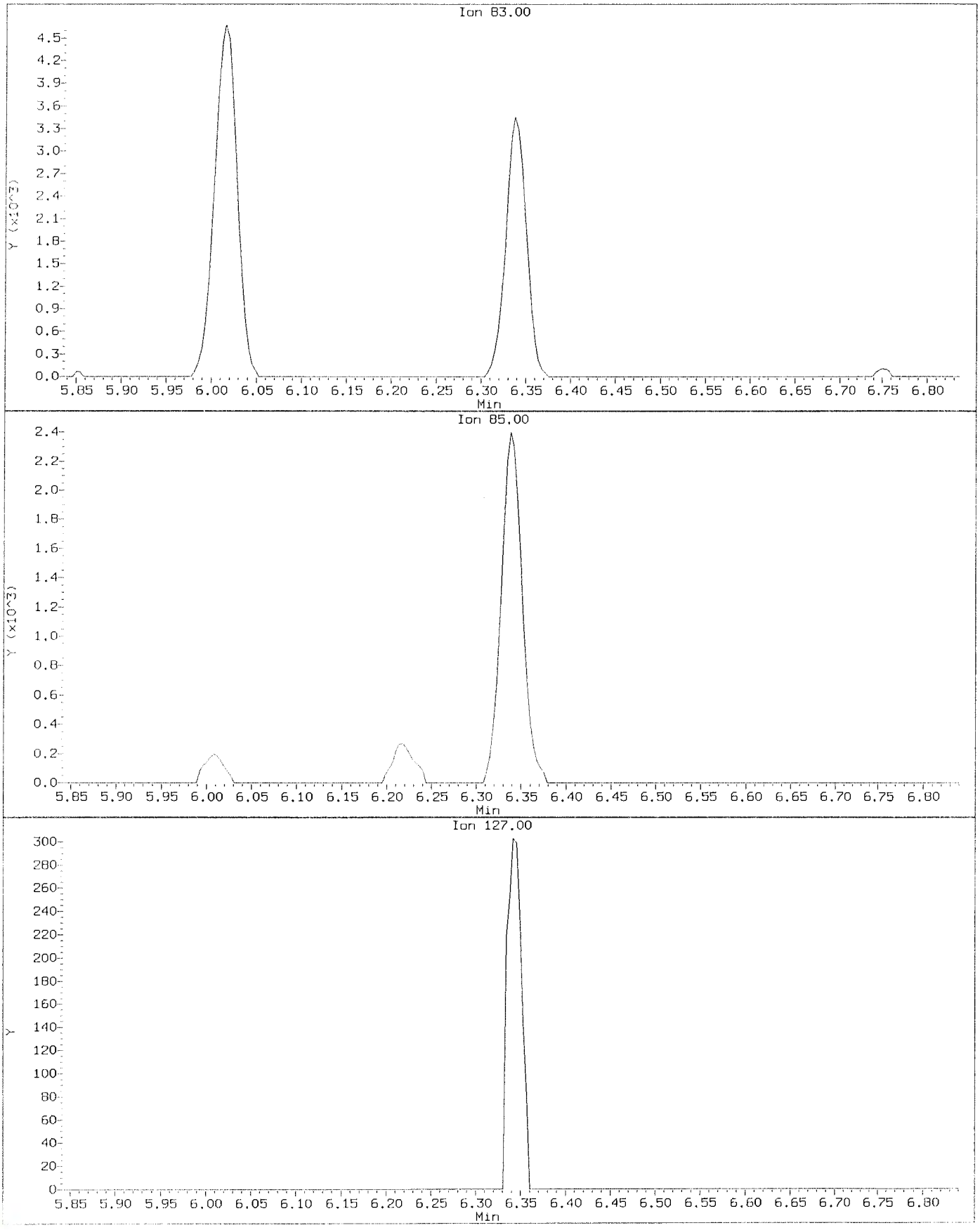
Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111505.D
Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Bromodichloromethane
CAS Number: 75-27-4



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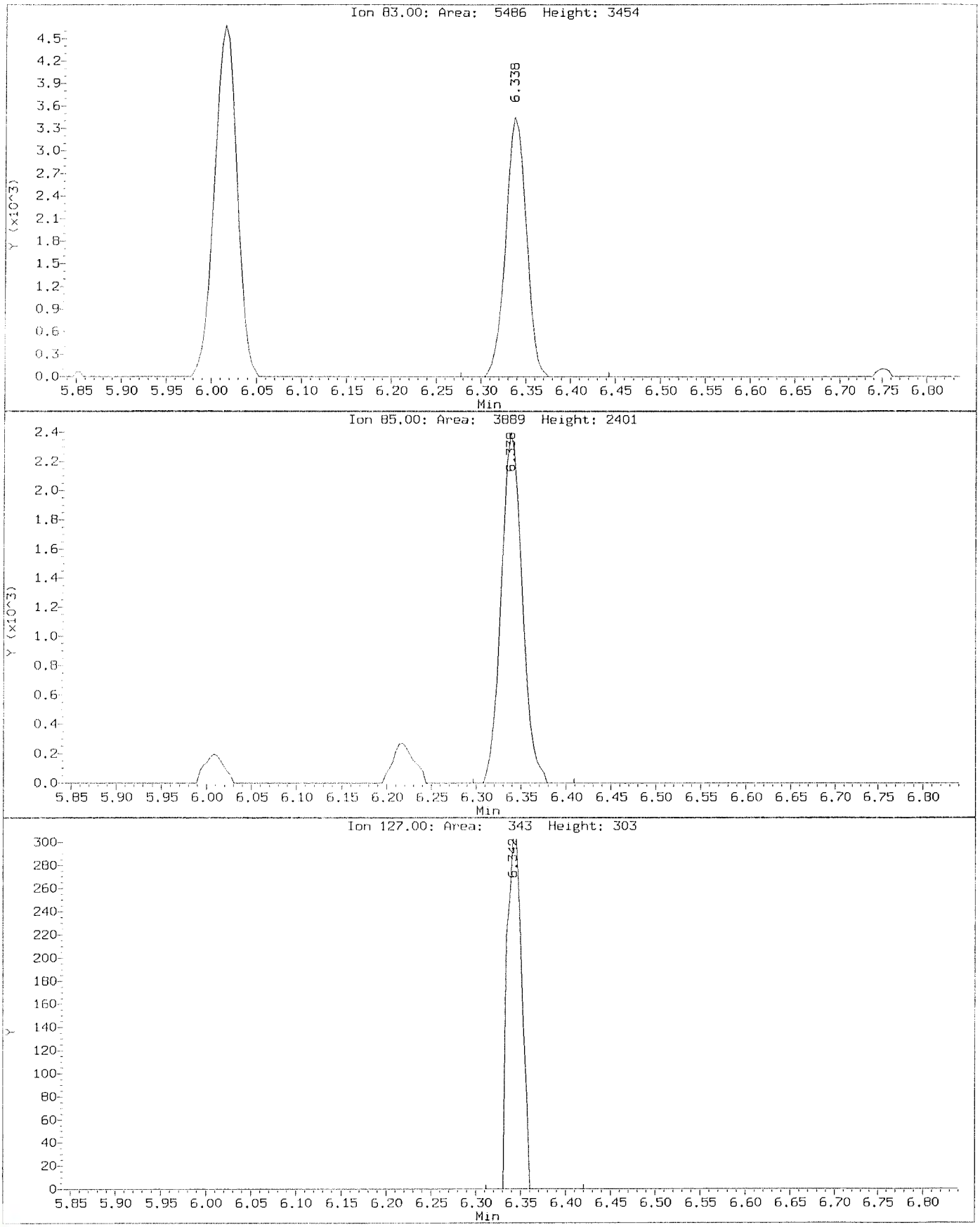
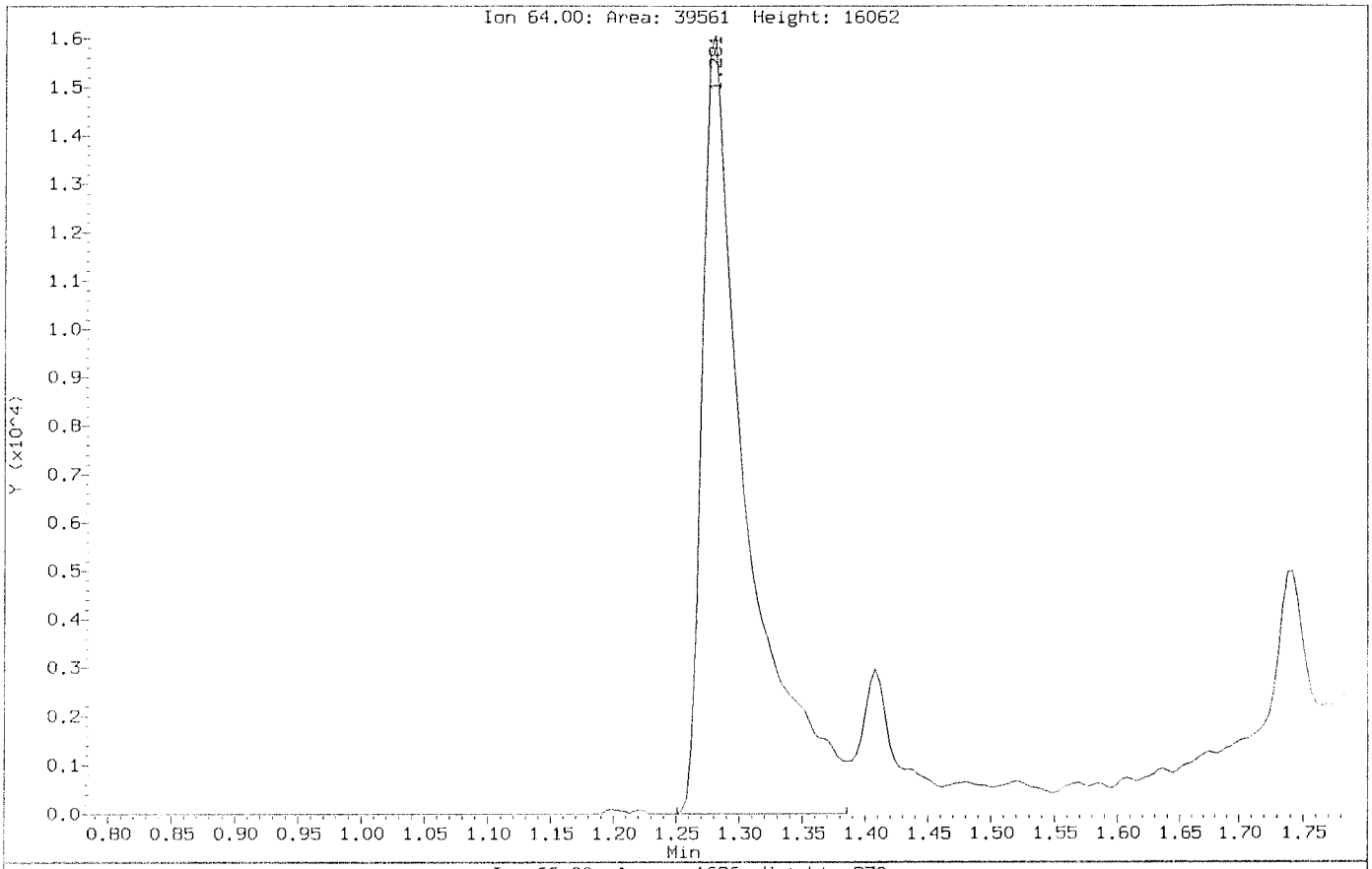
Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

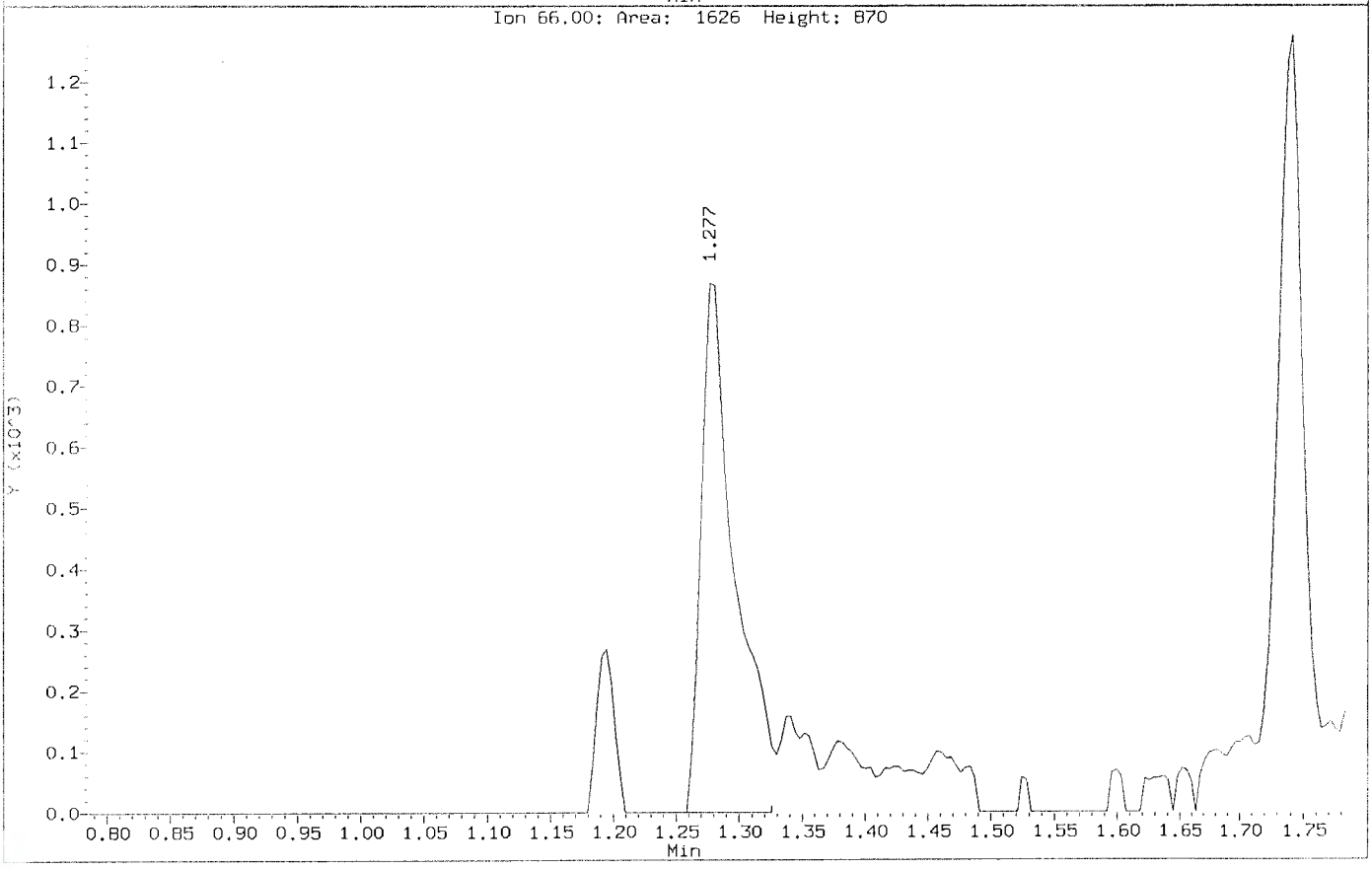
Compound: Bromodichloromethane
CAS Number: 75-27-4



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111505.D
Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Chloroethane
CAS Number: 75-00-3





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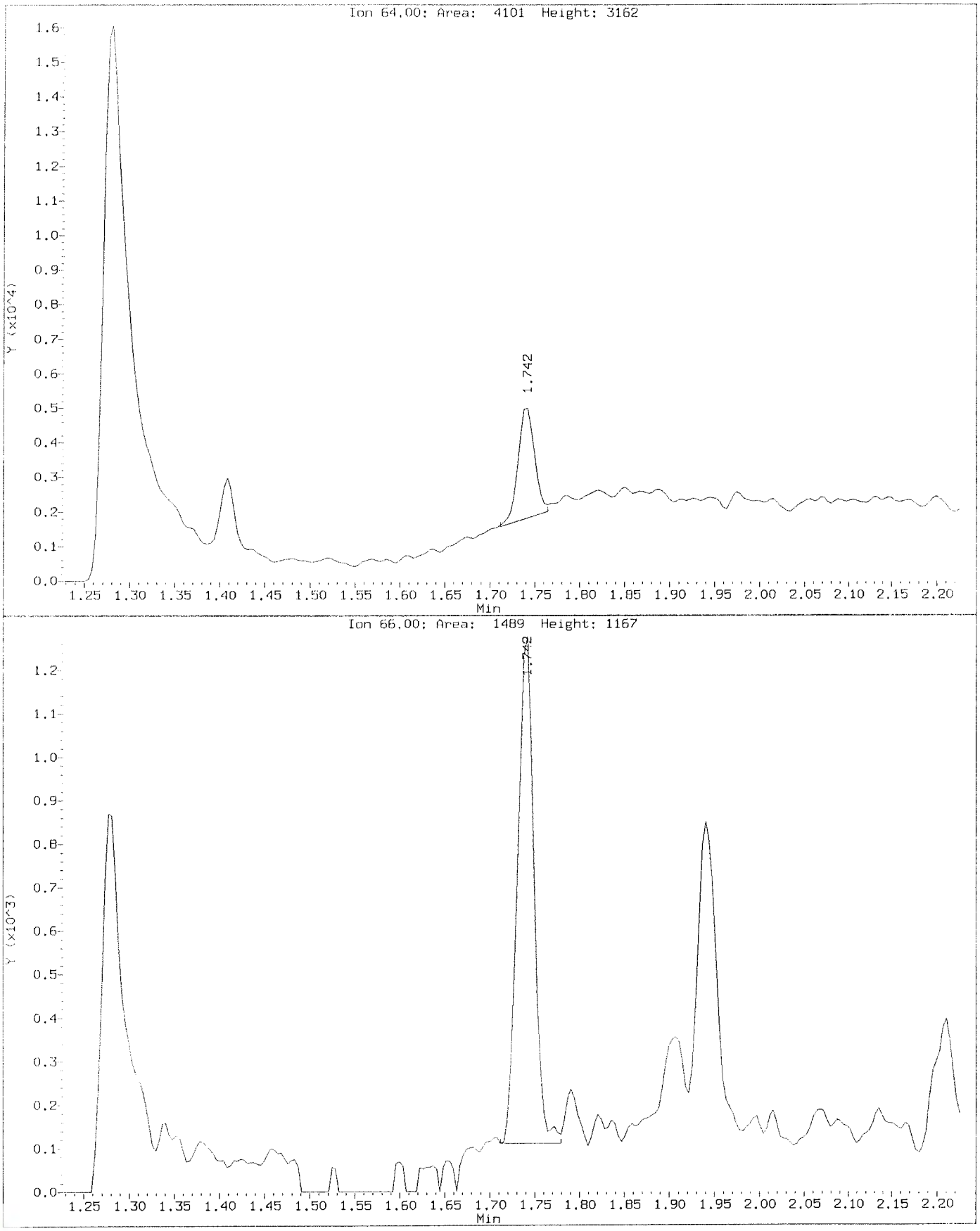
Injection Date: 15-NOV-2021 15:20
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Chloroethane
CAS Number: 75-00-3



ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111506.D
Lab Smp Id: VSTD005 Client Smp ID: VSTD005
Inj Date : 15-NOV-2021 15:43
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 15:20 Cal File: U111505.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

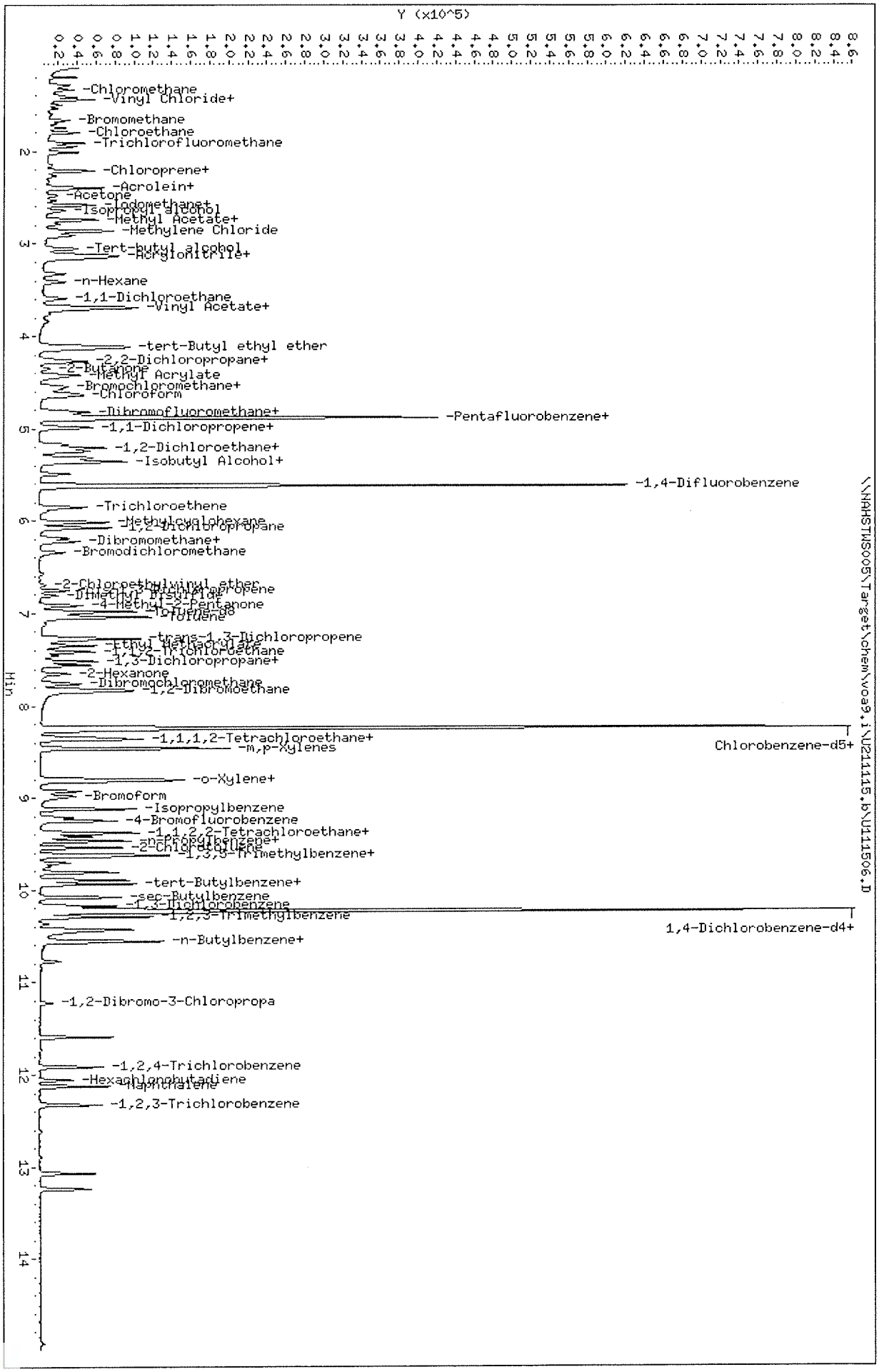
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	259004	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	458652	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	409495	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	203243	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	15313	5.00000	4.87(a)
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	19646	5.00000	4.86(a)
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	58951	5.00000	5.53
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	23787	5.00000	4.79(a)
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	11768	5.00000	4.90(a)
31 1,1,1-Trichloroethane	97	4.812	4.812	(0.985)	17435	5.00000	4.67(a)
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	22452	5.00000	5.24
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	13113	5.00000	5.43
22 1,1-Dichloroethane	63	3.590	3.590	(0.735)	24605	5.00000	5.34
11 1,1-Dichloroethene	96	2.390	2.390	(0.490)	11651	5.00000	5.04
32 1,1-Dichloropropene	75	4.992	4.992	(0.889)	19635	5.00000	5.21
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	18192	5.00000	4.99(a)
71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	21536	5.00000	5.12
90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	18332	5.00000	4.90(a)
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	51830	5.00000	5.08
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	2022	5.00000	5.15
57 1,2-Dibromoethane	107	7.841	7.841	(0.951)	15326	5.00000	5.22
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	30096	5.00000	5.25

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111506.D Page 2
Report Date: 03-Jan-2022 10:12

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.935)	22428	5.00000	5.42
42	1,2-Dichloropropane	63	6.075	6.075	(1.082)	15359	5.00000	5.32
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	50426	5.00000	5.04
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	30110	5.00000	5.14
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	28565	5.00000	5.55
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	31699	5.00000	5.26
26	2,2-Dichloropropane	77	4.261	4.261	(0.873)	11813	5.00000	4.52(a)
24	2-Butanone	43	4.351	4.351	(0.891)	13640	10.0000	10.07
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	46528	5.00000	5.31
52	2-Hexanone	43	7.649	7.649	(0.928)	20582	10.0000	10.58(H)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	53956	5.00000	5.31
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	49045	5.00000	4.95(a)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	29230	10.0000	9.91
10	Acetone	43	2.472	2.472	(0.506)	12006	10.0000	7.52
37	Benzene	78	5.205	5.205	(0.927)	59955	5.00000	5.16
74	Bromobenzene	156	9.374	9.374	(0.917)	16545	5.00000	5.24
29	Bromochloromethane	128	4.545	4.545	(0.931)	7796	5.00000	5.33
39	Bromodichloromethane	83	6.337	6.337	(1.129)	15337	5.00000	5.06
66	Bromoform	173	8.973	8.973	(1.089)	6778	5.00000	4.91(a)
6	Bromomethane	94	1.663	1.663	(0.341)	9672	5.00000	5.60
19	Carbon Disulfide	76	2.577	2.577	(0.528)	63439	10.0000	9.89
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	13108	5.00000	4.99(a)
59	Chlorobenzene	112	8.264	8.264	(1.003)	41501	5.00000	5.19
7	Chloroethane	64	1.741	1.741	(0.357)	11038	5.00000	5.15(M)
28	Chloroform	83	4.647	4.647	(0.952)	26919	5.00000	5.39
3	Chloromethane	50	1.333	1.333	(0.273)	13015	5.00000	4.51(a)
27	cis-1,2-Dichloroethene	96	4.276	4.276	(0.876)	16593	5.00000	5.24
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	15790	5.00000	4.89(a)
55	Dibromochloromethane	129	7.747	7.747	(0.940)	11164	5.00000	5.01
44	Dibromomethane	93	6.180	6.180	(1.101)	10158	5.00000	5.16
2	Dichlorodifluoromethane	85	1.198	1.198	(0.245)	15309	5.00000	4.31(a)
61	Ethylbenzene	106	8.362	8.362	(1.015)	20541	5.00000	5.14
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	6204	5.00000	4.48(a)
67	Isopropylbenzene	105	9.115	9.115	(1.106)	60913	5.00000	5.06
62	m,p-Xylenes	106	8.463	8.463	(1.027)	51822	10.0000	10.49
17	Methylene Chloride	84	2.859	2.859	(0.585)	15812	5.00000	5.18
87	n-Butylbenzene	91	10.547	10.547	(1.032)	43095	5.00000	4.85(a)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	70372	5.00000	5.09
92	Naphthalene	128	12.122	12.122	(1.186)	53513	5.00000	4.77(a)
63	o-Xylene	106	8.800	8.800	(1.068)	25615	5.00000	5.23
81	sec-Butylbenzene	105	10.079	10.079	(0.986)	56145	5.00000	4.95(a)
64	Styrene	104	8.815	8.815	(1.070)	43765	5.00000	5.21
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	42020	5.00000	4.98(a)
56	Tetrachloroethene	164	7.514	7.514	(0.912)	11689	5.00000	5.06
50	Toluene	91	7.038	7.038	(0.854)	64107	5.00000	5.23
20	trans-1,2-Dichloroethene	96	3.128	3.128	(0.641)	13129	5.00000	5.04
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	12599	5.00000	5.02
38	Trichloroethene	130	5.850	5.850	(1.042)	15133	5.00000	5.05
8	Trichlorofluoromethane	101	1.944	1.944	(0.398)	20844	5.00000	4.99(a)
5	Vinyl Chloride	62	1.412	1.412	(0.289)	15859	5.00000	5.06

QC Flag Legend

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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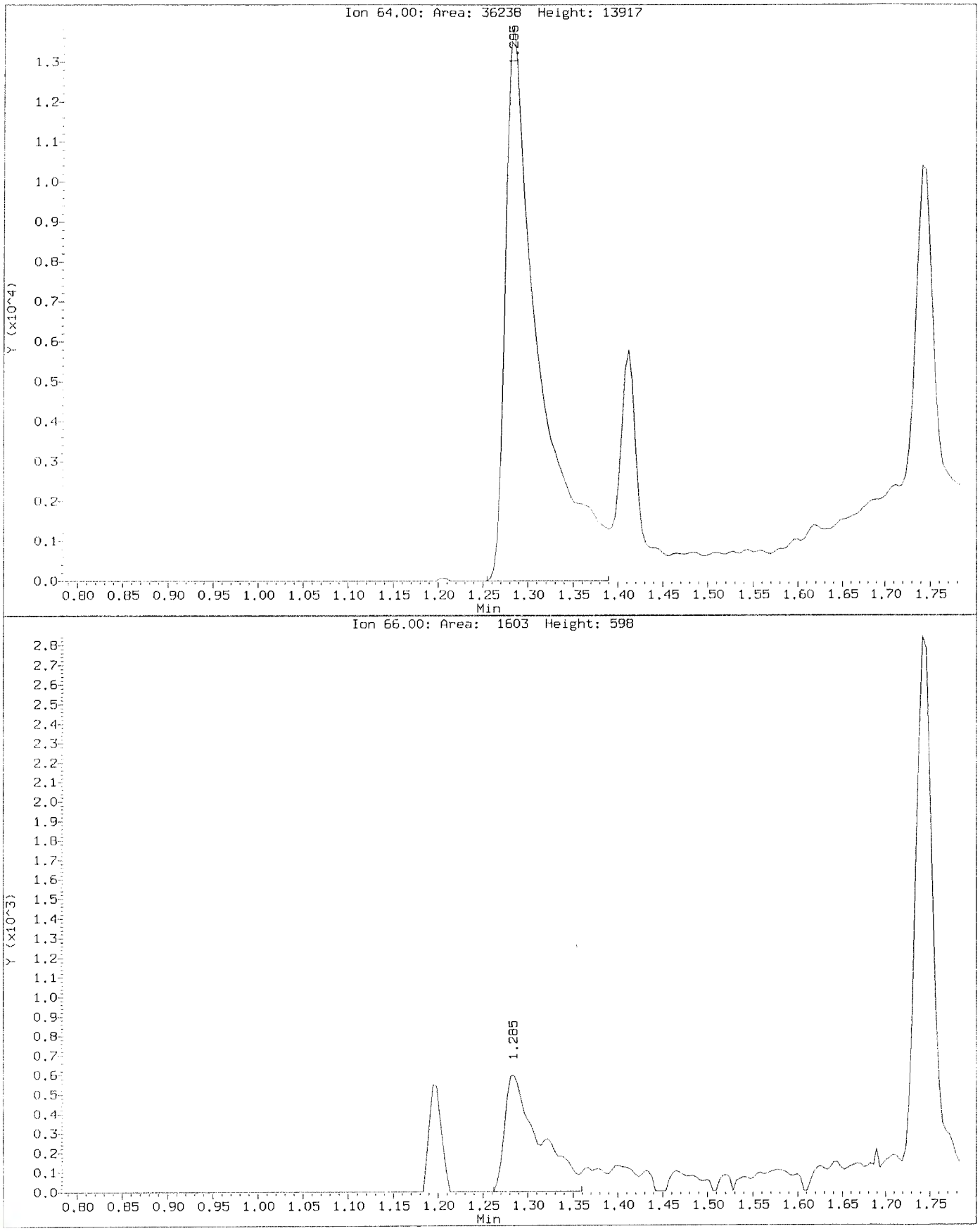
Client ID: WSTD005
Sample Info: WSTD005;WSTD005;1;5;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111506.D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111506.D
Injection Date: 15-NOV-2021 15:43
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Chloroethane
CAS Number: 75-00-3



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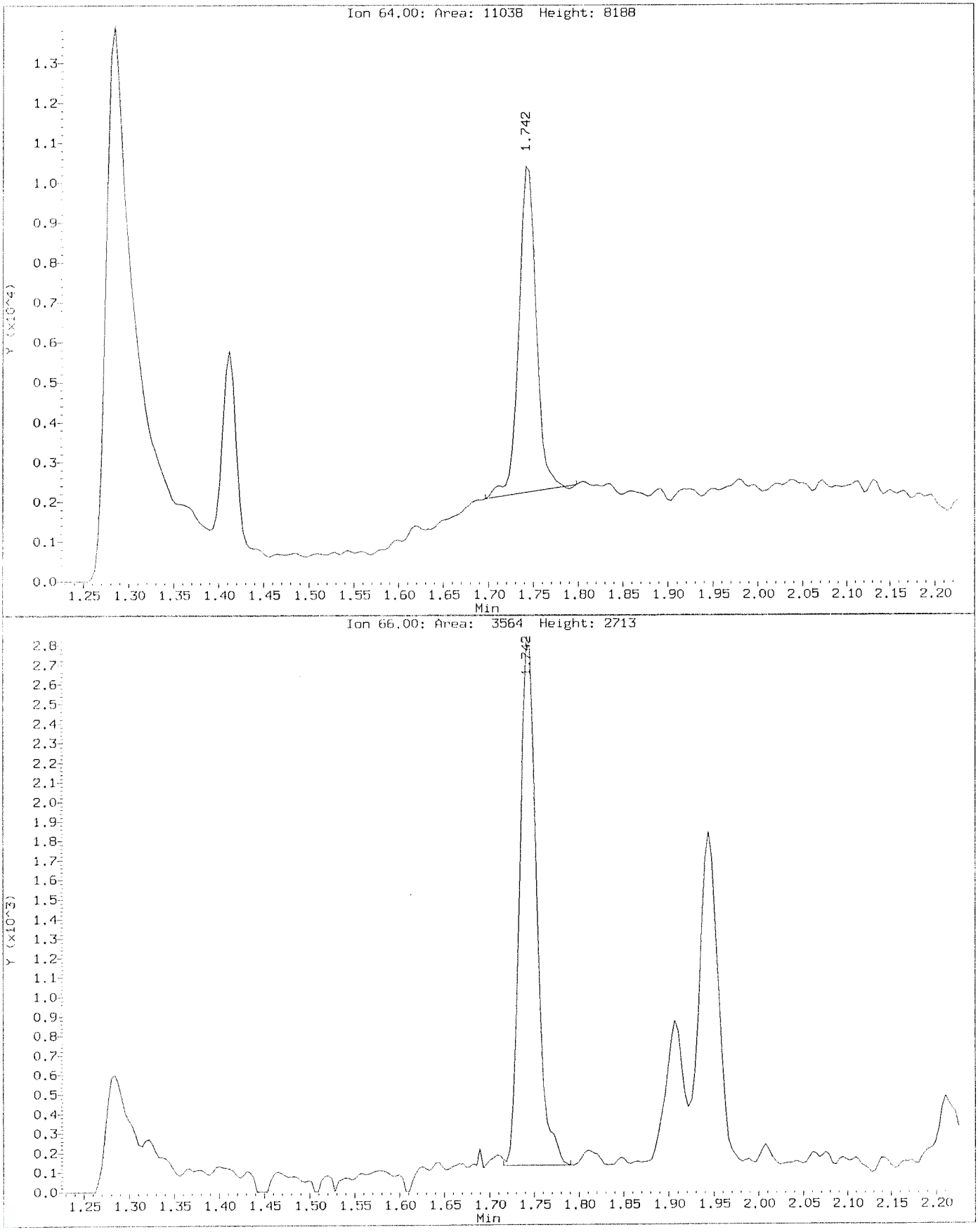
Injection Date: 15-NOV-2021 15:43
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Chloroethane
CAS Number: 75-00-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D Page 1
Report Date: 03-Jan-2022 10:12

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 15-NOV-2021 16:05
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 15:43 Cal File: U111506.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

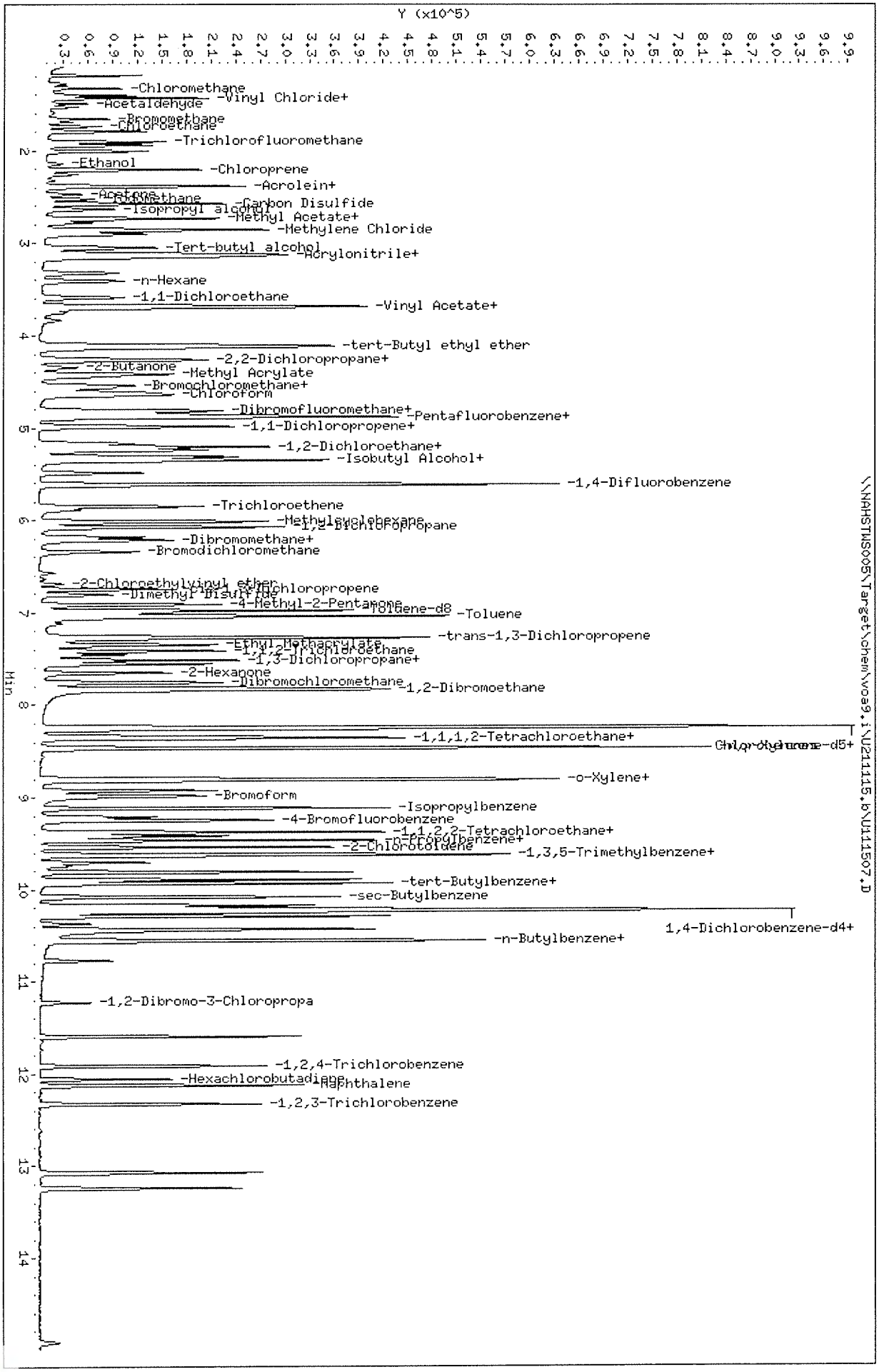
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.879	4.879	(1.000)	264317	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	463809	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	419294	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	209272	50.0000	
$ 30 Dibromofluoromethane	113	4.815	4.815	(0.987)	59371	20.0000	20.90
$ 35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	71255	20.0000	21.13
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	222856	20.0000	20.42
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	86314	20.0000	20.41
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	54596	20.0000	19.29
31 1,1,1-Trichloroethane	97	4.811	4.811	(0.986)	77494	20.0000	20.36
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	93137	20.0000	21.14
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	51258	20.0000	20.74
22 1,1-Dichloroethane	63	3.586	3.586	(0.735)	97169	20.0000	20.69
11 1,1-Dichloroethene	96	2.382	2.382	(0.488)	47090	20.0000	19.98
32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	77211	20.0000	20.27
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	74907	20.0000	19.98
71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	88639	20.0000	20.49
90 1,2,4-Trichlorobenzene	180	11.915	11.915	(1.165)	75774	20.0000	19.67
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	221020	20.0000	21.06
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	11576	20.0000	17.55
57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	65351	20.0000	21.77
88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	121358	20.0000	20.56

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D Page 2
Report Date: 03-Jan-2022 10:12

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.242	5.242	(0.934)	86931	20.0000	20.77
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	60765	20.0000	20.82
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	211420	20.0000	20.54
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	121441	20.0000	20.14
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	111361	20.0000	21.15
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	125166	20.0000	20.18
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	50678	20.0000	19.04
24	2-Butanone	43	4.343	4.343	(0.890)	57283	40.0000	41.44
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	184931	20.0000	20.52
52	2-Hexanone	43	7.645	7.645	(0.928)	89034	40.0000	44.73(H)
77	4-Chlorotoluene	91	9.628	9.628	(0.942)	217131	20.0000	20.79
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	209271	20.0000	20.52
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	127487	40.0000	42.21
10	Acetone	43	2.468	2.468	(0.506)	42250	40.0000	42.21
37	Benzene	78	5.205	5.205	(0.927)	239195	20.0000	20.39
74	Bromobenzene	156	9.374	9.374	(0.917)	68062	20.0000	20.97
29	Bromochloromethane	128	4.538	4.538	(0.930)	32696	20.0000	21.93
39	Bromodichloromethane	83	6.337	6.337	(1.129)	68589	20.0000	18.83
66	Bromoform	173	8.972	8.972	(1.089)	32750	20.0000	17.80
6	Bromomethane	94	1.655	1.655	(0.339)	34362	20.0000	20.80
19	Carbon Disulfide	76	2.573	2.573	(0.528)	263250	40.0000	40.24
34	Carbon Tetrachloride	117	4.976	4.976	(0.886)	61682	20.0000	17.73
59	Chlorobenzene	112	8.264	8.264	(1.003)	165227	20.0000	20.21
7	Chloroethane	64	1.737	1.737	(0.356)	43002	20.0000	19.66(M)
28	Chloroform	83	4.643	4.643	(0.952)	107071	20.0000	21.03
3	Chloromethane	50	1.329	1.329	(0.272)	52032	20.0000	19.40
27	cis-1,2-Dichloroethene	96	4.268	4.268	(0.875)	66536	20.0000	20.60
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	82868	20.0000	18.10
55	Dibromochloromethane	129	7.747	7.747	(0.940)	55171	20.0000	18.44
44	Dibromomethane	93	6.180	6.180	(1.101)	41095	20.0000	20.64
2	Dichlorodifluoromethane	85	1.190	1.190	(0.244)	63286	20.0000	19.63
61	Ethylbenzene	106	8.361	8.361	(1.015)	82503	20.0000	20.16
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	27398	20.0000	19.24
67	Isopropylbenzene	105	9.115	9.115	(1.106)	251092	20.0000	20.38
62	m,p-Xylenes	106	8.463	8.463	(1.027)	209942	40.0000	41.53
17	Methylene Chloride	84	2.855	2.855	(0.585)	60113	20.0000	19.29
87	n-Butylbenzene	91	10.547	10.547	(1.032)	184043	20.0000	20.12
73	n-Propylbenzene	91	9.467	9.467	(0.926)	292230	20.0000	20.55
92	Naphthalene	128	12.121	12.121	(1.186)	228366	20.0000	19.80
63	o-Xylene	106	8.800	8.800	(1.068)	102220	20.0000	20.41
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	235156	20.0000	20.13
64	Styrene	104	8.815	8.815	(1.070)	182495	20.0000	21.22
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	176018	20.0000	20.29
56	Tetrachloroethene	164	7.514	7.514	(0.912)	46359	20.0000	19.60
50	Toluene	91	7.038	7.038	(0.854)	258382	20.0000	20.59
20	trans-1,2-Dichloroethene	96	3.121	3.121	(0.640)	53117	20.0000	19.98
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	66354	20.0000	17.27
38	Trichloroethene	130	5.850	5.850	(1.042)	60190	20.0000	19.86
8	Trichlorofluoromethane	101	1.940	1.940	(0.398)	86234	20.0000	20.23
5	Vinyl Chloride	62	1.404	1.404	(0.288)	64078	20.0000	20.04

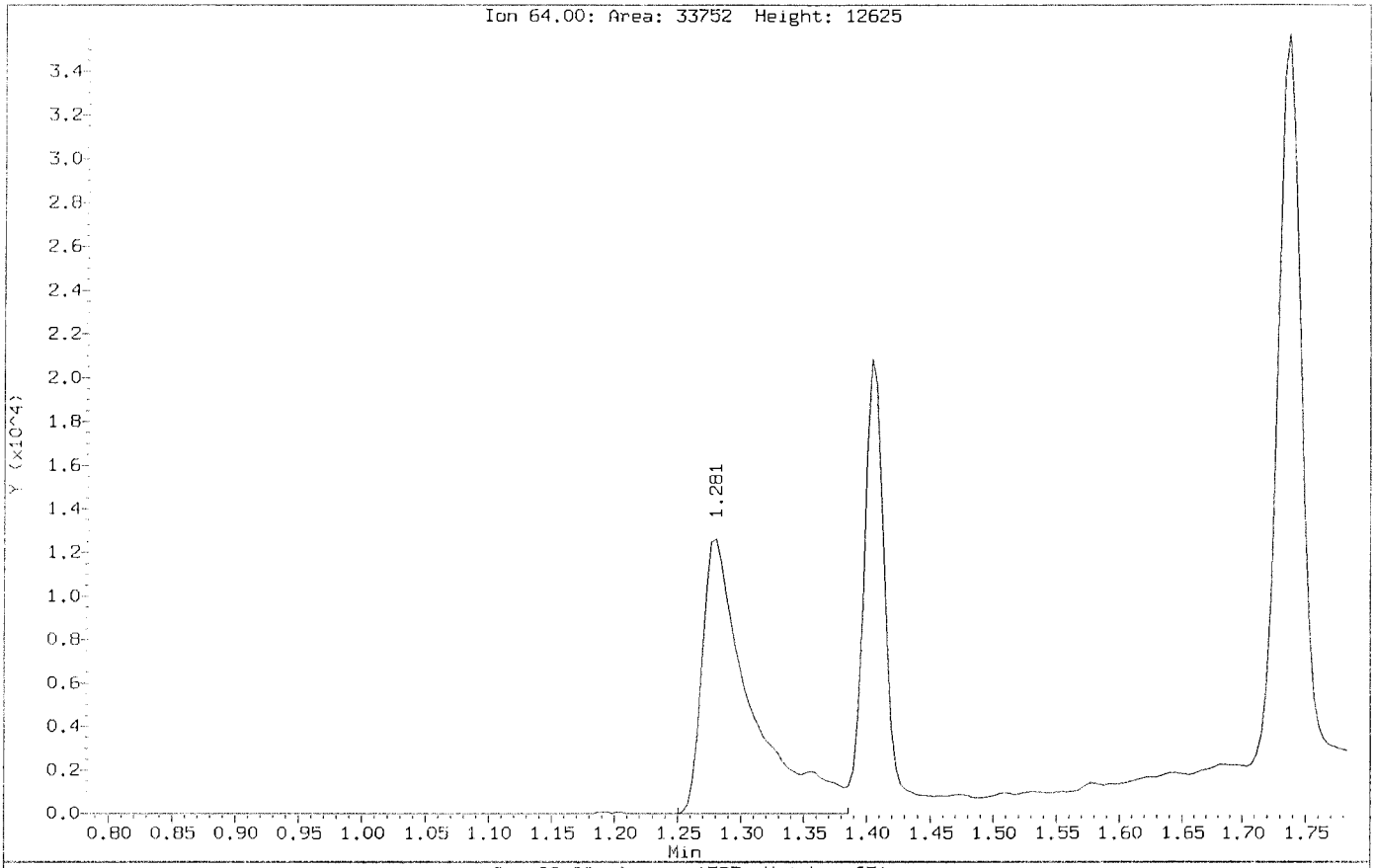
QC Flag Legend

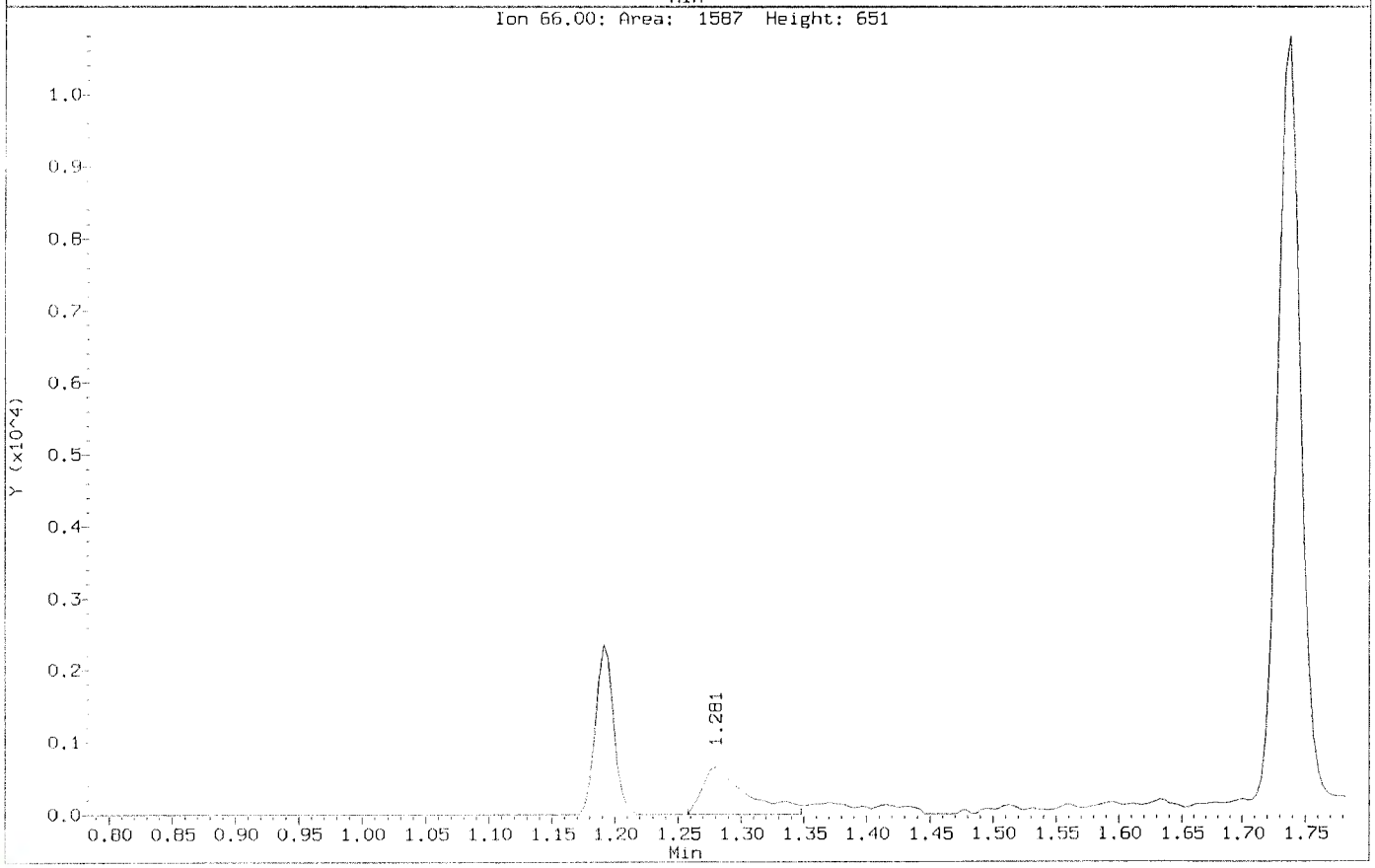
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.


Y (x10^5)
Min
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-Ethanol
-Chloroprene
-Acrolein+
-Acetone
-Carbon Disulfide
-Isopropyl alcohol
-Methyl Acetate+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-n-Hexane
-1,1-Dichloroethane
-Vinyl Acetate+
-tert-Butyl ethyl ether
-2,2-Dichloropropane+
-2-Butanone
-Methyl Acrylate
-Bromochloromethane+
-Chloroform
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-Isobutyl Alcohol+
-1,4-Difluorobenzene
-Trichloroethene
-Methylcyclohexane
-1,2-Dichloropropane
-Dibromomethane+
-Bromodichloromethane
-2-Chloroethylvinyl ether
-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+
Chlorobenzene-d5+
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-tert-Butylbenzene+
-sec-Butylbenzene
1,4-Dichlorobenzene-d4+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
\\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111507.D
Date : 15-NOV-2021 16:05
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
Page 4

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111507.D
Injection Date: 15-NOV-2021 16:05
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Chloroethane
CAS Number: 75-00-3





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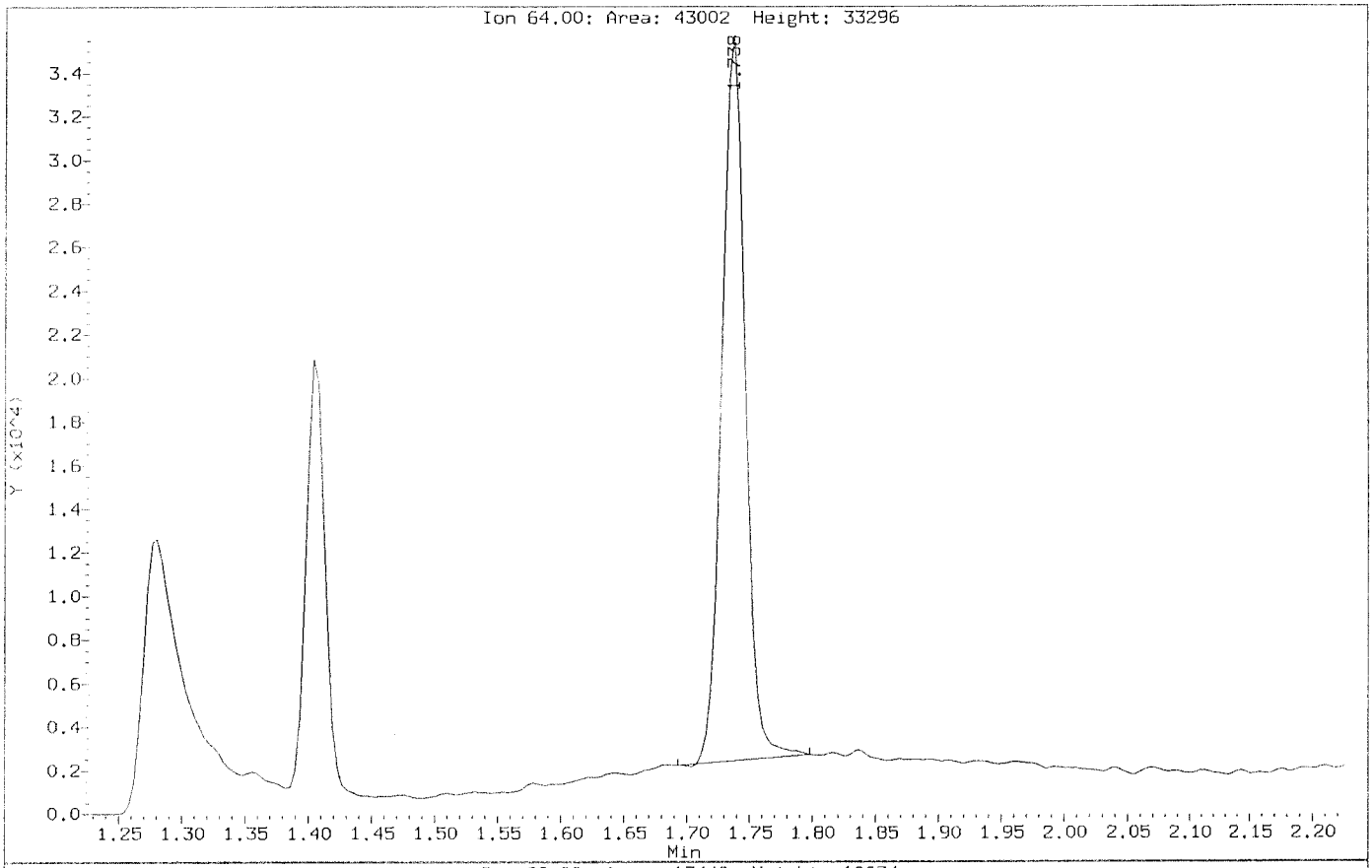
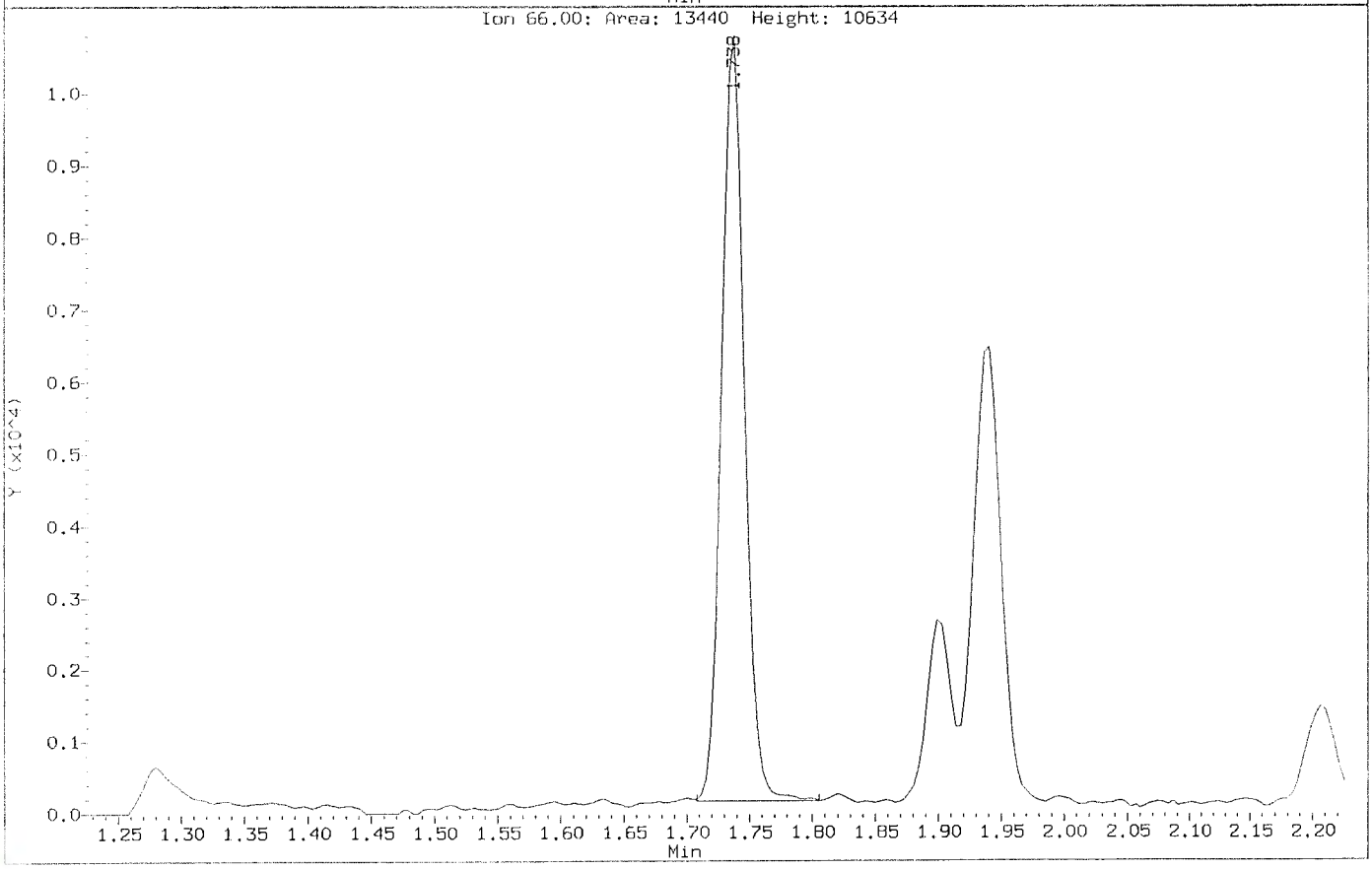
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111508.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 15-NOV-2021 16:27
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:05 Cal File: U111507.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

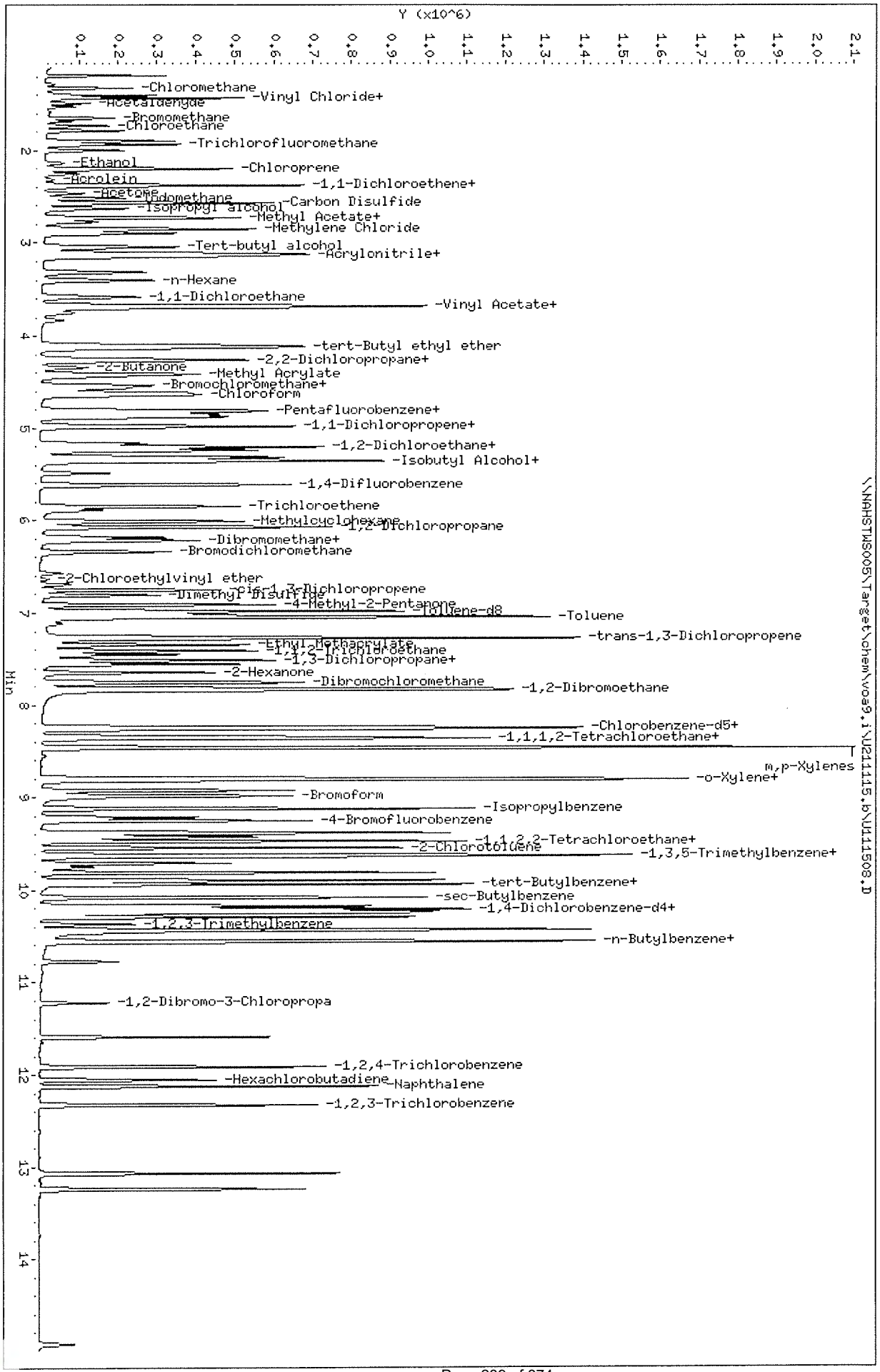
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.879	4.879	(1.000)	276380	50.0000	
*	36 1,4-Difluorobenzene	114	5.613	5.613	(1.000)	475930	50.0000	
*	47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	429500	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	217147	50.0000	
$	30 Dibromofluoromethane	113	4.815	4.815	(0.987)	146958	50.0000	50.66
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	174378	50.0000	51.47
$	48 Toluene-d8	98	6.978	6.978	(0.847)	546357	50.0000	48.87
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	212217	50.0000	50.89
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	145929	50.0000	49.02
	31 1,1,1-Trichloroethane	97	4.807	4.807	(0.985)	216178	50.0000	54.33
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	232653	50.0000	50.90
	53 1,1,2-Trichloroethane	83	7.409	7.409	(0.899)	129181	50.0000	51.04
	22 1,1-Dichloroethane	63	3.582	3.582	(0.734)	248821	50.0000	50.67
	11 1,1-Dichloroethene	96	2.378	2.378	(0.488)	128120	50.0000	51.99
	32 1,1-Dichloropropene	75	4.984	4.984	(0.888)	205255	50.0000	52.51
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	197495	50.0000	50.78
	71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	236775	50.0000	52.76
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	206782	50.0000	51.73
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	575954	50.0000	52.90
	89 1,2-Dibromo-3-Chloropropane	155	11.221	11.221	(1.098)	34570	50.0000	45.93
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	164064	50.0000	53.36
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	312765	50.0000	51.07

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111508.D Page 2
Report Date: 03-Jan-2022 10:12

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.238	5.238	(0.933)	215530	50.0000	50.20
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	153894	50.0000	51.38
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	552914	50.0000	51.78
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	312442	50.0000	49.95
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	276461	50.0000	51.26
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	324361	50.0000	50.40
26	2,2-Dichloropropane	77	4.253	4.253	(0.872)	146044	50.0000	52.48
24	2-Butanone	43	4.339	4.339	(0.889)	145658	100.000	100.78
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	478010	50.0000	51.12
52	2-Hexanone	43	7.645	7.645	(0.928)	229120	100.000	112.37(H)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	554589	50.0000	51.17
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	565348	50.0000	53.42
45	4-Methyl-2-Pentanone	43	6.910	6.910	(0.839)	327903	100.000	106.00
10	Acetone	43	2.464	2.464	(0.505)	102765	100.000	106.98
37	Benzene	78	5.201	5.201	(0.927)	614439	50.0000	51.05
74	Bromobenzene	156	9.373	9.373	(0.917)	173629	50.0000	51.56
29	Bromochloromethane	128	4.537	4.537	(0.930)	81234	50.0000	52.10
39	Bromodichloromethane	83	6.337	6.337	(1.129)	187745	50.0000	48.50
66	Bromoform	173	8.972	8.972	(1.089)	96626	50.0000	47.90
6	Bromomethane	94	1.644	1.644	(0.337)	83889	50.0000	49.25
19	Carbon Disulfide	76	2.566	2.566	(0.526)	726090	100.000	106.16
34	Carbon Tetrachloride	117	4.976	4.976	(0.886)	182502	50.0000	48.29
59	Chlorobenzene	112	8.264	8.264	(1.003)	417893	50.0000	49.90
7	Chloroethane	64	1.730	1.730	(0.355)	110524	50.0000	48.32(M)
28	Chloroform	83	4.639	4.639	(0.951)	276051	50.0000	51.85
3	Chloromethane	50	1.321	1.321	(0.271)	145589	50.0000	52.90
27	cis-1,2-Dichloroethene	96	4.264	4.264	(0.874)	173599	50.0000	51.41
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	238784	50.0000	47.68
55	Dibromochloromethane	129	7.746	7.746	(0.940)	155960	50.0000	48.26
44	Dibromomethane	93	6.179	6.179	(1.101)	103075	50.0000	50.46
2	Dichlorodifluoromethane	85	1.186	1.186	(0.243)	172970	50.0000	52.46
61	Ethylbenzene	106	8.361	8.361	(1.015)	218185	50.0000	52.06
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	78634	50.0000	53.23
67	Isopropylbenzene	105	9.115	9.115	(1.106)	666038	50.0000	52.78
62	m,p-Xylenes	106	8.462	8.462	(1.027)	543578	100.000	104.98
17	Methylene Chloride	84	2.847	2.847	(0.584)	151108	50.0000	46.39
87	n-Butylbenzene	91	10.547	10.547	(1.032)	501371	50.0000	52.84
73	n-Propylbenzene	91	9.467	9.467	(0.926)	766824	50.0000	51.99
92	Naphthalene	128	12.121	12.121	(1.186)	619173	50.0000	51.75
63	o-Xylene	106	8.800	8.800	(1.068)	268452	50.0000	52.34
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	640176	50.0000	52.83
64	Styrene	104	8.815	8.815	(1.070)	476282	50.0000	54.08
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	467210	50.0000	51.91
56	Tetrachloroethene	164	7.510	7.510	(0.911)	121252	50.0000	50.05
50	Toluene	91	7.034	7.034	(0.854)	651446	50.0000	50.69
20	trans-1,2-Dichloroethene	96	3.117	3.117	(0.639)	141166	50.0000	50.78
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	203307	50.0000	47.39
38	Trichloroethene	130	5.846	5.846	(1.041)	161654	50.0000	51.99
8	Trichlorofluoromethane	101	1.932	1.932	(0.396)	235822	50.0000	52.90
5	Vinyl Chloride	62	1.400	1.400	(0.287)	173173	50.0000	51.80

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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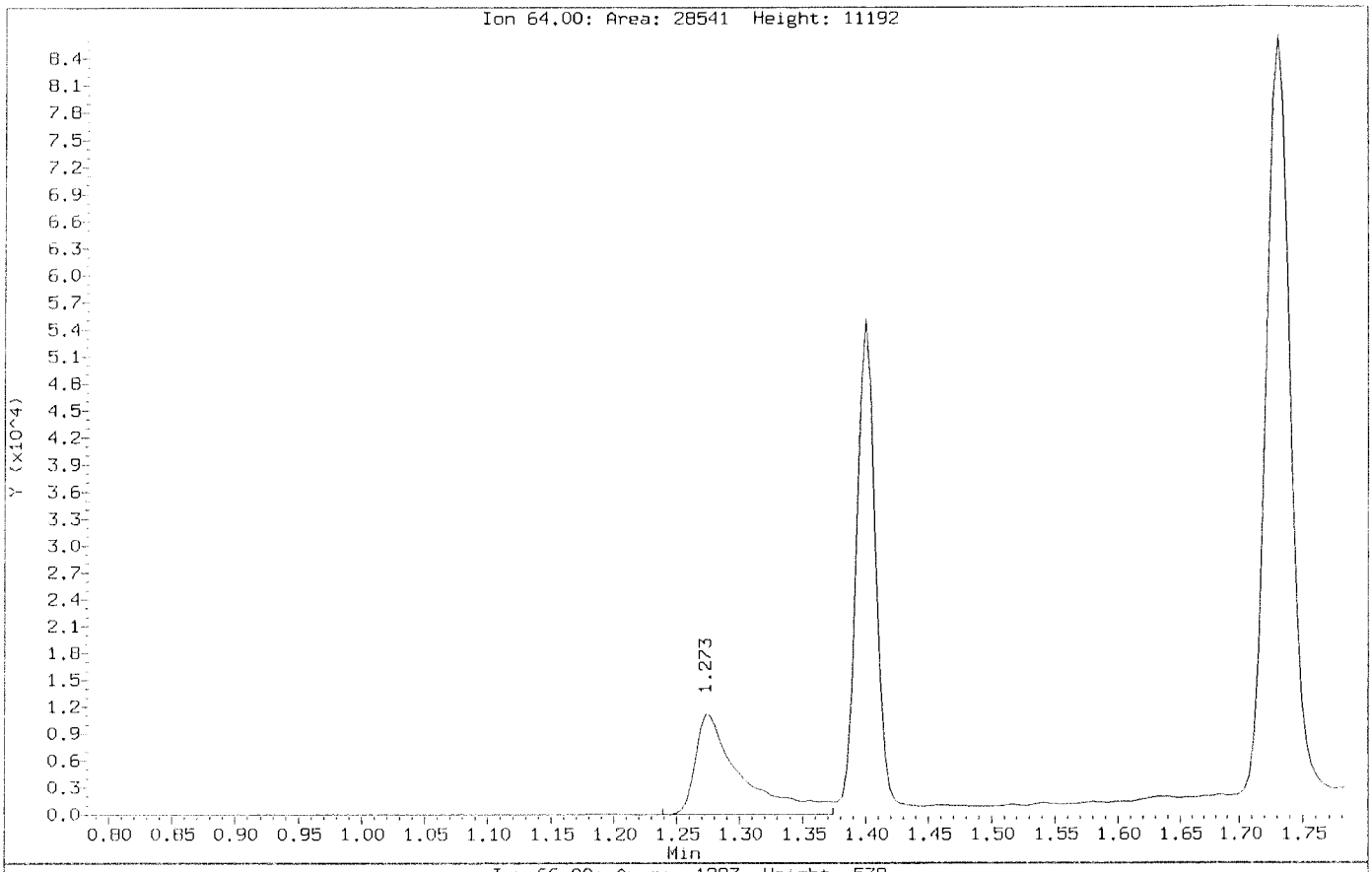
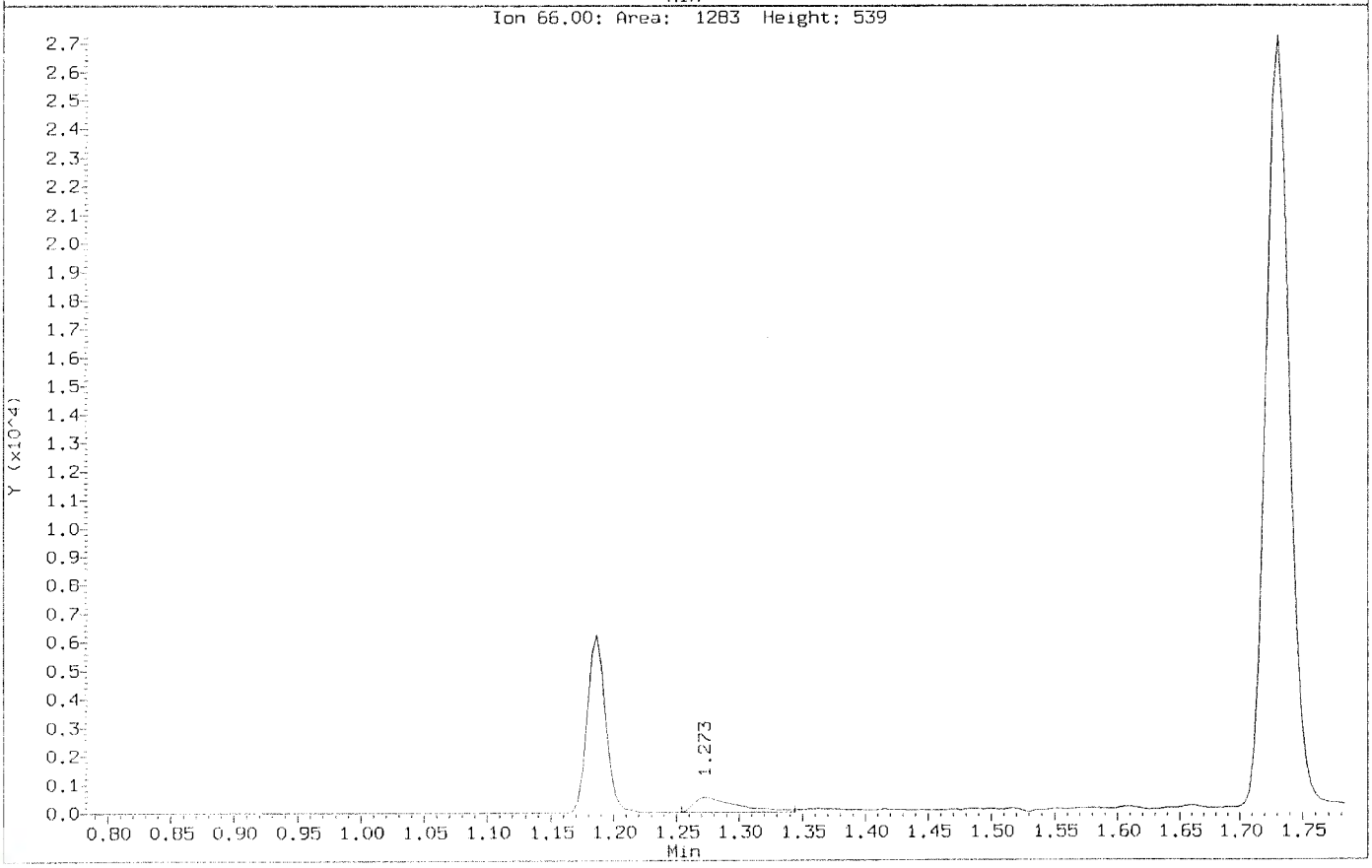
Sample Info: VSTD050;VSTD050;1;7;;
Purge Volume: 5.0
Column phase: DB624

Instrument: \VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111508.D
Injection Date: 15-NOV-2021 16:27
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3





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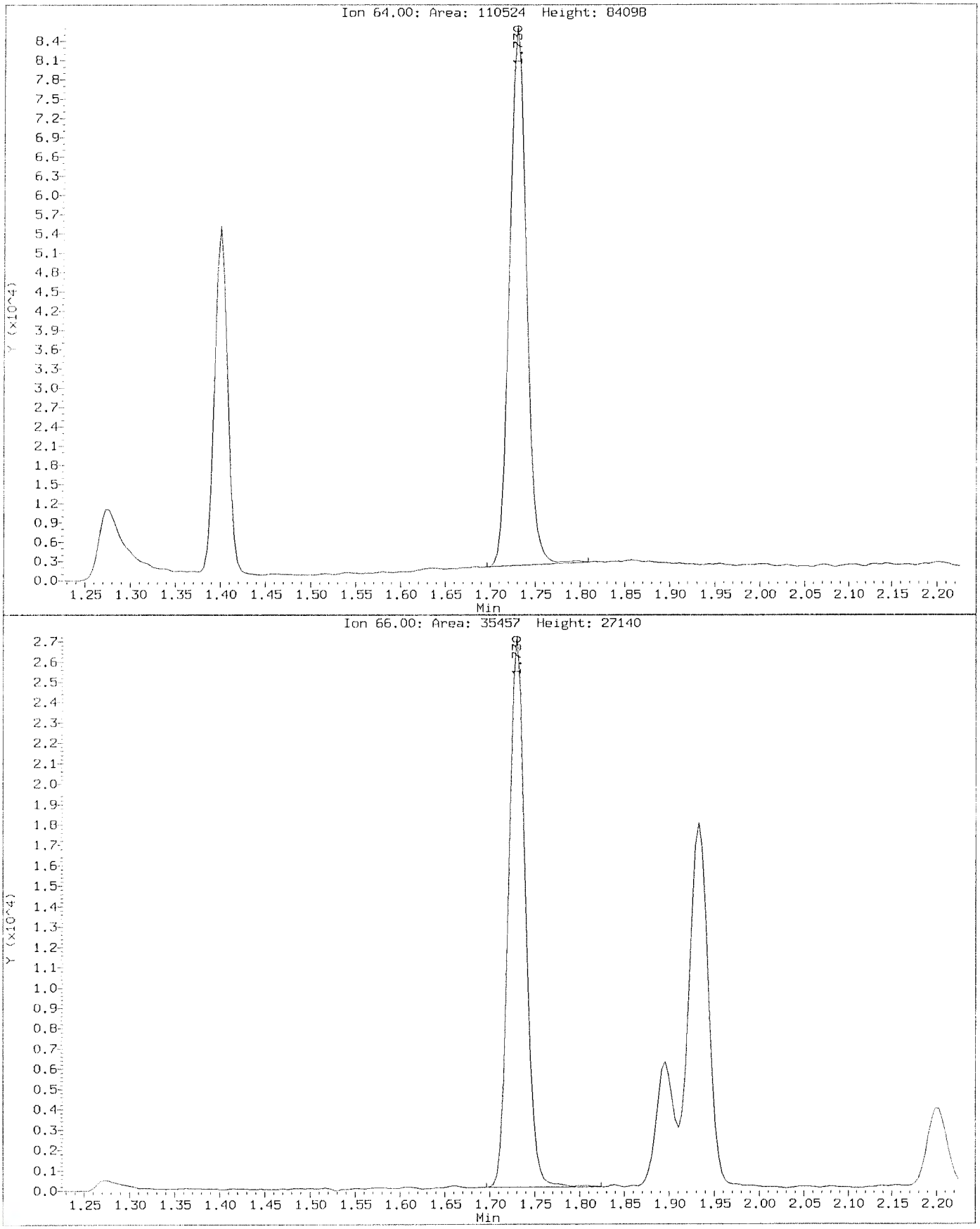
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Chloroethane
CAS Number: 75-00-3



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Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111509.D
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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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

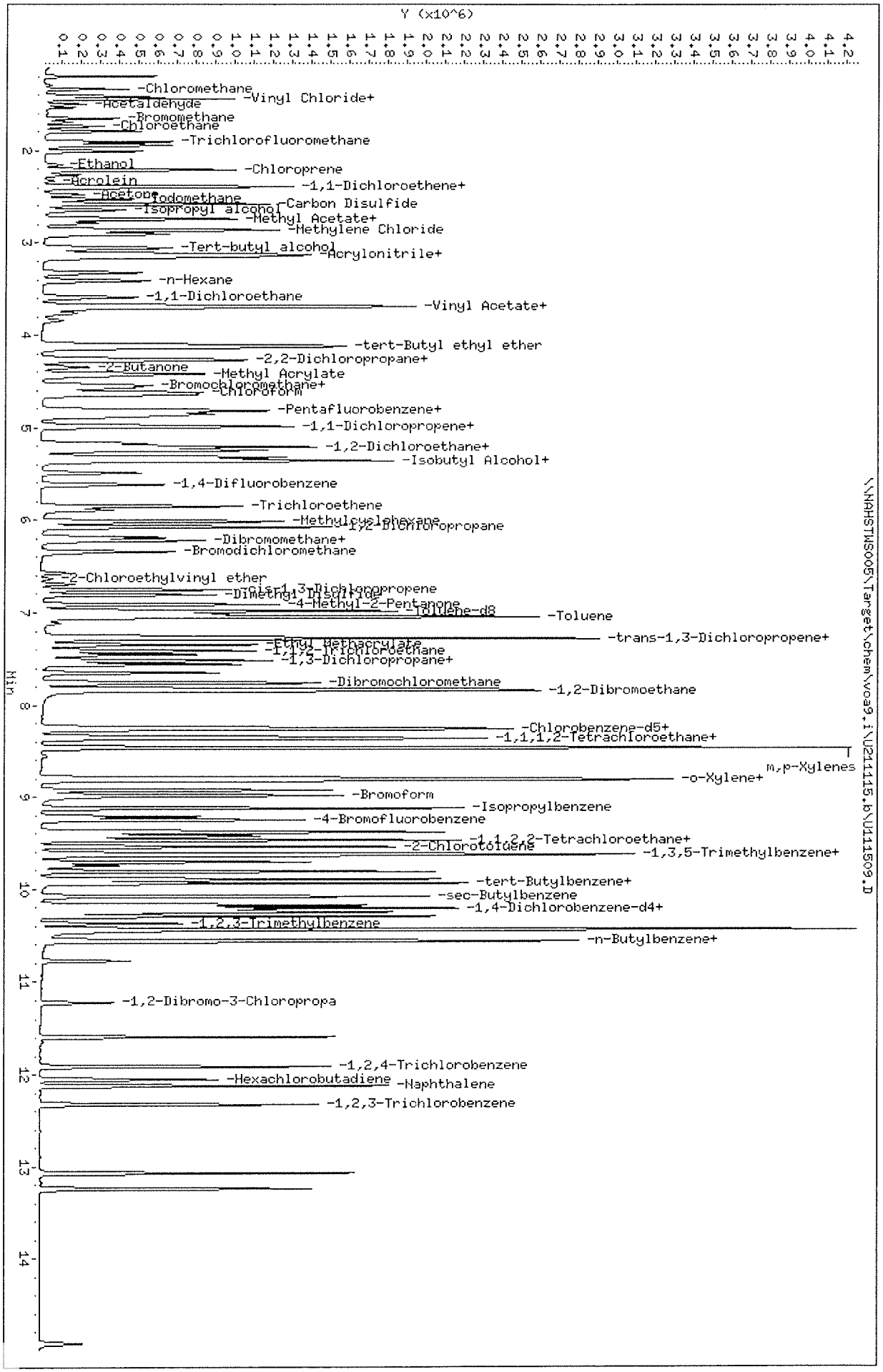
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.883	4.883	(1.000)	276955	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	474551	50.0000	
*	47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	433803	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	217322	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.819	(0.987)	294099	100.000	102.04
$	35 1,2-Dichloroethane-d4	65	5.167	5.167	(1.058)	347770	100.000	103.92
$	48 Toluene-d8	98	6.978	6.978	(0.847)	1088412	100.000	96.40
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	425707	100.000	102.40
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	305424	100.000	100.70
	31 1,1,1-Trichloroethane	97	4.811	4.811	(0.985)	448245	100.000	112.43
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	465345	100.000	101.73
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	259942	100.000	101.69
	22 1,1-Dichloroethane	63	3.589	3.589	(0.735)	487188	100.000	99.01
	11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	252111	100.000	102.10
	32 1,1-Dichloropropene	75	4.991	4.991	(0.889)	404548	100.000	103.81
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	401804	100.000	103.24
	71 1,2,3-Trichloropropane	75	9.418	9.418	(0.921)	493615	100.000	109.90
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	420010	100.000	105.00
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	1141292	100.000	104.75
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	77043	100.000	99.30
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	332327	100.000	107.02
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	620557	100.000	101.25

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111509.D Page 2
Report Date: 03-Jan-2022 10:12

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.242	5.242	(0.934)	431283	100.000	100.74
42 1,2-Dichloropropane	63	6.071	6.071	(1.081)	308280	100.000	103.23
75 1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	1105545	100.000	103.46
83 1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	623472	100.000	99.60
54 1,3-Dichloropropane	76	7.555	7.555	(0.917)	554036	100.000	101.71
84 1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	649602	100.000	100.86
26 2,2-Dichloropropane	77	4.260	4.260	(0.873)	310140	100.000	111.21
24 2-Butanone	43	4.346	4.346	(0.890)	294665	200.000	203.46(A)
76 2-Chlorotoluene	91	9.538	9.538	(0.933)	950588	100.000	101.57
52 2-Hexanone	43	7.274	7.274	(0.883)	422256	200.000	205.05(A)
77 4-Chlorotoluene	91	9.628	9.628	(0.942)	1112395	100.000	102.57
82 p-Isopropyltoluene	119	10.202	10.202	(0.998)	1145933	100.000	108.20
45 4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	662320	200.000	211.99(A)
10 Acetone	43	2.472	2.472	(0.506)	199248	200.000	213.20(A)
37 Benzene	78	5.205	5.205	(0.927)	1218325	100.000	101.53
74 Bromobenzene	156	9.373	9.373	(0.917)	352762	100.000	104.67
29 Bromochloromethane	128	4.541	4.541	(0.930)	158137	100.000	101.22
39 Bromodichloromethane	83	6.341	6.341	(1.130)	392803	100.000	100.64
66 Bromoform	173	8.976	8.976	(1.089)	216725	100.000	101.79
6 Bromomethane	94	1.651	1.651	(0.338)	170081	100.000	100.17
19 Carbon Disulfide	76	2.577	2.577	(0.528)	1439204	200.000	210.00(A)
34 Carbon Tetrachloride	117	4.980	4.980	(0.887)	382517	100.000	99.86
59 Chlorobenzene	112	8.264	8.264	(1.003)	839635	100.000	99.28
7 Chloroethane	64	1.737	1.737	(0.356)	222198	100.000	96.95
28 Chloroform	83	4.646	4.646	(0.952)	549897	100.000	103.07
3 Chloromethane	50	1.333	1.333	(0.273)	274951	100.000	100.21
27 cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	341672	100.000	100.97
46 cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	512945	100.000	100.71
55 Dibromochloromethane	129	7.750	7.750	(0.940)	334001	100.000	100.65
44 Dibromomethane	93	6.180	6.180	(1.101)	208170	100.000	102.21
2 Dichlorodifluoromethane	85	1.194	1.194	(0.245)	337382	100.000	102.80
61 Ethylbenzene	106	8.361	8.361	(1.015)	434998	100.000	102.77
91 Hexachlorobutadiene	225	12.054	12.054	(1.179)	165847	100.000	112.18
67 Isopropylbenzene	105	9.119	9.119	(1.106)	1327982	100.000	104.20
62 m,p-Xylenes	106	8.463	8.463	(1.027)	1092288	200.000	208.86(A)
17 Methylene Chloride	84	2.858	2.858	(0.585)	297977	100.000	91.29
87 n-Butylbenzene	91	10.547	10.547	(1.032)	1006428	100.000	105.98
73 n-Propylbenzene	91	9.467	9.467	(0.926)	1535160	100.000	104.00
92 Naphthalene	128	12.121	12.121	(1.186)	1265419	100.000	105.68
63 o-Xylene	106	8.800	8.800	(1.068)	531572	100.000	102.62
81 sec-Butylbenzene	105	10.078	10.078	(0.986)	1285548	100.000	106.00
64 Styrene	104	8.815	8.815	(1.070)	954419	100.000	107.30
78 tert-Butylbenzene	119	9.891	9.891	(0.967)	938646	100.000	104.21
56 Tetrachloroethene	164	7.514	7.514	(0.912)	241581	100.000	98.74
50 Toluene	91	7.038	7.038	(0.854)	1292303	100.000	99.57
20 trans-1,2-Dichloroethene	96	3.124	3.124	(0.640)	274819	100.000	98.66
51 trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	440168	100.000	100.43
38 Trichloroethene	130	5.850	5.850	(1.042)	320726	100.000	103.45
8 Trichlorofluoromethane	101	1.940	1.940	(0.397)	459124	100.000	102.79
5 Vinyl Chloride	62	1.411	1.411	(0.289)	341984	100.000	102.09

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111509.D
Date : 15-NOV-2021 16:49
Client ID: VSTD100
Sample Info: VSTD100;VSTD100;1;8;;
Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111509.D

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111510.D
Lab Smp Id: VSTD150 Client Smp ID: VSTD150
Inj Date : 15-NOV-2021 17:11
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:49 Cal File: U111509.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

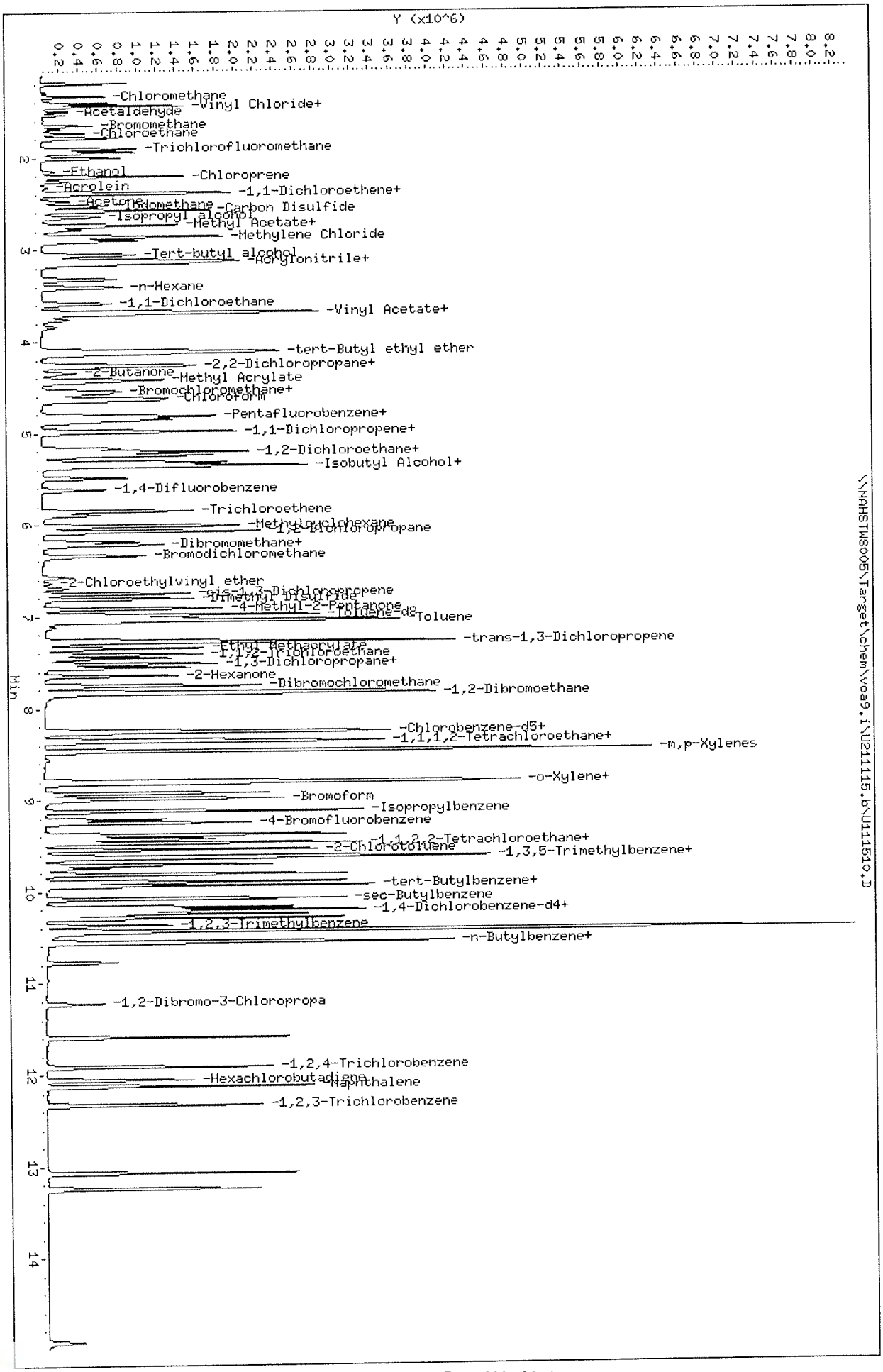
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.879	4.879	(1.000)	287432	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	488809	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	448388	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	223026	50.0000	
$	30 Dibromofluoromethane	113	4.815	4.815	(0.987)	451793	150.000	151.46
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	519537	150.000	150.25
$	48 Toluene-d8	98	6.978	6.978	(0.847)	1655087	150.000	141.82
$	69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	646932	150.000	151.19
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	468015	150.000	148.90
	31 1,1,1-Trichloroethane	97	4.811	4.811	(0.986)	684856	150.000	165.51
	68 1,1,2,2-Tetrachloroethane	83	9.385	9.385	(0.918)	690970	150.000	147.19
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	380690	150.000	144.08
	22 1,1-Dichloroethane	63	3.586	3.586	(0.735)	719035	150.000	140.80
	11 1,1-Dichloroethene	96	2.382	2.382	(0.488)	376843	150.000	147.05
	32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	611762	150.000	152.40
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	625529	150.000	156.61
	71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	764142	150.000	165.79
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	647828	150.000	157.81
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	1716802	150.000	153.54
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	120988	150.000	150.67
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	493996	150.000	153.91
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	931353	150.000	148.08

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.243	5.243	(0.934)	635572	150.000	144.13
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	458917	150.000	149.20
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	1672188	150.000	152.49
83	1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	954409	150.000	148.58
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	818561	150.000	145.39
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	973989	150.000	147.36
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	486198	150.000	167.99
24	2-Butanone	43	4.343	4.343	(0.890)	433312	300.000	288.30(A)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	1428226	150.000	148.71
52	2-Hexanone	43	7.645	7.645	(0.928)	695436	300.000	326.72(AH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	1660020	150.000	149.15
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	1733366	150.000	159.48
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	985556	300.000	305.19(A)
10	Acetone	43	2.469	2.469	(0.506)	287306	300.000	298.80(A)
37	Benzene	78	5.205	5.205	(0.927)	1815130	150.000	146.85
74	Bromobenzene	156	9.374	9.374	(0.917)	533195	150.000	154.16
29	Bromochloromethane	128	4.542	4.542	(0.931)	233535	150.000	144.04
39	Bromodichloromethane	83	6.337	6.337	(1.129)	600907	150.000	148.96
66	Bromoform	173	8.976	8.976	(1.089)	341423	150.000	150.26
6	Bromomethane	94	1.644	1.644	(0.337)	215171	150.000	122.22
19	Carbon Disulfide	76	2.570	2.570	(0.527)	2162433	300.000	304.03(A)
34	Carbon Tetrachloride	117	4.976	4.976	(0.886)	595268	150.000	150.10
59	Chlorobenzene	112	8.264	8.264	(1.003)	1261119	150.000	144.27
7	Chloroethane	64	1.730	1.730	(0.355)	337912	150.000	142.07
28	Chloroform	83	4.643	4.643	(0.952)	820803	150.000	148.25
3	Chloromethane	50	1.329	1.329	(0.272)	431092	150.000	151.70
27	cis-1,2-Dichloroethene	96	4.268	4.268	(0.875)	510106	150.000	145.25
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	784849	150.000	148.76
55	Dibromochloromethane	129	7.750	7.750	(0.940)	509745	150.000	147.90
44	Dibromomethane	93	6.180	6.180	(1.101)	311006	150.000	148.25
2	Dichlorodifluoromethane	85	1.190	1.190	(0.244)	508351	150.000	149.57
61	Ethylbenzene	106	8.361	8.361	(1.015)	661822	150.000	151.27
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	263784	150.000	173.86
67	Isopropylbenzene	105	9.119	9.119	(1.106)	2002397	150.000	152.00
62	m,p-Xylenes	106	8.463	8.463	(1.027)	1637388	300.000	302.91(A)
17	Methylene Chloride	84	2.851	2.851	(0.584)	437879	150.000	129.27
87	n-Butylbenzene	91	10.547	10.547	(1.032)	1511185	150.000	155.07
73	n-Propylbenzene	91	9.467	9.467	(0.926)	2317098	150.000	152.96
92	Naphthalene	128	12.121	12.121	(1.186)	1938991	150.000	157.79
63	o-Xylene	106	8.800	8.800	(1.068)	801718	150.000	149.74
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	1960196	150.000	157.50
64	Styrene	104	8.815	8.815	(1.070)	1424573	150.000	154.95
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	1423086	150.000	153.96
56	Tetrachloroethene	164	7.514	7.514	(0.912)	368036	150.000	145.53
50	Toluene	91	7.038	7.038	(0.854)	1931747	150.000	144.00
20	trans-1,2-Dichloroethene	96	3.121	3.121	(0.640)	410390	150.000	141.96
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	679057	150.000	149.36
38	Trichloroethene	130	5.850	5.850	(1.042)	484476	150.000	151.71
8	Trichlorofluoromethane	101	1.936	1.936	(0.397)	686186	150.000	148.03
5	Vinyl Chloride	62	1.404	1.404	(0.288)	510132	150.000	146.74

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
H - Operator selected an alternate compound hit.



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Client ID: VSTD150
Sample Info: VSTD150;VSTD150;1;9;;
Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9,i\U211115,b\U111510,D

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111511.D Page 1
Report Date: 03-Jan-2022 10:12

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111511.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 15-NOV-2021 17:34
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 17:11 Cal File: U111510.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

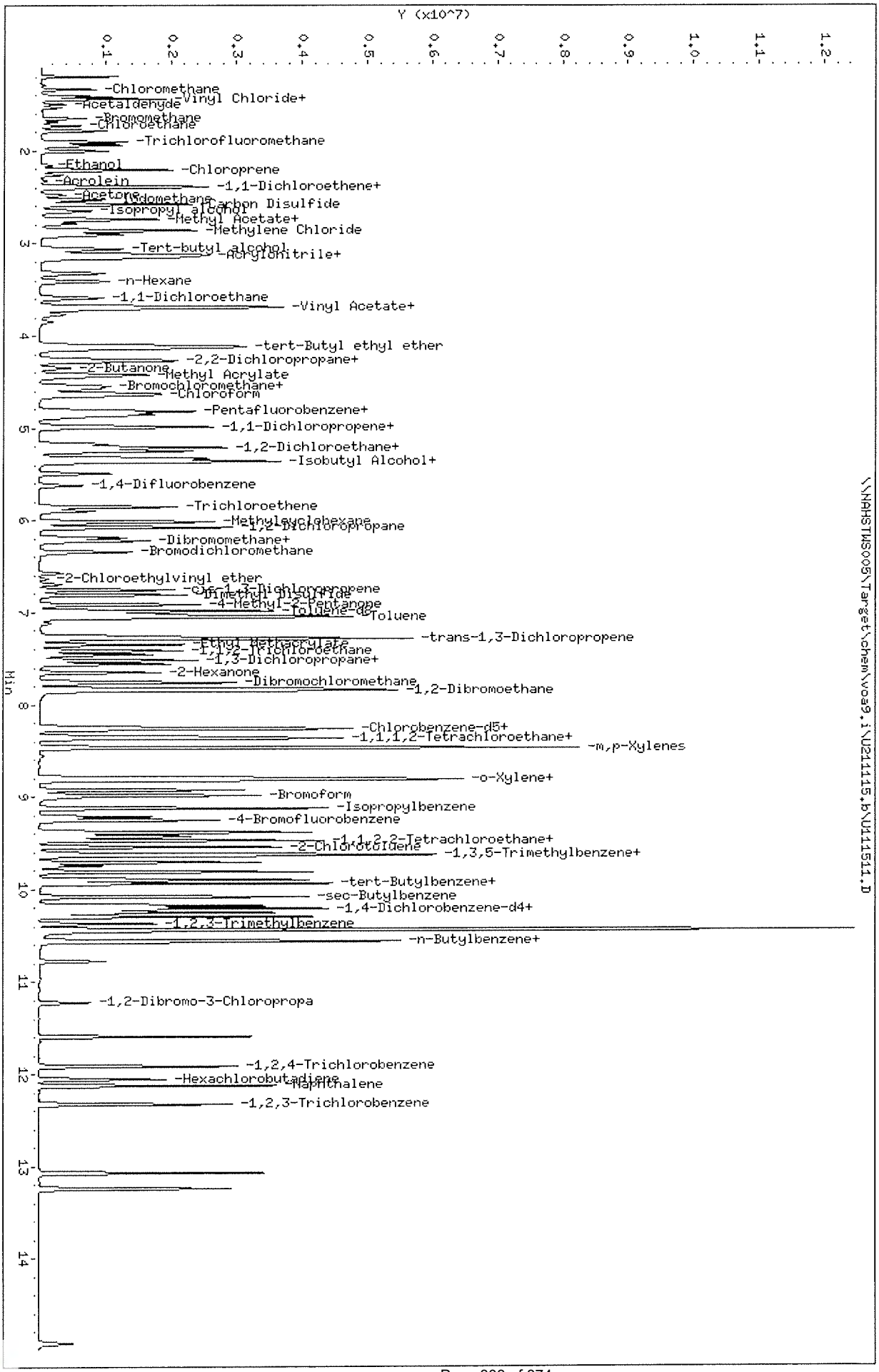
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.883	4.883	(1.000)	285252	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	490029	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	448063	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	225618	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.819	(0.987)	584069	200.000	197.56
$	35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	675186	200.000	197.22
$	48 Toluene-d8	98	6.978	6.978	(0.847)	2114876	200.000	181.35
$	69 4-Bromofluorobenzene	95	9.250	9.250	(1.122)	842976	200.000	197.56
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	631462	200.000	200.75(A)
	31 1,1,1-Trichloroethane	97	4.812	4.812	(0.985)	923358	200.000	224.86(A)
	68 1,1,2,2-Tetrachloroethane	83	9.385	9.385	(0.918)	911732	200.000	191.99
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	511919	200.000	193.89
	22 1,1-Dichloroethane	63	3.586	3.586	(0.734)	953825	200.000	188.21
	11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	498067	200.000	195.84
	32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	805619	200.000	200.20(A)
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	836695	200.000	207.08(A)
	71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	1019741	200.000	218.70(A)
	90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	869474	200.000	209.37(A)
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	2267562	200.000	200.47(A)
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	163858	200.000	200.89(A)
	57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	653050	200.000	203.61(A)
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	1244446	200.000	195.59

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111511.D Page 2
Report Date: 03-Jan-2022 10:12

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.243	5.243	(0.934)	840563	200.000	190.14
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	611859	200.000	198.43
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	2209947	200.000	199.22
83	1,3-Dichlorobenzene	146	10.172	10.172	(0.995)	1276700	200.000	196.47
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	1084428	200.000	192.75
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	1312117	200.000	196.23
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	661532	200.000	230.33(A)
24	2-Butanone	43	4.347	4.347	(0.890)	567478	400.000	380.45(A)
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	1904334	200.000	196.01
52	2-Hexanone	43	7.649	7.649	(0.928)	909144	400.000	427.43(AH)
77	4-Chlorotoluene	91	9.632	9.632	(0.942)	2211302	200.000	196.40
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	2280793	200.000	207.44(A)
45	4-Methyl-2-Pentanone	43	6.915	6.915	(0.839)	1295771	400.000	401.55(A)
10	Acetone	43	2.472	2.472	(0.506)	371722	400.000	391.57(A)
37	Benzene	78	5.205	5.205	(0.927)	2409160	200.000	194.43
74	Bromobenzene	156	9.374	9.374	(0.917)	714850	200.000	204.31(A)
29	Bromochloromethane	128	4.542	4.542	(0.930)	308852	200.000	191.95
39	Bromodichloromethane	83	6.337	6.337	(1.129)	813877	200.000	200.89(A)
66	Bromoform	173	8.976	8.976	(1.089)	468271	200.000	199.55
6	Bromomethane	94	1.644	1.644	(0.337)	270719	200.000	155.08
19	Carbon Disulfide	76	2.574	2.574	(0.527)	2848696	400.000	403.57(A)
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	799370	200.000	200.55(A)
59	Chlorobenzene	112	8.268	8.268	(1.003)	1683826	200.000	192.76
7	Chloroethane	64	1.726	1.726	(0.354)	426580	200.000	180.72
28	Chloroform	83	4.647	4.647	(0.952)	1093898	200.000	199.08
3	Chloromethane	50	1.329	1.329	(0.272)	557544	200.000	197.88
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	684672	200.000	196.45
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	1067583	200.000	201.23(A)
55	Dibromochloromethane	129	7.750	7.750	(0.940)	696655	200.000	201.73(A)
44	Dibromomethane	93	6.184	6.184	(1.101)	415970	200.000	197.79
2	Dichlorodifluoromethane	85	1.194	1.194	(0.245)	667949	200.000	198.26
61	Ethylbenzene	106	8.362	8.362	(1.015)	875310	200.000	200.22(A)
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	346631	200.000	225.84(A)
67	Isopropylbenzene	105	9.119	9.119	(1.106)	2674363	200.000	203.16(A)
62	m,p-Xylenes	106	8.463	8.463	(1.027)	2180098	400.000	403.60(A)
17	Methylene Chloride	84	2.855	2.855	(0.585)	578716	200.000	172.15
87	n-Butylbenzene	91	10.547	10.547	(1.032)	1974686	200.000	200.30(A)
73	n-Propylbenzene	91	9.467	9.467	(0.926)	3047395	200.000	198.86
92	Naphthalene	128	12.121	12.121	(1.186)	2562320	200.000	206.12(A)
63	o-Xylene	106	8.804	8.804	(1.068)	1072334	200.000	200.43(A)
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	2570698	200.000	204.18(A)
64	Styrene	104	8.815	8.815	(1.070)	1898305	200.000	206.63(A)
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	1889047	200.000	202.02(A)
56	Tetrachloroethene	164	7.514	7.514	(0.912)	491043	200.000	194.32
50	Toluene	91	7.038	7.038	(0.854)	2555981	200.000	190.68
20	trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	548207	200.000	191.08
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	919660	200.000	201.04(A)
38	Trichloroethene	130	5.850	5.850	(1.042)	651192	200.000	203.41(A)
8	Trichlorofluoromethane	101	1.936	1.936	(0.397)	910358	200.000	197.89
5	Vinyl Chloride	62	1.408	1.408	(0.288)	672430	200.000	194.91

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
H - Operator selected an alternate compound hit.



Data File: \\NAHSTWS005\Target\chem\voa9,i\U211115,b\U111511,D
Date : 15-NOV-2021 17:34
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\U211115.b\U111513.D Page 1
Report Date: 03-Jan-2022 10:12

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111513.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 15-NOV-2021 18:18
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\U211115.b\8260C.m
Meth Date : 03-Jan-2022 10:12 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 17:34 Cal File: U111511.D
Als bottle: 14 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

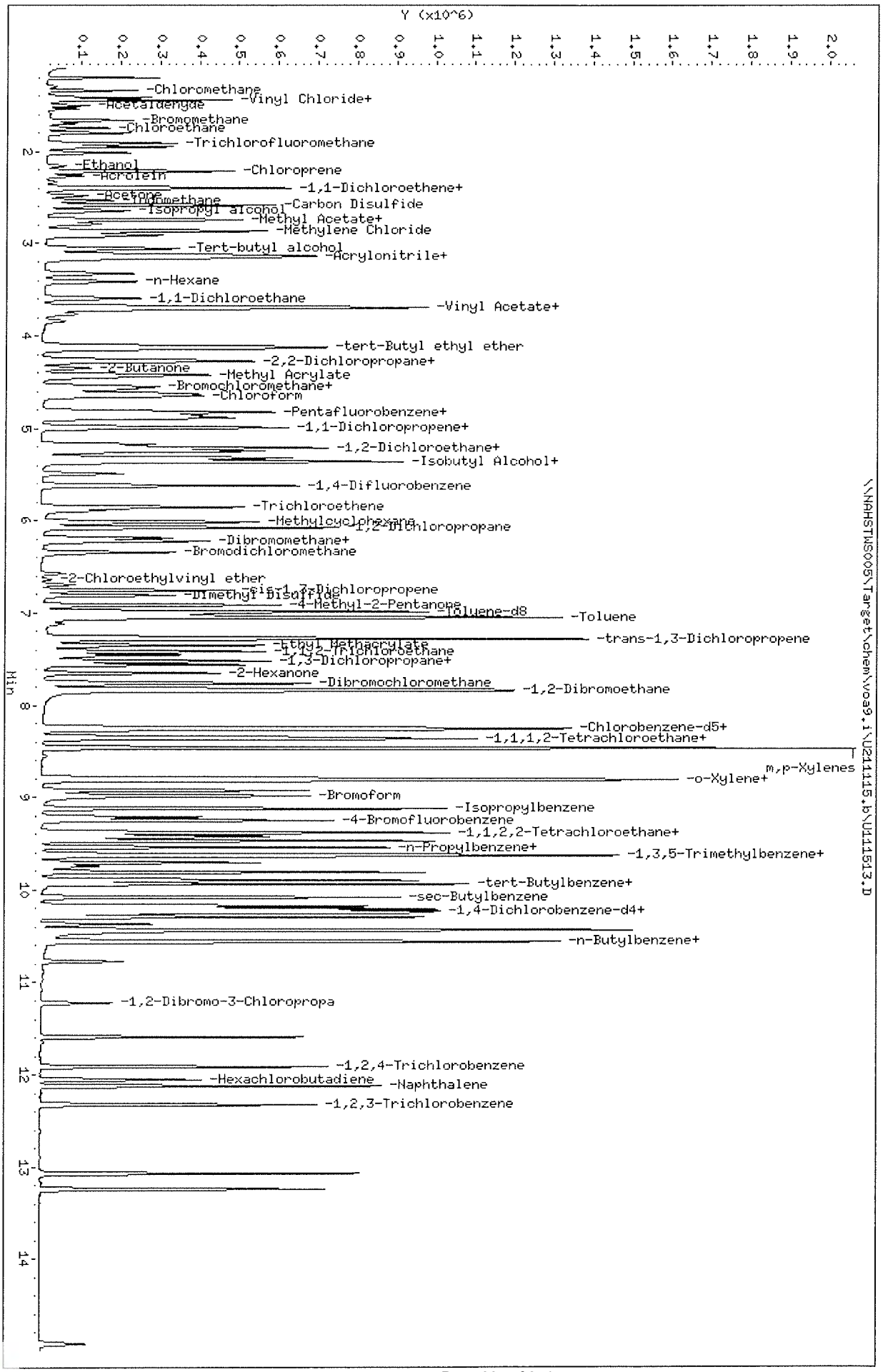
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.887	4.883	(1.000)	284064	50.0000	
*	36 1,4-Difluorobenzene	114	5.618	5.614	(1.000)	484722	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	441442	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	220674	50.0000	
$	30 Dibromofluoromethane	113	4.823	4.819	(0.987)	157305	52.8049	52.80
$	35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	183207	52.6492	52.64
$	48 Toluene-d8	98	6.978	6.978	(0.847)	578307	50.3349	50.33
$	69 4-Bromofluorobenzene	95	9.246	9.250	(1.122)	224672	52.4648	52.46
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	149257	48.7916	48.79
	31 1,1,1-Trichloroethane	97	4.815	4.812	(0.985)	210930	51.5822	51.58
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.385	(0.918)	233777	50.3319	50.33
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	131825	50.6785	50.67
	22 1,1-Dichloroethane	63	3.593	3.586	(0.735)	241068	47.7683	47.76
	11 1,1-Dichloroethene	96	2.394	2.386	(0.490)	122139	48.2264	48.22
	32 1,1-Dichloropropene	75	4.991	4.988	(0.889)	195154	49.0277	49.02
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	194769	49.2851	49.28
	71 1,2,3-Trichloropropane	75	9.419	9.419	(0.921)	241453	52.9455	52.94
	90 1,2,4-Trichlorobenzene	180	11.912	11.912	(1.165)	205098	50.4960	50.49
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	547052	49.4489	49.44
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	36047	47.0718	47.07
	57 1,2-Dibromoethane	107	7.844	7.844	(0.952)	167352	52.9622	52.96
	88 1,2-Dichlorobenzene	146	10.562	10.562	(1.033)	305551	49.1003	49.10

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111513.D Page 2
Report Date: 03-Jan-2022 10:12

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.243	(0.934)	217435	49.7252	49.72
42	1,2-Dichloropropane	63	6.075	6.071	(1.081)	154517	50.6599	50.65
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	525006	48.3897	48.38
83	1,3-Dichlorobenzene	146	10.168	10.172	(0.995)	305860	48.1239	48.12
54	1,3-Dichloropropane	76	7.556	7.556	(0.917)	276841	49.9461	49.94
84	1,4-Dichlorobenzene	146	10.247	10.247	(1.002)	317845	48.6012	48.60
26	2,2-Dichloropropane	77	4.264	4.257	(0.873)	149988	52.4410	52.44
24	2-Butanone	43	4.347	4.347	(0.890)	146702	98.7644	98.76
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	458017	48.1995	48.19
52	2-Hexanone	43	7.646	7.649	(0.928)	236040	112.639	112.63
77	4-Chlorotoluene	91	9.629	9.632	(0.942)	539200	48.9631	48.96
82	p-Isopropyltoluene	119	10.202	10.202	(0.998)	523508	48.6806	48.68
45	4-Methyl-2-Pentanone	43	6.911	6.915	(0.839)	330171	103.852	103.85
10	Acetone	43	2.476	2.472	(0.507)	101577	102.635	102.63
37	Benzene	78	5.209	5.205	(0.927)	613633	50.0652	50.06
74	Bromobenzene	156	9.374	9.374	(0.917)	174545	51.0044	51.00
29	Bromochloromethane	128	4.545	4.542	(0.930)	84018	52.4360	52.43
39	Bromodichloromethane	83	6.341	6.337	(1.129)	186469	47.3284	47.32
66	Bromoform	173	8.973	8.976	(1.089)	100202	48.3130	48.31
6	Bromomethane	94	1.659	1.644	(0.340)	103205	59.0539	59.05
19	Carbon Disulfide	76	2.581	2.574	(0.528)	706398	100.495	100.49
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	174535	45.4435	45.44
59	Chlorobenzene	112	8.264	8.268	(1.003)	418271	48.6028	48.60
7	Chloroethane	64	1.745	1.726	(0.357)	105520	44.8919	44.89(M)
28	Chloroform	83	4.647	4.647	(0.951)	274842	50.2297	50.22
3	Chloromethane	50	1.337	1.329	(0.274)	144132	50.9348	50.93
27	cis-1,2-Dichloroethene	96	4.275	4.272	(0.875)	172874	49.8115	49.81
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	244859	47.9988	47.99
55	Dibromochloromethane	129	7.751	7.750	(0.940)	159082	47.9094	47.90
44	Dibromomethane	93	6.184	6.184	(1.101)	106658	51.2713	51.27
2	Dichlorodifluoromethane	85	1.202	1.194	(0.246)	161569	47.6202	47.62
61	Ethylbenzene	106	8.362	8.362	(1.015)	211842	49.1848	49.18
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	72925	48.5787	48.57
67	Isopropylbenzene	105	9.115	9.119	(1.106)	624216	48.1318	48.13
62	m,p-Xylenes	106	8.463	8.463	(1.027)	534173	100.376	100.37
17	Methylene Chloride	84	2.862	2.855	(0.586)	151865	45.3661	45.36
87	n-Butylbenzene	91	10.547	10.547	(1.032)	450936	46.7664	46.76
73	n-Propylbenzene	91	9.467	9.467	(0.926)	726518	48.4726	48.47
92	Naphthalene	128	12.121	12.121	(1.186)	610596	50.2191	50.21
63	o-Xylene	106	8.800	8.804	(1.068)	261202	49.5552	49.55
81	sec-Butylbenzene	105	10.078	10.078	(0.986)	579302	47.0438	47.04
64	Styrene	104	8.815	8.815	(1.070)	469983	51.9253	51.92
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	434765	47.5378	47.53
56	Tetrachloroethene	164	7.514	7.514	(0.912)	115893	46.5507	46.55
50	Toluene	91	7.038	7.038	(0.854)	644212	48.7803	48.78
20	trans-1,2-Dichloroethene	96	3.132	3.125	(0.641)	138064	48.3258	48.32
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.291)	207482	47.4845	47.48
38	Trichloroethene	130	5.854	5.850	(1.042)	161856	51.1125	51.11
8	Trichlorofluoromethane	101	1.948	1.936	(0.399)	216391	47.2358	47.23
5	Vinyl Chloride	62	1.415	1.408	(0.290)	163317	47.5379	47.53

QC Flag Legend

M - Compound response manually integrated.

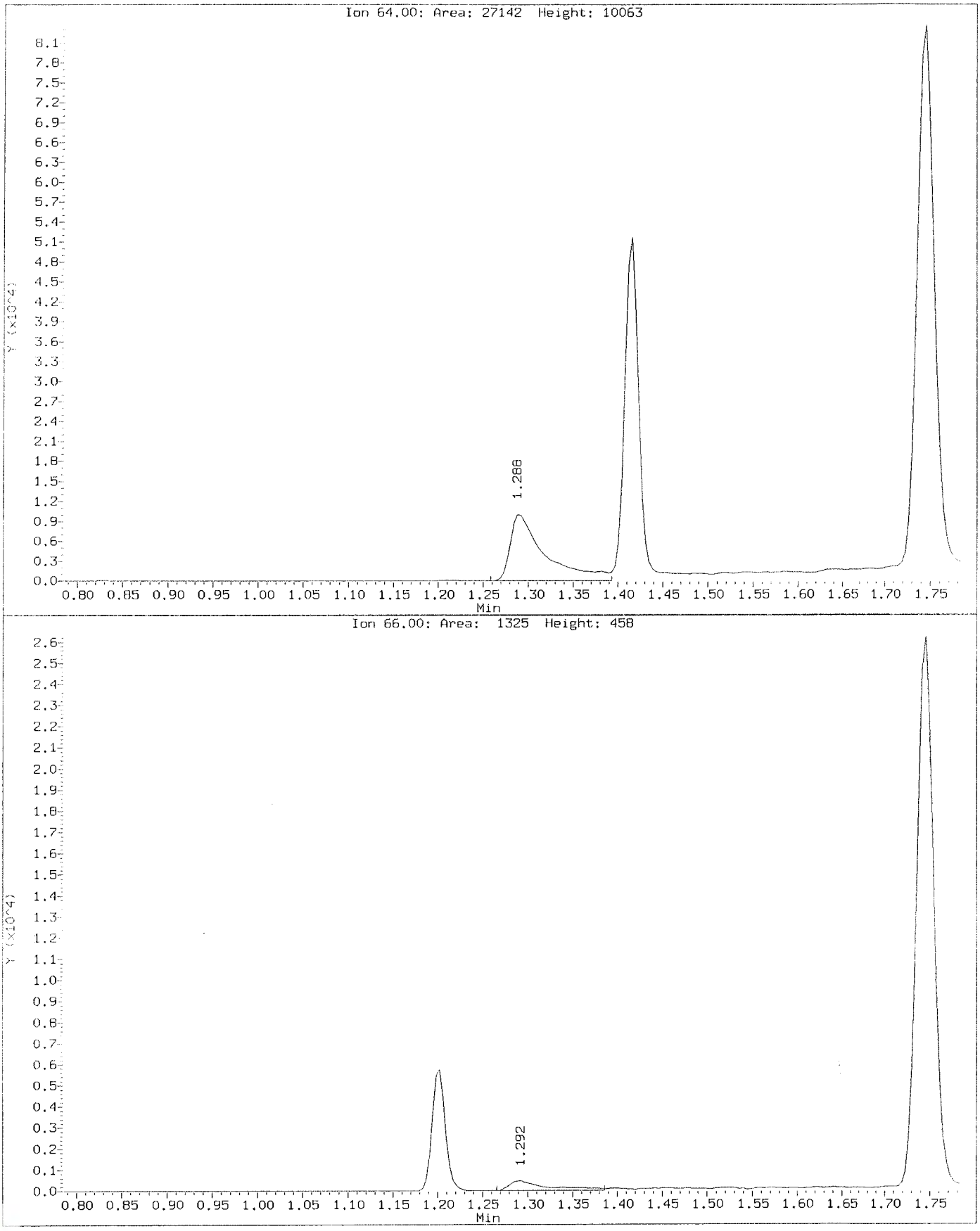


Data File: \\NAHSTWS005\Target\chem\voa9,i\U211115,b\U111513.D
Date : 15-NOV-2021 18:18
Client ID: ICV
Sample Info: VSTD050,VSTD050,2,,,ICV
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

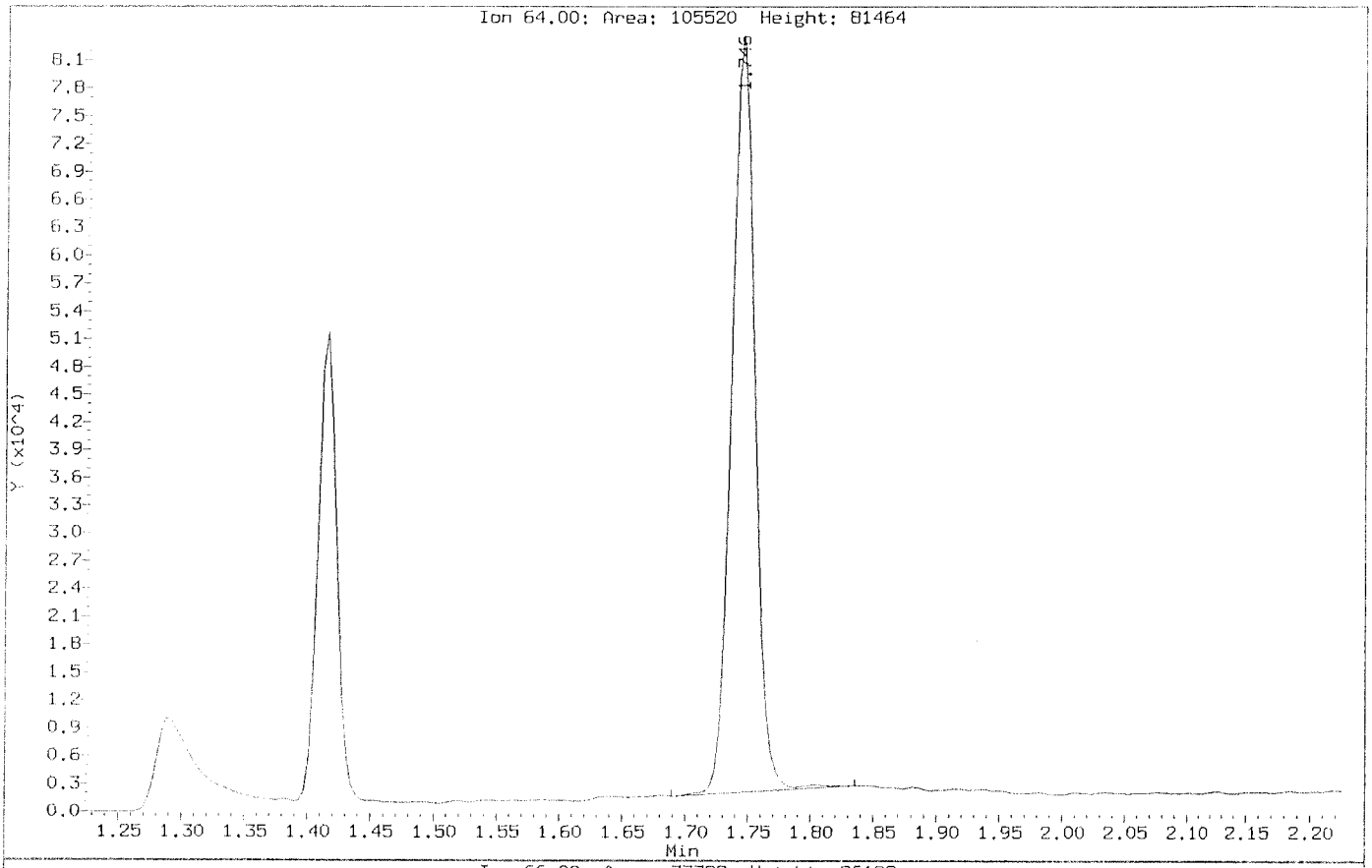
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\Before\U111513.D
Injection Date: 15-NOV-2021 18:18
Instrument: VOA9.i
Client Sample ID: ICV

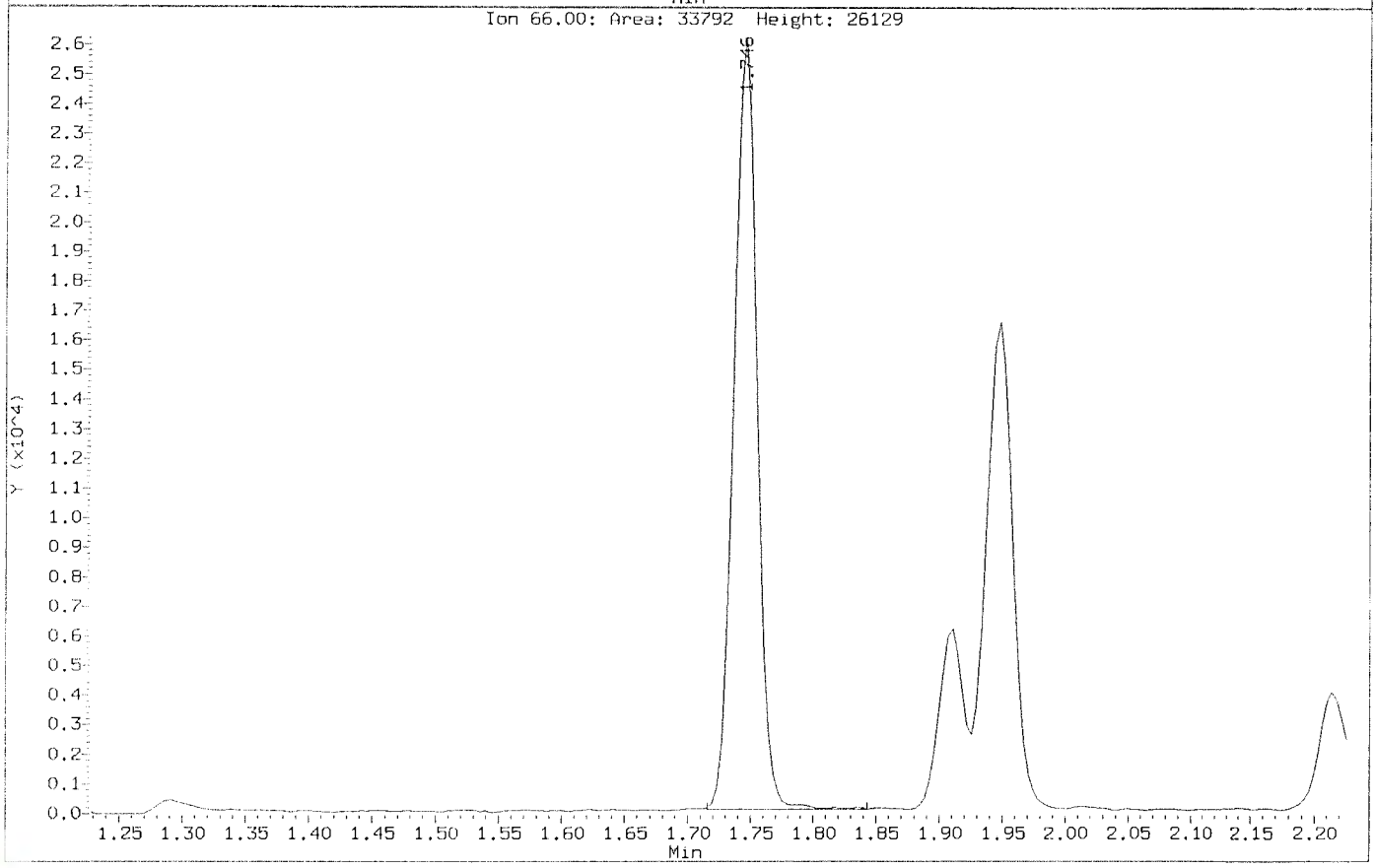
Compound: Chloroethane
CAS Number: 75-00-3



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211115.b\U111513.D
Injection Date: 15-NOV-2021 18:18
Instrument: VOA9.i
Client Sample ID: ICV

Compound: Chloroethane
CAS Number: 75-00-3





MSVOA09 -Logbook

Batch: 47460
Date: 12-09-2021
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	12-09-2021 10:37 am	1.00	50 mL	50 mL	U120901.D	Liquid	Y	NA
2	VSTD050	CCV	12-09-2021 10:59 am	1.00	50 mL	50 mL	U120902a.D	Liquid	Y	NA
3	VSTD050	CCV	12-09-2021 11:21 am	1.00	50 mL	50 mL	U120903.D	Liquid	Y	NA
4	CCB	SAMP	12-09-2021 11:43 am	1.00	50 mL	50 mL	U120904.D	Liquid	Y	NA
5	VLCSW-211209	LCS	12-09-2021 12:05 pm	1.00	50 mL	50 mL	U120905.D	Liquid	Y	NA
6	BLANK	SAMP	12-09-2021 12:28 pm	1.00	50 mL	50 mL	U120906.D	Liquid	Y	NA
7	VBLKW-211209	MBLK	12-09-2021 12:50 pm	1.00	50 mL	50 mL	U120907.D	Liquid	Y	NA
8	HS21120103-01	SAMP	12-09-2021 01:13 pm	1.00	50 mL	50 mL	U120908.D	Liquid	Y	NA
9	HS21120103-02	SAMP	12-09-2021 01:35 pm	1.00	50 mL	50 mL	U120909.D	Liquid	Y	NA
10	HS21120103-05	SAMP	12-09-2021 01:57 pm	1.00	50 mL	50 mL	U120910.D	Liquid	Y	NA
11	HS21120103-01MS	MS	12-09-2021 02:20 pm	1.00	50 mL	50 mL	U120911.D	Liquid	Y	NA
12	HS21120103-01MSD	MSD	12-09-2021 02:42 pm	1.00	50 mL	50 mL	U120912.D	Liquid	Y	NA
13	HS21120092-06	SAMP	12-09-2021 03:05 pm	5.00	10 mL	50 mL	U120913.D	Liquid	Y	NA
14	HS21120103-05	SAMP	12-09-2021 03:27 pm	10.00	5 mL	50 mL	U120914.D	Liquid	Y	NA
15	HS21120103-07	SAMP	12-09-2021 03:49 pm	1.00	50 mL	50 mL	U120915.D	Liquid	Y	NA
16	HS21120103-03	SAMP	12-09-2021 04:12 pm	1.00	50 mL	50 mL	U120916.D	Liquid	Y	NA
17	HS21120103-04	SAMP	12-09-2021 04:34 pm	1.00	50 mL	50 mL	U120917.D	Liquid	Y	NA
18	HS21120103-06	SAMP	12-09-2021 04:56 pm	1.00	50 mL	50 mL	U120918.D	Liquid	Y	NA
19	HS21120185-01	SAMP	12-09-2021 05:19 pm	1.00	50 mL	50 mL	U120919.D	Liquid	Y	NA
20	HS21120185-07	SAMP	12-09-2021 05:41 pm	1.00	50 mL	50 mL	U120920.D	Liquid	Y	NA
21	HS21120185-02	SAMP	12-09-2021 06:04 pm	1.00	50 mL	50 mL	U120921.D	Liquid	Y	NA
22	HS21120185-06	SAMP	12-09-2021 06:26 pm	1.00	50 mL	50 mL	U120922.D	Liquid	Y	NA
23	HS21120185-08	SAMP	12-09-2021 06:48 pm	1.00	50 mL	50 mL	U120923.D	Liquid	Y	NA
24	HS21120185-03	SAMP	12-09-2021 07:11 pm	1.00	50 mL	50 mL	U120924.D	Liquid	Y	NA
25	HS21120185-04	SAMP	12-09-2021 07:33 pm	1.00	50 mL	50 mL	U120925.D	Liquid	Y	NA
26	HS21120185-05	SAMP	12-09-2021 07:56 pm	1.00	50 mL	50 mL	U120926.D	Liquid	Y	NA
27	VSTD050-END	CCV	12-09-2021 08:18 pm	1.00	50 mL	50 mL	U120927.D	Liquid	Y	NA
28	HS21120467-01	SAMP	12-09-2021 08:40 pm	1.00	50 mL	50 mL	U120928.D	Liquid	Y	NA
29	HS21120139-02	SAMP	12-09-2021 09:03 pm	1.00	50 mL	50 mL	U120929.D	Liquid	Y	NA
30	HS21120305-01	SAMP	12-09-2021 09:25 pm	100.0(	500 µL	50 mL	U120930.D	Liquid	Y	NA
31	BFB	TUNE	12-09-2021 09:47 pm	1.00	50 mL	50 mL	V120901.D	Liquid	Y	NA
32	VSTD050	CCV	12-09-2021 10:10 pm	1.00	50 mL	50 mL	V120902.D	Liquid	Y	NA
33	VSTD050	CCV	12-09-2021 10:32 pm	1.00	50 mL	50 mL	V120903.D	Liquid	Y	NA
34	CCB	SAMP	12-09-2021 10:54 pm	1.00	50 mL	50 mL	V120904.D	Liquid	Y	NA
35	VLCSW-211209	LCS	12-09-2021 11:17 pm	1.00	50 mL	50 mL	V120905.D	Liquid	Y	NA
36	BLANK	SAMP	12-09-2021 11:39 pm	1.00	50 mL	50 mL	V120906.D	Liquid	Y	NA
37	VBLKW-211209	MBLK	12-10-2021 12:01 am	50.00	1 mL	50 mL	V120907.D	Liquid	Y	NA
38	HS21120161-01	SAMP	12-10-2021 12:24 am	50.00	1 mL	50 mL	V120908.D	Liquid	Y	NA
39	HS21120161-11	SAMP	12-10-2021 12:46 am	50.00	1 mL	50 mL	V120909.D	Liquid	Y	NA
40	HS21120161-04	SAMP	12-10-2021 01:08 am	50.00	1 mL	50 mL	V120910.D	Liquid	Y	NA
41	HS21120161-04MS	MS	12-10-2021 01:31 am	50.00	1 mL	50 mL	V120911.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
42	HS21120161-04MSD	MSD	12-10-2021 01:53 am	50.00	1 mL	50 mL	V120912.D	Liquid	Y	NA
43	BLANK	SAMP	12-10-2021 02:15 am	1.00	50 mL	50 mL	V120913.D	Liquid	Y	NA
44	HS21120161-12	SAMP	12-10-2021 02:38 am	500.0(	100 µL	50 mL	V120914.D	Liquid	Y	NA
45	HS21120161-13	SAMP	12-10-2021 03:00 am	100.0(	500 µL	50 mL	V120915.D	Liquid	Y	NA
46	HS21120161-15	SAMP	12-10-2021 03:23 am	50.00	1 mL	50 mL	V120916.D	Liquid	Y	NA
47	HS21120161-02	SAMP	12-10-2021 03:45 am	50.00	1 mL	50 mL	V120917.D	Liquid	Y	NA
48	HS21120161-03	SAMP	12-10-2021 04:07 am	500.0(	100 µL	50 mL	V120918.D	Liquid	Y	NA
49	HS21120161-05	SAMP	12-10-2021 04:30 am	500.0(	100 µL	50 mL	V120919.D	Liquid	Y	NA
50	HS21120196-01	SAMP	12-10-2021 04:52 am	50.00	1 mL	50 mL	V120920.D	Liquid	Y	NA
51	HS21120196-02	SAMP	12-10-2021 05:14 am	100.0(	500 µL	50 mL	V120921.D	Liquid	Y	NA
52	HS21120196-07	SAMP	12-10-2021 05:37 am	50.00	1 mL	50 mL	V120922.D	Liquid	Y	NA
53	HS21120155-03	SAMP	12-10-2021 05:59 am	10000.(	5 µL	50 mL	V120923.D	Liquid	Y	NA
54	HS21120155-04	SAMP	12-10-2021 06:21 am	50.00	1 mL	50 mL	V120924.D	Liquid	Y	NA
55	HS21120155-05	SAMP	12-10-2021 06:44 am	50.00	1 mL	50 mL	V120925.D	Liquid	Y	NA
56	HS21120182-07	SAMP	12-10-2021 07:06 am	50.00	1 mL	50 mL	V120926.D	Liquid	Y	NA
57	HS21120182-05	SAMP	12-10-2021 07:28 am	5000.0	10 µL	50 mL	V120927.D	Liquid	Y	NA
58	HS21120182-01	SAMP	12-10-2021 07:51 am	5000.0	10 µL	50 mL	V120928.D	Liquid	Y	NA
59	HS21120182-02	SAMP	12-10-2021 08:13 am	1000.0	50 µL	50 mL	V120929.D	Liquid	Y	NA
60	HS21120182-04	SAMP	12-10-2021 08:35 am	500.0(	100 µL	50 mL	V120930.D	Liquid	Y	NA
61	BLANK	SAMP	12-10-2021 08:58 am	1.00	50 mL	50 mL	V120931.D	Liquid	Y	NA
62	CCV-END	CCV	12-10-2021 09:20 am	1.00	50 mL	50 mL	V120932.D	Liquid	Y	NA
63	BLANK	SAMP	12-10-2021 09:42 am	1.00	50 mL	50 mL	V120933.D	Liquid	Y	NA

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

	CLIENT SAMPLE NO.	SMC1 (DCE) #	SMC2 #	SMC3 (TOL) #	OTHER #	TOT OUT
01	VLSCW-211209	107	101	93	96	0
02	VBLKW-211209	104	99	103	101	0
03	HS21120103-01	107	98	103	102	0
04	HS21120103-02	105	98	104	101	0
05	HS21120103-05	106	101	103	101	0
06	HS21120103-01MS	102	100	104	104	0
07	HS21120103-01MSD	102	102	104	106	0
08	HS21120103-05	106	99	102	101	0
09	HS21120103-07	106	98	104	101	0
10	HS21120103-03	108	100	104	100	0
11	HS21120103-04	106	100	103	101	0
12	HS21120103-06	106	99	103	101	0
13						
14						
15						
16						
17						
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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-211209

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Lab File ID: U120907 Lab Sample ID: VBLKW-211209

Date Analyzed: 12/09/21 Time Analyzed: 1250

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	VLSCW-211209	VLCSW-211209	U120905	1205
02	HS21120103-01	HS21120103-01	U120908	1313
03	HS21120103-02	HS21120103-02	U120909	1335
04	HS21120103-05	HS21120103-05	U120910	1357
05	HS21120103-01MS	HS21120103-01MS	U120911	1420
06	HS21120103-01MSD	HS21120103-01MSD	U120912	1442
07	HS21120103-05	HS21120103-05	U120914	1527
08	HS21120103-07	HS21120103-07	U120915	1549
09	HS21120103-03	HS21120103-03	U120916	1612
10	HS21120103-04	HS21120103-04	U120917	1634
11	HS21120103-06	HS21120103-06	U120918	1656
12				
13				
14				
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Lab File ID: U120901 BFB Injection Date: 12/09/21

Instrument ID: VOA9 BFB Injection Time: 1037

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	16.5
75	30.0 - 60.0% of mass 95	49.8
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	1.1 (1.6)1
174	Greater than 50.0% of mass 95	68.5
175	5.0 - 9.0% of mass 174	5.6 (8.1)1
176	95.0 - 101.0% of mass 174	65.0 (95.0)1
177	5.0 - 9.0% of mass 176	4.6 (7.1)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	CCV	CCV	U120903	12/09/21	1121
02	VLSCW-211209	VLCSW-211209	U120905	12/09/21	1205
03	VBLKW-211209	VBLKW-211209	U120907	12/09/21	1250
04	HS21120103-01	HS21120103-01	U120908	12/09/21	1313
05	HS21120103-02	HS21120103-02	U120909	12/09/21	1335
06	HS21120103-05	HS21120103-05	U120910	12/09/21	1357
07	HS21120103-01MS	HS21120103-01MS	U120911	12/09/21	1420
08	HS21120103-01MSD	HS21120103-01MSD	U120912	12/09/21	1442
09	HS21120103-05	HS21120103-05	U120914	12/09/21	1527
10	HS21120103-07	HS21120103-07	U120915	12/09/21	1549
11	HS21120103-03	HS21120103-03	U120916	12/09/21	1612
12	HS21120103-04	HS21120103-04	U120917	12/09/21	1634
13	HS21120103-06	HS21120103-06	U120918	12/09/21	1656
14	CCV-END	CCV-END	U120927	12/09/21	2018
15					
16					
17					
18					
19					
20					
21					
22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: VOA9 Calibration Date: 12/09/21 Time: 1121

Lab File ID: U120903 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

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	47.981991	50.000000	0.5049700	0.2	4.04	20.00	LINR	
trans-1,3-Dichloropropene	46.832798	50.000000	0.4218950	0.1	6.33	20.00	LINR	
1,3-Dichlorobenzene	1.4400000	1.3830028	1.3830028	0.6	3.96	20.00	AVRG	
2,2-Dichloropropane	0.5030000	0.5869687	0.5869687	0.1	-16.69	20.00	AVRG	
1,1-Dichloropropene	0.4100000	0.4328800	0.4328800	0.1	-5.58	20.00	AVRG	
Dibromomethane	0.2140000	0.2183436	0.2183436	0.1	-2.03	20.00	AVRG	
1,2-Dibromoethane	0.3580000	0.3613042	0.3613042	0.1	-0.92	20.00	AVRG	
trans-1,2-Dichloroethene	0.5030000	0.5326022	0.5326022	0.1	-5.88	20.00	AVRG	
1,1,1,2-Tetrachloroethane	46.760866	50.000000	0.3237976	0.1	6.48	20.00	LINR	
1,1,1-Trichloroethane	0.7200000	0.7913430	0.7913430	0.1	-9.91	20.00	AVRG	
1,1,2,2-Tetrachloroethane	1.0520000	1.0803880	1.0803880	0.3	-2.70	20.00	AVRG	
1,1,2-Trichloroethane	0.2950000	0.3042144	0.3042144	0.1	-3.12	20.00	AVRG	
1,1-Dichloroethane	0.8880000	0.9944962	0.9944962	0.2	-11.99	20.00	AVRG	
1,1-Dichloroethene	0.4460000	0.4742628	0.4742628	0.1	-6.34	20.00	AVRG	
Trichloroethene	0.3260000	0.3170139	0.3170139	0.2	2.76	20.00	AVRG	
1,2,3-Trichlorobenzene	0.8950000	0.8127102	0.8127102	0.1	9.19	20.00	AVRG	
Trichlorofluoromethane	0.8060000	0.8880909	0.8880909	0.1	-10.18	20.00	AVRG	
1,2,4-Trichlorobenzene	0.9200000	0.8543497	0.8543497	0.2	7.14	20.00	AVRG	
1,2,4-Trimethylbenzene	2.5070000	2.5858161	2.5858161	0.1	-3.14	20.00	AVRG	
Tetrachloroethene	0.2820000	0.2559561	0.2559561	0.2	9.24	20.00	AVRG	
1,2-Dichlorobenzene	1.4100000	1.3603745	1.3603745	0.4	3.52	20.00	AVRG	
1,2-Dichloroethane	0.4510000	0.4546226	0.4546226	0.1	-0.80	20.00	AVRG	
1,2-Dichloropropane	0.3150000	0.3354391	0.3354391	0.1	-6.49	20.00	AVRG	
1,3,5-Trimethylbenzene	2.4580000	2.4890582	2.4890582	0.1	-1.26	20.00	AVRG	
1,3-Dichloropropane	0.6280000	0.6487501	0.6487501	0.1	-3.30	20.00	AVRG	
1,4-Dichlorobenzene	1.4820000	1.4190361	1.4190361	0.4	4.25	20.00	AVRG	
Toluene	1.4960000	1.5022701	1.5022701	0.4	-0.42	20.00	AVRG	
2-Butanone	0.2610000	0.2635086	0.2635086	0.1	-0.96	20.00	AVRG	
2-Chlorotoluene	2.1530000	2.2199279	2.2199279	0.1	-3.11	20.00	AVRG	
2-Hexanone	0.2370000	0.2544559	0.2544559	0.1	-7.36	20.00	AVRG	
4-Chlorotoluene	2.4950000	2.6051510	2.6051510	0.1	-4.41	20.00	AVRG	
tert-Butylbenzene	2.0720000	2.0407930	2.0407930	0.1	1.51	20.00	AVRG	
4-Methyl-2-Pentanone	0.3600000	0.3629085	0.3629085	0.1	-0.81	20.00	AVRG	
Acetone	112.11558	100.00000	0.1943055	0.1	-12.12	20.00	LINR	
Benzene	1.2640000	1.3015989	1.3015989	0.5	-2.97	20.00	AVRG	
Bromobenzene	0.7750000	0.7611211	0.7611211	0.1	1.79	20.00	AVRG	
Bromochloromethane	0.2820000	0.2987576	0.2987576	0.1	-5.94	20.00	AVRG	
Bromodichloromethane	47.480506	50.000000	0.3859566	0.2	5.04	20.00	LINR	
Bromoform	41.315945	50.000000	0.1924443	0.1	17.37	20.00	2RDR	
Bromomethane	61.351646	50.000000	0.3773304	0.1	-22.70	20.00	LINR	<-
Carbon Disulfide	1.2370000	1.3937975	1.3937975	0.1	-12.68	20.00	AVRG	
Carbon Tetrachloride	46.868243	50.000000	0.3717484	0.1	6.26	20.00	LINR	

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: VOA9 Calibration Date: 12/09/21 Time: 1121

Lab File ID: U120903 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

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
Chlorobenzene	0.9750000	0.9357749	0.9357749	0.5	4.02	20.00	AVRG
Chloroethane	0.4140000	0.4665789	0.4665789	0.1	-12.70	20.00	AVRG
Chloroform	0.9630000	1.0513859	1.0513859	0.2	-9.18	20.00	AVRG
Chloromethane	55.946834	50.000000	0.5567532	0.1	-11.89	20.00	LINR
cis-1,2-Dichloroethene	0.6110000	0.6457324	0.6457324	0.1	-5.68	20.00	AVRG
Dibromochloromethane	44.506415	50.000000	0.3339447	0.1	10.99	20.00	LINR
Dichlorodifluoromethane	47.261165	50.000000	0.5645515	0.1	5.48	20.00	LINR
Ethylbenzene	0.4880000	0.4839437	0.4839437	0.1	0.83	20.00	AVRG
Hexachlorobutadiene	0.3400000	0.3358959	0.3358959	0.1	1.21	20.00	AVRG
Isopropylbenzene	1.4690000	1.4719465	1.4719465	0.1	-0.20	20.00	AVRG
m,p-Xylenes	0.6030000	0.6121879	0.6121879	0.1	-1.52	20.00	AVRG
Methylene Chloride	0.5890000	0.5870794	0.5870794	0.1	0.33	20.00	AVRG
n-Butylbenzene	2.1850000	2.2912220	2.2912220	0.5	-4.86	20.00	AVRG
n-Propylbenzene	3.3960000	3.6297823	3.6297823	0.1	-6.88	20.00	AVRG
Naphthalene	2.7550000	2.5913807	2.5913807	0.2	5.94	20.00	AVRG
o-Xylene	0.5970000	0.5963320	0.5963320	0.3	0.11	20.00	AVRG
sec-Butylbenzene	2.7900000	2.8459959	2.8459959	0.1	-2.01	20.00	AVRG
Styrene	1.0250000	1.0654479	1.0654479	0.3	-3.95	20.00	AVRG
Vinyl Chloride	0.6040000	0.6619191	0.6619191	0.1	-9.59	20.00	AVRG
1,2,3-Trichloropropane	1.0330000	1.0945793	1.0945793	0.1	-5.96	20.00	AVRG
p-Isopropyltoluene	2.4370000	2.4753017	2.4753017	0.1	-1.57	20.00	AVRG
1,2-Dibromo-3-Chloropropane	41.246876	50.000000	0.1420331	0.05	17.51	20.00	LINR
1,2-Dichloroethane-d4	52.340168	50.000000	0.6412688	0.1	-4.68	20.00	LINR
Dibromofluoromethane	51.337033	50.000000	0.5386187	0.1	-2.67	20.00	LINR
Toluene-d8	1.3010000	1.2230035	1.2230035	0.1	6.00	20.00	AVRG
4-Bromofluorobenzene	49.072929	50.000000	0.4768695	0.1	1.85	20.00	LINR

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: VOA9 Calibration Date: 12/09/21 Time: 2018

Lab File ID: U120927 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

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	43.832203	50.000000	0.4596504	0.2	12.34	50.00	LINR
trans-1,3-Dichloropropene	42.693109	50.000000	0.3828409	0.1	14.61	50.00	LINR
1,3-Dichlorobenzene	1.4400000	1.3227647	1.3227647	0.6	8.14	50.00	AVRG
2,2-Dichloropropane	0.5030000	0.4100369	0.4100369	0.1	18.48	50.00	AVRG
1,1-Dichloropropene	0.4100000	0.4062911	0.4062911	0.1	0.90	50.00	AVRG
Dibromomethane	0.2140000	0.2127803	0.2127803	0.1	0.57	50.00	AVRG
1,2-Dibromoethane	0.3580000	0.3593608	0.3593608	0.1	-0.38	50.00	AVRG
trans-1,2-Dichloroethene	0.5030000	0.5259808	0.5259808	0.1	-4.57	50.00	AVRG
1,1,1,2-Tetrachloroethane	44.980080	50.000000	0.3112450	0.1	10.04	50.00	LINR
1,1,1-Trichloroethane	0.7200000	0.7779446	0.7779446	0.1	-8.05	50.00	AVRG
1,1,2,2-Tetrachloroethane	1.0520000	0.9751068	0.9751068	0.3	7.31	50.00	AVRG
1,1,2-Trichloroethane	0.2950000	0.2941764	0.2941764	0.1	0.28	50.00	AVRG
1,1-Dichloroethane	0.8880000	1.0200119	1.0200119	0.2	-14.87	50.00	AVRG
1,1-Dichloroethene	0.4460000	0.4716422	0.4716422	0.1	-5.75	50.00	AVRG
Trichloroethene	0.3260000	0.3362479	0.3362479	0.2	-3.14	50.00	AVRG
1,2,3-Trichlorobenzene	0.8950000	0.7663257	0.7663257	0.1	14.38	50.00	AVRG
Trichlorofluoromethane	0.8060000	0.8701451	0.8701451	0.1	-7.96	50.00	AVRG
1,2,4-Trichlorobenzene	0.9200000	0.7877891	0.7877891	0.2	14.37	50.00	AVRG
1,2,4-Trimethylbenzene	2.5070000	2.4682331	2.4682331	0.1	1.55	50.00	AVRG
Tetrachloroethene	0.2820000	0.2371991	0.2371991	0.2	15.89	50.00	AVRG
1,2-Dichlorobenzene	1.4100000	1.3330495	1.3330495	0.4	5.46	50.00	AVRG
1,2-Dichloroethane	0.4510000	0.4523186	0.4523186	0.1	-0.29	50.00	AVRG
1,2-Dichloropropane	0.3150000	0.3320510	0.3320510	0.1	-5.41	50.00	AVRG
1,3,5-Trimethylbenzene	2.4580000	2.3694695	2.3694695	0.1	3.60	50.00	AVRG
1,3-Dichloropropane	0.6280000	0.6354416	0.6354416	0.1	-1.18	50.00	AVRG
1,4-Dichlorobenzene	1.4820000	1.3702928	1.3702928	0.4	7.54	50.00	AVRG
Toluene	1.4960000	1.4564253	1.4564253	0.4	2.64	50.00	AVRG
2-Butanone	0.2610000	0.2614359	0.2614359	0.1	-0.17	50.00	AVRG
2-Chlorotoluene	2.1530000	2.1651062	2.1651062	0.1	-0.56	50.00	AVRG
2-Hexanone	0.2370000	0.2432808	0.2432808	0.1	-2.65	50.00	AVRG
4-Chlorotoluene	2.4950000	2.5131688	2.5131688	0.1	-0.73	50.00	AVRG
tert-Butylbenzene	2.0720000	1.9445114	1.9445114	0.1	6.15	50.00	AVRG
4-Methyl-2-Pentanone	0.3600000	0.3512050	0.3512050	0.1	2.44	50.00	AVRG
Acetone	117.90307	100.00000	0.2037753	0.1	-17.90	50.00	LINR
Benzene	1.2640000	1.2899580	1.2899580	0.5	-2.05	50.00	AVRG
Bromobenzene	0.7750000	0.7450552	0.7450552	0.1	3.86	50.00	AVRG
Bromochloromethane	0.2820000	0.3006693	0.3006693	0.1	-6.62	50.00	AVRG
Bromodichloromethane	46.800571	50.000000	0.3803061	0.2	6.40	50.00	LINR
Bromoform	38.705026	50.000000	0.1796168	0.1	22.59	50.00	2RDR
Bromomethane	62.583011	50.000000	0.3848409	0.1	-25.17	50.00	LINR
Carbon Disulfide	1.2370000	1.3524724	1.3524724	0.1	-9.33	50.00	AVRG
Carbon Tetrachloride	43.815522	50.000000	0.3467310	0.1	12.37	50.00	LINR

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: VOA9 Calibration Date: 12/09/21 Time: 2018

Lab File ID: U120927 Init. Calib. Date(s): 11/15/21 11/15/21

Init. Calib. Times: 1352 1734

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
Chlorobenzene	0.9750000	0.8962375	0.8962375	0.5	8.08	50.00	AVRG
Chloroethane	0.4140000	0.4540677	0.4540677	0.1	-9.68	50.00	AVRG
Chloroform	0.9630000	1.0769123	1.0769123	0.2	-11.83	50.00	AVRG
Chloromethane	59.010571	50.000000	0.5869258	0.1	-18.02	50.00	LINR
cis-1,2-Dichloroethene	0.6110000	0.6512892	0.6512892	0.1	-6.59	50.00	AVRG
Dibromochloromethane	42.960892	50.000000	0.3219438	0.1	14.08	50.00	LINR
Dichlorodifluoromethane	46.030059	50.000000	0.5500638	0.1	7.94	50.00	LINR
Ethylbenzene	0.4880000	0.4577359	0.4577359	0.1	6.20	50.00	AVRG
Hexachlorobutadiene	0.3400000	0.2890688	0.2890688	0.1	14.98	50.00	AVRG
Isopropylbenzene	1.4690000	1.3567352	1.3567352	0.1	7.64	50.00	AVRG
m,p-Xylenes	0.6030000	0.5740604	0.5740604	0.1	4.80	50.00	AVRG
Methylene Chloride	0.5890000	0.6148686	0.6148686	0.1	-4.39	50.00	AVRG
n-Butylbenzene	2.1850000	2.0512966	2.0512966	0.5	6.12	50.00	AVRG
n-Propylbenzene	3.3960000	3.4113612	3.4113612	0.1	-0.45	50.00	AVRG
Naphthalene	2.7550000	2.4619662	2.4619662	0.2	10.64	50.00	AVRG
o-Xylene	0.5970000	0.5678056	0.5678056	0.3	4.89	50.00	AVRG
sec-Butylbenzene	2.7900000	2.6435723	2.6435723	0.1	5.25	50.00	AVRG
Styrene	1.0250000	1.0215562	1.0215562	0.3	0.34	50.00	AVRG
Vinyl Chloride	0.6040000	0.6694863	0.6694863	0.1	-10.84	50.00	AVRG
1,2,3-Trichloropropane	1.0330000	1.0615437	1.0615437	0.1	-2.76	50.00	AVRG
p-Isopropyltoluene	2.4370000	2.2909178	2.2909178	0.1	5.99	50.00	AVRG
1,2-Dibromo-3-Chloropropane	39.051178	50.000000	0.1339980	0.05	21.90	50.00	LINR
1,2-Dichloroethane-d4	55.129316	50.000000	0.6744893	0.1	-10.26	50.00	LINR
Dibromofluoromethane	51.837358	50.000000	0.5437817	0.1	-3.67	50.00	LINR
Toluene-d8	1.3010000	1.2094093	1.2094093	0.1	7.04	50.00	AVRG
4-Bromofluorobenzene	48.031016	50.000000	0.4670148	0.1	3.94	50.00	LINR

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Lab File ID (Standard): U120903 Date Analyzed: 12/09/21

Instrument ID: VOA9 Time Analyzed: 1121

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(CBZ) AREA #	IS1(CBZ) RT #	IS2(DFB) AREA #	IS2(DFB) RT #	IS3(DCB) AREA #	IS3(DCB) RT #
	12 HOUR STD	441603	8.24	488029	5.61	216189	10.23
	UPPER LIMIT	883206	8.74	976058	6.11	432378	10.73
	LOWER LIMIT	220802	7.74	244015	5.11	108095	9.73
	CLIENT SAMPLE NO.						
01	VLSCW-211209	445343	8.24	493291	5.61	217608	10.22
02	VBLKW-211209	424661	8.24	485762	5.61	199374	10.23
03	HS21120103-01	423608	8.24	479759	5.61	198054	10.23
04	HS21120103-02	410794	8.24	470027	5.61	191830	10.23
05	HS21120103-05	408188	8.24	460998	5.62	190796	10.23
06	HS21120103-01MS	429420	8.24	483887	5.62	207774	10.22
07	HS21120103-01MSD	425055	8.24	481685	5.61	208080	10.22
08	HS21120103-05	424622	8.24	476678	5.61	198648	10.23
09	HS21120103-07	423940	8.24	484675	5.62	198879	10.22
10	HS21120103-03	421447	8.24	479242	5.62	198673	10.22
11	HS21120103-04	422322	8.24	477044	5.62	200227	10.23
12	HS21120103-06	415519	8.24	468951	5.61	194792	10.22
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (CBZ) = Chlorobenzene-d5
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (DCB) = 1,4-Dichlorobenzene-d4

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 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Lab File ID (Standard): U120903 Date Analyzed: 12/09/21

Instrument ID: VOA9 Time Analyzed: 1121

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	271086	4.88				
	UPPER LIMIT	542172	5.38				
	LOWER LIMIT	135543	4.38				
	CLIENT SAMPLE NO.						
01	VLSCW-211209	274359	4.88				
02	VBLKW-211209	281404	4.88				
03	HS21120103-01	278646	4.88				
04	HS21120103-02	273042	4.88				
05	HS21120103-05	267764	4.89				
06	HS21120103-01MS	287359	4.89				
07	HS21120103-01MSD	284281	4.88				
08	HS21120103-05	276766	4.88				
09	HS21120103-07	282223	4.88				
10	HS21120103-03	275723	4.89				
11	HS21120103-04	277717	4.88				
12	HS21120103-06	273462	4.88				
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\U211209.b\U120901.D

Date : 09-DEC-2021 10:37

Client ID: BFB

Instrument: VOA9.i

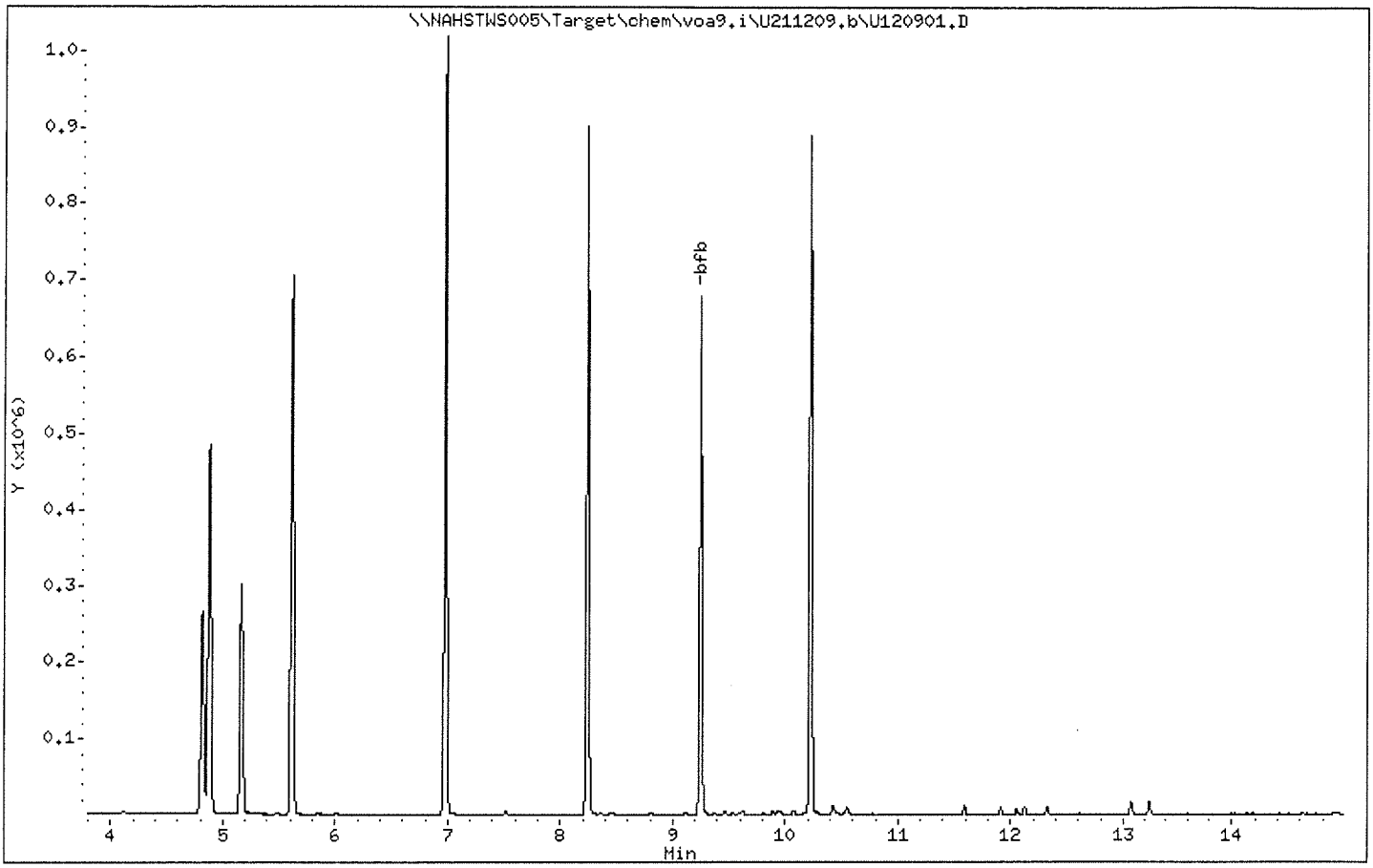
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120901.D

Date : 09-DEC-2021 10:37

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

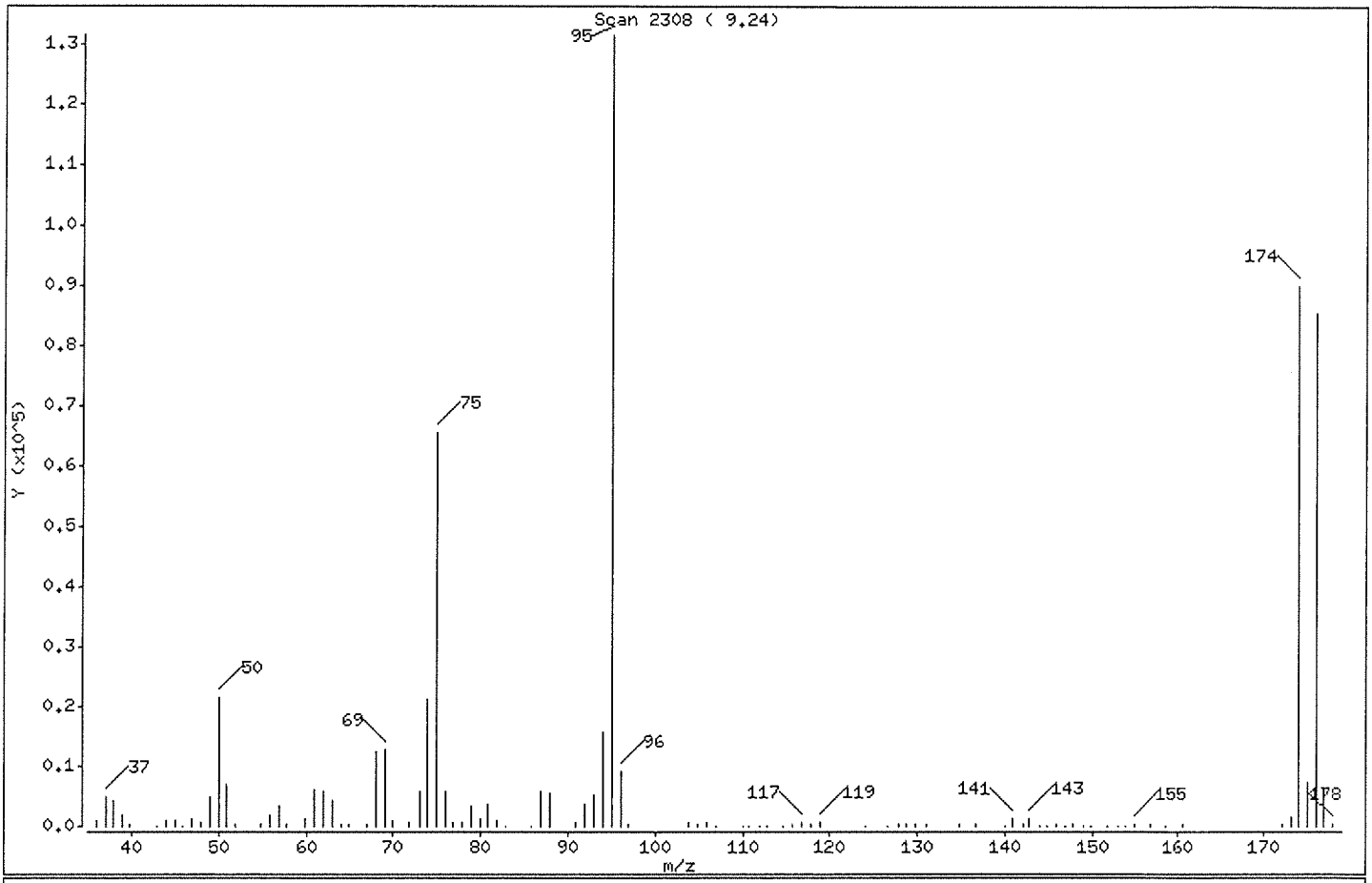
Volume Injected (uL): 2.0

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	16.46
75	30.00 - 60.00% of mass 95	49.76
96	5.00 - 9.00% of mass 95	6.97
173	Less than 2.00% of mass 174	1.11 (1.62)
174	Greater than 50.00% of mass 95	68.45
175	5.00 - 9.00% of mass 174	5.57 (8.14)
176	95.00 - 101.00% of mass 174	65.04 (95.01)
177	5.00 - 9.00% of mass 176	4.64 (7.13)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120901.D

Date : 09-DEC-2021 10:37

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: U120901.D
Spectrum: Scan 2308 (9.24)
Location of Maximum: 95.00
Number of points: 98

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	903	67.10	343	97.00	251	142.80	1227
37.00	4868	68.00	12303	103.80	534	143.90	84
38.00	4187	69.00	12761	104.80	234	144.80	135
39.00	1671	70.00	1057	105.80	509	145.80	191
39.90	219	71.90	699	106.90	122	146.80	53
43.00	60	73.00	5727	110.00	57	147.80	365
44.00	775	74.00	21336	110.70	95	148.90	57
45.00	988	75.00	65408	111.90	94	149.90	124
45.90	101	76.00	5666	112.90	95	151.70	83
47.00	1353	76.80	614	114.70	119	152.90	119
47.90	713	77.90	589	115.80	442	153.90	67
49.00	4743	78.90	3449	116.80	740	154.80	289
50.00	21632	79.90	1103	117.80	417	156.70	190
51.00	6875	80.90	3601	118.90	644	158.70	141
51.90	344	81.90	818	124.00	75	160.70	182
54.90	341	82.80	83	126.60	55	160.80	178
56.00	1685	85.80	146	127.90	436	172.00	305
56.90	3252	86.90	5688	128.80	156	173.00	1459
57.90	154	87.90	5448	129.80	441	173.90	89984
59.90	1092	90.90	469	130.90	166	174.90	7321
61.00	6117	91.90	3588	134.80	244	175.90	85496
62.00	5717	93.00	5169	136.70	269	176.90	6096
63.00	4305	94.00	15679	140.00	124	177.90	189
64.00	411	95.00	131456	140.90	1255		
65.00	273	96.00	9163	142.00	216		

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120903.D
Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 09-DEC-2021 11:21
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:50 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

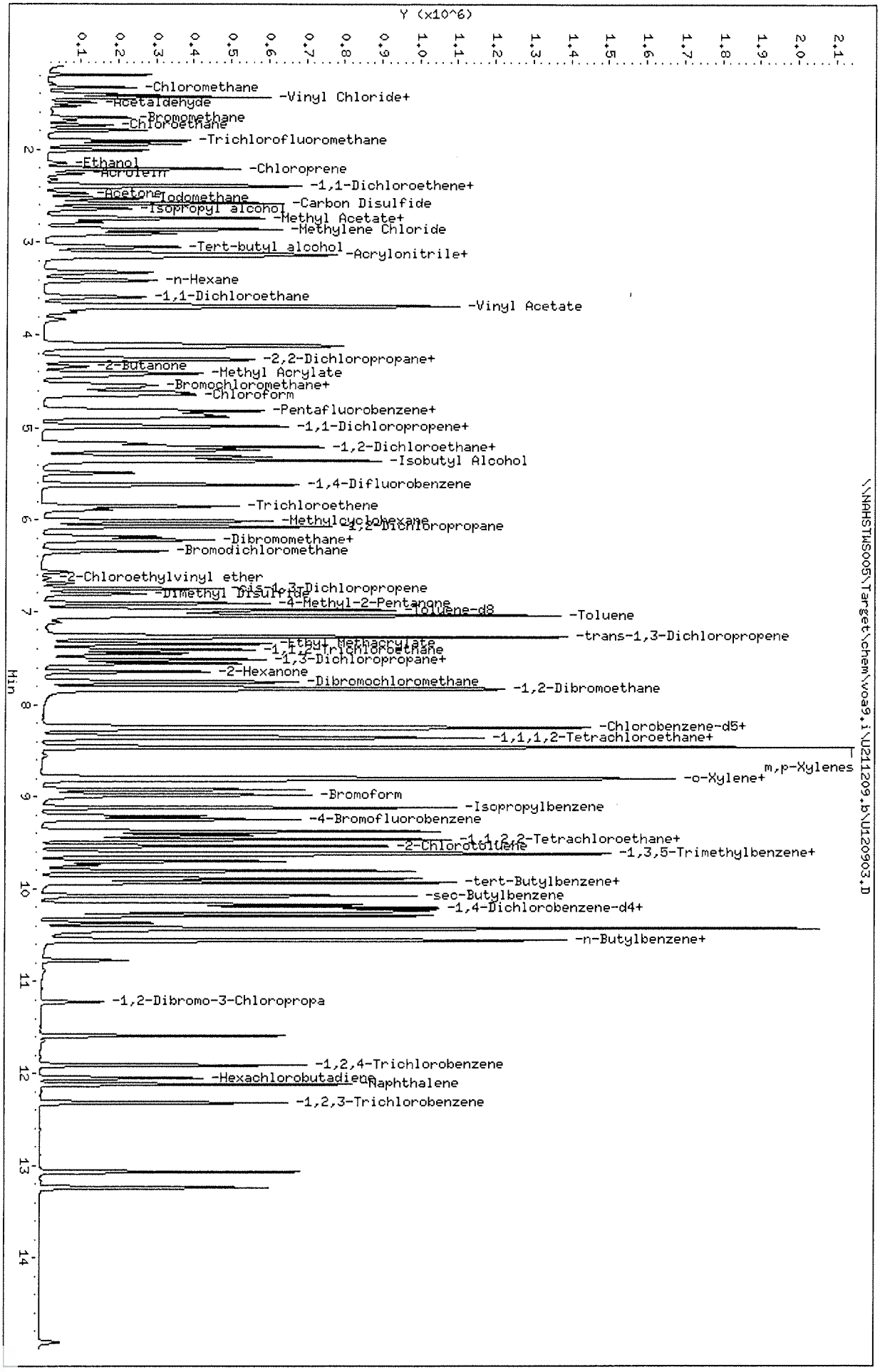
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.883	4.883	(1.000)	271086	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	488029	50.0000	
*	47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	441603	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	216189	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.819	(0.987)	146012	50.0000	51.33
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	173839	50.0000	52.34
$	48 Toluene-d8	98	6.978	6.978	(0.847)	540082	50.0000	46.99
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	210587	50.0000	49.07
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	142990	50.0000	46.76
	31 1,1,1-Trichloroethane	97	4.811	4.811	(0.985)	214522	50.0000	54.97
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	233568	50.0000	51.33
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	134342	50.0000	51.62
	22 1,1-Dichloroethane	63	3.589	3.589	(0.735)	269594	50.0000	55.97
	11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	128566	50.0000	53.19
	32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	211258	50.0000	52.71
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	175699	50.0000	45.38
	71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	236636	50.0000	52.96
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	184701	50.0000	46.41
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	559025	50.0000	51.57
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	30706	50.0000	41.24
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	159553	50.0000	50.47
	88 1,2-Dichlorobenzene	146	10.558	10.558	(1.033)	294098	50.0000	48.24

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120903.D Page 2
Report Date: 03-Jan-2022 09:50

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.243	5.243	(0.934)	221869	50.0000	50.39
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	163704	50.0000	53.30
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	538107	50.0000	50.62
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	298990	50.0000	48.01
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	286490	50.0000	51.66
84	1,4-Dichlorobenzene	146	10.243	10.243	(1.002)	306780	50.0000	47.88
26	2,2-Dichloropropane	77	4.260	4.260	(0.873)	159119	50.0000	58.29
24	2-Butanone	43	4.343	4.343	(0.889)	142867	100.000	100.78
76	2-Chlorotoluene	91	9.539	9.539	(0.933)	479924	50.0000	51.55
52	2-Hexanone	43	7.645	7.645	(0.928)	224737	100.000	107.20
77	4-Chlorotoluene	91	9.629	9.629	(0.942)	563205	50.0000	52.20
82	p-Isopropyltoluene	119	10.198	10.198	(0.997)	535133	50.0000	50.79
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	320523	100.000	100.78
10	Acetone	43	2.469	2.469	(0.506)	105347	100.000	112.11
37	Benzene	78	5.205	5.205	(0.927)	635218	50.0000	51.47
74	Bromobenzene	156	9.374	9.374	(0.917)	164546	50.0000	49.08
29	Bromochloromethane	128	4.542	4.542	(0.930)	80989	50.0000	52.96
39	Bromodichloromethane	83	6.337	6.337	(1.129)	188358	50.0000	47.48
66	Bromoform	173	8.972	8.972	(1.089)	84984	50.0000	41.31
6	Bromomethane	94	1.655	1.655	(0.339)	102289	50.0000	61.35
19	Carbon Disulfide	76	2.577	2.577	(0.528)	755678	100.000	112.65
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	181424	50.0000	46.86
59	Chlorobenzene	112	8.264	8.264	(1.003)	413241	50.0000	48.00
7	Chloroethane	64	1.738	1.738	(0.356)	126483	50.0000	56.38
28	Chloroform	83	4.643	4.643	(0.951)	285016	50.0000	54.58
3	Chloromethane	50	1.329	1.329	(0.272)	150928	50.0000	55.94
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	175049	50.0000	52.85
46	cis-1,3-Dichloropropene	75	6.750	6.750	(1.202)	246440	50.0000	47.98
55	Dibromochloromethane	129	7.747	7.747	(0.940)	147471	50.0000	44.50
44	Dibromomethane	93	6.180	6.180	(1.101)	106558	50.0000	50.87
2	Dichlorodifluoromethane	85	1.194	1.194	(0.245)	153042	50.0000	47.26
61	Ethylbenzene	106	8.361	8.361	(1.015)	213711	50.0000	49.60
91	Hexachlorobutadiene	225	12.050	12.050	(1.179)	72617	50.0000	49.37
67	Isopropylbenzene	105	9.115	9.115	(1.106)	650016	50.0000	50.10
62	m,p-Xylenes	106	8.463	8.463	(1.027)	540688	100.000	101.56
17	Methylene Chloride	84	2.855	2.855	(0.585)	159149	50.0000	49.81
87	n-Butylbenzene	91	10.547	10.547	(1.032)	495337	50.0000	52.43
73	n-Propylbenzene	91	9.464	9.464	(0.926)	784719	50.0000	53.44
92	Naphthalene	128	12.121	12.121	(1.186)	560228	50.0000	47.03
63	o-Xylene	106	8.800	8.800	(1.068)	263342	50.0000	49.94
81	sec-Butylbenzene	105	10.075	10.075	(0.985)	615273	50.0000	51.00
64	Styrene	104	8.815	8.815	(1.070)	470505	50.0000	51.96
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	441197	50.0000	49.24
56	Tetrachloroethene	164	7.514	7.514	(0.912)	113031	50.0000	45.38
50	Toluene	91	7.038	7.038	(0.854)	663407	50.0000	50.21
20	trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	144381	50.0000	52.95
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	205897	50.0000	46.83
38	Trichloroethene	130	5.850	5.850	(1.042)	154712	50.0000	48.52
8	Trichlorofluoromethane	101	1.940	1.940	(0.397)	240749	50.0000	55.06
5	Vinyl Chloride	62	1.408	1.408	(0.288)	179437	50.0000	54.73



Data File: \\NAHSTWS005\Target\chem\voa9,i\U211209,b\U120903.D
Date : 09-DEC-2021 11:21
Client ID: CCV
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\U211209.b\U120905.D Page 1
Report Date: 03-Jan-2022 09:50

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Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120905.D
Lab Smp Id: VLCSW-211209 Client Smp ID: VLSCW-211209
Inj Date : 09-DEC-2021 12:05
Operator : PC Inst ID: VOA9.i
Smp Info : VLCSW-211209;VLSCW-211209;3;;LCS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:50 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

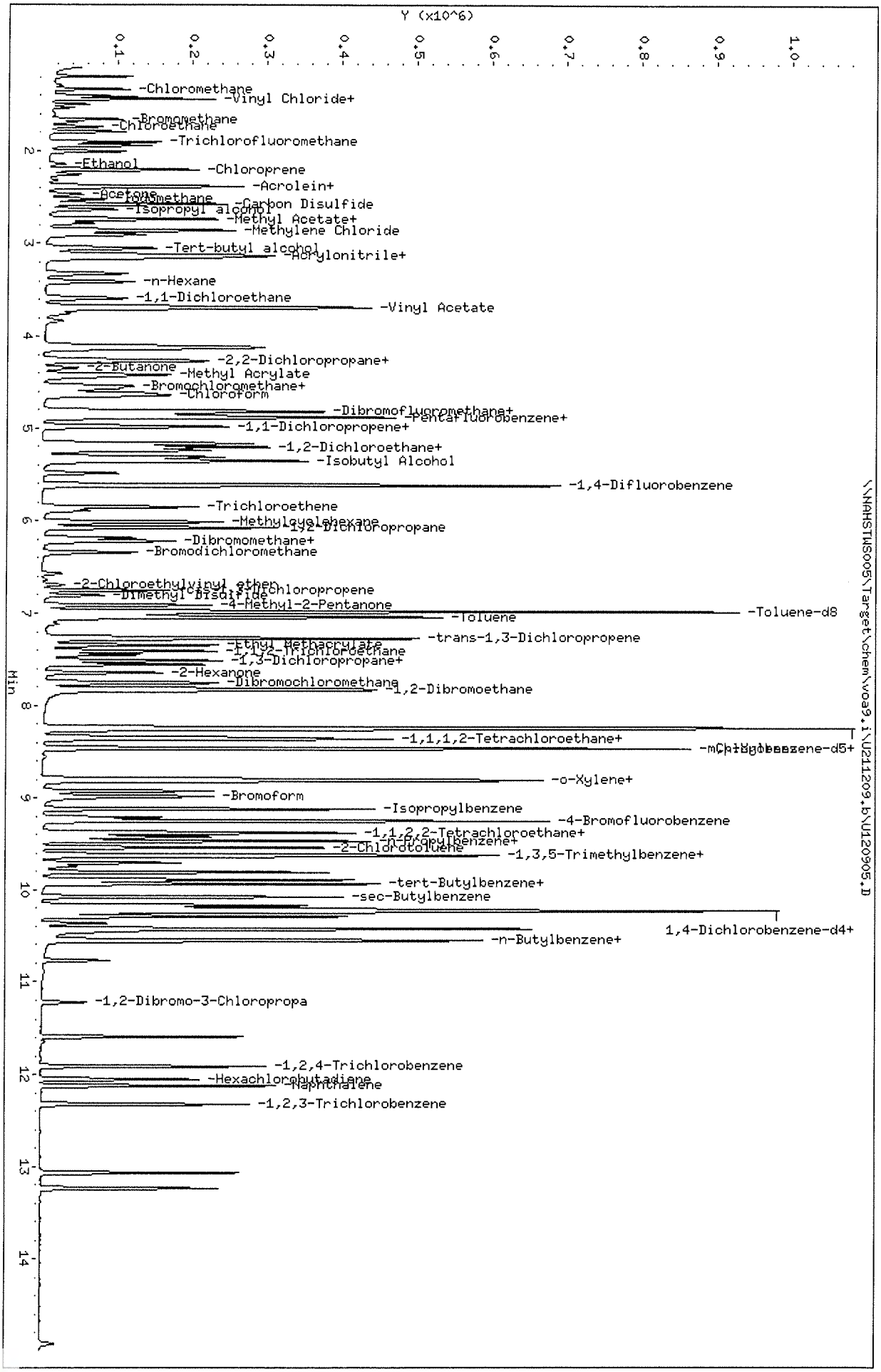
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.883	4.883	(1.000)	274359	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	493291	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	445343	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.225	(1.000)	217608	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	145174	50.4184	50.41
$ 35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	179354	53.3856	53.38
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	541048	46.6794	46.67
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	208954	48.2618	48.26
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	55048	18.3609	18.36
31 1,1,1-Trichloroethane	97	4.811	4.811	(0.985)	81101	20.5345	20.53
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	95172	20.7791	20.77
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	53918	20.5465	20.54
22 1,1-Dichloroethane	63	3.586	3.589	(0.734)	108146	22.1875	22.18
11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	50269	20.5507	20.55
32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	81452	20.1074	20.10
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	74218	19.0450	19.04
71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	89840	19.9776	19.97
90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	78234	19.5329	19.53
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	231626	21.2320	21.23
89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	10849	16.0584	16.05
57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	65446	20.5304	20.53
88 1,2-Dichlorobenzene	146	10.562	10.558	(1.033)	121530	19.8043	19.80

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120905.D Page 2
Report Date: 03-Jan-2022 09:50

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.242	5.243	(0.934)	91430	20.5459	20.54
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	65466	21.0908	21.09
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	221351	20.6893	20.68
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	123279	19.6700	19.66
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	116312	20.8005	20.80
84	1,4-Dichlorobenzene	146	10.243	10.243	(1.002)	128185	19.8767	19.87
26	2,2-Dichloropropane	77	4.257	4.260	(0.872)	57105	20.6721	20.67
24	2-Butanone	43	4.343	4.343	(0.889)	56426	39.3315	39.33
76	2-Chlorotoluene	91	9.538	9.539	(0.933)	193136	20.6111	20.61
52	2-Hexanone	43	7.645	7.645	(0.928)	87255	41.2737	41.27
77	4-Chlorotoluene	91	9.628	9.629	(0.942)	234308	21.5766	21.57
82	p-Isopropyltoluene	119	10.198	10.198	(0.997)	220821	20.8233	20.82
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	124819	38.9168	38.91
10	Acetone	43	2.468	2.469	(0.506)	43842	42.1953	42.19
37	Benzene	78	5.205	5.205	(0.927)	256125	20.5338	20.53
74	Bromobenzene	156	9.373	9.374	(0.917)	65466	19.3996	19.39
29	Bromochloromethane	128	4.541	4.542	(0.930)	32537	21.0248	21.02
39	Bromodichloromethane	83	6.337	6.337	(1.129)	70372	18.2036	18.20
66	Bromoform	173	8.976	8.972	(1.089)	28858	15.0311	15.03
6	Bromomethane	94	1.655	1.655	(0.339)	45133	26.4579	26.45
19	Carbon Disulfide	76	2.573	2.577	(0.527)	287451	42.3404	42.34
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	64719	17.5154	17.51
59	Chlorobenzene	112	8.264	8.264	(1.003)	169372	19.5085	19.50
7	Chloroethane	64	1.737	1.738	(0.356)	53606	23.6126	23.61
28	Chloroform	83	4.643	4.643	(0.951)	116001	21.9501	21.95
3	Chloromethane	50	1.329	1.329	(0.272)	64916	23.4394	23.43
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	70071	20.9043	20.90
46	cis-1,3-Dichloropropene	75	6.749	6.750	(1.202)	87435	17.9734	17.97
55	Dibromochloromethane	129	7.747	7.747	(0.940)	52840	16.7799	16.77
44	Dibromomethane	93	6.180	6.180	(1.101)	42456	20.0544	20.05
2	Dichlorodifluoromethane	85	1.194	1.194	(0.245)	57933	17.2312	17.23
61	Ethylbenzene	106	8.361	8.361	(1.015)	86906	20.0008	20.00
91	Hexachlorobutadiene	225	12.050	12.050	(1.179)	34724	23.4572	23.45
67	Isopropylbenzene	105	9.115	9.115	(1.106)	263086	20.1082	20.10
62	m,p-Xylenes	106	8.463	8.463	(1.027)	220057	40.9885	40.98
17	Methylene Chloride	84	2.855	2.855	(0.585)	65266	20.1864	20.18
87	n-Butylbenzene	91	10.547	10.547	(1.032)	212988	22.4001	22.40
73	n-Propylbenzene	91	9.463	9.464	(0.926)	316065	21.3847	21.38
92	Naphthalene	128	12.121	12.121	(1.186)	215550	17.9779	17.97
63	o-Xylene	106	8.800	8.800	(1.068)	106108	19.9545	19.95
81	sec-Butylbenzene	105	10.074	10.075	(0.985)	252207	20.7697	20.76
64	Styrene	104	8.815	8.815	(1.070)	189648	20.7694	20.76
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	182084	20.1898	20.18
56	Tetrachloroethene	164	7.514	7.514	(0.912)	45046	17.9351	17.93
50	Toluene	91	7.038	7.038	(0.854)	268180	20.1289	20.12
20	trans-1,2-Dichloroethene	96	3.124	3.125	(0.640)	57090	20.6898	20.68
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	70812	17.3285	17.32
38	Trichloroethene	130	5.850	5.850	(1.042)	61279	19.0151	19.01
8	Trichlorofluoromethane	101	1.940	1.940	(0.397)	90789	20.5193	20.51
5	Vinyl Chloride	62	1.408	1.408	(0.288)	69034	20.8050	20.80



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Date : 09-DEC-2021 12:05
Client ID: VLSCW-211209
Sample Info: VLCSW-211209;VLSCW-211209;3;LCS
Purge Volume: 5.0
Column phase: DB624

\\NAHSTWS005\Target\chem\voa9,i\U211209,b\U120905,D

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120907.D
Lab Smp Id: VBLKW-211209 Client Smp ID: VBLKW-211209
Inj Date : 09-DEC-2021 12:50
Operator : PC Inst ID: VOA9.i
Smp Info : VBLKW-211209;VBLKW-211209;3;;BLANK
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:50 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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	4.879	4.883	(1.000)	281404	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	485762	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	424661	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	199374	50.0000	
$ 30 Dibromofluoromethane	113	4.815	4.819	(0.987)	146265	49.5104	49.51
$ 35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	180201	52.2642	52.26
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	570192	51.5897	51.58
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	208114	50.4687	50.46

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120907.D

Date : 09-DEC-2021 12:50

Client ID: VBLKW-211209

Instrument: VOA9.i

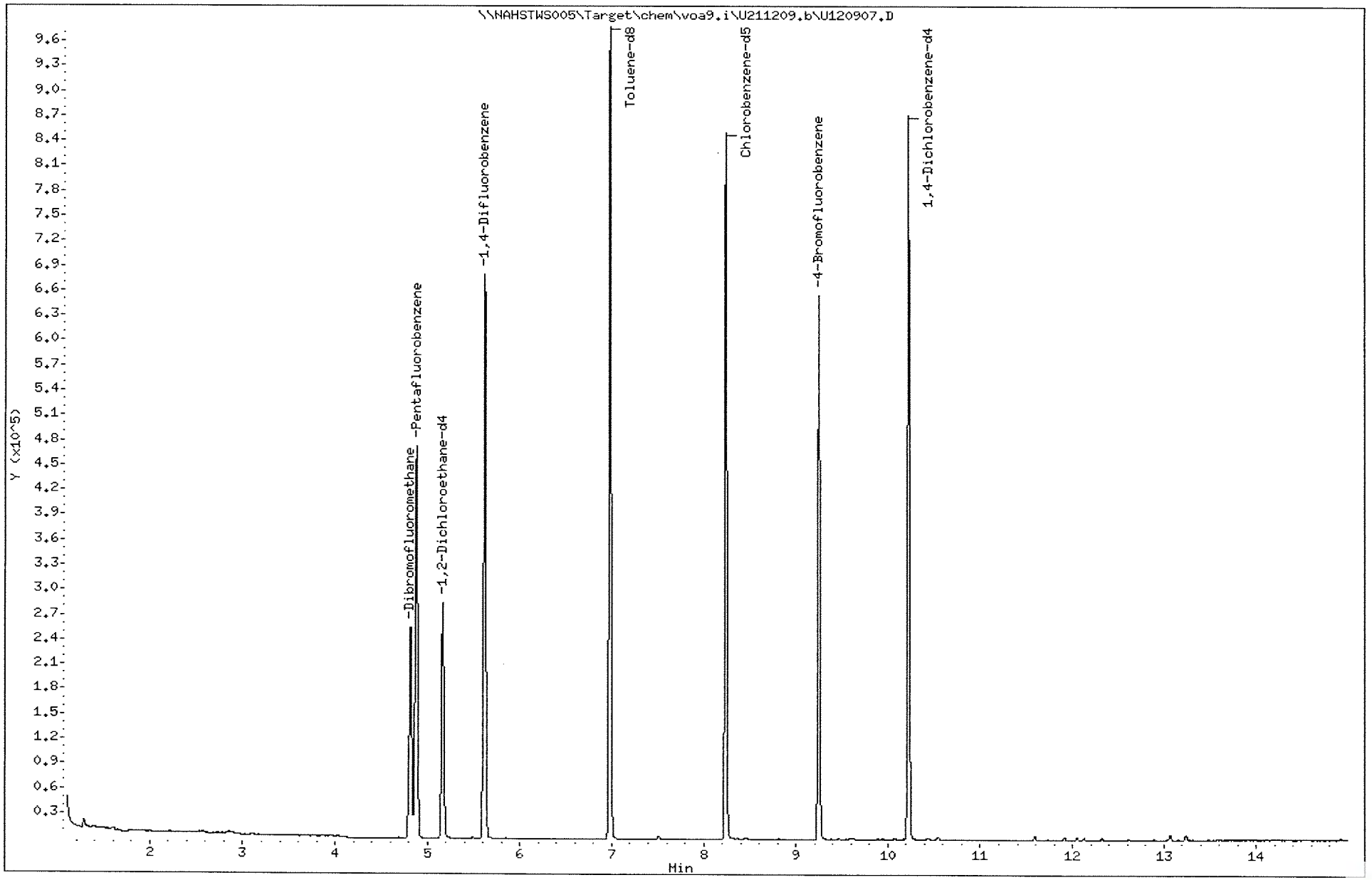
Sample Info: VBLKW-211209;VBLKW-211209;3;;BLANK

Purge Volume: 5.0

Operator: PC

Column phase: DB624

Column diameter: 0.18



ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120908.D
Lab Smp Id: HS21120103-01 Client Smp ID: HS21120103-01
Inj Date : 09-DEC-2021 13:13
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-01;HS21120103-01;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

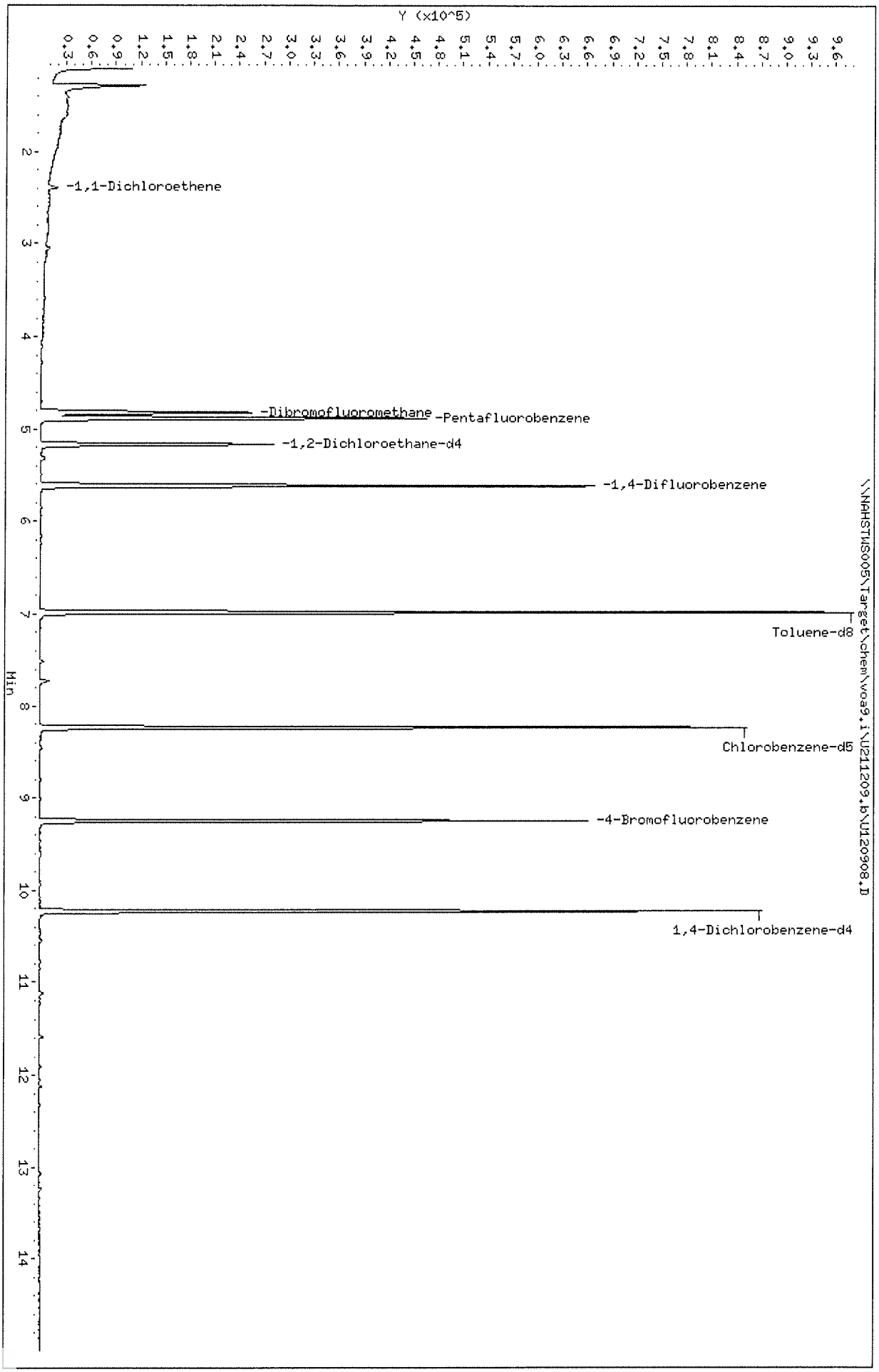
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.883	4.883	(1.000)	278646	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	479759	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	423608	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	198054	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	143705	49.1186	49.11
$ 35 1,2-Dichloroethane-d4	65	5.164	5.168	(1.058)	182302	53.4294	53.42
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	569273	51.6346	51.63
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	210299	51.1428	51.14
11 1,1-Dichloroethene	96	2.390	2.390	(0.490)	3720	1.49740	1.49(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



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Date : 09-DEC-2021 13:13
Client ID: HS21120103-01
Sample Info: HS21120103-01;HS21120103-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120908.D

Date : 09-DEC-2021 13:13

Client ID: HS21120103-01

Instrument: VOA9.i

Sample Info: HS21120103-01;HS21120103-01;;;

Purge Volume: 5.0

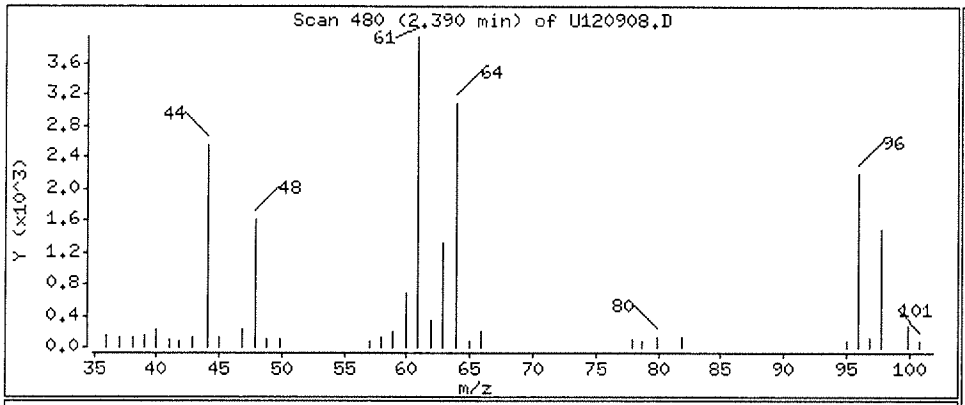
Operator: PC

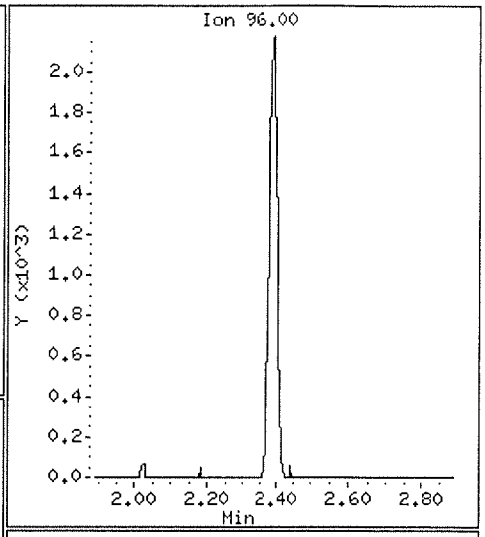
Column phase: DB624

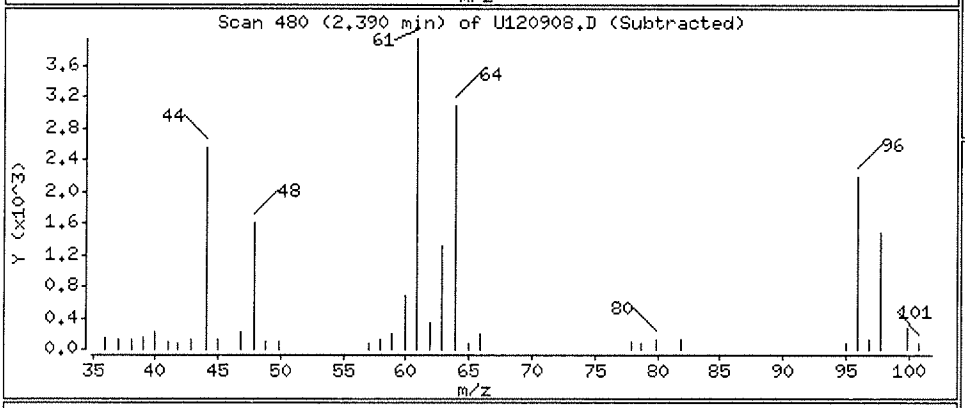
Column diameter: 0.18

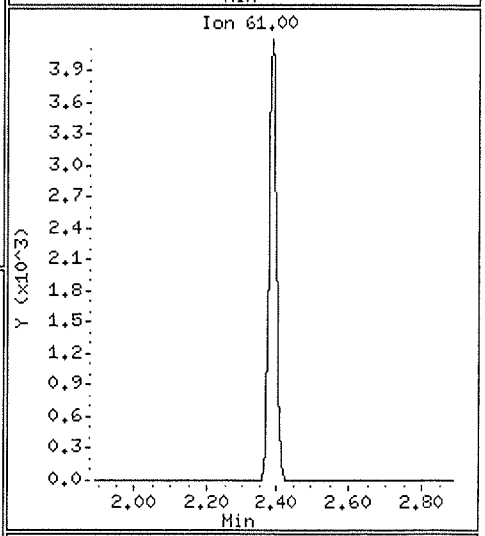
11 1,1-Dichloroethene

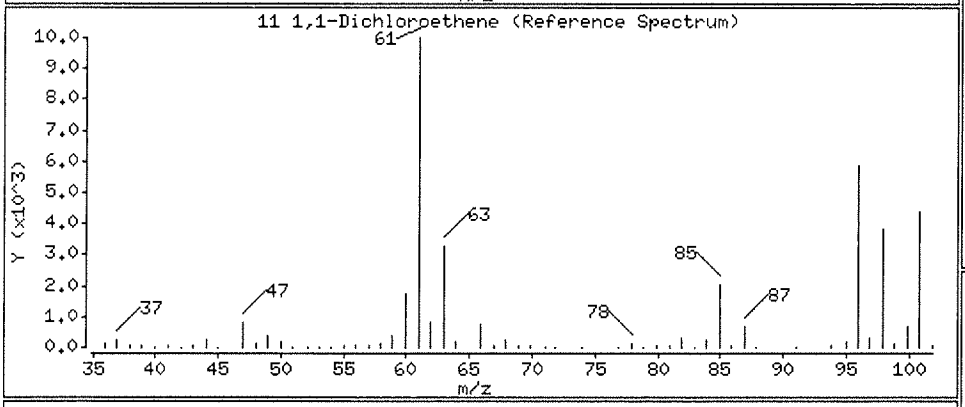
Concentration: 1.49 ug/l

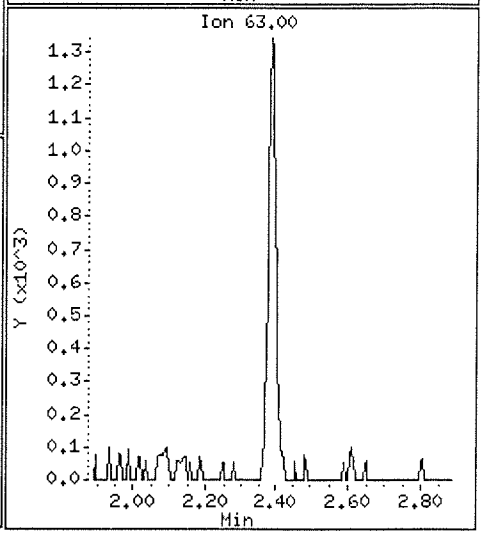


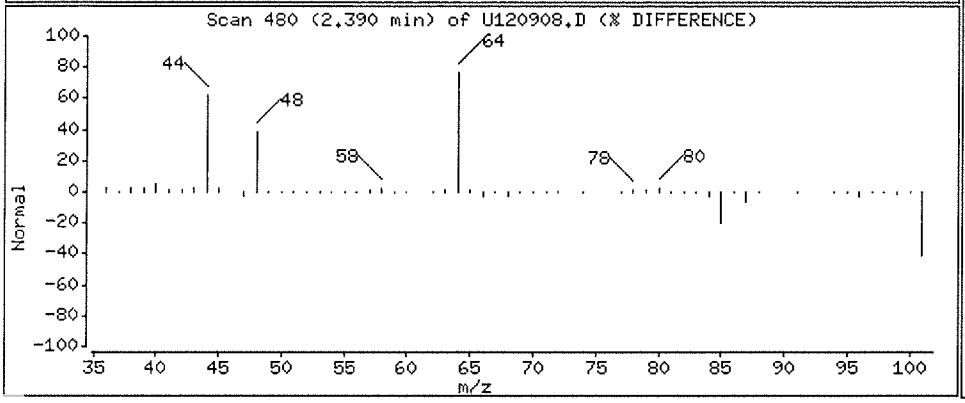












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120909.D
Lab Smp Id: HS21120103-02 Client Smp ID: HS21120103-02
Inj Date : 09-DEC-2021 13:35
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-02;HS21120103-02;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

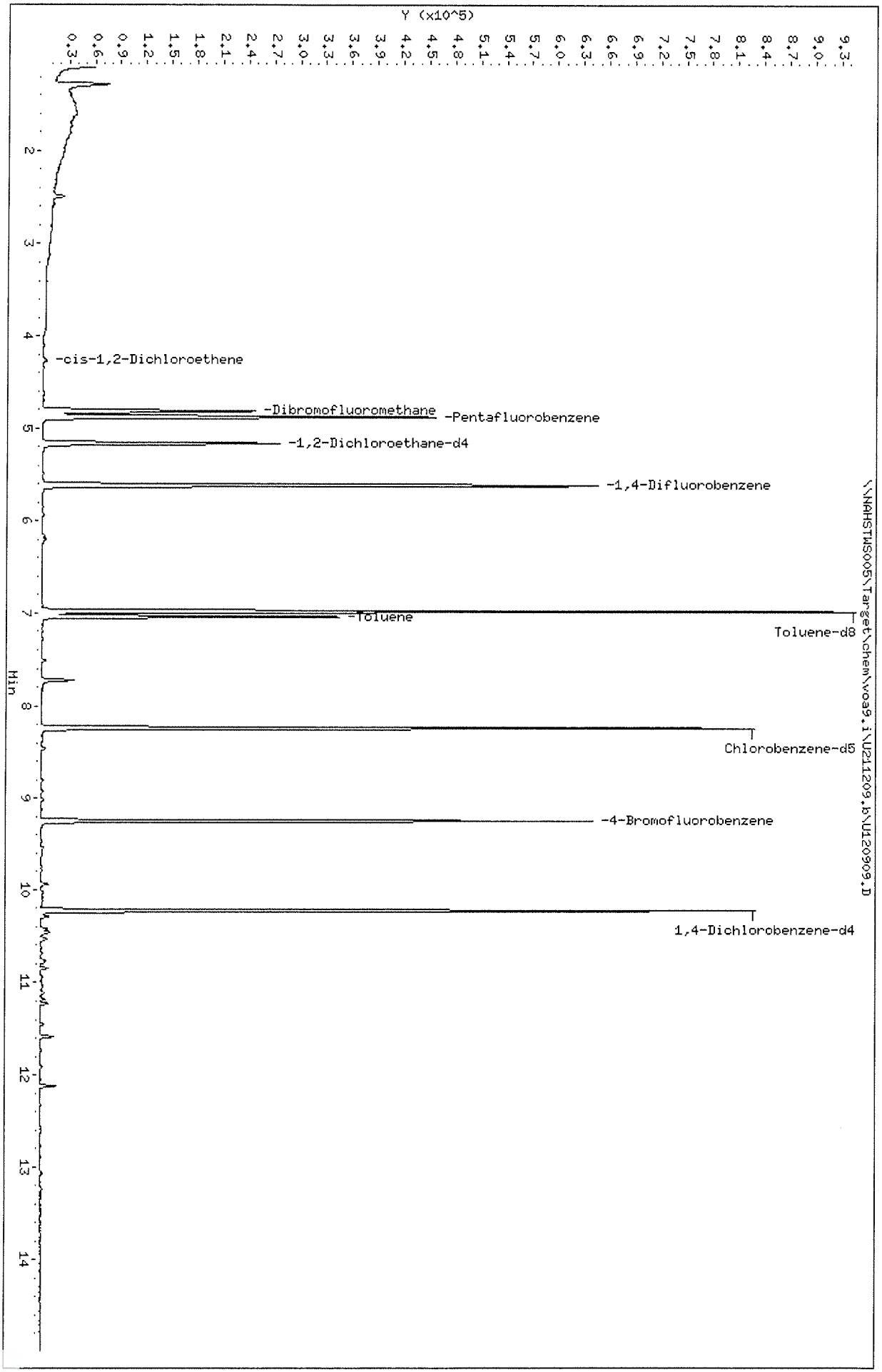
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.879	4.883	(1.000)	273042	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	470027	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	410794	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	191830	50.0000	
$ 30 Dibromofluoromethane	113	4.815	4.819	(0.987)	140727	49.0874	49.08
$ 35 1,2-Dichloroethane-d4	65	5.164	5.168	(1.058)	176090	52.6466	52.64
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	554357	51.8501	51.85
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	201420	50.4949	50.49
27 cis-1,2-Dichloroethene	96	4.268	4.272	(0.875)	2097	0.62862	0.62(a)
50 Toluene	91	7.038	7.038	(0.854)	225791	18.3727	18.37

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120909.D
Date : 09-DEC-2021 13:35
Client ID: HS21120103-02
Sample Info: HS21120103-02;HS21120103-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120909.D

Date : 09-DEC-2021 13:35

Client ID: HS21120103-02

Instrument: VOA9.i

Sample Info: HS21120103-02;HS21120103-02;;;

Purge Volume: 5.0

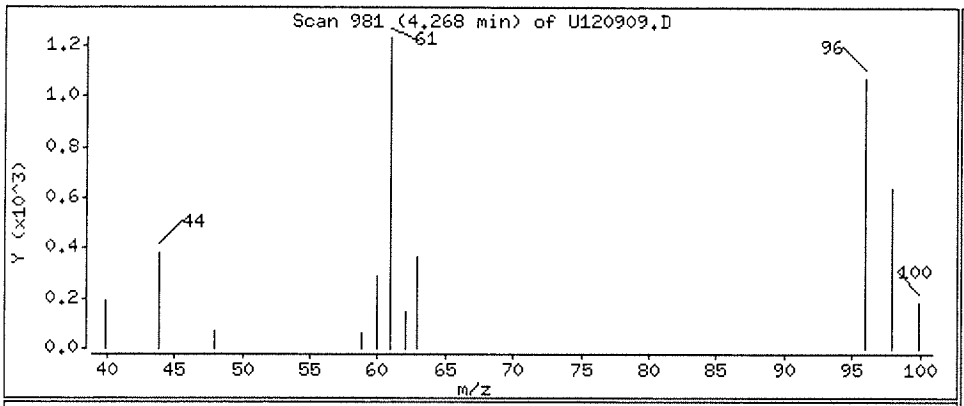
Operator: PC

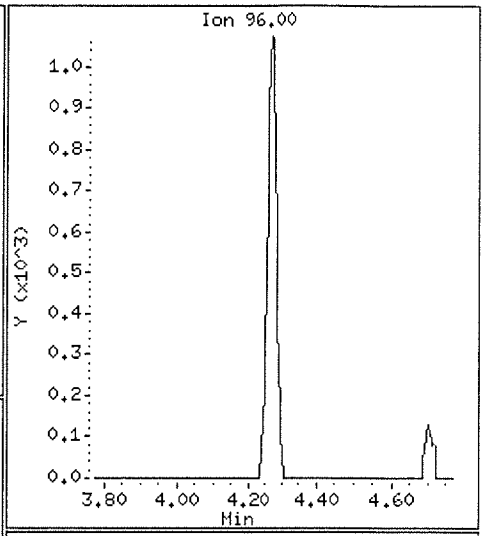
Column phase: DB624

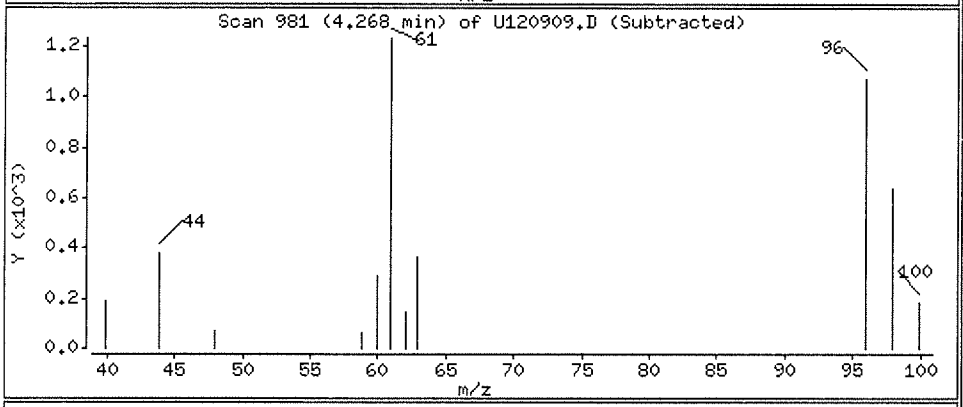
Column diameter: 0.18

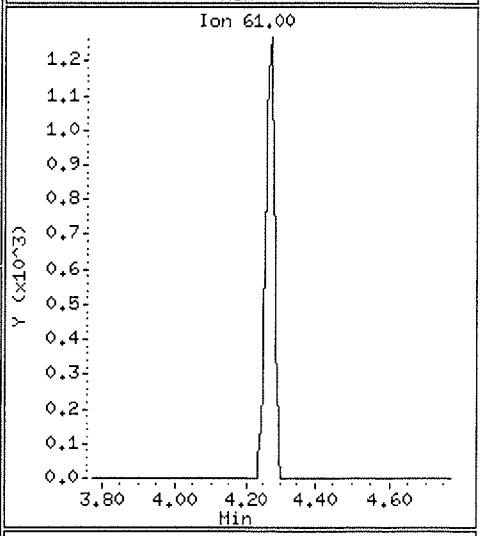
27 cis-1,2-Dichloroethene

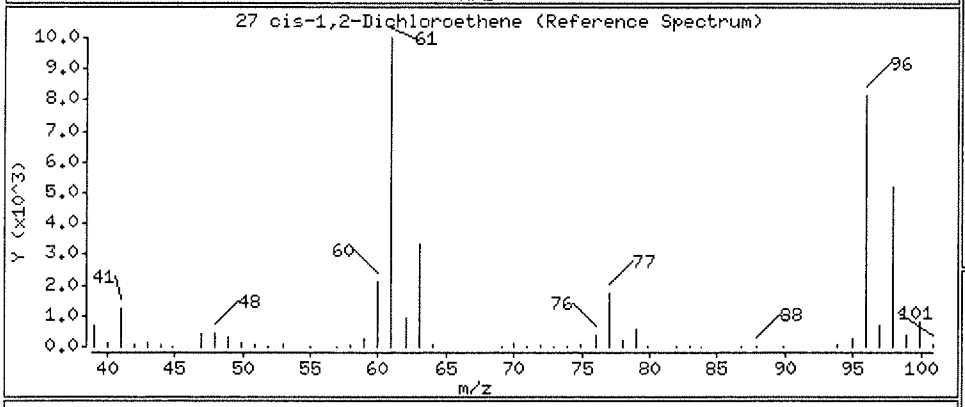
Concentration: 0.62 ug/l

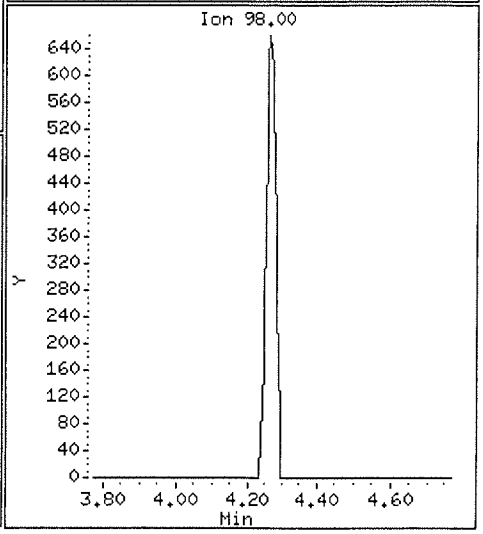


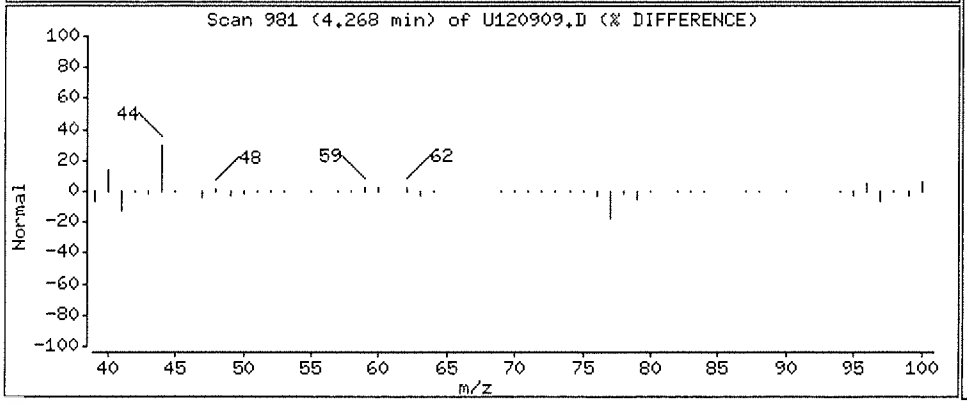












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120909.D

Date : 09-DEC-2021 13:35

Client ID: HS21120103-02

Instrument: VOA9.i

Sample Info: HS21120103-02;HS21120103-02;;;

Purge Volume: 5.0

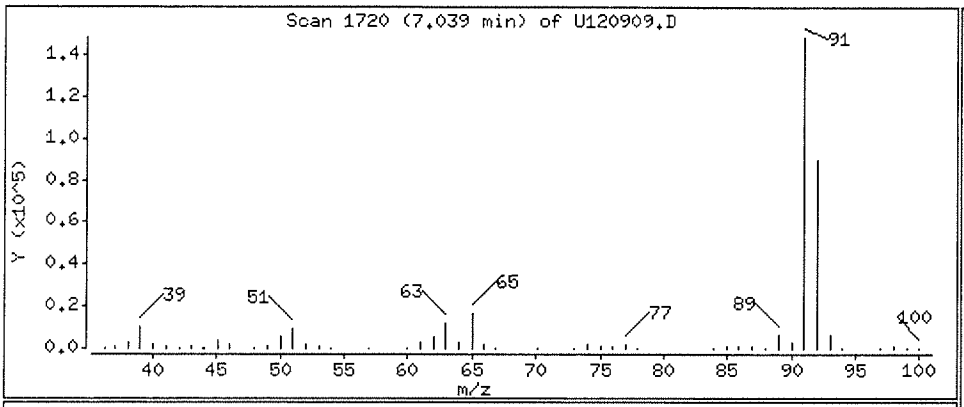
Operator: PC

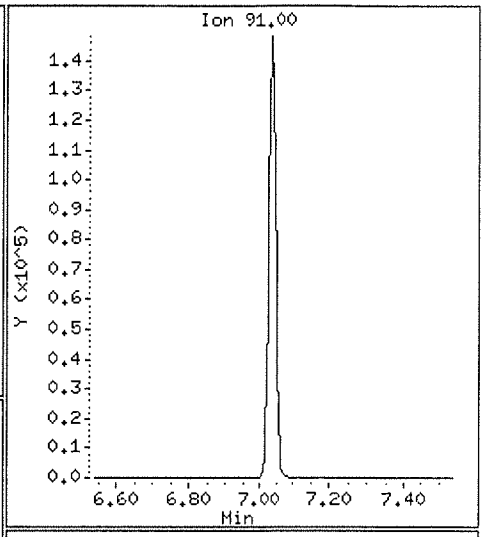
Column phase: DB624

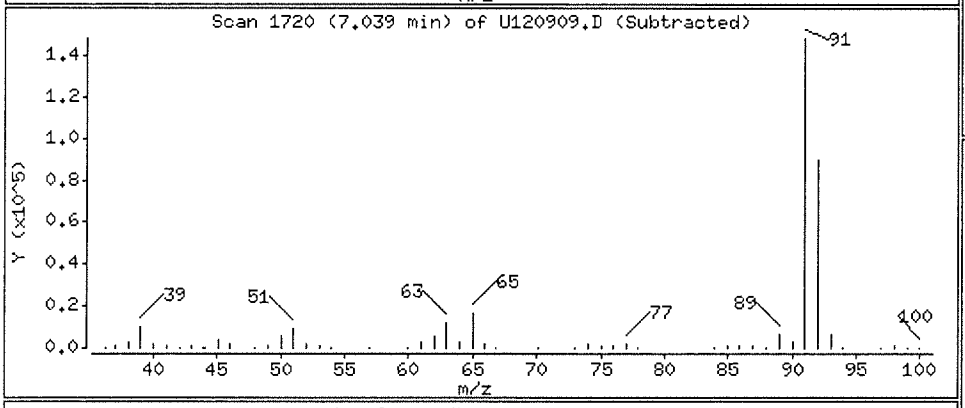
Column diameter: 0.18

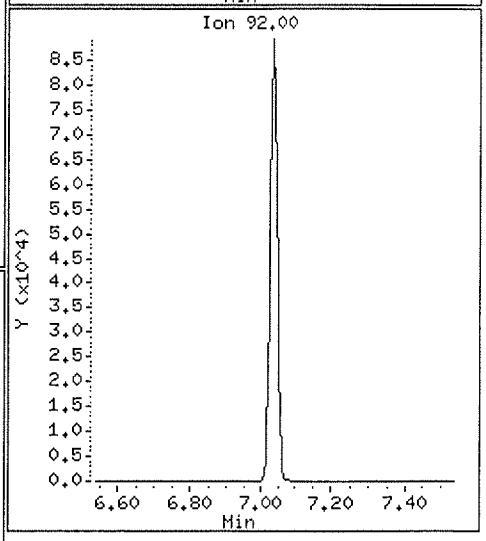
50 Toluene

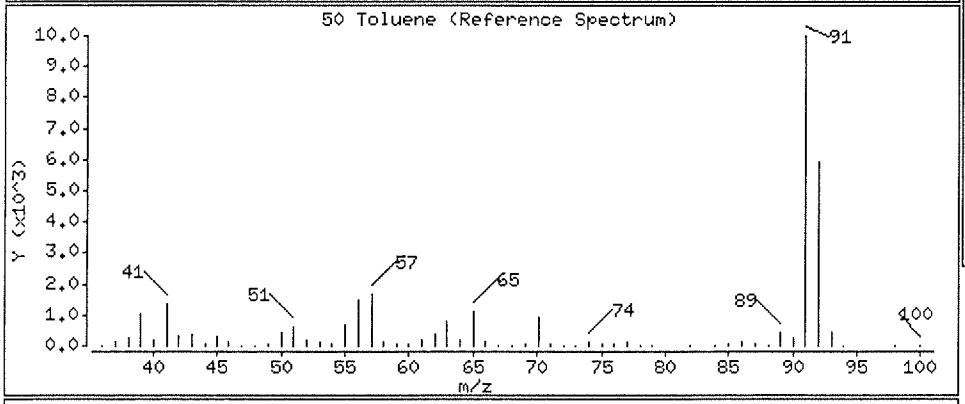
Concentration: 18.37 ug/l

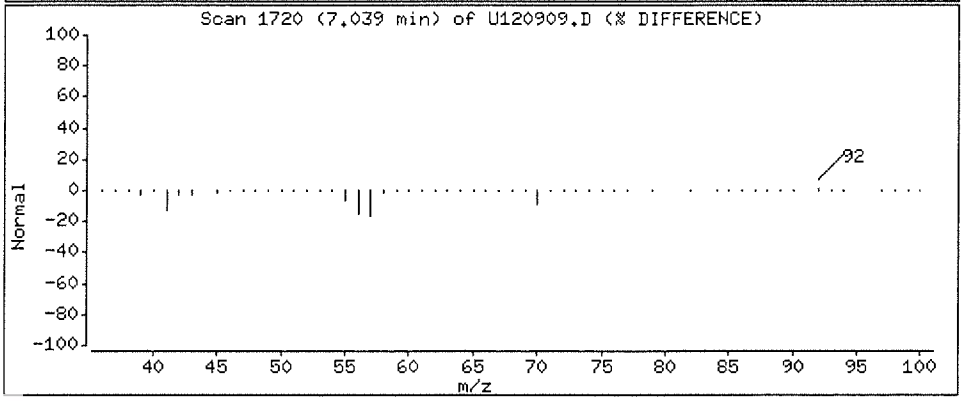












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D
Lab Smp Id: HS21120103-05 Client Smp ID: HS21120103-05
Inj Date : 09-DEC-2021 13:57
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-05;HS21120103-05;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

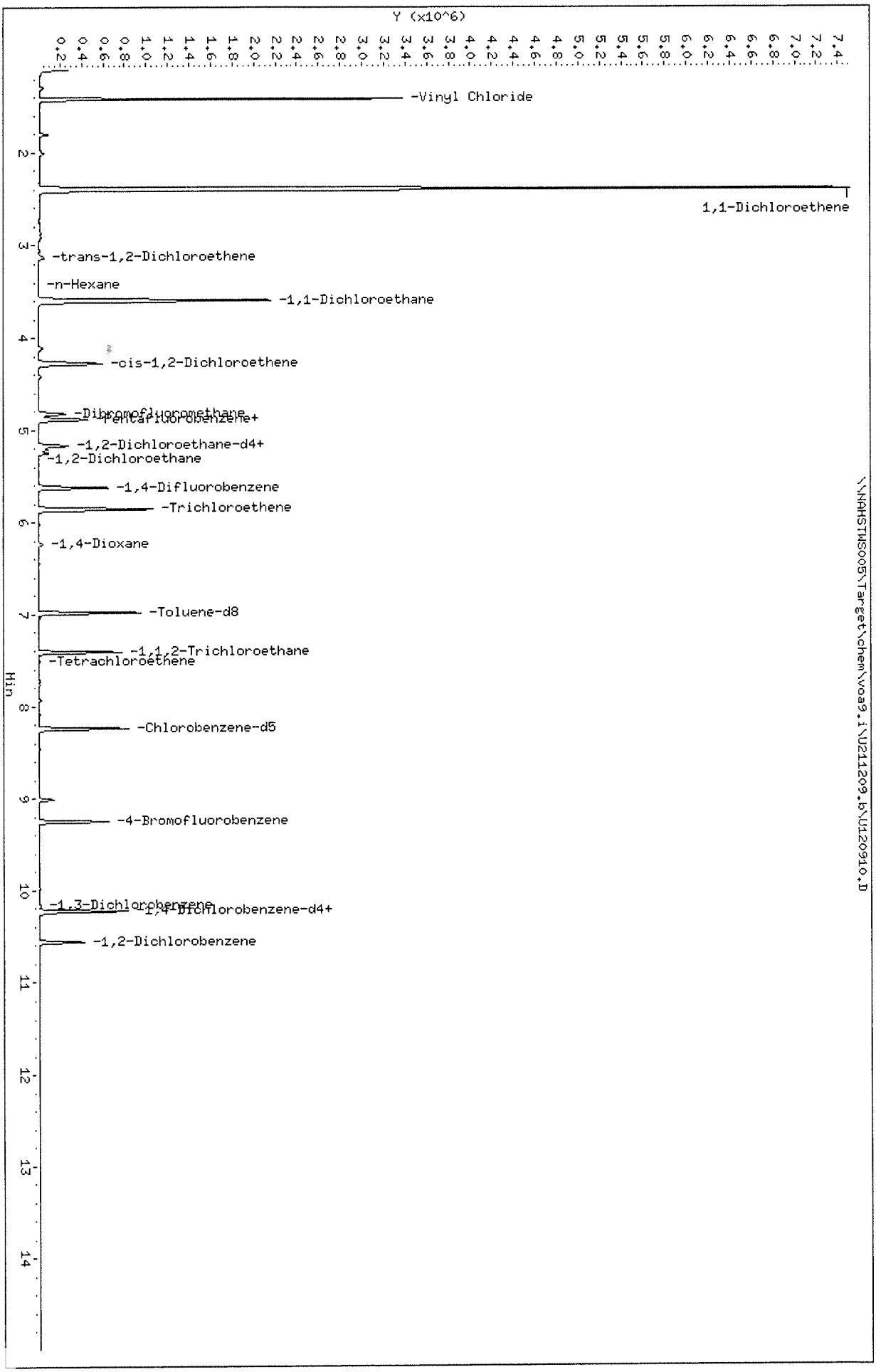
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.886	4.883	(1.000)	267764	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.614	(1.000)	460998	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	408188	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	190796	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.819	(0.987)	141426	50.3249	50.32
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	173831	53.0056	53.00
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	546333	51.4259	51.42
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	200394	50.5601	50.56
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	180458	75.0266	75.02
22 1,1-Dichloroethane	63	3.593	3.589	(0.735)	2136085	449.038	449.03(A)
11 1,1-Dichloroethene	96	2.394	2.390	(0.490)	2402718	1006.46	1006.46(A)
88 1,2-Dichlorobenzene	146	10.562	10.558	(1.033)	148224	27.5487	27.54
33 1,2-Dichloroethane	62	5.246	5.243	(0.934)	60181	14.4710	14.47
83 1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	6013	1.09424	1.09(a)
84 1,4-Dichlorobenzene	146	10.247	10.243	(1.002)	25725	4.54955	4.54(a)
37 Benzene	78	5.209	5.205	(0.927)	67351	5.77783	5.77
27 cis-1,2-Dichloroethene	96	4.275	4.272	(0.875)	280526	85.7506	85.75
56 Tetrachloroethene	164	7.514	7.514	(0.912)	1513	0.65724	0.65(a)
20 trans-1,2-Dichloroethene	96	3.132	3.125	(0.641)	13257	4.92275	4.92(a)
38 Trichloroethene	130	5.854	5.850	(1.042)	315820	104.865	104.86
5 Vinyl Chloride	62	1.415	1.412	(0.290)	2065954	637.960	637.95(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\U211209.b\U120910.D
Date : 09-DEC-2021 13:57
Client ID: HS21120103-05
Sample Info: HS21120103-05;HS21120103-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

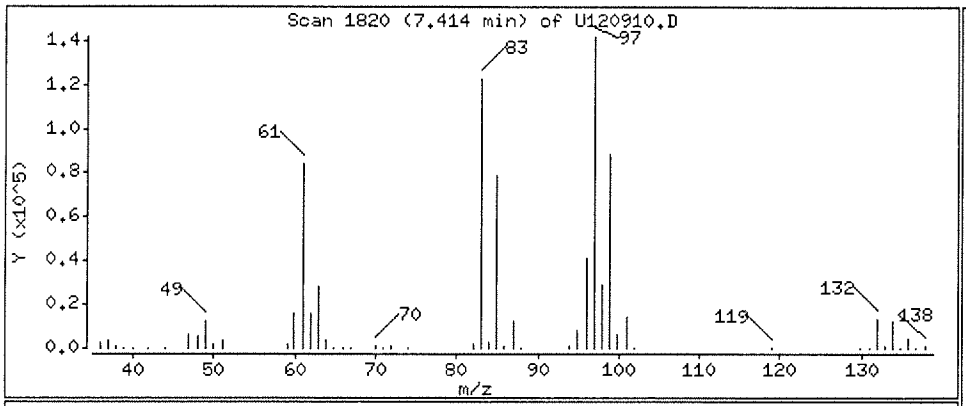
Operator: PC

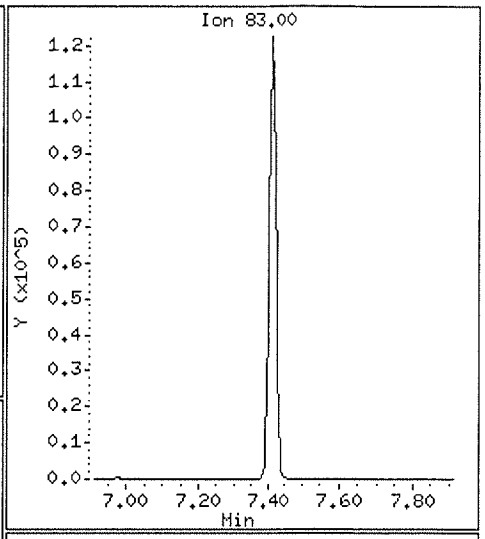
Column phase: DB624

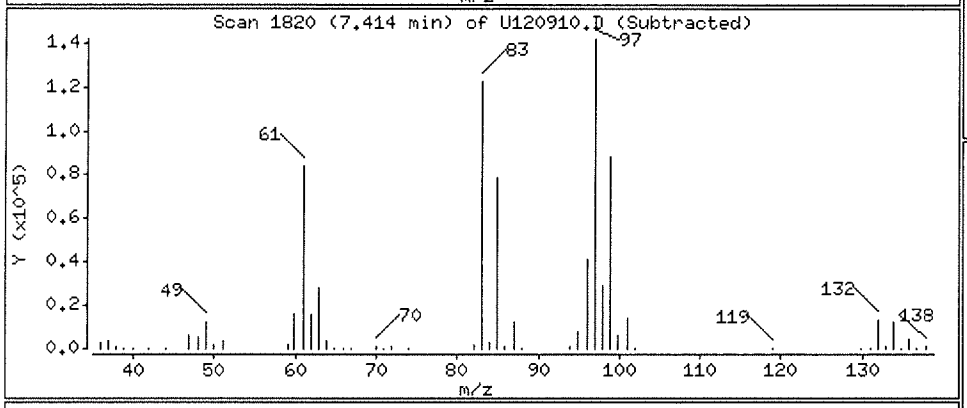
Column diameter: 0.18

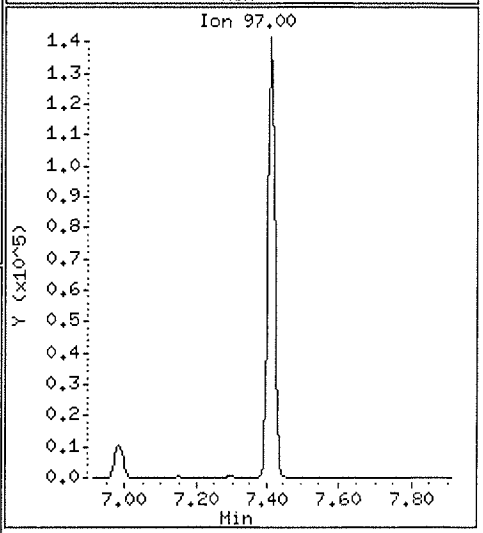
53 1,1,2-Trichloroethane

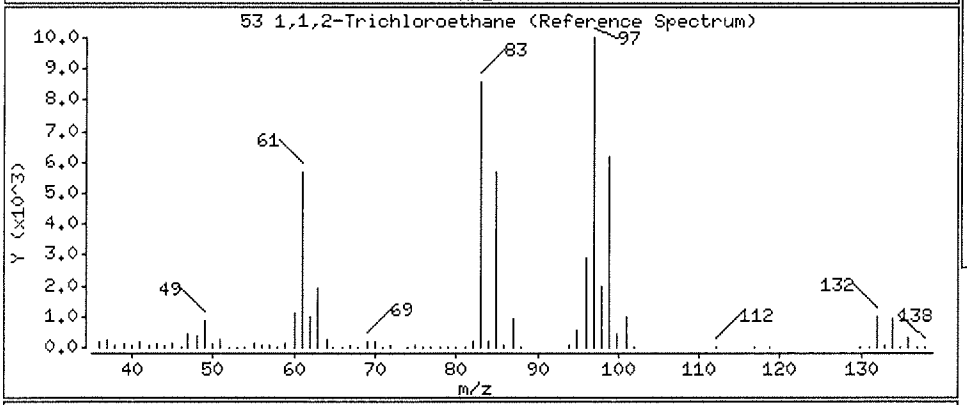
Concentration: 75.02 ug/l

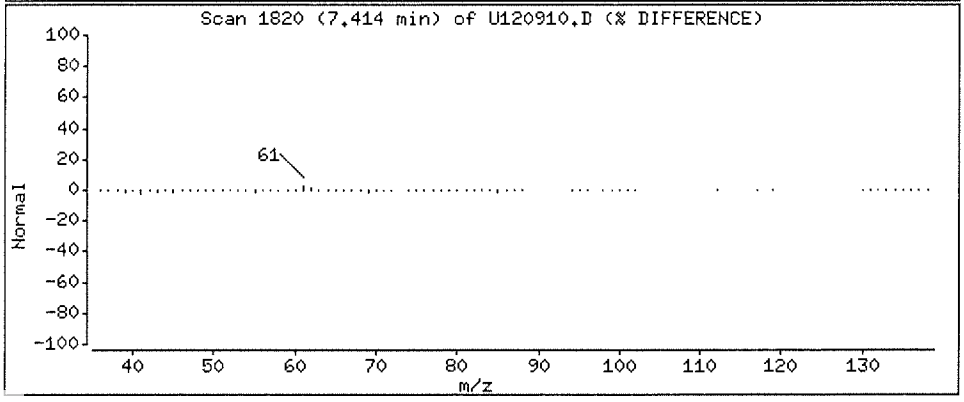












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

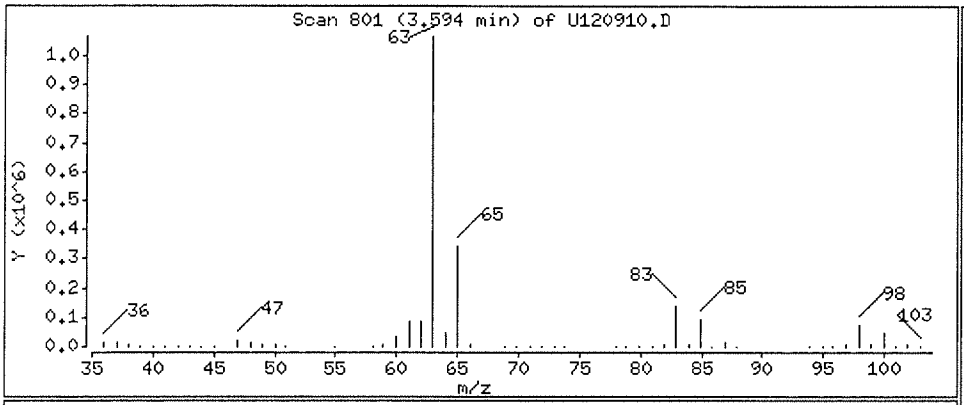
Operator: PC

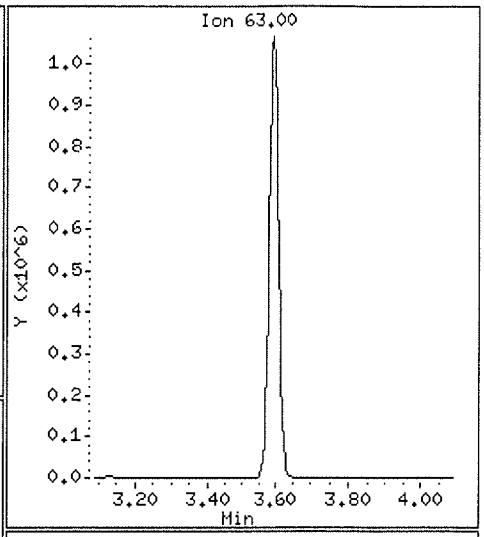
Column phase: DB624

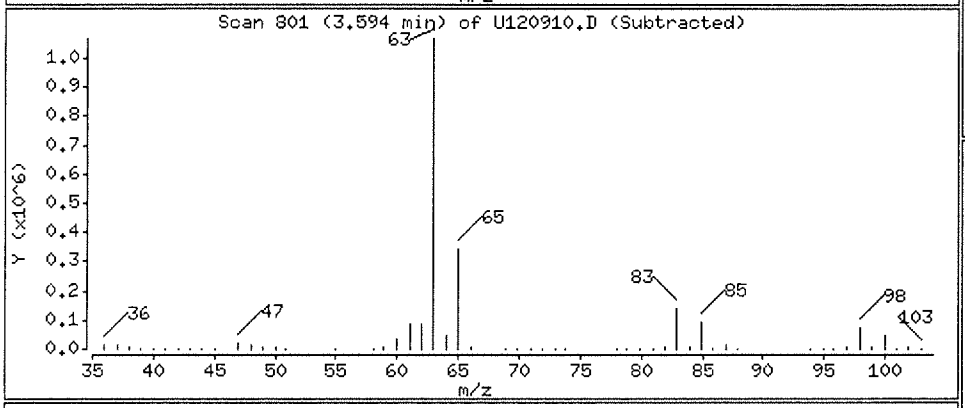
Column diameter: 0.18

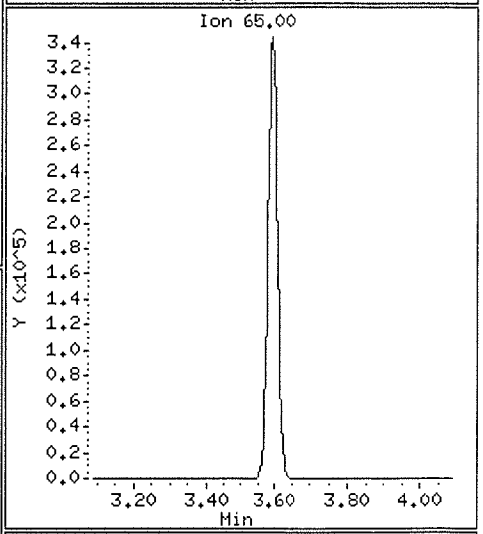
22 1,1-Dichloroethane

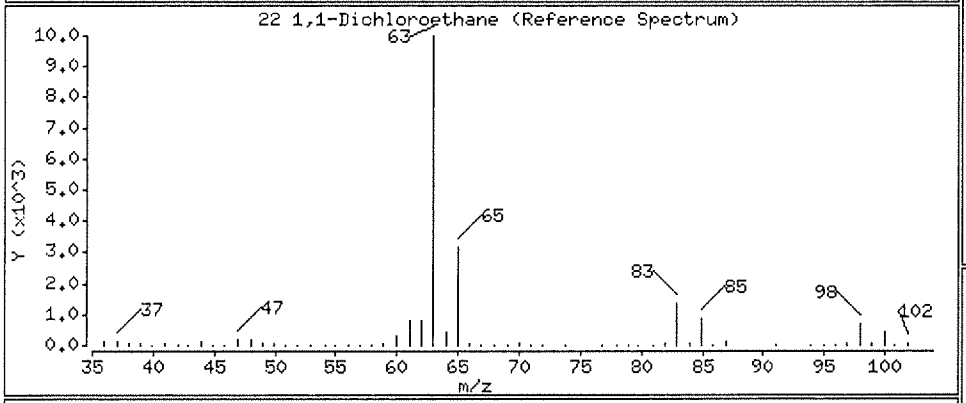
Concentration: 449.03 ug/l

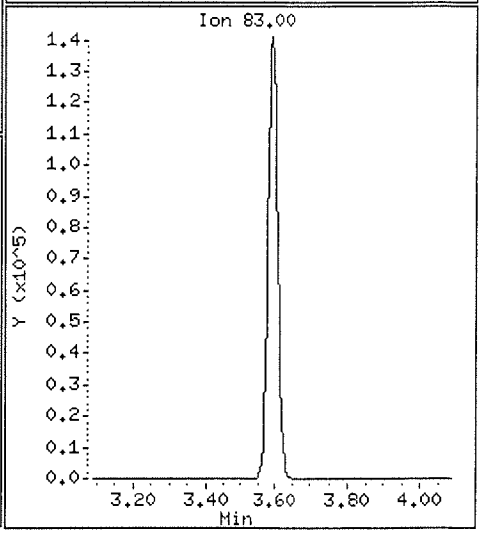


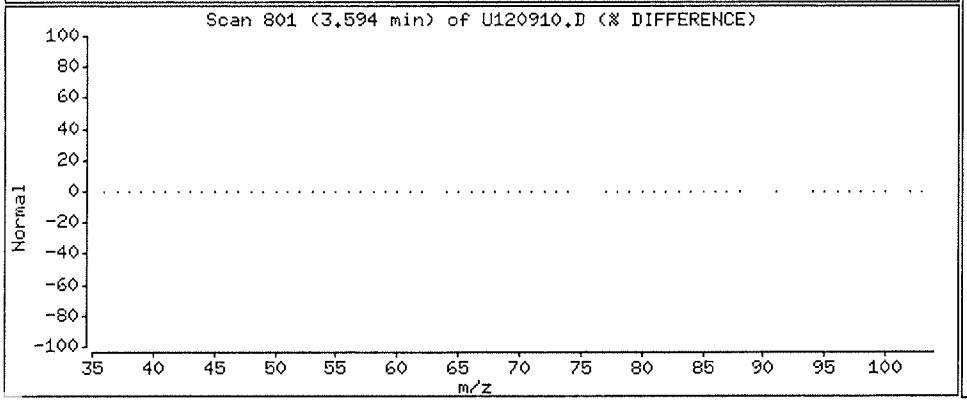












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

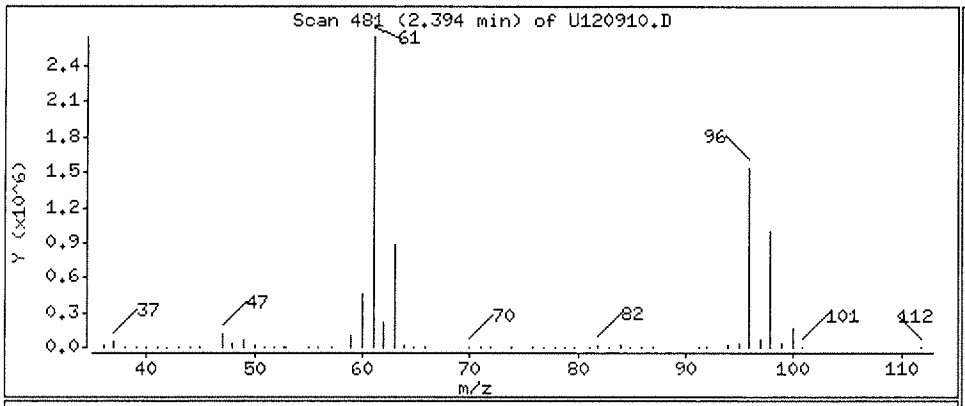
Operator: PC

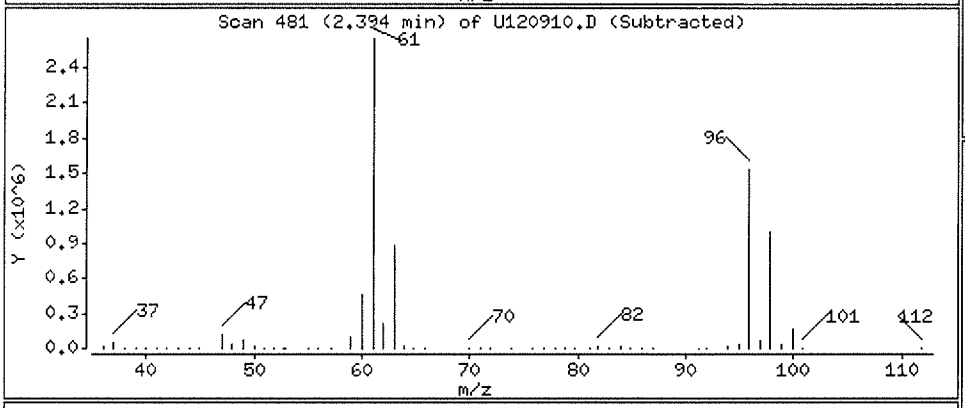
Column phase: DB624

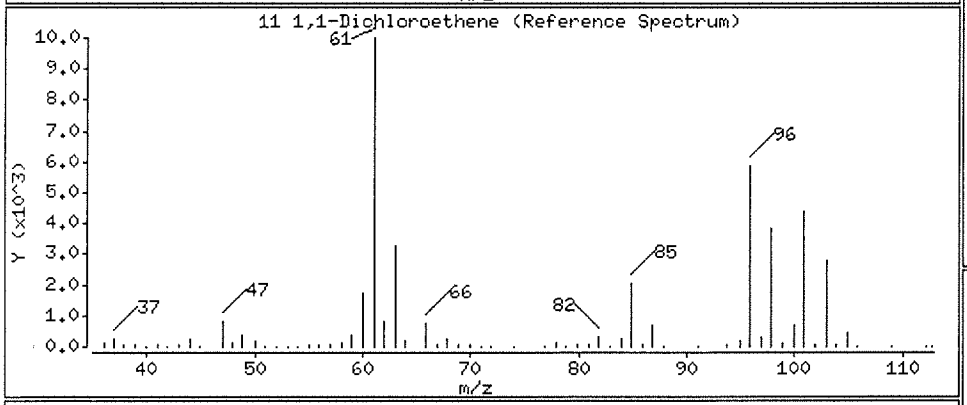
Column diameter: 0.18

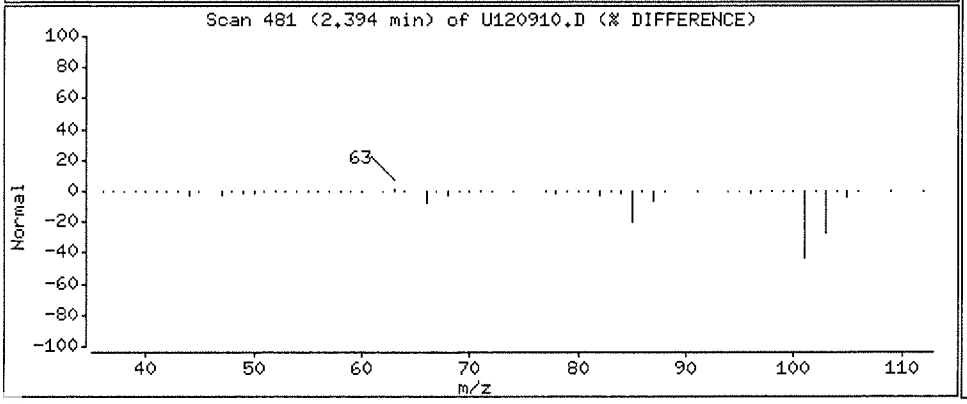
11 1,1-Dichloroethene

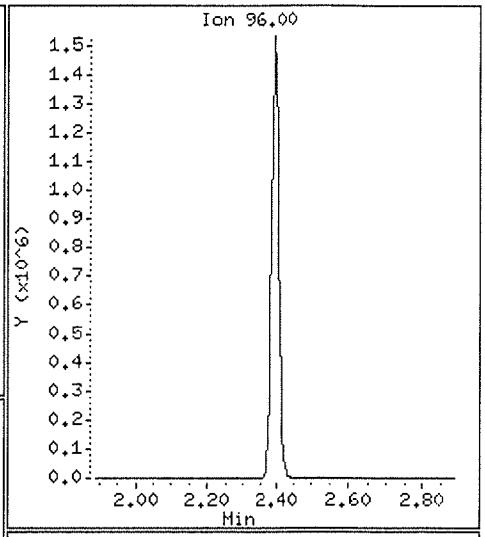
Concentration: 1006.46 ug/l

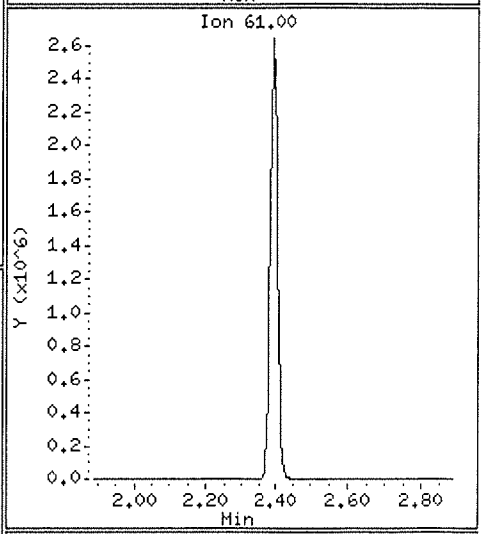


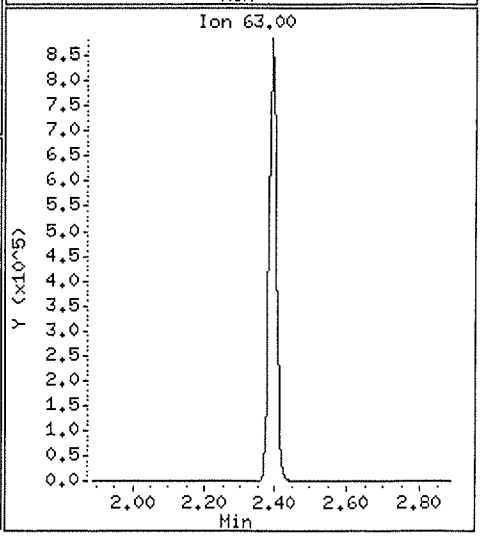












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

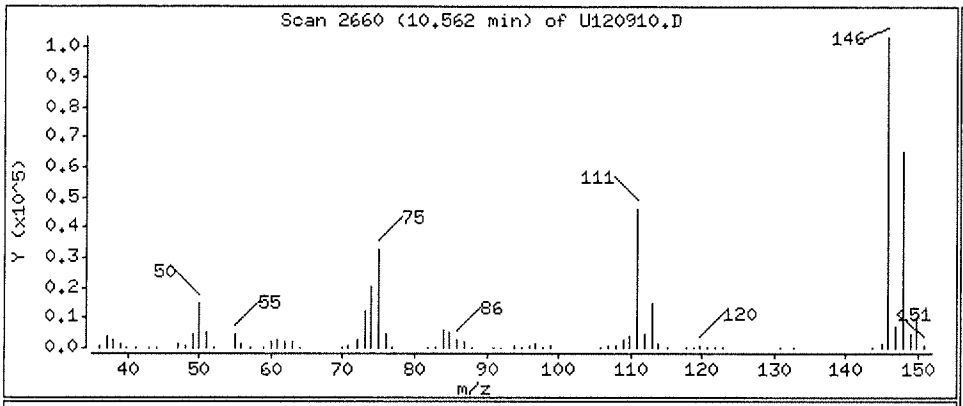
Operator: PC

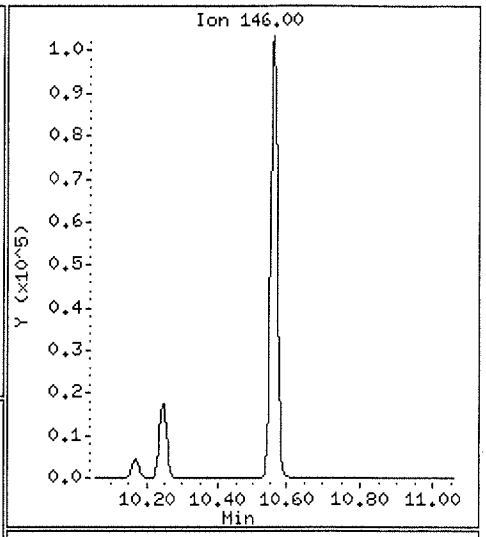
Column phase: DB624

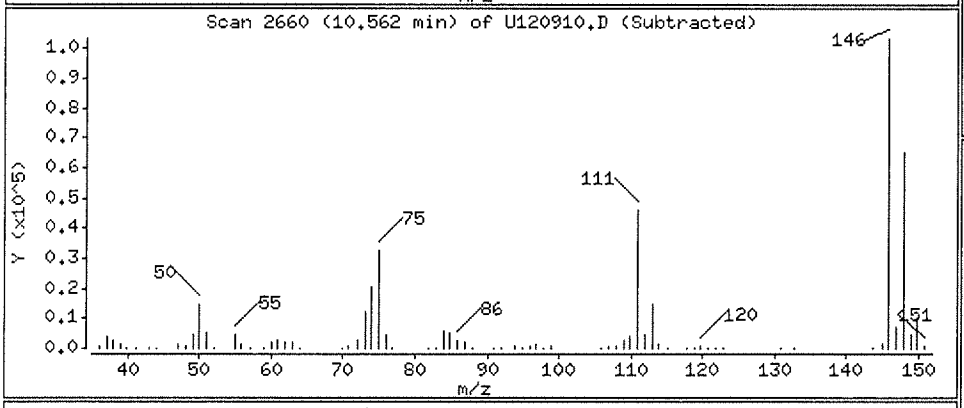
Column diameter: 0.18

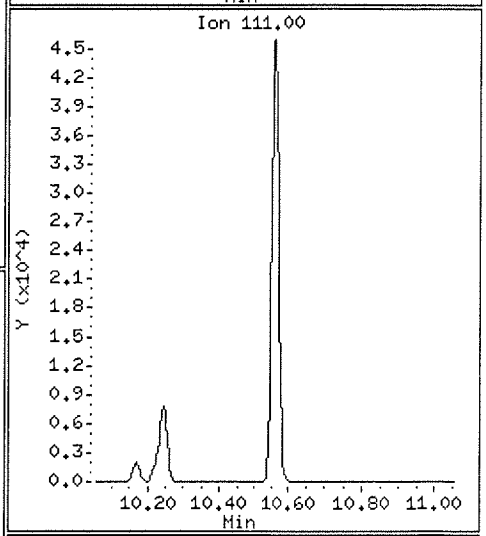
88 1,2-Dichlorobenzene

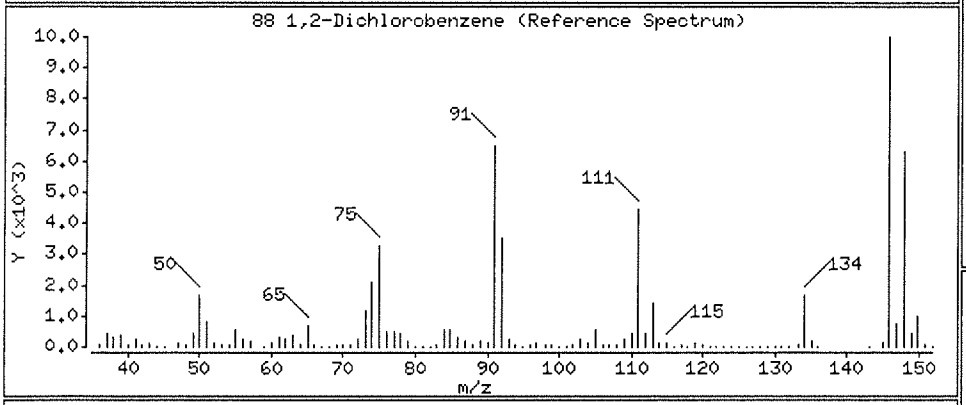
Concentration: 27.54 ug/l

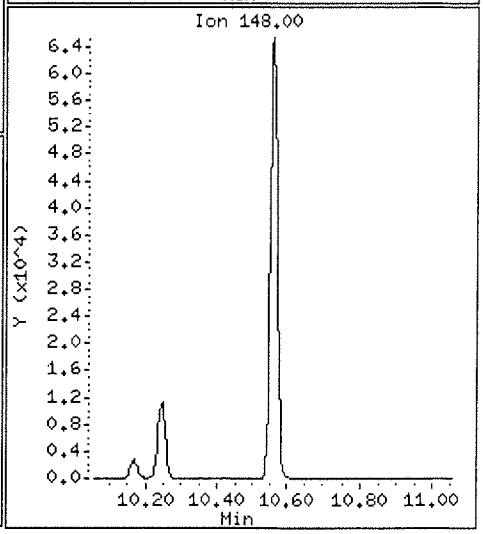


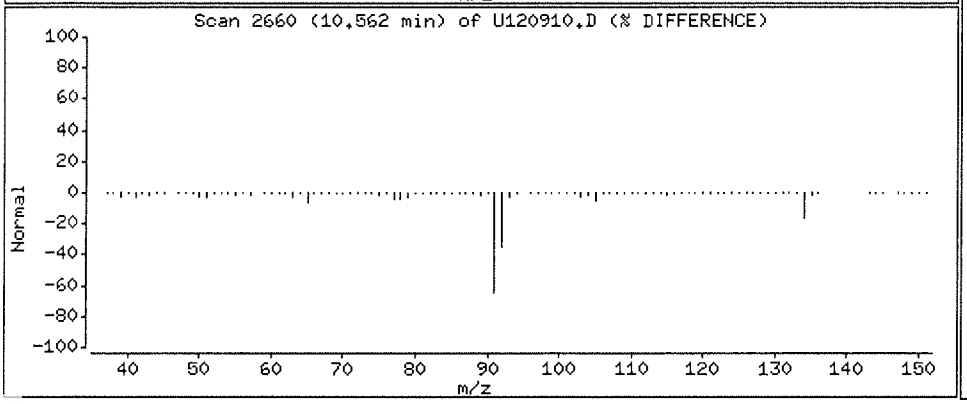












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

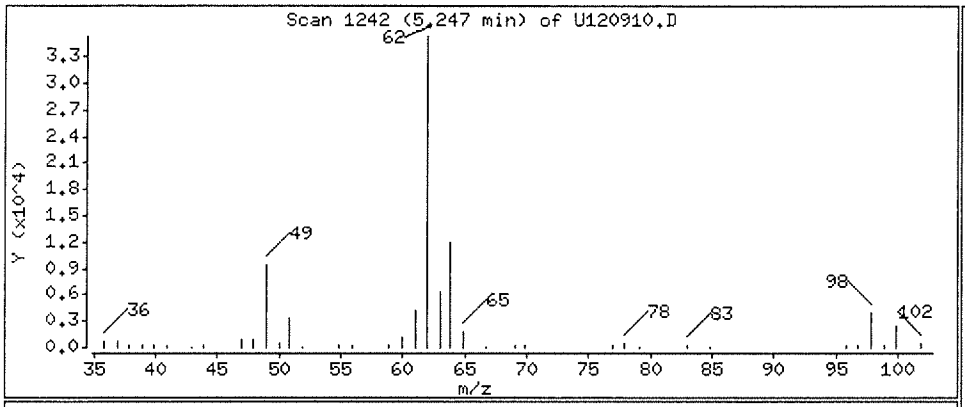
Operator: PC

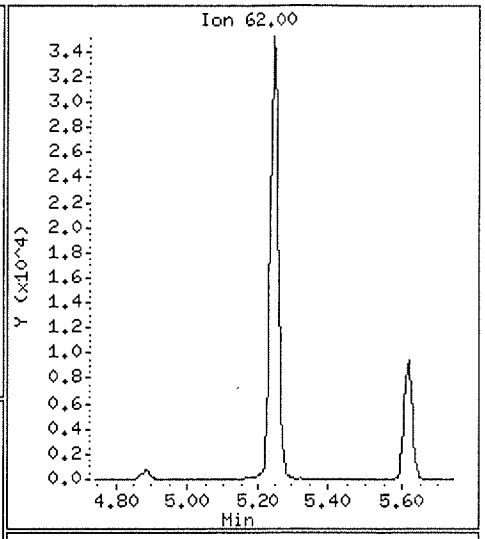
Column phase: DB624

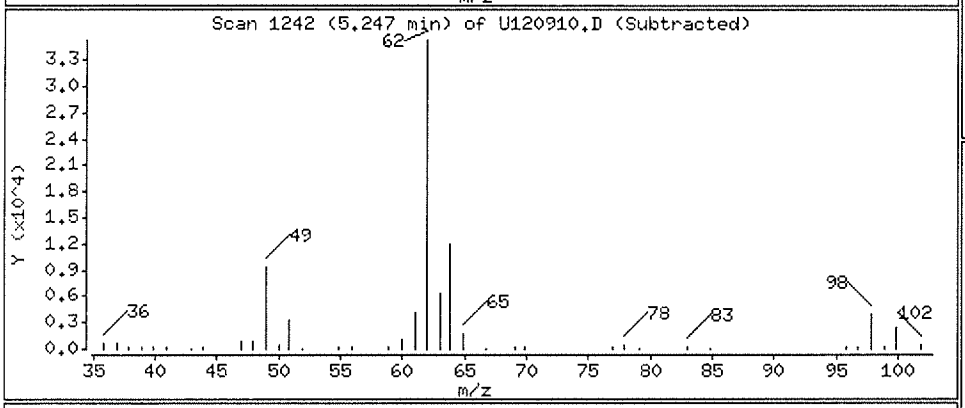
Column diameter: 0.18

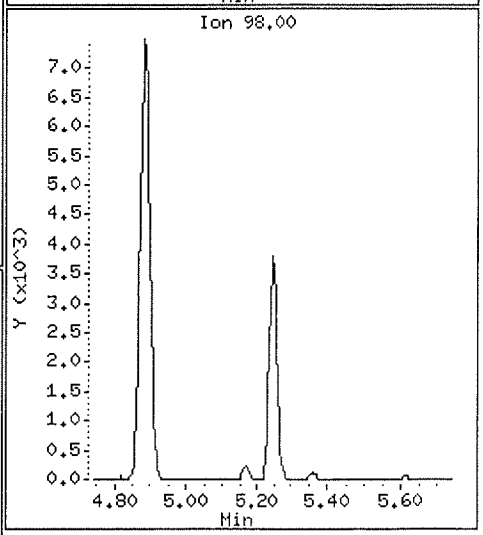
33 1,2-Dichloroethane

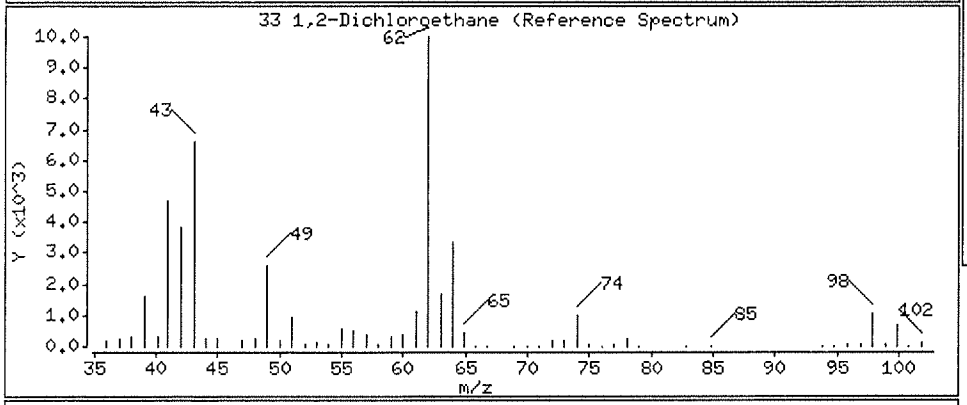
Concentration: 14.47 ug/l

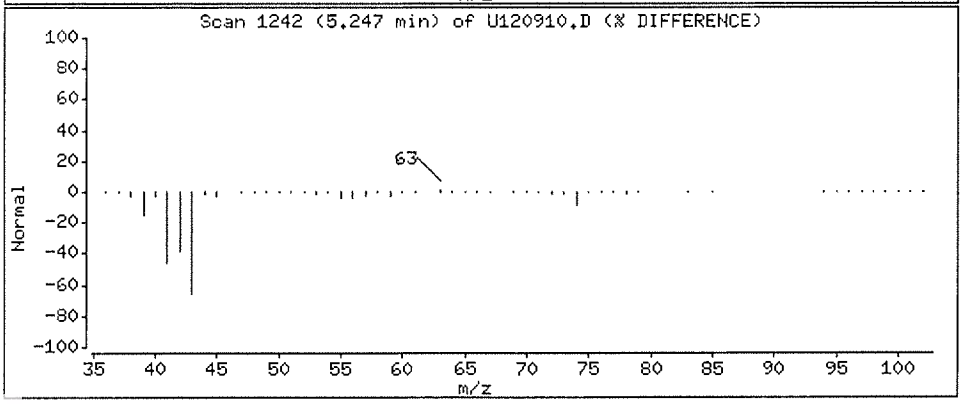












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

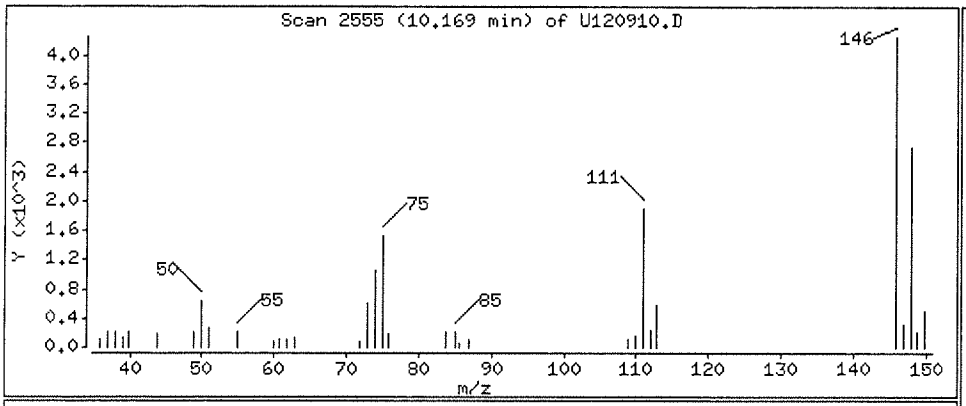
Operator: PC

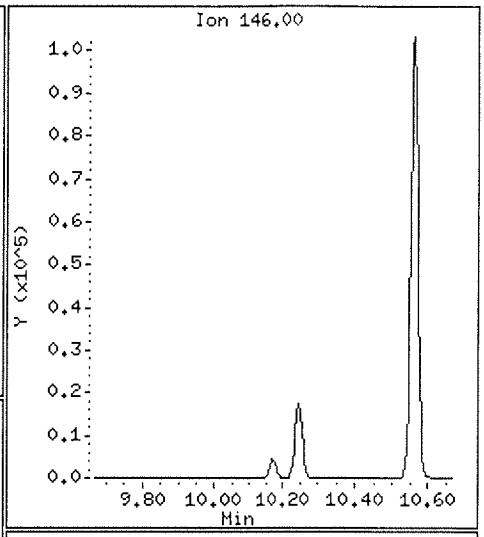
Column phase: DB624

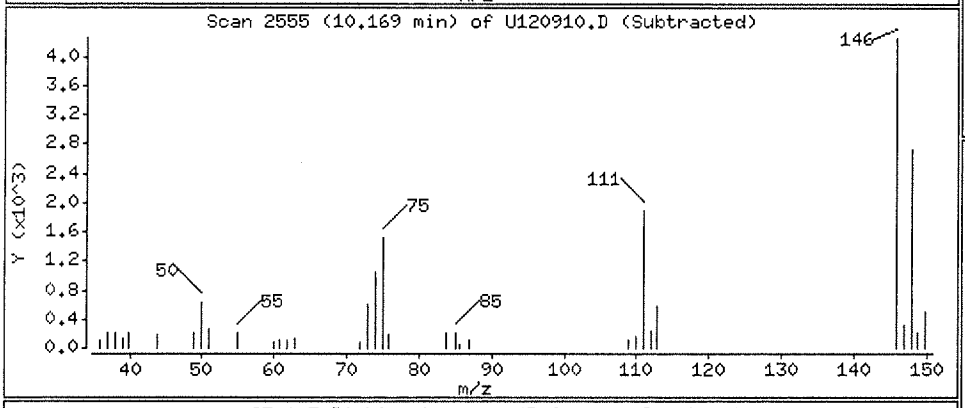
Column diameter: 0.18

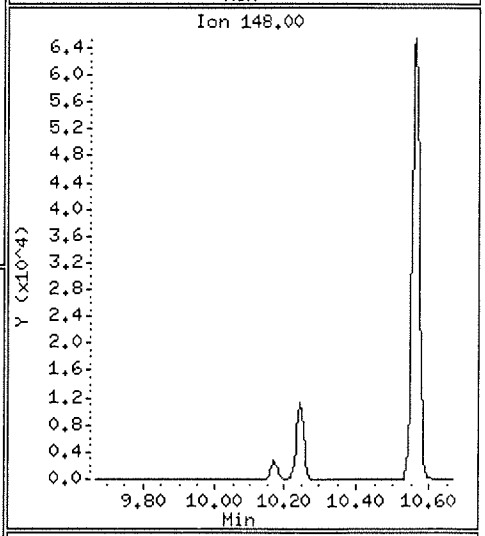
83 1,3-Dichlorobenzene

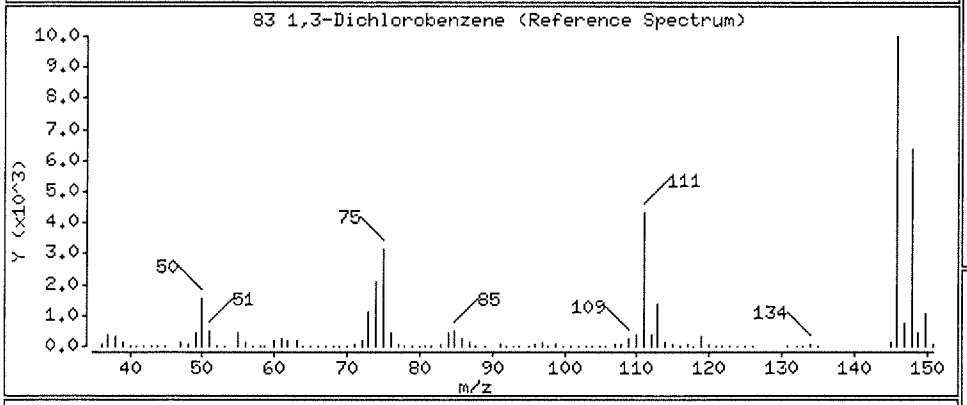
Concentration: 1.09 ug/l

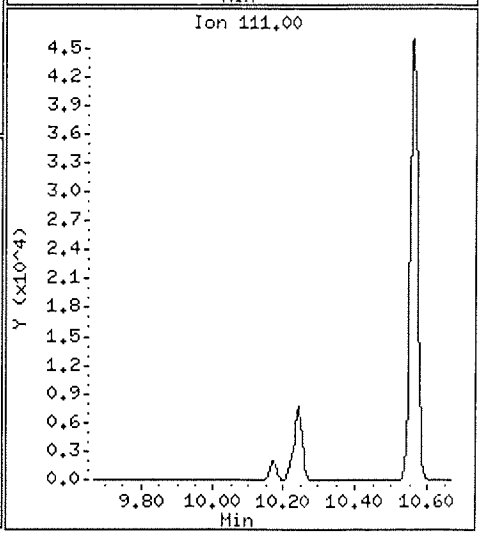


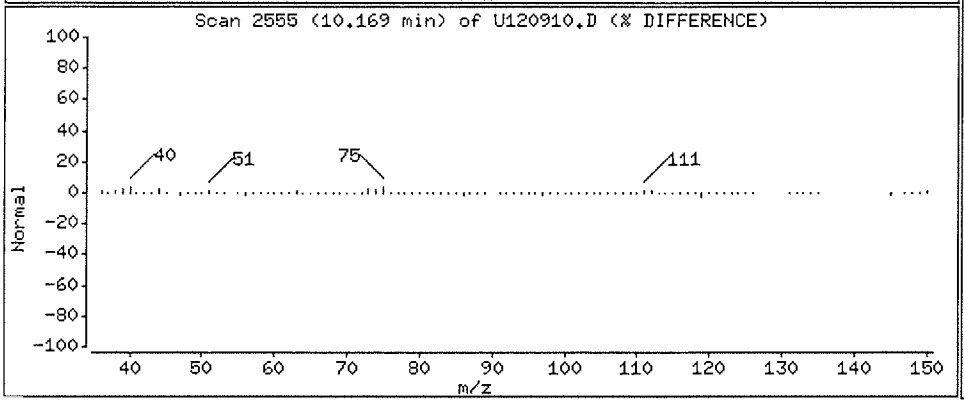












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

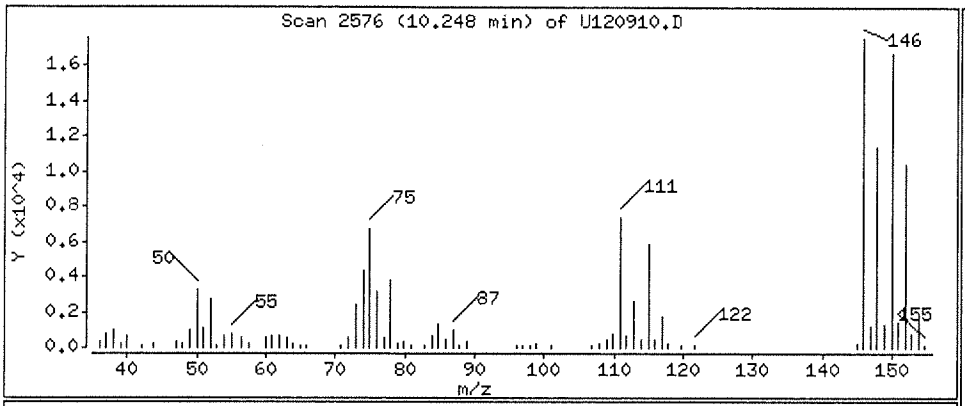
Operator: PC

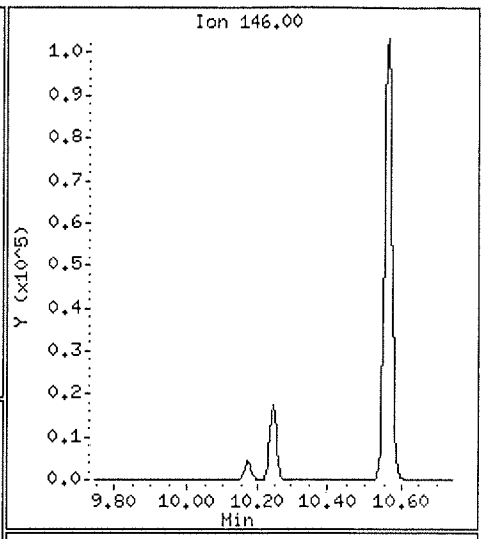
Column phase: DB624

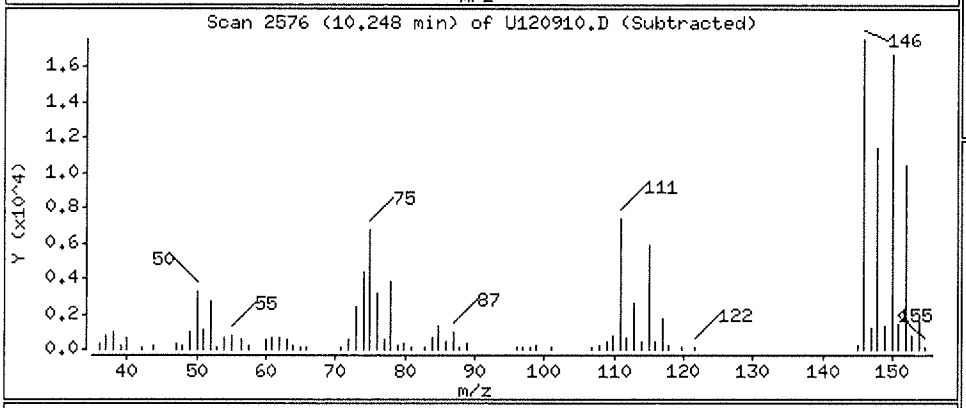
Column diameter: 0.18

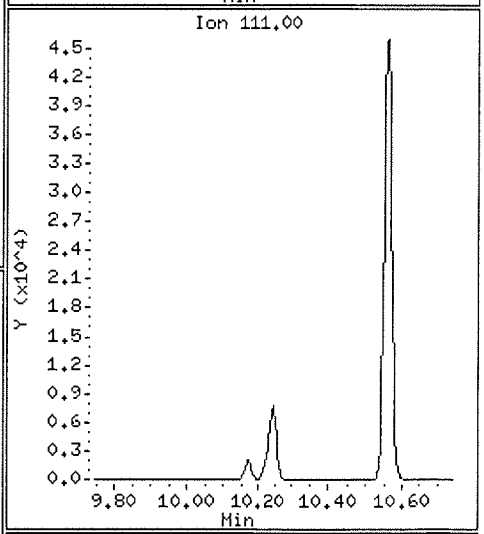
84 1,4-Dichlorobenzene

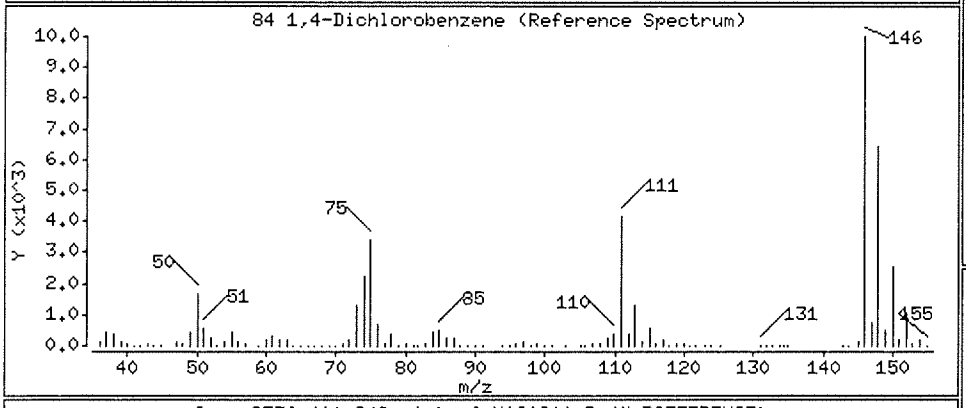
Concentration: 4.54 ug/l

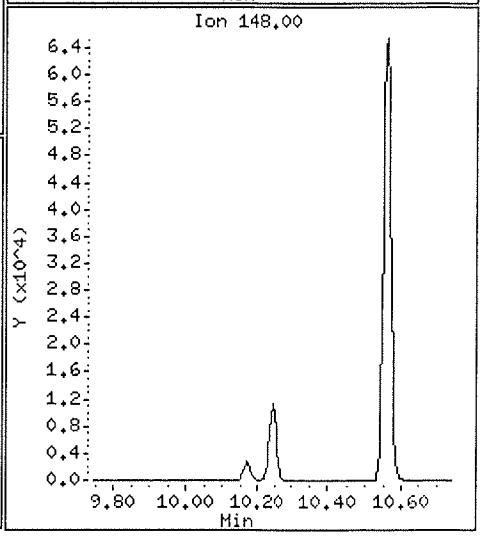


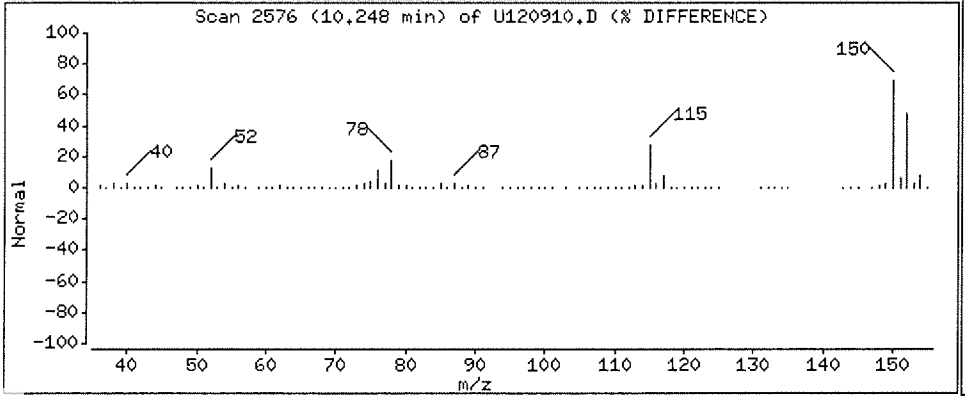












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Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

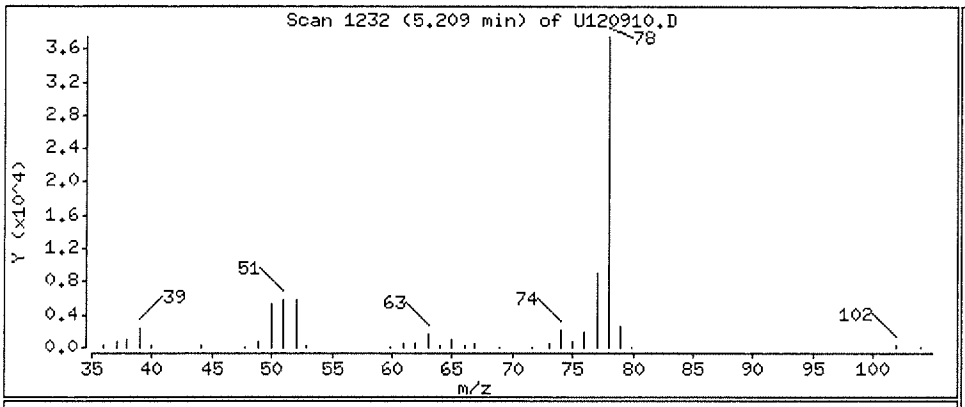
Operator: PC

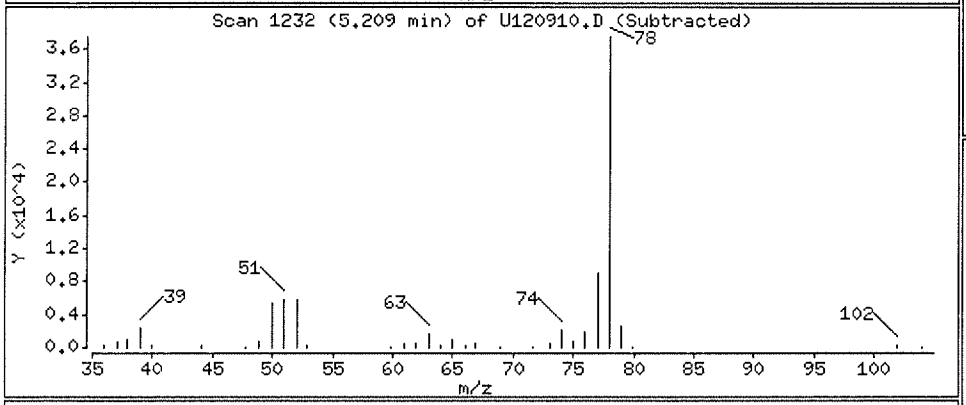
Column phase: DB624

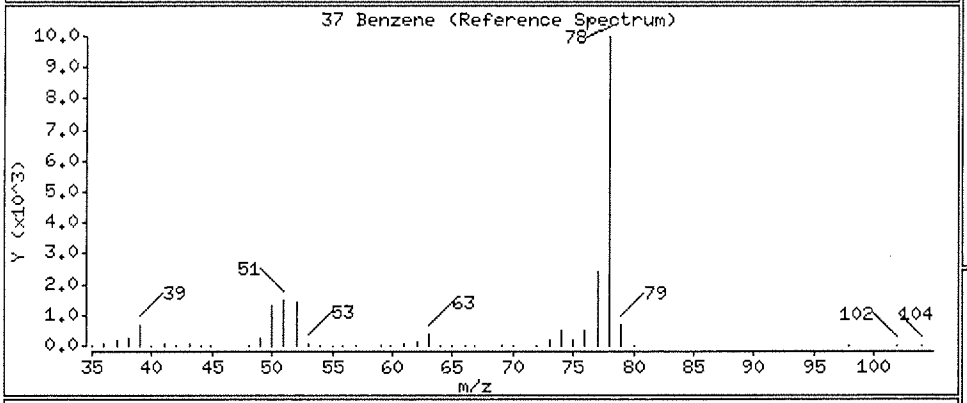
Column diameter: 0.18

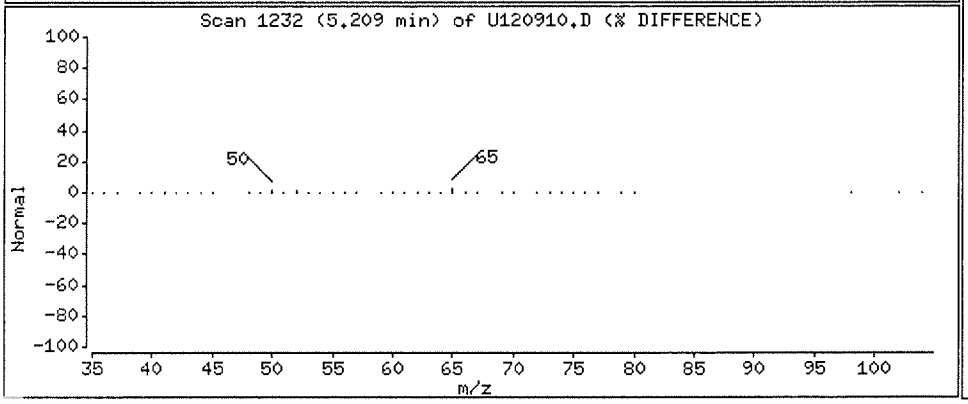
37 Benzene

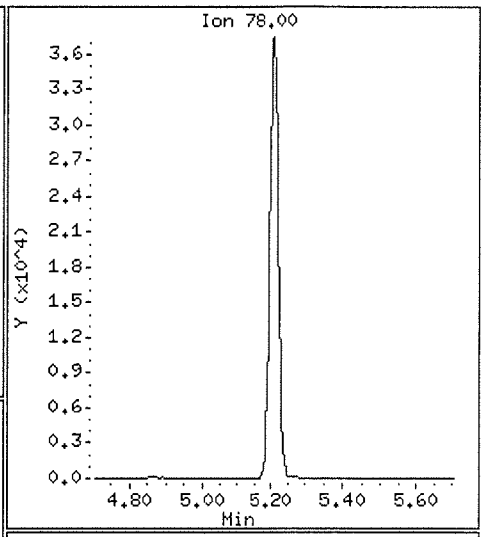
Concentration: 5.77 ug/l

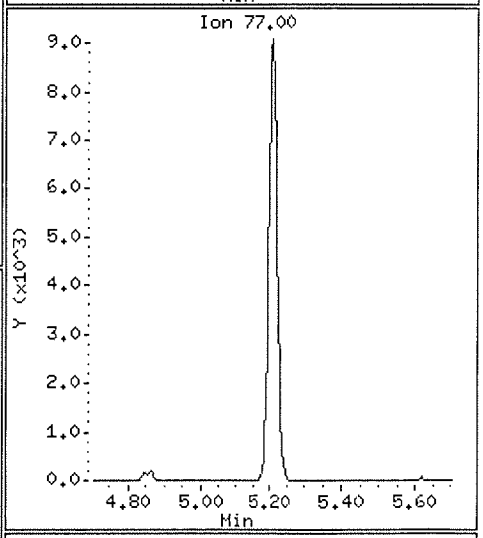


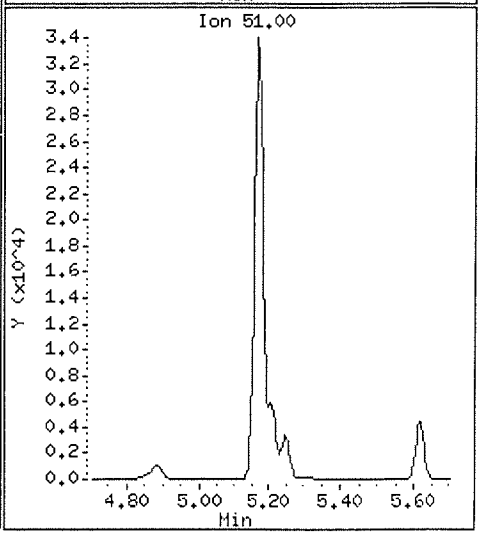












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Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

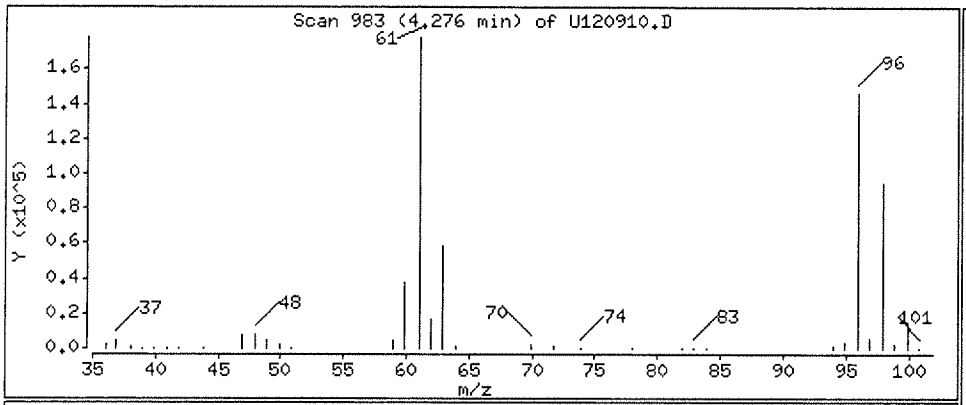
Operator: PC

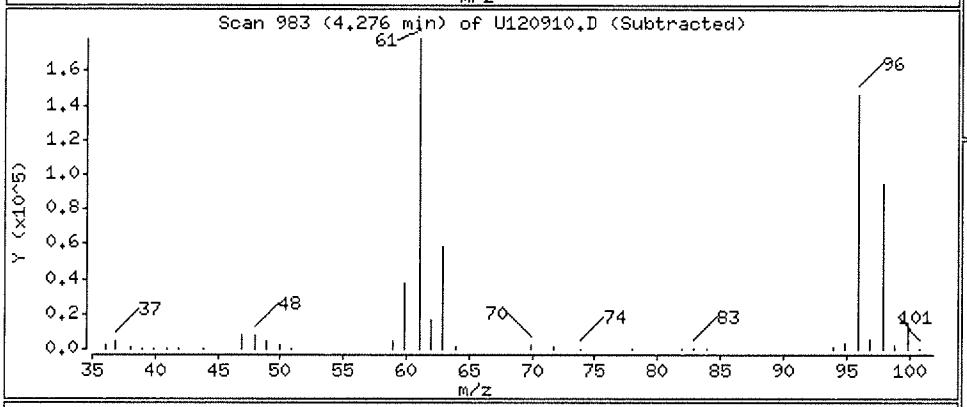
Column phase: DB624

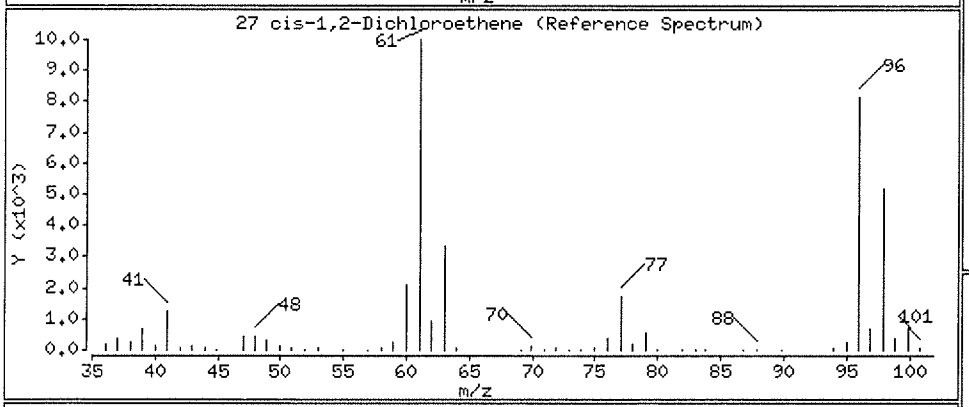
Column diameter: 0.18

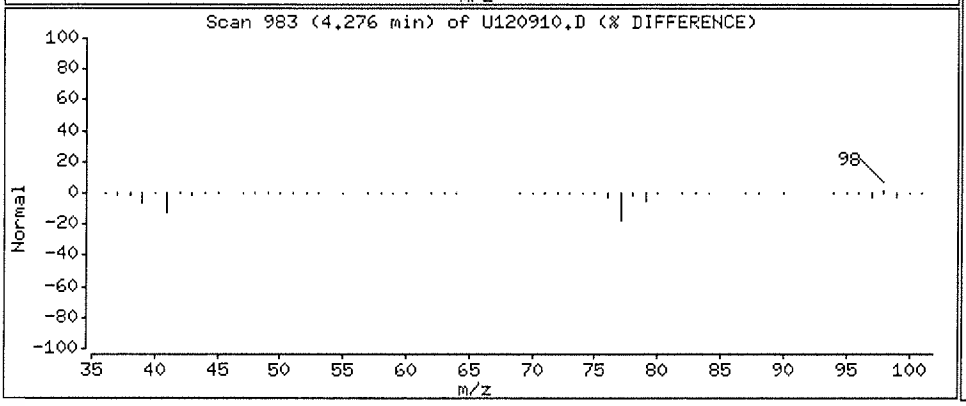
27 cis-1,2-Dichloroethene

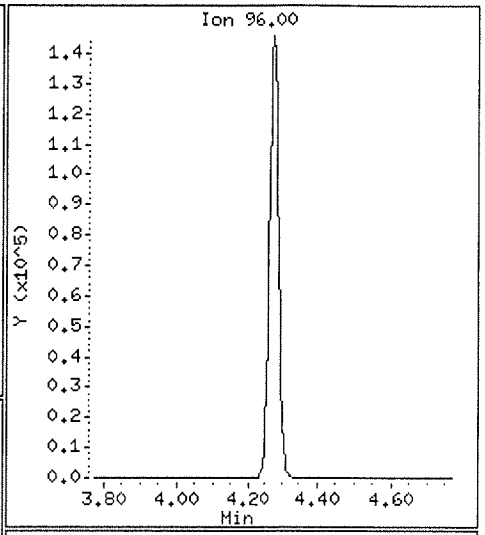
Concentration: 85.75 ug/l

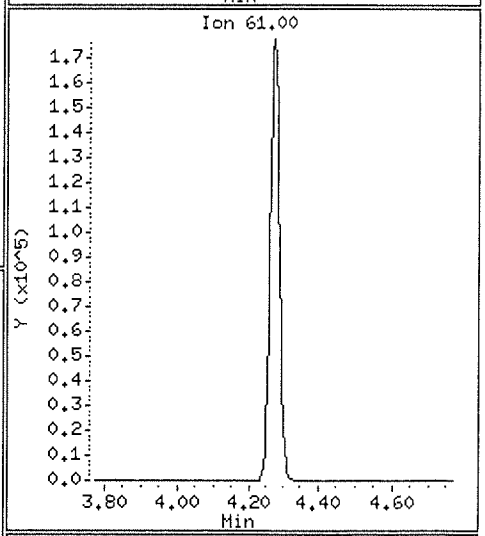


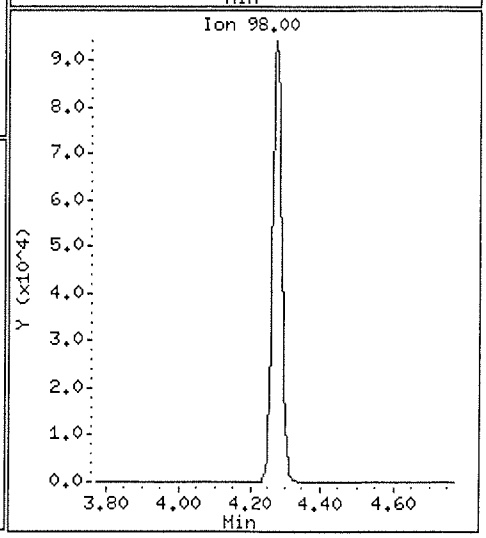












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

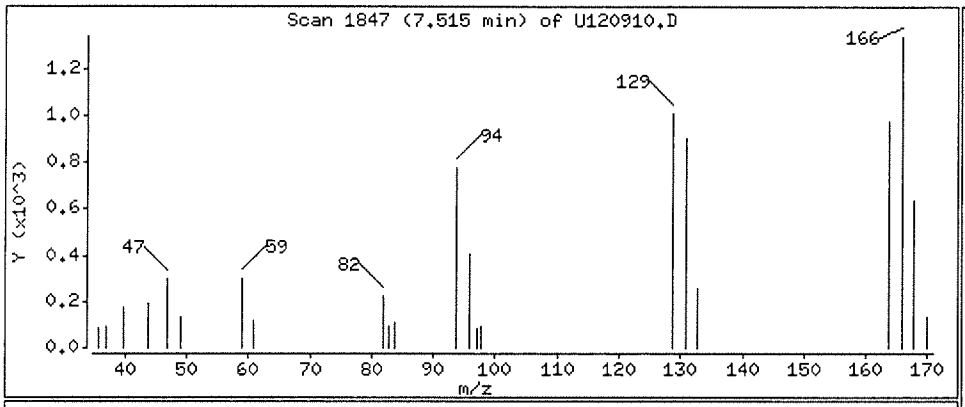
Operator: PC

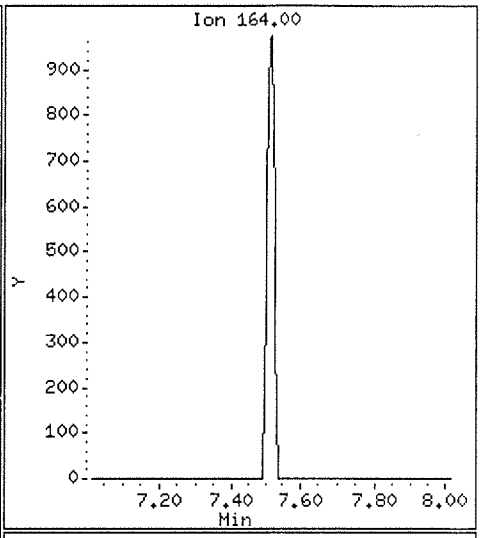
Column phase: DB624

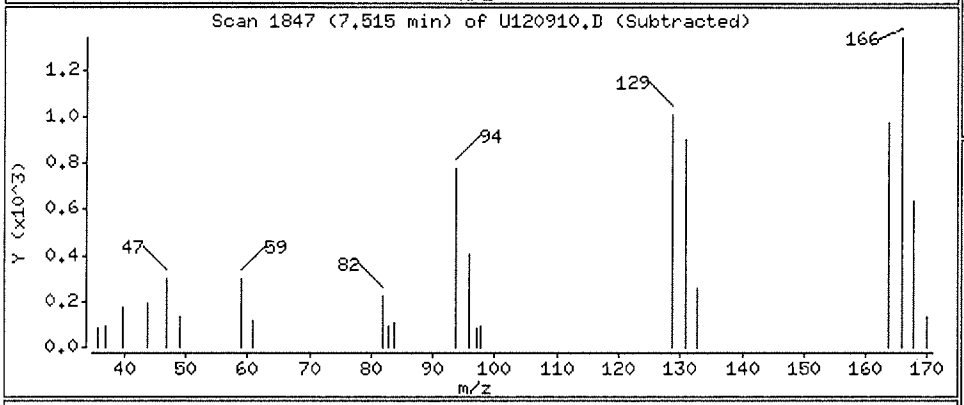
Column diameter: 0.18

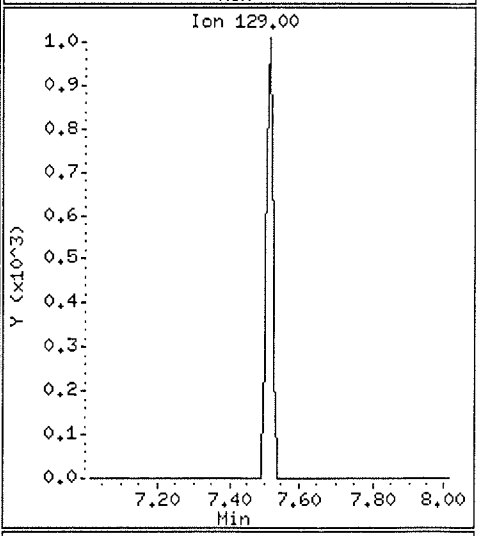
56 Tetrachloroethene

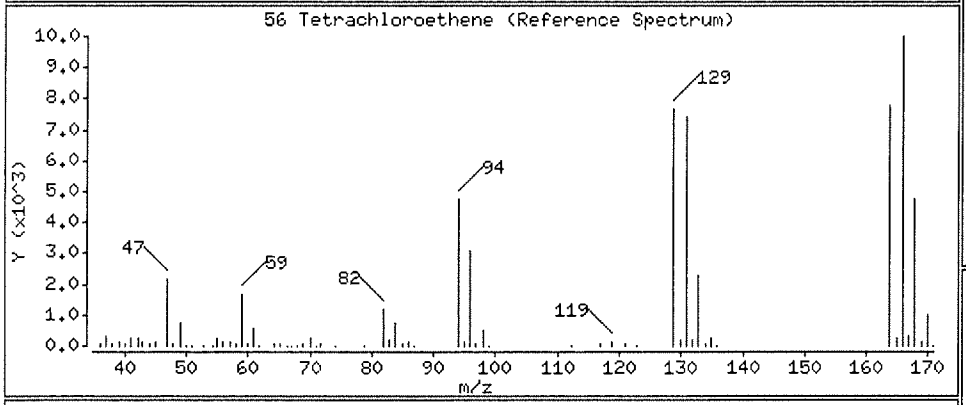
Concentration: 0.65 ug/l

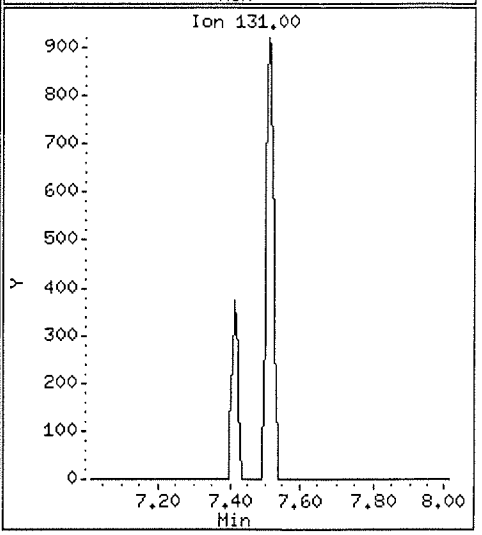


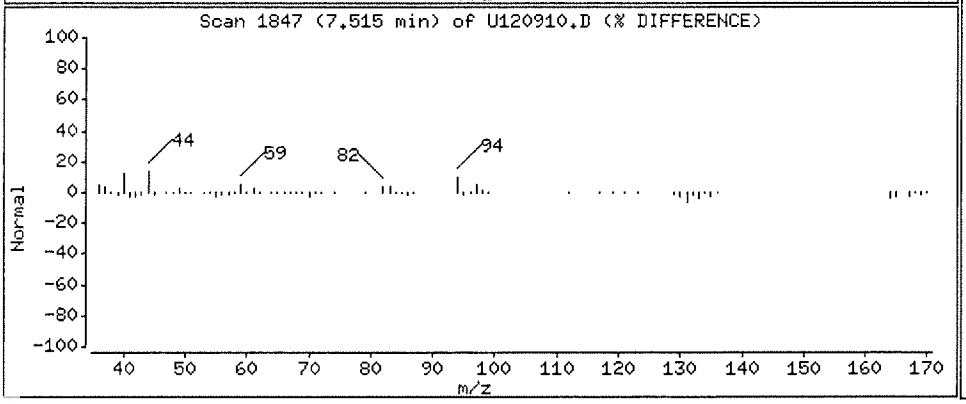












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

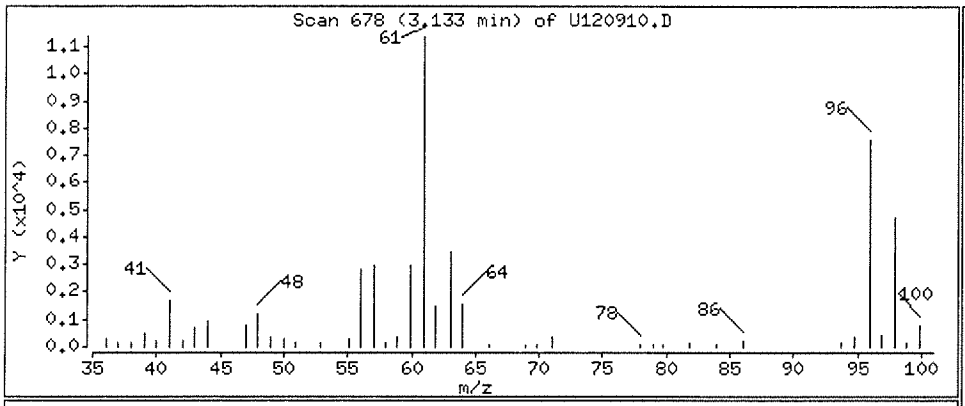
Operator: PC

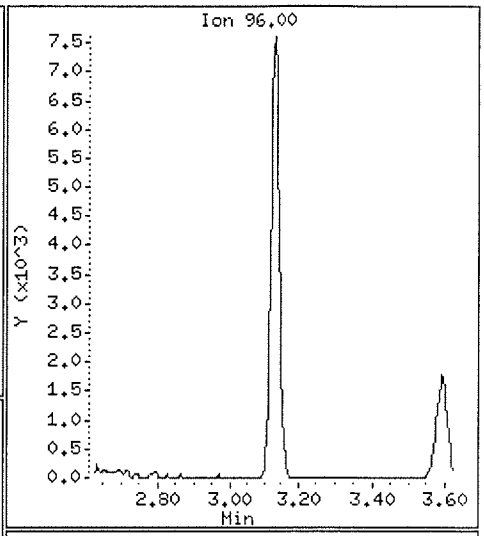
Column phase: DB624

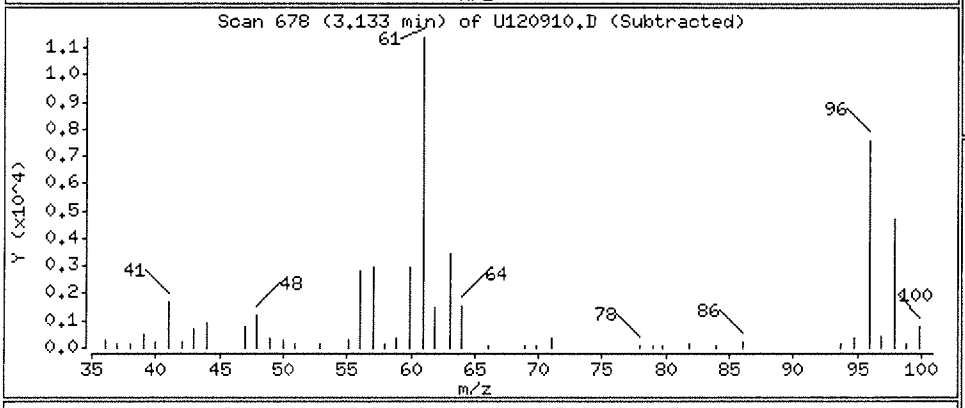
Column diameter: 0.18

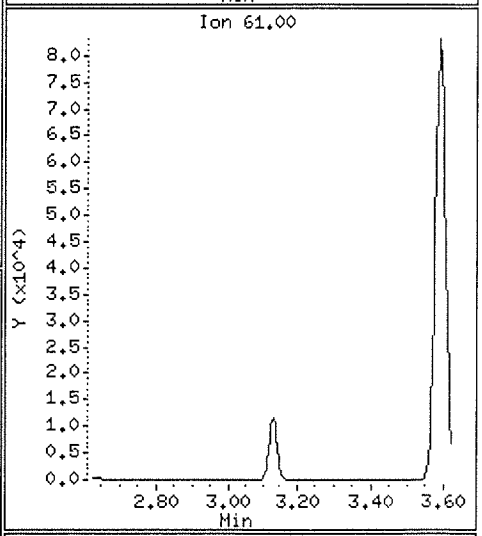
20 trans-1,2-Dichloroethene

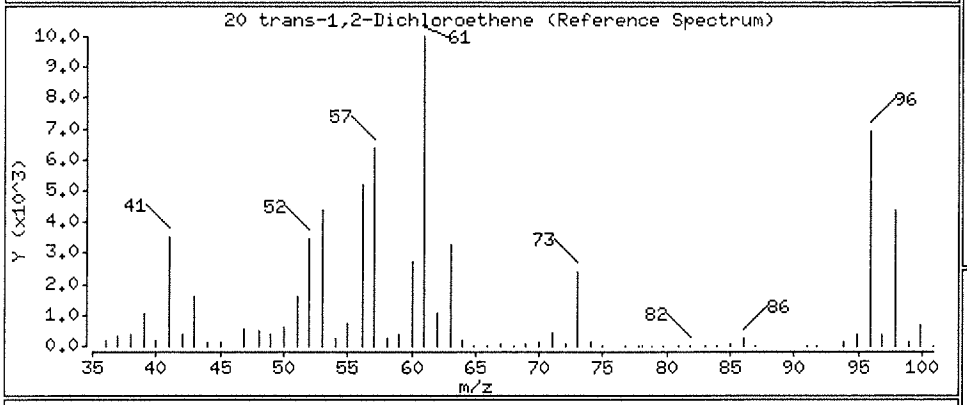
Concentration: 4.92 ug/l

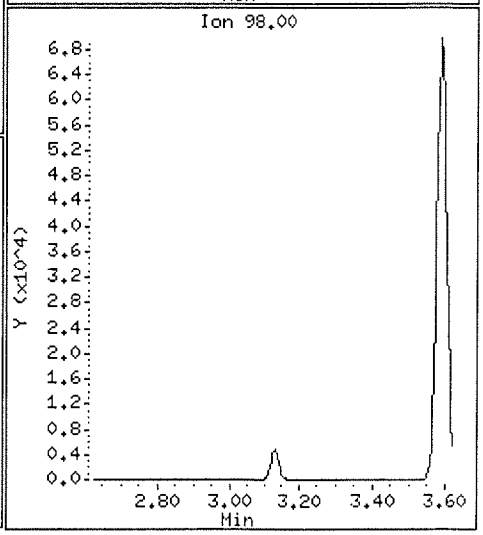


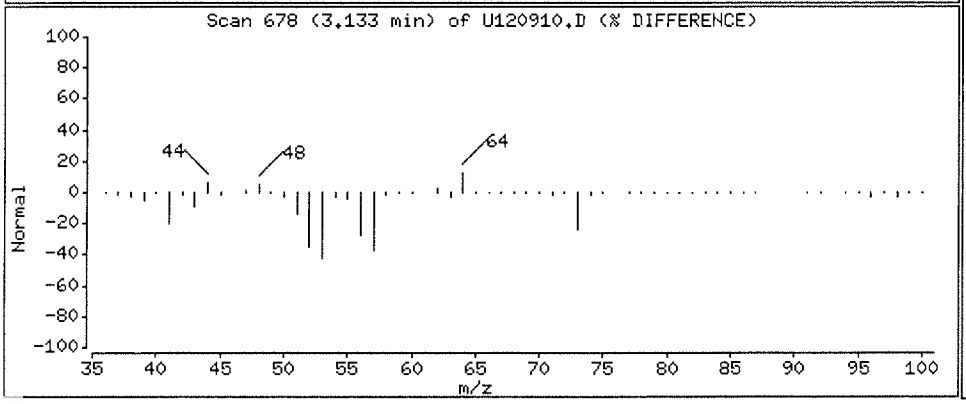












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

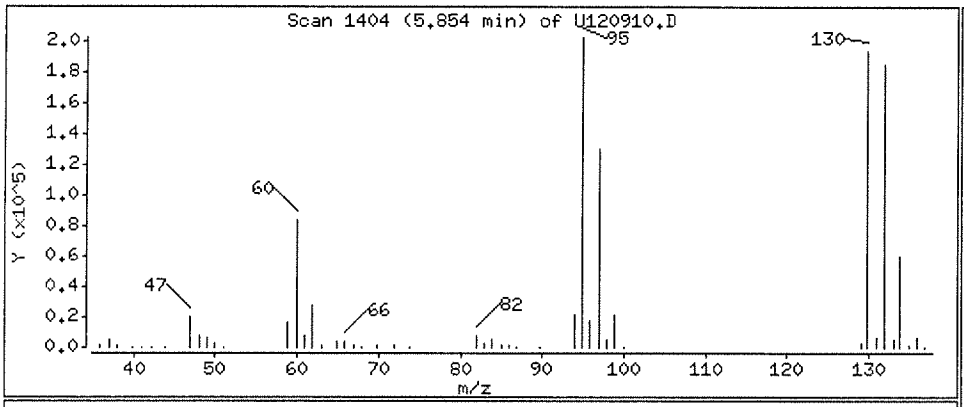
Operator: PC

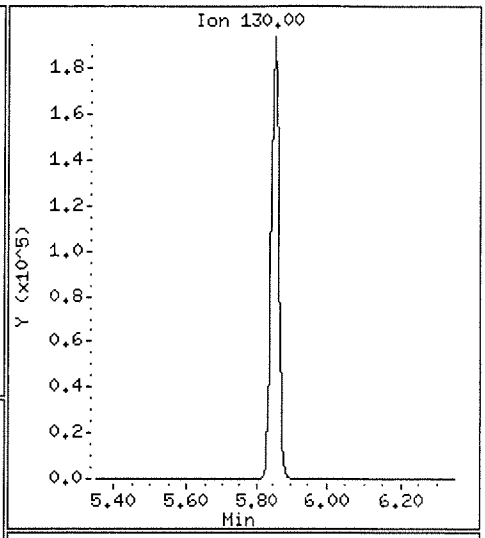
Column phase: DB624

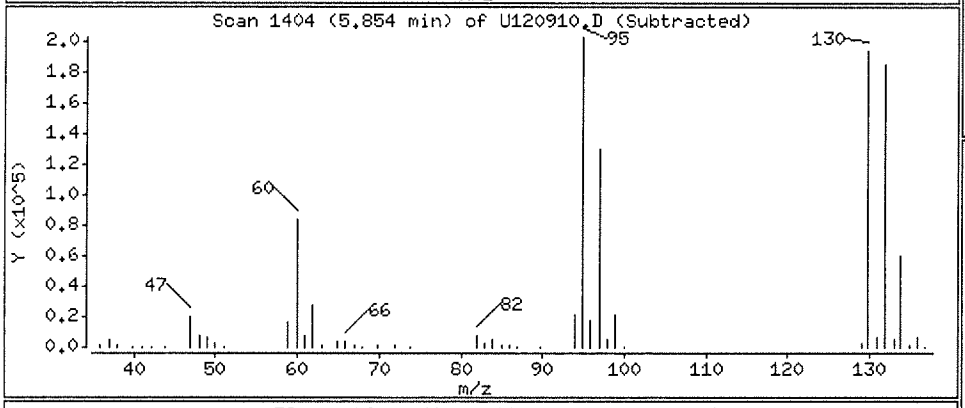
Column diameter: 0.18

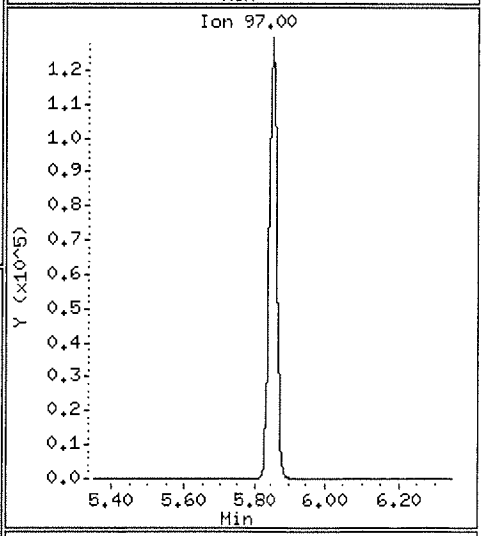
38 Trichloroethene

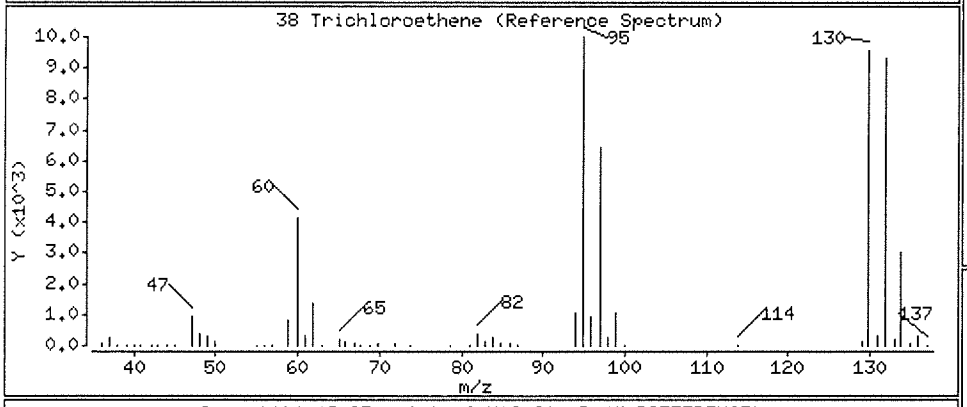
Concentration: 104.86 ug/l

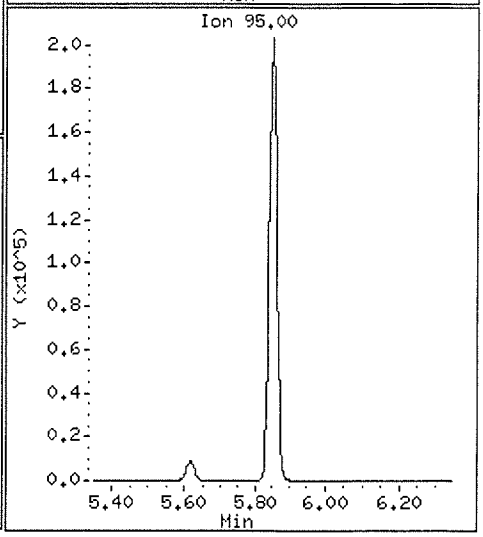


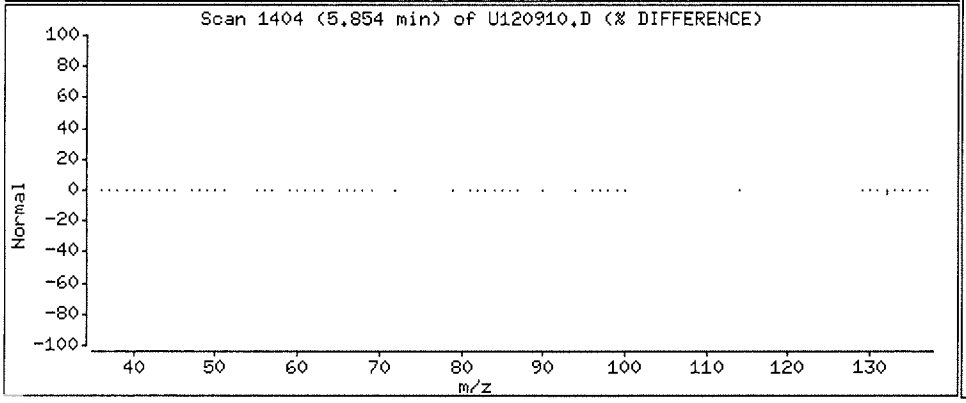












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120910.D

Date : 09-DEC-2021 13:57

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

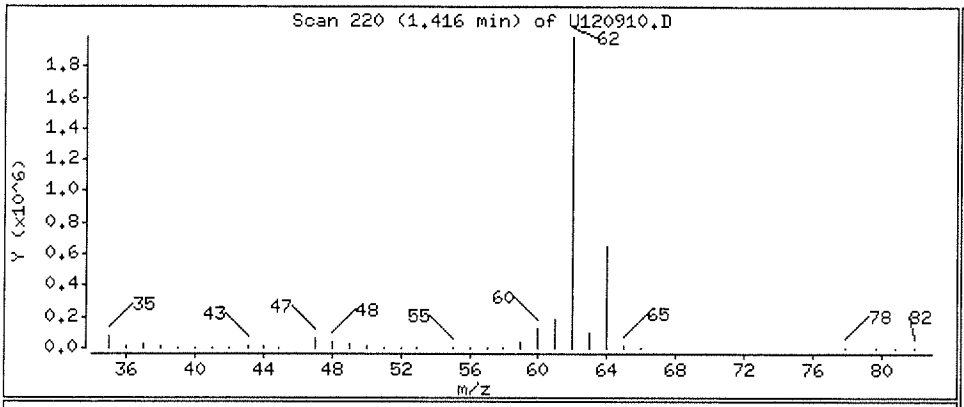
Operator: PC

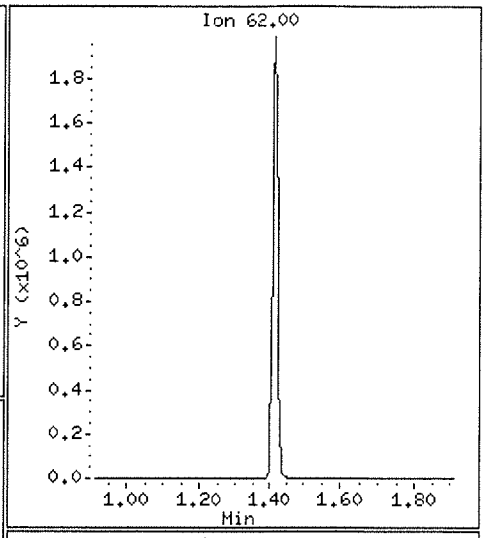
Column phase: DB624

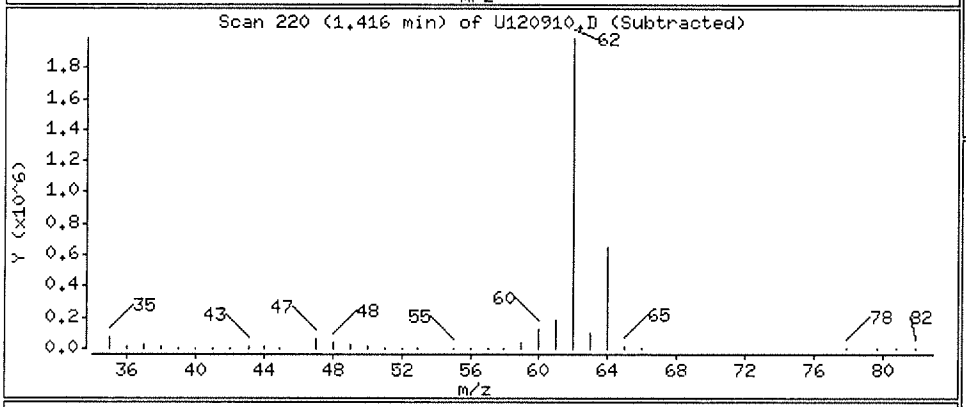
Column diameter: 0.18

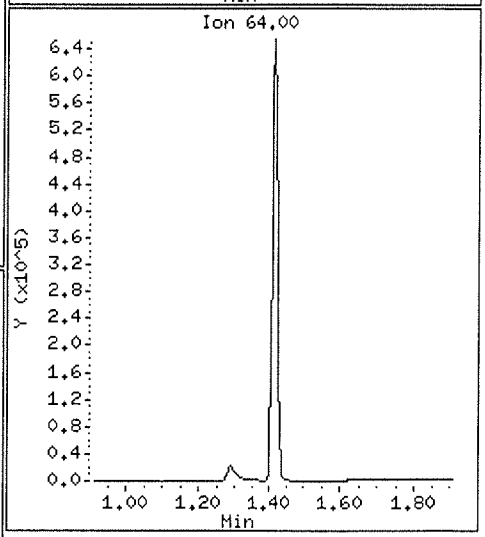
5 Vinyl Chloride

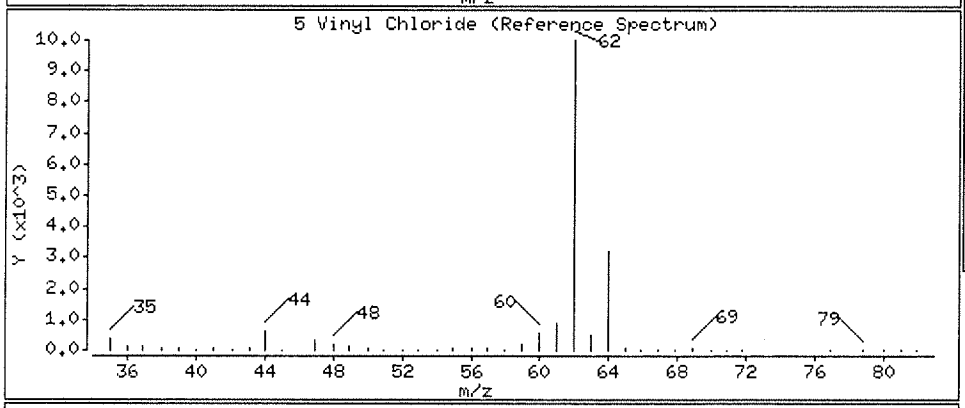
Concentration: 637.95 ug/l

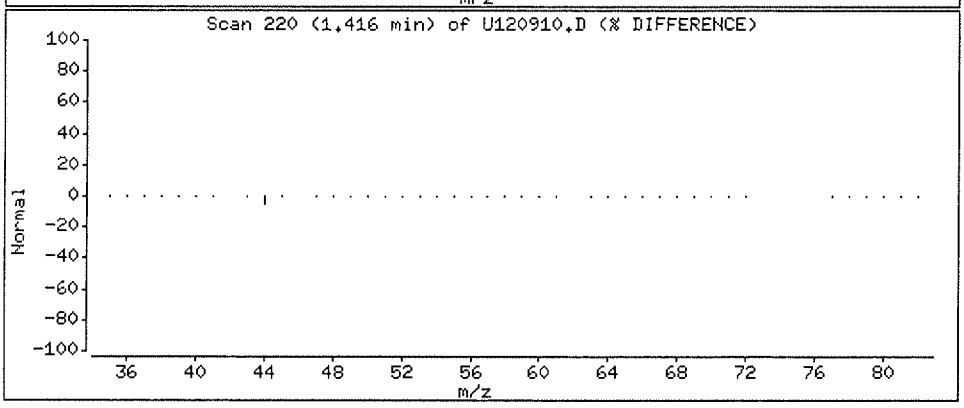












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120911.D
Lab Smp Id: HS21120103-01MS Client Smp ID: HS21120103-01MS
Inj Date : 09-DEC-2021 14:20
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-01MS;HS21120103-01MS;3;;MS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:50 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 11 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

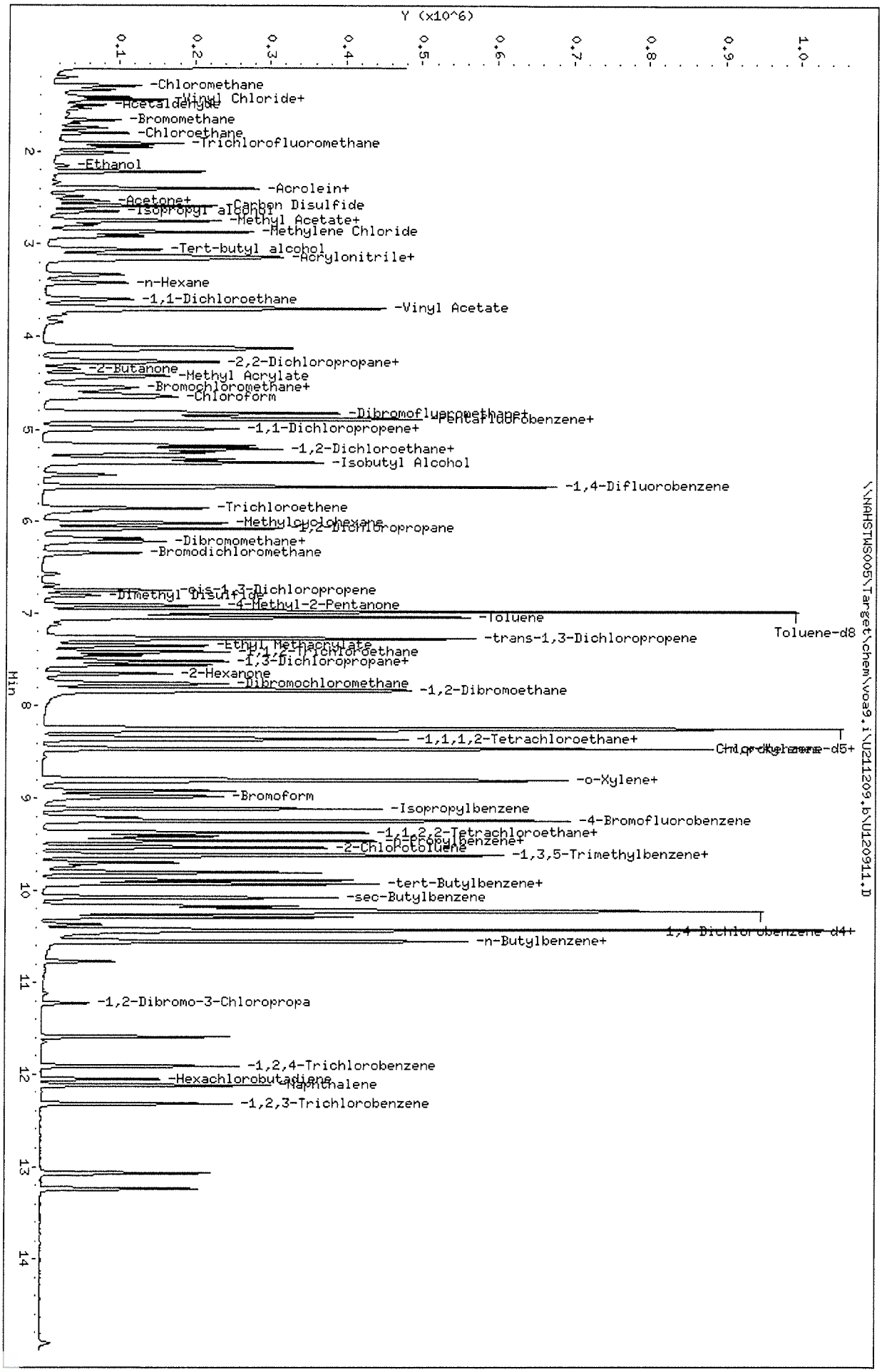
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.886	4.883	(1.000)	287359	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.614	(1.000)	483887	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	429420	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.225	(1.000)	207774	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.819	(0.987)	150967	50.0522	50.05
$ 35 1,2-Dichloroethane-d4	65	5.171	5.164	(1.058)	179268	50.8774	50.87
$ 48 Toluene-d8	98	6.982	6.978	(0.847)	584103	52.2627	52.26
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	217049	52.0944	52.09
60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	56738	19.5695	19.56
31 1,1,1-Trichloroethane	97	4.819	4.811	(0.986)	83968	20.2986	20.29
68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	96900	22.1577	22.15
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	56186	22.2047	22.20
22 1,1-Dichloroethane	63	3.593	3.589	(0.735)	115740	22.6712	22.67
11 1,1-Dichloroethene	96	2.397	2.386	(0.491)	55433	21.6367	21.63
32 1,1-Dichloropropene	75	4.995	4.988	(0.889)	84715	21.3193	21.31
93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	65734	17.6663	17.66
71 1,2,3-Trichloropropane	75	9.418	9.415	(0.921)	91764	21.3712	21.37
90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	69212	18.0983	18.09
79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	225762	21.6740	21.67
89 1,2-Dibromo-3-Chloropropane	155	11.225	11.222	(1.098)	10414	16.1311	16.13
57 1,2-Dibromoethane	107	7.844	7.840	(0.952)	66287	21.5653	21.56
88 1,2-Dichlorobenzene	146	10.562	10.558	(1.033)	119525	20.3995	20.39

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.243	(0.934)	93436	21.4047	21.40
42	1,2-Dichloropropane	63	6.075	6.071	(1.081)	67586	22.1970	22.19
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	216909	21.2337	21.23
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	118915	19.8717	19.87
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	119677	22.1959	22.19
84	1,4-Dichlorobenzene	146	10.247	10.243	(1.002)	123727	20.0935	20.09
26	2,2-Dichloropropane	77	4.264	4.260	(0.873)	59290	20.4921	20.49
24	2-Butanone	43	4.350	4.343	(0.890)	56966	37.9115	37.91
76	2-Chlorotoluene	91	9.538	9.539	(0.933)	197640	22.0900	22.09
52	2-Hexanone	43	7.649	7.645	(0.928)	91223	44.7506	44.75
77	4-Chlorotoluene	91	9.628	9.629	(0.942)	232724	22.4450	22.44
82	p-Isopropyltoluene	119	10.202	10.198	(0.998)	210101	20.7501	20.75
45	4-Methyl-2-Pentanone	43	6.914	6.911	(0.839)	128425	41.5258	41.52
10	Acetone	43	2.480	2.469	(0.508)	42996	39.0866	39.08
37	Benzene	78	5.209	5.205	(0.927)	265501	21.6991	21.69
74	Bromobenzene	156	9.373	9.374	(0.917)	65839	20.4335	20.43
29	Bromochloromethane	128	4.545	4.542	(0.930)	33850	20.8837	20.88
39	Bromodichloromethane	83	6.341	6.337	(1.129)	73548	19.3271	19.32
66	Bromoform	173	8.976	8.972	(1.089)	29206	15.7011	15.70
6	Bromomethane	94	1.666	1.655	(0.341)	35463	19.7205	19.72
19	Carbon Disulfide	76	2.585	2.577	(0.529)	265000	37.2676	37.26
34	Carbon Tetrachloride	117	4.984	4.980	(0.887)	68210	18.7069	18.70
59	Chlorobenzene	112	8.264	8.264	(1.003)	172188	20.5683	20.56
7	Chloroethane	64	1.749	1.738	(0.358)	38273	16.0960	16.09(M)
28	Chloroform	83	4.650	4.643	(0.952)	120796	21.8233	21.82
3	Chloromethane	50	1.340	1.329	(0.274)	39608	13.4097	13.40
27	cis-1,2-Dichloroethene	96	4.279	4.272	(0.876)	73964	21.0675	21.06
46	cis-1,3-Dichloropropene	75	6.753	6.750	(1.202)	87796	18.3572	18.35
55	Dibromochloromethane	129	7.750	7.747	(0.940)	53871	17.6557	17.65
44	Dibromomethane	93	6.183	6.180	(1.101)	43940	21.1588	21.15
2	Dichlorodifluoromethane	85	1.205	1.194	(0.247)	15531	3.88063	3.88(a)
61	Ethylbenzene	106	8.361	8.361	(1.015)	88271	21.0682	21.06
91	Hexachlorobutadiene	225	12.054	12.050	(1.179)	26499	18.7482	18.74
67	Isopropylbenzene	105	9.115	9.115	(1.106)	267670	21.2172	21.21
62	m,p-Xylenes	106	8.463	8.463	(1.027)	223164	43.1085	43.10
17	Methylene Chloride	84	2.866	2.855	(0.587)	66881	19.7501	19.75
87	n-Butylbenzene	91	10.547	10.547	(1.032)	193567	21.3211	21.32
73	n-Propylbenzene	91	9.467	9.464	(0.926)	317314	22.4853	22.48
92	Naphthalene	128	12.121	12.121	(1.186)	206864	18.0701	18.07
63	o-Xylene	106	8.804	8.800	(1.068)	108591	21.1786	21.17
81	sec-Butylbenzene	105	10.078	10.075	(0.986)	245008	21.1319	21.13
64	Styrene	104	8.815	8.815	(1.070)	191418	21.7406	21.74
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	179124	20.8017	20.80
56	Tetrachloroethene	164	7.514	7.514	(0.912)	47115	19.4545	19.45
50	Toluene	91	7.038	7.038	(0.854)	275884	21.4750	21.47
20	trans-1,2-Dichloroethene	96	3.132	3.125	(0.641)	58236	20.1503	20.15
51	trans-1,3-Dichloropropene	75	7.255	7.252	(1.292)	69989	17.4440	17.44
38	Trichloroethene	130	5.853	5.850	(1.042)	64291	20.3375	20.33
8	Trichlorofluoromethane	101	1.951	1.940	(0.399)	81957	17.6852	17.68
5	Vinyl Chloride	62	1.419	1.408	(0.290)	53243	15.3201	15.32

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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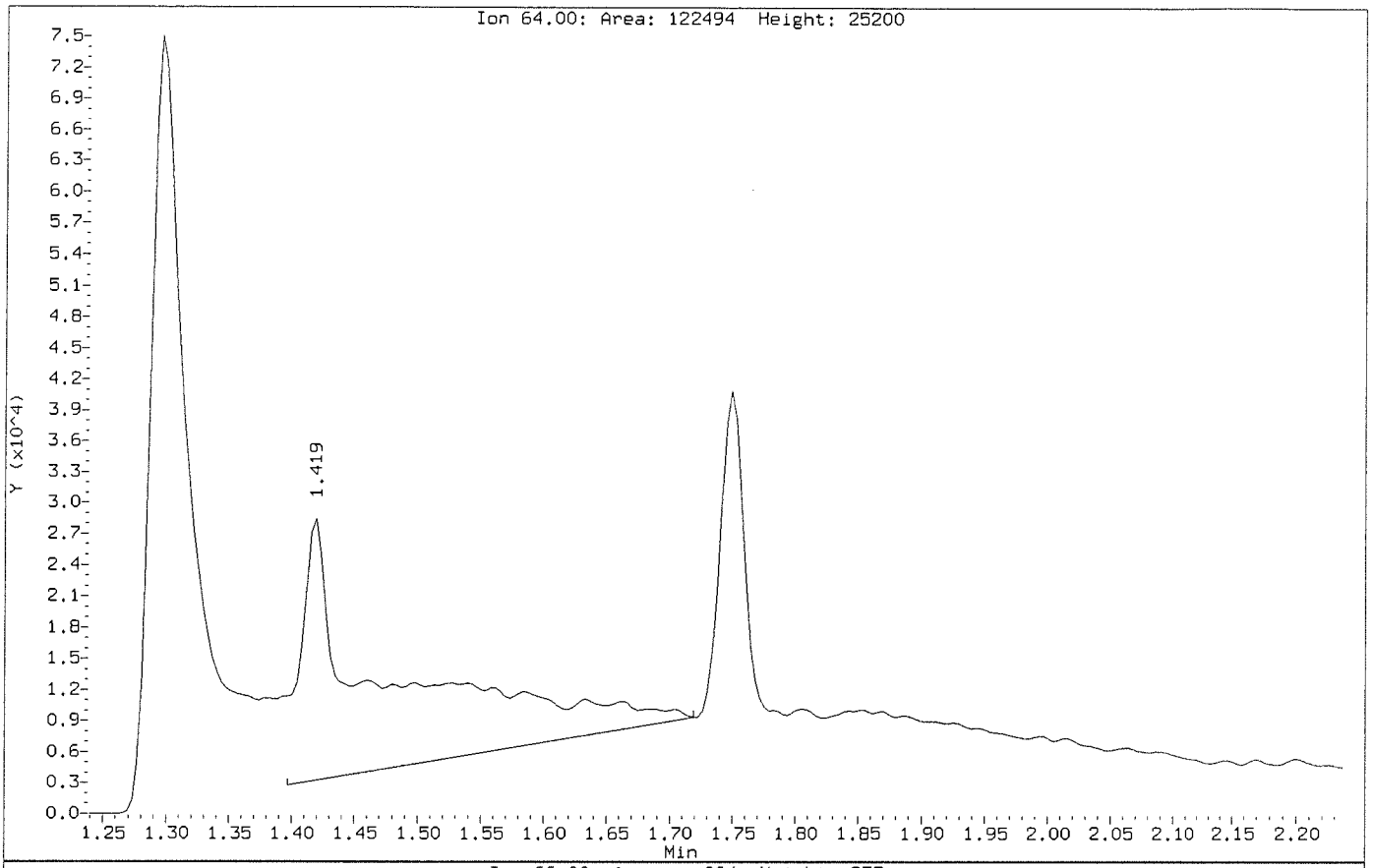
Sample Info: HS21120103-01MS;HS21120103-01MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

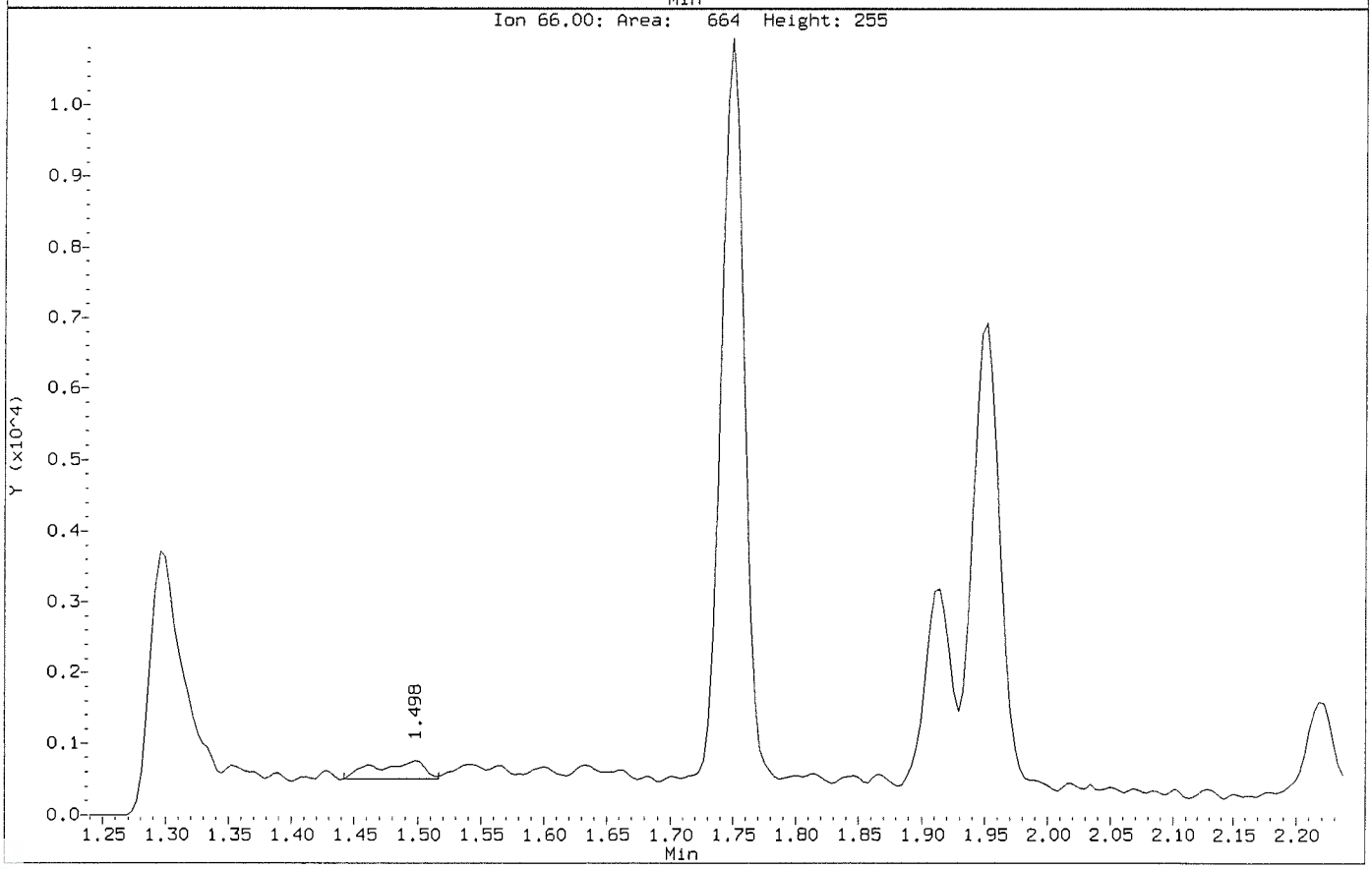
Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

\\NAHSTWS005\Target\chem\voa9,i\U211209,b\U120911.D

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\before\U120911.D
Injection Date: 09-DEC-2021 14:20
Instrument: VOA9.i
Client Sample ID: HS21120103-01MS

Compound: Chloroethane
CAS Number: 75-00-3





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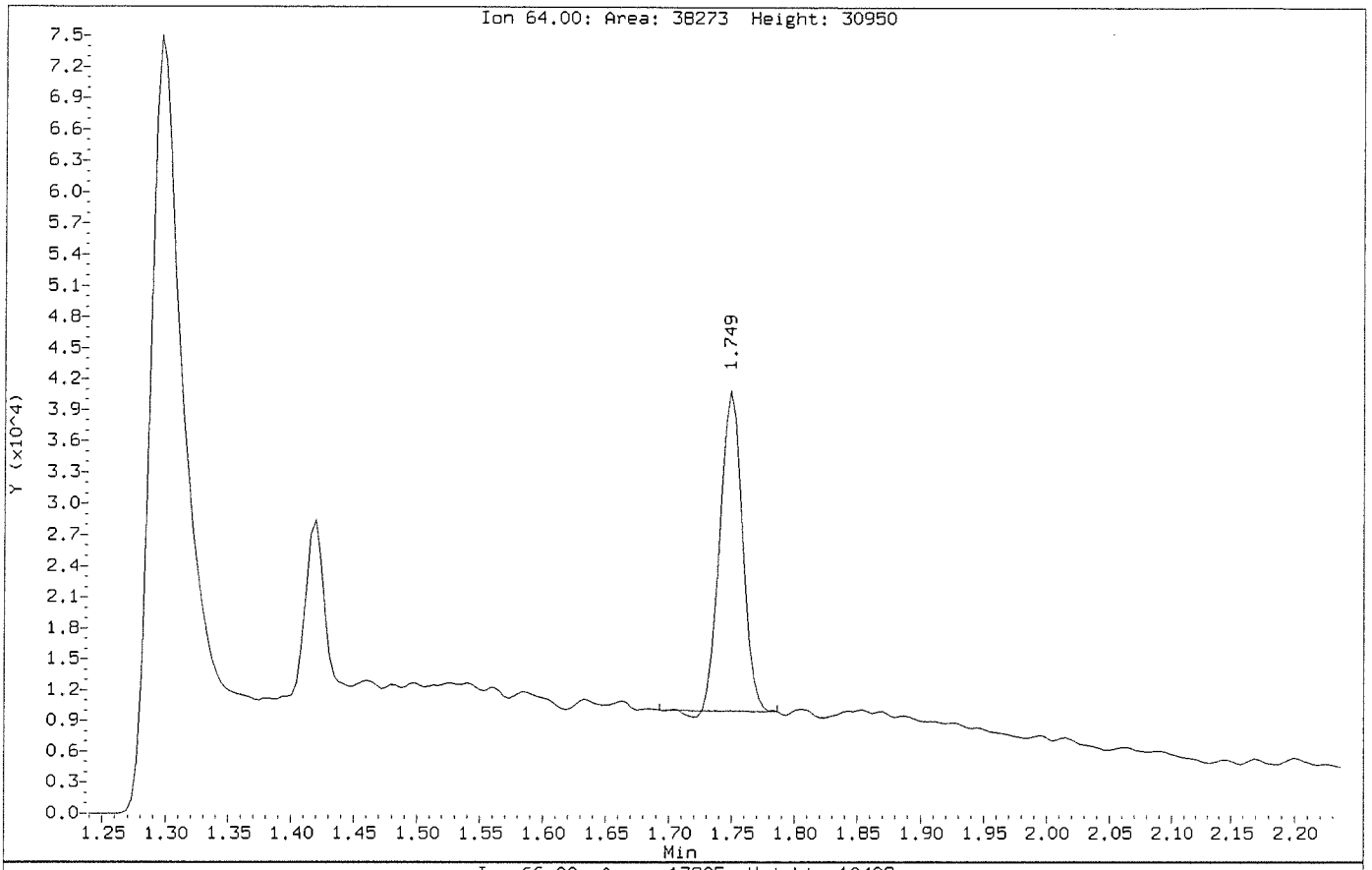
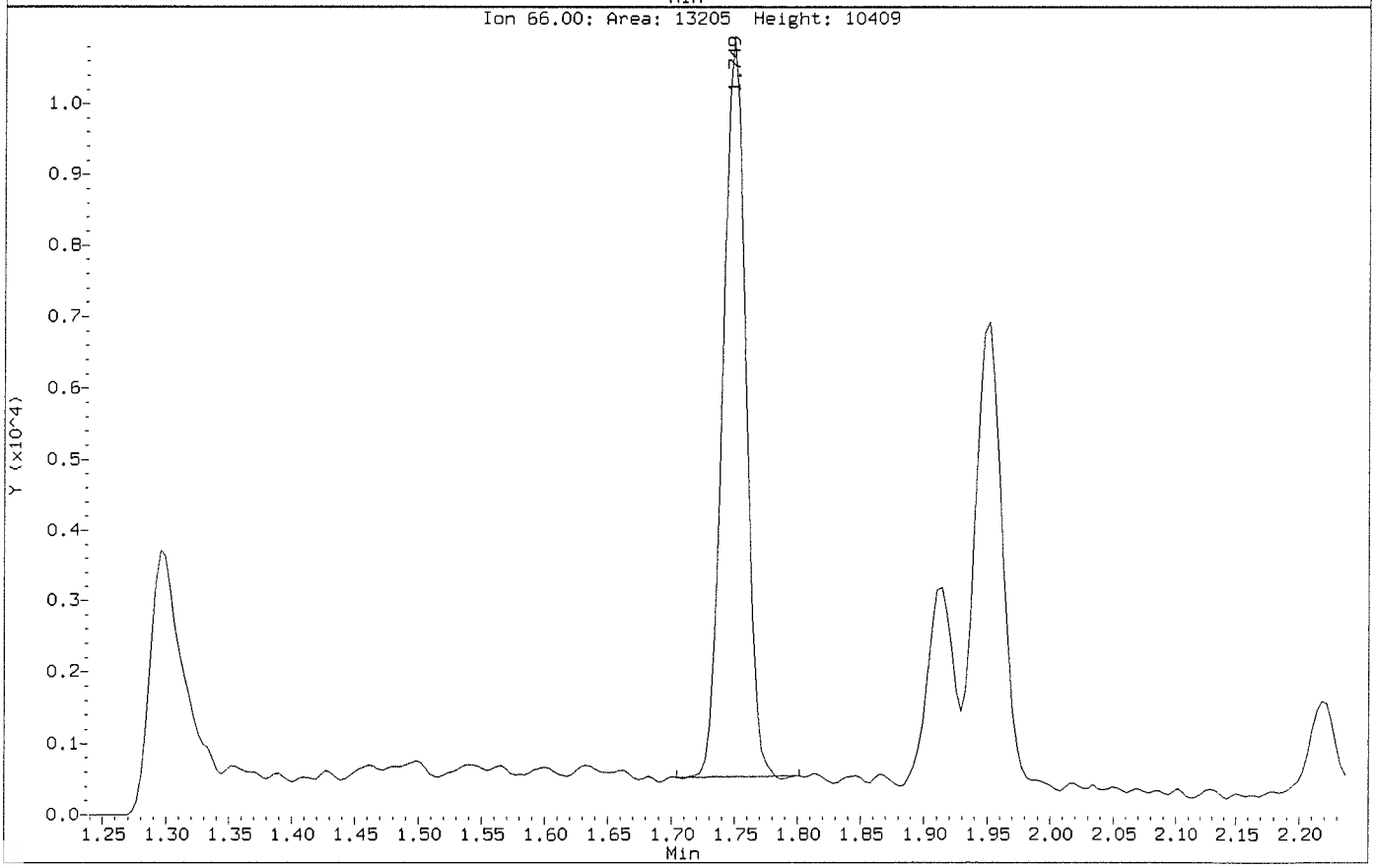
Injection Date: 09-DEC-2021 14:20
Instrument: VOA9.i
Client Sample ID: HS21120103-01MS

Compound: Chloroethane
CAS Number: 75-00-3





Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120912.D Page 1
Report Date: 03-Jan-2022 09:50

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Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120912.D
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Inj Date : 09-DEC-2021 14:42
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-01MSD;HS21120103-01MSD;3;;MSD
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:50 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 11 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

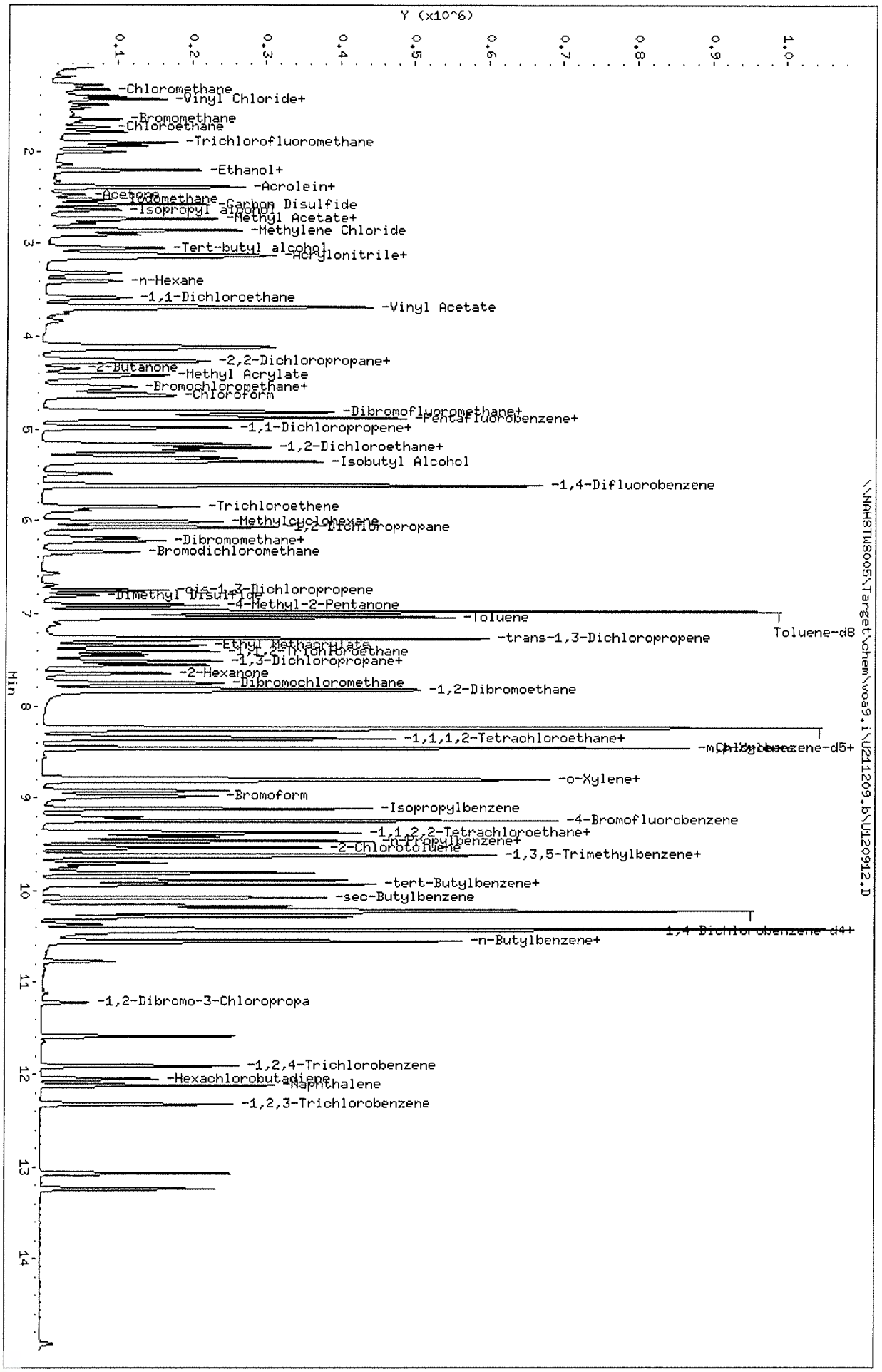
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.879	4.883	(1.000)	284281	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	481685	50.0000	
*	47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	425055	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.224	10.225	(1.000)	208080	50.0000	
$	30 Dibromofluoromethane	113	4.815	4.819	(0.987)	152030	50.9658	50.96
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	178081	51.0940	51.09
$	48 Toluene-d8	98	6.978	6.978	(0.847)	578462	52.2895	52.28
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	217785	52.8262	52.82
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	55654	19.4001	19.40
	31 1,1,1-Trichloroethane	97	4.811	4.811	(0.986)	82546	20.1709	20.17
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	98987	22.6017	22.60
	53 1,1,2-Trichloroethane	83	7.409	7.413	(0.899)	56210	22.4423	22.44
	22 1,1-Dichloroethane	63	3.586	3.589	(0.735)	112923	22.3589	22.35
	11 1,1-Dichloroethene	96	2.382	2.386	(0.488)	51676	20.3886	20.38
	32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	83683	21.1559	21.15
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	66700	17.8996	17.89
	71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	94144	21.8932	21.89
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	70874	18.5056	18.50
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	232396	22.2781	22.27
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	10474	16.1897	16.18
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	66866	21.9770	21.97
	88 1,2-Dichlorobenzene	146	10.562	10.558	(1.033)	120579	20.5491	20.54

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120912.D Page 2
Report Date: 03-Jan-2022 09:50

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33 1,2-Dichloroethane	62	5.242	5.243	(0.934)	93963	21.6239	21.62
42 1,2-Dichloropropane	63	6.071	6.071	(1.081)	66538	21.9527	21.95
75 1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	216152	21.1285	21.12
83 1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	118871	19.8351	19.83
54 1,3-Dichloropropane	76	7.555	7.555	(0.917)	119789	22.4448	22.44
84 1,4-Dichlorobenzene	146	10.247	10.243	(1.002)	124412	20.1750	20.17
26 2,2-Dichloropropane	77	4.257	4.260	(0.872)	55179	19.2778	19.27
24 2-Butanone	43	4.343	4.343	(0.890)	58318	39.2315	39.23
76 2-Chlorotoluene	91	9.538	9.539	(0.933)	193591	21.6056	21.60
52 2-Hexanone	43	7.645	7.645	(0.928)	95041	47.1024	47.10
77 4-Chlorotoluene	91	9.628	9.629	(0.942)	230398	22.1880	22.18
82 p-Isopropyltoluene	119	10.198	10.198	(0.997)	212234	20.9300	20.92
45 4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	131117	42.8316	42.83
10 Acetone	43	2.468	2.469	(0.506)	43546	40.1729	40.17
37 Benzene	78	5.201	5.205	(0.927)	261084	21.4357	21.43
74 Bromobenzene	156	9.374	9.374	(0.917)	65085	20.1698	20.16
29 Bromochloromethane	128	4.538	4.542	(0.930)	34086	21.2570	21.25
39 Bromodichloromethane	83	6.337	6.337	(1.129)	72856	19.2378	19.23
66 Bromoform	173	8.972	8.972	(1.089)	28624	15.5613	15.56
6 Bromomethane	94	1.651	1.655	(0.339)	34235	19.2314	19.23
19 Carbon Disulfide	76	2.573	2.577	(0.528)	256658	36.4853	36.48
34 Carbon Tetrachloride	117	4.976	4.980	(0.886)	66732	18.4111	18.41
59 Chlorobenzene	112	8.264	8.264	(1.003)	171771	20.7292	20.72
7 Chloroethane	64	1.737	1.738	(0.356)	41069	17.4588	17.45(M)
28 Chloroform	83	4.643	4.643	(0.952)	118121	21.5711	21.57
3 Chloromethane	50	1.329	1.329	(0.272)	39933	13.6774	13.67
27 cis-1,2-Dichloroethene	96	4.268	4.272	(0.875)	71803	20.6734	20.67
46 cis-1,3-Dichloropropene	75	6.749	6.750	(1.202)	86174	18.1248	18.12
55 Dibromochloromethane	129	7.747	7.747	(0.940)	54005	17.8622	17.86
44 Dibromomethane	93	6.180	6.180	(1.101)	44031	21.2995	21.29
2 Dichlorodifluoromethane	85	1.190	1.194	(0.244)	15461	3.90944	3.90(a)
61 Ethylbenzene	106	8.361	8.361	(1.015)	87746	21.1580	21.15
91 Hexachlorobutadiene	225	12.050	12.050	(1.179)	26355	18.6189	18.61
67 Isopropylbenzene	105	9.115	9.115	(1.106)	265544	21.2648	21.26
62 m,p-Xylenes	106	8.463	8.463	(1.027)	221006	43.1301	43.13
17 Methylene Chloride	84	2.855	2.855	(0.585)	66162	19.7493	19.74
87 n-Butylbenzene	91	10.547	10.547	(1.032)	193382	21.2694	21.26
73 n-Propylbenzene	91	9.467	9.464	(0.926)	310972	22.0035	22.00
92 Naphthalene	128	12.121	12.121	(1.186)	218570	19.0645	19.06
63 o-Xylene	106	8.800	8.800	(1.068)	106227	20.9303	20.93
81 sec-Butylbenzene	105	10.075	10.075	(0.985)	245441	21.1381	21.13
64 Styrene	104	8.815	8.815	(1.070)	191418	21.9639	21.96
78 tert-Butylbenzene	119	9.891	9.891	(0.967)	179866	20.8571	20.85
56 Tetrachloroethene	164	7.514	7.514	(0.912)	46087	19.2254	19.22
50 Toluene	91	7.038	7.038	(0.854)	273381	21.4987	21.49
20 trans-1,2-Dichloroethene	96	3.121	3.125	(0.640)	57593	20.1436	20.14
51 trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	70979	17.7319	17.73
38 Trichloroethene	130	5.850	5.850	(1.042)	62961	20.0078	20.00
8 Trichlorofluoromethane	101	1.936	1.940	(0.397)	79397	17.3183	17.31
5 Vinyl Chloride	62	1.404	1.408	(0.288)	50829	14.7839	14.78

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

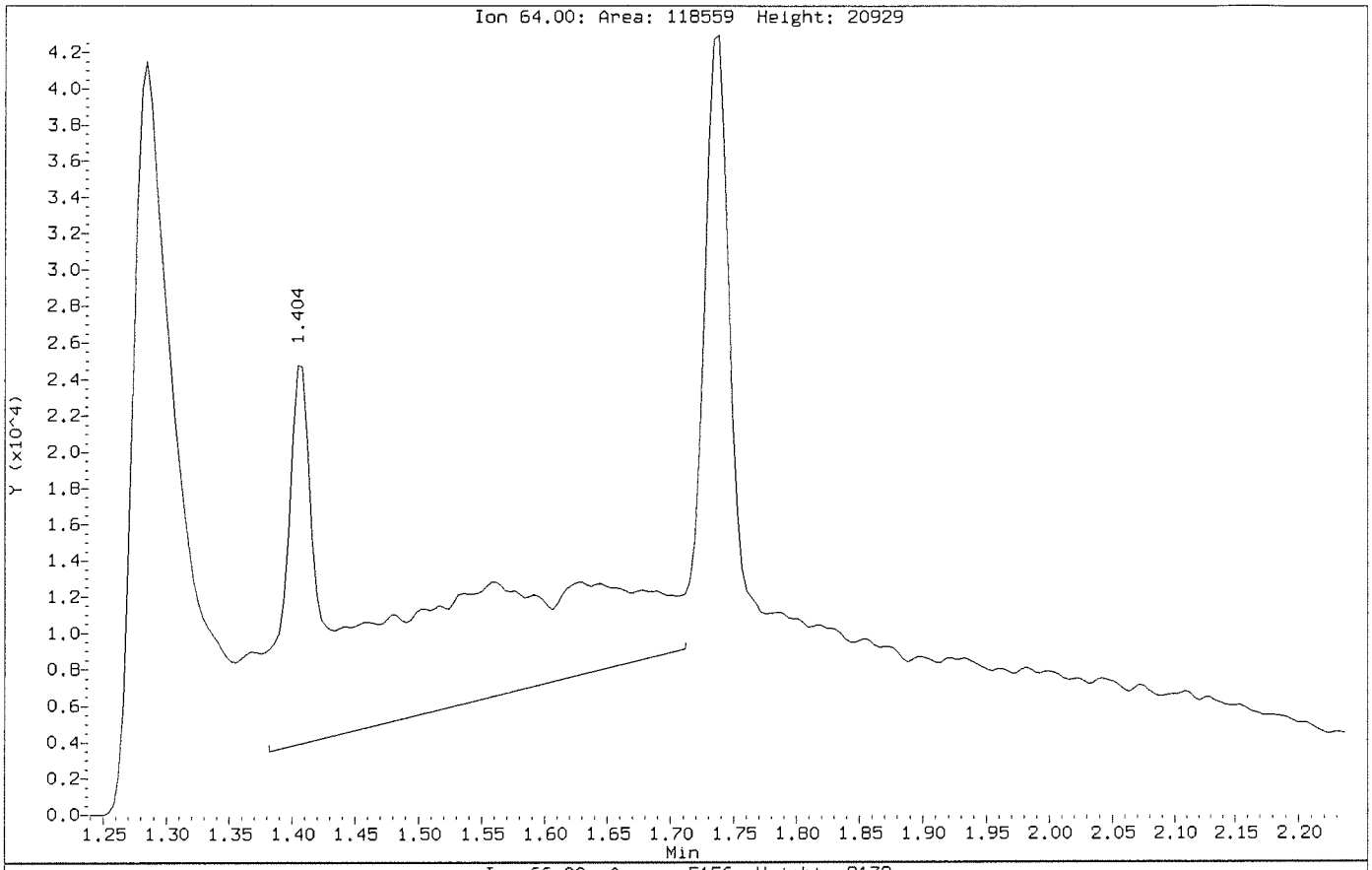


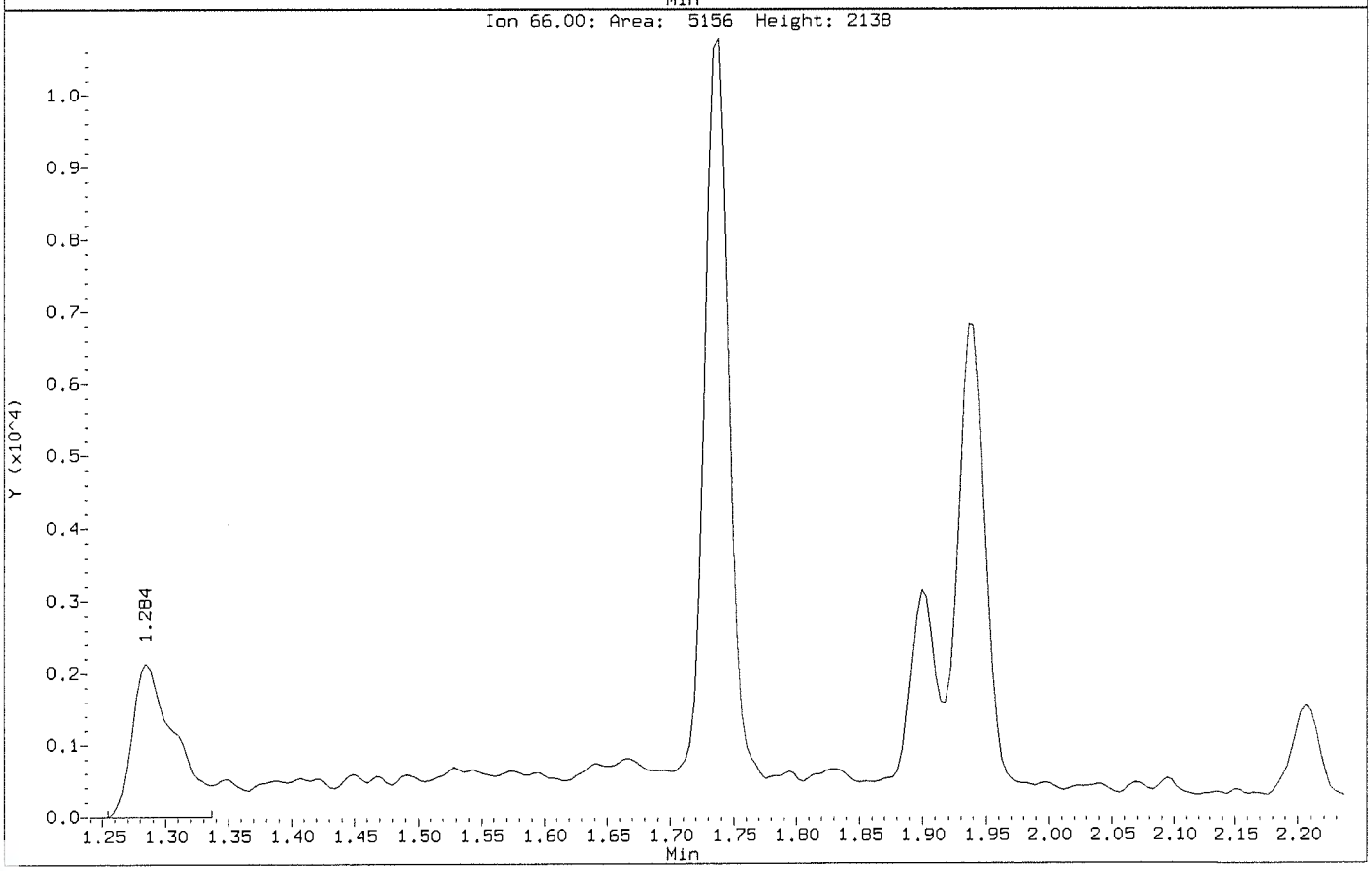
Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120912.D
Date : 09-DEC-2021 14:42
Client ID: HS2112010З-01MSD
Sample Info: HS2112010З-01MSD;HS2112010З-01MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\before\U120912.D
Injection Date: 09-DEC-2021 14:42
Instrument: VOA9.i
Client Sample ID: HS21120103-01MSD

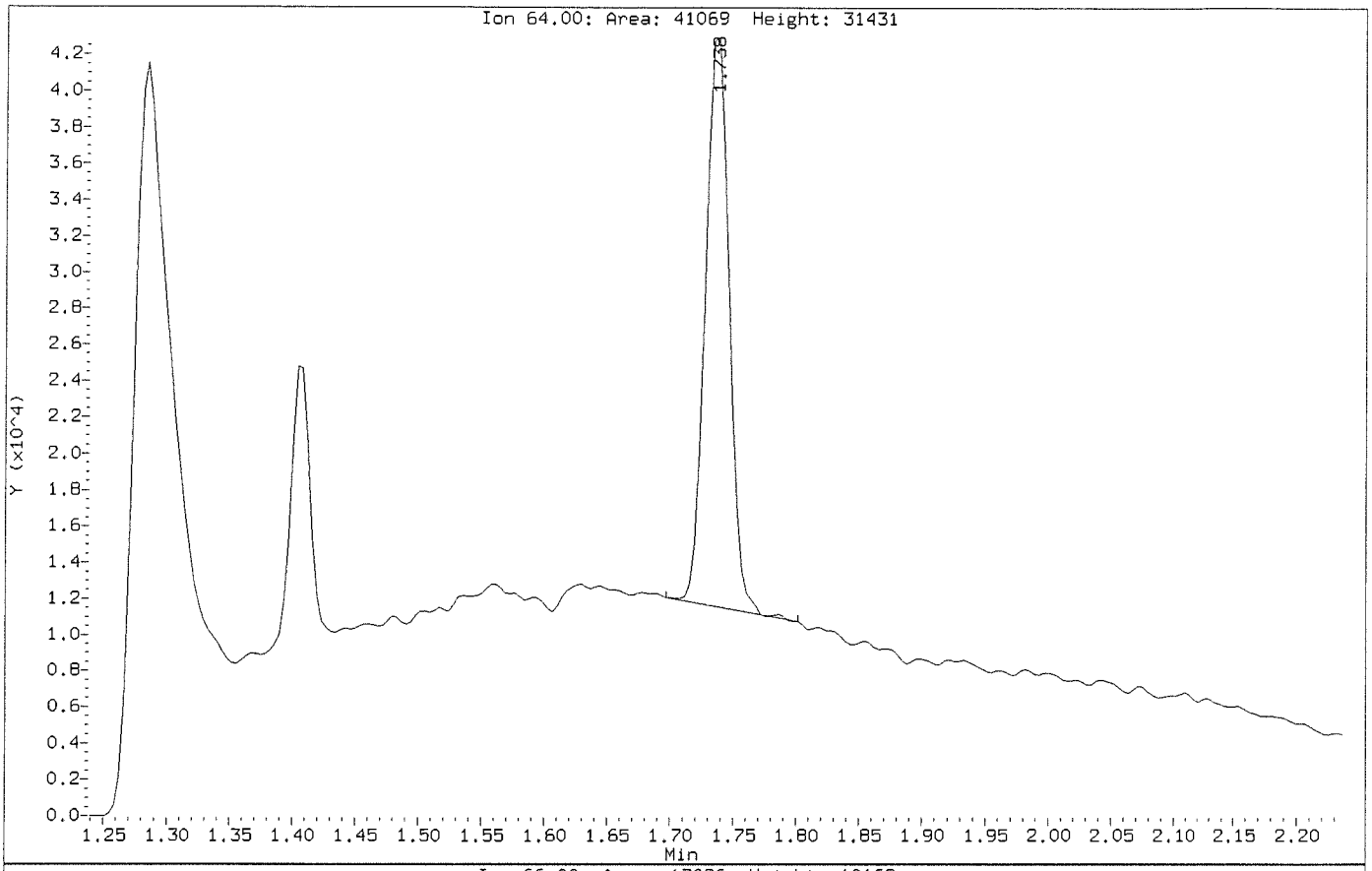
Compound: Chloroethane
CAS Number: 75-00-3

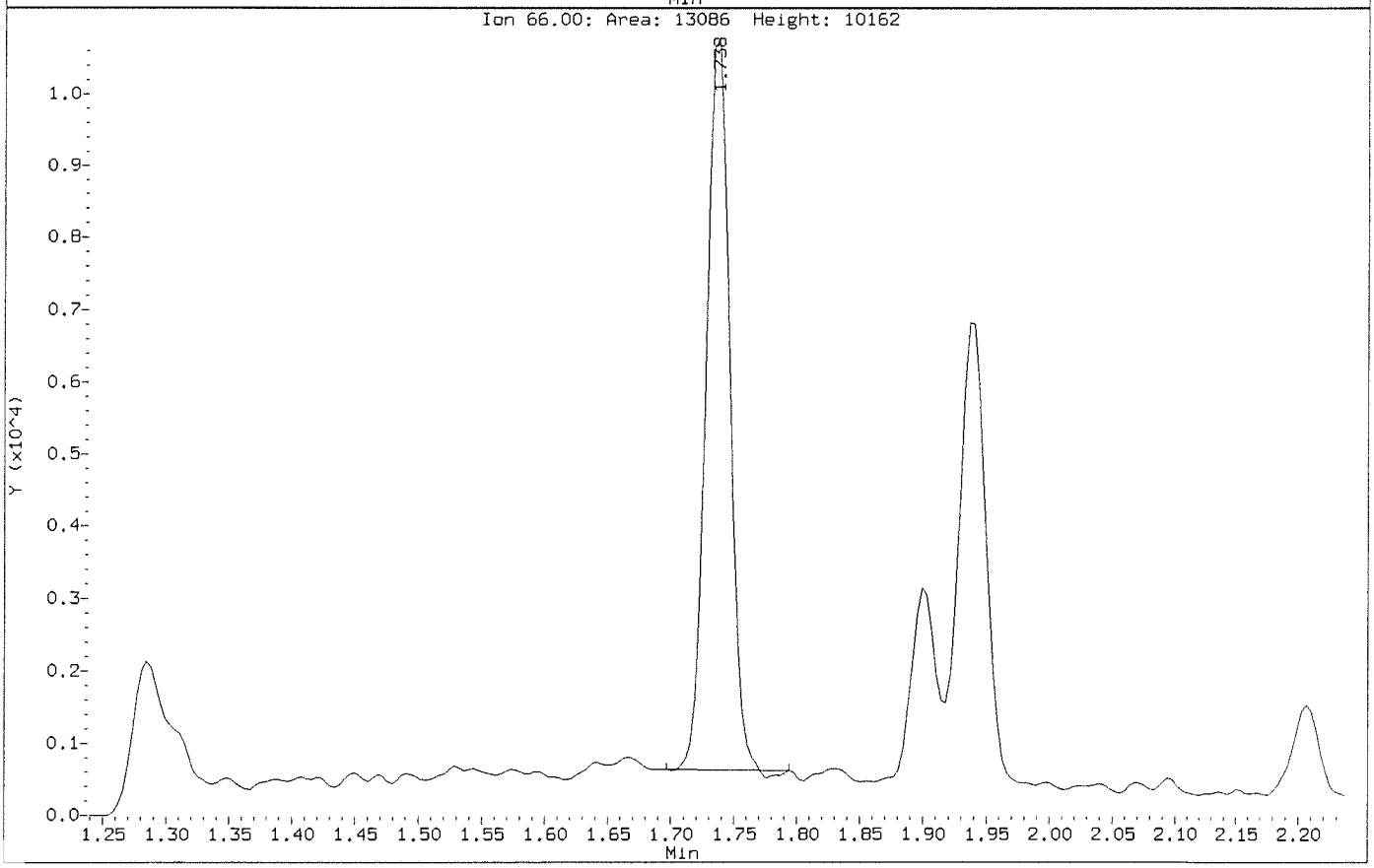




Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120912.D
Injection Date: 09-DEC-2021 14:42
Instrument: VOA9.i
Client Sample ID: HS21120103-01MSD

Compound: Chloroethane
CAS Number: 75-00-3





ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D
Lab Smp Id: HS21120103-05 Client Smp ID: HS21120103-05
Inj Date : 09-DEC-2021 15:27
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-05;HS21120103-05;;;
Misc Info : 180315V9;WATER;0;10;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 13
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

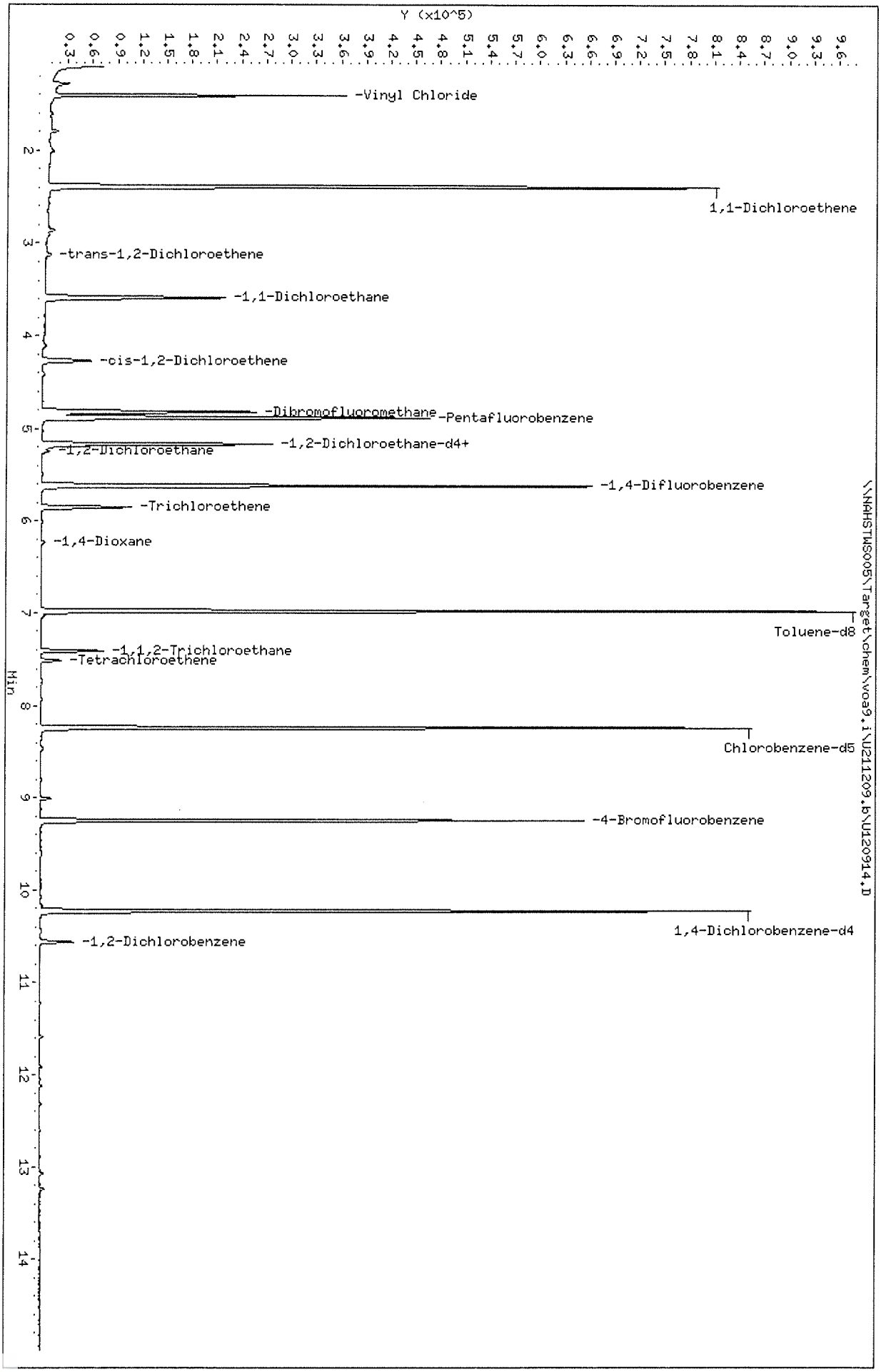
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	276766	50.0000	
* 36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	476678	50.0000	
* 47 Chlorobenzene-d5	117	8.242	8.242	(1.000)	424622	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	198648	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	144448	49.7182	49.71
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	179551	52.9680	52.96
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	565893	51.2055	51.20
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	208249	50.5071	50.50
53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	17808	7.11725	71.17
22 1,1-Dichloroethane	63	3.589	3.589	(0.735)	215194	43.7657	437.65
11 1,1-Dichloroethene	96	2.390	2.390	(0.490)	260245	105.467	1054.66
88 1,2-Dichlorobenzene	146	10.562	10.558	(1.033)	14703	2.62466	26.24(a)
33 1,2-Dichloroethane	62	5.243	5.243	(0.934)	6618	1.53901	15.39(a)
37 Benzene	78	5.205	5.205	(0.927)	7818	0.64862	6.48(a)
27 cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	28037	8.29154	82.91
56 Tetrachloroethene	164	7.514	7.514	(0.912)	4467	1.86533	18.65(a)
20 trans-1,2-Dichloroethene	96	3.125	3.125	(0.640)	1399	0.50260	5.02(a)
38 Trichloroethene	130	5.850	5.850	(1.042)	32632	10.4787	104.78
5 Vinyl Chloride	62	1.411	1.412	(0.289)	217579	65.0024	650.02

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D
Date : 09-DEC-2021 15:27
Client ID: HS21120103-05
Sample Info: HS21120103-05;HS21120103-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

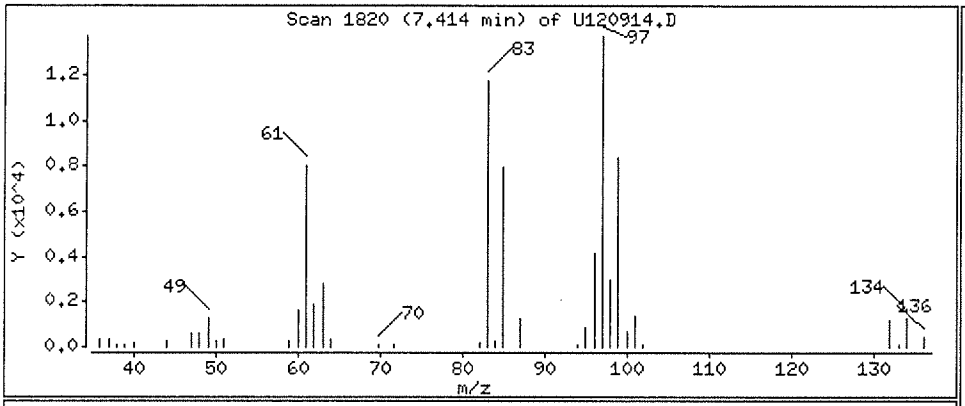
Operator: PC

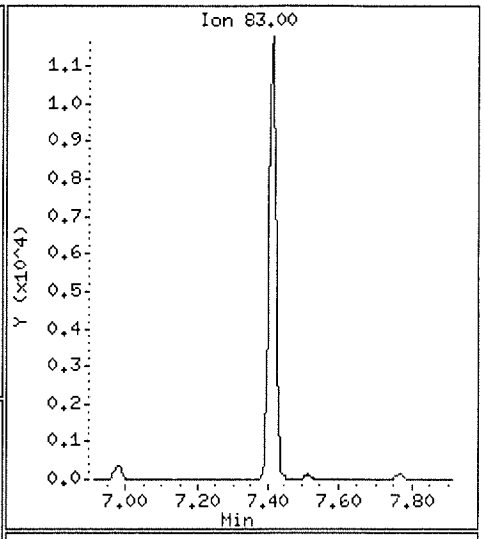
Column phase: DB624

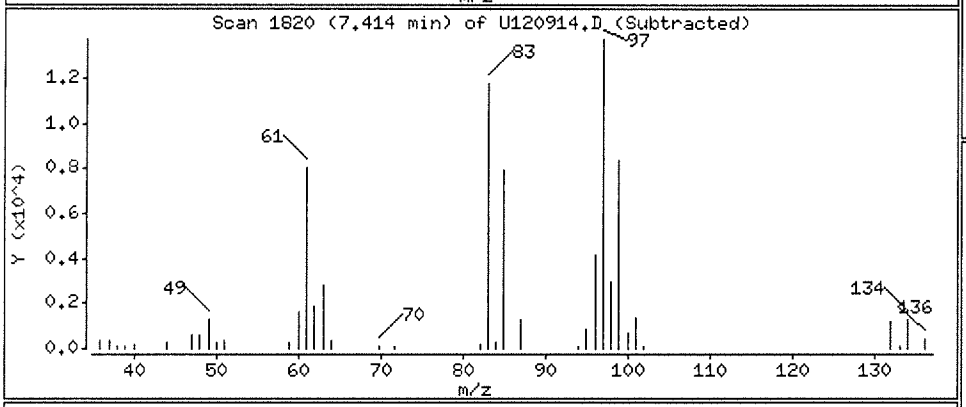
Column diameter: 0.18

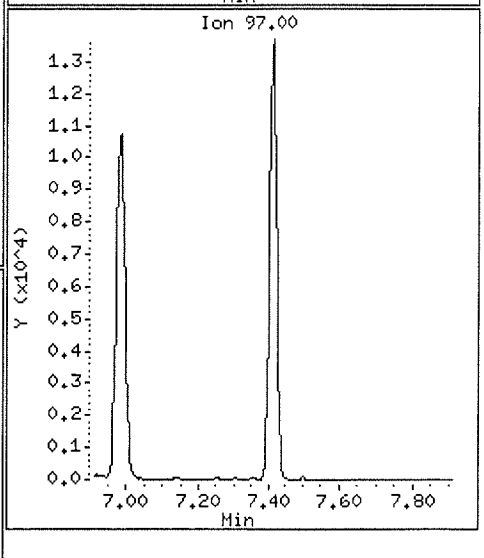
53 1,1,2-Trichloroethane

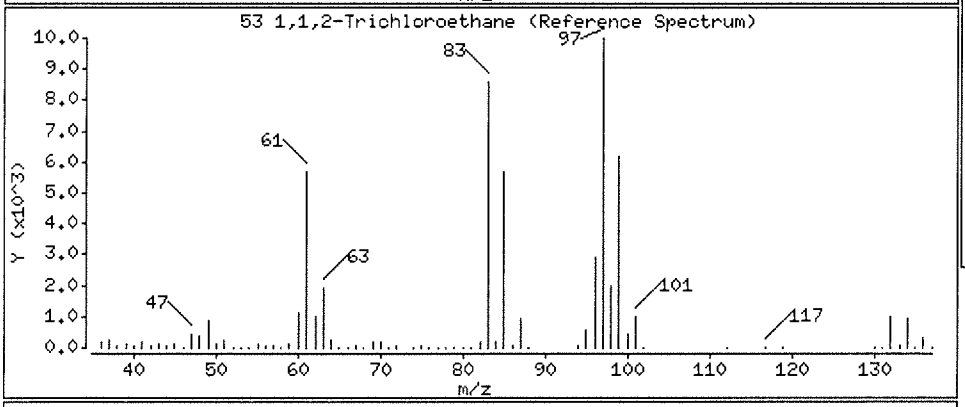
Concentration: 71.17 ug/l

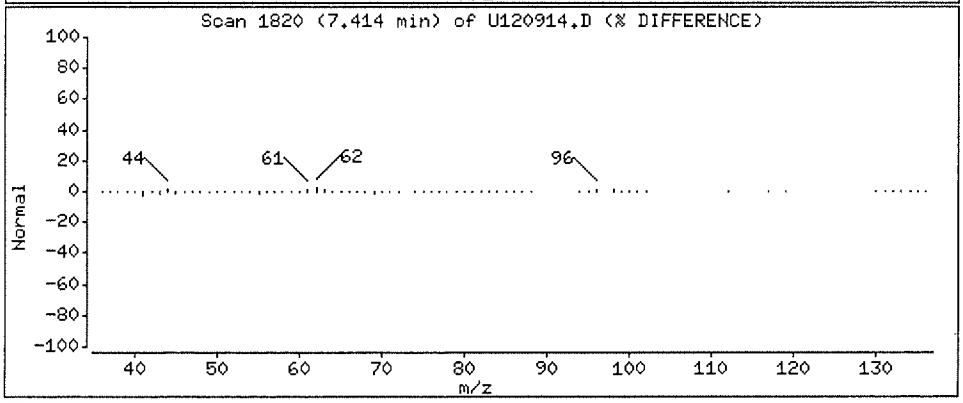












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

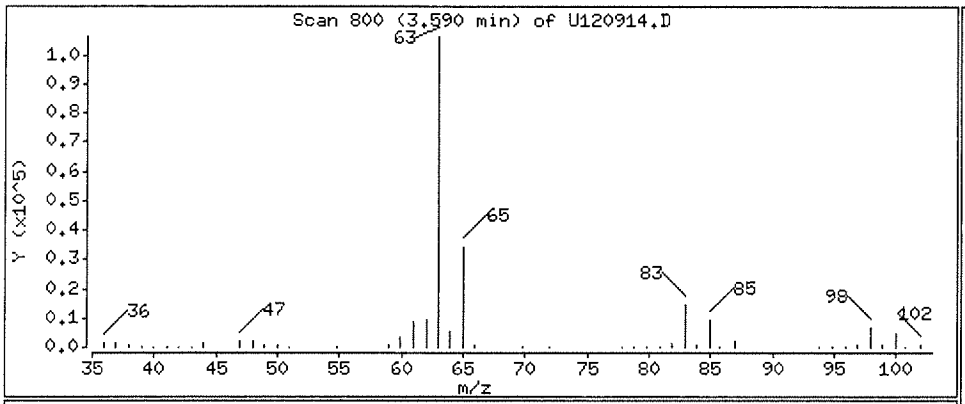
Operator: PC

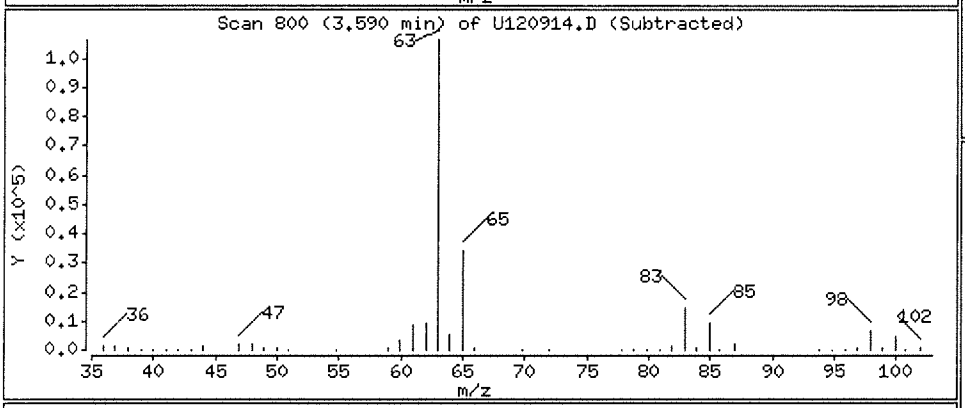
Column phase: DB624

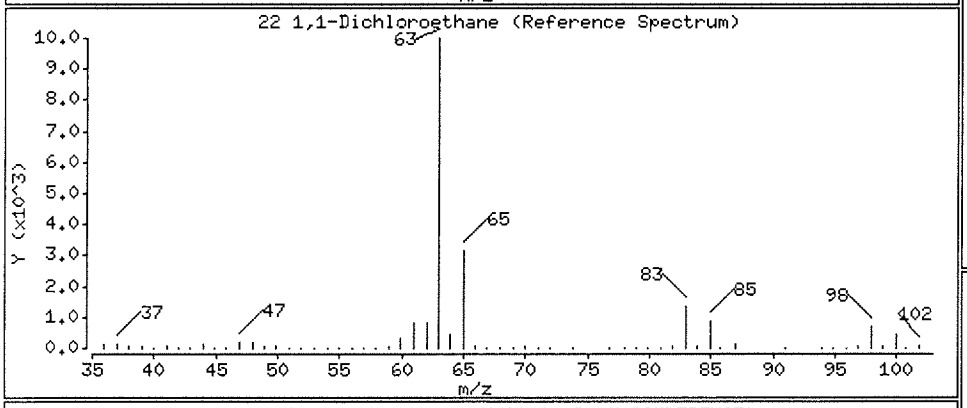
Column diameter: 0.18

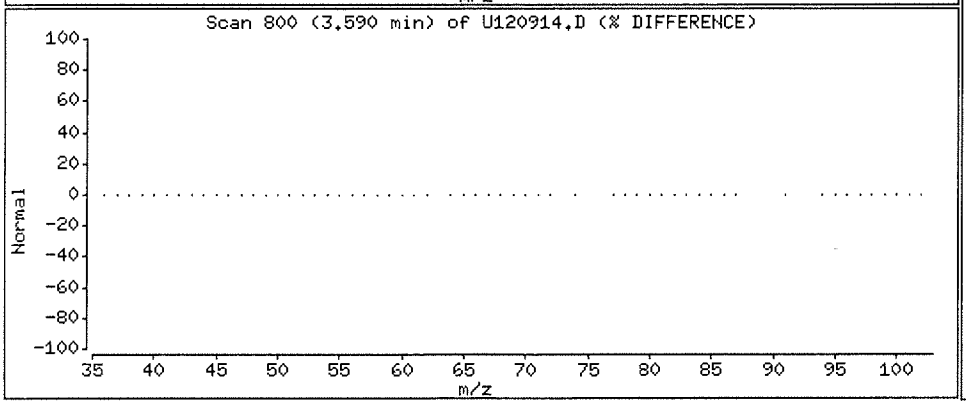
22 1,1-Dichloroethane

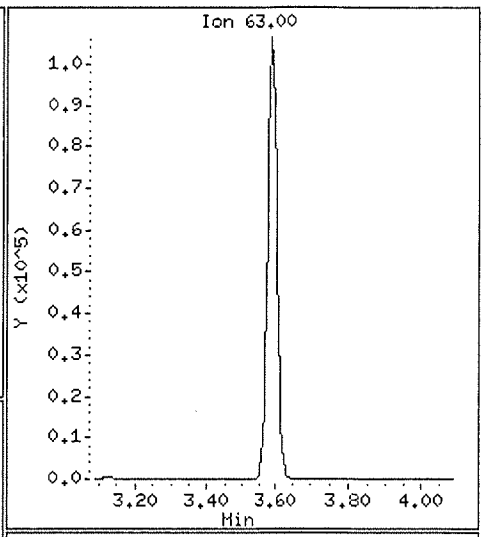
Concentration: 437.65 ug/l

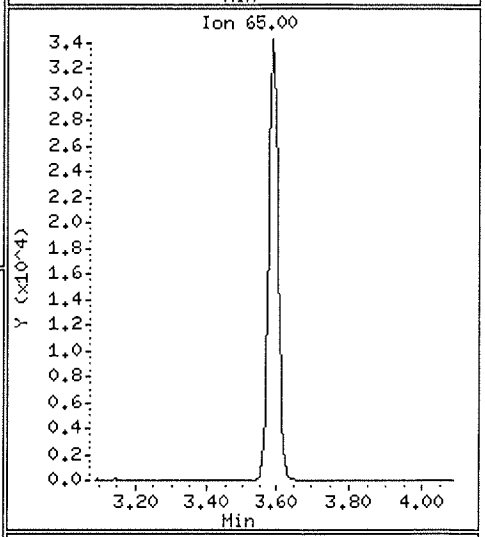


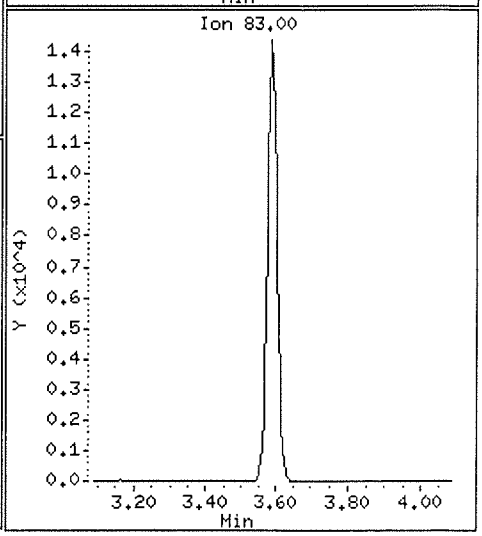












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

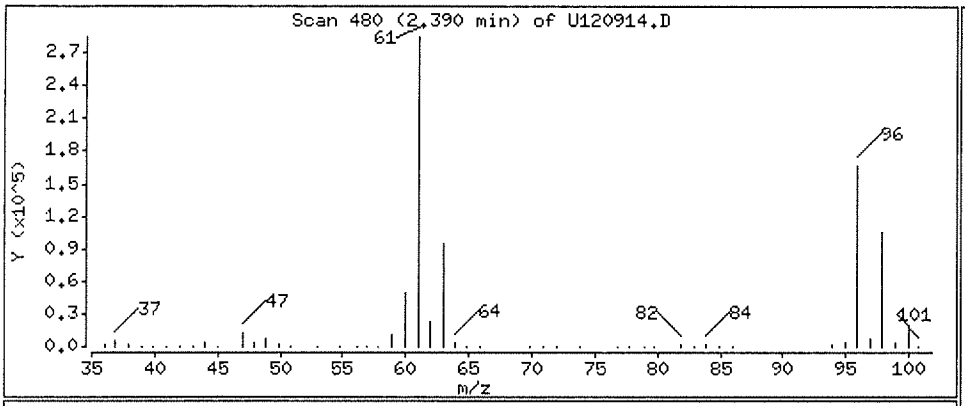
Operator: PC

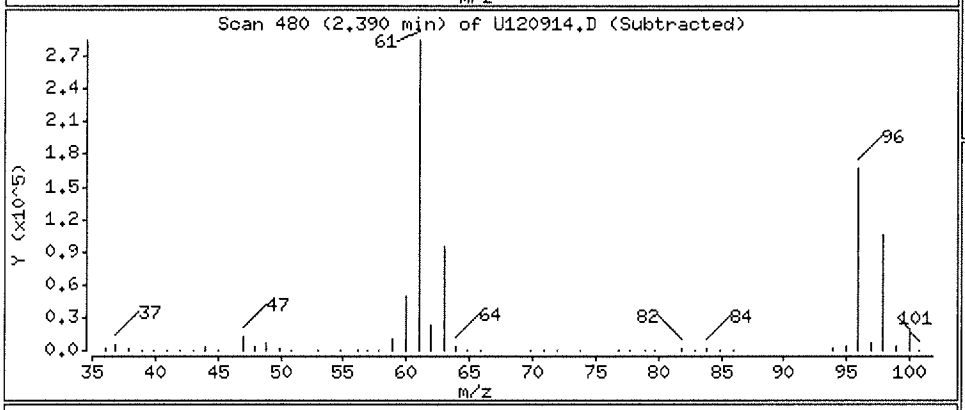
Column phase: DB624

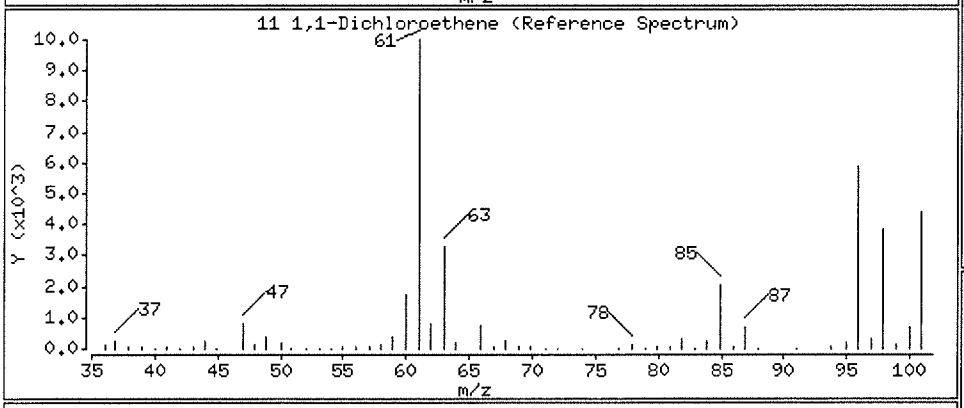
Column diameter: 0.18

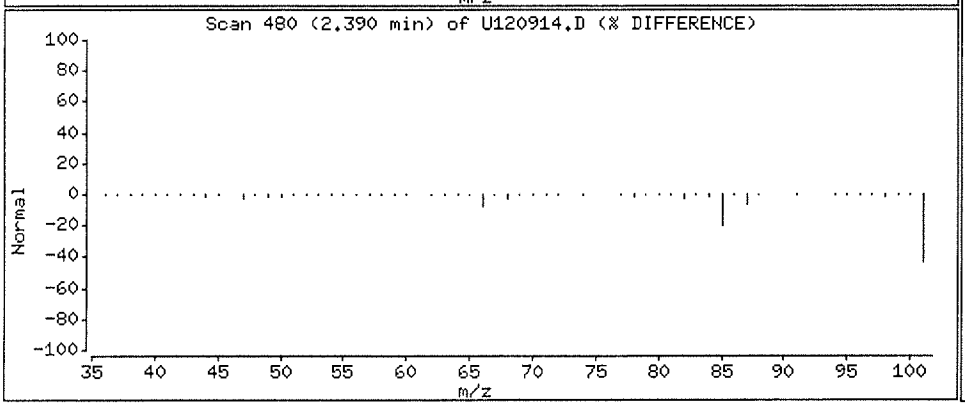
11 1,1-Dichloroethene

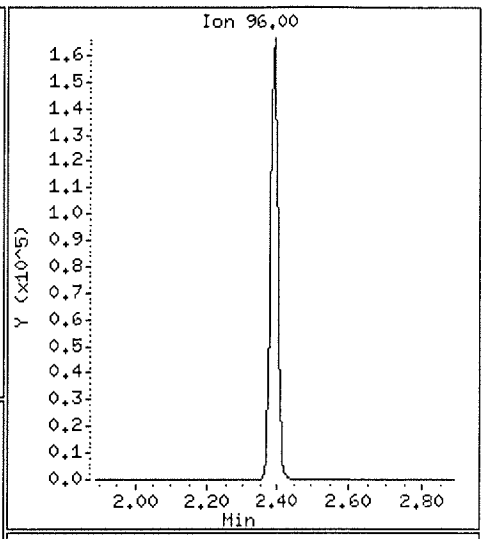
Concentration: 1054.66 ug/l

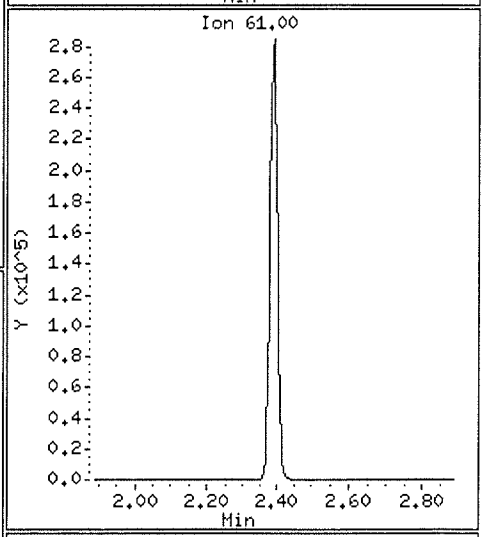


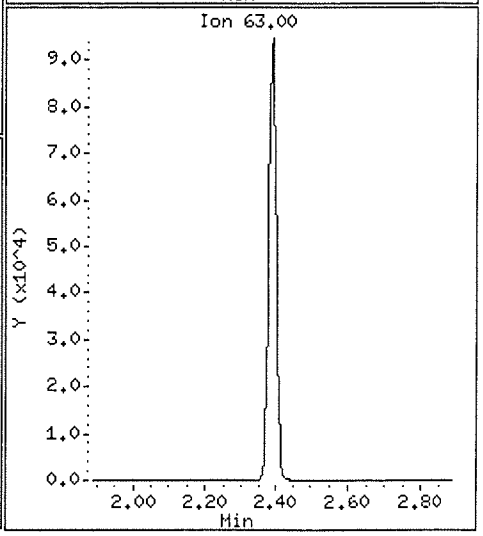












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

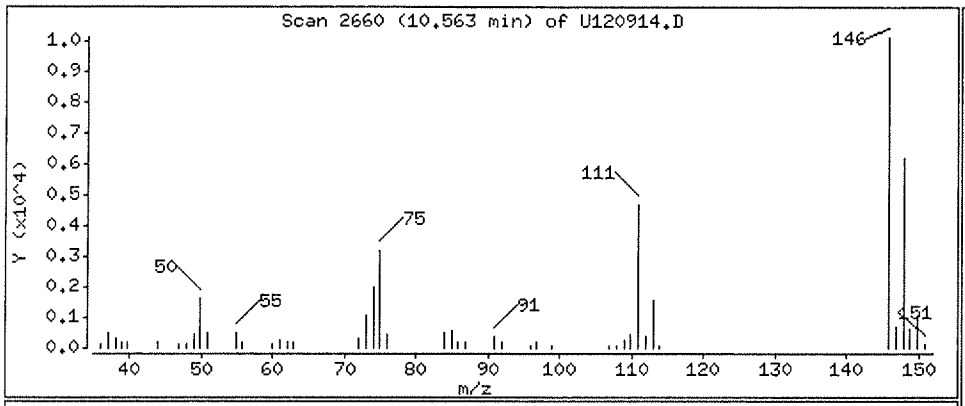
Operator: PC

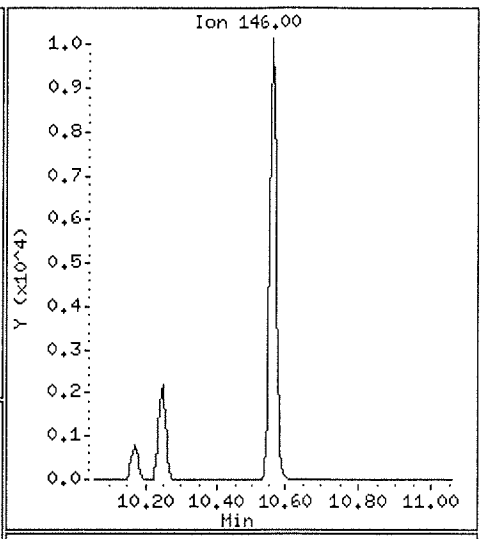
Column phase: DB624

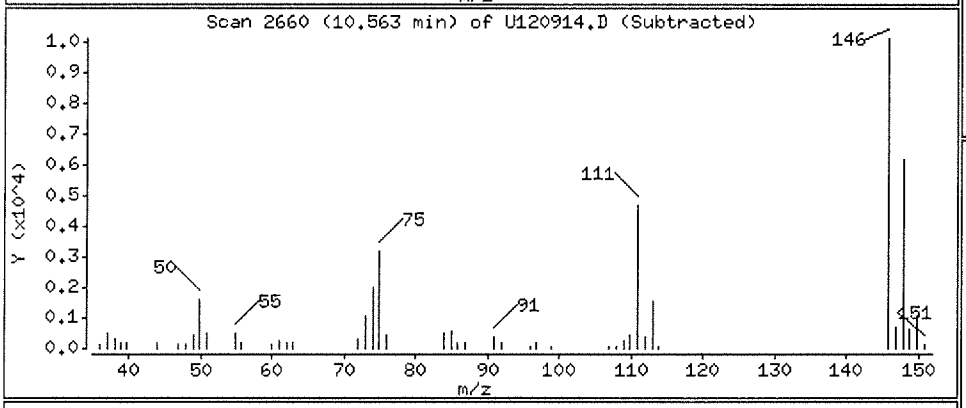
Column diameter: 0.18

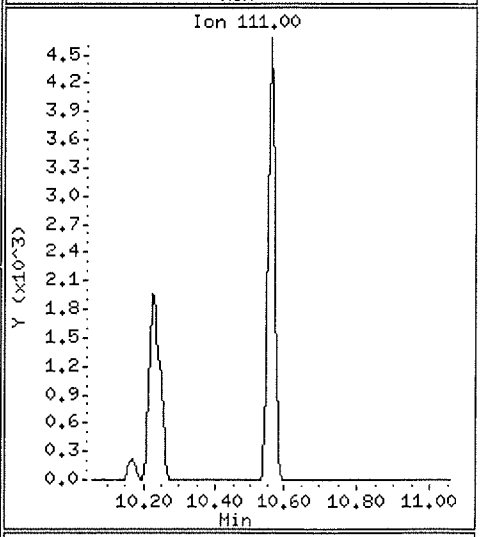
88 1,2-Dichlorobenzene

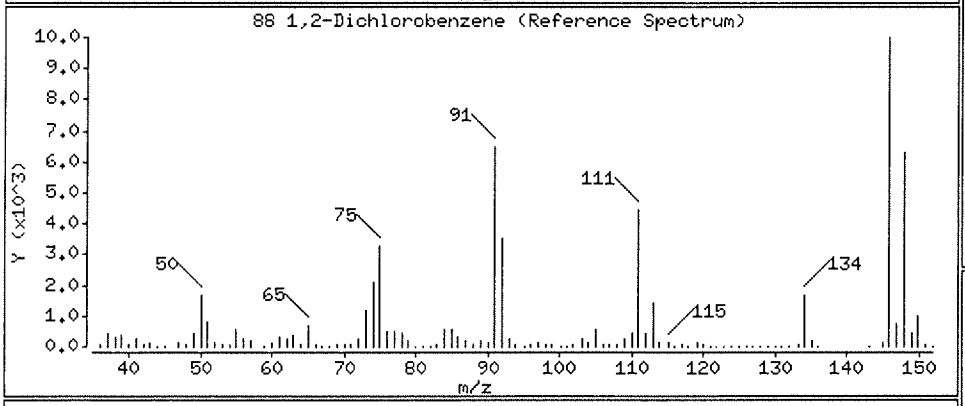
Concentration: 26.24 ug/l

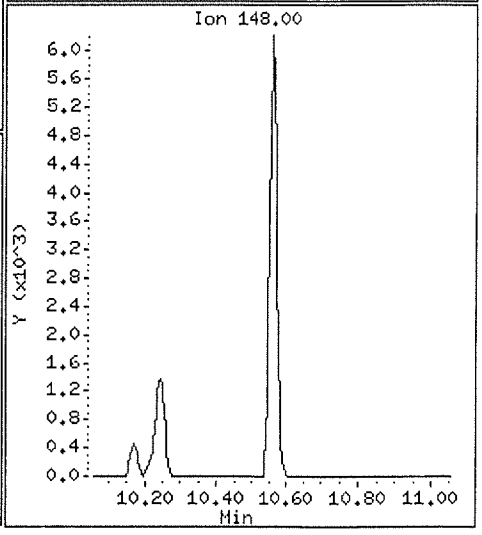


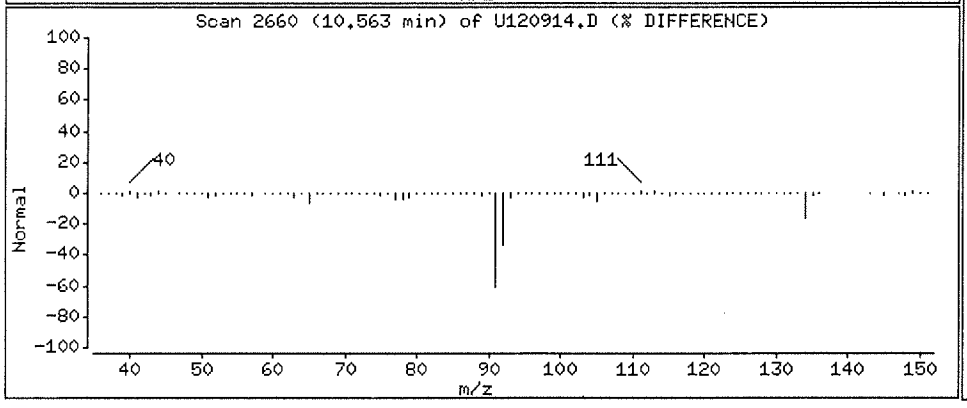












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

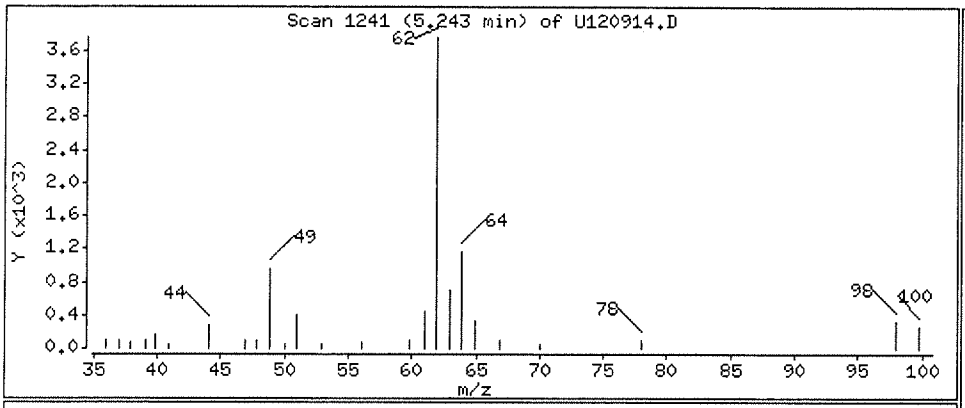
Operator: PC

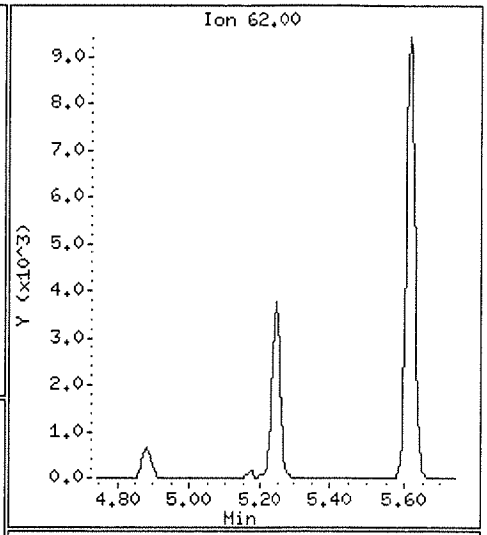
Column phase: DB624

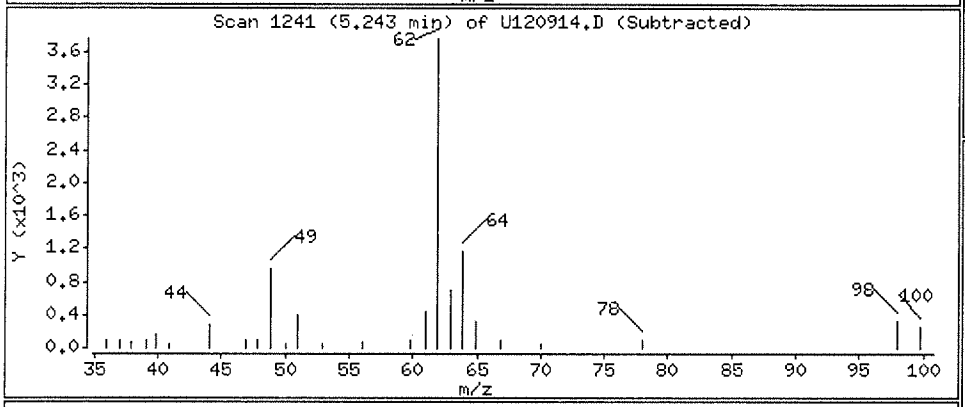
Column diameter: 0.18

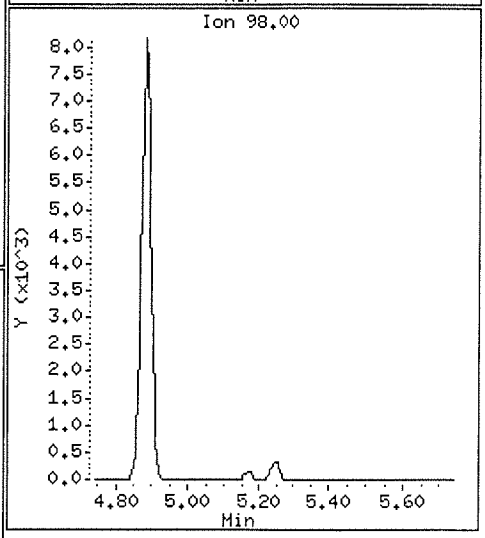
33 1,2-Dichloroethane

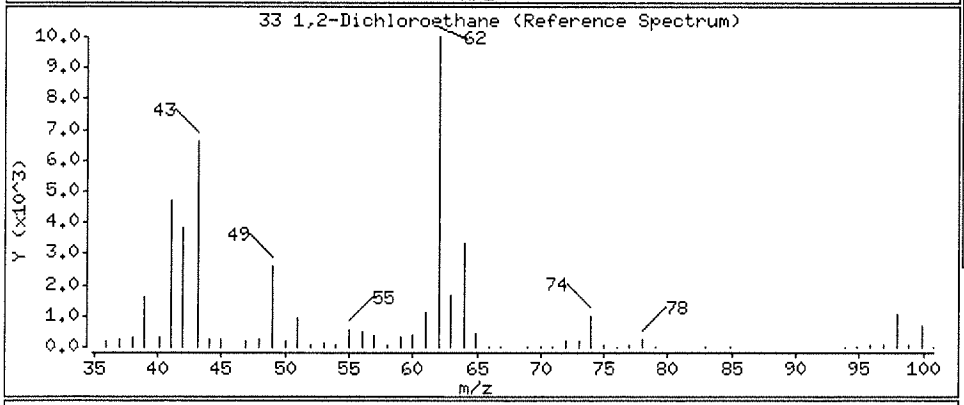
Concentration: 15.39 ug/l

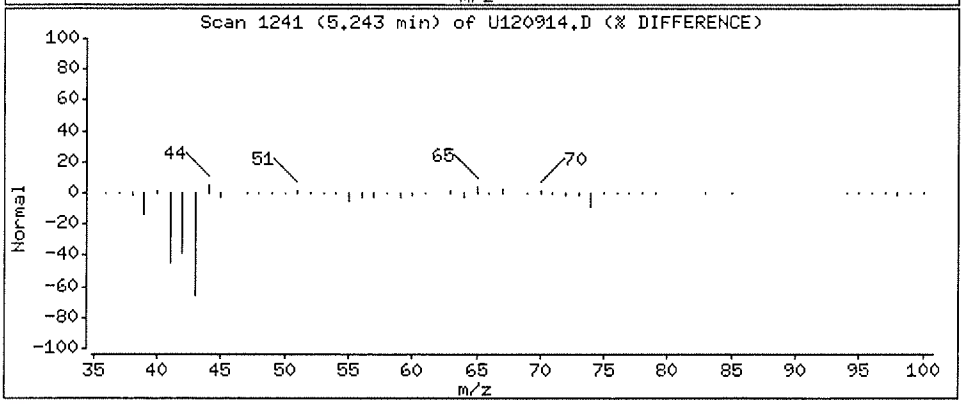












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

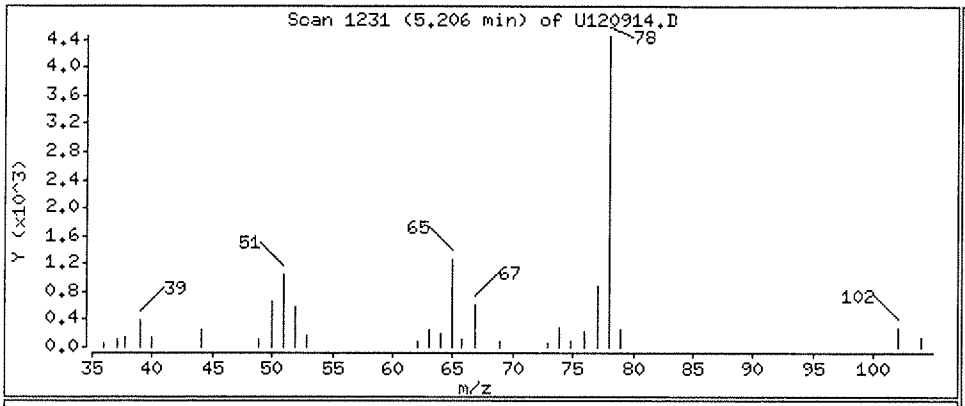
Operator: PC

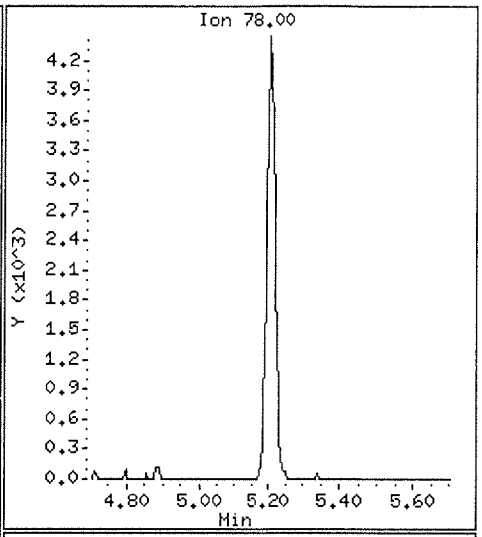
Column phase: DB624

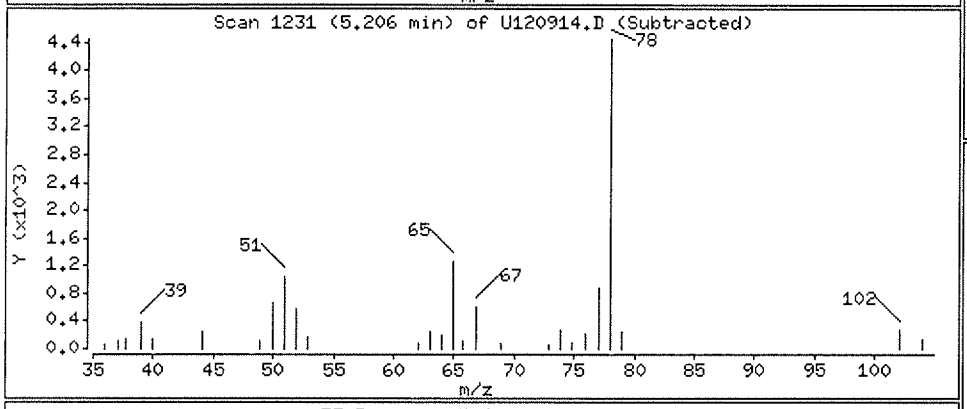
Column diameter: 0.18

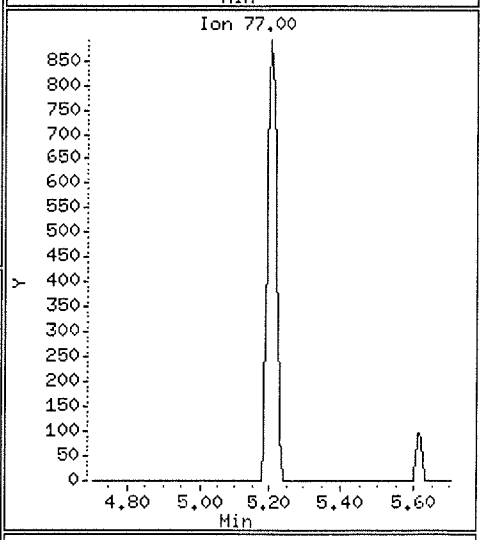
37 Benzene

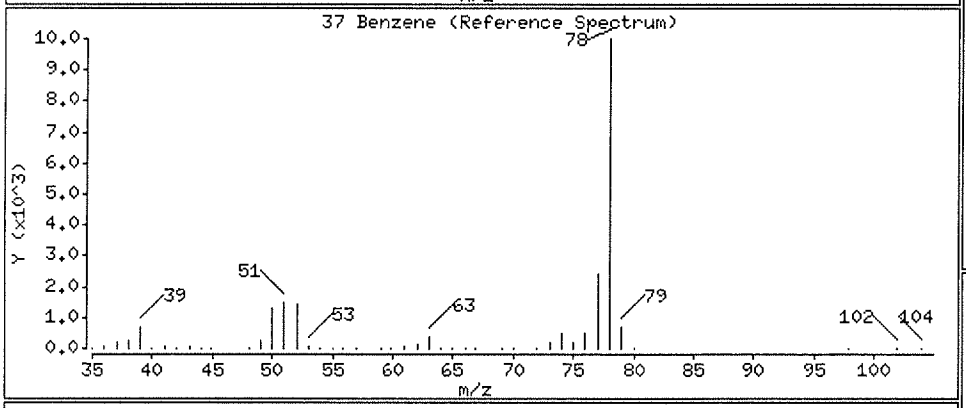
Concentration: 6.48 ug/l

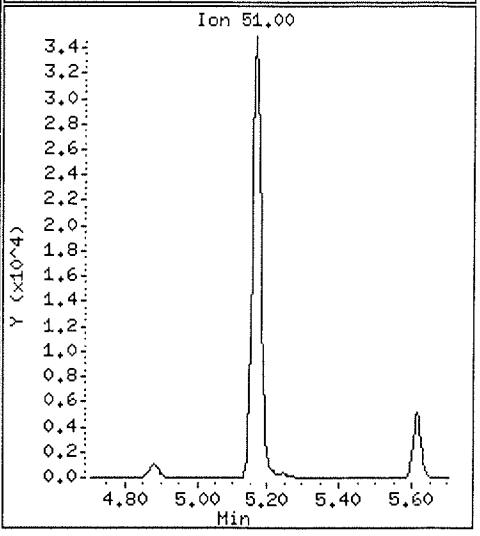


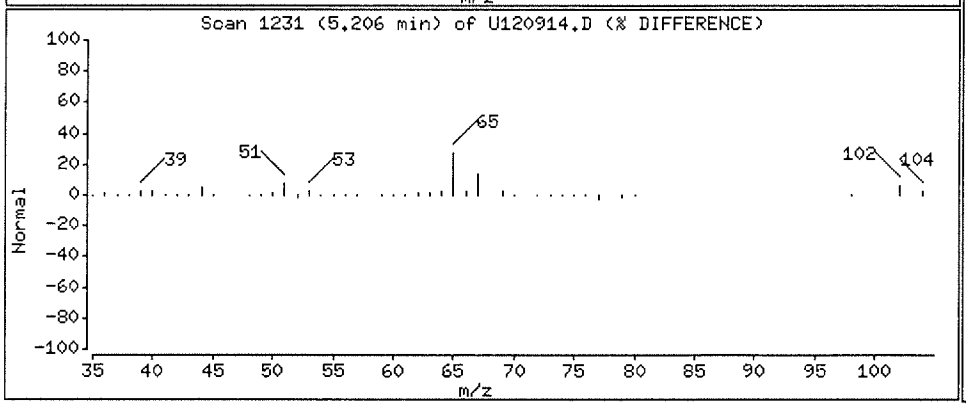












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

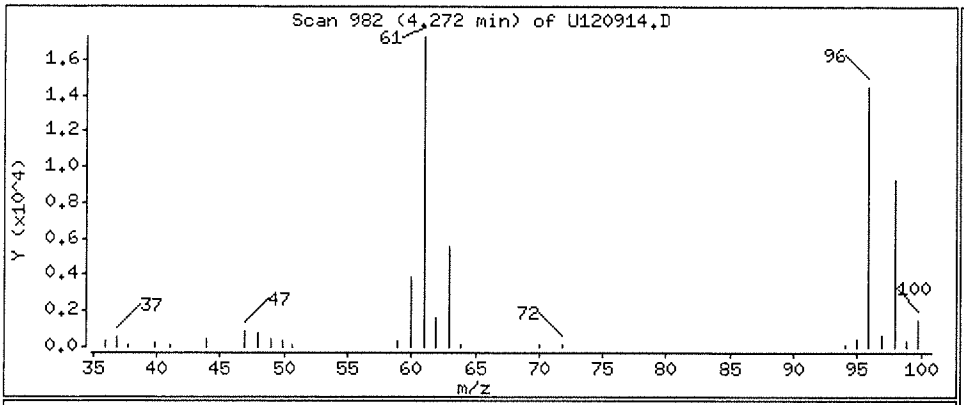
Operator: PC

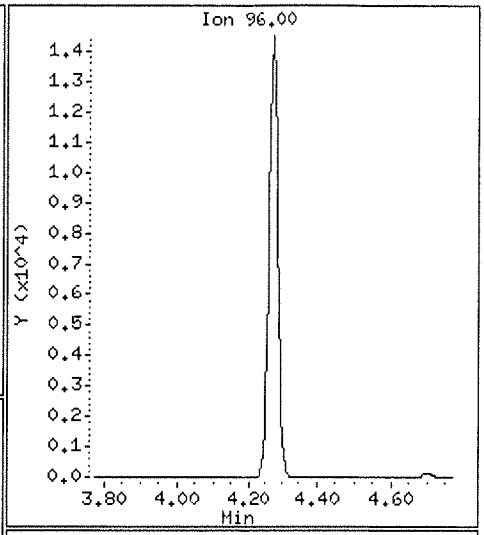
Column phase: DB624

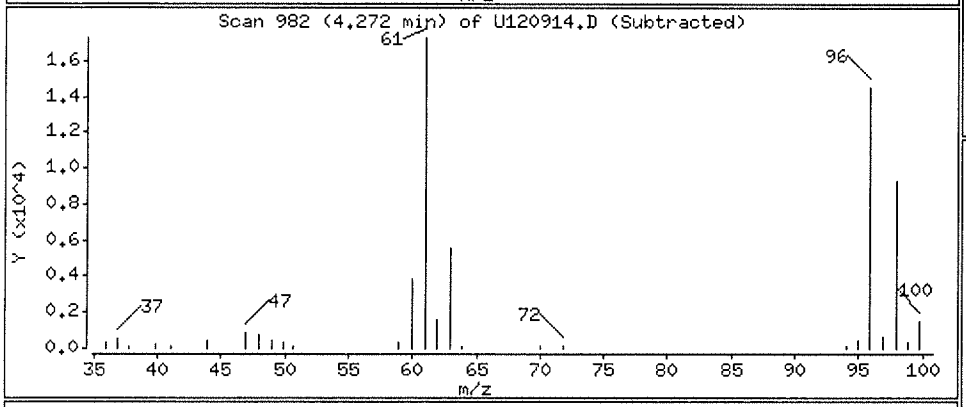
Column diameter: 0.18

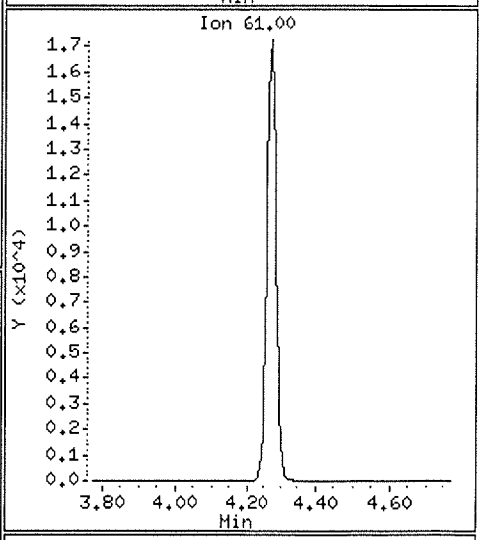
27 cis-1,2-Dichloroethene

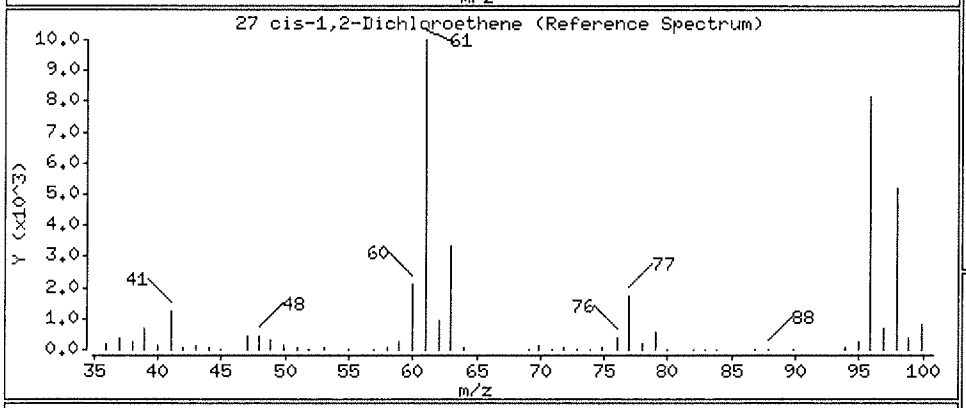
Concentration: 82.91 ug/l

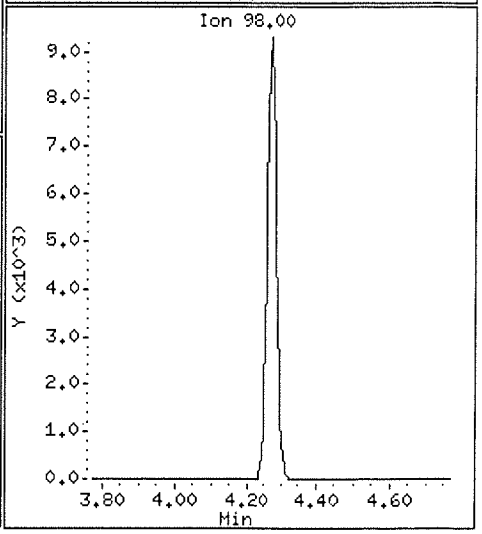


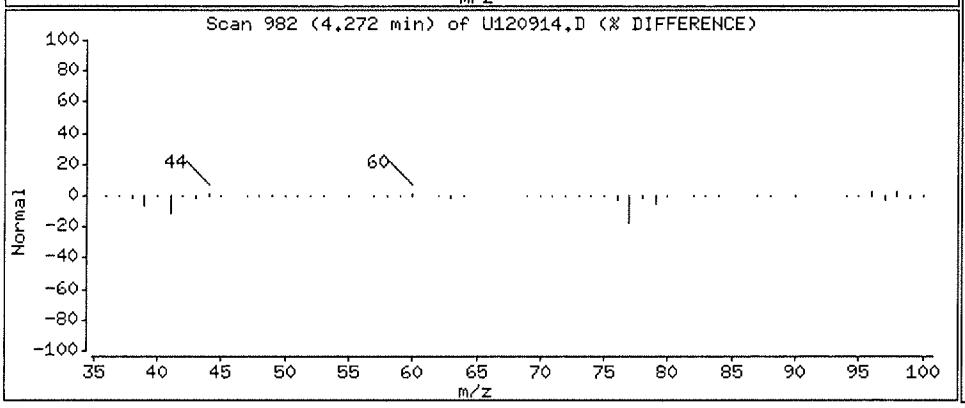












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

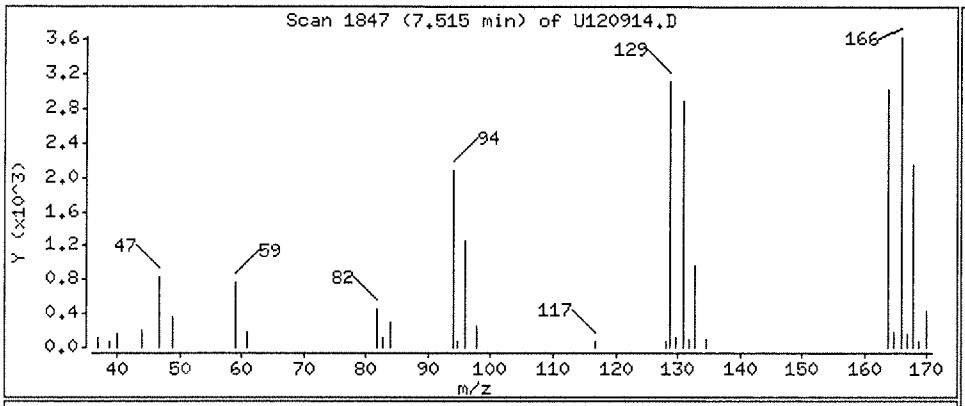
Operator: PC

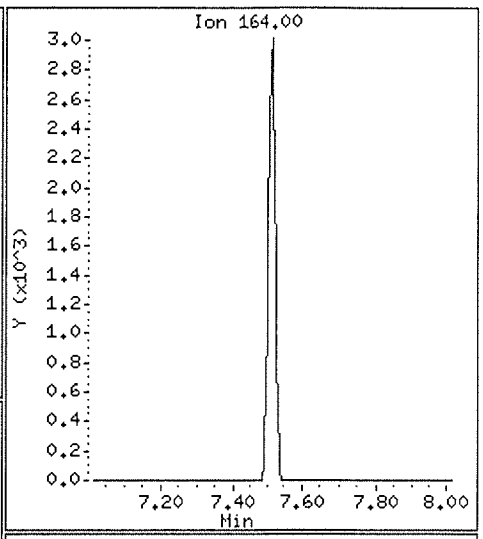
Column phase: DB624

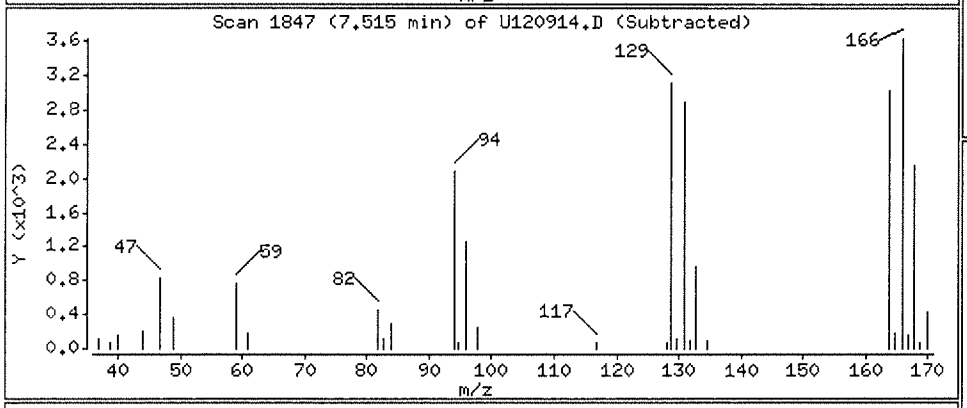
Column diameter: 0.18

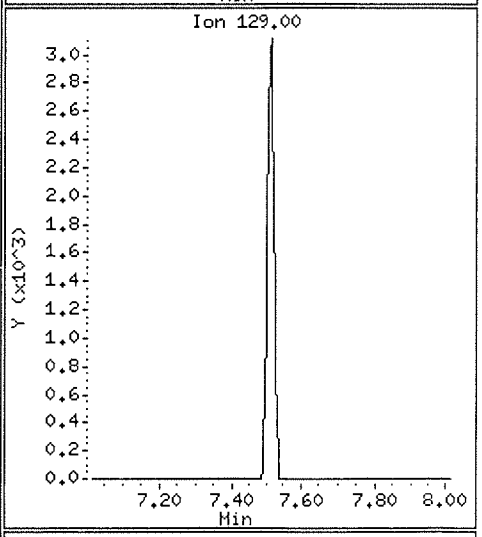
56 Tetrachloroethene

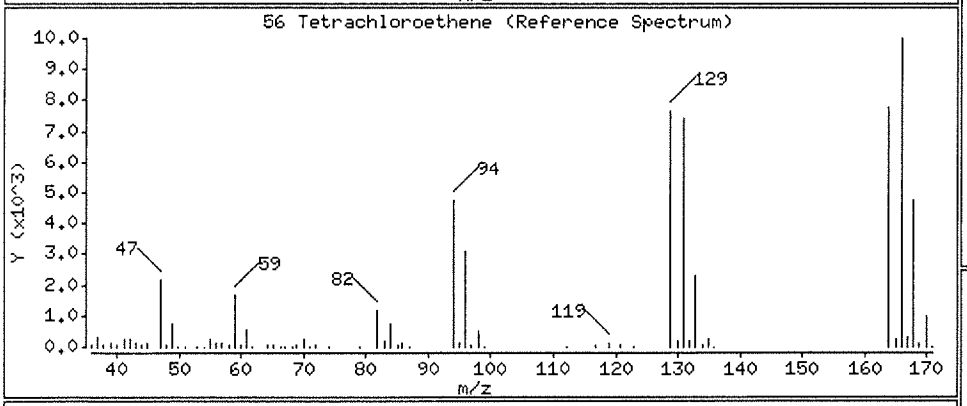
Concentration: 18.65 ug/l

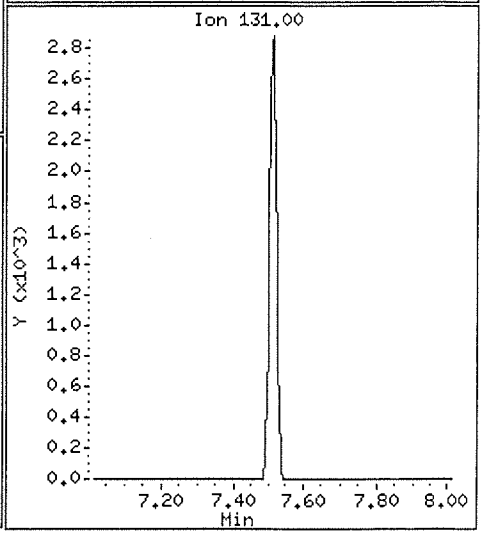


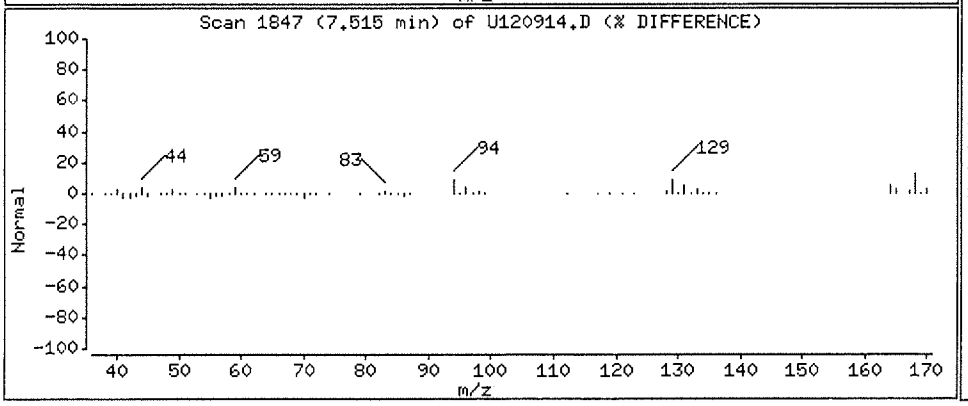












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

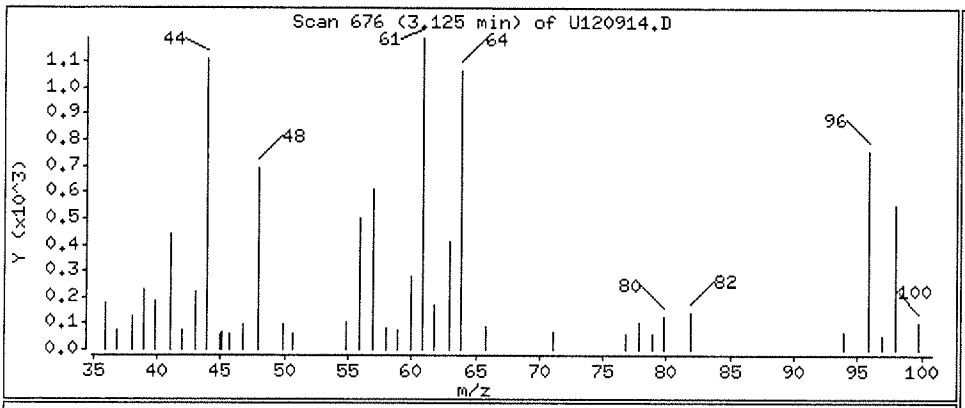
Operator: PC

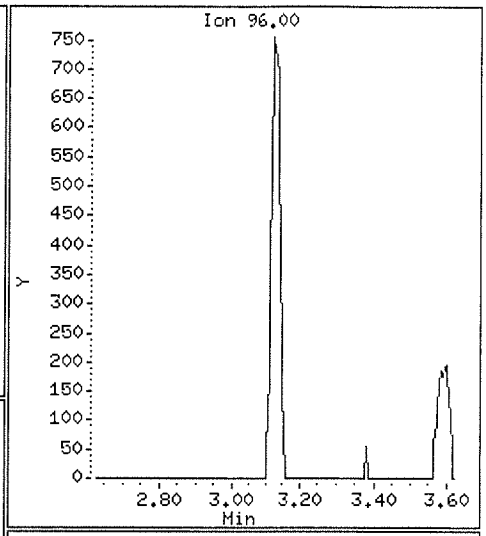
Column phase: DB624

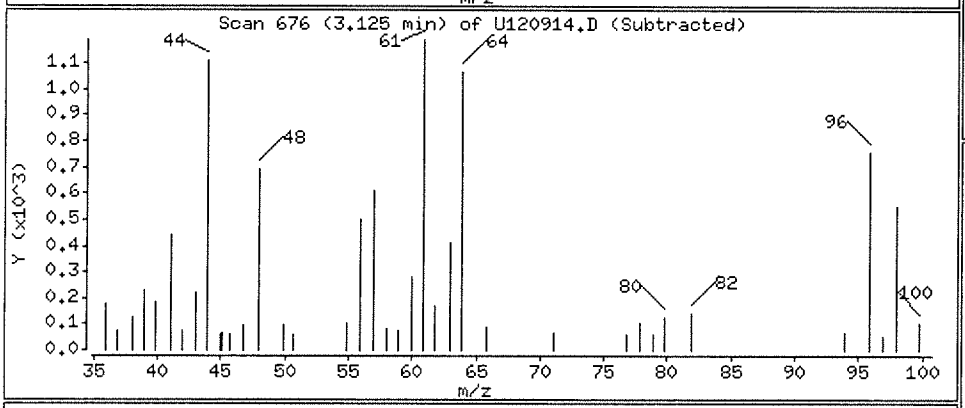
Column diameter: 0.18

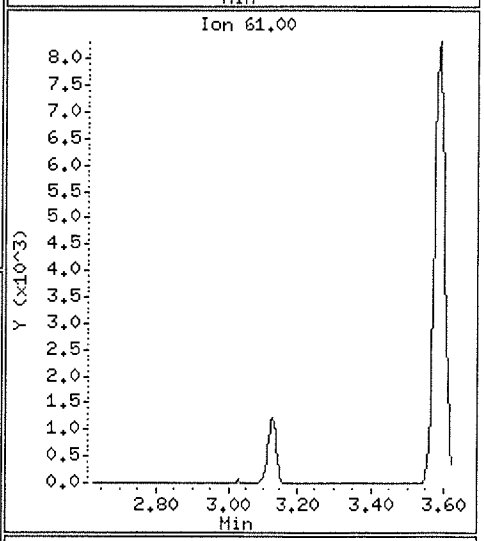
20 trans-1,2-Dichloroethene

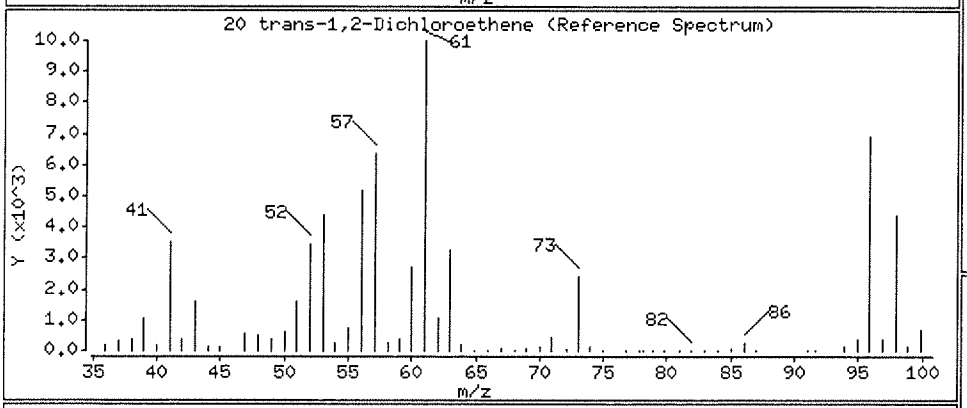
Concentration: 5.02 ug/l

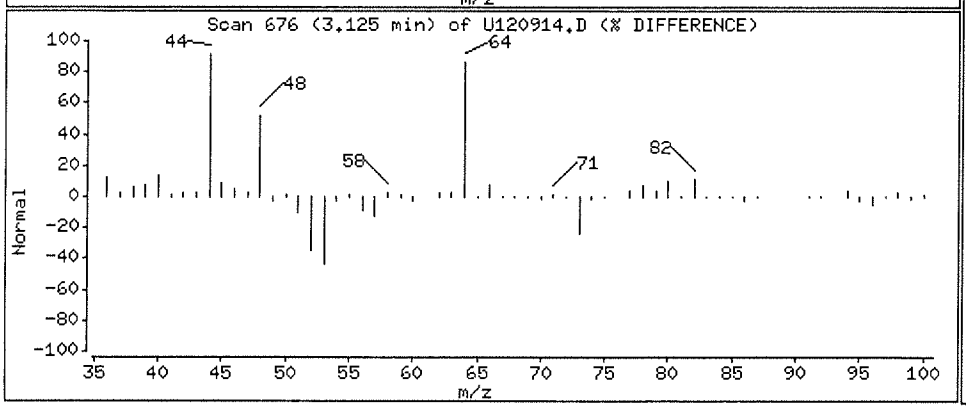


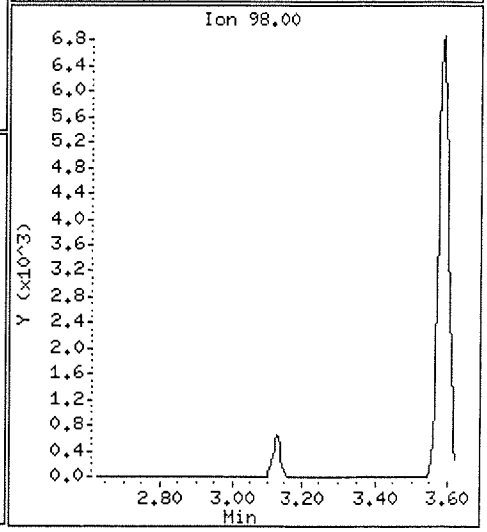












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

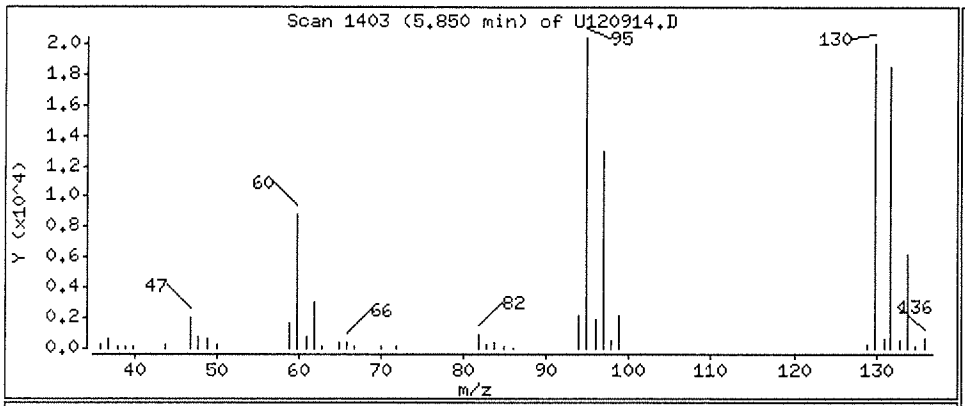
Operator: PC

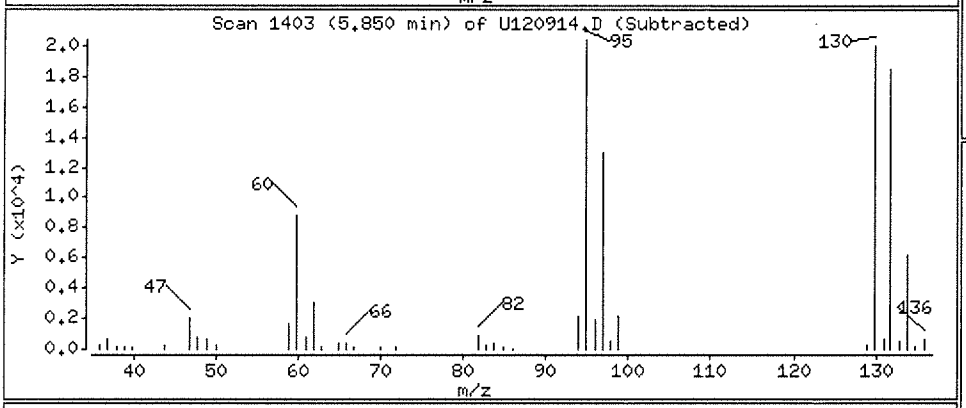
Column phase: DB624

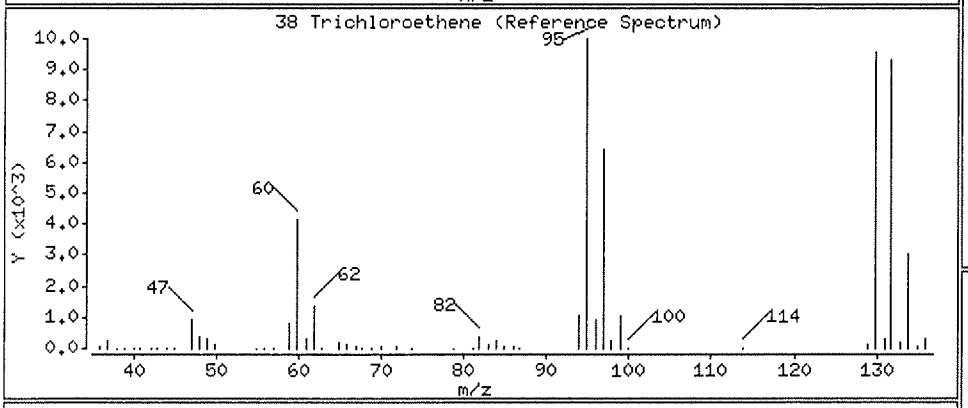
Column diameter: 0.18

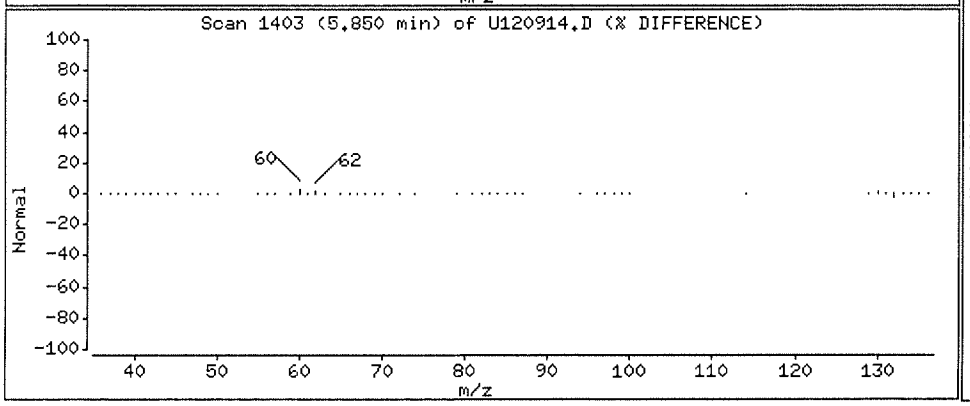
38 Trichloroethene

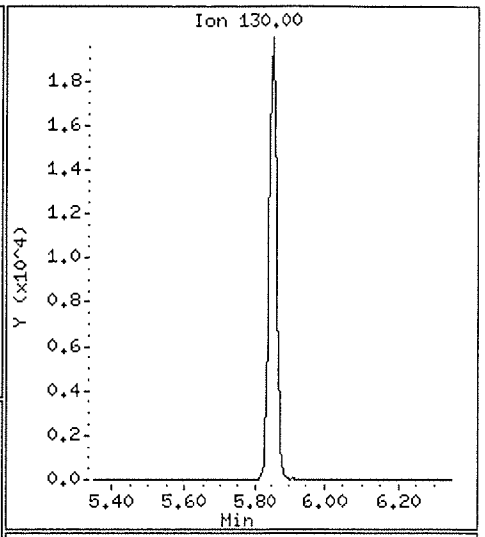
Concentration: 104.78 ug/l

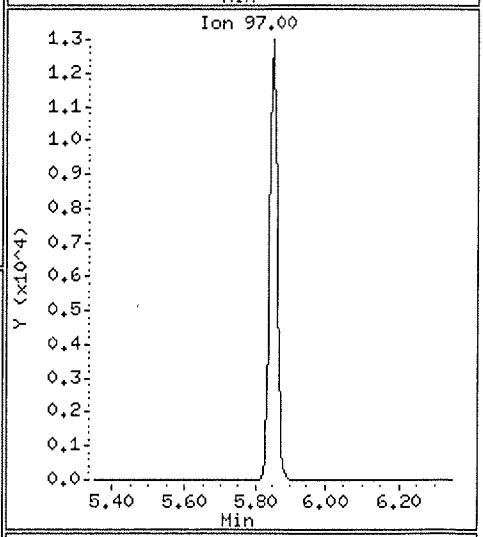


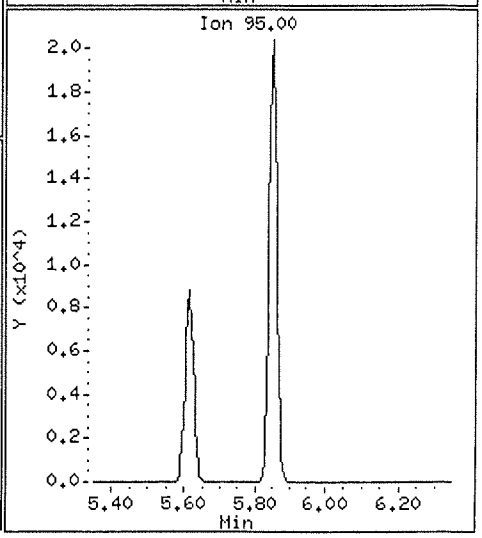












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120914.D

Date : 09-DEC-2021 15:27

Client ID: HS21120103-05

Instrument: VOA9.i

Sample Info: HS21120103-05;HS21120103-05;;;

Purge Volume: 5.0

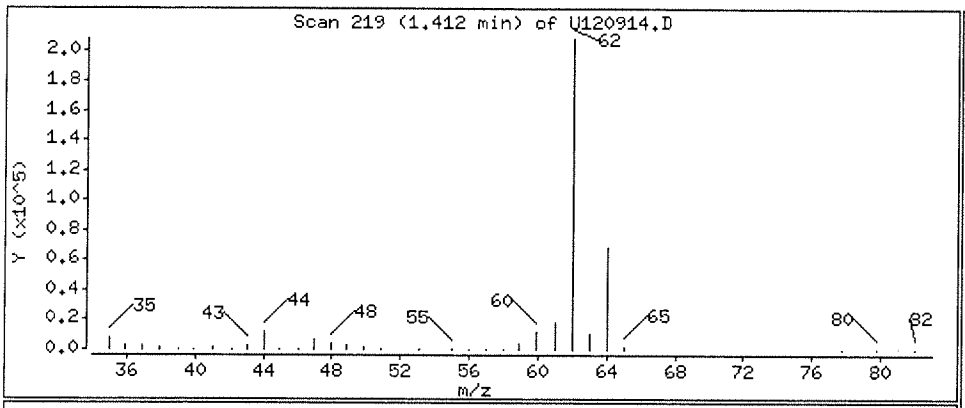
Operator: PC

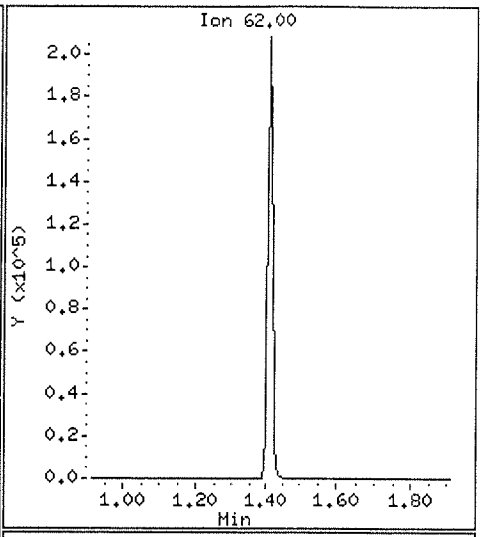
Column phase: DB624

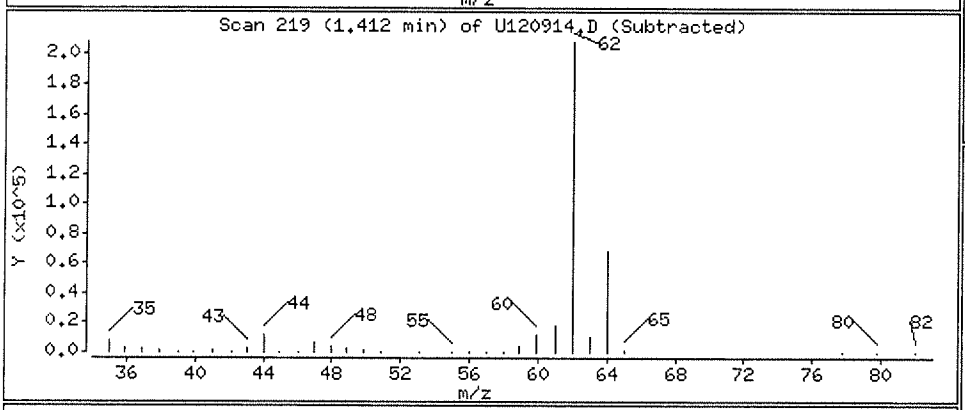
Column diameter: 0.18

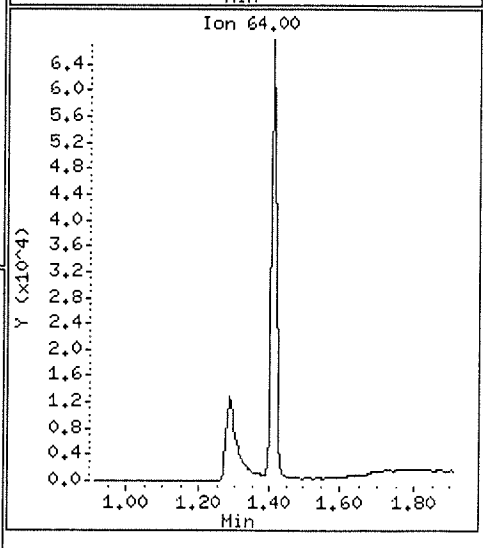
5 Vinyl Chloride

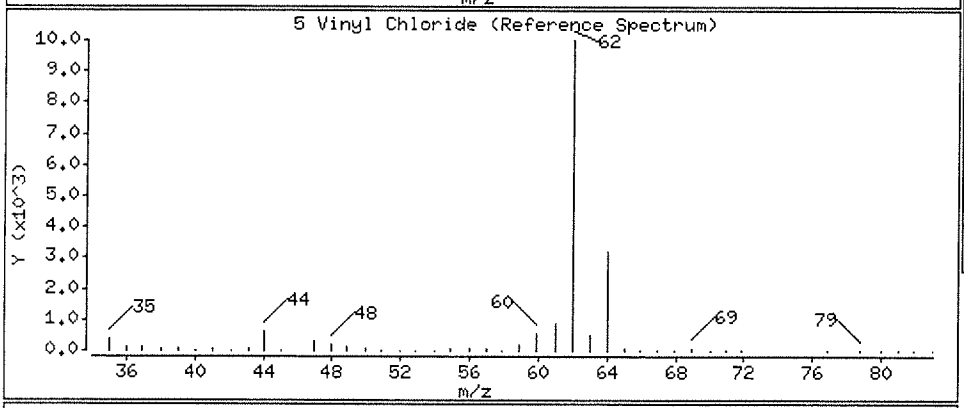
Concentration: 650.02 ug/l

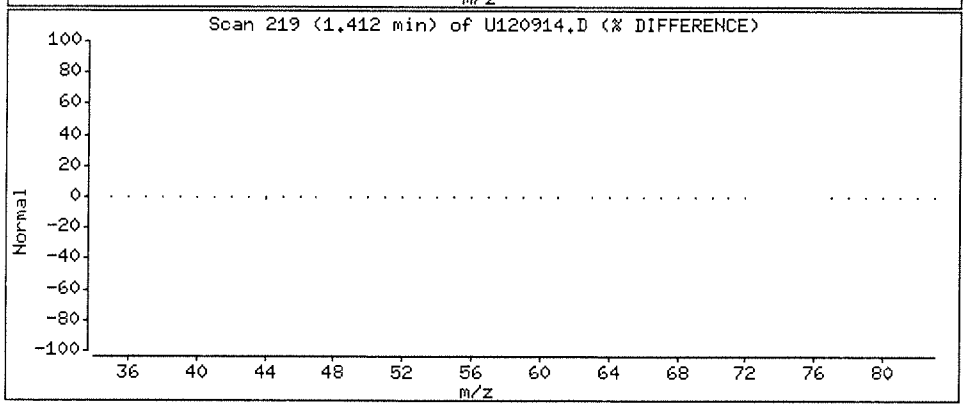












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120915.D
Lab Smp Id: HS21120103-07 Client Smp ID: HS21120103-07
Inj Date : 09-DEC-2021 15:49
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-07;HS21120103-07;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 14
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

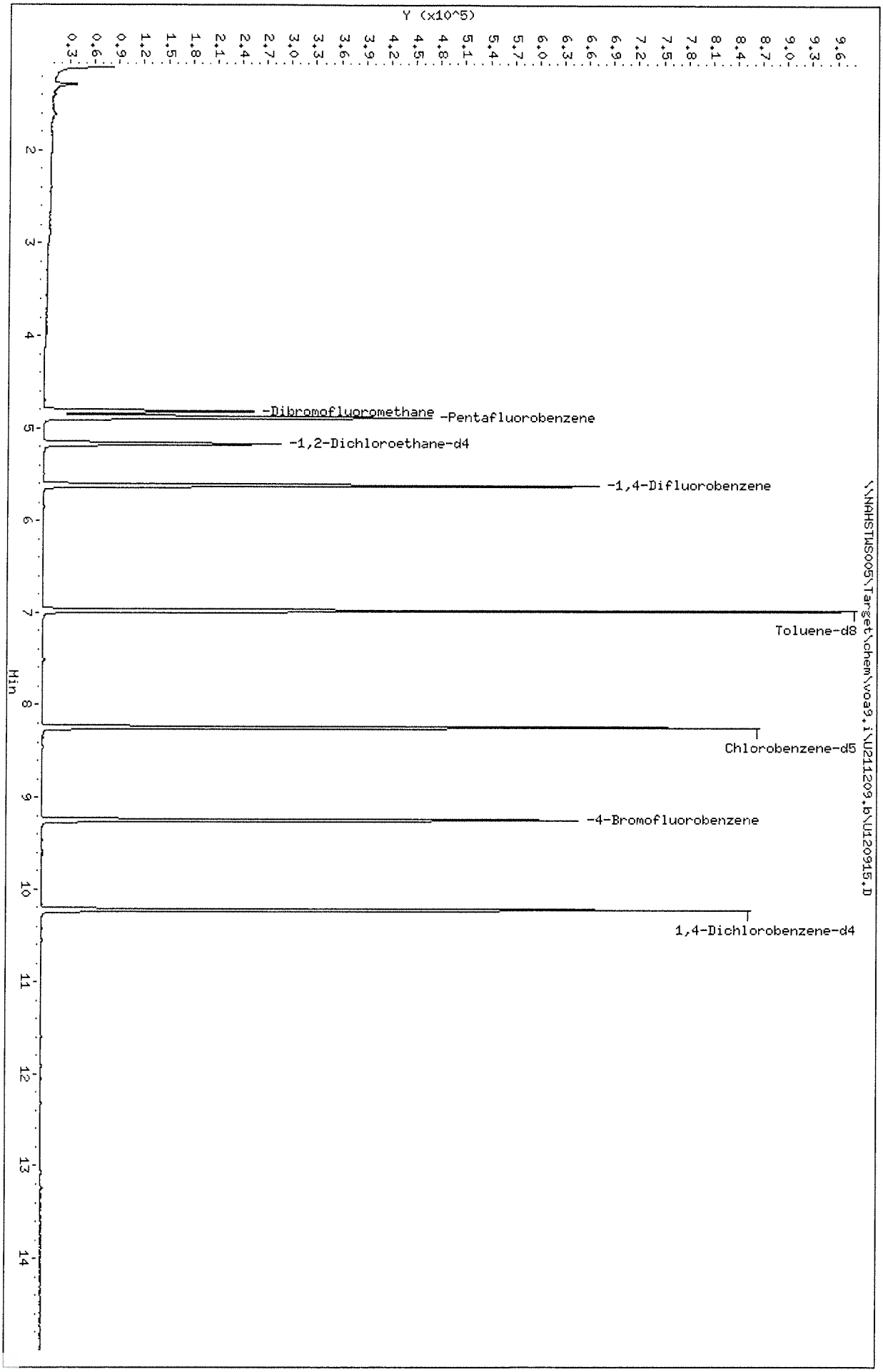
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.883	4.883	(1.000)	282223	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.614	(1.000)	484675	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	423940	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.225	(1.000)	198879	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.819	(0.988)	145745	49.1856	49.18
$ 35 1,2-Dichloroethane-d4	65	5.167	5.168	(1.058)	183079	52.9644	52.96
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	573717	51.9969	51.99
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	208041	50.5386	50.53

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120915.D
Date : 09-DEC-2021 15:49
Client ID: HS21120103-07
Sample Info: HS21120103-07;HS21120103-07;;;
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\U211209.b\U120916.D
Lab Smp Id: HS21120103-03 Client Smp ID: HS21120103-03
Inj Date : 09-DEC-2021 16:12
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-03;HS21120103-03;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 15
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

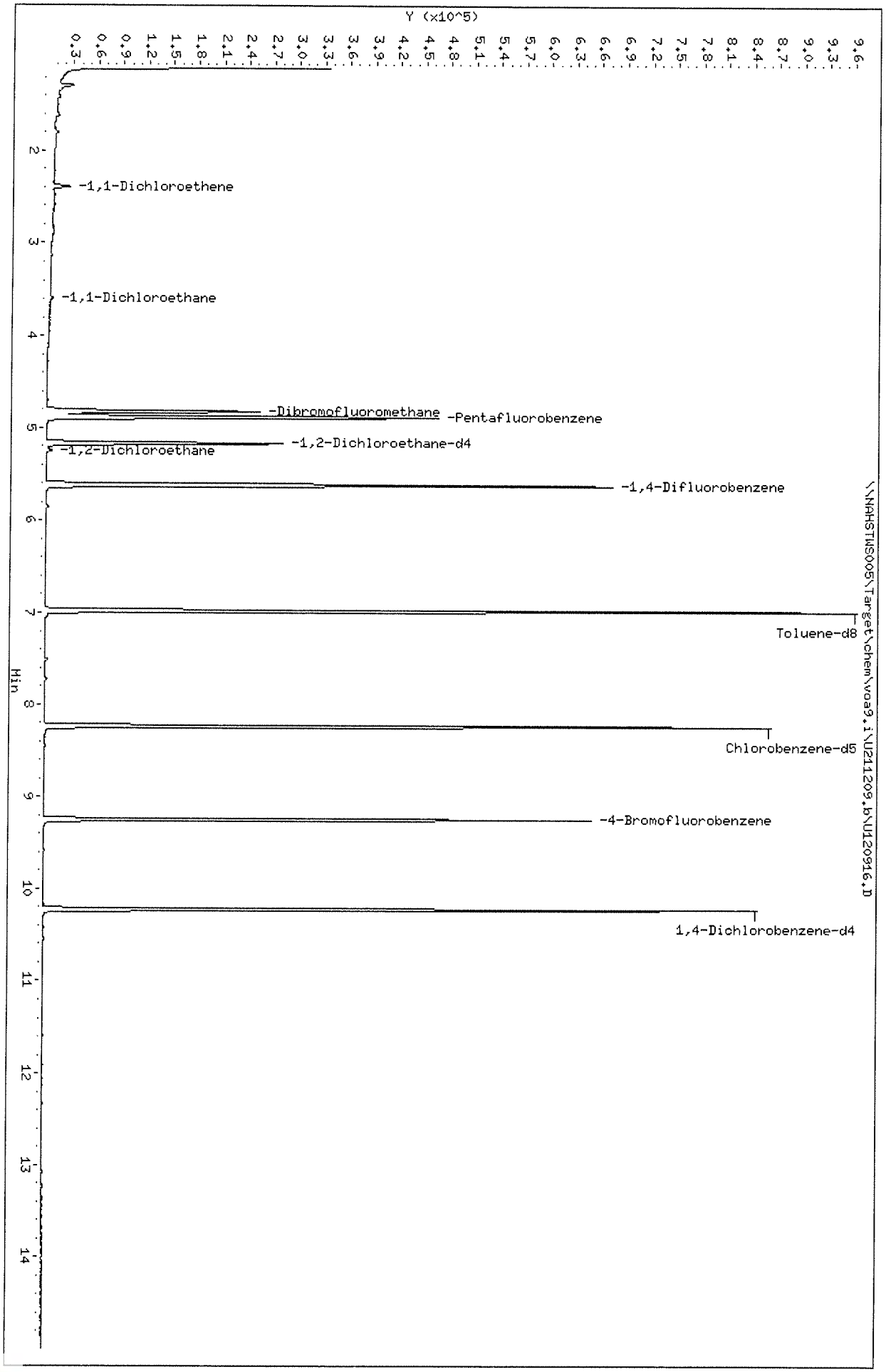
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.886	4.883	(1.000)	275723	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.614	(1.000)	479242	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	421447	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.225	(1.000)	198673	50.0000	
$ 30 Dibromofluoromethane	113	4.823	4.819	(0.987)	144711	50.0020	50.00
$ 35 1,2-Dichloroethane-d4	65	5.167	5.168	(1.058)	181805	53.8604	53.86
$ 48 Toluene-d8	98	6.982	6.978	(0.847)	569328	51.9044	51.90
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	205544	50.2191	50.21
22 1,1-Dichloroethane	63	3.593	3.589	(0.735)	3445	0.70329	0.70(a)
11 1,1-Dichloroethene	96	2.393	2.390	(0.490)	5917	2.40699	2.40(a)
33 1,2-Dichloroethane	62	5.250	5.243	(0.935)	4041	0.93470	0.93(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120916.D
Date : 09-DEC-2021 16:12
Client ID: HS21120103-03
Sample Info: HS21120103-03;HS21120103-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120916.D

Date : 09-DEC-2021 16:12

Client ID: HS21120103-03

Instrument: VOA9.i

Sample Info: HS21120103-03;HS21120103-03;;;

Purge Volume: 5.0

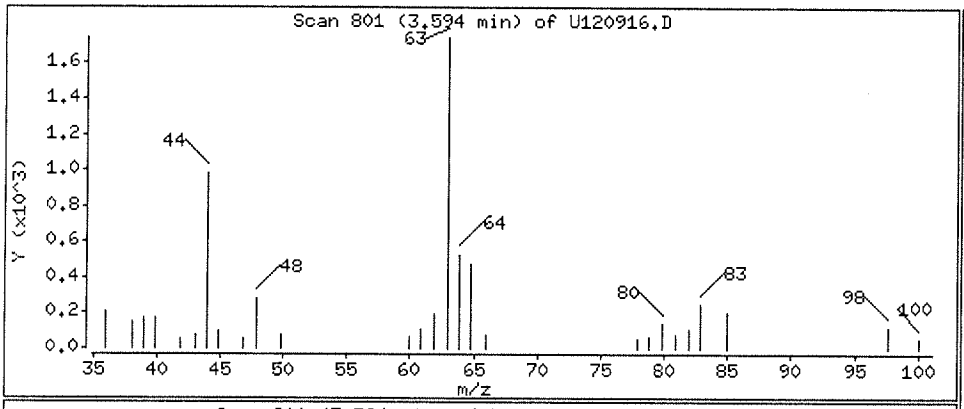
Operator: PC

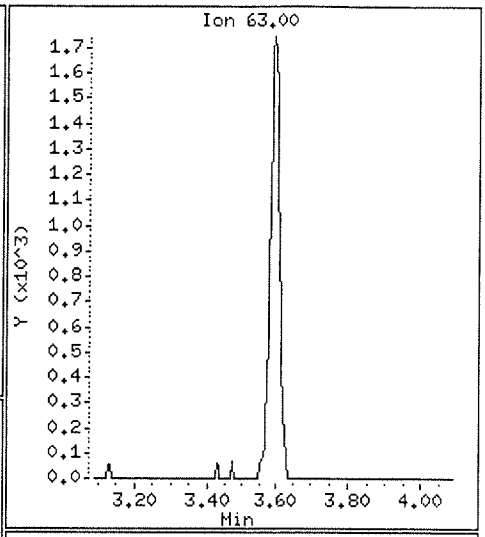
Column phase: DB624

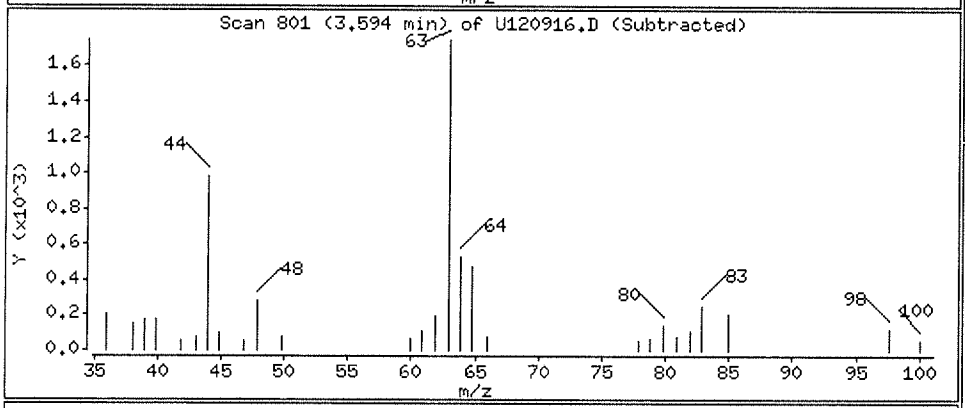
Column diameter: 0.18

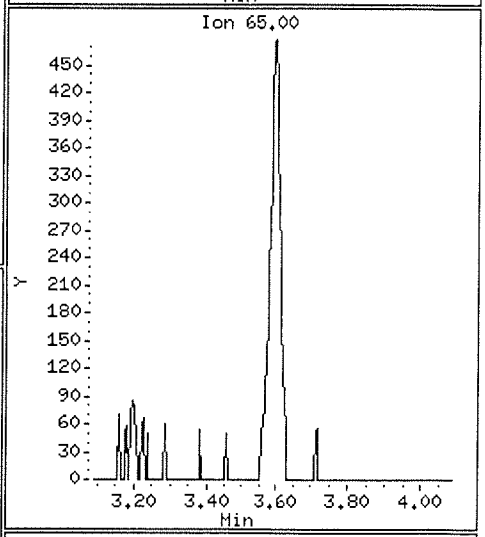
22 1,1-Dichloroethane

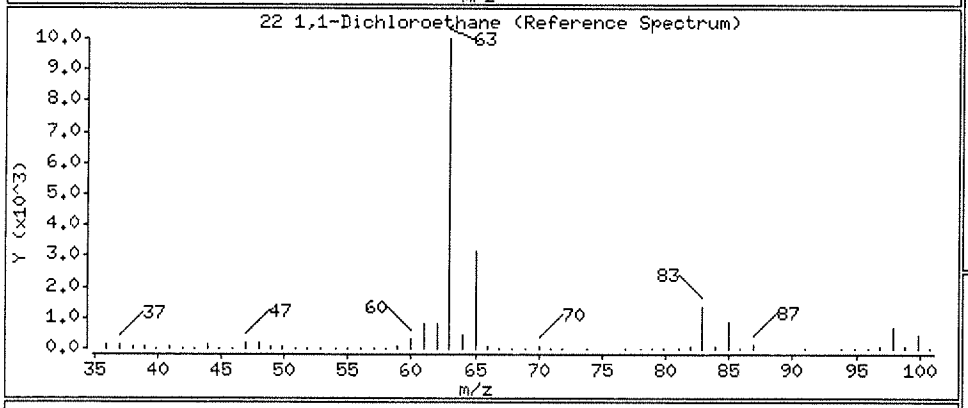
Concentration: 0.70 ug/l

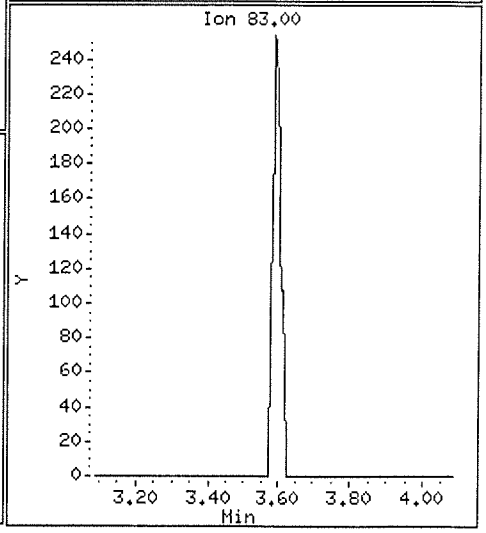


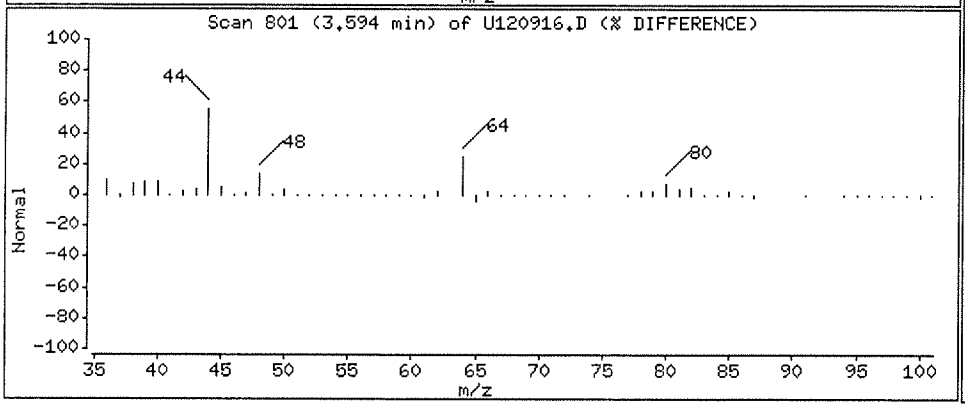












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Date : 09-DEC-2021 16:12

Client ID: HS21120103-03

Instrument: VOA9.i

Sample Info: HS21120103-03;HS21120103-03;;;

Purge Volume: 5.0

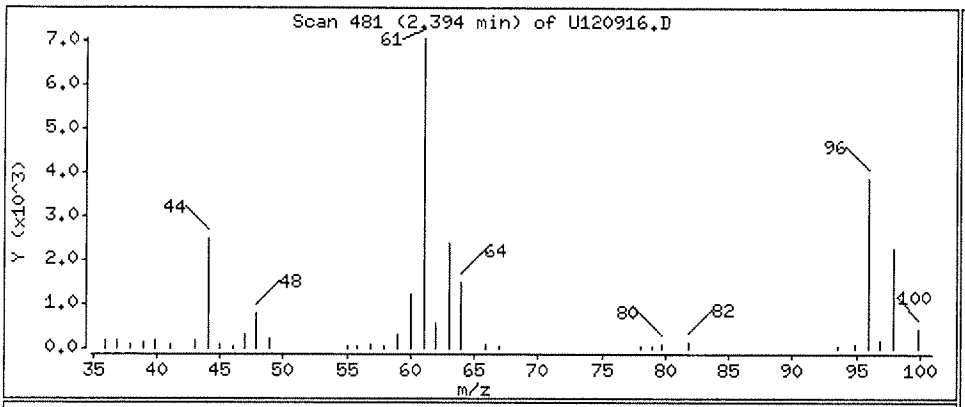
Operator: PC

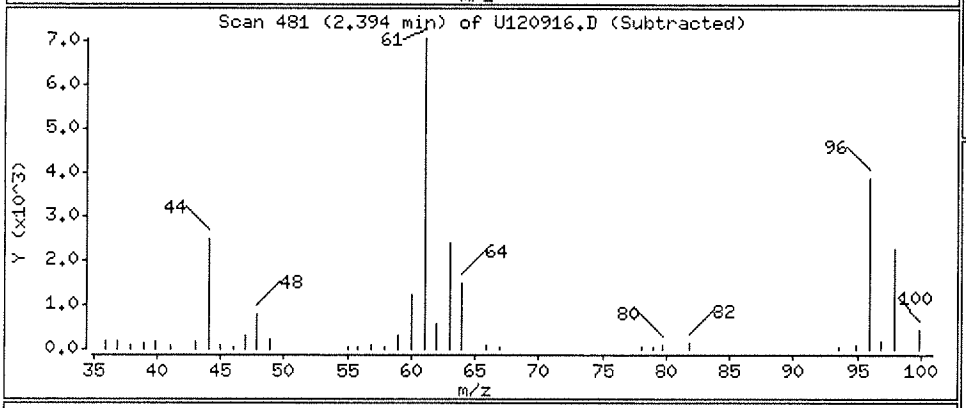
Column phase: DB624

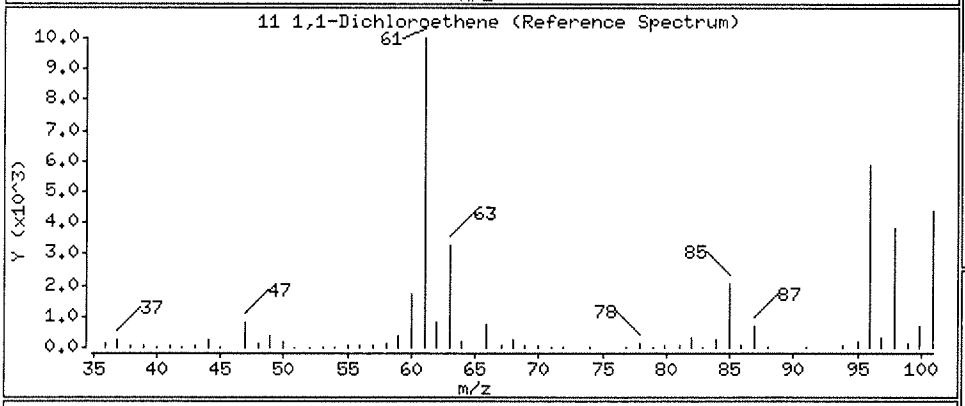
Column diameter: 0.18

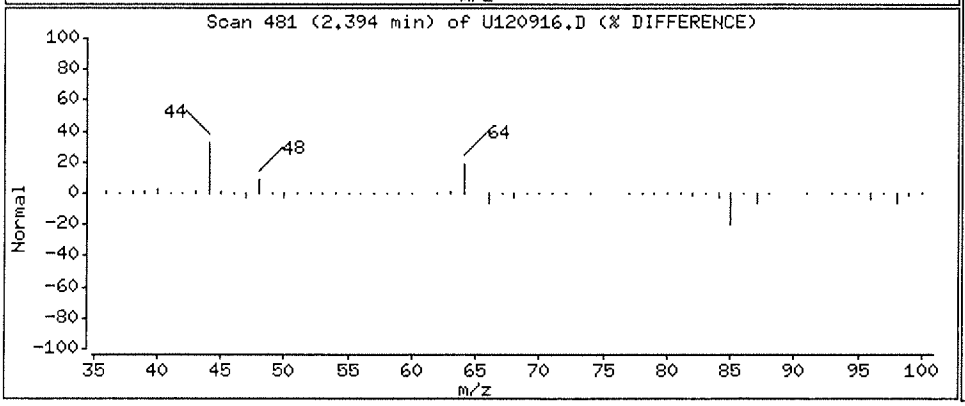
11 1,1-Dichloroethene

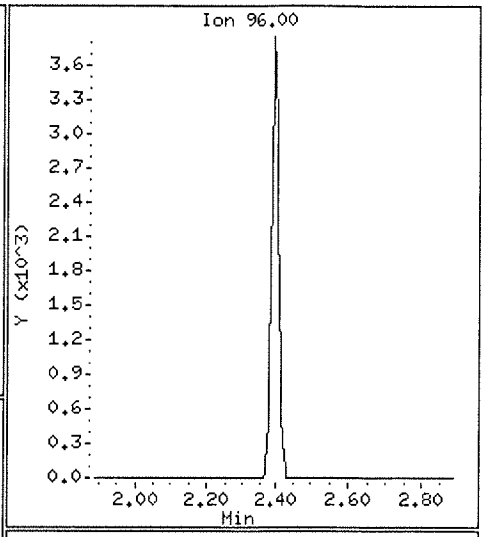
Concentration: 2.40 ug/l

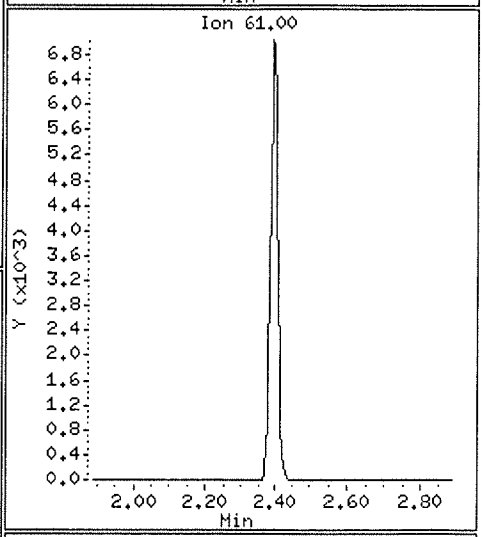


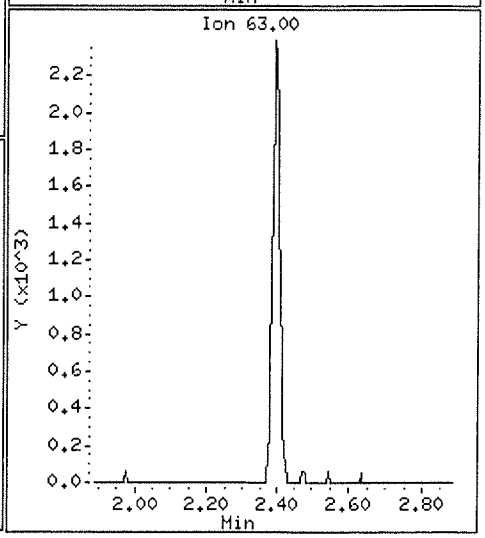












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120916.D

Date : 09-DEC-2021 16:12

Client ID: HS21120103-03

Instrument: VOA9.i

Sample Info: HS21120103-03;HS21120103-03;;;

Purge Volume: 5.0

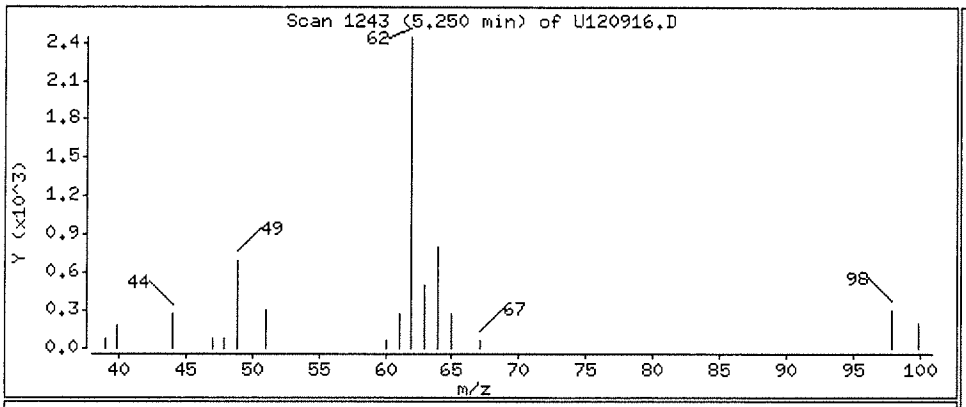
Operator: PC

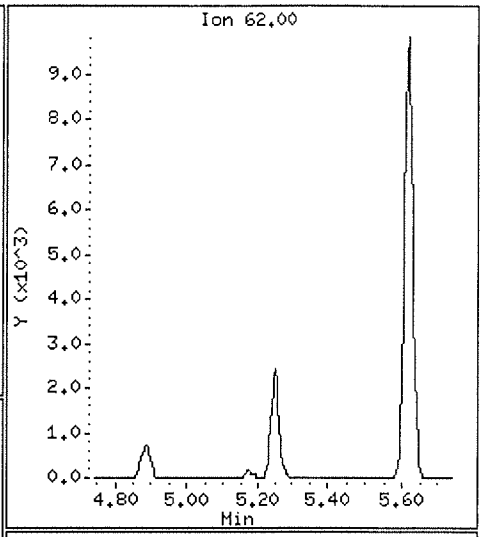
Column phase: DB624

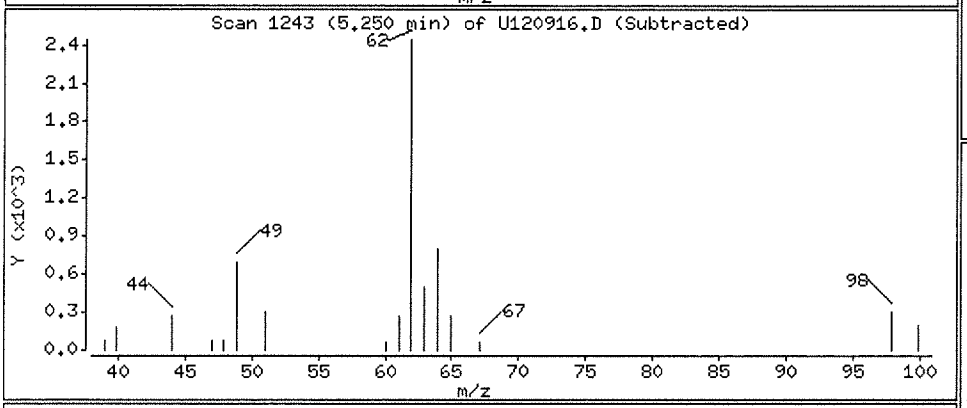
Column diameter: 0.18

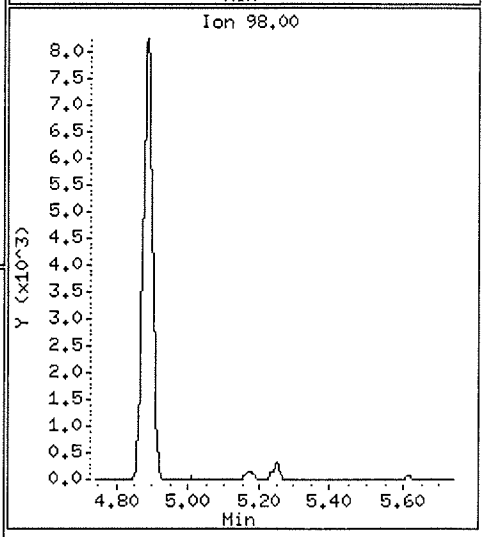
33 1,2-Dichloroethane

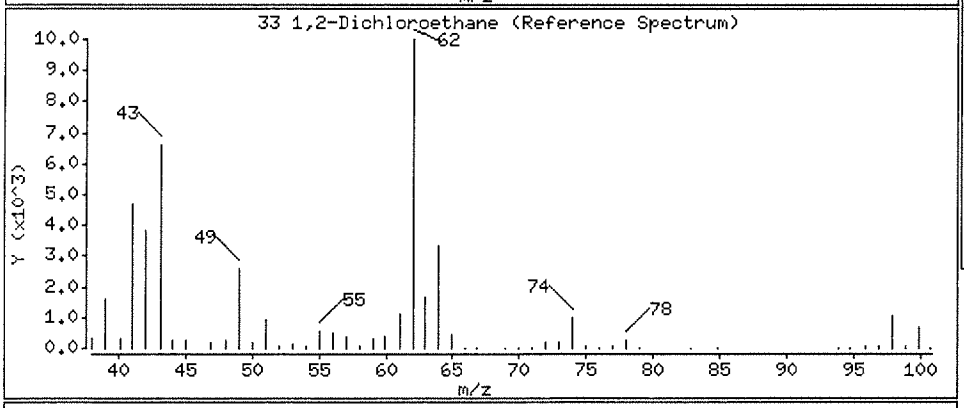
Concentration: 0.93 ug/l

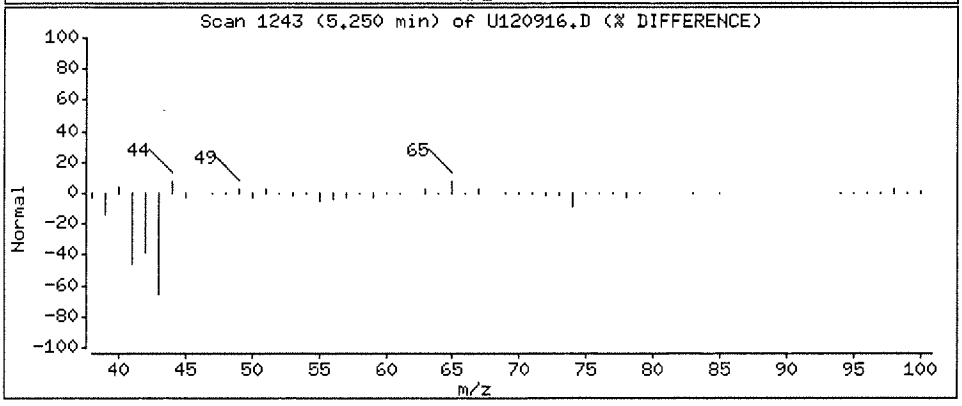












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120917.D
Lab Smp Id: HS21120103-04 Client Smp ID: HS21120103-04
Inj Date : 09-DEC-2021 16:34
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-04;HS21120103-04;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 16
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

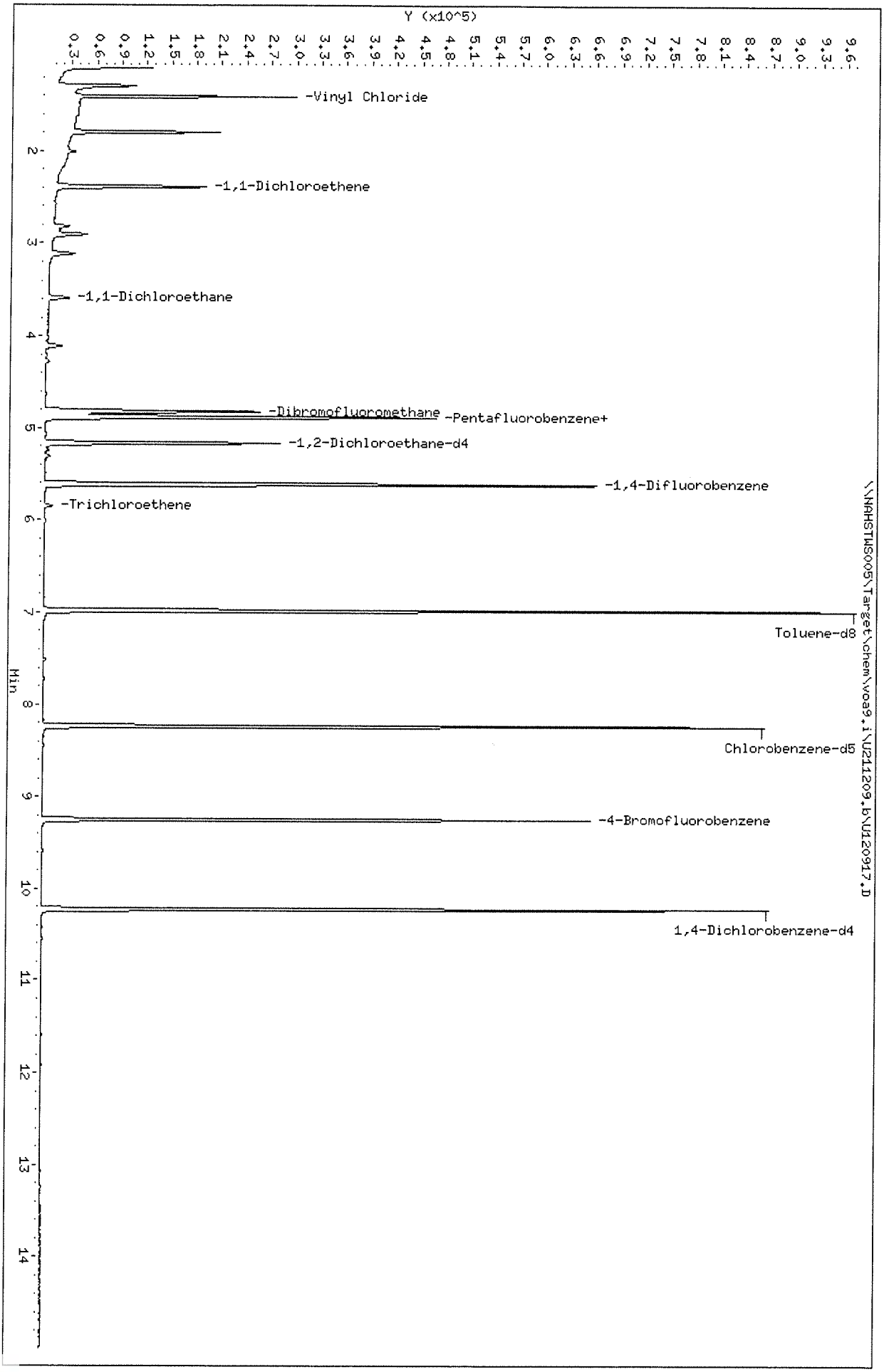
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.883	4.883	(1.000)	277717	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.614	(1.000)	477044	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	422322	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.225	10.225	(1.000)	200227	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	145217	49.8134	49.81
$ 35 1,2-Dichloroethane-d4	65	5.168	5.168	(1.058)	180150	52.9626	52.96
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	568800	51.7488	51.74
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	207789	50.6743	50.67
22 1,1-Dichloroethane	63	3.589	3.589	(0.735)	24993	5.06562	5.06
11 1,1-Dichloroethene	96	2.390	2.390	(0.489)	53833	21.7417	21.74
38 Trichloroethene	130	5.854	5.850	(1.042)	3035	0.97385	0.97(a)
5 Vinyl Chloride	62	1.411	1.412	(0.289)	117716	35.0476	35.04

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120917.D
Date : 09-DEC-2021 16:34
Client ID: HS21120103-04
Sample Info: HS21120103-04;HS21120103-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120917.D

Date : 09-DEC-2021 16:34

Client ID: HS21120103-04

Instrument: VOA9.i

Sample Info: HS21120103-04;HS21120103-04;;;

Purge Volume: 5.0

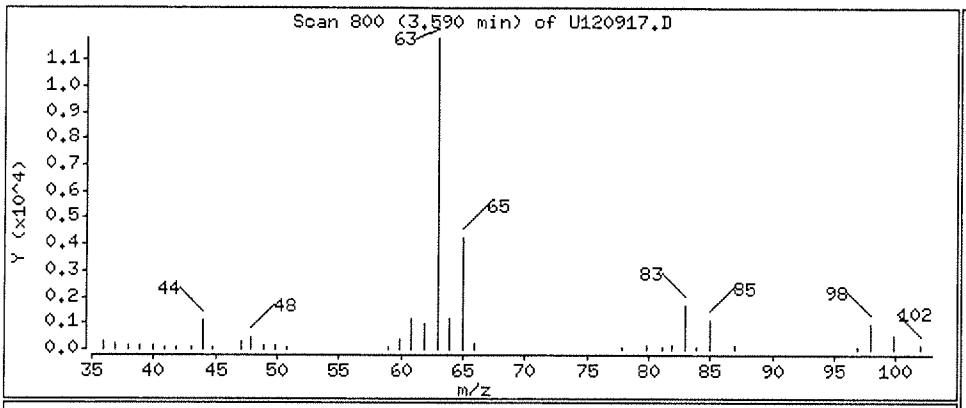
Operator: PC

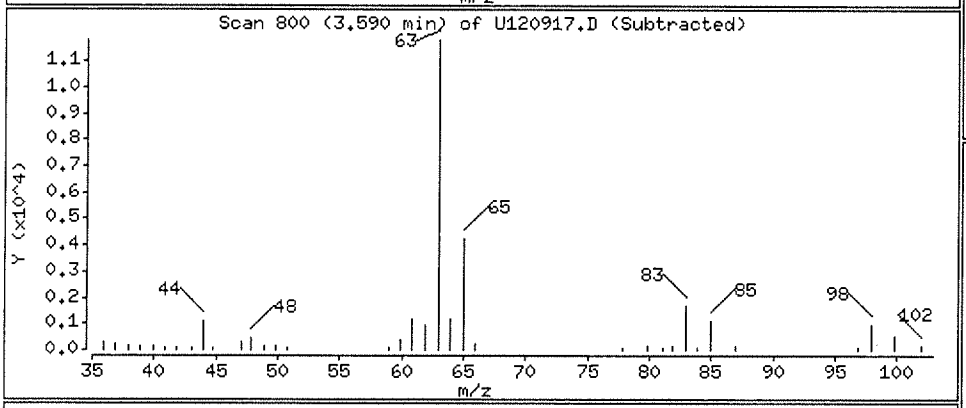
Column phase: DB624

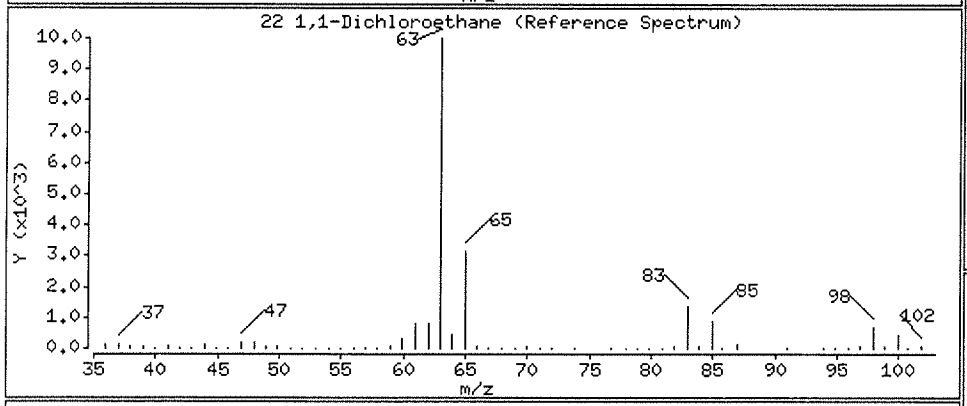
Column diameter: 0.18

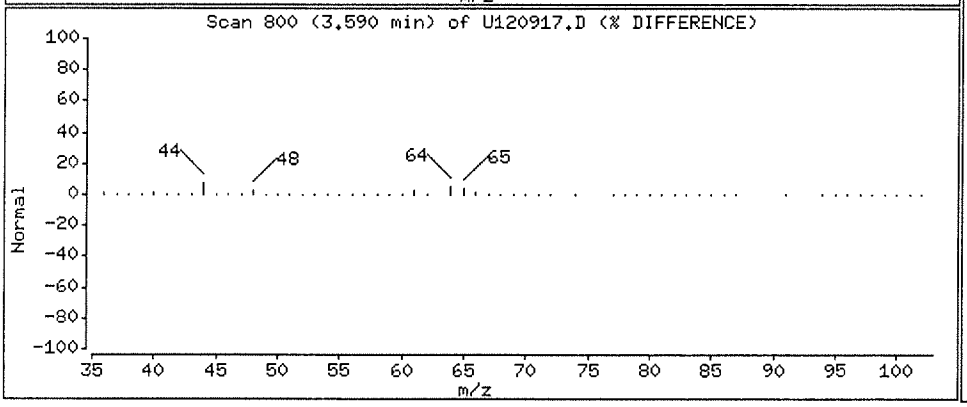
22 1,1-Dichloroethane

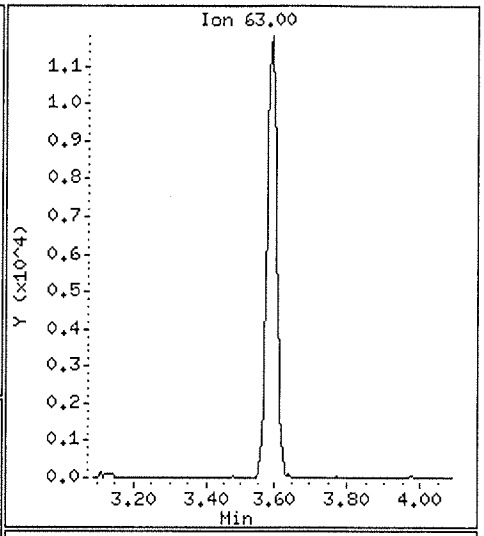
Concentration: 5.06 ug/l

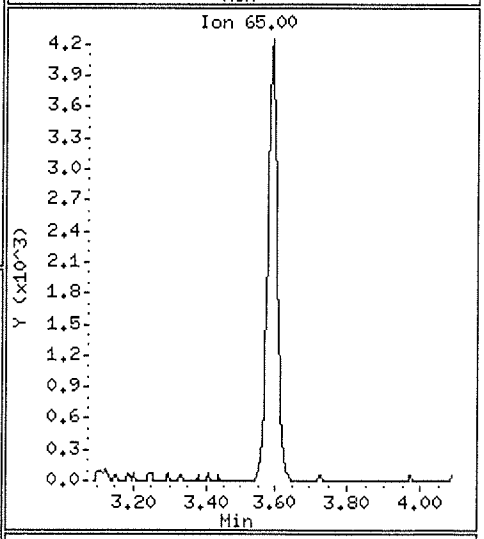


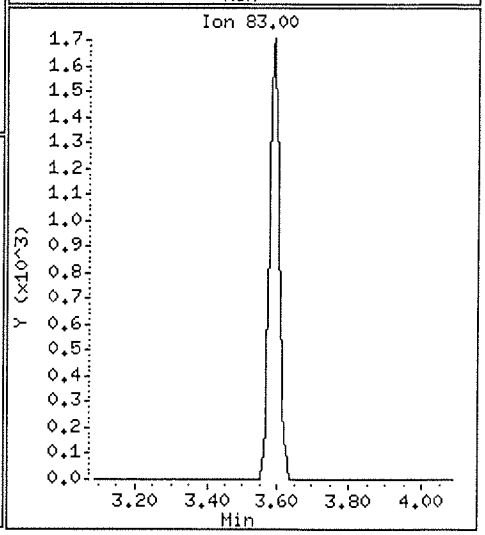












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120917.D

Date : 09-DEC-2021 16:34

Client ID: HS21120103-04

Instrument: VOA9.i

Sample Info: HS21120103-04;HS21120103-04;;;

Purge Volume: 5.0

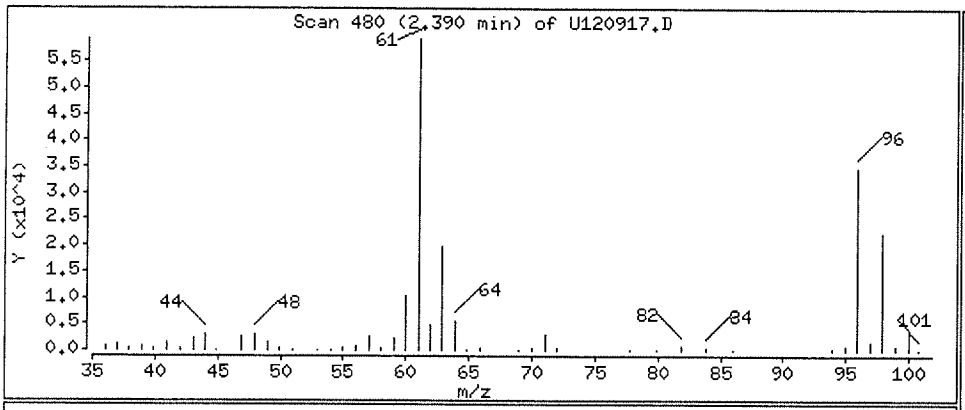
Operator: PC

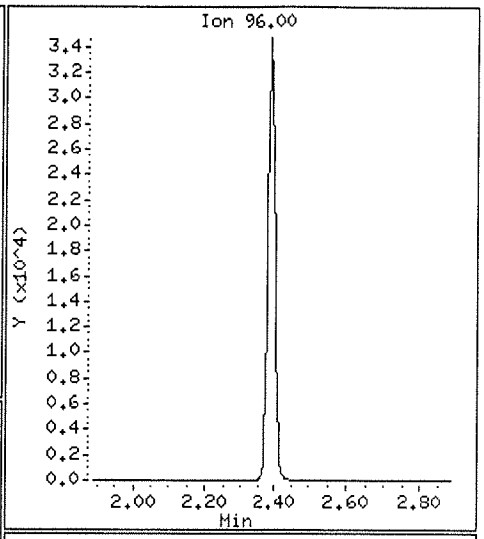
Column phase: DB624

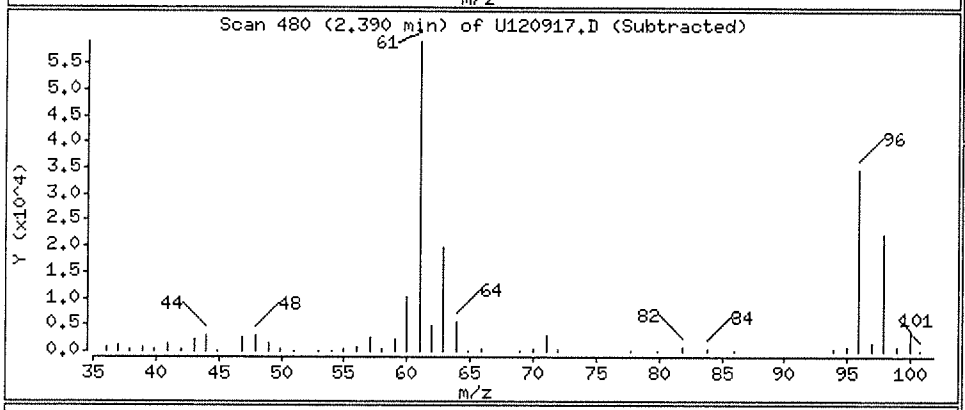
Column diameter: 0.18

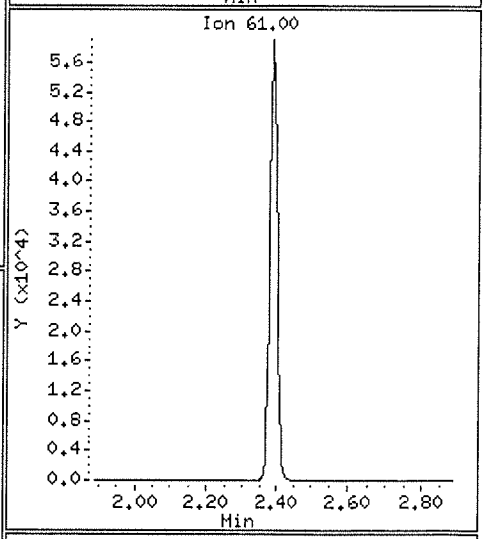
11 1,1-Dichloroethene

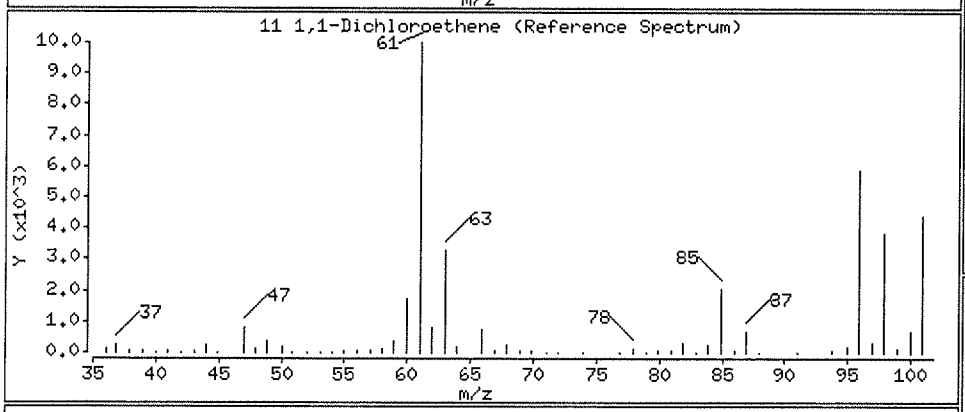
Concentration: 21.74 ug/l

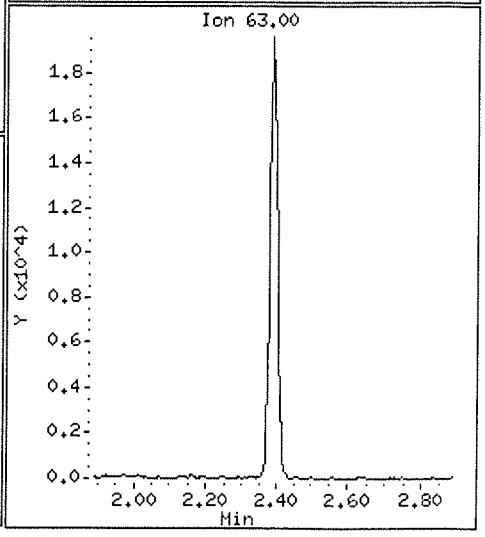


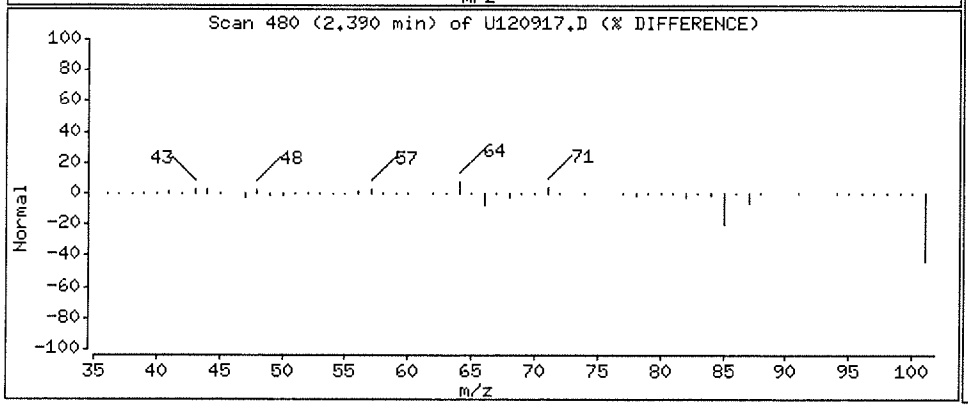












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Date : 09-DEC-2021 16:34

Client ID: HS21120103-04

Instrument: VOA9.i

Sample Info: HS21120103-04;HS21120103-04;;;

Purge Volume: 5.0

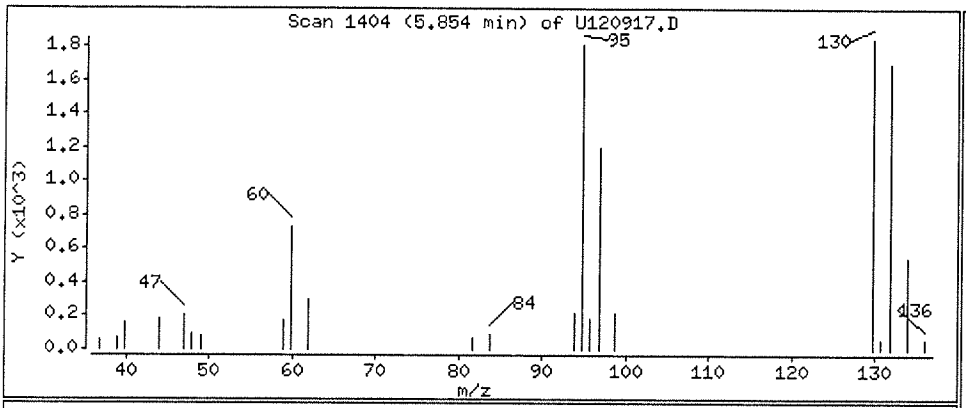
Operator: PC

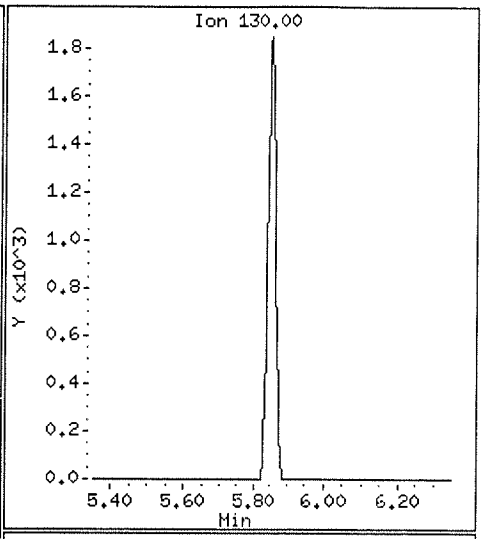
Column phase: DB624

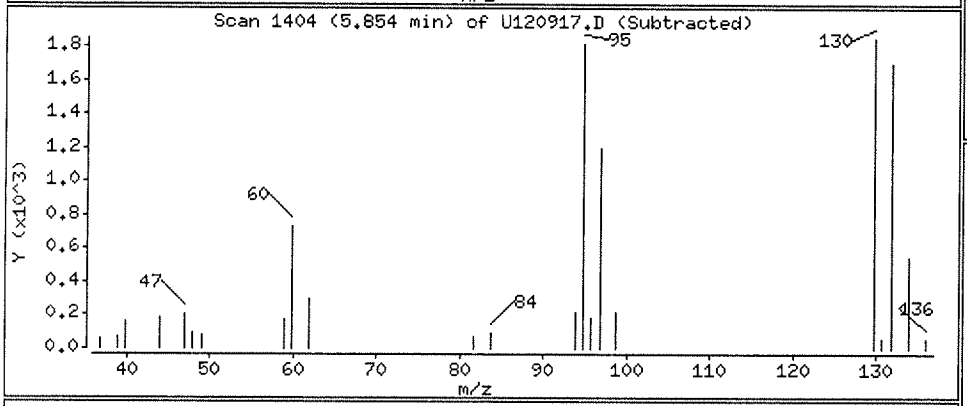
Column diameter: 0.18

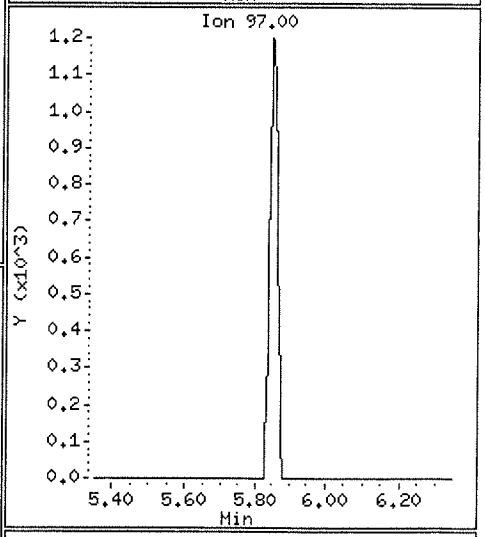
38 Trichloroethene

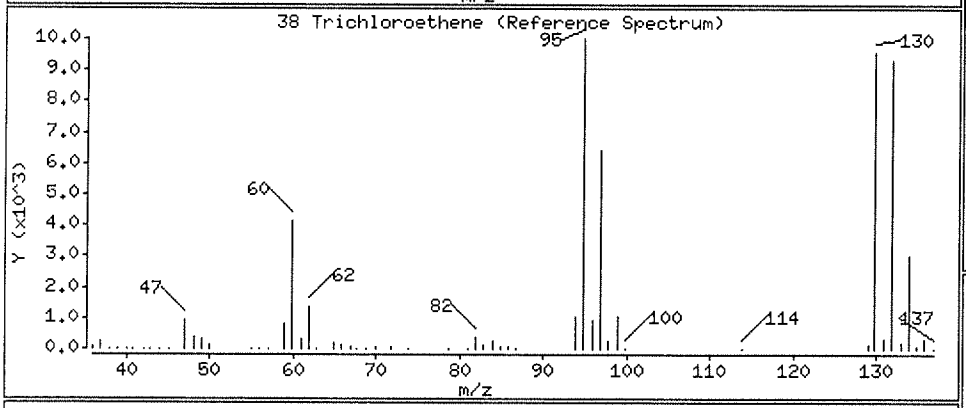
Concentration: 0.97 ug/l

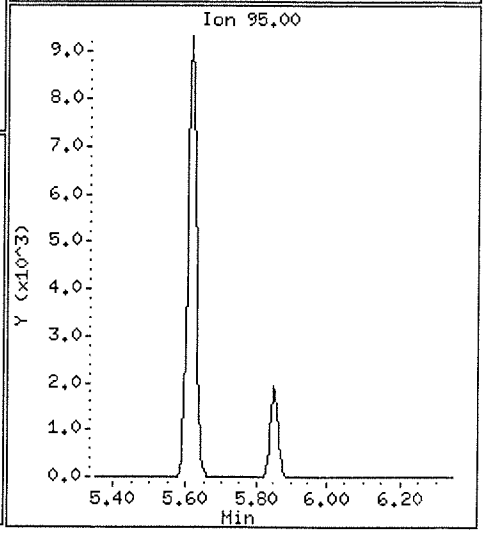


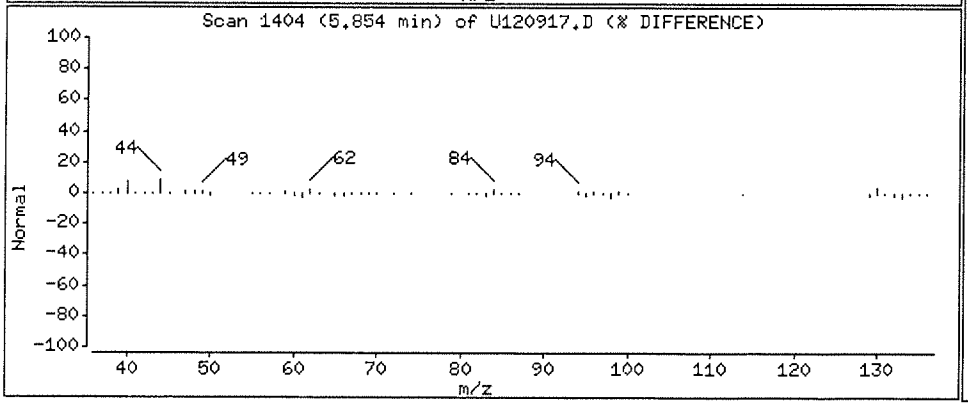












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120917.D

Date : 09-DEC-2021 16:34

Client ID: HS21120103-04

Instrument: VOA9.i

Sample Info: HS21120103-04;HS21120103-04;;;

Purge Volume: 5.0

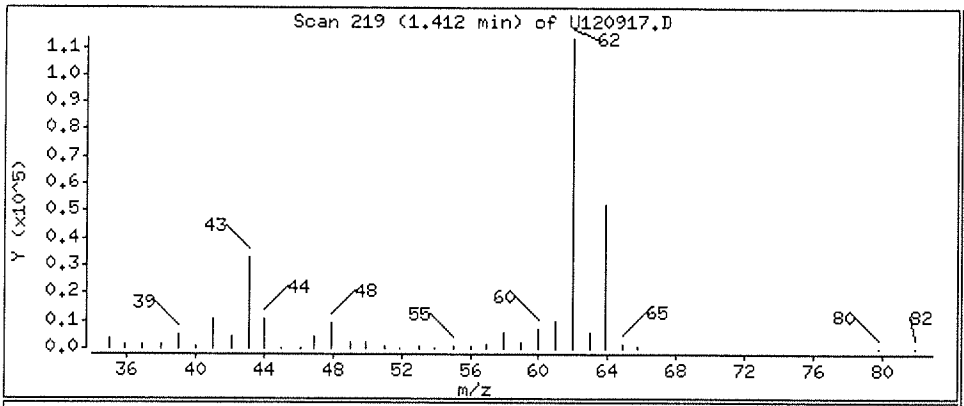
Operator: PC

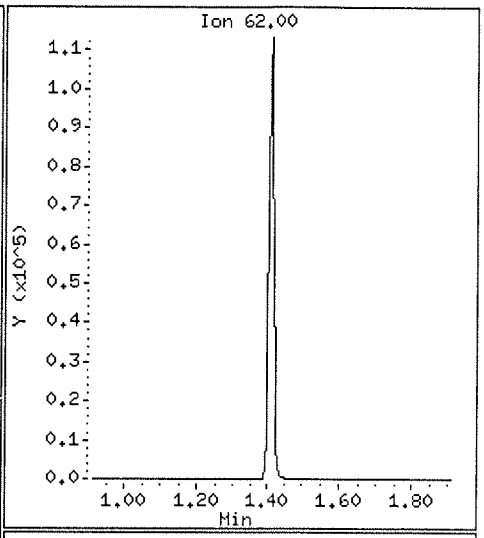
Column phase: DB624

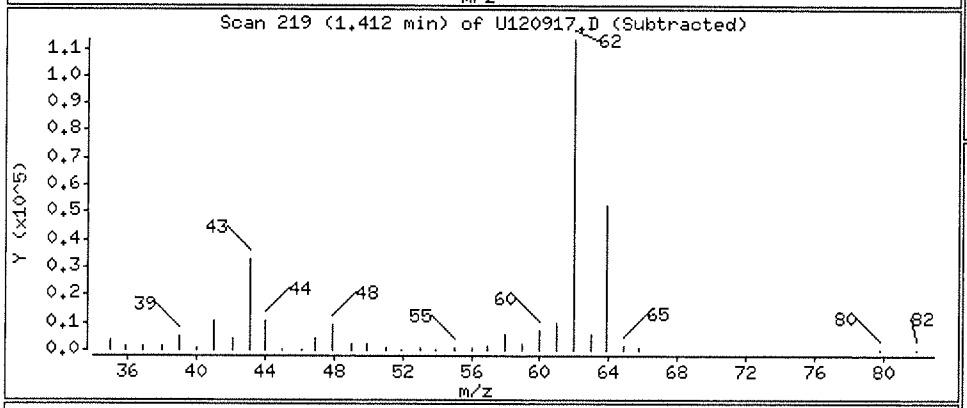
Column diameter: 0.18

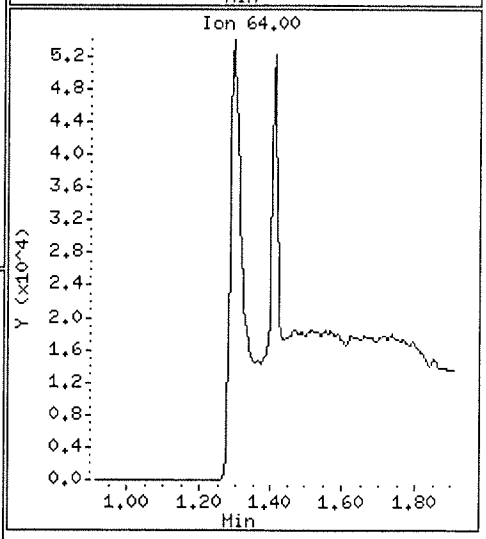
5 Vinyl Chloride

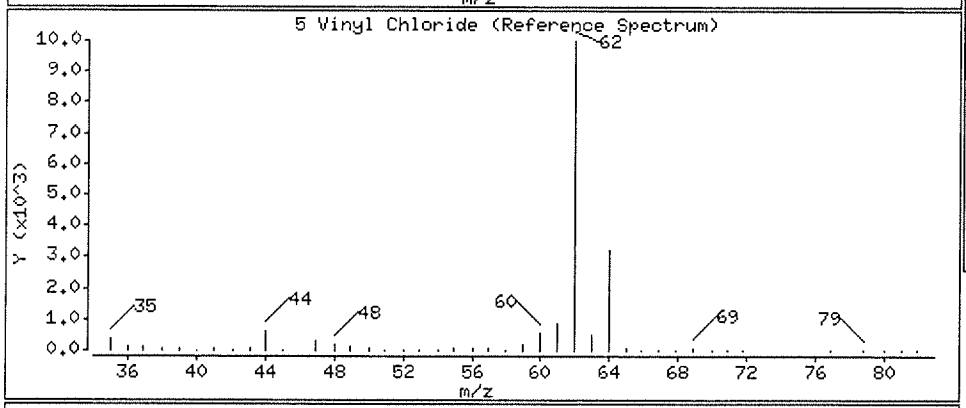
Concentration: 35.04 ug/l

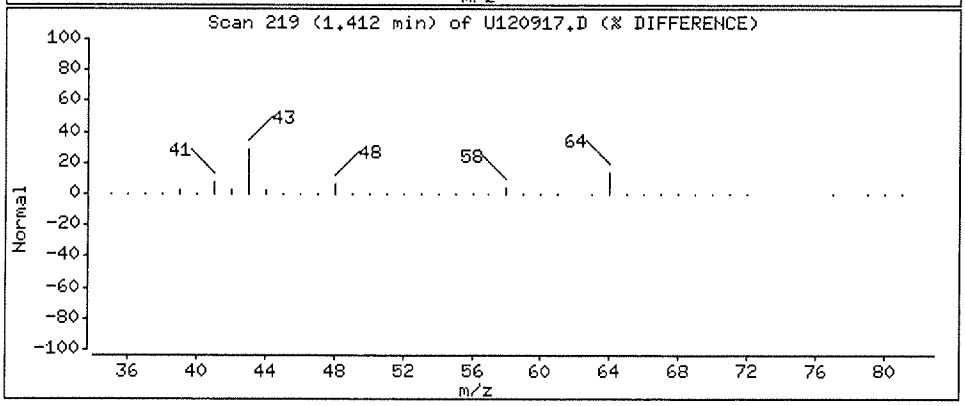












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120918.D
Lab Smp Id: HS21120103-06 Client Smp ID: HS21120103-06
Inj Date : 09-DEC-2021 16:56
Operator : PC Inst ID: VOA9.i
Smp Info : HS21120103-06;HS21120103-06;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:46 kori.bagsb Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 17
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

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

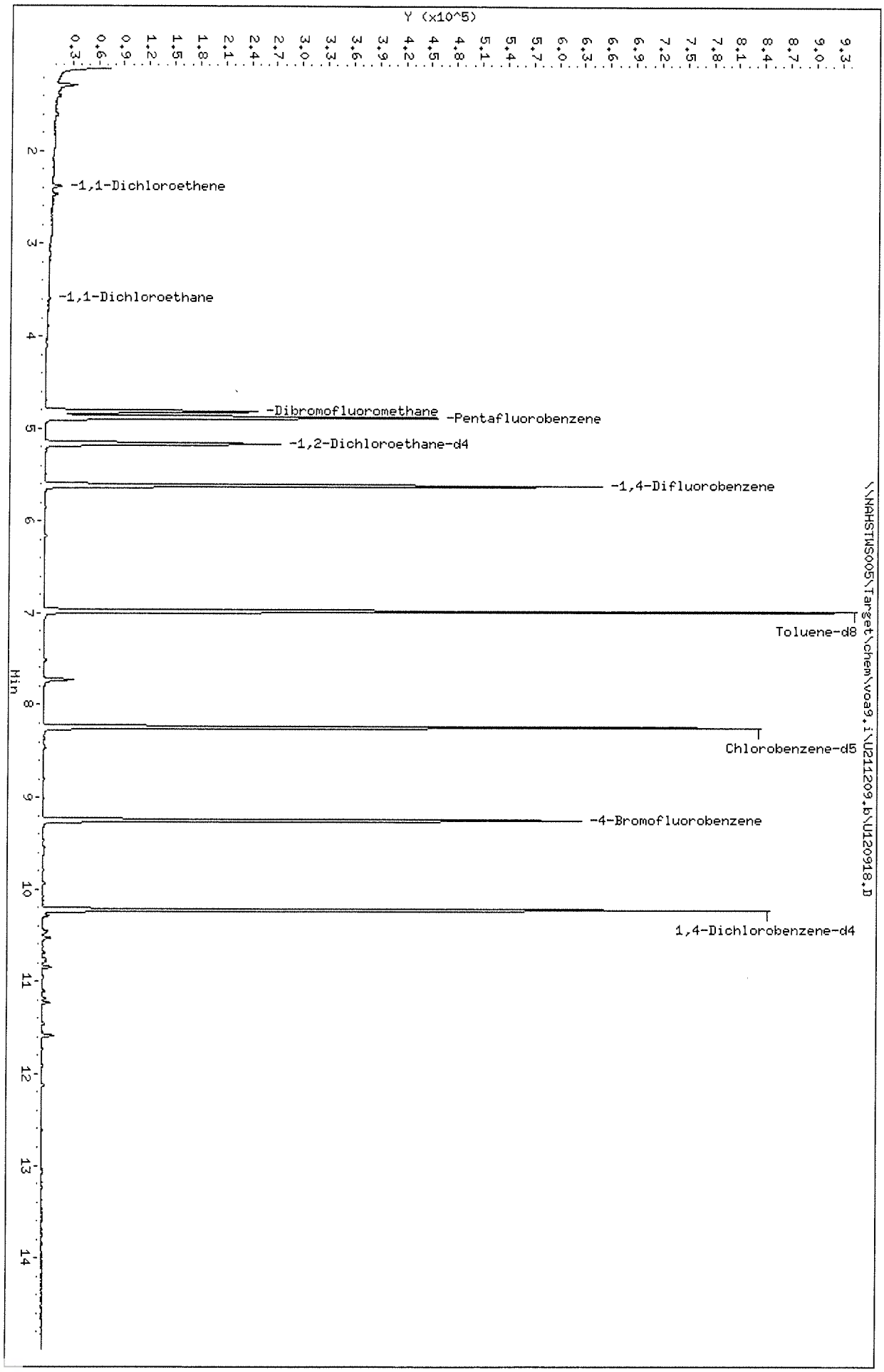
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.883	4.883	(1.000)	273462	50.0000	
* 36 1,4-Difluorobenzene	114	5.613	5.614	(1.000)	468951	50.0000	
* 47 Chlorobenzene-d5	117	8.241	8.242	(1.000)	415519	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.224	10.225	(1.000)	194792	50.0000	
$ 30 Dibromofluoromethane	113	4.819	4.819	(0.987)	142188	49.5284	49.52
$ 35 1,2-Dichloroethane-d4	65	5.164	5.168	(1.058)	176831	52.7910	52.79
$ 48 Toluene-d8	98	6.978	6.978	(0.847)	559253	51.7133	51.71
$ 69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	203633	50.4685	50.46
22 1,1-Dichloroethane	63	3.585	3.589	(0.734)	2019	0.41558	0.41(a)
11 1,1-Dichloroethene	96	2.386	2.390	(0.489)	3361	1.37854	1.37(a)

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\NAHSTWS005\Target\chem\voa9,i\U211209,b\U120918,D
Date : 09-DEC-2021 16:56
Client ID: HS21120103-06
Sample Info: HS21120103-06;HS21120103-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120918.D

Date : 09-DEC-2021 16:56

Client ID: HS21120103-06

Instrument: VOA9.i

Sample Info: HS21120103-06;HS21120103-06;;;

Purge Volume: 5.0

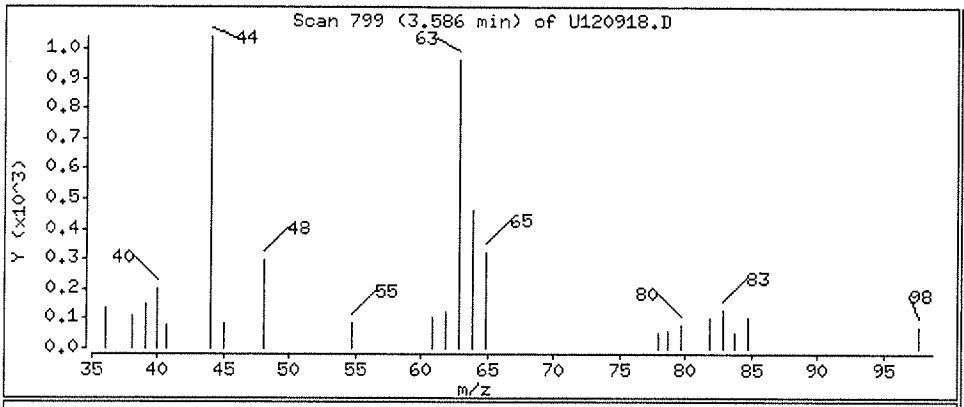
Operator: PC

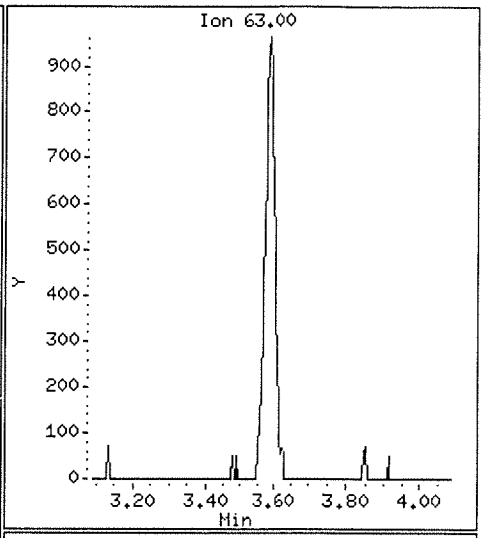
Column phase: DB624

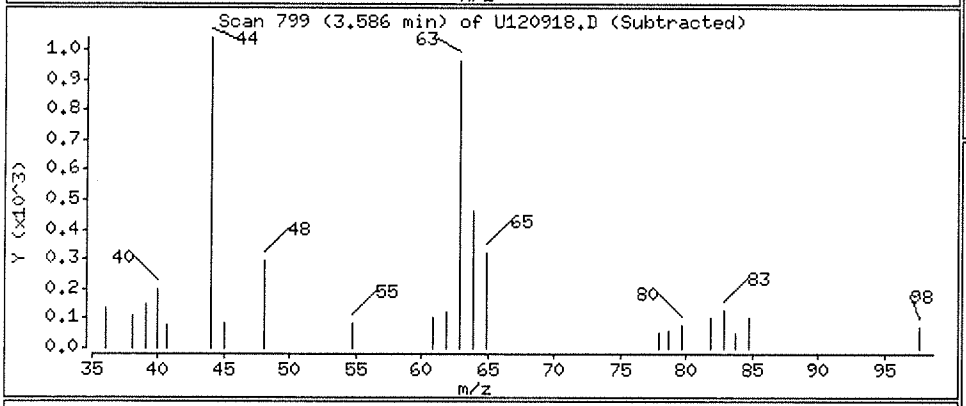
Column diameter: 0.18

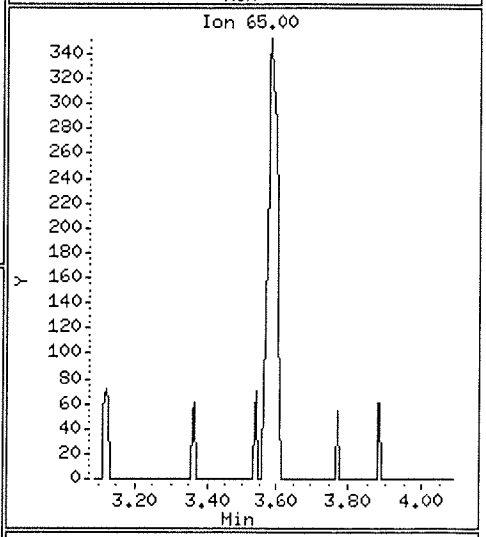
22 1,1-Dichloroethane

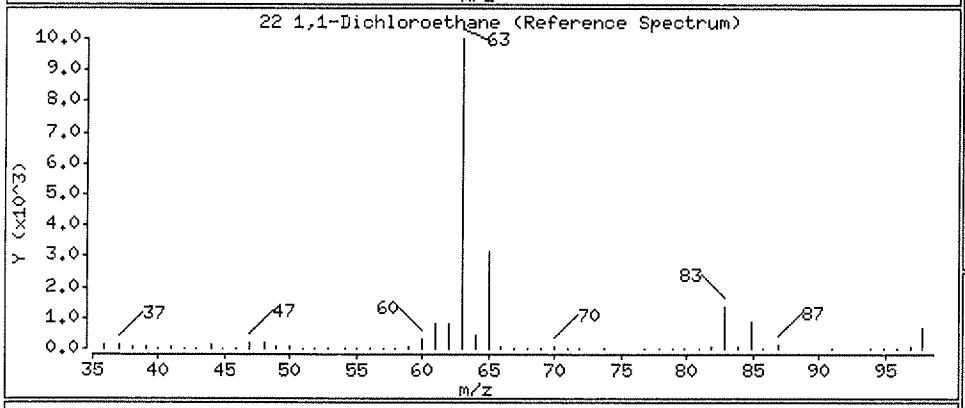
Concentration: 0.41 ug/l

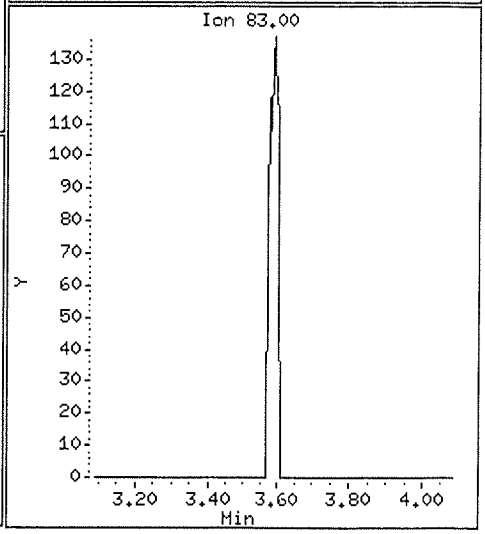


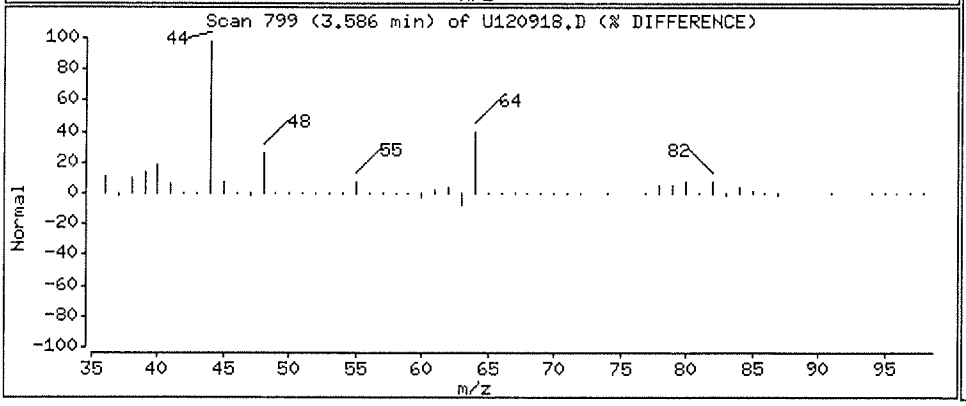












Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120918.D

Date : 09-DEC-2021 16:56

Client ID: HS21120103-06

Instrument: VOA9.i

Sample Info: HS21120103-06;HS21120103-06;;;

Purge Volume: 5.0

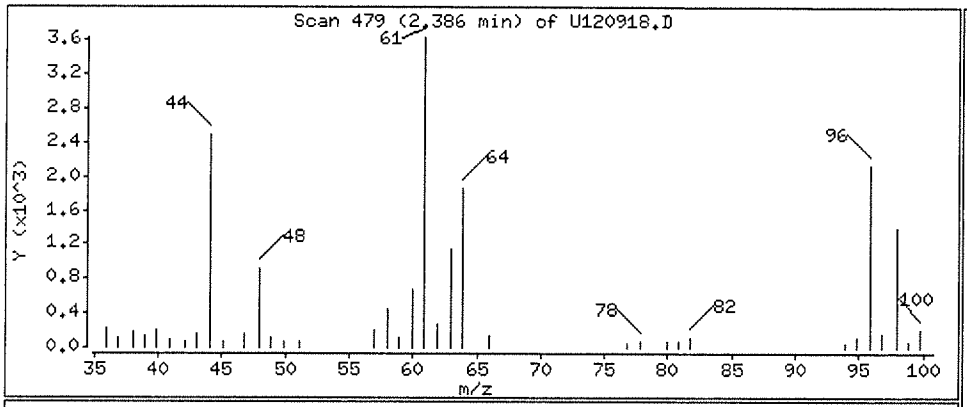
Operator: PC

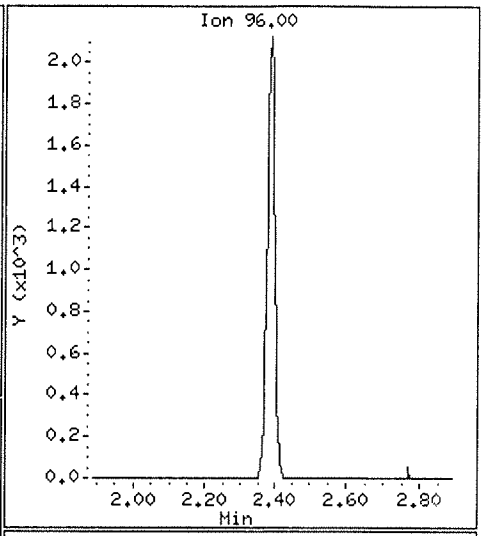
Column phase: DB624

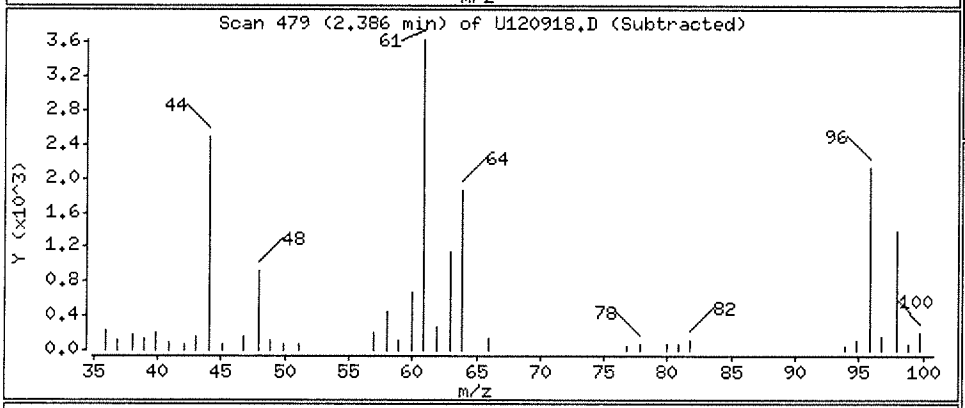
Column diameter: 0.18

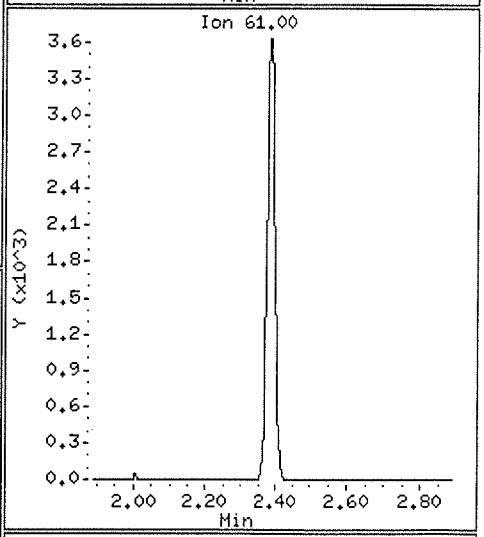
11 1,1-Dichloroethene

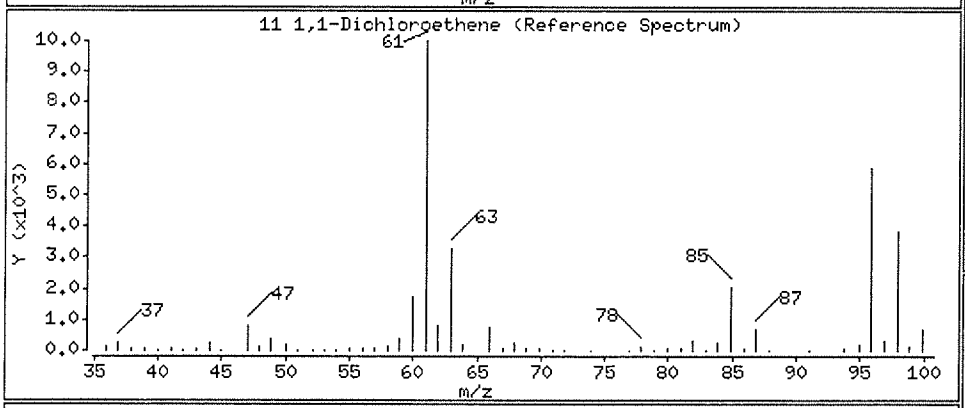
Concentration: 1.37 ug/l

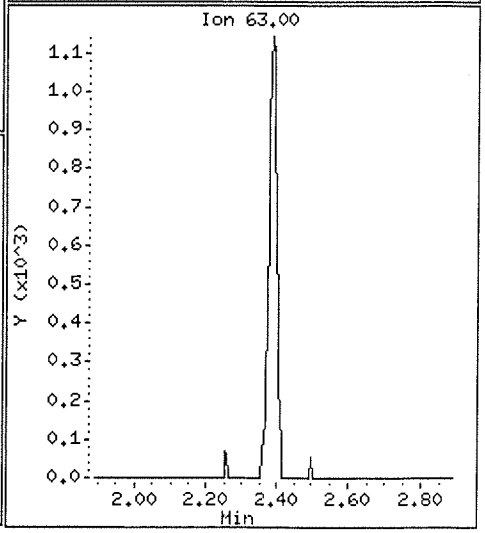


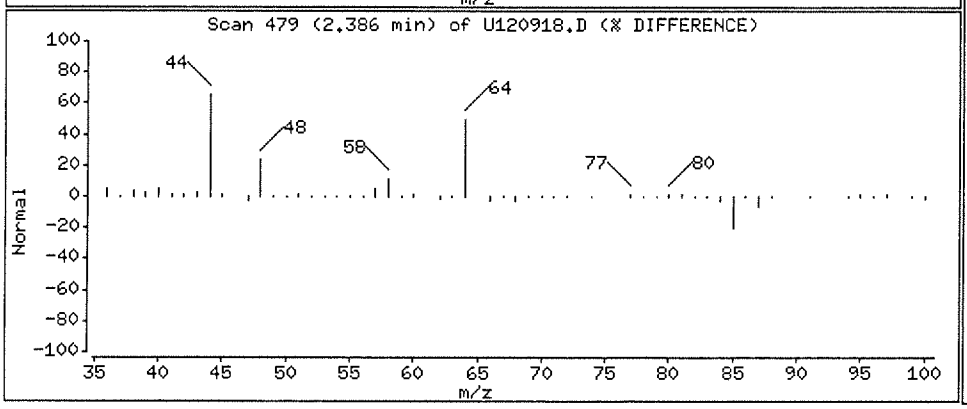












ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120927.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 09-DEC-2021 20:18
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\U211209.b\8260C.m
Meth Date : 03-Jan-2022 09:50 VOA9.i Quant Type: ISTD
Cal Date : 15-NOV-2021 16:27 Cal File: U111508.D
Als bottle: 26 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: bhate.sub
Target Version: 4.14
Processing Host: NAHSTW7017

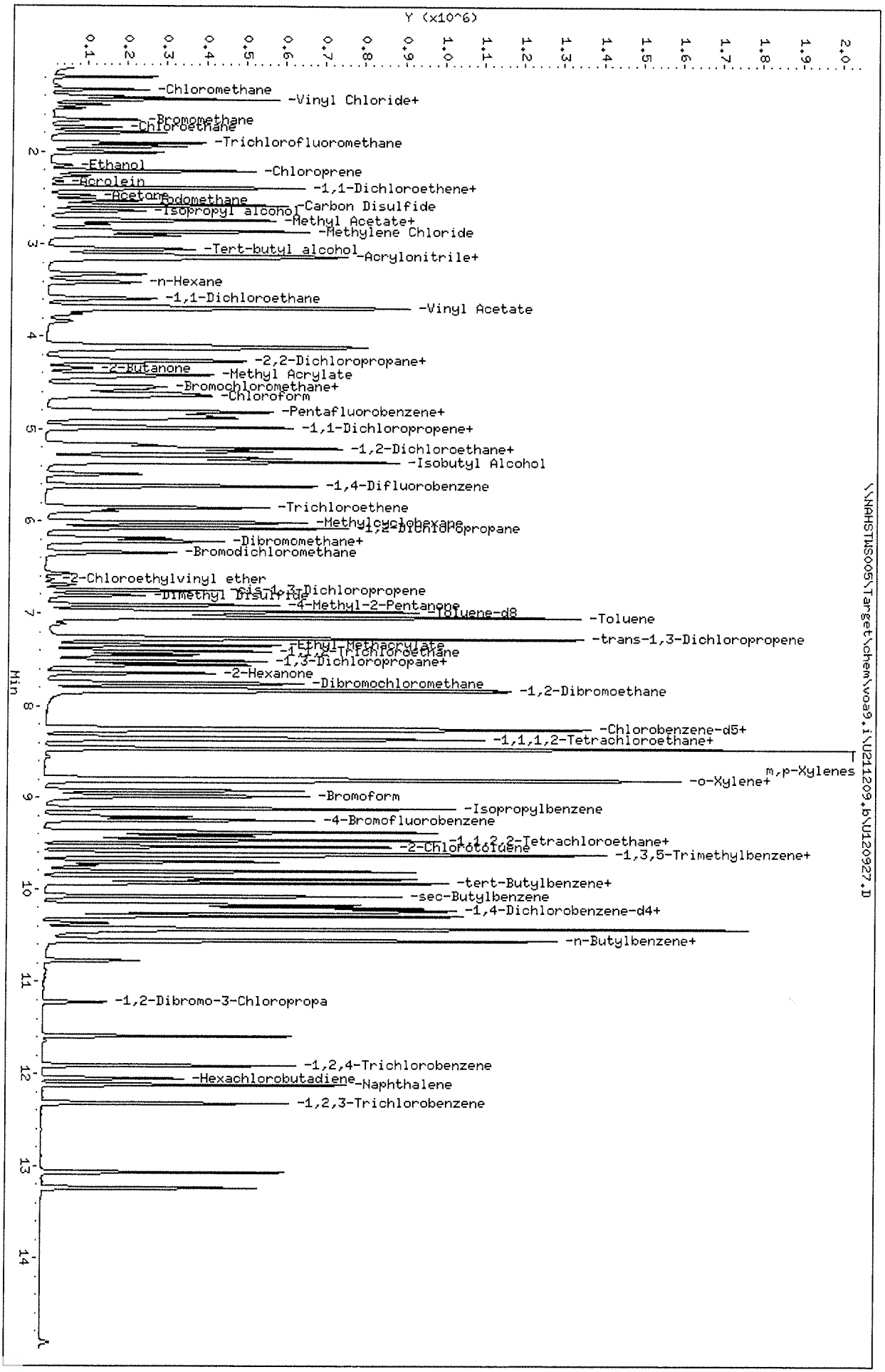
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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	4.883	4.883	(1.000)	265042	50.0000	
*	36 1,4-Difluorobenzene	114	5.614	5.614	(1.000)	491554	50.0000	
*	47 Chlorobenzene-d5	117	8.241	8.241	(1.000)	447898	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.224	10.224	(1.000)	212548	50.0000	
$	30 Dibromofluoromethane	113	4.819	4.819	(0.987)	144125	50.0000	51.83
$	35 1,2-Dichloroethane-d4	65	5.164	5.164	(1.058)	178768	50.0000	55.12
$	48 Toluene-d8	98	6.978	6.978	(0.847)	541692	50.0000	46.46
$	69 4-Bromofluorobenzene	95	9.246	9.246	(1.122)	209175	50.0000	48.03
	60 1,1,1,2-Tetrachloroethane	131	8.339	8.339	(1.012)	139406	50.0000	44.98
	31 1,1,1-Trichloroethane	97	4.811	4.811	(0.985)	206188	50.0000	54.04
	68 1,1,2,2-Tetrachloroethane	83	9.381	9.381	(0.918)	207257	50.0000	46.32
	53 1,1,2-Trichloroethane	83	7.413	7.413	(0.899)	131761	50.0000	49.92
	22 1,1-Dichloroethane	63	3.586	3.586	(0.734)	270346	50.0000	57.41
	11 1,1-Dichloroethene	96	2.386	2.386	(0.489)	125005	50.0000	52.90
	32 1,1-Dichloropropene	75	4.988	4.988	(0.888)	199714	50.0000	49.47
	93 1,2,3-Trichlorobenzene	180	12.324	12.324	(1.205)	162881	50.0000	42.79
	71 1,2,3-Trichloropropane	75	9.415	9.415	(0.921)	225629	50.0000	51.36
	90 1,2,4-Trichlorobenzene	180	11.911	11.911	(1.165)	167443	50.0000	42.80
	79 1,2,4-Trimethylbenzene	105	9.932	9.932	(0.971)	524618	50.0000	49.23
	89 1,2-Dibromo-3-Chloropropane	155	11.222	11.222	(1.098)	28481	50.0000	39.05
	57 1,2-Dibromoethane	107	7.840	7.840	(0.951)	160957	50.0000	50.20
	88 1,2-Dichlorobenzene	146	10.558	10.558	(1.033)	283337	50.0000	47.27

Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120927.D Page 2
Report Date: 03-Jan-2022 09:50

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.242	5.242	(0.934)	222339	50.0000	50.13
42	1,2-Dichloropropane	63	6.071	6.071	(1.081)	163221	50.0000	52.76
75	1,3,5-Trimethylbenzene	105	9.617	9.617	(0.941)	503626	50.0000	48.19
83	1,3-Dichlorobenzene	146	10.168	10.168	(0.995)	281151	50.0000	45.92
54	1,3-Dichloropropane	76	7.555	7.555	(0.917)	284613	50.0000	50.60
84	1,4-Dichlorobenzene	146	10.243	10.243	(1.002)	291253	50.0000	46.23
26	2,2-Dichloropropane	77	4.257	4.257	(0.872)	108677	50.0000	40.72
24	2-Butanone	43	4.347	4.347	(0.890)	138583	100.000	99.99
76	2-Chlorotoluene	91	9.538	9.538	(0.933)	460189	50.0000	50.27
52	2-Hexanone	43	7.645	7.645	(0.928)	217930	100.000	102.49
77	4-Chlorotoluene	91	9.628	9.628	(0.942)	534169	50.0000	50.36
82	p-Isopropyltoluene	119	10.198	10.198	(0.997)	486930	50.0000	47.01
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.839)	314608	100.000	97.53
10	Acetone	43	2.472	2.472	(0.506)	108018	100.000	117.90
37	Benzene	78	5.205	5.205	(0.927)	634084	50.0000	51.01
74	Bromobenzene	156	9.373	9.373	(0.917)	158360	50.0000	48.04
29	Bromochloromethane	128	4.541	4.541	(0.930)	79690	50.0000	53.30
39	Bromodichloromethane	83	6.337	6.337	(1.129)	186941	50.0000	46.80
66	Bromoform	173	8.976	8.976	(1.089)	80450	50.0000	38.70
6	Bromomethane	94	1.655	1.655	(0.339)	101999	50.0000	62.58
19	Carbon Disulfide	76	2.577	2.577	(0.528)	716924	100.000	109.31
34	Carbon Tetrachloride	117	4.980	4.980	(0.887)	170437	50.0000	43.81
59	Chlorobenzene	112	8.264	8.264	(1.003)	401423	50.0000	45.97
7	Chloroethane	64	1.737	1.737	(0.356)	120347	50.0000	54.87
28	Chloroform	83	4.646	4.646	(0.952)	285427	50.0000	55.90
3	Chloromethane	50	1.333	1.333	(0.273)	155560	50.0000	59.01
27	cis-1,2-Dichloroethene	96	4.272	4.272	(0.875)	172619	50.0000	53.30
46	cis-1,3-Dichloropropene	75	6.749	6.749	(1.202)	225943	50.0000	43.83
55	Dibromochloromethane	129	7.750	7.750	(0.940)	144198	50.0000	42.96
44	Dibromomethane	93	6.180	6.180	(1.101)	104593	50.0000	49.57
2	Dichlorodifluoromethane	85	1.194	1.194	(0.245)	145790	50.0000	46.03
61	Ethylbenzene	106	8.361	8.361	(1.015)	205019	50.0000	46.91
91	Hexachlorobutadiene	225	12.054	12.054	(1.179)	61441	50.0000	42.49
67	Isopropylbenzene	105	9.115	9.115	(1.106)	607679	50.0000	46.18
62	m,p-Xylenes	106	8.463	8.463	(1.027)	514241	100.000	95.23
17	Methylene Chloride	84	2.855	2.855	(0.585)	162966	50.0000	52.17
87	n-Butylbenzene	91	10.547	10.547	(1.032)	435999	50.0000	46.94
73	n-Propylbenzene	91	9.467	9.467	(0.926)	725078	50.0000	50.22
92	Naphthalene	128	12.121	12.121	(1.186)	523286	50.0000	44.68
63	o-Xylene	106	8.800	8.800	(1.068)	254319	50.0000	47.55
81	sec-Butylbenzene	105	10.074	10.074	(0.985)	561886	50.0000	47.37
64	Styrene	104	8.815	8.815	(1.070)	457553	50.0000	49.82
78	tert-Butylbenzene	119	9.891	9.891	(0.967)	413302	50.0000	46.91
56	Tetrachloroethene	164	7.514	7.514	(0.912)	106241	50.0000	42.05
50	Toluene	91	7.038	7.038	(0.854)	652330	50.0000	48.68
20	trans-1,2-Dichloroethene	96	3.124	3.124	(0.640)	139407	50.0000	52.29
51	trans-1,3-Dichloropropene	75	7.252	7.252	(1.292)	188187	50.0000	42.69
38	Trichloroethene	130	5.850	5.850	(1.042)	165284	50.0000	51.46
8	Trichlorofluoromethane	101	1.940	1.940	(0.397)	230625	50.0000	53.95
5	Vinyl Chloride	62	1.408	1.408	(0.288)	177442	50.0000	55.35



Data File: \\NAHSTWS005\Target\chem\voa9.i\U211209.b\U120927.D
Date : 09-DEC-2021 20:18
Client ID: CCV-END
Sample Info: VSTD050-END;VSTD050-END;2;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

HS21120103 RSK175

ALS WO# HS21120103

FID04 -Logbook

Batch: 26730
Date: 01-24-2017
Method: RSK 175 ICAL
Comments: Target Sequence 170124

Analyst: Nosa Izekor
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	p
1	ICAL1	CALIB_1	01-24-2017 09:06 am	1.00	0.00 mL	0.00 mL	001.D	Liquid	Y	N
2	ICAL2	CALIB_2	01-24-2017 09:30 am	1.00	0.00 mL	0.00 mL	002.D	Liquid	Y	N
3	ICAL3	CALIB_3	01-24-2017 09:59 am	1.00	0.00 mL	0.00 mL	003.D	Liquid	Y	N
4	ICAL4	CALIB_4	01-24-2017 10:15 am	1.00	0.00 mL	0.00 mL	004.D	Liquid	Y	N
5	ICAL5	CALIB_5	01-24-2017 10:39 am	1.00	0.00 mL	0.00 mL	005.D	Liquid	Y	N
6	ICAL6	CALIB_6	01-24-2017 10:57 am	1.00	0.00 mL	0.00 mL	006.D	Liquid	Y	N
7	ICAL7	CALIB_7	01-24-2017 11:13 am	1.00	0.00 mL	0.00 mL	007.D	Liquid	Y	N
8	ICV	METHSPIKI	01-24-2017 12:05 pm	1.00	0.00 mL	0.00 mL	008.D	Liquid	Y	N
9	LCS-170124	LCS	01-24-2017 12:24 pm	1.00	0.00 mL	0.00 mL	009.D	Liquid	Y	N
10	LCSD-170124	LCSD	01-24-2017 12:40 pm	1.00	0.00 mL	0.00 mL	010.D	Liquid	Y	N
11	MBLK-170124	MBLK	01-24-2017 12:57 pm	1.00	0.00 mL	0.00 mL	011.D	Liquid	Y	N
12	HS17010778-01	SAMP	01-24-2017 01:14 pm	1.00	0.00 mL	0.00 mL	012.D	Liquid	Y	N
13	HS17010779-01	SAMP	01-24-2017 01:31 pm	1.00	0.00 mL	0.00 mL	013.D	Liquid	Y	N
14	HS17010779-01DUP	SAMP	01-24-2017 01:47 pm	1.00	0.00 mL	0.00 mL	014.D	Liquid	Y	N
15	CCV	CCV	01-24-2017 02:01 pm	1.00	0.00 mL	0.00 mL	015.D	Liquid	Y	N

Chemical	Value
ICAL STD ID	30010700217
ICV STD ID	30010700610

FORM 3
WATER GASES METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Matrix Spike - ENG SC Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
Ethene	16.800	19.090	114	75-125
Methane	9.647	9.597	99	75-125
Ethane	18.043	19.657	109	75-125
Propane	26.463	27.238	103	75-125
N-Butane	34.955	36.010	103	75-125

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

_____

FORM III GASES

FORM 6
GASES INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: FID-4 Calibration Date(s): 01/24/17 01/24/17

Column: RTX-PLOT ID: 0.53 (mm) Calibration Time(s): 0906 1113

LAB FILE ID: RF10: 001 RF25: 002 RF50: 003
RF100: 004 RF250: 005 RF500: 006

COMPOUND	RF10	RF25	RF50	RF100	RF250	RF500
Ethene	535.608	567.359	564.985	516.024	665.282	425.678
Methane	968.912	978.238	1019.699	880.798	960.713	930.704
Ethane	602.493	670.177	658.908	597.201	808.513	817.630
Propane	500	1279	2602	4785	18294	38286
N-Butane	438	936	2034	3864	18446	42817

FORM VI GASES

FORM 6
GASES INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS2112010

Instrument ID: FID-4 Calibration Date(s): 01/24/17 01/24/17

Column: RTX-PLOT ID: 0.53 (mm) Calibration Time(s): 0906 1113

RF1000: 007

COMPOUND	RF1000	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MA
Ethene	828.858	AVRG		586.256273		21.932	
Methane	1081.580	AVRG		974.377787		6.550	
Ethane	999.335	AVRG		736.322546		19.885	
Propane	96509	2ORDR	0.97987006	1.529e-003	-4.58e-009	0.9991365	0
N-Butane	114164	2ORDR	2.46870151	1.834e-003	-5.54e-009	0.9980766	0

FORM VI GASES

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\001.D
Lab Smp Id: ICAL1 Client Smp ID: ICAL1
Inj Date : 24-JAN-2017 09:06
Operator : JA Inst ID: FID-4.i
Smp Info : ICAL1;ICAL1;;;
Misc Info :
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 09:06 Cal File: 001.D
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.043	1.030	0.013	374	0.38600	0.383(a)
2 Ethene	1.553	1.556	-0.003	361	0.67400	0.615(a)
3 Ethane	1.716	1.723	-0.007	435	0.72200	0.590(a)
4 Propane	4.073	4.113	-0.040	500	1.05900	1.743
5 N-Butane	7.640	7.690	-0.050	438	1.39800	3.271

QC Flag Legend

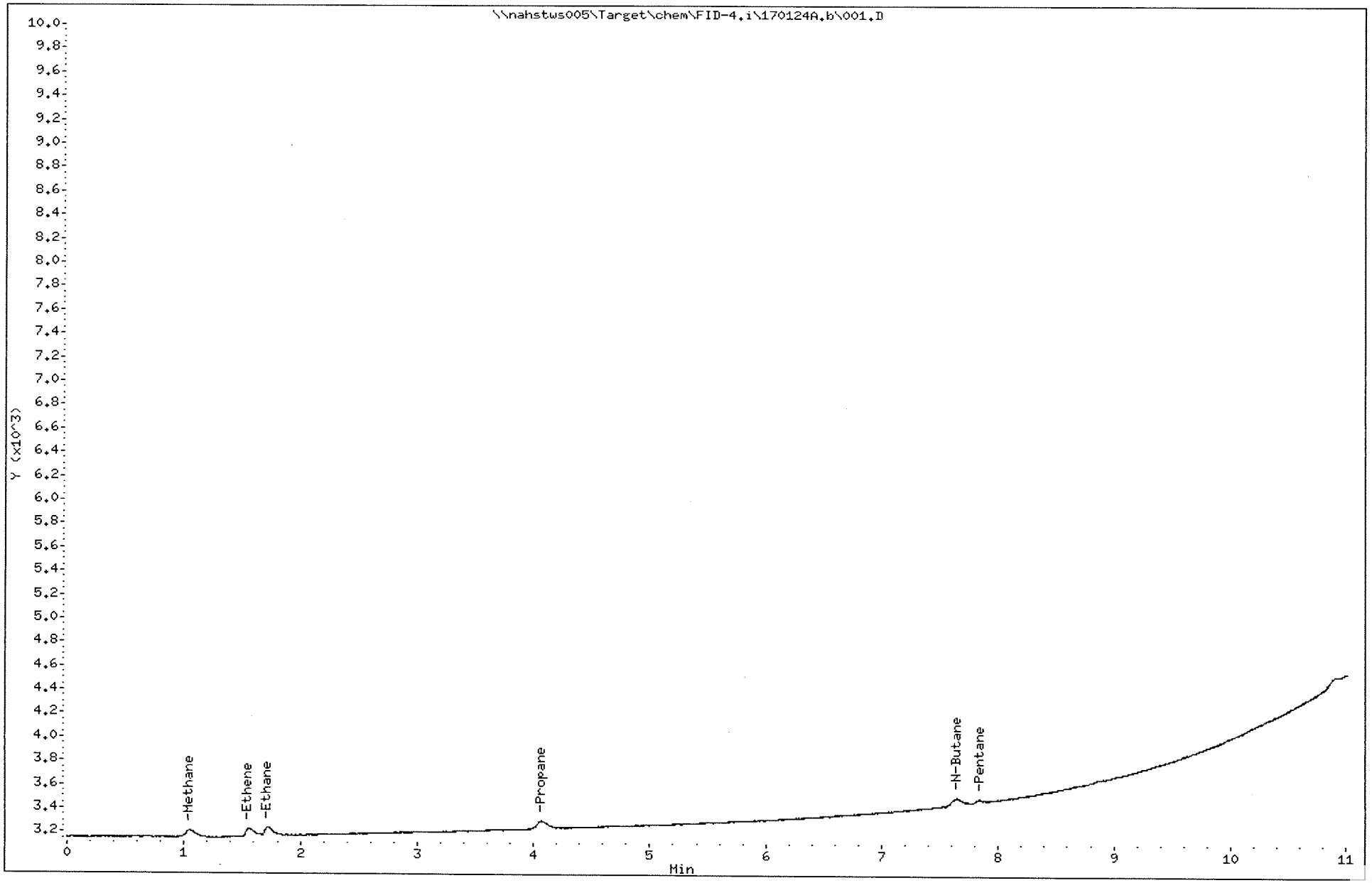
a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\001.D
Date : 24-JAN-2017 09:06
Client ID: ICAL1
Sample Info: ICAL1;ICAL1;;;

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: JA
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\002.D
Lab Smp Id: ICAL2 Client Smp ID: ICAL2
Inj Date : 24-JAN-2017 09:30
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL2;ICAL2;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 09:59 Cal File: 003.D
Als bottle: 2 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.023	1.030	-0.007	944	0.96500	0.968
2 Ethene	1.560	1.556	0.004	956	1.68500	1.630
3 Ethane	1.723	1.723	0.000	1209	1.80400	1.641
4 Propane	4.123	4.113	0.010	1279	2.64600	2.927
5 N-Butane	7.716	7.690	0.026	936	3.49600	4.180

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\002.D

Date : 24-JAN-2017 09:30

Client ID: ICAL2

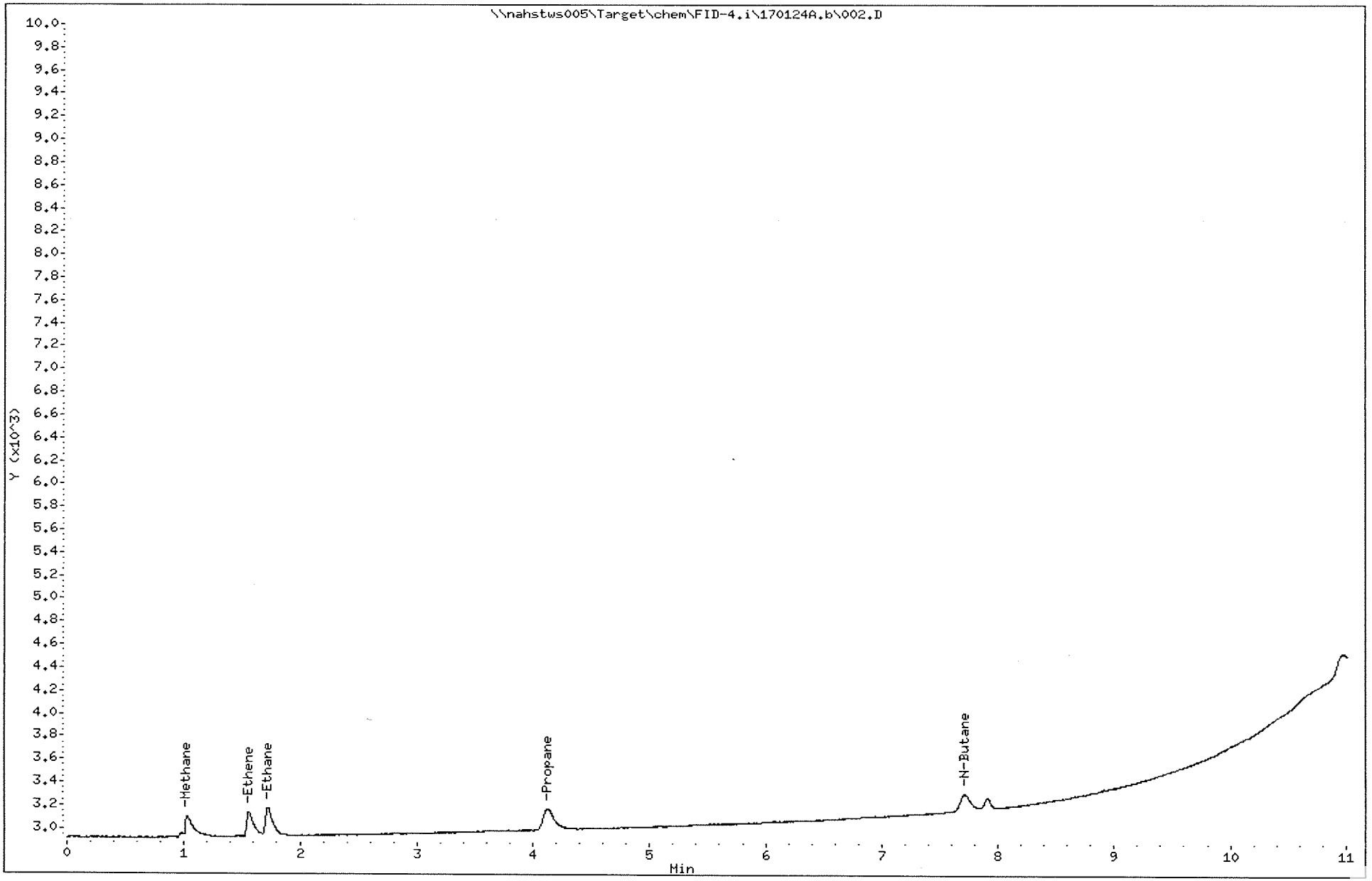
Instrument: FID-4.i

Sample Info: ICAL2;ICAL2;;;

Operator: MA

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\003.D
Lab Smp Id: ICAL3 Client Smp ID: ICAL3
Inj Date : 24-JAN-2017 09:59
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL3;ICAL3;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 11:13 Cal File: 007.D
Als bottle: 3 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.043	1.030	0.013	1967	1.92900	2.018
2 Ethene	1.570	1.556	0.014	1904	3.37000	3.247
3 Ethane	1.736	1.723	0.013	2378	3.60900	3.229
4 Propane	4.123	4.113	0.010	2602	5.29300	4.926
5 N-Butane	7.703	7.690	0.013	2034	6.99100	6.176

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\003.D

Date : 24-JAN-2017 09:59

Client ID: ICAL3

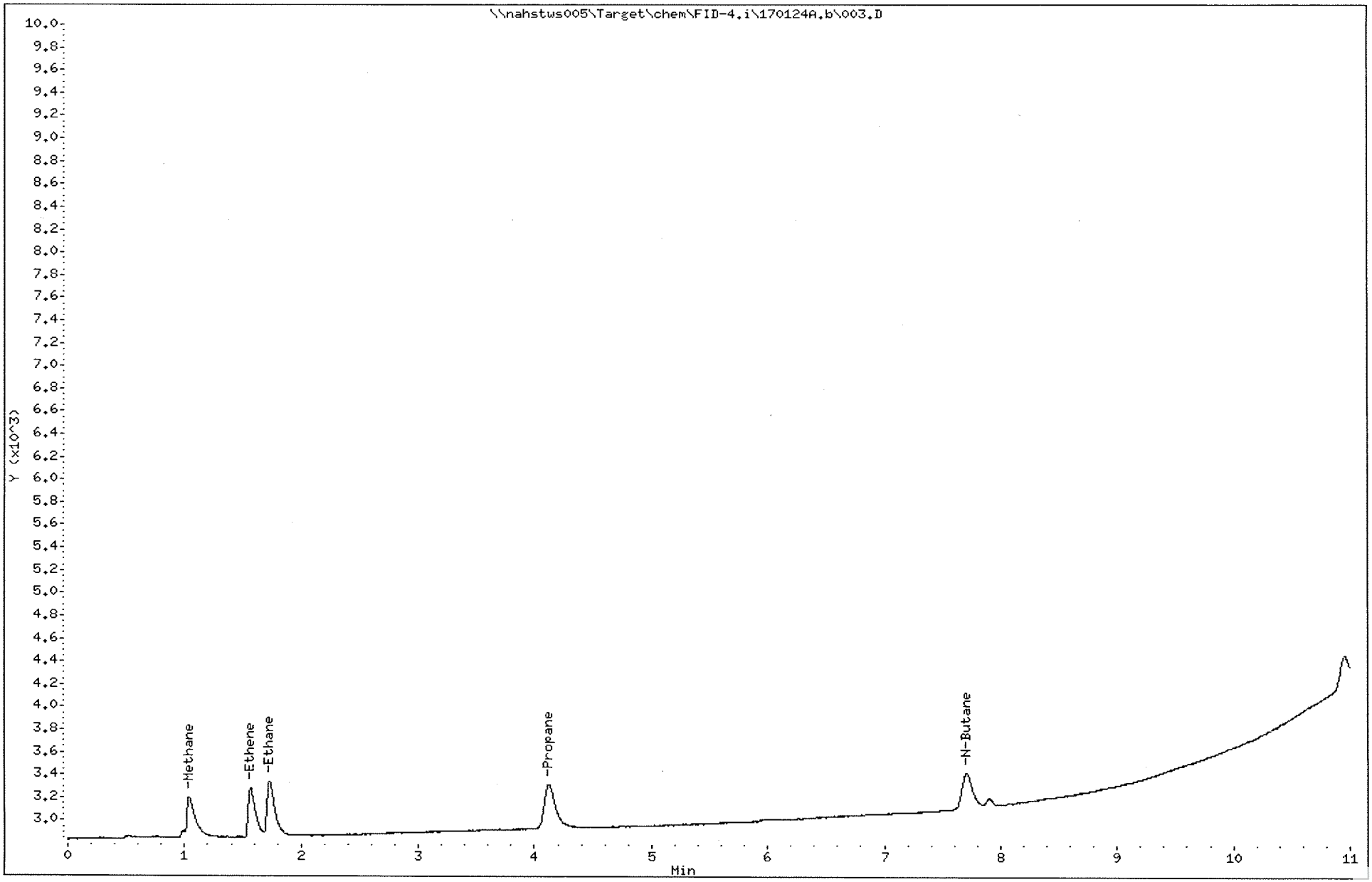
Instrument: FID-4.i

Sample Info: ICAL3;ICAL3;;;

Operator: MA

Column phase: Rtx-PLOT

Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\004.D
Report Date: 16-Nov-2021 16:09

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\004.D
Lab Smp Id: ICAL4 Client Smp ID: ICAL4
Inj Date : 24-JAN-2017 10:15
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL4;ICAL4;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 09:30 Cal File: 002.D
Als bottle: 4 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.033	1.030	0.003	3399	3.85900	3.488
2 Ethene	1.563	1.556	0.007	3478	6.74000	5.932
3 Ethane	1.726	1.723	0.003	4310	7.21700	5.853
4 Propane	4.120	4.113	0.007	4785	10.5850	8.190
5 N-Butane	7.703	7.690	0.013	3864	13.9820	9.473(M)

QC Flag Legend

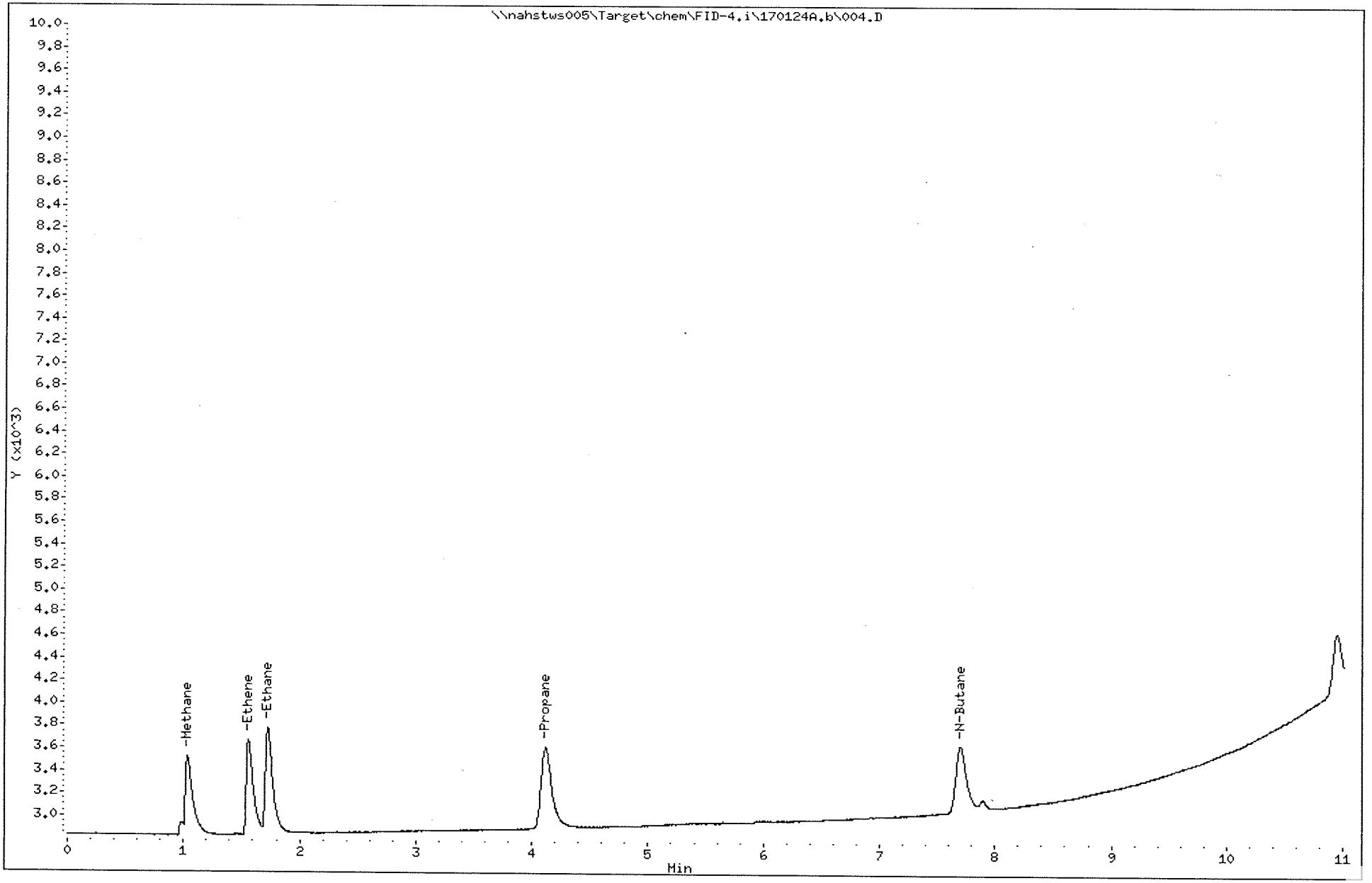
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\004.D
Date : 24-JAN-2017 10:15
Client ID: ICAL4
Sample Info: ICAL4;ICAL4;;;

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: MA
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\005.D
Lab Smp Id: ICAL5 Client Smp ID: ICAL5
Inj Date : 24-JAN-2017 10:39
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL5;ICAL5;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:39 Cal File: 005.D
Als bottle: 5 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.043	1.030	0.013	9268	9.64700	9.511
2 Ethene	1.570	1.556	0.014	11210	16.8500	19.121
3 Ethane	1.733	1.723	0.010	14588	18.0430	19.811
4 Propane	4.120	4.113	0.007	18294	26.4630	27.415
5 N-Butane	7.700	7.690	0.010	18446	34.9550	34.419(M)

QC Flag Legend

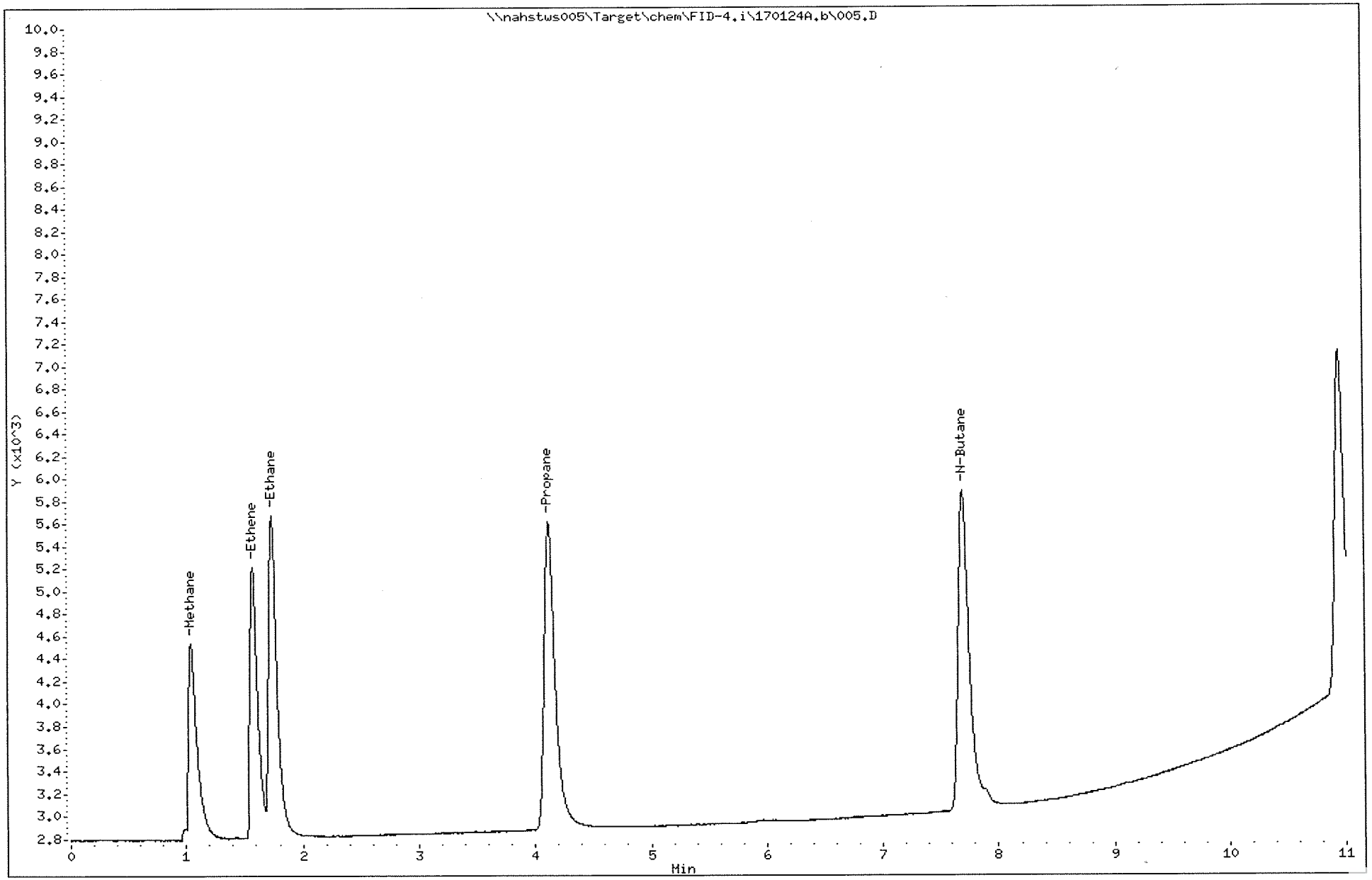
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\005.D
Date : 24-JAN-2017 10:39
Client ID: ICAL5
Sample Info: ICAL5;ICAL5;;;

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: MA
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\006.D
Lab Smp Id: ICAL6 Client Smp ID: ICAL6
Inj Date : 24-JAN-2017 10:57
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL6;ICAL6;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:39 Cal File: 005.D
Als bottle: 6 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

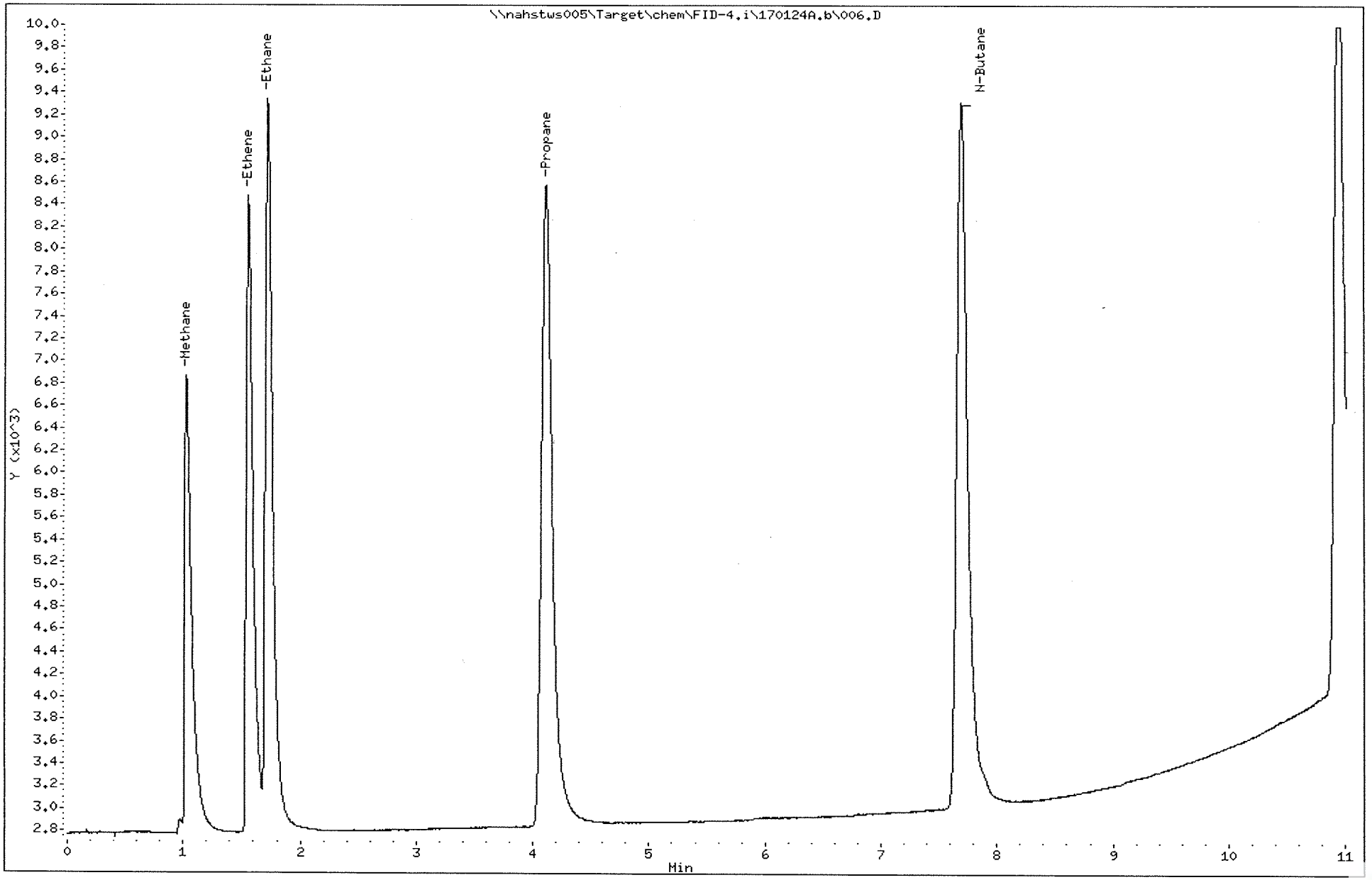
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.023	1.030	-0.007	17957	19.2940	18.429
2 Ethene	1.550	1.556	-0.006	22910	53.8200	39.078
3 Ethane	1.716	1.723	-0.007	29505	36.0860	40.070
4 Propane	4.110	4.113	-0.003	38286	52.9260	52.796
5 N-Butane	7.696	7.690	0.006	42817	69.9110	70.855

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\006.D
Date : 24-JAN-2017 10:57
Client ID: ICAL6
Sample Info: ICAL6;ICAL6;;;

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: MA
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\007.D
Lab Smp Id: ICAL7 Client Smp ID: ICAL7
Inj Date : 24-JAN-2017 11:13
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL7;ICAL7;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:57 Cal File: 006.D
Als bottle: 7 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	ON-COL (ug/L)
1 Methane	1.030	1.030	0.000	41736	38.5880	42.833(A)
2 Ethene	1.556	1.556	0.000	55865	67.4000	95.291(A)
3 Ethane	1.723	1.723	0.000	72124	72.1720	97.951(A)
4 Propane	4.113	4.113	0.000	96509	105.852	105.844
5 N-Butane	7.690	7.690	0.000	114164	139.821	139.707

QC Flag Legend

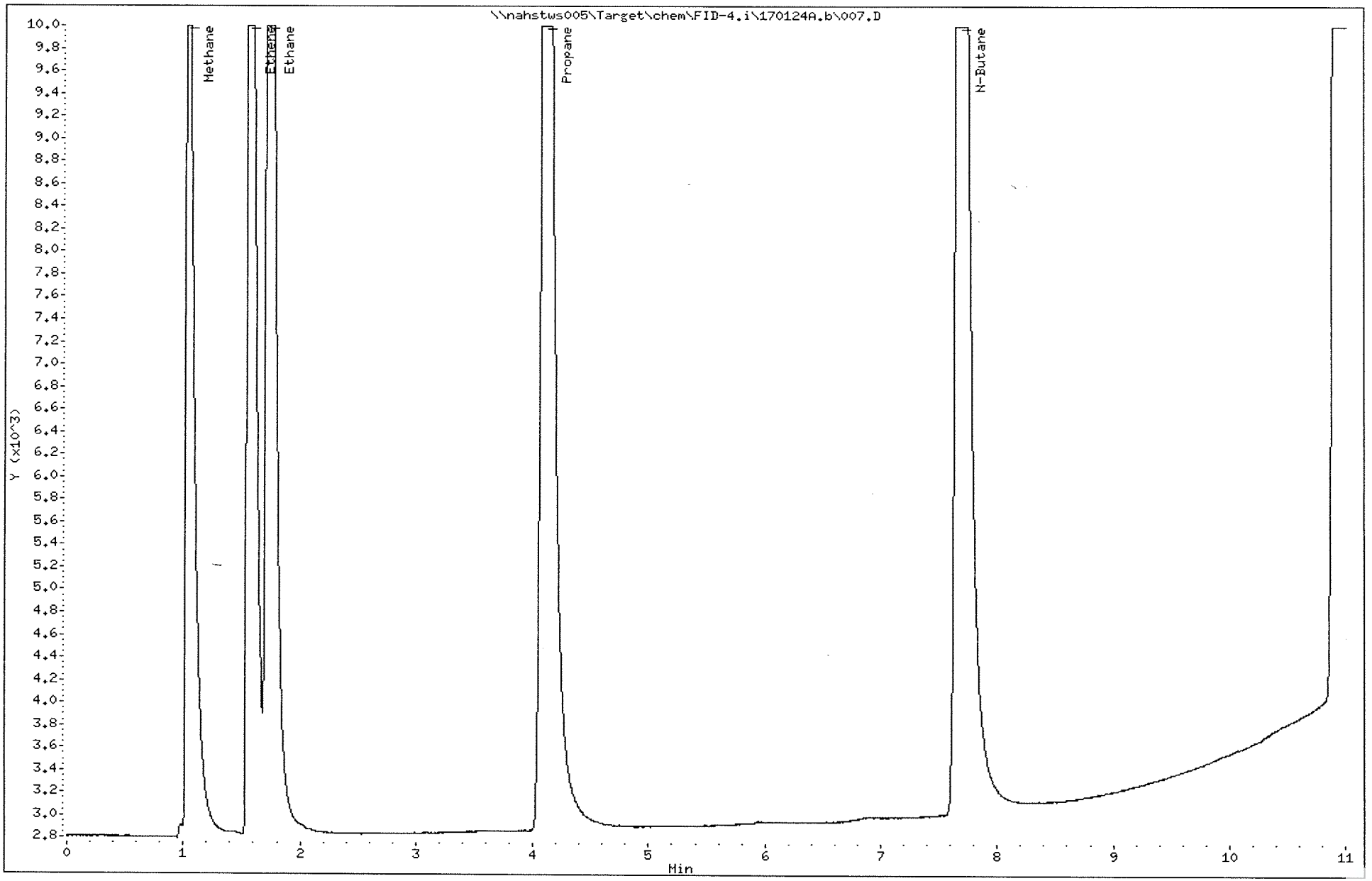
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\007.D
Date : 24-JAN-2017 11:13
Client ID: ICAL7
Sample Info: ICAL7;ICAL7;;;

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: MA
Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\008.D
Report Date: 16-Nov-2021 16:09

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\170124A.b\008.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 24-JAN-2017 12:05
Operator : MA Inst ID: FID-4.i
Smp Info : ICV;ICV;;;
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\170124A.b\RSKNI2.m
Meth Date : 15-Nov-2021 14:10 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 11:13 Cal File: 007.D
Als bottle: 8 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNIP2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

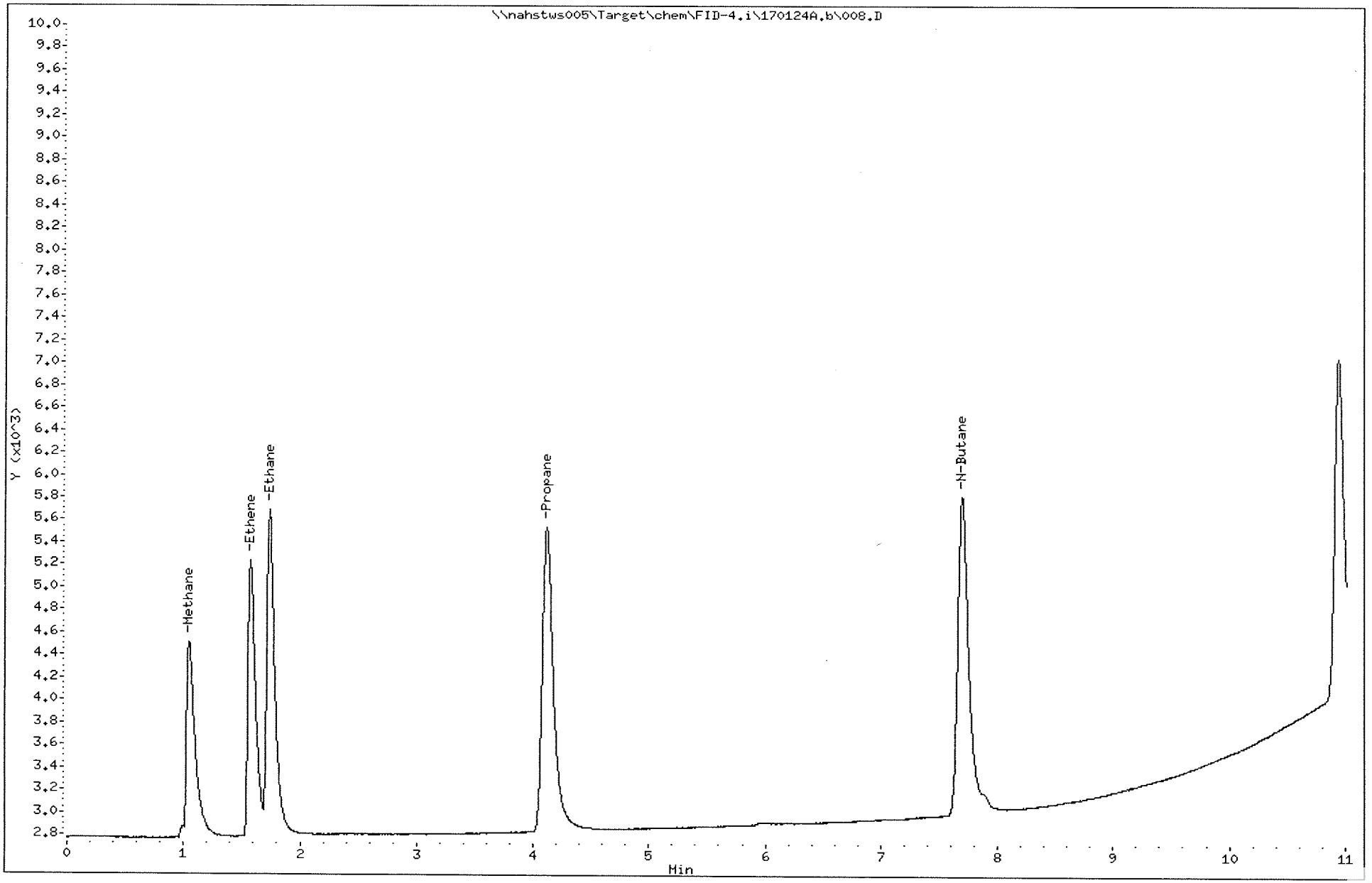
					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	1.046	1.030	0.016	9352	9.59792	9.597
2 Ethene	1.573	1.556	0.017	11192	19.0906	19.090
3 Ethane	1.736	1.723	0.013	14474	19.6571	19.657
4 Propane	4.116	4.113	0.003	18164	27.2381	27.238
5 N-Butane	7.696	7.690	0.006	19425	36.0103	36.010

Data File: \\nahstws005\Target\chem\FID-4.i\170124A.b\008.D
Date : 24-JAN-2017 12:05
Client ID: ICV
Sample Info: ICV;ICV;;;

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: MA
Column diameter: 0.53



FID04 -Logbook

Batch: 47517
Date: 12-13-2021
Method: RSK175
Comments:

Analyst: Purvi Lad
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	p
1	RSK-CCV	CCV	12-13-2021 09:28 am	1.00	0.00 mL	0.00 mL	001.D	Liquid	Y	N
2	MBLK-211213	MBLK	12-13-2021 09:39 am	1.00	0.00 mL	0.00 mL	002.D	Liquid	Y	N
3	LCS-211213	LCS	12-13-2021 09:50 am	1.00	0.00 mL	0.00 mL	003.D	Liquid	Y	N
4	HS21120092-05	SAMP	12-13-2021 09:59 am	1.00	0.00 mL	0.00 mL	004.D	Liquid	Y	<
5	HS21120092-05MS	MS	12-13-2021 10:19 am	1.00	0.00 mL	0.00 mL	005.D	Liquid	Y	<
6	HS21120092-05MSD	MSD	12-13-2021 10:28 am	1.00	0.00 mL	0.00 mL	006.D	Liquid	Y	<
7	HS21120092-06	SAMP	12-13-2021 10:46 am	1.00	0.00 mL	0.00 mL	007.D	Liquid	Y	<
8	HS21120103-01	SAMP	12-13-2021 10:55 am	1.00	0.00 mL	0.00 mL	008.D	Liquid	Y	<
9	HS21120103-02	SAMP	12-13-2021 11:04 am	1.00	0.00 mL	0.00 mL	009.D	Liquid	Y	<
10	HS21120092-07	SAMP	12-13-2021 11:14 am	1.00	0.00 mL	0.00 mL	010.D	Liquid	Y	<
11	RSK-CCV	CCV	12-13-2021 11:27 am	1.00	0.00 mL	0.00 mL	011.D	Liquid	Y	N
12	HS21120103-03	SAMP	12-13-2021 11:36 am	1.00	0.00 mL	0.00 mL	012.D	Liquid	Y	<
13	HS21120103-04	SAMP	12-13-2021 11:47 am	1.00	0.00 mL	0.00 mL	013.D	Liquid	Y	<
14	HS21120103-05	SAMP	12-13-2021 11:55 am	1.00	0.00 mL	0.00 mL	014.D	Liquid	Y	<
15	HS21120103-06	SAMP	12-13-2021 12:05 pm	1.00	0.00 mL	0.00 mL	015.D	Liquid	Y	<
16	HS21120185-03	SAMP	12-13-2021 12:13 pm	1.00	0.00 mL	0.00 mL	016.D	Liquid	Y	<
17	HS21120185-04	SAMP	12-13-2021 12:24 pm	1.00	0.00 mL	0.00 mL	017.D	Liquid	Y	<
18	HS21120185-05	SAMP	12-13-2021 12:32 pm	1.00	0.00 mL	0.00 mL	018.D	Liquid	Y	<
19	HS21120185-06	SAMP	12-13-2021 12:42 pm	1.00	0.00 mL	0.00 mL	019.D	Liquid	Y	<
20	HS21120408-01	SAMP	12-13-2021 12:58 pm	1.00	0.00 mL	0.00 mL	020.D	Liquid	Y	<
21	HS21120408-03	SAMP	12-13-2021 01:07 pm	1.00	0.00 mL	0.00 mL	021.D	Liquid	Y	<
22	RSK-CCV	CCV	12-13-2021 01:16 pm	1.00	0.00 mL	0.00 mL	022.D	Liquid	Y	N
23	HS21120185-07	SAMP	12-13-2021 01:47 pm	1.00	0.00 mL	0.00 mL	023.D	Liquid	Y	<
24	HS21120483-04	SAMP	12-13-2021 01:57 pm	1.00	0.00 mL	0.00 mL	024.D	Liquid	Y	<
25	HS21120483-05	SAMP	12-13-2021 02:07 pm	1.00	0.00 mL	0.00 mL	025.D	Liquid	Y	<
26	HS21120483-06	SAMP	12-13-2021 02:16 pm	1.00	0.00 mL	0.00 mL	026.D	Liquid	Y	<
27	HS21120483-07	SAMP	12-13-2021 02:24 pm	1.00	0.00 mL	0.00 mL	027.D	Liquid	Y	<
28	HS21120103-01	SAMP	12-13-2021 02:32 pm	50.00	0.00 mL	0.00 mL	028.D	Liquid	Y	<
29	HS21120103-02	SAMP	12-13-2021 02:40 pm	100.0(	0.00 mL	0.00 mL	029.D	Liquid	Y	<
30	HS21120103-04	SAMP	12-13-2021 03:00 pm	50.00	0.00 mL	0.00 mL	030.D	Liquid	Y	<
31	HS21120103-05	SAMP	12-13-2021 03:11 pm	50.00	0.00 mL	0.00 mL	031.D	Liquid	Y	N
32	HS21120103-06	SAMP	12-13-2021 03:22 pm	100.0(	0.00 mL	0.00 mL	032.D	Liquid	Y	N
33	RSK-CCV	CCV	12-13-2021 03:54 pm	1.00	0.00 mL	0.00 mL	033.D	Liquid	Y	N

Chemical	Value
pH Paper	300107065-15
CCV/LC/LSD/MS/MSD	300107043-11

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: FID-4 Calibration Date: 12/13/21 Time: 0928

Lab File ID: 001 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	682.09278	0.01	5.20	20.00	AVRG
Methane	974.99200	940.08500	0.01	3.58	20.00	AVRG
Ethene	585.76000	496.97329	0.01	15.16	20.00	AVRG

FORM VII GASES

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: FID-4 Calibration Date: 12/13/21 Time: 1127

Lab File ID: 011 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	625.11777	0.01	13.12	20.00	AVRG
Methane	974.99200	903.80429	0.01	7.30	20.00	AVRG
Ethene	585.76000	518.81306	0.01	11.43	20.00	AVRG

FORM VII GASES

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: FID-4 Calibration Date: 12/13/21 Time: 1316

Lab File ID: 022 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	661.53079	0.01	8.06	20.00	AVRG
Methane	974.99200	885.14564	0.01	9.22	20.00	AVRG
Ethene	585.76000	508.30861	0.01	13.22	20.00	AVRG

FORM VII GASES

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS21120103

Instrument ID: FID-4 Calibration Date: 12/13/21 Time: 1554

Lab File ID: 033 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	854.34795	0.01	-18.74	20.00	AVRG
Methane	974.99200	1028.0916	0.01	-5.45	20.00	AVRG
Ethene	585.76000	690.32641	0.01	-17.85	20.00	AVRG

FORM VII GASES

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\001.D Page 1
Report Date: 03-Jan-2022 14:09

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\001.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 09:28
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

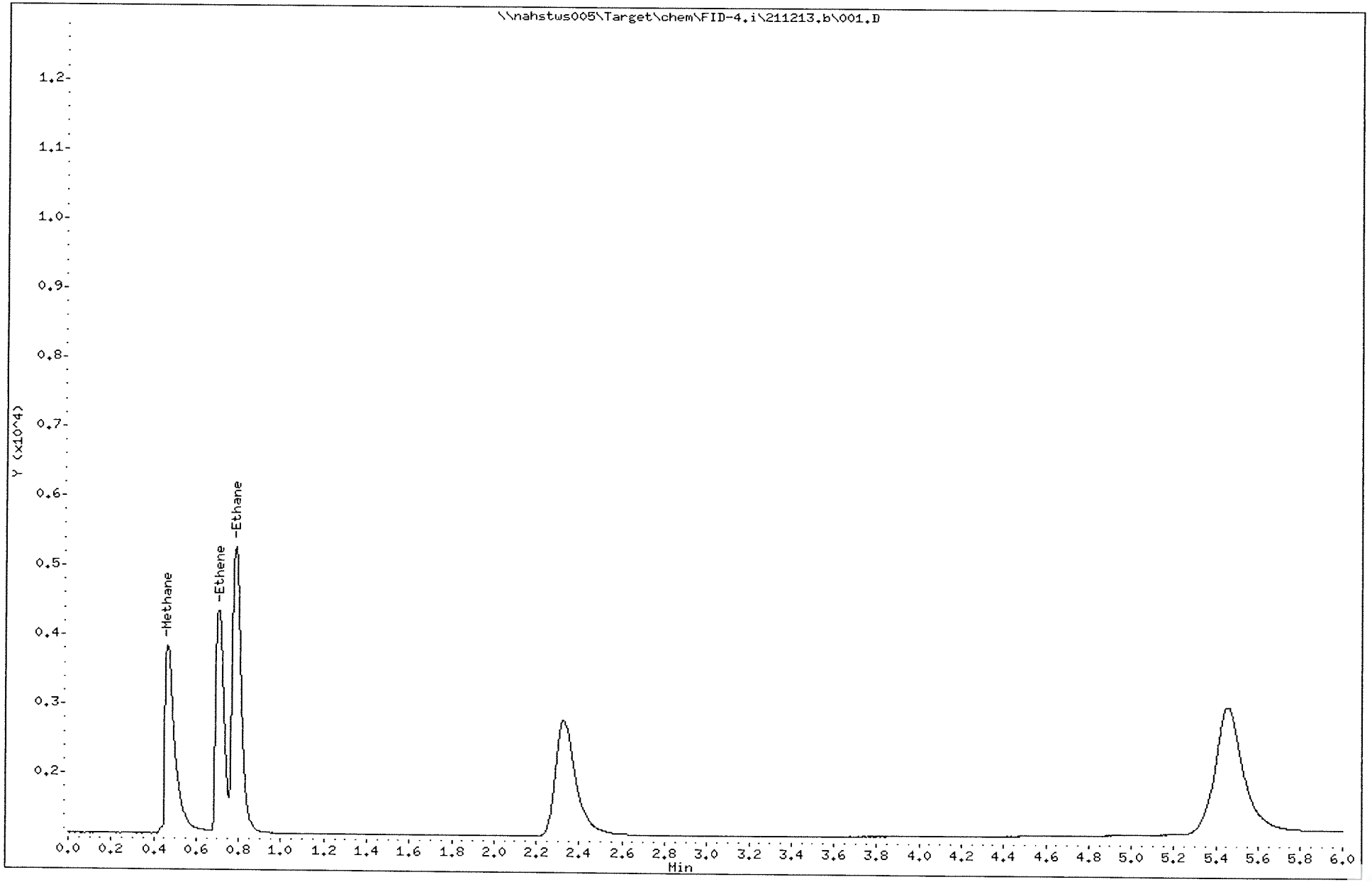
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	ON-COL (ug/L)
1 Methane	0.463	0.463	0.000	9069	9.64700	9.301
2 Ethene	0.706	0.703	0.003	8374	16.8500	14.295
3 Ethane	0.783	0.783	0.000	12307	18.0430	17.105

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\001.D
Date : 13-DEC-2021 09:28
Client ID: RSK-CCV
Sample Info: RSK-CCV;RSK-CCV;2;4

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\001.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 09:28
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment   :
Method   : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.463	0.463	0.000	8994	9.64700	9.224
2 Ethene	0.706	0.703	0.003	8277	16.8500	14.130
3 Ethane	0.783	0.783	0.000	12147	18.0430	16.882

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\001.D

Date : 13-DEC-2021 09:28

Client ID: RSK-CCV

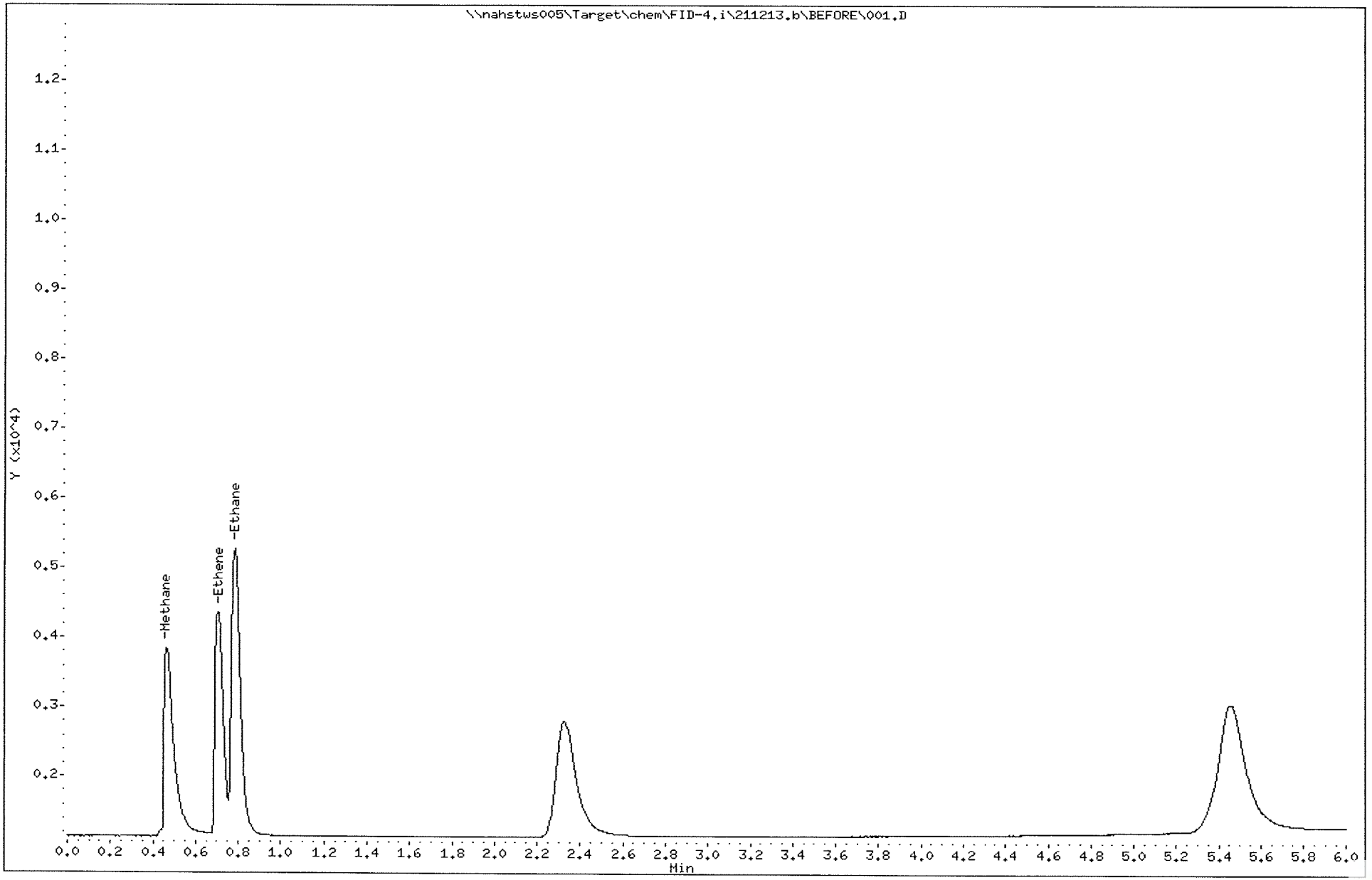
Instrument: FID-4.i

Sample Info: RSK-CCV;RSK-CCV;2;4

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\002.D
Lab Smp Id: MBLK-211213 Client Smp ID: MBLK-211213
Inj Date : 13-DEC-2021 09:39
Operator : PL Inst ID: FID-4.i
Smp Info : MBLK-211213;MBLK-211213;3;;BLANK
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 2 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)

01153593

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\002.D

Page 2

Date : 13-DEC-2021 09:39

Client ID: MBLK-211213

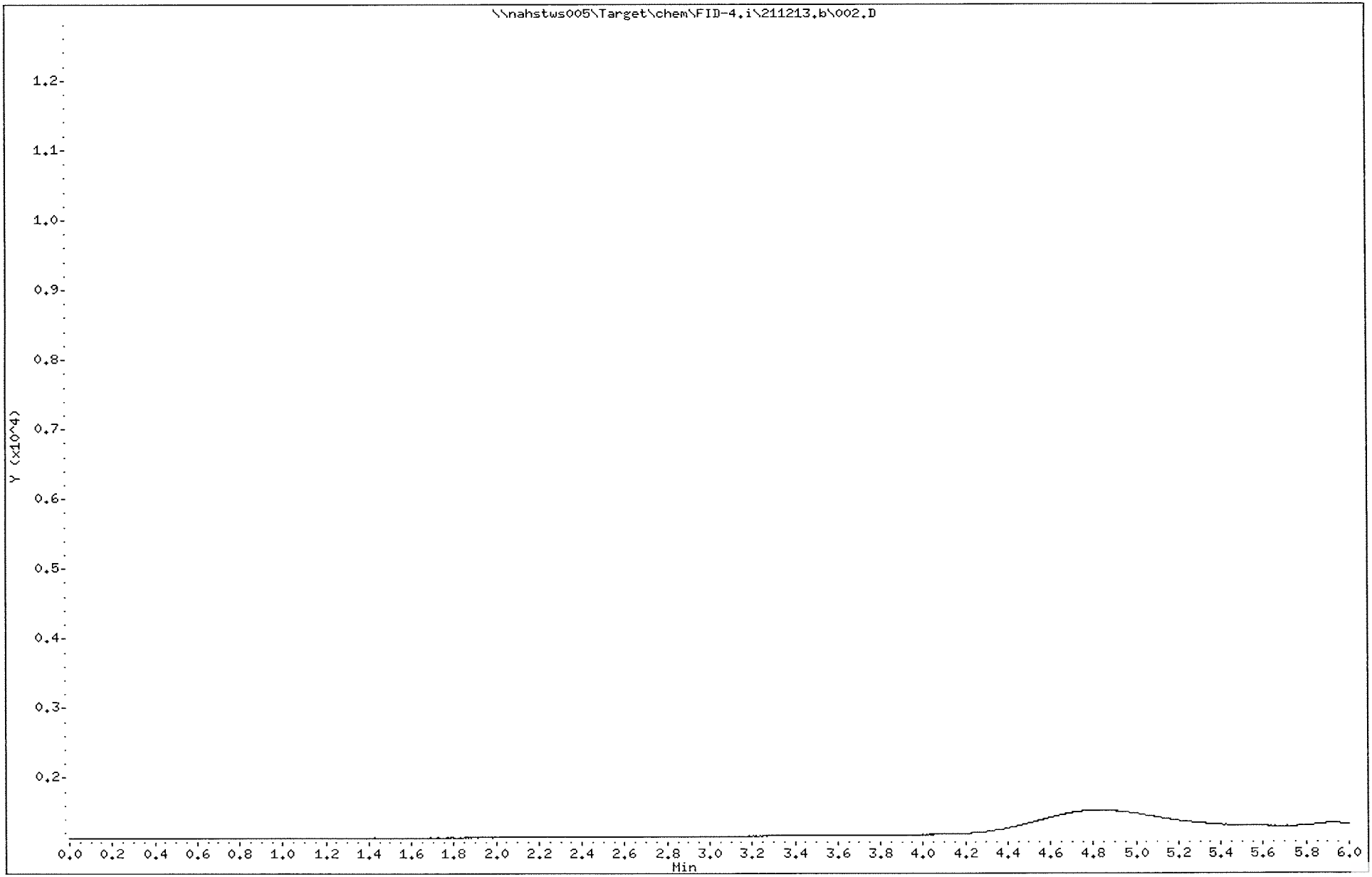
Instrument: FID-4.i

Sample Info: MBLK-211213;MBLK-211213;3;;BLANK

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\002.D
Lab Smp Id: MBLK-211213 Client Smp ID: MBLK-211213
Inj Date : 13-DEC-2021 09:39
Operator : PL Inst ID: FID-4.i
Smp Info : MBLK-211213;MBLK-211213;3;;BLANK
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 2 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
==========	====	========	========	========	=======	=======

01153595

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\002.D

Date : 13-DEC-2021 09:39

Client ID: MBLK-211213

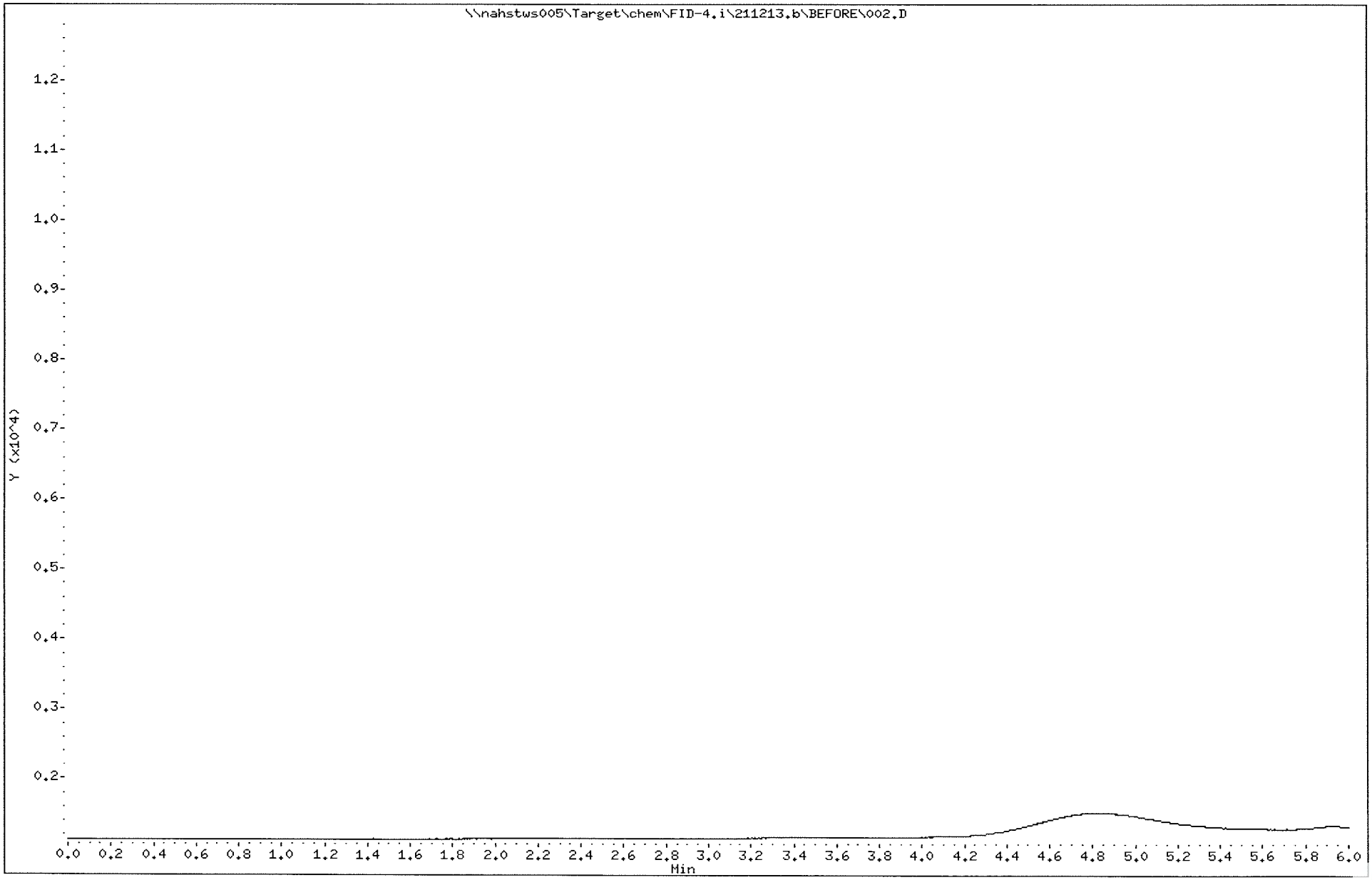
Instrument: FID-4.i

Sample Info: MBLK-211213;MBLK-211213;3;;BLANK

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\003.D
Lab Smp Id: LCS-211213 Client Smp ID: LCS-211213
Inj Date : 13-DEC-2021 09:50
Operator : PL Inst ID: FID-4.i
Smp Info : LCS-211213;LCS-211213;3;;LCS
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 3 QC Sample: LCS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.463	0.463	0.000	9441	9.68315	9.683
2 Ethene	0.703	0.703	0.000	8711	14.8713	14.871(M)
3 Ethane	0.783	0.783	0.000	12408	17.2456	17.245(M)

QC Flag Legend

M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\003.D

Date : 13-DEC-2021 09:50

Client ID: LCS-211213

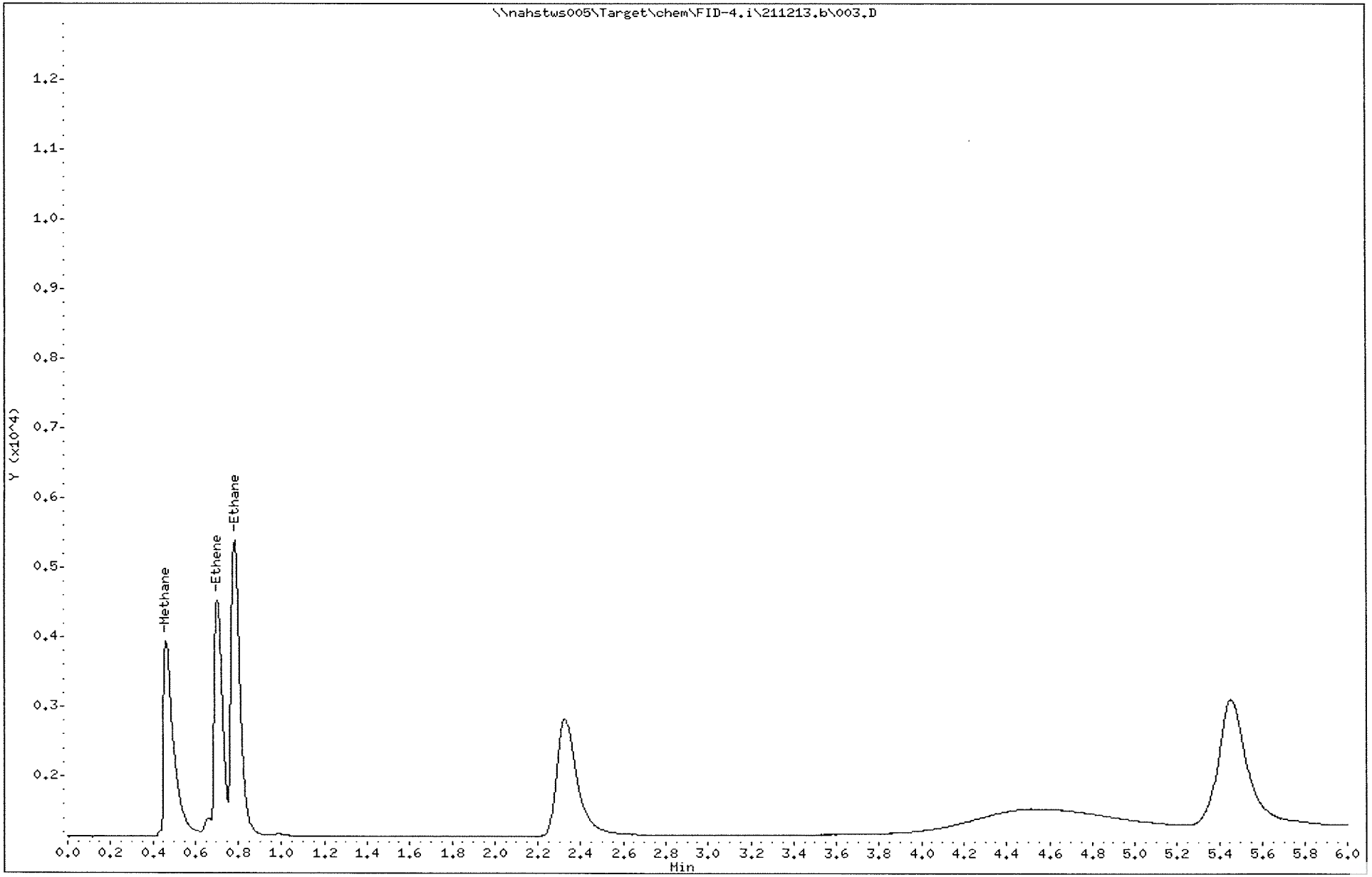
Instrument: FID-4.i

Sample Info: LCS-211213;LCS-211213;3;;LCS

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\003.D
Lab Smp Id: LCS-211213 Client Smp ID: LCS-211213
Inj Date : 13-DEC-2021 09:50
Operator : PL Inst ID: FID-4.i
Smp Info : LCS-211213;LCS-211213;3;;LCS
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 3 QC Sample: LCS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

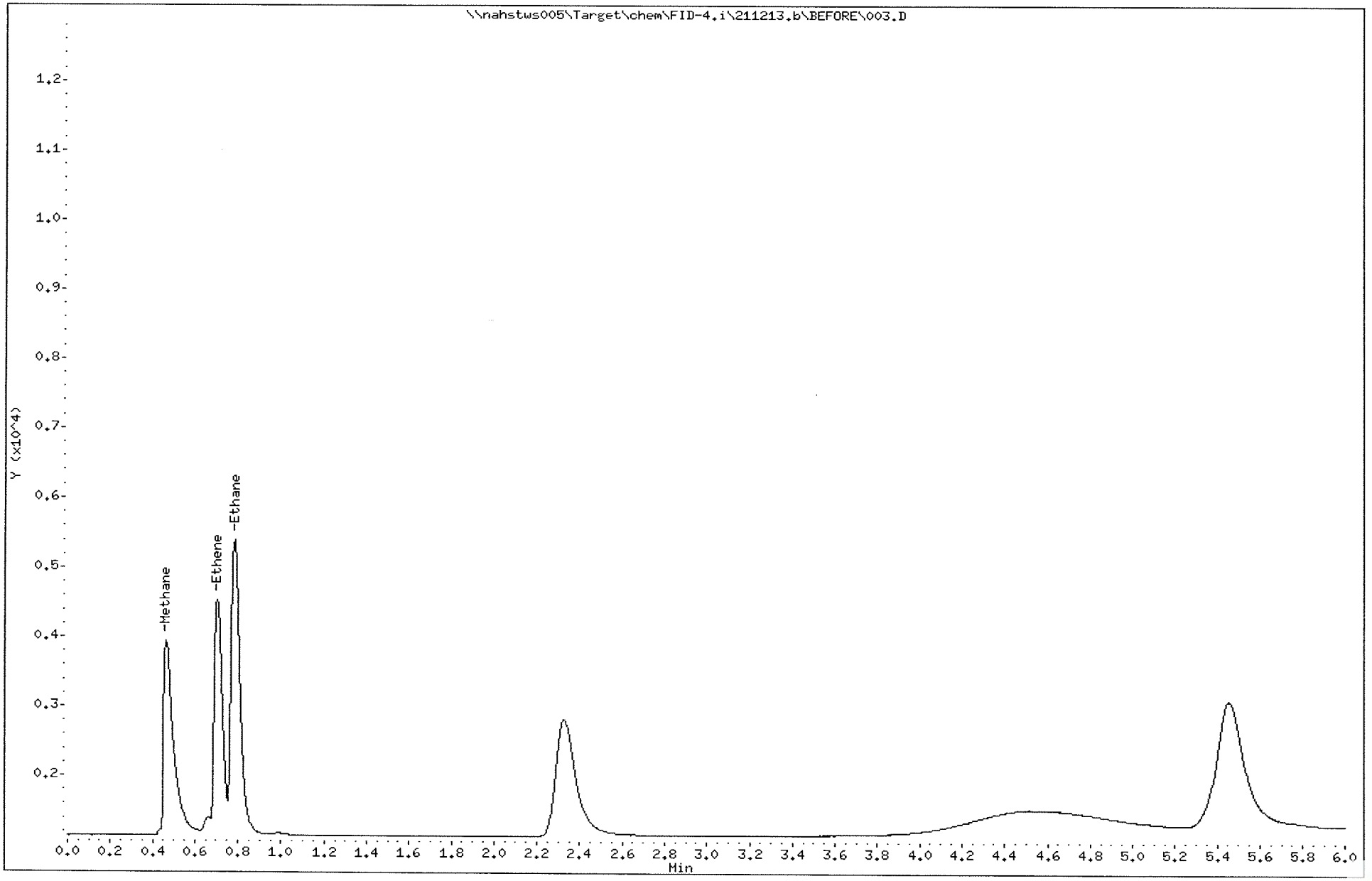
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.463	0.463	0.000	9394	9.63495	9.634
2 Ethene	0.703	0.703	0.000	9192	15.6924	15.692
3 Ethane	0.783	0.783	0.000	12471	17.3331	17.333

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\003.D
Date : 13-DEC-2021 09:50
Client ID: LCS-211213
Sample Info: LCS-211213;LCS-211213;3;;LCS

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\005.D
Lab Smp Id: HS21120092-05MS Client Smp ID: HS21120092-05MS
Inj Date : 13-DEC-2021 10:19
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120092-05MS;HS21120092-05MS
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 5 QC Sample: MS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.470	0.463	0.007	7385	7.57442	7.574
2 Ethene	0.706	0.703	0.003	7838	13.3809	13.380(M)
3 Ethane	0.786	0.783	0.003	10000	13.8987	13.898

QC Flag Legend

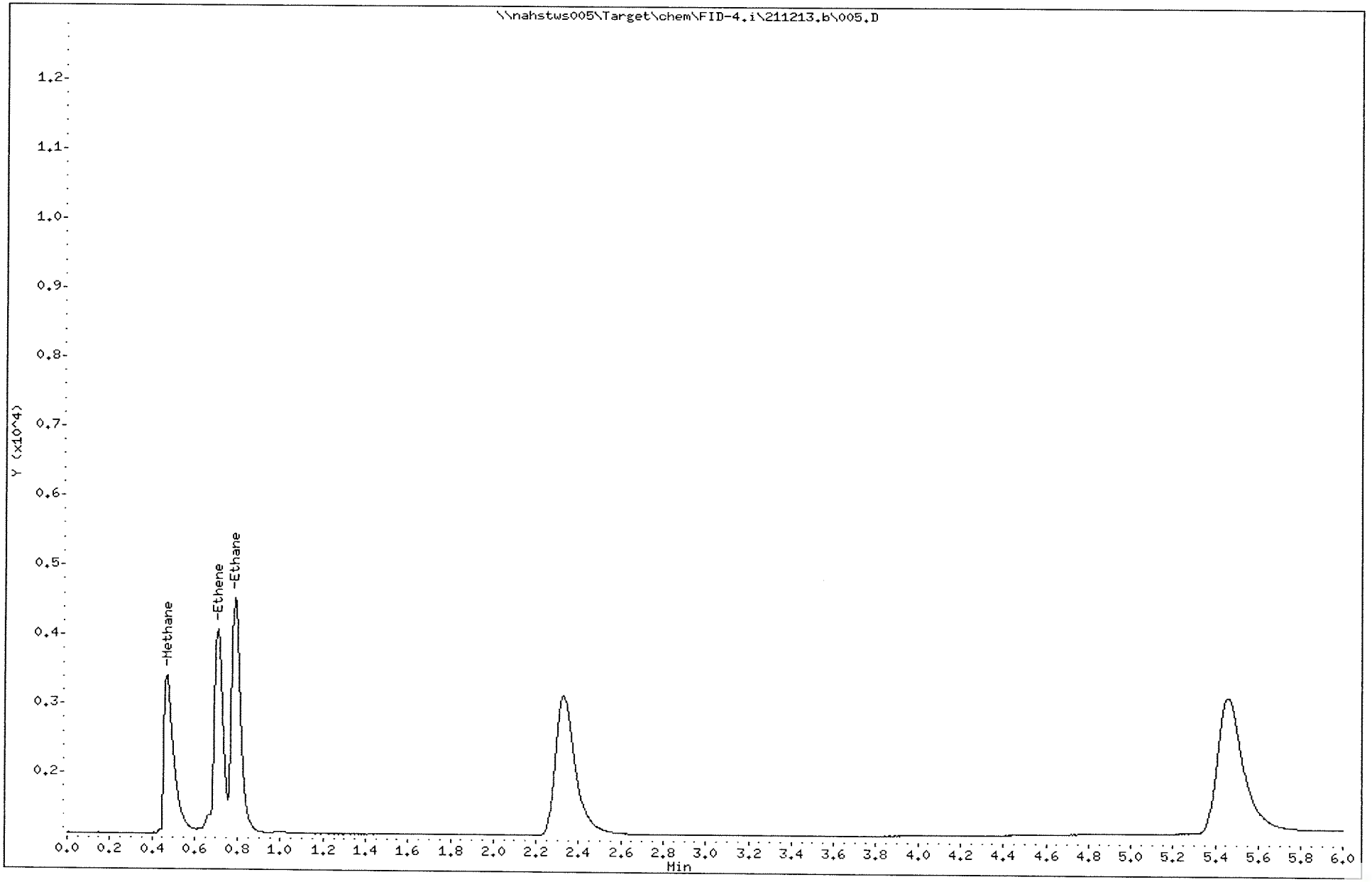
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\005.D
Date : 13-DEC-2021 10:19
Client ID: HS21120092-05MS
Sample Info: HS21120092-05MS;HS21120092-05MS

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\005.D
Lab Smp Id: HS21120092-05MS Client Smp ID: HS21120092-05MS
Inj Date : 13-DEC-2021 10:19
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120092-05MS;HS21120092-05MS
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 5 QC Sample: MS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.470	0.463	0.007	7336	7.52416	7.524
2 Ethene	0.706	0.703	0.003	8279	14.1338	14.133
3 Ethane	0.786	0.783	0.003	9861	13.7055	13.705

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\005.D

Date : 13-DEC-2021 10:19

Client ID: HS21120092-05MS

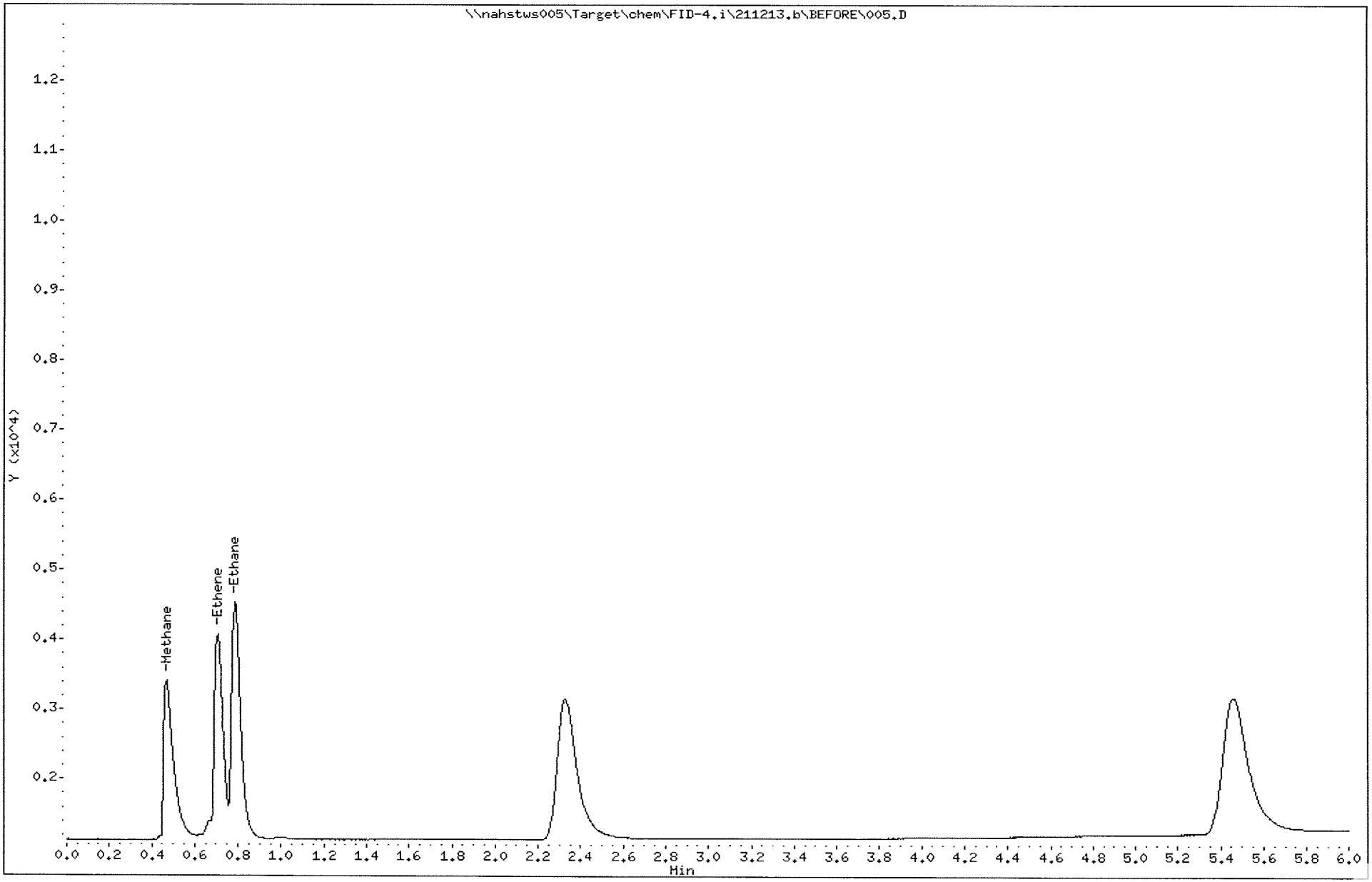
Instrument: FID-4.i

Sample Info: HS21120092-05MS;HS21120092-05MS

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\006.D
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Inj Date : 13-DEC-2021 10:28
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120092-05MSD;HS21120092-05MSD
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 6 QC Sample: MSD
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

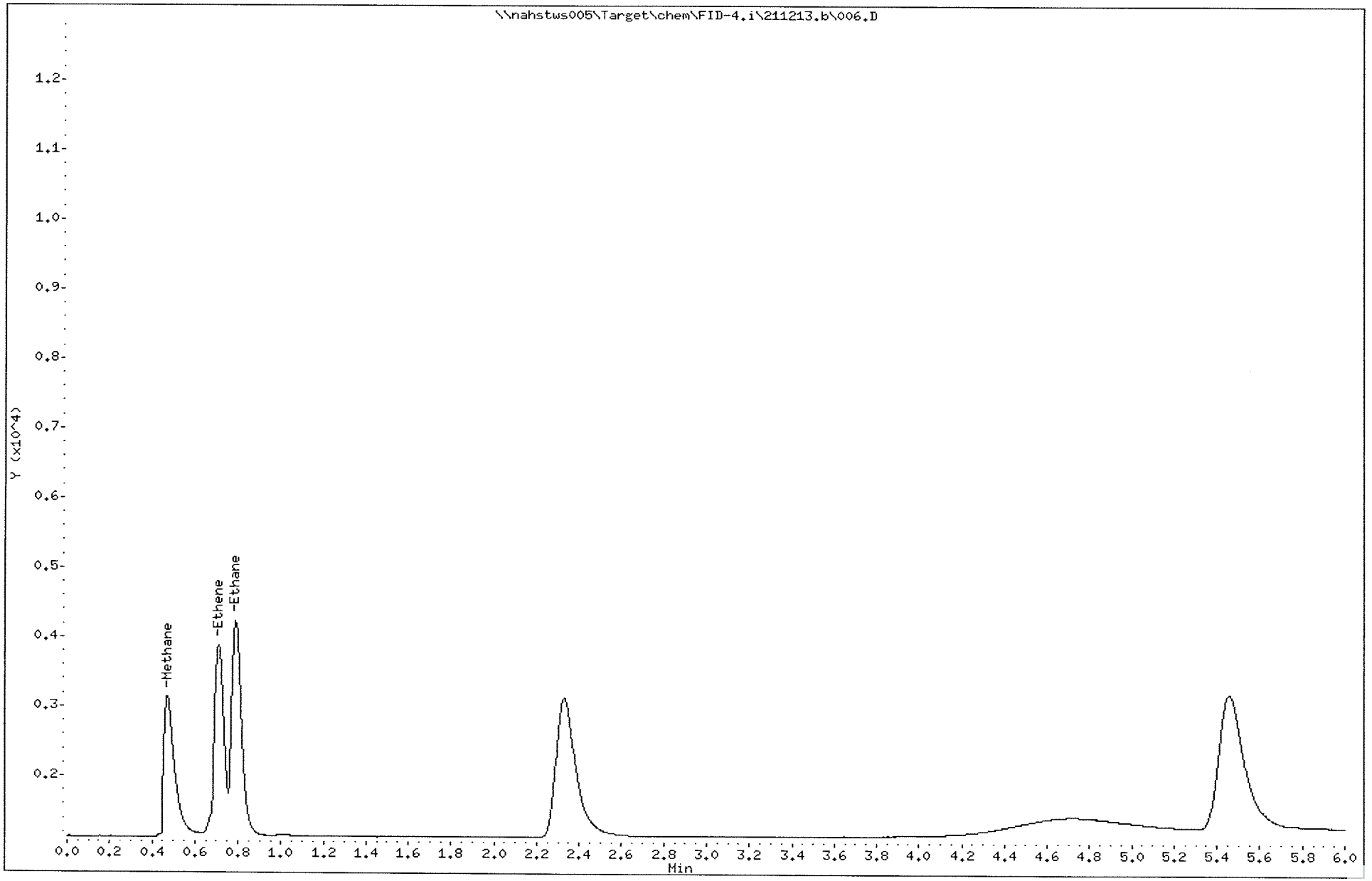
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.473	0.463	0.010	7120	7.30262	7.302
2 Ethene	0.710	0.703	0.007	8612	14.7023	14.702
3 Ethane	0.790	0.783	0.007	10119	14.0641	14.064

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\006.D
Date : 13-DEC-2021 10:28
Client ID: HS21120092-05MSD
Sample Info: HS21120092-05MSD;HS21120092-05MSD

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\006.D
Lab Smp Id: HS21120092-05MSD Client Smp ID: HS21120092-05MSD
Inj Date : 13-DEC-2021 10:28
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120092-05MSD;HS21120092-05MSD
Misc Info : ;1;0;1
Comment   :
Method   : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 6 QC Sample: MSD
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

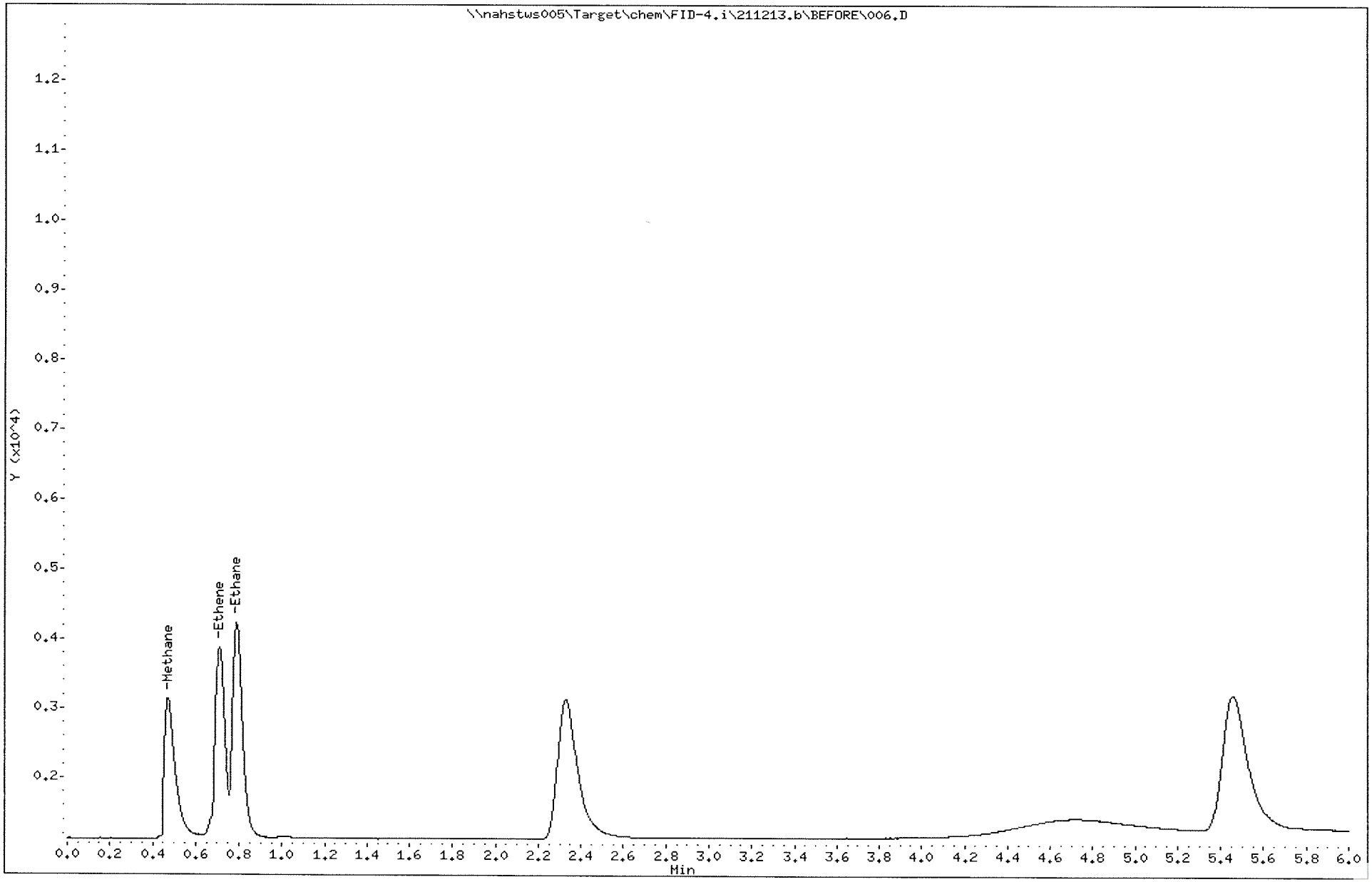
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.473	0.463	0.010	7064	7.24519	7.245
2 Ethene	0.710	0.703	0.007	8482	14.4803	14.480
3 Ethane	0.790	0.783	0.007	9962	13.8459	13.845

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\006.D
Date : 13-DEC-2021 10:28
Client ID: HS21120092-05MSD
Sample Info: HS21120092-05MSD;HS21120092-05MSD

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\008.D
Lab Smp Id: HS21120103-01 Client Smp ID: HS21120103-01
Inj Date : 13-DEC-2021 10:55
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-01;HS21120103-01
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.473	0.463	0.010	925540	949.279	949.279(AM)
2 Ethene	0.700	0.703	-0.003	3862	6.59314	6.593(M)

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

01153609

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\008.D

Date : 13-DEC-2021 10:55

Client ID: HS21120103-01

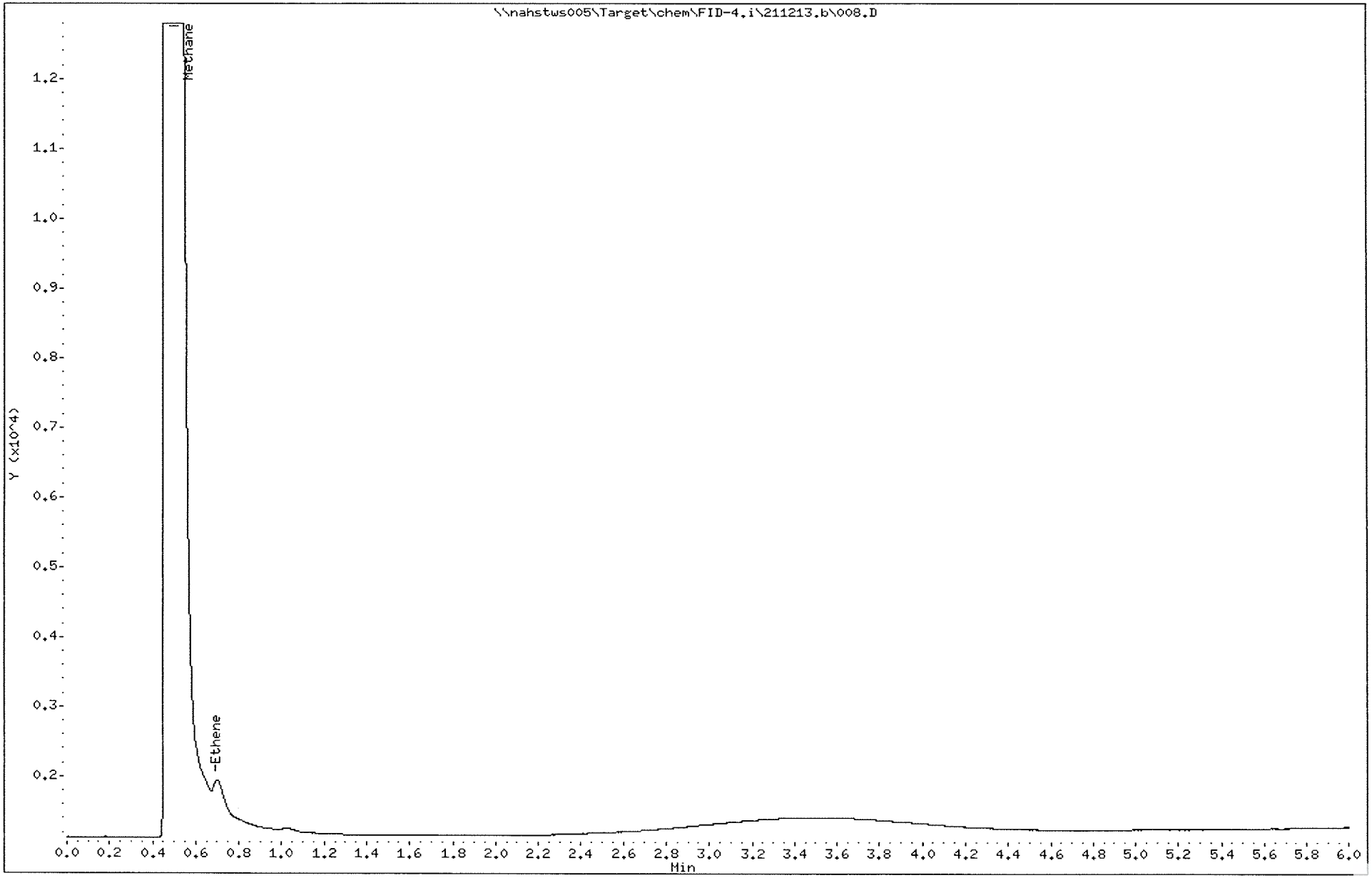
Instrument: FID-4.i

Sample Info: HS21120103-01;HS21120103-01

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\008.D
Lab Smp Id: HS21120103-01 Client Smp ID: HS21120103-01
Inj Date : 13-DEC-2021 10:55
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-01;HS21120103-01
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.473	0.463	0.010	927709	951.504	951.503(A)

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\008.D

Date : 13-DEC-2021 10:55

Client ID: HS21120103-01

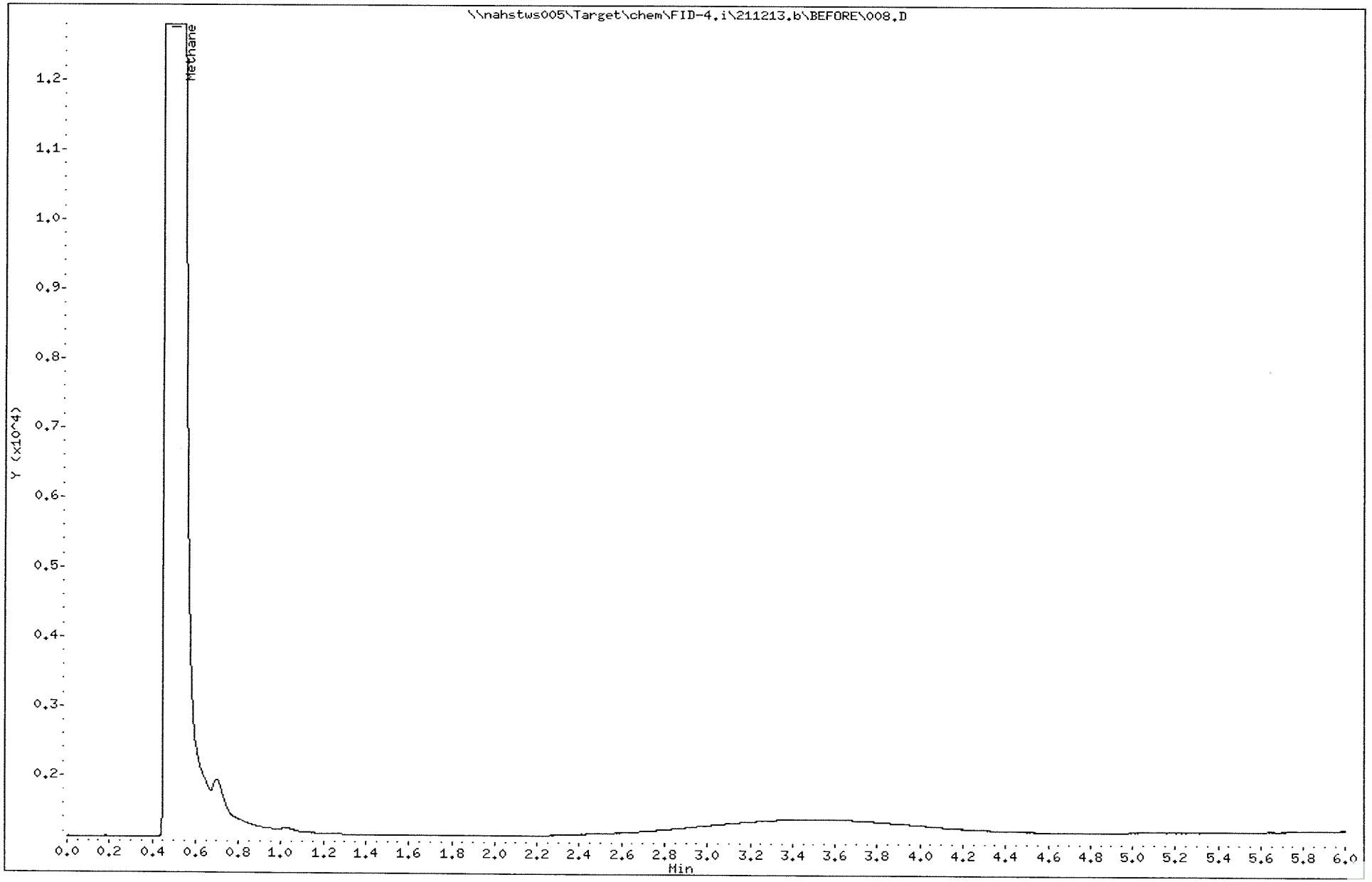
Instrument: FID-4.i

Sample Info: HS21120103-01;HS21120103-01

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\009.D
Lab Smp Id: HS21120103-02 Client Smp ID: HS21120103-02
Inj Date : 13-DEC-2021 11:04
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-02;HS21120103-02
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 9
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.470	0.463	0.007	1935776	1985.43	1985.426(A)

QC Flag Legend

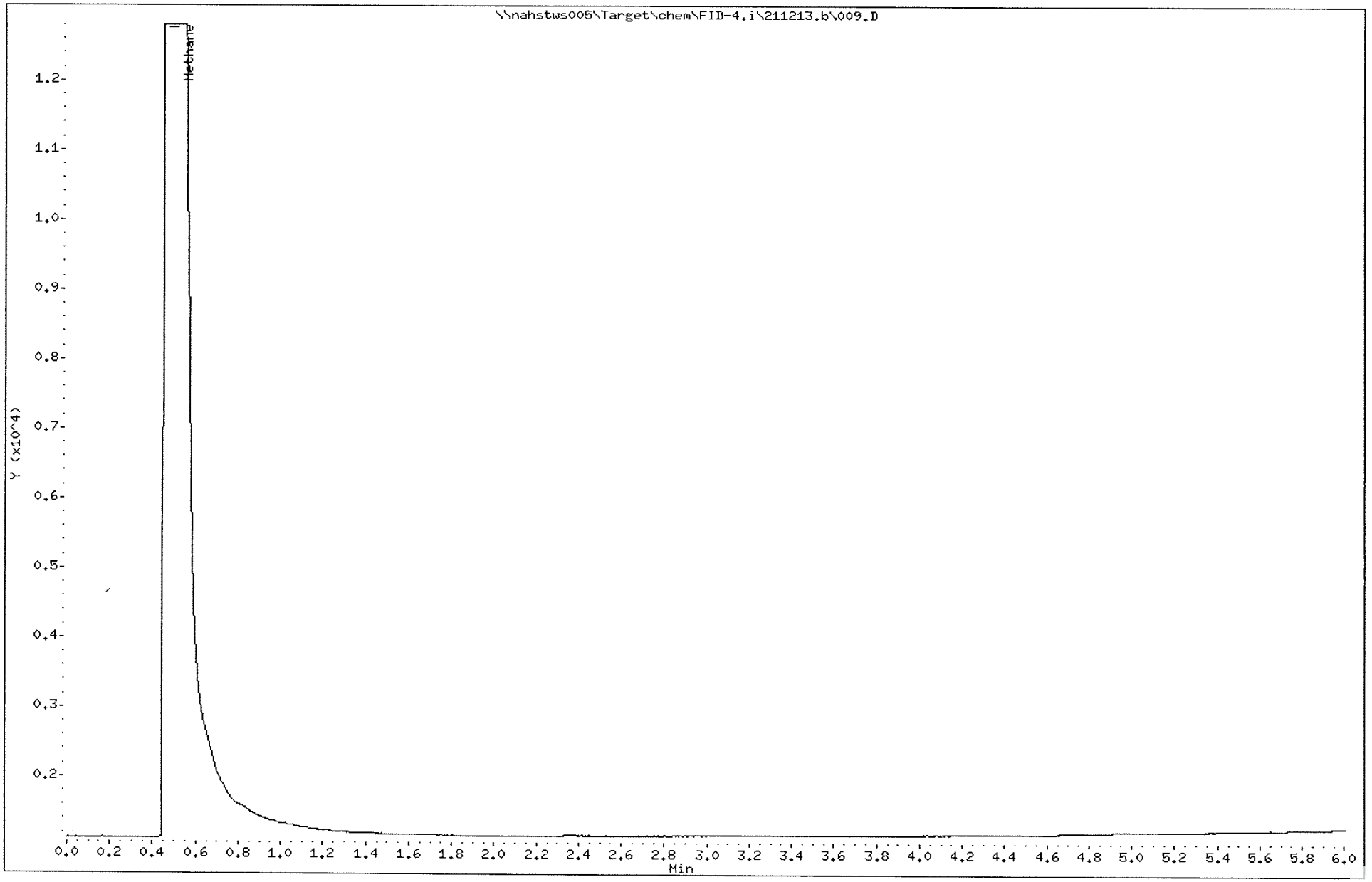
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\009.D
Date : 13-DEC-2021 11:04
Client ID: HS21120103-02
Sample Info: HS21120103-02;HS21120103-02

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\009.D
Lab Smp Id: HS21120103-02 Client Smp ID: HS21120103-02
Inj Date : 13-DEC-2021 11:04
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-02;HS21120103-02
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 9
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.470	0.463	0.007	1935776	1985.43	1985.426(A)

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\009.D

Date : 13-DEC-2021 11:04

Client ID: HS21120103-02

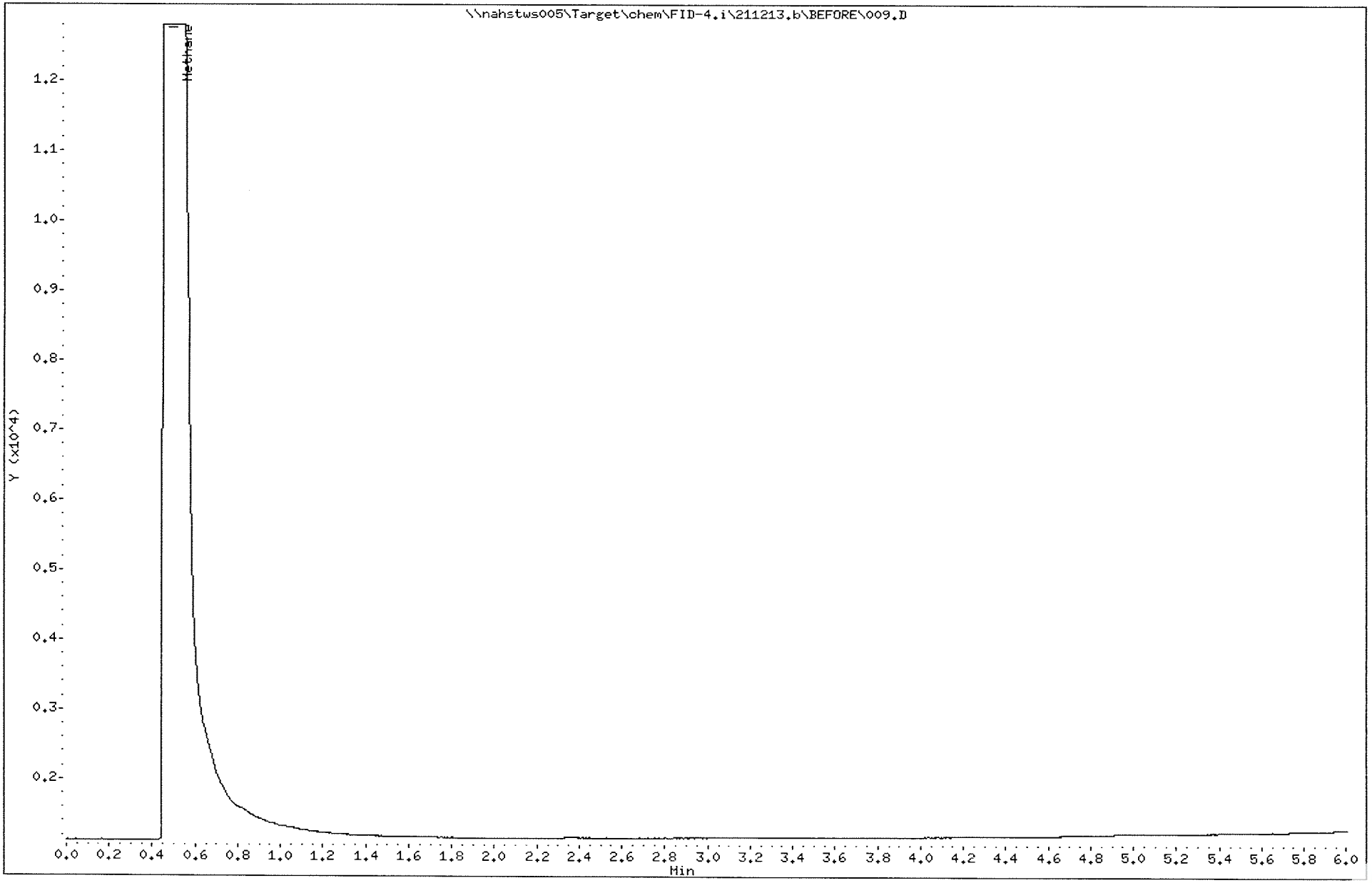
Sample Info: HS21120103-02;HS21120103-02

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\011.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 11:27
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 11 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.466	0.463	0.003	8719	9.64700	8.942
2 Ethene	0.706	0.703	0.003	8742	16.8500	14.924
3 Ethane	0.786	0.783	0.003	11279	18.0430	15.676

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\011.D

Date : 13-DEC-2021 11:27

Client ID: RSK-CCV

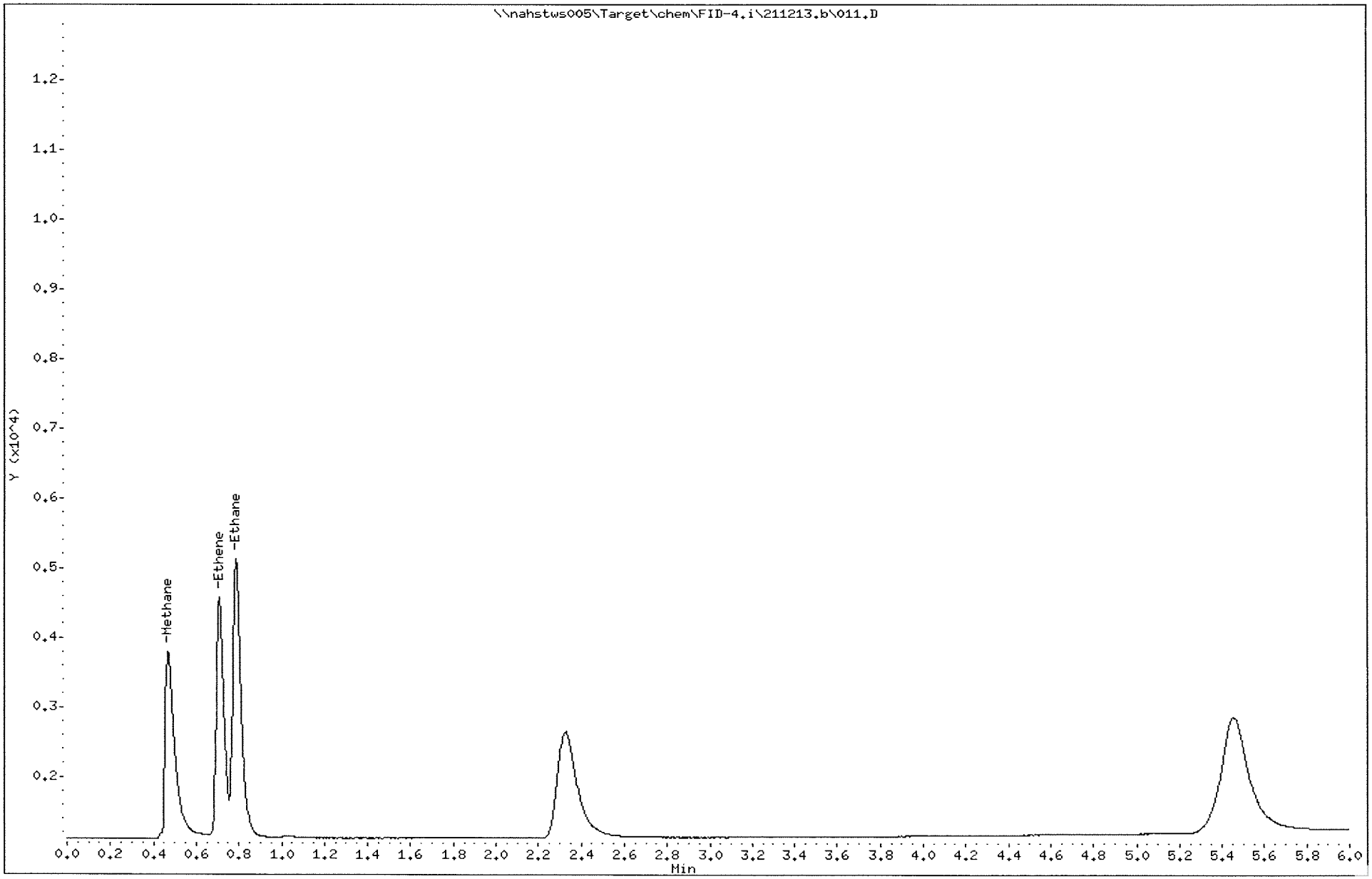
Instrument: FID-4.i

Sample Info: RSK-CCV;RSK-CCV;2;4

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\011.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 11:27
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 11 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.466	0.463	0.003	8645	9.64700	8.866
2 Ethene	0.706	0.703	0.003	8631	16.8500	14.734
3 Ethane	0.786	0.783	0.003	11115	18.0430	15.448

01153619

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\011.D

Date : 13-DEC-2021 11:27

Client ID: RSK-CCV

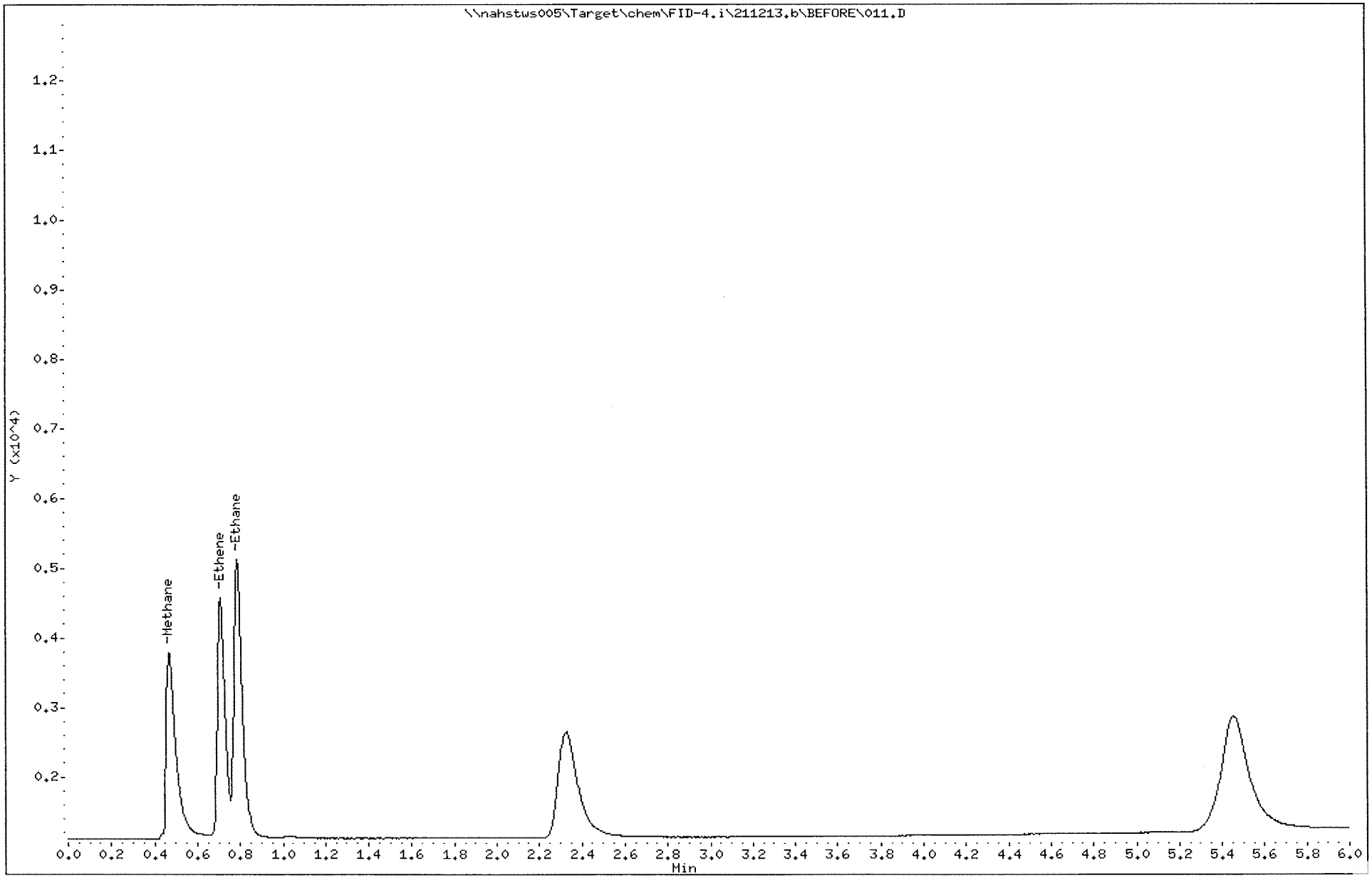
Instrument: FID-4.i

Sample Info: RSK-CCV;RSK-CCV;2;4

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\012.D
Lab Smp Id: HS21120103-03 Client Smp ID: HS21120103-03
Inj Date : 13-DEC-2021 11:36
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-03;HS21120103-03
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 12
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.470	0.463	0.007	2337	2.39694	2.396
2 Ethene	0.673	0.703	-0.030	544	0.92871	0.928(M)

QC Flag Legend

M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\012.D

Date : 13-DEC-2021 11:36

Client ID: HS21120103-03

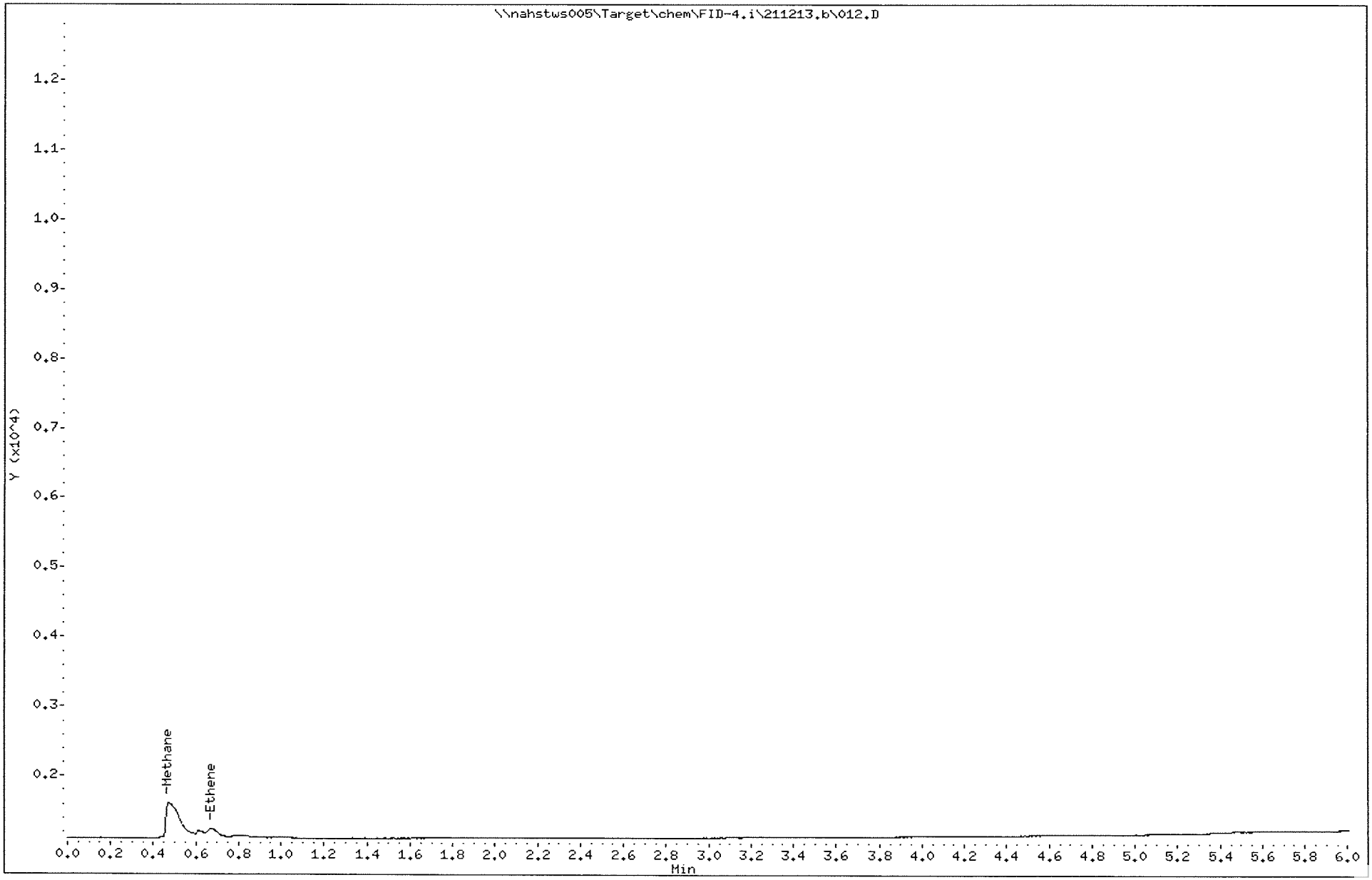
Instrument: FID-4.i

Sample Info: HS21120103-03;HS21120103-03

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\012.D
Lab Smp Id: HS21120103-03 Client Smp ID: HS21120103-03
Inj Date : 13-DEC-2021 11:36
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-03;HS21120103-03
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 12
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.470	0.463	0.007	2284	2.34258	2.342
2 Ethene	0.673	0.703	-0.030	697	1.18991	1.189

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\012.D

Date : 13-DEC-2021 11:36

Client ID: HS21120103-03

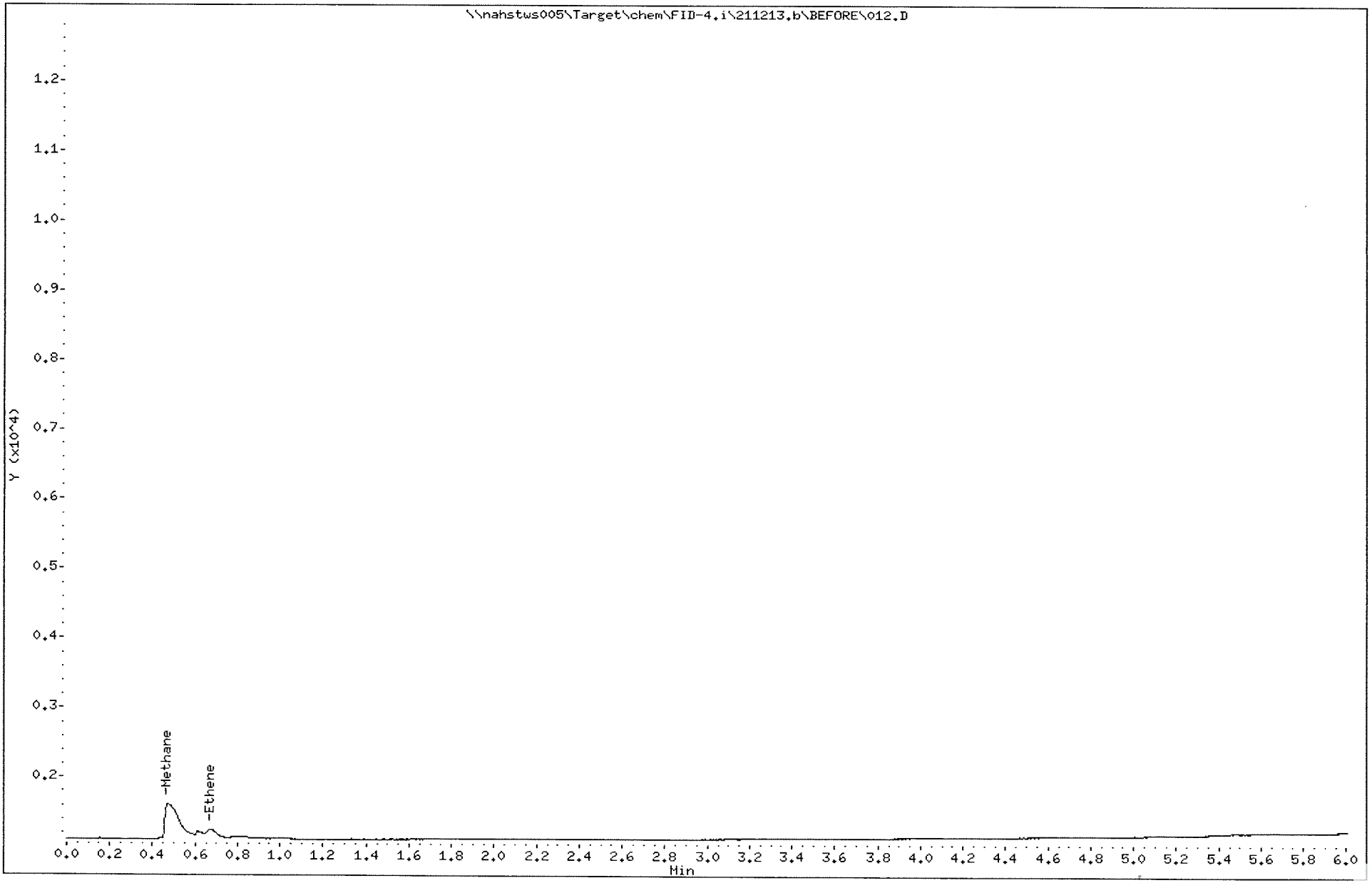
Instrument: FID-4.i

Sample Info: HS21120103-03;HS21120103-03

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\013.D
Lab Smp Id: HS21120103-04 Client Smp ID: HS21120103-04
Inj Date : 13-DEC-2021 11:47
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-04;HS21120103-04
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 13
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.466	0.463	0.003	554225	568.440	568.440(A)
2 Ethene	0.696	0.703	-0.007	3708	6.33023	6.330(M)

QC Flag Legend

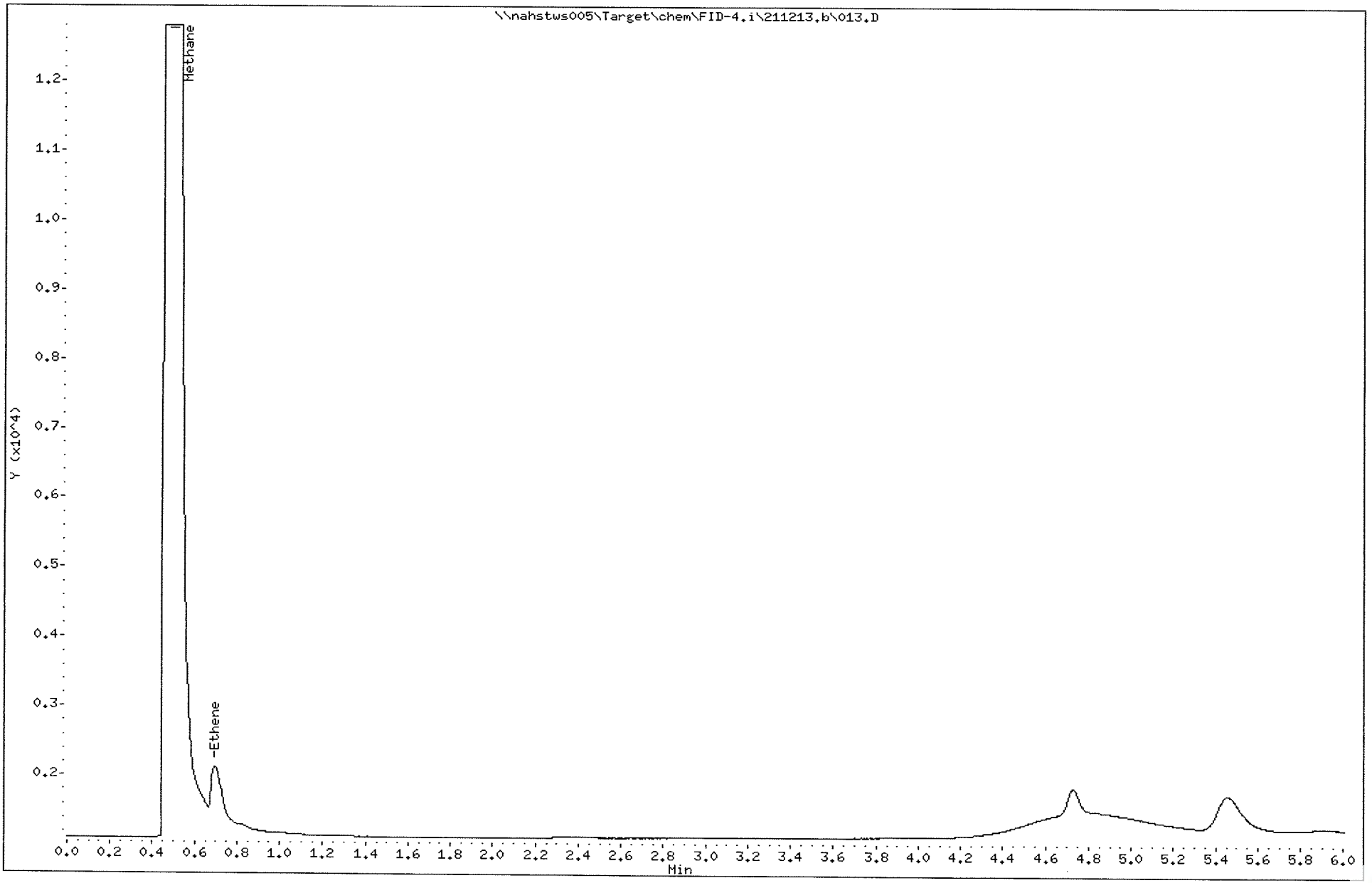
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\013.D
Date : 13-DEC-2021 11:47
Client ID: HS21120103-04
Sample Info: HS21120103-04;HS21120103-04

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\013.D
Lab Smp Id: HS21120103-04 Client Smp ID: HS21120103-04
Inj Date : 13-DEC-2021 11:47
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-04;HS21120103-04
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 13
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.466	0.463	0.003	554225	568.440	568.440(A)
2 Ethene	0.696	0.703	-0.007	5178	8.83979	8.839

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\013.D

Date : 13-DEC-2021 11:47

Client ID: HS21120103-04

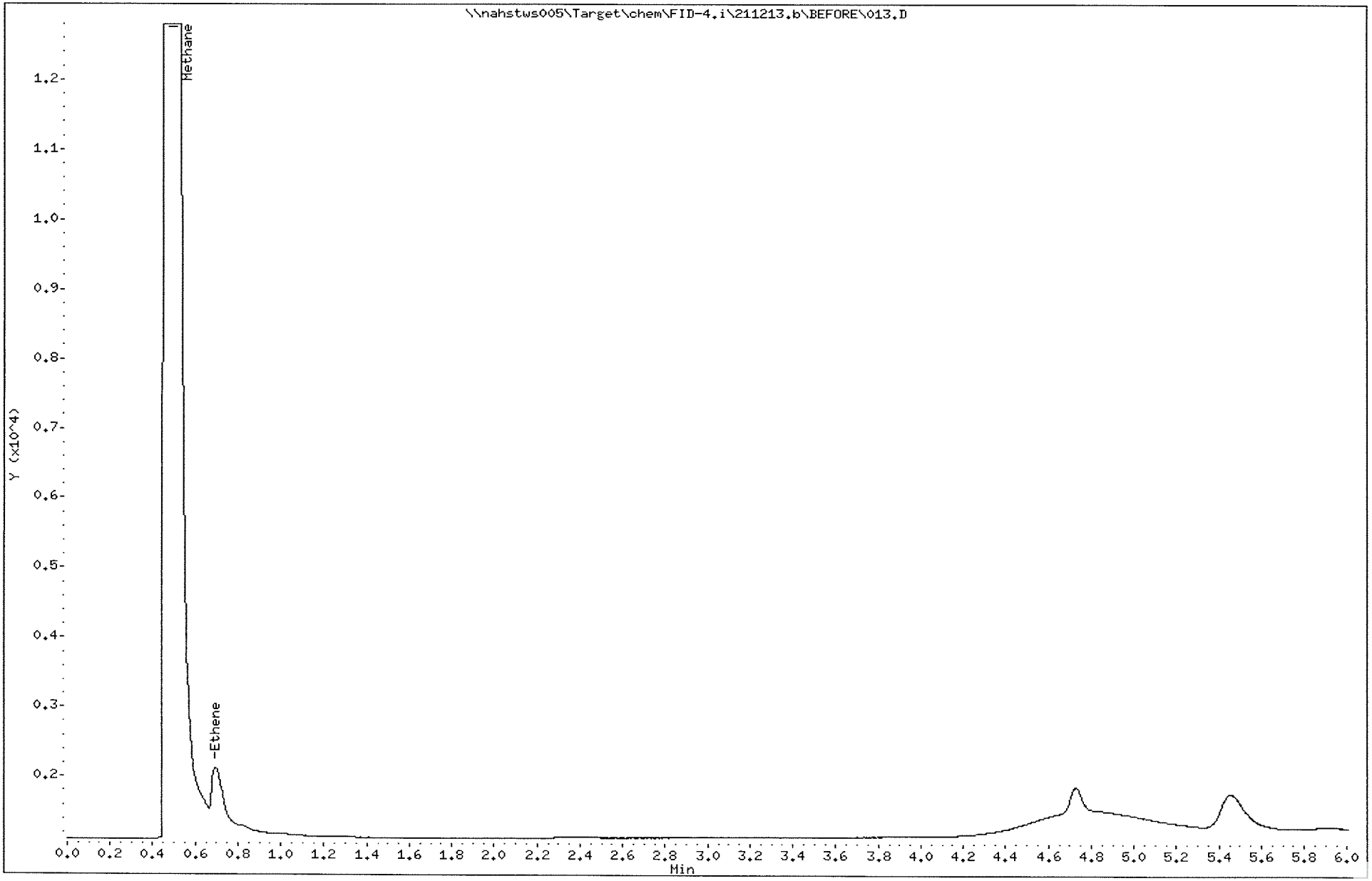
Instrument: FID-4.i

Sample Info: HS21120103-04;HS21120103-04

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\014.D
Report Date: 03-Jan-2022 14:09

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\014.D
Lab Smp Id: HS21120103-05 Client Smp ID: HS21120103-05
Inj Date : 13-DEC-2021 11:55
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-05;HS21120103-05
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 14
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.473	0.463	0.010	465812	477.760	477.759(AM)
2 Ethene	0.703	0.703	0.000	4415	7.53721	7.537(M)

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\014.D

Date : 13-DEC-2021 11:55

Client ID: HS21120103-05

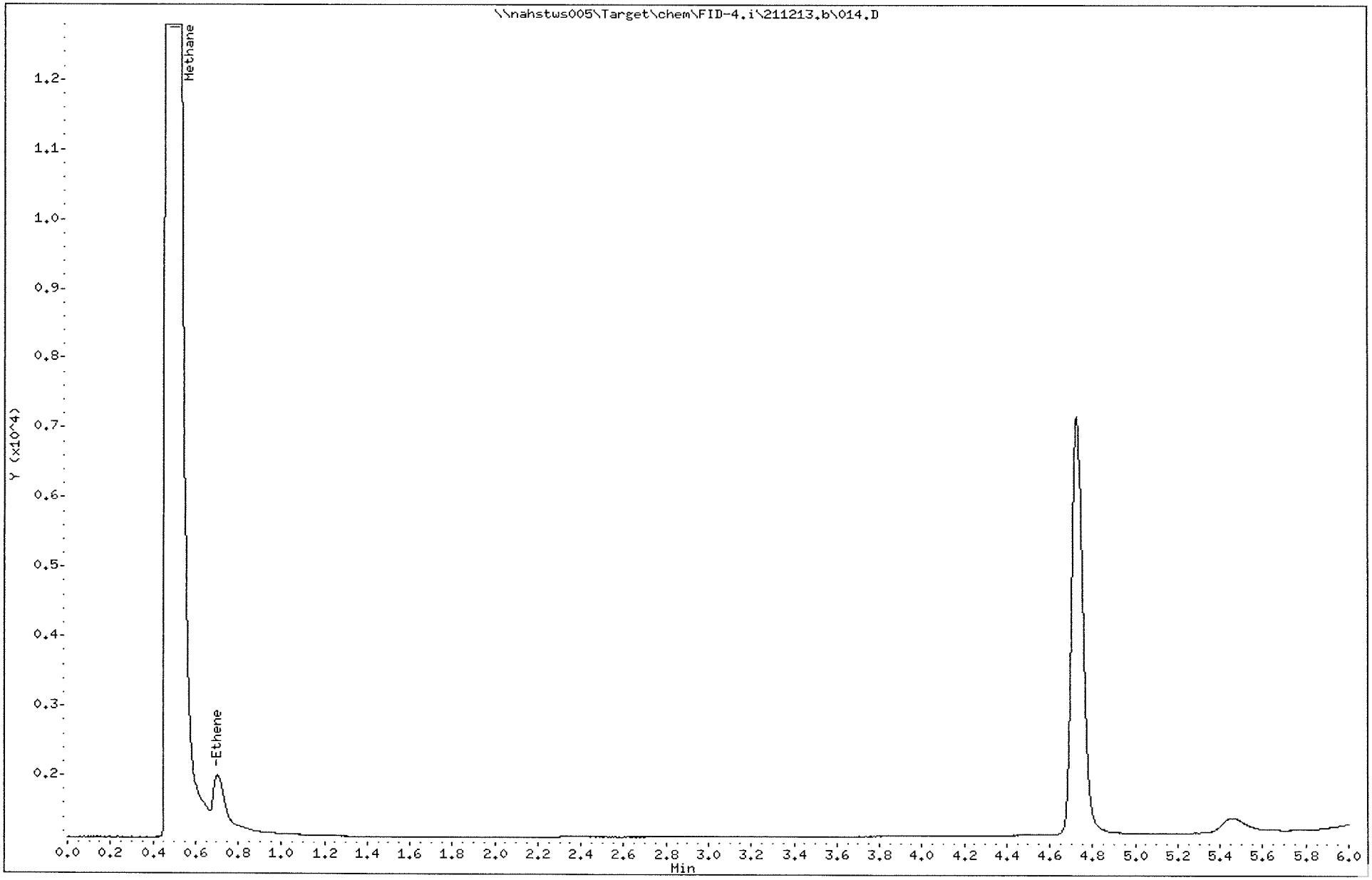
Instrument: FID-4.i

Sample Info: HS21120103-05;HS21120103-05

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\014.D
Lab Smp Id: HS21120103-05 Client Smp ID: HS21120103-05
Inj Date : 13-DEC-2021 11:55
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-05;HS21120103-05
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 14
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.473	0.463	0.010	466330	478.291	478.290(A)

QC Flag Legend

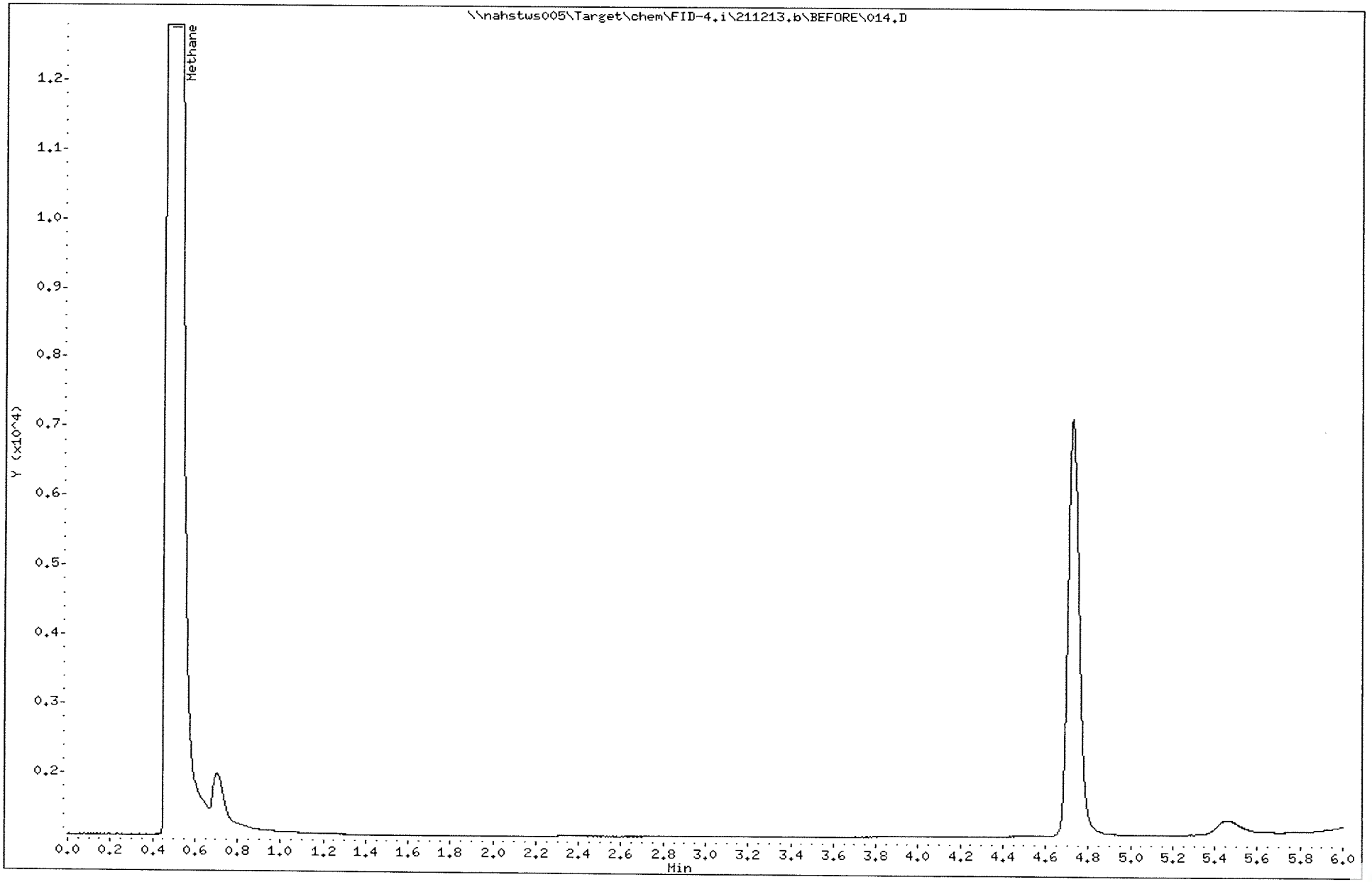
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\014.D
Date : 13-DEC-2021 11:55
Client ID: HS21120103-05
Sample Info: HS21120103-05;HS21120103-05

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\015.D
Lab Smp Id: HS21120103-06 Client Smp ID: HS21120103-06
Inj Date : 13-DEC-2021 12:05
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-06;HS21120103-06
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 15
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.470	0.463	0.007	2704083	2773.44	2773.440(A)

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\015.D

Date : 13-DEC-2021 12:05

Client ID: HS21120103-06

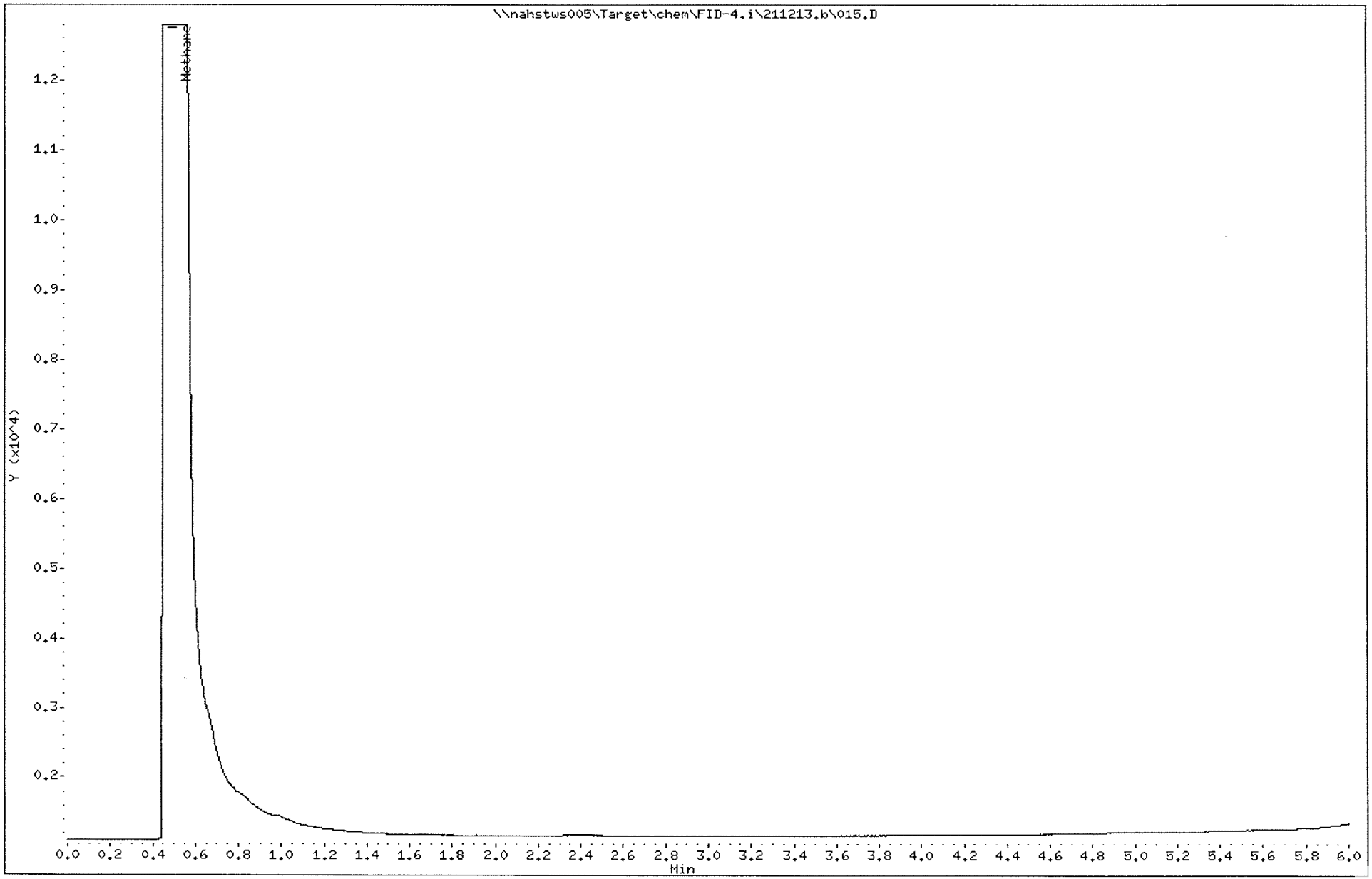
Instrument: FID-4.i

Sample Info: HS21120103-06;HS21120103-06

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\015.D
Lab Smp Id: HS21120103-06 Client Smp ID: HS21120103-06
Inj Date : 13-DEC-2021 12:05
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-06;HS21120103-06
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 15
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.470	0.463	0.007	2704083	2773.44	2773.440(A)

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\015.D

Date : 13-DEC-2021 12:05

Client ID: HS21120103-06

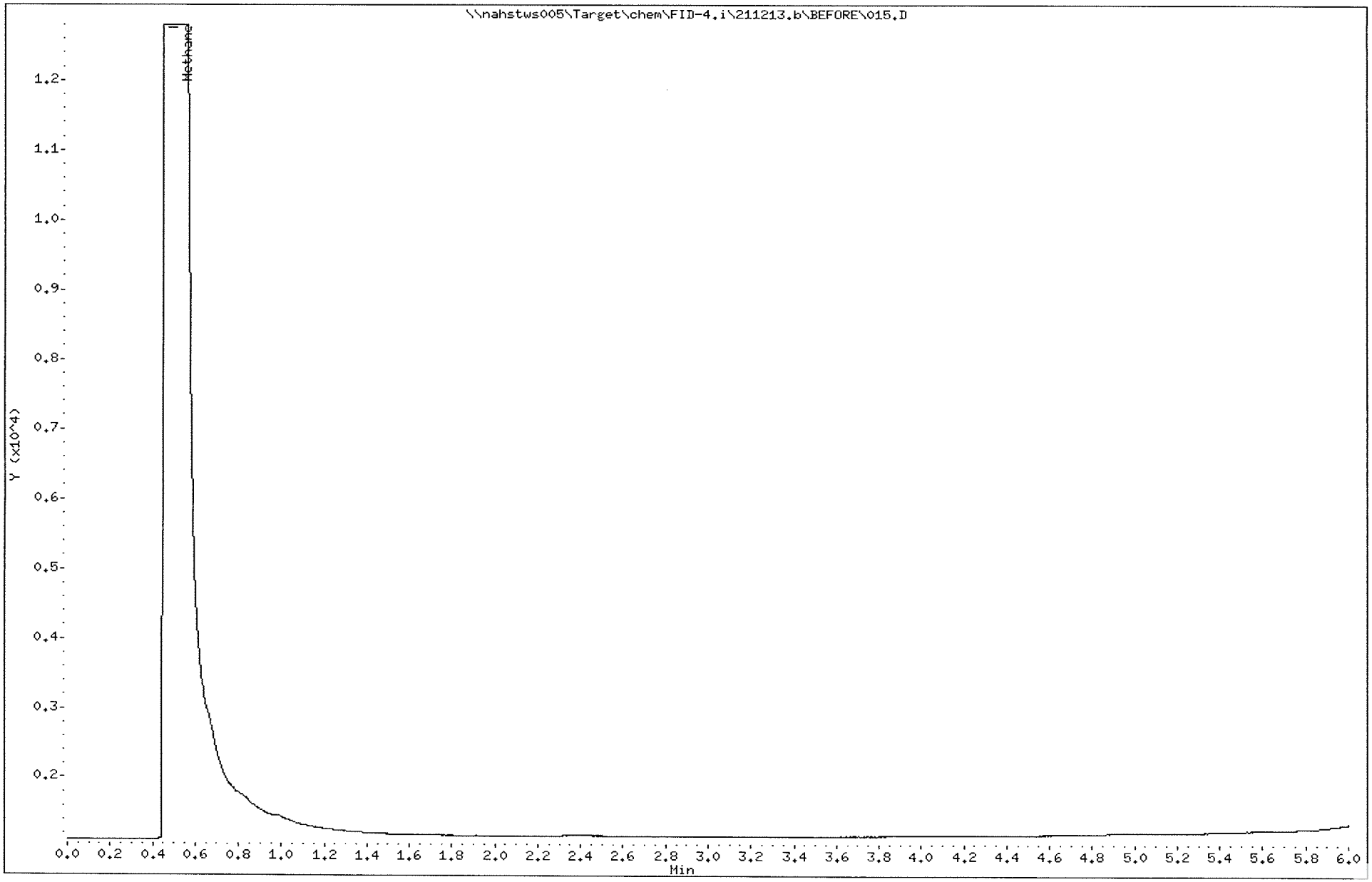
Instrument: FID-4.i

Sample Info: HS21120103-06;HS21120103-06

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\022.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 13:16
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 22 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.470	0.463	0.007	8539	9.64700	8.758
2 Ethene	0.710	0.703	0.007	8565	16.8500	14.622
3 Ethane	0.786	0.783	0.003	11936	18.0430	16.589

01153637

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\022.D

Date : 13-DEC-2021 13:16

Client ID: RSK-CCV

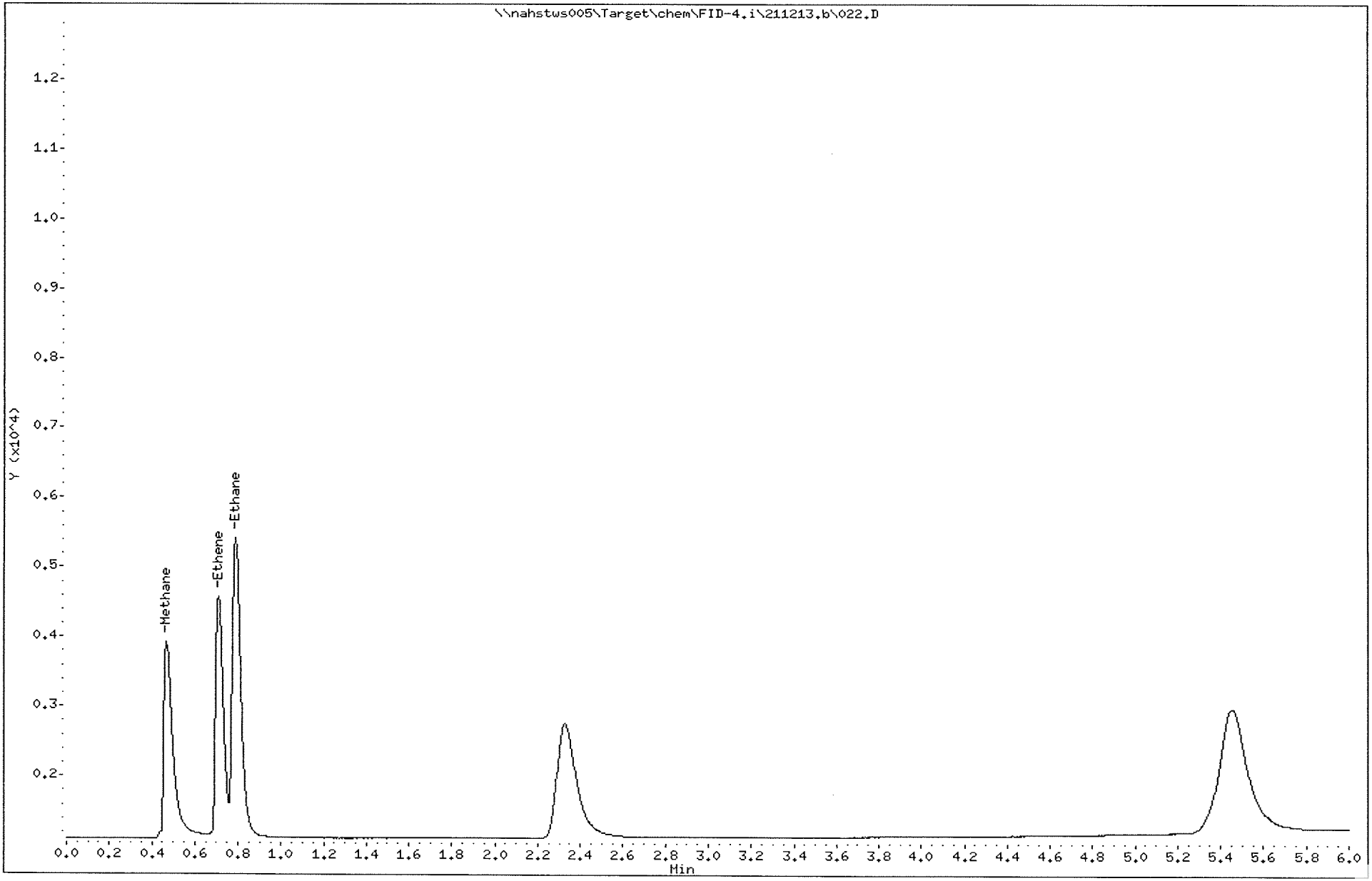
Sample Info: RSK-CCV;RSK-CCV;2;4

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\022.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 13:16
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 22 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.470	0.463	0.007	8453	9.64700	8.669
2 Ethene	0.710	0.703	0.007	8453	16.8500	14.430
3 Ethane	0.786	0.783	0.003	11770	18.0430	16.358

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\022.D

Date : 13-DEC-2021 13:16

Client ID: RSK-CCV

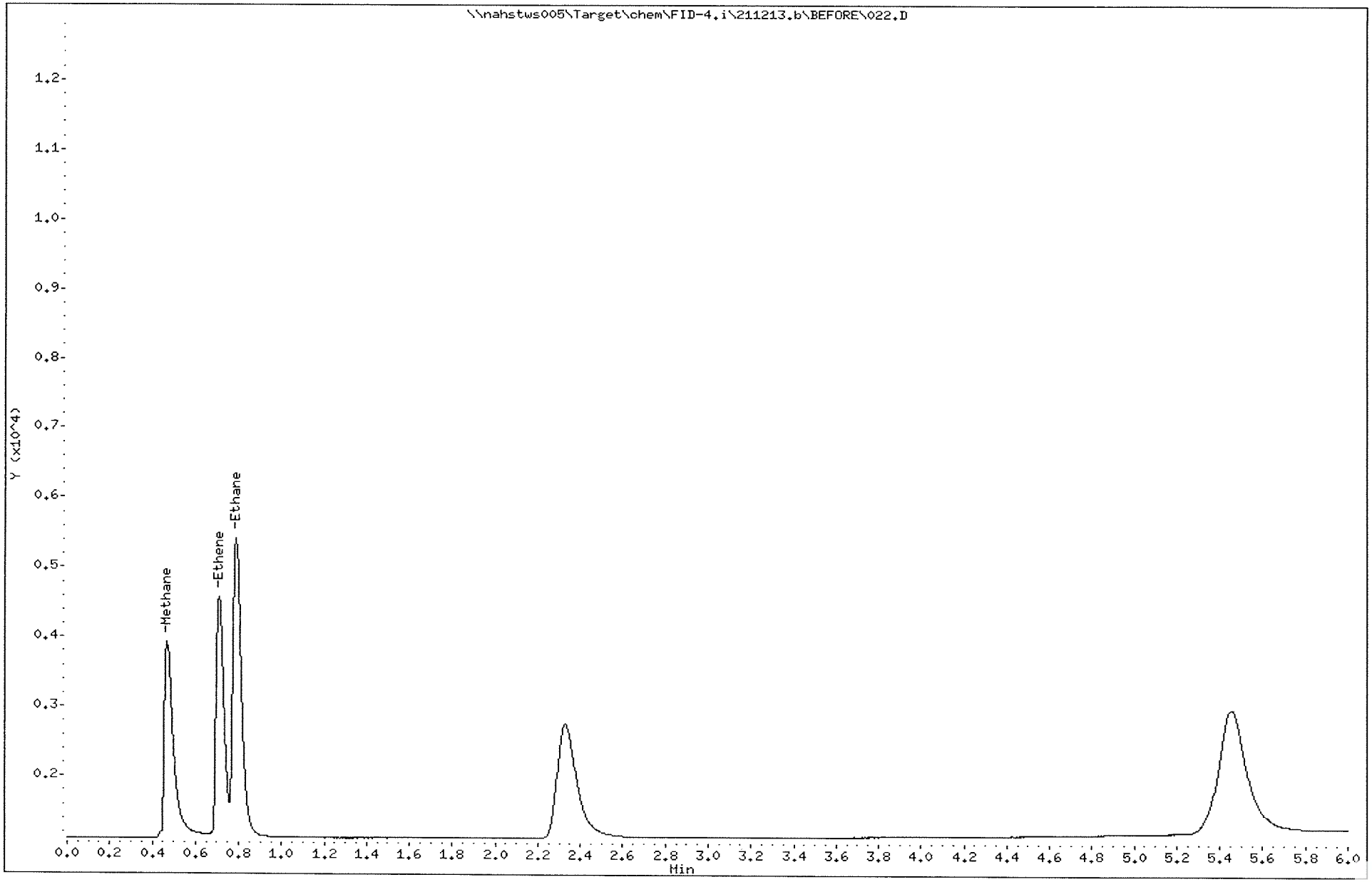
Instrument: FID-4.i

Sample Info: RSK-CCV;RSK-CCV;2;4

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\028.D
Lab Smp Id: HS21120103-01 Client Smp ID: HS21120103-01
Inj Date : 13-DEC-2021 14:32
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-01;HS21120103-01
Misc Info : ;1;0;50
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 28
Dil Factor: 50.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

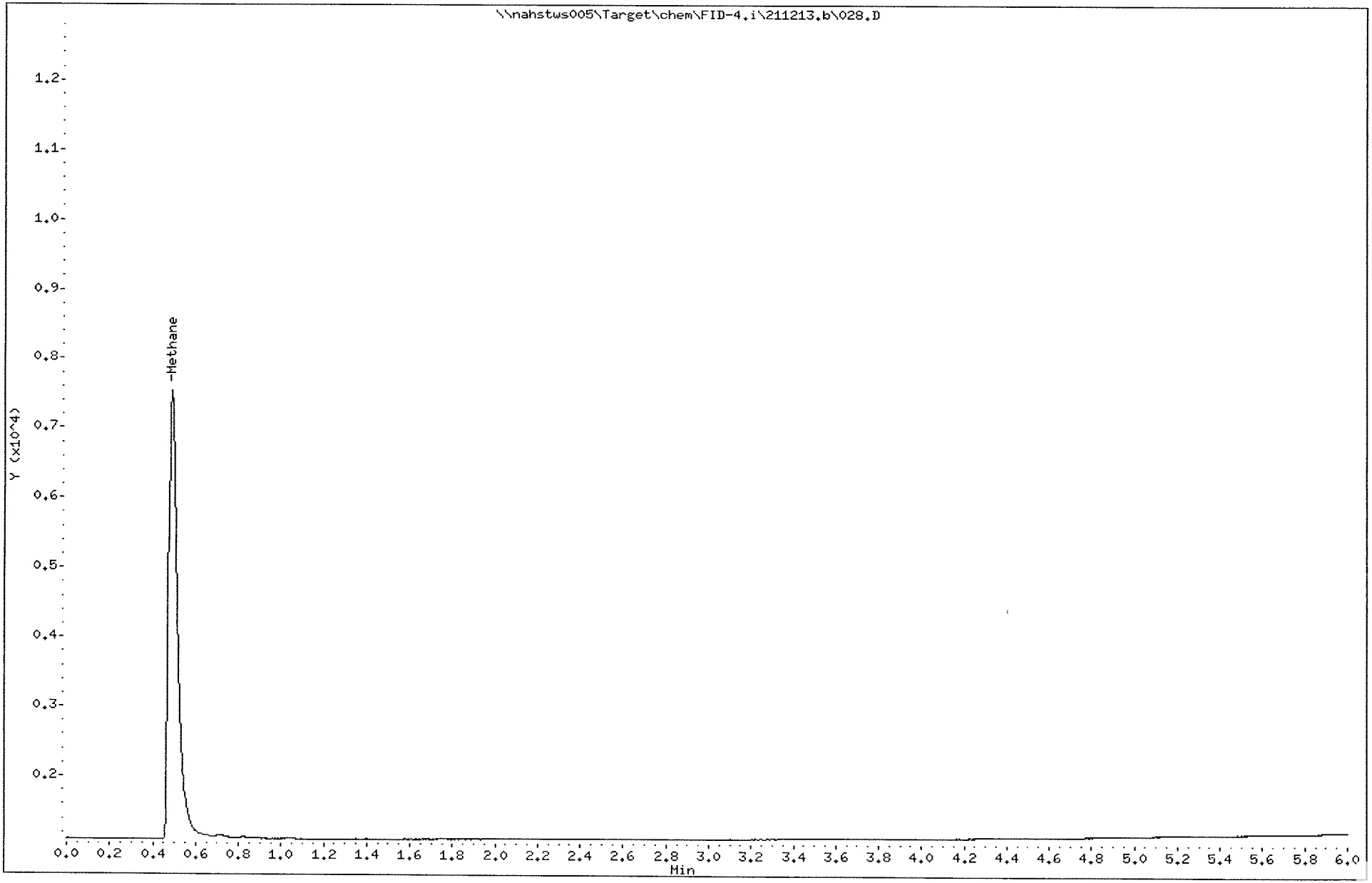
					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.486	0.463	0.023	19230	19.7232	986.161

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\028.D
Date : 13-DEC-2021 14:32
Client ID: HS21120103-01
Sample Info: HS21120103-01;HS21120103-01

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\028.D
Lab Smp Id: HS21120103-01 Client Smp ID: HS21120103-01
Inj Date : 13-DEC-2021 14:32
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-01;HS21120103-01
Misc Info : ;1;0;50
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 28
Dil Factor: 50.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.486	0.463	0.023	19074	19.5632	978.161

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\028.D

Date : 13-DEC-2021 14:32

Client ID: HS21120103-01

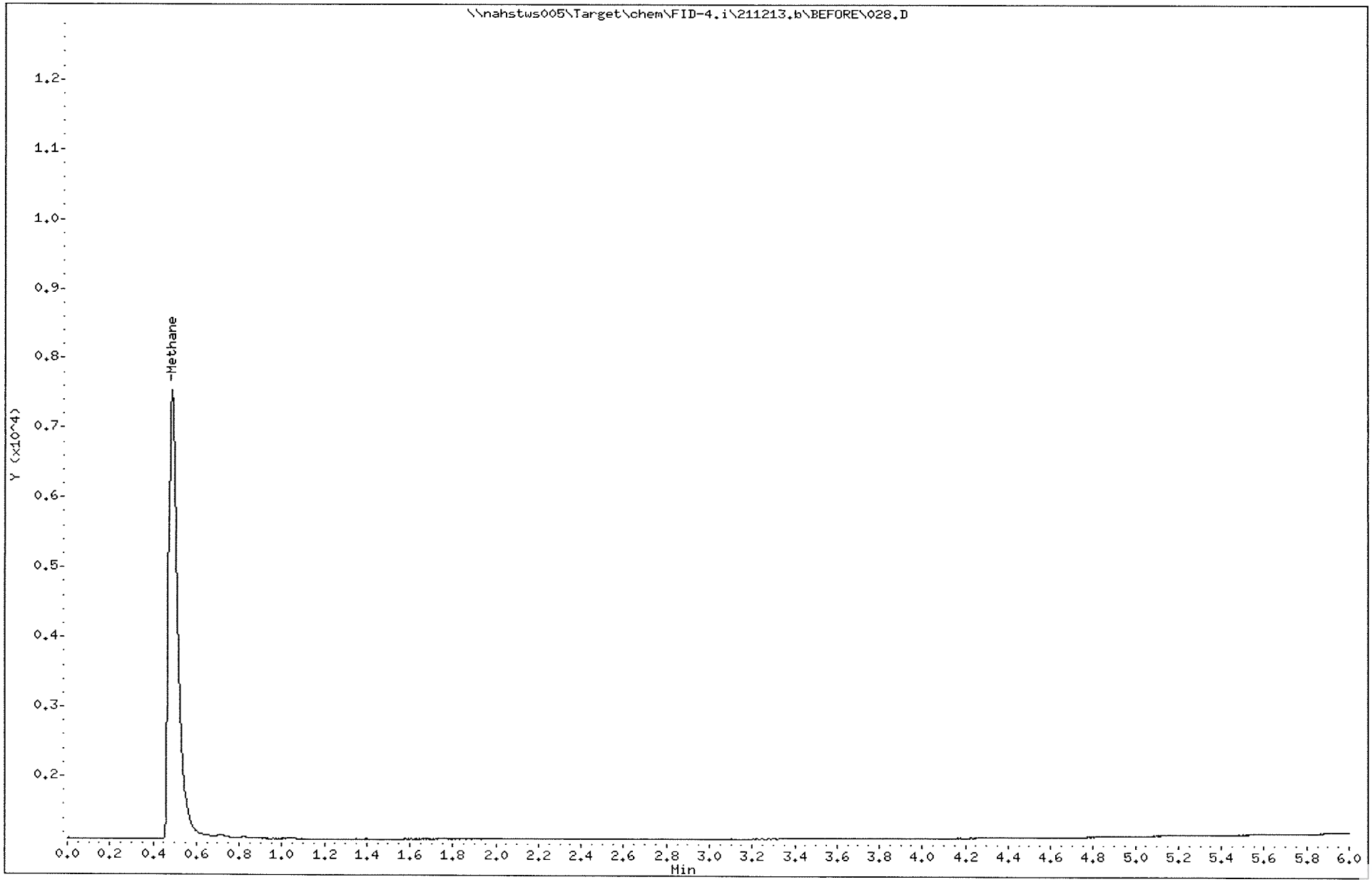
Instrument: FID-4.i

Sample Info: HS21120103-01;HS21120103-01

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\029.D
Report Date: 03-Jan-2022 14:09

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\029.D
Lab Smp Id: HS21120103-02 Client Smp ID: HS21120103-02
Inj Date : 13-DEC-2021 14:40
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-02;HS21120103-02
Misc Info : ;1;0;100
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 29
Dil Factor: 100.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.486	0.463	0.023	22153	22.7212	2272.120(M)

QC Flag Legend

M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\029.D

Date : 13-DEC-2021 14:40

Client ID: HS21120103-02

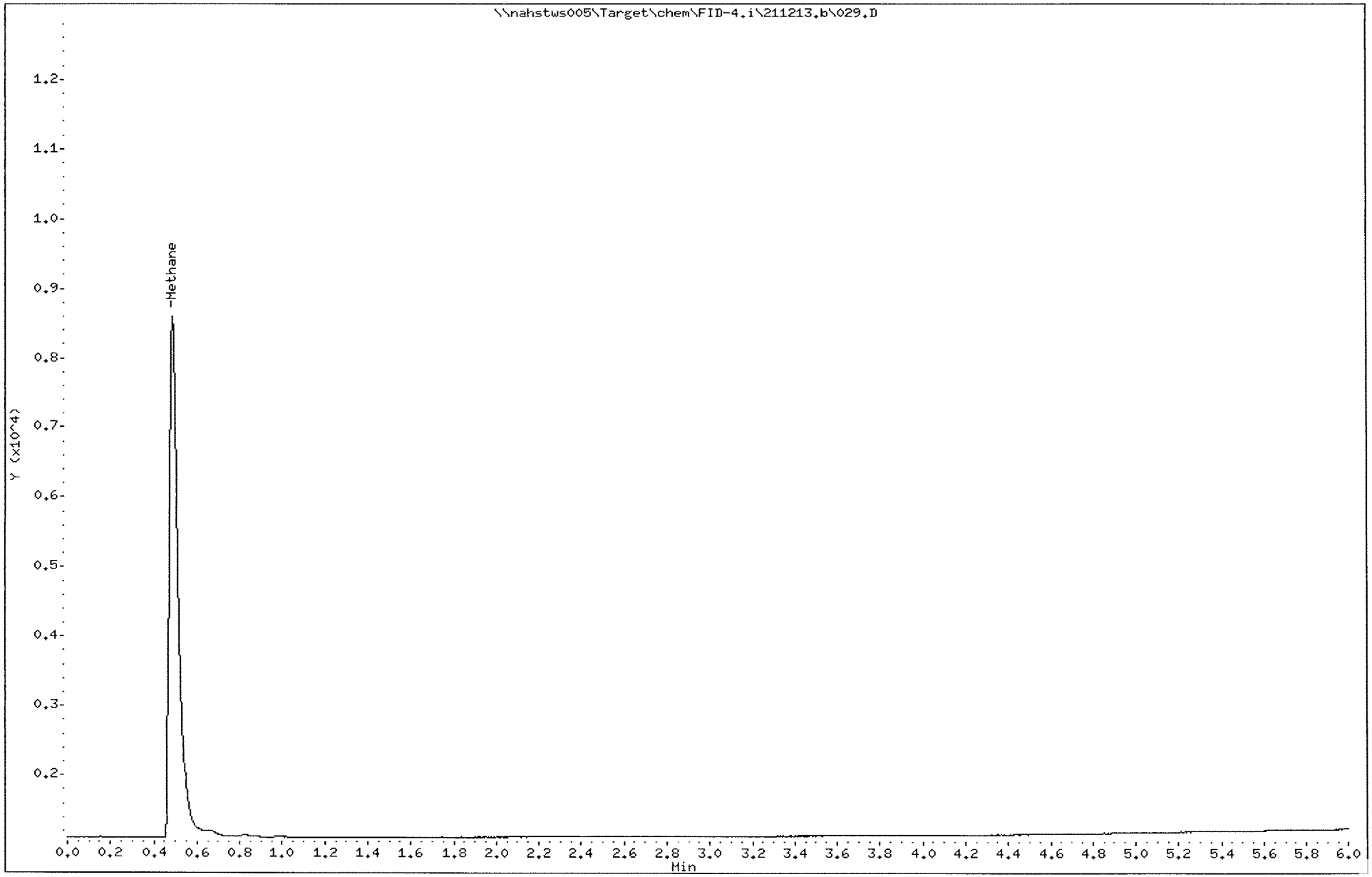
Instrument: FID-4.i

Sample Info: HS21120103-02;HS21120103-02

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\029.D
Lab Smp Id: HS21120103-02 Client Smp ID: HS21120103-02
Inj Date : 13-DEC-2021 14:40
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-02;HS21120103-02
Misc Info : ;1;0;100
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 29
Dil Factor: 100.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.486	0.463	0.023	22470	23.0463	2304.633

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\029.D
Date : 13-DEC-2021 14:40
Client ID: HS21120103-02
Sample Info: HS21120103-02;HS21120103-02

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\030.D
Lab Smp Id: HS21120103-04 Client Smp ID: HS21120103-04
Inj Date : 13-DEC-2021 15:00
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-04;HS21120103-04
Misc Info : ;1;0;50
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 30
Dil Factor: 50.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.483	0.463	0.020	12439	12.7580	637.902(M)

QC Flag Legend

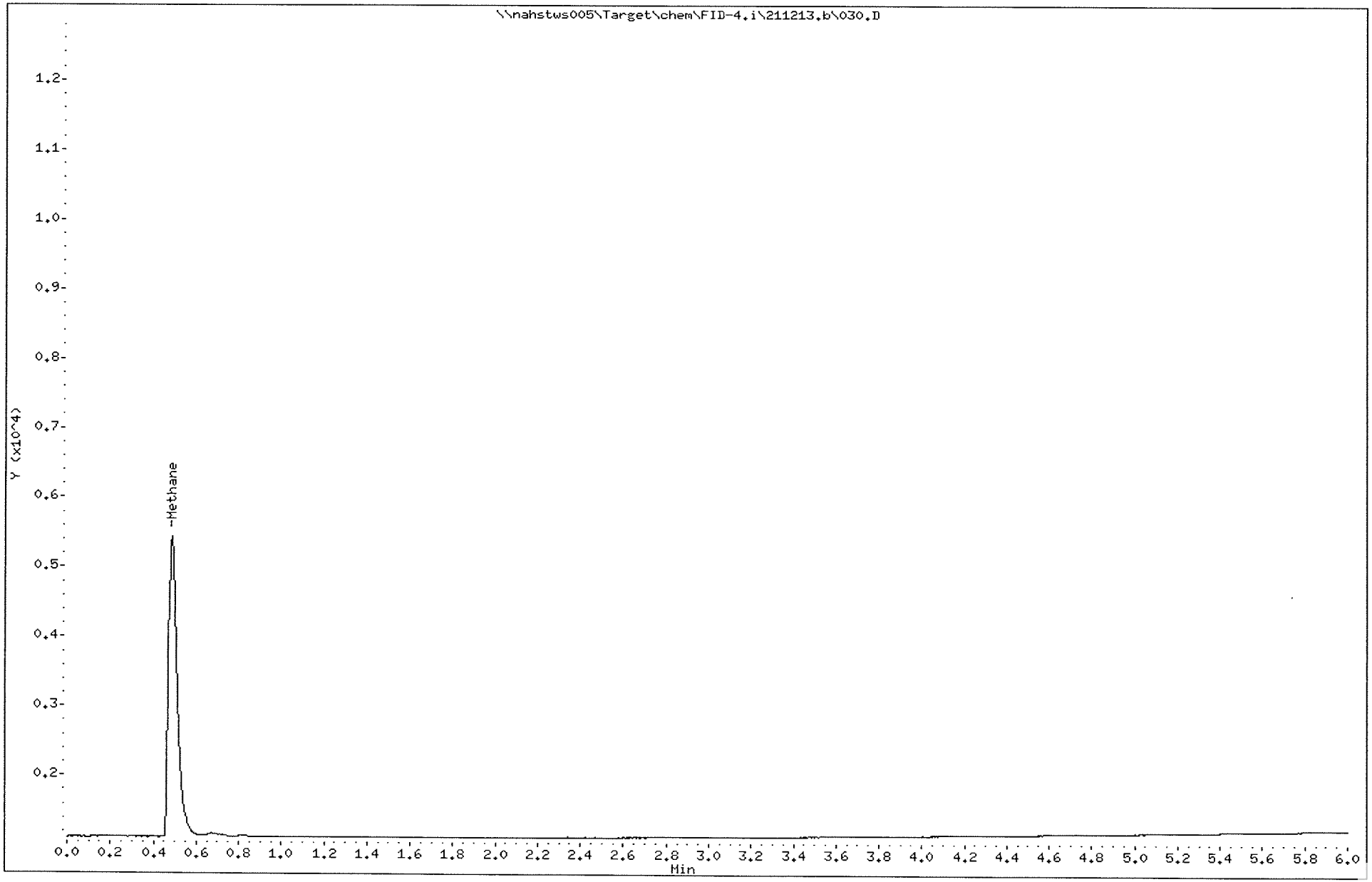
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\030.D
Date : 13-DEC-2021 15:00
Client ID: HS21120103-04
Sample Info: HS21120103-04;HS21120103-04

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\030.D
Lab Smp Id: HS21120103-04 Client Smp ID: HS21120103-04
Inj Date : 13-DEC-2021 15:00
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-04;HS21120103-04
Misc Info : ;1;0;50
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 30
Dil Factor: 50.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.483	0.463	0.020	12603	12.9263	646.312

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\030.D

Date : 13-DEC-2021 15:00

Client ID: HS21120103-04

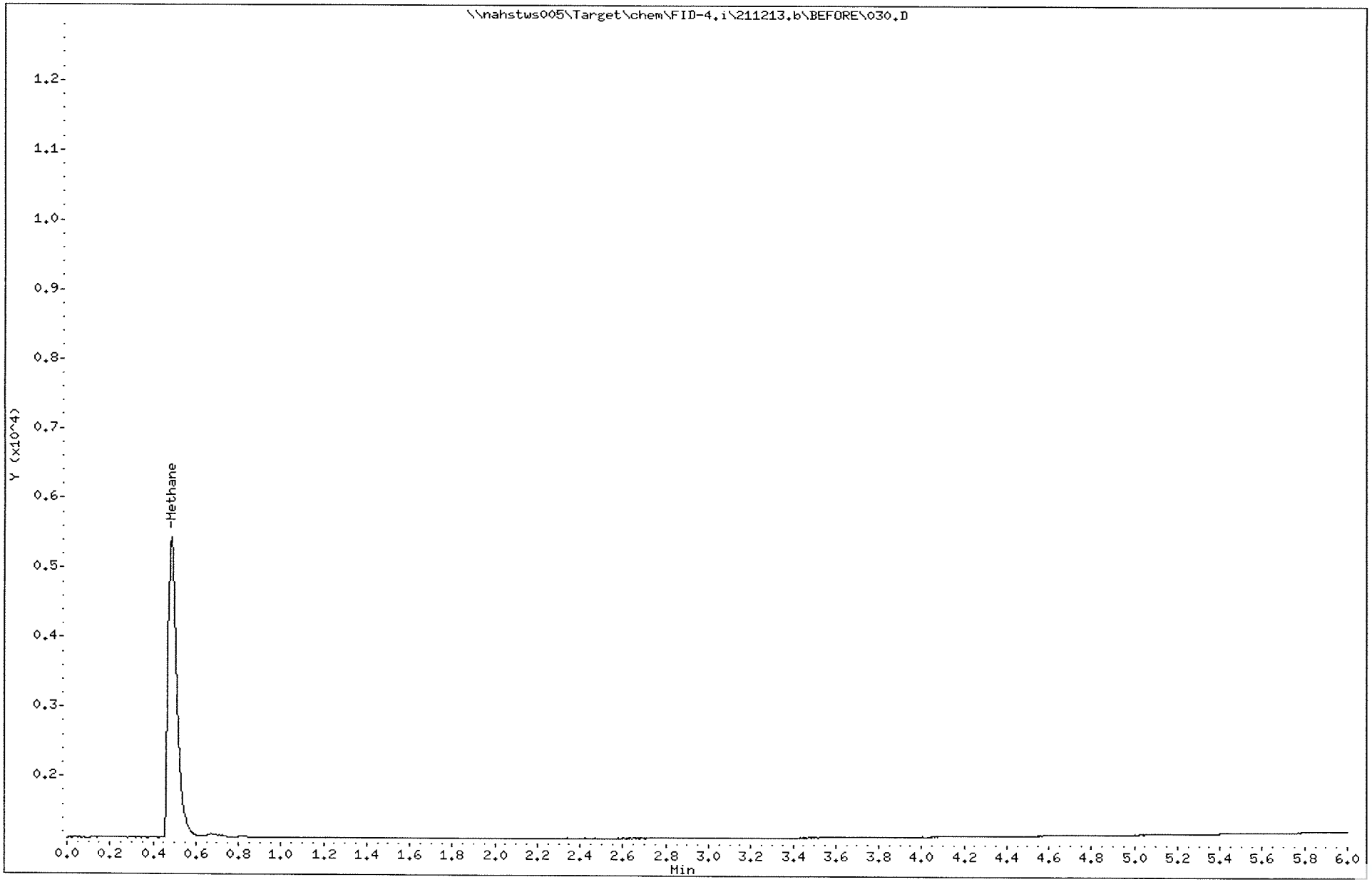
Instrument: FID-4.i

Sample Info: HS21120103-04;HS21120103-04

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\031.D
Lab Smp Id: HS21120103-05 Client Smp ID: HS21120103-05
Inj Date : 13-DEC-2021 15:11
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-05;HS21120103-05
Misc Info : ;1;0;50
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 31
Dil Factor: 50.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.486	0.463	0.023	10346	10.6114	530.568(M)

QC Flag Legend

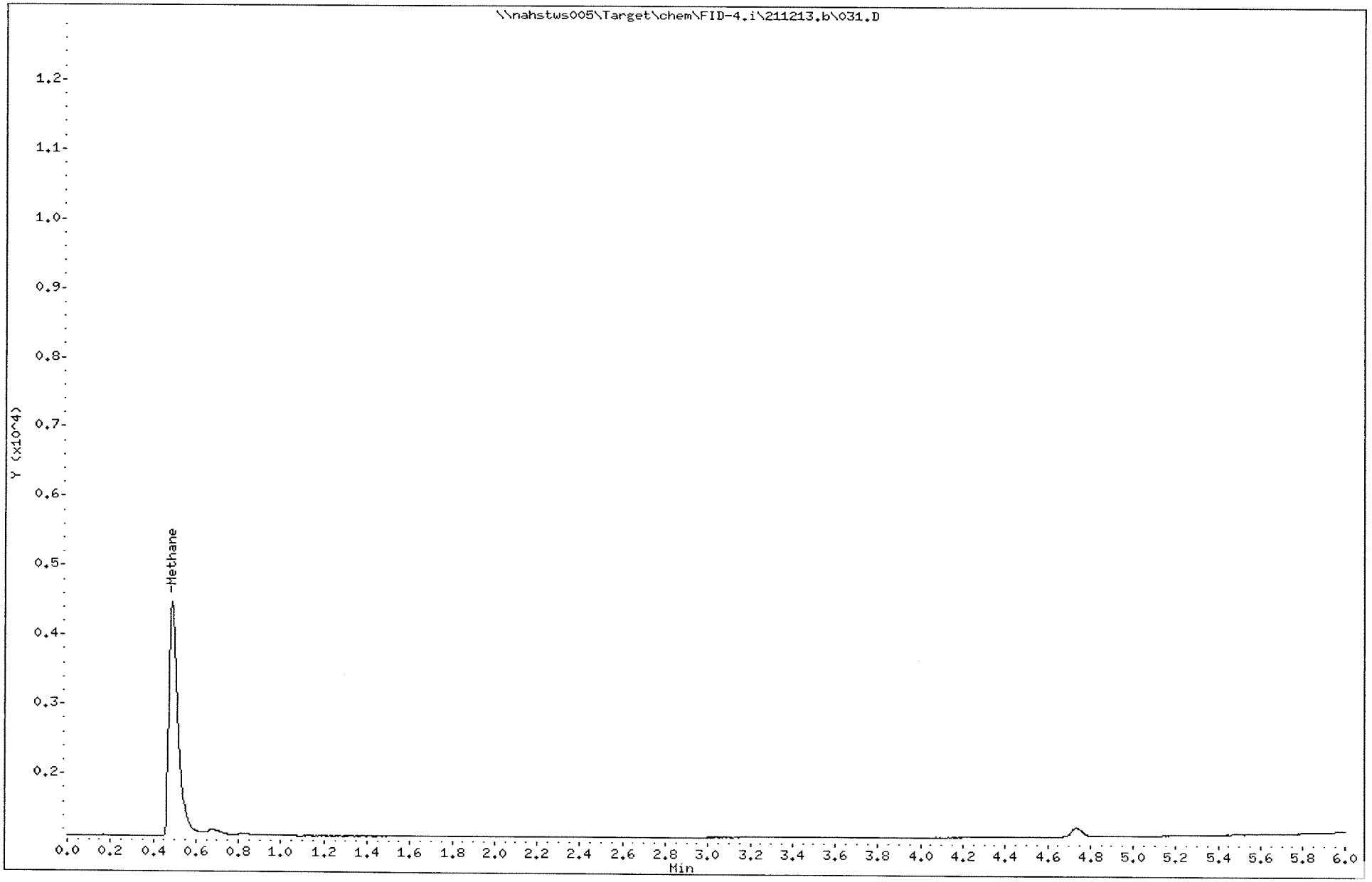
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\031.D
Date : 13-DEC-2021 15:11
Client ID: HS21120103-05
Sample Info: HS21120103-05;HS21120103-05

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\031.D
Lab Smp Id: HS21120103-05 Client Smp ID: HS21120103-05
Inj Date : 13-DEC-2021 15:11
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-05;HS21120103-05
Misc Info : ;1;0;50
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 31
Dil Factor: 50.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.486	0.463	0.023	10592	10.8637	543.183

01153655

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\031.D

Date : 13-DEC-2021 15:11

Client ID: HS21120103-05

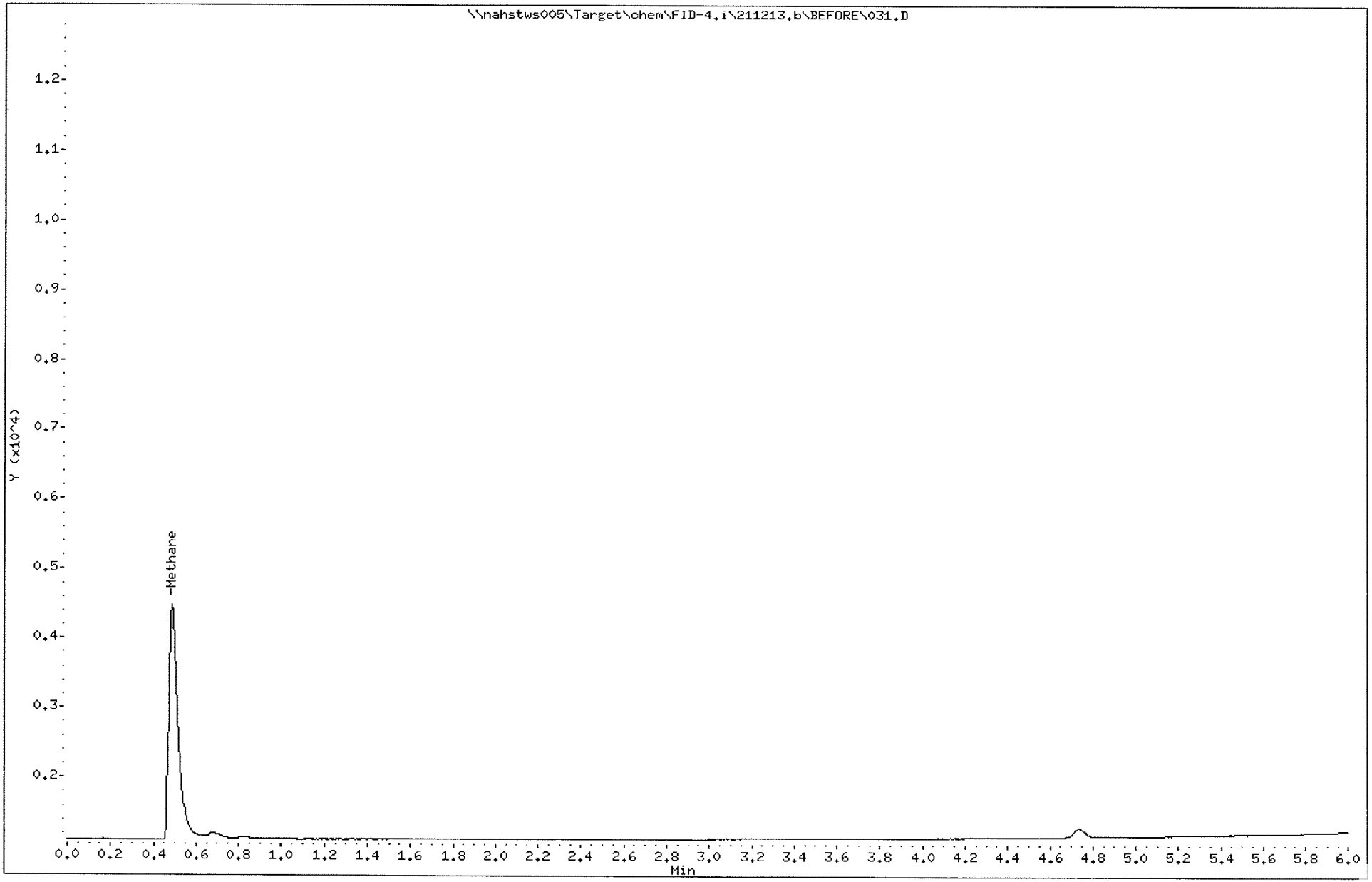
Sample Info: HS21120103-05;HS21120103-05

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\032.D
Lab Smp Id: HS21120103-06 Client Smp ID: HS21120103-06
Inj Date : 13-DEC-2021 15:22
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-06;HS21120103-06
Misc Info : ;1;0;100
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 32
Dil Factor: 100.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	0.483	0.463	0.020	29915	30.6823	3068.229(M)

QC Flag Legend

M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\032.D

Date : 13-DEC-2021 15:22

Client ID: HS21120103-06

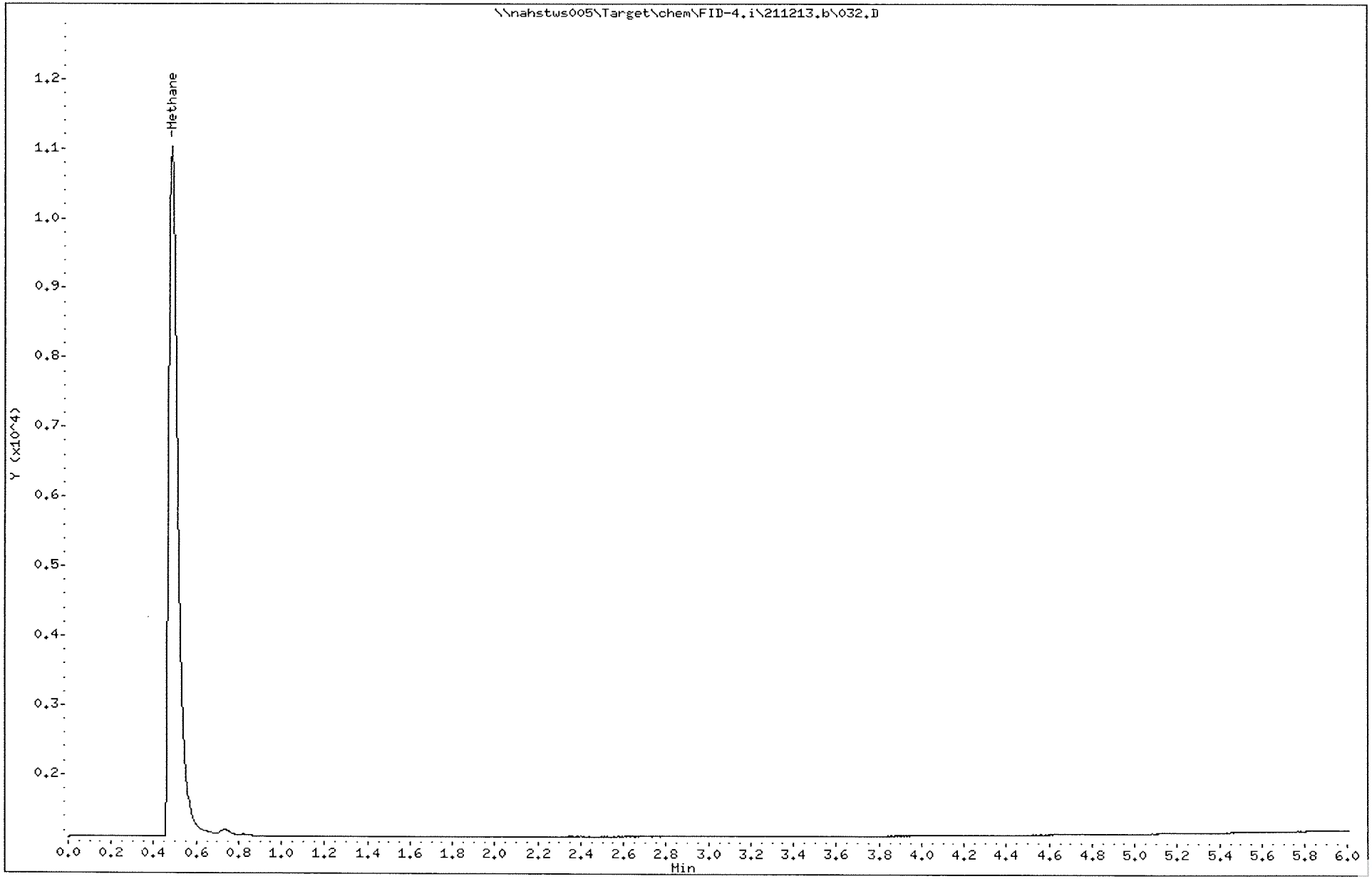
Instrument: FID-4.i

Sample Info: HS21120103-06;HS21120103-06

Operator: PL

Column phase: Rtx-PLOT

Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\032.D
Lab Smp Id: HS21120103-06 Client Smp ID: HS21120103-06
Inj Date : 13-DEC-2021 15:22
Operator : PL Inst ID: FID-4.i
Smp Info : HS21120103-06;HS21120103-06
Misc Info : ;1;0;100
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 32
Dil Factor: 100.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

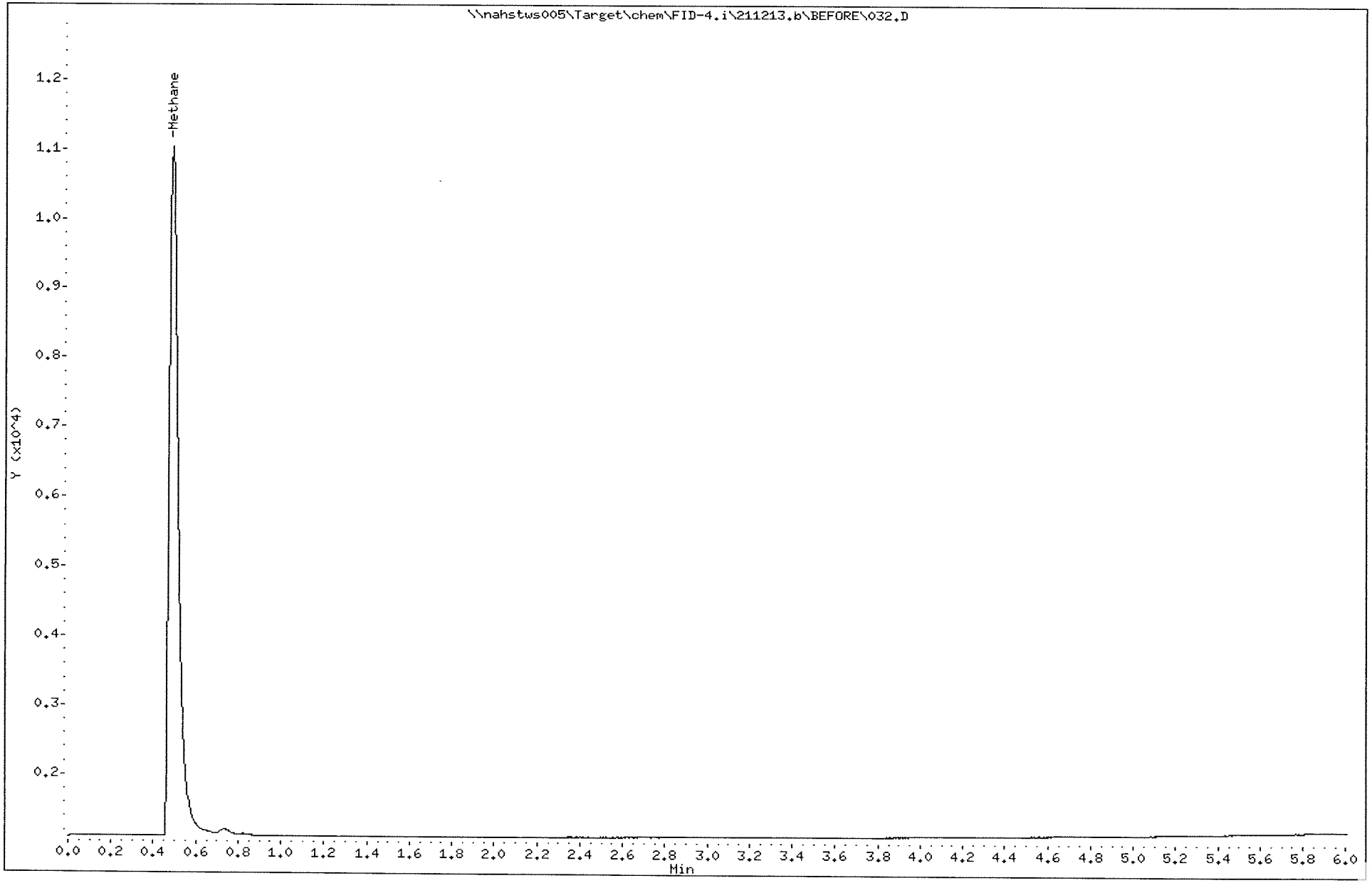
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.483	0.463	0.020	30158	30.9315	3093.152

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\032.D
Date : 13-DEC-2021 15:22
Client ID: HS21120103-06
Sample Info: HS21120103-06;HS21120103-06

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\033.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 15:54
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 33 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: ALSHSW7104

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

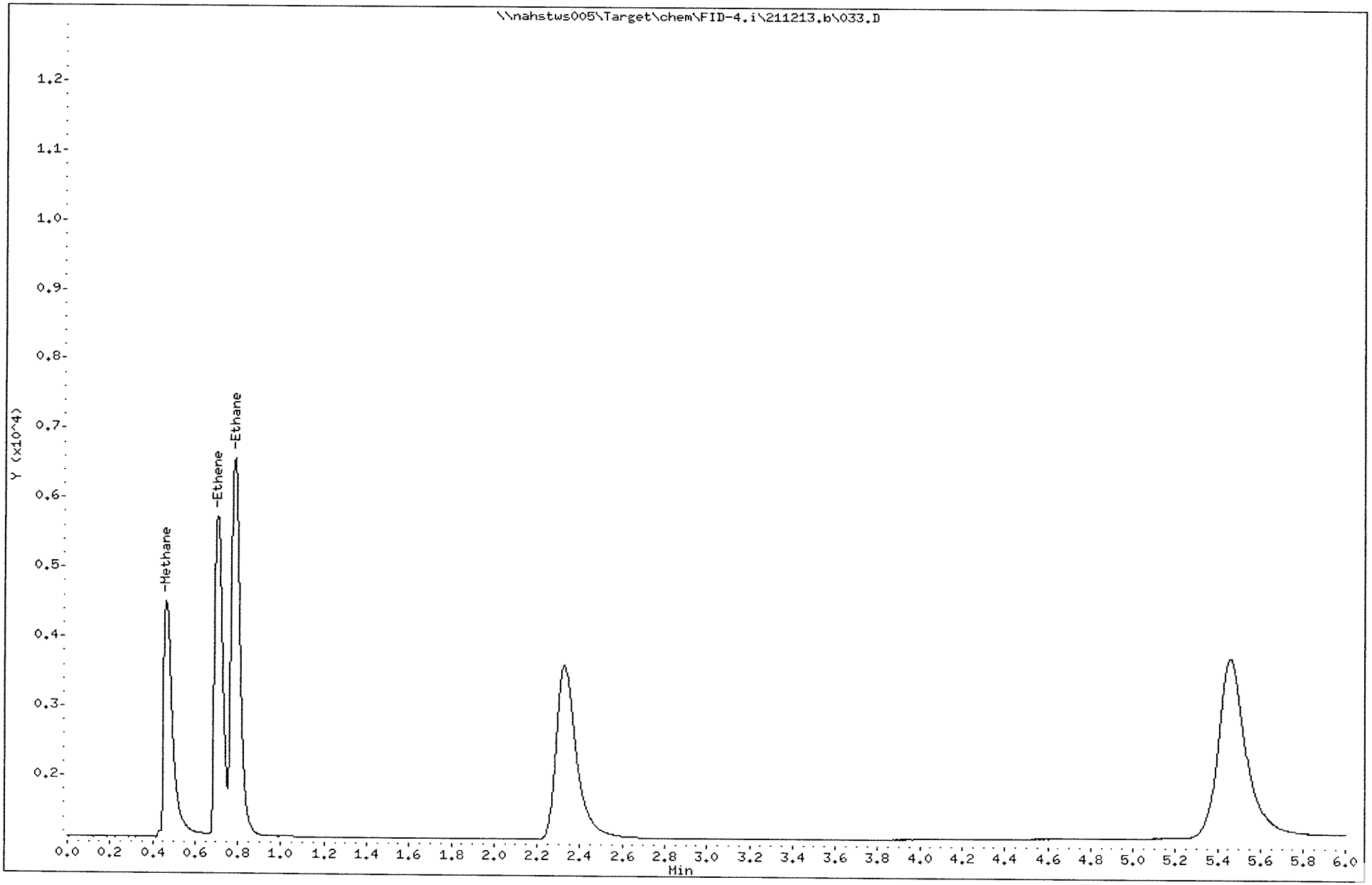
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.463	0.463	0.000	9918	9.64700	10.172
2 Ethene	0.703	0.703	0.000	11632	16.8500	19.857
3 Ethane	0.783	0.783	0.000	15415	18.0430	21.424

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\033.D
Date : 13-DEC-2021 15:54
Client ID: RSK-CCV
Sample Info: RSK-CCV;RSK-CCV;2;4

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\033.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 13-DEC-2021 15:54
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\NAHSTWS005\Target\chem\FID-4.i\211213.b\RSKNI3.m
Meth Date : 03-Jan-2022 14:05 linh.pham Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 33 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

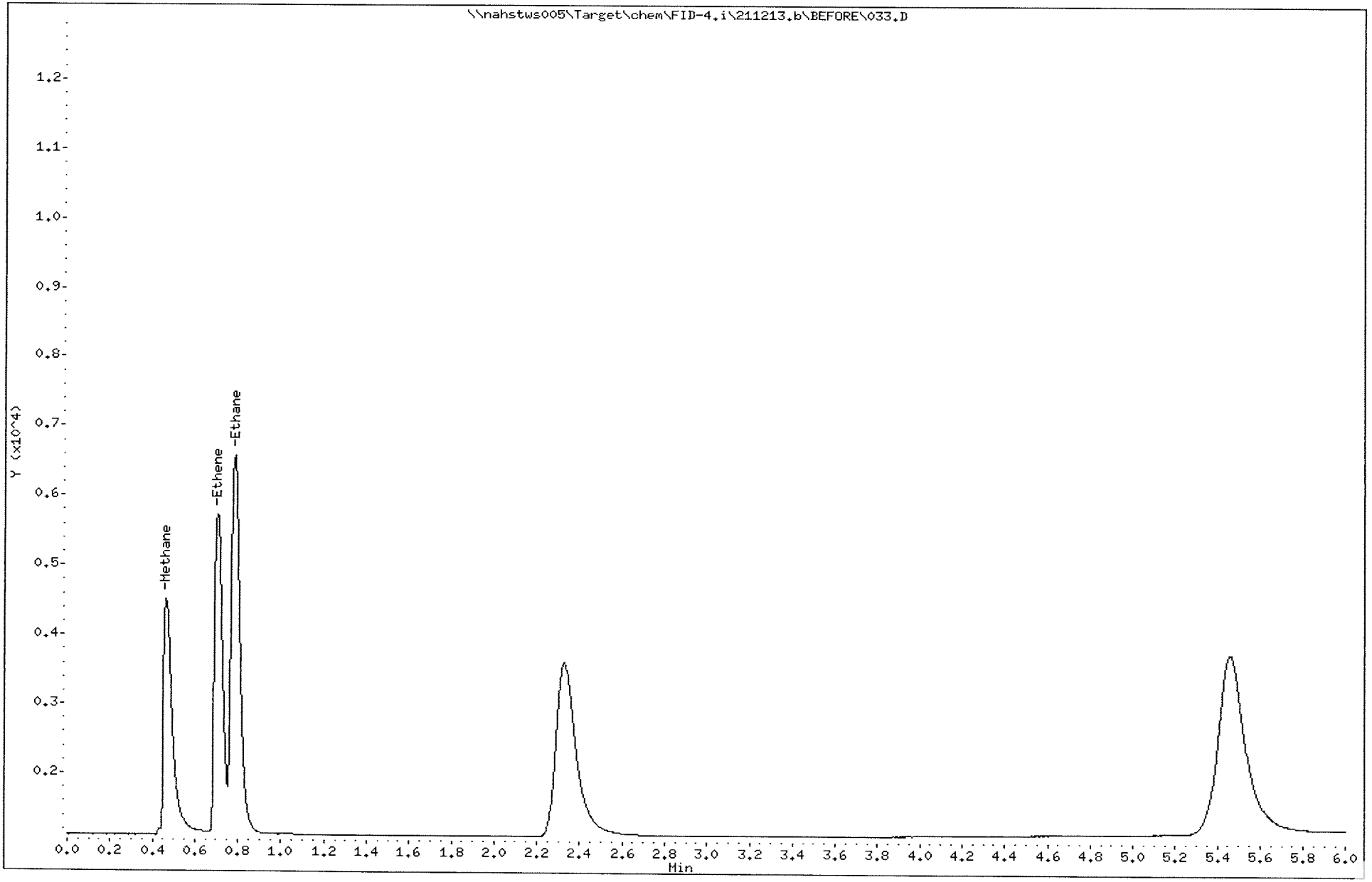
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.463	0.463	0.000	10172	9.64700	10.432
2 Ethene	0.703	0.703	0.000	11727	16.8500	20.020
3 Ethane	0.783	0.783	0.000	15572	18.0430	21.643

Data File: \\nahstws005\Target\chem\FID-4.i\211213.b\BEFORE\033.D
Date : 13-DEC-2021 15:54
Client ID: RSK-CCV
Sample Info: RSK-CCV;RSK-CCV;2;4

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53



HS21120103 - ME - ICP_W_DOD

ALS WO# HS21120103

Form 11 - INTERNAL STANDARD ASSOCIATION

Client: Bhate Environmental Associates, Inc.

Project: LHAAP-58

WorkOrder: HS21120103

Instrument:ICPMS06

Mass	Analyte	Assoc Int Standard 1	Assoc Int Standard 2	Mode
9	Beryllium	Lithium		Ar
11	Boron	Lithium		Ar
23	Sodium	Germanium		ArHe
24	Magnesium	Germanium		ArHe
27	Aluminum	Germanium		ArHe
39	Potassium	Germanium		ArHe
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
82	Selenium	Germanium		Ar
88	Strontium	Indium		Ar
95	Molybdenum	Indium		Ar
105	Palladium	Germanium		Ar
107	Silver	Indium		Ar
114	Cadmium	Indium		Ar
118	Tin	Indium		Ar
121	Antimony	Germanium		ArHe
137	Barium	Indium		Ar
205	Thallium	Bismuth		Ar
208	Lead	Bismuth		Ar

ALS Houston, US Date: 06-Jan-22

FORM 12 - PREPARATION LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103
Start Date: 15-Dec-2021 09:30 End Date: 15-Dec-2021 13:30

Batch ID: 173565
Prep Code: 3010A
Method: SW3010A
Technician:

SampID	ClientID	Matrix	Init Wt	Init Vol	FinalVol (mL)	PrepFac
HS21120092-05MS				10	10	1
HS21120092-05MSD				10	10	1
HS21120092-05PDS				10	10	1
HS21120092-05SD				10	10	1
HS21120103-05	35AWW20_120121	Groundwater		10	10	1
LCS-173565				10	10	1
MBLK-173565				10	10	1

ALS Houston, US

Date: 06-Jan-22

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103
Start Date: 15-Dec-2021 End Date: 16-Dec-2021

Run ID:ICPMS06_397733
Instrument:ICPMS06
Method:

Sample No.	D/F	Time	FileID	Analytes
ICPMS06_397733_Tune	1	15-Dec-2021 00:00	ICPMS06_397733_Tune_1	
CAL BLK	1	15-Dec-2021 11:06	008CALB.d_6423983	AS
2/10/200	1	15-Dec-2021 11:08	009CALS.d_6423984	AS
5/25/500	1	15-Dec-2021 11:10	010CALS.d_6423985	AS
10/50/100	1	15-Dec-2021 11:12	011CALS.d_6423986	AS
100/500/10K	1	15-Dec-2021 11:14	012CALS.d_6423987	AS
200/1000/20K	1	15-Dec-2021 11:16	013CALS.d_6423988	AS
ICV	1	15-Dec-2021 11:20	015_ICV.d_6423990	AS
LLICV2	1	15-Dec-2021 11:22	016LCV2.d_6423991	AS
LLICV5	1	15-Dec-2021 11:24	017LCV5.d_6423992	AS
ICB	1	15-Dec-2021 11:26	018_ICB.d_6423993	AS
ICSA	1	15-Dec-2021 11:38	020ICSA.d_6423995	AS
ICSAB	1	15-Dec-2021 11:40	021ICSB.d_6423996	AS
CAL BLK	1	15-Dec-2021 19:51	155CALB.d_6424018	AS
2/10/200	1	15-Dec-2021 19:53	156CALS.d_6424019	AS
5/25/500	1	15-Dec-2021 19:55	157CALS.d_6424020	AS
10/50/100	1	15-Dec-2021 19:57	158CALS.d_6424021	AS
100/500/10K	1	15-Dec-2021 19:59	159CALS.d_6424022	AS
200/1000/20K	1	15-Dec-2021 20:01	160CALS.d_6424023	AS
ICV	1	15-Dec-2021 20:04	162_ICV.d_6424025	AS
LLICCV5	1	15-Dec-2021 20:06	163LCV5.d_6424026	AS
LLICCV2	1	15-Dec-2021 20:08	164LCV2.d_6424027	AS
ICCB 1	1	15-Dec-2021 20:10	165_ICB.d_6424028	AS
CCV 1	1	15-Dec-2021 21:21	201_CCV.d_6424039	AS
CCB 2	1	15-Dec-2021 21:23	202_CCB.d_6424040	AS
MBLK-173565	1	15-Dec-2021 21:25	203SMPL.d_6424041	AS
LCS-173565	1	15-Dec-2021 21:27	204SMPL.d_6424042	AS
ZZZZZZSD	5	15-Dec-2021 21:31	206SMPL.d_6424044	AS
ZZZZZZMS	1	15-Dec-2021 21:33	207SMPL.d_6424045	AS
ZZZZZZMSD	1	15-Dec-2021 21:35	208SMPL.d_6424046	AS
ZZZZZZPDS	1	15-Dec-2021 21:37	209SMPL.d_6424047	
CCV 2	1	15-Dec-2021 21:39	210_CCV.d_6424048	AS
CCB 3	1	15-Dec-2021 21:41	211_CCB.d_6424049	AS
35AWW20_120121	1	15-Dec-2021 21:47	214SMPL.d_6424052	AS
CCV 3	1	15-Dec-2021 21:55	218_CCV.d_6424056	AS
CCB 4	1	15-Dec-2021 21:57	219_CCB.d_6424057	AS
CCV 4	1	15-Dec-2021 22:14	227_CCV.d_6424036	AS
CCB 5	1	15-Dec-2021 22:16	228_CCB.d_6424037	AS
CCV 5	1	16-Dec-2021 00:08	284_CCV.d_6424253	AS
CCB 6	1	16-Dec-2021 00:09	285_CCB.d_6424254	AS
LLCCV2	1	16-Dec-2021 00:11	286LCV2.d_6424255	AS
LLCCV5	1	16-Dec-2021 00:13	287LCV5.d_6424256	AS
ICSA	1	16-Dec-2021 00:15	288ICSA.d_6424257	AS
ICSAB	1	16-Dec-2021 00:17	289ICSB.d_6424258	AS

ALS Houston, US

Date: 06-Jan-22

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

Run ID: ICPMS06_397733
Instrument: ICPMS06
Method: SW6020A

ICV	Date: 15-Dec-2021 11:20		Seq: 6423990	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	105.047	105	90-110	

ICV	Date: 15-Dec-2021 20:04		Seq: 6424025	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	104.062	104	90-110	

CCV1	Date: 15-Dec-2021 21:21		Seq: 6424039	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	100.043	100	90-110	

CCV2	Date: 15-Dec-2021 21:39		Seq: 6424048	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.361	99	90-110	

CCV3	Date: 15-Dec-2021 21:55		Seq: 6424056	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.717	100	90-110	

CCV4	Date: 15-Dec-2021 22:14		Seq: 6424036	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.839	100	90-110	

CCV5	Date: 16-Dec-2021 00:08		Seq: 6424253	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.288	99	90-110	

ALS Houston, US Date: 06-Jan-22

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

Run ID: ICPMS06_397733
Instrument: ICPMS06
Method: SW6020A

ICB	Date: 15-Dec-2021 11:26	Seq: 6423993	ICB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	5	0.4	5	U

ICCB1	Date: 15-Dec-2021 20:10	Seq: 6424028	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	5	0.4	5	U

CCB2	Date: 15-Dec-2021 21:23	Seq: 6424040	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	2	0.4	2	U

MBLK-173565	Date: 15-Dec-2021 21:25	Seq: 6424041	MBLK	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	5	0.4	5	U

CCB3	Date: 15-Dec-2021 21:41	Seq: 6424049	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	2	0.4	2	U

CCB4	Date: 15-Dec-2021 21:57	Seq: 6424057	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	2	0.4	2	U

CCB5	Date: 15-Dec-2021 22:16	Seq: 6424037	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	2	0.4	2	U

CCB6	Date: 16-Dec-2021 00:09	Seq: 6424254	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**
Arsenic	2	0.4	2	U

ALS Houston, US Date: 06-Jan-22

Form 4 - ICP Interference Check Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

Run ID: ICPMS06_397733
Instrument: ICPMS06
Method: SW6020A

ICSA	Date: 15-Dec-2021 11:38	Seq: 6423995	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic		0.094	0	

ICSAB	Date: 15-Dec-2021 11:40	Seq: 6423996	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic	100	97.12	97.1	

ICSA	Date: 16-Dec-2021 00:15	Seq: 6424257	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic		0.023	0	

ICSAB	Date: 16-Dec-2021 00:17	Seq: 6424258	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic	100	97.92	97.9	

ALS Houston, US

Date: 06-Jan-22

Form 5A - Matrix Spike/Matrix Spike Duplicate Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

Date Analyzed: 15-Dec-2021 21:35
Date Extracted: 15-Dec-2021 13:30
Units: ug/L

Matrix Spike: HS21120092-05MS
Client Sample ID:

Analysis Method: SW6020A

Analyte	Sample Result	MS Result	Spike Amount	% Rec	MSD Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Arsenic	1.712	56.42	50.00	109	56.88	50.00	110	84-116	0.809	20

ALS Houston, US Date: 06-Jan-22

Form 7 - Laboratory Control Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

Date Analyzed: 15-Dec-2021 21:27
Date Extracted: 15-Dec-2021 13:30
Units: ug/L

Lab Sample ID: LCS-173565 Analysis Method: SW6020A

Analyte	Spike Amount	LCS Result	% Rec	% Rec Limits
Arsenic	50	53.07	106	84-116

ALS Houston, US Date: 06-Jan-22

Form 8 - ICP Serial Dilutions

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS21120103

Date Analyzed: 15-Dec-2021 21:31
Date Extracted: 15-Dec-2021 13:30
Units: ug/L

Lab Sample ID: HS21120092-05SD
Client Sample ID:

Analysis Method: SW6020A

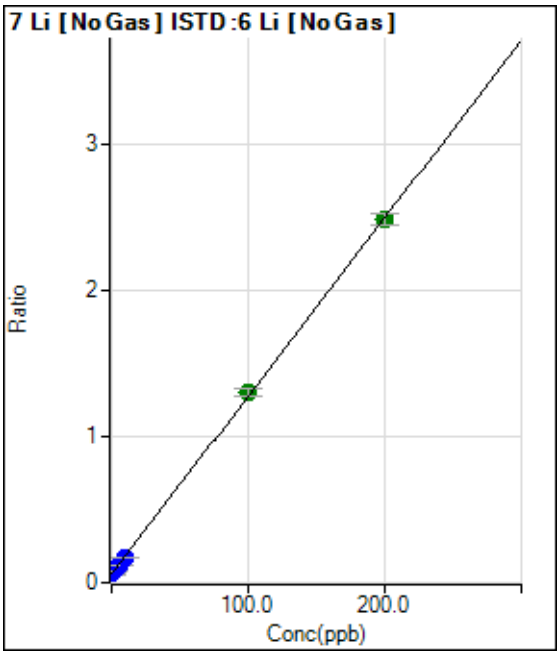
Analyte	Sample Result	C	SD Result	C	RPD	Q
Arsenic	1.712	J	0	U	0	

Calibration for 162_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 8:05:33 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	155CALB.d	CAL BLK	12/15/2021 7:51:17 PM
2	156CALS.d	2/10/200	12/15/2021 7:53:15 PM
3	157CALS.d	5/25/500	12/15/2021 7:55:13 PM
4	158CALS.d	10/50/100	12/15/2021 7:57:11 PM
5	159CALS.d	100/500/10K	12/15/2021 7:59:09 PM
6	160CALS.d	200/1000/20K	12/15/2021 8:01:02 PM

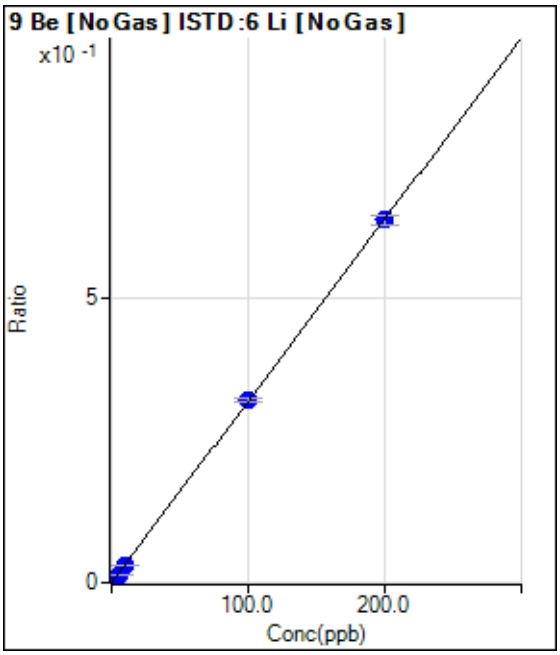
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50552.12	0.0594	P	0.8
2	☐	2.000	1.899	69634.36	0.0825	P	1.1
3	☐	5.000	4.798	98214.42	0.1178	P	1.7
4	☐	10.000	9.544	146627.60	0.1756	P	1.4
5	☐	100.000	101.940	1024927.49	1.3011	A	4.5
6	☐	200.000	199.059	1916055.96	2.4842	A	3.4

y = 0.0122 * x + 0.0594
R = 0.9999
DL = 0.1106
BEC = 4.874

Weight: <None>
Min Conc: <None>

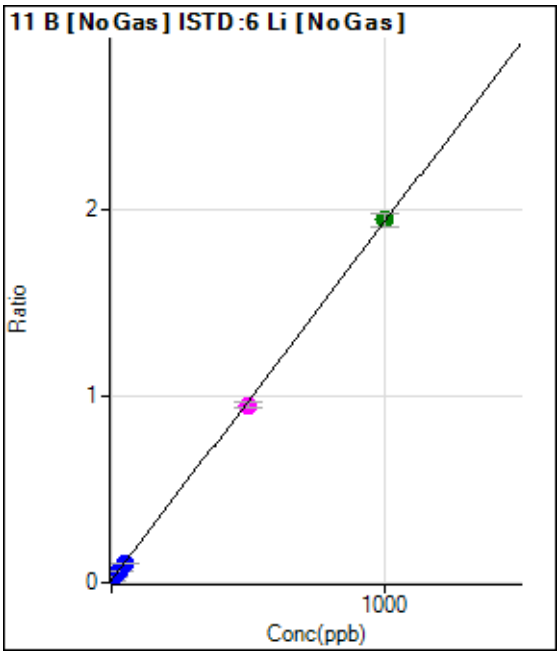


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11.67	0.0000	P	64.5
2	☐	2.000	1.867	5025.95	0.0060	P	4.4
3	☐	5.000	4.688	12452.24	0.0149	P	2.3
4	☐	10.000	9.303	24736.75	0.0296	P	1.9
5	☐	100.000	100.368	251783.29	0.3196	P	2.4
6	☐	200.000	199.860	490818.99	0.6363	P	3.0

y = 0.0032 * x + 1.3642E-005
R = 1.0000
DL = 0.008288
BEC = 0.004285

Weight: <None>
Min Conc: <None>

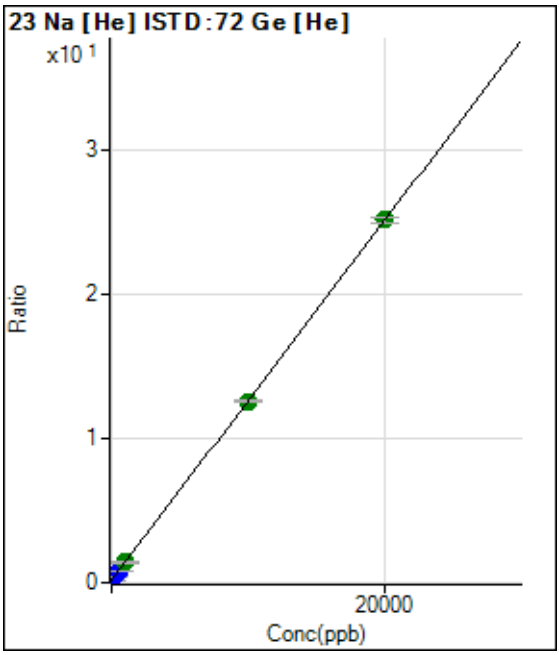
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10959.36	0.0129	P	1.7
2	☐	10.000	9.165	25700.24	0.0304	P	0.9
3	☐	25.000	23.392	48130.44	0.0577	P	1.2
4	☐	50.000	47.375	86603.19	0.1037	P	0.5
5	☐	500.000	489.236	749403.14	0.9512	M	3.2
6	☐	1000.000	1005.562	1497279.20	1.9414	A	3.9

y = 0.0019 * x + 0.0129
R = 0.9999
DL = 0.3404
BEC = 6.711

Weight: <None>
Min Conc: <None>

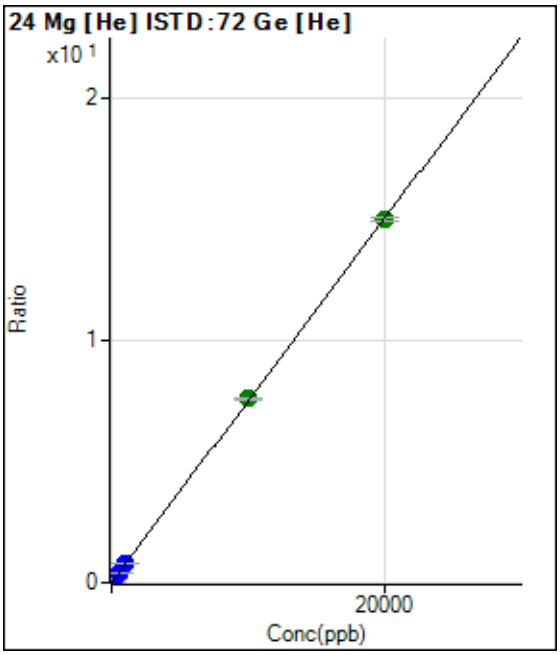


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113314.05	0.1633	P	0.7
2	☐	200.000	198.289	286337.36	0.4101	P	0.5
3	☐	500.000	501.016	555136.35	0.7870	P	1.0
4	☐	1000.000	1002.597	986188.45	1.4115	A	2.3
5	☐	10000.00	9928.910	8630568.00	12.5249	A	1.3
6	☐	20000.00	20035.40	17034505.17	25.1076	A	1.3

y = 0.0012 * x + 0.1633
R = 1.0000
DL = 2.612
BEC = 131.1

Weight: <None>
Min Conc: <None>

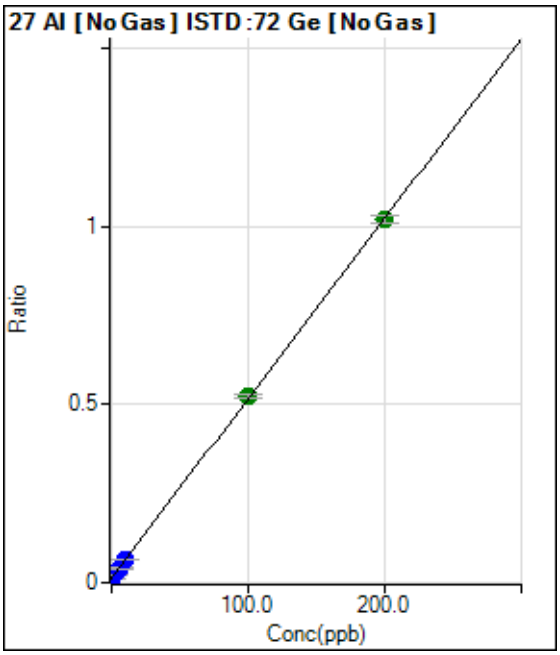
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	443.35	0.0006	P	9.4
2	☐	200.000	206.815	108913.14	0.1560	P	0.4
3	☐	500.000	516.749	274258.94	0.3888	P	0.2
4	☐	1000.000	1046.621	549796.96	0.7869	P	1.3
5	☐	10000.00	10118.72	5238421.49	7.6019	A	1.3
6	☐	20000.00	19937.81	10162238.18	14.9782	A	1.1

y = 7.5121E-004 * x + 6.3888E-004
R = 1.0000
DL = 0.2391
BEC = 0.8505

Weight: <None>
Min Conc: <None>

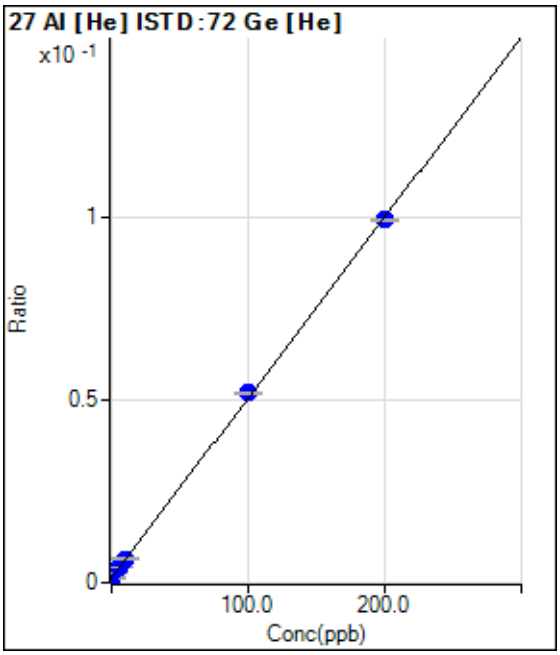


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27811.48	0.0130	P	0.3
2	☐	2.000	2.098	50608.92	0.0236	P	0.6
3	☐	5.000	5.412	86450.94	0.0403	P	1.3
4	☐	10.000	10.639	141654.95	0.0667	P	0.8
5	☐	100.000	101.232	1095713.63	0.5238	A	1.8
6	☐	200.000	199.340	2115045.70	1.0189	A	2.1

y = 0.0050 * x + 0.0130
R = 1.0000
DL = 0.02521
BEC = 2.576

Weight: <None>
Min Conc: <None>

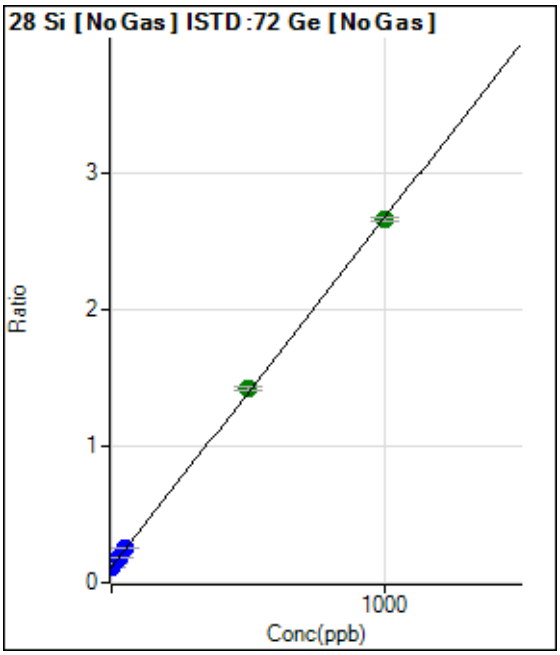
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	910.04	0.0013	P	6.0
2	☐	2.000	4.163	2345.78	0.0034	P	50.4
3	☐	5.000	5.715	2913.70	0.0041	P	8.5
4	☐	10.000	10.539	4547.49	0.0065	P	4.0
5	☐	100.000	102.636	35779.61	0.0519	P	0.8
6	☐	200.000	198.615	67345.96	0.0993	P	0.6

y = 4.9311E-004 * x + 0.0013
R = 0.9999
DL = 0.479
BEC = 2.659

Weight: <None>
Min Conc: <None>

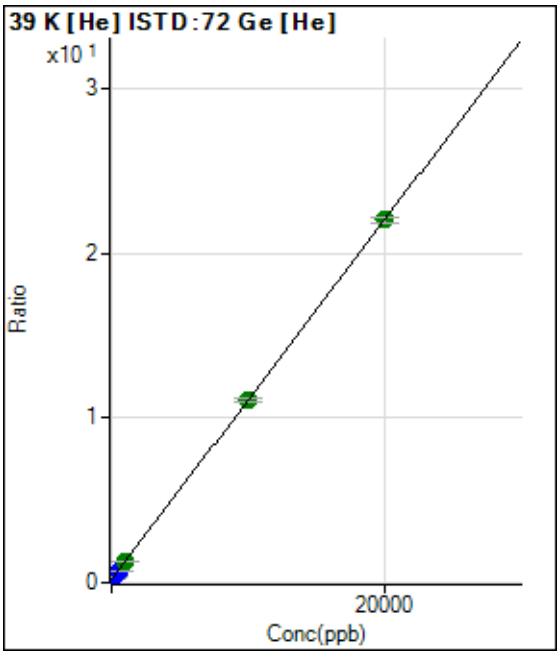


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244693.35	0.1144	P	0.8
2	☐	10.000	11.161	306587.58	0.1429	P	1.4
3	☐	25.000	25.934	387339.06	0.1806	P	1.0
4	☐	50.000	54.999	541457.00	0.2548	P	2.7
5	☐	500.000	510.462	2966471.94	1.4181	A	1.6
6	☐	1000.000	994.484	5510487.42	2.6543	A	1.0

y = 0.0026 * x + 0.1144
R = 0.9999
DL = 1.031
BEC = 44.78

Weight: <None>
Min Conc: <None>

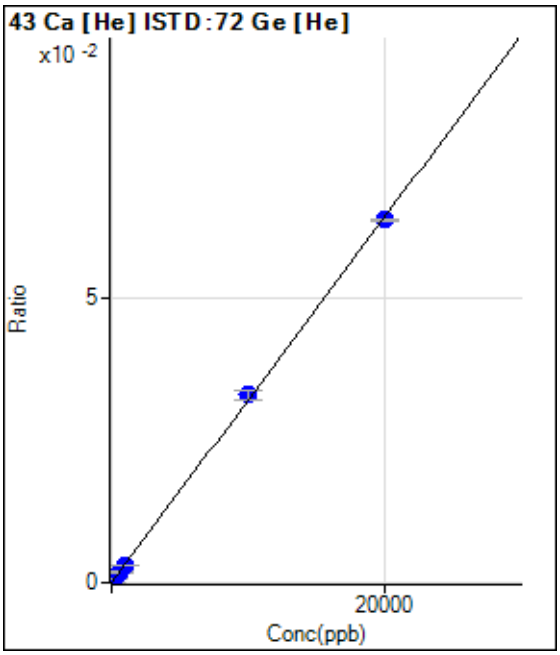
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	128419.33	0.1850	P	1.2
2	☐	200.000	196.550	278995.15	0.3996	P	0.8
3	☐	500.000	489.935	507812.43	0.7200	P	0.4
4	☐	1000.000	1010.304	900013.14	1.2881	A	2.5
5	☐	10000.00	9992.037	7644615.93	11.0945	A	1.9
6	☐	20000.00	20003.75	14945588.53	22.0255	A	1.4

y = 0.0011 * x + 0.1850
R = 1.0000
DL = 5.92
BEC = 169.5

Weight: <None>
Min Conc: <None>

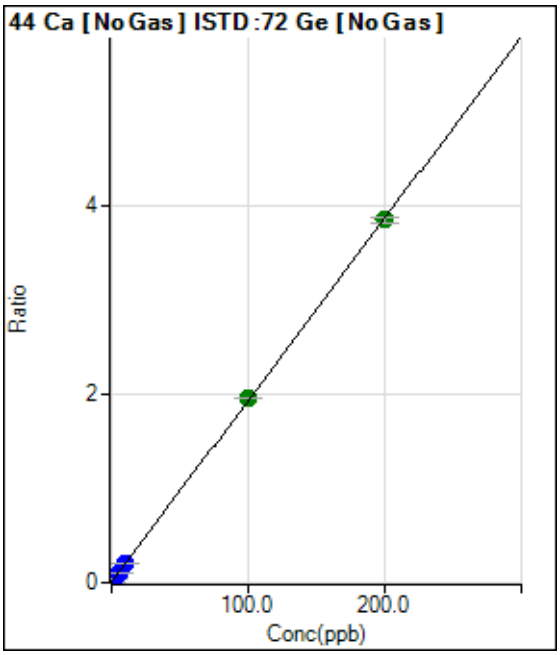


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	65.7
2	☐	200.000	200.542	473.35	0.0007	P	20.4
3	☐	500.000	520.666	1203.41	0.0017	P	20.6
4	☐	1000.000	945.359	2146.88	0.0031	P	4.6
5	☐	10000.00	10278.06	22789.11	0.0331	P	4.6
6	☐	20000.00	19863.18	43355.16	0.0639	P	0.7

y = 3.2151E-006 * x + 3.3638E-005
R = 0.9999
DL = 20.62
BEC = 10.46

Weight: <None>
Min Conc: <None>

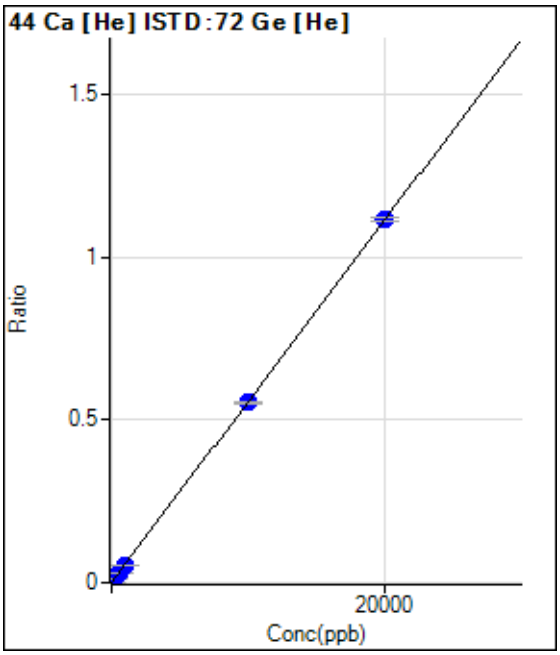
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8732.91	0.0041	P	5.1
2	☐	2.000	1.997	91626.69	0.0427	P	0.6
3	☐	5.000	5.025	217152.36	0.1013	P	2.3
4	☐	10.000	10.225	428703.83	0.2018	P	1.2
5	☐	100.000	101.354	4109185.35	1.9642	A	0.3
6	☐	200.000	199.311	8011030.30	3.8587	A	1.7

y = 0.0193 * x + 0.0041
R = 1.0000
DL = 0.03208
BEC = 0.211

Weight: <None>
Min Conc: <None>

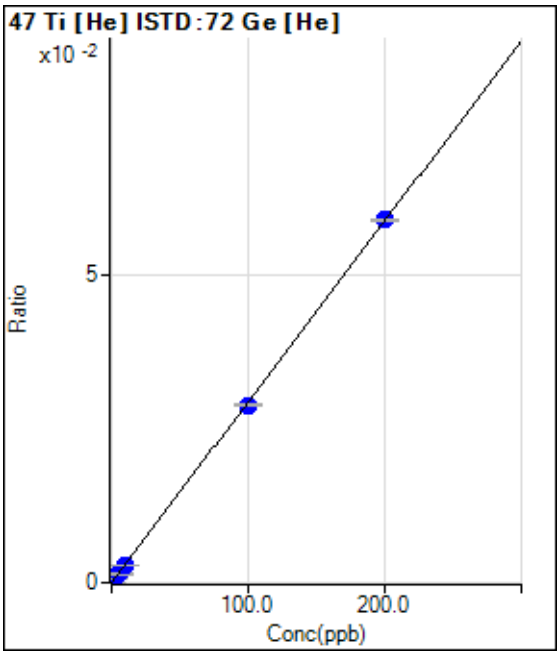


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	546.69	0.0008	P	18.5
2	☐	200.000	190.831	7965.79	0.0114	P	3.3
3	☐	500.000	483.440	19534.13	0.0277	P	2.6
4	☐	1000.000	973.385	38407.17	0.0550	P	0.7
5	☐	10000.00	9940.334	381811.75	0.5541	P	0.8
6	☐	20000.00	20031.66	757009.42	1.1157	P	0.9

y = 5.5660E-005 * x + 7.8783E-004
R = 1.0000
DL = 7.866
BEC = 14.15

Weight: <None>
Min Conc: <None>

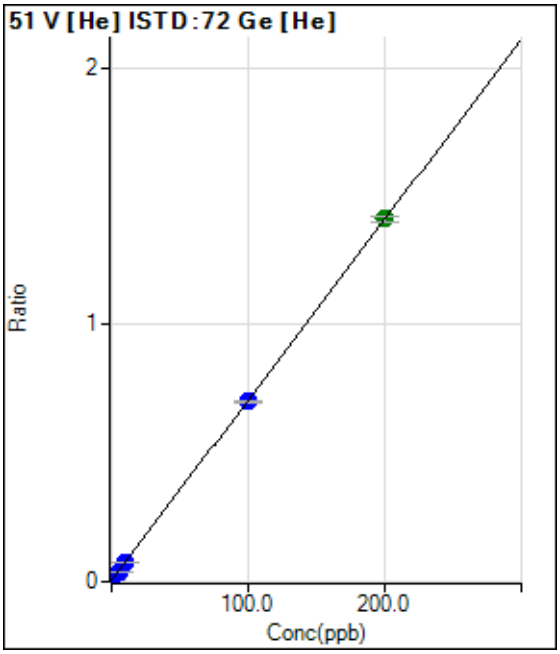
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	42.9
2	☐	2.000	1.919	406.68	0.0006	P	1.3
3	☐	5.000	5.003	1050.06	0.0015	P	16.0
4	☐	10.000	9.782	2020.19	0.0029	P	4.0
5	☐	100.000	98.402	19918.05	0.0289	P	1.4
6	☐	200.000	200.811	40005.09	0.0590	P	0.4

y = 2.9351E-004 * x + 1.9193E-005
R = 1.0000
DL = 0.08424
BEC = 0.06539

Weight: <None>
Min Conc: <None>

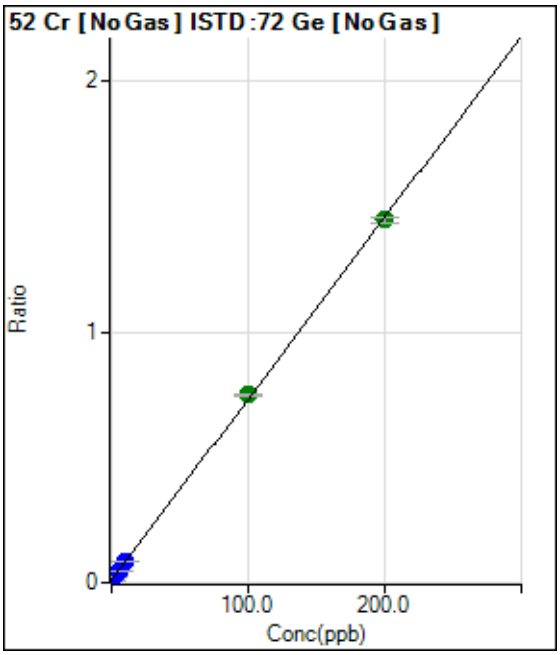


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4102.86	0.0059	P	2.1
2	☐	2.000	1.914	13505.57	0.0193	P	0.5
3	☐	5.000	4.767	27767.01	0.0394	P	1.0
4	☐	10.000	9.693	51660.06	0.0739	P	0.4
5	☐	100.000	99.023	482915.14	0.7008	P	1.0
6	☐	200.000	200.511	958686.66	1.4130	A	1.8

y = 0.0070 * x + 0.0059
R = 1.0000
DL = 0.05371
BEC = 0.8424

Weight: <None>
Min Conc: <None>

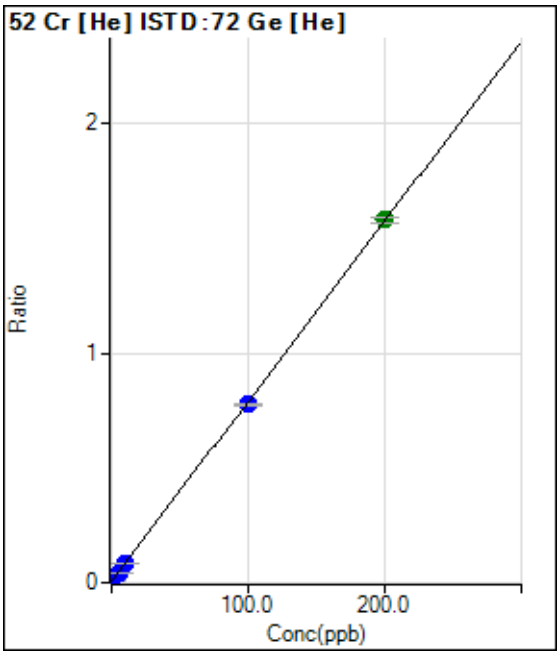
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	19674.40	0.0092	P	2.6
2	☐	2.000	2.013	50951.59	0.0237	P	1.6
3	☐	5.000	5.040	97868.01	0.0456	P	1.1
4	☐	10.000	10.124	174976.90	0.0824	P	1.9
5	☐	100.000	102.297	1566235.60	0.7487	A	1.2
6	☐	200.000	198.844	3003258.91	1.4467	A	1.5

y = 0.0072 * x + 0.0092
R = 0.9999
DL = 0.09736
BEC = 1.272

Weight: <None>
Min Conc: <None>

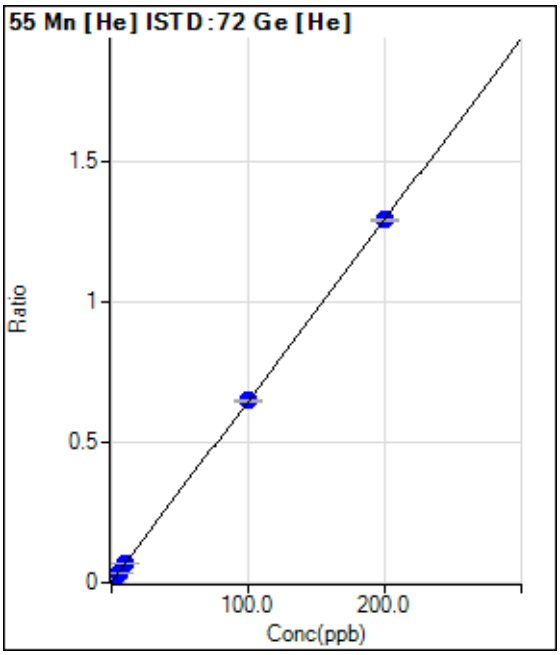


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3803.93	0.0055	P	4.2
2	☐	2.000	2.039	14995.08	0.0215	P	3.0
3	☐	5.000	4.898	30978.65	0.0439	P	1.9
4	☐	10.000	9.974	58521.46	0.0838	P	1.1
5	☐	100.000	98.300	535351.20	0.7769	P	0.4
6	☐	200.000	200.853	1073166.31	1.5816	A	1.3

y = 0.0078 * x + 0.0055
R = 0.9999
DL = 0.08734
BEC = 0.6984

Weight: <None>
Min Conc: <None>

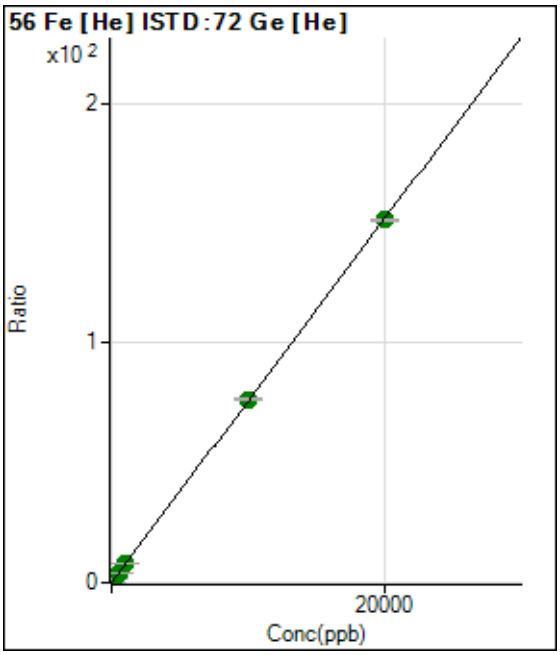
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1766.82	0.0025	P	9.6
2	☐	2.000	1.976	10671.01	0.0153	P	4.1
3	☐	5.000	4.880	23987.98	0.0340	P	0.7
4	☐	10.000	9.847	46144.89	0.0660	P	2.5
5	☐	100.000	100.084	446422.66	0.6478	P	0.7
6	☐	200.000	199.969	876514.18	1.2919	P	0.6

y = 0.0064 * x + 0.0025
R = 1.0000
DL = 0.1135
BEC = 0.3948

Weight: <None>
Min Conc: <None>

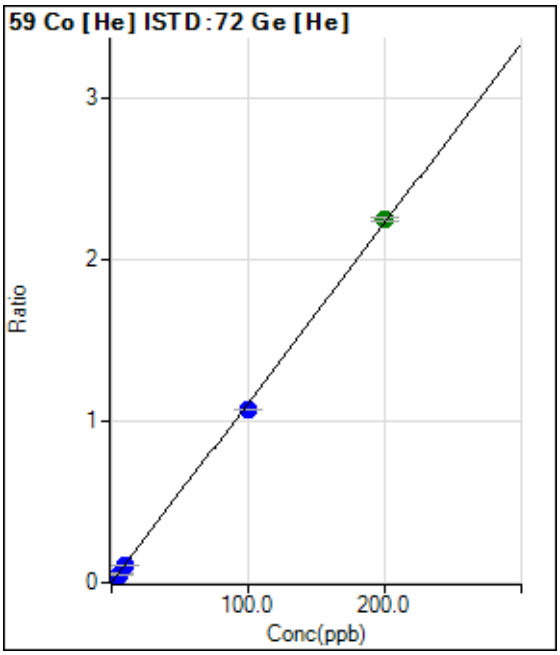


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13430.13	0.0194	P	1.8
2	☐	200.000	201.884	1082643.03	1.5508	A	1.8
3	☐	500.000	501.049	2694485.38	3.8202	A	1.1
4	☐	1000.000	1013.739	5386461.17	7.7094	A	2.0
5	☐	10000.00	10095.62	52787539.21	76.6034	A	0.7
6	☐	20000.00	19951.45	102704068.4	151.368	A	0.3

y = 0.0076 * x + 0.0194
R = 1.0000
DL = 0.1374
BEC = 2.551

Weight: <None>
Min Conc: <None>

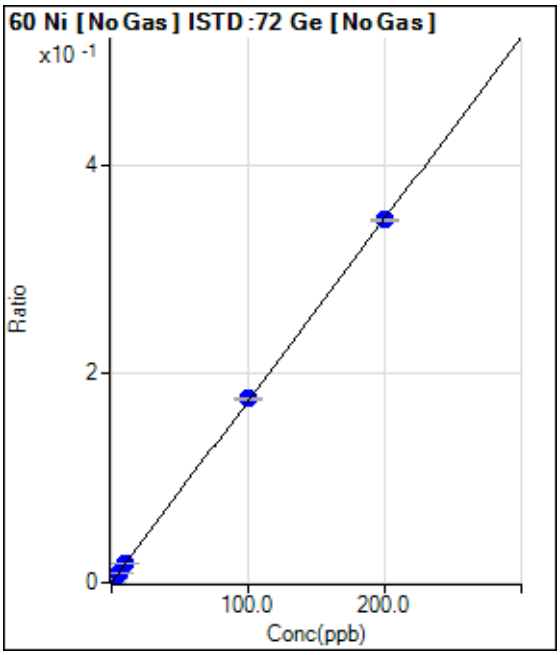
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	33.33	0.0000	P	75.6
2	☐	2.000	1.884	14688.12	0.0210	P	4.0
3	☐	5.000	4.772	37528.52	0.0532	P	3.4
4	☐	10.000	9.576	74587.09	0.1067	P	0.5
5	☐	100.000	96.338	739721.81	1.0735	P	0.6
6	☐	200.000	201.859	1526007.06	2.2492	A	1.1

y = 0.0111 * x + 4.8018E-005
R = 0.9998
DL = 0.009775
BEC = 0.00431

Weight: <None>
Min Conc: <None>

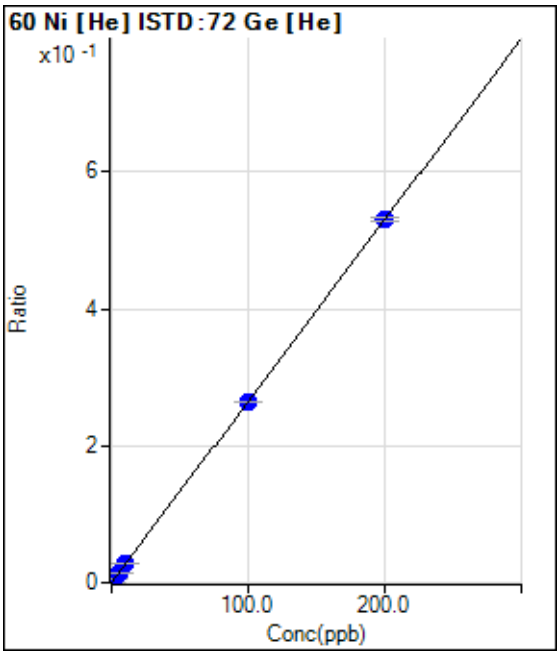


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	413.35	0.0002	P	4.7
2	☐	2.000	2.063	8122.56	0.0038	P	1.1
3	☐	5.000	4.979	19010.27	0.0089	P	3.2
4	☐	10.000	10.155	37979.88	0.0179	P	1.2
5	☐	100.000	101.033	368511.39	0.1762	P	1.7
6	☐	200.000	199.476	721702.54	0.3476	P	0.7

y = 0.0017 * x + 1.9318E-004
R = 1.0000
DL = 0.0156
BEC = 0.1109

Weight: <None>
Min Conc: <None>

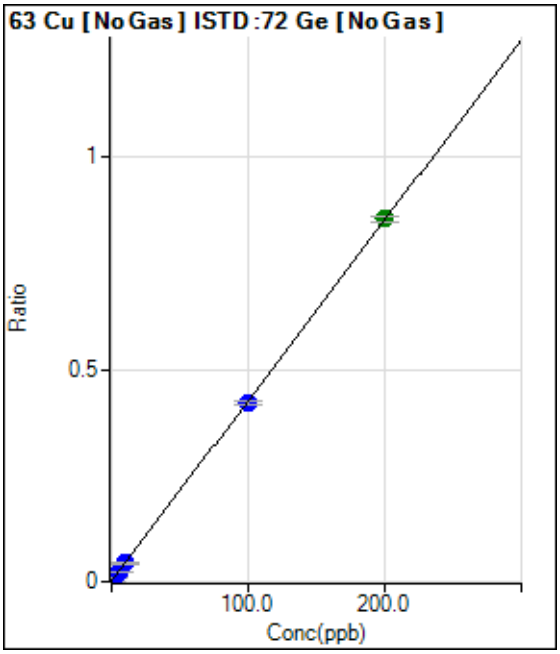
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	0.3
2	☐	2.000	2.087	3947.30	0.0057	P	5.8
3	☐	5.000	4.978	9390.02	0.0133	P	0.7
4	☐	10.000	10.122	18819.89	0.0269	P	0.8
5	☐	100.000	99.856	182307.53	0.2645	P	0.2
6	☐	200.000	200.066	359532.01	0.5299	P	1.1

y = 0.0026 * x + 1.2967E-004
R = 1.0000
DL = 0.0004827
BEC = 0.04897

Weight: <None>
Min Conc: <None>

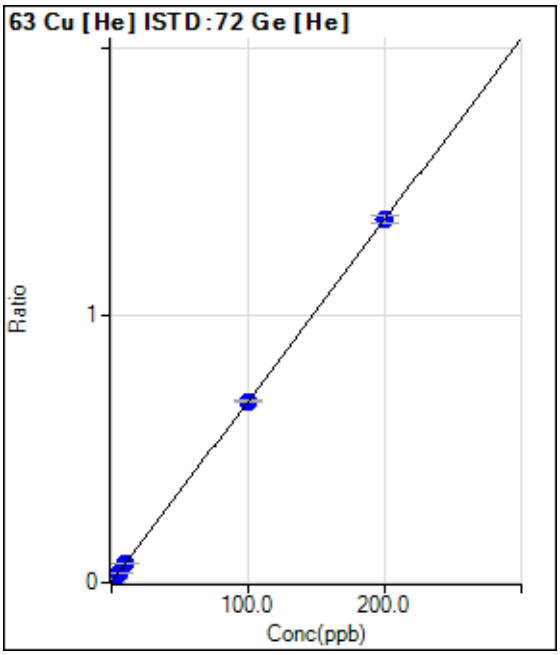


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2376.93	0.0011	P	4.9
2	☐	2.000	1.875	19484.22	0.0091	P	2.0
3	☐	5.000	4.875	46824.36	0.0218	P	4.0
4	☐	10.000	9.943	92140.88	0.0434	P	1.7
5	☐	100.000	98.504	878314.15	0.4199	P	2.0
6	☐	200.000	200.755	1774057.53	0.8546	A	1.9

y = 0.0043 * x + 0.0011
R = 1.0000
DL = 0.03844
BEC = 0.2614

Weight: <None>
Min Conc: <None>

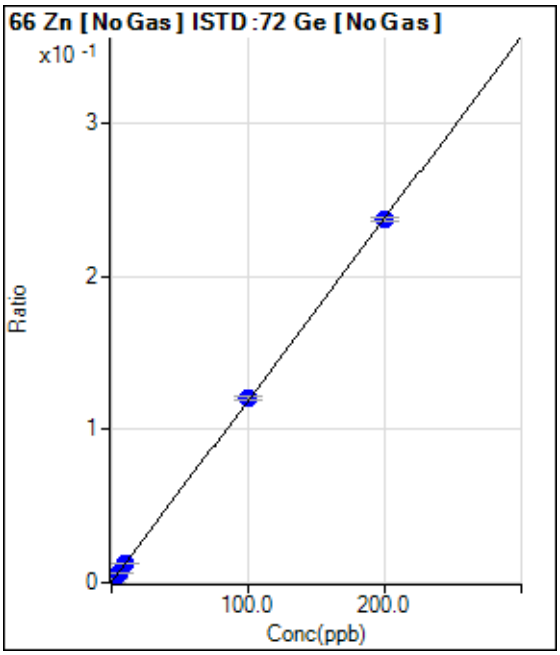
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	983.38	0.0014	P	4.2
2	☐	2.000	1.994	10427.52	0.0149	P	6.4
3	☐	5.000	4.908	24472.29	0.0347	P	1.9
4	☐	10.000	10.035	48530.34	0.0695	P	2.4
5	☐	100.000	100.017	468287.56	0.6795	P	0.2
6	☐	200.000	199.992	920881.78	1.3574	P	2.1

y = 0.0068 * x + 0.0014
R = 1.0000
DL = 0.02615
BEC = 0.209

Weight: <None>
Min Conc: <None>

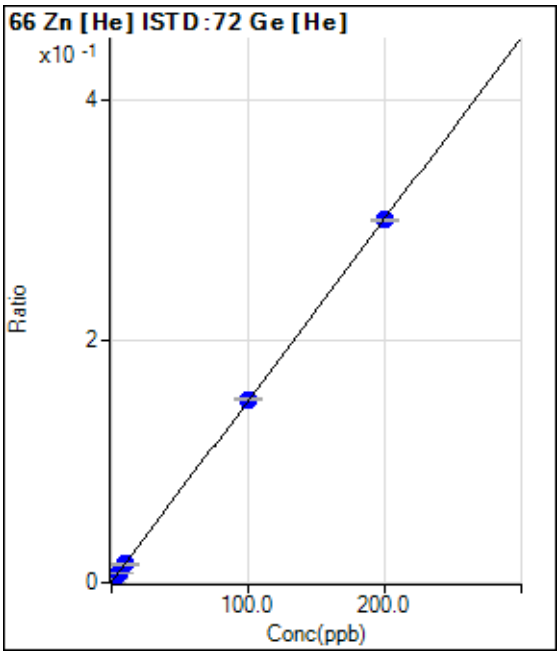


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	626.69	0.0003	P	29.2
2	☐	2.000	1.873	5394.50	0.0025	P	5.3
3	☐	5.000	5.037	13443.56	0.0063	P	1.9
4	☐	10.000	9.986	25788.16	0.0121	P	1.7
5	☐	100.000	101.425	252361.26	0.1206	P	1.4
6	☐	200.000	199.288	491509.50	0.2368	P	1.1

y = 0.0012 * x + 2.9278E-004
R = 1.0000
DL = 0.2161
BEC = 0.2468

Weight: <None>
Min Conc: <None>

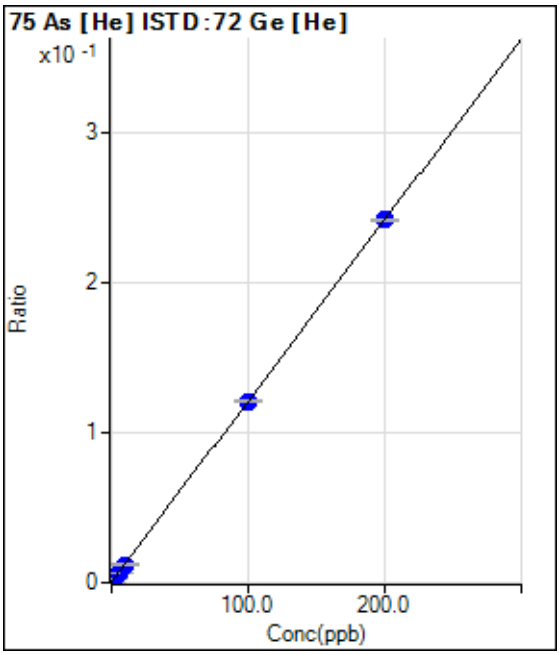
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	266.68	0.0004	P	12.3
2	☐	2.000	1.855	2213.56	0.0032	P	1.0
3	☐	5.000	4.842	5401.17	0.0077	P	7.6
4	☐	10.000	9.816	10574.28	0.0151	P	3.9
5	☐	100.000	100.860	104691.33	0.1519	P	0.6
6	☐	200.000	199.584	203721.61	0.3003	P	0.8

y = 0.0015 * x + 3.8432E-004
R = 1.0000
DL = 0.09465
BEC = 0.2558

Weight: <None>
Min Conc: <None>

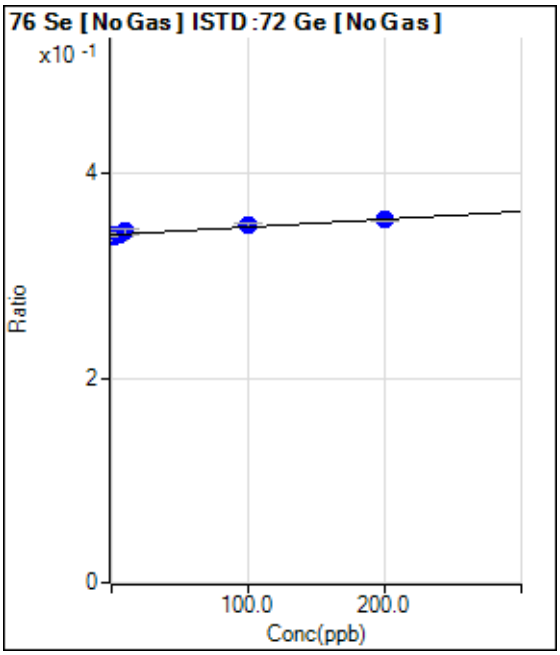


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	317.79	0.0005	P	8.8
2	☐	2.000	1.910	1925.71	0.0028	P	1.6
3	☐	5.000	4.725	4337.39	0.0061	P	2.2
4	☐	10.000	9.667	8458.24	0.0121	P	2.6
5	☐	100.000	99.868	83221.19	0.1208	P	0.9
6	☐	200.000	200.091	163860.94	0.2415	P	0.8

y = 0.0012 * x + 4.5777E-004
R = 1.0000
DL = 0.1006
BEC = 0.38

Weight: <None>
Min Conc: <None>

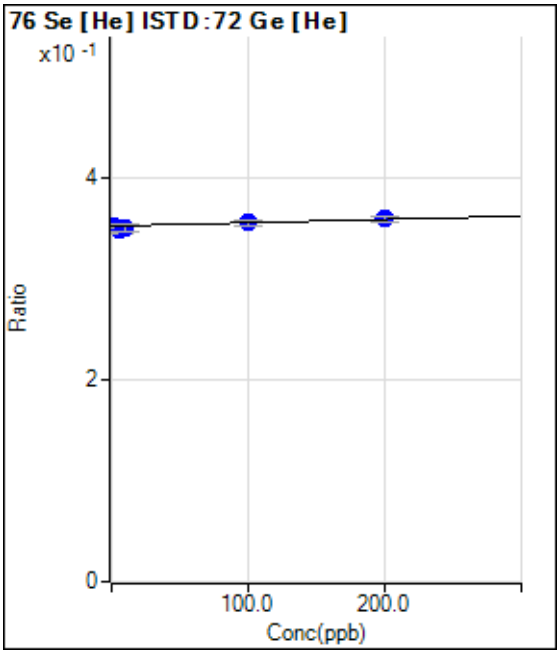
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	727412.57	0.3400	P	0.5
2	☐	2.000	-29.630	724616.68	0.3377	P	1.4
3	☐	5.000	-2.077	728842.23	0.3398	P	1.0
4	☐	10.000	48.900	730107.75	0.3437	P	1.7
5	☐	100.000	115.843	729778.82	0.3489	P	1.0
6	☐	200.000	190.626	736115.51	0.3546	P	0.4

y = 7.6366E-005 * x + 0.3400
R = 0.9585
DL = 61.1
BEC = 4452

Weight: <None>
Min Conc: <None>

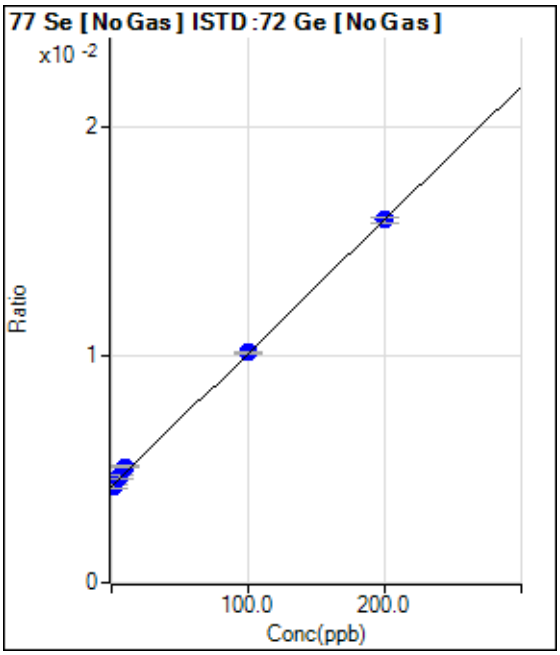


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244719.10	0.3526	P	1.0
2	☐	2.000	12.062	246438.62	0.3530	P	1.0
3	☐	5.000	-144.691	245345.07	0.3478	P	1.6
4	☐	10.000	-64.315	244886.86	0.3505	P	1.8
5	☐	100.000	89.892	245009.27	0.3555	P	1.3
6	☐	200.000	212.411	243956.77	0.3596	P	1.4

y = 3.2851E-005 * x + 0.3526
R = 0.8815
DL = 335.5
BEC = 1.073E+04

Weight: <None>
Min Conc: <None>

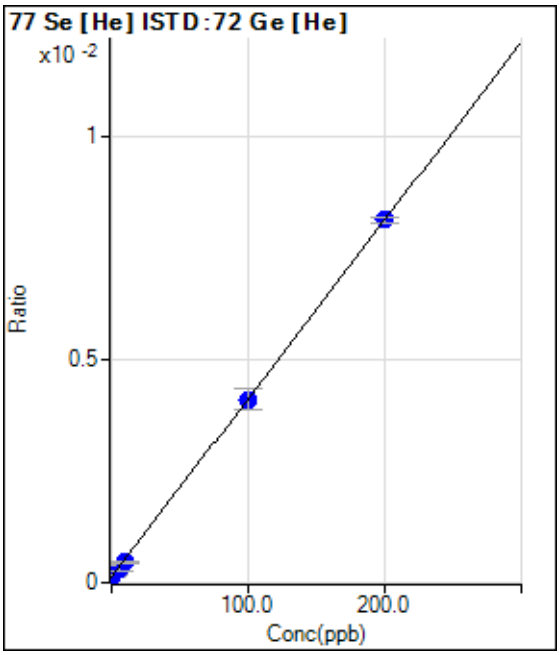
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9059.87	0.0042	P	3.3
2	☐	2.000	0.340	9126.57	0.0043	P	4.5
3	☐	5.000	7.334	10003.90	0.0047	P	2.8
4	☐	10.000	14.732	10831.15	0.0051	P	1.6
5	☐	100.000	100.191	21160.16	0.0101	P	1.1
6	☐	200.000	199.626	33111.02	0.0159	P	1.8

y = 5.8684E-005 * x + 0.0042
R = 0.9996
DL = 7.179
BEC = 72.16

Weight: <None>
Min Conc: <None>

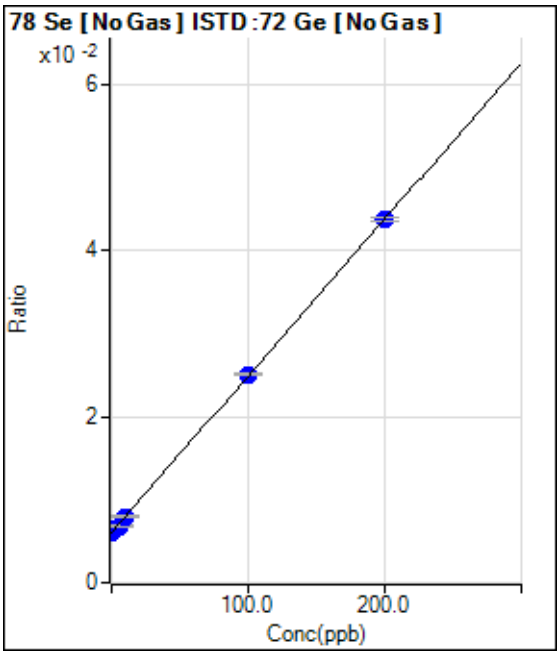


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	11.3
2	☐	2.000	1.651	136.67	0.0002	P	15.5
3	☐	5.000	4.656	223.34	0.0003	P	35.3
4	☐	10.000	8.311	323.34	0.0005	P	6.7
5	☐	100.000	99.748	2843.69	0.0041	P	10.9
6	☐	200.000	200.222	5527.91	0.0081	P	1.8

y = 4.0046E-005 * x + 1.2970E-004
R = 1.0000
DL = 1.102
BEC = 3.239

Weight: <None>
Min Conc: <None>

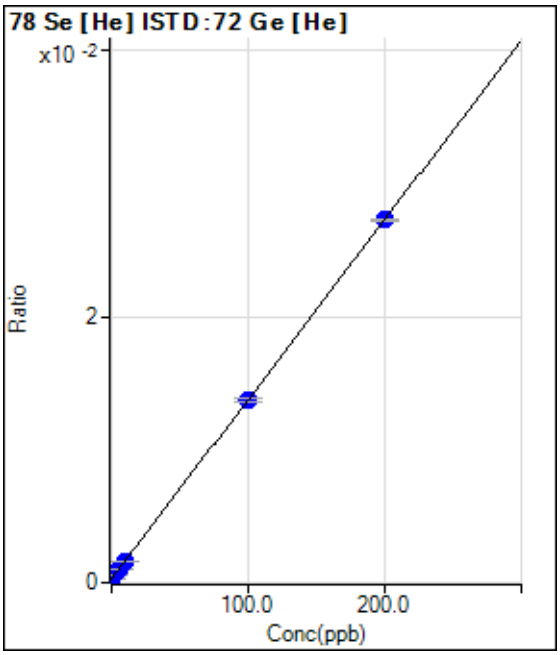
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12976.40	0.0061	P	3.4
2	☐	2.000	2.102	13864.03	0.0065	P	6.1
3	☐	5.000	3.962	14611.46	0.0068	P	1.0
4	☐	10.000	9.740	16784.01	0.0079	P	3.2
5	☐	100.000	100.925	52525.64	0.0251	P	0.9
6	☐	200.000	199.575	90771.54	0.0437	P	0.9

y = 1.8869E-004 * x + 0.0061
R = 1.0000
DL = 3.288
BEC = 32.14

Weight: <None>
Min Conc: <None>

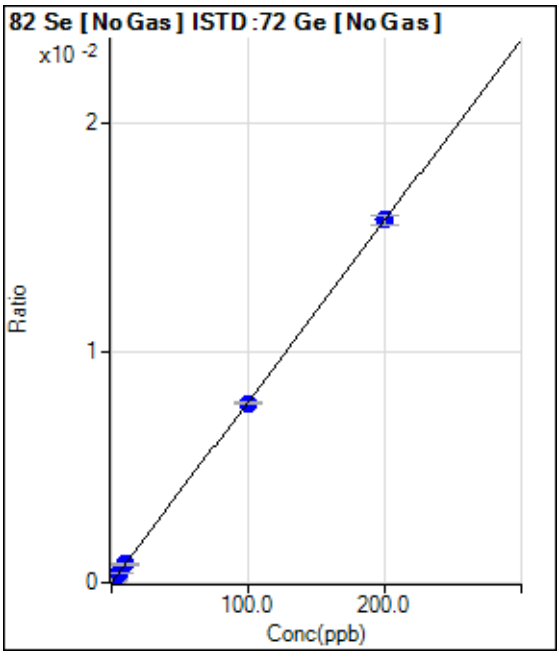


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	191.33	0.0003	P	10.2
2	☐	2.000	2.075	388.01	0.0006	P	1.9
3	☐	5.000	5.114	681.35	0.0010	P	3.5
4	☐	10.000	9.702	1108.05	0.0016	P	5.3
5	☐	100.000	99.935	9484.69	0.0138	P	1.7
6	☐	200.000	200.044	18505.35	0.0273	P	0.3

y = 1.3496E-004 * x + 2.7573E-004
R = 1.0000
DL = 0.6278
BEC = 2.043

Weight: <None>
Min Conc: <None>

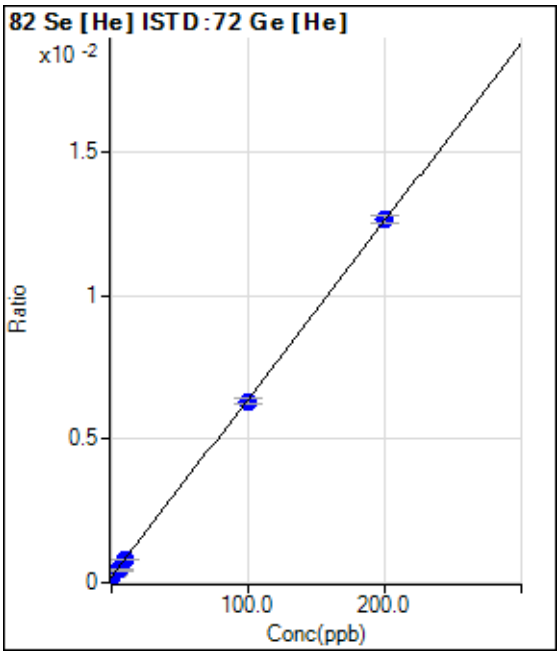
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-47.84	0.0000	P	-178.9
2	☐	2.000	1.670	234.98	0.0001	P	65.7
3	☐	5.000	5.042	805.87	0.0004	P	8.0
4	☐	10.000	10.416	1698.71	0.0008	P	10.9
5	☐	100.000	99.061	16312.69	0.0078	P	1.0
6	☐	200.000	200.451	32806.75	0.0158	P	2.4

y = 7.8946E-005 * x - 2.2463E-005
R = 1.0000
DL = 1.527
BEC = -0.2845

Weight: <None>
Min Conc: <None>

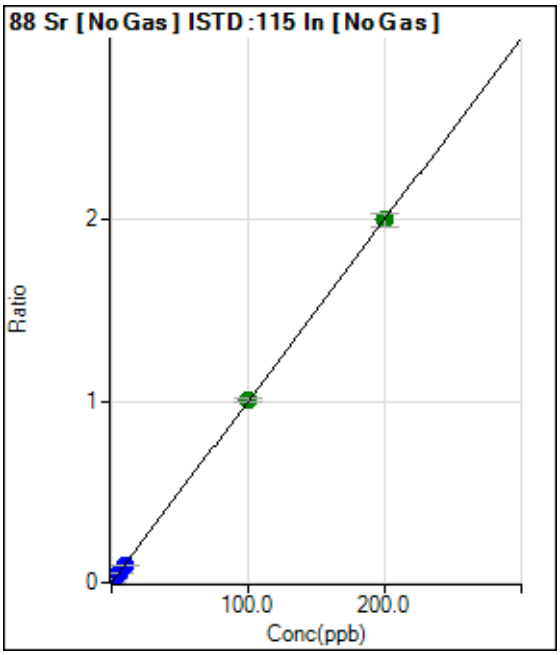


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0002	P	31.1
2	☐	2.000	1.835	223.34	0.0003	P	13.4
3	☐	5.000	3.838	313.34	0.0004	P	6.1
4	☐	10.000	9.532	556.69	0.0008	P	4.5
5	☐	100.000	98.807	4360.79	0.0063	P	3.4
6	☐	200.000	200.651	8572.88	0.0126	P	2.2

y = 6.1943E-005 * x + 2.0638E-004
R = 1.0000
DL = 3.112
BEC = 3.332

Weight: <None>
Min Conc: <None>

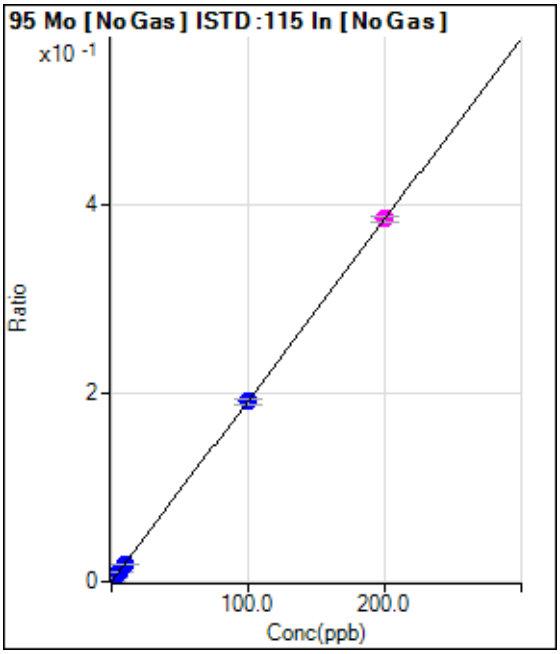
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1343.43	0.0005	P	10.1
2	☐	2.000	1.873	52359.32	0.0192	P	1.6
3	☐	5.000	4.780	131241.93	0.0483	P	0.6
4	☐	10.000	9.487	261107.26	0.0954	P	0.6
5	☐	100.000	100.306	2644517.98	1.0035	A	2.1
6	☐	200.000	199.879	5225902.53	1.9992	A	3.4

y = 0.0100 * x + 4.9411E-004
R = 1.0000
DL = 0.01501
BEC = 0.04941

Weight: <None>
Min Conc: <None>

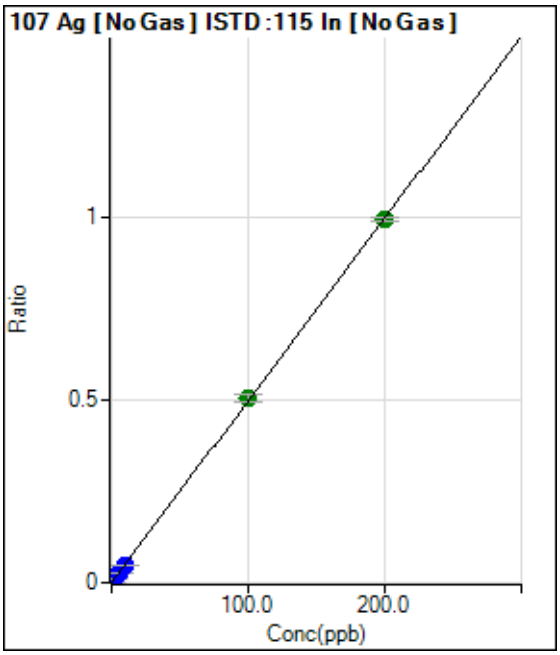


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	35.7
2	☐	2.000	1.924	10147.36	0.0037	P	1.3
3	☐	5.000	4.843	25397.84	0.0093	P	0.3
4	☐	10.000	9.588	50606.31	0.0185	P	1.0
5	☐	100.000	99.342	504255.51	0.1914	P	2.3
6	☐	200.000	200.354	1008879.65	0.3859	M	1.3

y = 0.0019 * x + 1.8426E-005
R = 1.0000
DL = 0.01024
BEC = 0.009567

Weight: <None>
Min Conc: <None>

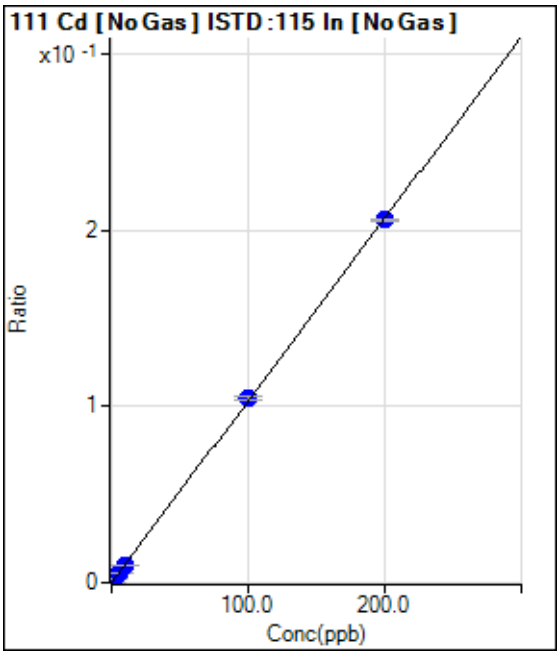
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	160.00	0.0001	P	28.3
2	☐	2.000	1.904	25945.63	0.0095	P	1.6
3	☐	5.000	4.767	64574.07	0.0238	P	0.4
4	☐	10.000	9.704	132276.17	0.0483	P	1.3
5	☐	100.000	101.404	1328584.30	0.5043	A	4.2
6	☐	200.000	199.319	2591097.26	0.9912	A	1.0

y = 0.0050 * x + 5.8942E-005
R = 1.0000
DL = 0.01005
BEC = 0.01185

Weight: <None>
Min Conc: <None>

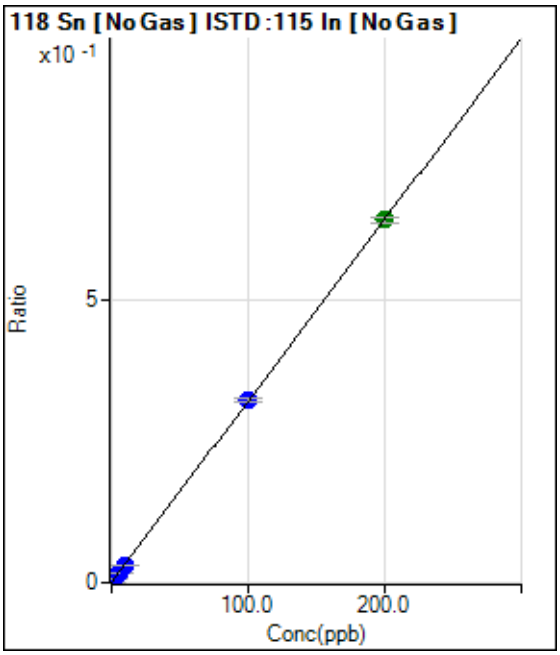


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	86.6
2	☐	2.000	1.908	5384.55	0.0020	P	5.2
3	☐	5.000	4.853	13650.59	0.0050	P	2.2
4	☐	10.000	9.859	27923.28	0.0102	P	0.8
5	☐	100.000	101.223	275812.55	0.1047	P	2.0
6	☐	200.000	199.400	538979.20	0.2062	P	0.3

y = 0.0010 * x + 4.8773E-006
R = 1.0000
DL = 0.01226
BEC = 0.004718

Weight: <None>
Min Conc: <None>

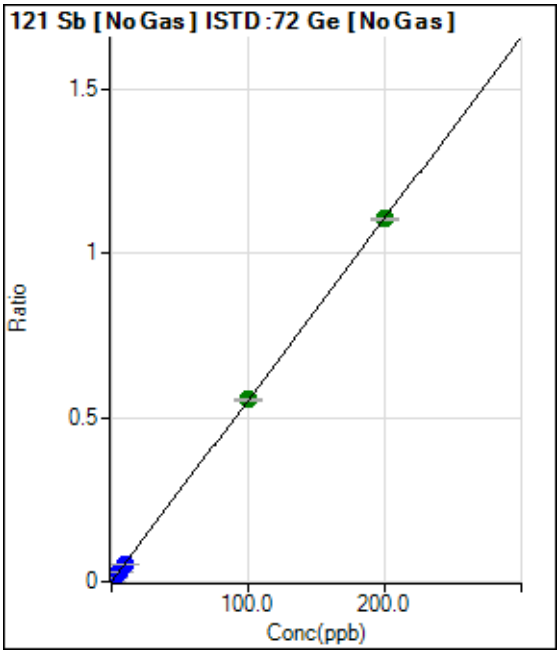
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1323.42	0.0005	P	6.9
2	☐	2.000	1.909	17992.65	0.0066	P	6.0
3	☐	5.000	4.844	43522.43	0.0160	P	1.2
4	☐	10.000	9.631	85859.65	0.0314	P	1.2
5	☐	100.000	100.163	847408.76	0.3216	P	2.3
6	☐	200.000	199.942	1676551.59	0.6414	A	1.9

y = 0.0032 * x + 4.8650E-004
R = 1.0000
DL = 0.03142
BEC = 0.1518

Weight: <None>
Min Conc: <None>

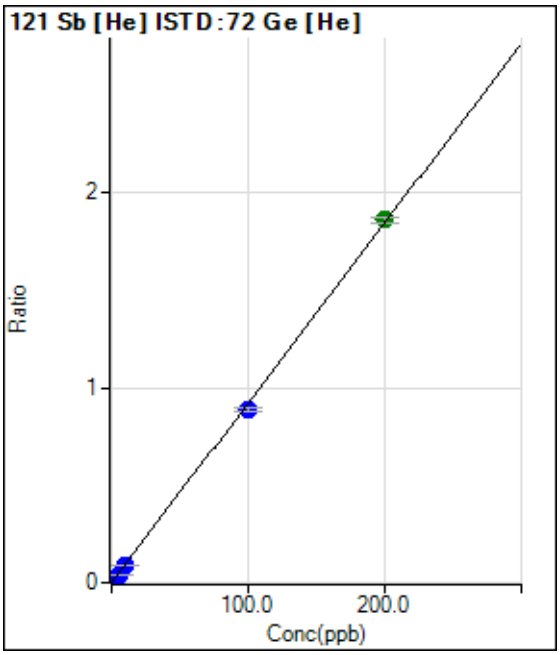


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	430.02	0.0002	P	19.6
2	☐	2.000	1.861	22526.25	0.0105	P	1.3
3	☐	5.000	4.824	57666.64	0.0269	P	2.5
4	☐	10.000	9.769	115192.57	0.0542	P	4.4
5	☐	100.000	100.341	1161695.11	0.5553	A	0.6
6	☐	200.000	199.847	2295859.34	1.1058	A	0.6

y = 0.0055 * x + 2.0093E-004
R = 1.0000
DL = 0.02138
BEC = 0.03632

Weight: <None>
Min Conc: <None>

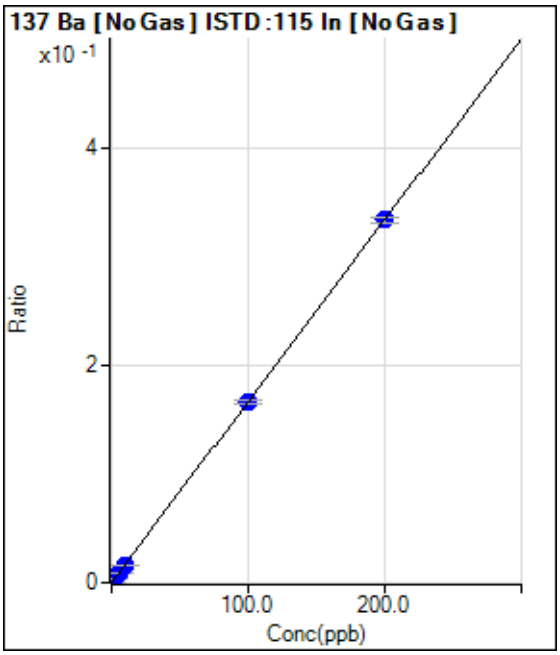
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	213.34	0.0003	P	22.0
2	☐	2.000	1.836	12029.07	0.0172	P	0.8
3	☐	5.000	4.626	30285.26	0.0429	P	1.1
4	☐	10.000	9.330	60291.79	0.0863	P	0.3
5	☐	100.000	96.372	612148.93	0.8884	P	1.5
6	☐	200.000	201.859	1262334.83	1.8605	A	1.3

y = 0.0092 * x + 3.0731E-004
R = 0.9998
DL = 0.02201
BEC = 0.03335

Weight: <None>
Min Conc: <None>

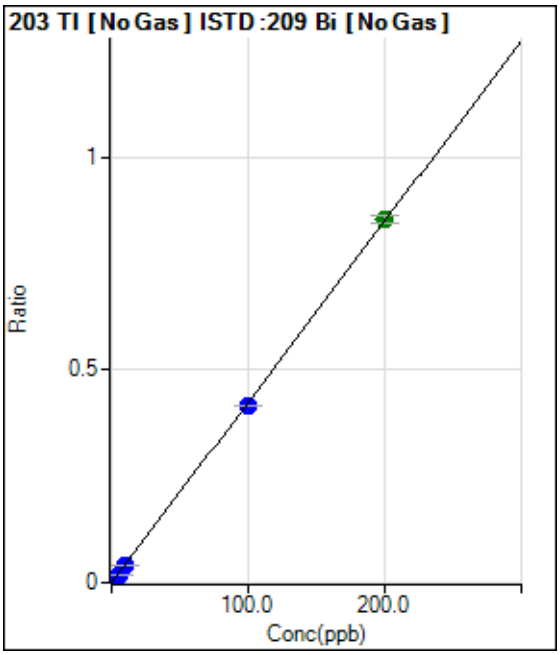


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	220.01	0.0001	P	11.1
2	☐	2.000	1.898	8826.49	0.0032	P	0.8
3	☐	5.000	4.815	21998.89	0.0081	P	2.6
4	☐	10.000	9.627	44085.02	0.0161	P	2.2
5	☐	100.000	99.635	437151.43	0.1659	P	2.8
6	☐	200.000	200.207	871177.83	0.3333	P	1.5

y = 0.0017 * x + 8.0844E-005
R = 1.0000
DL = 0.01623
BEC = 0.04858

Weight: <None>
Min Conc: <None>

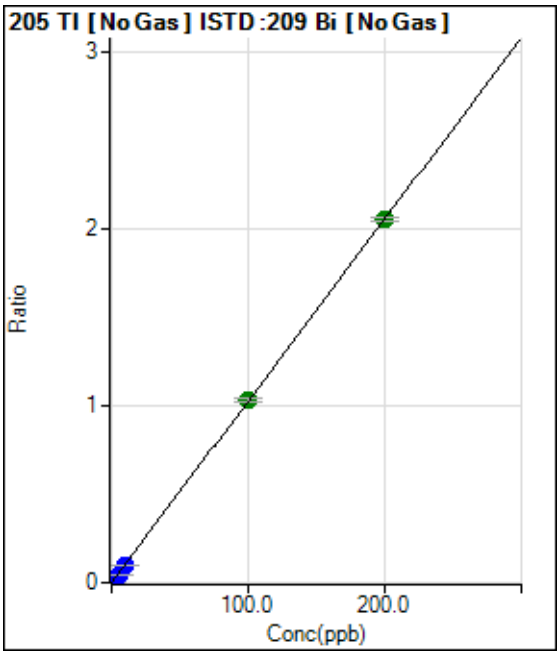
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0000	P	65.1
2	☐	2.000	1.848	20089.72	0.0079	P	2.8
3	☐	5.000	4.734	52125.72	0.0201	P	1.0
4	☐	10.000	9.829	105301.46	0.0417	P	1.2
5	☐	100.000	98.258	1053303.71	0.4168	P	0.4
6	☐	200.000	200.887	2120172.52	0.8522	A	2.2

y = 0.0042 * x + 2.0878E-005
R = 0.9999
DL = 0.009612
BEC = 0.004922

Weight: <None>
Min Conc: <None>

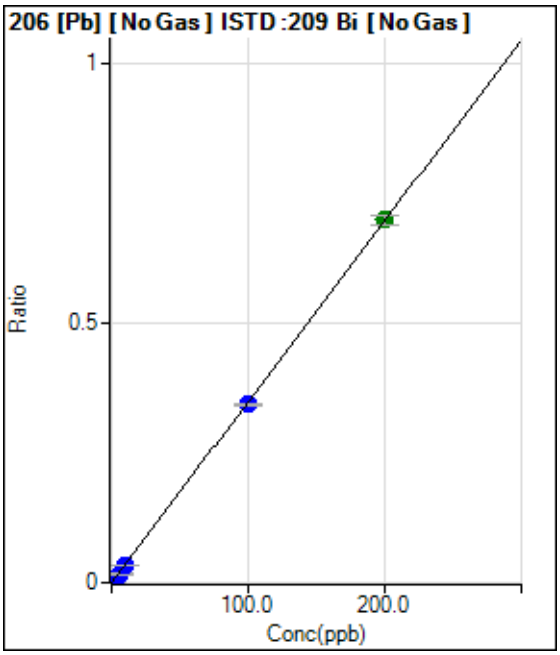


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	86.67	0.0000	P	51.8
2	☐	2.000	1.854	48661.91	0.0190	P	2.5
3	☐	5.000	4.650	123715.88	0.0477	P	2.6
4	☐	10.000	9.721	251697.18	0.0997	P	0.8
5	☐	100.000	100.609	2606829.28	1.0316	A	1.5
6	☐	200.000	199.720	5096070.03	2.0479	A	1.0

y = 0.0103 * x + 3.4236E-005
R = 1.0000
DL = 0.005189
BEC = 0.003339

Weight: <None>
Min Conc: <None>

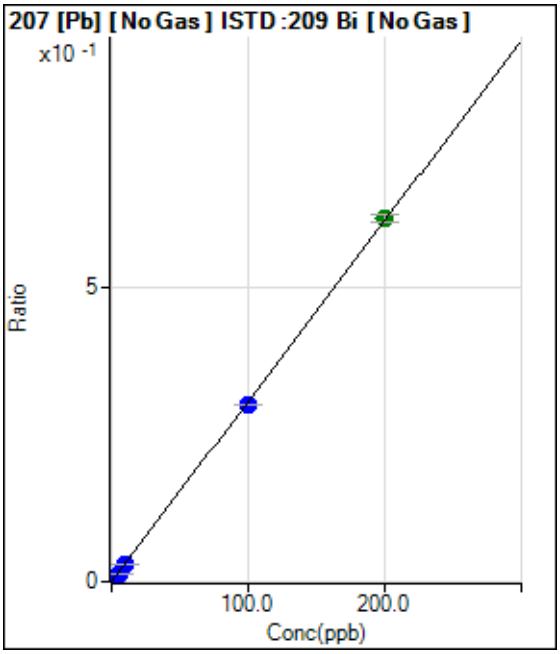
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	170.00	0.0001	P	25.7
2	☐	2.000	1.909	17165.45	0.0067	P	3.6
3	☐	5.000	4.728	42880.69	0.0165	P	2.0
4	☐	10.000	9.926	87448.76	0.0346	P	1.2
5	☐	100.000	98.667	868698.48	0.3438	P	1.1
6	☐	200.000	200.678	1739395.81	0.6991	A	2.8

y = 0.0035 * x + 6.7264E-005
R = 1.0000
DL = 0.01491
BEC = 0.01931

Weight: <None>
Min Conc: <None>

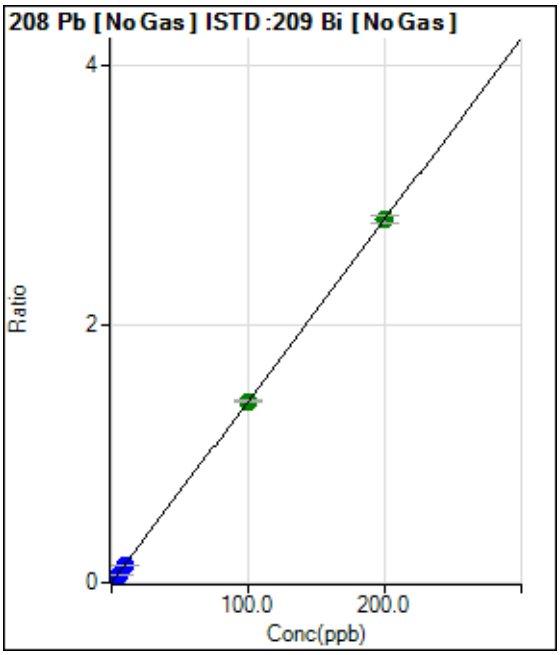


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0001	P	37.0
2	☐	2.000	1.865	14782.39	0.0058	P	0.8
3	☐	5.000	4.678	37386.66	0.0144	P	1.1
4	☐	10.000	9.750	75706.30	0.0300	P	3.3
5	☐	100.000	97.788	758791.34	0.3003	P	0.5
6	☐	200.000	201.128	1536432.27	0.6175	A	2.3

y = 0.0031 * x + 5.6821E-005
R = 0.9999
DL = 0.02052
BEC = 0.01851

Weight: <None>
Min Conc: <None>

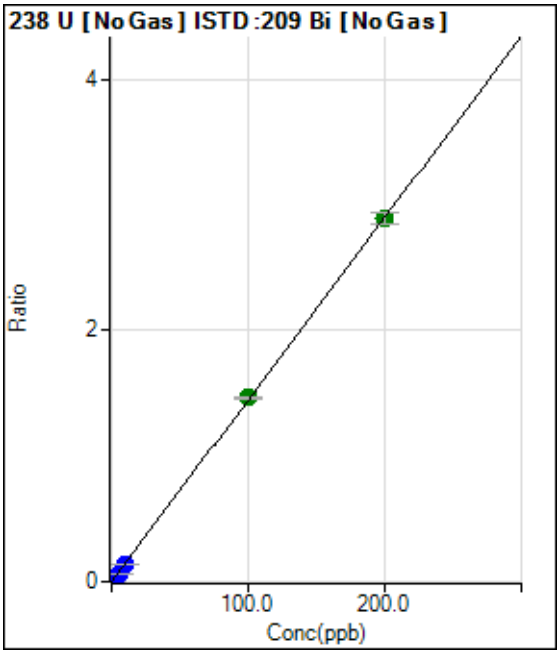
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	656.68	0.0003	P	17.3
2	☐	2.000	1.874	67859.79	0.0265	P	1.8
3	☐	5.000	4.707	171927.26	0.0663	P	1.7
4	☐	10.000	9.791	347423.54	0.1376	P	0.8
5	☐	100.000	100.141	3551009.12	1.4053	A	0.8
6	☐	200.000	199.948	6980568.75	2.8056	A	2.1

y = 0.0140 * x + 2.5944E-004
R = 1.0000
DL = 0.009597
BEC = 0.01849

Weight: <None>
Min Conc: <None>

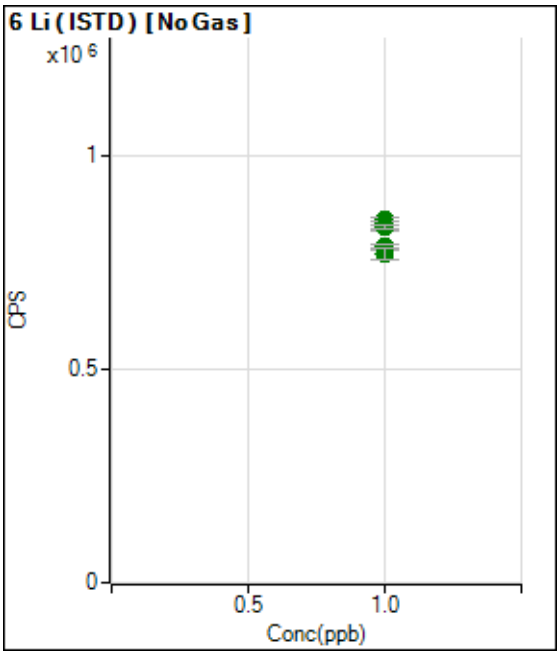


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	40.00	0.0000	P	43.9
2	☐	2.000	1.852	68618.76	0.0268	P	2.1
3	☐	5.000	4.556	171188.53	0.0660	P	2.2
4	☐	10.000	9.419	344517.43	0.1365	P	0.4
5	☐	100.000	101.071	3700484.21	1.4644	A	0.6
6	☐	200.000	199.506	7191373.85	2.8906	A	3.0

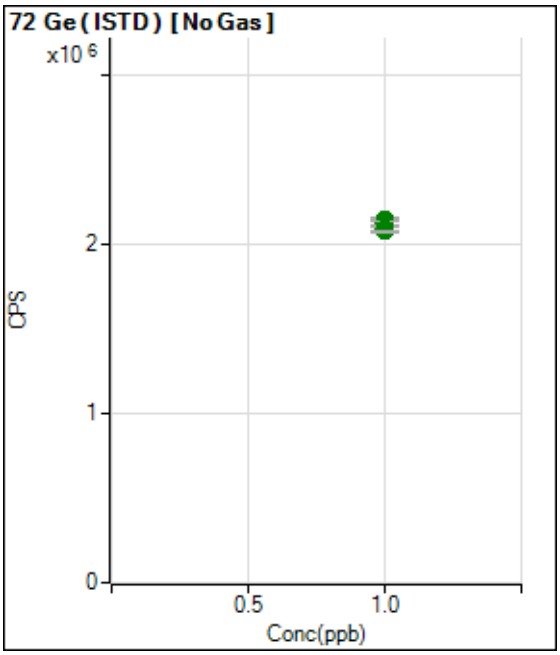
y = 0.0145 * x + 1.5811E-005
R = 1.0000
DL = 0.001437
BEC = 0.001091

Weight: <None>
Min Conc: <None>

Calibration for 162_ICV.d

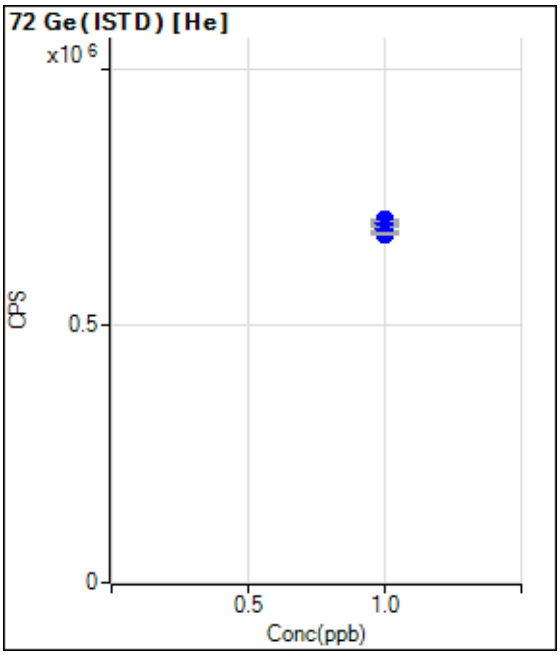


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		851396.56		A	1.0
2	☐	1.000		844098.40		A	1.3
3	☐	1.000		833751.25		A	1.4
4	☐	1.000		834919.48		A	0.8
5	☐	1.000		788191.01		A	2.1
6	☐	1.000		771890.78		A	3.5

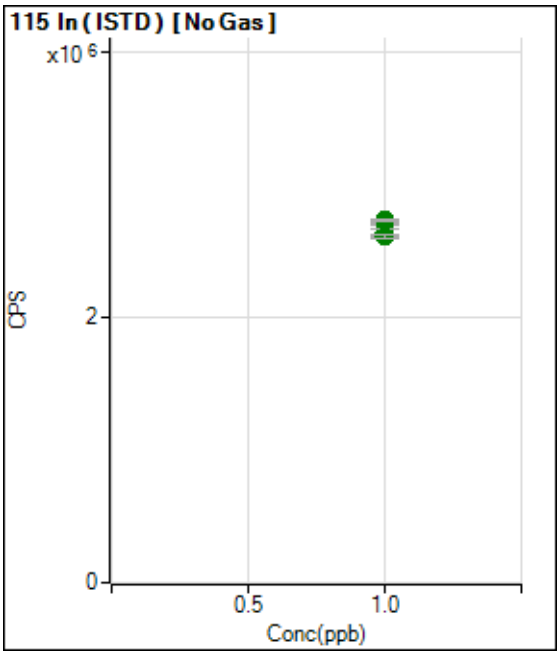


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2139407.73		A	0.4
2	☐	1.000		2145638.15		A	0.9
3	☐	1.000		2144715.12		A	0.8
4	☐	1.000		2124268.15		A	1.2
5	☐	1.000		2092022.57		A	0.9
6	☐	1.000		2076150.54		A	0.9

Calibration for 162_ICV.d

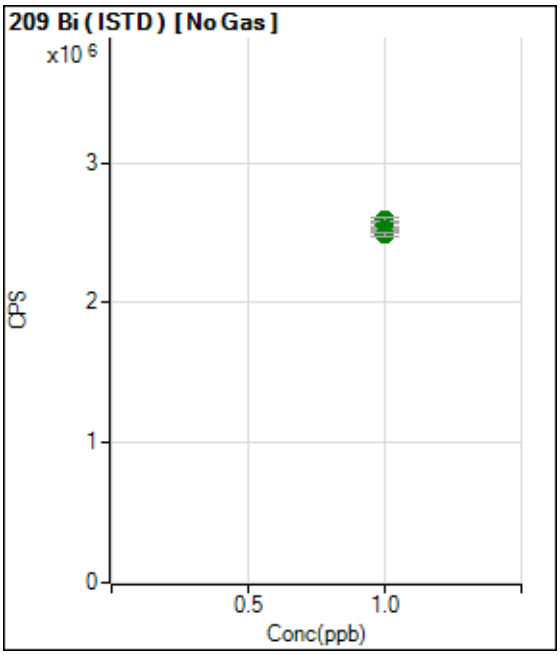


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		694064.57		P	0.3
2	☐	1.000		698154.70		P	0.5
3	☐	1.000		705354.52		P	0.7
4	☐	1.000		698779.05		P	1.1
5	☐	1.000		689128.38		P	1.0
6	☐	1.000		678517.99		P	1.0



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2719437.47		A	1.0
2	☐	1.000		2724329.72		A	1.1
3	☐	1.000		2717717.10		A	0.3
4	☐	1.000		2737982.30		A	0.7
5	☐	1.000		2636127.70		A	2.2
6	☐	1.000		2614362.72		A	1.4

Calibration for 162_ICV.d



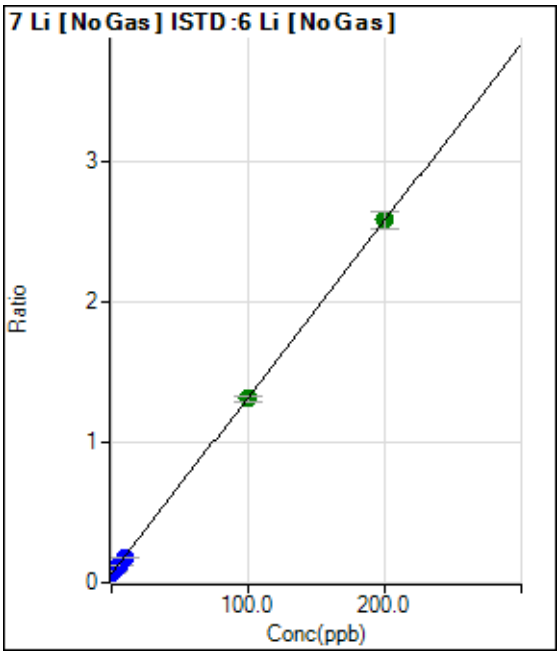
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2536806.21		A	2.3
2	☐	1.000		2556187.20		A	0.9
3	☐	1.000		2593317.67		A	1.2
4	☐	1.000		2524222.72		A	0.8
5	☐	1.000		2526930.85		A	0.6
6	☐	1.000		2488386.47		A	1.1

Calibration for 015_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 7:42:15 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	008CALB.d	CAL BLK	12/15/2021 11:06:53 AM
2	009CALS.d	2/10/200	12/15/2021 11:08:50 AM
3	010CALS.d	5/25/500	12/15/2021 11:10:48 AM
4	011CALS.d	10/50/100	12/15/2021 11:12:46 AM
5	012CALS.d	100/500/10K	12/15/2021 11:14:44 AM
6	013CALS.d	200/1000/20K	12/15/2021 11:16:36 AM

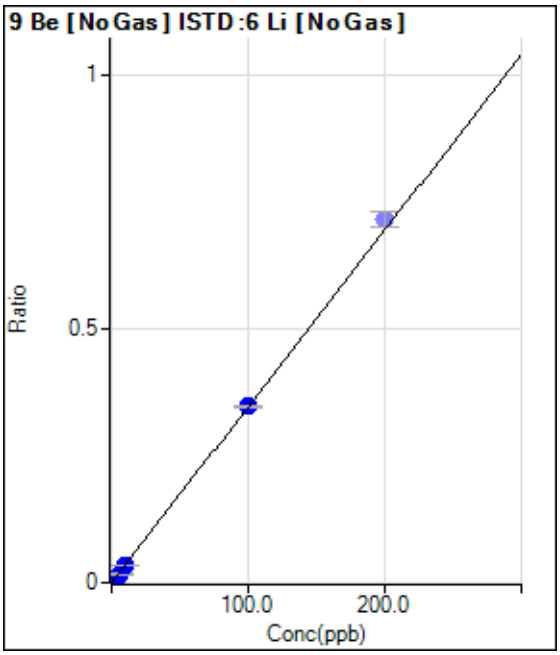
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	58628.02	0.0629	P	2.7
2	☐	2.000	1.810	78792.14	0.0857	P	0.6
3	☐	5.000	4.742	111488.67	0.1225	P	2.4
4	☐	10.000	9.165	165738.28	0.1781	P	1.1
5	☐	100.000	99.260	1150972.46	1.3101	A	3.1
6	☐	200.000	200.420	2174305.38	2.5811	A	5.1

y = 0.0126 * x + 0.0629
R = 1.0000
DL = 0.4019
BEC = 5.01

Weight: <None>
Min Conc: <None>

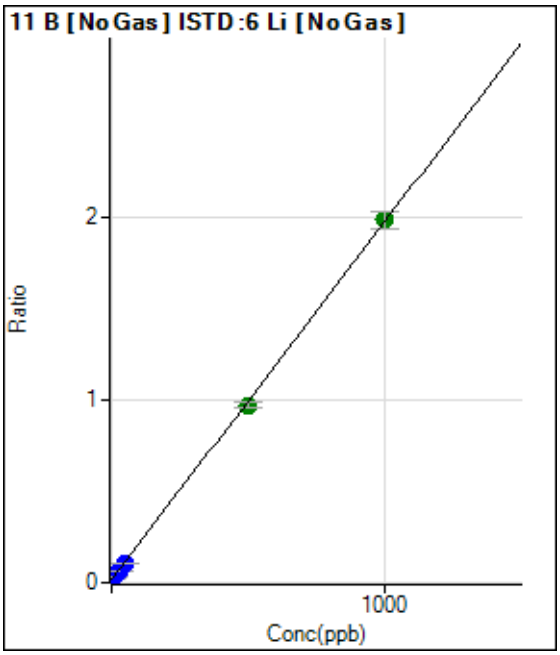


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	35.00	0.0000	P	38.2
2	☐	2.000	1.843	5911.29	0.0064	P	1.7
3	☐	5.000	4.880	15428.53	0.0170	P	2.6
4	☐	10.000	9.453	30533.13	0.0328	P	2.0
5	☐	100.000	100.064	304758.41	0.3469	P	1.9
6	☑	200.000		602014.46	0.7145	P	4.4

y = 0.0035 * x + 3.7589E-005
R = 1.0000
DL = 0.01243
BEC = 0.01084

Weight: <None>
Min Conc: <None>

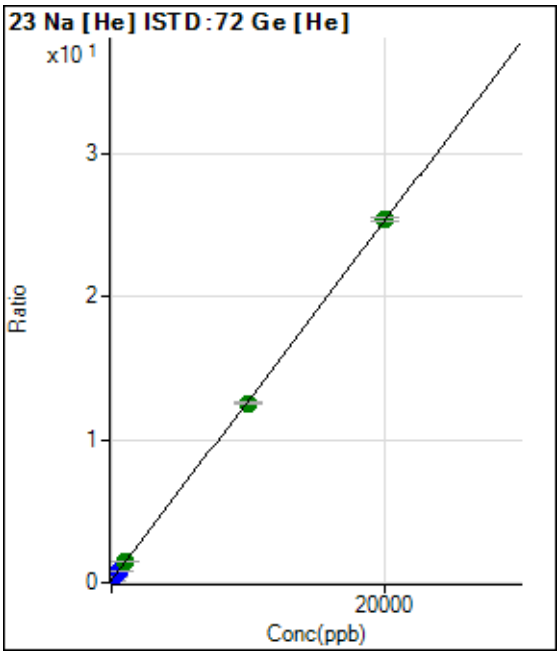
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	15086.53	0.0162	P	4.3
2	☐	10.000	8.783	30735.30	0.0334	P	1.6
3	☐	25.000	23.113	55959.36	0.0615	P	4.6
4	☐	50.000	45.927	98896.47	0.1063	P	4.1
5	☐	500.000	488.727	855953.48	0.9746	A	3.2
6	☐	1000.000	1005.900	1675507.37	1.9887	A	4.8

y = 0.0020 * x + 0.0162
R = 0.9999
DL = 1.058
BEC = 8.261

Weight: <None>
Min Conc: <None>

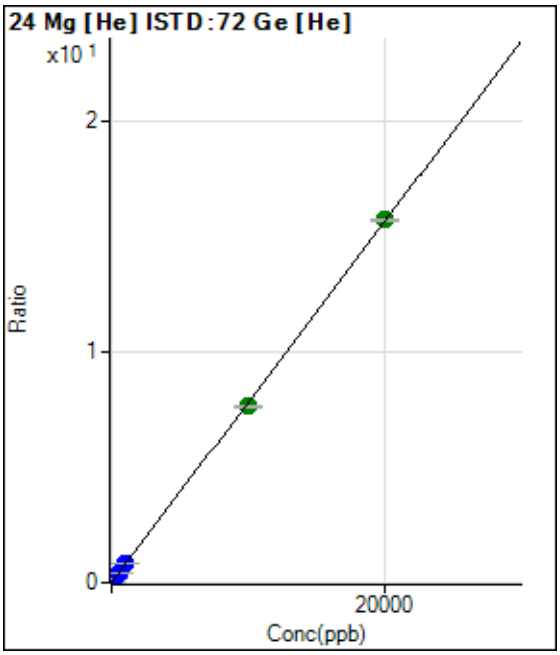


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	118768.40	0.1665	P	2.0
2	☐	200.000	198.922	295962.34	0.4164	P	0.8
3	☐	500.000	508.261	572668.50	0.8050	P	0.9
4	☐	1000.000	1023.779	1029697.20	1.4526	A	1.2
5	☐	10000.00	9853.266	8800545.91	12.5442	A	0.7
6	☐	20000.00	20071.98	17289039.74	25.3809	A	1.0

y = 0.0013 * x + 0.1665
R = 1.0000
DL = 7.979
BEC = 132.5

Weight: <None>
Min Conc: <None>

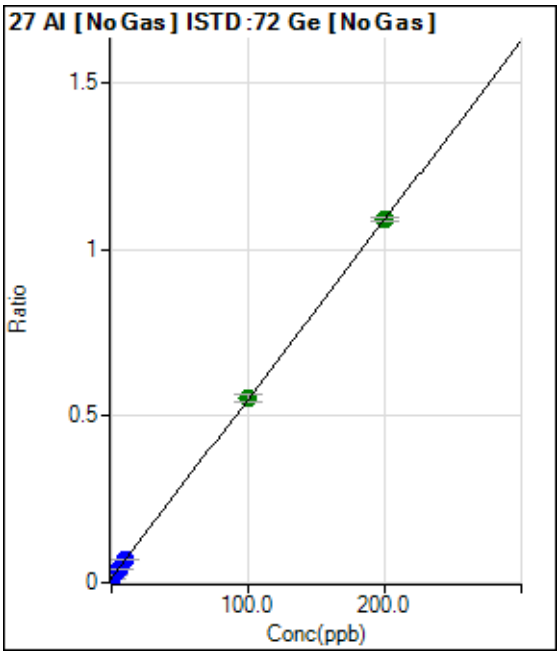
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	260.01	0.0004	P	43.2
2	☐	200.000	200.144	111362.24	0.1567	P	0.2
3	☐	500.000	512.031	284733.08	0.4002	P	1.1
4	☐	1000.000	1033.900	572602.53	0.8078	P	0.9
5	☐	10000.00	9790.616	5364572.63	7.6462	A	1.3
6	☐	20000.00	20102.69	10694104.84	15.6993	A	0.8

y = 7.8094E-004 * x + 3.6532E-004
R = 0.9999
DL = 0.6057
BEC = 0.4678

Weight: <None>
Min Conc: <None>

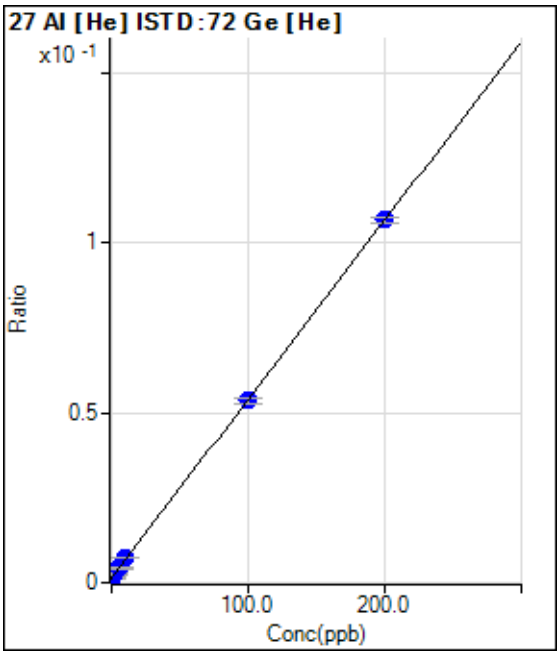


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	28716.77	0.0137	P	3.1
2	☐	2.000	2.077	51626.31	0.0249	P	1.0
3	☐	5.000	5.088	85568.91	0.0411	P	3.2
4	☐	10.000	10.424	143567.60	0.0698	P	2.6
5	☐	100.000	100.040	1114018.03	0.5518	A	4.3
6	☐	200.000	199.956	2157891.79	1.0893	A	1.1

y = 0.0054 * x + 0.0137
R = 1.0000
DL = 0.2399
BEC = 2.556

Weight: <None>
Min Conc: <None>

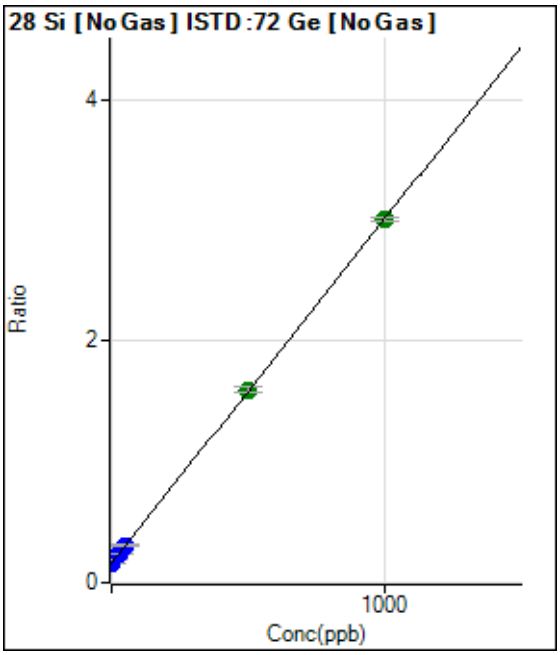
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1006.72	0.0014	P	12.2
2	☐	2.000	2.070	1776.81	0.0025	P	4.4
3	☐	5.000	5.418	3030.38	0.0043	P	9.4
4	☐	10.000	11.129	5147.71	0.0073	P	4.3
5	☐	100.000	99.176	37577.69	0.0536	P	2.6
6	☐	200.000	200.344	72726.42	0.1068	P	1.3

y = 5.2587E-004 * x + 0.0014
R = 1.0000
DL = 0.9836
BEC = 2.684

Weight: <None>
Min Conc: <None>

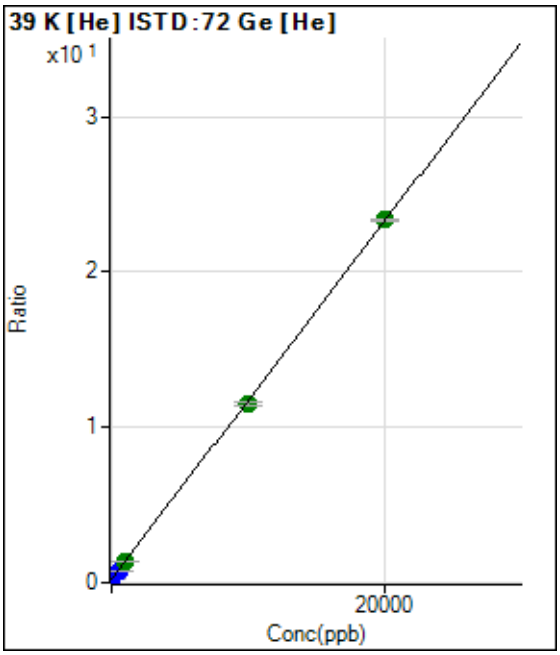


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	335760.93	0.1608	P	0.4
2	☐	10.000	14.203	416738.94	0.2012	P	10.1
3	☐	25.000	25.469	485684.00	0.2333	P	1.6
4	☐	50.000	51.851	634486.90	0.3085	P	2.2
5	☐	500.000	504.670	3229488.49	1.5990	A	2.2
6	☐	1000.000	997.519	5949471.37	3.0035	A	1.1

y = 0.0028 * x + 0.1608
R = 1.0000
DL = 0.7413
BEC = 56.41

Weight: <None>
Min Conc: <None>

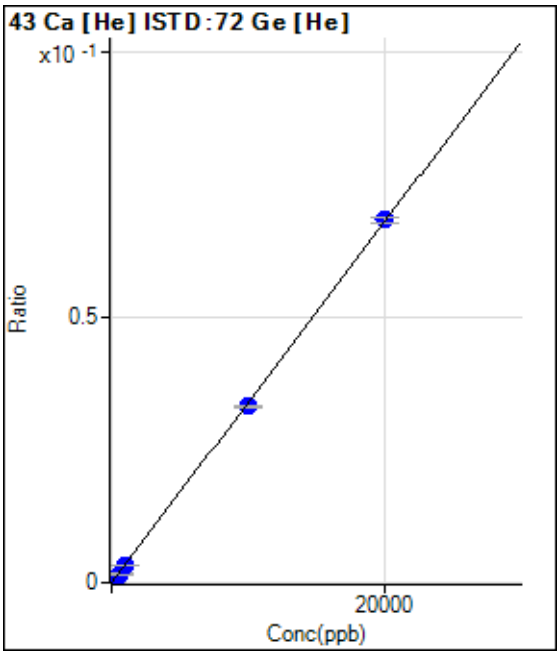
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	161478.41	0.2263	P	1.1
2	☐	200.000	192.427	318483.73	0.4481	P	0.6
3	☐	500.000	492.282	564567.52	0.7935	P	0.2
4	☐	1000.000	1017.715	991593.60	1.3989	A	2.6
5	☐	10000.00	9835.836	8109321.34	11.5592	A	2.4
6	☐	20000.00	20081.46	15915292.68	23.3642	A	0.7

y = 0.0012 * x + 0.2263
R = 1.0000
DL = 6.642
BEC = 196.4

Weight: <None>
Min Conc: <None>

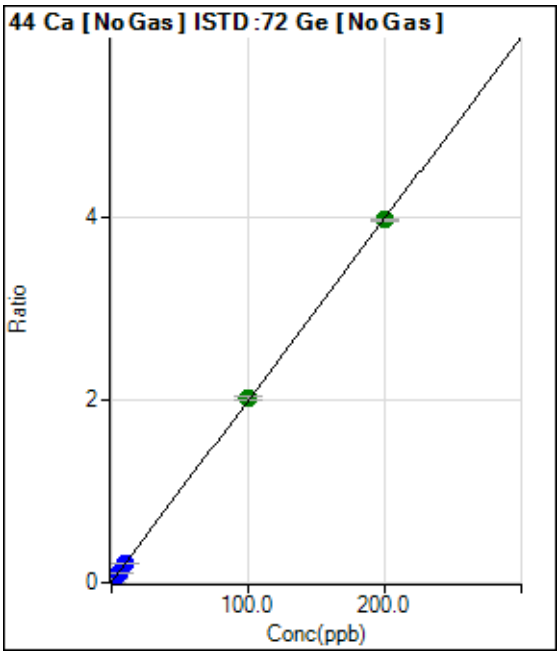


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30.00	0.0000	P	87.9
2	☐	200.000	187.820	483.35	0.0007	P	14.1
3	☐	500.000	438.611	1090.06	0.0015	P	15.9
4	☐	1000.000	952.504	2323.57	0.0033	P	2.1
5	☐	10000.00	9778.968	23336.73	0.0333	P	0.7
6	☐	20000.00	20114.54	46575.62	0.0684	P	1.9

y = 3.3973E-006 * x + 4.1913E-005
R = 0.9999
DL = 32.53
BEC = 12.34

Weight: <None>
Min Conc: <None>

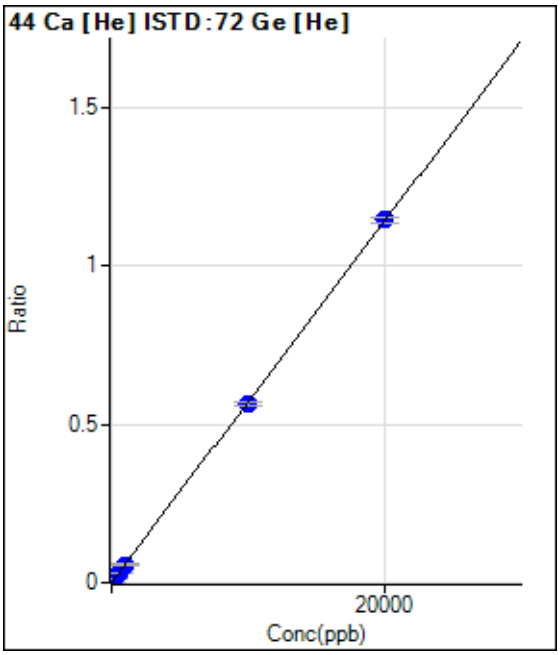
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14247.65	0.0068	P	1.2
2	☐	2.000	1.974	95264.75	0.0460	P	0.2
3	☐	5.000	4.891	216184.86	0.1039	P	1.3
4	☐	10.000	10.093	425802.01	0.2071	P	2.8
5	☐	100.000	101.219	4069402.54	2.0151	A	2.5
6	☐	200.000	199.389	7850137.80	3.9629	A	0.7

y = 0.0198 * x + 0.0068
R = 1.0000
DL = 0.01238
BEC = 0.3438

Weight: <None>
Min Conc: <None>

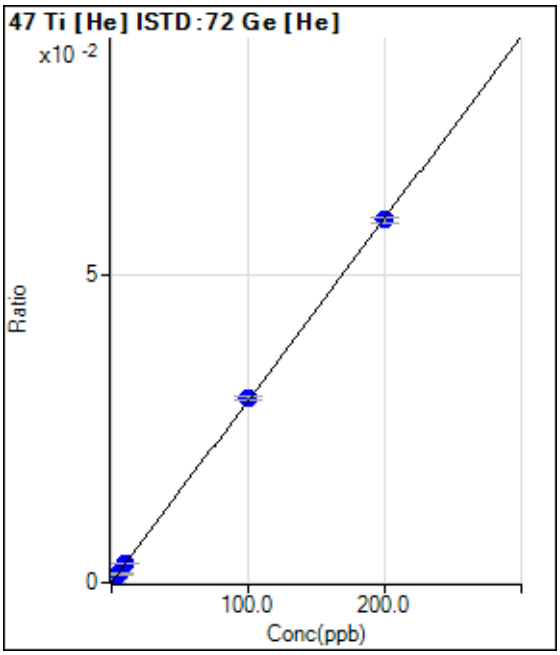


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	560.02	0.0008	P	10.5
2	☐	200.000	192.717	8376.01	0.0118	P	4.9
3	☐	500.000	484.923	20248.53	0.0285	P	1.9
4	☐	1000.000	996.662	40877.63	0.0577	P	1.9
5	☐	10000.00	9845.486	394749.10	0.5627	P	2.2
6	☐	20000.00	20077.87	781055.22	1.1466	P	1.8

y = 5.7070E-005 * x + 7.8454E-004
R = 1.0000
DL = 4.311
BEC = 13.75

Weight: <None>
Min Conc: <None>

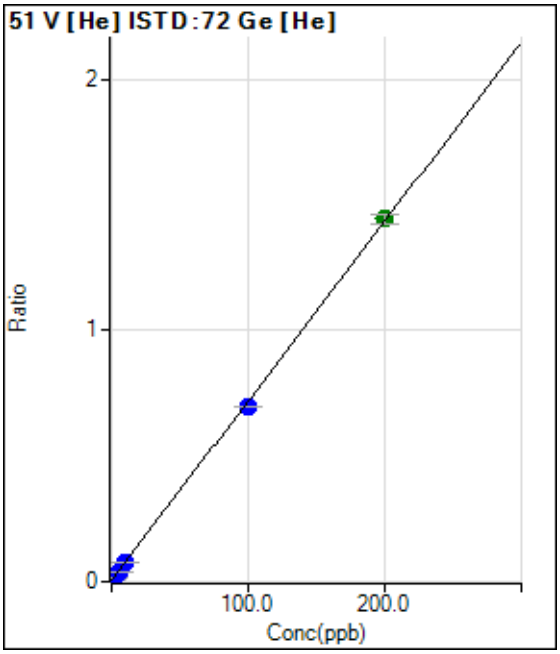
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	49.4
2	☐	2.000	1.758	390.01	0.0005	P	4.6
3	☐	5.000	4.757	1023.39	0.0014	P	16.8
4	☐	10.000	10.189	2160.21	0.0030	P	3.5
5	☐	100.000	101.511	21119.90	0.0301	P	1.4
6	☐	200.000	199.244	40232.56	0.0591	P	1.6

y = 2.9629E-004 * x + 2.7953E-005
R = 1.0000
DL = 0.1398
BEC = 0.09434

Weight: <None>
Min Conc: <None>

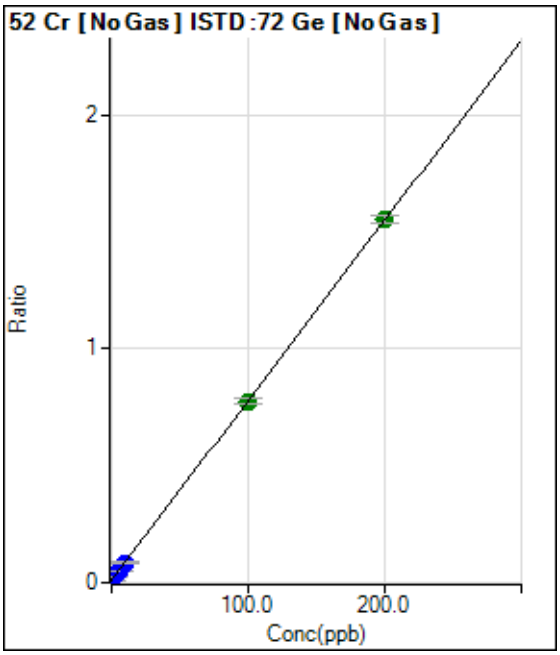


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3837.23	0.0054	P	2.1
2	☐	2.000	1.878	13352.10	0.0188	P	1.8
3	☐	5.000	4.732	27860.49	0.0392	P	0.5
4	☐	10.000	9.702	52911.59	0.0747	P	2.8
5	☐	100.000	96.952	489413.71	0.6976	P	0.8
6	☐	200.000	201.547	983895.48	1.4444	A	2.5

y = 0.0071 * x + 0.0054
R = 0.9998
DL = 0.047
BEC = 0.7532

Weight: <None>
Min Conc: <None>

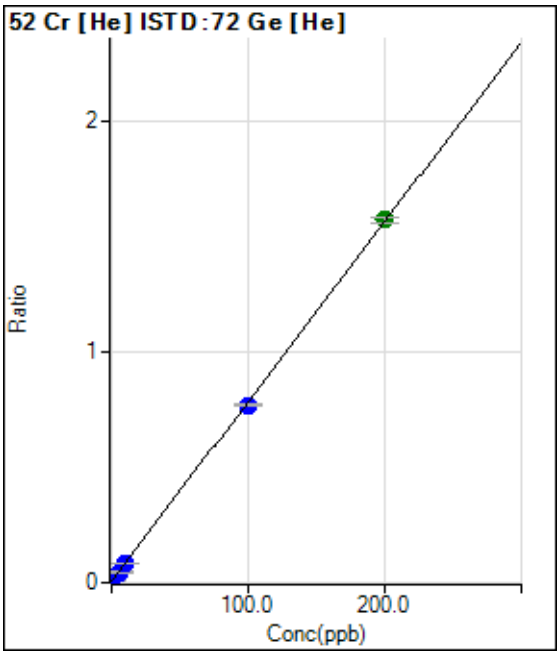
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20886.36	0.0100	P	2.3
2	☐	2.000	1.938	51590.44	0.0249	P	1.6
3	☐	5.000	4.830	98103.02	0.0471	P	1.4
4	☐	10.000	9.859	176394.34	0.0858	P	3.1
5	☐	100.000	99.405	1563227.69	0.7742	A	2.9
6	☐	200.000	200.309	3069983.18	1.5499	A	2.0

y = 0.0077 * x + 0.0100
R = 1.0000
DL = 0.08963
BEC = 1.301

Weight: <None>
Min Conc: <None>

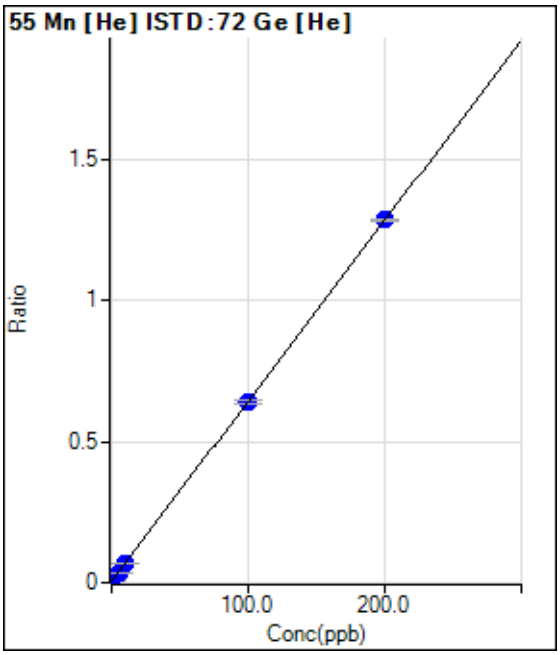


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4730.91	0.0066	P	3.9
2	☐	2.000	1.908	15282.05	0.0215	P	1.8
3	☐	5.000	4.957	32214.86	0.0453	P	3.8
4	☐	10.000	9.801	58866.59	0.0830	P	1.6
5	☐	100.000	97.740	539172.58	0.7685	P	1.1
6	☐	200.000	201.142	1072552.98	1.5746	A	1.8

y = 0.0078 * x + 0.0066
R = 0.9999
DL = 0.1
BEC = 0.8504

Weight: <None>
Min Conc: <None>

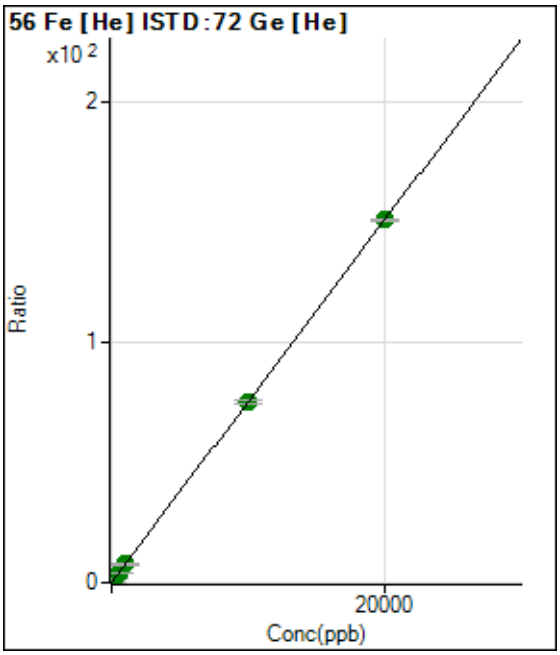
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4043.99	0.0057	P	7.6
2	☐	2.000	1.862	12499.26	0.0176	P	0.5
3	☐	5.000	4.815	25948.29	0.0365	P	3.1
4	☐	10.000	10.061	49653.78	0.0700	P	1.3
5	☐	100.000	99.283	449656.36	0.6409	P	1.8
6	☐	200.000	200.362	877161.71	1.2877	P	0.8

y = 0.0064 * x + 0.0057
R = 1.0000
DL = 0.202
BEC = 0.8862

Weight: <None>
Min Conc: <None>

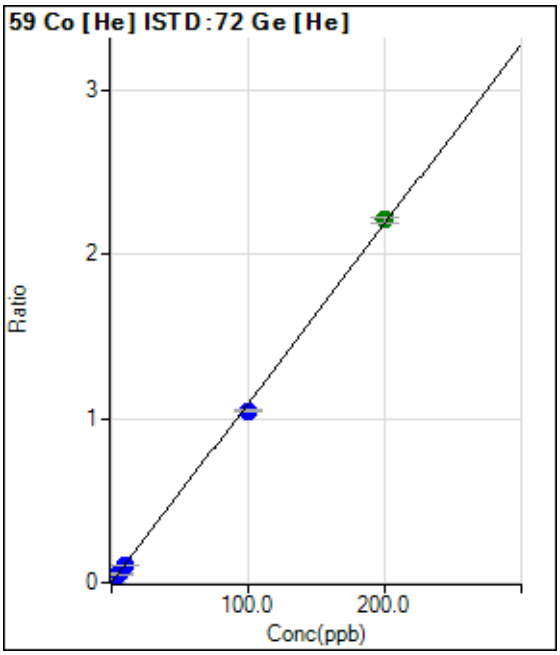


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14911.86	0.0209	P	6.3
2	☐	200.000	200.335	1089655.56	1.5329	A	1.2
3	☐	500.000	507.947	2742459.02	3.8546	A	2.2
4	☐	1000.000	1012.551	5431625.55	7.6631	A	2.4
5	☐	10000.00	9952.420	52712055.88	75.1364	A	1.8
6	☐	20000.00	20022.96	102958401.8	151.143	A	0.6

y = 0.0075 * x + 0.0209
R = 1.0000
DL = 0.5227
BEC = 2.77

Weight: <None>
Min Conc: <None>

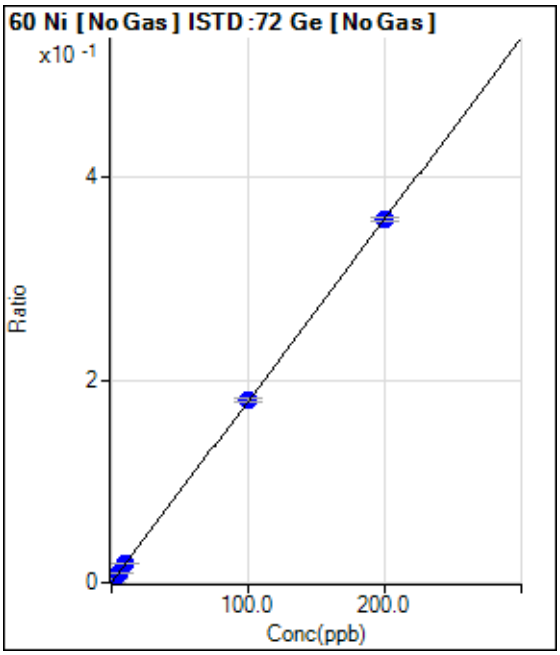
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.33	0.0001	P	23.4
2	☐	2.000	1.894	14778.30	0.0208	P	4.3
3	☐	5.000	4.863	37866.24	0.0532	P	3.1
4	☐	10.000	9.595	74392.71	0.1049	P	0.9
5	☐	100.000	95.672	733518.79	1.0456	P	1.5
6	☐	200.000	202.189	1505152.16	2.2095	A	1.4

y = 0.0109 * x + 8.8662E-005
R = 0.9997
DL = 0.005694
BEC = 0.008114

Weight: <None>
Min Conc: <None>

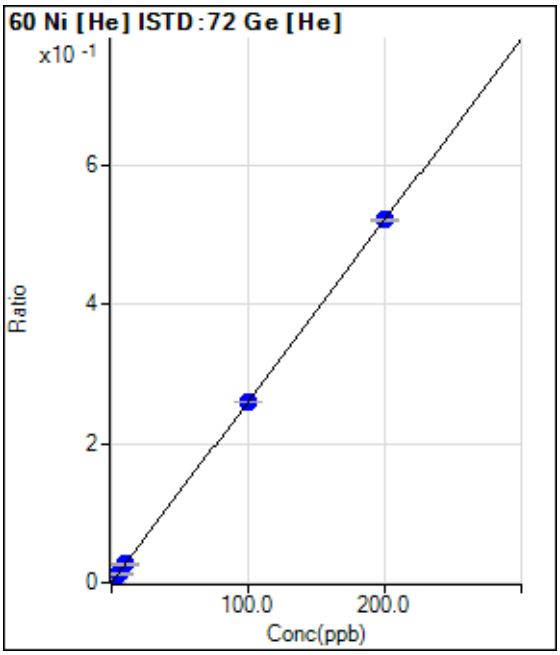


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	310.01	0.0001	P	17.0
2	☐	2.000	1.970	7615.63	0.0037	P	4.0
3	☐	5.000	4.959	18786.48	0.0090	P	4.4
4	☐	10.000	10.163	37735.87	0.0183	P	1.3
5	☐	100.000	100.402	363374.37	0.1799	P	2.3
6	☐	200.000	199.792	708991.06	0.3579	P	0.9

y = 0.0018 * x + 1.4842E-004
R = 1.0000
DL = 0.04232
BEC = 0.08288

Weight: <None>
Min Conc: <None>

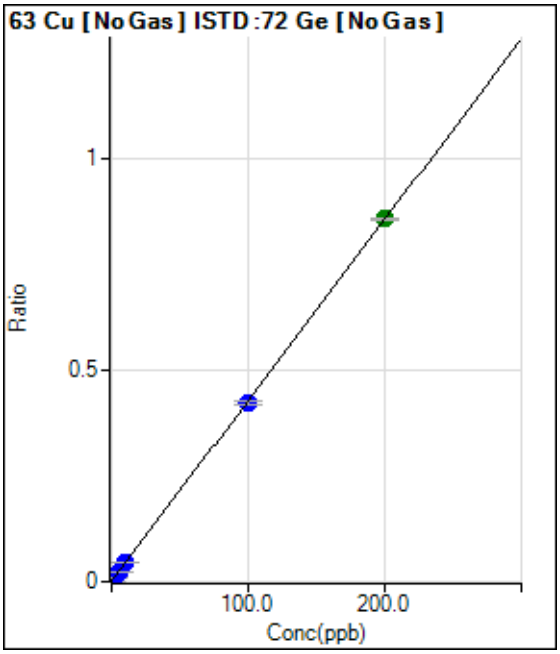
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	116.67	0.0002	P	35.0
2	☐	2.000	1.848	3530.53	0.0050	P	3.1
3	☐	5.000	4.730	8863.04	0.0125	P	3.6
4	☐	10.000	10.021	18586.27	0.0262	P	2.1
5	☐	100.000	99.617	181814.79	0.2592	P	0.2
6	☐	200.000	200.199	354657.56	0.5206	P	0.7

y = 0.0026 * x + 1.6318E-004
R = 1.0000
DL = 0.06599
BEC = 0.06276

Weight: <None>
Min Conc: <None>

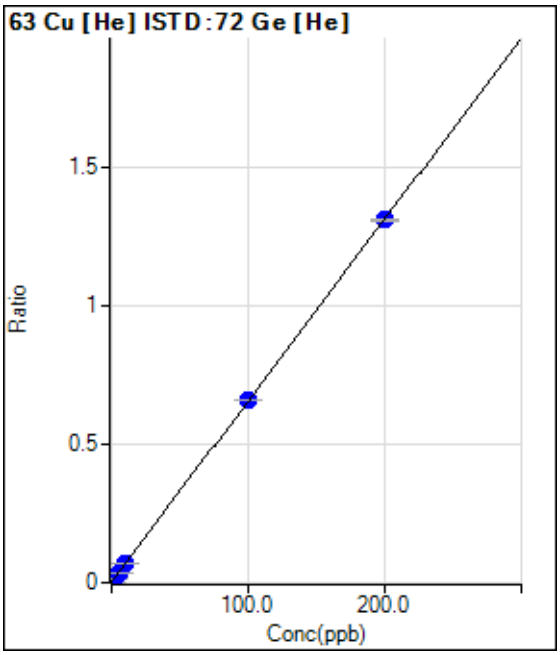


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2893.70	0.0014	P	5.4
2	☐	2.000	1.966	20302.08	0.0098	P	0.5
3	☐	5.000	5.039	47774.00	0.0230	P	1.5
4	☐	10.000	10.072	91462.82	0.0445	P	4.5
5	☐	100.000	99.090	859184.26	0.4255	P	2.2
6	☐	200.000	200.451	1702139.25	0.8592	A	0.7

y = 0.0043 * x + 0.0014
R = 1.0000
DL = 0.05242
BEC = 0.3238

Weight: <None>
Min Conc: <None>

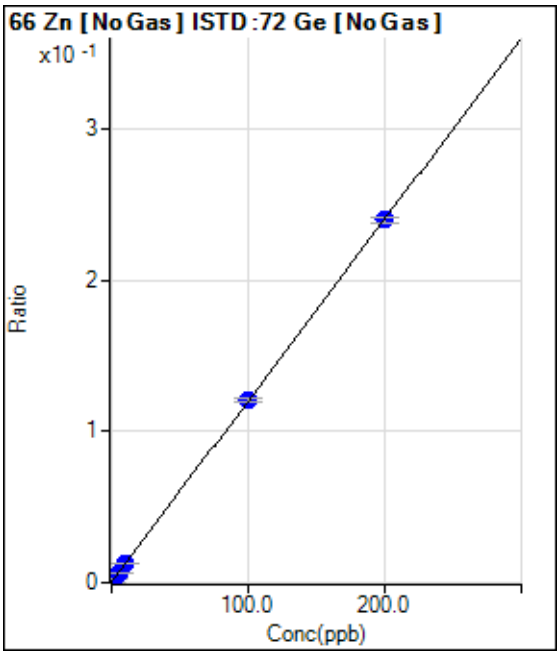
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1463.45	0.0021	P	12.4
2	☐	2.000	1.956	10570.96	0.0149	P	1.5
3	☐	5.000	4.949	24532.43	0.0345	P	2.6
4	☐	10.000	9.984	47841.08	0.0675	P	0.5
5	☐	100.000	100.444	463315.92	0.6604	P	0.7
6	☐	200.000	199.780	893359.00	1.3115	P	0.6

y = 0.0066 * x + 0.0021
R = 1.0000
DL = 0.1168
BEC = 0.3128

Weight: <None>
Min Conc: <None>

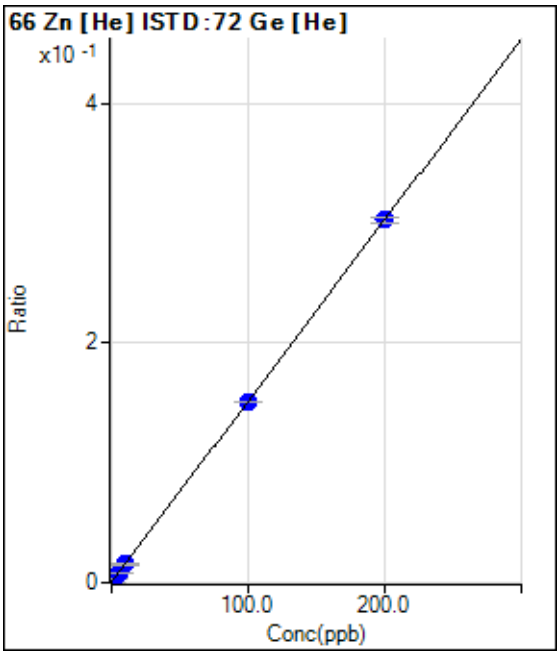


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	636.69	0.0003	P	14.1
2	☐	2.000	2.009	5631.27	0.0027	P	2.2
3	☐	5.000	4.926	12949.77	0.0062	P	3.6
4	☐	10.000	10.171	25758.08	0.0125	P	0.9
5	☐	100.000	100.377	244131.66	0.1209	P	1.6
6	☐	200.000	199.805	476020.83	0.2403	P	1.4

y = 0.0012 * x + 3.0487E-004
R = 1.0000
DL = 0.1077
BEC = 0.2538

Weight: <None>
Min Conc: <None>

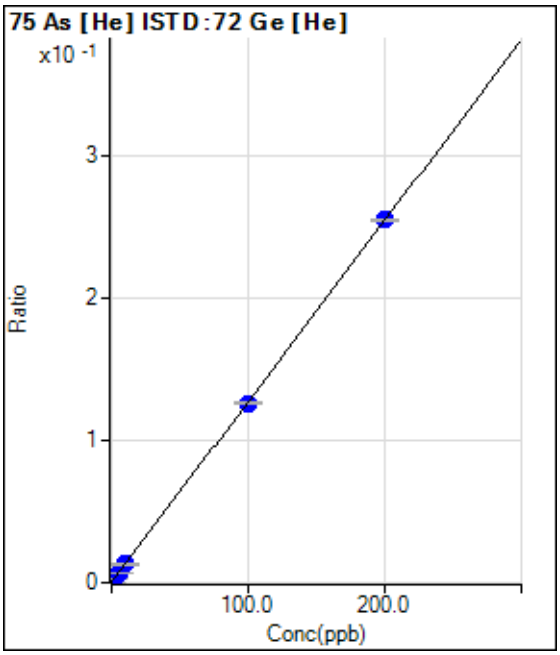
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	253.34	0.0004	P	15.4
2	☐	2.000	2.001	2403.59	0.0034	P	2.8
3	☐	5.000	4.760	5374.49	0.0076	P	1.9
4	☐	10.000	9.927	10894.54	0.0154	P	3.9
5	☐	100.000	99.744	106075.82	0.1512	P	0.5
6	☐	200.000	200.138	206409.59	0.3030	P	1.8

y = 0.0015 * x + 3.5490E-004
R = 1.0000
DL = 0.1083
BEC = 0.2347

Weight: <None>
Min Conc: <None>

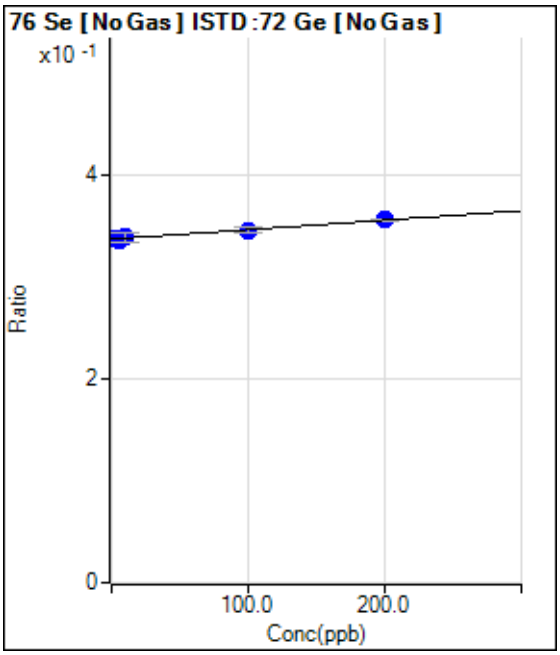


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	216.67	0.0003	P	6.5
2	☐	2.000	2.004	2024.61	0.0028	P	1.2
3	☐	5.000	4.871	4615.26	0.0065	P	3.3
4	☐	10.000	9.901	9124.24	0.0129	P	3.2
5	☐	100.000	99.077	88457.46	0.1261	P	1.0
6	☐	200.000	200.470	173569.71	0.2548	P	0.7

y = 0.0013 * x + 3.0380E-004
R = 1.0000
DL = 0.04665
BEC = 0.2393

Weight: <None>
Min Conc: <None>

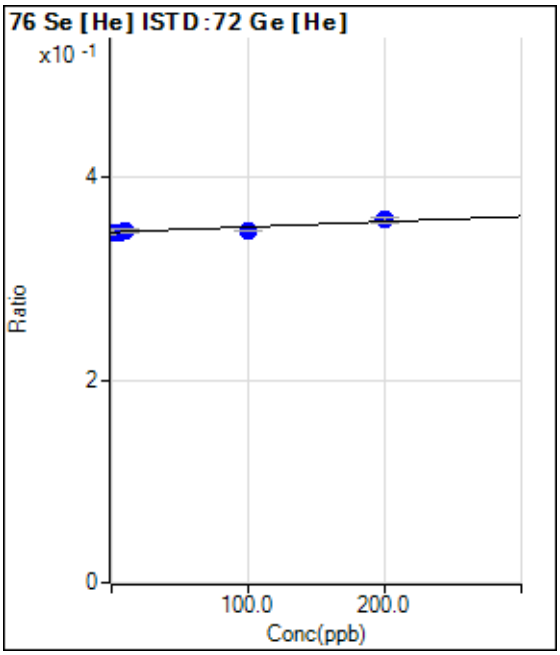
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	702503.12	0.3364	P	0.9
2	☐	2.000	7.485	698254.83	0.3371	P	0.1
3	☐	5.000	-17.753	696702.73	0.3347	P	0.9
4	☐	10.000	19.821	695467.54	0.3382	P	2.8
5	☐	100.000	95.981	697355.95	0.3453	P	2.1
6	☐	200.000	202.033	703595.72	0.3552	P	0.9

y = 9.3189E-005 * x + 0.3364
R = 0.9908
DL = 96.95
BEC = 3610

Weight: <None>
Min Conc: <None>

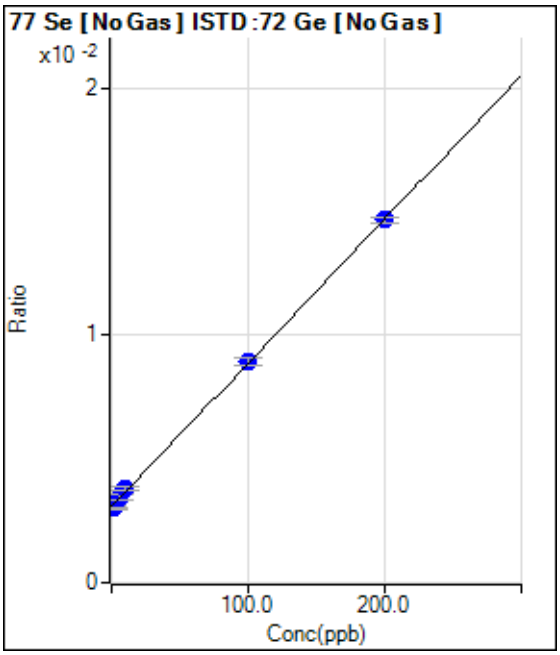


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	246910.93	0.3461	P	0.1
2	☐	2.000	-2.650	245896.80	0.3459	P	1.5
3	☐	5.000	-2.487	246107.47	0.3459	P	1.0
4	☐	10.000	33.619	246553.04	0.3478	P	1.0
5	☐	100.000	35.658	244088.77	0.3479	P	0.2
6	☐	200.000	231.224	243913.92	0.3581	P	1.3

y = 5.1926E-005 * x + 0.3461
R = 0.9294
DL = 10.09
BEC = 6665

Weight: <None>
Min Conc: <None>

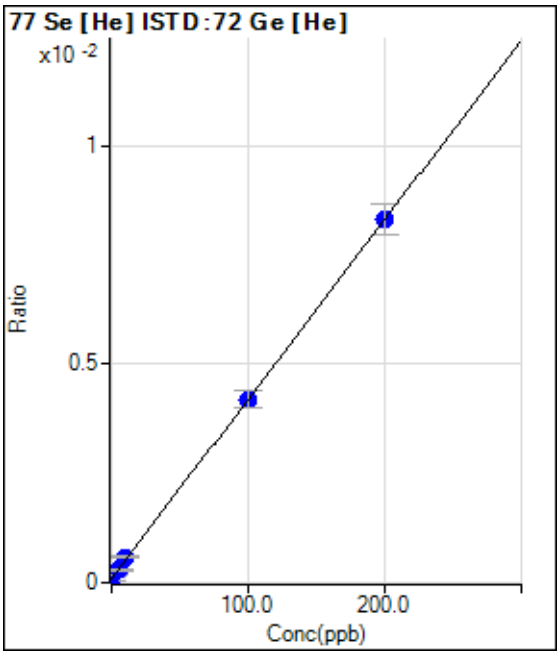
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6414.99	0.0031	P	3.1
2	☐	2.000	-1.337	6201.53	0.0030	P	1.3
3	☐	5.000	6.296	7152.02	0.0034	P	7.5
4	☐	10.000	12.441	7802.44	0.0038	P	4.1
5	☐	100.000	100.871	18039.03	0.0089	P	4.2
6	☐	200.000	199.443	29051.79	0.0147	P	1.7

y = 5.8138E-005 * x + 0.0031
R = 0.9997
DL = 4.976
BEC = 52.83

Weight: <None>
Min Conc: <None>

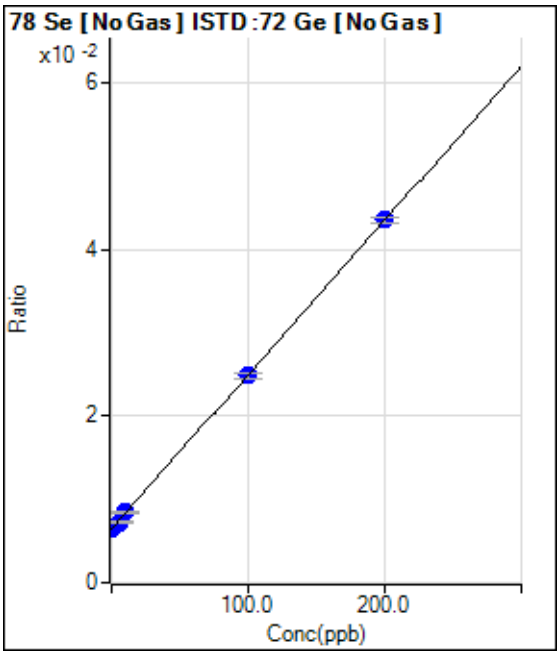


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0001	P	83.6
2	☐	2.000	2.965	153.34	0.0002	P	29.3
3	☐	5.000	4.788	206.67	0.0003	P	19.7
4	☐	10.000	12.033	416.68	0.0006	P	6.0
5	☐	100.000	99.781	2940.39	0.0042	P	9.2
6	☐	200.000	200.004	5657.96	0.0083	P	8.3

y = 4.1062E-005 * x + 9.3930E-005
R = 0.9999
DL = 5.734
BEC = 2.288

Weight: <None>
Min Conc: <None>

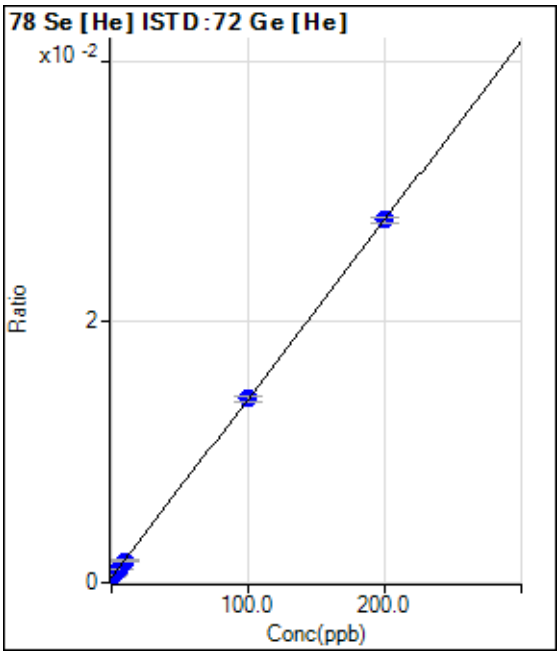
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13533.68	0.0065	P	1.7
2	☐	2.000	1.511	14004.13	0.0068	P	2.5
3	☐	5.000	4.180	15102.00	0.0073	P	3.1
4	☐	10.000	10.557	17351.50	0.0084	P	1.9
5	☐	100.000	99.431	50247.17	0.0249	P	2.5
6	☐	200.000	200.282	86261.74	0.0435	P	1.3

y = 1.8508E-004 * x + 0.0065
R = 1.0000
DL = 1.764
BEC = 35.01

Weight: <None>
Min Conc: <None>

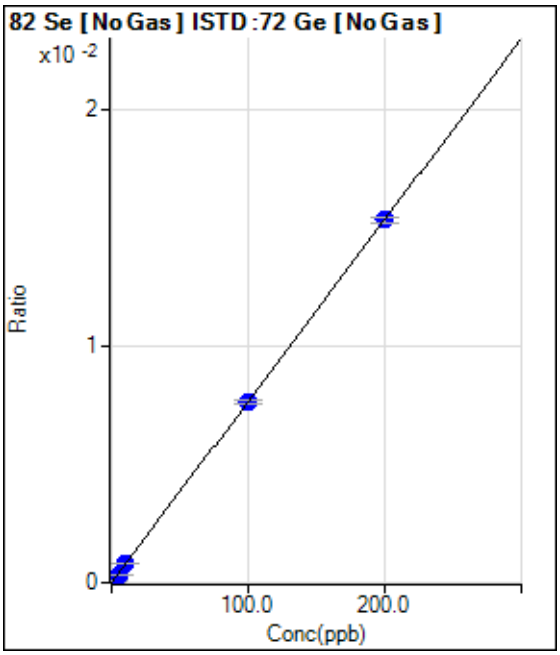


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	274.00	0.0004	P	6.8
2	☐	2.000	1.677	436.68	0.0006	P	8.3
3	☐	5.000	4.798	741.35	0.0010	P	5.2
4	☐	10.000	9.535	1199.39	0.0017	P	0.8
5	☐	100.000	99.900	9882.31	0.0141	P	2.1
6	☐	200.000	200.082	18955.96	0.0278	P	1.7

y = 1.3716E-004 * x + 3.8419E-004
R = 1.0000
DL = 0.5681
BEC = 2.801

Weight: <None>
Min Conc: <None>

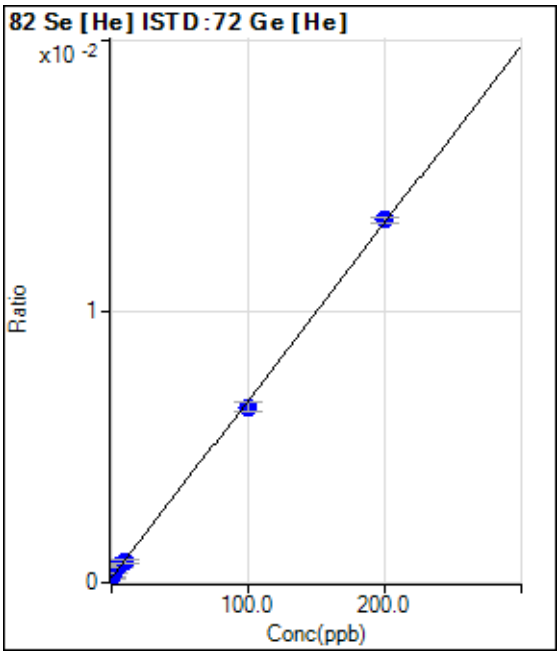
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-28.74	0.0000	P	-256.6
2	☐	2.000	1.596	224.17	0.0001	P	54.8
3	☐	5.000	4.351	664.54	0.0003	P	5.2
4	☐	10.000	10.770	1668.89	0.0008	P	4.2
5	☐	100.000	99.703	15391.26	0.0076	P	2.5
6	☐	200.000	200.130	30327.22	0.0153	P	1.7

y = 7.6566E-005 * x - 1.3891E-005
R = 1.0000
DL = 1.397
BEC = -0.1814

Weight: <None>
Min Conc: <None>

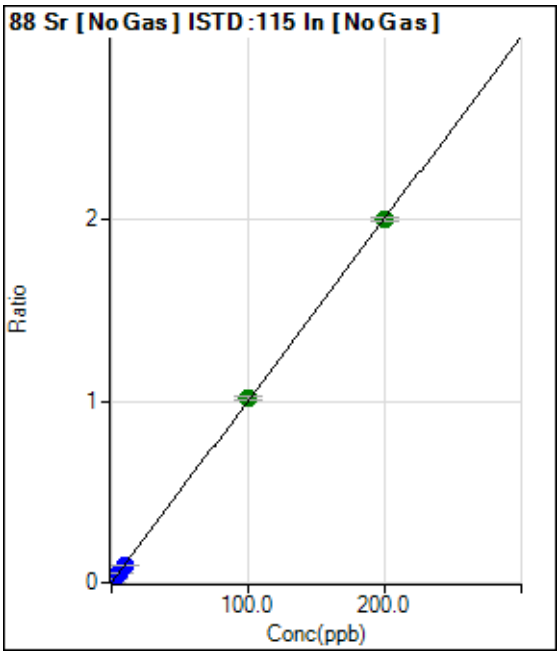


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	126.67	0.0002	P	12.1
2	☐	2.000	2.663	250.01	0.0004	P	14.4
3	☐	5.000	6.672	436.68	0.0006	P	5.0
4	☐	10.000	8.860	536.69	0.0008	P	18.1
5	☐	100.000	96.418	4547.52	0.0065	P	4.6
6	☐	200.000	201.800	9109.92	0.0134	P	1.9

y = 6.5392E-005 * x + 1.7756E-004
R = 0.9997
DL = 0.9884
BEC = 2.715

Weight: <None>
Min Conc: <None>

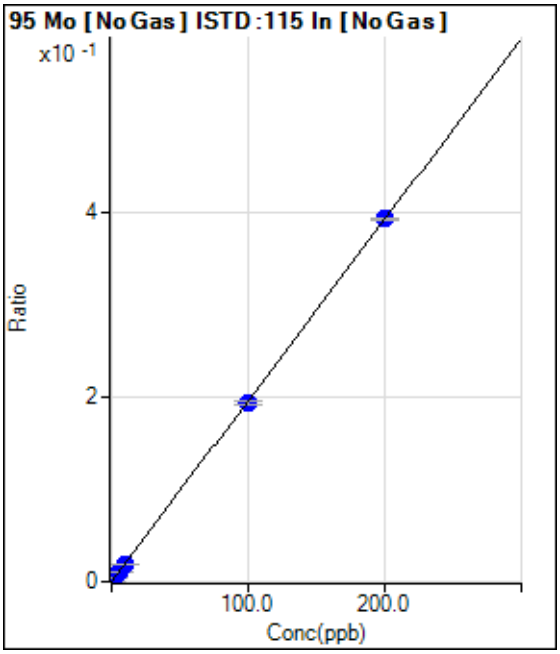
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1140.07	0.0005	P	3.4
2	☐	2.000	1.905	46918.98	0.0196	P	2.6
3	☐	5.000	4.898	119046.74	0.0496	P	0.3
4	☐	10.000	9.739	238649.35	0.0981	P	1.6
5	☐	100.000	101.401	2390961.22	1.0165	A	1.1
6	☐	200.000	199.316	4613811.91	1.9976	A	1.1

y = 0.0100 * x + 4.8415E-004
R = 1.0000
DL = 0.004905
BEC = 0.04832

Weight: <None>
Min Conc: <None>

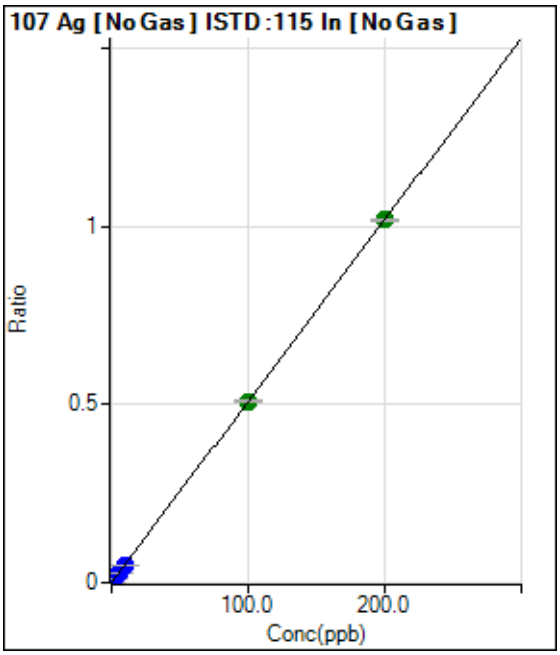


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	60.00	0.0000	P	33.6
2	☐	2.000	1.924	9129.97	0.0038	P	3.1
3	☐	5.000	4.902	23207.23	0.0097	P	3.2
4	☐	10.000	9.760	46748.81	0.0192	P	1.9
5	☐	100.000	99.110	458324.74	0.1948	P	1.9
6	☐	200.000	200.460	910125.01	0.3941	P	0.5

y = 0.0020 * x + 2.5474E-005
R = 1.0000
DL = 0.01306
BEC = 0.01296

Weight: <None>
Min Conc: <None>

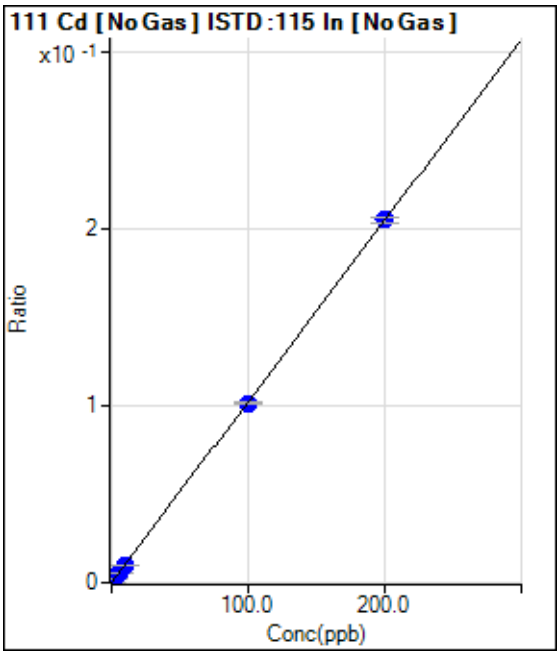
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	303.34	0.0001	P	25.3
2	☐	2.000	1.879	23264.18	0.0097	P	1.9
3	☐	5.000	4.785	58874.37	0.0245	P	0.2
4	☐	10.000	9.694	120532.21	0.0495	P	2.4
5	☐	100.000	99.941	1198411.10	0.5095	A	1.2
6	☐	200.000	200.051	2354936.48	1.0196	A	0.8

y = 0.0051 * x + 1.2851E-004
R = 1.0000
DL = 0.01913
BEC = 0.02522

Weight: <None>
Min Conc: <None>

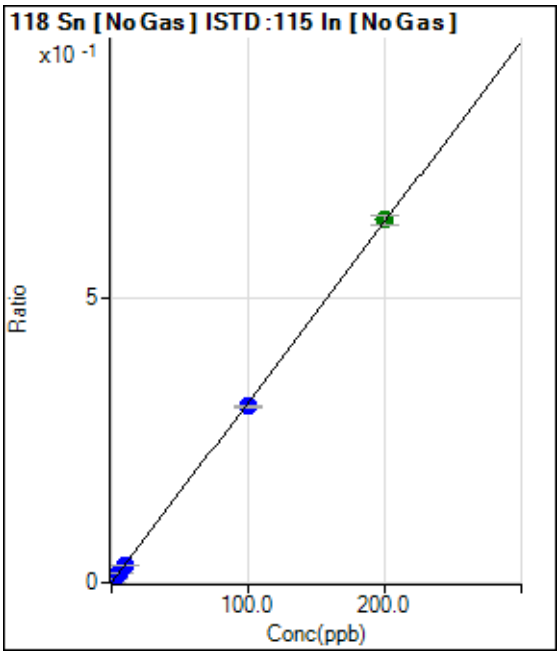


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	108.7
2	☐	2.000	1.910	4710.93	0.0020	P	6.3
3	☐	5.000	4.948	12192.52	0.0051	P	2.9
4	☐	10.000	9.899	24693.49	0.0101	P	2.2
5	☐	100.000	99.194	238966.40	0.1016	P	0.8
6	☐	200.000	200.410	473997.53	0.2052	P	1.9

y = 0.0010 * x + 9.9156E-006
R = 1.0000
DL = 0.03157
BEC = 0.009683

Weight: <None>
Min Conc: <None>

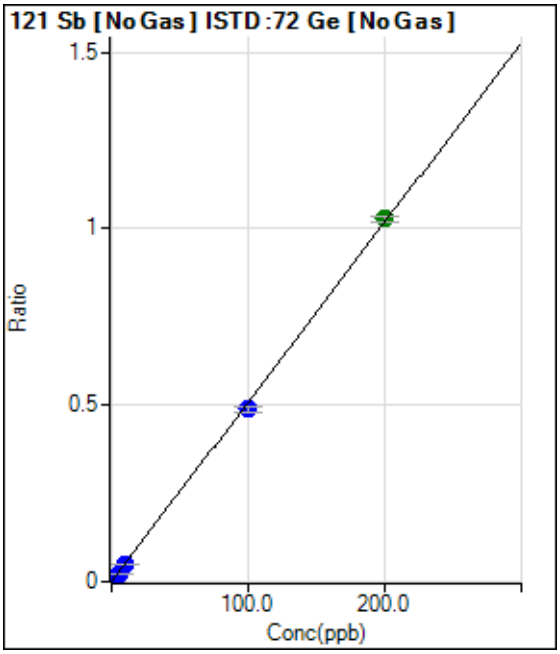
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1243.42	0.0005	P	8.3
2	☐	2.000	1.919	15803.17	0.0066	P	4.4
3	☐	5.000	4.751	37343.46	0.0155	P	3.0
4	☐	10.000	9.607	75201.72	0.0309	P	0.8
5	☐	100.000	97.711	727912.02	0.3094	P	1.0
6	☐	200.000	201.171	1469992.90	0.6365	A	2.6

y = 0.0032 * x + 5.2762E-004
R = 0.9999
DL = 0.04158
BEC = 0.1669

Weight: <None>
Min Conc: <None>

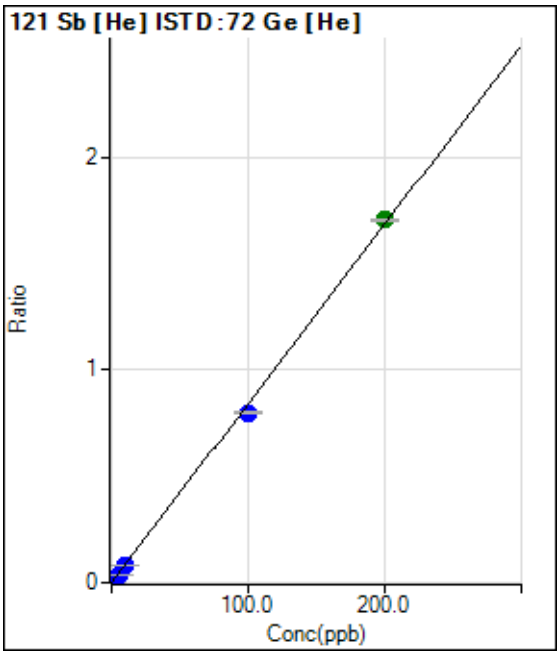


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	336.68	0.0002	P	2.9
2	☐	2.000	1.756	18837.10	0.0091	P	0.9
3	☐	5.000	4.401	46930.76	0.0225	P	0.5
4	☐	10.000	9.476	99455.02	0.0484	P	2.3
5	☐	100.000	96.006	986444.80	0.4885	P	2.9
6	☐	200.000	202.041	2036073.25	1.0279	A	1.2

y = 0.0051 * x + 1.6119E-004
R = 0.9997
DL = 0.002784
BEC = 0.03169

Weight: <None>
Min Conc: <None>

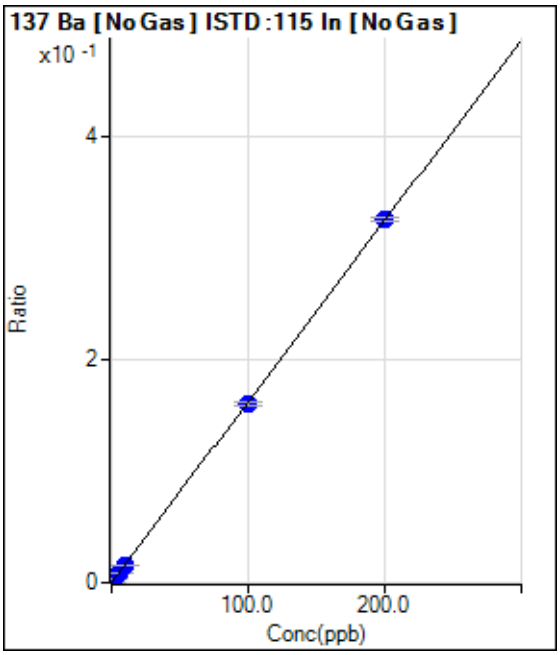
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	210.01	0.0003	P	16.1
2	☐	2.000	1.728	10547.70	0.0148	P	2.8
3	☐	5.000	4.578	27616.02	0.0388	P	3.5
4	☐	10.000	9.215	55179.50	0.0778	P	1.2
5	☐	100.000	94.956	560869.93	0.7994	P	0.4
6	☐	200.000	202.575	1161532.75	1.7052	A	0.7

y = 0.0084 * x + 2.9423E-004
R = 0.9996
DL = 0.01687
BEC = 0.03496

Weight: <None>
Min Conc: <None>

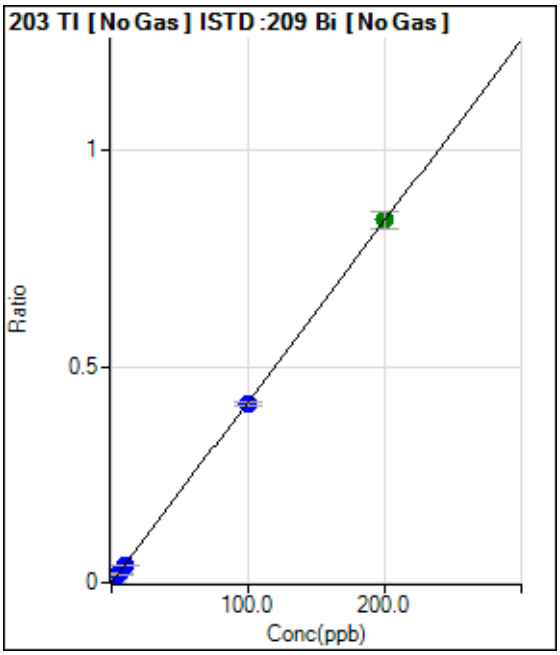


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146.67	0.0001	P	28.5
2	☐	2.000	1.872	7425.58	0.0031	P	2.5
3	☐	5.000	4.925	19328.11	0.0080	P	3.9
4	☐	10.000	9.703	38427.37	0.0158	P	3.9
5	☐	100.000	98.847	377122.10	0.1603	P	1.5
6	☐	200.000	200.595	751319.11	0.3253	P	1.1

y = 0.0016 * x + 6.2394E-005
R = 1.0000
DL = 0.03289
BEC = 0.03848

Weight: <None>
Min Conc: <None>

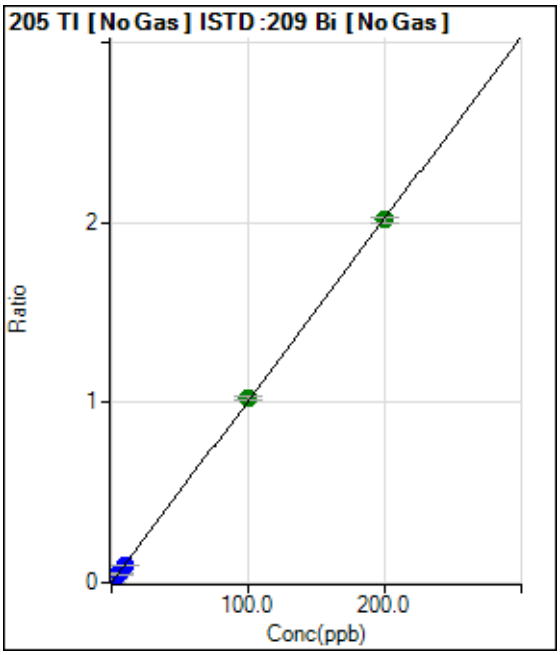
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	76.67	0.0000	P	35.3
2	☐	2.000	1.847	16227.49	0.0078	P	2.8
3	☐	5.000	4.830	42204.85	0.0203	P	2.6
4	☐	10.000	9.745	86495.62	0.0408	P	2.2
5	☐	100.000	98.876	858291.24	0.4141	P	1.3
6	☐	200.000	200.581	1728079.09	0.8400	A	4.6

y = 0.0042 * x + 3.6840E-005
R = 1.0000
DL = 0.009313
BEC = 0.008798

Weight: <None>
Min Conc: <None>

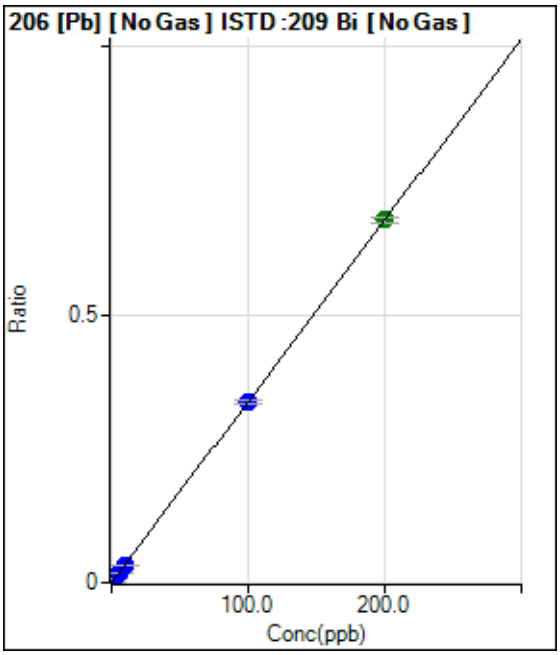


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	226.67	0.0001	P	22.7
2	☐	2.000	1.847	39208.63	0.0188	P	2.8
3	☐	5.000	4.818	101591.22	0.0488	P	5.0
4	☐	10.000	9.589	205409.70	0.0970	P	2.5
5	☐	100.000	101.287	2121323.25	1.0236	A	2.4
6	☐	200.000	199.383	4146407.65	2.0148	A	1.6

y = 0.0101 * x + 1.0909E-004
R = 1.0000
DL = 0.007359
BEC = 0.0108

Weight: <None>
Min Conc: <None>

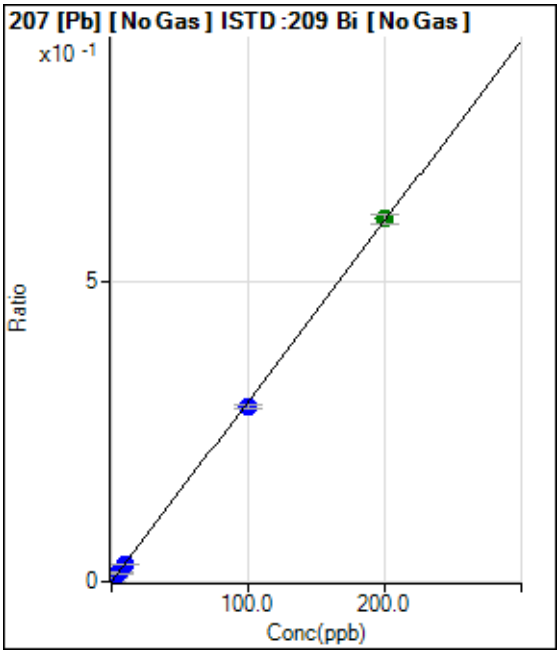
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	250.01	0.0001	P	5.8
2	☐	2.000	1.950	14018.09	0.0067	P	3.1
3	☐	5.000	4.897	34715.39	0.0167	P	3.6
4	☐	10.000	9.847	70730.47	0.0334	P	2.8
5	☐	100.000	99.398	696515.09	0.3361	P	1.9
6	☐	200.000	200.312	1393526.70	0.6771	A	1.4

y = 0.0034 * x + 1.2063E-004
R = 1.0000
DL = 0.006175
BEC = 0.03569

Weight: <None>
Min Conc: <None>

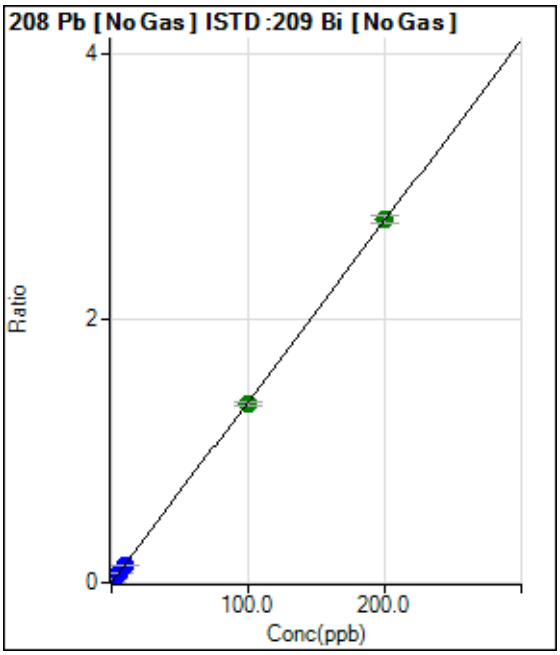


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.68	0.0001	P	19.4
2	☐	2.000	1.826	11755.75	0.0056	P	2.5
3	☐	5.000	4.812	30387.45	0.0146	P	2.7
4	☐	10.000	9.523	60838.47	0.0287	P	2.6
5	☐	100.000	97.532	607046.46	0.2929	P	2.2
6	☐	200.000	201.264	1243347.79	0.6042	A	2.5

y = 0.0030 * x + 1.4803E-004
R = 0.9999
DL = 0.02865
BEC = 0.04932

Weight: <None>
Min Conc: <None>

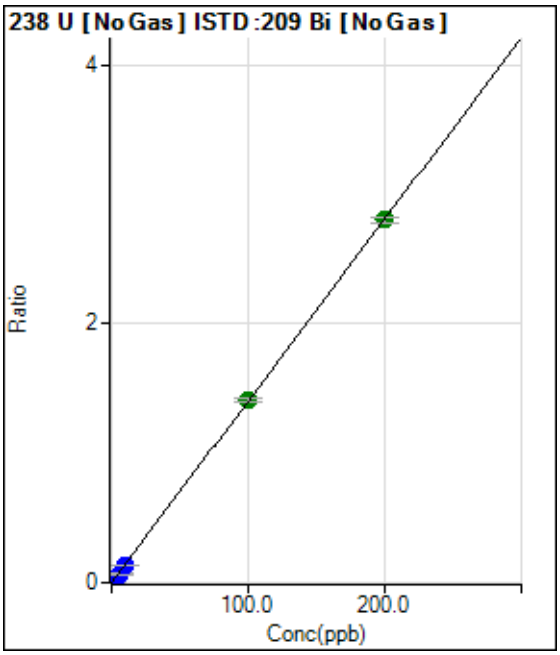
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1163.38	0.0006	P	3.8
2	☐	2.000	1.872	54757.91	0.0262	P	1.3
3	☐	5.000	4.837	139182.79	0.0668	P	3.3
4	☐	10.000	9.710	282936.43	0.1336	P	2.3
5	☐	100.000	98.920	2810359.40	1.3559	A	1.8
6	☐	200.000	200.560	5656282.78	2.7486	A	2.2

y = 0.0137 * x + 5.6210E-004
R = 1.0000
DL = 0.004726
BEC = 0.04102

Weight: <None>
Min Conc: <None>

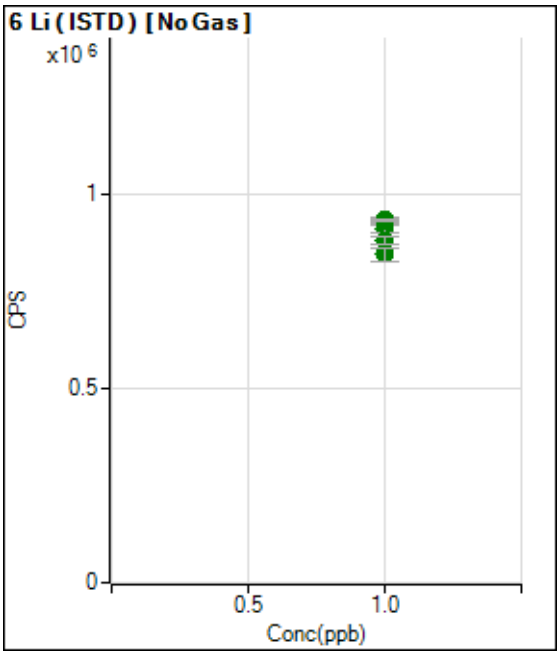


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56.67	0.0000	P	68.7
2	☐	2.000	1.821	53467.02	0.0256	P	1.9
3	☐	5.000	4.691	137193.24	0.0659	P	4.6
4	☐	10.000	9.421	280152.63	0.1323	P	3.0
5	☐	100.000	100.641	2929770.58	1.4132	A	2.6
6	☐	200.000	199.718	5771433.25	2.8044	A	1.5

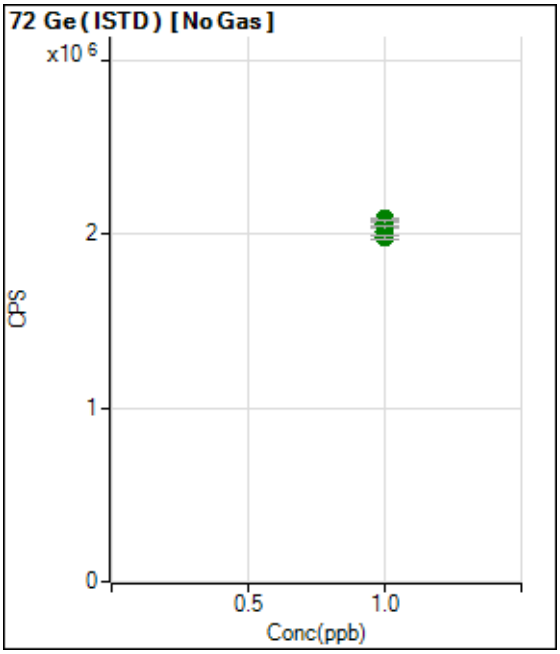
y = 0.0140 * x + 2.7612E-005
R = 1.0000
DL = 0.004052
BEC = 0.001966

Weight: <None>
Min Conc: <None>

Calibration for 015_ICV.d

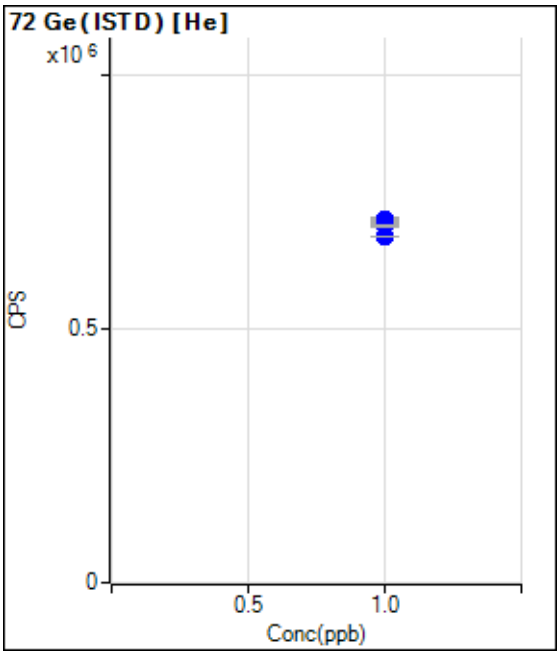


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		931764.05		A	1.9
2	☐	1.000		919641.37		A	0.7
3	☐	1.000		910315.15		A	2.7
4	☐	1.000		930654.78		A	0.3
5	☐	1.000		878633.32		A	1.9
6	☐	1.000		843606.75		A	4.3

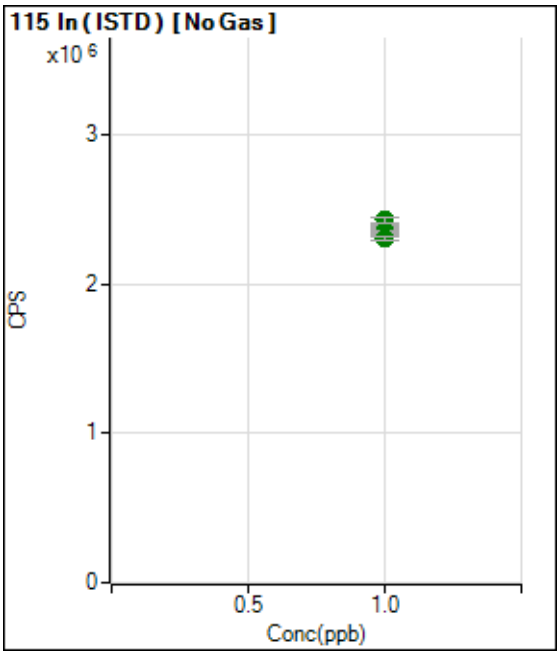


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2088541.12		A	0.6
2	☐	1.000		2071565.54		A	0.5
3	☐	1.000		2081608.46		A	1.1
4	☐	1.000		2057208.46		A	2.5
5	☐	1.000		2020187.21		A	2.5
6	☐	1.000		1980948.72		A	0.8

Calibration for 015_ICV.d

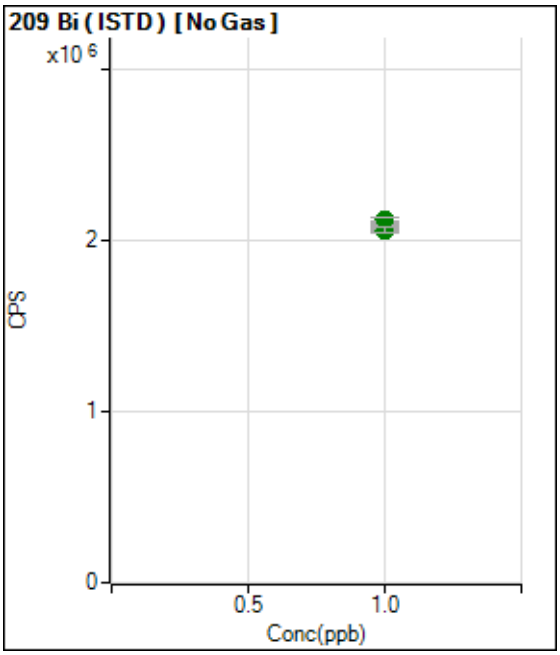


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		713484.34		P	0.9
2	☐	1.000		710825.67		P	0.2
3	☐	1.000		711451.11		P	0.7
4	☐	1.000		708905.59		P	1.0
5	☐	1.000		701575.93		P	0.4
6	☐	1.000		681191.37		P	0.3



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2355410.06		A	1.4
2	☐	1.000		2397214.76		A	0.7
3	☐	1.000		2401881.85		A	0.3
4	☐	1.000		2433841.52		A	1.4
5	☐	1.000		2352213.73		A	0.7
6	☐	1.000		2309617.41		A	0.7

Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2070771.43		A	2.3
2	☐	1.000		2088803.77		A	1.4
3	☐	1.000		2083659.50		A	2.8
4	☐	1.000		2118234.19		A	1.9
5	☐	1.000		2072859.66		A	1.1
6	☐	1.000		2058329.40		A	1.7

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	008CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:06:53-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	7	1	No Gas	58628	0.00
Be	9	1	No Gas	35	107.99
V	51	2	He	3837	0.06
Cr	52	2	He	4731	0.10
Fe	56	2	He	14912	0.04
Se	78	2	He	274	2.11
As	75	2	He	217	2.56
Ca	44	2	He	560	1.99
Na	23	2	He	118768	0.00
Mg	24	2	He	260	16.27
K	39	2	He	161478	0.00
Mn	55	2	He	4044	0.16
Co	59	2	He	63	38.08
Ni	60	2	He	117	30.59
Cu	63	2	He	1463	0.88
Zn	66	2	He	253	6.30
Al	27	2	He	1007	1.19
B	11	1	No Gas	15087	0.02
Al	27	1	No Gas	28717	0.01
Si	28	1	No Gas	335761	0.00
Ag	107	1	No Gas	303	8.78
Cd	111	1	No Gas	23	462.23
Sr	88	1	No Gas	1140	0.20
Mo	95	1	No Gas	60	55.56
Sn	118	1	No Gas	1243	0.75
Sb	121	1	No Gas	337	1.02
Ba	137	1	No Gas	147	18.79
Tl	205	1	No Gas	227	11.07
Tl	203	1	No Gas	77	49.11
Pb	208	1	No Gas	1163	0.19
U	238	1	No Gas	57	117.90
Ca	43	2	He	30	293.97
Sb	121	2	He	210	7.86
Ti	47	2	He	20	250.00
Cu	63	1	No Gas	2894	0.17

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD

Calibration Blank Report

Li	6	1	No Gas	931764	1.90
Ge	72	2	He	713484	0.94
Ge	72	1	No Gas	2088541	0.57
In	115	1	No Gas	2355410	1.36

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Bi	209	1	No Gas	2070771	2.28

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	009CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:08:50-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	5911	0.03
V	51	2	He	13352	0.01
Cr	52	2	He	15282	0.01
Fe	56	2	He	1089656	0.00
Se	78	2	He	437	1.93
As	75	2	He	2025	0.05
Ca	44	2	He	8376	0.06
Na	23	2	He	295962	0.00
Mg	24	2	He	111362	0.00
K	39	2	He	318484	0.00
Mn	55	2	He	12499	0.00
Co	59	2	He	14778	0.03
Ni	60	2	He	3531	0.08
Cu	63	2	He	10571	0.01
Zn	66	2	He	2404	0.12
Al	27	2	He	1777	0.24
B	11	1	No Gas	30735	0.00
Al	27	1	No Gas	51626	0.00
Si	28	1	No Gas	416739	0.00
Ag	107	1	No Gas	23264	0.01
Cd	111	1	No Gas	4711	0.12
Sr	88	1	No Gas	46919	0.00
Mo	95	1	No Gas	9130	0.04
Sn	118	1	No Gas	15803	0.02
Sb	121	1	No Gas	18837	0.01
Ba	137	1	No Gas	7426	0.03
Tl	205	1	No Gas	39209	0.00
Tl	203	1	No Gas	16227	0.01
Pb	208	1	No Gas	54758	0.00
U	238	1	No Gas	53467	0.00
Ca	43	2	He	483	2.91
Sb	121	2	He	10548	0.03
Cu	63	1	No Gas	20302	0.01

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	919641	0.68	931764	98.70	70	120	
Ge	72	2	He	710826	0.16	713484	99.63	70	120	
Ge	72	1	No Gas	2071566	0.53	2088541	99.19	70	120	

Calibration Standard Report

In	115	1	No Gas	2397215	0.72	2355410	101.77	70	120	
Bi	209	1	No Gas	2088804	1.41	2070771	100.87	70	120	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	010CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:10:48-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	15429	0.01
V	51	2	He	27860	0.00
Cr	52	2	He	32215	0.01
Fe	56	2	He	2742459	0.00
Se	78	2	He	741	0.62
As	75	2	He	4615	0.07
Ca	44	2	He	20249	0.01
Na	23	2	He	572668	0.00
Mg	24	2	He	284733	0.00
K	39	2	He	564568	0.00
Mn	55	2	He	25948	0.01
Co	59	2	He	37866	0.01
Ni	60	2	He	8863	0.03
Cu	63	2	He	24532	0.01
Zn	66	2	He	5374	0.05
Al	27	2	He	3030	0.29
B	11	1	No Gas	55959	0.00
Al	27	1	No Gas	85569	0.00
Si	28	1	No Gas	485684	0.00
Ag	107	1	No Gas	58874	0.00
Cd	111	1	No Gas	12193	0.02
Sr	88	1	No Gas	119047	0.00
Mo	95	1	No Gas	23207	0.01
Sn	118	1	No Gas	37343	0.01
Sb	121	1	No Gas	46931	0.00
Ba	137	1	No Gas	19328	0.02
Tl	205	1	No Gas	101591	0.00
Tl	203	1	No Gas	42205	0.00
Pb	208	1	No Gas	139183	0.00
U	238	1	No Gas	137193	0.00
Ca	43	2	He	1090	1.46
Sb	121	2	He	27616	0.01
Cu	63	1	No Gas	47774	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	910315	2.71	931764	97.70	70	120	
Ge	72	2	He	711451	0.66	713484	99.72	70	120	
Ge	72	1	No Gas	2081608	1.10	2088541	99.67	70	120	

Calibration Standard Report

In	115	1	No Gas	2401882	0.34	2355410	101.97	70	120	
Bi	209	1	No Gas	2083660	2.76	2070771	100.62	70	120	

Calibration Standard Report

Sample Table

Sample Name	10/50/100
Data File Name	011CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:12:46-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	30533	0.01
V	51	2	He	52912	0.00
Cr	52	2	He	58867	0.00
Fe	56	2	He	5431626	0.00
Se	78	2	He	1199	0.06
As	75	2	He	9124	0.03
Ca	44	2	He	40878	0.00
Na	23	2	He	1029697	0.00
Mg	24	2	He	572603	0.00
K	39	2	He	991594	0.00
Mn	55	2	He	49654	0.00
Co	59	2	He	74393	0.00
Ni	60	2	He	18586	0.01
Cu	63	2	He	47841	0.00
Zn	66	2	He	10895	0.04
Al	27	2	He	5148	0.06
B	11	1	No Gas	98896	0.00
Al	27	1	No Gas	143568	0.00
Si	28	1	No Gas	634487	0.00
Ag	107	1	No Gas	120532	0.00
Cd	111	1	No Gas	24693	0.01
Sr	88	1	No Gas	238649	0.00
Mo	95	1	No Gas	46749	0.00
Sn	118	1	No Gas	75202	0.00
Sb	121	1	No Gas	99455	0.00
Ba	137	1	No Gas	38427	0.01
Tl	205	1	No Gas	205410	0.00
Tl	203	1	No Gas	86496	0.00
Pb	208	1	No Gas	282936	0.00
U	238	1	No Gas	280153	0.00
Ca	43	2	He	2324	0.09
Sb	121	2	He	55179	0.00
Cu	63	1	No Gas	91463	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	930655	0.30	931764	99.88	70	120	
Ge	72	2	He	708906	0.99	713484	99.36	70	120	
Ge	72	1	No Gas	2057208	2.46	2088541	98.50	70	120	

Calibration Standard Report

In	115	1	No Gas	2433842	1.41	2355410	103.33	70	120	
Bi	209	1	No Gas	2118234	1.94	2070771	102.29	70	120	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	012CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:14:44-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	304758	0.00
V	51	2	He	489414	0.00
Cr	52	2	He	539173	0.00
Fe	56	2	He	52712056	0.00
Se	78	2	He	9882	0.02
As	75	2	He	88457	0.00
Ca	44	2	He	394749	0.00
Na	23	2	He	8800546	0.00
Mg	24	2	He	5364573	0.00
K	39	2	He	8109321	0.00
Mn	55	2	He	449656	0.00
Co	59	2	He	733519	0.00
Ni	60	2	He	181815	0.00
Cu	63	2	He	463316	0.00
Zn	66	2	He	106076	0.00
Al	27	2	He	37578	0.01
B	11	1	No Gas	855953	0.00
Al	27	1	No Gas	1114018	0.00
Si	28	1	No Gas	3229488	0.00
Ag	107	1	No Gas	1198411	0.00
Cd	111	1	No Gas	238966	0.00
Sr	88	1	No Gas	2390961	0.00
Mo	95	1	No Gas	458325	0.00
Sn	118	1	No Gas	727912	0.00
Sb	121	1	No Gas	986445	0.00
Ba	137	1	No Gas	377122	0.00
Tl	205	1	No Gas	2121323	0.00
Tl	203	1	No Gas	858291	0.00
Pb	208	1	No Gas	2810359	0.00
U	238	1	No Gas	2929771	0.00
Ca	43	2	He	23337	0.00
Sb	121	2	He	560870	0.00
Cu	63	1	No Gas	859184	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	878633	1.88	931764	94.30	70	120	
Ge	72	2	He	701576	0.35	713484	98.33	70	120	
Ge	72	1	No Gas	2020187	2.53	2088541	96.73	70	120	

Calibration Standard Report

In	115	1	No Gas	2352214	0.66	2355410	99.86	70	120	
Bi	209	1	No Gas	2072860	1.12	2070771	100.10	70	120	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	013CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:16:36-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	008CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	602014	0.00
V	51	2	He	983895	0.00
Cr	52	2	He	1072553	0.00
Fe	56	2	He	102958402	0.00
Se	78	2	He	18956	0.01
As	75	2	He	173570	0.00
Ca	44	2	He	781055	0.00
Na	23	2	He	17289040	0.00
Mg	24	2	He	10694105	0.00
K	39	2	He	15915293	0.00
Mn	55	2	He	877162	0.00
Co	59	2	He	1505152	0.00
Ni	60	2	He	354658	0.00
Cu	63	2	He	893359	0.00
Zn	66	2	He	206410	0.00
Al	27	2	He	72726	0.00
B	11	1	No Gas	1675507	0.00
Al	27	1	No Gas	2157892	0.00
Si	28	1	No Gas	5949471	0.00
Ag	107	1	No Gas	2354936	0.00
Cd	111	1	No Gas	473998	0.00
Sr	88	1	No Gas	4613812	0.00
Mo	95	1	No Gas	910125	0.00
Sn	118	1	No Gas	1469993	0.00
Sb	121	1	No Gas	2036073	0.00
Ba	137	1	No Gas	751319	0.00
Tl	205	1	No Gas	4146408	0.00
Tl	203	1	No Gas	1728079	0.00
Pb	208	1	No Gas	5656283	0.00
U	238	1	No Gas	5771433	0.00
Ca	43	2	He	46576	0.00
Sb	121	2	He	1161533	0.00
Cu	63	1	No Gas	1702139	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	843607	4.27	931764	90.54	70	120	
Ge	72	2	He	681191	0.27	713484	95.47	70	120	
Ge	72	1	No Gas	1980949	0.77	2088541	94.85	70	120	

Calibration Standard Report

In	115	1	No Gas	2309617	0.67	2355410	98.06	70	120	
Bi	209	1	No Gas	2058329	1.70	2070771	99.40	70	120	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICV
Data File Name	015_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:20:24-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	008CALB.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	Exp Value	%Rec	%Low	%High	QC Flag
Li	7	1	No Gas	100.298	1.683	1166260	1.77	100	100.3	90	110	
Be	9	1	No Gas	102.159	0.418	319789	0.39	100	102.2	90	110	
V	51	2	He	99.193	0.689	506090	0.54	100	99.2	90	110	
Cr	52	2	He	100.821	0.495	562092	0.78	100	100.8	90	110	
Fe	56	2	He	9606.941	0.993	51438004	0.92	10000	96.1	90	110	
Se	78	2	He	101.953	1.407	10190	1.16	100	102.0	90	110	
As	75	2	He	105.047	1.377	94791	0.48	100	105.0	90	110	
Ca	44	2	He	9512.517	0.704	385586	1.17	10000	95.1	90	110	
Na	23	2	He	9762.584	1.531	8815800	1.66	10000	97.6	90	110	
Mg	24	2	He	9663.103	0.783	5352096	0.51	10000	96.6	90	110	
K	39	2	He	9486.275	1.662	7911665	0.70	10000	94.9	90	110	
Mn	55	2	He	104.238	1.057	477039	0.64	100	104.2	90	110	
Co	59	2	He	99.783	0.332	773396	0.76	100	99.8	90	110	
Ni	60	2	He	102.568	0.698	189233	0.54	100	102.6	90	110	
Cu	63	2	He	102.997	0.662	480221	0.46	100	103.0	90	110	
Zn	66	2	He	103.472	0.849	111226	0.39	100	103.5	90	110	
Al	27	2	He	102.267	1.041	39146	2.01	100	102.3	90	110	
B	11	1	No Gas	480.774	0.740	845266	0.78	500	96.2	90	110	
Al	27	1	No Gas	104.192	2.868	1165069	2.12	100	104.2	90	110	
Si	28	1	No Gas	523.714	1.180	3354943	0.50	500	104.7	90	110	
Ag	107	1	No Gas	98.314	5.284	1188673	2.45	100	98.3	90	110	
Cd	111	1	No Gas	102.258	3.806	248499	2.29	100	102.3	90	110	
Sr	88	1	No Gas	100.587	3.472	2392501	0.97	100	100.6	90	110	
Mo	95	1	No Gas	98.020	3.891	457194	1.54	100	98.0	90	110	
Sn	118	1	No Gas	96.838	2.325	727859	1.62	100	96.8	90	110	
Sb	121	1	No Gas	102.111	0.784	1054422	1.26	100	102.1	90	110	
Ba	137	1	No Gas	102.993	2.901	396418	1.39	100	103.0	90	110	
Tl	205	1	No Gas	106.276	0.630	2226164	1.33	100	106.3	90	110	
Tl	203	1	No Gas	103.126	1.918	895133	1.41	100	103.1	90	110	
Pb	208	1	No Gas	102.681	1.691	2917078	0.29	100	102.7	90	110	
U	238	1	No Gas	107.753	2.189	3135737	0.95	100	107.8	90	110	
Ca	43	2	He	9413.252	1.216	22713	2.29	10000	94.1	90	110	
Sb	121	2	He	102.861	1.062	614145	0.80	100	102.9	90	110	
Ti	47	2	He	99.896	5.865	21003	4.78	100	99.9	90	110	
Cu	63	1	No Gas	102.313	0.926	891374	0.14	100	102.3	90	110	
Se	82	1	No Gas	104.513	3.189	16213	3.69	100	104.5	90	110	

QC ISTD Table

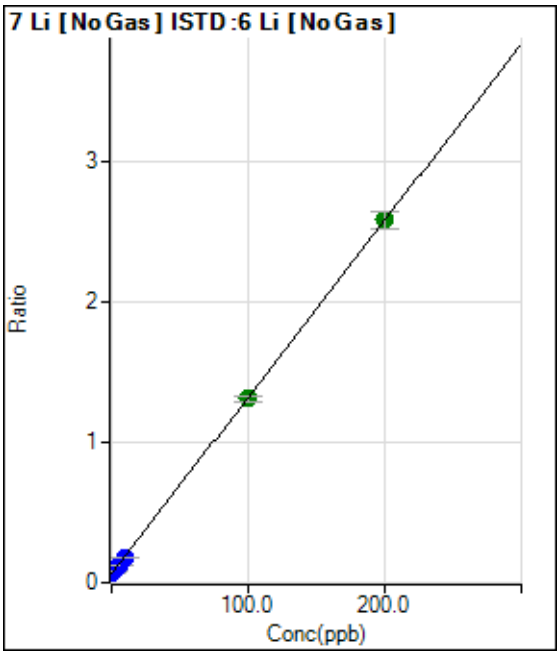
Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	881438	0.21	931764	94.60	70	120	
Ge	72	2	He	709238	1.09	713484	99.40	70	120	
Ge	72	1	No Gas	2029407	0.86	2088541	97.17	70	120	
In	115	1	No Gas	2374171	2.83	2355410	100.80	70	120	
Bi	209	1	No Gas	2073001	1.96	2070771	100.11	70	120	

Calibration for 015_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 7:42:15 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	008CALB.d	CAL BLK	12/15/2021 11:06:53 AM
2	009CALS.d	2/10/200	12/15/2021 11:08:50 AM
3	010CALS.d	5/25/500	12/15/2021 11:10:48 AM
4	011CALS.d	10/50/100	12/15/2021 11:12:46 AM
5	012CALS.d	100/500/10K	12/15/2021 11:14:44 AM
6	013CALS.d	200/1000/20K	12/15/2021 11:16:36 AM

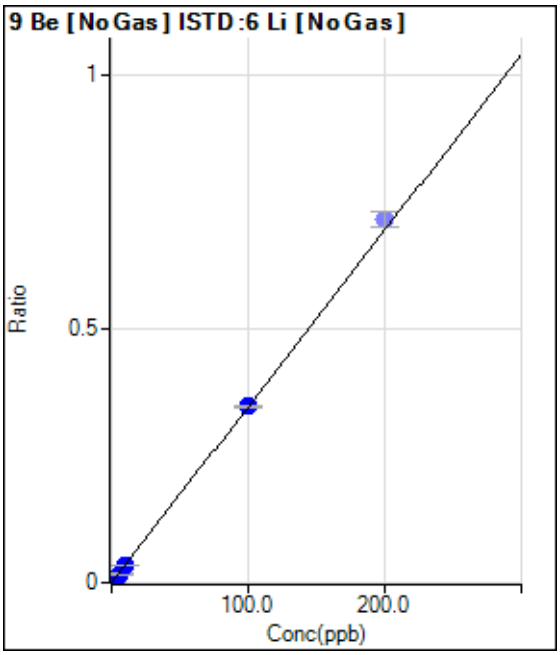
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	58628.02	0.0629	P	2.7
2	☐	2.000	1.810	78792.14	0.0857	P	0.6
3	☐	5.000	4.742	111488.67	0.1225	P	2.4
4	☐	10.000	9.165	165738.28	0.1781	P	1.1
5	☐	100.000	99.260	1150972.46	1.3101	A	3.1
6	☐	200.000	200.420	2174305.38	2.5811	A	5.1

y = 0.0126 * x + 0.0629
R = 1.0000
DL = 0.4019
BEC = 5.01

Weight: <None>
Min Conc: <None>

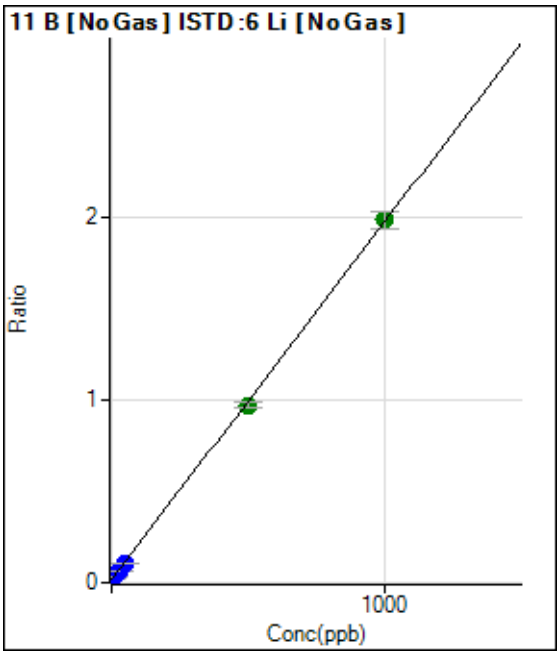


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	35.00	0.0000	P	38.2
2	☐	2.000	1.843	5911.29	0.0064	P	1.7
3	☐	5.000	4.880	15428.53	0.0170	P	2.6
4	☐	10.000	9.453	30533.13	0.0328	P	2.0
5	☐	100.000	100.064	304758.41	0.3469	P	1.9
6	☑	200.000		602014.46	0.7145	P	4.4

y = 0.0035 * x + 3.7589E-005
R = 1.0000
DL = 0.01243
BEC = 0.01084

Weight: <None>
Min Conc: <None>

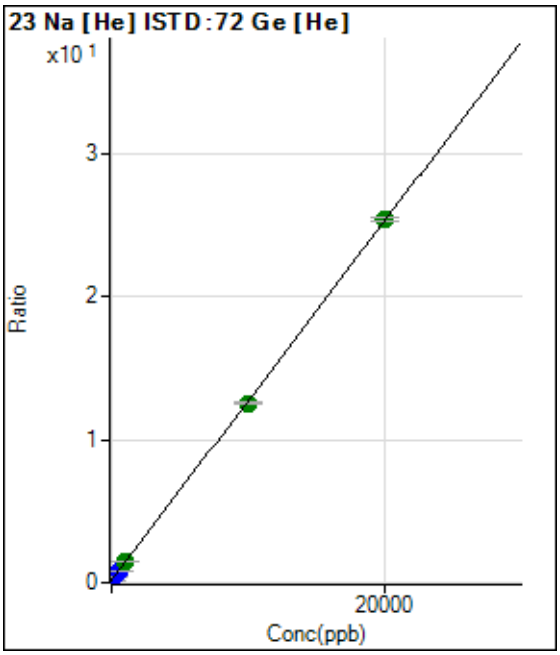
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	15086.53	0.0162	P	4.3
2	☐	10.000	8.783	30735.30	0.0334	P	1.6
3	☐	25.000	23.113	55959.36	0.0615	P	4.6
4	☐	50.000	45.927	98896.47	0.1063	P	4.1
5	☐	500.000	488.727	855953.48	0.9746	A	3.2
6	☐	1000.000	1005.900	1675507.37	1.9887	A	4.8

y = 0.0020 * x + 0.0162
R = 0.9999
DL = 1.058
BEC = 8.261

Weight: <None>
Min Conc: <None>

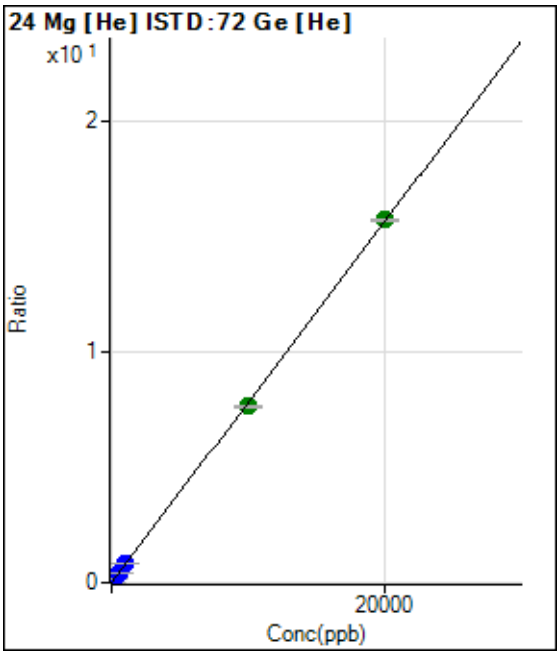


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	118768.40	0.1665	P	2.0
2	☐	200.000	198.922	295962.34	0.4164	P	0.8
3	☐	500.000	508.261	572668.50	0.8050	P	0.9
4	☐	1000.000	1023.779	1029697.20	1.4526	A	1.2
5	☐	10000.00	9853.266	8800545.91	12.5442	A	0.7
6	☐	20000.00	20071.98	17289039.74	25.3809	A	1.0

y = 0.0013 * x + 0.1665
R = 1.0000
DL = 7.979
BEC = 132.5

Weight: <None>
Min Conc: <None>

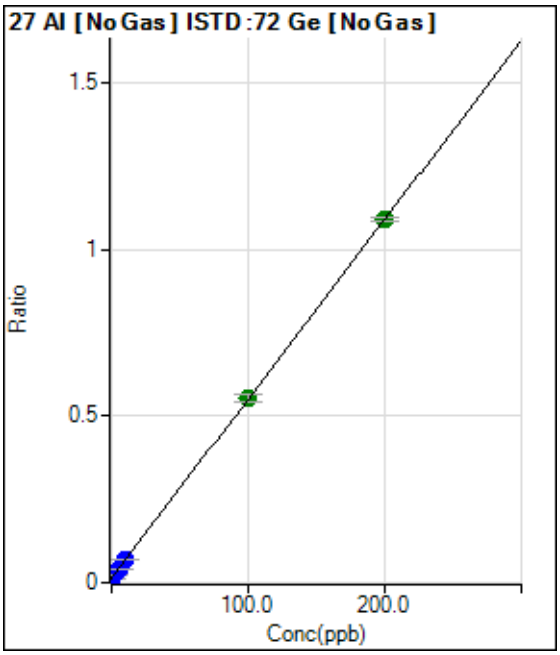
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	260.01	0.0004	P	43.2
2	☐	200.000	200.144	111362.24	0.1567	P	0.2
3	☐	500.000	512.031	284733.08	0.4002	P	1.1
4	☐	1000.000	1033.900	572602.53	0.8078	P	0.9
5	☐	10000.00	9790.616	5364572.63	7.6462	A	1.3
6	☐	20000.00	20102.69	10694104.84	15.6993	A	0.8

y = 7.8094E-004 * x + 3.6532E-004
R = 0.9999
DL = 0.6057
BEC = 0.4678

Weight: <None>
Min Conc: <None>

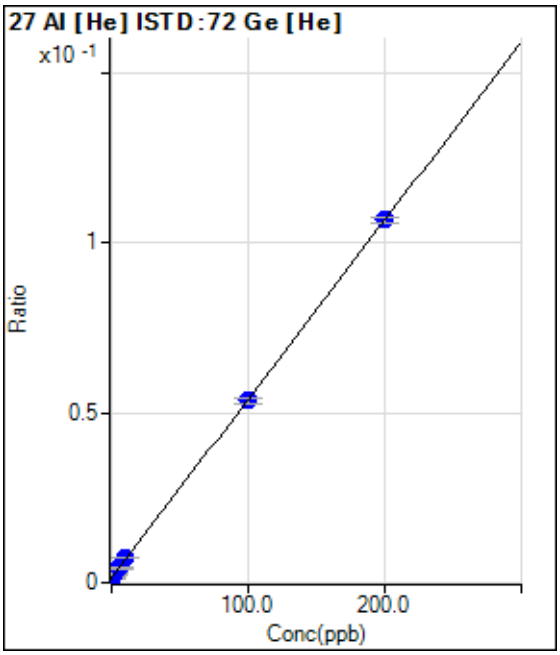


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	28716.77	0.0137	P	3.1
2	☐	2.000	2.077	51626.31	0.0249	P	1.0
3	☐	5.000	5.088	85568.91	0.0411	P	3.2
4	☐	10.000	10.424	143567.60	0.0698	P	2.6
5	☐	100.000	100.040	1114018.03	0.5518	A	4.3
6	☐	200.000	199.956	2157891.79	1.0893	A	1.1

y = 0.0054 * x + 0.0137
R = 1.0000
DL = 0.2399
BEC = 2.556

Weight: <None>
Min Conc: <None>

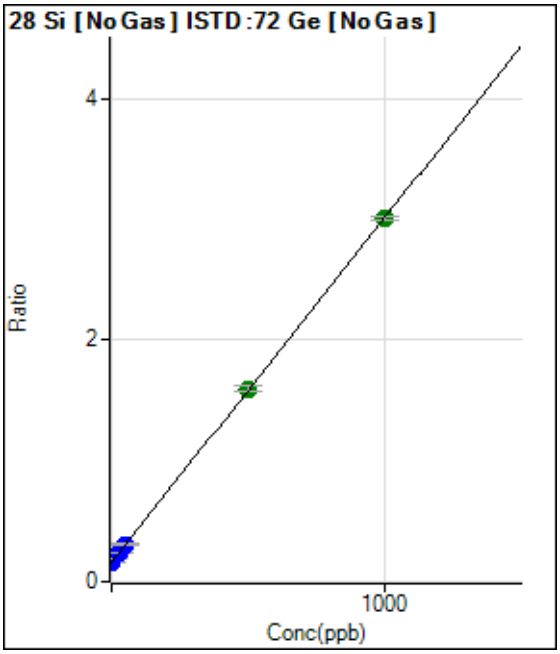
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1006.72	0.0014	P	12.2
2	☐	2.000	2.070	1776.81	0.0025	P	4.4
3	☐	5.000	5.418	3030.38	0.0043	P	9.4
4	☐	10.000	11.129	5147.71	0.0073	P	4.3
5	☐	100.000	99.176	37577.69	0.0536	P	2.6
6	☐	200.000	200.344	72726.42	0.1068	P	1.3

y = 5.2587E-004 * x + 0.0014
R = 1.0000
DL = 0.9836
BEC = 2.684

Weight: <None>
Min Conc: <None>

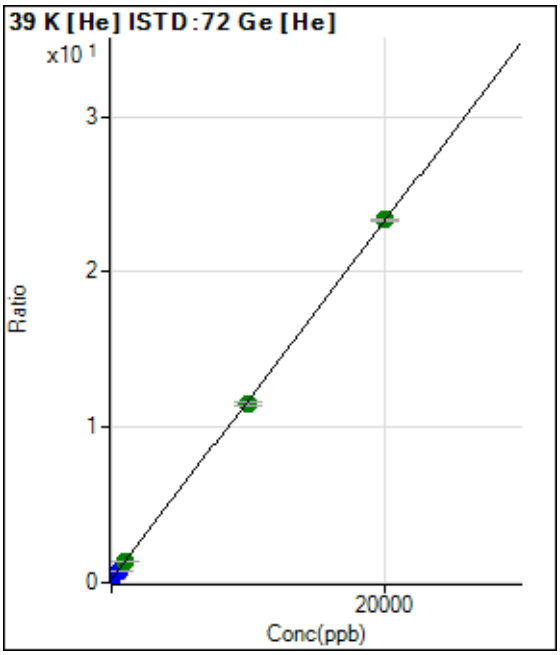


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	335760.93	0.1608	P	0.4
2	☐	10.000	14.203	416738.94	0.2012	P	10.1
3	☐	25.000	25.469	485684.00	0.2333	P	1.6
4	☐	50.000	51.851	634486.90	0.3085	P	2.2
5	☐	500.000	504.670	3229488.49	1.5990	A	2.2
6	☐	1000.000	997.519	5949471.37	3.0035	A	1.1

y = 0.0028 * x + 0.1608
R = 1.0000
DL = 0.7413
BEC = 56.41

Weight: <None>
Min Conc: <None>

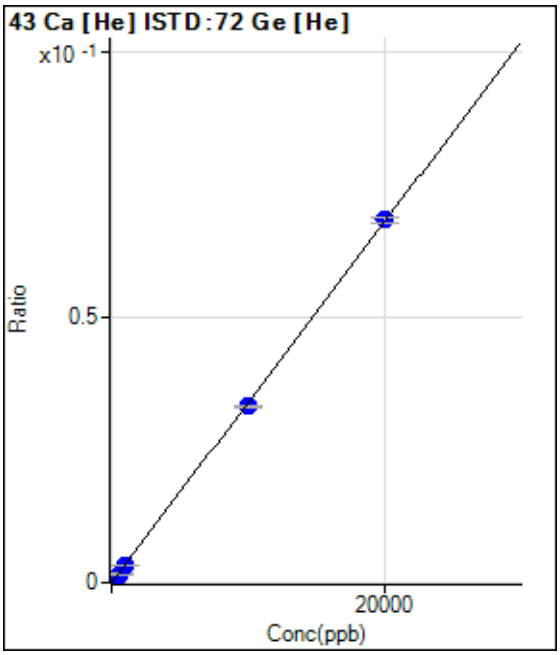
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	161478.41	0.2263	P	1.1
2	☐	200.000	192.427	318483.73	0.4481	P	0.6
3	☐	500.000	492.282	564567.52	0.7935	P	0.2
4	☐	1000.000	1017.715	991593.60	1.3989	A	2.6
5	☐	10000.00	9835.836	8109321.34	11.5592	A	2.4
6	☐	20000.00	20081.46	15915292.68	23.3642	A	0.7

y = 0.0012 * x + 0.2263
R = 1.0000
DL = 6.642
BEC = 196.4

Weight: <None>
Min Conc: <None>

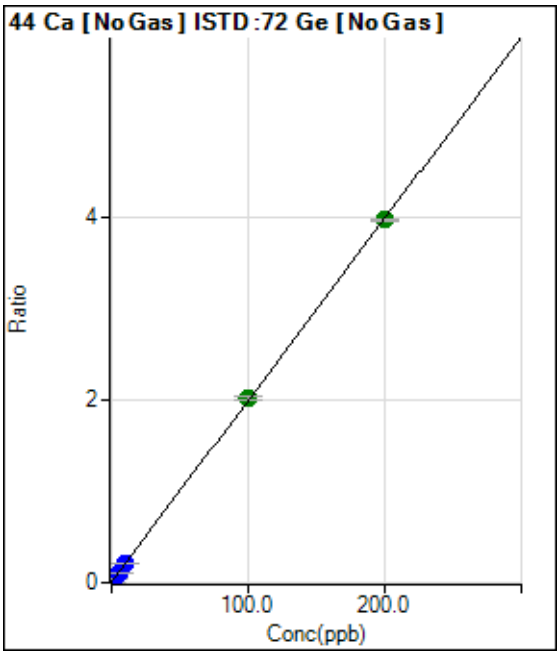


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	30.00	0.0000	P	87.9
2	☐	200.000	187.820	483.35	0.0007	P	14.1
3	☐	500.000	438.611	1090.06	0.0015	P	15.9
4	☐	1000.000	952.504	2323.57	0.0033	P	2.1
5	☐	10000.00	9778.968	23336.73	0.0333	P	0.7
6	☐	20000.00	20114.54	46575.62	0.0684	P	1.9

y = 3.3973E-006 * x + 4.1913E-005
R = 0.9999
DL = 32.53
BEC = 12.34

Weight: <None>
Min Conc: <None>

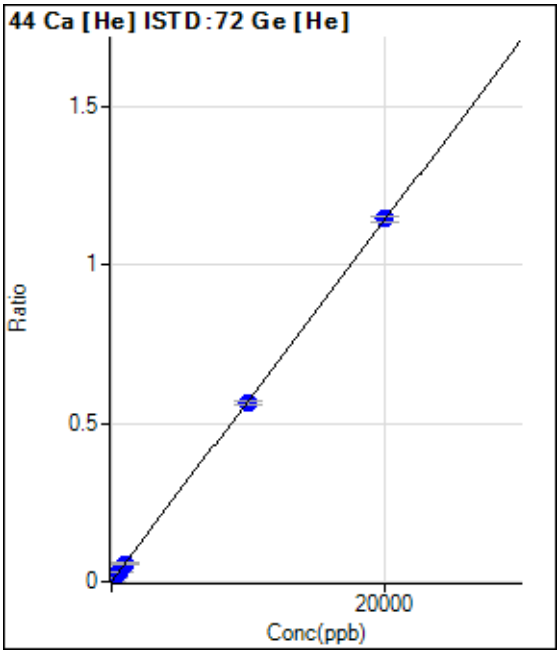
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14247.65	0.0068	P	1.2
2	☐	2.000	1.974	95264.75	0.0460	P	0.2
3	☐	5.000	4.891	216184.86	0.1039	P	1.3
4	☐	10.000	10.093	425802.01	0.2071	P	2.8
5	☐	100.000	101.219	4069402.54	2.0151	A	2.5
6	☐	200.000	199.389	7850137.80	3.9629	A	0.7

y = 0.0198 * x + 0.0068
R = 1.0000
DL = 0.01238
BEC = 0.3438

Weight: <None>
Min Conc: <None>

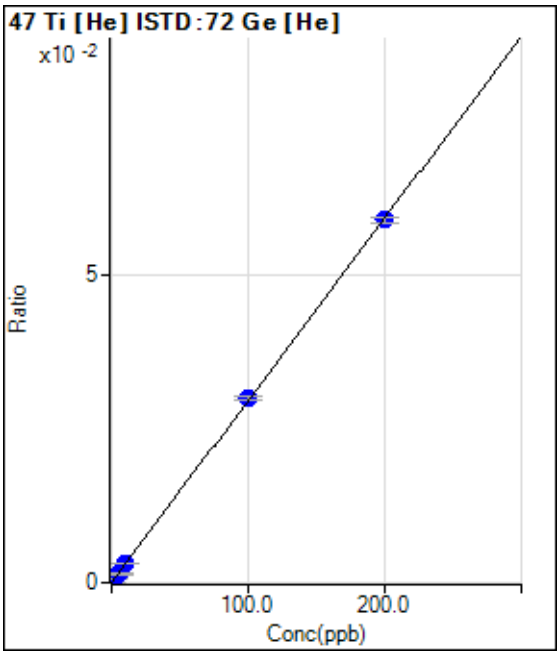


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	560.02	0.0008	P	10.5
2	☐	200.000	192.717	8376.01	0.0118	P	4.9
3	☐	500.000	484.923	20248.53	0.0285	P	1.9
4	☐	1000.000	996.662	40877.63	0.0577	P	1.9
5	☐	10000.00	9845.486	394749.10	0.5627	P	2.2
6	☐	20000.00	20077.87	781055.22	1.1466	P	1.8

y = 5.7070E-005 * x + 7.8454E-004
R = 1.0000
DL = 4.311
BEC = 13.75

Weight: <None>
Min Conc: <None>

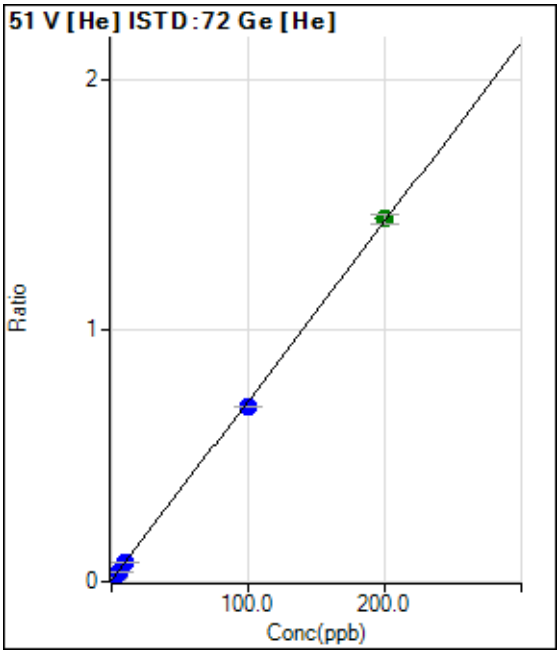
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	49.4
2	☐	2.000	1.758	390.01	0.0005	P	4.6
3	☐	5.000	4.757	1023.39	0.0014	P	16.8
4	☐	10.000	10.189	2160.21	0.0030	P	3.5
5	☐	100.000	101.511	21119.90	0.0301	P	1.4
6	☐	200.000	199.244	40232.56	0.0591	P	1.6

y = 2.9629E-004 * x + 2.7953E-005
R = 1.0000
DL = 0.1398
BEC = 0.09434

Weight: <None>
Min Conc: <None>

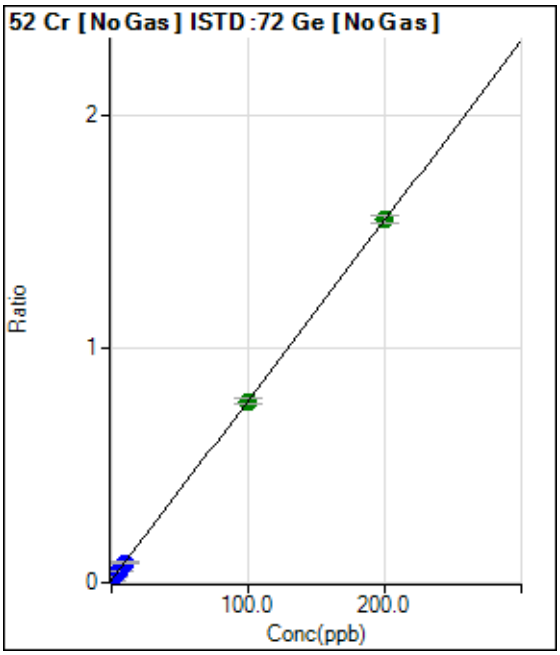


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3837.23	0.0054	P	2.1
2	☐	2.000	1.878	13352.10	0.0188	P	1.8
3	☐	5.000	4.732	27860.49	0.0392	P	0.5
4	☐	10.000	9.702	52911.59	0.0747	P	2.8
5	☐	100.000	96.952	489413.71	0.6976	P	0.8
6	☐	200.000	201.547	983895.48	1.4444	A	2.5

y = 0.0071 * x + 0.0054
R = 0.9998
DL = 0.047
BEC = 0.7532

Weight: <None>
Min Conc: <None>

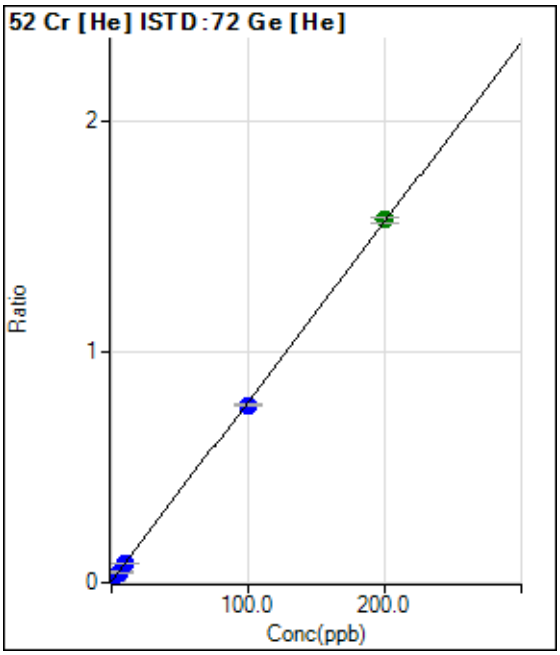
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20886.36	0.0100	P	2.3
2	☐	2.000	1.938	51590.44	0.0249	P	1.6
3	☐	5.000	4.830	98103.02	0.0471	P	1.4
4	☐	10.000	9.859	176394.34	0.0858	P	3.1
5	☐	100.000	99.405	1563227.69	0.7742	A	2.9
6	☐	200.000	200.309	3069983.18	1.5499	A	2.0

y = 0.0077 * x + 0.0100
R = 1.0000
DL = 0.08963
BEC = 1.301

Weight: <None>
Min Conc: <None>

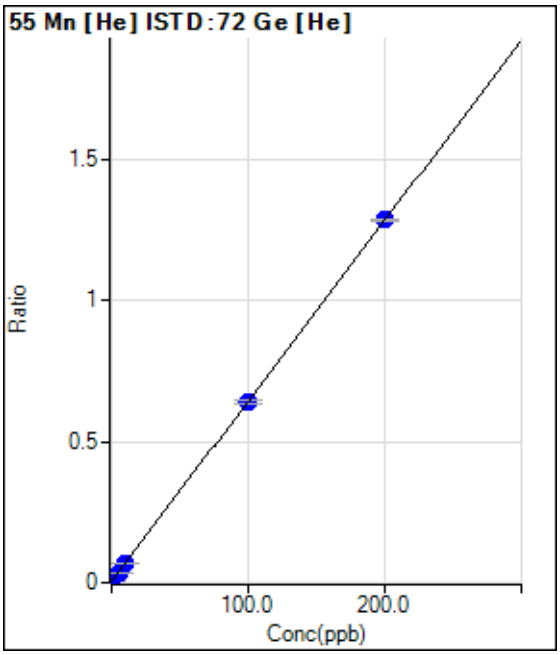


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4730.91	0.0066	P	3.9
2	☐	2.000	1.908	15282.05	0.0215	P	1.8
3	☐	5.000	4.957	32214.86	0.0453	P	3.8
4	☐	10.000	9.801	58866.59	0.0830	P	1.6
5	☐	100.000	97.740	539172.58	0.7685	P	1.1
6	☐	200.000	201.142	1072552.98	1.5746	A	1.8

y = 0.0078 * x + 0.0066
R = 0.9999
DL = 0.1
BEC = 0.8504

Weight: <None>
Min Conc: <None>

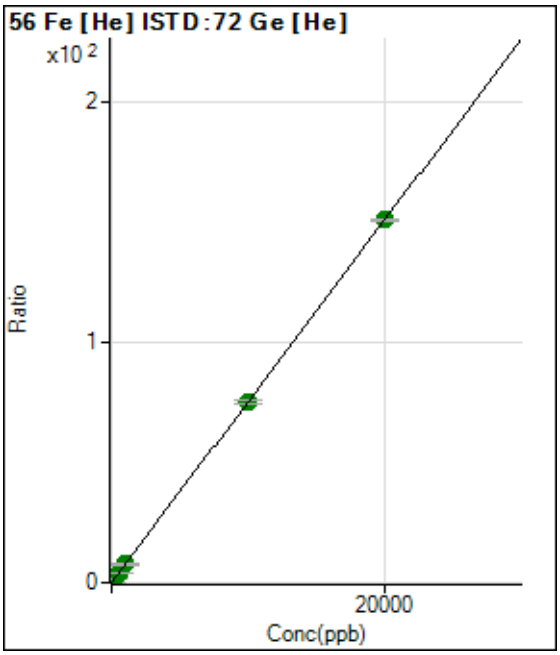
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4043.99	0.0057	P	7.6
2	☐	2.000	1.862	12499.26	0.0176	P	0.5
3	☐	5.000	4.815	25948.29	0.0365	P	3.1
4	☐	10.000	10.061	49653.78	0.0700	P	1.3
5	☐	100.000	99.283	449656.36	0.6409	P	1.8
6	☐	200.000	200.362	877161.71	1.2877	P	0.8

y = 0.0064 * x + 0.0057
R = 1.0000
DL = 0.202
BEC = 0.8862

Weight: <None>
Min Conc: <None>

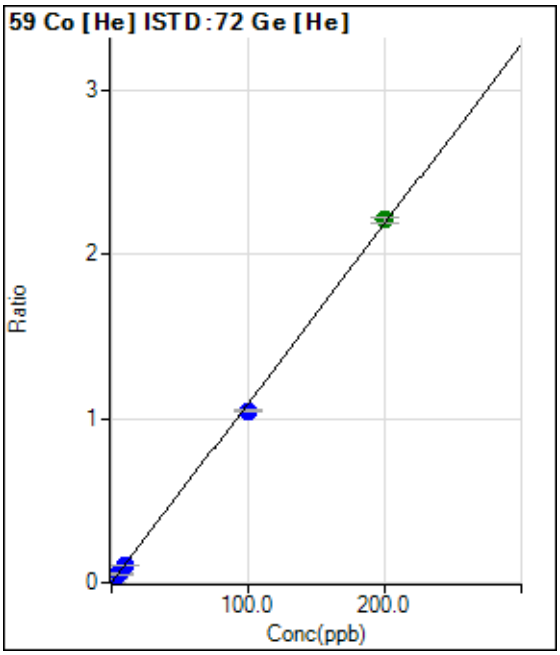


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14911.86	0.0209	P	6.3
2	☐	200.000	200.335	1089655.56	1.5329	A	1.2
3	☐	500.000	507.947	2742459.02	3.8546	A	2.2
4	☐	1000.000	1012.551	5431625.55	7.6631	A	2.4
5	☐	10000.00	9952.420	52712055.88	75.1364	A	1.8
6	☐	20000.00	20022.96	102958401.8	151.143	A	0.6

y = 0.0075 * x + 0.0209
R = 1.0000
DL = 0.5227
BEC = 2.77

Weight: <None>
Min Conc: <None>

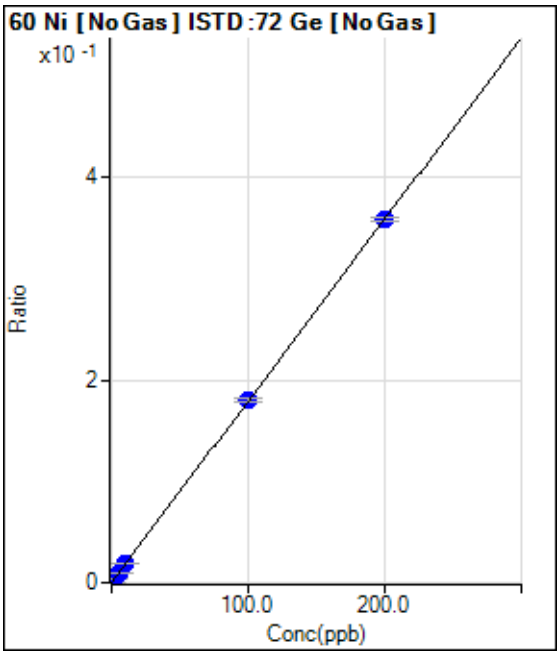
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.33	0.0001	P	23.4
2	☐	2.000	1.894	14778.30	0.0208	P	4.3
3	☐	5.000	4.863	37866.24	0.0532	P	3.1
4	☐	10.000	9.595	74392.71	0.1049	P	0.9
5	☐	100.000	95.672	733518.79	1.0456	P	1.5
6	☐	200.000	202.189	1505152.16	2.2095	A	1.4

y = 0.0109 * x + 8.8662E-005
R = 0.9997
DL = 0.005694
BEC = 0.008114

Weight: <None>
Min Conc: <None>

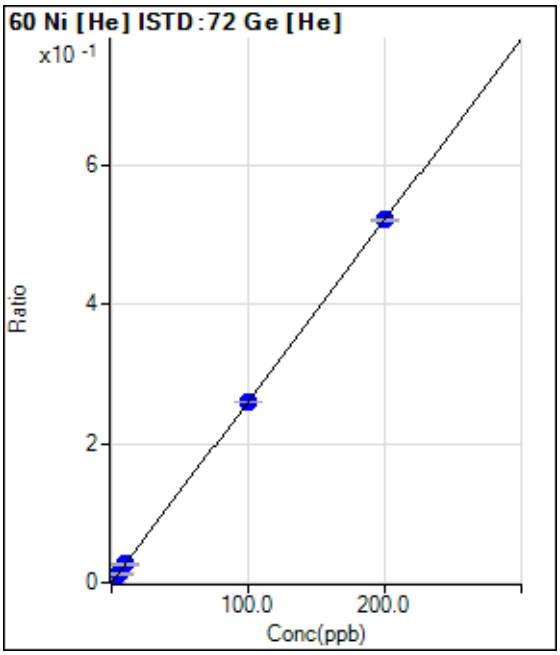


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	310.01	0.0001	P	17.0
2	☐	2.000	1.970	7615.63	0.0037	P	4.0
3	☐	5.000	4.959	18786.48	0.0090	P	4.4
4	☐	10.000	10.163	37735.87	0.0183	P	1.3
5	☐	100.000	100.402	363374.37	0.1799	P	2.3
6	☐	200.000	199.792	708991.06	0.3579	P	0.9

y = 0.0018 * x + 1.4842E-004
R = 1.0000
DL = 0.04232
BEC = 0.08288

Weight: <None>
Min Conc: <None>

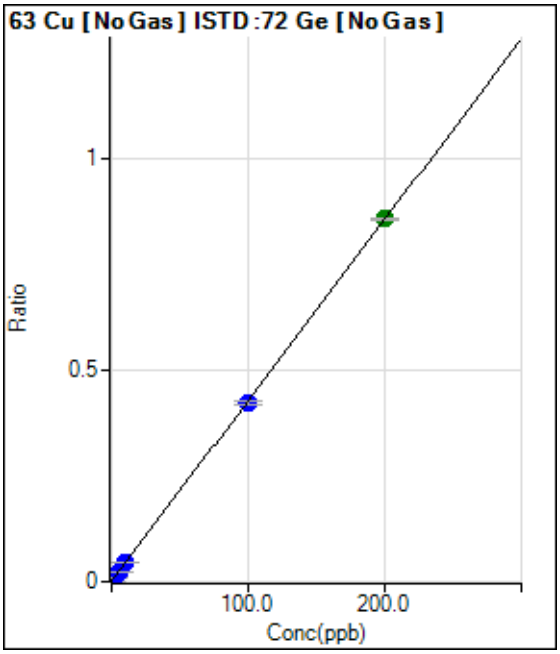
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	116.67	0.0002	P	35.0
2	☐	2.000	1.848	3530.53	0.0050	P	3.1
3	☐	5.000	4.730	8863.04	0.0125	P	3.6
4	☐	10.000	10.021	18586.27	0.0262	P	2.1
5	☐	100.000	99.617	181814.79	0.2592	P	0.2
6	☐	200.000	200.199	354657.56	0.5206	P	0.7

y = 0.0026 * x + 1.6318E-004
R = 1.0000
DL = 0.06599
BEC = 0.06276

Weight: <None>
Min Conc: <None>

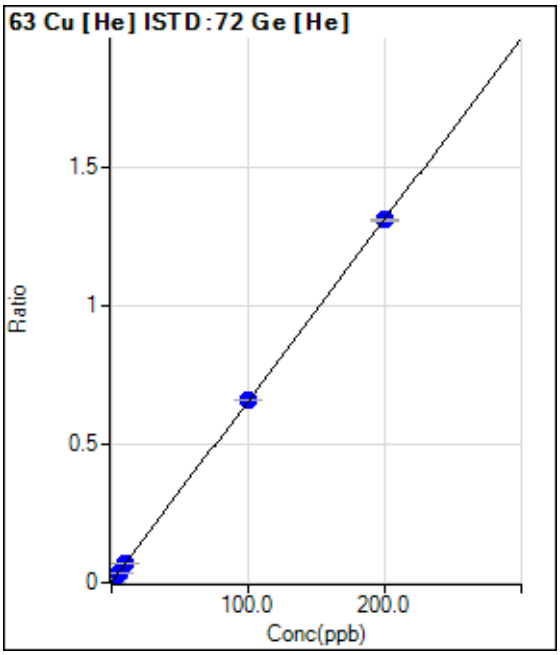


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2893.70	0.0014	P	5.4
2	☐	2.000	1.966	20302.08	0.0098	P	0.5
3	☐	5.000	5.039	47774.00	0.0230	P	1.5
4	☐	10.000	10.072	91462.82	0.0445	P	4.5
5	☐	100.000	99.090	859184.26	0.4255	P	2.2
6	☐	200.000	200.451	1702139.25	0.8592	A	0.7

y = 0.0043 * x + 0.0014
R = 1.0000
DL = 0.05242
BEC = 0.3238

Weight: <None>
Min Conc: <None>

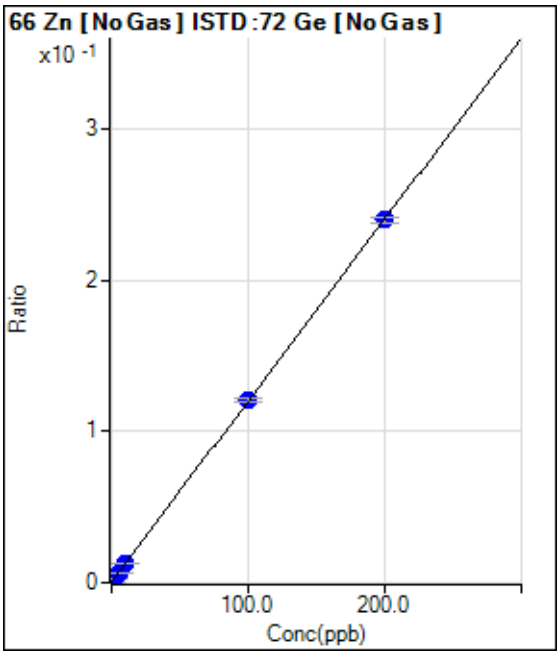
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1463.45	0.0021	P	12.4
2	☐	2.000	1.956	10570.96	0.0149	P	1.5
3	☐	5.000	4.949	24532.43	0.0345	P	2.6
4	☐	10.000	9.984	47841.08	0.0675	P	0.5
5	☐	100.000	100.444	463315.92	0.6604	P	0.7
6	☐	200.000	199.780	893359.00	1.3115	P	0.6

y = 0.0066 * x + 0.0021
R = 1.0000
DL = 0.1168
BEC = 0.3128

Weight: <None>
Min Conc: <None>

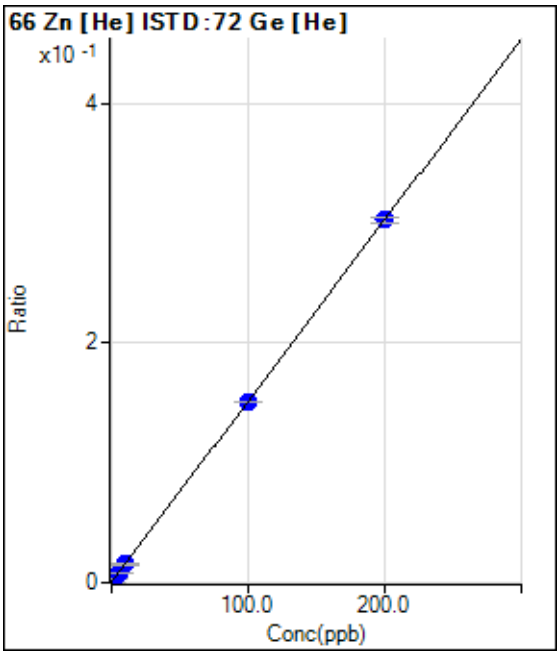


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	636.69	0.0003	P	14.1
2	☐	2.000	2.009	5631.27	0.0027	P	2.2
3	☐	5.000	4.926	12949.77	0.0062	P	3.6
4	☐	10.000	10.171	25758.08	0.0125	P	0.9
5	☐	100.000	100.377	244131.66	0.1209	P	1.6
6	☐	200.000	199.805	476020.83	0.2403	P	1.4

y = 0.0012 * x + 3.0487E-004
R = 1.0000
DL = 0.1077
BEC = 0.2538

Weight: <None>
Min Conc: <None>

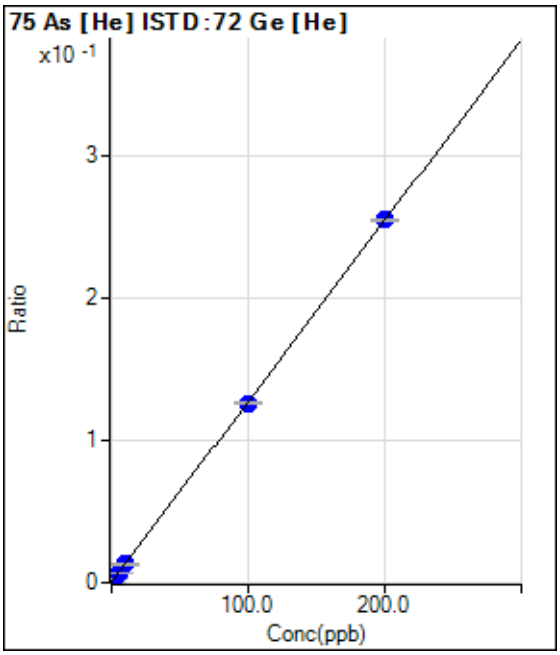
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	253.34	0.0004	P	15.4
2	☐	2.000	2.001	2403.59	0.0034	P	2.8
3	☐	5.000	4.760	5374.49	0.0076	P	1.9
4	☐	10.000	9.927	10894.54	0.0154	P	3.9
5	☐	100.000	99.744	106075.82	0.1512	P	0.5
6	☐	200.000	200.138	206409.59	0.3030	P	1.8

y = 0.0015 * x + 3.5490E-004
R = 1.0000
DL = 0.1083
BEC = 0.2347

Weight: <None>
Min Conc: <None>

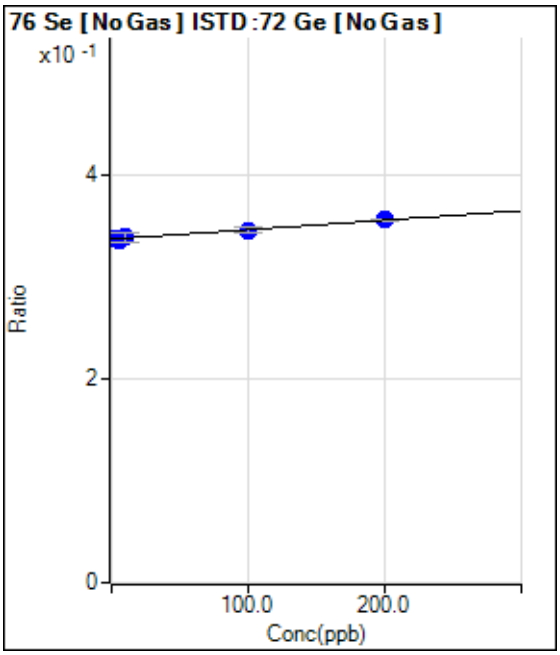


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	216.67	0.0003	P	6.5
2	☐	2.000	2.004	2024.61	0.0028	P	1.2
3	☐	5.000	4.871	4615.26	0.0065	P	3.3
4	☐	10.000	9.901	9124.24	0.0129	P	3.2
5	☐	100.000	99.077	88457.46	0.1261	P	1.0
6	☐	200.000	200.470	173569.71	0.2548	P	0.7

y = 0.0013 * x + 3.0380E-004
R = 1.0000
DL = 0.04665
BEC = 0.2393

Weight: <None>
Min Conc: <None>

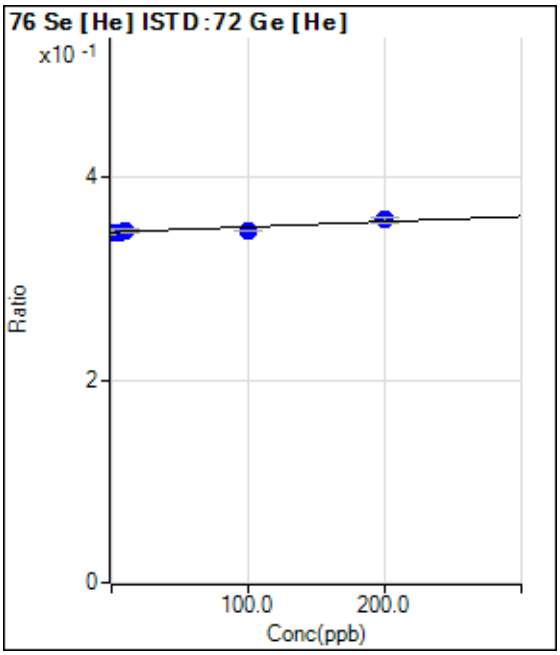
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	702503.12	0.3364	P	0.9
2	☐	2.000	7.485	698254.83	0.3371	P	0.1
3	☐	5.000	-17.753	696702.73	0.3347	P	0.9
4	☐	10.000	19.821	695467.54	0.3382	P	2.8
5	☐	100.000	95.981	697355.95	0.3453	P	2.1
6	☐	200.000	202.033	703595.72	0.3552	P	0.9

y = 9.3189E-005 * x + 0.3364
R = 0.9908
DL = 96.95
BEC = 3610

Weight: <None>
Min Conc: <None>

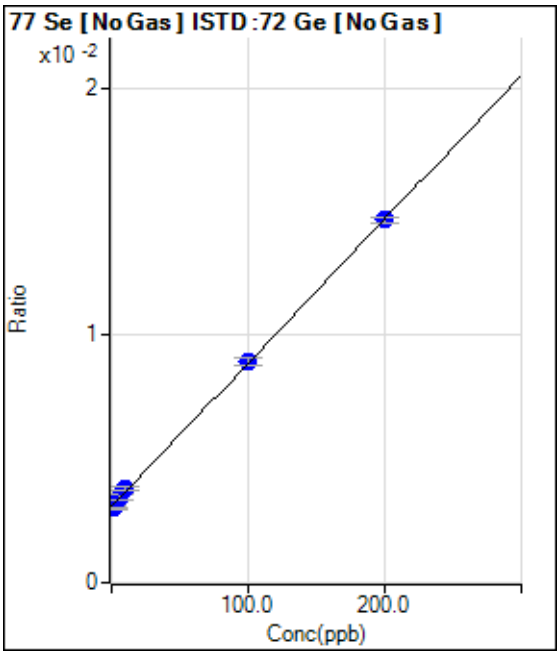


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	246910.93	0.3461	P	0.1
2	☐	2.000	-2.650	245896.80	0.3459	P	1.5
3	☐	5.000	-2.487	246107.47	0.3459	P	1.0
4	☐	10.000	33.619	246553.04	0.3478	P	1.0
5	☐	100.000	35.658	244088.77	0.3479	P	0.2
6	☐	200.000	231.224	243913.92	0.3581	P	1.3

y = 5.1926E-005 * x + 0.3461
R = 0.9294
DL = 10.09
BEC = 6665

Weight: <None>
Min Conc: <None>

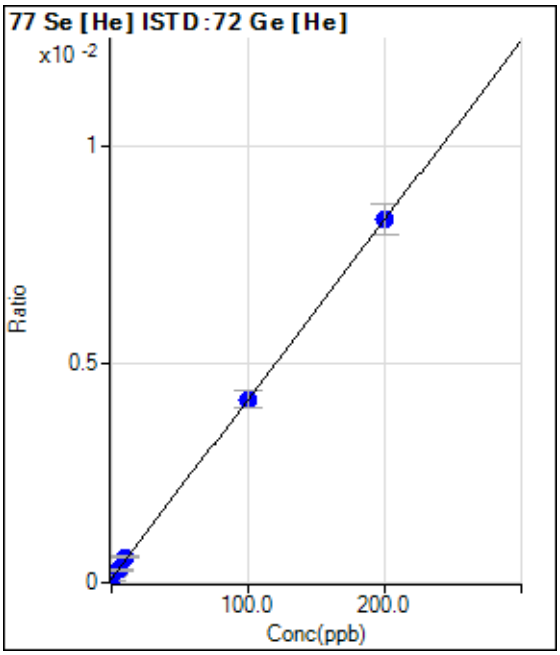
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6414.99	0.0031	P	3.1
2	☐	2.000	-1.337	6201.53	0.0030	P	1.3
3	☐	5.000	6.296	7152.02	0.0034	P	7.5
4	☐	10.000	12.441	7802.44	0.0038	P	4.1
5	☐	100.000	100.871	18039.03	0.0089	P	4.2
6	☐	200.000	199.443	29051.79	0.0147	P	1.7

y = 5.8138E-005 * x + 0.0031
R = 0.9997
DL = 4.976
BEC = 52.83

Weight: <None>
Min Conc: <None>

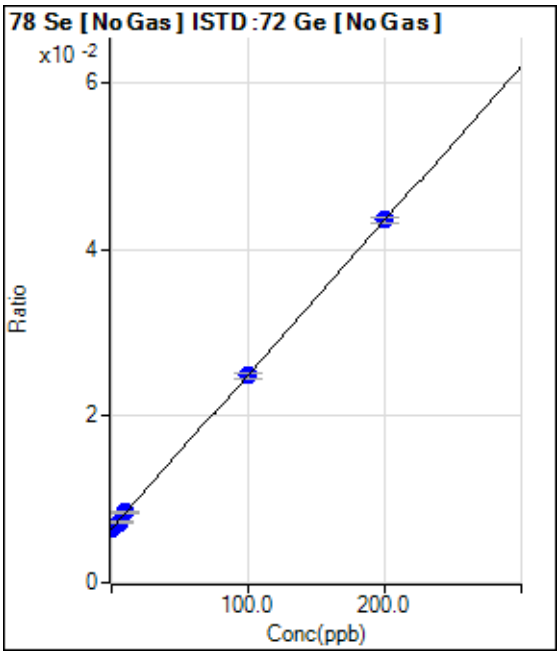


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0001	P	83.6
2	☐	2.000	2.965	153.34	0.0002	P	29.3
3	☐	5.000	4.788	206.67	0.0003	P	19.7
4	☐	10.000	12.033	416.68	0.0006	P	6.0
5	☐	100.000	99.781	2940.39	0.0042	P	9.2
6	☐	200.000	200.004	5657.96	0.0083	P	8.3

y = 4.1062E-005 * x + 9.3930E-005
R = 0.9999
DL = 5.734
BEC = 2.288

Weight: <None>
Min Conc: <None>

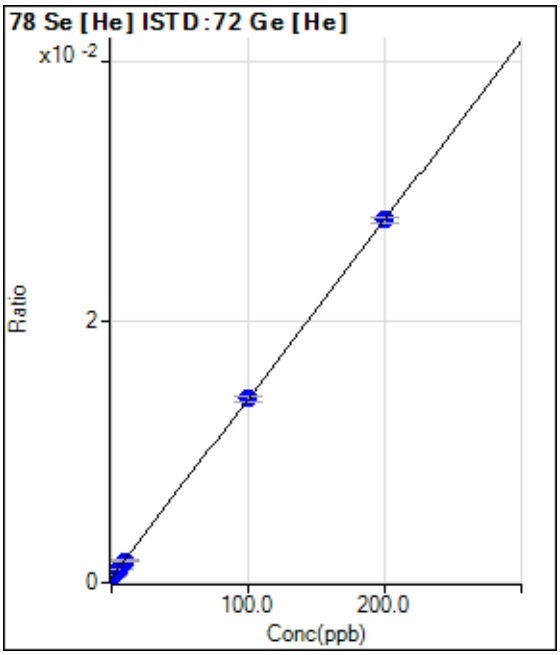
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13533.68	0.0065	P	1.7
2	☐	2.000	1.511	14004.13	0.0068	P	2.5
3	☐	5.000	4.180	15102.00	0.0073	P	3.1
4	☐	10.000	10.557	17351.50	0.0084	P	1.9
5	☐	100.000	99.431	50247.17	0.0249	P	2.5
6	☐	200.000	200.282	86261.74	0.0435	P	1.3

y = 1.8508E-004 * x + 0.0065
R = 1.0000
DL = 1.764
BEC = 35.01

Weight: <None>
Min Conc: <None>

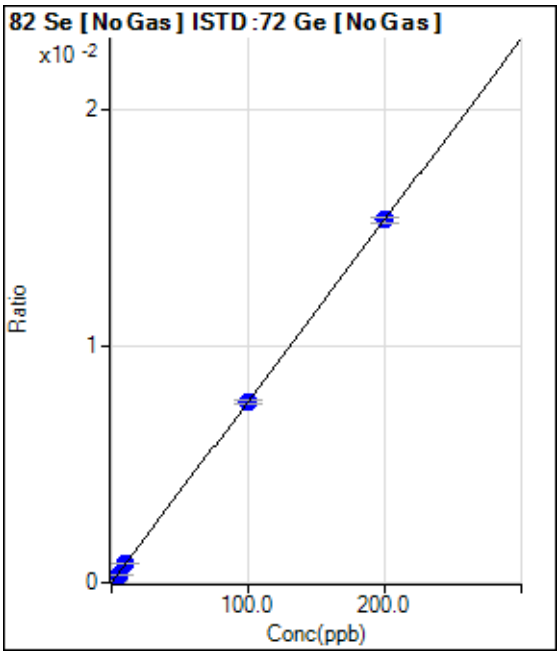


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	274.00	0.0004	P	6.8
2	☐	2.000	1.677	436.68	0.0006	P	8.3
3	☐	5.000	4.798	741.35	0.0010	P	5.2
4	☐	10.000	9.535	1199.39	0.0017	P	0.8
5	☐	100.000	99.900	9882.31	0.0141	P	2.1
6	☐	200.000	200.082	18955.96	0.0278	P	1.7

y = 1.3716E-004 * x + 3.8419E-004
R = 1.0000
DL = 0.5681
BEC = 2.801

Weight: <None>
Min Conc: <None>

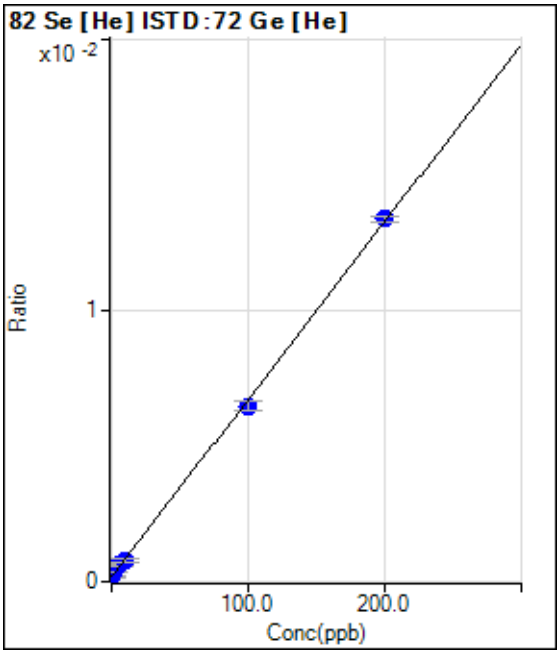
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-28.74	0.0000	P	-256.6
2	☐	2.000	1.596	224.17	0.0001	P	54.8
3	☐	5.000	4.351	664.54	0.0003	P	5.2
4	☐	10.000	10.770	1668.89	0.0008	P	4.2
5	☐	100.000	99.703	15391.26	0.0076	P	2.5
6	☐	200.000	200.130	30327.22	0.0153	P	1.7

y = 7.6566E-005 * x - 1.3891E-005
R = 1.0000
DL = 1.397
BEC = -0.1814

Weight: <None>
Min Conc: <None>

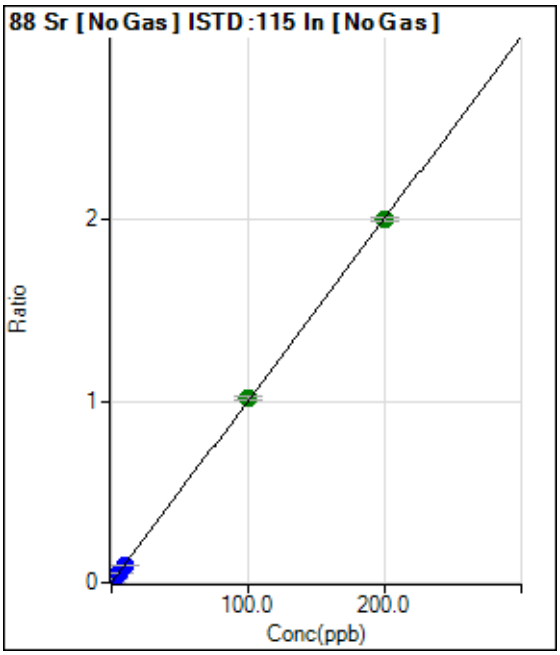


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	126.67	0.0002	P	12.1
2	☐	2.000	2.663	250.01	0.0004	P	14.4
3	☐	5.000	6.672	436.68	0.0006	P	5.0
4	☐	10.000	8.860	536.69	0.0008	P	18.1
5	☐	100.000	96.418	4547.52	0.0065	P	4.6
6	☐	200.000	201.800	9109.92	0.0134	P	1.9

y = 6.5392E-005 * x + 1.7756E-004
R = 0.9997
DL = 0.9884
BEC = 2.715

Weight: <None>
Min Conc: <None>

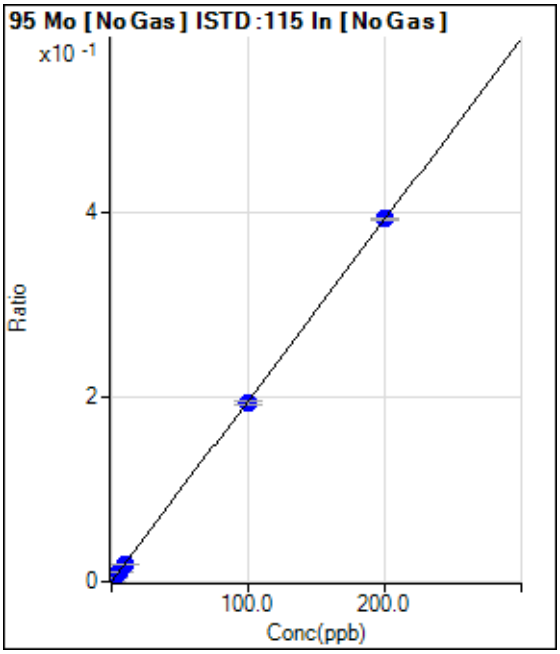
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1140.07	0.0005	P	3.4
2	☐	2.000	1.905	46918.98	0.0196	P	2.6
3	☐	5.000	4.898	119046.74	0.0496	P	0.3
4	☐	10.000	9.739	238649.35	0.0981	P	1.6
5	☐	100.000	101.401	2390961.22	1.0165	A	1.1
6	☐	200.000	199.316	4613811.91	1.9976	A	1.1

y = 0.0100 * x + 4.8415E-004
R = 1.0000
DL = 0.004905
BEC = 0.04832

Weight: <None>
Min Conc: <None>

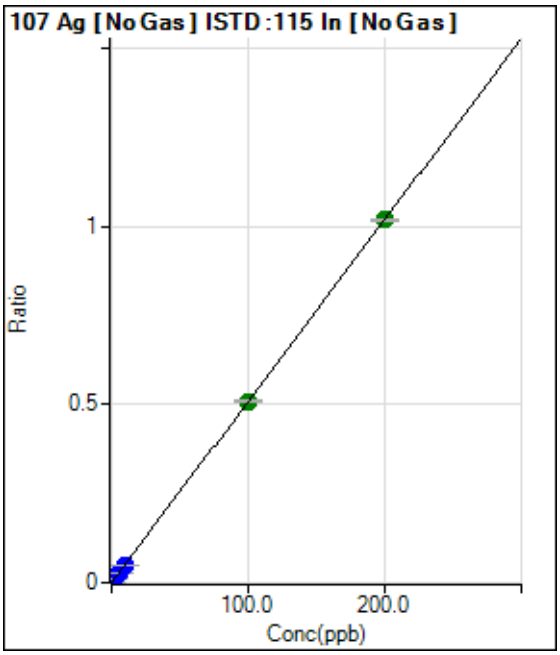


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	60.00	0.0000	P	33.6
2	☐	2.000	1.924	9129.97	0.0038	P	3.1
3	☐	5.000	4.902	23207.23	0.0097	P	3.2
4	☐	10.000	9.760	46748.81	0.0192	P	1.9
5	☐	100.000	99.110	458324.74	0.1948	P	1.9
6	☐	200.000	200.460	910125.01	0.3941	P	0.5

y = 0.0020 * x + 2.5474E-005
R = 1.0000
DL = 0.01306
BEC = 0.01296

Weight: <None>
Min Conc: <None>

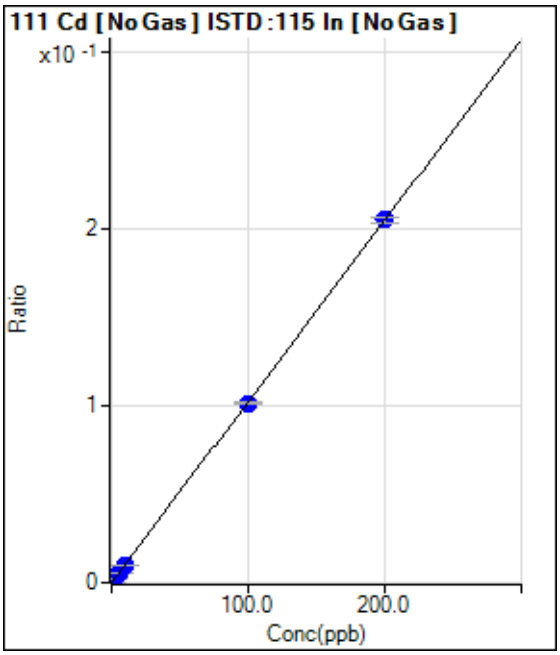
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	303.34	0.0001	P	25.3
2	☐	2.000	1.879	23264.18	0.0097	P	1.9
3	☐	5.000	4.785	58874.37	0.0245	P	0.2
4	☐	10.000	9.694	120532.21	0.0495	P	2.4
5	☐	100.000	99.941	1198411.10	0.5095	A	1.2
6	☐	200.000	200.051	2354936.48	1.0196	A	0.8

y = 0.0051 * x + 1.2851E-004
R = 1.0000
DL = 0.01913
BEC = 0.02522

Weight: <None>
Min Conc: <None>

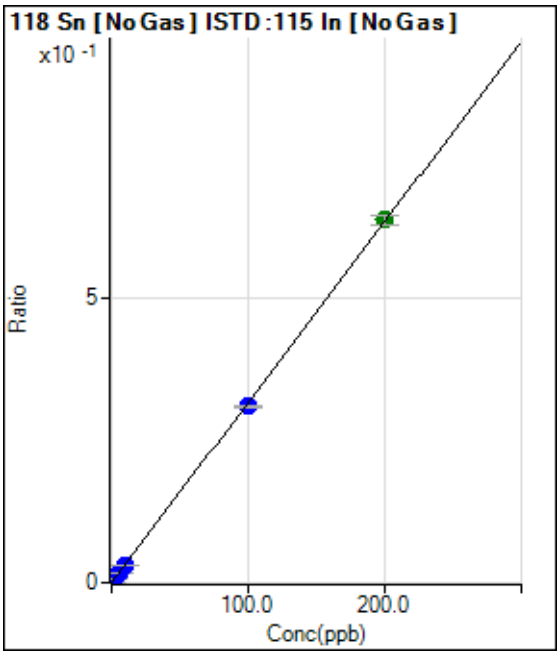


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	108.7
2	☐	2.000	1.910	4710.93	0.0020	P	6.3
3	☐	5.000	4.948	12192.52	0.0051	P	2.9
4	☐	10.000	9.899	24693.49	0.0101	P	2.2
5	☐	100.000	99.194	238966.40	0.1016	P	0.8
6	☐	200.000	200.410	473997.53	0.2052	P	1.9

y = 0.0010 * x + 9.9156E-006
R = 1.0000
DL = 0.03157
BEC = 0.009683

Weight: <None>
Min Conc: <None>

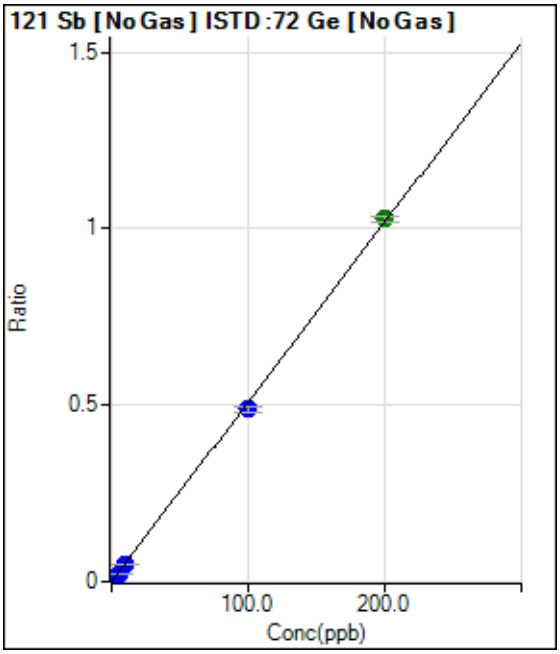
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1243.42	0.0005	P	8.3
2	☐	2.000	1.919	15803.17	0.0066	P	4.4
3	☐	5.000	4.751	37343.46	0.0155	P	3.0
4	☐	10.000	9.607	75201.72	0.0309	P	0.8
5	☐	100.000	97.711	727912.02	0.3094	P	1.0
6	☐	200.000	201.171	1469992.90	0.6365	A	2.6

y = 0.0032 * x + 5.2762E-004
R = 0.9999
DL = 0.04158
BEC = 0.1669

Weight: <None>
Min Conc: <None>

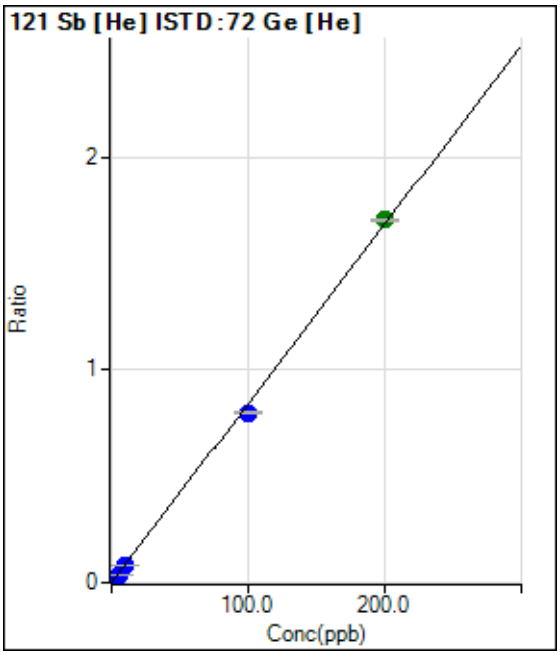


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	336.68	0.0002	P	2.9
2	☐	2.000	1.756	18837.10	0.0091	P	0.9
3	☐	5.000	4.401	46930.76	0.0225	P	0.5
4	☐	10.000	9.476	99455.02	0.0484	P	2.3
5	☐	100.000	96.006	986444.80	0.4885	P	2.9
6	☐	200.000	202.041	2036073.25	1.0279	A	1.2

y = 0.0051 * x + 1.6119E-004
R = 0.9997
DL = 0.002784
BEC = 0.03169

Weight: <None>
Min Conc: <None>

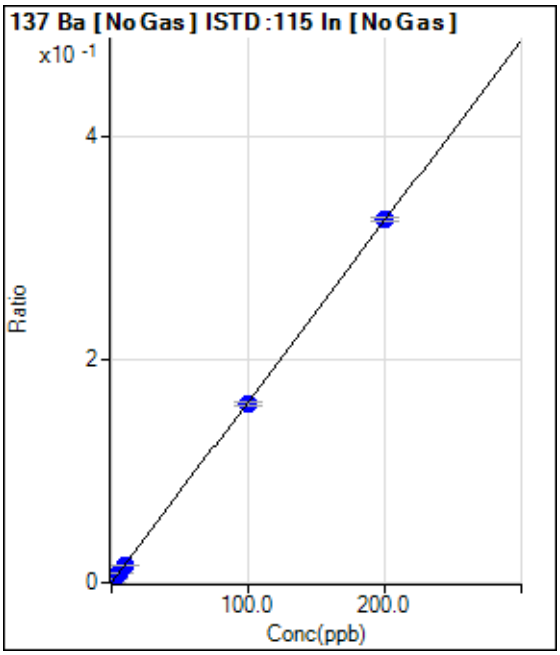
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	210.01	0.0003	P	16.1
2	☐	2.000	1.728	10547.70	0.0148	P	2.8
3	☐	5.000	4.578	27616.02	0.0388	P	3.5
4	☐	10.000	9.215	55179.50	0.0778	P	1.2
5	☐	100.000	94.956	560869.93	0.7994	P	0.4
6	☐	200.000	202.575	1161532.75	1.7052	A	0.7

y = 0.0084 * x + 2.9423E-004
R = 0.9996
DL = 0.01687
BEC = 0.03496

Weight: <None>
Min Conc: <None>

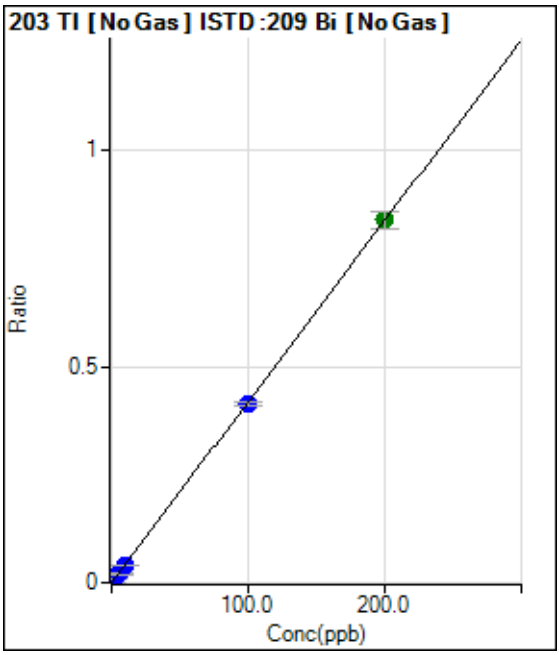


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146.67	0.0001	P	28.5
2	☐	2.000	1.872	7425.58	0.0031	P	2.5
3	☐	5.000	4.925	19328.11	0.0080	P	3.9
4	☐	10.000	9.703	38427.37	0.0158	P	3.9
5	☐	100.000	98.847	377122.10	0.1603	P	1.5
6	☐	200.000	200.595	751319.11	0.3253	P	1.1

y = 0.0016 * x + 6.2394E-005
R = 1.0000
DL = 0.03289
BEC = 0.03848

Weight: <None>
Min Conc: <None>

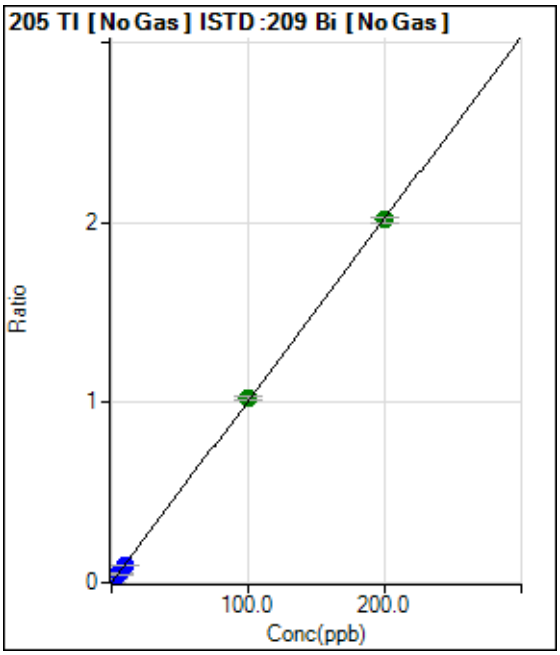
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	76.67	0.0000	P	35.3
2	☐	2.000	1.847	16227.49	0.0078	P	2.8
3	☐	5.000	4.830	42204.85	0.0203	P	2.6
4	☐	10.000	9.745	86495.62	0.0408	P	2.2
5	☐	100.000	98.876	858291.24	0.4141	P	1.3
6	☐	200.000	200.581	1728079.09	0.8400	A	4.6

y = 0.0042 * x + 3.6840E-005
R = 1.0000
DL = 0.009313
BEC = 0.008798

Weight: <None>
Min Conc: <None>

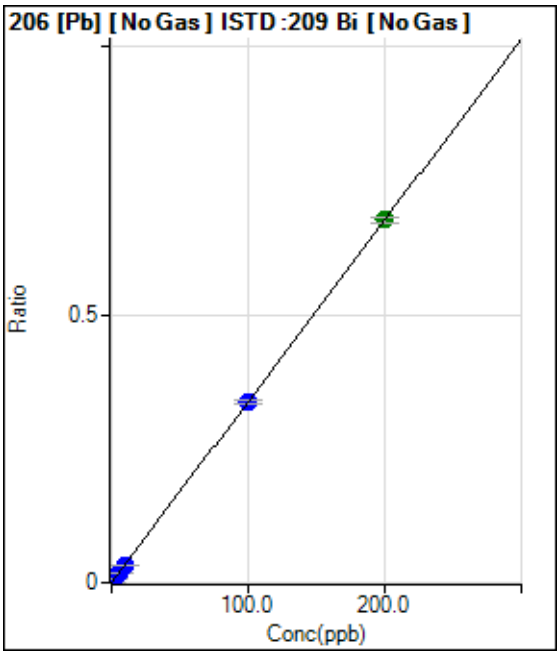


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	226.67	0.0001	P	22.7
2	☐	2.000	1.847	39208.63	0.0188	P	2.8
3	☐	5.000	4.818	101591.22	0.0488	P	5.0
4	☐	10.000	9.589	205409.70	0.0970	P	2.5
5	☐	100.000	101.287	2121323.25	1.0236	A	2.4
6	☐	200.000	199.383	4146407.65	2.0148	A	1.6

y = 0.0101 * x + 1.0909E-004
R = 1.0000
DL = 0.007359
BEC = 0.0108

Weight: <None>
Min Conc: <None>

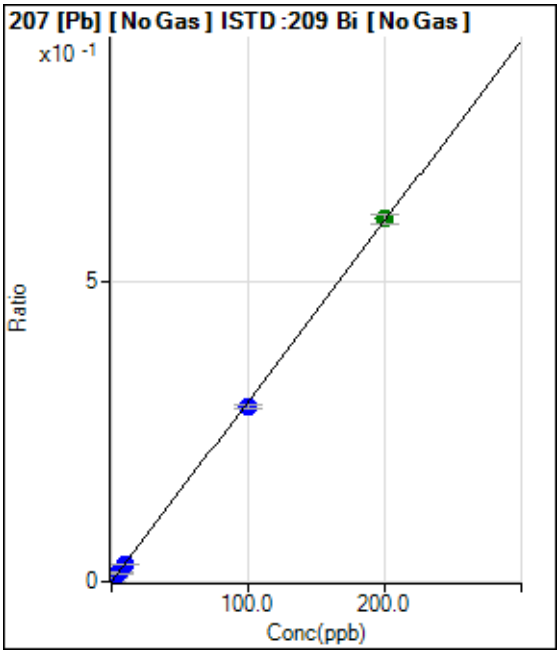
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	250.01	0.0001	P	5.8
2	☐	2.000	1.950	14018.09	0.0067	P	3.1
3	☐	5.000	4.897	34715.39	0.0167	P	3.6
4	☐	10.000	9.847	70730.47	0.0334	P	2.8
5	☐	100.000	99.398	696515.09	0.3361	P	1.9
6	☐	200.000	200.312	1393526.70	0.6771	A	1.4

y = 0.0034 * x + 1.2063E-004
R = 1.0000
DL = 0.006175
BEC = 0.03569

Weight: <None>
Min Conc: <None>

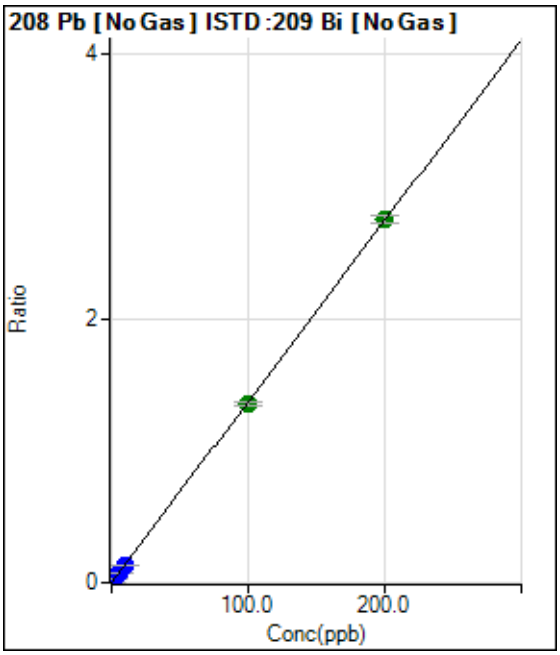


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.68	0.0001	P	19.4
2	☐	2.000	1.826	11755.75	0.0056	P	2.5
3	☐	5.000	4.812	30387.45	0.0146	P	2.7
4	☐	10.000	9.523	60838.47	0.0287	P	2.6
5	☐	100.000	97.532	607046.46	0.2929	P	2.2
6	☐	200.000	201.264	1243347.79	0.6042	A	2.5

y = 0.0030 * x + 1.4803E-004
R = 0.9999
DL = 0.02865
BEC = 0.04932

Weight: <None>
Min Conc: <None>

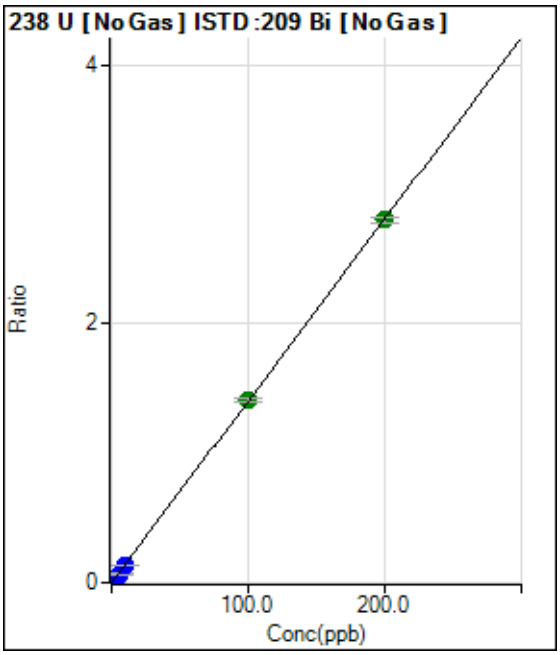
Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1163.38	0.0006	P	3.8
2	☐	2.000	1.872	54757.91	0.0262	P	1.3
3	☐	5.000	4.837	139182.79	0.0668	P	3.3
4	☐	10.000	9.710	282936.43	0.1336	P	2.3
5	☐	100.000	98.920	2810359.40	1.3559	A	1.8
6	☐	200.000	200.560	5656282.78	2.7486	A	2.2

y = 0.0137 * x + 5.6210E-004
R = 1.0000
DL = 0.004726
BEC = 0.04102

Weight: <None>
Min Conc: <None>

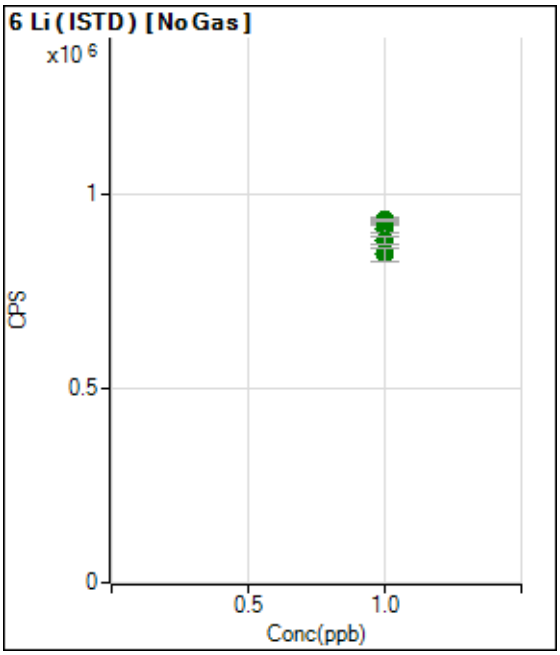


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	56.67	0.0000	P	68.7
2	☐	2.000	1.821	53467.02	0.0256	P	1.9
3	☐	5.000	4.691	137193.24	0.0659	P	4.6
4	☐	10.000	9.421	280152.63	0.1323	P	3.0
5	☐	100.000	100.641	2929770.58	1.4132	A	2.6
6	☐	200.000	199.718	5771433.25	2.8044	A	1.5

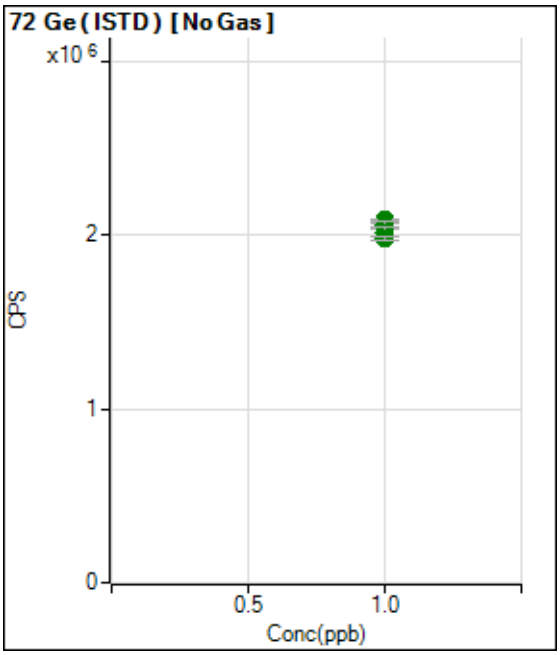
y = 0.0140 * x + 2.7612E-005
R = 1.0000
DL = 0.004052
BEC = 0.001966

Weight: <None>
Min Conc: <None>

Calibration for 015_ICV.d

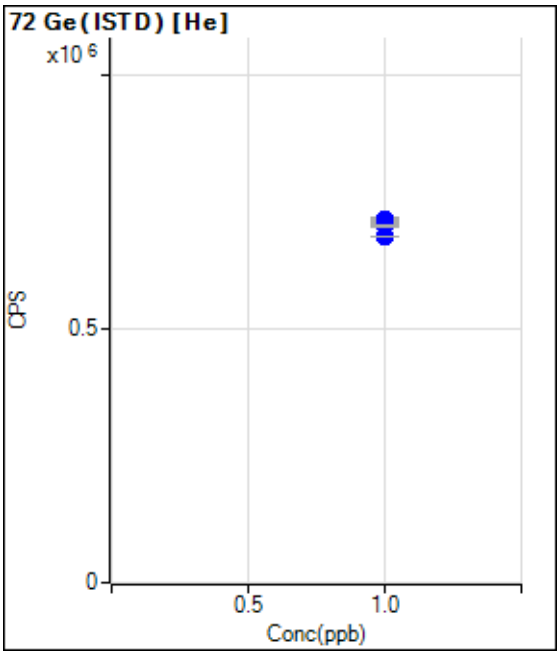


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		931764.05		A	1.9
2	☐	1.000		919641.37		A	0.7
3	☐	1.000		910315.15		A	2.7
4	☐	1.000		930654.78		A	0.3
5	☐	1.000		878633.32		A	1.9
6	☐	1.000		843606.75		A	4.3

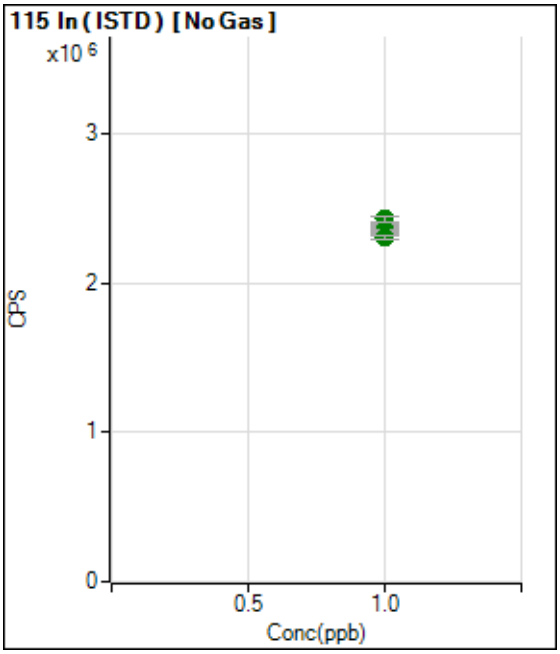


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2088541.12		A	0.6
2	☐	1.000		2071565.54		A	0.5
3	☐	1.000		2081608.46		A	1.1
4	☐	1.000		2057208.46		A	2.5
5	☐	1.000		2020187.21		A	2.5
6	☐	1.000		1980948.72		A	0.8

Calibration for 015_ICV.d

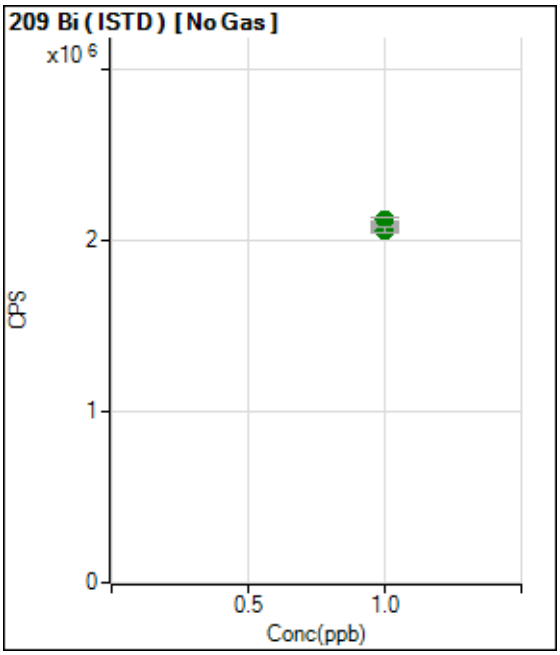


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		713484.34		P	0.9
2	☐	1.000		710825.67		P	0.2
3	☐	1.000		711451.11		P	0.7
4	☐	1.000		708905.59		P	1.0
5	☐	1.000		701575.93		P	0.4
6	☐	1.000		681191.37		P	0.3



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2355410.06		A	1.4
2	☐	1.000		2397214.76		A	0.7
3	☐	1.000		2401881.85		A	0.3
4	☐	1.000		2433841.52		A	1.4
5	☐	1.000		2352213.73		A	0.7
6	☐	1.000		2309617.41		A	0.7

Calibration for 015_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2070771.43		A	2.3
2	☐	1.000		2088803.77		A	1.4
3	☐	1.000		2083659.50		A	2.8
4	☐	1.000		2118234.19		A	1.9
5	☐	1.000		2072859.66		A	1.1
6	☐	1.000		2058329.40		A	1.7

Sample Report

Sample Table

Sample Name	LLICV2
Data File Name	016LCV2.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:22:17-06:00
Sample Type	LLCCV2
Dilution	1
Comment	
ISTD Ref FileName	008CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	1.753	1.753	1.89	77579	0.00	2	
Be	9	1	No Gas	1.905	1.905	4.07	6210	0.03	2	
V	51	2	He	1.762	1.762	3.21	12782	0.01	2	
Cr	52	2	He	1.950	1.950	3.37	15532	0.01	2	
Fe	56	2	He	199.985	199.985	2.57	1088836	0.02	200	
Se	78	2	He	1.674	1.674	26.07	437	0.38	2	
As	75	2	He	1.909	1.909	7.58	1941	0.10	2	
Ca	44	2	He	200.326	200.326	2.34	8693	2.30	200	
Na	23	2	He	187.620	187.620	2.86	286164	0.07	200	
Mg	24	2	He	198.466	198.466	2.33	110546	0.18	200	
K	39	2	He	186.001	186.001	1.87	313559	0.06	200	
Mn	55	2	He	1.766	1.766	3.63	12079	0.01	2	
Co	59	2	He	1.854	1.854	3.08	14478	0.01	2	
Ni	60	2	He	1.903	1.903	4.67	3637	0.05	2	
Cu	63	2	He	1.880	1.880	3.20	10224	0.02	2	
Zn	66	2	He	2.079	2.079	1.99	2490	0.08	2	
Al	27	2	He	2.062	2.062	22.34	1777	0.12	2	
B	11	1	No Gas	16.300	16.300	4.67	43957	0.04	10	NewName Main CR1 Failed
Al	27	1	No Gas	2.092	2.092	4.55	51562	0.00	2	
Si	28	1	No Gas	11.070	11.070	9.91	396619	0.00	10	
Ag	107	1	No Gas	1.922	1.922	0.67	23651	0.01	2	
Cd	111	1	No Gas	1.986	1.986	2.90	4871	0.04	2	
Sr	88	1	No Gas	1.964	1.964	1.85	48050	0.00	2	
Mo	95	1	No Gas	2.002	2.002	3.28	9440	0.02	2	
Sn	118	1	No Gas	2.004	2.004	1.22	16354	0.01	2	
Sb	121	1	No Gas	1.987	1.987	1.15	21177	0.01	2	
Ba	137	1	No Gas	2.020	2.020	4.13	7949	0.03	2	
Tl	205	1	No Gas	1.941	1.941	0.56	41720	0.00	2	
Tl	203	1	No Gas	1.975	1.975	3.81	17573	0.01	2	
Pb	208	1	No Gas	1.973	1.973	1.30	58361	0.00	2	
U	238	1	No Gas	1.914	1.914	0.90	56899	0.00	2	
Ca	43	2	He	187.553	187.553	22.35	483	38.80	200	
Sb	121	2	He	2.068	2.068	3.49	12593	0.02	2	
Ti	47	2	He	1.802	1.802	14.16	400	0.45	200	
Cu	63	1	No Gas	1.966	1.966	1.17	20209	0.01	2	
Se	82	1	No Gas	3.023	3.023	15.37	449	0.67	2	NewName 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	No Gas	912990	1.95	931764	97.99	70	120	
Ge	72	2	He	711604	0.75	713484	99.74	70	120	
Ge	72	1	No Gas	2062546	0.88	2088541	98.76	70	120	
In	115	1	No Gas	2383023	1.66	2355410	101.17	70	120	
Bi	209	1	No Gas	2115167	0.40	2070771	102.14	70	120	

Sample Report

Sample Table

Sample Name	LLICV5
Data File Name	017LCV5.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:24:15-06:00
Sample Type	LLCCV5
Dilution	1
Comment	
ISTD Ref FileName	008CALB.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
Li	7	1	No Gas	4.620	4.620	8.92	110197	0.00	5	
Be	9	1	No Gas	4.671	4.671	6.14	15135	0.03	5	
V	51	2	He	4.708	4.708	0.16	27552	0.02	5	
Cr	52	2	He	4.889	4.889	0.73	31613	0.02	5	
Fe	56	2	He	503.683	503.683	1.39	2700638	0.02	500	
Se	78	2	He	4.695	4.695	9.18	727	0.65	5	
As	75	2	He	4.926	4.926	1.46	4634	0.11	5	
Ca	44	2	He	492.534	492.534	1.44	20415	2.41	500	
Na	23	2	He	499.899	499.899	0.28	561343	0.09	500	
Mg	24	2	He	513.359	513.359	0.15	283521	0.18	500	
K	39	2	He	487.645	487.645	0.37	556931	0.09	500	
Mn	55	2	He	4.822	4.822	1.89	25805	0.02	5	
Co	59	2	He	4.865	4.865	1.71	37626	0.01	5	
Ni	60	2	He	5.154	5.154	2.52	9584	0.05	5	
Cu	63	2	He	5.018	5.018	3.07	24693	0.02	5	
Zn	66	2	He	4.982	4.982	3.45	5575	0.09	5	
Al	27	2	He	5.099	5.099	11.78	2890	0.18	5	
B	11	1	No Gas	26.869	26.869	3.56	62766	0.04	25	
Al	27	1	No Gas	5.047	5.047	1.81	84124	0.01	5	
Si	28	1	No Gas	25.869	25.869	4.54	482349	0.01	25	
Ag	107	1	No Gas	4.846	4.846	0.49	59614	0.01	5	
Cd	111	1	No Gas	4.972	4.972	1.81	12246	0.04	5	
Sr	88	1	No Gas	4.884	4.884	0.64	118673	0.00	5	
Mo	95	1	No Gas	4.741	4.741	2.22	22436	0.02	5	
Sn	118	1	No Gas	4.776	4.776	2.26	37514	0.01	5	
Sb	121	1	No Gas	4.698	4.698	3.53	49477	0.01	5	
Ba	137	1	No Gas	4.906	4.906	1.30	19248	0.03	5	
Tl	205	1	No Gas	4.749	4.749	0.73	102687	0.00	5	
Tl	203	1	No Gas	4.721	4.721	1.71	42279	0.01	5	
Pb	208	1	No Gas	4.819	4.819	0.94	142178	0.00	5	
U	238	1	No Gas	4.609	4.609	0.54	138239	0.00	5	
Ca	43	2	He	518.531	518.531	10.27	1273	40.72	500	
Sb	121	2	He	4.850	4.850	0.09	29046	0.02	5	
Ti	47	2	He	5.045	5.045	11.64	1077	0.47	5	
Cu	63	1	No Gas	5.027	5.027	0.25	47109	0.01	5	
Se	82	1	No Gas	5.295	5.295	14.65	805	0.66	5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	911672	3.29	931764	97.84	70	120	
Ge	72	2	He	706573	1.05	713484	99.03	70	120	
Ge	72	1	No Gas	2057379	1.86	2088541	98.51	70	120	

Sample Report

In	115	1	No Gas	2401252	2.06	2355410	101.95	70	120	
Bi	209	1	No Gas	2135135	1.50	2070771	103.11	70	120	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICB
Data File Name	018_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:26:13-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	008CALB.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
Li	7	1	No Gas	-0.003	-4213.2	57380	0.4	0.5	
Be	9	1	No Gas	0.002	408.0	40	57.3	0.5	
V	51	2	He	-0.047	-57.0	3588	3.8	2.5	
Cr	52	2	He	-0.016	-468.4	4634	9.7	2.5	
Fe	56	2	He	0.213	21.9	16026	1.4	100	
Se	78	2	He	-0.431	-39.8	231	6.3	1	
As	75	2	He	-0.016	-60.2	202	4.1	2.5	
Ca	44	2	He	6.781	45.1	833	14.0	100	
Na	23	2	He	-14.940	-6.8	105170	1.7	100	
Mg	24	2	He	0.545	38.3	563	20.7	100	
K	39	2	He	-7.650	-24.4	154857	0.0	100	
Mn	55	2	He	-0.246	-18.5	2914	6.8	2.5	
Co	59	2	He	0.005	79.3	103	31.1	2.5	
Ni	60	2	He	0.020	39.7	153	10.0	2.5	
Cu	63	2	He	-0.043	-10.7	1260	1.6	1	
Zn	66	2	He	-0.052	-54.3	197	15.5	2.5	
Al	27	2	He	1.875	32.6	1707	13.5	5	
B	11	1	No Gas	3.078	8.7	20283	0.7	0.5	ICB Main CR1 Failed
Al	27	1	No Gas	1.805	4.1	49632	1.7	5	
Si	28	1	No Gas	-1.698	-29.3	329912	0.6	10	
Ag	107	1	No Gas	0.007	32.8	390	6.8	2.5	
Cd	111	1	No Gas	0.000	-2261.1	23	65.5	1	
Sr	88	1	No Gas	0.026	22.0	1787	7.5	2.5	
Mo	95	1	No Gas	0.012	43.0	120	22.0	2.5	
Sn	118	1	No Gas	-0.006	-290.8	1223	8.3	5	
Sb	121	1	No Gas	0.164	12.0	2104	10.2	2.5	
Ba	137	1	No Gas	0.027	35.8	253	14.9	2.5	
Tl	205	1	No Gas	0.008	40.9	410	17.1	1	
Tl	203	1	No Gas	0.019	47.4	243	31.1	1	
Pb	208	1	No Gas	0.013	12.1	1573	3.7	2.5	
U	238	1	No Gas	0.006	10.3	250	6.9	2.5	
Ca	43	2	He	6.988	71.3	47	24.7	100	
Sb	121	2	He	0.165	8.4	1200	7.4	2.5	
Ti	47	2	He	-0.063	-43.9	7	86.6	2.5	
Se	82	1	No Gas	-0.426	-210.8	-98	-148.7	1	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	912446	2.04	931764	97.93	70	120	
Ge	72	2	He	711957	0.95	713484	99.79	70	120	
Ge	72	1	No Gas	2115901	0.88	2088541	101.31	70	120	
In	115	1	No Gas	2400672	1.86	2355410	101.92	70	120	
Bi	209	1	No Gas	2119876	1.16	2070771	102.37	70	120	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	020ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:38:57-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	008CALB.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
Li	7	1	No Gas	0.641	24.0	61242	2.4	0	ICSA Main CR1 Failed
Be	9	1	No Gas	-0.004	-79.5	20	50.0	0	ICSA Main CR1 Failed
V	51	2	He	0.257	13.8	4844	3.4	0	ICSA Main CR1 Failed
Cr	52	2	He	2.464	2.3	17358	1.8	0	ICSA Main CR1 Failed
Fe	56	2	He	98951.616	1.2	501766073	1.4	0	
Se	78	2	He	-0.102	-316.0	249	11.8	0	ICSA Main CR1 Failed
As	75	2	He	0.094	51.6	284	14.7	0	ICSA Main CR1 Failed
Ca	44	2	He	98847.565	0.8	3790516	1.0	0	
Na	23	2	He	99433.184	0.6	84028864	0.8	0	
Mg	24	2	He	97883.549	1.6	51354621	1.4	0	
K	39	2	He	97206.855	0.7	75397469	0.7	0	
Mn	55	2	He	0.680	11.1	6732	4.7	0	ICSA Main CR1 Failed
Co	59	2	He	0.212	11.0	1617	10.4	0	ICSA Main CR1 Failed
Ni	60	2	He	0.517	5.8	1013	5.0	0	ICSA Main CR1 Failed
Cu	63	2	He	0.544	8.5	3771	5.2	0	ICSA Main CR1 Failed
Zn	66	2	He	1.084	15.3	1340	12.4	0	ICSA Main CR1 Failed
Al	27	2	He	99672.292	0.8	35214759	1.1	0	
B	11	1	No Gas	-0.247	-68.3	13557	2.2	0	ICSA Main CR1 Failed
Al	27	1	No Gas	93836.854	1.8	1007911398	0.8	0	
Si	28	1	No Gas	19.891	8.5	434198	0.4	0	ICSA Main CR1 Failed
Ag	107	1	No Gas	0.305	5.9	3784	7.8	0	ICSA Main CR1 Failed
Cd	111	1	No Gas	2.148	2.3	4964	4.2	0	
Sr	88	1	No Gas	1.191	1.4	27893	2.3	0	ICSA Main CR1 Failed
Mo	95	1	No Gas	2059.949	2.8	9089594	0.6	0	
Sn	118	1	No Gas	0.060	56.0	1610	12.6	0	ICSA Main CR1 Failed
Sb	121	1	No Gas	0.160	5.7	1944	6.6	0	ICSA Main CR1 Failed
Ba	137	1	No Gas	0.430	6.0	1703	3.3	0	ICSA Main CR1 Failed
Tl	205	1	No Gas	0.002	47.1	260	7.7	0	ICSA Main CR1 Failed
Tl	203	1	No Gas	0.008	51.4	140	24.7	0	ICSA Main CR1 Failed
Pb	208	1	No Gas	0.080	7.0	3277	4.8	0	ICSA Main CR1 Failed
U	238	1	No Gas	0.003	28.8	143	17.6	0	ICSA Main CR1 Failed
Ca	43	2	He	95008.337	0.5	216873	0.7	0	
Sb	121	2	He	0.151	8.2	1053	6.5	0	ICSA Main CR1 Failed
Ti	47	2	He	2058.823	1.0	409835	1.0	0	
Se	82	1	No Gas	0.319	129.5	22	293.6	0	ICSA 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	No Gas	862664	0.46	931764	92.58	70	120	
Ge	72	2	He	671826	0.24	713484	94.16	70	120	
Ge	72	1	No Gas	1997312	1.88	2088541	95.63	70	120	
In	115	1	No Gas	2245750	2.39	2355410	95.34	70	120	
Bi	209	1	No Gas	1978761	0.33	2070771	95.56	70	120	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	021ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T11:40:57-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	008CALB.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
Li	7	1	No Gas	91.285	3.149	1049524	1.13	100	91.3	180	120	ICSB Main CR1 Failed
Be	9	1	No Gas	88.770	2.138	273513	0.75	100	88.8	80	120	
V	51	2	He	94.236	0.308	458973	0.34	100	94.2	80	120	
Cr	52	2	He	96.300	1.013	512492	0.77	100	96.3	80	120	
Fe	56	2	He	105616.602	0.650	539481739	1.09	100	105616.6	80	120	ICSB Main CR1 Failed
Se	78	2	He	98.378	0.983	9392	1.39	100	98.4	80	120	
As	75	2	He	97.123	0.162	83648	0.46	100	97.1	80	120	
Ca	44	2	He	105622.428	0.082	4079886	0.48	100	105622.4	80	120	ICSB Main CR1 Failed
Na	23	2	He	105419.358	0.753	89731045	0.58	100	105419.4	80	120	ICSB Main CR1 Failed
Mg	24	2	He	103371.957	1.048	54630223	0.67	100	103372.0	80	120	ICSB Main CR1 Failed
K	39	2	He	103521.200	1.685	80869114	1.25	100	103521.2	80	120	ICSB Main CR1 Failed
Mn	55	2	He	97.015	1.256	423916	0.81	100	97.0	80	120	
Co	59	2	He	92.704	0.277	685625	0.55	100	92.7	80	120	
Ni	60	2	He	95.348	1.094	167872	1.38	100	95.3	80	120	
Cu	63	2	He	95.316	0.756	424178	1.17	100	95.3	80	120	
Zn	66	2	He	96.396	0.233	98895	0.67	100	96.4	80	120	
Al	27	2	He	96912.653	0.562	34489377	0.13	100	96912.7	80	120	ICSB Main CR1 Failed
B	11	1	No Gas	450.795	1.237	781105	1.67	100	450.8	80	120	
Al	27	1	No Gas	92967.726	0.871	986391052	0.91	100	92967.7	80	120	ICSB Main CR1 Failed
Si	28	1	No Gas	493.356	0.384	3090607	1.39	100	493.4	80	120	
Ag	107	1	No Gas	89.984	1.499	1047900	0.68	100	90.0	80	120	
Cd	111	1	No Gas	97.738	2.426	228650	1.29	100	97.7	80	120	
Sr	88	1	No Gas	100.528	2.810	2302038	2.11	100	100.5	80	120	
Mo	95	1	No Gas	2066.194	1.739	9278014	0.77	100	2066.2	80	120	ICSB Main CR1 Failed
Sn	118	1	No Gas	94.581	2.370	684236	0.97	100	94.6	80	120	
Sb	121	1	No Gas	93.796	1.160	941391	0.19	100	93.8	80	120	
Ba	137	1	No Gas	97.202	2.090	360145	0.78	100	97.2	80	120	
Tl	205	1	No Gas	97.713	1.210	1995993	0.42	100	97.7	80	120	
Tl	203	1	No Gas	93.738	1.066	793549	0.97	100	93.7	80	120	
Pb	208	1	No Gas	96.091	0.874	2662597	0.64	100	96.1	80	120	
U	238	1	No Gas	101.572	0.729	2883044	0.58	100	101.6	80	120	
Ca	43	2	He	102678.172	0.464	236089	0.20	100	102678.2	80	120	ICSB Main CR1 Failed
Sb	121	2	He	95.267	0.867	542774	0.44	100	95.3	80	120	
Ti	47	2	He	2089.332	0.160	418950	0.30	100	2089.3	80	120	ICSB Main CR1 Failed
Cu	63	1	No Gas	92.990	1.223	787690	0.15	100	93.0	80	120	
Se	82	1	No Gas	97.714	1.740	14731	1.95	100	97.7	80	120	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	867931	2.90	931764	93.15	70	120	
Ge	72	2	He	676743	0.44	713484	94.85	70	120	
Ge	72	1	No Gas	1972621	1.25	2088541	94.45	70	120	
In	115	1	No Gas	2284729	1.51	2355410	97.00	70	120	
Bi	209	1	No Gas	2021558	1.31	2070771	97.62	70	120	

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	155CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:51:17-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	7	1	No Gas	50552	0.00
Be	9	1	No Gas	12	561.13
V	51	2	He	4103	0.05
Cr	52	2	He	3804	0.11
Fe	56	2	He	13430	0.01
Se	78	2	He	191	5.19
As	75	2	He	318	2.88
Ca	44	2	He	547	3.35
Na	23	2	He	113314	0.00
Mg	24	2	He	443	2.06
K	39	2	He	128419	0.00
Mn	55	2	He	1767	0.54
Co	59	2	He	33	226.50
Ni	60	2	He	90	0.00
Cu	63	2	He	983	0.39
Zn	66	2	He	267	4.52
Al	27	2	He	910	0.64
B	11	1	No Gas	10959	0.03
Al	27	1	No Gas	27811	0.00
Si	28	1	No Gas	244693	0.00
Ag	107	1	No Gas	160	17.03
Cd	111	1	No Gas	13	649.52
Sr	88	1	No Gas	1343	0.74
Mo	95	1	No Gas	50	69.28
Sn	118	1	No Gas	1323	0.58
Sb	121	1	No Gas	430	4.62
Ba	137	1	No Gas	220	5.47
Tl	205	1	No Gas	87	60.03
Tl	203	1	No Gas	53	123.46
Pb	208	1	No Gas	657	2.32
U	238	1	No Gas	40	108.25
Ca	43	2	He	23	280.57
Sb	121	2	He	213	10.38
Ti	47	2	He	13	324.76
Cu	63	1	No Gas	2377	0.19

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD

Calibration Blank Report

Li	6	1	No Gas	851397	1.05
Ge	72	2	He	694065	0.33
Ge	72	1	No Gas	2139408	0.40
In	115	1	No Gas	2719437	0.96

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Bi	209	1	No Gas	2536806	2.28

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	156CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:53:15-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	5026	0.06
V	51	2	He	13506	0.00
Cr	52	2	He	14995	0.02
Fe	56	2	He	1082643	0.00
Se	78	2	He	388	0.61
As	75	2	He	1926	0.09
Ca	44	2	He	7966	0.04
Na	23	2	He	286337	0.00
Mg	24	2	He	108913	0.00
K	39	2	He	278995	0.00
Mn	55	2	He	10671	0.03
Co	59	2	He	14688	0.02
Ni	60	2	He	3947	0.13
Cu	63	2	He	10428	0.06
Zn	66	2	He	2214	0.03
Al	27	2	He	2346	2.13
B	11	1	No Gas	25700	0.00
Al	27	1	No Gas	50609	0.00
Si	28	1	No Gas	306588	0.00
Ag	107	1	No Gas	25946	0.00
Cd	111	1	No Gas	5385	0.08
Sr	88	1	No Gas	52359	0.00
Mo	95	1	No Gas	10147	0.02
Sn	118	1	No Gas	17993	0.03
Sb	121	1	No Gas	22526	0.01
Ba	137	1	No Gas	8826	0.02
Tl	205	1	No Gas	48662	0.00
Tl	203	1	No Gas	20090	0.01
Pb	208	1	No Gas	67860	0.00
U	238	1	No Gas	68619	0.00
Ca	43	2	He	473	4.22
Sb	121	2	He	12029	0.00
Cu	63	1	No Gas	19484	0.01

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	844098	1.26	851397	99.14	70	120	
Ge	72	2	He	698155	0.54	694065	100.59	70	120	
Ge	72	1	No Gas	2145638	0.93	2139408	100.29	70	120	

Calibration Standard Report

In	115	1	No Gas	2724330	1.13	2719437	100.18	70	120	
Bi	209	1	No Gas	2556187	0.93	2536806	100.76	70	120	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	157CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:55:13-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	12452	0.01
V	51	2	He	27767	0.00
Cr	52	2	He	30979	0.01
Fe	56	2	He	2694485	0.00
Se	78	2	He	681	0.55
As	75	2	He	4337	0.05
Ca	44	2	He	19534	0.01
Na	23	2	He	555136	0.00
Mg	24	2	He	274259	0.00
K	39	2	He	507812	0.00
Mn	55	2	He	23988	0.01
Co	59	2	He	37529	0.01
Ni	60	2	He	9390	0.01
Cu	63	2	He	24472	0.01
Zn	66	2	He	5401	0.13
Al	27	2	He	2914	0.31
B	11	1	No Gas	48130	0.00
Al	27	1	No Gas	86451	0.00
Si	28	1	No Gas	387339	0.00
Ag	107	1	No Gas	64574	0.00
Cd	111	1	No Gas	13651	0.02
Sr	88	1	No Gas	131242	0.00
Mo	95	1	No Gas	25398	0.00
Sn	118	1	No Gas	43522	0.00
Sb	121	1	No Gas	57667	0.00
Ba	137	1	No Gas	21999	0.01
Tl	205	1	No Gas	123716	0.00
Tl	203	1	No Gas	52126	0.00
Pb	208	1	No Gas	171927	0.00
U	238	1	No Gas	171189	0.00
Ca	43	2	He	1203	1.66
Sb	121	2	He	30285	0.00
Cu	63	1	No Gas	46824	0.01

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	833751	1.41	851397	97.93	70	120	
Ge	72	2	He	705355	0.67	694065	101.63	70	120	
Ge	72	1	No Gas	2144715	0.80	2139408	100.25	70	120	

Calibration Standard Report

In	115	1	No Gas	2717717	0.31	2719437	99.94	70	120	
Bi	209	1	No Gas	2593318	1.20	2536806	102.23	70	120	

Calibration Standard Report

Sample Table

Sample Name	10/50/100
Data File Name	158CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:57:11-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	24737	0.00
V	51	2	He	51660	0.00
Cr	52	2	He	58521	0.00
Fe	56	2	He	5386461	0.00
Se	78	2	He	1108	0.58
As	75	2	He	8458	0.03
Ca	44	2	He	38407	0.00
Na	23	2	He	986188	0.00
Mg	24	2	He	549797	0.00
K	39	2	He	900013	0.00
Mn	55	2	He	46145	0.01
Co	59	2	He	74587	0.00
Ni	60	2	He	18820	0.00
Cu	63	2	He	48530	0.00
Zn	66	2	He	10574	0.04
Al	27	2	He	4547	0.09
B	11	1	No Gas	86603	0.00
Al	27	1	No Gas	141655	0.00
Si	28	1	No Gas	541457	0.00
Ag	107	1	No Gas	132276	0.00
Cd	111	1	No Gas	27923	0.00
Sr	88	1	No Gas	261107	0.00
Mo	95	1	No Gas	50606	0.00
Sn	118	1	No Gas	85860	0.00
Sb	121	1	No Gas	115193	0.00
Ba	137	1	No Gas	44085	0.00
Tl	205	1	No Gas	251697	0.00
Tl	203	1	No Gas	105301	0.00
Pb	208	1	No Gas	347424	0.00
U	238	1	No Gas	344517	0.00
Ca	43	2	He	2147	0.18
Sb	121	2	He	60292	0.00
Cu	63	1	No Gas	92141	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	834919	0.82	851397	98.06	70	120	
Ge	72	2	He	698779	1.08	694065	100.68	70	120	
Ge	72	1	No Gas	2124268	1.19	2139408	99.29	70	120	

Calibration Standard Report

In	115	1	No Gas	2737982	0.67	2719437	100.68	70	120	
Bi	209	1	No Gas	2524223	0.84	2536806	99.50	70	120	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	159CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T19:59:09-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	251783	0.00
V	51	2	He	482915	0.00
Cr	52	2	He	535351	0.00
Fe	56	2	He	52787539	0.00
Se	78	2	He	9485	0.02
As	75	2	He	83221	0.00
Ca	44	2	He	381812	0.00
Na	23	2	He	8630568	0.00
Mg	24	2	He	5238421	0.00
K	39	2	He	7644616	0.00
Mn	55	2	He	446423	0.00
Co	59	2	He	739722	0.00
Ni	60	2	He	182308	0.00
Cu	63	2	He	468288	0.00
Zn	66	2	He	104691	0.00
Al	27	2	He	35780	0.00
B	11	1	No Gas	749403	0.00
Al	27	1	No Gas	1095714	0.00
Si	28	1	No Gas	2966472	0.00
Ag	107	1	No Gas	1328584	0.00
Cd	111	1	No Gas	275813	0.00
Sr	88	1	No Gas	2644518	0.00
Mo	95	1	No Gas	504256	0.00
Sn	118	1	No Gas	847409	0.00
Sb	121	1	No Gas	1161695	0.00
Ba	137	1	No Gas	437151	0.00
Tl	205	1	No Gas	2606829	0.00
Tl	203	1	No Gas	1053304	0.00
Pb	208	1	No Gas	3551009	0.00
U	238	1	No Gas	3700484	0.00
Ca	43	2	He	22789	0.02
Sb	121	2	He	612149	0.00
Cu	63	1	No Gas	878314	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	788191	2.07	851397	92.58	70	120	
Ge	72	2	He	689128	0.98	694065	99.29	70	120	
Ge	72	1	No Gas	2092023	0.86	2139408	97.79	70	120	

Calibration Standard Report

In	115	1	No Gas	2636128	2.20	2719437	96.94	70	120	
Bi	209	1	No Gas	2526931	0.57	2536806	99.61	70	120	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	160CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:01:02-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	155CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	No Gas	490819	0.00
V	51	2	He	958687	0.00
Cr	52	2	He	1073166	0.00
Fe	56	2	He	102704068	0.00
Se	78	2	He	18505	0.01
As	75	2	He	163861	0.00
Ca	44	2	He	757009	0.00
Na	23	2	He	17034505	0.00
Mg	24	2	He	10162238	0.00
K	39	2	He	14945589	0.00
Mn	55	2	He	876514	0.00
Co	59	2	He	1526007	0.00
Ni	60	2	He	359532	0.00
Cu	63	2	He	920882	0.00
Zn	66	2	He	203722	0.00
Al	27	2	He	67346	0.00
B	11	1	No Gas	1497279	0.00
Al	27	1	No Gas	2115046	0.00
Si	28	1	No Gas	5510487	0.00
Ag	107	1	No Gas	2591097	0.00
Cd	111	1	No Gas	538979	0.00
Sr	88	1	No Gas	5225903	0.00
Mo	95	1	No Gas	1008880	0.00
Sn	118	1	No Gas	1676552	0.00
Sb	121	1	No Gas	2295859	0.00
Ba	137	1	No Gas	871178	0.00
Tl	205	1	No Gas	5096070	0.00
Tl	203	1	No Gas	2120173	0.00
Pb	208	1	No Gas	6980569	0.00
U	238	1	No Gas	7191374	0.00
Ca	43	2	He	43355	0.00
Sb	121	2	He	1262335	0.00
Cu	63	1	No Gas	1774058	0.00

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	771891	3.47	851397	90.66	70	120	
Ge	72	2	He	678518	0.97	694065	97.76	70	120	
Ge	72	1	No Gas	2076151	0.87	2139408	97.04	70	120	

Calibration Standard Report

In	115	1	No Gas	2614363	1.42	2719437	96.14	70	120	
Bi	209	1	No Gas	2488386	1.14	2536806	98.09	70	120	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICCV
Data File Name	162_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:04:50-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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	Exp Value	%Rec	%Low	%High	QC Flag
Li	7	1	No Gas	100.499	4.755	1030151	2.34	100	100.5	90	110	
Be	9	1	No Gas	101.478	2.821	259360	0.21	100	101.5	90	110	
V	51	2	He	100.363	1.480	495379	0.94	100	100.4	90	110	
Cr	52	2	He	101.347	1.597	558541	0.80	100	101.3	90	110	
Fe	56	2	He	10051.522	1.188	53197961	0.21	10000	100.5	90	110	
Se	78	2	He	102.624	0.814	9854	1.57	100	102.6	90	110	
As	75	2	He	104.062	1.010	87767	1.03	100	104.1	90	110	
Ca	44	2	He	9844.914	1.513	382752	0.66	10000	98.4	90	110	
Na	23	2	He	9967.199	1.040	8769640	0.61	10000	99.7	90	110	
Mg	24	2	He	10101.210	0.855	5293429	0.74	10000	101.0	90	110	
K	39	2	He	9884.433	1.605	7656326	0.46	10000	98.8	90	110	
Mn	55	2	He	103.928	1.412	469171	1.16	100	103.9	90	110	
Co	59	2	He	99.735	1.698	775111	0.47	100	99.7	90	110	
Ni	60	2	He	103.311	1.013	190910	0.34	100	103.3	90	110	
Cu	63	2	He	102.667	1.144	486514	0.33	100	102.7	90	110	
Zn	66	2	He	104.085	1.456	109345	0.48	100	104.1	90	110	
Al	27	2	He	107.232	4.226	37792	3.41	100	107.2	90	110	
B	11	1	No Gas	480.688	2.559	750506	1.79	500	96.1	90	110	
Al	27	1	No Gas	109.599	3.578	1201459	2.99	100	109.6	90	110	
Si	28	1	No Gas	513.164	1.034	3025045	0.67	500	102.6	90	110	
Ag	107	1	No Gas	100.467	1.790	1335665	1.97	100	100.5	90	110	
Cd	111	1	No Gas	101.701	0.928	281084	0.48	100	101.7	90	110	
Sr	88	1	No Gas	98.606	1.347	2637067	1.21	100	98.6	90	110	
Mo	95	1	No Gas	97.868	0.770	503929	0.71	100	97.9	90	110	
Sn	118	1	No Gas	98.716	0.461	847229	1.11	100	98.7	90	110	
Sb	121	1	No Gas	101.258	2.433	1189491	1.68	100	101.3	90	110	
Ba	137	1	No Gas	101.982	0.768	453916	0.18	100	102.0	90	110	
Tl	205	1	No Gas	106.523	0.546	2734894	0.08	100	106.5	90	110	
Tl	203	1	No Gas	104.534	0.830	1110303	0.38	100	104.5	90	110	
Pb	208	1	No Gas	103.069	1.260	3621625	1.64	100	103.1	90	110	
U	238	1	No Gas	105.845	1.782	3840081	2.19	100	105.8	90	110	
Ca	43	2	He	10348.811	1.456	23233	1.79	10000	103.5	90	110	
Sb	121	2	He	98.490	1.887	633243	1.11	100	98.5	90	110	
Ti	47	2	He	99.210	2.656	20329	3.55	100	99.2	90	110	
Cu	63	1	No Gas	100.213	0.455	906763	0.30	100	100.2	90	110	
Se	82	1	No Gas	98.911	3.573	16529	3.66	100	98.9	90	110	

QC ISTD Table

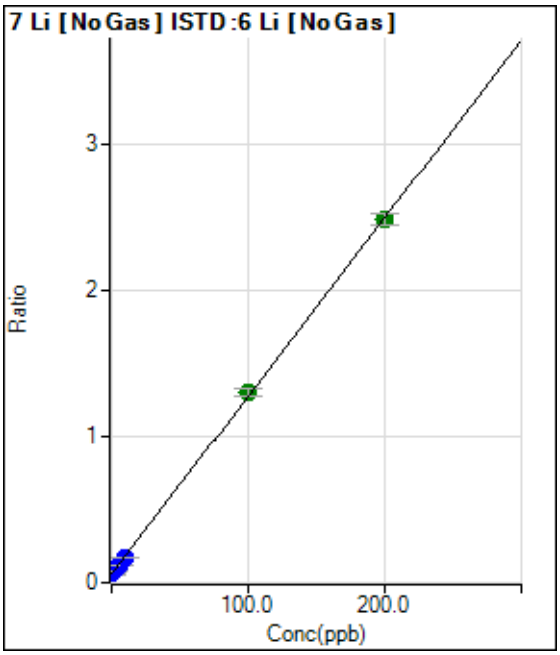
Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	803175	2.74	851397	94.34	70	120	
Ge	72	2	He	697580	1.34	694065	100.51	70	120	
Ge	72	1	No Gas	2122884	0.75	2139408	99.23	70	120	
In	115	1	No Gas	2673264	0.66	2719437	98.30	70	120	
Bi	209	1	No Gas	2503863	0.46	2536806	98.70	70	120	

Calibration for 162_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\121521A.b\
Analysis File: 121521A.batch.bin
DA Date-Time: 12/15/2021 8:05:33 PM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	155CALB.d	CAL BLK	12/15/2021 7:51:17 PM
2	156CALS.d	2/10/200	12/15/2021 7:53:15 PM
3	157CALS.d	5/25/500	12/15/2021 7:55:13 PM
4	158CALS.d	10/50/100	12/15/2021 7:57:11 PM
5	159CALS.d	100/500/10K	12/15/2021 7:59:09 PM
6	160CALS.d	200/1000/20K	12/15/2021 8:01:02 PM

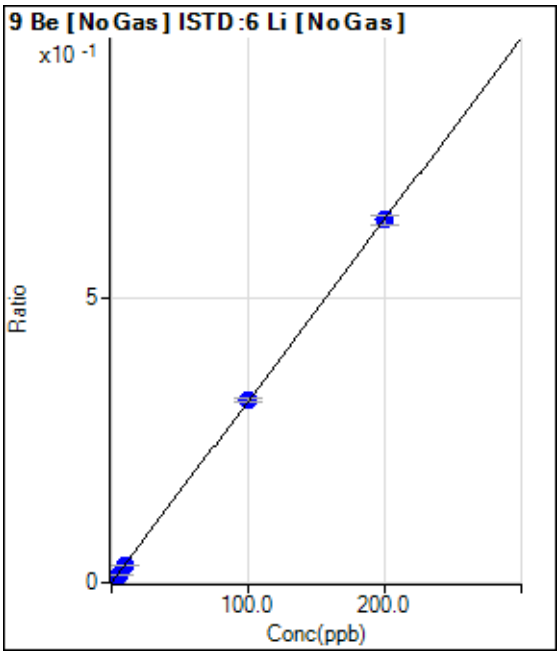
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50552.12	0.0594	P	0.8
2	☐	2.000	1.899	69634.36	0.0825	P	1.1
3	☐	5.000	4.798	98214.42	0.1178	P	1.7
4	☐	10.000	9.544	146627.60	0.1756	P	1.4
5	☐	100.000	101.940	1024927.49	1.3011	A	4.5
6	☐	200.000	199.059	1916055.96	2.4842	A	3.4

y = 0.0122 * x + 0.0594
R = 0.9999
DL = 0.1106
BEC = 4.874

Weight: <None>
Min Conc: <None>

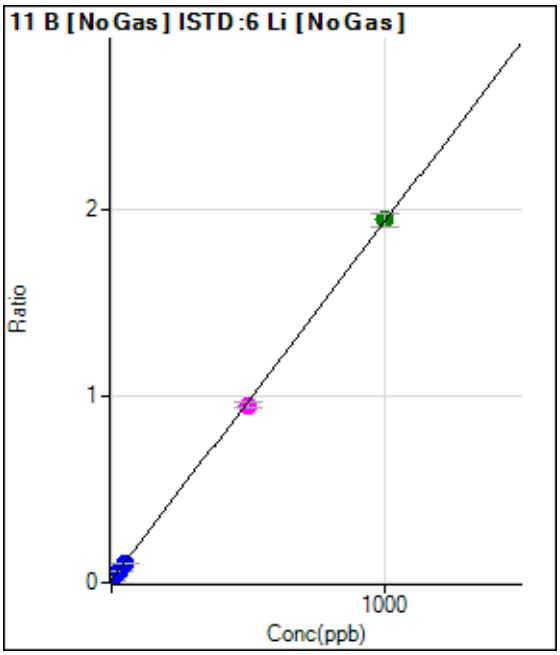


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11.67	0.0000	P	64.5
2	☐	2.000	1.867	5025.95	0.0060	P	4.4
3	☐	5.000	4.688	12452.24	0.0149	P	2.3
4	☐	10.000	9.303	24736.75	0.0296	P	1.9
5	☐	100.000	100.368	251783.29	0.3196	P	2.4
6	☐	200.000	199.860	490818.99	0.6363	P	3.0

y = 0.0032 * x + 1.3642E-005
R = 1.0000
DL = 0.008288
BEC = 0.004285

Weight: <None>
Min Conc: <None>

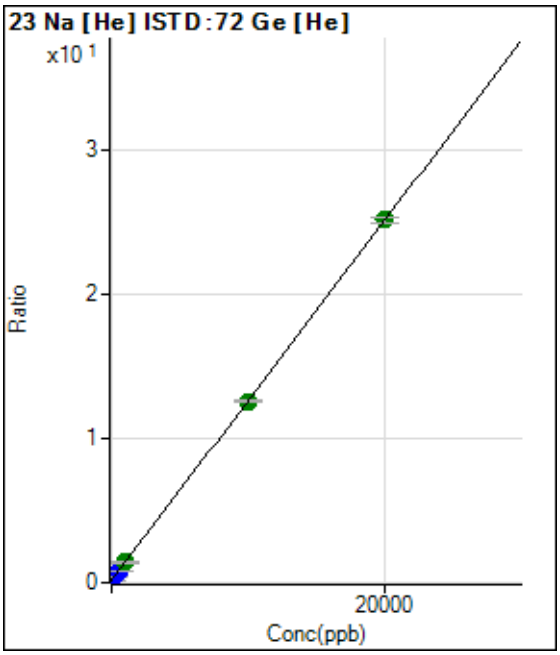
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10959.36	0.0129	P	1.7
2	☐	10.000	9.165	25700.24	0.0304	P	0.9
3	☐	25.000	23.392	48130.44	0.0577	P	1.2
4	☐	50.000	47.375	86603.19	0.1037	P	0.5
5	☐	500.000	489.236	749403.14	0.9512	M	3.2
6	☐	1000.000	1005.562	1497279.20	1.9414	A	3.9

y = 0.0019 * x + 0.0129
R = 0.9999
DL = 0.3404
BEC = 6.711

Weight: <None>
Min Conc: <None>

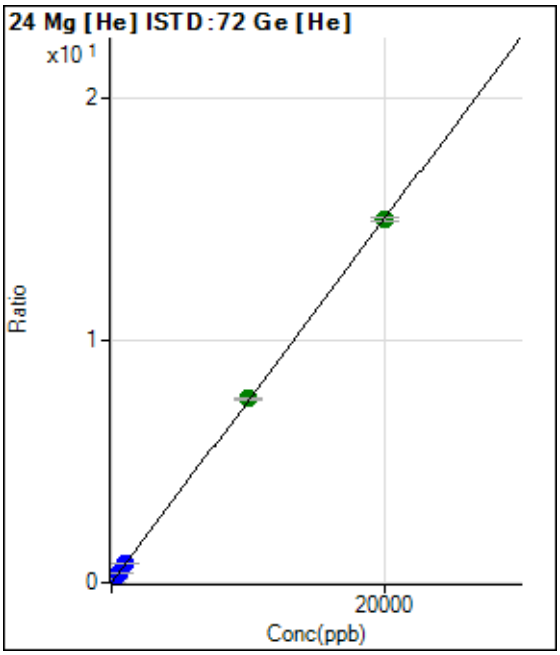


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113314.05	0.1633	P	0.7
2	☐	200.000	198.289	286337.36	0.4101	P	0.5
3	☐	500.000	501.016	555136.35	0.7870	P	1.0
4	☐	1000.000	1002.597	986188.45	1.4115	A	2.3
5	☐	10000.00	9928.910	8630568.00	12.5249	A	1.3
6	☐	20000.00	20035.40	17034505.17	25.1076	A	1.3

y = 0.0012 * x + 0.1633
R = 1.0000
DL = 2.612
BEC = 131.1

Weight: <None>
Min Conc: <None>

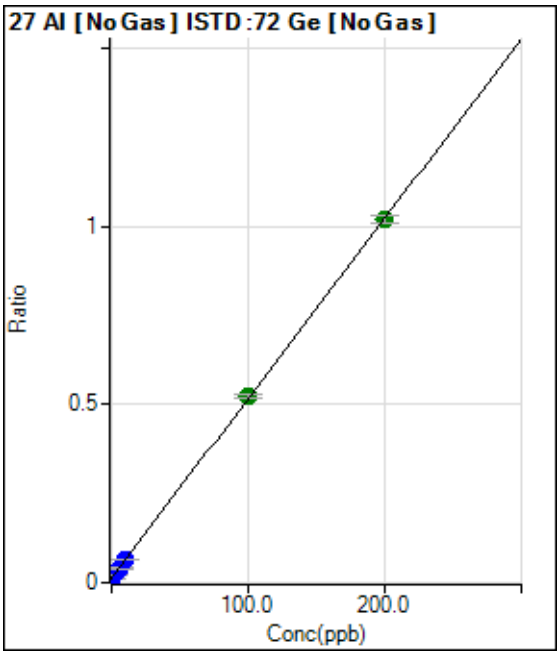
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	443.35	0.0006	P	9.4
2	☐	200.000	206.815	108913.14	0.1560	P	0.4
3	☐	500.000	516.749	274258.94	0.3888	P	0.2
4	☐	1000.000	1046.621	549796.96	0.7869	P	1.3
5	☐	10000.00	10118.72	5238421.49	7.6019	A	1.3
6	☐	20000.00	19937.81	10162238.18	14.9782	A	1.1

y = 7.5121E-004 * x + 6.3888E-004
R = 1.0000
DL = 0.2391
BEC = 0.8505

Weight: <None>
Min Conc: <None>

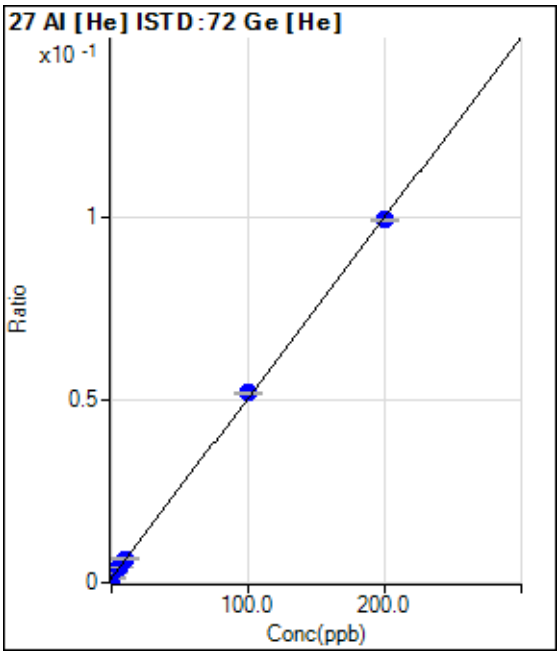


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27811.48	0.0130	P	0.3
2	☐	2.000	2.098	50608.92	0.0236	P	0.6
3	☐	5.000	5.412	86450.94	0.0403	P	1.3
4	☐	10.000	10.639	141654.95	0.0667	P	0.8
5	☐	100.000	101.232	1095713.63	0.5238	A	1.8
6	☐	200.000	199.340	2115045.70	1.0189	A	2.1

y = 0.0050 * x + 0.0130
R = 1.0000
DL = 0.02521
BEC = 2.576

Weight: <None>
Min Conc: <None>

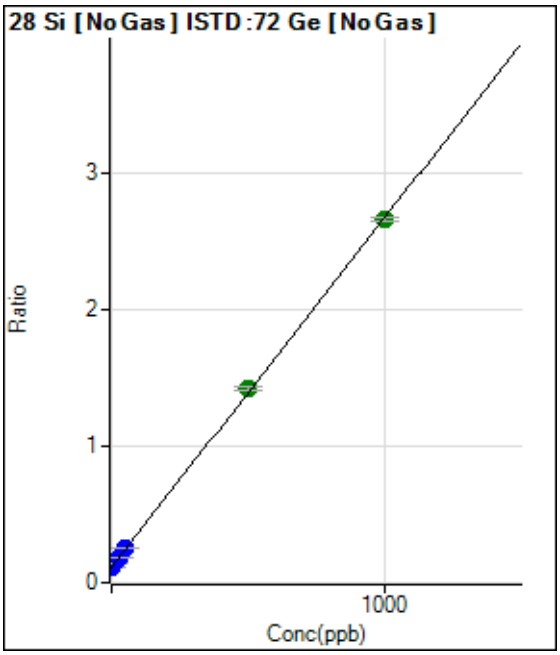
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	910.04	0.0013	P	6.0
2	☐	2.000	4.163	2345.78	0.0034	P	50.4
3	☐	5.000	5.715	2913.70	0.0041	P	8.5
4	☐	10.000	10.539	4547.49	0.0065	P	4.0
5	☐	100.000	102.636	35779.61	0.0519	P	0.8
6	☐	200.000	198.615	67345.96	0.0993	P	0.6

y = 4.9311E-004 * x + 0.0013
R = 0.9999
DL = 0.479
BEC = 2.659

Weight: <None>
Min Conc: <None>

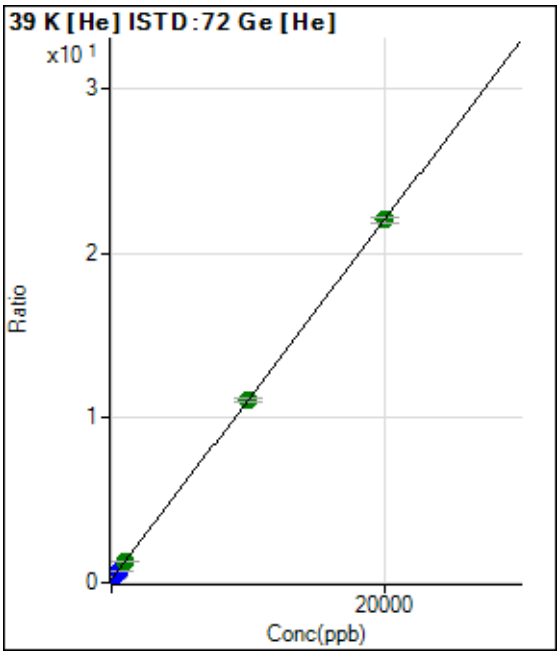


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244693.35	0.1144	P	0.8
2	☐	10.000	11.161	306587.58	0.1429	P	1.4
3	☐	25.000	25.934	387339.06	0.1806	P	1.0
4	☐	50.000	54.999	541457.00	0.2548	P	2.7
5	☐	500.000	510.462	2966471.94	1.4181	A	1.6
6	☐	1000.000	994.484	5510487.42	2.6543	A	1.0

y = 0.0026 * x + 0.1144
R = 0.9999
DL = 1.031
BEC = 44.78

Weight: <None>
Min Conc: <None>

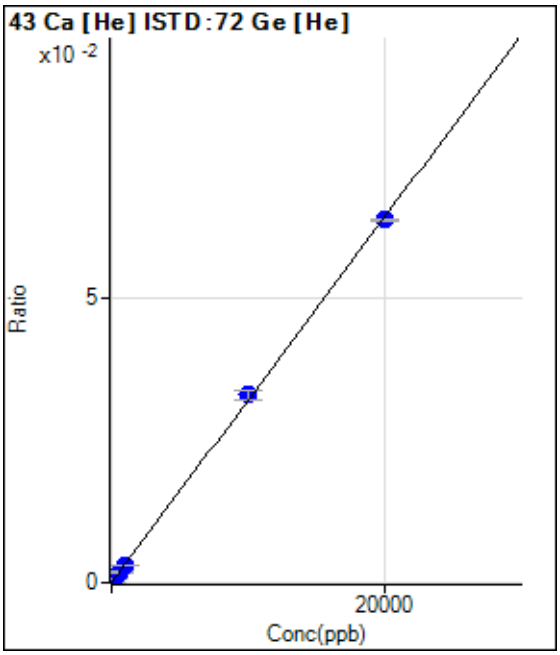
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	128419.33	0.1850	P	1.2
2	☐	200.000	196.550	278995.15	0.3996	P	0.8
3	☐	500.000	489.935	507812.43	0.7200	P	0.4
4	☐	1000.000	1010.304	900013.14	1.2881	A	2.5
5	☐	10000.00	9992.037	7644615.93	11.0945	A	1.9
6	☐	20000.00	20003.75	14945588.53	22.0255	A	1.4

y = 0.0011 * x + 0.1850
R = 1.0000
DL = 5.92
BEC = 169.5

Weight: <None>
Min Conc: <None>

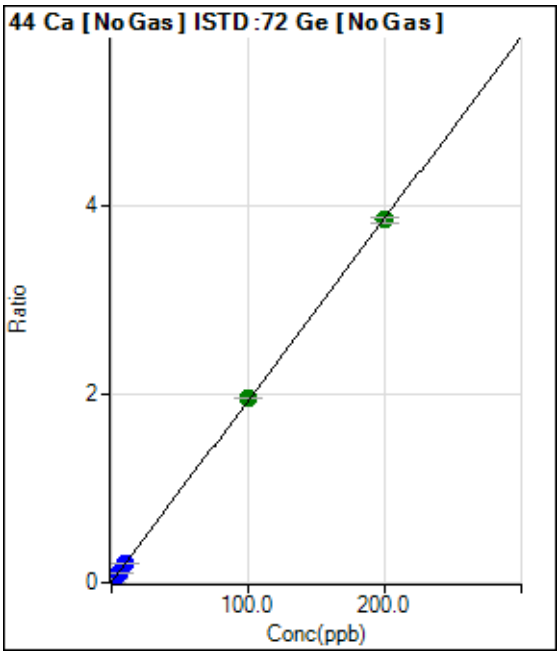


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	65.7
2	☐	200.000	200.542	473.35	0.0007	P	20.4
3	☐	500.000	520.666	1203.41	0.0017	P	20.6
4	☐	1000.000	945.359	2146.88	0.0031	P	4.6
5	☐	10000.00	10278.06	22789.11	0.0331	P	4.6
6	☐	20000.00	19863.18	43355.16	0.0639	P	0.7

y = 3.2151E-006 * x + 3.3638E-005
R = 0.9999
DL = 20.62
BEC = 10.46

Weight: <None>
Min Conc: <None>

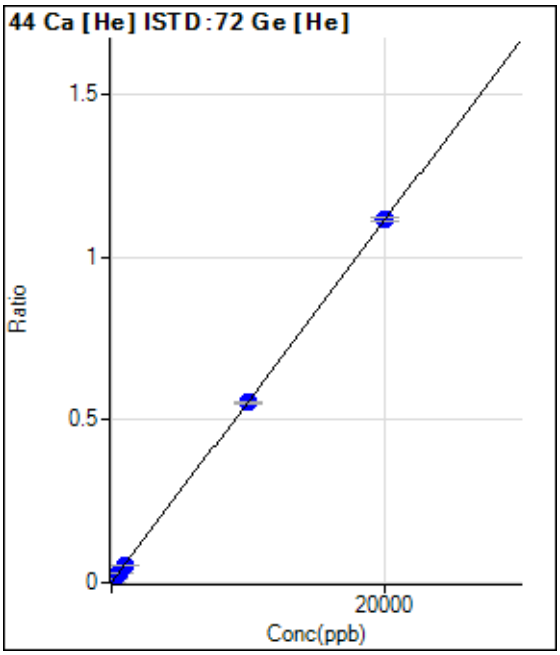
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8732.91	0.0041	P	5.1
2	☐	2.000	1.997	91626.69	0.0427	P	0.6
3	☐	5.000	5.025	217152.36	0.1013	P	2.3
4	☐	10.000	10.225	428703.83	0.2018	P	1.2
5	☐	100.000	101.354	4109185.35	1.9642	A	0.3
6	☐	200.000	199.311	8011030.30	3.8587	A	1.7

y = 0.0193 * x + 0.0041
R = 1.0000
DL = 0.03208
BEC = 0.211

Weight: <None>
Min Conc: <None>

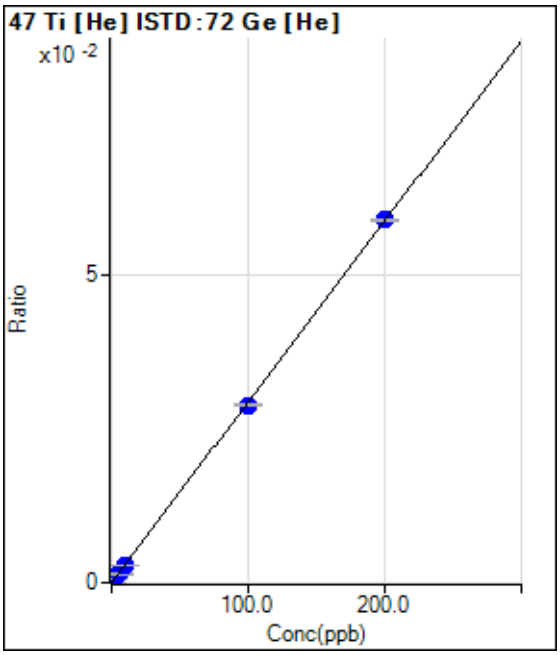


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	546.69	0.0008	P	18.5
2	☐	200.000	190.831	7965.79	0.0114	P	3.3
3	☐	500.000	483.440	19534.13	0.0277	P	2.6
4	☐	1000.000	973.385	38407.17	0.0550	P	0.7
5	☐	10000.00	9940.334	381811.75	0.5541	P	0.8
6	☐	20000.00	20031.66	757009.42	1.1157	P	0.9

y = 5.5660E-005 * x + 7.8783E-004
R = 1.0000
DL = 7.866
BEC = 14.15

Weight: <None>
Min Conc: <None>

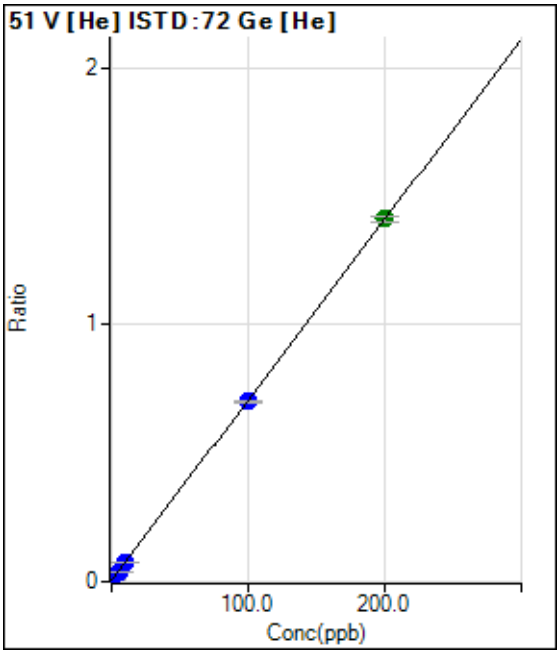
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	42.9
2	☐	2.000	1.919	406.68	0.0006	P	1.3
3	☐	5.000	5.003	1050.06	0.0015	P	16.0
4	☐	10.000	9.782	2020.19	0.0029	P	4.0
5	☐	100.000	98.402	19918.05	0.0289	P	1.4
6	☐	200.000	200.811	40005.09	0.0590	P	0.4

y = 2.9351E-004 * x + 1.9193E-005
R = 1.0000
DL = 0.08424
BEC = 0.06539

Weight: <None>
Min Conc: <None>

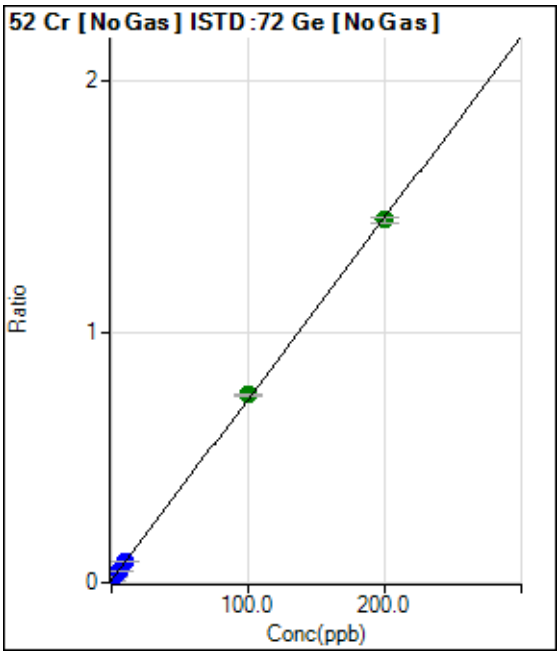


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4102.86	0.0059	P	2.1
2	☐	2.000	1.914	13505.57	0.0193	P	0.5
3	☐	5.000	4.767	27767.01	0.0394	P	1.0
4	☐	10.000	9.693	51660.06	0.0739	P	0.4
5	☐	100.000	99.023	482915.14	0.7008	P	1.0
6	☐	200.000	200.511	958686.66	1.4130	A	1.8

y = 0.0070 * x + 0.0059
R = 1.0000
DL = 0.05371
BEC = 0.8424

Weight: <None>
Min Conc: <None>

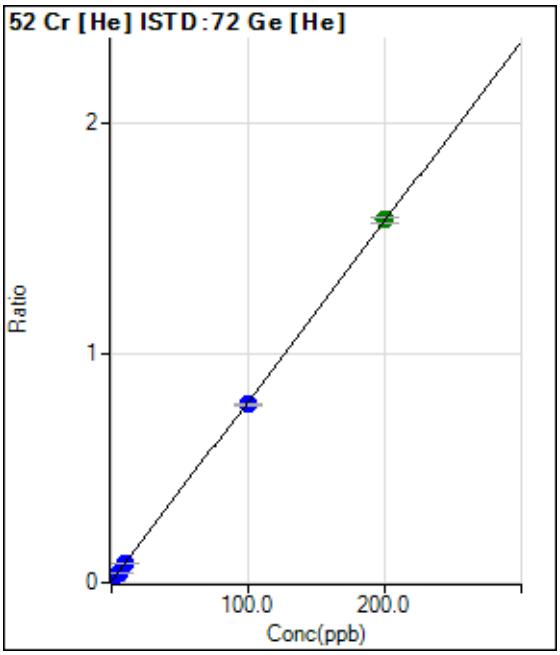
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	19674.40	0.0092	P	2.6
2	☐	2.000	2.013	50951.59	0.0237	P	1.6
3	☐	5.000	5.040	97868.01	0.0456	P	1.1
4	☐	10.000	10.124	174976.90	0.0824	P	1.9
5	☐	100.000	102.297	1566235.60	0.7487	A	1.2
6	☐	200.000	198.844	3003258.91	1.4467	A	1.5

y = 0.0072 * x + 0.0092
R = 0.9999
DL = 0.09736
BEC = 1.272

Weight: <None>
Min Conc: <None>

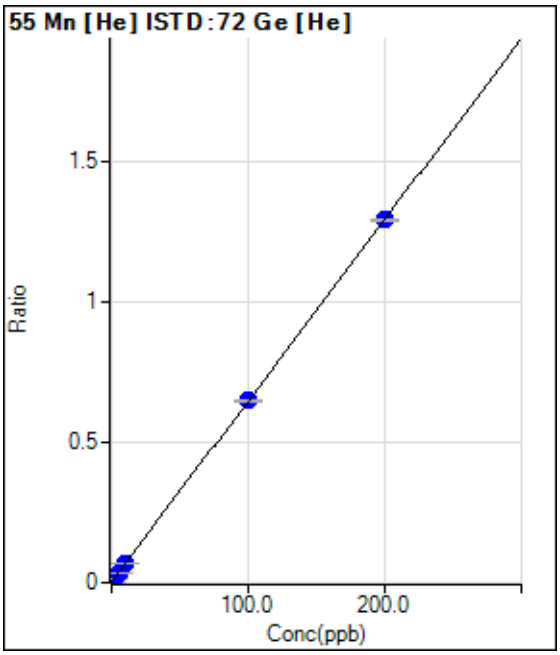


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3803.93	0.0055	P	4.2
2	☐	2.000	2.039	14995.08	0.0215	P	3.0
3	☐	5.000	4.898	30978.65	0.0439	P	1.9
4	☐	10.000	9.974	58521.46	0.0838	P	1.1
5	☐	100.000	98.300	535351.20	0.7769	P	0.4
6	☐	200.000	200.853	1073166.31	1.5816	A	1.3

y = 0.0078 * x + 0.0055
R = 0.9999
DL = 0.08734
BEC = 0.6984

Weight: <None>
Min Conc: <None>

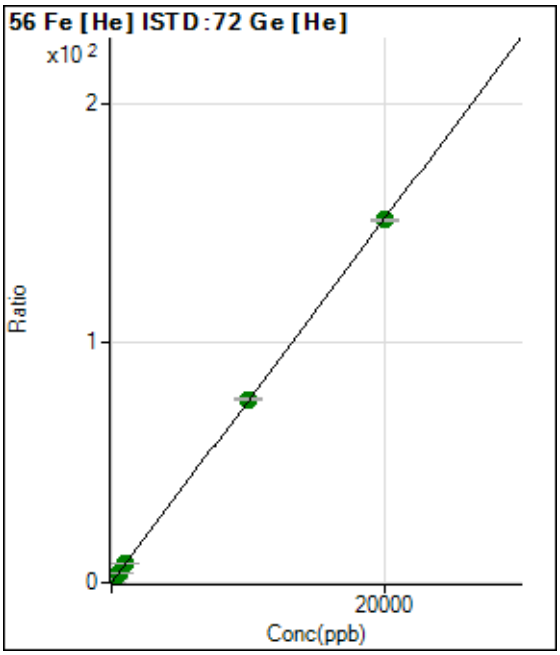
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1766.82	0.0025	P	9.6
2	☐	2.000	1.976	10671.01	0.0153	P	4.1
3	☐	5.000	4.880	23987.98	0.0340	P	0.7
4	☐	10.000	9.847	46144.89	0.0660	P	2.5
5	☐	100.000	100.084	446422.66	0.6478	P	0.7
6	☐	200.000	199.969	876514.18	1.2919	P	0.6

y = 0.0064 * x + 0.0025
R = 1.0000
DL = 0.1135
BEC = 0.3948

Weight: <None>
Min Conc: <None>

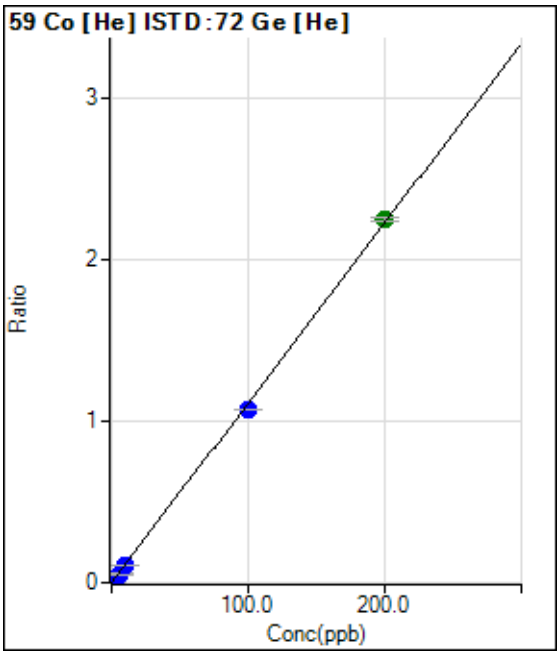


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13430.13	0.0194	P	1.8
2	☐	200.000	201.884	1082643.03	1.5508	A	1.8
3	☐	500.000	501.049	2694485.38	3.8202	A	1.1
4	☐	1000.000	1013.739	5386461.17	7.7094	A	2.0
5	☐	10000.00	10095.62	52787539.21	76.6034	A	0.7
6	☐	20000.00	19951.45	102704068.4	151.368	A	0.3

y = 0.0076 * x + 0.0194
R = 1.0000
DL = 0.1374
BEC = 2.551

Weight: <None>
Min Conc: <None>

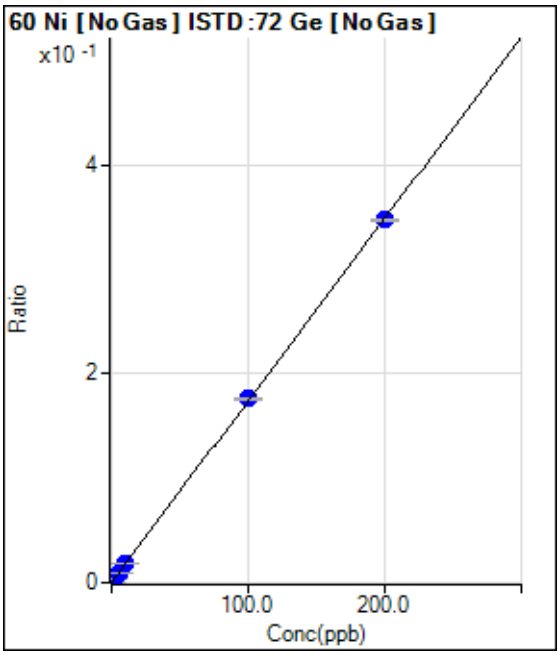
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	33.33	0.0000	P	75.6
2	☐	2.000	1.884	14688.12	0.0210	P	4.0
3	☐	5.000	4.772	37528.52	0.0532	P	3.4
4	☐	10.000	9.576	74587.09	0.1067	P	0.5
5	☐	100.000	96.338	739721.81	1.0735	P	0.6
6	☐	200.000	201.859	1526007.06	2.2492	A	1.1

y = 0.0111 * x + 4.8018E-005
R = 0.9998
DL = 0.009775
BEC = 0.00431

Weight: <None>
Min Conc: <None>

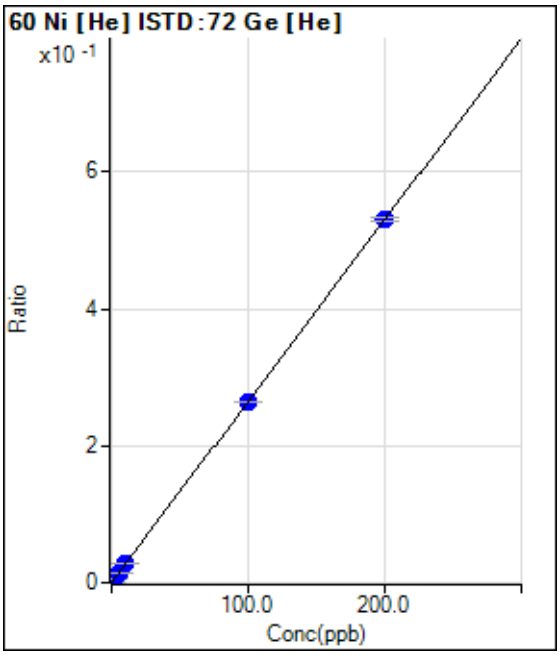


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	413.35	0.0002	P	4.7
2	☐	2.000	2.063	8122.56	0.0038	P	1.1
3	☐	5.000	4.979	19010.27	0.0089	P	3.2
4	☐	10.000	10.155	37979.88	0.0179	P	1.2
5	☐	100.000	101.033	368511.39	0.1762	P	1.7
6	☐	200.000	199.476	721702.54	0.3476	P	0.7

y = 0.0017 * x + 1.9318E-004
R = 1.0000
DL = 0.0156
BEC = 0.1109

Weight: <None>
Min Conc: <None>

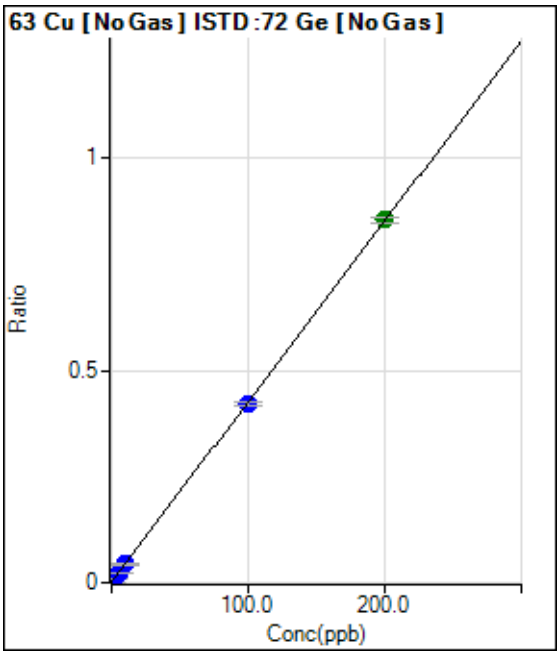
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	0.3
2	☐	2.000	2.087	3947.30	0.0057	P	5.8
3	☐	5.000	4.978	9390.02	0.0133	P	0.7
4	☐	10.000	10.122	18819.89	0.0269	P	0.8
5	☐	100.000	99.856	182307.53	0.2645	P	0.2
6	☐	200.000	200.066	359532.01	0.5299	P	1.1

y = 0.0026 * x + 1.2967E-004
R = 1.0000
DL = 0.0004827
BEC = 0.04897

Weight: <None>
Min Conc: <None>

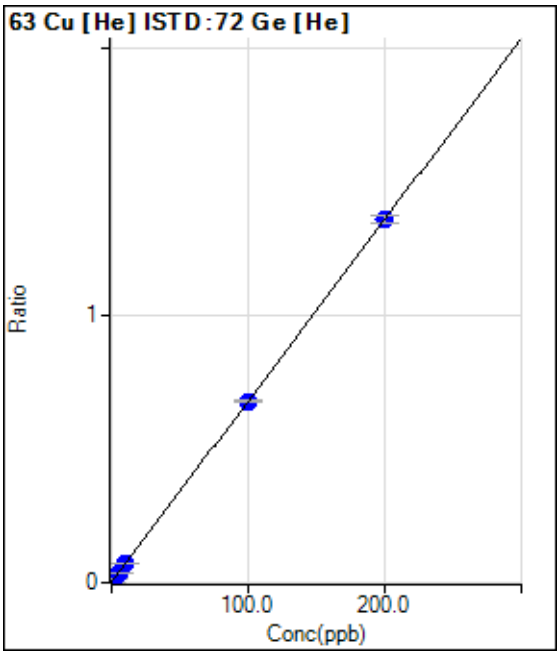


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2376.93	0.0011	P	4.9
2	☐	2.000	1.875	19484.22	0.0091	P	2.0
3	☐	5.000	4.875	46824.36	0.0218	P	4.0
4	☐	10.000	9.943	92140.88	0.0434	P	1.7
5	☐	100.000	98.504	878314.15	0.4199	P	2.0
6	☐	200.000	200.755	1774057.53	0.8546	A	1.9

y = 0.0043 * x + 0.0011
R = 1.0000
DL = 0.03844
BEC = 0.2614

Weight: <None>
Min Conc: <None>

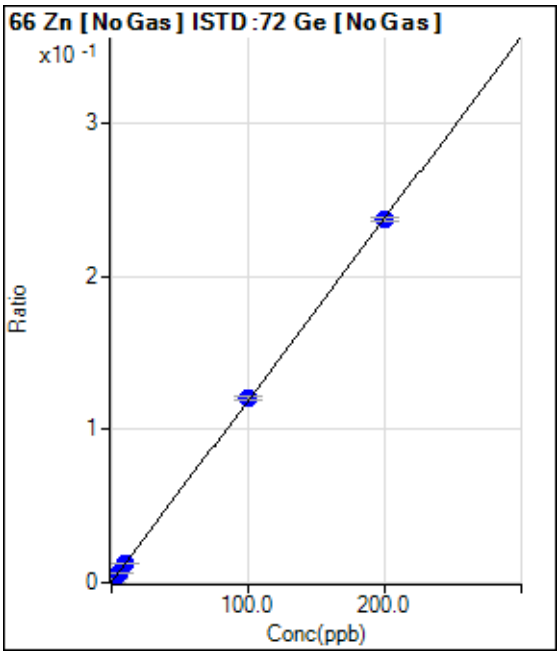
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	983.38	0.0014	P	4.2
2	☐	2.000	1.994	10427.52	0.0149	P	6.4
3	☐	5.000	4.908	24472.29	0.0347	P	1.9
4	☐	10.000	10.035	48530.34	0.0695	P	2.4
5	☐	100.000	100.017	468287.56	0.6795	P	0.2
6	☐	200.000	199.992	920881.78	1.3574	P	2.1

y = 0.0068 * x + 0.0014
R = 1.0000
DL = 0.02615
BEC = 0.209

Weight: <None>
Min Conc: <None>

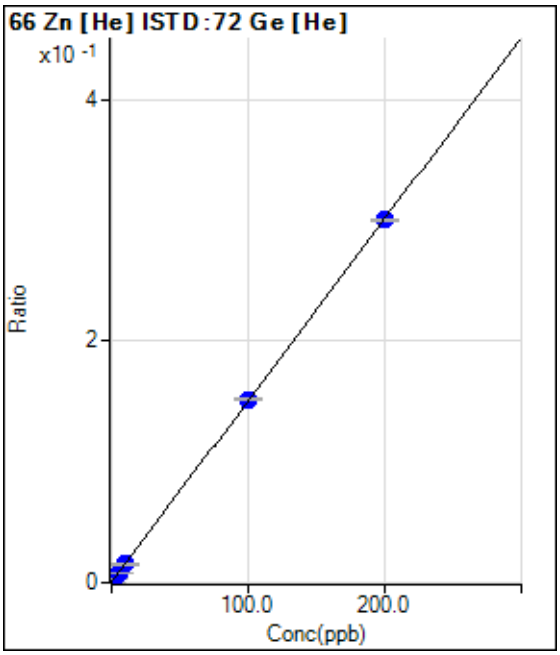


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	626.69	0.0003	P	29.2
2	☐	2.000	1.873	5394.50	0.0025	P	5.3
3	☐	5.000	5.037	13443.56	0.0063	P	1.9
4	☐	10.000	9.986	25788.16	0.0121	P	1.7
5	☐	100.000	101.425	252361.26	0.1206	P	1.4
6	☐	200.000	199.288	491509.50	0.2368	P	1.1

y = 0.0012 * x + 2.9278E-004
R = 1.0000
DL = 0.2161
BEC = 0.2468

Weight: <None>
Min Conc: <None>

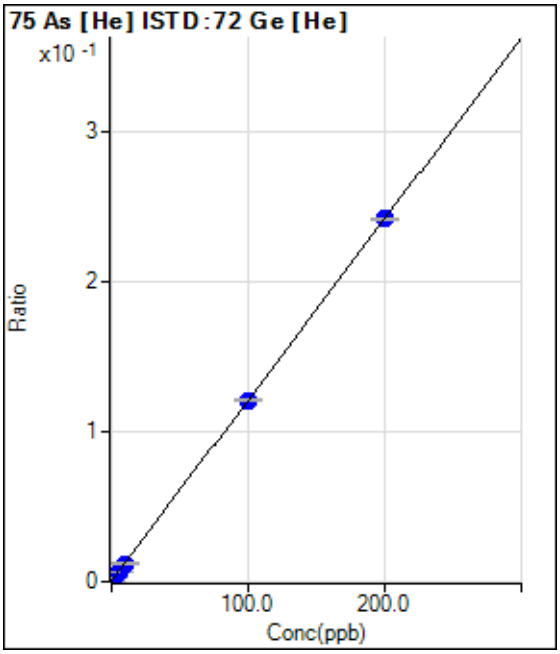
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	266.68	0.0004	P	12.3
2	☐	2.000	1.855	2213.56	0.0032	P	1.0
3	☐	5.000	4.842	5401.17	0.0077	P	7.6
4	☐	10.000	9.816	10574.28	0.0151	P	3.9
5	☐	100.000	100.860	104691.33	0.1519	P	0.6
6	☐	200.000	199.584	203721.61	0.3003	P	0.8

y = 0.0015 * x + 3.8432E-004
R = 1.0000
DL = 0.09465
BEC = 0.2558

Weight: <None>
Min Conc: <None>

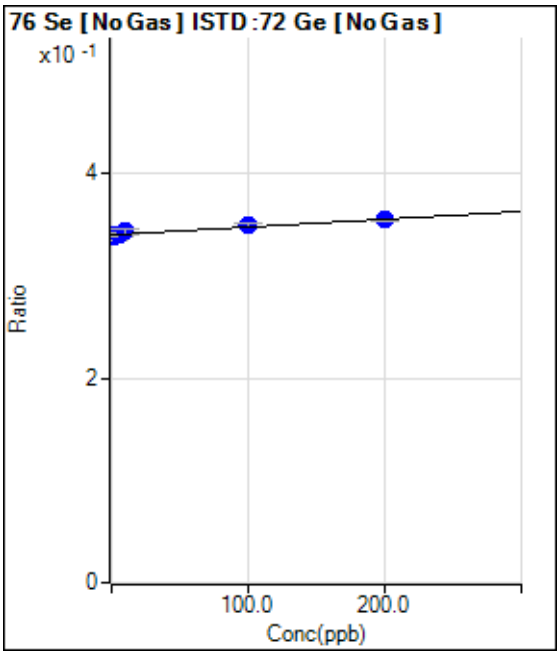


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	317.79	0.0005	P	8.8
2	☐	2.000	1.910	1925.71	0.0028	P	1.6
3	☐	5.000	4.725	4337.39	0.0061	P	2.2
4	☐	10.000	9.667	8458.24	0.0121	P	2.6
5	☐	100.000	99.868	83221.19	0.1208	P	0.9
6	☐	200.000	200.091	163860.94	0.2415	P	0.8

y = 0.0012 * x + 4.5777E-004
R = 1.0000
DL = 0.1006
BEC = 0.38

Weight: <None>
Min Conc: <None>

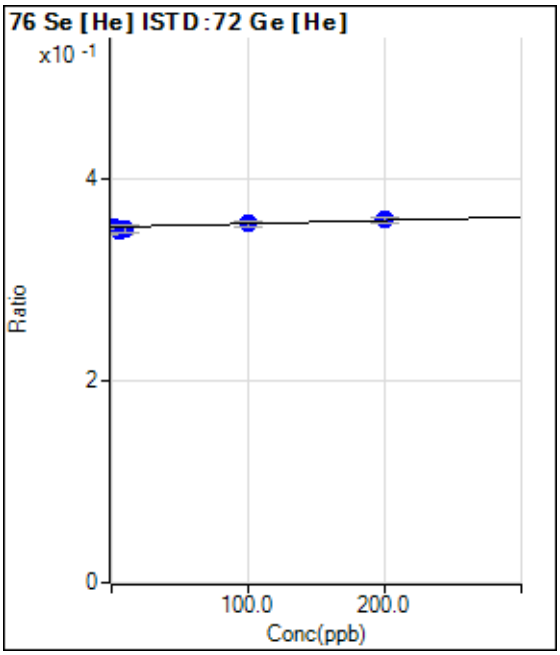
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	727412.57	0.3400	P	0.5
2	☐	2.000	-29.630	724616.68	0.3377	P	1.4
3	☐	5.000	-2.077	728842.23	0.3398	P	1.0
4	☐	10.000	48.900	730107.75	0.3437	P	1.7
5	☐	100.000	115.843	729778.82	0.3489	P	1.0
6	☐	200.000	190.626	736115.51	0.3546	P	0.4

y = 7.6366E-005 * x + 0.3400
R = 0.9585
DL = 61.1
BEC = 4452

Weight: <None>
Min Conc: <None>

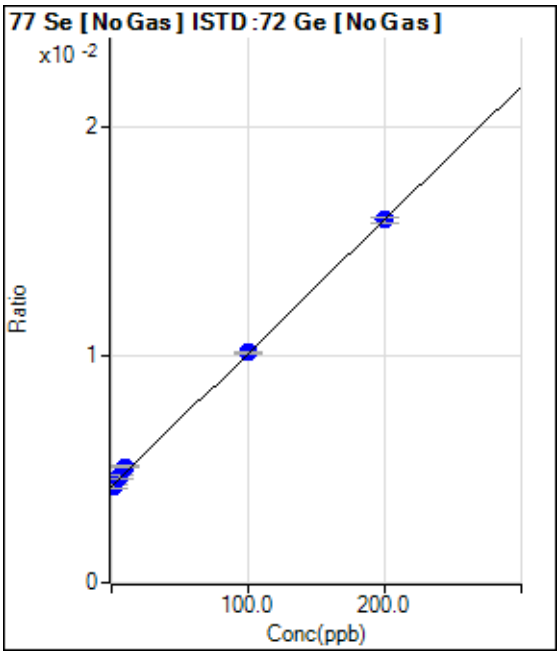


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	244719.10	0.3526	P	1.0
2	☐	2.000	12.062	246438.62	0.3530	P	1.0
3	☐	5.000	-144.691	245345.07	0.3478	P	1.6
4	☐	10.000	-64.315	244886.86	0.3505	P	1.8
5	☐	100.000	89.892	245009.27	0.3555	P	1.3
6	☐	200.000	212.411	243956.77	0.3596	P	1.4

y = 3.2851E-005 * x + 0.3526
R = 0.8815
DL = 335.5
BEC = 1.073E+04

Weight: <None>
Min Conc: <None>

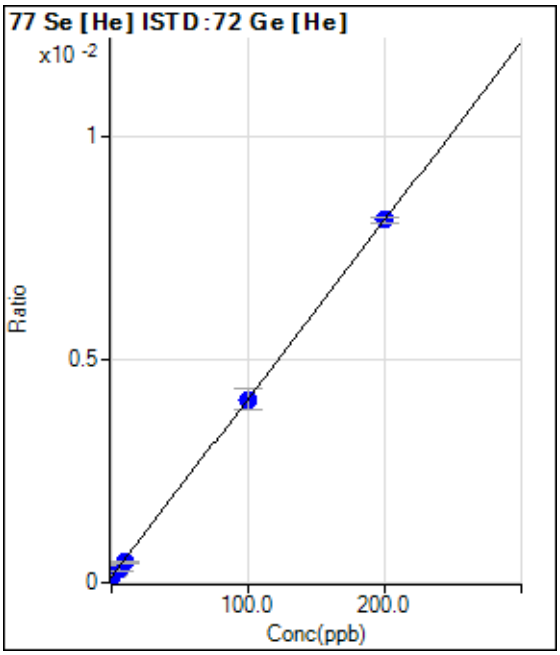
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9059.87	0.0042	P	3.3
2	☐	2.000	0.340	9126.57	0.0043	P	4.5
3	☐	5.000	7.334	10003.90	0.0047	P	2.8
4	☐	10.000	14.732	10831.15	0.0051	P	1.6
5	☐	100.000	100.191	21160.16	0.0101	P	1.1
6	☐	200.000	199.626	33111.02	0.0159	P	1.8

y = 5.8684E-005 * x + 0.0042
R = 0.9996
DL = 7.179
BEC = 72.16

Weight: <None>
Min Conc: <None>

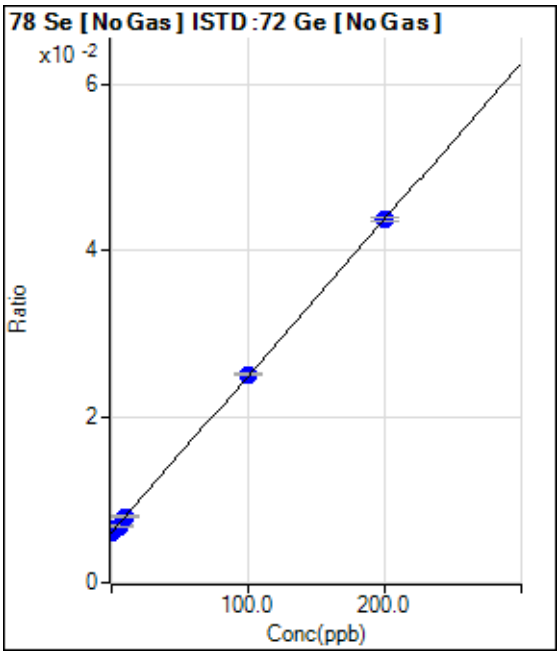


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.00	0.0001	P	11.3
2	☐	2.000	1.651	136.67	0.0002	P	15.5
3	☐	5.000	4.656	223.34	0.0003	P	35.3
4	☐	10.000	8.311	323.34	0.0005	P	6.7
5	☐	100.000	99.748	2843.69	0.0041	P	10.9
6	☐	200.000	200.222	5527.91	0.0081	P	1.8

y = 4.0046E-005 * x + 1.2970E-004
R = 1.0000
DL = 1.102
BEC = 3.239

Weight: <None>
Min Conc: <None>

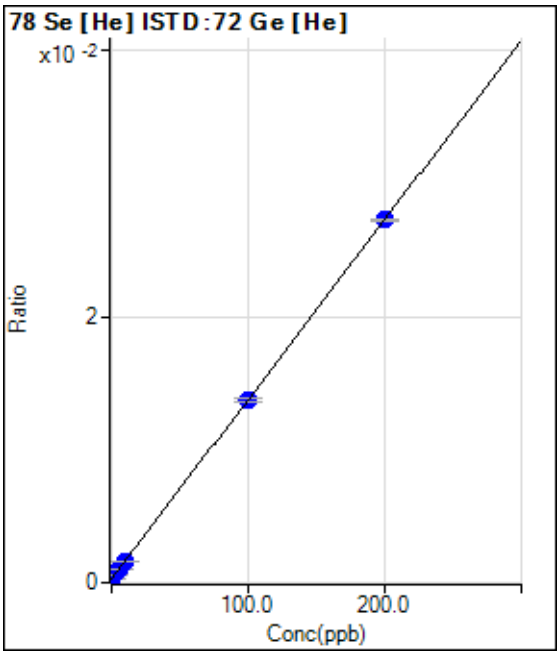
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12976.40	0.0061	P	3.4
2	☐	2.000	2.102	13864.03	0.0065	P	6.1
3	☐	5.000	3.962	14611.46	0.0068	P	1.0
4	☐	10.000	9.740	16784.01	0.0079	P	3.2
5	☐	100.000	100.925	52525.64	0.0251	P	0.9
6	☐	200.000	199.575	90771.54	0.0437	P	0.9

y = 1.8869E-004 * x + 0.0061
R = 1.0000
DL = 3.288
BEC = 32.14

Weight: <None>
Min Conc: <None>

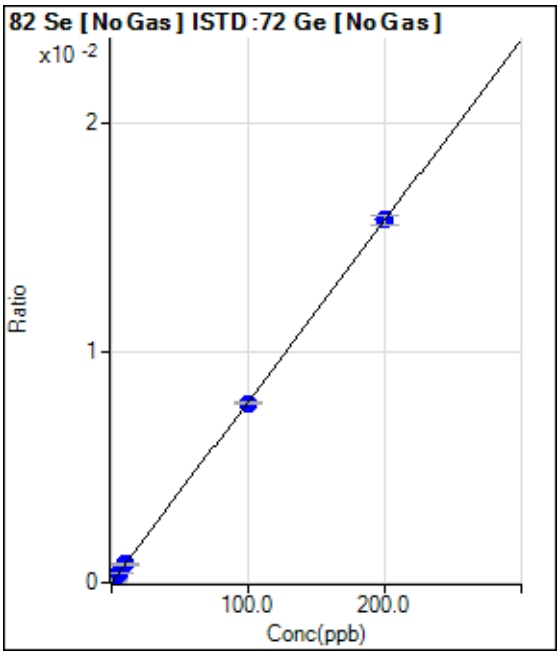


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	191.33	0.0003	P	10.2
2	☐	2.000	2.075	388.01	0.0006	P	1.9
3	☐	5.000	5.114	681.35	0.0010	P	3.5
4	☐	10.000	9.702	1108.05	0.0016	P	5.3
5	☐	100.000	99.935	9484.69	0.0138	P	1.7
6	☐	200.000	200.044	18505.35	0.0273	P	0.3

y = 1.3496E-004 * x + 2.7573E-004
R = 1.0000
DL = 0.6278
BEC = 2.043

Weight: <None>
Min Conc: <None>

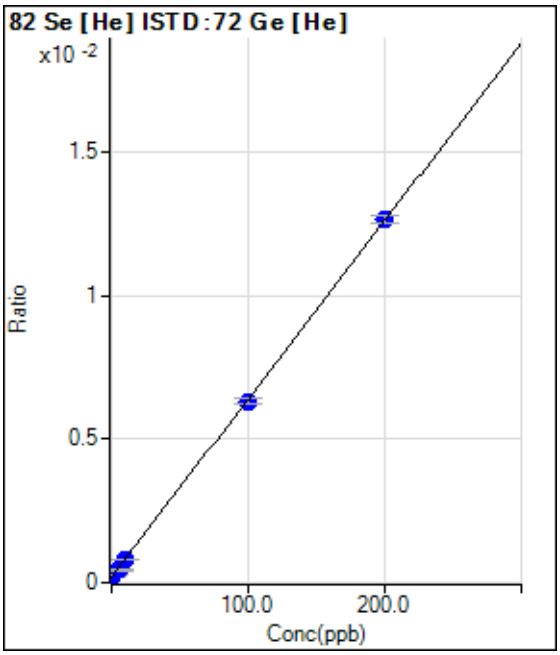
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	-47.84	0.0000	P	-178.9
2	☐	2.000	1.670	234.98	0.0001	P	65.7
3	☐	5.000	5.042	805.87	0.0004	P	8.0
4	☐	10.000	10.416	1698.71	0.0008	P	10.9
5	☐	100.000	99.061	16312.69	0.0078	P	1.0
6	☐	200.000	200.451	32806.75	0.0158	P	2.4

y = 7.8946E-005 * x - 2.2463E-005
R = 1.0000
DL = 1.527
BEC = -0.2845

Weight: <None>
Min Conc: <None>

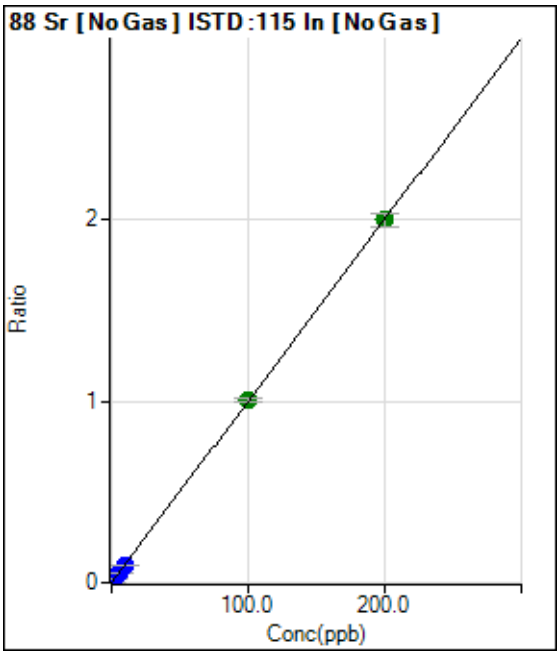


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0002	P	31.1
2	☐	2.000	1.835	223.34	0.0003	P	13.4
3	☐	5.000	3.838	313.34	0.0004	P	6.1
4	☐	10.000	9.532	556.69	0.0008	P	4.5
5	☐	100.000	98.807	4360.79	0.0063	P	3.4
6	☐	200.000	200.651	8572.88	0.0126	P	2.2

y = 6.1943E-005 * x + 2.0638E-004
R = 1.0000
DL = 3.112
BEC = 3.332

Weight: <None>
Min Conc: <None>

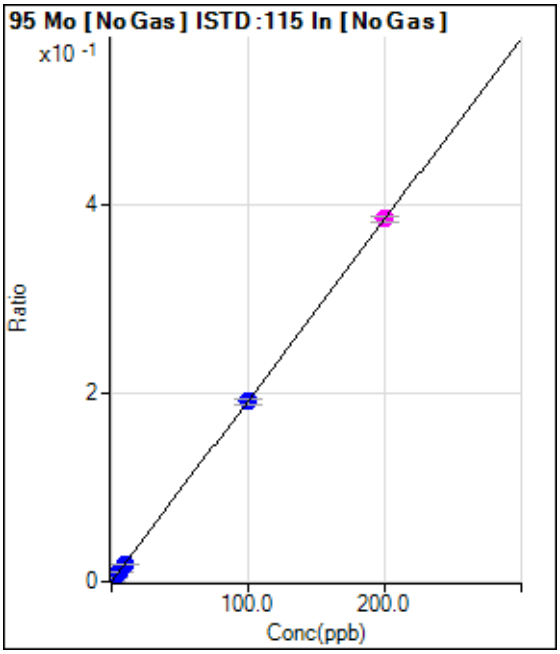
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1343.43	0.0005	P	10.1
2	☐	2.000	1.873	52359.32	0.0192	P	1.6
3	☐	5.000	4.780	131241.93	0.0483	P	0.6
4	☐	10.000	9.487	261107.26	0.0954	P	0.6
5	☐	100.000	100.306	2644517.98	1.0035	A	2.1
6	☐	200.000	199.879	5225902.53	1.9992	A	3.4

y = 0.0100 * x + 4.9411E-004
R = 1.0000
DL = 0.01501
BEC = 0.04941

Weight: <None>
Min Conc: <None>

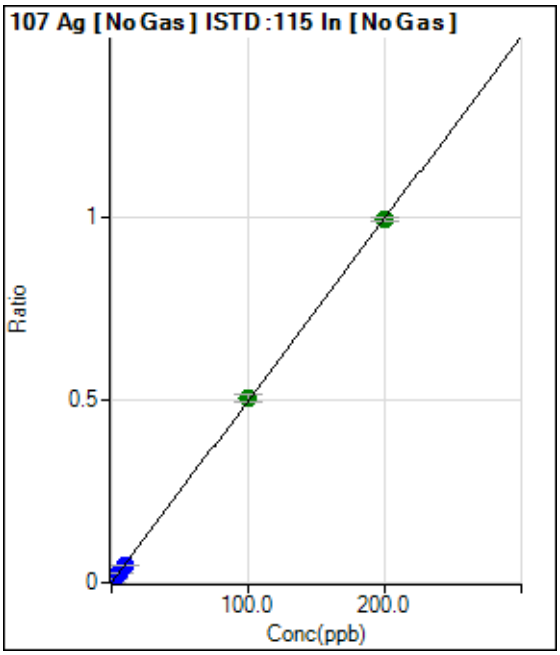


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	35.7
2	☐	2.000	1.924	10147.36	0.0037	P	1.3
3	☐	5.000	4.843	25397.84	0.0093	P	0.3
4	☐	10.000	9.588	50606.31	0.0185	P	1.0
5	☐	100.000	99.342	504255.51	0.1914	P	2.3
6	☐	200.000	200.354	1008879.65	0.3859	M	1.3

y = 0.0019 * x + 1.8426E-005
R = 1.0000
DL = 0.01024
BEC = 0.009567

Weight: <None>
Min Conc: <None>

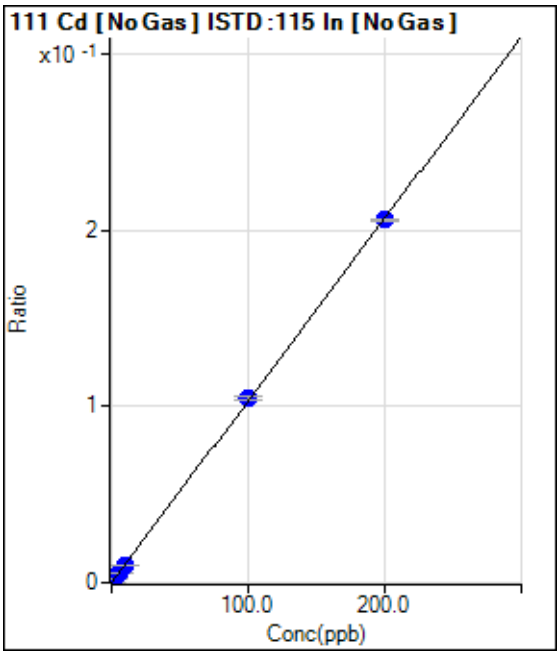
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	160.00	0.0001	P	28.3
2	☐	2.000	1.904	25945.63	0.0095	P	1.6
3	☐	5.000	4.767	64574.07	0.0238	P	0.4
4	☐	10.000	9.704	132276.17	0.0483	P	1.3
5	☐	100.000	101.404	1328584.30	0.5043	A	4.2
6	☐	200.000	199.319	2591097.26	0.9912	A	1.0

y = 0.0050 * x + 5.8942E-005
R = 1.0000
DL = 0.01005
BEC = 0.01185

Weight: <None>
Min Conc: <None>

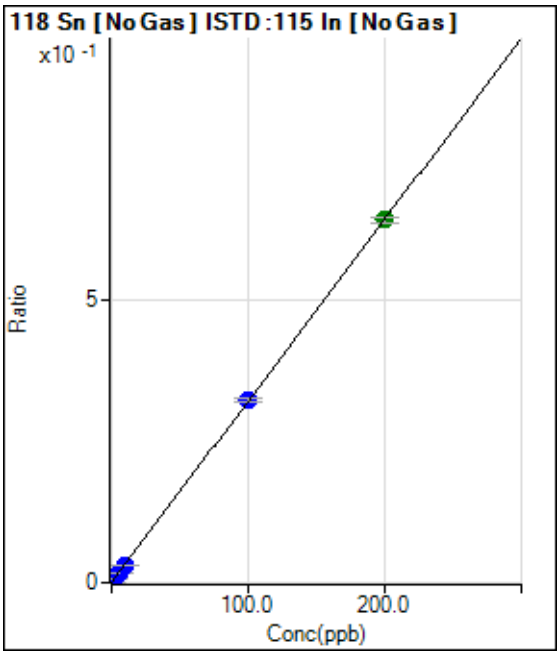


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0000	P	86.6
2	☐	2.000	1.908	5384.55	0.0020	P	5.2
3	☐	5.000	4.853	13650.59	0.0050	P	2.2
4	☐	10.000	9.859	27923.28	0.0102	P	0.8
5	☐	100.000	101.223	275812.55	0.1047	P	2.0
6	☐	200.000	199.400	538979.20	0.2062	P	0.3

y = 0.0010 * x + 4.8773E-006
R = 1.0000
DL = 0.01226
BEC = 0.004718

Weight: <None>
Min Conc: <None>

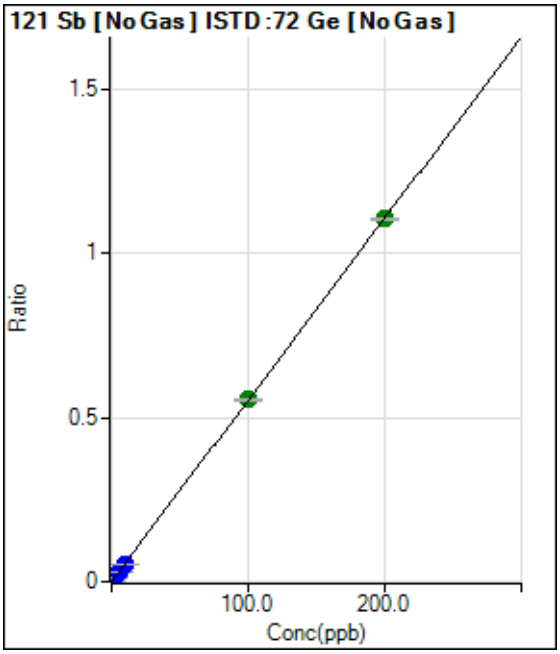
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1323.42	0.0005	P	6.9
2	☐	2.000	1.909	17992.65	0.0066	P	6.0
3	☐	5.000	4.844	43522.43	0.0160	P	1.2
4	☐	10.000	9.631	85859.65	0.0314	P	1.2
5	☐	100.000	100.163	847408.76	0.3216	P	2.3
6	☐	200.000	199.942	1676551.59	0.6414	A	1.9

y = 0.0032 * x + 4.8650E-004
R = 1.0000
DL = 0.03142
BEC = 0.1518

Weight: <None>
Min Conc: <None>

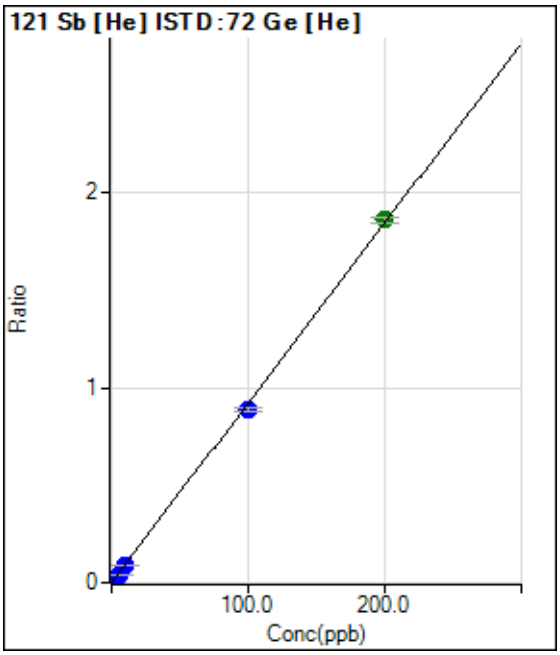


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	430.02	0.0002	P	19.6
2	☐	2.000	1.861	22526.25	0.0105	P	1.3
3	☐	5.000	4.824	57666.64	0.0269	P	2.5
4	☐	10.000	9.769	115192.57	0.0542	P	4.4
5	☐	100.000	100.341	1161695.11	0.5553	A	0.6
6	☐	200.000	199.847	2295859.34	1.1058	A	0.6

y = 0.0055 * x + 2.0093E-004
R = 1.0000
DL = 0.02138
BEC = 0.03632

Weight: <None>
Min Conc: <None>

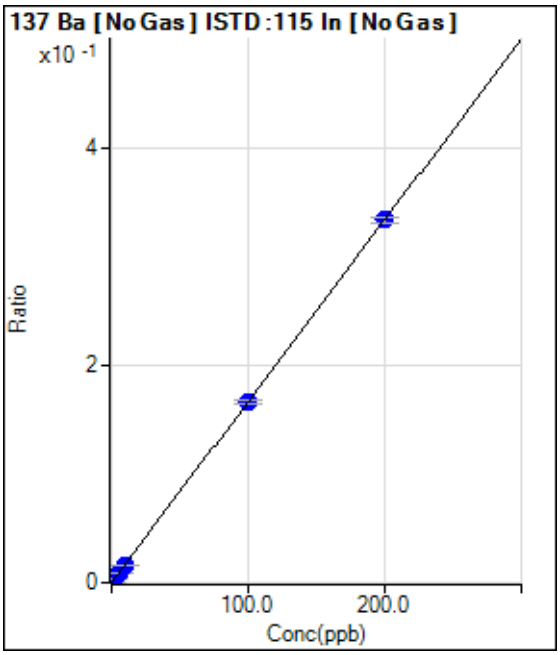
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	213.34	0.0003	P	22.0
2	☐	2.000	1.836	12029.07	0.0172	P	0.8
3	☐	5.000	4.626	30285.26	0.0429	P	1.1
4	☐	10.000	9.330	60291.79	0.0863	P	0.3
5	☐	100.000	96.372	612148.93	0.8884	P	1.5
6	☐	200.000	201.859	1262334.83	1.8605	A	1.3

y = 0.0092 * x + 3.0731E-004
R = 0.9998
DL = 0.02201
BEC = 0.03335

Weight: <None>
Min Conc: <None>

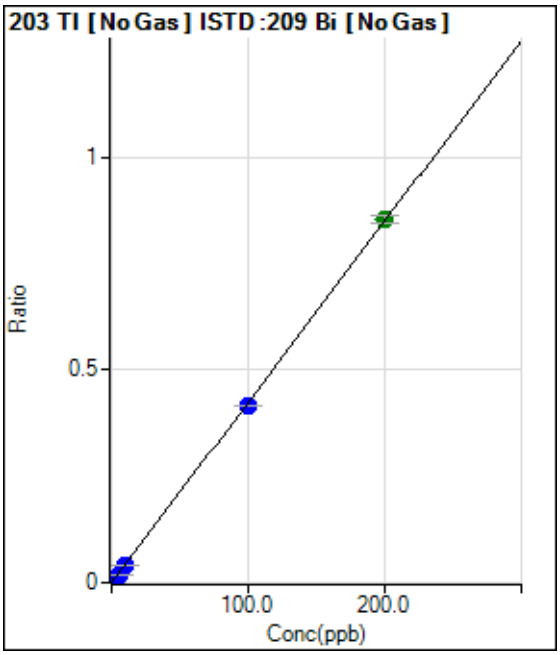


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	220.01	0.0001	P	11.1
2	☐	2.000	1.898	8826.49	0.0032	P	0.8
3	☐	5.000	4.815	21998.89	0.0081	P	2.6
4	☐	10.000	9.627	44085.02	0.0161	P	2.2
5	☐	100.000	99.635	437151.43	0.1659	P	2.8
6	☐	200.000	200.207	871177.83	0.3333	P	1.5

y = 0.0017 * x + 8.0844E-005
R = 1.0000
DL = 0.01623
BEC = 0.04858

Weight: <None>
Min Conc: <None>

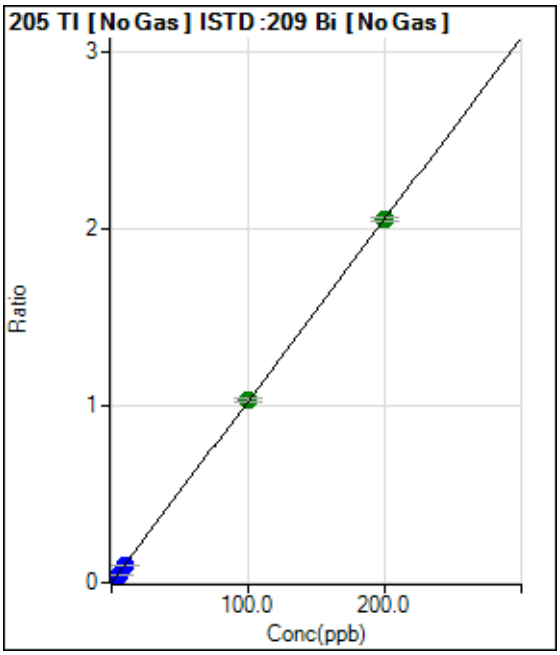
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0000	P	65.1
2	☐	2.000	1.848	20089.72	0.0079	P	2.8
3	☐	5.000	4.734	52125.72	0.0201	P	1.0
4	☐	10.000	9.829	105301.46	0.0417	P	1.2
5	☐	100.000	98.258	1053303.71	0.4168	P	0.4
6	☐	200.000	200.887	2120172.52	0.8522	A	2.2

y = 0.0042 * x + 2.0878E-005
R = 0.9999
DL = 0.009612
BEC = 0.004922

Weight: <None>
Min Conc: <None>

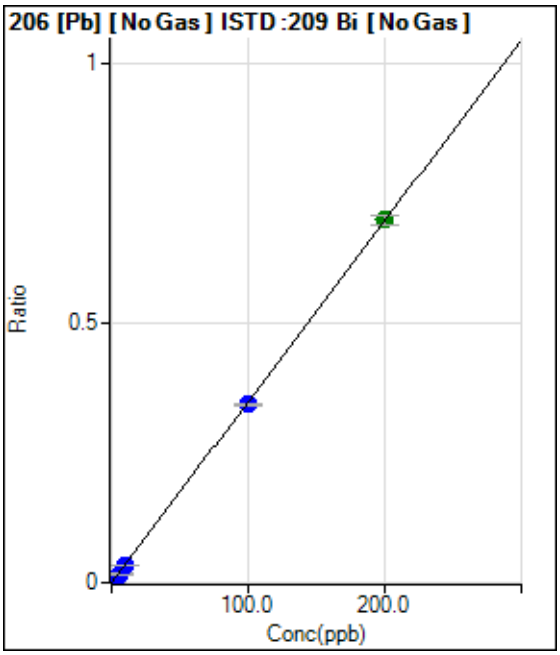


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	86.67	0.0000	P	51.8
2	☐	2.000	1.854	48661.91	0.0190	P	2.5
3	☐	5.000	4.650	123715.88	0.0477	P	2.6
4	☐	10.000	9.721	251697.18	0.0997	P	0.8
5	☐	100.000	100.609	2606829.28	1.0316	A	1.5
6	☐	200.000	199.720	5096070.03	2.0479	A	1.0

y = 0.0103 * x + 3.4236E-005
R = 1.0000
DL = 0.005189
BEC = 0.003339

Weight: <None>
Min Conc: <None>

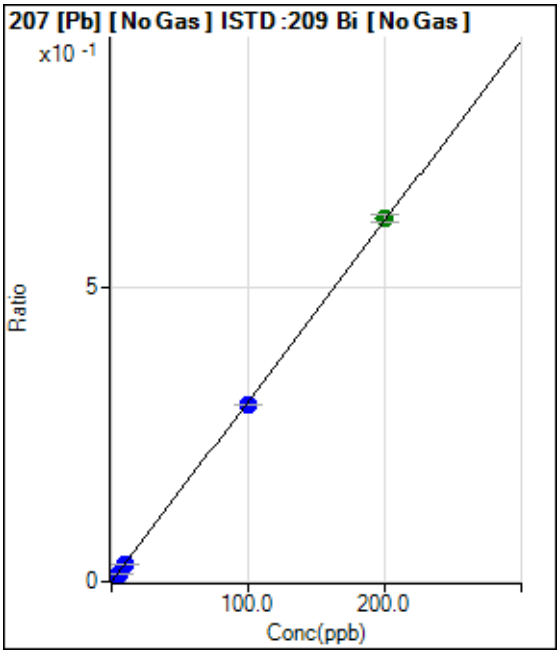
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	170.00	0.0001	P	25.7
2	☐	2.000	1.909	17165.45	0.0067	P	3.6
3	☐	5.000	4.728	42880.69	0.0165	P	2.0
4	☐	10.000	9.926	87448.76	0.0346	P	1.2
5	☐	100.000	98.667	868698.48	0.3438	P	1.1
6	☐	200.000	200.678	1739395.81	0.6991	A	2.8

y = 0.0035 * x + 6.7264E-005
R = 1.0000
DL = 0.01491
BEC = 0.01931

Weight: <None>
Min Conc: <None>

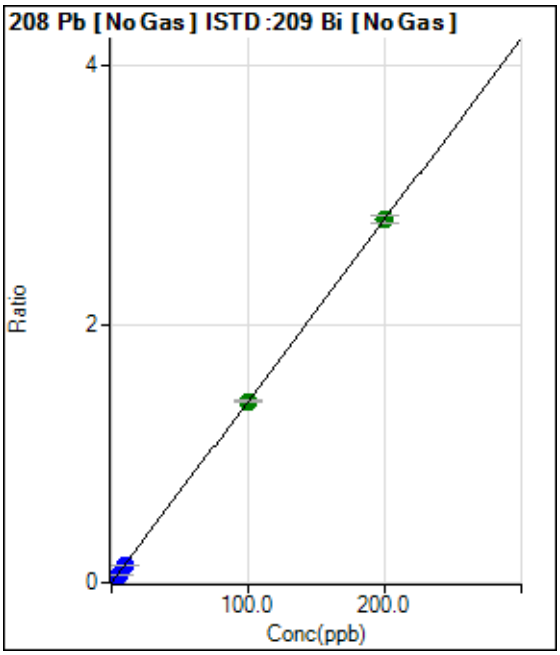


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0001	P	37.0
2	☐	2.000	1.865	14782.39	0.0058	P	0.8
3	☐	5.000	4.678	37386.66	0.0144	P	1.1
4	☐	10.000	9.750	75706.30	0.0300	P	3.3
5	☐	100.000	97.788	758791.34	0.3003	P	0.5
6	☐	200.000	201.128	1536432.27	0.6175	A	2.3

y = 0.0031 * x + 5.6821E-005
R = 0.9999
DL = 0.02052
BEC = 0.01851

Weight: <None>
Min Conc: <None>

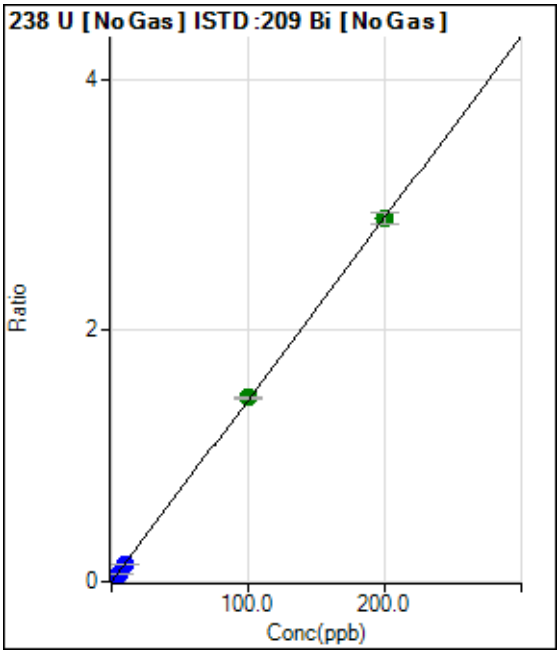
Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	656.68	0.0003	P	17.3
2	☐	2.000	1.874	67859.79	0.0265	P	1.8
3	☐	5.000	4.707	171927.26	0.0663	P	1.7
4	☐	10.000	9.791	347423.54	0.1376	P	0.8
5	☐	100.000	100.141	3551009.12	1.4053	A	0.8
6	☐	200.000	199.948	6980568.75	2.8056	A	2.1

y = 0.0140 * x + 2.5944E-004
R = 1.0000
DL = 0.009597
BEC = 0.01849

Weight: <None>
Min Conc: <None>

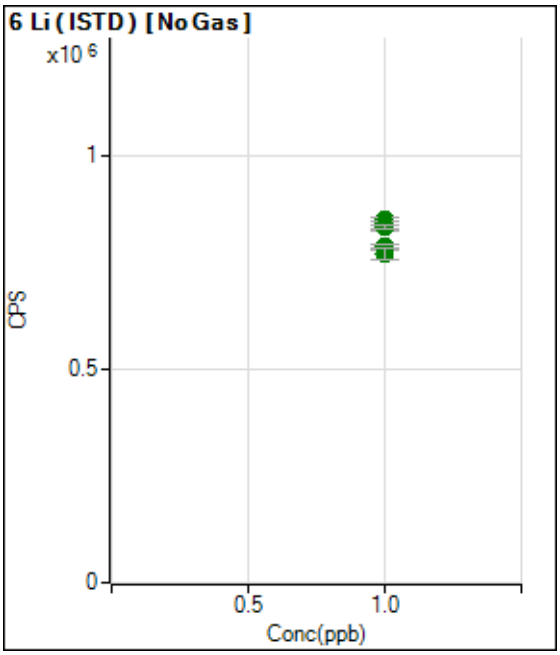


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	40.00	0.0000	P	43.9
2	☐	2.000	1.852	68618.76	0.0268	P	2.1
3	☐	5.000	4.556	171188.53	0.0660	P	2.2
4	☐	10.000	9.419	344517.43	0.1365	P	0.4
5	☐	100.000	101.071	3700484.21	1.4644	A	0.6
6	☐	200.000	199.506	7191373.85	2.8906	A	3.0

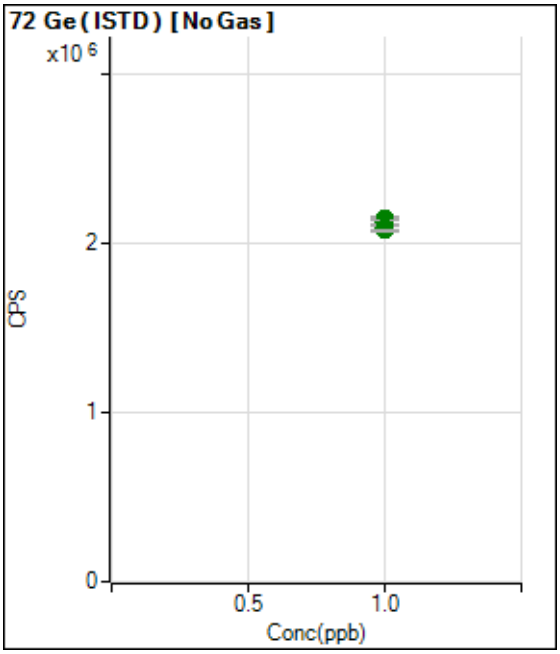
y = 0.0145 * x + 1.5811E-005
R = 1.0000
DL = 0.001437
BEC = 0.001091

Weight: <None>
Min Conc: <None>

Calibration for 162_ICV.d

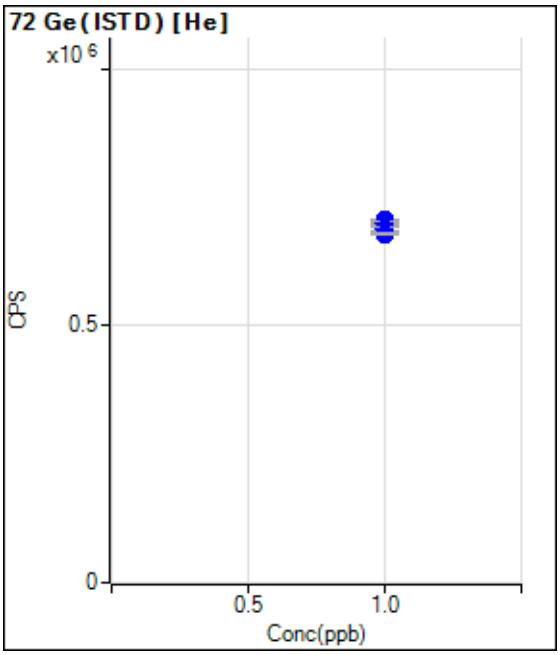


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		851396.56		A	1.0
2	☐	1.000		844098.40		A	1.3
3	☐	1.000		833751.25		A	1.4
4	☐	1.000		834919.48		A	0.8
5	☐	1.000		788191.01		A	2.1
6	☐	1.000		771890.78		A	3.5

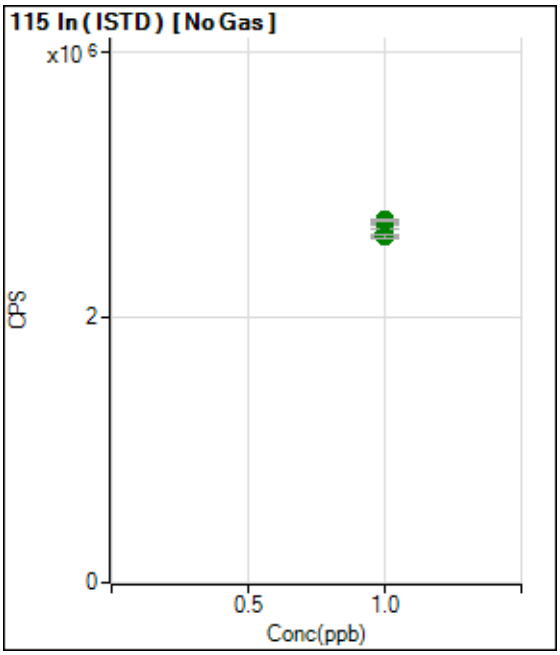


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2139407.73		A	0.4
2	☐	1.000		2145638.15		A	0.9
3	☐	1.000		2144715.12		A	0.8
4	☐	1.000		2124268.15		A	1.2
5	☐	1.000		2092022.57		A	0.9
6	☐	1.000		2076150.54		A	0.9

Calibration for 162_ICV.d

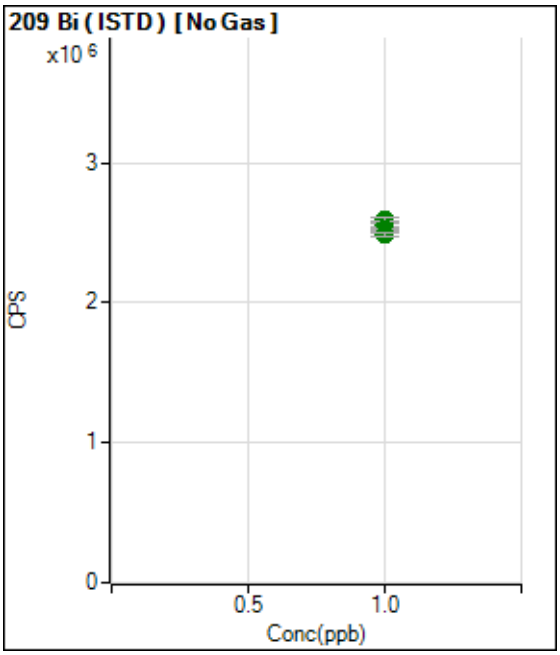


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		694064.57		P	0.3
2	☐	1.000		698154.70		P	0.5
3	☐	1.000		705354.52		P	0.7
4	☐	1.000		698779.05		P	1.1
5	☐	1.000		689128.38		P	1.0
6	☐	1.000		678517.99		P	1.0



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2719437.47		A	1.0
2	☐	1.000		2724329.72		A	1.1
3	☐	1.000		2717717.10		A	0.3
4	☐	1.000		2737982.30		A	0.7
5	☐	1.000		2636127.70		A	2.2
6	☐	1.000		2614362.72		A	1.4

Calibration for 162_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2536806.21		A	2.3
2	☐	1.000		2556187.20		A	0.9
3	☐	1.000		2593317.67		A	1.2
4	☐	1.000		2524222.72		A	0.8
5	☐	1.000		2526930.85		A	0.6
6	☐	1.000		2488386.47		A	1.1

Sample Report

Sample Table

Sample Name	LLICCV5
Data File Name	163LCV5.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:06:43-06:00
Sample Type	LLCCV5
Dilution	1
Comment	
ISTD Ref FileName	155CALB.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
Li	7	1	No Gas	4.549	4.549	4.50	96917	0.00	5	
Be	9	1	No Gas	4.650	4.650	4.24	12509	0.04	5	
V	51	2	He	4.541	4.541	1.91	26527	0.02	5	
Cr	52	2	He	4.885	4.885	1.07	30768	0.02	5	
Fe	56	2	He	502.943	502.943	2.17	2692481	0.02	500	
Se	78	2	He	5.708	5.708	2.18	735	0.78	5	
As	75	2	He	4.829	4.829	2.16	4406	0.11	5	
Ca	44	2	He	490.925	490.925	2.56	19738	2.49	500	
Na	23	2	He	494.167	494.167	0.76	546676	0.09	500	
Mg	24	2	He	520.025	520.025	0.97	274772	0.19	500	
K	39	2	He	484.552	484.552	1.22	501420	0.10	500	
Mn	55	2	He	4.916	4.916	0.58	24045	0.02	5	
Co	59	2	He	4.844	4.844	0.37	37933	0.01	5	
Ni	60	2	He	4.915	4.915	4.70	9230	0.05	5	
Cu	63	2	He	4.920	4.920	1.14	24419	0.02	5	
Zn	66	2	He	4.602	4.602	2.16	5124	0.09	5	
Al	27	2	He	5.554	5.554	9.21	2844	0.20	5	
B	11	1	No Gas	27.662	27.662	5.30	55643	0.05	25	
Al	27	1	No Gas	5.536	5.536	5.49	88034	0.01	5	
Si	28	1	No Gas	27.649	27.649	8.19	397895	0.01	25	
Ag	107	1	No Gas	4.864	4.864	1.12	66015	0.01	5	
Cd	111	1	No Gas	4.982	4.982	2.75	14034	0.04	5	
Sr	88	1	No Gas	4.722	4.722	0.93	129898	0.00	5	
Mo	95	1	No Gas	4.879	4.879	3.50	25635	0.02	5	
Sn	118	1	No Gas	4.852	4.852	1.32	43663	0.01	5	
Sb	121	1	No Gas	4.878	4.878	3.14	58481	0.01	5	
Ba	137	1	No Gas	4.893	4.893	0.31	22390	0.02	5	
Tl	205	1	No Gas	4.783	4.783	0.97	127974	0.00	5	
Tl	203	1	No Gas	4.779	4.779	2.22	52916	0.01	5	
Pb	208	1	No Gas	4.776	4.776	0.78	175417	0.00	5	
U	238	1	No Gas	4.609	4.609	0.50	174160	0.00	5	
Ca	43	2	He	551.578	551.578	10.67	1270	43.43	500	
Sb	121	2	He	4.735	4.735	1.30	30853	0.02	5	
Ti	47	2	He	4.576	4.576	3.08	957	0.48	5	
Cu	63	1	No Gas	4.876	4.876	3.12	46978	0.01	5	
Se	82	1	No Gas	4.462	4.462	12.85	709	0.63	5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	844628	2.77	851397	99.21	70	120	
Ge	72	2	He	702247	1.36	694065	101.18	70	120	
Ge	72	1	No Gas	2151989	2.67	2139408	100.59	70	120	

Sample Report

In	115	1	No Gas	2722736	1.36	2719437	100.12	70	120	
Bi	209	1	No Gas	2607641	1.38	2536806	102.79	70	120	

Sample Report

Sample Table

Sample Name	LLICCV2
Data File Name	164LCV2.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:08:41-06:00
Sample Type	LLCCV2
Dilution	1
Comment	
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	2.024	2.024	5.84	68606	0.00	2	
Be	9	1	No Gas	1.857	1.857	3.12	4838	0.04	2	
V	51	2	He	1.670	1.670	4.38	12383	0.01	2	
Cr	52	2	He	1.886	1.886	3.05	14244	0.01	2	
Fe	56	2	He	196.679	196.679	1.49	1061400	0.02	200	
Se	78	2	He	2.241	2.241	9.60	406	0.55	2	
As	75	2	He	1.822	1.822	2.86	1863	0.10	2	
Ca	44	2	He	194.053	194.053	5.61	8139	2.38	200	
Na	23	2	He	187.248	187.248	1.17	278385	0.07	200	
Mg	24	2	He	204.100	204.100	0.99	108127	0.19	200	
K	39	2	He	189.244	189.244	0.95	275057	0.07	200	
Mn	55	2	He	1.861	1.861	5.83	10214	0.02	2	
Co	59	2	He	1.889	1.889	1.63	14818	0.01	2	
Ni	60	2	He	1.914	1.914	4.86	3651	0.05	2	
Cu	63	2	He	1.937	1.937	2.80	10217	0.02	2	
Zn	66	2	He	2.010	2.010	2.17	2390	0.08	2	
Al	27	2	He	2.637	2.637	44.48	1834	0.14	2	NewName Main CR1 Failed
B	11	1	No Gas	12.460	12.460	1.38	30019	0.04	10	
Al	27	1	No Gas	2.136	2.136	1.05	50254	0.00	2	
Si	28	1	No Gas	12.060	12.060	12.76	306843	0.00	10	
Ag	107	1	No Gas	1.943	1.943	3.03	26193	0.01	2	
Cd	111	1	No Gas	1.942	1.942	4.86	5425	0.04	2	
Sr	88	1	No Gas	1.916	1.916	1.11	52962	0.00	2	
Mo	95	1	No Gas	1.937	1.937	3.17	10107	0.02	2	
Sn	118	1	No Gas	1.953	1.953	3.95	18193	0.01	2	
Sb	121	1	No Gas	1.966	1.966	4.75	23408	0.01	2	
Ba	137	1	No Gas	1.977	1.977	2.58	9087	0.02	2	
Tl	205	1	No Gas	1.918	1.918	2.64	50194	0.00	2	
Tl	203	1	No Gas	1.903	1.903	1.83	20624	0.01	2	
Pb	208	1	No Gas	1.933	1.933	2.03	69747	0.00	2	
U	238	1	No Gas	1.827	1.827	1.39	67486	0.00	2	
Ca	43	2	He	182.935	182.935	3.73	437	41.89	200	
Sb	121	2	He	1.903	1.903	1.39	12530	0.02	2	
Ti	47	2	He	2.167	2.167	26.00	460	0.47	200	
Cu	63	1	No Gas	1.923	1.923	4.23	19624	0.01	2	
Se	82	1	No Gas	1.572	1.572	46.66	215	0.73	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	816496	1.17	851397	95.90	70	120	
Ge	72	2	He	702300	0.17	694065	101.19	70	120	
Ge	72	1	No Gas	2113538	0.19	2139408	98.79	70	120	
In	115	1	No Gas	2695718	1.44	2719437	99.13	70	120	
Bi	209	1	No Gas	2548095	0.52	2536806	100.45	70	120	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICCB
Data File Name	165_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T20:10:39-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	0.107	107.5	50532	1.2	0.5	
Be	9	1	No Gas	0.011	48.4	40	33.1	0.5	
V	51	2	He	-0.254	-11.4	2903	5.2	2.5	
Cr	52	2	He	0.054	65.0	4154	5.2	2.5	
Fe	56	2	He	0.673	21.2	17198	4.4	100	
Se	78	2	He	0.296	62.1	222	8.0	1	
As	75	2	He	-0.072	-22.5	261	5.8	2.5	
Ca	44	2	He	5.773	65.6	780	19.0	100	
Na	23	2	He	-16.340	-7.0	100510	1.2	100	
Mg	24	2	He	0.342	57.4	630	16.5	100	
K	39	2	He	-8.084	-23.4	123921	1.5	100	
Mn	55	2	He	-0.018	-9.0	1707	0.9	2.5	
Co	59	2	He	0.007	61.6	90	38.5	2.5	
Ni	60	2	He	0.119	30.0	313	21.3	2.5	
Cu	63	2	He	0.001	2037.6	1000	7.2	1	
Zn	66	2	He	0.000	-127878.1	270	32.9	2.5	
Al	27	2	He	2.196	5.1	1683	1.9	5	
B	11	1	No Gas	2.637	1.0	14933	1.6	0.5	ICB Main CR1 Failed
Al	27	1	No Gas	1.969	0.3	49070	0.7	5	
Si	28	1	No Gas	1.351	123.9	252026	3.1	10	
Ag	107	1	No Gas	0.004	137.1	213	33.3	2.5	
Cd	111	1	No Gas	-0.002	-173.3	7	173.2	1	
Sr	88	1	No Gas	0.040	25.5	2420	11.4	2.5	
Mo	95	1	No Gas	0.008	34.3	93	16.4	2.5	
Sn	118	1	No Gas	0.059	11.3	1830	2.7	5	
Sb	121	1	No Gas	0.033	12.4	820	6.5	2.5	
Ba	137	1	No Gas	0.035	67.1	377	29.1	2.5	
Tl	205	1	No Gas	0.012	2.4	410	2.4	1	
Tl	203	1	No Gas	0.016	23.0	220	18.2	1	
Pb	208	1	No Gas	0.020	19.1	1367	9.4	2.5	
U	238	1	No Gas	0.005	25.4	240	22.0	2.5	
Ca	43	2	He	16.118	83.1	60	50.0	100	
Sb	121	2	He	0.028	10.3	400	4.3	2.5	
Ti	47	2	He	0.015	183.1	17	34.6	2.5	
Se	82	1	No Gas	-0.636	-68.3	-155	-46.6	1	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	832914	1.67	851397	97.83	70	120	
Ge	72	2	He	703267	0.50	694065	101.33	70	120	
Ge	72	1	No Gas	2139297	0.57	2139408	99.99	70	120	
In	115	1	No Gas	2706418	1.67	2719437	99.52	70	120	
Bi	209	1	No Gas	2527899	0.78	2536806	99.65	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	201_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:21:16-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	100.346	1.318	1037588	0.99	100	100.3	90	110	
Be	9	1	No Gas	98.829	1.285	254712	0.37	100	98.8	90	110	
V	51	2	He	99.066	0.221	487838	0.21	100	99.1	90	110	
Cr	52	2	He	99.076	0.287	544789	0.44	100	99.1	90	110	
Fe	56	2	He	10015.831	1.403	52880604	1.54	10000	100.2	90	110	
Se	78	2	He	99.309	0.905	9517	0.95	100	99.3	90	110	
As	75	2	He	100.043	0.884	84181	1.08	100	100.0	90	110	
Ca	44	2	He	9928.839	1.270	385079	1.37	10000	99.3	90	110	
Na	23	2	He	9929.683	1.747	8715766	1.91	10000	99.3	90	110	
Mg	24	2	He	10144.391	0.325	5302919	0.53	10000	101.4	90	110	
K	39	2	He	9852.083	1.352	7613461	1.53	10000	98.5	90	110	
Mn	55	2	He	100.890	0.840	454386	0.87	100	100.9	90	110	
Co	59	2	He	97.140	1.468	753140	1.60	100	97.1	90	110	
Ni	60	2	He	101.370	0.630	186867	0.83	100	101.4	90	110	
Cu	63	2	He	100.733	0.203	476203	0.30	100	100.7	90	110	
Zn	66	2	He	100.732	1.172	105575	1.25	100	100.7	90	110	
Al	27	2	He	103.266	2.259	36344	2.29	100	103.3	90	110	
B	11	1	No Gas	475.515	1.682	748654	0.96	500	95.1	90	110	
Al	27	1	No Gas	102.680	2.486	1112980	1.87	100	102.7	90	110	
Si	28	1	No Gas	508.763	0.098	2962910	0.51	5000	10.2	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	99.226	1.978	1309174	1.26	100	99.2	90	110	
Cd	111	1	No Gas	100.668	1.731	276137	1.07	100	100.7	90	110	
Sr	88	1	No Gas	98.633	3.115	2617745	2.42	100	98.6	90	110	
Mo	95	1	No Gas	98.439	2.129	503048	1.62	100	98.4	90	110	
Sn	118	1	No Gas	99.252	1.819	845372	1.21	100	99.3	90	110	
Sb	121	1	No Gas	99.802	0.465	1157570	1.06	100	99.8	90	110	
Ba	137	1	No Gas	99.035	1.088	437501	0.53	100	99.0	90	110	
Tl	205	1	No Gas	104.796	2.359	2683340	1.18	100	104.8	90	110	
Tl	203	1	No Gas	100.009	1.819	1059434	0.63	100	100.0	90	110	
Pb	208	1	No Gas	99.308	1.702	3480184	0.91	100	99.3	90	110	
U	238	1	No Gas	101.721	1.264	3680895	1.45	100	101.7	90	110	
Ca	43	2	He	10185.058	3.811	22809	3.94	10000	101.9	90	110	
Sb	121	2	He	97.071	0.703	622623	0.71	100	97.1	90	110	
Ti	47	2	He	98.757	0.608	20182	0.66	100	98.8	90	110	
Cu	63	1	No Gas	99.285	0.789	886912	0.80	100	99.3	90	110	
Se	82	1	No Gas	100.009	1.433	16500	1.85	100	100.0	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	809585	1.18	851397	95.09	70	120	
Ge	72	2	He	695807	0.20	694065	100.25	70	120	
Ge	72	1	No Gas	2095745	0.60	2139408	97.96	70	120	
In	115	1	No Gas	2653269	0.73	2719437	97.57	70	120	
Bi	209	1	No Gas	2497555	1.20	2536806	98.45	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	202_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:23:10-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	0.149	28.9	50611	0.4	0.5	
Be	9	1	No Gas	0.065	31.3	182	29.4	0.5	
V	51	2	He	-0.074	-27.8	3782	2.7	2.5	
Cr	52	2	He	0.025	351.3	3981	11.8	2.5	
Fe	56	2	He	2.489	12.7	26820	6.5	100	
Se	78	2	He	0.309	47.1	223	5.8	2	
As	75	2	He	-0.045	-108.2	283	14.7	2.5	
Ca	44	2	He	-1.270	-151.0	503	15.4	100	
Na	23	2	He	-18.376	-15.1	98475	2.1	100	
Mg	24	2	He	2.621	23.7	1830	18.4	100	
K	39	2	He	-5.302	-28.3	125738	0.4	100	
Mn	55	2	He	-0.026	-116.4	1667	8.2	2.5	
Co	59	2	He	0.030	12.4	270	11.1	2.5	
Ni	60	2	He	0.043	91.6	170	42.4	2.5	
Cu	63	2	He	0.005	405.0	1017	9.3	2	
Zn	66	2	He	0.114	54.0	390	16.8	2.5	
Al	27	2	He	-0.915	-7.4	603	3.8	5	
B	11	1	No Gas	4.741	10.2	18165	4.0	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	-0.775	-8.5	19527	1.3	5	
Si	28	1	No Gas	2.647	66.4	260236	0.6	10	
Ag	107	1	No Gas	0.063	22.4	1000	16.7	2.5	
Cd	111	1	No Gas	0.046	43.6	140	37.8	1	
Sr	88	1	No Gas	0.046	35.5	2570	15.2	2.5	
Mo	95	1	No Gas	0.087	42.8	497	36.7	2.5	
Sn	118	1	No Gas	0.112	12.1	2274	3.3	5	
Sb	121	1	No Gas	0.111	13.5	1753	9.1	2.5	
Ba	137	1	No Gas	0.073	51.0	540	28.5	2.5	
Tl	205	1	No Gas	0.117	27.6	3164	26.8	1	
Tl	203	1	No Gas	0.119	22.6	1340	21.0	1	
Pb	208	1	No Gas	0.088	23.3	3810	17.5	2.5	
U	238	1	No Gas	0.064	24.5	2417	23.5	2.5	
Ca	43	2	He	8.750	58.5	43	26.6	100	
Sb	121	2	He	0.062	2.2	613	1.9	2.5	
Ti	47	2	He	-0.017	-285.5	10	100.0	2.5	
Cu	63	1	No Gas	0.019	90.3	2564	3.2	2.5	
Se	82	1	No Gas	-0.603	-88.2	-149	-58.4	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	827142	0.80	851397	97.15	70	120	
Ge	72	2	He	701525	0.54	694065	101.07	70	120	
Ge	72	1	No Gas	2149992	3.21	2139408	100.49	70	120	
In	115	1	No Gas	2690073	2.37	2719437	98.92	70	120	
Bi	209	1	No Gas	2560364	3.17	2536806	100.93	70	120	

Sample Report

Sample Table

Sample Name	MBLK-173565
Data File Name	203SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:25:13-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.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
Li	7	1	No Gas	-0.058	-0.058	-180.83	51194	0.00	2000	
Be	9	1	No Gas	0.010	0.010	82.23	40	0.03	2000	
V	51	2	He	-0.052	-0.052	-43.49	3928	0.00	2000	
Cr	52	2	He	0.011	0.011	482.44	3941	0.00	2000	
Fe	56	2	He	2.320	2.320	4.60	26169	0.01	200000	
Se	78	2	He	-0.035	-0.035	-1151.08	192	-0.02	2000	
As	75	2	He	-0.041	-0.041	-167.43	289	-0.01	2000	
Ca	44	2	He	2.507	2.507	74.85	657	0.38	200000	
Na	23	2	He	-20.661	-20.661	-5.27	97408	-0.02	200000	
Mg	24	2	He	7.891	7.891	1.86	4651	0.17	200000	
K	39	2	He	-7.527	-7.527	-14.73	125223	-0.01	200000	
Mn	55	2	He	-0.018	-0.018	-124.62	1720	0.00	2000	
Co	59	2	He	0.036	0.036	10.26	320	0.01	2000	
Ni	60	2	He	0.038	0.038	45.17	163	0.02	2000	
Cu	63	2	He	0.053	0.053	25.08	1257	0.00	2000	
Zn	66	2	He	0.277	0.277	46.54	567	0.05	2000	
Al	27	2	He	3.659	3.659	11.06	2207	0.17	2000	
B	11	1	No Gas	2.585	2.585	8.88	15557	0.02	2000	
Al	27	1	No Gas	3.534	3.534	0.34	66747	0.01	2000	
Si	28	1	No Gas	29.518	29.518	0.71	410815	0.01	2000	
Ag	107	1	No Gas	0.017	0.017	2.62	387	0.00	2000	
Cd	111	1	No Gas	0.009	0.009	63.50	40	0.02	2000	
Sr	88	1	No Gas	0.017	0.017	15.48	1817	0.00	2000	
Mo	95	1	No Gas	0.016	0.016	49.04	133	0.01	2000	
Sn	118	1	No Gas	0.038	0.038	18.93	1660	0.00	2000	
Sb	121	1	No Gas	0.027	0.027	23.84	760	0.00	2000	
Ba	137	1	No Gas	0.051	0.051	14.88	450	0.01	2000	
Tl	205	1	No Gas	0.020	0.020	28.03	617	0.00	2000	
Tl	203	1	No Gas	0.022	0.022	10.26	303	0.01	2000	
Pb	208	1	No Gas	0.019	0.019	8.64	1380	0.00	2000	
U	238	1	No Gas	0.009	0.009	30.15	377	0.00	2000	
Ca	43	2	He	8.551	8.551	106.36	43	19.73	200000	
Sb	121	2	He	0.021	0.021	28.50	357	0.01	2000	
Ti	47	2	He	-0.001	-0.001	-6256.31	13	-0.01	2000	
Cu	63	1	No Gas	0.032	0.032	15.65	2697	0.00	2000	
Zn	66	1	No Gas	0.280	0.280	31.04	1353	0.02	2000	
Se	82	1	No Gas	-0.466	-0.466	-80.72	-129	0.36	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	872724	1.28	851397	102.51	70	120	
Ge	72	2	He	708232	0.32	694065	102.04	70	120	
Ge	72	1	No Gas	2164901	0.96	2139408	101.19	70	120	
In	115	1	No Gas	2725929	0.88	2719437	100.24	70	120	

Sample Report

Bi	209	1	No Gas	2611568	0.43	2536806	102.95	70	120	

Sample Report

Sample Table

Sample Name	LCS-173565
Data File Name	204SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:27:17-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.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
Li	7	1	No Gas	0.104	0.104	63.77	52767	0.00	2000	
Be	9	1	No Gas	51.933	51.933	2.31	143856	0.04	2000	
V	51	2	He	52.254	52.254	0.75	270782	0.02	2000	
Cr	52	2	He	52.093	52.093	0.28	301077	0.02	2000	
Fe	56	2	He	5194.185	5194.185	0.51	28650546	0.02	200000	
Se	78	2	He	55.627	55.627	1.15	5657	0.98	2000	
As	75	2	He	53.066	53.066	0.70	46792	0.11	2000	
Ca	44	2	He	5163.830	5163.830	0.95	209442	2.47	200000	
Na	23	2	He	5277.601	5277.601	1.84	4893358	0.11	200000	
Mg	24	2	He	5391.664	5391.664	1.75	2943728	0.18	200000	
K	39	2	He	5230.840	5230.840	2.50	4284537	0.12	200000	
Mn	55	2	He	53.395	53.395	0.65	252041	0.02	2000	
Co	59	2	He	52.336	52.336	0.83	423846	0.01	2000	
Ni	60	2	He	53.957	53.957	1.48	103937	0.05	2000	
Cu	63	2	He	55.036	55.036	1.20	272199	0.02	2000	
Zn	66	2	He	56.851	56.851	1.20	62353	0.09	2000	
Al	27	2	He	121.281	121.281	3.14	44408	0.27	2000	
B	11	1	No Gas	1.673	1.673	20.81	13987	0.01	2000	
Al	27	1	No Gas	121.308	121.308	1.69	1399456	0.01	2000	
Si	28	1	No Gas	89.226	89.226	0.57	766232	0.01	2000	
Ag	107	1	No Gas	53.631	53.631	0.37	730610	0.01	2000	
Cd	111	1	No Gas	54.677	54.677	1.33	154841	0.04	2000	
Sr	88	1	No Gas	0.059	0.059	9.27	2977	0.00	2000	
Mo	95	1	No Gas	53.194	53.194	0.55	280671	0.02	2000	
Sn	118	1	No Gas	0.201	0.201	14.32	3097	0.01	2000	
Sb	121	1	No Gas	51.463	51.463	0.85	637826	0.01	2000	
Ba	137	1	No Gas	53.442	53.442	0.21	243834	0.02	2000	
Tl	205	1	No Gas	53.194	53.194	2.46	1430261	0.00	2000	
Tl	203	1	No Gas	52.115	52.115	2.60	579551	0.01	2000	
Pb	208	1	No Gas	52.255	52.255	2.36	1922666	0.00	2000	
U	238	1	No Gas	0.004	0.004	6.63	180	0.00	2000	
Ca	43	2	He	5325.785	5325.785	4.86	12466	42.72	200000	
Sb	121	2	He	51.291	51.291	0.48	343719	0.01	2000	
Ti	47	2	He	51.204	51.204	2.96	10935	0.47	2000	
Cu	63	1	No Gas	53.020	53.020	0.80	507105	0.01	2000	
Zn	66	1	No Gas	55.492	55.492	1.76	148059	0.04	2000	
Se	82	1	No Gas	55.409	55.409	2.02	9743	0.57	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	870213	1.53	851397	102.21	70	120	
Ge	72	2	He	726757	1.01	694065	104.71	70	120	
Ge	72	1	No Gas	2238743	0.29	2139408	104.64	70	120	
In	115	1	No Gas	2739026	0.52	2719437	100.72	70	120	

Sample Report

Bi	209	1	No Gas	2622269	2.09	2536806	103.37	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05SD
Data File Name	206SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:31:24-06:00
Sample Type	Sample
Dilution	5
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	66.526	332.632	2.28	668607	0.01	2000	
Be	9	1	No Gas	1.465	7.326	6.49	3595	0.04	2000	
V	51	2	He	0.884	4.421	1.59	8257	0.01	2000	
Cr	52	2	He	0.150	0.748	78.98	4538	0.00	2000	
Fe	56	2	He	43.104	215.521	4.69	236030	0.02	200000	
Se	78	2	He	6.612	33.062	4.09	796	0.83	2000	
As	75	2	He	0.325	1.626	4.66	579	0.06	2000	
Ca	44	2	He	79885.975	399429.874	2.49	3030444	2.64	200000	
Na	23	2	He	27414.060	137070.300	0.92	23370837	0.12	200000	
Mg	24	2	He	34520.054	172600.269	1.18	17672256	0.20	200000	
K	39	2	He	1489.946	7449.730	0.80	1234698	0.12	200000	
Mn	55	2	He	530.432	2652.162	1.06	2332360	0.02	2000	
Co	59	2	He	27.574	137.871	0.54	209413	0.01	2000	
Ni	60	2	He	135.103	675.513	0.80	243894	0.06	2000	
Cu	63	2	He	0.987	4.936	3.53	5528	0.02	2000	
Zn	66	2	He	87.840	439.198	0.41	90205	0.10	2000	
Al	27	2	He	3624.977	18124.883	1.16	1219068	0.30	2000	>LDR
B	11	1	No Gas	230.158	1150.790	2.73	349197	0.07	2000	
Al	27	1	No Gas	3463.424	17317.121	1.46	35531778	0.01	2000	>LDR
Si	28	1	No Gas	2332.020	11660.101	0.59	12333617	0.02	2000	>LDR
Ag	107	1	No Gas	0.019	0.093	27.15	387	0.00	2000	
Cd	111	1	No Gas	1.461	7.303	5.00	3864	0.04	2000	
Sr	88	1	No Gas	339.696	1698.478	1.70	8667500	0.00	2000	
Mo	95	1	No Gas	0.075	0.373	8.71	413	0.02	2000	
Sn	118	1	No Gas	0.010	0.052	205.99	1327	0.00	2000	
Sb	121	1	No Gas	0.040	0.202	17.68	863	0.00	2000	
Ba	137	1	No Gas	2.121	10.604	1.69	9210	0.02	2000	
Tl	205	1	No Gas	0.059	0.295	7.85	1613	0.00	2000	
Tl	203	1	No Gas	0.055	0.274	3.50	640	0.01	2000	
Pb	208	1	No Gas	0.144	0.719	7.07	5754	0.00	2000	
U	238	1	No Gas	0.441	2.203	1.50	16154	0.00	2000	
Ca	43	2	He	79296.835	396484.174	1.52	173769	45.63	200000	
Sb	121	2	He	0.048	0.242	30.69	513	0.01	2000	
Ti	47	2	He	0.134	0.672	133.44	40	0.34	2000	
Cu	63	1	No Gas	1.148	5.739	5.61	12169	0.01	2000	
Zn	66	1	No Gas	87.295	436.474	1.92	211031	0.04	2000	
Se	82	1	No Gas	5.949	29.743	2.87	909	0.65	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	768930	1.90	851397	90.31	70	120	
Ge	72	2	He	681506	0.72	694065	98.19	70	120	
Ge	72	1	No Gas	2031805	0.82	2139408	94.97	70	120	
In	115	1	No Gas	2551278	1.00	2719437	93.82	70	120	

Sample Report

Bi	209	1	No Gas	2524832	3.19	2536806	99.53	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05MS
Data File Name	207SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:33:25-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	442.441	442.441	1.35	3865355	0.01	2000	
Be	9	1	No Gas	61.723	61.723	1.36	139406	0.04	2000	
V	51	2	He	53.167	53.167	0.52	247236	0.02	2000	
Cr	52	2	He	51.538	51.538	0.74	267408	0.02	2000	
Fe	56	2	He	5279.534	5279.534	0.71	26138648	0.02	200000	
Se	78	2	He	99.315	99.315	1.78	8922	1.11	2000	
As	75	2	He	56.419	56.419	1.27	44639	0.13	2000	
Ca	44	2	He	517807.964	517807.964	0.73	18800895	2.75	200000	>LDR
Na	23	2	He	180405.827	180405.827	0.66	146623301	0.12	200000	>LDR
Mg	24	2	He	225650.105	225650.105	0.88	110573368	0.20	200000	>LDR
K	39	2	He	14327.794	14327.794	0.77	10325585	0.14	200000	
Mn	55	2	He	3341.968	3341.968	0.93	14056921	0.02	2000	>LDR
Co	59	2	He	233.425	233.425	0.27	1696646	0.01	2000	
Ni	60	2	He	931.347	931.347	0.98	1608861	0.06	2000	
Cu	63	2	He	56.546	56.546	0.70	251008	0.02	2000	
Zn	66	2	He	582.778	582.778	0.90	571416	0.10	2000	
Al	27	2	He	23069.406	23069.406	0.56	7421730	0.31	2000	>LDR
B	11	1	No Gas	1439.408	1439.408	2.46	1967325	0.07	2000	
Al	27	1	No Gas	21615.314	21615.314	2.03	217161223	0.01	2000	>LDR
Si	28	1	No Gas	14884.683	14884.683	1.76	75917391	0.02	2000	>LDR
Ag	107	1	No Gas	47.438	47.438	1.87	595322	0.01	2000	
Cd	111	1	No Gas	60.485	60.485	2.97	157754	0.04	2000	
Sr	88	1	No Gas	2096.675	2096.675	1.31	52913039	0.00	2000	>LDR
Mo	95	1	No Gas	52.030	52.030	2.40	252880	0.02	2000	
Sn	118	1	No Gas	0.032	0.032	22.55	1487	0.00	2000	
Sb	121	1	No Gas	52.555	52.555	1.02	579332	0.01	2000	
Ba	137	1	No Gas	64.194	64.194	2.48	269740	0.02	2000	
Tl	205	1	No Gas	54.138	54.138	2.81	1282581	0.00	2000	
Tl	203	1	No Gas	53.080	53.080	1.25	520256	0.01	2000	
Pb	208	1	No Gas	52.743	52.743	2.51	1710304	0.00	2000	
U	238	1	No Gas	2.973	2.973	2.55	99556	0.00	2000	
Ca	43	2	He	549699.901	549699.901	1.15	1152906	47.68	200000	>LDR
Sb	121	2	He	51.300	51.300	0.63	308580	0.02	2000	
Ti	47	2	He	51.925	51.925	0.67	9954	0.52	2000	
Cu	63	1	No Gas	55.113	55.113	2.62	468653	0.01	2000	
Zn	66	1	No Gas	585.670	585.670	1.47	1384608	0.04	2000	
Se	82	1	No Gas	98.594	98.594	2.43	15451	0.64	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	709418	0.68	851397	83.32	70	120	
Ge	72	2	He	652324	0.77	694065	93.99	70	120	
Ge	72	1	No Gas	1991373	2.21	2139408	93.08	70	120	
In	115	1	No Gas	2524257	3.61	2719437	92.82	70	120	
Bi	209	1	No Gas	2310532	0.69	2536806	91.08	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05MSD
Data File Name	208SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:35:29-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	452.893	452.893	1.26	3867188	0.01	2000	
Be	9	1	No Gas	63.326	63.326	1.03	139806	0.05	2000	
V	51	2	He	53.463	53.463	0.93	249276	0.02	2000	
Cr	52	2	He	51.312	51.312	0.50	266975	0.02	2000	
Fe	56	2	He	5342.566	5342.566	0.49	26525573	0.02	200000	
Se	78	2	He	100.804	100.804	1.56	9079	1.11	2000	
As	75	2	He	56.877	56.877	0.16	45122	0.13	2000	
Ca	44	2	He	529430.397	529430.397	1.19	19277159	2.75	200000	>LDR
Na	23	2	He	183887.344	183887.344	0.48	149865424	0.12	200000	>LDR
Mg	24	2	He	228402.529	228402.529	1.10	112228255	0.20	200000	>LDR
K	39	2	He	14577.461	14577.461	1.71	10530993	0.14	200000	
Mn	55	2	He	3392.986	3392.986	0.96	14311266	0.02	2000	>LDR
Co	59	2	He	237.049	237.049	0.67	1727737	0.01	2000	
Ni	60	2	He	941.102	941.102	1.70	1630169	0.06	2000	
Cu	63	2	He	56.906	56.906	1.25	253287	0.02	2000	
Zn	66	2	He	590.633	590.633	1.73	580660	0.10	2000	
Al	27	2	He	23364.537	23364.537	2.41	7535872	0.31	2000	>LDR
B	11	1	No Gas	1508.017	1508.017	1.69	2014419	0.07	2000	
Al	27	1	No Gas	22590.475	22590.475	2.10	223622017	0.01	2000	>LDR
Si	28	1	No Gas	15343.040	15343.040	2.05	77090659	0.02	2000	>LDR
Ag	107	1	No Gas	48.767	48.767	1.56	601313	0.01	2000	
Cd	111	1	No Gas	62.770	62.770	0.93	160912	0.04	2000	
Sr	88	1	No Gas	2195.744	2195.744	1.98	54429829	0.00	2000	>LDR
Mo	95	1	No Gas	54.169	54.169	2.86	258639	0.02	2000	
Sn	118	1	No Gas	0.029	0.029	45.95	1433	0.00	2000	
Sb	121	1	No Gas	54.481	54.481	1.51	591602	0.01	2000	
Ba	137	1	No Gas	66.765	66.765	1.12	275678	0.02	2000	
Tl	205	1	No Gas	54.890	54.890	2.84	1307992	0.00	2000	
Tl	203	1	No Gas	54.320	54.320	1.85	535531	0.01	2000	
Pb	208	1	No Gas	53.657	53.657	1.24	1750169	0.00	2000	
U	238	1	No Gas	3.012	3.012	1.76	101472	0.00	2000	
Ca	43	2	He	565781.837	565781.837	1.61	1190152	47.54	200000	>LDR
Sb	121	2	He	52.020	52.020	1.57	313737	0.02	2000	
Ti	47	2	He	52.370	52.370	4.21	10064	0.52	2000	
Cu	63	1	No Gas	57.007	57.007	1.68	477564	0.01	2000	
Zn	66	1	No Gas	614.073	614.073	1.47	1429796	0.04	2000	
Se	82	1	No Gas	98.378	98.378	2.79	15194	0.65	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	693442	1.41	851397	81.45	70	120	
Ge	72	2	He	654157	1.47	694065	94.25	70	120	
Ge	72	1	No Gas	1961696	0.89	2139408	91.69	70	120	
In	115	1	No Gas	2479613	2.15	2719437	91.18	70	120	
Bi	209	1	No Gas	2324051	0.60	2536806	91.61	70	120	

Sample Report

Sample Table

Sample Name	HS21120092-05PDS
Data File Name	209SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:37:33-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	451.352	451.352	1.83	3725317	0.01	2000	
Be	9	1	No Gas	131.074	131.074	0.96	279728	0.05	2000	
V	51	2	He	122.456	122.456	0.98	547689	0.02	2000	
Cr	52	2	He	117.537	117.537	0.96	587304	0.02	2000	
Fe	56	2	He	11892.679	11892.679	0.28	57121587	0.02	200000	
Se	78	2	He	176.520	176.520	0.58	15254	1.16	2000	
As	75	2	He	129.312	129.312	0.53	98901	0.13	2000	
Ca	44	2	He	533826.276	533826.276	0.81	18808046	2.84	200000	>LDR
Na	23	2	He	191777.635	191777.635	1.93	151248098	0.13	200000	>LDR
Mg	24	2	He	235524.249	235524.249	1.20	111989212	0.21	200000	>LDR
K	39	2	He	21144.309	21144.309	2.36	14728095	0.14	200000	
Mn	55	2	He	3489.487	3489.487	0.87	14243448	0.02	2000	>LDR
Co	59	2	He	305.181	305.181	1.05	2152688	0.01	2000	
Ni	60	2	He	1009.619	1009.619	1.15	1692506	0.06	2000	
Cu	63	2	He	121.732	121.732	0.92	523327	0.02	2000	
Zn	66	2	He	652.998	652.998	0.31	621285	0.11	2000	
Al	27	2	He	23261.201	23261.201	2.81	7260256	0.32	2000	>LDR
B	11	1	No Gas	1510.863	1510.863	2.67	1951265	0.08	2000	
Al	27	1	No Gas	22136.400	22136.400	1.64	216239243	0.01	2000	>LDR
Si	28	1	No Gas	15001.901	15001.901	0.70	74392132	0.02	2000	>LDR
Ag	107	1	No Gas	87.533	87.533	0.45	1068854	0.01	2000	
Cd	111	1	No Gas	127.193	127.193	0.93	322872	0.04	2000	
Sr	88	1	No Gas	2158.430	2158.430	1.22	52988851	0.00	2000	>LDR
Mo	95	1	No Gas	121.582	121.582	0.96	574965	0.02	2000	
Sn	118	1	No Gas	0.080	0.080	24.03	1820	0.00	2000	
Sb	121	1	No Gas	122.086	122.086	1.68	1307756	0.01	2000	
Ba	137	1	No Gas	133.999	133.999	1.80	547747	0.02	2000	
Tl	205	1	No Gas	124.559	124.559	3.74	2956022	0.00	2000	
Tl	203	1	No Gas	122.981	122.981	2.93	1207532	0.01	2000	
Pb	208	1	No Gas	121.278	121.278	2.97	3939155	0.00	2000	
U	238	1	No Gas	2.982	2.982	2.78	100057	0.00	2000	
Ca	43	2	He	572635.599	572635.599	2.40	1165253	49.14	200000	>LDR
Sb	121	2	He	118.816	118.816	1.72	693201	0.02	2000	
Ti	47	2	He	120.927	120.927	2.06	22482	0.54	2000	
Cu	63	1	No Gas	117.349	117.349	0.49	967808	0.01	2000	
Zn	66	1	No Gas	666.651	666.651	1.08	1531829	0.04	2000	
Se	82	1	No Gas	171.000	171.000	1.39	26085	0.66	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	670369	1.61	851397	78.74	70	120	
Ge	72	2	He	633021	1.22	694065	91.20	70	120	
Ge	72	1	No Gas	1935680	1.28	2139408	90.48	70	120	
In	115	1	No Gas	2455361	1.75	2719437	90.29	70	120	
Bi	209	1	No Gas	2315415	1.73	2536806	91.27	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	210_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:39:32-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	98.441	3.161	901616	1.43	100	98.4	90	110	
Be	9	1	No Gas	98.115	1.568	223827	0.50	100	98.1	90	110	
V	51	2	He	97.700	0.476	448880	0.68	100	97.7	90	110	
Cr	52	2	He	97.358	0.945	499482	1.09	100	97.4	90	110	
Fe	56	2	He	9910.602	0.748	48812449	0.46	10000	99.1	90	110	
Se	78	2	He	100.647	0.784	8996	0.33	100	100.6	90	110	
As	75	2	He	99.361	0.243	77999	0.92	100	99.4	90	110	
Ca	44	2	He	9840.710	1.246	356034	0.45	10000	98.4	90	110	
Na	23	2	He	9851.863	1.738	8067258	0.99	10000	98.5	90	110	
Mg	24	2	He	9882.625	1.725	4819278	1.54	10000	98.8	90	110	
K	39	2	He	9613.318	2.198	6932656	1.54	10000	96.1	90	110	
Mn	55	2	He	100.705	0.884	423147	1.69	100	100.7	90	110	
Co	59	2	He	96.675	0.734	699218	0.12	100	96.7	90	110	
Ni	60	2	He	100.660	0.820	173103	0.69	100	100.7	90	110	
Cu	63	2	He	100.111	0.419	441509	0.57	100	100.1	90	110	
Zn	66	2	He	101.452	1.216	99188	0.51	100	101.5	90	110	
Al	27	2	He	105.005	2.345	34467	3.12	100	105.0	90	110	
B	11	1	No Gas	498.177	2.194	693762	0.59	500	99.6	90	110	
Al	27	1	No Gas	115.362	8.482	1178614	6.22	100	115.4	90	110	CCV Main CR1-2 Failed
Si	28	1	No Gas	490.524	3.091	2709720	0.82	5000	9.8	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	101.797	1.485	1294458	1.26	100	101.8	90	110	
Cd	111	1	No Gas	100.993	0.542	266996	0.25	100	101.0	90	110	
Sr	88	1	No Gas	99.128	1.359	2535925	1.76	100	99.1	90	110	
Mo	95	1	No Gas	97.360	1.283	479512	1.07	100	97.4	90	110	
Sn	118	1	No Gas	98.664	0.220	809959	0.76	100	98.7	90	110	
Sb	121	1	No Gas	103.373	2.951	1133881	1.42	100	103.4	90	110	
Ba	137	1	No Gas	101.169	0.268	430730	0.31	100	101.2	90	110	
Tl	205	1	No Gas	102.908	2.680	2641125	1.50	100	102.9	90	110	
Tl	203	1	No Gas	100.524	1.662	1067427	0.84	100	100.5	90	110	
Pb	208	1	No Gas	99.968	0.380	3512027	1.34	100	100.0	90	110	
U	238	1	No Gas	101.813	1.115	3692688	0.27	100	101.8	90	110	
Ca	43	2	He	9980.839	1.525	20853	2.01	10000	99.8	90	110	
Sb	121	2	He	99.344	1.561	594397	0.72	100	99.3	90	110	
Ti	47	2	He	95.560	0.180	18219	1.02	100	95.6	90	110	
Cu	63	1	No Gas	97.313	2.127	822237	0.63	100	97.3	90	110	
Se	82	1	No Gas	98.942	3.219	15438	2.46	100	98.9	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	716641	1.61	851397	84.17	70	120	
Ge	72	2	He	649127	0.85	694065	93.53	70	120	
Ge	72	1	No Gas	1982705	2.01	2139408	92.68	70	120	
In	115	1	No Gas	2557039	0.57	2719437	94.03	70	120	
Bi	209	1	No Gas	2503461	1.30	2536806	98.69	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	211_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:41:26-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	0.555	18.8	48396	0.9	0.5	CCB Main CR1 Failed
Be	9	1	No Gas	0.087	26.8	213	25.9	0.5	
V	51	2	He	0.110	11.2	4365	1.3	2.5	
Cr	52	2	He	-0.060	-142.7	3270	13.4	2.5	
Fe	56	2	He	2.891	12.4	26954	6.5	100	
Se	78	2	He	0.583	59.6	231	12.9	2	
As	75	2	He	-0.058	-49.7	253	8.6	2.5	
Ca	44	2	He	36.880	39.0	1854	27.8	100	
Na	23	2	He	35.981	9.1	135859	1.9	100	
Mg	24	2	He	18.367	5.0	9427	4.8	100	
K	39	2	He	-6.863	-14.5	115930	0.7	100	
Mn	55	2	He	0.164	41.3	2354	12.1	2.5	
Co	59	2	He	0.044	17.3	353	15.6	2.5	
Ni	60	2	He	0.101	31.4	260	21.4	2.5	
Cu	63	2	He	0.014	239.7	987	15.0	2	
Zn	66	2	He	0.166	32.4	413	12.4	2.5	
Al	27	2	He	0.695	36.5	1080	7.6	5	
B	11	1	No Gas	10.284	5.3	23855	3.3	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	1.238	31.3	38096	8.9	5	
Si	28	1	No Gas	2.178	61.4	237556	2.2	10	
Ag	107	1	No Gas	0.080	12.5	1180	12.0	2.5	
Cd	111	1	No Gas	0.066	27.7	190	27.4	1	
Sr	88	1	No Gas	0.263	22.8	8103	20.1	2.5	
Mo	95	1	No Gas	0.136	14.5	727	14.8	2.5	
Sn	118	1	No Gas	0.085	19.4	1964	7.2	5	
Sb	121	1	No Gas	0.226	14.7	2870	11.6	2.5	
Ba	137	1	No Gas	0.056	45.1	450	25.6	2.5	
Tl	205	1	No Gas	0.143	30.0	3731	29.2	1	
Tl	203	1	No Gas	0.129	37.0	1410	35.4	1	
Pb	208	1	No Gas	0.104	21.0	4264	17.7	2.5	
U	238	1	No Gas	0.067	35.0	2457	34.5	2.5	
Ca	43	2	He	41.853	90.7	110	72.7	100	
Sb	121	2	He	0.157	10.6	1143	8.8	2.5	
Ti	47	2	He	0.091	206.7	30	120.2	2.5	
Cu	63	1	No Gas	0.038	44.7	2520	4.8	2.5	
Se	82	1	No Gas	1.715	18.6	224	22.6	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	732016	2.49	851397	85.98	70	120	
Ge	72	2	He	652992	0.34	694065	94.08	70	120	
Ge	72	1	No Gas	1980999	1.31	2139408	92.60	70	120	
In	115	1	No Gas	2589491	1.62	2719437	95.22	70	120	
Bi	209	1	No Gas	2488321	1.06	2536806	98.09	70	120	

Sample Report

Sample Table

Sample Name	HS21120103-05
Data File Name	214SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:47:41-06:00
Sample Type	Sample
Dilution	1
Comment	DOD TW 173565
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	147.117	147.117	2.16	1324535	0.01	2000	
Be	9	1	No Gas	0.228	0.228	12.10	528	0.04	2000	
V	51	2	He	1.916	1.916	2.83	12581	0.02	2000	
Cr	52	2	He	0.501	0.501	4.57	6118	0.01	2000	
Fe	56	2	He	2448.414	2448.414	1.81	12084871	0.02	200000	
Se	78	2	He	1.009	1.009	42.76	268	0.38	2000	
As	75	2	He	2.458	2.458	2.43	2222	0.11	2000	
Ca	44	2	He	262212.077	262212.077	2.23	9485871	2.76	200000	>LDR
Na	23	2	He	706579.627	706579.627	2.53	571815525	0.12	200000	>LDR
Mg	24	2	He	128906.450	128906.450	1.99	62938667	0.20	200000	
K	39	2	He	817.204	817.204	3.20	700106	0.12	200000	
Mn	55	2	He	2186.642	2186.642	1.80	9165718	0.02	2000	>LDR
Co	59	2	He	0.810	0.810	0.78	5898	0.01	2000	
Ni	60	2	He	2.850	2.850	3.85	4988	0.06	2000	
Cu	63	2	He	0.485	0.485	6.28	3060	0.02	2000	
Zn	66	2	He	3.023	3.023	6.37	3200	0.09	2000	
Al	27	2	He	32.295	32.295	11.96	11188	0.29	2000	
B	11	1	No Gas	45.259	45.259	1.62	71311	0.06	2000	
Al	27	1	No Gas	29.695	29.695	1.46	322427	0.01	2000	
Si	28	1	No Gas	17235.221	17235.221	1.40	87395485	0.02	2000	>LDR
Ag	107	1	No Gas	0.021	0.021	28.60	400	0.01	2000	
Cd	111	1	No Gas	0.057	0.057	32.60	157	0.04	2000	
Sr	88	1	No Gas	6096.185	6096.185	0.38	150372034	0.00	2000	>LDR
Mo	95	1	No Gas	0.484	0.484	2.98	2344	0.02	2000	
Sn	118	1	No Gas	0.015	0.015	80.26	1317	0.00	2000	
Sb	121	1	No Gas	0.254	0.254	3.53	3177	0.01	2000	
Ba	137	1	No Gas	38.867	38.867	0.33	159761	0.02	2000	
Tl	205	1	No Gas	0.013	0.013	12.92	367	0.00	2000	
Tl	203	1	No Gas	0.013	0.013	73.06	170	0.01	2000	
Pb	208	1	No Gas	0.183	0.183	2.14	6207	0.00	2000	
U	238	1	No Gas	23.446	23.446	2.50	743857	0.00	2000	
Ca	43	2	He	268368.662	268368.662	3.02	560735	47.86	200000	>LDR
Sb	121	2	He	0.238	0.238	4.21	1627	0.01	2000	
Ti	47	2	He	1.718	1.718	25.18	340	0.51	2000	
Cu	63	1	No Gas	4.066	4.066	0.96	36436	0.01	2000	
Zn	66	1	No Gas	4.107	4.107	2.04	10227	0.04	2000	
Se	82	1	No Gas	10.123	10.123	9.99	1539	0.66	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	715568	1.81	851397	84.05	70	120	
Ge	72	2	He	650144	2.33	694065	93.67	70	120	
Ge	72	1	No Gas	1980216	1.23	2139408	92.56	70	120	
In	115	1	No Gas	2466790	0.46	2719437	90.71	70	120	
Bi	209	1	No Gas	2190581	2.62	2536806	86.35	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	218_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:55:53-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	101.671	2.798	859425	1.16	100	101.7	90	110	
Be	9	1	No Gas	101.940	0.531	214963	1.04	100	101.9	90	110	
V	51	2	He	97.082	0.326	428722	0.21	100	97.1	90	110	
Cr	52	2	He	97.332	0.478	479930	0.41	100	97.3	90	110	
Fe	56	2	He	9933.126	0.524	47022534	0.74	10000	99.3	90	110	
Se	78	2	He	100.369	0.767	8623	0.84	100	100.4	90	110	
As	75	2	He	99.717	1.024	75232	0.81	100	99.7	90	110	
Ca	44	2	He	9688.393	0.427	336918	0.23	10000	96.9	90	110	
Na	23	2	He	9624.459	1.905	7577383	1.72	10000	96.2	90	110	
Mg	24	2	He	9722.379	0.750	4556973	0.92	10000	97.2	90	110	
K	39	2	He	9582.369	1.701	6642528	1.59	10000	95.8	90	110	
Mn	55	2	He	99.969	0.736	403709	0.73	100	100.0	90	110	
Co	59	2	He	95.566	0.600	664332	0.45	100	95.6	90	110	
Ni	60	2	He	99.568	0.807	164572	0.87	100	99.6	90	110	
Cu	63	2	He	98.522	1.656	417618	1.56	100	98.5	90	110	
Zn	66	2	He	99.771	0.675	93759	0.52	100	99.8	90	110	
Al	27	2	He	102.956	1.763	32492	1.70	100	103.0	90	110	
B	11	1	No Gas	504.493	1.771	649276	0.23	500	100.9	90	110	
Al	27	1	No Gas	101.384	1.878	989430	1.84	100	101.4	90	110	
Si	28	1	No Gas	490.196	2.434	2576935	1.53	5000	9.8	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	101.904	1.139	1221375	2.04	100	101.9	90	110	
Cd	111	1	No Gas	100.917	0.353	251456	1.28	100	100.9	90	110	
Sr	88	1	No Gas	99.047	1.246	2388120	2.02	100	99.0	90	110	
Mo	95	1	No Gas	97.507	0.663	452602	0.36	100	97.5	90	110	
Sn	118	1	No Gas	100.443	0.828	777055	0.34	100	100.4	90	110	
Sb	121	1	No Gas	103.316	1.164	1078478	1.40	100	103.3	90	110	
Ba	137	1	No Gas	101.566	0.675	407525	0.33	100	101.6	90	110	
Tl	205	1	No Gas	102.404	3.261	2507481	2.06	100	102.4	90	110	
Tl	203	1	No Gas	99.955	1.064	1012742	0.73	100	100.0	90	110	
Pb	208	1	No Gas	100.724	1.897	3375736	1.01	100	100.7	90	110	
U	238	1	No Gas	104.370	2.144	3611383	0.53	100	104.4	90	110	
Ca	43	2	He	9908.077	2.823	19895	2.70	10000	99.1	90	110	
Sb	121	2	He	99.089	0.321	569866	0.43	100	99.1	90	110	
Ti	47	2	He	97.843	2.361	17929	2.54	100	97.8	90	110	
Cu	63	1	No Gas	97.195	0.700	781451	0.30	100	97.2	90	110	
Se	82	1	No Gas	97.587	2.985	14488	2.73	100	97.6	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	662366	1.53	851397	77.80	70	120	
Ge	72	2	He	623879	0.22	694065	89.89	70	120	
Ge	72	1	No Gas	1886208	0.95	2139408	88.16	70	120	
In	115	1	No Gas	2409926	1.00	2719437	88.62	70	120	
Bi	209	1	No Gas	2388708	1.74	2536806	94.16	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	219_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T21:57:48-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	0.551	12.0	46180	1.2	0.5	CCB Main CR1 Failed
Be	9	1	No Gas	0.074	21.3	173	19.6	0.5	
V	51	2	He	0.339	11.5	5279	2.8	2.5	
Cr	52	2	He	-0.012	-631.3	3427	10.6	2.5	
Fe	56	2	He	2.285	9.5	23367	5.1	100	
Se	78	2	He	0.315	41.5	203	5.4	2	
As	75	2	He	0.007	1272.0	297	22.8	2.5	
Ca	44	2	He	26.097	12.6	1427	8.2	100	
Na	23	2	He	68.488	2.1	158266	0.6	100	
Mg	24	2	He	16.724	6.3	8409	6.6	100	
K	39	2	He	-5.544	-45.6	113971	1.2	100	
Mn	55	2	He	0.155	16.3	2257	5.3	2.5	
Co	59	2	He	0.036	19.4	283	16.7	2.5	
Ni	60	2	He	0.087	30.0	230	19.9	2.5	
Cu	63	2	He	0.026	48.3	1017	5.4	2	
Zn	66	2	He	0.086	42.9	327	10.8	2.5	
Al	27	2	He	0.206	112.9	900	8.8	5	
B	11	1	No Gas	14.015	3.0	27777	1.6	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	0.476	27.5	30080	2.8	5	
Si	28	1	No Gas	0.168	320.3	224272	1.2	10	
Ag	107	1	No Gas	0.061	26.7	903	20.7	2.5	
Cd	111	1	No Gas	0.061	72.1	170	66.8	1	
Sr	88	1	No Gas	0.209	9.6	6498	8.0	2.5	
Mo	95	1	No Gas	0.101	32.5	537	29.6	2.5	
Sn	118	1	No Gas	0.088	48.5	1924	17.0	5	
Sb	121	1	No Gas	0.117	18.6	1653	13.0	2.5	
Ba	137	1	No Gas	0.079	31.1	533	19.0	2.5	
Tl	205	1	No Gas	0.116	33.2	2994	32.4	1	
Tl	203	1	No Gas	0.104	33.6	1130	32.2	1	
Pb	208	1	No Gas	0.084	29.6	3510	24.4	2.5	
U	238	1	No Gas	0.067	38.2	2420	37.8	2.5	
Ca	43	2	He	15.574	35.7	53	21.7	100	
Sb	121	2	He	0.073	21.0	627	14.8	2.5	
Ti	47	2	He	-0.012	-438.5	10	100.0	2.5	
Cu	63	1	No Gas	0.011	207.7	2264	7.2	2.5	
Se	82	1	No Gas	-0.314	-237.1	-91	-124.5	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	698853	0.56	851397	82.08	70	120	
Ge	72	2	He	636823	0.69	694065	91.75	70	120	
Ge	72	1	No Gas	1953659	1.47	2139408	91.32	70	120	
In	115	1	No Gas	2510704	2.41	2719437	92.32	70	120	
Bi	209	1	No Gas	2449070	0.39	2536806	96.54	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	227_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T22:14:07-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	99.943	7.852	907961	4.34	100	99.9	90	110	
Be	9	1	No Gas	101.198	4.004	229291	0.67	100	101.2	90	110	
V	51	2	He	97.463	0.946	444304	0.14	100	97.5	90	110	
Cr	52	2	He	97.316	0.503	495395	0.97	100	97.3	90	110	
Fe	56	2	He	9839.132	1.905	48080839	1.17	10000	98.4	90	110	
Se	78	2	He	100.849	3.769	8943	3.47	100	100.8	90	110	
As	75	2	He	99.839	1.056	77759	0.43	100	99.8	90	110	
Ca	44	2	He	9635.350	0.918	345911	0.22	10000	96.4	90	110	
Na	23	2	He	9592.038	1.576	7796278	0.81	10000	95.9	90	110	
Mg	24	2	He	9657.848	1.130	4672993	0.40	10000	96.6	90	110	
K	39	2	He	9760.821	1.158	6982956	1.00	10000	97.6	90	110	
Mn	55	2	He	99.003	1.456	412740	0.63	100	99.0	90	110	
Co	59	2	He	94.921	2.133	681145	1.30	100	94.9	90	110	
Ni	60	2	He	98.482	1.490	168041	1.26	100	98.5	90	110	
Cu	63	2	He	98.334	1.602	430286	0.81	100	98.3	90	110	
Zn	66	2	He	98.053	2.589	95122	1.87	100	98.1	90	110	
Al	27	2	He	101.634	2.314	33120	1.43	100	101.6	90	110	
B	11	1	No Gas	487.207	2.926	674294	0.54	500	97.4	90	110	
Al	27	1	No Gas	103.309	3.183	1024702	1.89	100	103.3	90	110	
Si	28	1	No Gas	513.809	1.227	2736749	1.20	5000	10.3	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	99.199	1.523	1233065	0.03	100	99.2	90	110	
Cd	111	1	No Gas	98.921	0.072	255679	1.62	100	98.9	90	110	
Sr	88	1	No Gas	99.784	1.427	2495680	2.48	100	99.8	90	110	
Mo	95	1	No Gas	96.124	1.373	462790	0.26	100	96.1	90	110	
Sn	118	1	No Gas	98.718	0.913	792205	0.69	100	98.7	90	110	
Sb	121	1	No Gas	101.800	1.885	1080719	1.78	100	101.8	90	110	
Ba	137	1	No Gas	100.212	0.758	417094	0.87	100	100.2	90	110	
Tl	205	1	No Gas	101.951	1.198	2487454	1.39	100	102.0	90	110	
Tl	203	1	No Gas	99.870	0.884	1008057	1.09	100	99.9	90	110	
Pb	208	1	No Gas	99.239	0.522	3313581	0.40	100	99.2	90	110	
U	238	1	No Gas	103.242	0.808	3559192	0.63	100	103.2	90	110	
Ca	43	2	He	10073.449	2.360	20879	1.71	10000	100.7	90	110	
Sb	121	2	He	97.591	0.937	579397	0.42	100	97.6	90	110	
Ti	47	2	He	96.266	2.747	18209	2.32	100	96.3	90	110	
Cu	63	1	No Gas	98.664	1.729	806689	0.70	100	98.7	90	110	
Se	82	1	No Gas	98.834	0.681	14925	0.83	100	98.8	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	712301	3.41	851397	83.66	70	120	
Ge	72	2	He	644081	0.84	694065	92.80	70	120	
Ge	72	1	No Gas	1918364	1.21	2139408	89.67	70	120	
In	115	1	No Gas	2499871	1.55	2719437	91.93	70	120	
Bi	209	1	No Gas	2379366	0.27	2536806	93.79	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	228_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-15T22:16:01-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	0.652	11.7	48854	1.4	0.5	CCB Main CR1 Failed
Be	9	1	No Gas	0.054	53.5	133	48.9	0.5	
V	51	2	He	0.309	19.8	5213	4.8	2.5	
Cr	52	2	He	-0.043	-85.6	3320	4.5	2.5	
Fe	56	2	He	2.134	15.0	22930	6.1	100	
Se	78	2	He	0.696	34.1	239	9.2	2	
As	75	2	He	0.040	155.1	327	14.4	2.5	
Ca	44	2	He	10.166	12.9	873	4.3	100	
Na	23	2	He	87.085	4.8	175337	1.1	100	
Mg	24	2	He	9.469	3.1	5004	3.6	100	
K	39	2	He	-0.514	-288.0	119060	0.8	100	
Mn	55	2	He	0.008	366.1	1677	8.1	2.5	
Co	59	2	He	0.022	14.1	187	12.4	2.5	
Ni	60	2	He	0.027	65.8	130	23.1	2.5	
Cu	63	2	He	0.032	68.6	1057	10.1	2	
Zn	66	2	He	0.037	217.2	283	26.5	2.5	
Al	27	2	He	-0.238	-90.8	770	7.9	5	
B	11	1	No Gas	10.810	6.9	24381	3.3	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	-0.150	-129.8	24058	7.4	5	
Si	28	1	No Gas	1.518	12.5	232457	1.0	10	
Ag	107	1	No Gas	0.044	21.3	703	17.2	2.5	
Cd	111	1	No Gas	0.046	47.9	133	43.9	1	
Sr	88	1	No Gas	0.136	15.4	4701	11.6	2.5	
Mo	95	1	No Gas	0.101	24.4	540	22.8	2.5	
Sn	118	1	No Gas	0.081	49.3	1900	17.4	5	
Sb	121	1	No Gas	0.091	23.9	1387	17.3	2.5	
Ba	137	1	No Gas	0.044	65.7	390	31.5	2.5	
Tl	205	1	No Gas	0.092	32.8	2304	30.2	1	
Tl	203	1	No Gas	0.092	43.4	967	39.5	1	
Pb	208	1	No Gas	0.079	32.0	3227	24.6	2.5	
U	238	1	No Gas	0.059	36.5	2047	34.4	2.5	
Ca	43	2	He	4.010	242.7	30	66.7	100	
Sb	121	2	He	0.066	22.4	590	13.9	2.5	
Ti	47	2	He	0.005	1626.0	13	114.6	2.5	
Cu	63	1	No Gas	0.022	151.8	2370	12.1	2.5	
Se	82	1	No Gas	0.017	2238.7	-41	-142.1	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	725782	1.07	851397	85.25	70	120	
Ge	72	2	He	645451	1.10	694065	93.00	70	120	
Ge	72	1	No Gas	1965749	0.59	2139408	91.88	70	120	
In	115	1	No Gas	2541301	0.55	2719437	93.45	70	120	
Bi	209	1	No Gas	2354112	1.67	2536806	92.80	70	120	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	284_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:08:03-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	99.998	4.606	880636	3.04	100	100.0	90	110	
Be	9	1	No Gas	100.310	1.132	220222	0.34	100	100.3	90	110	
V	51	2	He	96.630	0.900	440498	0.74	100	96.6	90	110	
Cr	52	2	He	96.967	0.360	493590	1.40	100	97.0	90	110	
Fe	56	2	He	9779.929	0.966	47792754	1.67	10000	97.8	90	110	
Se	78	2	He	97.050	1.184	8612	0.84	100	97.0	90	110	
As	75	2	He	99.288	0.403	77327	0.81	100	99.3	90	110	
Ca	44	2	He	9702.064	0.606	348283	1.12	10000	97.0	90	110	
Na	23	2	He	9494.949	1.812	7717300	0.65	10000	94.9	90	110	
Mg	24	2	He	9699.648	1.248	4692697	0.70	10000	97.0	90	110	
K	39	2	He	9680.644	1.554	6925832	1.49	10000	96.8	90	110	
Mn	55	2	He	98.422	0.704	410320	1.28	100	98.4	90	110	
Co	59	2	He	95.265	0.714	683595	0.47	100	95.3	90	110	
Ni	60	2	He	97.486	1.067	166322	0.41	100	97.5	90	110	
Cu	63	2	He	98.664	1.424	431686	0.65	100	98.7	90	110	
Zn	66	2	He	99.295	0.743	96324	0.98	100	99.3	90	110	
Al	27	2	He	98.450	5.202	32097	3.93	100	98.4	90	110	
B	11	1	No Gas	501.253	1.504	671750	0.49	500	100.3	90	110	
Al	27	1	No Gas	98.245	2.927	972036	1.10	100	98.2	90	110	
Si	28	1	No Gas	509.573	2.177	2705506	0.36	5000	10.2	90	110	CCV Main CR1-2 Failed
Ag	107	1	No Gas	100.653	0.473	1236963	1.52	100	100.7	90	110	
Cd	111	1	No Gas	100.037	1.460	255564	0.91	100	100.0	90	110	
Sr	88	1	No Gas	100.646	0.637	2488051	0.96	100	100.6	90	110	
Mo	95	1	No Gas	98.580	1.563	469161	0.30	100	98.6	90	110	
Sn	118	1	No Gas	100.245	1.698	795152	0.48	100	100.2	90	110	
Sb	121	1	No Gas	100.911	1.649	1067233	0.93	100	100.9	90	110	
Ba	137	1	No Gas	101.658	1.545	418216	0.09	100	101.7	90	110	
Tl	205	1	No Gas	102.296	1.349	2496133	0.63	100	102.3	90	110	
Tl	203	1	No Gas	100.492	1.538	1014432	0.81	100	100.5	90	110	
Pb	208	1	No Gas	99.274	1.835	3315094	1.15	100	99.3	90	110	
U	238	1	No Gas	101.768	0.454	3508978	0.29	100	101.8	90	110	
Ca	43	2	He	9771.047	3.317	20249	2.18	10000	97.7	90	110	
Sb	121	2	He	97.239	0.780	577253	0.42	100	97.2	90	110	
Ti	47	2	He	98.314	0.134	18596	1.17	100	98.3	90	110	
Cu	63	1	No Gas	98.675	1.430	803794	0.68	100	98.7	90	110	
Se	82	1	No Gas	98.937	1.295	14887	2.82	100	98.9	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	689633	1.42	851397	81.00	70	120	
Ge	72	2	He	644021	1.14	694065	92.79	70	120	
Ge	72	1	No Gas	1911351	1.90	2139408	89.34	70	120	
In	115	1	No Gas	2471189	1.54	2719437	90.87	70	120	
Bi	209	1	No Gas	2379801	0.73	2536806	93.81	70	120	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	285_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:09:58-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	0.351	13.7	45752	1.5	0.5	
Be	9	1	No Gas	0.072	46.0	175	42.7	0.5	
V	51	2	He	-0.076	-13.8	3502	1.3	2.5	
Cr	52	2	He	-0.036	-110.0	3384	6.4	2.5	
Fe	56	2	He	2.761	7.4	26219	3.4	100	
Se	78	2	He	0.463	73.4	220	13.2	2	
As	75	2	He	-0.072	-38.8	241	9.4	2.5	
Ca	44	2	He	-2.464	-79.3	423	16.6	100	
Na	23	2	He	1.164	115.8	107179	0.6	100	
Mg	24	2	He	2.813	17.0	1790	12.6	100	
K	39	2	He	-6.541	-14.2	115756	0.3	100	
Mn	55	2	He	-0.071	-15.0	1357	3.7	2.5	
Co	59	2	He	0.024	14.2	203	12.4	2.5	
Ni	60	2	He	0.054	6.9	177	3.3	2.5	
Cu	63	2	He	-0.005	-149.1	900	4.0	2	
Zn	66	2	He	0.245	33.1	490	16.2	2.5	
Al	27	2	He	-0.778	-45.1	603	18.3	5	
B	11	1	No Gas	11.509	6.8	25109	3.1	0.5	CCB Main CR1 Failed
Al	27	1	No Gas	-0.751	-8.7	17915	1.9	5	
Si	28	1	No Gas	0.273	185.0	223884	1.3	10	
Ag	107	1	No Gas	0.056	11.8	843	8.7	2.5	
Cd	111	1	No Gas	0.066	34.9	183	32.0	1	
Sr	88	1	No Gas	0.053	40.8	2560	20.3	2.5	
Mo	95	1	No Gas	0.092	46.3	490	41.3	2.5	
Sn	118	1	No Gas	0.154	19.0	2460	9.2	5	
Sb	121	1	No Gas	0.086	29.3	1310	19.6	2.5	
Ba	137	1	No Gas	0.047	46.2	400	22.2	2.5	
Tl	205	1	No Gas	0.118	32.8	3027	32.7	1	
Tl	203	1	No Gas	0.121	40.2	1307	39.6	1	
Pb	208	1	No Gas	0.088	18.4	3637	15.2	2.5	
U	238	1	No Gas	0.060	29.7	2144	29.9	2.5	
Ca	43	2	He	2.288	637.2	27	114.6	100	
Sb	121	2	He	0.053	14.7	520	8.8	2.5	
Ti	47	2	He	0.074	162.8	27	86.6	2.5	
Cu	63	1	No Gas	0.056	53.2	2624	8.6	2.5	
Se	82	1	No Gas	0.064	688.5	-35	-200.3	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	718822	1.19	851397	84.43	70	120	
Ge	72	2	He	650733	0.43	694065	93.76	70	120	
Ge	72	1	No Gas	1945753	1.77	2139408	90.95	70	120	
In	115	1	No Gas	2512925	1.08	2719437	92.41	70	120	
Bi	209	1	No Gas	2439477	2.02	2536806	96.16	70	120	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	286LCV2.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:11:56-06:00
Sample Type	LLCCV2
Dilution	1
Comment	
ISTD Ref FileName	155CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Li	7	1	No Gas	2.141	2.141	2.30	61622	0.00	2	
Be	9	1	No Gas	1.865	1.865	2.75	4291	0.04	2	
V	51	2	He	1.744	1.744	2.26	11830	0.01	2	
Cr	52	2	He	1.711	1.711	5.23	12322	0.01	2	
Fe	56	2	He	196.129	196.129	1.30	982321	0.02	200	
Se	78	2	He	2.201	2.201	11.78	373	0.59	2	
As	75	2	He	1.679	1.679	20.54	1617	0.10	2	
Ca	44	2	He	186.959	186.959	5.91	7295	2.56	200	
Na	23	2	He	190.527	190.527	0.52	261016	0.07	200	
Mg	24	2	He	196.939	196.939	2.24	96838	0.20	200	
K	39	2	He	182.870	182.870	3.35	250725	0.07	200	
Mn	55	2	He	1.743	1.743	6.59	8983	0.02	2	
Co	59	2	He	1.868	1.868	0.91	13600	0.01	2	
Ni	60	2	He	1.850	1.850	3.16	3277	0.06	2	
Cu	63	2	He	1.924	1.924	4.86	9427	0.02	2	
Zn	66	2	He	1.780	1.780	12.89	1994	0.09	2	
Al	27	2	He	2.134	2.134	26.04	1540	0.14	2	
B	11	1	No Gas	18.038	18.038	2.02	34223	0.05	10	NewName Main CR1 Failed
Al	27	1	No Gas	2.056	2.056	4.39	45561	0.00	2	
Si	28	1	No Gas	8.950	8.950	8.75	267514	0.00	10	
Ag	107	1	No Gas	1.855	1.855	4.19	23972	0.01	2	
Cd	111	1	No Gas	1.832	1.832	3.82	4904	0.04	2	
Sr	88	1	No Gas	1.869	1.869	2.77	49548	0.00	2	
Mo	95	1	No Gas	1.892	1.892	4.61	9457	0.02	2	
Sn	118	1	No Gas	1.897	1.897	2.65	16961	0.01	2	
Sb	121	1	No Gas	1.970	1.970	0.92	21641	0.01	2	
Ba	137	1	No Gas	1.923	1.923	2.15	8480	0.02	2	
Tl	205	1	No Gas	1.906	1.906	1.00	47882	0.00	2	
Tl	203	1	No Gas	1.948	1.948	1.29	20260	0.01	2	
Pb	208	1	No Gas	1.894	1.894	2.82	65594	0.00	2	
U	238	1	No Gas	1.823	1.823	1.46	64611	0.00	2	
Ca	43	2	He	197.888	197.888	13.05	437	45.32	200	
Sb	121	2	He	1.868	1.868	1.15	11422	0.02	2	
Ti	47	2	He	1.852	1.852	11.72	367	0.51	200	
Cu	63	1	No Gas	1.935	1.935	3.45	18202	0.01	2	
Se	82	1	No Gas	1.486	1.486	25.94	185	0.80	2	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	721079	0.66	851397	84.69	70	120	
Ge	72	2	He	651779	0.32	694065	93.91	70	120	
Ge	72	1	No Gas	1949636	1.66	2139408	91.13	70	120	
In	115	1	No Gas	2583779	1.97	2719437	95.01	70	120	
Bi	209	1	No Gas	2445078	0.77	2536806	96.38	70	120	

Sample Report

Sample Table

Sample Name	LLCCV5
Data File Name	287LCV5.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:13:54-06:00
Sample Type	LLCCV5
Dilution	1
Comment	
ISTD Ref FileName	155CALB.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
Li	7	1	No Gas	5.003	5.003	3.21	85710	0.01	5	
Be	9	1	No Gas	4.662	4.662	0.69	10582	0.04	5	
V	51	2	He	4.604	4.604	2.05	24629	0.02	5	
Cr	52	2	He	4.566	4.566	3.66	26623	0.02	5	
Fe	56	2	He	497.568	497.568	1.03	2444794	0.02	500	
Se	78	2	He	5.347	5.347	2.49	643	0.83	5	
As	75	2	He	4.676	4.676	1.31	3925	0.12	5	
Ca	44	2	He	477.641	477.641	3.83	17642	2.71	500	
Na	23	2	He	480.497	480.497	1.30	490704	0.10	500	
Mg	24	2	He	500.061	500.061	0.90	242484	0.21	500	
K	39	2	He	479.382	479.382	1.69	456512	0.11	500	
Mn	55	2	He	4.563	4.563	1.30	20602	0.02	5	
Co	59	2	He	4.654	4.654	2.30	33441	0.01	5	
Ni	60	2	He	4.897	4.897	3.72	8439	0.06	5	
Cu	63	2	He	4.864	4.864	0.76	22165	0.02	5	
Zn	66	2	He	4.921	4.921	4.78	5011	0.10	5	
Al	27	2	He	5.304	5.304	3.31	2530	0.21	5	
B	11	1	No Gas	31.098	31.098	2.36	51651	0.06	25	
Al	27	1	No Gas	5.309	5.309	2.33	76929	0.01	5	
Si	28	1	No Gas	24.122	24.122	3.63	340213	0.01	25	
Ag	107	1	No Gas	4.842	4.842	1.06	60957	0.01	5	
Cd	111	1	No Gas	4.907	4.907	1.21	12826	0.04	5	
Sr	88	1	No Gas	4.761	4.761	0.76	121487	0.00	5	
Mo	95	1	No Gas	4.941	4.941	2.37	24079	0.02	5	
Sn	118	1	No Gas	4.928	4.928	2.16	41128	0.01	5	
Sb	121	1	No Gas	4.991	4.991	1.09	53770	0.01	5	
Ba	137	1	No Gas	5.206	5.206	2.81	22082	0.02	5	
Tl	205	1	No Gas	4.800	4.800	2.35	119501	0.00	5	
Tl	203	1	No Gas	4.837	4.837	2.47	49840	0.01	5	
Pb	208	1	No Gas	4.774	4.774	2.88	163151	0.00	5	
U	238	1	No Gas	4.639	4.639	2.63	163103	0.00	5	
Ca	43	2	He	489.971	489.971	2.80	1037	47.26	500	
Sb	121	2	He	4.756	4.756	1.28	28441	0.02	5	
Ti	47	2	He	4.358	4.358	13.66	837	0.52	5	
Cu	63	1	No Gas	4.816	4.816	0.96	41734	0.01	5	
Se	82	1	No Gas	4.454	4.454	14.00	636	0.70	5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	712373	0.65	851397	83.67	70	120	
Ge	72	2	He	644443	0.95	694065	92.85	70	120	
Ge	72	1	No Gas	1933433	1.28	2139408	90.37	70	120	

Sample Report

In	115	1	No Gas	2525595	1.04	2719437	92.87	70	120	
Bi	209	1	No Gas	2427459	2.89	2536806	95.69	70	120	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	288ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:15:53-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	0.800	2.7	45448	0.2	0	ICSA Main CR1 Failed
Be	9	1	No Gas	0.007	87.6	23	53.9	0	ICSA Main CR1 Failed
V	51	2	He	0.031	20.5	3776	0.4	0	ICSA Main CR1 Failed
Cr	52	2	He	2.951	1.0	17648	0.6	0	ICSA Main CR1 Failed
Fe	56	2	He	95679.657	0.8	447299433	0.5	0	
Se	78	2	He	0.658	38.4	225	9.4	0	ICSA Main CR1 Failed
As	75	2	He	0.023	98.9	299	5.2	0	ICSA Main CR1 Failed
Ca	44	2	He	97552.760	1.5	3346805	1.9	0	
Na	23	2	He	95279.585	0.9	73204062	0.7	0	
Mg	24	2	He	94340.681	1.6	43673321	1.3	0	
K	39	2	He	96674.978	1.2	65160164	0.8	0	
Mn	55	2	He	0.874	3.2	5041	2.6	0	ICSA Main CR1 Failed
Co	59	2	He	0.188	6.9	1323	7.0	0	ICSA Main CR1 Failed
Ni	60	2	He	1.375	8.0	2324	7.7	0	ICSA Main CR1 Failed
Cu	63	2	He	0.354	0.5	2354	0.6	0	ICSA Main CR1 Failed
Zn	66	2	He	1.847	4.4	1947	3.6	0	ICSA Main CR1 Failed
Al	27	2	He	97210.822	1.8	29541261	1.6	0	
B	11	1	No Gas	9.218	4.6	20088	2.5	0	
Al	27	1	No Gas	92103.136	1.4	862219854	0.6	0	
Si	28	1	No Gas	18.722	6.2	300883	0.8	0	ICSA Main CR1 Failed
Ag	107	1	No Gas	0.284	10.4	3481	10.0	0	ICSA Main CR1 Failed
Cd	111	1	No Gas	1.976	0.6	4844	0.6	0	ICSA Main CR1 Failed
Sr	88	1	No Gas	1.186	2.2	29216	1.5	0	ICSA Main CR1 Failed
Mo	95	1	No Gas	1986.453	0.4	9050905	1.1	0	
Sn	118	1	No Gas	0.243	15.0	2994	9.5	0	ICSA Main CR1 Failed
Sb	121	1	No Gas	0.069	3.9	1077	1.9	0	ICSA Main CR1 Failed
Ba	137	1	No Gas	0.446	9.5	1947	8.8	0	ICSA Main CR1 Failed
Tl	205	1	No Gas	0.022	30.4	577	25.2	0	ICSA Main CR1 Failed
Tl	203	1	No Gas	0.020	35.7	233	27.6	0	ICSA Main CR1 Failed
Pb	208	1	No Gas	0.106	8.4	3880	6.4	0	ICSA Main CR1 Failed
U	238	1	No Gas	0.008	42.4	303	36.3	0	ICSA Main CR1 Failed
Ca	43	2	He	95480.416	0.2	189202	0.3	0	
Sb	121	2	He	0.054	32.4	497	20.4	0	ICSA Main CR1 Failed
Ti	47	2	He	1967.745	0.7	355927	0.3	0	
Se	82	1	No Gas	-0.230	-455.2	-75	-203.7	0	ICSA 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	No Gas	657572	0.19	851397	77.23	70	120	
Ge	72	2	He	616268	0.42	694065	88.79	70	120	
Ge	72	1	No Gas	1855428	1.49	2139408	86.73	70	120	
In	115	1	No Gas	2365658	0.71	2719437	86.99	70	120	
Bi	209	1	No Gas	2215313	1.33	2536806	87.33	70	120	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	289ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq Date Time	2021-12-16T00:17:54-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	155CALB.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
Li	7	1	No Gas	97.554	0.342	804674	0.53	100	97.6	180	120	ICSB Main CR1 Failed
Be	9	1	No Gas	98.773	1.297	202804	0.83	100	98.8	80	120	
V	51	2	He	95.375	1.621	422918	0.55	100	95.4	80	120	
Cr	52	2	He	95.369	1.437	472189	0.15	100	95.4	80	120	
Fe	56	2	He	105307.020	1.868	500366686	1.08	100	105307.0	80	120	
Se	78	2	He	98.388	0.761	8490	0.65	100	98.4	80	120	
As	75	2	He	97.921	0.684	74181	0.65	100	97.9	80	120	
Ca	44	2	He	103722.677	2.114	3616484	1.40	100	103722.7	80	120	ICSB Main CR1 Failed
Na	23	2	He	101497.940	0.999	79258515	1.12	100	101497.9	80	120	ICSB Main CR1 Failed
Mg	24	2	He	102596.446	1.269	48276138	0.74	100	102596.4	80	120	
K	39	2	He	103317.083	1.553	70771212	0.68	100	103317.1	80	120	ICSB Main CR1 Failed
Mn	55	2	He	96.532	2.166	391415	1.14	100	96.5	80	120	
Co	59	2	He	91.493	1.643	638541	0.34	100	91.5	80	120	
Ni	60	2	He	93.831	2.847	155692	1.67	100	93.8	80	120	
Cu	63	2	He	93.364	0.549	397404	0.77	100	93.4	80	120	
Zn	66	2	He	96.773	0.511	91319	0.96	100	96.8	80	120	
Al	27	2	He	94134.867	2.238	29073730	1.02	100	94134.9	80	120	ICSB Main CR1 Failed
B	11	1	No Gas	494.277	0.497	619664	0.91	100	494.3	80	120	
Al	27	1	No Gas	91463.543	1.802	865179614	0.61	100	91463.5	80	120	ICSB Main CR1 Failed
Si	28	1	No Gas	493.969	2.419	2579757	2.42	100	494.0	80	120	
Ag	107	1	No Gas	96.239	4.137	1134477	2.07	100	96.2	80	120	
Cd	111	1	No Gas	101.273	2.603	248247	0.79	100	101.3	80	120	
Sr	88	1	No Gas	102.555	2.479	2432477	0.69	100	102.6	80	120	
Mo	95	1	No Gas	2106.612	3.292	9618163	0.96	100	2106.6	80	120	ICSB Main CR1 Failed
Sn	118	1	No Gas	101.410	1.879	771954	1.18	100	101.4	80	120	
Sb	121	1	No Gas	101.155	1.770	1049423	0.14	100	101.2	80	120	
Ba	137	1	No Gas	101.928	3.672	402279	0.64	100	101.9	80	120	
Tl	205	1	No Gas	100.109	0.576	2301759	1.26	100	100.1	80	120	
Tl	203	1	No Gas	98.642	1.078	938217	0.15	100	98.6	80	120	
Pb	208	1	No Gas	99.389	0.401	3127407	1.14	100	99.4	80	120	
U	238	1	No Gas	104.168	1.711	3383819	0.62	100	104.2	80	120	
Ca	43	2	He	104412.980	1.484	210290	0.62	100	104413.0	80	120	
Sb	121	2	He	96.828	1.391	559076	0.07	100	96.8	80	120	
Ti	47	2	He	2041.599	1.630	375333	0.55	100	2041.6	80	120	ICSB Main CR1 Failed
Cu	63	1	No Gas	93.597	1.840	747989	0.26	100	93.6	80	120	
Se	82	1	No Gas	101.411	2.955	14964	1.81	100	101.4	80	120	

QC ISTD Table

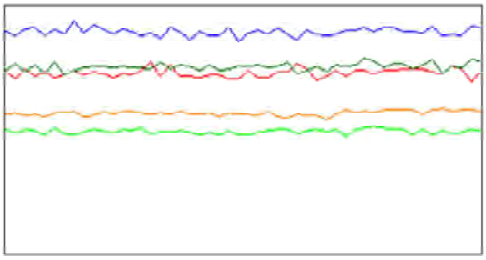
Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	No Gas	644933	0.77	851397	75.75	70	120	
Ge	72	2	He	626433	1.32	694065	90.26	70	120	
Ge	72	1	No Gas	1874992	1.91	2139408	87.64	70	120	
In	115	1	No Gas	2372058	2.98	2719437	87.23	70	120	
Bi	209	1	No Gas	2242274	1.08	2536806	88.39	70	120	

Tune Check Report

Operator Name	ALSHS NoUser
Acq/Data Batch	C:\Agilent\ICPMH\1\DATA\121521A.b
Acq. Date-Time	12/15/2021 10:23:58 AM
Report Comment	---
Instrument Name	G8421A SG18523544

[No Gas]

Sensitivity



Sampling Period [sec]	0.514
Integration Time [sec]	0.1

Mass	Range	Count	Resp [cps/ug/l]	Resp (Required) [cps/ug/l]	Resp (Flag)
9	5000	3652	36517.75		
24	20000	9894	98936.56		
59	20000	17942	179415.69		
115	50000	28460	284603.17		
208	20000	15113	151127.70		

Mass	Resp Ratio	Resp Ratio (Required)	Resp Ratio (Flag)
9		-	
24		-	
59		-	
115		-	
208		-	

Mass	RSD%	RSD% (Required)	RSD% (Flag)
9	2.319	5.000	
24	1.883	5.000	
59	1.920	5.000	
115	1.690	5.000	
208	2.020	5.000	

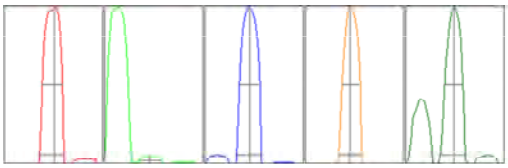
Mass	Background	Background (Required)	Background (Flag)
9	0.600		
24	0.500		
59	0.600		
115	0.500		
208	0.800		

Oxide/Doubly Charged Ratio

Oxide	156 / 140 1.168 %
Doubly Charged	70 / 140 0.957 %

Tune Check Report

Resolution/Axis



Integration Time [sec]	0.1
Acquisition Time [sec]	37.4
Y Axis	Linear

Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)
9	3722.52	9.05	8.90 - 9.10	
24	10091.31	23.90	23.90 - 24.10	
59	18554.56	58.90	58.90 - 59.10	
115	29341.61	114.90	114.90 - 115.10	
208	15101.13	208.00	207.90 - 208.10	

Mass	W-50%	W-5%	W-5% (Required)	W-5% (Flag)
9	0.62	0.739		
24	0.67	0.742		
59	0.61	0.740		
115	0.55	0.692		
208	0.57	0.759		

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.48 L/min	Dilution Gas	0.55 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.80 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	10.0 V	Deflect	14.0 V
Extract 2	-195.0 V	Cell Entrance	-30 V	Plate Bias	-45 V
Omega Bias	-90 V	Cell Exit	-50 V		

Cell Parameters

Use Gas	No	3rd Gas Flow	---	Energy Discrimination	5.0 V
He Flow	0.0 mL/min	OctP Bias	-8.0 V		
H2 Flow	---	OctP RF	200 V		

QP Parameters

Mass Gain	133	Axis Gain	1.0005	QP Bias	-3.0 V
Mass Offset	125	Axis Offset	0.04		

Hardware Settings

Torch

Torch H	0.9 mm	Torch V	-0.5 mm

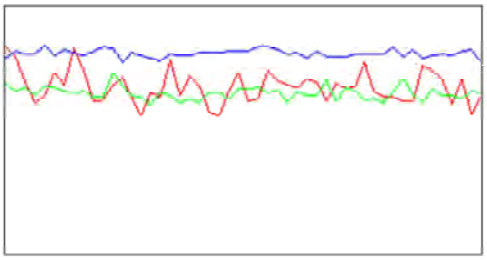
EM

Discriminator	4.4 mV	Analog HV	2601 V	Pulse HV	1377 V

[He]

Tune Check Report

Sensitivity



Sampling Period [sec]	0.306
Integration Time [sec]	0.1

Mass	Range	Count	Resp [cps/ug/l]	Resp (Required) [cps/ug/l]	Resp (Flag)
9	200	135	1350.06		
24	1000	649	6490.70		
59	10000	8098	80981.61		

Mass	Resp Ratio	Resp Ratio (Required)	Resp Ratio (Flag)
9		-	
24		-	
59		-	

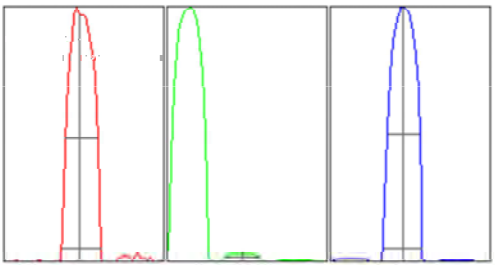
Mass	RSD%	RSD% (Required)	RSD% (Flag)
9	9.824	5.000	Fail
24	4.136	5.000	
59	1.925	5.000	

Mass	Background	Background (Required)	Background (Flag)
9	0.300		
24	0.200		
59	0.100		

Oxide/Doubly Charged Ratio

Oxide	156 / 140 1.161 %
Doubly Charged	70 / 140 0.867 %

Resolution/Axis



Integration Time [sec]	0.1
Acquisition Time [sec]	22.24
Y Axis	Linear

Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)
9	132.26	8.95	8.90 - 9.10	
24	664.19	23.95	23.90 - 24.10	
59	8229.16	58.90	58.90 - 59.10	

Mass	W-50%	W-5%	W-5% (Required)	W-5% (Flag)
9	0.62	0.738		
24	0.66	0.743		

Tune Check Report

Mass	W-50%	W-5%	W-5% (Required)	W-5% (Flag)
59	0.60	0.738		

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.48 L/min	Dilution Gas	0.55 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.80 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	10.0 V	Deflect	0.2 V
Extract 2	-195.0 V	Cell Entrance	-40 V	Plate Bias	-60 V
Omega Bias	-80 V	Cell Exit	-60 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	---	Energy Discrimination	3.0 V
He Flow	3.8 mL/min	OctP Bias	-18.0 V		
H2 Flow	---	OctP RF	200 V		

QP Parameters

Mass Gain	133	Axis Gain	1.0005	QP Bias	-15.0 V
Mass Offset	125	Axis Offset	0.04		

Hardware Settings

Torch

Torch H	0.9 mm	Torch V	-0.5 mm

EM

Discriminator	4.4 mV	Analog HV	2601 V	Pulse HV	1377 V

HS21120103 9056_W IC

ALS WO# HS21120103

Sequence: 120221
Last Update Operator: ALSHS.NoUser

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	Processing Method	Volume	Status	Inject Time
	STD1		Calibratio	BC7	1.00	1	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:00:12 AM -06:00
	STD2		Calibratio	BC8	1.00	2	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:07:31 AM -06:00
	STD3		Calibratio	BD1	1.00	3	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:14:50 AM -06:00
	STD4		Calibratio	BD2	1.00	4	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:22:19 AM -06:00
	STD5		Calibratio	BD3	1.00	5	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:29:49 AM -06:00
	STD6		Calibratio	BD4	1.00	6	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:37:07 AM -06:00
	ICV		Unknown	BD5	1.00		Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:44:36 AM -06:00
	ICB		Unknown	BC4	1.00		Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:52:05 AM -06:00
	CCV		Unknown	G1	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 6:38:53 AM -06:00
	CCB		Unknown	R4	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 6:46:27 AM -06:00
	MBLK		Unknown	R5	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 7:24:09 AM -06:00
	LCS		Unknown	G2	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 7:31:43 AM -06:00
	CCV1		Unknown	G3	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 7:54:15 AM -06:00
	CCB		Unknown	R8	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 8:01:50 AM -06:00
	CCV1		Unknown	G3	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 1:31:21 PM -06:00
	CCB		Unknown	R8	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 1:39:07 PM -06:00
	HS21120092-05DF10	9056_W-SH	Unknown	BE7	10.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 1:46:42 PM -06:00
	HS21120092-05MSDF10		Unknown	BE8	10.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 1:54:16 PM -06:00
	HS21120092-05MSDDF10		Unknown	RA1	10.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 2:01:50 PM -06:00
	HS21120103-01DF10		Unknown	RA4	10.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 2:24:11 PM -06:00
	HS21120103-01DF50		Unknown	RA5	50.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 2:31:46 PM -06:00
	HS21120103-02DF10		Unknown	RA6	10.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 2:39:20 PM -06:00
	HS21120103-02DF50		Unknown	RA7	50.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 2:46:54 PM -06:00
	CCV		Unknown	G1	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:01:52 PM -06:00
	CCB		Unknown	R4	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:09:26 PM -06:00
	HS21120103-03DF2		Unknown	RB1	2.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:17:01 PM -06:00
	HS21120103-03DF20		Unknown	RB2	20.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:24:35 PM -06:00
	HS21120103-04DF5		Unknown	RB3	5.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:32:10 PM -06:00
	HS21120103-04DF50		Unknown	RB4	50.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:39:44 PM -06:00
	HS21120103-05DF2		Unknown	RB5	2.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:47:19 PM -06:00
	HS21120103-05DF20		Unknown	RB6	20.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 3:54:53 PM -06:00
	HS21120103-06DF5		Unknown	RB7	5.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 4:02:16 PM -06:00
	HS21120103-06DF50	9056_W-SH	Unknown	RB8	50.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 4:09:50 PM -06:00
	CCV1		Unknown	G3	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 4:32:23 PM -06:00
	CCB		Unknown	R8	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/2/2021 4:39:57 PM -06:00

Sequence: 120721
Injection #6: STD6

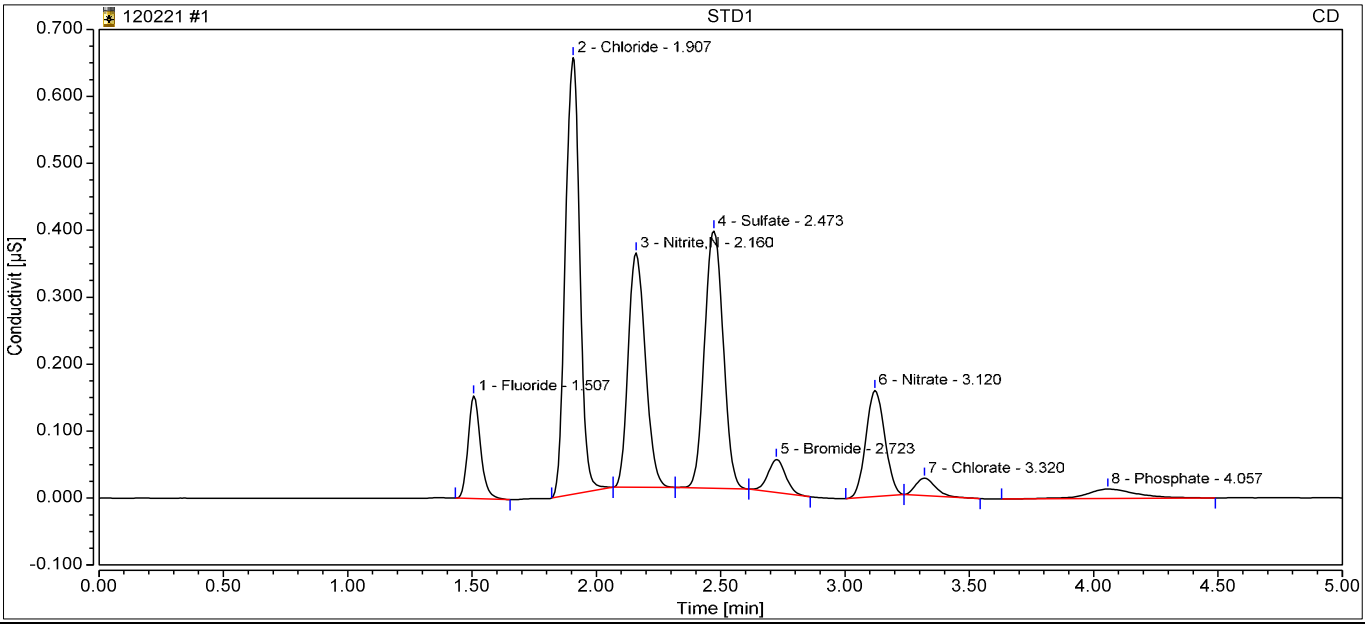
Calibration

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	***Fluoride***	***Lin, WithOffset, 1/***	***Area***	***6***	***20.8005***	***0.99829***	***-0.0130***	***0.2152***	***0.0000***
2	Chloride	Lin, WithOffset, 1/	Area	6	3.5331	0.99994	-0.0278	0.1453	0.0000
3	Nitrite,N	Quad, WithOffset,	Area	6	7.6353	0.99973	-0.0036	0.3206	-0.0034
4	Sulfate	Lin, WithOffset, 1/	Area	6	4.0513	0.99993	-0.0189	0.1061	0.0000
5	Bromide	Lin, WithOffset, 1/	Area	6	23.6161	0.99783	-0.0038	0.0602	0.0000
6	Nitrate	Lin, WithOffset, 1/	Area	6	6.5575	0.99983	-0.0214	0.3283	0.0000
7	Chlorate	Lin, WithOffset, 1/	Area	6	21.0683	0.99794	-0.0009	0.0317	0.0000
n.a.	Phosphate	Quad, WithOffset,	Area	5	33.7500	0.99725	-0.0088	0.0942	0.0028
Maximum					**33.7500**	0.99994			
Minimum					3.5331	**0.99725**			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**BC7**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:00**	*Sample Weight:*	**1.0000**

Run Time:



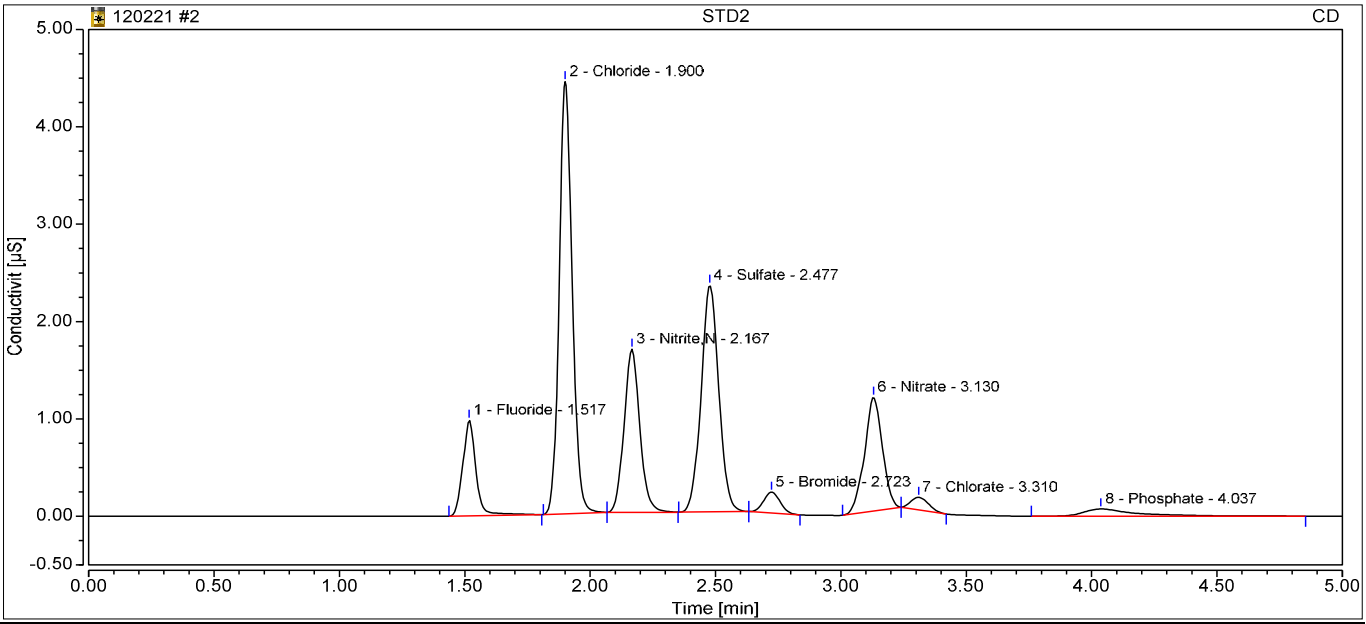
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.009	0.1018	0.1018	1.0000
2	1.91	Chloride	BMB	0.044	0.4914	0.4914	1.0000
3	2.16	Nitrite,N	BMB	0.028	0.0987	0.0987	1.0000
4	2.47	Sulfate	BMB	0.033	0.4938	0.4938	1.0000
5	2.72	Bromide	BMB	0.004	0.1308	0.1308	1.0000
6	3.12	Nitrate	BMB	0.014	0.1076	0.1076	1.0000
7	3.32	Chlorate	BMB	0.002	0.1039	0.1039	1.0000
8	4.06	Phosphate	BMB	0.003	0.1282	0.1282	1.0000
Total:			**0.000**	**0.138**		**1.66**	

2 STD2

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**BC8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:07**	*Sample Weight:*	**1.0000**

Run Time:

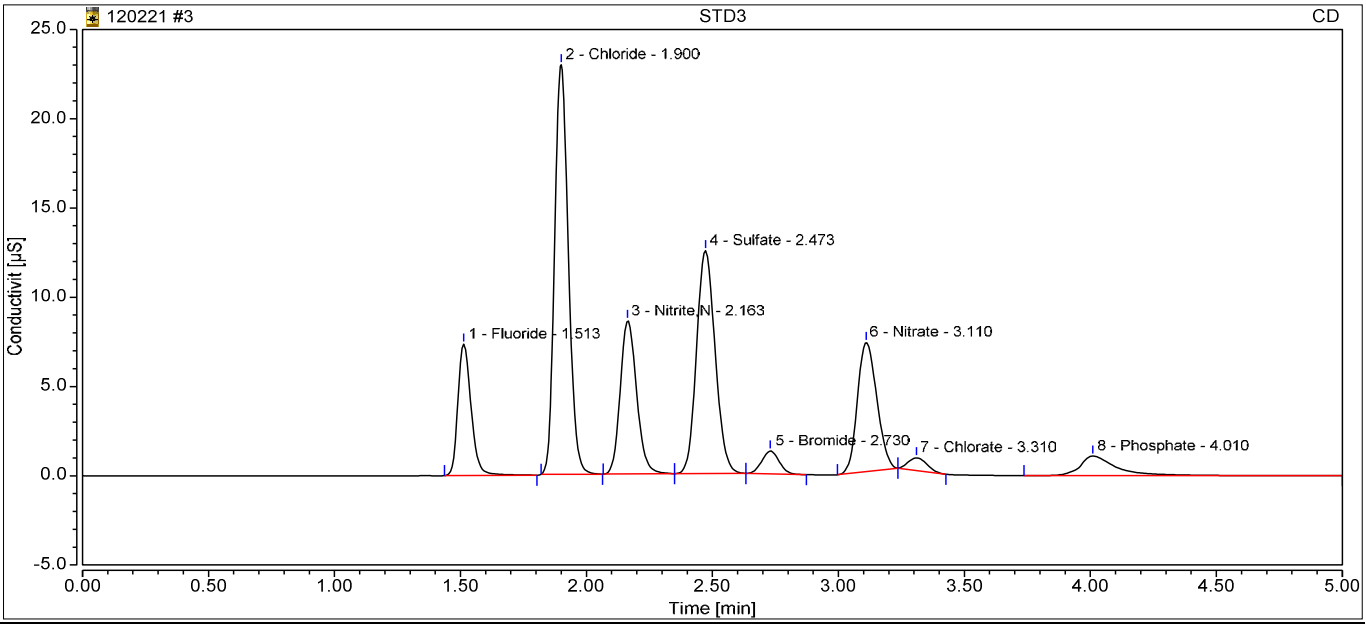


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	0.060	0.3395	0.3395	1.0000
2	1.90	Chloride	BMB	0.265	2.0129	2.0129	1.0000
3	2.17	Nitrite,N	BMB	0.122	0.3924	0.3924	1.0000
4	2.48	Sulfate	BMB	0.190	1.9659	1.9659	1.0000
5	2.72	Bromide	BMB	0.016	0.3362	0.3362	1.0000
6	3.13	Nitrate	BMB	0.097	0.3599	0.3599	1.0000
7	3.31	Chlorate	BMB	0.011	0.3622	0.3622	1.0000
8	4.04	Phosphate	BMB	0.018	0.2816	0.2816	1.0000
Total:			**0.000**	**0.778**		**6.05**	

3 STD3			
Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**BD1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:14**	*Sample Weight:*	**1.0000**

Run Time:



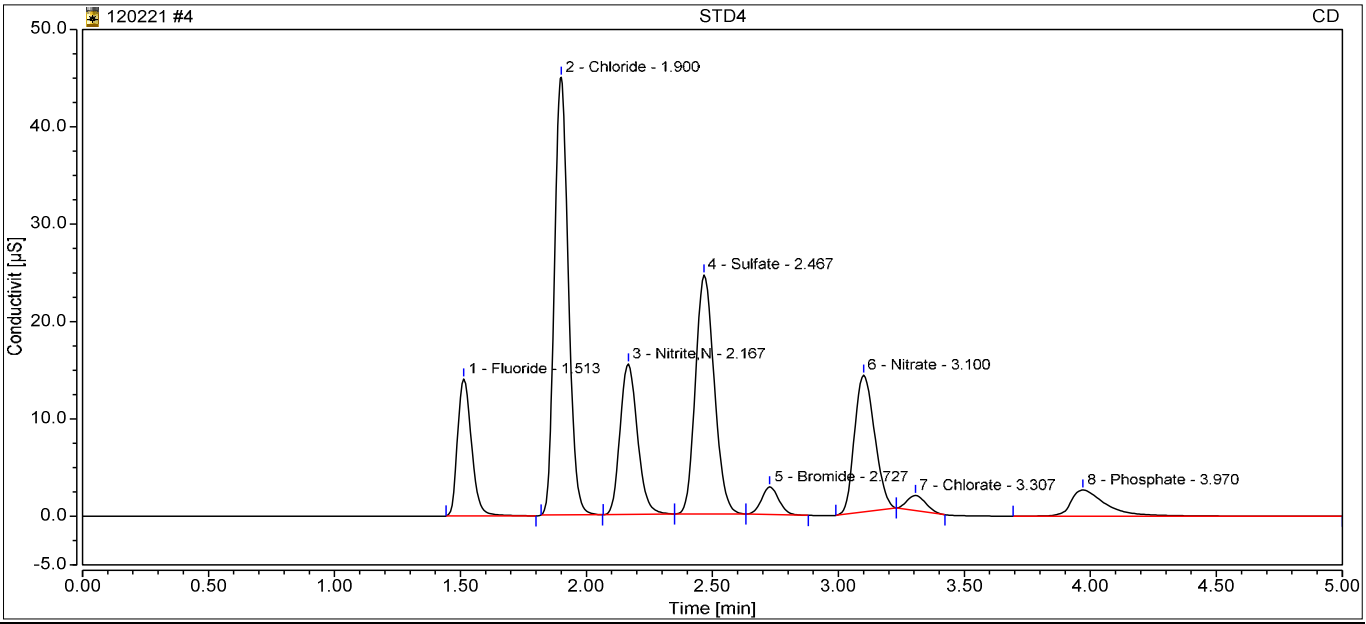
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.450	2.1496	2.1496	1.0000
2	1.90	Chloride	BMB	1.450	10.1720	10.1720	1.0000
3	2.16	Nitrite,N	BMB	0.648	2.0763	2.0763	1.0000
4	2.47	Sulfate	BMB	1.069	10.2544	10.2544	1.0000
5	2.73	Bromide	BMB	0.103	1.7696	1.7696	1.0000
6	3.11	Nitrate	BMB	0.646	2.0317	2.0317	1.0000
7	3.31	Chlorate	BMB	0.061	1.9584	1.9584	1.0000
8	4.01	Phosphate	BMB	0.184	1.9390	1.9390	1.0000
Total:			**0.000**	**4.610**		**32.35**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**BD2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:22**	*Sample Weight:*	**1.0000**

Run Time:



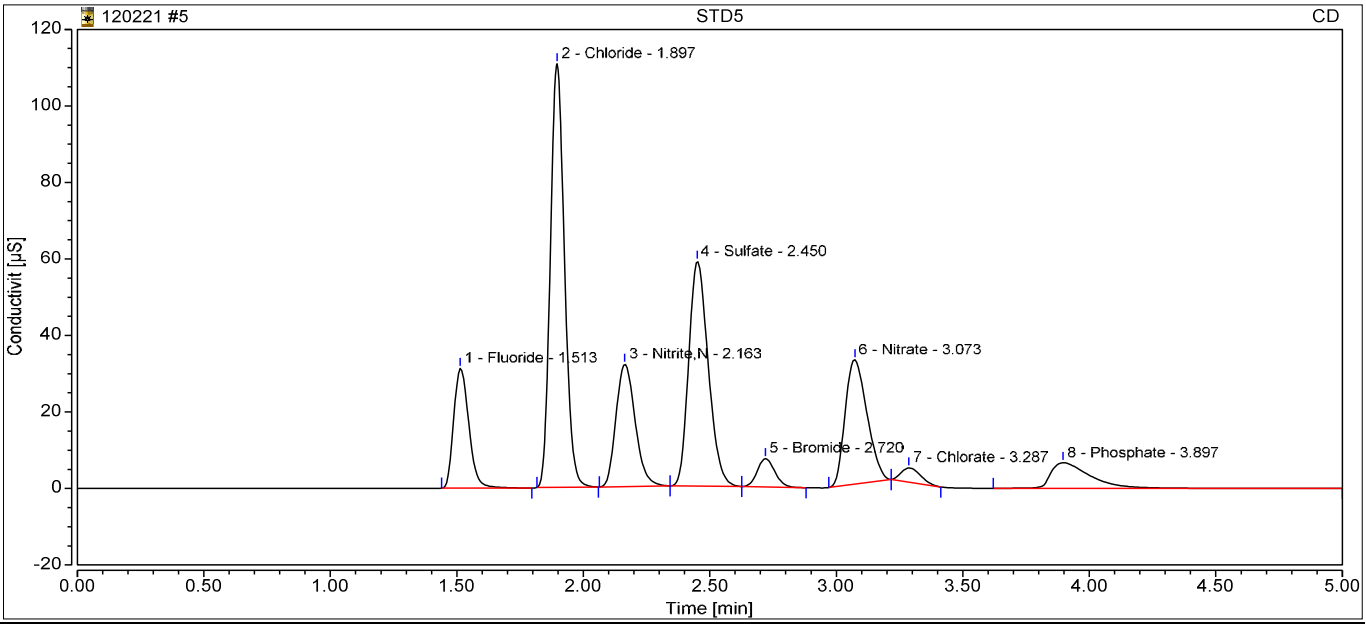
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.905	4.2644	4.2644	1.0000
2	1.90	Chloride	BMB	2.879	20.0096	20.0096	1.0000
3	2.17	Nitrite,N	BMB	1.237	4.0414	4.0414	1.0000
4	2.47	Sulfate	BMB	2.129	20.2388	20.2388	1.0000
5	2.73	Bromide	BMB	0.224	3.7876	3.7876	1.0000
6	3.10	Nitrate	BMB	1.306	4.0426	4.0426	1.0000
7	3.31	Chlorate	BMB	0.133	4.2276	4.2276	1.0000
8	3.97	Phosphate	BMB	0.435	4.1908	4.1908	1.0000
Total:			**0.000**	**9.248**		**64.80**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**BD3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:29**	*Sample Weight:*	**1.0000**

Run Time:

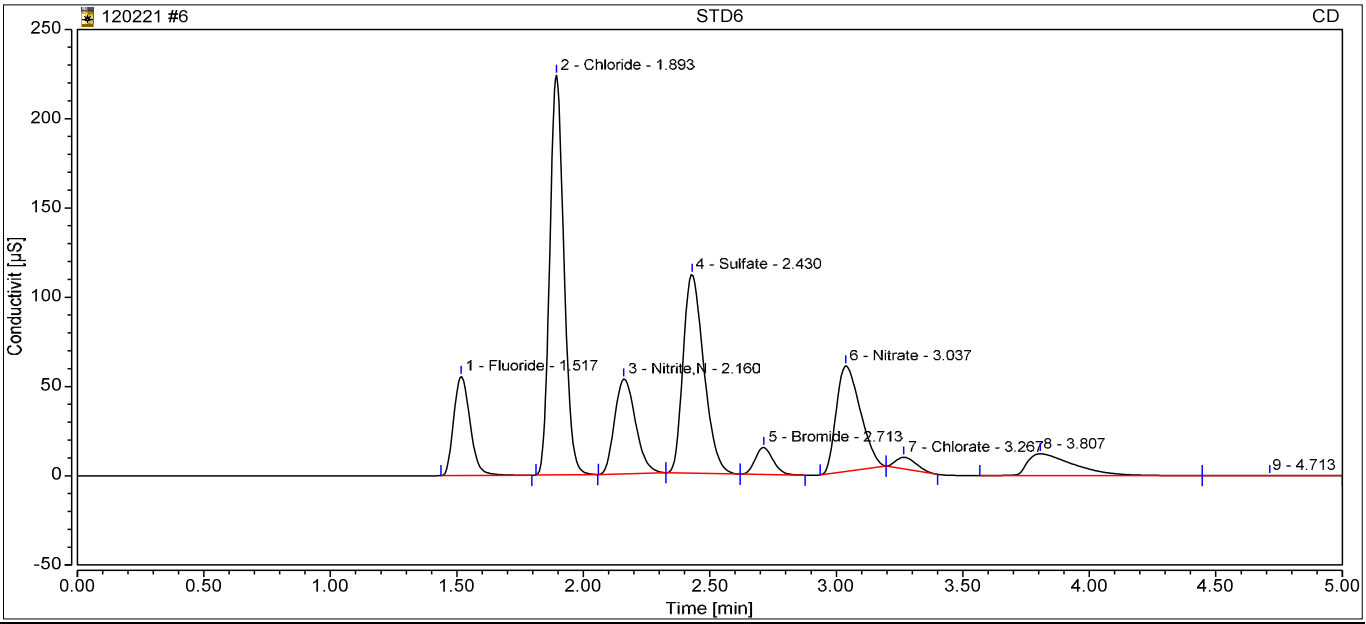


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	2.184	10.2071	10.2071	1.0000
2	1.90	Chloride	BMB	7.162	49.4936	49.4936	1.0000
3	2.16	Nitrite,N	BMB	2.810	9.7795	9.7795	1.0000
4	2.45	Sulfate	BMB	5.250	49.6578	49.6578	1.0000
5	2.72	Bromide	BMB	0.593	9.9182	9.9182	1.0000
6	3.07	Nitrate	BMB	3.259	9.9925	9.9925	1.0000
7	3.29	Chlorate	BMB	0.333	10.5345	10.5345	1.0000
8	3.90	Phosphate	BMB	1.205	9.9518	9.9518	1.0000
Total:			**0.000**	**22.797**		**159.54**	

6 STD6			
Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**BD4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:37**	*Sample Weight:*	**1.0000**

Run Time:

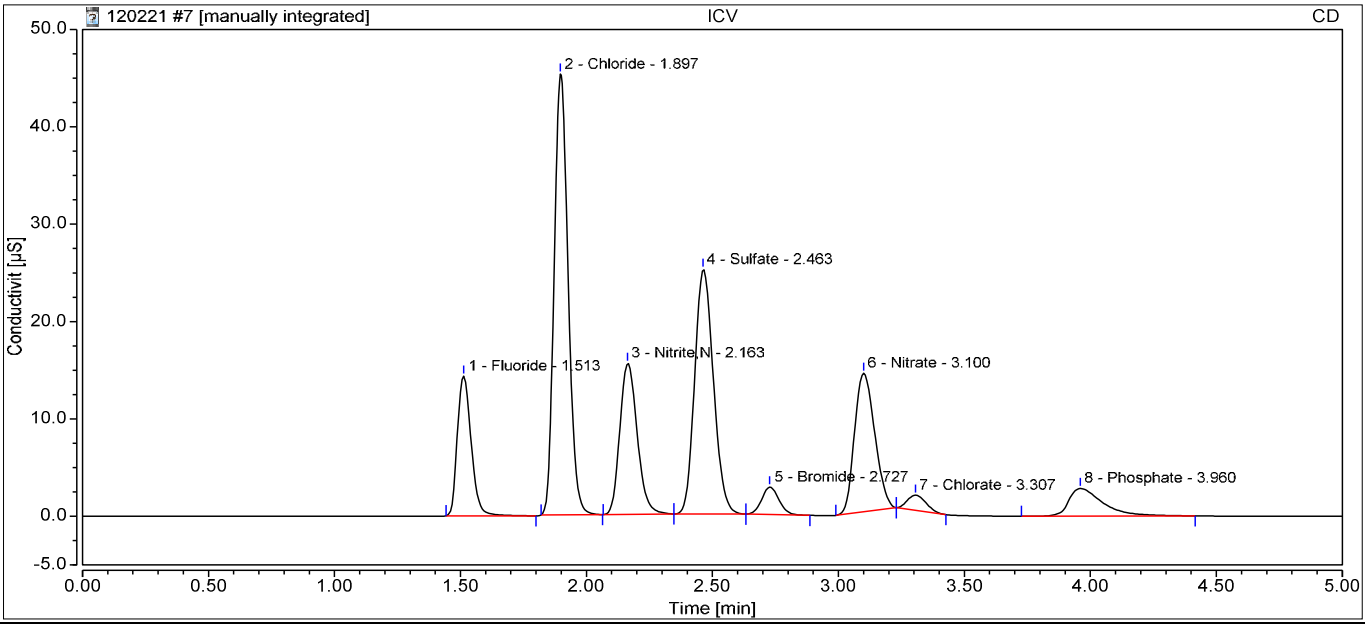


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	4.171	19.4376	19.4376	1.0000
2	1.89	Chloride	BMB	14.546	100.3205	100.3205	1.0000
3	2.16	Nitrite,N	BMB	5.087	20.1255	20.1255	1.0000
4	2.43	Sulfate	BMB	10.580	99.8893	99.8893	1.0000
5	2.71	Bromide	BMB	1.233	20.5575	20.5575	1.0000
6	3.04	Nitrate	BMB	6.532	19.9657	19.9657	1.0000
7	3.27	Chlorate	BMB	0.611	19.3134	19.3134	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**42.760**		**299.61**	

7 ICV			
Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**BD5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:44**	*Sample Weight:*	**1.0000**

Run Time:



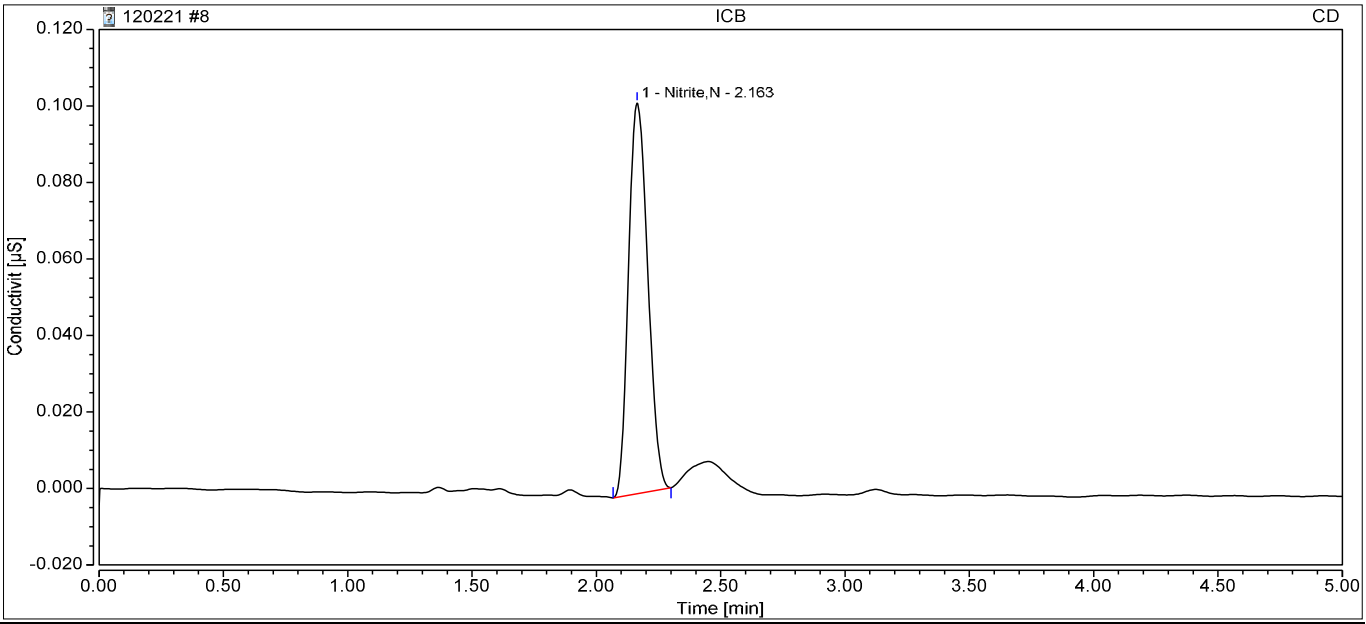
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.915	4.3113	4.3113	1.0000
2	1.90	Chloride	BMB	2.895	20.1215	20.1215	1.0000
3	2.16	Nitrite,N	BMB	1.240	4.0518	4.0518	1.0000
4	2.46	Sulfate	BMB	2.169	20.6197	20.6197	1.0000
5	2.73	Bromide	BMB	0.224	3.7819	3.7819	1.0000
6	3.10	Nitrate	BMB	1.325	4.1019	4.1019	1.0000
7	3.31	Chlorate	BMB	0.136	4.3121	4.3121	1.0000
8	3.96	Phosphate	BMB*	0.448	4.3023	4.3023	1.0000
Total:			**0.000**	**9.352**		**65.60**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**BC4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:52**	*Sample Weight:*	**1.0000**

Run Time:

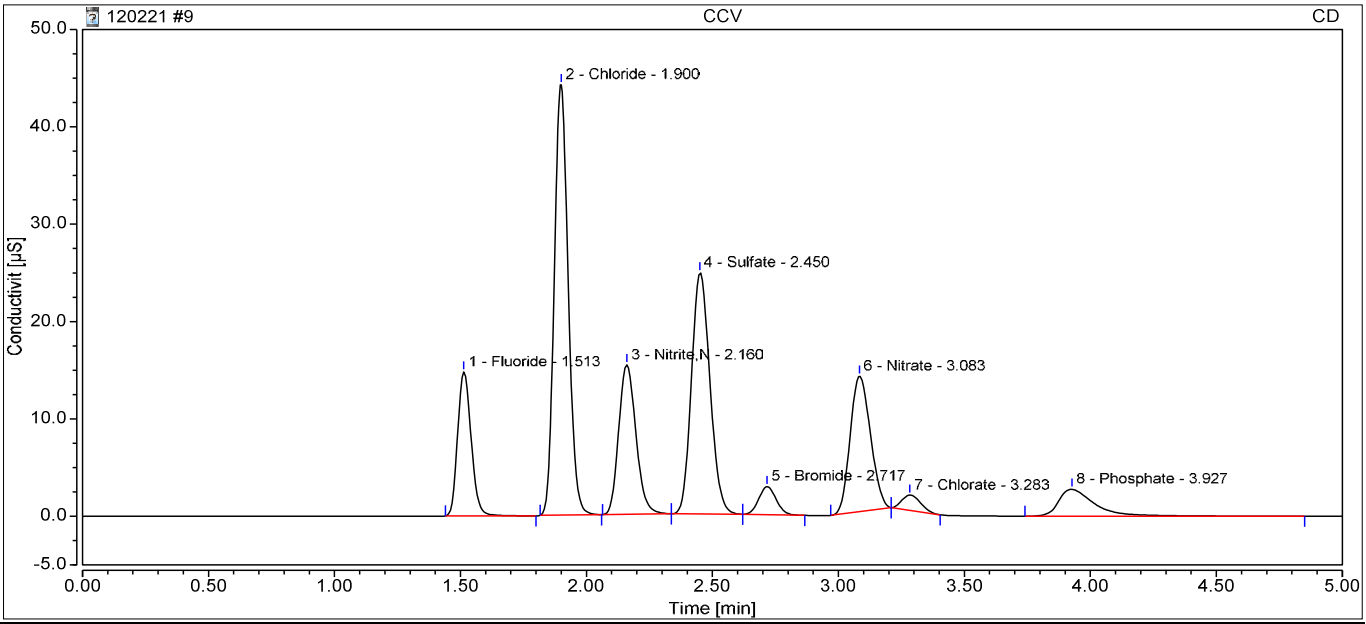


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
1	2.16	Nitrite,N	BMB	0.009	0.0398	0.0398	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.009**		**0.04**	

9 CCV			
Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**G1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 06:38**	*Sample Weight:*	**1.0000**

Run Time:



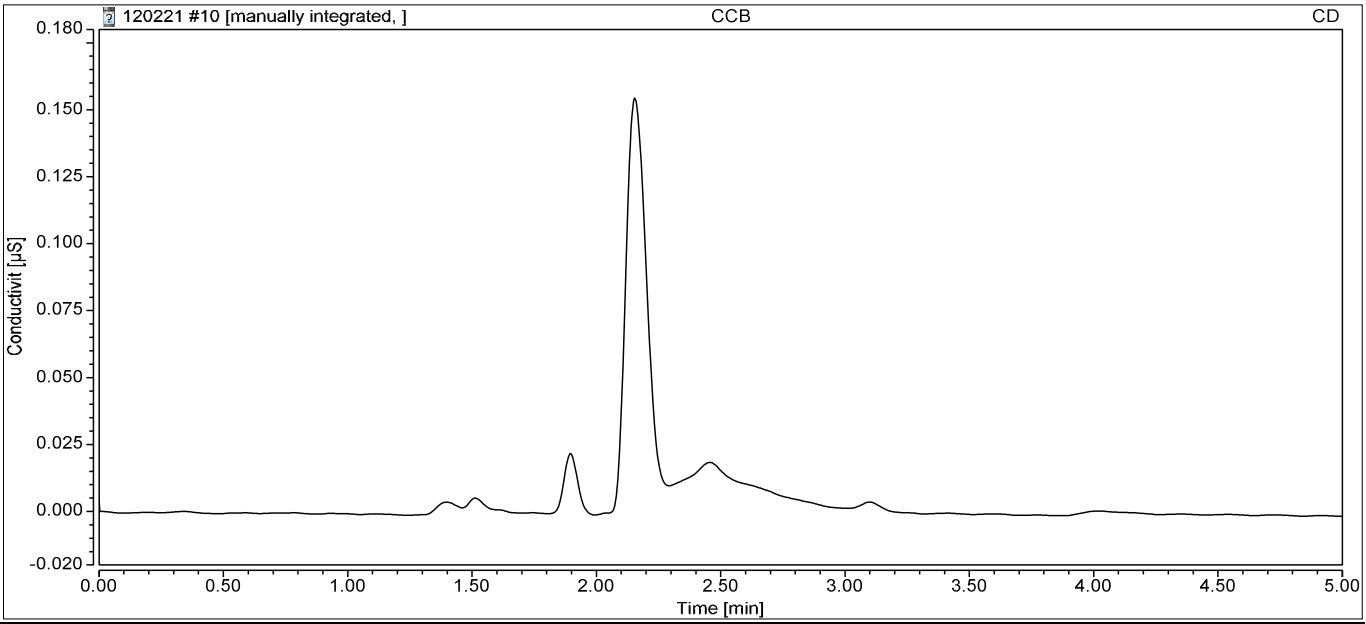
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.923	4.3508	4.3508	1.0000
2	1.90	Chloride	BMB	2.826	19.6474	19.6474	1.0000
3	2.16	Nitrite,N	BMB	1.220	3.9832	3.9832	1.0000
4	2.45	Sulfate	BMB	2.107	20.0358	20.0358	1.0000
5	2.72	Bromide	BMB	0.231	3.9040	3.9040	1.0000
6	3.08	Nitrate	BMB	1.300	4.0257	4.0257	1.0000
7	3.28	Chlorate	BMB	0.136	4.3356	4.3356	1.0000
8	3.93	Phosphate	BMB	0.464	4.4360	4.4360	1.0000
Total:			**0.000**	**9.209**		**64.72**	

10 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 06:46**	*Sample Weight:*	**1.0000**

Run Time:



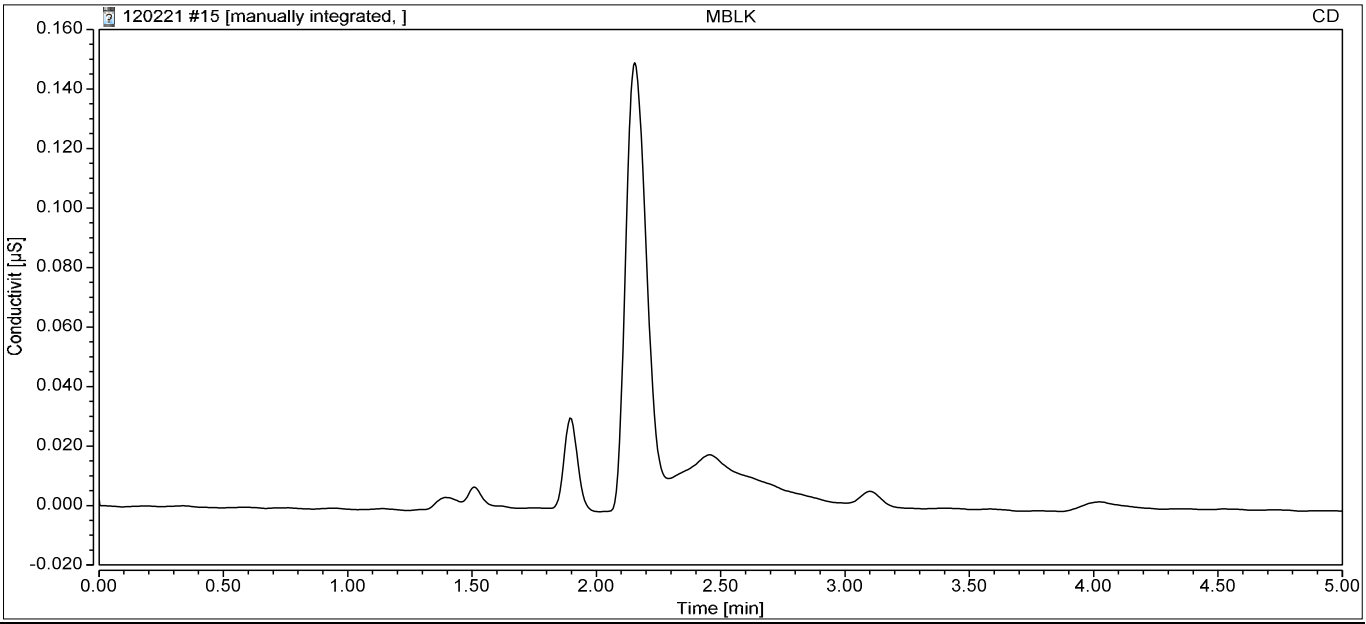
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

15 MBLK

Sample Name:	**MBLK**	*Injection Volume:*	**5.00**
Vial Number:	**R5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 07:24**	*Sample Weight:*	**1.0000**

Run Time:

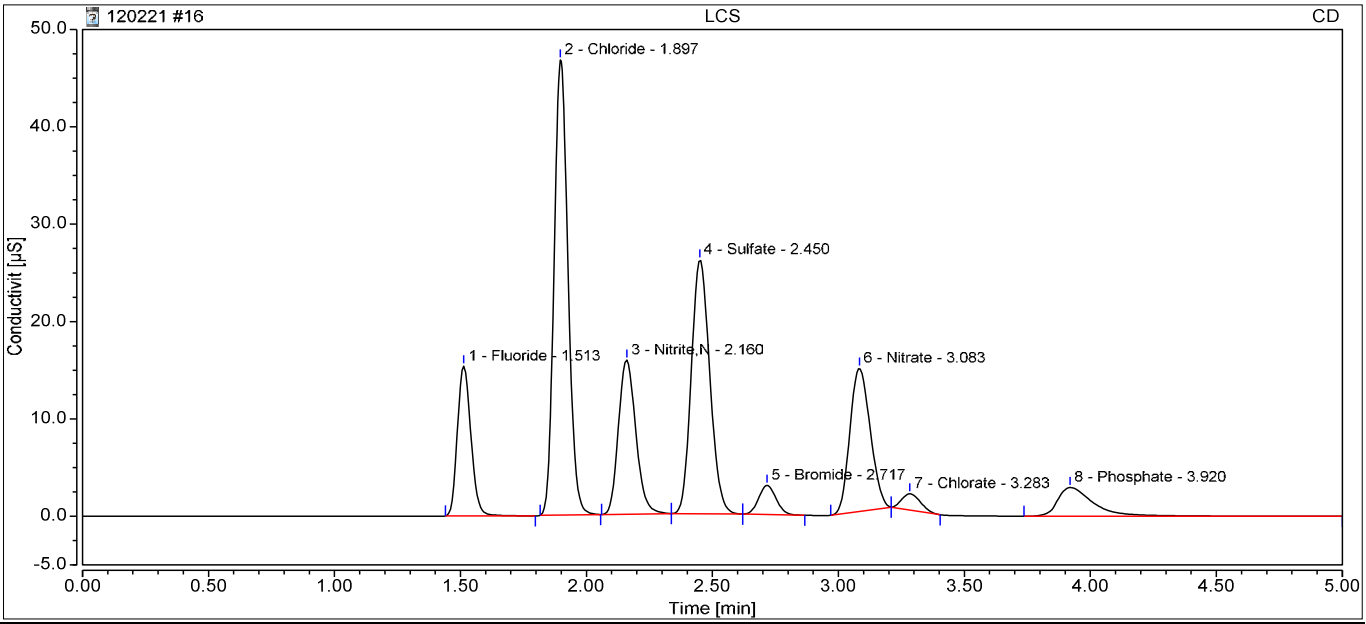


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

16 LCS			
Sample Name:	**LCS**	*Injection Volume:*	**5.00**
Vial Number:	**G2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 07:31**	*Sample Weight:*	**1.0000**

Run Time:



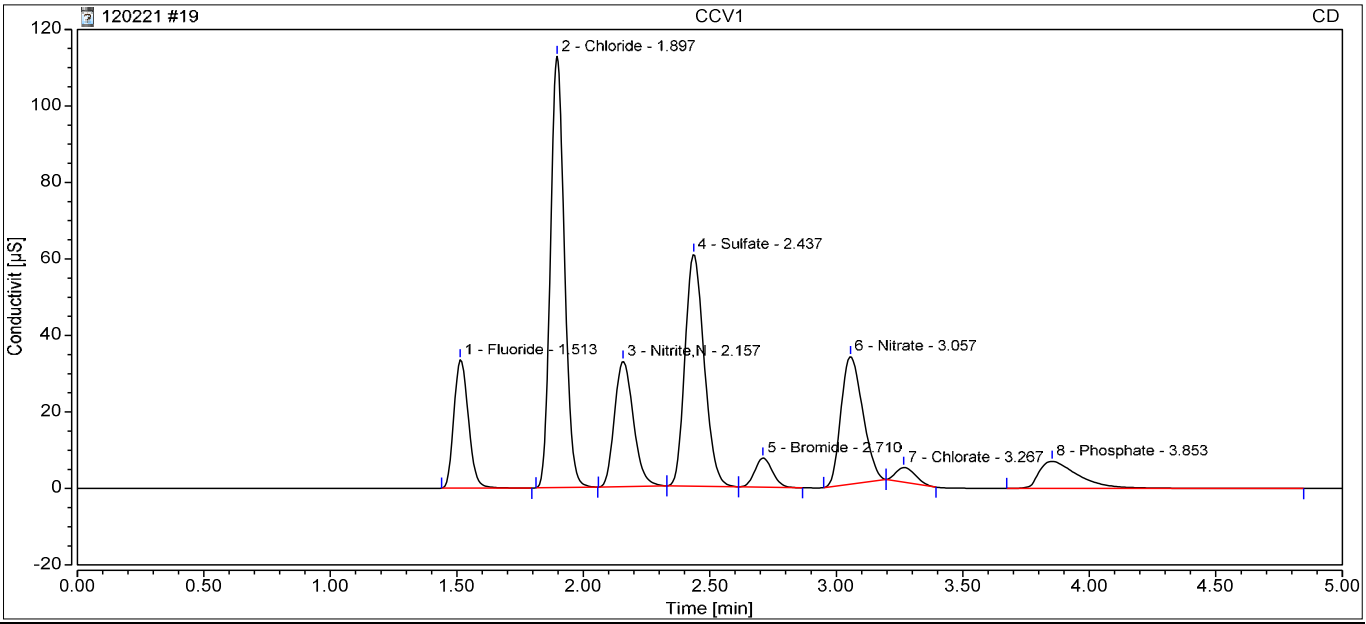
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.960	4.5219	4.5219	1.0000
2	1.90	Chloride	BMB	2.987	20.7526	20.7526	1.0000
3	2.16	Nitrite,N	BMB	1.268	4.1449	4.1449	1.0000
4	2.45	Sulfate	BMB	2.219	21.0909	21.0909	1.0000
5	2.72	Bromide	BMB	0.240	4.0598	4.0598	1.0000
6	3.08	Nitrate	BMB	1.376	4.2562	4.2562	1.0000
7	3.28	Chlorate	BMB	0.144	4.5669	4.5669	1.0000
8	3.92	Phosphate	BMB	0.492	4.6718	4.6718	1.0000
Total:			**0.000**	**9.686**		**68.06**	

19 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**G3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 07:54**	*Sample Weight:*	**1.0000**

Run Time:



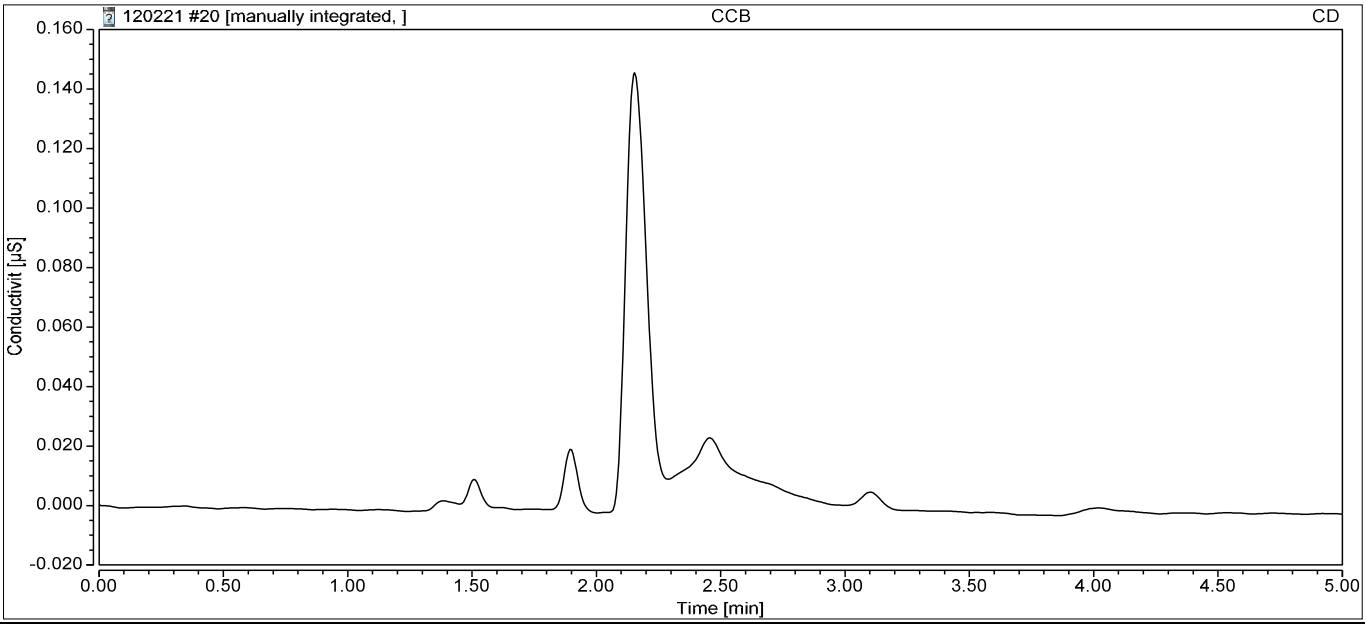
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	2.243	10.4813	10.4813	1.0000
2	1.90	Chloride	BMB	7.237	50.0097	50.0097	1.0000
3	2.16	Nitrite,N	BMB	2.833	9.8688	9.8688	1.0000
4	2.44	Sulfate	BMB	5.333	50.4421	50.4421	1.0000
5	2.71	Bromide	BMB	0.613	10.2590	10.2590	1.0000
6	3.06	Nitrate	BMB	3.326	10.1990	10.1990	1.0000
7	3.27	Chlorate	BMB	0.342	10.8378	10.8378	1.0000
8	3.85	Phosphate	BMB	1.271	10.3853	10.3853	1.0000
Total:			**0.000**	**23.200**		**162.48**	

20 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 08:01**	*Sample Weight:*	**1.0000**

Run Time:



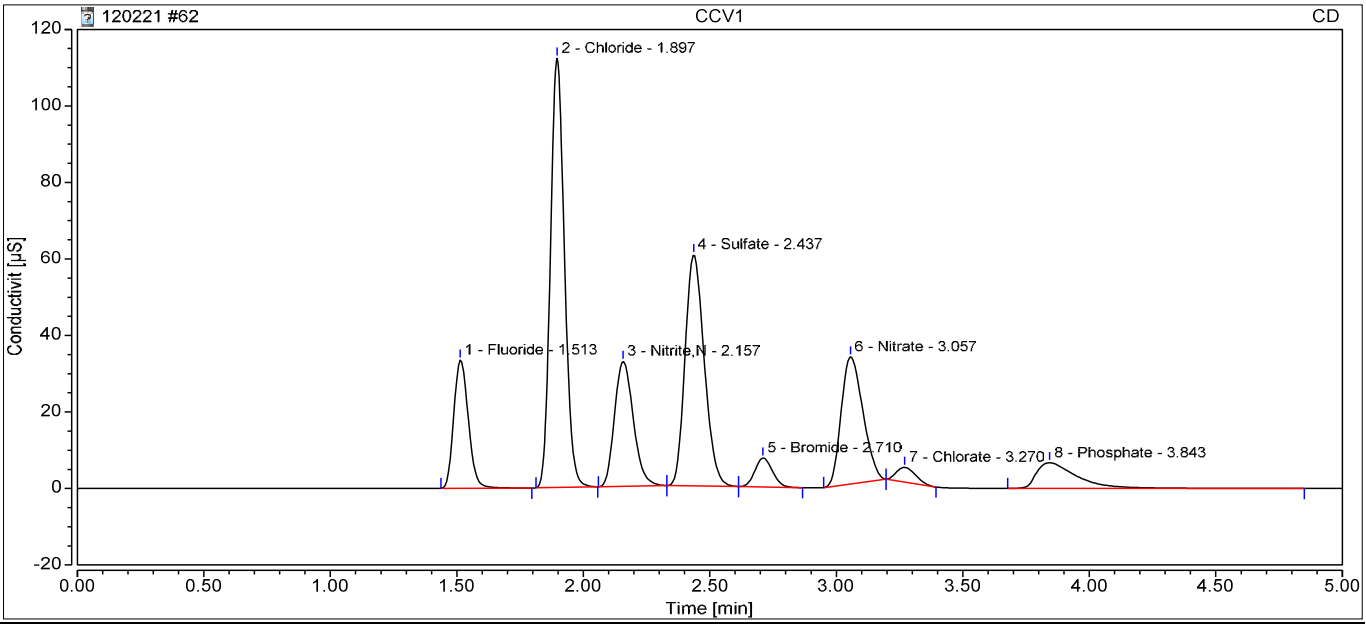
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

62 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**G3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 13:31**	*Sample Weight:*	**1.0000**

Run Time:



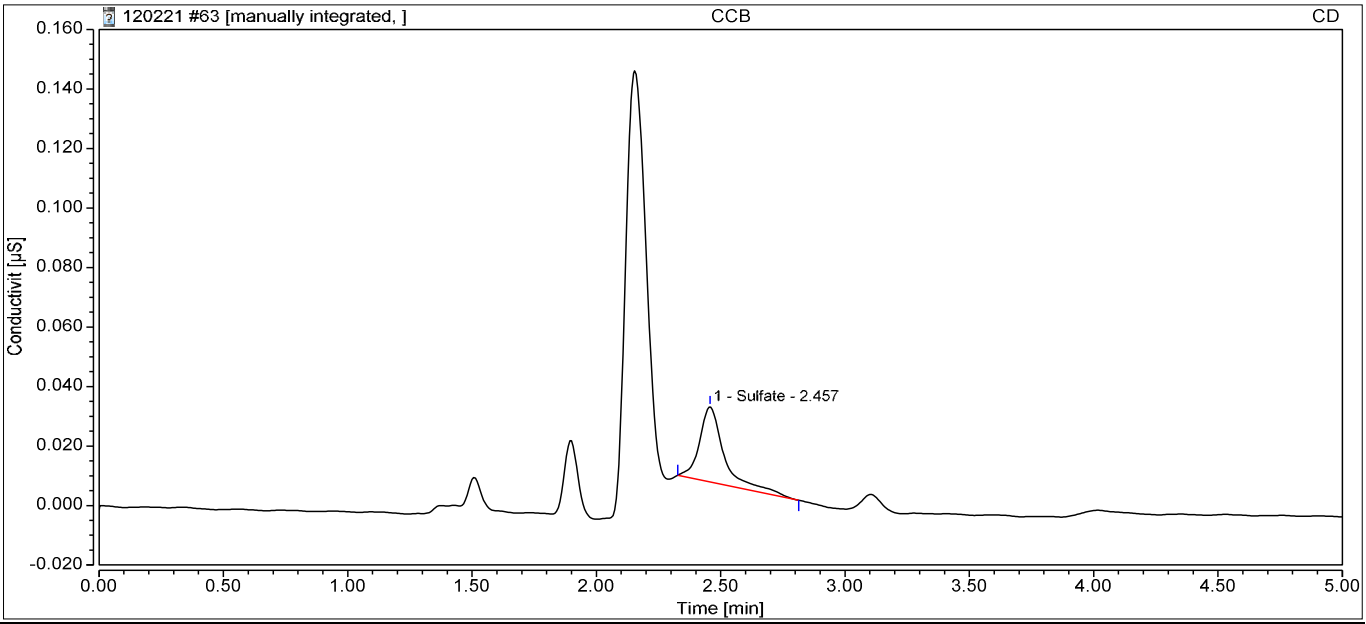
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	2.244	10.4855	10.4855	1.0000
2	1.90	Chloride	BMB	7.207	49.8039	49.8039	1.0000
3	2.16	Nitrite,N	BMB	2.819	9.8137	9.8137	1.0000
4	2.44	Sulfate	BMB	5.313	50.2472	50.2472	1.0000
5	2.71	Bromide	BMB	0.611	10.2113	10.2113	1.0000
6	3.06	Nitrate	BMB	3.313	10.1573	10.1573	1.0000
7	3.27	Chlorate	BMB	0.344	10.8961	10.8961	1.0000
8	3.84	Phosphate	BMB	1.246	10.2202	10.2202	1.0000
Total:			**0.000**	**23.096**		**161.84**	

63 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 13:39**	*Sample Weight:*	**1.0000**

Run Time:



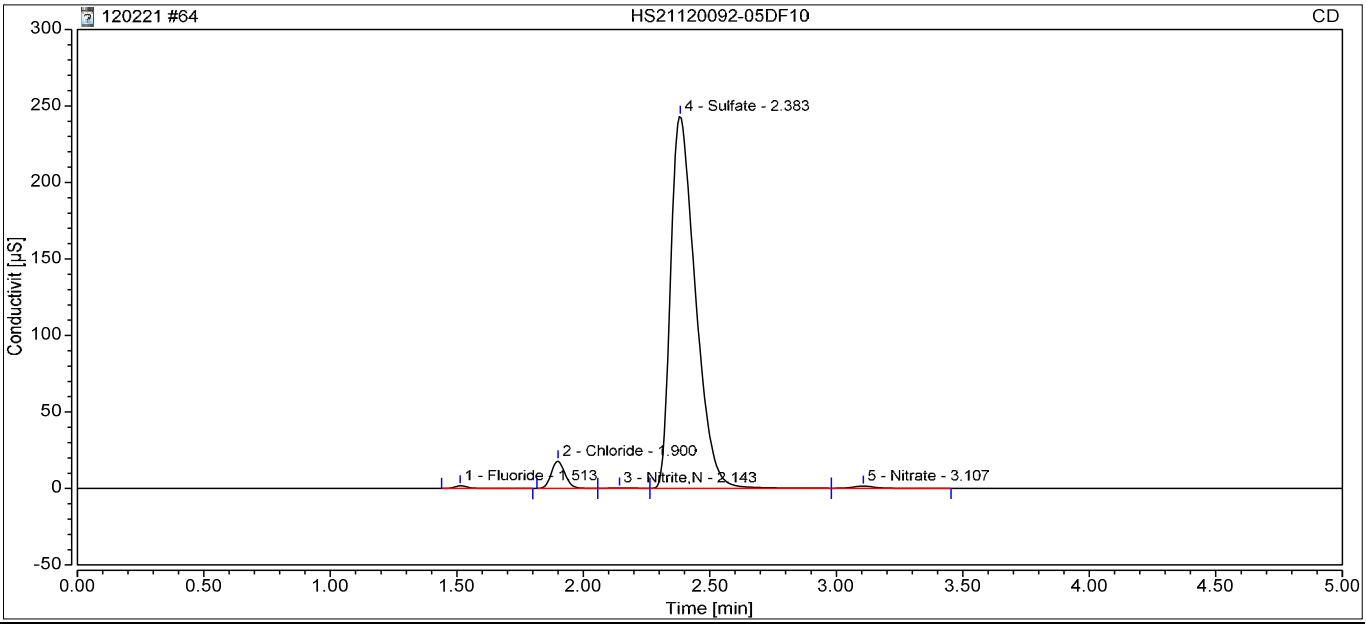
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
1	2.46	Sulfate	BMB	0.003	0.2063	0.2063	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.21**	

64 HS21120092-05DF10

Sample Name:	**HS21120092-05DF10**	*Injection Volume:*	**5.00**
Vial Number:	**BE7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**10.0000**
Recording Time:	**12/02/2021 13:46**	*Sample Weight:*	**1.0000**

Run Time:



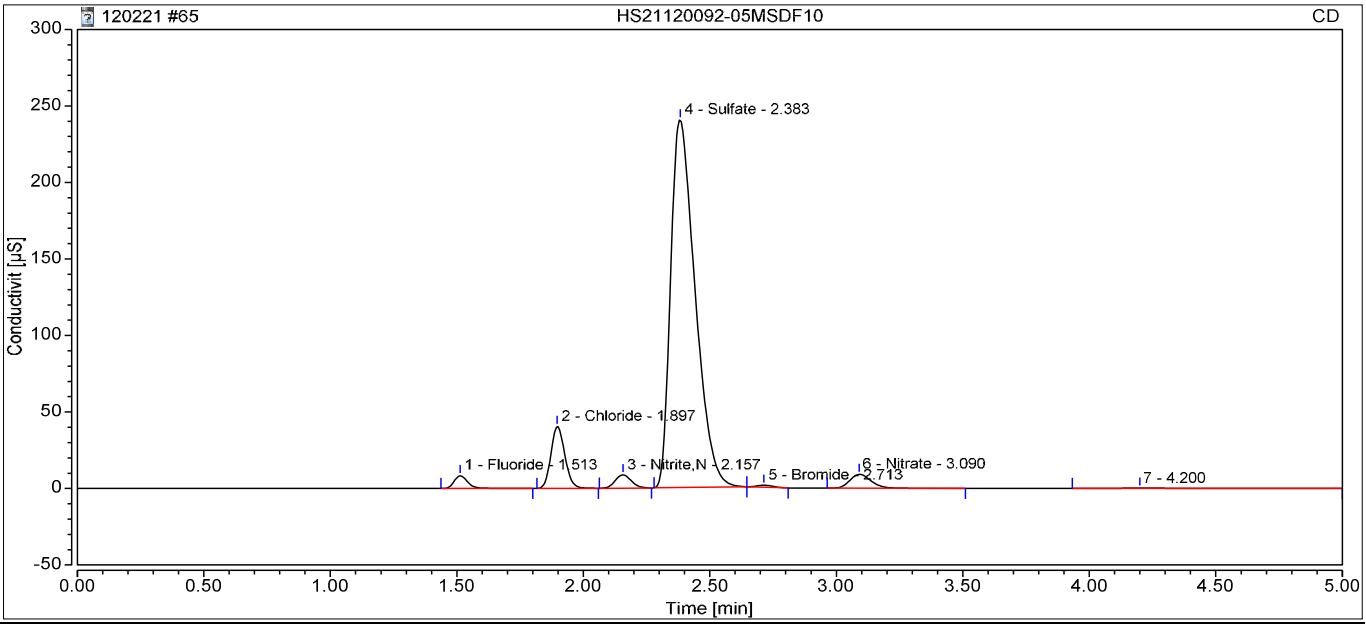
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.110	0.5720	5.7197	10.0000
2	1.90	Chloride	BMB	1.123	7.9207	79.2074	10.0000
3	2.14	Nitrite,N	BMB	0.021	0.0763	0.7628	10.0000
4	2.38	Sulfate	BMB	27.548	259.7991	2597.9911	10.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	10.0000
5	3.11	Nitrate	BMB	0.134	0.4727	4.7271	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**28.936**		**2688.41**	

65 HS21120092-05MSDF10

Sample Name:	**HS21120092-05MSDF10**	*Injection Volume:*	**5.00**
Vial Number:	**BE8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**10.0000**
Recording Time:	**12/02/2021 13:54**	*Sample Weight:*	**1.0000**

Run Time:



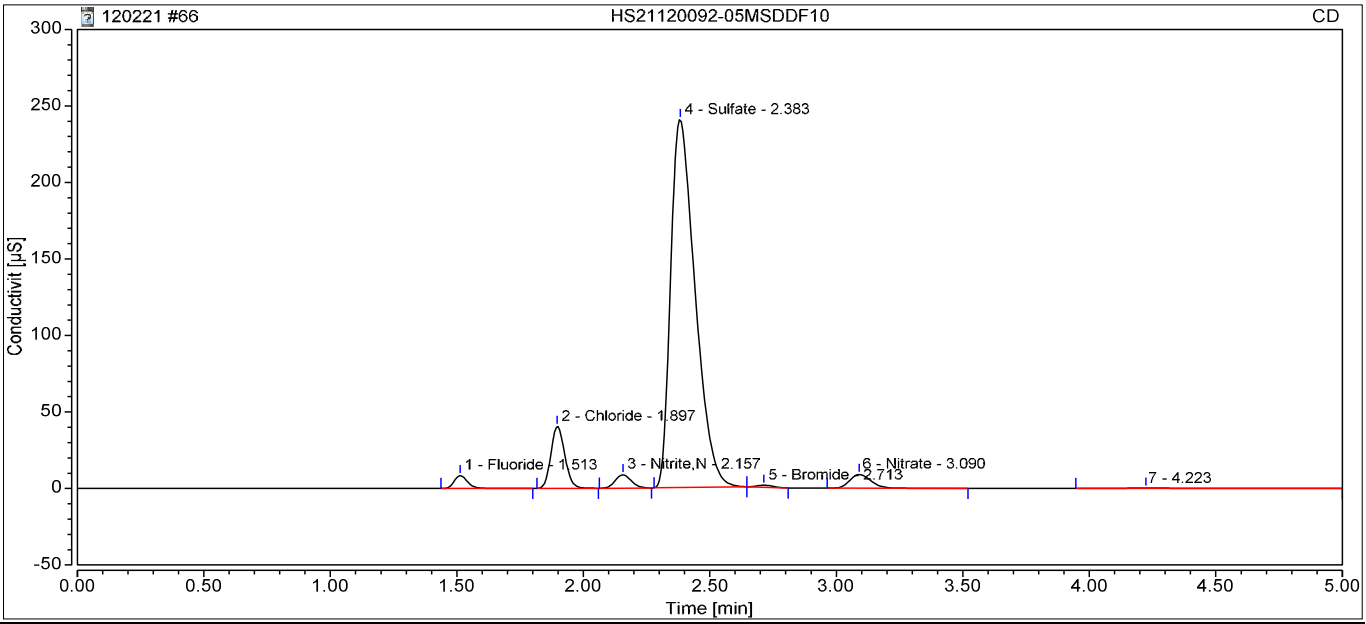
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.519	2.4736	24.7365	10.0000
2	1.90	Chloride	BMB	2.567	17.8634	178.6337	10.0000
3	2.16	Nitrite,N	BMB	0.635	2.0361	20.3611	10.0000
4	2.38	Sulfate	BMB	26.863	253.3382	2533.3815	10.0000
5	2.71	Bromide	BMB	0.093	1.6116	16.1155	10.0000
6	3.09	Nitrate	BMB	0.881	2.7492	27.4917	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**31.559**		**2800.72**	

66 HS21120092-05MSDDF10

Sample Name:	**HS21120092-05MSDDF10**	*Injection Volume:*	**5.00**
Vial Number:	**RA1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**10.0000**
Recording Time:	**12/02/2021 14:01**	*Sample Weight:*	**1.0000**

Run Time:



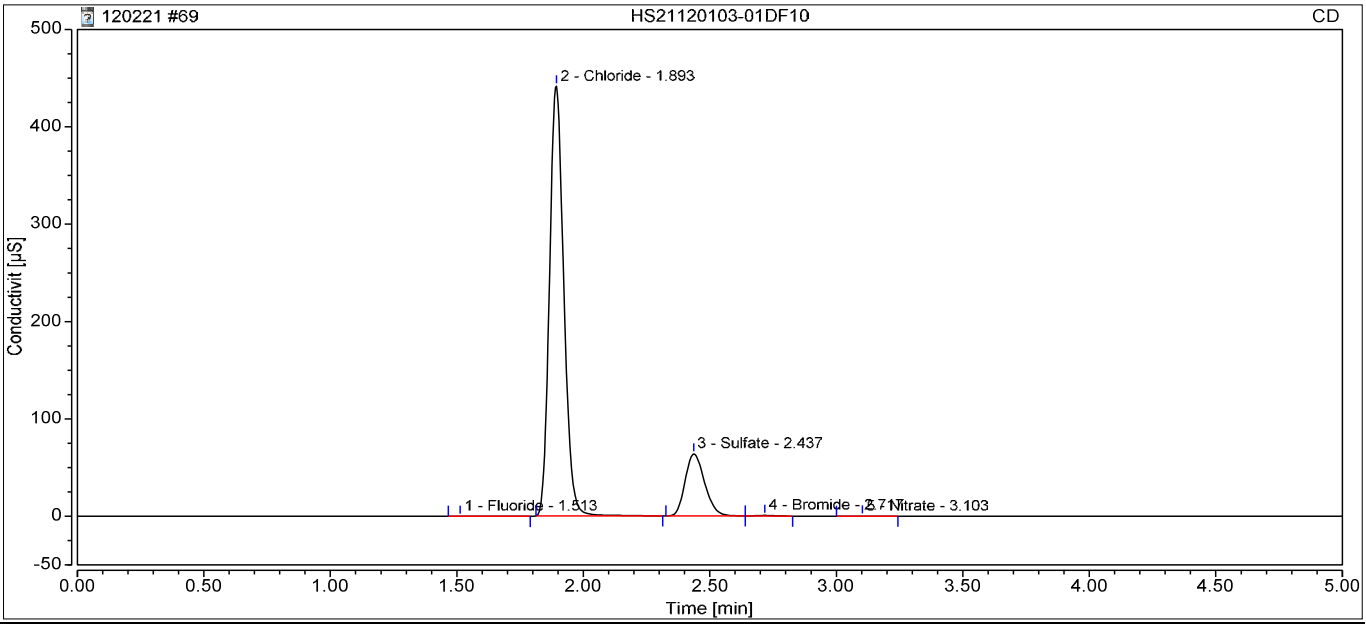
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.523	2.4893	24.8927	10.0000
2	1.90	Chloride	BMB	2.573	17.8998	178.9981	10.0000
3	2.16	Nitrite,N	BMB	0.637	2.0410	20.4096	10.0000
4	2.38	Sulfate	BMB	26.883	253.5340	2535.3398	10.0000
5	2.71	Bromide	BMB	0.094	1.6179	16.1785	10.0000
6	3.09	Nitrate	BMB	0.879	2.7444	27.4441	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**31.589**		**2803.26**	

69 HS21120103-01DF10

Sample Name:	**HS21120103-01DF10**	*Injection Volume:*	**5.00**
Vial Number:	**RA4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**10.0000**
Recording Time:	**12/02/2021 14:24**	*Sample Weight:*	**1.0000**

Run Time:



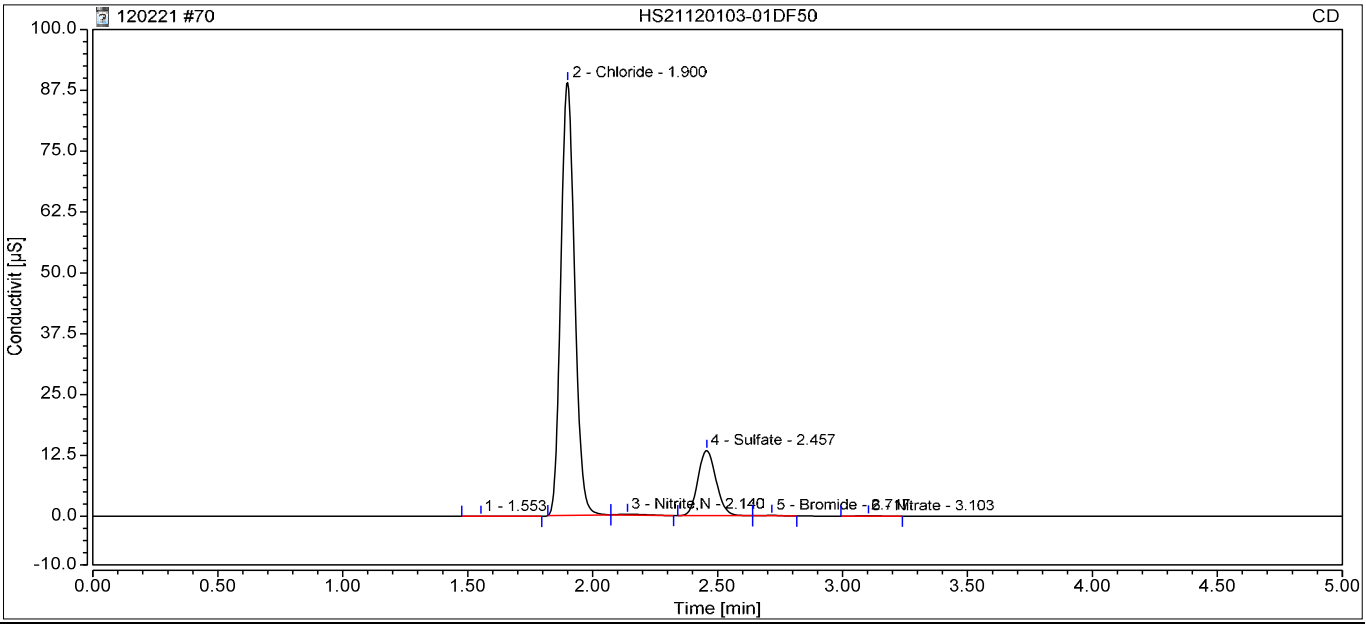
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.005	0.0854	0.8542	10.0000
2	1.89	Chloride	BMB	28.843	198.7378	1987.3782	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
3	2.44	Sulfate	BMB	5.673	53.6418	536.4182	10.0000
4	2.72	Bromide	BMB	0.045	0.8151	8.1513	10.0000
5	3.10	Nitrate	BMB	0.005	0.0814	0.8142	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**34.572**		**2533.62**	

70 HS21120103-01DF50

Sample Name:	**HS21120103-01DF50**	*Injection Volume:*	**5.00**
Vial Number:	**RA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/02/2021 14:31**	*Sample Weight:*	**1.0000**

Run Time:



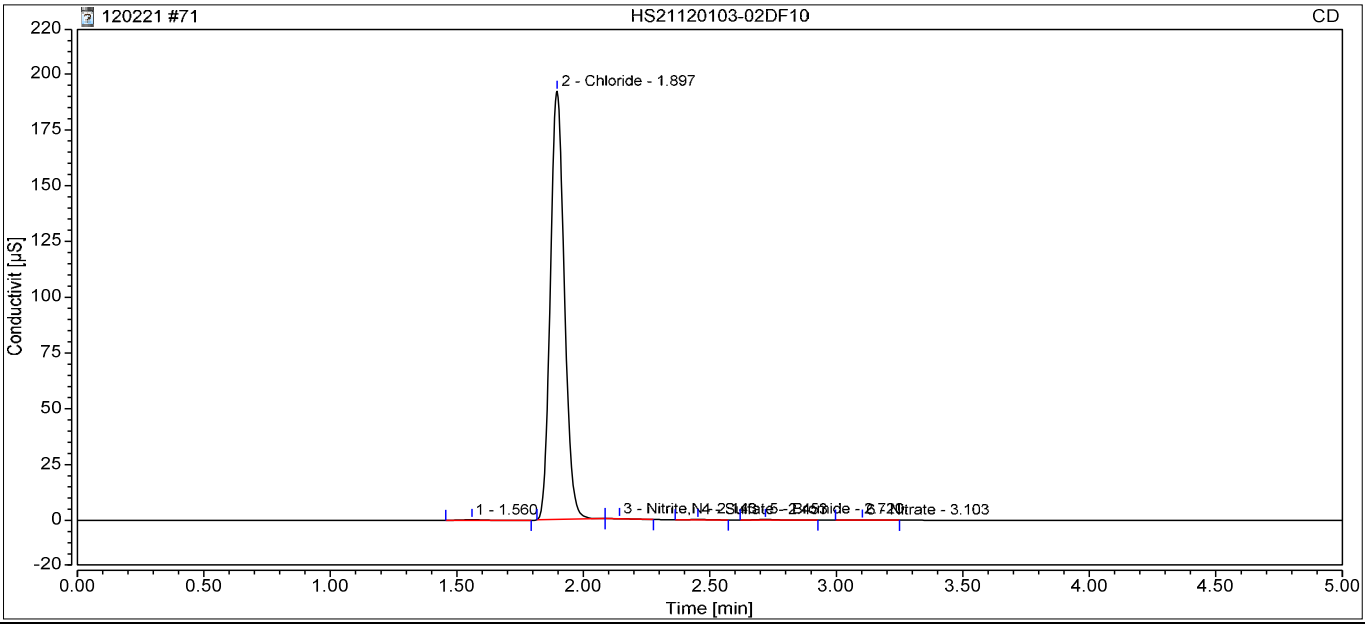
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	50.0000
2	1.90	Chloride	BMB	5.697	39.4063	1970.3150	50.0000
3	2.14	Nitrite,N	BMB	0.020	0.0744	3.7199	50.0000
4	2.46	Sulfate	BMB	1.124	10.7759	538.7948	50.0000
5	2.72	Bromide	BMB	0.008	0.1902	9.5088	50.0000
6	3.10	Nitrate	BMB	0.005	0.0800	4.0018	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	50.0000
Total:			**0.000**	**6.854**		**2526.34**	

71 HS21120103-02DF10

Sample Name:	**HS21120103-02DF10**	*Injection Volume:*	**5.00**
Vial Number:	**RA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**10.0000**
Recording Time:	**12/02/2021 14:39**	*Sample Weight:*	**1.0000**

Run Time:



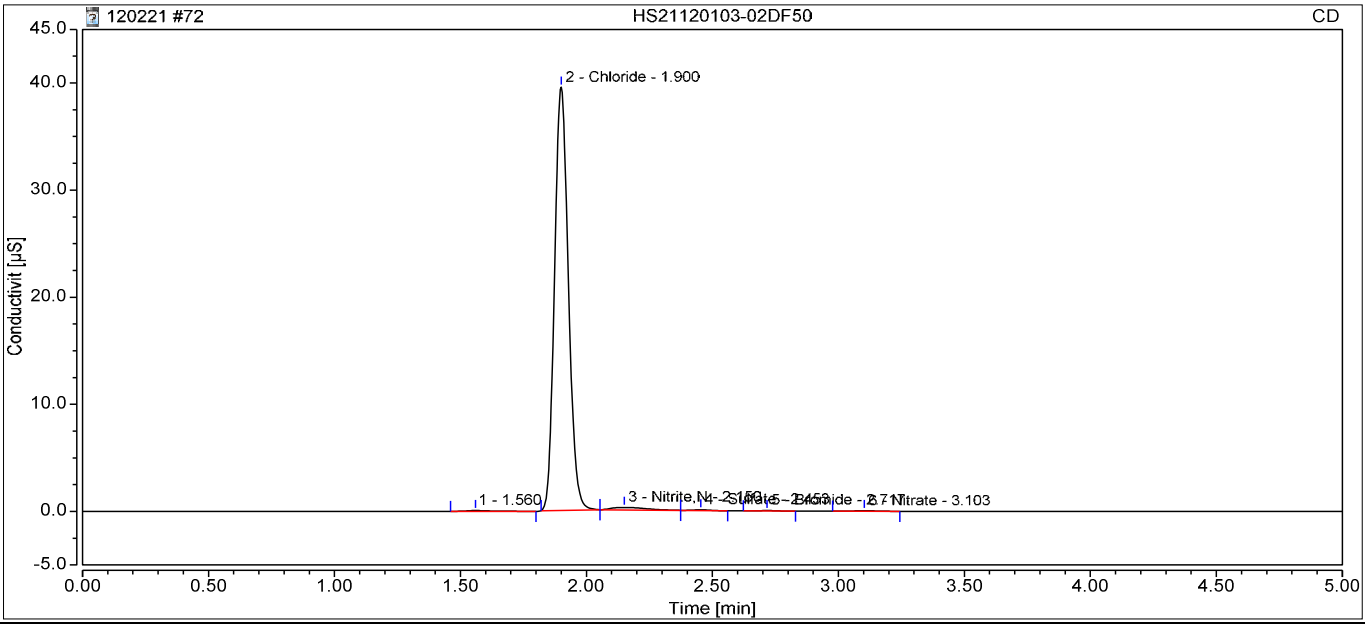
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	10.0000
2	1.90	Chloride	BMB	12.301	84.8640	848.6403	10.0000
3	2.14	Nitrite,N	BMB	0.007	0.0325	0.3253	10.0000
4	2.45	Sulfate	BMB	0.014	0.3073	3.0728	10.0000
5	2.72	Bromide	BMB	0.021	0.4188	4.1881	10.0000
6	3.10	Nitrate	BMB	0.005	0.0796	0.7956	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**12.347**		**857.02**	

72 HS21120103-02DF50

Sample Name:	**HS21120103-02DF50**	*Injection Volume:*	**5.00**
Vial Number:	**RA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/02/2021 14:46**	*Sample Weight:*	**1.0000**

Run Time:



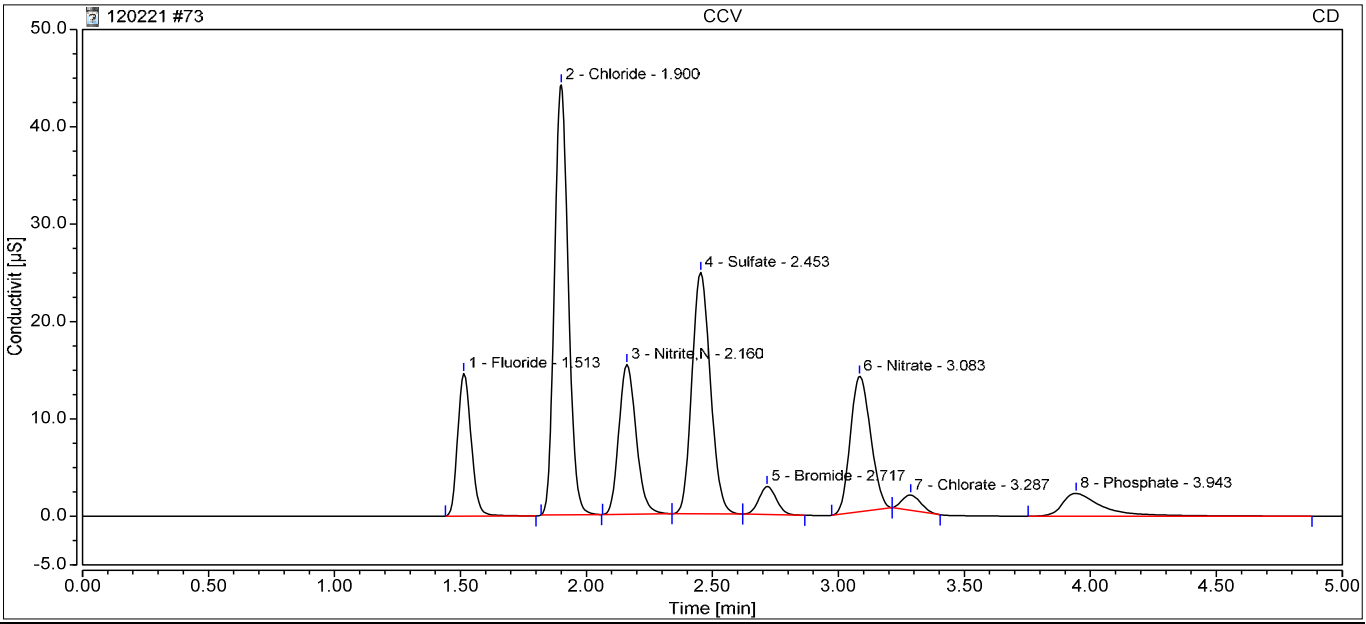
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	50.0000
2	1.90	Chloride	BMB	2.508	17.4539	872.6951	50.0000
3	2.15	Nitrite,N	BMB	0.036	0.1235	6.1773	50.0000
4	2.45	Sulfate	BMB	0.005	0.2261	11.3038	50.0000
5	2.72	Bromide	BMB	0.004	0.1242	6.2080	50.0000
6	3.10	Nitrate	BMB	0.005	0.0802	4.0107	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	50.0000
Total:			**0.000**	**2.557**		**900.39**	

73 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**G1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 15:01**	*Sample Weight:*	**1.0000**

Run Time:



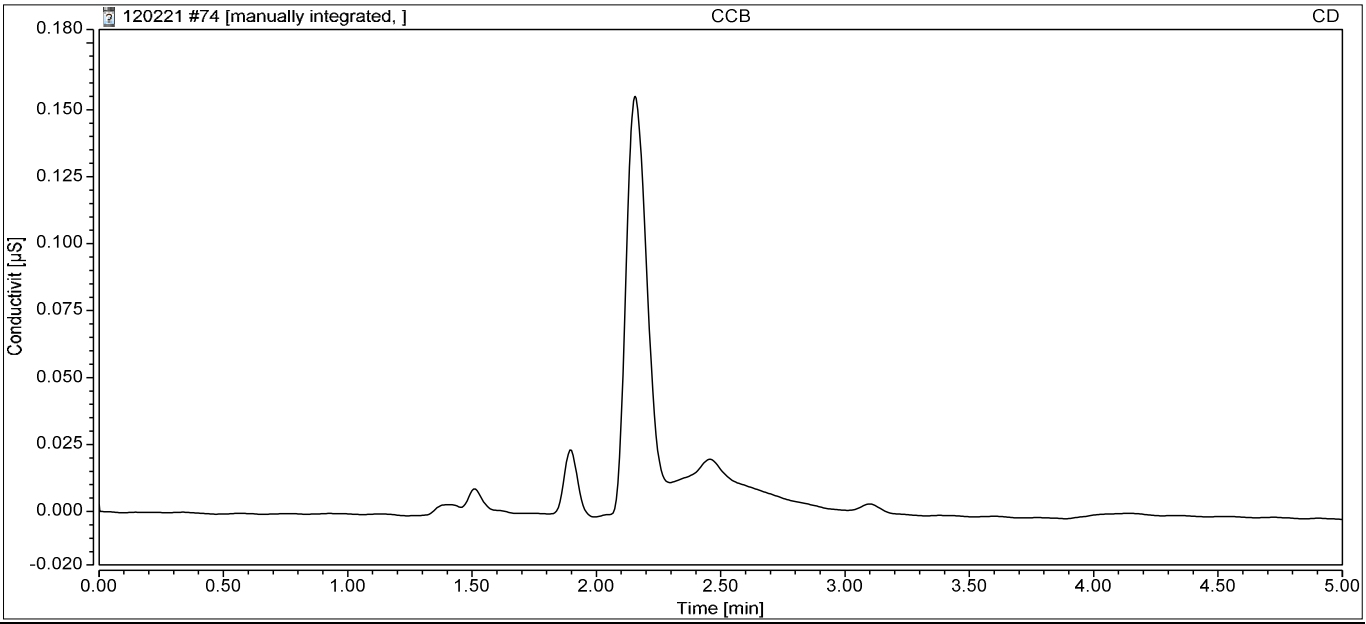
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.910	4.2887	4.2887	1.0000
2	1.90	Chloride	BMB	2.812	19.5491	19.5491	1.0000
3	2.16	Nitrite,N	BMB	1.218	3.9745	3.9745	1.0000
4	2.45	Sulfate	BMB	2.104	20.0076	20.0076	1.0000
5	2.72	Bromide	BMB	0.230	3.8864	3.8864	1.0000
6	3.08	Nitrate	BMB	1.297	4.0176	4.0176	1.0000
7	3.29	Chlorate	BMB	0.136	4.3080	4.3080	1.0000
8	3.94	Phosphate	BMB	0.435	4.1915	4.1915	1.0000
Total:			**0.000**	**9.142**		**64.22**	

74 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 15:09**	*Sample Weight:*	**1.0000**

Run Time:



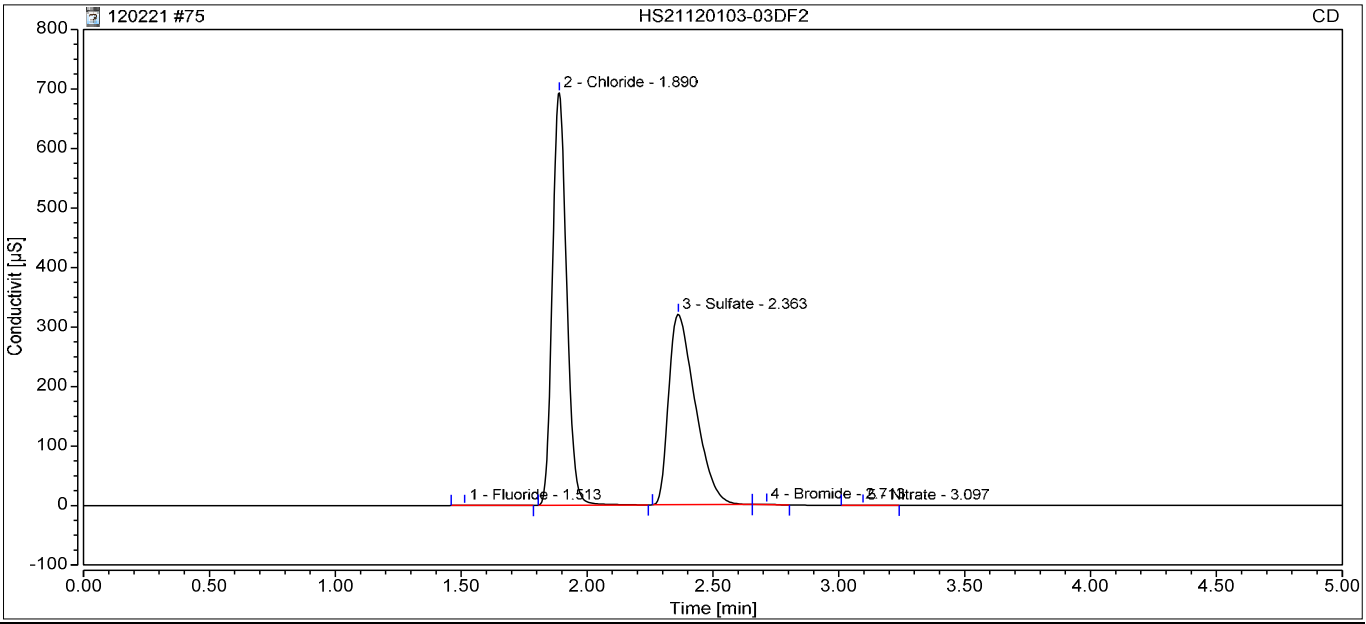
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

75 HS21120103-03DF2

Sample Name:	**HS21120103-03DF2**	*Injection Volume:*	**5.00**
Vial Number:	**RB1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**2.0000**
Recording Time:	**12/02/2021 15:17**	*Sample Weight:*	**1.0000**

Run Time:



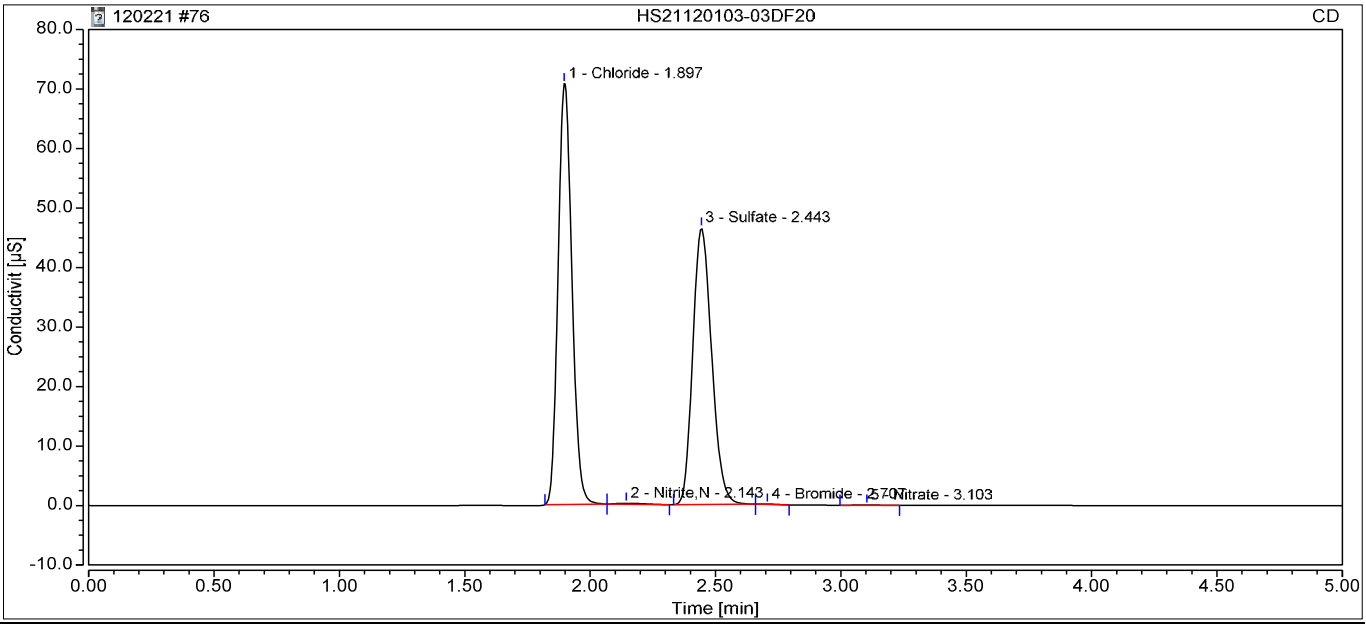
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.012	0.1161	0.2323	2.0000
2	1.89	Chloride	BMB	45.512	313.4771	626.9543	2.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	2.0000
3	2.36	Sulfate	BMB	38.992	367.6463	735.2926	2.0000
4	2.71	Bromide	BMB	0.060	1.0532	2.1064	2.0000
5	3.10	Nitrate	BMB	0.005	0.0810	0.1619	2.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	2.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	2.0000
Total:			**0.000**	**84.580**		**1364.75**	

76 HS21120103-03DF20

Sample Name:	**HS21120103-03DF20**	*Injection Volume:*	**5.00**
Vial Number:	**RB2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**20.0000**
Recording Time:	**12/02/2021 15:24**	*Sample Weight:*	**1.0000**

Run Time:



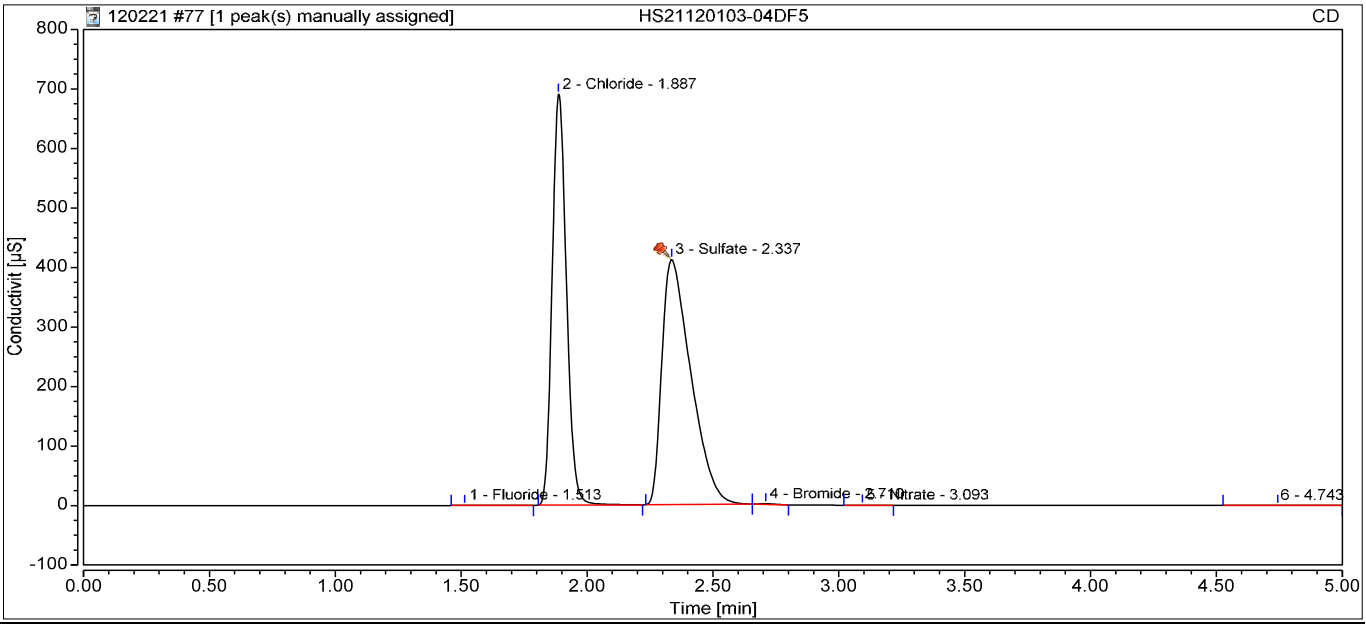
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	20.0000
1	1.90	Chloride	BMB	4.515	31.2736	625.4714	20.0000
2	2.14	Nitrite,N	BMB	0.022	0.0796	1.5921	20.0000
3	2.44	Sulfate	BMB	4.059	38.4357	768.7146	20.0000
4	2.71	Bromide	BMB	0.004	0.1365	2.7292	20.0000
5	3.10	Nitrate	BMB	0.005	0.0792	1.5846	20.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	20.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	20.0000
Total:			**0.000**	**8.606**		**1400.09**	

77 HS21120103-04DF5

Sample Name:	**HS21120103-04DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RB3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/02/2021 15:32**	*Sample Weight:*	**1.0000**

Run Time:



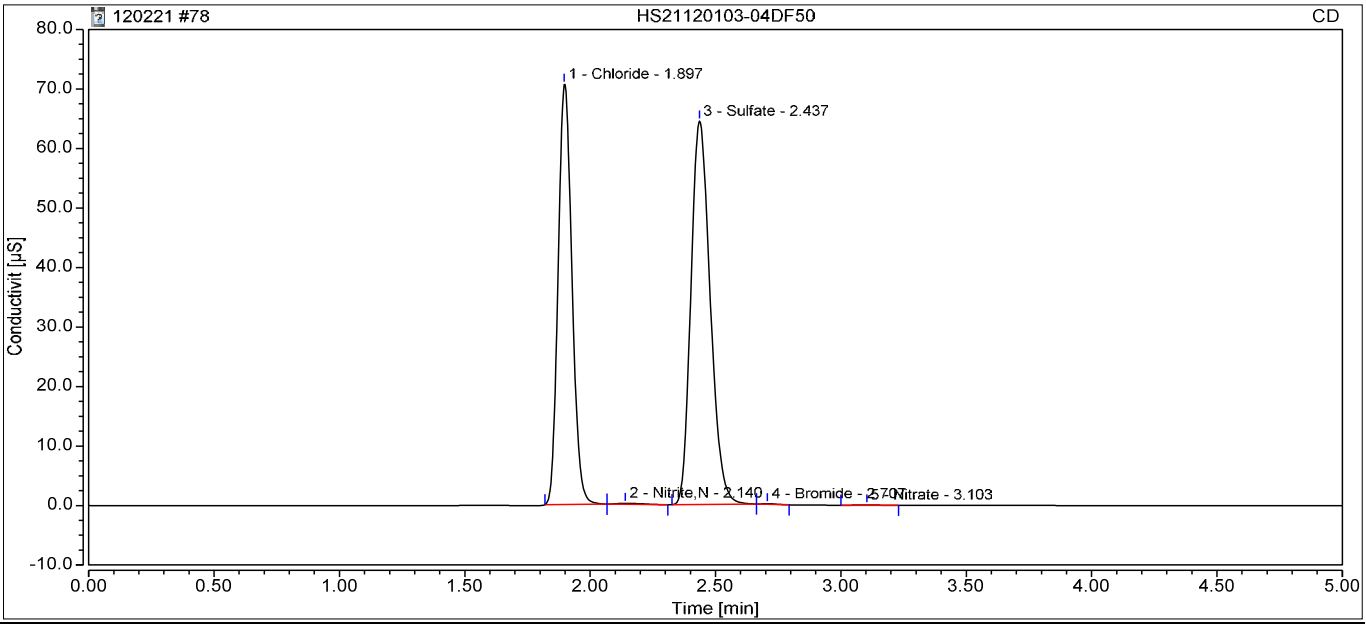
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.012	0.1165	0.5823	5.0000
2	1.89	Chloride	BMB	45.337	312.2713	1561.3566	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
3	2.34	Sulfate	BMB^	54.829	516.9017	2584.5084	5.0000
4	2.71	Bromide	BMB	0.074	1.2976	6.4878	5.0000
5	3.09	Nitrate	BMB	0.005	0.0814	0.4068	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**100.257**		**4153.34**	

78 HS21120103-04DF50

Sample Name:	**HS21120103-04DF50**	*Injection Volume:*	**5.00**
Vial Number:	**RB4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/02/2021 15:39**	*Sample Weight:*	**1.0000**

Run Time:



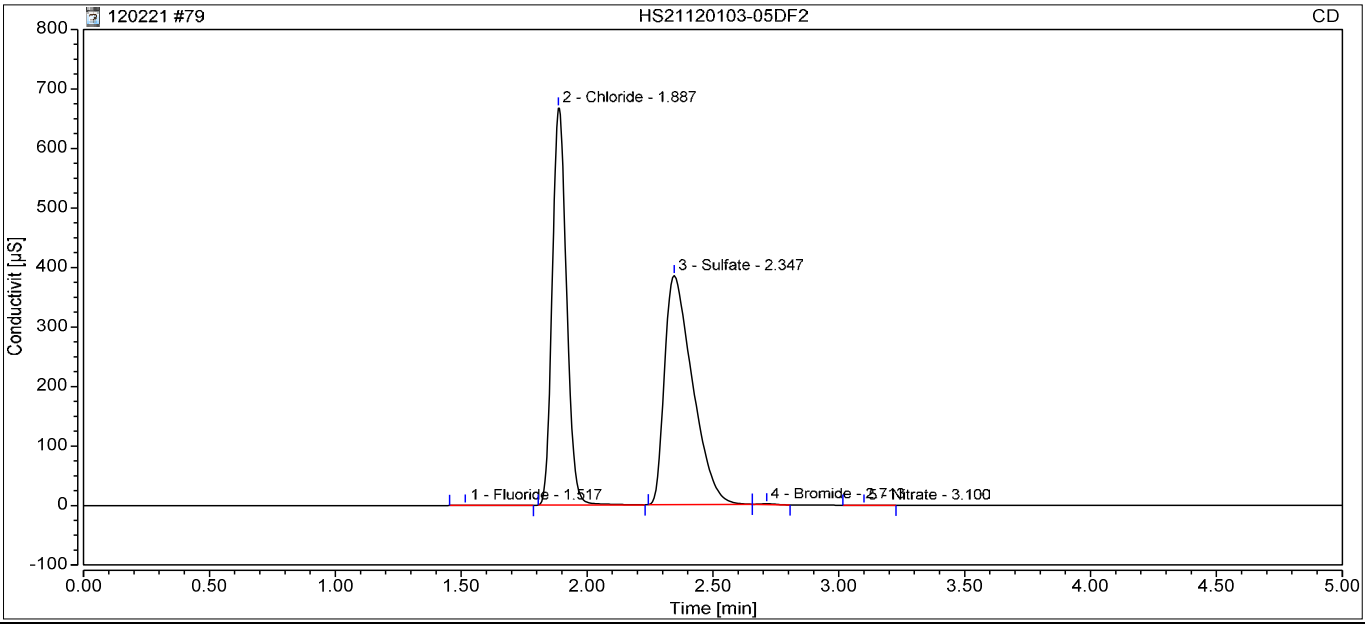
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	50.0000
1	1.90	Chloride	BMB	4.512	31.2469	1562.3455	50.0000
2	2.14	Nitrite,N	BMB	0.022	0.0808	4.0402	50.0000
3	2.44	Sulfate	BMB	5.745	54.3244	2716.2212	50.0000
4	2.71	Bromide	BMB	0.005	0.1523	7.6155	50.0000
5	3.10	Nitrate	BMB	0.005	0.0799	3.9935	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	50.0000
Total:			**0.000**	**10.289**		**4294.22**	

79 HS21120103-05DF2

Sample Name:	**HS21120103-05DF2**	*Injection Volume:*	**5.00**
Vial Number:	**RB5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**2.0000**
Recording Time:	**12/02/2021 15:47**	*Sample Weight:*	**1.0000**

Run Time:



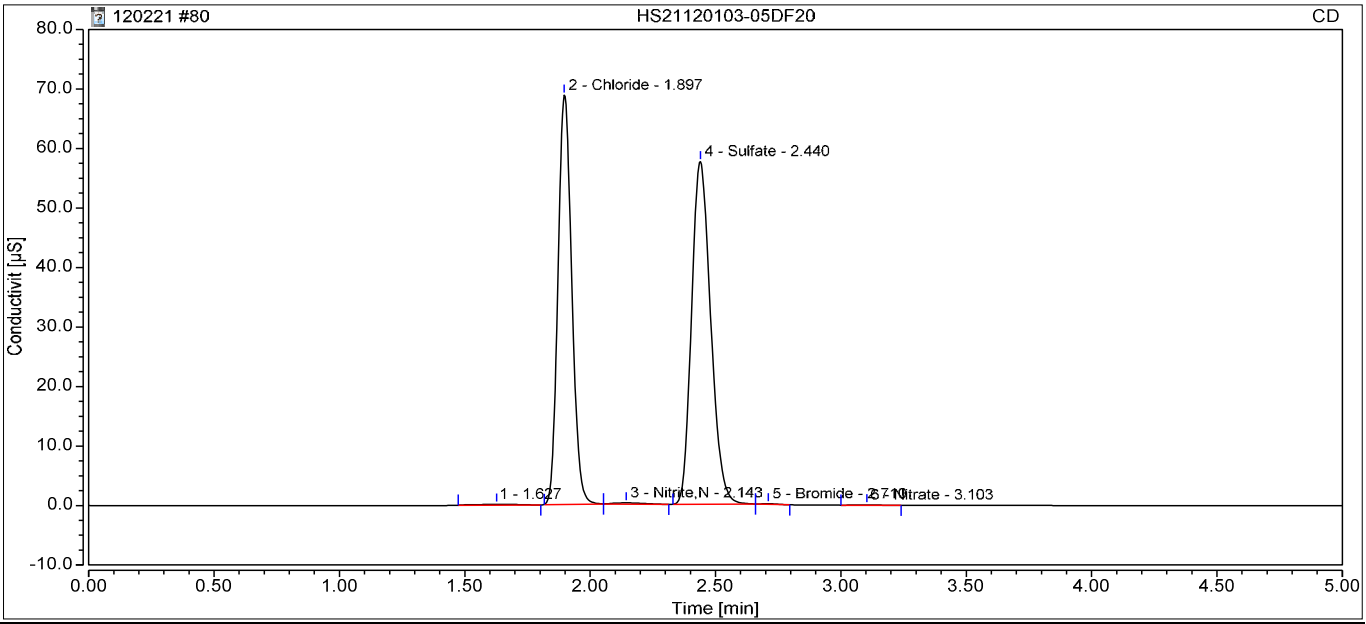
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	0.039	0.2410	0.4820	2.0000
2	1.89	Chloride	BMB	44.124	303.9269	607.8537	2.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	2.0000
3	2.35	Sulfate	BMB	49.480	466.4928	932.9856	2.0000
4	2.71	Bromide	BMB	0.082	1.4223	2.8446	2.0000
5	3.10	Nitrate	BMB	0.006	0.0819	0.1638	2.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	2.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	2.0000
Total:			**0.000**	**93.731**		**1544.33**	

80 HS21120103-05DF20

Sample Name:	**HS21120103-05DF20**	*Injection Volume:*	**5.00**
Vial Number:	**RB6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**20.0000**
Recording Time:	**12/02/2021 15:54**	*Sample Weight:*	**1.0000**

Run Time:



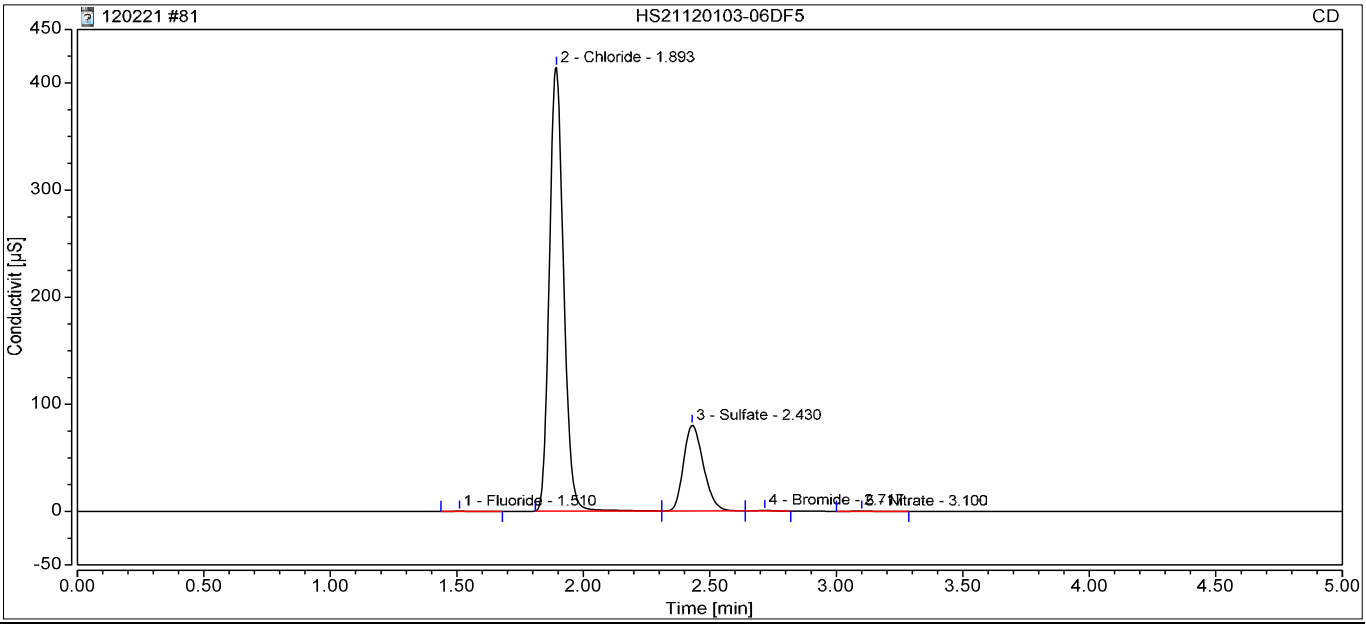
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	20.0000
2	1.90	Chloride	BMB	4.374	30.3019	606.0382	20.0000
3	2.14	Nitrite,N	BMB	0.029	0.1014	2.0281	20.0000
4	2.44	Sulfate	BMB	5.091	48.1542	963.0833	20.0000
5	2.71	Bromide	BMB	0.006	0.1594	3.1884	20.0000
6	3.10	Nitrate	BMB	0.005	0.0799	1.5973	20.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	20.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	20.0000
Total:			**0.000**	**9.504**		**1575.94**	

81 HS21120103-06DF5

Sample Name:	**HS21120103-06DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RB7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/02/2021 16:02**	*Sample Weight:*	**1.0000**

Run Time:



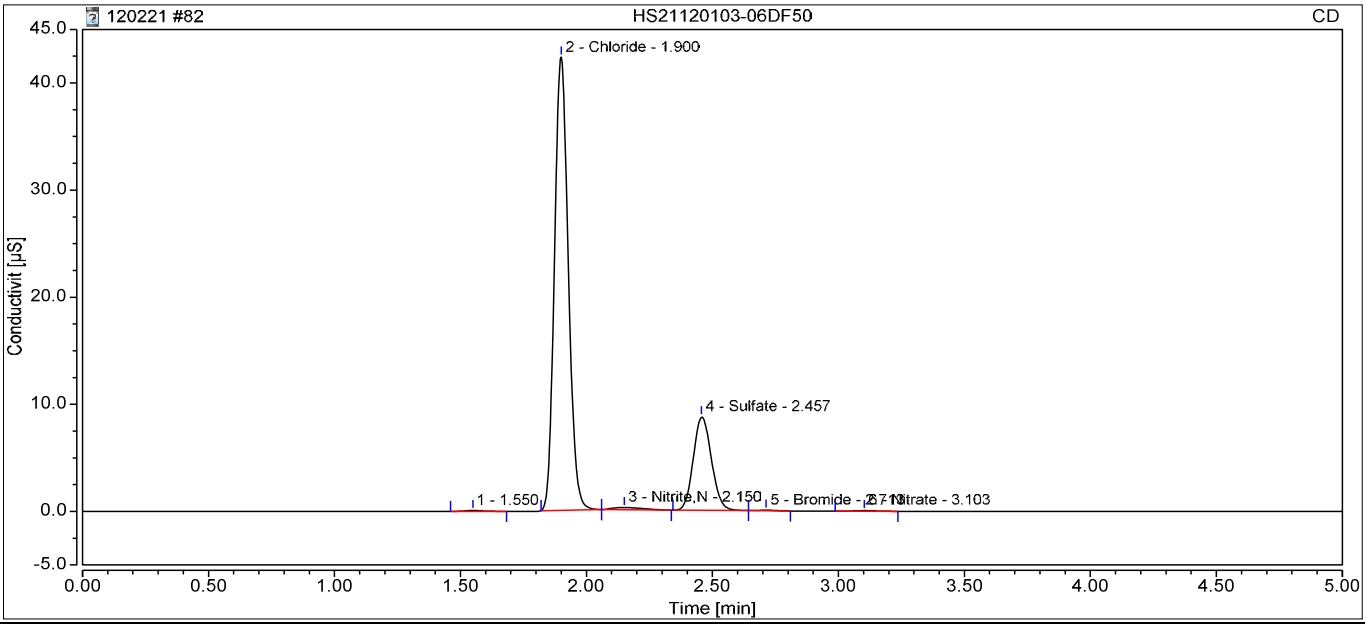
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.017	0.1386	0.6928	5.0000
2	1.89	Chloride	BMB	26.998	186.0370	930.1849	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
3	2.43	Sulfate	BMB	7.253	68.5313	342.6567	5.0000
4	2.72	Bromide	BMB	0.044	0.7908	3.9538	5.0000
5	3.10	Nitrate	BMB	0.005	0.0803	0.4017	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**34.317**		**1277.89**	

82 HS21120103-06DF50

Sample Name:	**HS21120103-06DF50**	*Injection Volume:*	**5.00**
Vial Number:	**RB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/02/2021 16:09**	*Sample Weight:*	**1.0000**

Run Time:



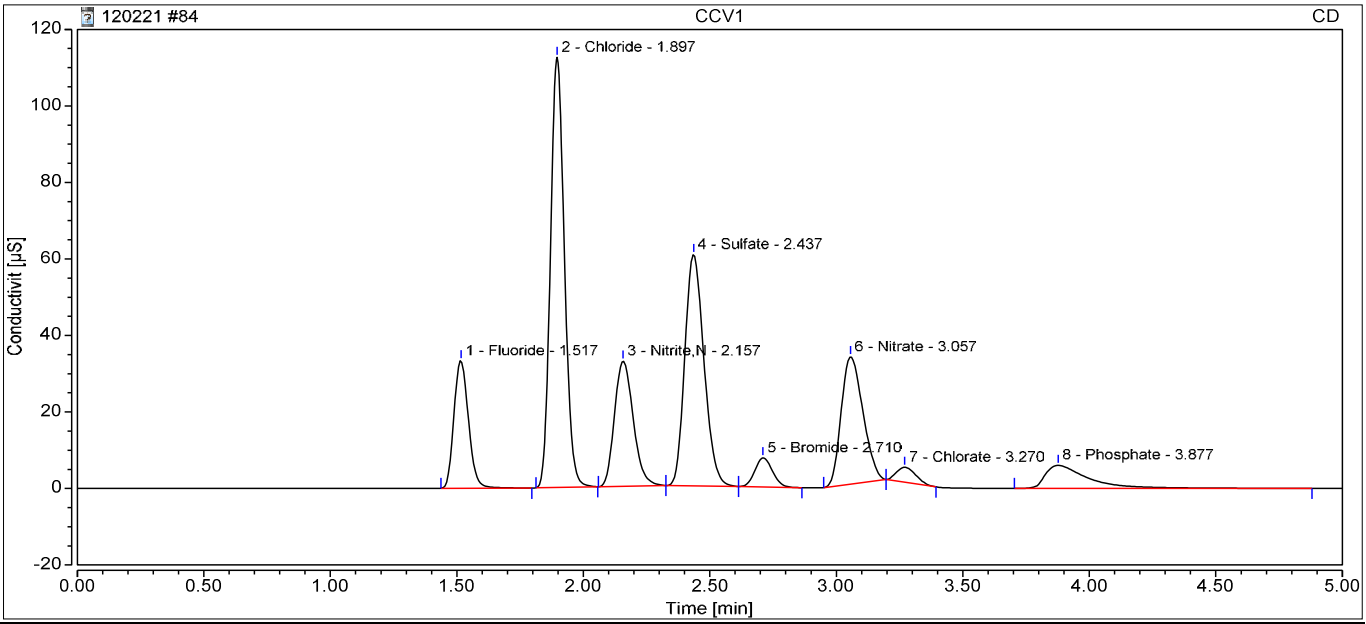
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	50.0000
2	1.90	Chloride	BMB	2.685	18.6767	933.8352	50.0000
3	2.15	Nitrite,N	BMB	0.031	0.1077	5.3828	50.0000
4	2.46	Sulfate	BMB	0.727	7.0329	351.6436	50.0000
5	2.71	Bromide	BMB	0.004	0.1218	6.0903	50.0000
6	3.10	Nitrate	BMB	0.005	0.0809	4.0427	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	50.0000
Total:			**0.000**	**3.452**		**1300.99**	

84 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**G3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 16:32**	*Sample Weight:*	**1.0000**

Run Time:



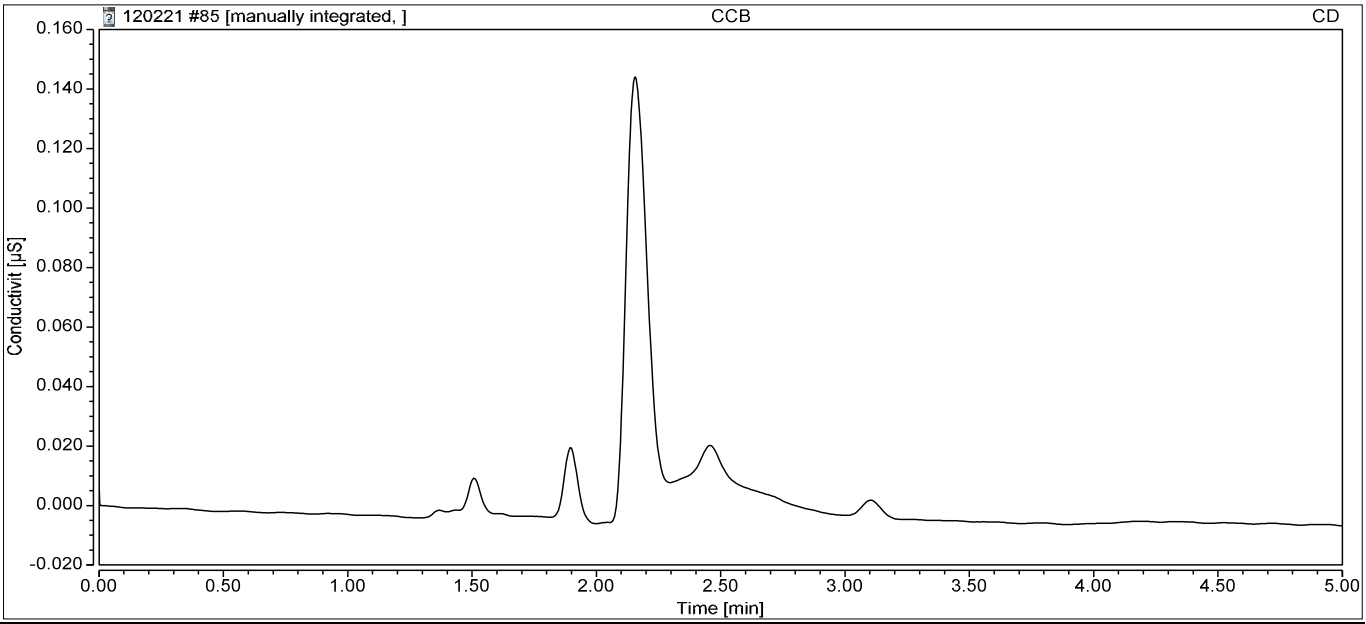
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	2.229	10.4164	10.4164	1.0000
2	1.90	Chloride	BMB	7.187	49.6623	49.6623	1.0000
3	2.16	Nitrite,N	BMB	2.812	9.7864	9.7864	1.0000
4	2.44	Sulfate	BMB	5.299	50.1175	50.1175	1.0000
5	2.71	Bromide	BMB	0.611	10.2225	10.2225	1.0000
6	3.06	Nitrate	BMB	3.311	10.1509	10.1509	1.0000
7	3.27	Chlorate	BMB	0.350	11.0787	11.0787	1.0000
8	3.88	Phosphate	BMB	1.189	9.8453	9.8453	1.0000
Total:			**0.000**	**22.988**		**161.28**	

85 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/02/2021 16:39**	*Sample Weight:*	**1.0000**

Run Time:



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

Sequence: 120321
Last Update Operator: ALSHS.NoUser

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	Processing Method	Volume	Status	Inject Time
	STD1		Calibratic	BC7	1.00	1	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:00:12 AM -06:00
	STD2		Calibratic	BC8	1.00	2	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:07:31 AM -06:00
	STD3		Calibratic	BD1	1.00	3	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:14:50 AM -06:00
	STD4		Calibratic	BD2	1.00	4	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:22:19 AM -06:00
	STD5		Calibratic	BD3	1.00	5	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:29:49 AM -06:00
	STD6		Calibratic	BD4	1.00	6	Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:37:07 AM -06:00
	ICV		Unknown	BD5	1.00		Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:44:36 AM -06:00
	ICB		Unknown	BC4	1.00		Anions Program IS	Anions Proce	5.0	Finished	11/17/2021 9:52:05 AM -06:00
	MBLK		Unknown	R5	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 7:36:34 AM -06:00
	LCS		Unknown	G2	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 7:44:08 AM -06:00
	CCV1		Unknown	G3	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 8:29:12 AM -06:00
	CCB		Unknown	R8	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 8:36:47 AM -06:00
	CCV		Unknown	G1	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 9:58:57 AM -06:00
	CCB		Unknown	R4	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 10:06:32 AM -06:00
	HS21120178-01DF50	9056_W-SH,SO4	Unknown	GD2	50.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 10:58:59 AM -06:00
	HS21120178-01MSDF50		Unknown	GD3	50.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 11:06:22 AM -06:00
	HS21120178-01MSDDF50		Unknown	GD4	50.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 11:13:56 AM -06:00
	CCV1		Unknown	G3	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 11:28:54 AM -06:00
	CCB		Unknown	R8	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 11:36:28 AM -06:00
	HS21120103-02	9056_W-SH	Unknown	GD6	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 11:44:02 AM -06:00
	CCV		Unknown	G1	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 12:16:25 PM -06:00
	CCB		Unknown	R4	1.00		Anions Program IS	Anions Proce	5.0	Finished	12/3/2021 12:23:59 PM -06:00

Sequence: 120721
Injection #6: STD6

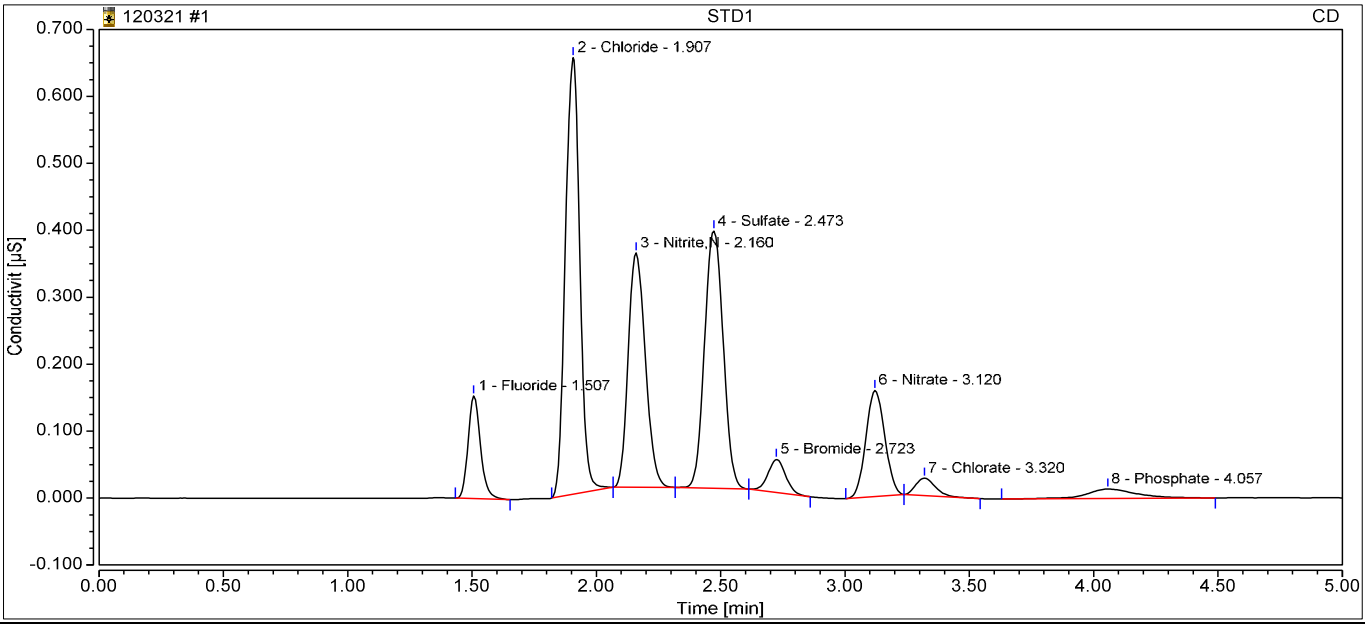
Calibration

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	***Fluoride***	***Lin, WithOffset, 1/***	***Area***	***6***	***20.8005***	***0.99829***	***-0.0130***	***0.2152***	***0.0000***
2	Chloride	Lin, WithOffset, 1/	Area	6	3.5331	0.99994	-0.0278	0.1453	0.0000
3	Nitrite,N	Quad, WithOffset,	Area	6	7.6353	0.99973	-0.0036	0.3206	-0.0034
4	Sulfate	Lin, WithOffset, 1/	Area	6	4.0513	0.99993	-0.0189	0.1061	0.0000
5	Bromide	Lin, WithOffset, 1/	Area	6	23.6161	0.99783	-0.0038	0.0602	0.0000
6	Nitrate	Lin, WithOffset, 1/	Area	6	6.5575	0.99983	-0.0214	0.3283	0.0000
7	Chlorate	Lin, WithOffset, 1/	Area	6	21.0683	0.99794	-0.0009	0.0317	0.0000
n.a.	Phosphate	Quad, WithOffset,	Area	5	33.7500	0.99725	-0.0088	0.0942	0.0028
Maximum					**33.7500**	0.99994			
Minimum					3.5331	**0.99725**			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**BC7**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:00**	*Sample Weight:*	**1.0000**

Run Time:

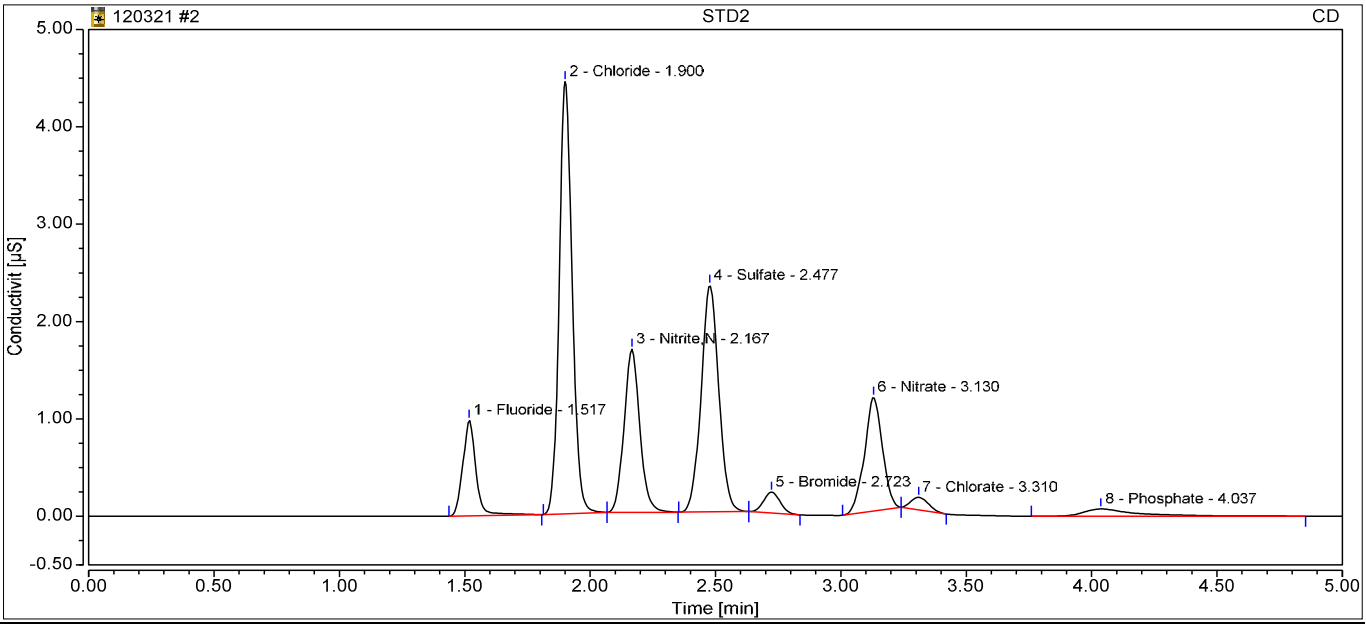


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.009	0.1018	0.1018	1.0000
2	1.91	Chloride	BMB	0.044	0.4914	0.4914	1.0000
3	2.16	Nitrite,N	BMB	0.028	0.0987	0.0987	1.0000
4	2.47	Sulfate	BMB	0.033	0.4938	0.4938	1.0000
5	2.72	Bromide	BMB	0.004	0.1308	0.1308	1.0000
6	3.12	Nitrate	BMB	0.014	0.1076	0.1076	1.0000
7	3.32	Chlorate	BMB	0.002	0.1039	0.1039	1.0000
8	4.06	Phosphate	BMB	0.003	0.1282	0.1282	1.0000
Total:			**0.000**	**0.138**		**1.66**	

2 STD2			
Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**BC8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:07**	*Sample Weight:*	**1.0000**

Run Time:

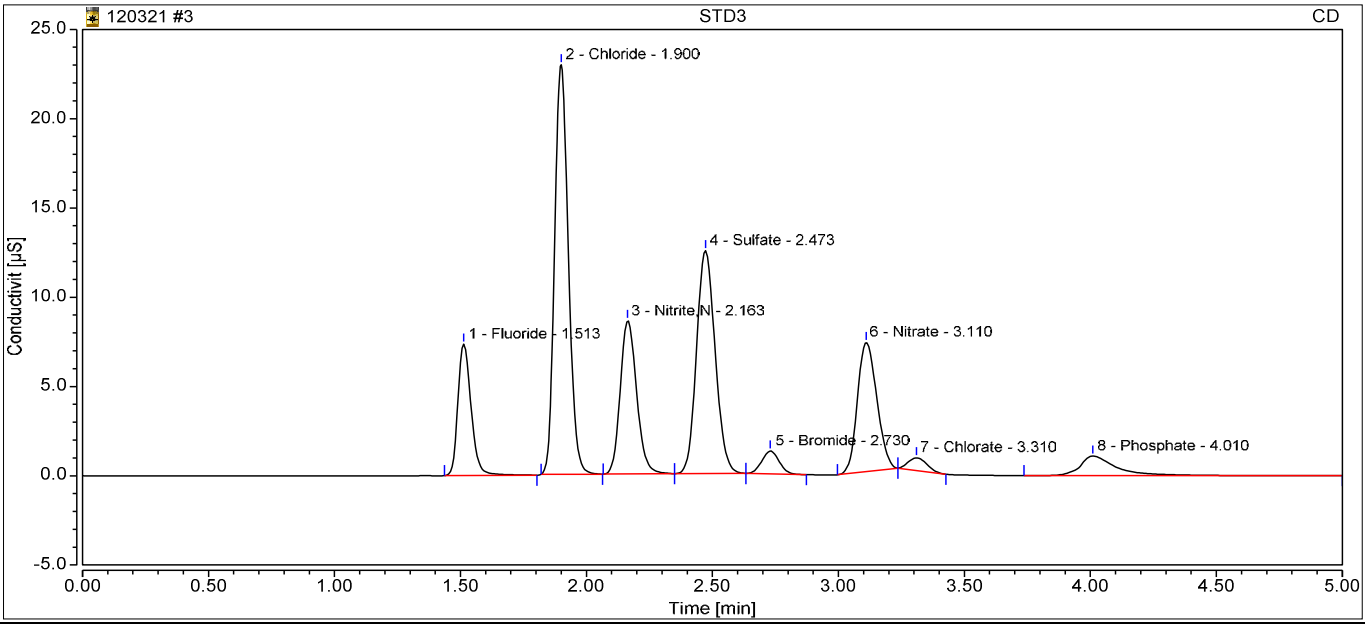


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	0.060	0.3395	0.3395	1.0000
2	1.90	Chloride	BMB	0.265	2.0129	2.0129	1.0000
3	2.17	Nitrite,N	BMB	0.122	0.3924	0.3924	1.0000
4	2.48	Sulfate	BMB	0.190	1.9659	1.9659	1.0000
5	2.72	Bromide	BMB	0.016	0.3362	0.3362	1.0000
6	3.13	Nitrate	BMB	0.097	0.3599	0.3599	1.0000
7	3.31	Chlorate	BMB	0.011	0.3622	0.3622	1.0000
8	4.04	Phosphate	BMB	0.018	0.2816	0.2816	1.0000
Total:			**0.000**	**0.778**		**6.05**	

3 STD3			
Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**BD1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:14**	*Sample Weight:*	**1.0000**

Run Time:



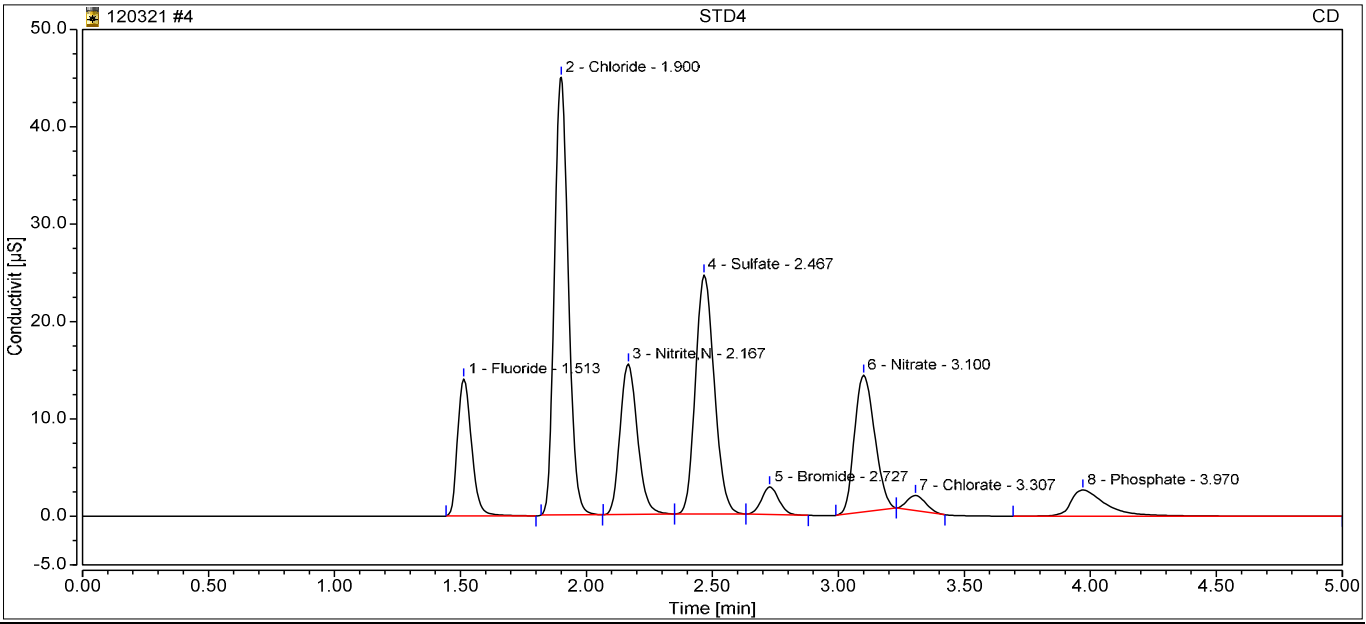
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.450	2.1496	2.1496	1.0000
2	1.90	Chloride	BMB	1.450	10.1720	10.1720	1.0000
3	2.16	Nitrite,N	BMB	0.648	2.0763	2.0763	1.0000
4	2.47	Sulfate	BMB	1.069	10.2544	10.2544	1.0000
5	2.73	Bromide	BMB	0.103	1.7696	1.7696	1.0000
6	3.11	Nitrate	BMB	0.646	2.0317	2.0317	1.0000
7	3.31	Chlorate	BMB	0.061	1.9584	1.9584	1.0000
8	4.01	Phosphate	BMB	0.184	1.9390	1.9390	1.0000
Total:			**0.000**	**4.610**		**32.35**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**BD2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:22**	*Sample Weight:*	**1.0000**

Run Time:



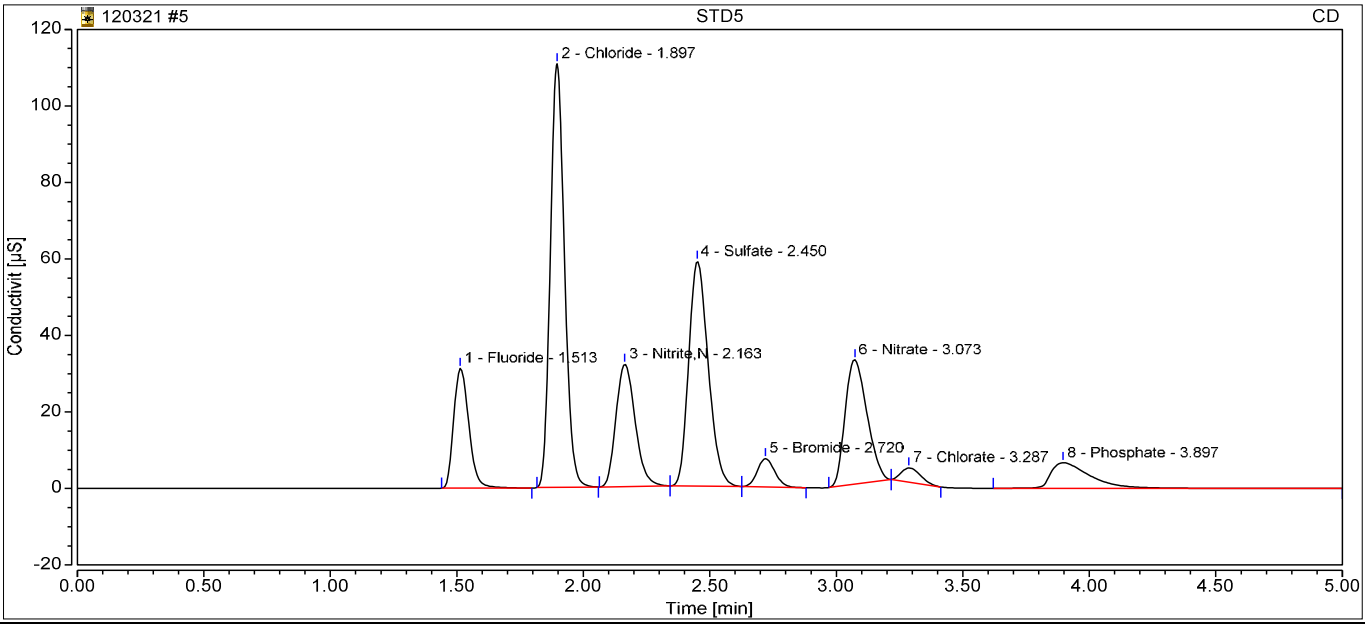
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.905	4.2644	4.2644	1.0000
2	1.90	Chloride	BMB	2.879	20.0096	20.0096	1.0000
3	2.17	Nitrite,N	BMB	1.237	4.0414	4.0414	1.0000
4	2.47	Sulfate	BMB	2.129	20.2388	20.2388	1.0000
5	2.73	Bromide	BMB	0.224	3.7876	3.7876	1.0000
6	3.10	Nitrate	BMB	1.306	4.0426	4.0426	1.0000
7	3.31	Chlorate	BMB	0.133	4.2276	4.2276	1.0000
8	3.97	Phosphate	BMB	0.435	4.1908	4.1908	1.0000
Total:			**0.000**	**9.248**		**64.80**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**BD3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:29**	*Sample Weight:*	**1.0000**

Run Time:

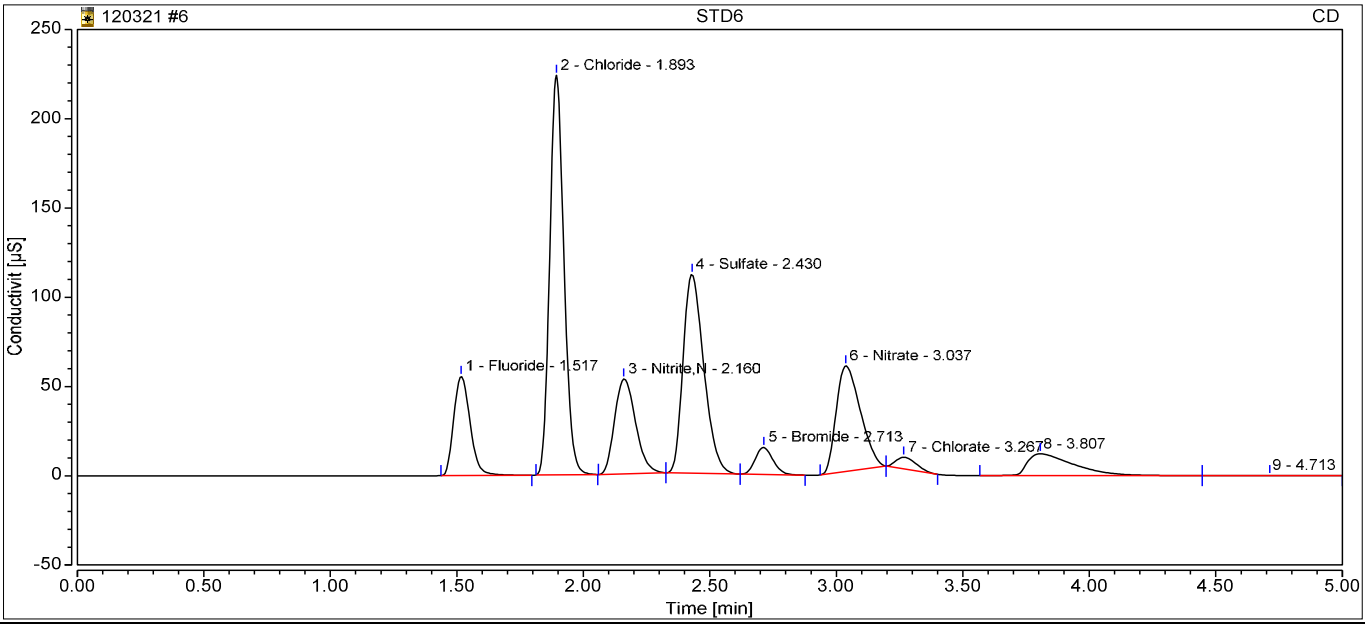


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	2.184	10.2071	10.2071	1.0000
2	1.90	Chloride	BMB	7.162	49.4936	49.4936	1.0000
3	2.16	Nitrite,N	BMB	2.810	9.7795	9.7795	1.0000
4	2.45	Sulfate	BMB	5.250	49.6578	49.6578	1.0000
5	2.72	Bromide	BMB	0.593	9.9182	9.9182	1.0000
6	3.07	Nitrate	BMB	3.259	9.9925	9.9925	1.0000
7	3.29	Chlorate	BMB	0.333	10.5345	10.5345	1.0000
8	3.90	Phosphate	BMB	1.205	9.9518	9.9518	1.0000
Total:			**0.000**	**22.797**		**159.54**	

6 STD6			
Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**BD4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:37**	*Sample Weight:*	**1.0000**

Run Time:



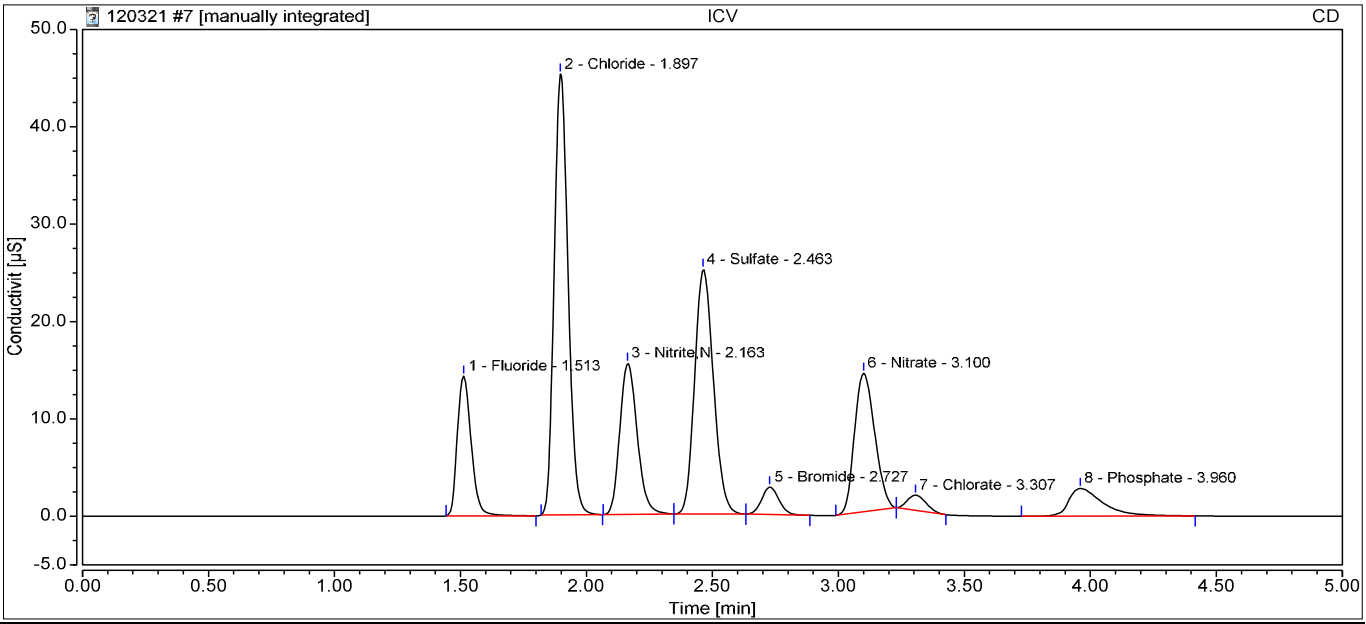
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	4.171	19.4376	19.4376	1.0000
2	1.89	Chloride	BMB	14.546	100.3205	100.3205	1.0000
3	2.16	Nitrite,N	BMB	5.087	20.1255	20.1255	1.0000
4	2.43	Sulfate	BMB	10.580	99.8893	99.8893	1.0000
5	2.71	Bromide	BMB	1.233	20.5575	20.5575	1.0000
6	3.04	Nitrate	BMB	6.532	19.9657	19.9657	1.0000
7	3.27	Chlorate	BMB	0.611	19.3134	19.3134	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**42.760**		**299.61**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**BD5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:44**	*Sample Weight:*	**1.0000**

Run Time:



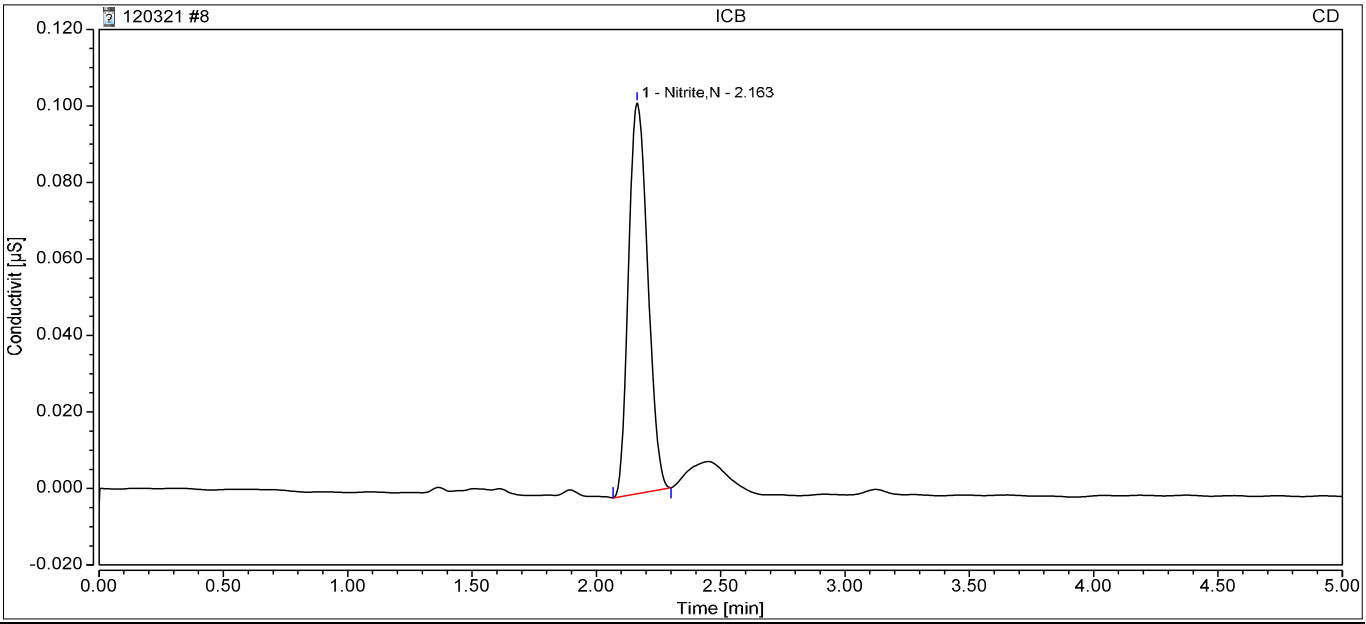
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.915	4.3113	4.3113	1.0000
2	1.90	Chloride	BMB	2.895	20.1215	20.1215	1.0000
3	2.16	Nitrite,N	BMB	1.240	4.0518	4.0518	1.0000
4	2.46	Sulfate	BMB	2.169	20.6197	20.6197	1.0000
5	2.73	Bromide	BMB	0.224	3.7819	3.7819	1.0000
6	3.10	Nitrate	BMB	1.325	4.1019	4.1019	1.0000
7	3.31	Chlorate	BMB	0.136	4.3121	4.3121	1.0000
8	3.96	Phosphate	BMB*	0.448	4.3023	4.3023	1.0000
Total:			**0.000**	**9.352**		**65.60**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**BC4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/17/2021 09:52**	*Sample Weight:*	**1.0000**

Run Time:



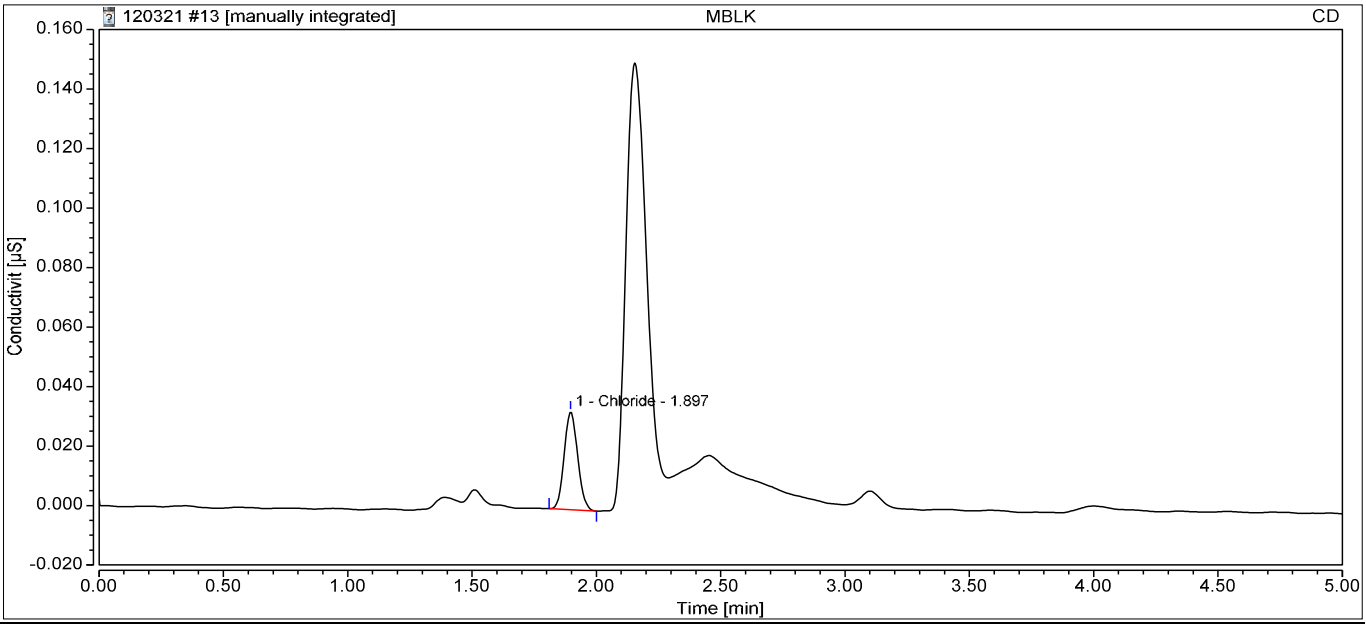
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
1	2.16	Nitrite,N	BMB	0.009	0.0398	0.0398	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.009**		**0.04**	

13 MBLK

Sample Name:	**MBLK**	*Injection Volume:*	**5.00**
Vial Number:	**R5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 07:36**	*Sample Weight:*	**1.0000**

Run Time:



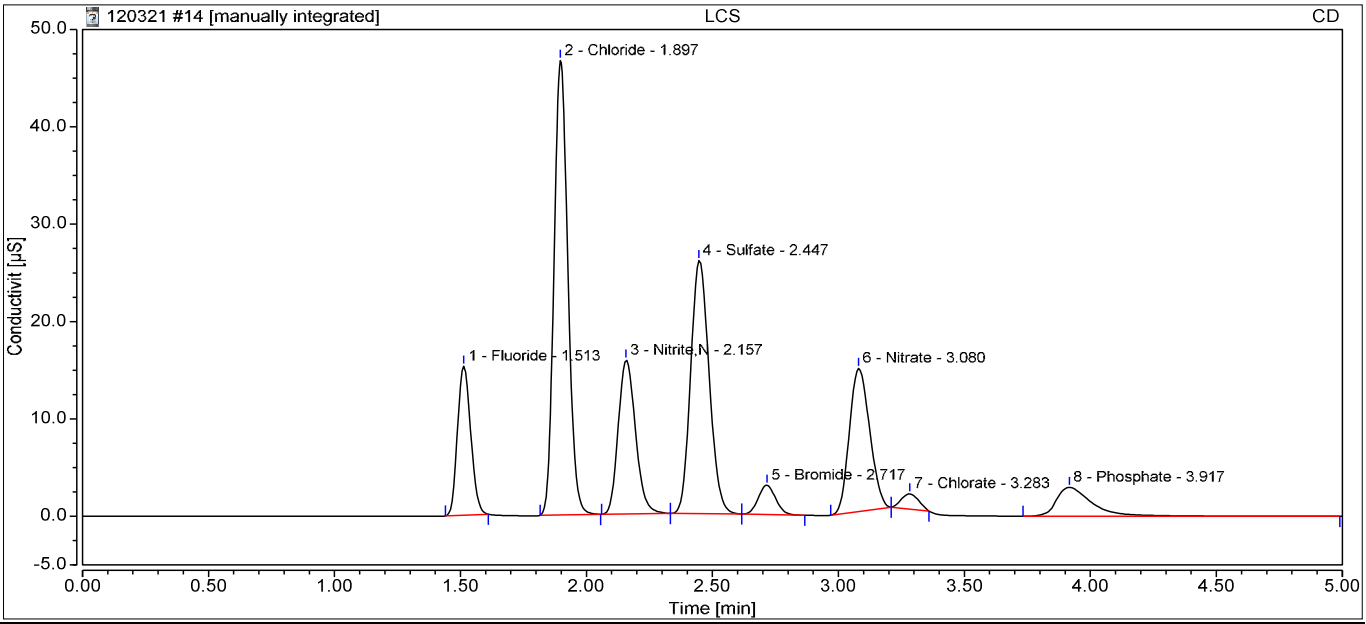
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	1.90	Chloride	BMB	0.002	0.2056	0.2056	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.002**		**0.21**	

14 LCS

Sample Name:	**LCS**	*Injection Volume:*	**5.00**
Vial Number:	**G2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 07:44**	*Sample Weight:*	**1.0000**

Run Time:

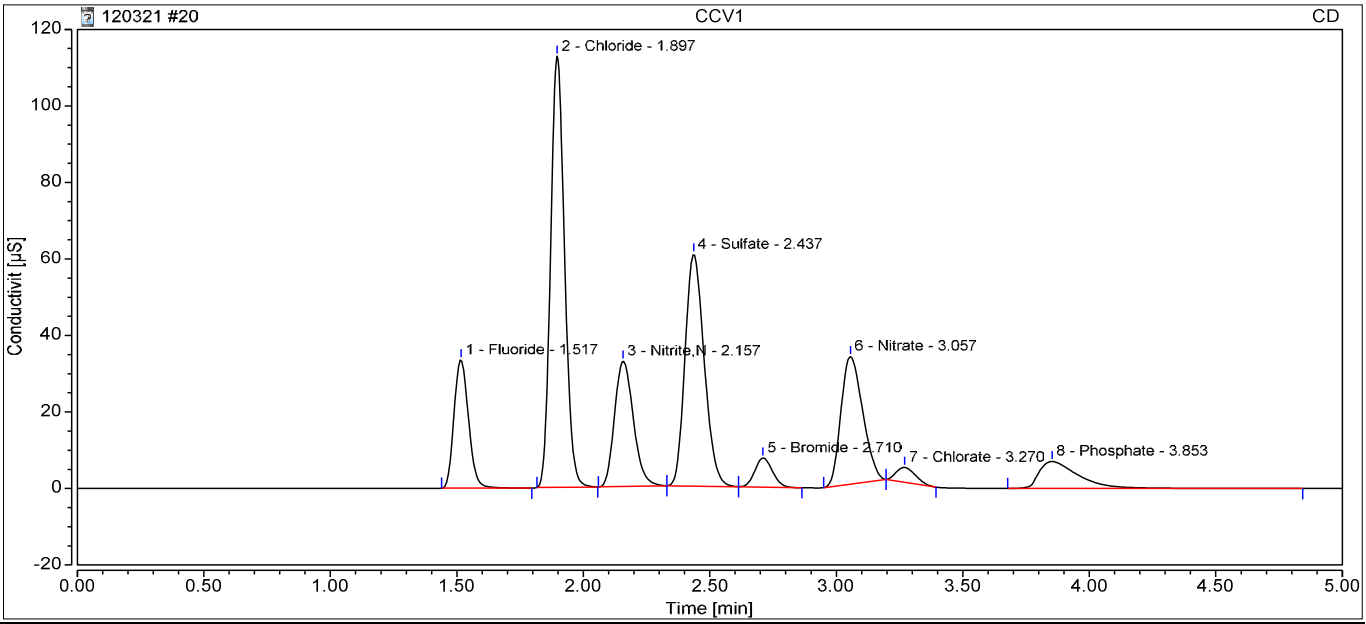


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB*	0.933	4.3934	4.3934	1.0000
2	1.90	Chloride	BMB	2.973	20.6539	20.6539	1.0000
3	2.16	Nitrite,N	BMB	1.260	4.1198	4.1198	1.0000
4	2.45	Sulfate	BMB	2.212	21.0273	21.0273	1.0000
5	2.72	Bromide	BMB	0.241	4.0606	4.0606	1.0000
6	3.08	Nitrate	BMb*	1.373	4.2473	4.2473	1.0000
7	3.28	Chlorate	bMB*	0.124	3.9550	3.9550	1.0000
8	3.92	Phosphate	BMB	0.488	4.6339	4.6339	1.0000
Total:			**0.000**	**9.603**		**67.09**	

20 CCV1			
Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**G3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 08:29**	*Sample Weight:*	**1.0000**

Run Time:



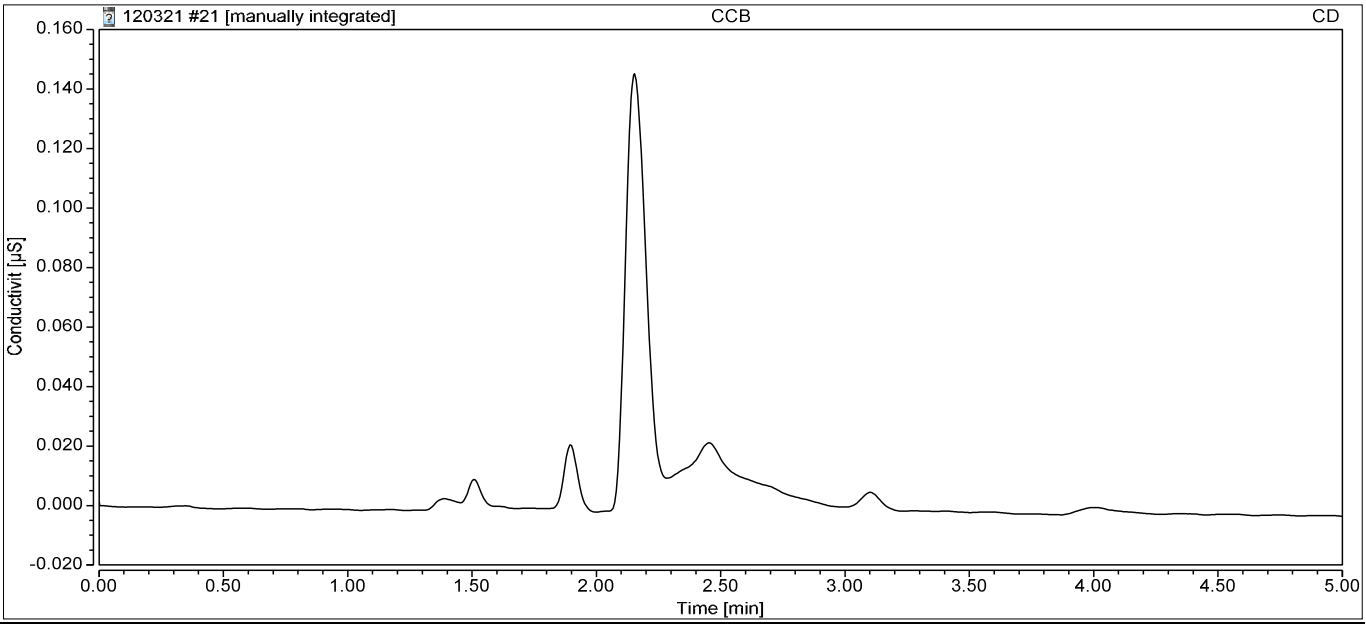
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	2.238	10.4563	10.4563	1.0000
2	1.90	Chloride	BMB	7.213	49.8434	49.8434	1.0000
3	2.16	Nitrite,N	BMB	2.823	9.8270	9.8270	1.0000
4	2.44	Sulfate	BMB	5.323	50.3426	50.3426	1.0000
5	2.71	Bromide	BMB	0.613	10.2581	10.2581	1.0000
6	3.06	Nitrate	BMB	3.324	10.1921	10.1921	1.0000
7	3.27	Chlorate	BMB	0.345	10.9289	10.9289	1.0000
8	3.85	Phosphate	BMB	1.264	10.3436	10.3436	1.0000
Total:			**0.000**	**23.143**		**162.19**	

21 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 08:36**	*Sample Weight:*	**1.0000**

Run Time:



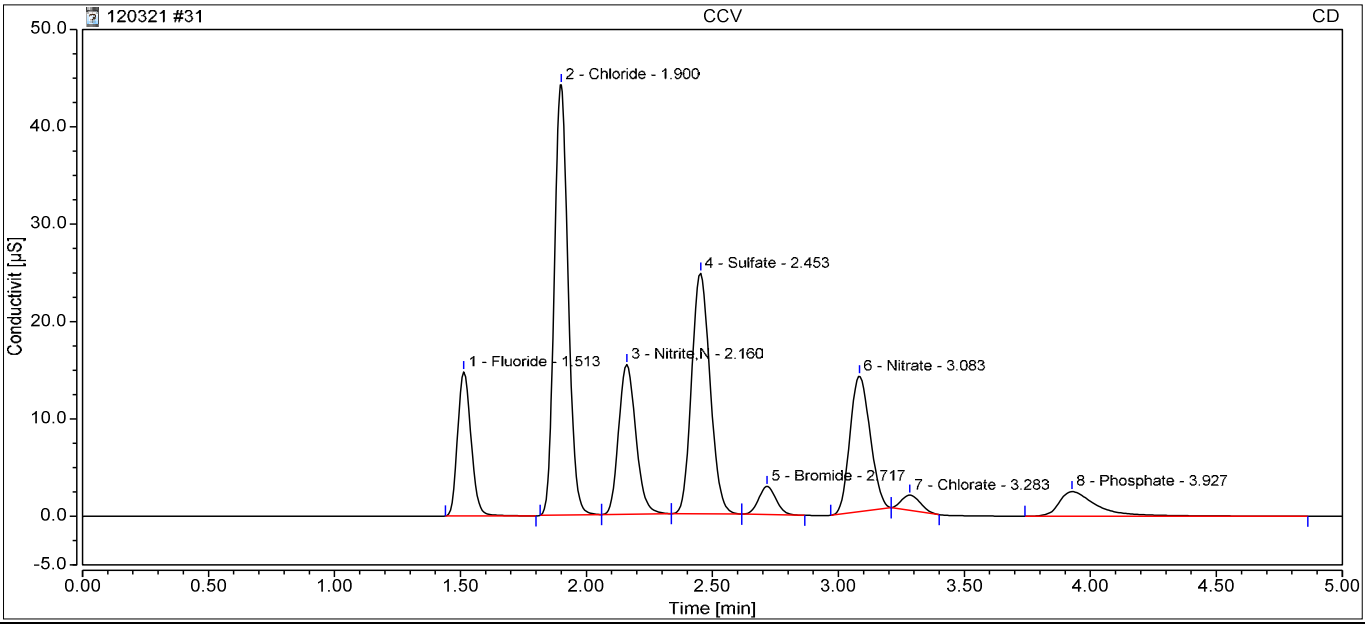
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

31 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**G1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 09:58**	*Sample Weight:*	**1.0000**

Run Time:



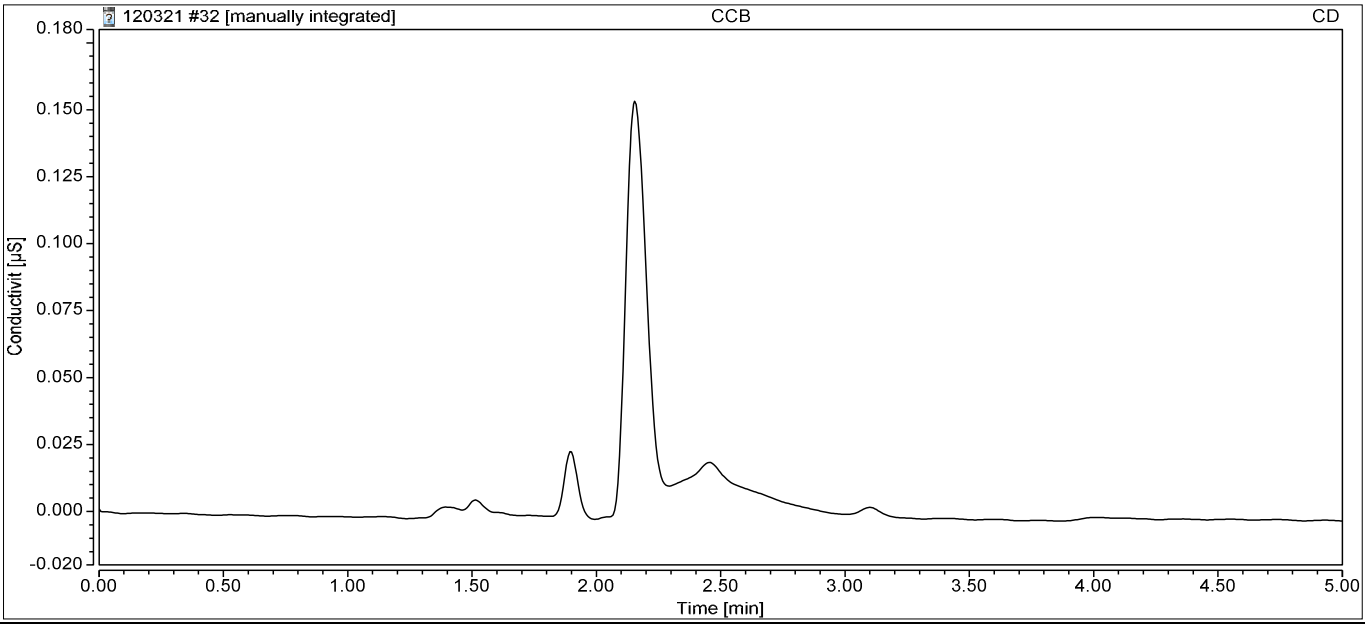
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.920	4.3329	4.3329	1.0000
2	1.90	Chloride	BMB	2.816	19.5753	19.5753	1.0000
3	2.16	Nitrite,N	BMB	1.217	3.9715	3.9715	1.0000
4	2.45	Sulfate	BMB	2.099	19.9576	19.9576	1.0000
5	2.72	Bromide	BMB	0.230	3.8896	3.8896	1.0000
6	3.08	Nitrate	BMB	1.298	4.0193	4.0193	1.0000
7	3.28	Chlorate	BMB	0.136	4.3251	4.3251	1.0000
8	3.93	Phosphate	BMB	0.445	4.2775	4.2775	1.0000
Total:			**0.000**	**9.161**		**64.35**	

32 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 10:06**	*Sample Weight:*	**1.0000**

Run Time:



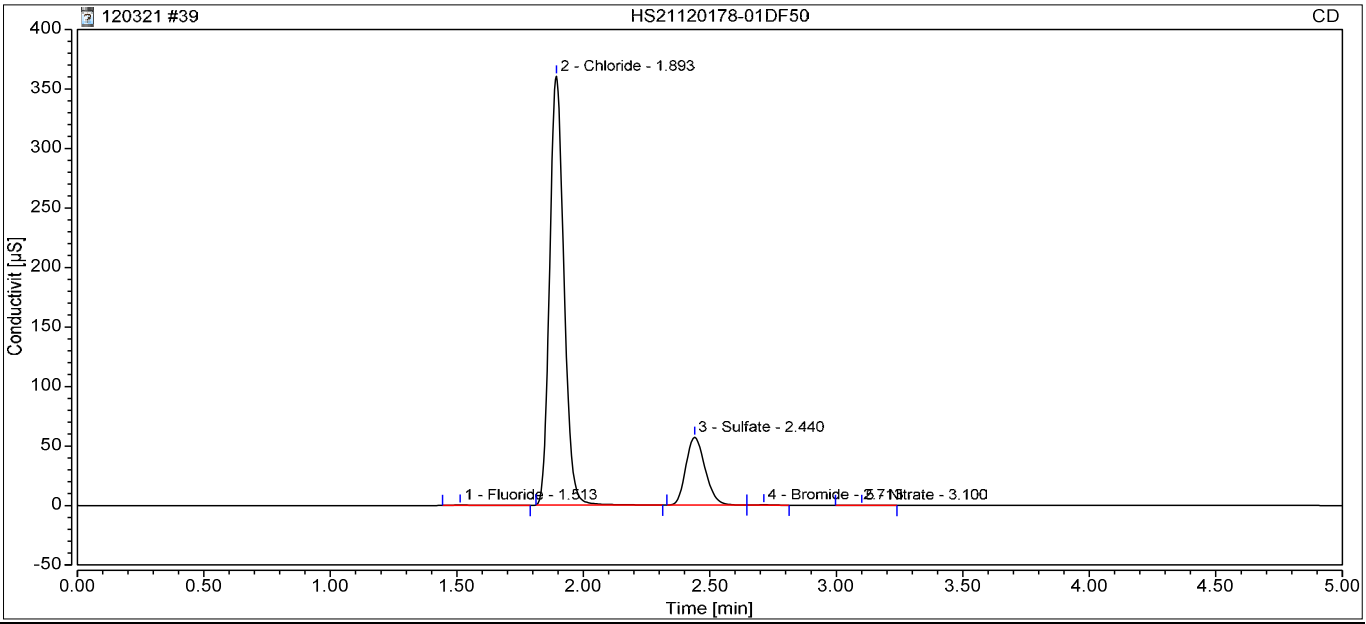
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

39 HS21120178-01DF50

Sample Name:	**HS21120178-01DF50**	*Injection Volume:*	**5.00**
Vial Number:	**GD2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/03/2021 10:58**	*Sample Weight:*	**1.0000**

Run Time:



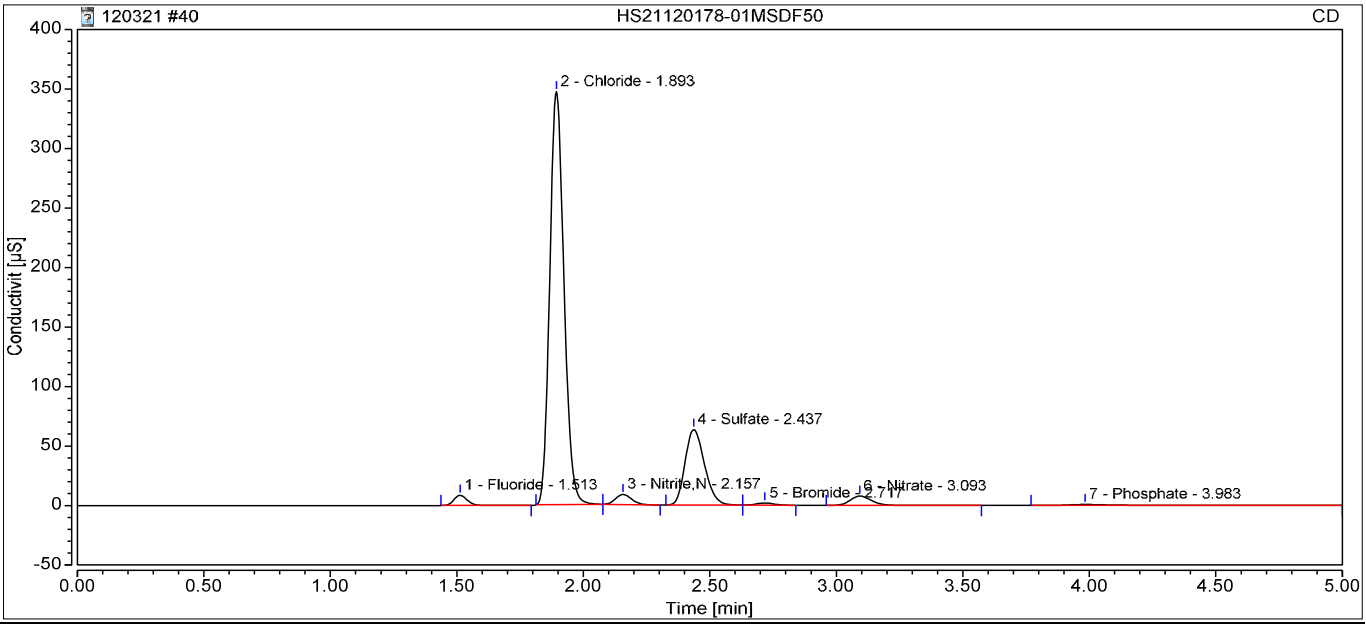
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.040	0.2456	12.2792	50.0000
2	1.89	Chloride	BMB	23.610	162.7151	8135.7540	50.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	50.0000
3	2.44	Sulfate	BMB	5.032	47.6042	2380.2103	50.0000
4	2.71	Bromide	BMB	0.021	0.4153	20.7669	50.0000
5	3.10	Nitrate	BMB	0.006	0.0839	4.1968	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	50.0000
Total:			**0.000**	**28.710**		**10553.21**	

40 HS21120178-01MSDF50

Sample Name:	**HS21120178-01MSDF50**	*Injection Volume:*	**5.00**
Vial Number:	**GD3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/03/2021 11:06**	*Sample Weight:*	**1.0000**

Run Time:



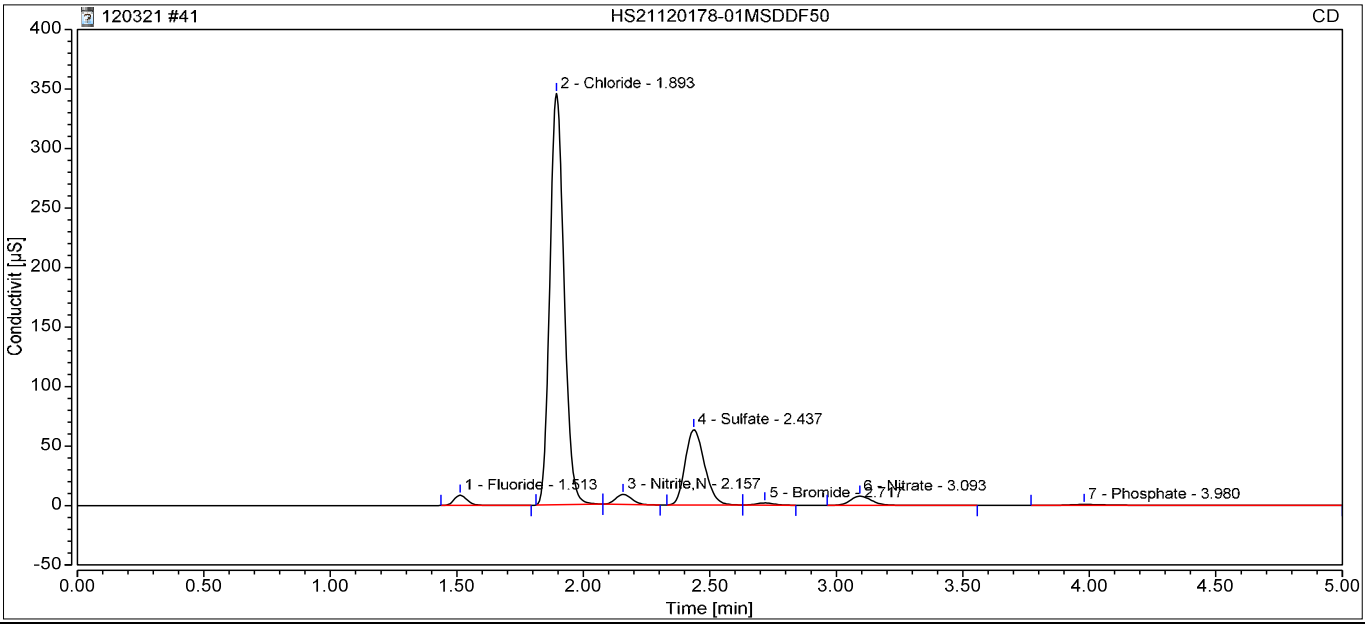
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.523	2.4917	124.5840	50.0000
2	1.89	Chloride	BMB	22.592	155.7078	7785.3893	50.0000
3	2.16	Nitrite,N	BMB	0.630	2.0179	100.8953	50.0000
4	2.44	Sulfate	BMB	5.637	53.3072	2665.3586	50.0000
5	2.72	Bromide	BMB	0.141	2.4090	120.4488	50.0000
6	3.09	Nitrate	BMB	0.758	2.3741	118.7068	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
7	3.98	Phosphate	BMB	0.196	2.0528	102.6388	50.0000
Total:			**0.000**	**30.478**		**11018.02**	

41 HS21120178-01MSDDF50

Sample Name:	**HS21120178-01MSDDF50**	*Injection Volume:*	**5.00**
Vial Number:	**GD4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/03/2021 11:13**	*Sample Weight:*	**1.0000**

Run Time:



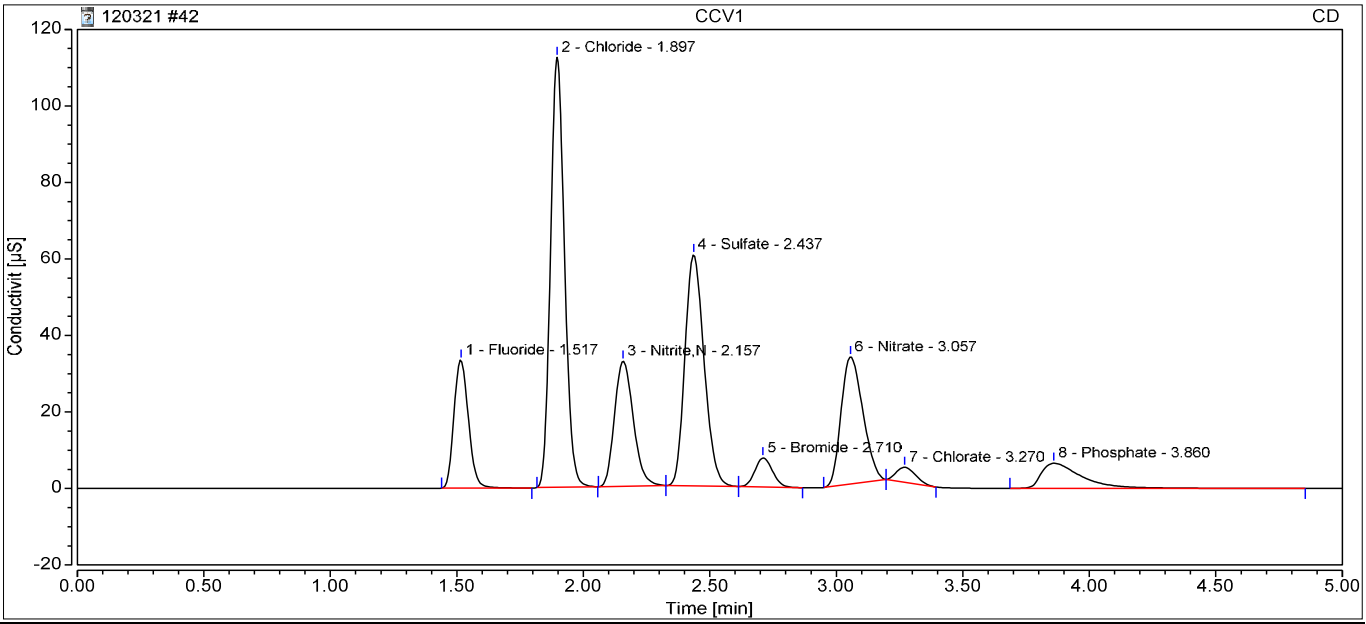
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.532	2.5299	126.4958	50.0000
2	1.89	Chloride	BMB	22.476	154.9055	7745.2745	50.0000
3	2.16	Nitrite,N	BMB	0.628	2.0114	100.5705	50.0000
4	2.44	Sulfate	BMB	5.610	53.0496	2652.4786	50.0000
5	2.72	Bromide	BMB	0.141	2.4080	120.4014	50.0000
6	3.09	Nitrate	BMB	0.752	2.3561	117.8049	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
7	3.98	Phosphate	BMB	0.198	2.0675	103.3743	50.0000
Total:			**0.000**	**30.336**		**10966.40**	

42 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**G3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 11:28**	*Sample Weight:*	**1.0000**

Run Time:



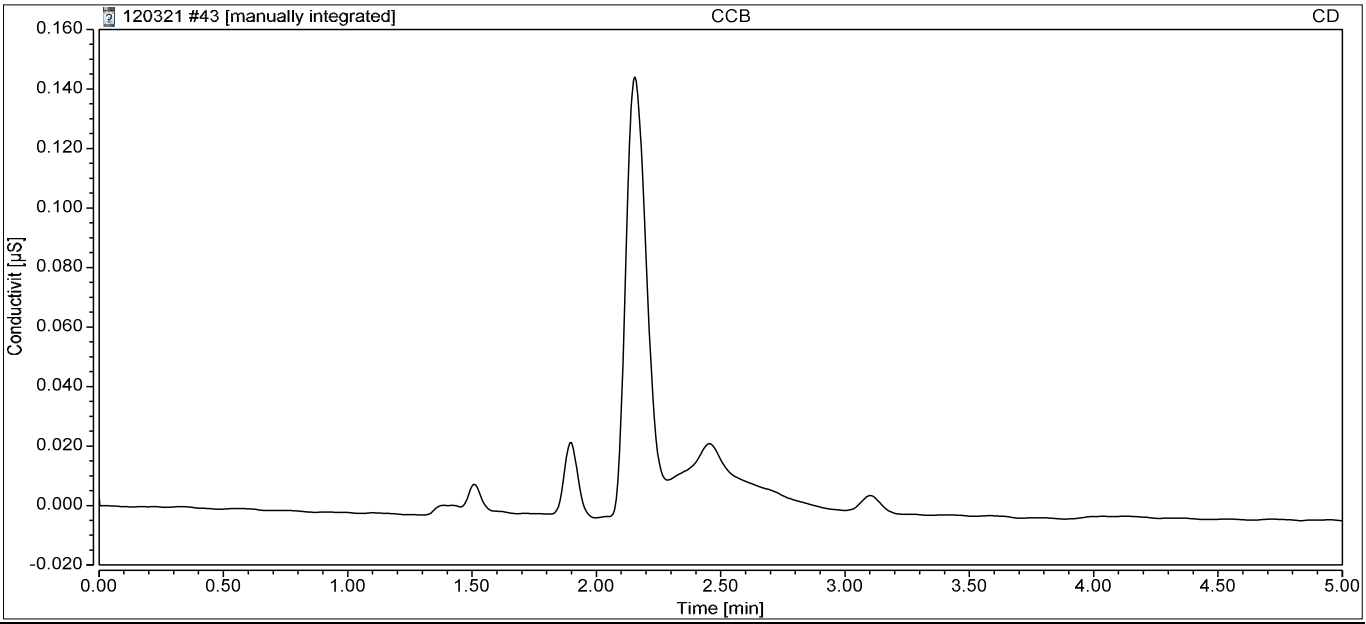
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.52	Fluoride	BMB	2.233	10.4340	10.4340	1.0000
2	1.90	Chloride	BMB	7.188	49.6721	49.6721	1.0000
3	2.16	Nitrite,N	BMB	2.813	9.7912	9.7912	1.0000
4	2.44	Sulfate	BMB	5.306	50.1849	50.1849	1.0000
5	2.71	Bromide	BMB	0.612	10.2283	10.2283	1.0000
6	3.06	Nitrate	BMB	3.314	10.1624	10.1624	1.0000
7	3.27	Chlorate	BMB	0.346	10.9660	10.9660	1.0000
8	3.86	Phosphate	BMB	1.229	10.1097	10.1097	1.0000
Total:			**0.000**	**23.042**		**161.55**	

43 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 11:36**	*Sample Weight:*	**1.0000**

Run Time:



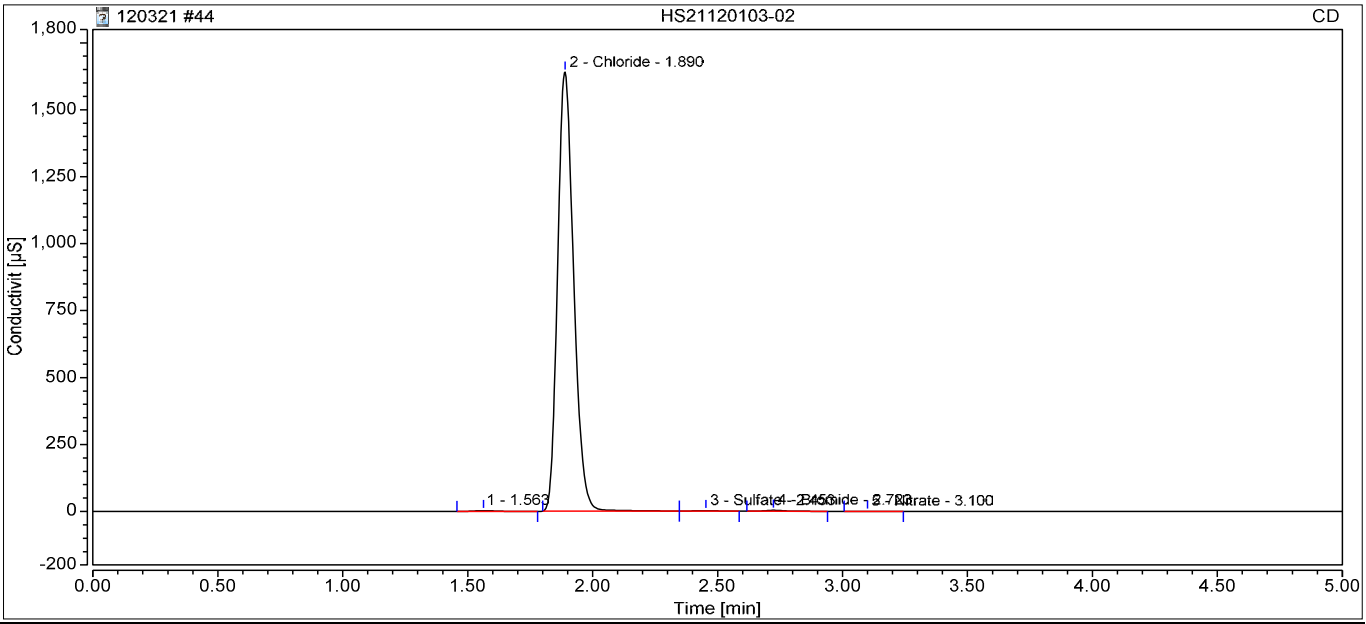
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

44 HS21120103-02

Sample Name:	**HS21120103-02**	*Injection Volume:*	**5.00**
Vial Number:	**GD6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 11:44**	*Sample Weight:*	**1.0000**

Run Time:



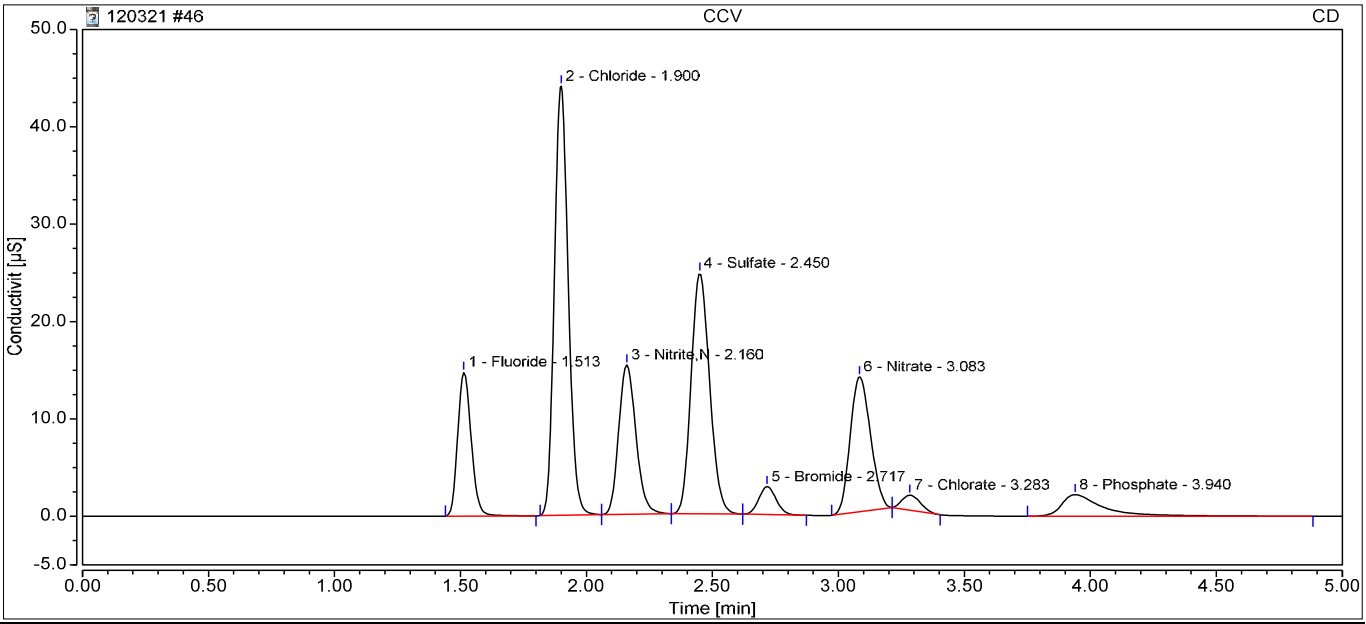
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
2	1.89	Chloride	BMB	122.132	840.9033	840.9033	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
3	2.45	Sulfate	BMB	0.160	1.6834	1.6834	1.0000
4	2.72	Bromide	BMB	0.294	4.9567	4.9567	1.0000
5	3.10	Nitrate	BMB	0.005	0.0811	0.0811	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**122.592**		**847.62**	

46 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**G1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 12:16**	*Sample Weight:*	**1.0000**

Run Time:



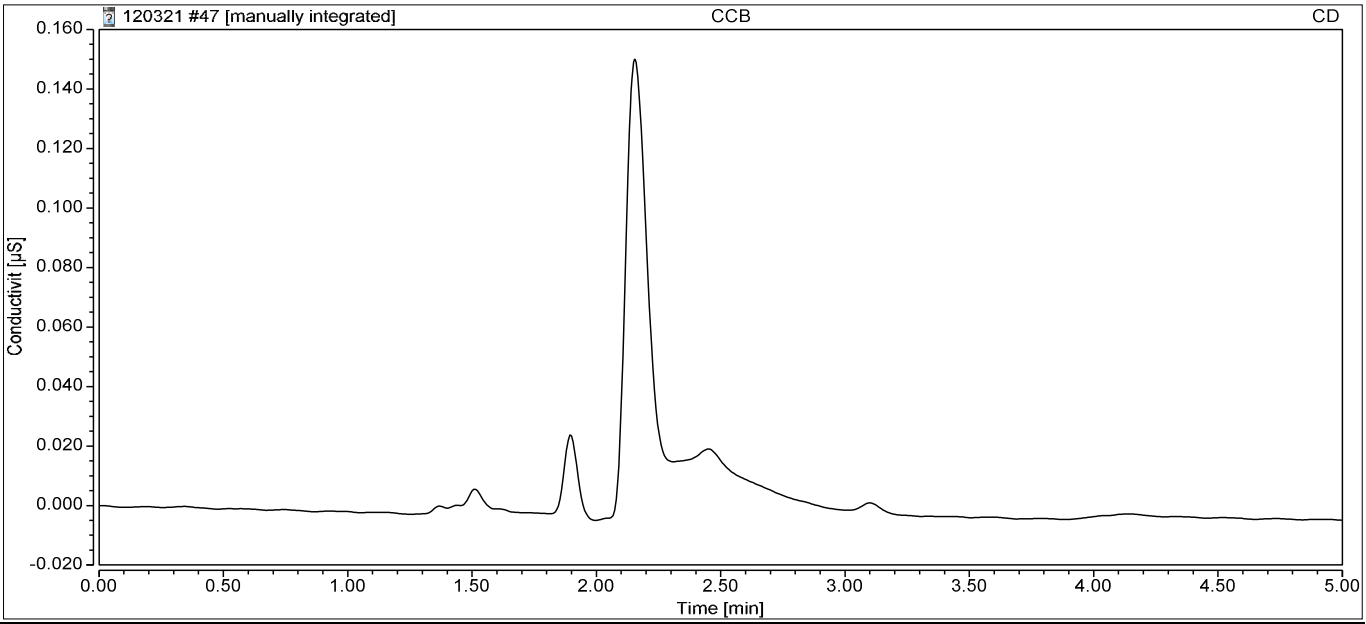
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	1.51	Fluoride	BMB	0.917	4.3213	4.3213	1.0000
2	1.90	Chloride	BMB	2.812	19.5455	19.5455	1.0000
3	2.16	Nitrite,N	BMB	1.215	3.9649	3.9649	1.0000
4	2.45	Sulfate	BMB	2.103	19.9996	19.9996	1.0000
5	2.72	Bromide	BMB	0.229	3.8710	3.8710	1.0000
6	3.08	Nitrate	BMB	1.292	4.0022	4.0022	1.0000
7	3.28	Chlorate	BMB	0.132	4.2026	4.2026	1.0000
8	3.94	Phosphate	BMB	0.424	4.0988	4.0988	1.0000
Total:			**0.000**	**9.125**		**64.01**	

47 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**R4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**n.a.**
Control Program:	**Anions Program ISO37mM 150mm short 0.4**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method ISO**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/03/2021 12:23**	*Sample Weight:*	**1.0000**

Run Time:



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

HS21120103 Wet Chem

ALS WO# HS21120103

HS2112010 3

	Type	Analysis	Sample Name	Sample ID	Origin	Manual Diluti	Result	Notes
1	Unknown	NPOC	RINSE		10_18_2021	1.000	NPOC:0.06454mg/L	
2	Unknown	NPOC	RINSE		10_18_2021	1.000	NPOC:0.06455mg/L	
3	Unknown	NPOC	RINSE		10_18_2021	1.000	NPOC:0.07074mg/L	
4	Standard	NPOC	CAL	3100604915	10_25_2021	1.000		
5	Unknown	NPOC	ICB		10_25_2021	1.000	NPOC:0.09179mg/L	
6	Unknown	NPOC	ICV	3100604423	10_25_2021	1.000	NPOC:10.60mg/L	
7	Unknown	NPOC	ICB		10_25_2021	1.000	NPOC:0.05172mg/L	
8	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.73mg/L	
9	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.06181mg/L	
10	Unknown	NPOC	MBLK-10252021		10_25_2021	1.000	NPOC:0.05600mg/L	
11	Unknown	NPOC	LCS-10252021	3100604423	10_25_2021	1.000	NPOC:9.287mg/L	
12	Unknown	NPOC	LCSD-10252021	3100604423	10_25_2021	1.000	NPOC:10.83mg/L	
13	Unknown	NPOC	HS21101075-01DF10		10_25_2021	1.000	NPOC:0.2805mg/L	
14	Unknown	NPOC	HS21101075-01MSDF10		10_25_2021	1.000	NPOC:12.37mg/L	
15	Unknown	NPOC	HS21101075-02DF10		10_25_2021	1.000	NPOC:0.3788mg/L	
16	Unknown	NPOC	HS21101075-03DF10		10_25_2021	1.000	NPOC:0.2410mg/L	
17	Unknown	NPOC	HS21101075-04DF10		10_25_2021	1.000	NPOC:0.3913mg/L	
18	Unknown	NPOC	HS21101075-05DF10		10_25_2021	1.000	NPOC:0.2171mg/L	
19	Unknown	NPOC	HS21101075-06DF10		10_25_2021	1.000	NPOC:0.1665mg/L	
20	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.66mg/L	
21	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.05208mg/L	
22	Unknown	NPOC	HS21101075-07DF10		10_25_2021	1.000	NPOC:0.1747mg/L	
23	Unknown	NPOC	HS21101075-08DF10		10_25_2021	1.000	NPOC:0.1648mg/L	
24	Unknown	NPOC	HS21101075-09DF10		10_25_2021	1.000	NPOC:0.1167mg/L	
25	Unknown	NPOC	HS21101075-10DF10		10_25_2021	1.000	NPOC:0.1071mg/L	
26	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.76mg/L	
27	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.05571mg/L	
28	Unknown	NPOC	MBLK-10252021		10_25_2021	1.000	NPOC:0.06486mg/L	
29	Unknown	NPOC	LCS-10252021	3100604423	10_25_2021	1.000	NPOC:9.320mg/L	
30	Unknown	NPOC	LCSD-10252021	3100604423	10_25_2021	1.000	NPOC:10.96mg/L	
31	Unknown	NPOC	HS21101075-11DF10		10_25_2021	1.000	NPOC:0.1323mg/L	
32	Unknown	NPOC	HS21101075-11MSDF10		10_25_2021	1.000	NPOC:11.21mg/L	
33	Unknown	NPOC	HS21101075-12DF10		10_25_2021	1.000	NPOC:0.2792mg/L	
34	Unknown	NPOC	HS21101080-01DF10		10_25_2021	1.000	NPOC:0.1261mg/L	
35	Unknown	NPOC	HS21101080-02DF10		10_25_2021	1.000	NPOC:0.1407mg/L	
36	Unknown	NPOC	HS21101080-03DF10		10_25_2021	1.000	NPOC:0.1267mg/L	
37	Unknown	NPOC	HS21101080-04DF10		10_25_2021	1.000	NPOC:0.1381mg/L	
38	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.74mg/L	
39	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.09212mg/L	
40	Unknown	NPOC	HS21101080-05DF10		10_25_2021	1.000	NPOC:0.1654mg/L	
41	Unknown	NPOC	HS21101080-06DF10		10_25_2021	1.000	NPOC:0.1460mg/L	
42	Unknown	NPOC	HS21101080-07DF10		10_25_2021	1.000	NPOC:0.1360mg/L	
43	Unknown	NPOC	HS21101080-08DF10		10_25_2021	1.000	NPOC:0.1453mg/L	
44	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.54mg/L	
45	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.1296mg/L	
46	Unknown	NPOC	MBLK-10252021		10_25_2021	1.000	NPOC:0.05576mg/L	
47	Unknown	NPOC	LCS-10252021	3100604423	10_25_2021	1.000	NPOC:9.292mg/L	
48	Unknown	NPOC	LCSD-10252021	3100604423	10_25_2021	1.000	NPOC:10.94mg/L	
49	Unknown	NPOC	HS21101080-09DF10		10_25_2021	1.000	NPOC:0.2259mg/L	
50	Unknown	NPOC	HS21101080-09MSDF10		10_25_2021	1.000	NPOC:11.03mg/L	
51	Unknown	NPOC	HS21101080-10DF10		10_25_2021	1.000	NPOC:0.1935mg/L	

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	Type	Analysis	Sample Name	Sample ID	Origin	Manual Dilut	Result	Notes
52	Unknown	NPOC	HS21101080-11DF10		10_25_2021	1.000	NPOC:0.1278mg/L	
53	Unknown	NPOC	HS21101080-12DF10		10_25_2021	1.000	NPOC:0.1284mg/L	
54	Unknown	NPOC	HS21101080-13DF10		10_25_2021	1.000	NPOC:0.1196mg/L	
55	Unknown	NPOC	HS21101080-14DF10		10_25_2021	1.000	NPOC:0.2314mg/L	
56	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.69mg/L	
57	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.02809mg/L	
58	Unknown	NPOC	HS21101083-01DF10		10_25_2021	1.000	NPOC:0.2332mg/L	
59	Unknown	NPOC	HS21101083-02DF10		10_25_2021	1.000	NPOC:0.2108mg/L	
60	Unknown	NPOC	HS21101083-03DF10		10_25_2021	1.000	NPOC:0.2038mg/L	
61	Unknown	NPOC	HS21101083-04DF10		10_25_2021	1.000	NPOC:0.3380mg/L	
62	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.53mg/L	
63	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.1115mg/L	
64	Unknown	NPOC	MBLK-10252021		10_25_2021	1.000	NPOC:0.06795mg/L	
65	Unknown	NPOC	LCS-10252021	3100604423	10_25_2021	1.000	NPOC:9.230mg/L	
66	Unknown	NPOC	LCSD-10252021	3100604423	10_25_2021	1.000	NPOC:10.89mg/L	
67	Unknown	NPOC	HS21101083-05DF10		10_25_2021	1.000	NPOC:0.4956mg/L	
68	Unknown	NPOC	HS21101083-05MSDF10		10_25_2021	1.000	NPOC:11.17mg/L	
69	Unknown	NPOC	HS21101083-06DF10		10_25_2021	1.000	NPOC:0.2640mg/L	
70	Unknown	NPOC	HS21101083-07DF10		10_25_2021	1.000	NPOC:0.2414mg/L	
71	Unknown	NPOC	HS21101083-08DF10		10_25_2021	1.000	NPOC:0.2102mg/L	
72	Unknown	NPOC	HS21101083-09DF10		10_25_2021	1.000	NPOC:0.1629mg/L	
73	Unknown	NPOC	HS21101083-10DF10		10_25_2021	1.000	NPOC:0.1838mg/L	
74	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.60mg/L	
75	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.1118mg/L	
76	Unknown	NPOC	HS21101083-11DF10		10_25_2021	1.000	NPOC:0.1718mg/L	
77	Unknown	NPOC	HS21101083-12DF10		10_25_2021	1.000	NPOC:0.1978mg/L	
78	Unknown	NPOC	HS21101083-13DF10		10_25_2021	1.000	NPOC:0.2415mg/L	
79	Unknown	NPOC	HS21101083-14DF10		10_25_2021	1.000	NPOC:0.2981mg/L	
80	Unknown	NPOC	CCV	317195504	10_25_2021	1.000	NPOC:25.57mg/L	
81	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.1184mg/L	

	Status	Date / Time	Vial
1	Completed	10/25/2021 6:02:30	64
2	Completed	10/25/2021 6:13:46	65
3	Completed	10/25/2021 6:24:47	66
4	Completed	10/25/2021 8:13:11	1, 2, 3, 4, 5,
5	Completed	10/25/2021 8:29:06	1
6	Completed	10/25/2021 8:45:09	8
7	Completed	10/25/2021 9:01:04	1
8	Completed	10/25/2021 10:05:19	9
9	Completed	10/25/2021 10:21:02	10
10	Completed	10/25/2021 10:36:45	11
11	Completed	10/25/2021 10:52:59	12
12	Completed	10/25/2021 11:09:01	13
13	Completed	10/25/2021 11:24:44	14
14	Completed	10/25/2021 11:40:52	15
15	Completed	10/25/2021 11:56:35	16
16	Completed	10/26/2021 12:12:18	17
17	Completed	10/26/2021 12:28:01	18
18	Completed	10/26/2021 12:43:44	19
19	Completed	10/26/2021 12:59:27	20
20	Completed	10/26/2021 1:15:58	9
21	Completed	10/26/2021 1:31:41	10
22	Completed	10/26/2021 1:47:30	21
23	Completed	10/26/2021 2:03:13	22
24	Completed	10/26/2021 2:18:56	23
25	Completed	10/26/2021 2:34:39	24
26	Completed	10/26/2021 2:50:56	9
27	Completed	10/26/2021 3:06:39	10
28	Completed	10/26/2021 3:22:22	11
29	Completed	10/26/2021 3:38:27	12
30	Completed	10/26/2021 3:54:35	13
31	Completed	10/26/2021 4:10:25	25
32	Completed	10/26/2021 4:26:25	26
33	Completed	10/26/2021 4:42:08	27
34	Completed	10/26/2021 4:57:52	28
35	Completed	10/26/2021 5:13:36	29
36	Completed	10/26/2021 5:29:20	30
37	Completed	10/26/2021 5:45:04	31
38	Completed	10/26/2021 6:01:22	32
39	Completed	10/26/2021 6:17:06	33
40	Completed	10/26/2021 6:32:50	34
41	Completed	10/26/2021 6:48:35	35
42	Completed	10/26/2021 7:04:19	36
43	Completed	10/26/2021 7:20:02	37
44	Completed	10/26/2021 7:36:27	32
45	Completed	10/26/2021 7:52:11	33
46	Completed	10/26/2021 8:07:55	11
47	Completed	10/26/2021 8:23:52	12
48	Completed	10/26/2021 8:39:51	13
49	Completed	10/26/2021 8:55:33	38
50	Completed	10/26/2021 9:11:37	39
51	Completed	10/26/2021 9:27:20	40

	Status	Date / Time	Vial
52	Completed	10/26/2021 9:43:06	41
53	Completed	10/26/2021 9:58:51	42
54	Completed	10/26/2021 10:14:35	43
55	Completed	10/26/2021 10:30:21	44
56	Completed	10/26/2021 10:46:46	32
57	Completed	10/26/2021 11:02:30	33
58	Completed	10/26/2021 11:18:23	45
59	Completed	10/26/2021 11:34:07	46
60	Completed	10/26/2021 11:49:51	47
61	Completed	10/26/2021 12:05:36	48
62	Completed	10/26/2021 12:21:57	49
63	Completed	10/26/2021 12:37:42	50
64	Completed	10/26/2021 12:53:28	11
65	Completed	10/26/2021 1:09:27	12
66	Completed	10/26/2021 1:25:38	13
67	Completed	10/26/2021 1:41:34	51
68	Completed	10/26/2021 1:57:34	52
69	Completed	10/26/2021 2:13:19	53
70	Completed	10/26/2021 2:29:04	54
71	Completed	10/26/2021 2:44:49	55
72	Completed	10/26/2021 3:00:34	56
73	Completed	10/26/2021 3:16:19	57
74	Completed	10/26/2021 3:32:39	49
75	Completed	10/26/2021 3:48:24	50
76	Completed	10/26/2021 4:04:17	58
77	Completed	10/26/2021 4:20:02	59
78	Completed	10/26/2021 4:35:47	60
79	Completed	10/26/2021 4:51:32	61
80	Completed	10/26/2021 5:07:56	49
81	Completed	10/26/2021 5:23:41	50

TOC-Control L Report

2021_10_25_002.tlx

Instr.Information

Instrument Options: TOC/ASI/IC Unit/
Catalyst: Regular Sensitivity

Cal. Curve

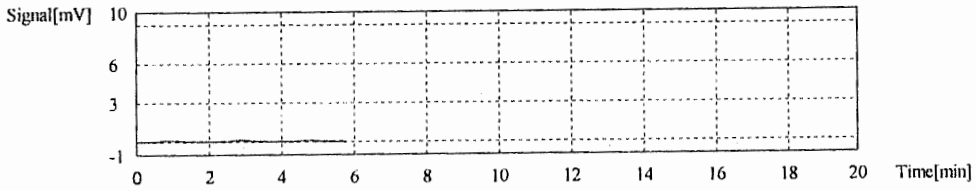
Sample Name: CAL
Sample ID:
Cal. Curve: 10_25_2021_CAL.2021_10_25_18_24_47.cal
Status: Completed

Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	0.1779	50uL	1.000	*******		10/25/2021 6:33:22 PM
2	0.000	50uL	1.000	*******		10/25/2021 6:36:36 PM
3	0.000	50uL	1.000	*******		10/25/2021 6:39:50 PM

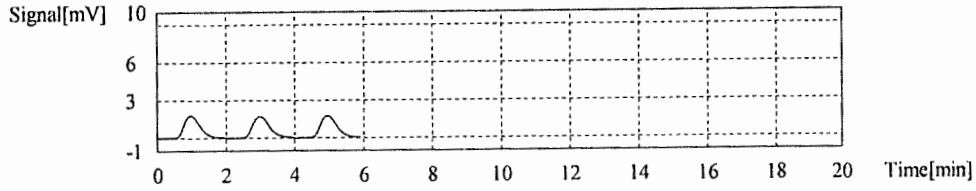
Acid Add. 1.500%
Sparge Gas Flow 80mL/min
Sp. Time 120.0sec
Mean Area 0.05930



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	5.679	50uL	1.000	*******		10/25/2021 6:48:38 PM
2	5.762	50uL	1.000	*******		10/25/2021 6:51:52 PM
3	5.629	50uL	1.000	*******		10/25/2021 6:55:02 PM

Acid Add. 1.500%
Sparge Gas Flow 80mL/min
Sp. Time 120.0sec
Mean Area 5.690



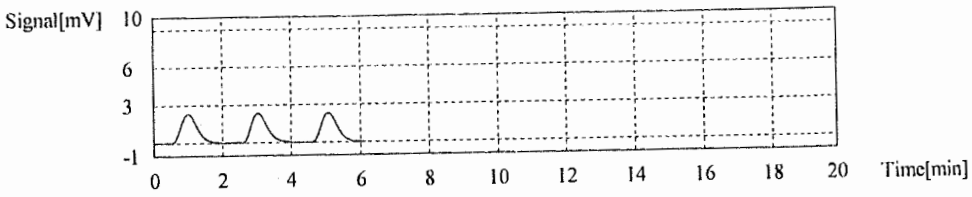
Conc: 2.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	7.704	50uL	1.000	*******		10/25/2021 7:03:55 PM
2	7.453	50uL	1.000	*******		10/25/2021 7:07:06 PM
3	7.508	50uL	1.000	*******		10/25/2021 7:10:22 PM

TOC-Control L Report

2021_10_25_002.tlx

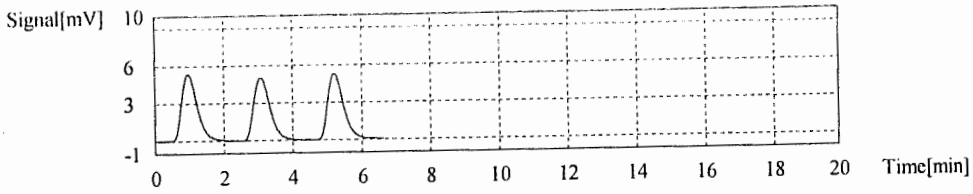
Acid Add.	1.500%
Sparge Gas Flow	80mL/min
Sp. Time	120.0sec
Mean Area	7.555



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	16.62	50uL	1.000	*******		10/25/2021 7:19:15 PM
2	16.58	50uL	1.000	*******		10/25/2021 7:22:33 PM
3	16.79	50uL	1.000	*******		10/25/2021 7:26:01 PM

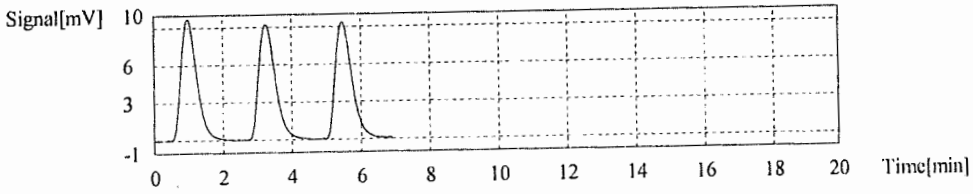
Acid Add.	1.500%
Sparge Gas Flow	80mL/min
Sp. Time	120.0sec
Mean Area	16.66



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	30.96	50uL	1.000	*******		10/25/2021 7:35:05 PM
2	31.10	50uL	1.000	*******		10/25/2021 7:38:17 PM
3	31.16	50uL	1.000	*******		10/25/2021 7:41:41 PM

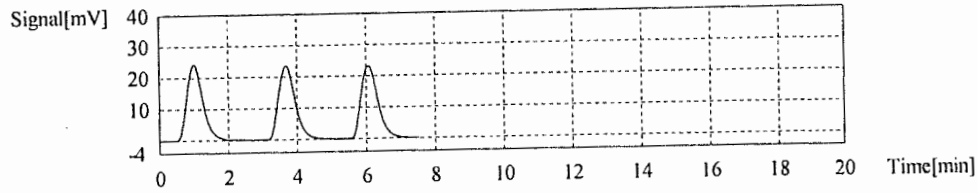
Acid Add.	1.500%
Sparge Gas Flow	80mL/min
Sp. Time	120.0sec
Mean Area	31.07



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	79.40	50uL	1.000	*******		10/25/2021 7:51:09 PM
2	79.56	50uL	1.000	*******		10/25/2021 7:54:09 PM
3	79.35	50uL	1.000	*******		10/25/2021 7:57:24 PM

Acid Add.	1.500%
Sparge Gas Flow	80mL/min
Sp. Time	120.0sec
Mean Area	79.44



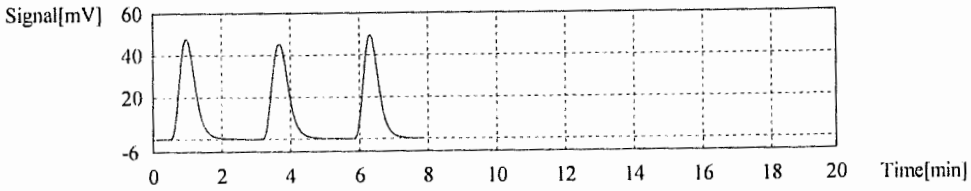
Conc: 50.00mg/L

TOC-Control L Report

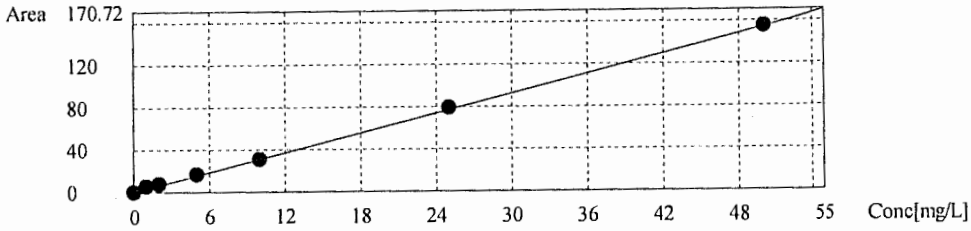
2021_10_25_002.tlx

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	156.1	50uL	1.000	*******		10/25/2021 8:06:53 PM
2	154.0	50uL	1.000	*******		10/25/2021 8:10:05 PM
3	155.5	50uL	1.000	*******		10/25/2021 8:13:11 PM

Acid Add. 1.500%
Sparge Gas Flow 80mL/min
Sp. Time 120.0sec
Mean Area 155.2



Slope: 3.086
Intercept 0.000
r^2 0.9997
r 0.9999
RSE(%) N/A
Zero Shift Yes



Sample

Sample Name: ICV
Sample ID: 3100604423
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

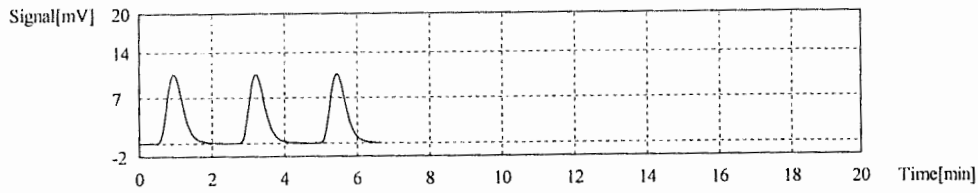
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:10.60mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	32.74	10.61mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	10/25/2021 8:38:14 PM
2	32.74	10.61mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	10/25/2021 8:41:41 PM
3	32.67	10.59mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	10/25/2021 8:45:09 PM

Mean Area 32.72
Mean Conc. 10.60mg/L



Sample

TOC-Control L Report

2021_10_25_002.tlx

Sample Name: ICB
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

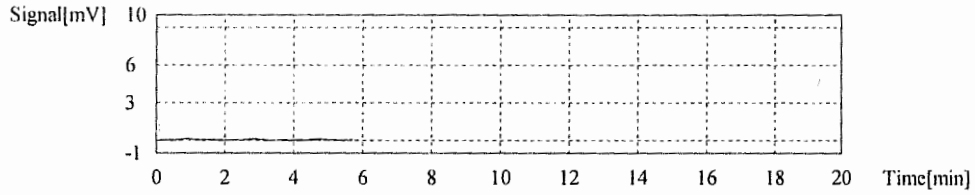
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.05172mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.1343	0.04352mg/L	50uL	1.000		10_25_2021_CAL 2021_10_25_18_24_47.cal	10/25/2021 8:54:04 PM
2	0.1944	0.06299mg/L	50uL	1.000		10_25_2021_CAL 2021_10_25_18_24_47.cal	10/25/2021 8:57:34 PM
3	0.1502	0.04867mg/L	50uL	1.000		10_25_2021_CAL 2021_10_25_18_24_47.cal	10/25/2021 9:01:04 PM

Mean Area 0.1596
Mean Conc. 0.05172mg/L



C:\TOC-L\Data\2021_12_14_001.tlx

	Type	Analysis	Sample Name	Sample ID	Origin	Manual Diluti	Result	Notes
1	Unknown	NPOC	CCV	318170604	10_25_2021	1.000	NPOC:25.72mg/L	
2	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.2061mg/L	
3	Unknown	NPOC	MBLK-12142021		10_25_2021	1.000	NPOC:0.1803mg/L	
4	Unknown	NPOC	LCS-12142021	3100604423	10_25_2021	1.000	NPOC:10.89mg/L	
5	Unknown	NPOC	LCSD-12142021	3100604423	10_25_2021	1.000	NPOC:10.93mg/L	
6	Unknown	NPOC	HS21120552-03		10_25_2021	1.000	NPOC:20.07mg/L	
7	Unknown	NPOC	HS21120552-04		10_25_2021	1.000	NPOC:29.30mg/L	
8	Unknown	NPOC	HS21120552-05		10_25_2021	1.000	NPOC:192.6mg/L	
9	Unknown	NPOC	HS21120552-06		10_25_2021	1.000	NPOC:26.37mg/L	
10	Unknown	NPOC	HS21120101-01		10_25_2021	1.000	NPOC:14.77mg/L	
11	Unknown	NPOC	HS21120101-01MS		10_25_2021	1.000	NPOC:24.19mg/L	
12	Unknown	NPOC	HS21120101-03		10_25_2021	1.000	NPOC:6.643mg/L	
13	Unknown	NPOC	CCV	318170604	10_25_2021	1.000	NPOC:26.33mg/L	
14	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.2158mg/L	
15	Unknown	NPOC	HS21120103-01		10_25_2021	1.000	NPOC:9.022mg/L	
16	Unknown	NPOC	HS21120103-02		10_25_2021	1.000	NPOC:21.24mg/L	
17	Unknown	NPOC	HS21120103-03		10_25_2021	1.000	NPOC:7.052mg/L	
18	Unknown	NPOC	HS21120103-04		10_25_2021	1.000	NPOC:10.75mg/L	
19	Unknown	NPOC	CCV	318170604	10_25_2021	1.000	NPOC:26.77mg/L	
20	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.3576mg/L	
21	Unknown	NPOC	CCV		TOC_W 906	1.000	NPOC:26.23mg/L	
22	Unknown	NPOC	CCB		TOC_W 906	1.000	NPOC:0.1833mg/L	
23	Unknown	NPOC	MBLK-12142021		TOC_W 906	1.000	NPOC:0.1515mg/L	
24	Unknown	NPOC	LCS-12142021	3100604423	TOC_W 906	1.000	NPOC:10.80mg/L	
25	Unknown	NPOC	LCSD-12142021	3100604423	TOC_W 906	1.000	NPOC:10.82mg/L	
26	Unknown	NPOC	HS21120072-01		TOC_W 906	1.000	NPOC:20.05mg/L	
27	Unknown	NPOC	HS21120072-02		TOC_W 906	1.000	NPOC:9.085mg/L	
28	Unknown	NPOC	HS21120083-01		TOC_W 906	1.000	NPOC:21.11mg/L	
29	Unknown	NPOC	HS21120083-01MS		TOC_W 906	1.000	NPOC:30.90mg/L	
30	Unknown	NPOC	HS21120231-04		TOC_W 906	1.000	NPOC:0.6088mg/L	
31	Unknown	NPOC	HS21120231-05		TOC_W 906	1.000	NPOC:0.4296mg/L	
32	Unknown	NPOC	HS21120231-11		TOC_W 906	1.000	NPOC:0.3882mg/L	
33	Unknown	NPOC	CCV	318170604	TOC_W 906	1.000	NPOC:26.03mg/L	
34	Unknown	NPOC	CCB		TOC_W 906	1.000	NPOC:0.1480mg/L	
35	Unknown	NPOC	HS21120231-12		TOC_W 906	1.000	NPOC:0.4356mg/L	
36	Unknown	NPOC	HS21120342-04		TOC_W 906	1.000	NPOC:0.6927mg/L	
37	Unknown	NPOC	HS21120342-05		TOC_W 906	1.000	NPOC:0.2167mg/L	
38	Unknown	NPOC	HS21120342-25		TOC_W 906	1.000	NPOC:0.8964mg/L	
39	Unknown	NPOC	HS21120342-26		TOC_W 906	1.000	NPOC:0.1652mg/L	
40	Unknown	NPOC	HS21120342-40		TOC_W 906	1.000	NPOC:0.1754mg/L	
41	Unknown	NPOC	HS21120342-41		TOC_W 906	1.000	NPOC:0.1794mg/L	
42	Unknown	NPOC	HS21120616-01		TOC_W 906	1.000	NPOC:34.04mg/L	
43	Unknown	NPOC	HS21120668-11		TOC_W 906	1.000	NPOC:3.953mg/L	
44	Unknown	NPOC	HS21120668-12		TOC_W 906	1.000	NPOC:0.5046mg/L	
45	Unknown	NPOC	CCV	318170604	TOC_W 906	1.000	NPOC:25.18mg/L	
46	Unknown	NPOC	CCB		TOC_W 906	1.000	NPOC:0.1529mg/L	

	Status	Date / Time	Vial
1	Completed	12/14/2021 6:46:55	1
2	Completed	12/14/2021 7:02:38	2
3	Completed	12/14/2021 7:18:21	3
4	Completed	12/14/2021 7:34:32	4
5	Completed	12/14/2021 7:50:40	5
6	Completed	12/14/2021 8:07:09	6
7	Completed	12/14/2021 8:23:30	7
8	Completed	12/14/2021 8:40:19	8
9	Completed	12/14/2021 8:57:09	9
10	Completed	12/14/2021 9:13:31	10
11	Completed	12/14/2021 9:30:04	11
12	Completed	12/14/2021 9:46:08	12
13	Completed	12/14/2021 10:18:19	1
14	Completed	12/14/2021 10:34:01	2
15	Completed	12/14/2021 10:50:24	13
16	Completed	12/14/2021 11:06:43	14
17	Completed	12/14/2021 11:22:36	15
18	Completed	12/14/2021 11:38:48	16
19	Completed	12/15/2021 12:11:11	1
20	Completed	12/15/2021 12:26:53	2
21	Completed	12/15/2021 12:44:31	1
22	Completed	12/15/2021 12:58:59	2
23	Completed	12/15/2021 1:13:27	3
24	Completed	12/15/2021 1:29:39	4
25	Completed	12/15/2021 1:45:52	5
26	Completed	12/15/2021 2:03:21	17
27	Completed	12/15/2021 2:19:29	18
28	Completed	12/15/2021 2:36:45	19
29	Completed	12/15/2021 2:54:06	20
30	Completed	12/15/2021 3:08:32	21
31	Completed	12/15/2021 3:22:58	22
32	Completed	12/15/2021 3:37:25	23
33	Completed	12/15/2021 4:09:08	24
34	Completed	12/15/2021 4:23:35	25
35	Completed	12/15/2021 4:38:01	26
36	Completed	12/15/2021 4:52:29	27
37	Completed	12/15/2021 5:06:56	28
38	Completed	12/15/2021 5:21:53	29
39	Completed	12/15/2021 5:36:20	30
40	Completed	12/15/2021 5:50:47	31
41	Completed	12/15/2021 6:05:15	32
42	Completed	12/15/2021 6:24:06	33
43	Completed	12/15/2021 6:39:54	34
44	Completed	12/15/2021 6:54:22	35
45	Completed	12/15/2021 7:25:34	24
46	Completed	12/15/2021 7:39:58	25

TOC-Control L Report

2021_12_14_001.tlx

Instr.Information

Instrument Options: TOC/ASI/IC Unit/
Catalyst: Regular Sensitivity

Sample

Sample Name: CCV
Sample ID: 318170604
Origin: 10_25_2021_CAL.cal
Status: Completed
Chk. Result:

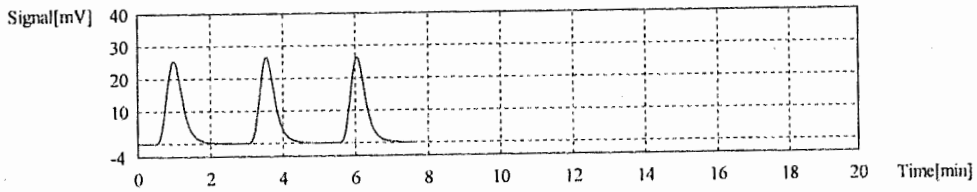
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:25.72mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	79.77	25.85mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 6:39:58 PM
2	79.41	25.73mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 6:43:25 PM
3	78.99	25.59mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 6:46:55 PM

Mean Area: 79.39
Mean Conc.: 25.72mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 10_25_2021_CAL.cal
Status: Completed
Chk. Result:

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.2061mg/L

1. Det

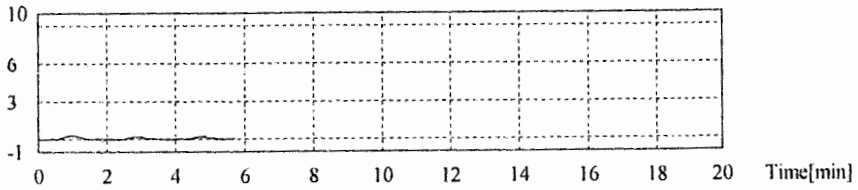
Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.8254	0.2674mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 6:55:38 PM
2	0.5673	0.1838mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 6:59:09 PM
3	0.5153	0.1670mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:02:38 PM

TOC-Control L Report

2021_12_14_001.tlx

Mean Area 0.6360
Mean Conc. 0.2061mg/L



Sample

Sample Name: MBLK-12142021
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

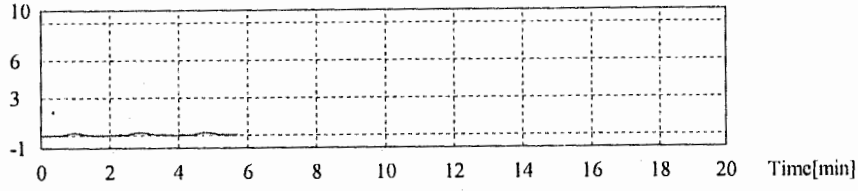
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.1803mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.5892	0.1909mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:11:22 PM
2	0.5361	0.1737mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:14:52 PM
3	0.5439	0.1762mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:18:21 PM

Mean Area 0.5564
Mean Conc. 0.1803mg/L



Sample

Sample Name: LCS-12142021
Sample ID: 3100604423
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:10.89mg/L

1. Det

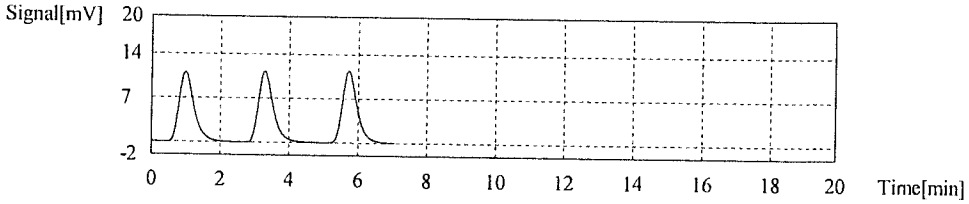
Anal.: NPOC

TOC-Control L Report

2021_12_14_001.tlx

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	33.33	10.80mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:27:27 PM
2	33.81	10.96mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:31:05 PM
3	33.65	10.90mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:34:32 PM

Mean Area 33.60
Mean Conc. 10.89mg/L



Sample

Sample Name: LCSD-12142021
Sample ID: 3100604423
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

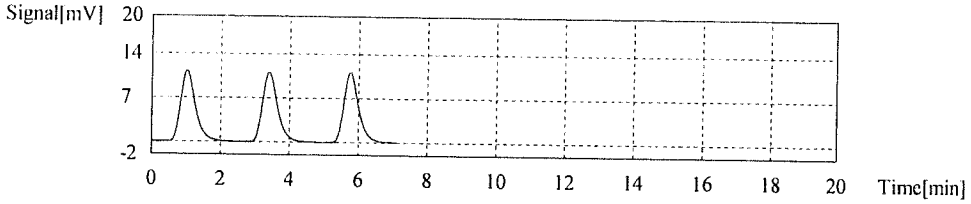
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:10.93mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	33.83	10.96mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:43:44 PM
2	33.83	10.96mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:47:13 PM
3	33.53	10.86mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 7:50:40 PM

Mean Area 33.73
Mean Conc. 10.93mg/L



Sample

Sample Name: HS21120101-01
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:14.77mg/L

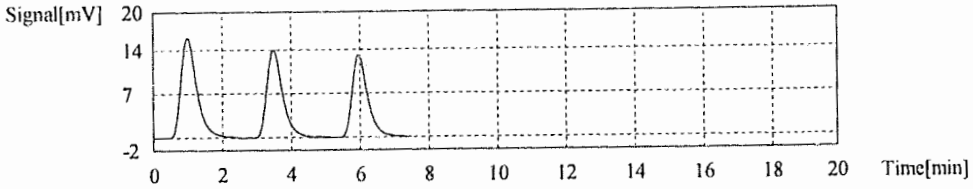
1. Det

TOC-Control L Report

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	51.02	16.53mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 9:06:26 PM
2	44.48	14.41mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 9:09:55 PM
3	41.29	13.38mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 9:13:31 PM

Mean Area 45.60
Mean Conc. 14.77mg/L



Sample

Sample Name: HS21120101-01MS
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

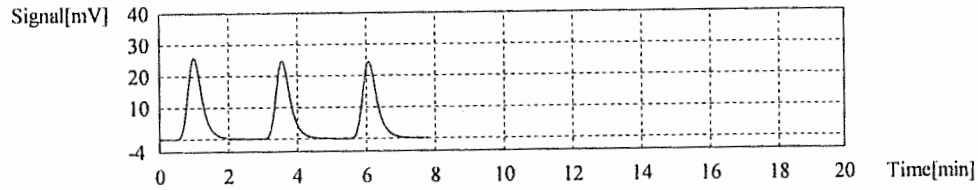
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.19mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	76.06	24.64mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 9:22:53 PM
2	73.60	23.85mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 9:26:19 PM
3	74.30	24.07mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 9:30:04 PM

Mean Area 74.65
Mean Conc. 24.19mg/L



Sample

Sample Name: CCV
Sample ID: 318170604
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:26.33mg/L

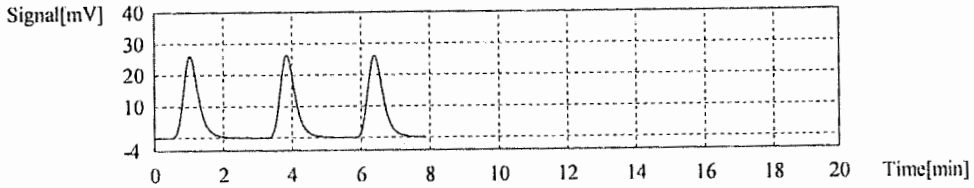
TOC-Control L Report

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	80.80	26.18mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:11:37 PM
2	81.64	26.45mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:14:53 PM
3	81.38	26.37mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:18:19 PM

Mean Area 81.27
Mean Conc. 26.33mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

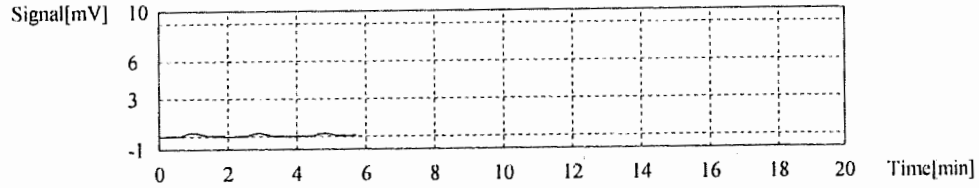
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.2158mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.7549	0.2446mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:27:02 PM
2	0.7173	0.2324mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:30:32 PM
3	0.5254	0.1702mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:34:01 PM

Mean Area 0.6659
Mean Conc. 0.2158mg/L



Sample

Sample Name: HS21120103-01
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

TOC-Control L Report

2021_12_14_001.tlx

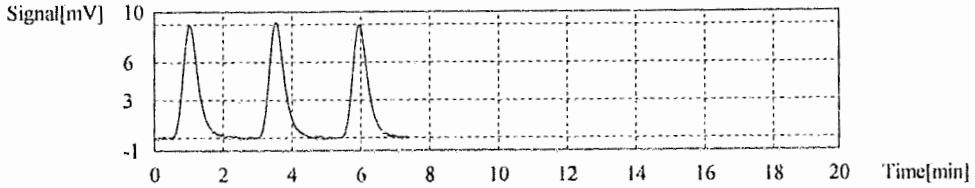
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:9.022mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	27.54	8.923mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:43:27 PM
2	27.79	9.004mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:46:51 PM
3	28.20	9.137mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:50:24 PM

Mean Area 27.84
Mean Conc. 9.022mg/L



Sample

Sample Name: HS21120103-02
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

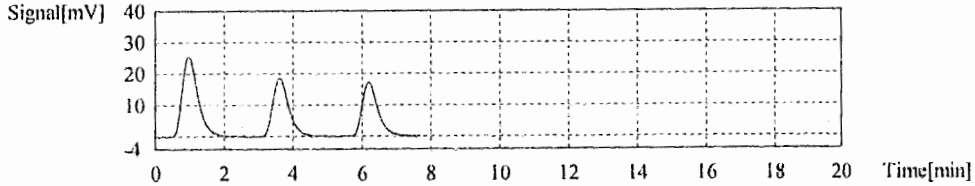
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:21.24mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	81.50	26.41mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 10:59:49 PM
2	60.18	19.50mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:03:19 PM
3	54.98	17.81mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:06:43 PM

Mean Area 65.55
Mean Conc. 21.24mg/L



Sample

TOC-Control L Report

Sample Name: HS21120103-03
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

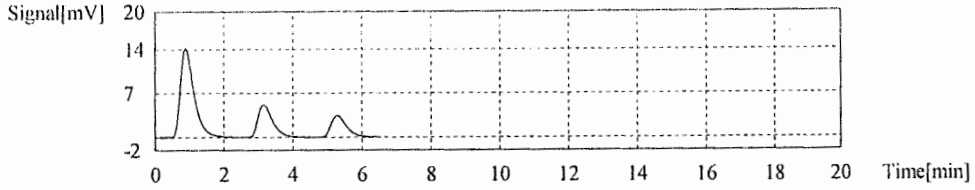
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:7.052mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	39.37	12.76mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:15:46 PM
2	15.41	4.993mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:19:08 PM
3	10.51	3.405mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:22:36 PM

Mean Area 21.76
Mean Conc. 7.052mg/L



Sample

Sample Name: HS21120103-04
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

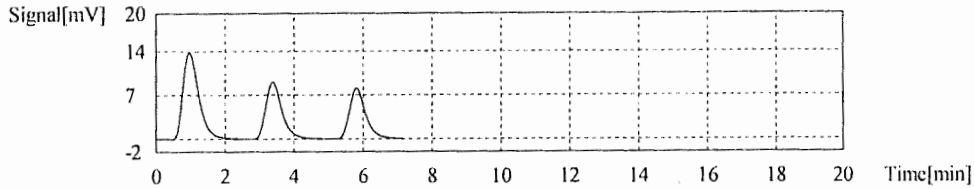
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:10.75mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	43.89	14.22mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:31:46 PM
2	29.60	9.591mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:35:21 PM
3	26.07	8.447mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/14/2021 11:38:48 PM

Mean Area 33.19
Mean Conc. 10.75mg/L



TOC-Control L Report

Sample

Sample Name: CCV
Sample ID: 318170604
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

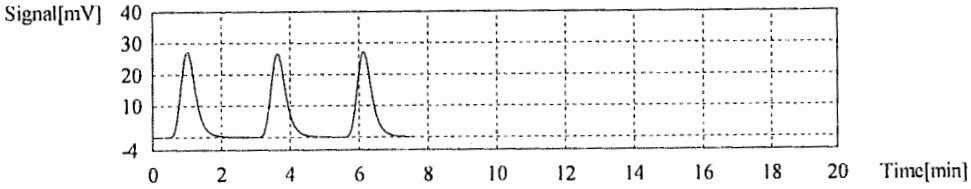
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:26.77mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	83.54	27.07mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 12:04:18 AM
2	82.26	26.65mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 12:07:42 AM
3	82.03	26.58mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 12:11:11 AM

Mean Area 82.61
Mean Conc. 26.77mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

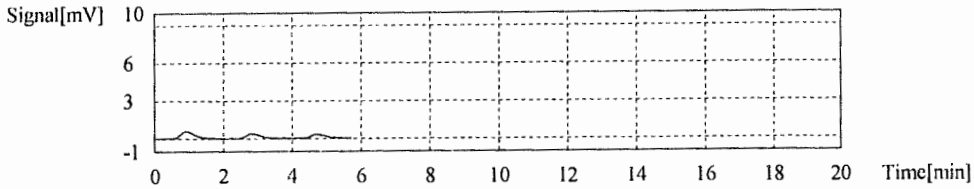
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.3576mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.549	0.5019mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 12:19:53 AM
2	0.9398	0.3045mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 12:23:23 AM
3	0.8224	0.2665mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 12:26:53 AM

Mean Area 1.104
Mean Conc. 0.3576mg/L



C:\TOC-L\Data\2021_12_15_002.tlx

	Type	Analysis	Sample Name	Sample ID	Origin	Manual Diluti	Result	Notes
1	Unknown	NPOC	CCV	318170907	10_25_2021	1.000	NPOC:24.67mg/L	
2	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.1685mg/L	
3	Unknown	NPOC	MBLK-12152021		10_25_2021	1.000	NPOC:0.1306mg/L	
4	Unknown	NPOC	LCS-12152021	3100604423	10_25_2021	1.000	NPOC:10.77mg/L	
5	Unknown	NPOC	LCSD-12152021	3100604423	10_25_2021	1.000	NPOC:10.80mg/L	
6	Unknown	NPOC	HS21120103-05		10_25_2021	1.000	NPOC:19.31mg/L	
7	Unknown	NPOC	HS21120103-05MS		10_25_2021	1.000	NPOC:33.77mg/L	
8	Unknown	NPOC	HS21120103-06		10_25_2021	1.000	NPOC:12.12mg/L	
9	Unknown	NPOC	HS21120849-01		10_25_2021	1.000	NPOC:12.57mg/L	
10	Unknown	NPOC	HS21120548-01DF10		10_25_2021	1.000	NPOC:4.706mg/L	
11	Unknown	NPOC	HS21120548-02DF10		10_25_2021	1.000	NPOC:1.803mg/L	
12	Unknown	NPOC	HS21120548-03DF10		10_25_2021	1.000	NPOC:1.242mg/L	
13	Unknown	NPOC	CCV	318170907	10_25_2021	1.000	NPOC:24.72mg/L	
14	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.1535mg/L	
15	Unknown	NPOC	HS21120548-04DF10		10_25_2021	1.000	NPOC:1.195mg/L	
16	Unknown	NPOC	HS21120548-05DF10		10_25_2021	1.000	NPOC:1.444mg/L	
17	Unknown	NPOC	HS21120738-01		10_25_2021	1.000	NPOC:11.95mg/L	
18	Unknown	NPOC	HS21120416-01		10_25_2021	1.000	NPOC:6.121mg/L	
19	Unknown	NPOC	CCV	318170907	10_25_2021	1.000	NPOC:24.80mg/L	
20	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.1537mg/L	
21	Unknown	NPOC	MBLK-12152021		10_25_2021	1.000	NPOC:0.1357mg/L	
22	Unknown	NPOC	LCS-12152021	3100604423	10_25_2021	1.000	NPOC:10.87mg/L	
23	Unknown	NPOC	LCSD-12152021	3100604423	10_25_2021	1.000	NPOC:10.88mg/L	
24	Unknown	NPOC	HS21120820-01		10_25_2021	1.000	NPOC:0.1377mg/L	
25	Unknown	NPOC	HS21120829-01		10_25_2021	1.000	NPOC:0.1355mg/L	
26	Unknown	NPOC	HS21120586-01		10_25_2021	1.000	NPOC:10.02mg/L	
27	Unknown	NPOC	HS21120586-01MS		10_25_2021	1.000	NPOC:20.43mg/L	
28	Unknown	NPOC	HS21120734-01		10_25_2021	1.000	NPOC:8.898mg/L	
29	Unknown	NPOC	HS21120840-01		10_25_2021	1.000	NPOC:880.9mg/L	
30	Unknown	NPOC	HS21120874-01		10_25_2021	1.000	NPOC:26.42mg/L	
31	Unknown	NPOC	CCV	318170907	10_25_2021	1.000	NPOC:25.62mg/L	
32	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.5171mg/L	
33	Unknown	NPOC	HS21120879-01		10_25_2021	1.000	NPOC:9.354mg/L	
34	Unknown	NPOC	HS21120728-01		10_25_2021	1.000	NPOC:17.41mg/L	
35	Unknown	NPOC	HS21120736-01		10_25_2021	1.000	NPOC:19.72mg/L	
36	Unknown	NPOC	HS21120784-01		10_25_2021	1.000	NPOC:10.02mg/L	
37	Unknown	NPOC	CCV	318170907	10_25_2021	1.000	NPOC:25.21mg/L	
38	Unknown	NPOC	CCB		10_25_2021	1.000	NPOC:0.3998mg/L	

	Status	Date / Time	Vial
1	Completed	12/15/2021 6:26:39	1
2	Completed	12/15/2021 6:42:22	2
3	Completed	12/15/2021 6:58:05	3
4	Completed	12/15/2021 7:14:22	4
5	Completed	12/15/2021 7:30:27	5
6	Completed	12/15/2021 7:46:48	6
7	Completed	12/15/2021 8:03:14	7
8	Completed	12/15/2021 8:19:33	8
9	Completed	12/15/2021 8:35:41	9
10	Completed	12/15/2021 8:51:35	10
11	Completed	12/15/2021 9:07:19	11
12	Completed	12/15/2021 9:23:02	12
13	Completed	12/15/2021 9:55:35	1
14	Completed	12/15/2021 10:11:18	2
15	Completed	12/15/2021 10:27:07	13
16	Completed	12/15/2021 10:42:50	14
17	Completed	12/15/2021 10:59:06	15
18	Completed	12/15/2021 11:15:09	16
19	Completed	12/15/2021 11:47:38	1
20	Completed	12/16/2021 12:03:21	2
21	Completed	12/16/2021 12:19:04	3
22	Completed	12/16/2021 12:35:10	4
23	Completed	12/16/2021 12:51:18	5
24	Completed	12/16/2021 1:07:08	17
25	Completed	12/16/2021 1:22:51	18
26	Completed	12/16/2021 1:38:54	19
27	Completed	12/16/2021 1:55:03	20
28	Completed	12/16/2021 2:11:03	21
29	Completed	12/16/2021 2:28:46	22
30	Completed	12/16/2021 2:45:11	23
31	Completed	12/16/2021 3:17:31	24
32	Completed	12/16/2021 3:33:14	25
33	Completed	12/16/2021 3:49:21	26
34	Completed	12/16/2021 4:05:37	27
35	Completed	12/16/2021 4:21:52	28
36	Completed	12/16/2021 4:38:00	29
37	Completed	12/16/2021 5:10:34	24
38	Completed	12/16/2021 5:26:17	25

TOC-Control L Report

2021_12_15_002.tlx

Instr.information

Instrument Option: TOC/ASI/IC Unit/
Catalyst: Regular Sensitivity

Sample

Sample Name: CCV
Sample ID: 318170907
Origin: 10_25_2021_CAL.cal
Status: Completed
Chk. Result:

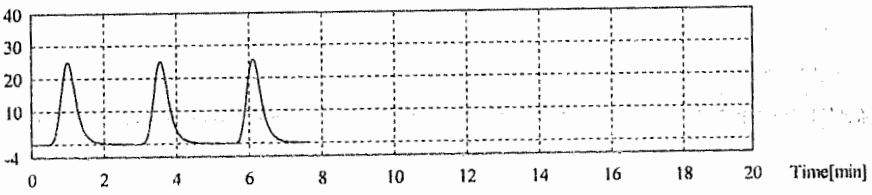
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.67mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date/Time
1	75.66	24.52mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:19:39 PM
2	76.77	24.87mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:23:12 PM
3	76.03	24.64mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:26:39 PM

Mean Area: 76.15
Mean Conc.: 24.67mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 10_25_2021_CAL.cal
Status: Completed
Chk. Result:

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.1685mg/L

1. Det

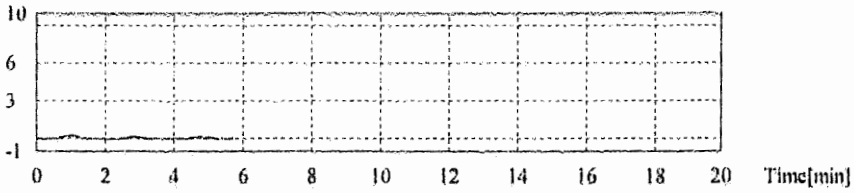
Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date/Time
1	0.7255	0.2351mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:35:22 PM
2	0.4679	0.1516mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:38:52 PM
3	0.3668	0.1188mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:42:22 PM

TOC-Control L Report

2021_12_15_002.tlx

Mean Area 0.8201
Mean Conc. 0.1685mg/L



Sample

Sample Name: MBLK-12152021
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

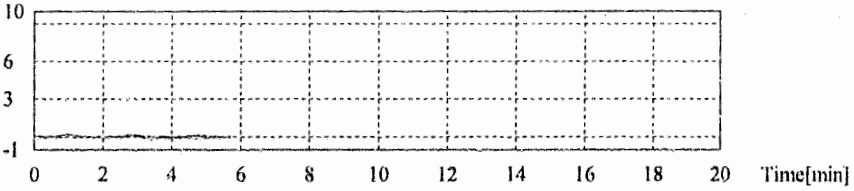
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.1306mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.4814	0.1560mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:51:05 PM
2	0.3622	0.1174mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:54:35 PM
3	0.3653	0.1184mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 6:58:05 PM

Mean Area 0.4030
Mean Conc. 0.1306mg/L



Sample

Sample Name: LCS-12152021
Sample ID: 3100604423
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:10.77mg/L

1. Det

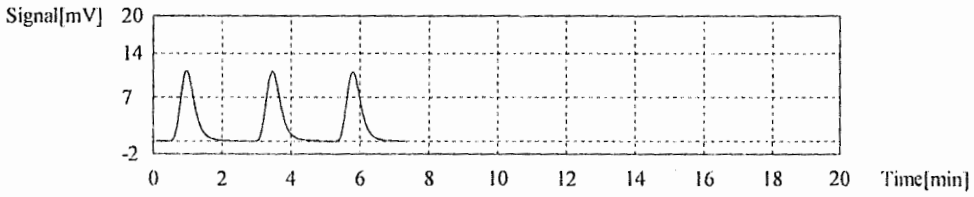
Anal.: NPOC

TOC-Control L Report

2021_12_15_002.tlx

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	33.22	10.76mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:07:22 PM
2	33.23	10.77mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:10:43 PM
3	33.27	10.78mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:14:22 PM

Mean Area 33.24
Mean Conc. 10.77mg/L



Sample

Sample Name: LCSD-12152021
Sample ID: 3100604423
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

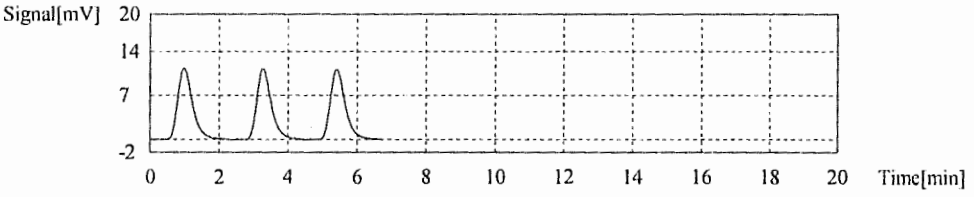
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:10.80mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	33.82	10.96mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:23:28 PM
2	32.92	10.67mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:26:49 PM
3	33.27	10.78mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:30:27 PM

Mean Area 33.34
Mean Conc. 10.80mg/L



Sample

Sample Name: HS21120103-05
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:19.31mg/L

1. Det

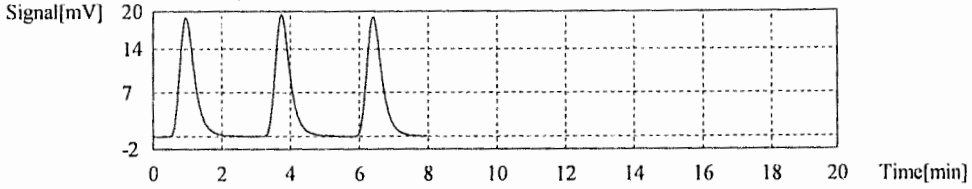
TOC-Control L Report

2021_12_15_002.tlx

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	59.03	19.13mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:40:00 PM
2	59.81	19.38mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:43:24 PM
3	59.96	19.43mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:46:48 PM

Mean Area 59.60
Mean Conc. 19.31mg/L



Sample

Sample Name: HS21120103-05MS
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

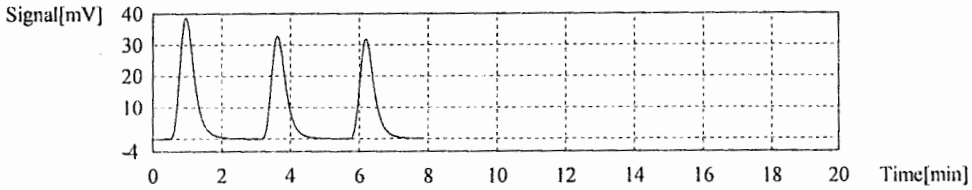
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:33.77mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	117.6	38.10mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:56:17 PM
2	99.32	32.18mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 7:59:40 PM
3	95.77	31.03mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 8:03:14 PM

Mean Area 104.2
Mean Conc. 33.77mg/L



Sample

Sample Name: HS21120103-06
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:12.12mg/L

TOC-Control L Report

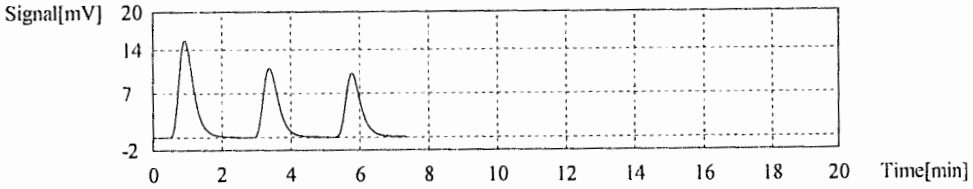
2021_12_15_002.tlx

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	46.59	15.10mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 8:12:29 PM
2	34.12	11.06mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 8:15:56 PM
3	31.50	10.21mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 8:19:33 PM

Mean Area 37.40
Mean Conc. 12.12mg/L



Sample

Sample Name: CCV
Sample ID: 318170907
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

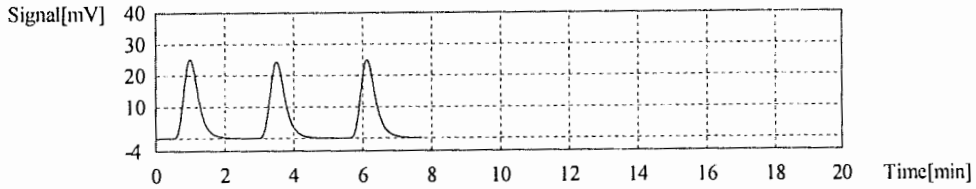
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.72mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	76.33	24.73mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 9:48:29 PM
2	75.97	24.62mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 9:52:08 PM
3	76.58	24.81mg/L	50uL	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 9:55:35 PM

Mean Area 76.29
Mean Conc. 24.72mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 10_25_2021_CAL.cal
Status Completed
Chk. Result

TOC-Control L Report

2021_12_15_002.tlx

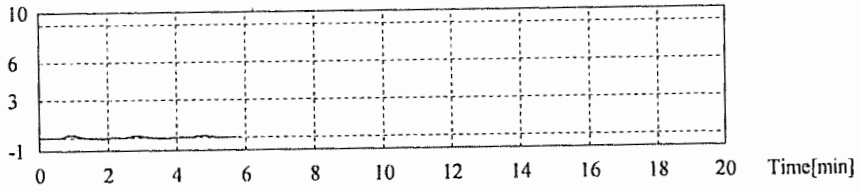
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC 0.1535mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.6059	0.1963mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 10:04:18 PM
2	0.4868	0.1577mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 10:07:48 PM
3	0.3285	0.1064mg/L	50ul	1.000		10_25_2021_CAL.2021_10_25_18_24_47.cal	12/15/2021 10:11:18 PM

Mean Area 0.4737
Mean Conc. 0.1535mg/L



HS21120103 Pace Lab Report 221120825 4

ALS WO# HS21120103

Pace Analytical®

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 01/19/2022

Report # 221120825

Project HS21120103

Samples Collected 12/1/21

Deliver To	***Additional Recipients***
Ragen Giga ALS Houston 10450 Stancliff Rd Suite 210 Houston, TX 77099 281-530-5656	Jumoke Lawal, ALS Houston

PJLA Testing DoD ELAP

ISO 17025

NELAP ACCREDITED TNI LABORATORY

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
Pace Gulf Coast Report 221120825

Certifications

Certification	Certification Number
DOD ELAP	74960
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: ALS Environmental - Houston, TX **Report:** 221120825

Pace Analytical Gulf Coast received and analyzed the sample(s) listed
on the Report Sample Summary page of this report. Receipt of the sample(s) is documented
by the attached chain of custody. This applies only to the sample(s) listed in this report.
No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.3 as specified in the contract.

No anomalies were found for the analyzed sample(s).

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22112082501	HS211120103-01	Water	12/01/21 07:35	12/07/21 11:18
22112082502	HS211120103-02	Water	12/01/21 08:25	12/07/21 11:18
22112082503	HS211120103-03	Water	12/01/21 09:20	12/07/21 11:18
22112082504	HS211120103-04	Water	12/01/21 10:10	12/07/21 11:18
22112082505	HS211120103-05	Water	12/01/21 11:00	12/07/21 11:18
22112082506	HS211120103-06	Water	12/01/21 11:55	12/07/21 11:18

Test Summary

EPA RSK-175					
Lab ID	**Client ID**	**Matrix**	**Batch**	**Instru**	**RunDate**
22112082501	HS211120103-01	Water	729093	GCV8B	12/10/21 15:10
22112082502	HS211120103-02	Water	729093	GCV8B	12/10/21 15:16
22112082503	HS211120103-03	Water	729093	GCV8B	12/10/21 15:22
22112082504	HS211120103-04	Water	729093	GCV8B	12/10/21 15:31
22112082505	HS211120103-05	Water	729093	GCV8B	12/10/21 15:36
22112082506	HS211120103-06	Water	729093	GCV8B	12/10/21 15:42

Manual Integrations

Manual Integrations for LC and IC (if performed) are documented in the raw data.
No other manual integrations were performed by Pace Gulf Coast.

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

EPA RSK-175						
Lab ID	**Client ID**	**Parameter**	**Units**	**Result**	**Dil.**	**%Moist**
22112082501	HS211120103-01	Carbon Dioxide	ug/L	778000	100	NA
22112082502	HS211120103-02	Carbon Dioxide	ug/L	779000	100	NA
22112082503	HS211120103-03	Carbon Dioxide	ug/L	744000	100	NA
22112082504	HS211120103-04	Carbon Dioxide	ug/L	820000	100	NA
22112082505	HS211120103-05	Carbon Dioxide	ug/L	661000	100	NA
22112082506	HS211120103-06	Carbon Dioxide	ug/L	423000	100	NA

EPA RSK-175

Form 1D

Results

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-01
Collect Date:	12/01/21 Time: 0735	GCAL Sample ID:	22112082501
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8025
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1510
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	778000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8025.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8025.d
Lab Smp Id: 22112082501 Client Smp ID: 22112082501
Inj Date : 10-DEC-2021 15:10
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082501
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

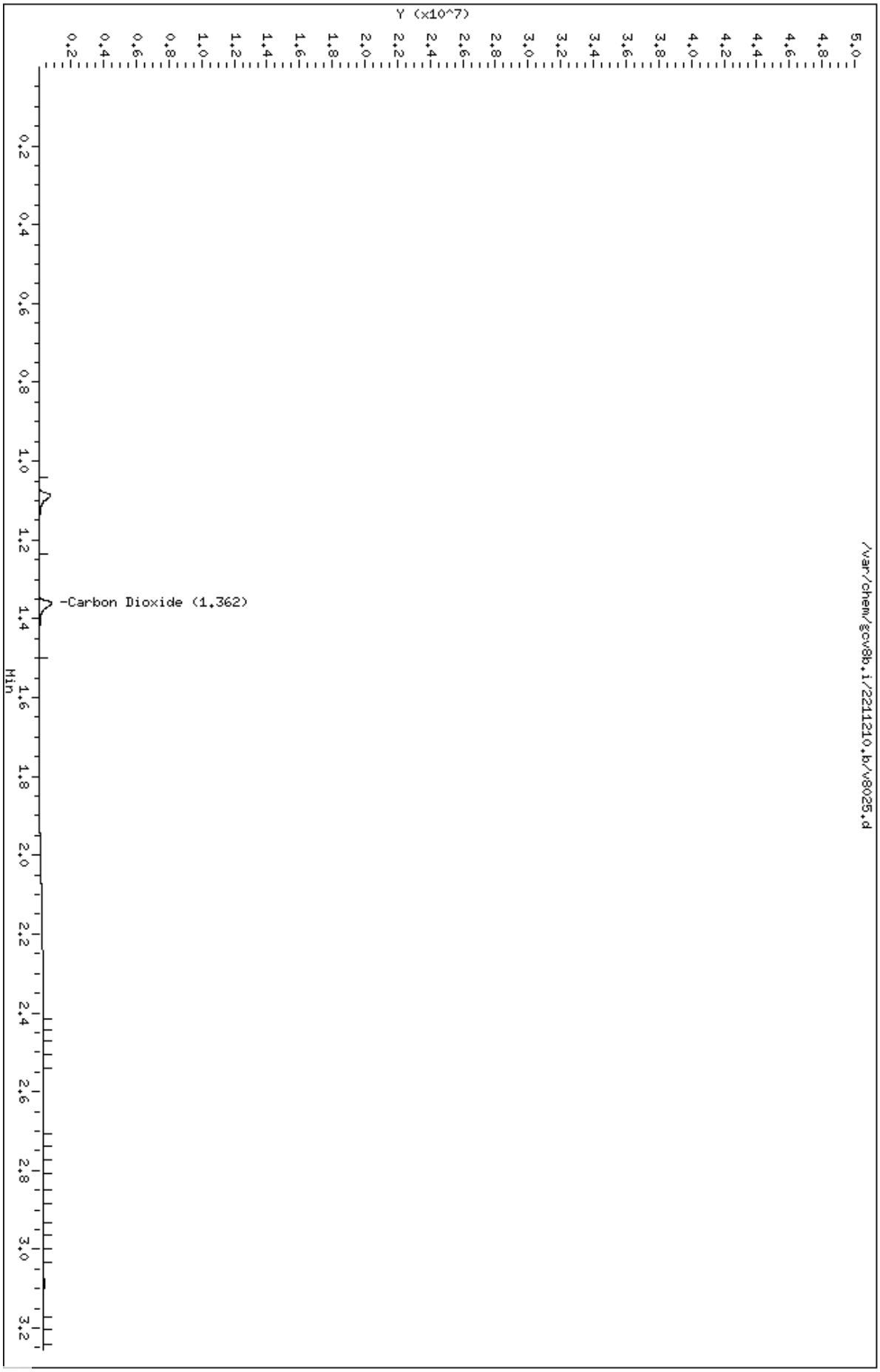
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.362	1.383	-0.021	23163980	7777.14	778000

Data File: /var/chem/gcv8b.i/221210.b/v8025.d
Date : 10-DEC-2021 15:10
Client ID: 22112082501
Sample Info: 22112082501
Column phase: GS-Q-30

Instrument: gcv8b.i
Operator: BHR
Column diameter: 0.53

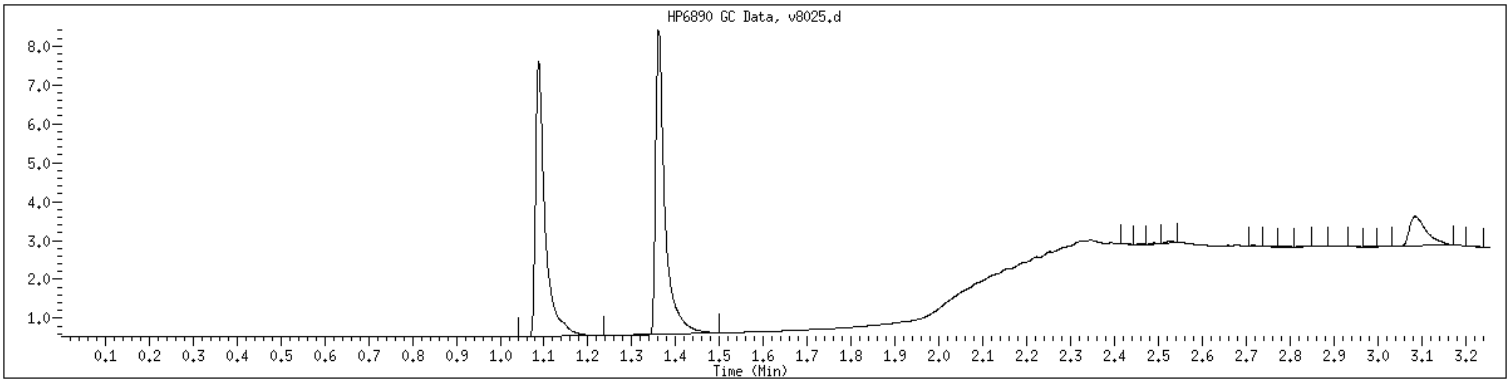
Page 1



Data file : /var/chem/gcv8b.i/2211210.b/v8025.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22112082501	SampleType	: SAMPLE
Injection Date	: 12/10/2021 15:10	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 22112082501		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 100		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-02
Collect Date:	12/01/21 Time: 0825	GCAL Sample ID:	22112082502
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8026
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1516
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	779000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8026.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8026.d
Lab Smp Id: 22112082502 Client Smp ID: 22112082502
Inj Date : 10-DEC-2021 15:16
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082502
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.368	1.383	-0.015	23196513	7788.06	779000

Data File: /var/chem/gcv8b.i/2211210.b/v8026.d

Page 1

Date : 10-DEC-2021 15:16

Client ID: 22112082502

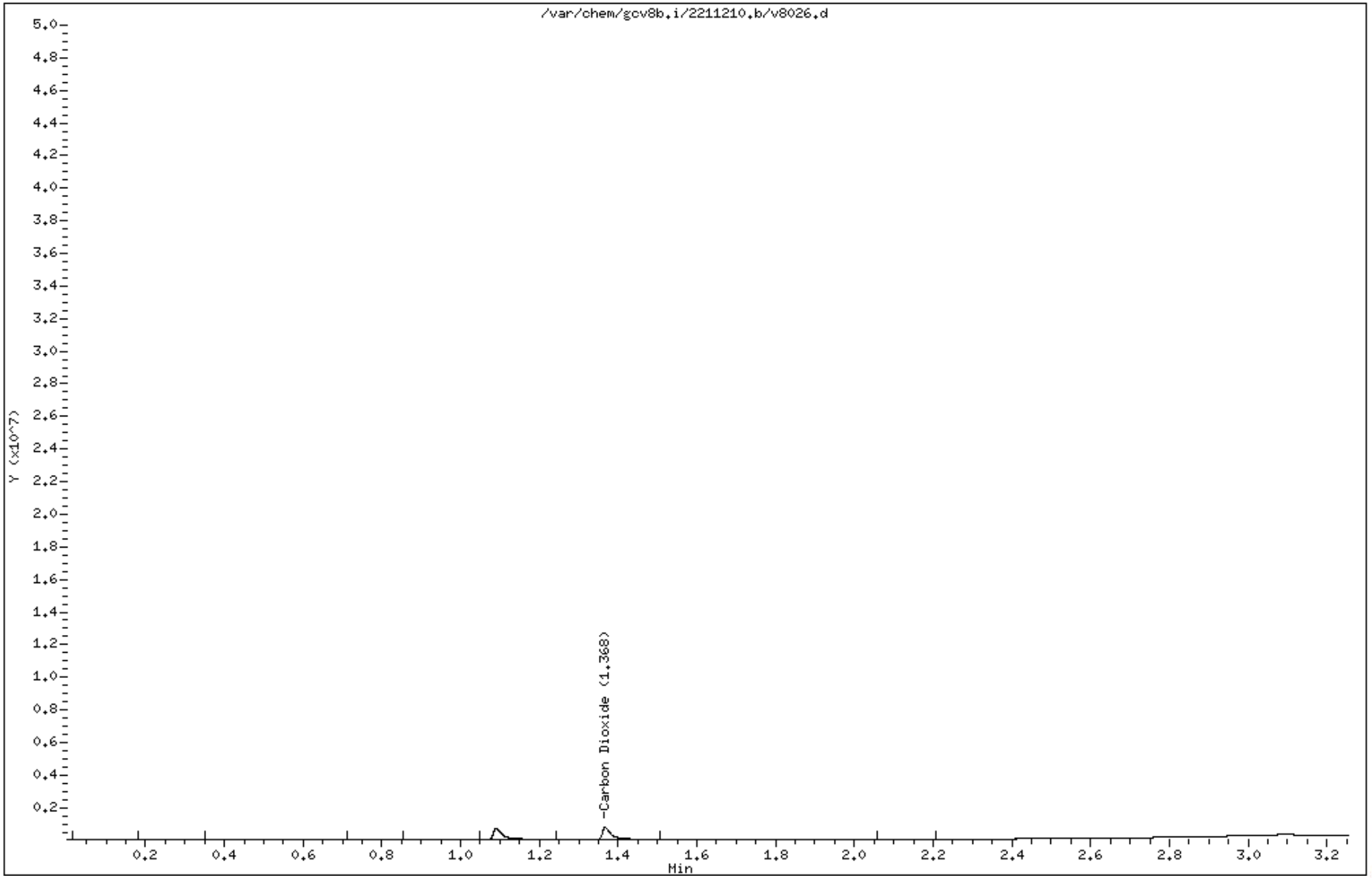
Instrument: gcv8b.i

Sample Info: 22112082502

Operator: BMR

Column phase: GS-Q-30

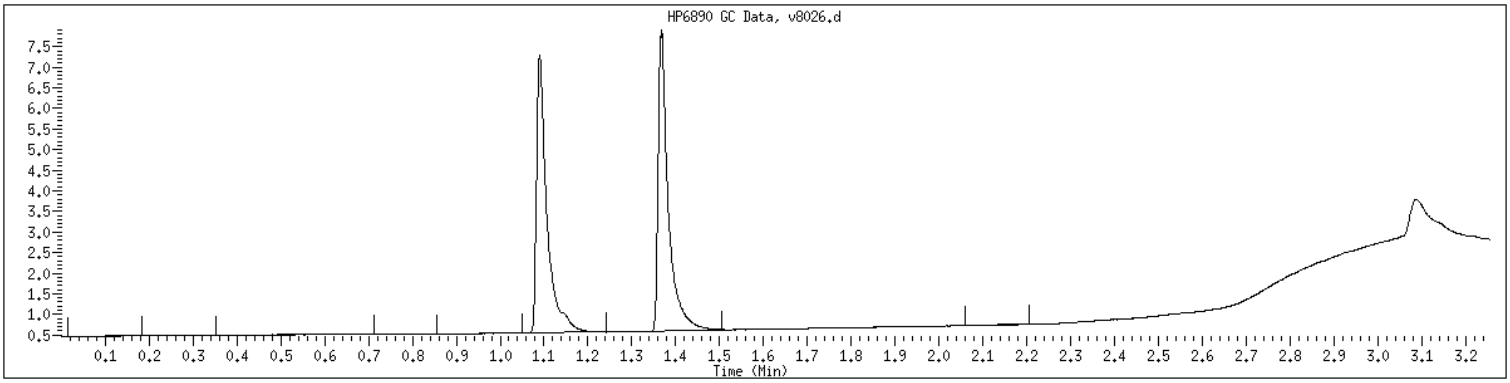
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8026.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22112082502	SampleType	: SAMPLE
Injection Date	: 12/10/2021 15:16	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 22112082502		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 100		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-03
Collect Date:	12/01/21 Time: 0920	GCAL Sample ID:	22112082503
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8027
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1522
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	744000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8027.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8027.d
Lab Smp Id: 22112082503 Client Smp ID: 22112082503
Inj Date : 10-DEC-2021 15:22
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082503
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.368	1.383	-0.015	22146805	7435.63	744000

Data File: /var/chem/gcv8b.i/2211210.b/v8027.d

Page 1

Date : 10-DEC-2021 15:22

Client ID: 22112082503

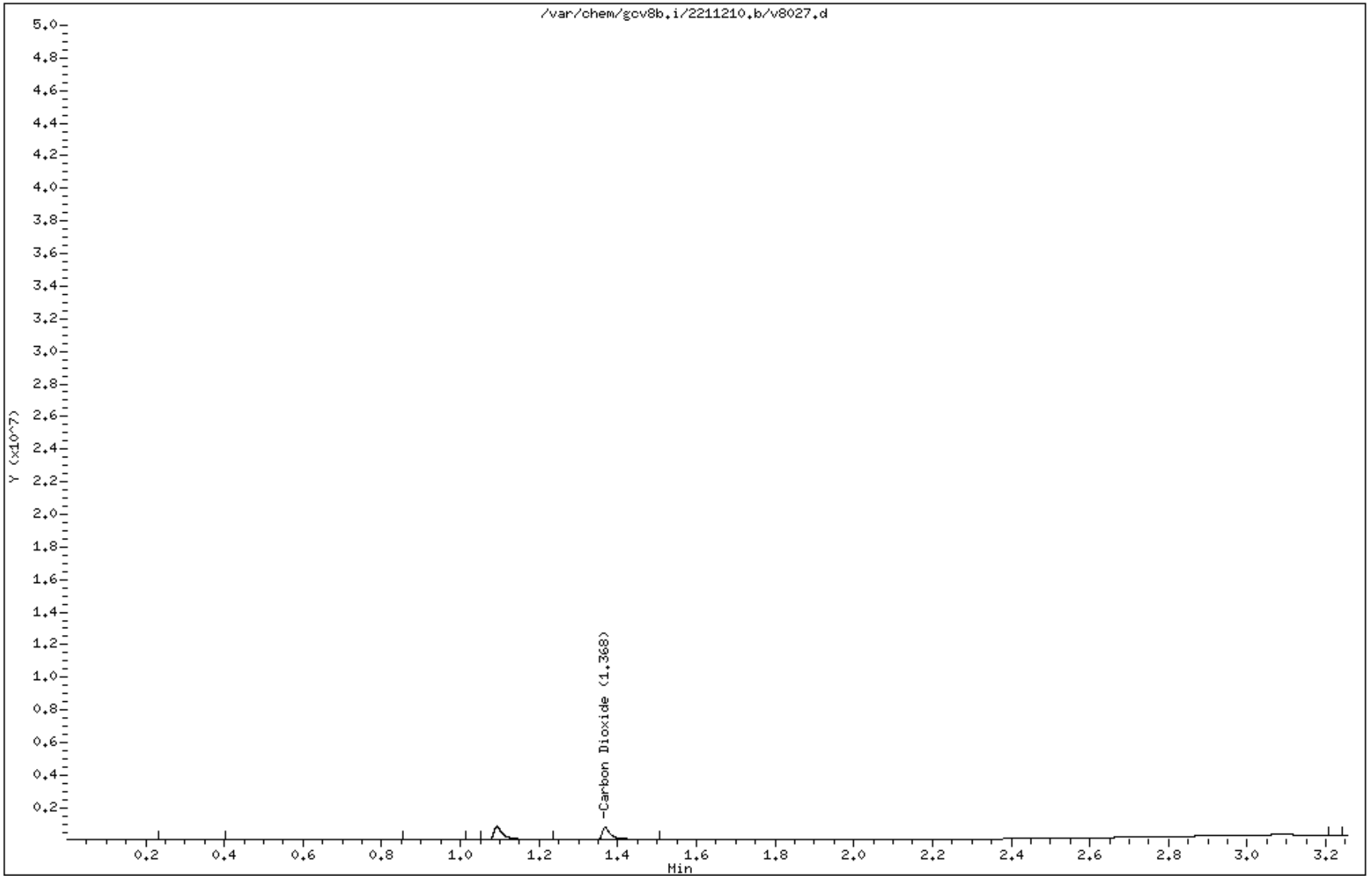
Instrument: gcv8b.i

Sample Info: 22112082503

Operator: BMR

Column phase: GS-Q-30

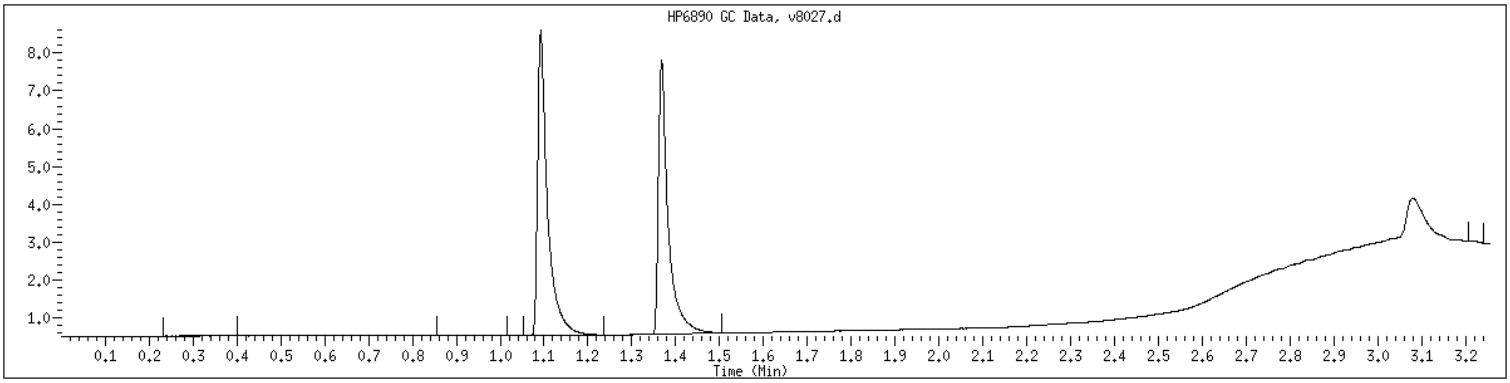
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8027.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 22112082503 SampleType : SAMPLE
Injection Date: 12/10/2021 15:22 Instrument : gcv8b.i
Operator : BMR
Sample Info : 22112082503
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Dilution : 100
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-04
Collect Date:	12/01/21 Time: 1010	GCAL Sample ID:	22112082504
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8028
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1531
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	820000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8028.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8028.d
Lab Smp Id: 22112082504 Client Smp ID: 22112082504
Inj Date : 10-DEC-2021 15:31
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082504
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.362	1.383	-0.021	24436786	8204.48	820000

Data File: /var/chem/gcv8b.i/2211210.b/v8028.d

Page 1

Date : 10-DEC-2021 15:31

Client ID: 22112082504

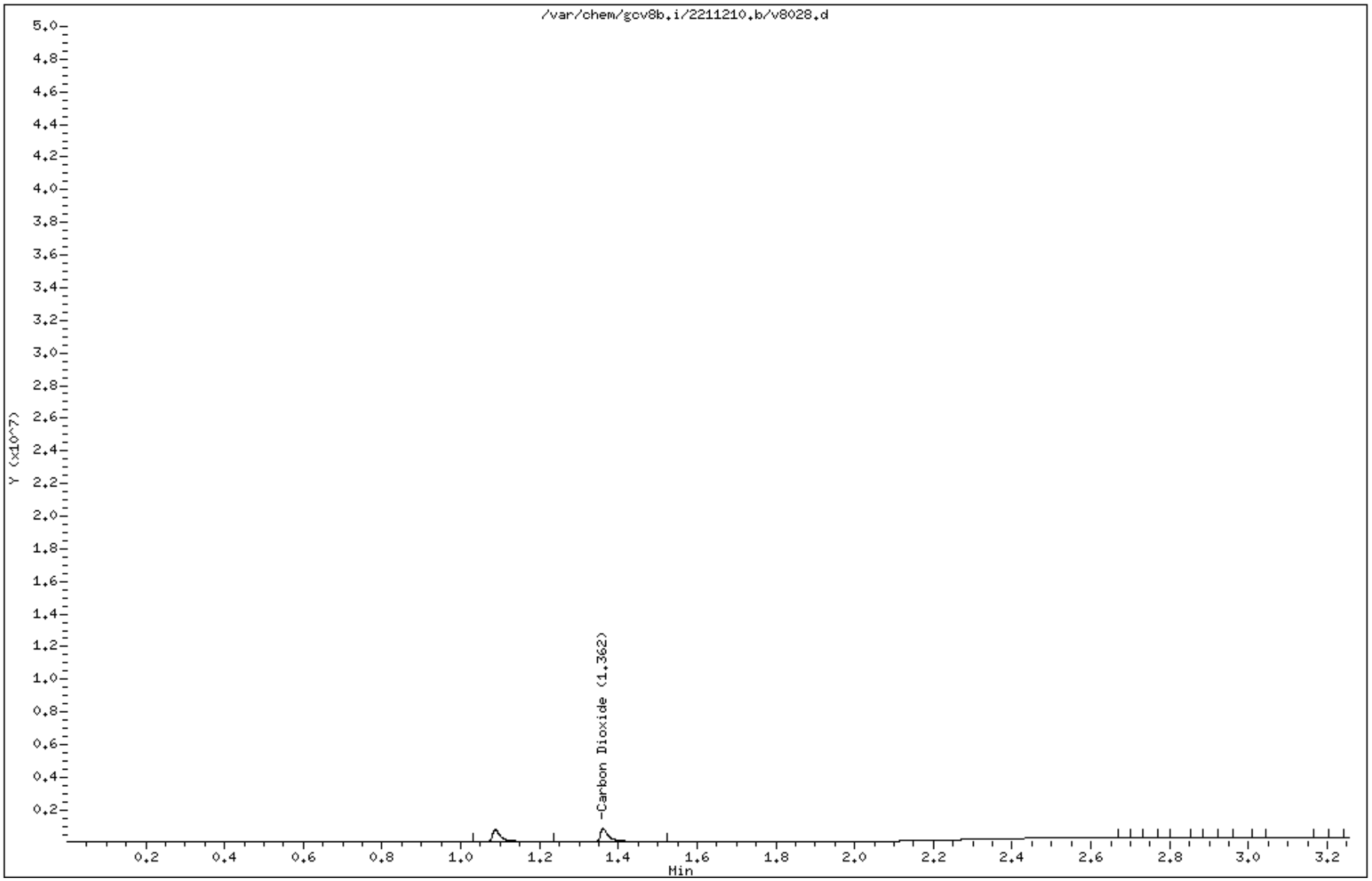
Instrument: gcv8b.i

Sample Info: 22112082504

Operator: BMR

Column phase: GS-Q-30

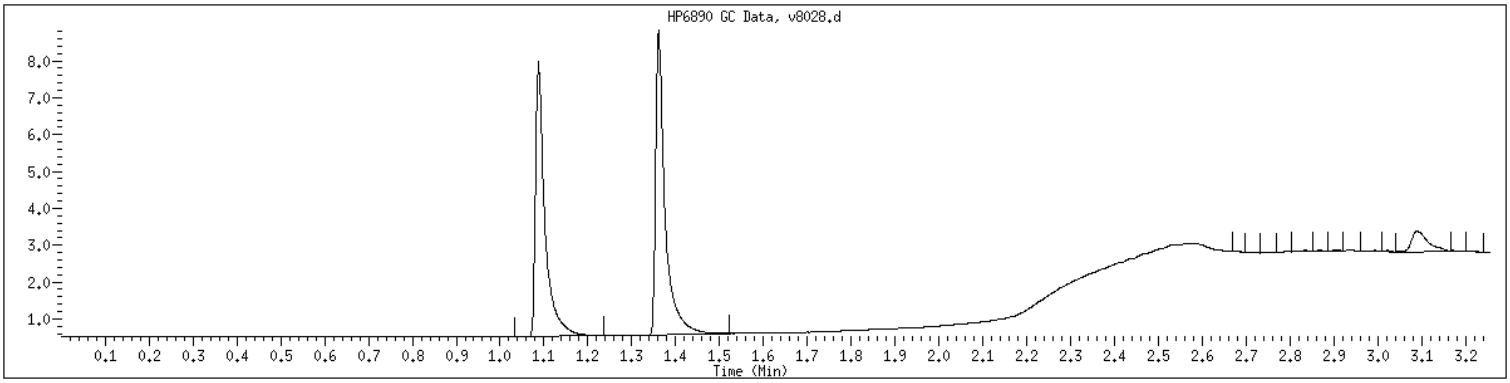
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8028.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 22112082504	SampleType	: SAMPLE
Injection Date	: 12/10/2021 15:31	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 22112082504		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 100		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-05
Collect Date:	12/01/21 Time: 1100	GCAL Sample ID:	22112082505
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8029
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1536
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	661000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8029.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8029.d
Lab Smp Id: 22112082505 Client Smp ID: 22112082505
Inj Date : 10-DEC-2021 15:36
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082505
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.353	1.383	-0.030	19678366	6606.87	661000

Data File: /var/chem/gcv8b.i/2211210.b/v8029.d

Page 1

Date : 10-DEC-2021 15:36

Client ID: 22112082505

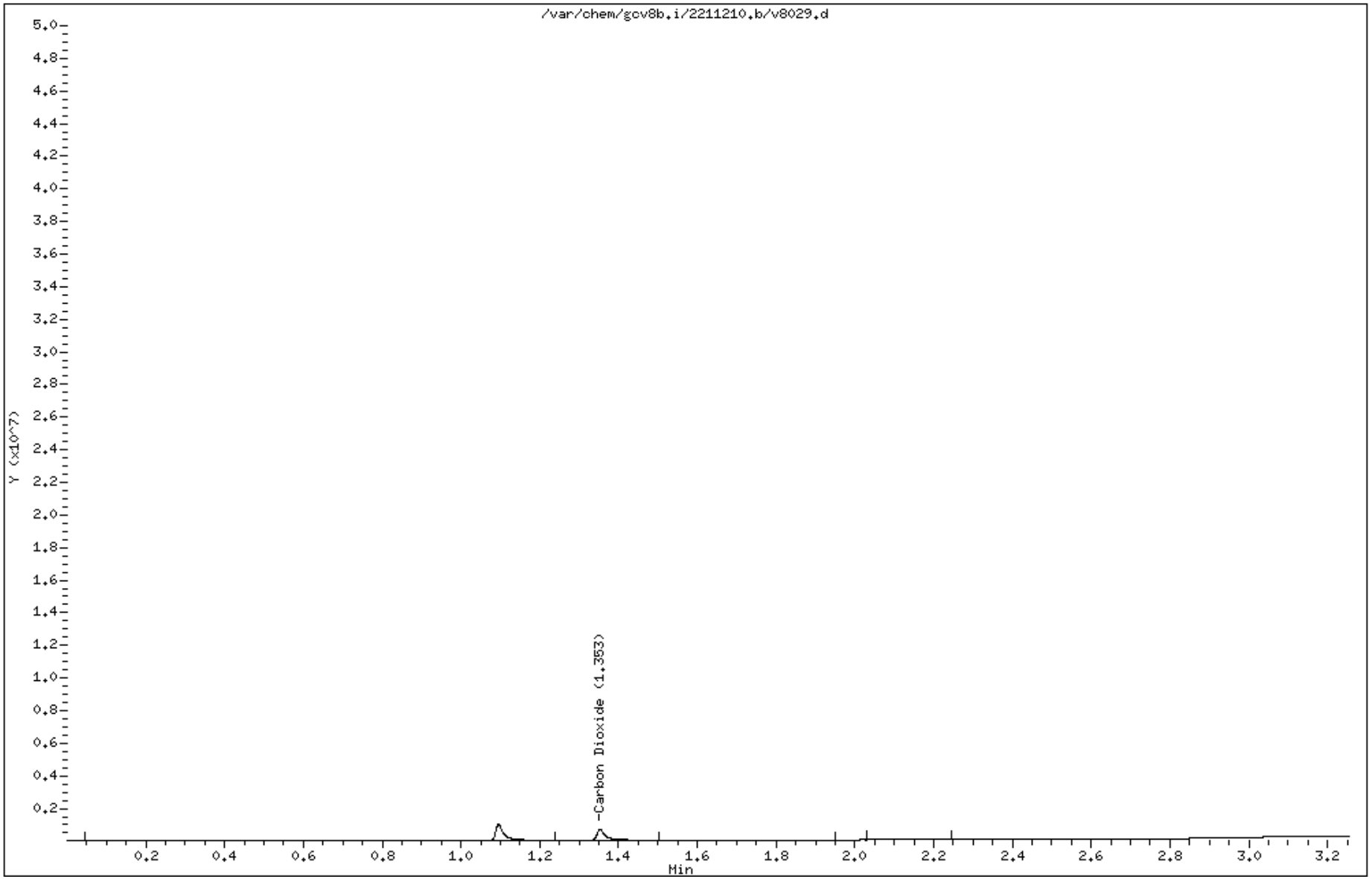
Instrument: gcv8b.i

Sample Info: 22112082505

Operator: BMR

Column phase: GS-Q-30

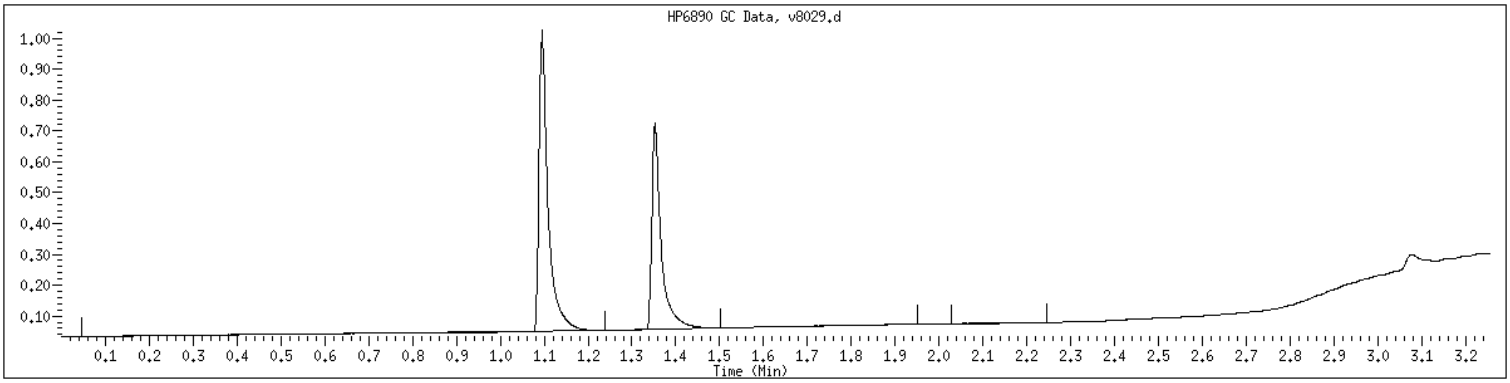
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8029.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 22112082505 SampleType : SAMPLE
Injection Date: 12/10/2021 15:36 Instrument : gcv8b.i
Operator : BMR
Sample Info : 22112082505
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Dilution : 100
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	HS211120103-06
Collect Date:	12/01/21 Time: 1155	GCAL Sample ID:	22112082506
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8030
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	100 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1542
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	423000		12700	38600	90000

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8030.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8030.d
Lab Smp Id: 22112082506 Client Smp ID: 22112082506
Inj Date : 10-DEC-2021 15:42
Operator : BMR Inst ID: gcv8b.i
Smp Info : 22112082506
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1
Dil Factor: 100.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.366	1.383	-0.017	12593882	4228.31	423000

Data File: /var/chem/gcv8b.i/2211210.b/v8030.d

Page 1

Date : 10-DEC-2021 15:42

Client ID: 22112082506

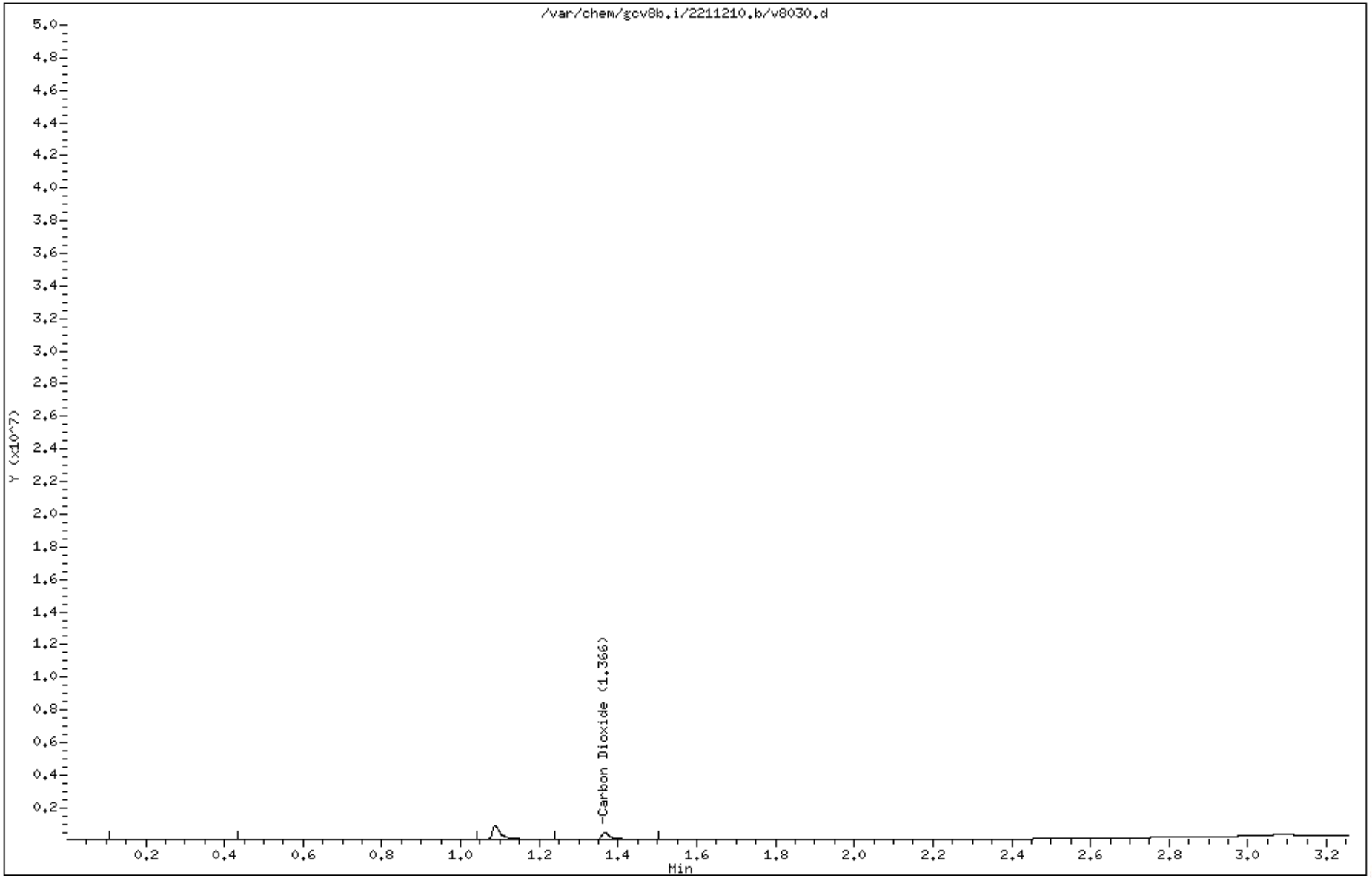
Instrument: gcv8b.i

Sample Info: 22112082506

Operator: BMR

Column phase: GS-Q-30

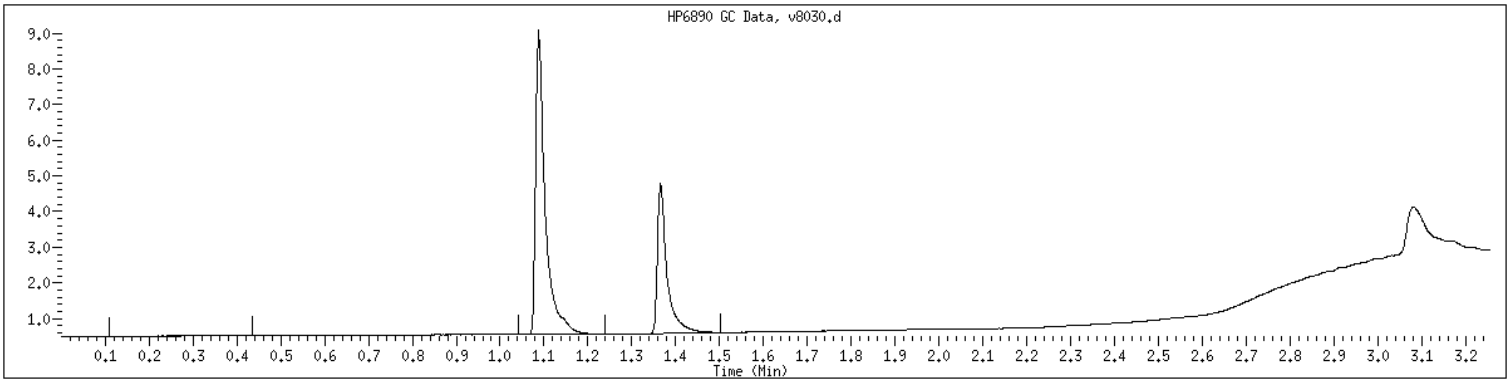
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8030.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 22112082506 SampleType : SAMPLE
Injection Date: 12/10/2021 15:42 Instrument : gcv8b.i
Operator : BMR
Sample Info : 22112082506
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Dilution : 100
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	MB2284464
Collect Date:	NA Time: NA	GCAL Sample ID:	2284464
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8002
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 0954
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	900	U	127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8002.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8002.d
Lab Smp Id: 2284464 Client Smp ID: 2284464
Inj Date : 10-DEC-2021 09:54
Operator : BMR Inst ID: gcv8b.i
Smp Info : 2284464
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)

Data File: /var/chem/gcv8b.i/2211210.b/v8002.d

Page 1

Date : 10-DEC-2021 09:54

Client ID: 2284464

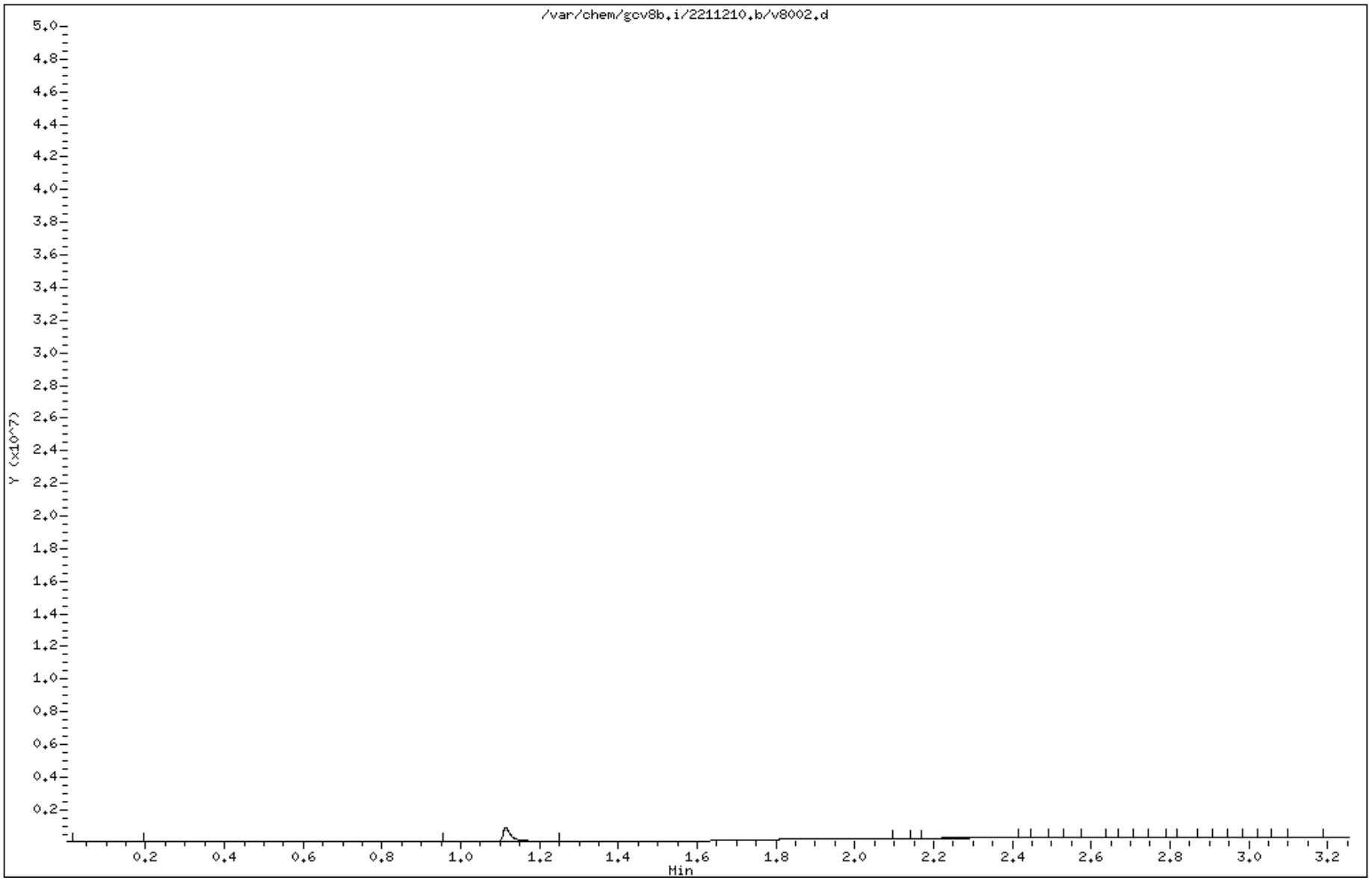
Instrument: gcv8b.i

Sample Info: 2284464

Operator: BMR

Column phase: GS-Q-30

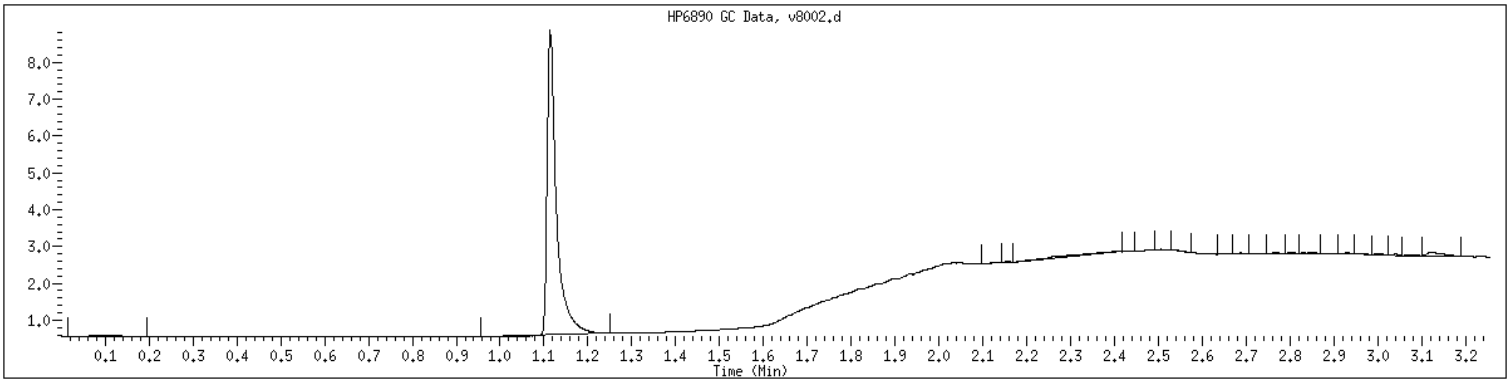
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8002.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2284464	SampleType	: BLANK
Injection Date	: 12/10/2021 09:54	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 2284464		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	LCS2284465
Collect Date:	NA Time: NA	GCAL Sample ID:	2284465
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8003
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1035
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	8630		127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8003.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8003.d
Lab Smp Id: 2284465 Client Smp ID: 2284465
Inj Date : 10-DEC-2021 10:35
Operator : BMR Inst ID: gcv8b.i
Smp Info : 2284465
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.383	1.383	0.000	25697296	8627.68	8630(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2211210.b/v8003.d

Page 1

Date : 10-DEC-2021 10:35

Client ID: 2284465

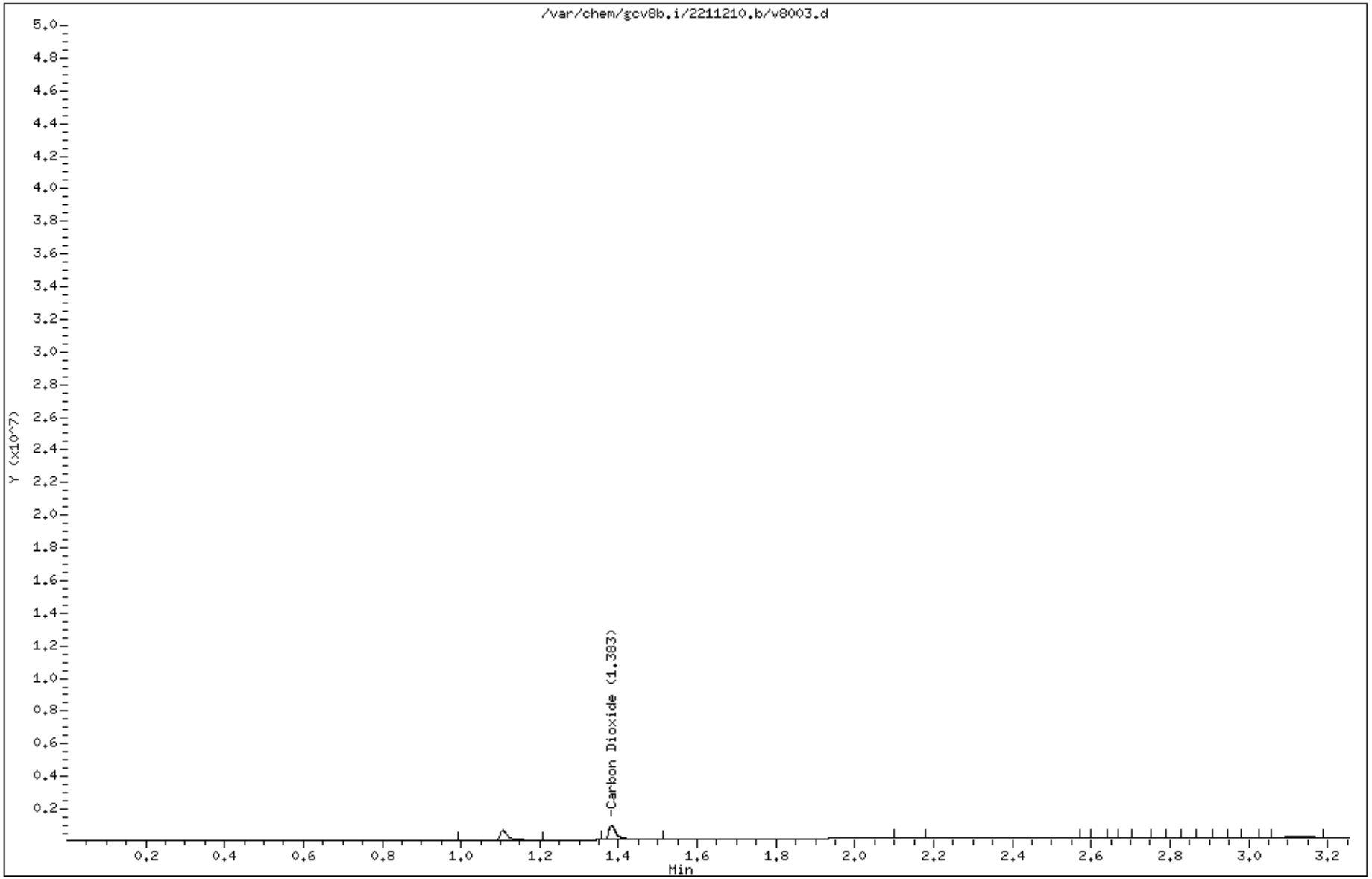
Instrument: gcv8b.i

Sample Info: 2284465

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

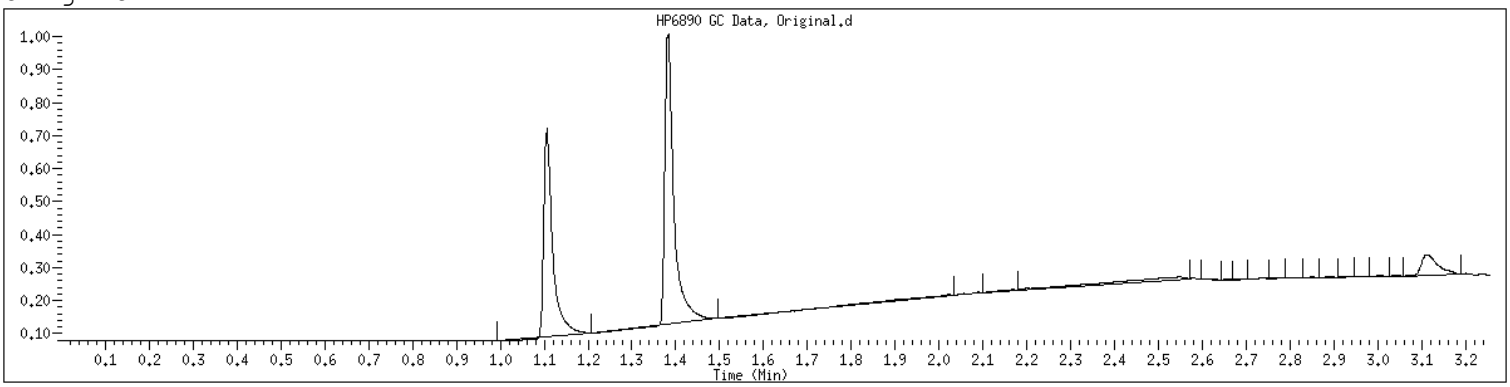


Data file : /var/chem/gcv8b.i/2211210.b/v8003.d Page: 1
Report Date: 12/10/2021 16:34

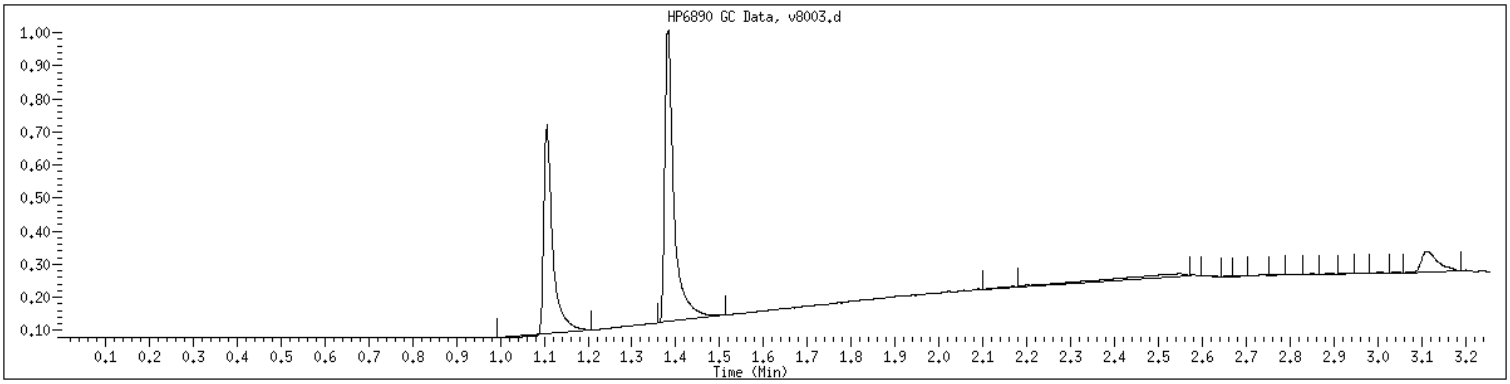
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2284465	SampleType	: LCS
Injection Date	: 12/10/2021 10:35	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 2284465		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



1D

ORGANICS ANALYSIS DATA SHEET

Report No:	221120825	Client Sample ID:	LCSD2284466
Collect Date:	NA Time: NA	GCAL Sample ID:	2284466
Matrix:	Water % Moisture: NA	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8004
Injection Vol.:	1 (µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 1119
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

CONCENTRATION UNITS: ug/L

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
124-38-9	Carbon Dioxide	8130		127	386	900

FORM I ORG-1

Data File: /var/chem/gcv8b.i/2211210.b/v8004.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8004.d
Lab Smp Id: 2284466 Client Smp ID: 2284466
Inj Date : 10-DEC-2021 11:19
Operator : BMR Inst ID: gcv8b.i
Smp Info : 2284466
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.379	1.383	-0.004	24229385	8134.84	8130(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2211210.b/v8004.d

Page 1

Date : 10-DEC-2021 11:19

Client ID: 2284466

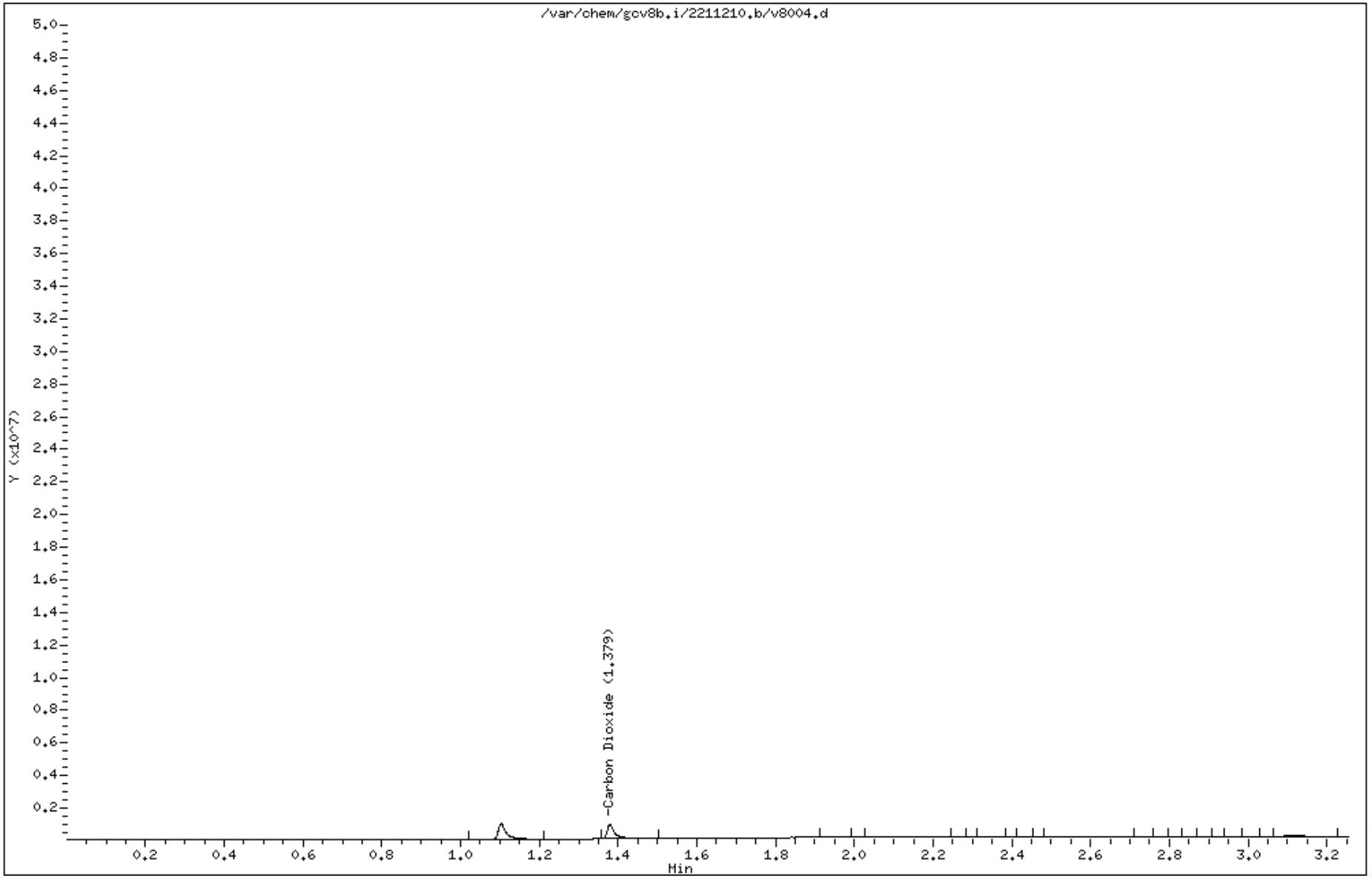
Instrument: gcv8b.i

Sample Info: 2284466

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

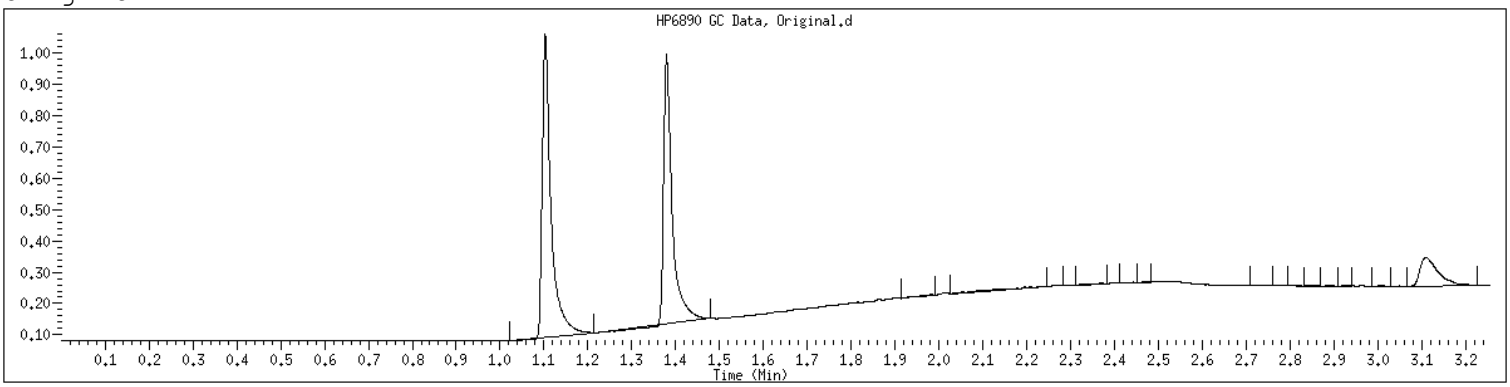


Data file : /var/chem/gcv8b.i/2211210.b/v8004.d Page: 1
Report Date: 12/10/2021 16:34

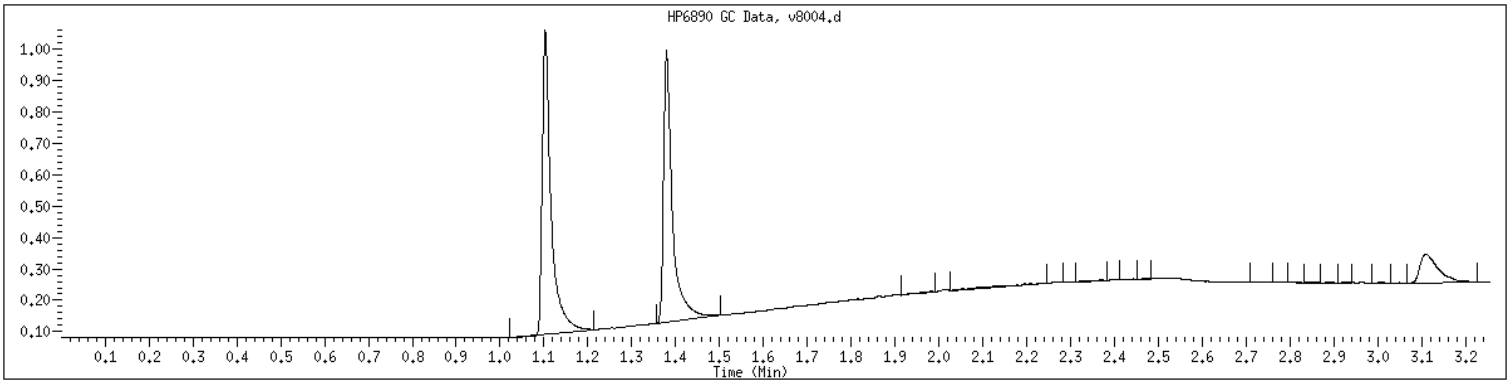
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 2284466	SampleType	: LCSD
Injection Date	: 12/10/2021 11:19	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 2284466		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



EPA RSK-175

Form 3E

Spikes

3E

WATER ORGANICS LCS/LCSD RECOVERY

Report No:	221120825		
Prep Method:	NA	Prep Batch:	NA
Analytical Method:	RSK-175	Analytical Batch:	729093

GCAL QC ID: 2284465

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
Carbon Dioxide	ug/L	8700	0	8630	99		38 - 147

GCAL QC ID: 2284466

ANALYTE	*UNITS*	*SPIKE ADDED*	*LCSD RESULT*	*LCSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*RPD*
Carbon Dioxide	ug/L	8700	8130	93		6		38 - 147	0 - 40

RPD : 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

EPA RSK-175

Form 4C

Method Blanks

4C
ORGANIC METHOD BLANK SUMMARY

Report No:	221120825	Method Blank ID:	2284464
Matrix:	Water	Instrument ID:	GCV8B
Sample Amt:	5 mL	Lab File ID:	2211210/v8002
Injection Vol.:	(µL)	GC Column:	GS-Q-30 ID .53 (mm)
Prep Final Vol.:	NA (µL)	Dilution Factor:	1 Analyst: BMR
Prep Date:	NA	Analysis Date:	12/10/21 Time: 0954
Prep Batch:	NA	Analytical Batch:	729093
Prep Method:	NA	Analytical Method:	RSK-175

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	*GCAL SAMPLE ID*	*DATE ANALYZED*	*TIME ANALYZED*	*INSTRUMENT ID*
1.	LCS2284465	2284465	12/10/21	1035	GCV8B
2.	LCSD2284466	2284466	12/10/21	1119	GCV8B
3.	HS211120103-01	22112082501	12/10/21	1510	GCV8B
4.	HS211120103-02	22112082502	12/10/21	1516	GCV8B
5.	HS211120103-03	22112082503	12/10/21	1522	GCV8B
6.	HS211120103-04	22112082504	12/10/21	1531	GCV8B
7.	HS211120103-05	22112082505	12/10/21	1536	GCV8B
8.	HS211120103-06	22112082506	12/10/21	1542	GCV8B

FORM IV ORGANIC

EPA RSK-175

Form 6E

Calibrations

6E

ORGANICS INITIAL CALIBRATION DATA

				LabQC ID - FileID - Conc	1201 ~ 2210921p/v8003 ~ mix	
Report No:	221120825	Instrument ID:	GCV8B	1202 ~ 2210921p/v8004 ~ mix	1203 ~ 2210921p/v8005 ~ mix	
GC Column:	GS-Q-30 ID .53 (mm)	Analyst:	BMR	1204 ~ 2210921p/v8006 ~ mix	1205 ~ 2210921p/v8007 ~ mix	
Calib. Date 1:	09/21/21 Time 1: 1153	Analytical Batch:	721348			
Calib. Date 2:	09/21/21 Time 2: 1218	Analytical Method:	RSK-175			

ANALYTE	*1201*	*1202*	*1203*	*1204*	*1205*	*1206*	*1207*	*1208*	*1209*	*$\overline{RF}$ / m / A*	*b / B*	*C*	*FIT*	*TYPE*
Carbon Dioxide	2723	2646	3214	3161	3149					2978			9.107	A

FIT = %RSD for Average Curve and the Coefficient of Determination (r2) for Linear and Quadratic

Curve Types: A - Averaged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

A,B,C = Coefficents For Quadratic Curve

FORM V I SVOA

Data File: /var/chem/gcv8b.i/2210921p.b/v8003.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8003.d
Lab Smp Id: 1201
Inj Date : 21-SEP-2021 11:53
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1201
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 11:53 Cal File: v8003.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.637	1.637	0.000	2352285	864.000	790(M1)

QC Flag Legend

M1- Compound response manually integrated because
Target system did not integrate.

Data File: /var/chem/gcv8b.i/2210921p.b/v8003.d

Page 1

Date : 21-SEP-2021 11:53

Client ID:

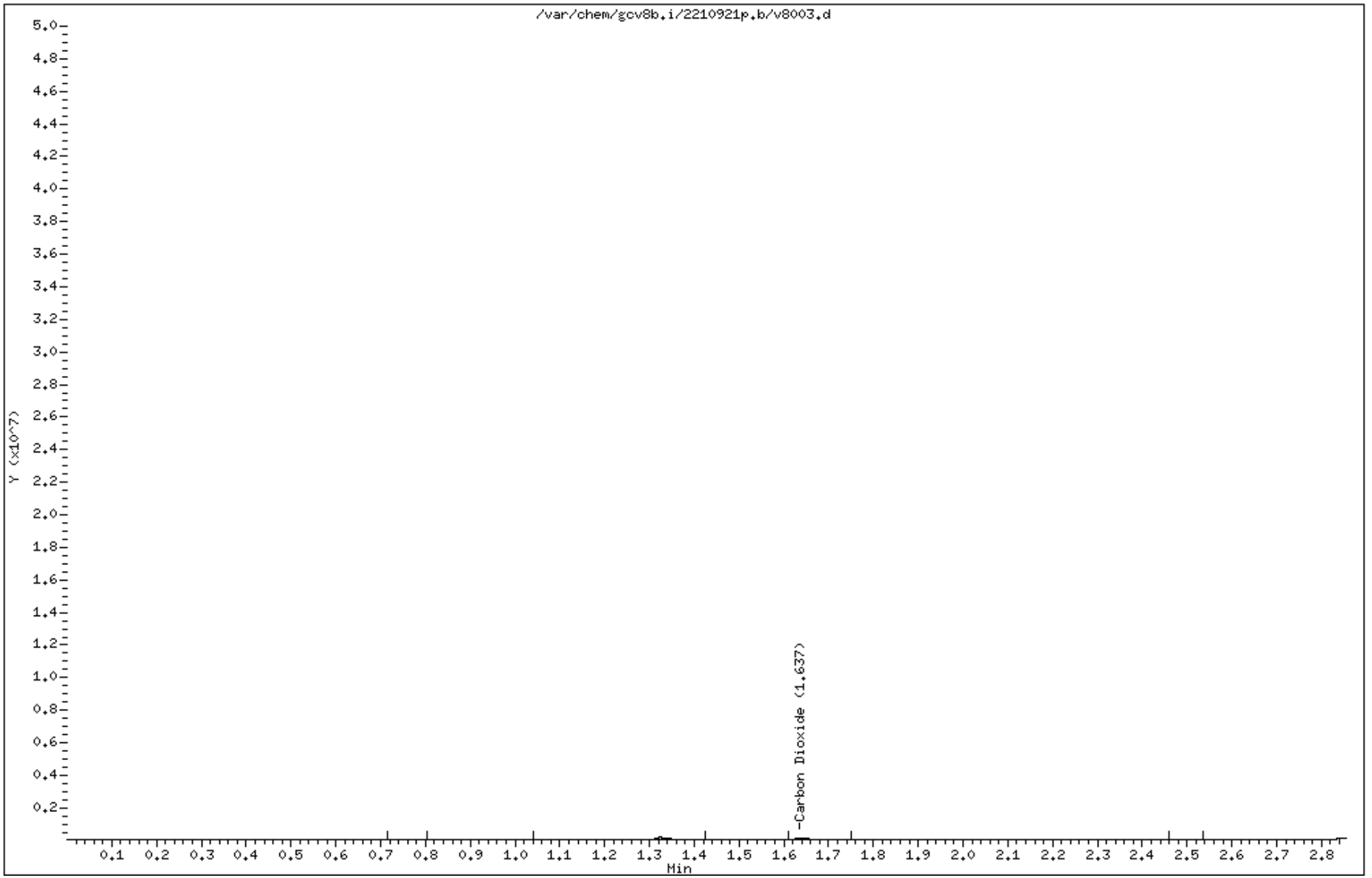
Instrument: gcv8b.i

Sample Info: 1201

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

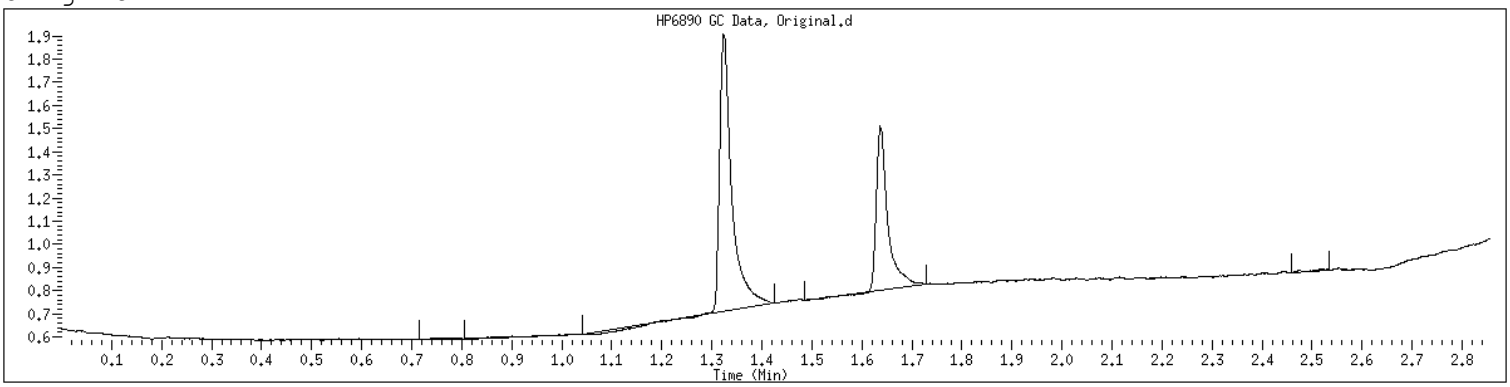


Data file : /var/chem/gcv8b.i/2210921p.b/v8003.d Page: 1
Report Date: 09/21/2021 15:58

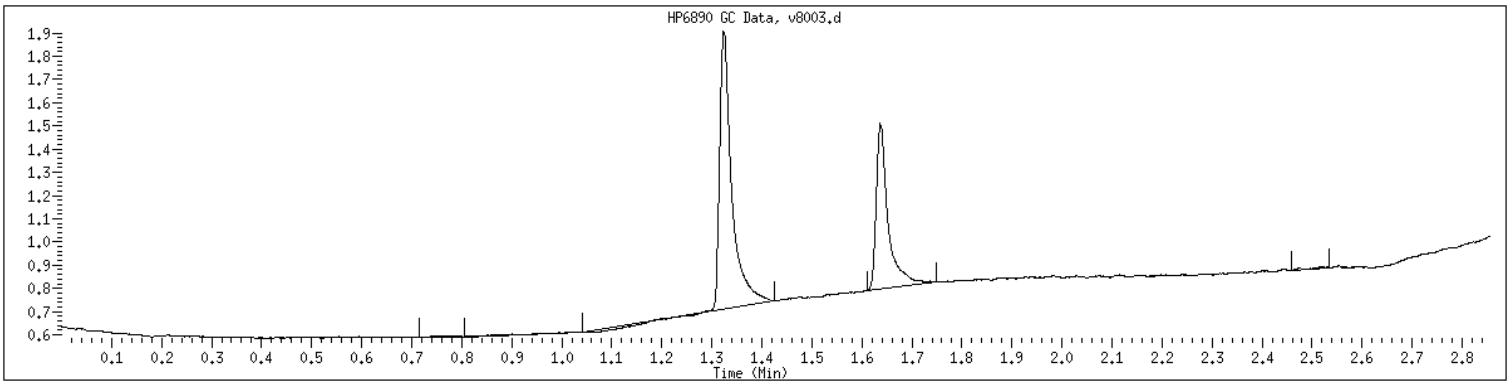
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1201	SampleType	: CALIB_1
Injection Date	: 09/21/2021 11:53	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1201		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



Data File: /var/chem/gcv8b.i/2210921p.b/v8004.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8004.d
Lab Smp Id: 1202
Inj Date : 21-SEP-2021 11:58
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1202
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 11:58 Cal File: v8004.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.634	1.634	0.000	4576744	1730.00	1540(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2210921p.b/v8004.d

Page 1

Date : 21-SEP-2021 11:58

Client ID:

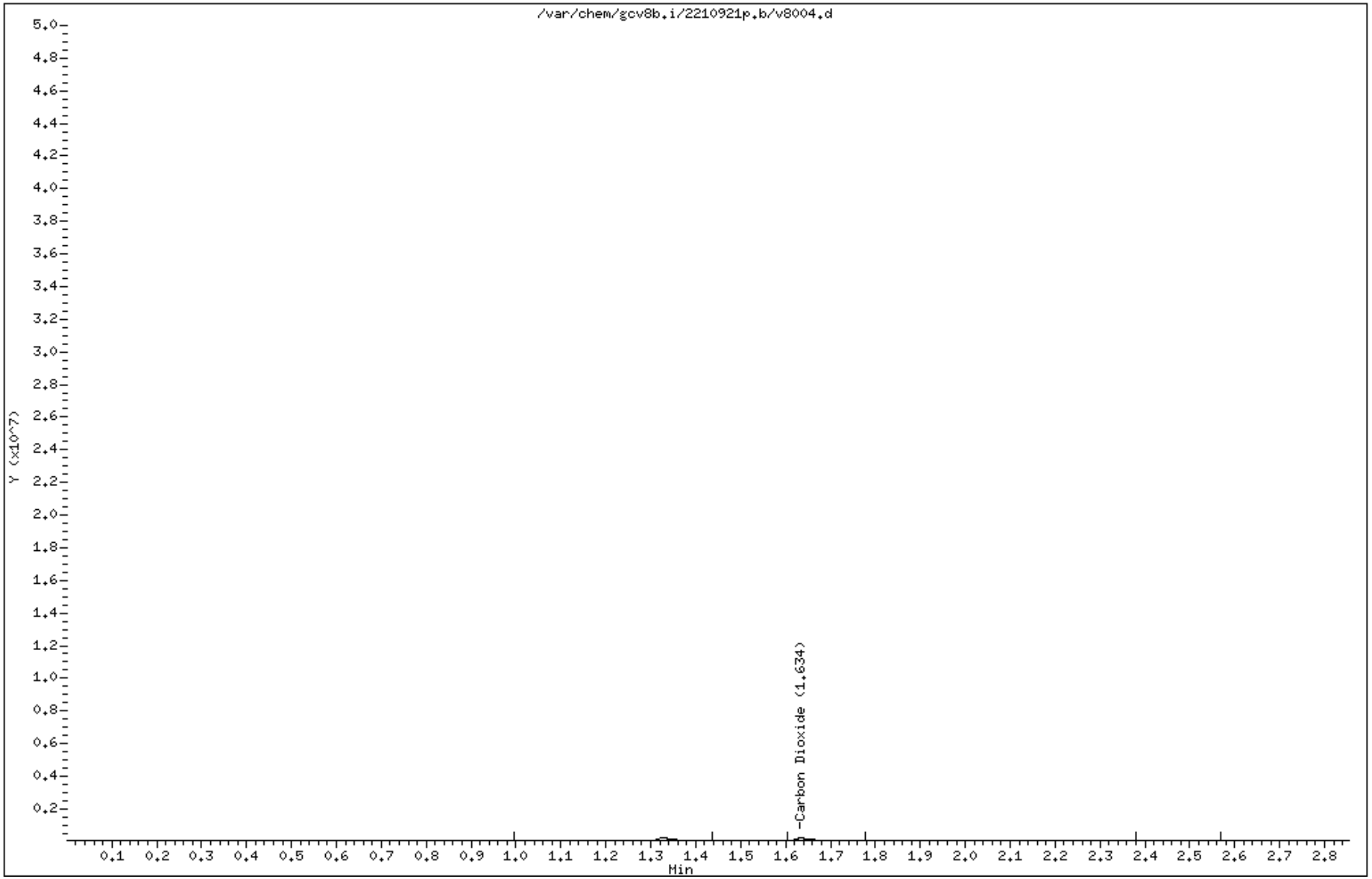
Instrument: gcv8b.i

Sample Info: 1202

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

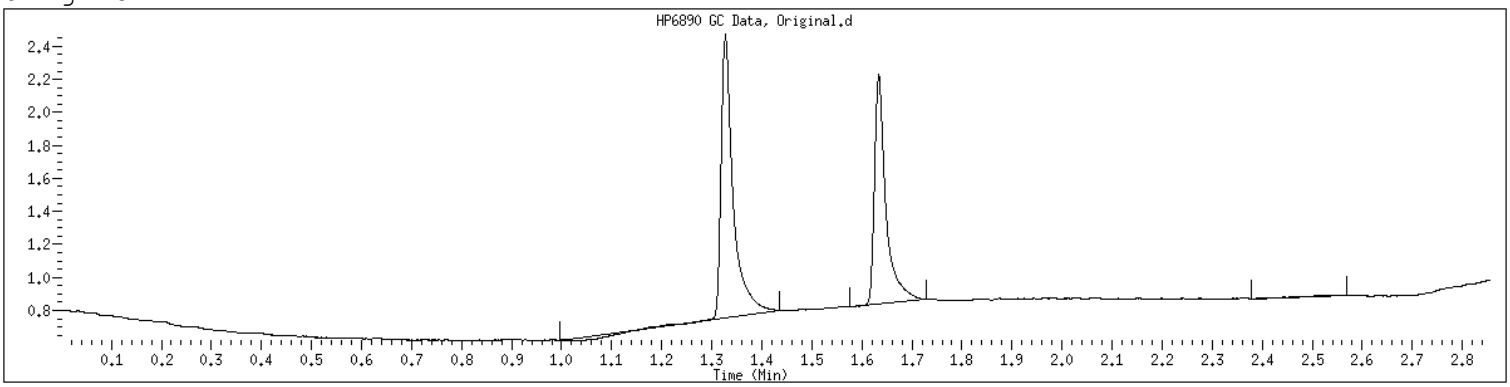


Data file : /var/chem/gcv8b.i/2210921p.b/v8004.d Page: 1
Report Date: 09/21/2021 15:58

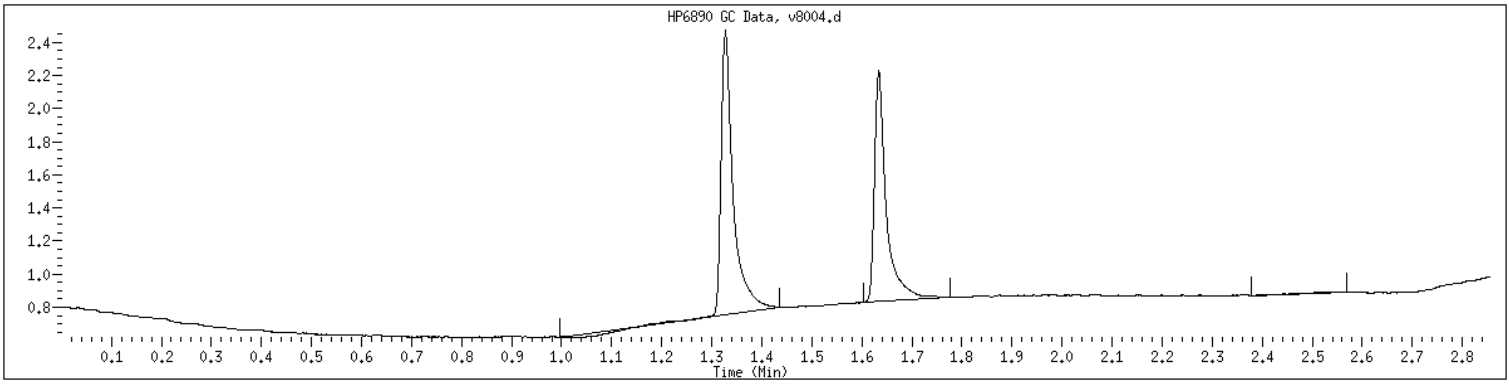
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1202	SampleType	: CALIB_2
Injection Date	: 09/21/2021 11:58	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1202		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



Data File: /var/chem/gcv8b.i/2210921p.b/v8005.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8005.d
Lab Smp Id: 1203
Inj Date : 21-SEP-2021 12:06
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1203
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:06 Cal File: v8005.d
Als bottle: 1 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.632	1.632	0.000	27769800	8640.00	9320(M2)

QC Flag Legend

M2- Compound response manually integrated because
Target system integrated incorrectly.

Data File: /var/chem/gcv8b.i/2210921p.b/v8005.d

Page 1

Date : 21-SEP-2021 12:06

Client ID:

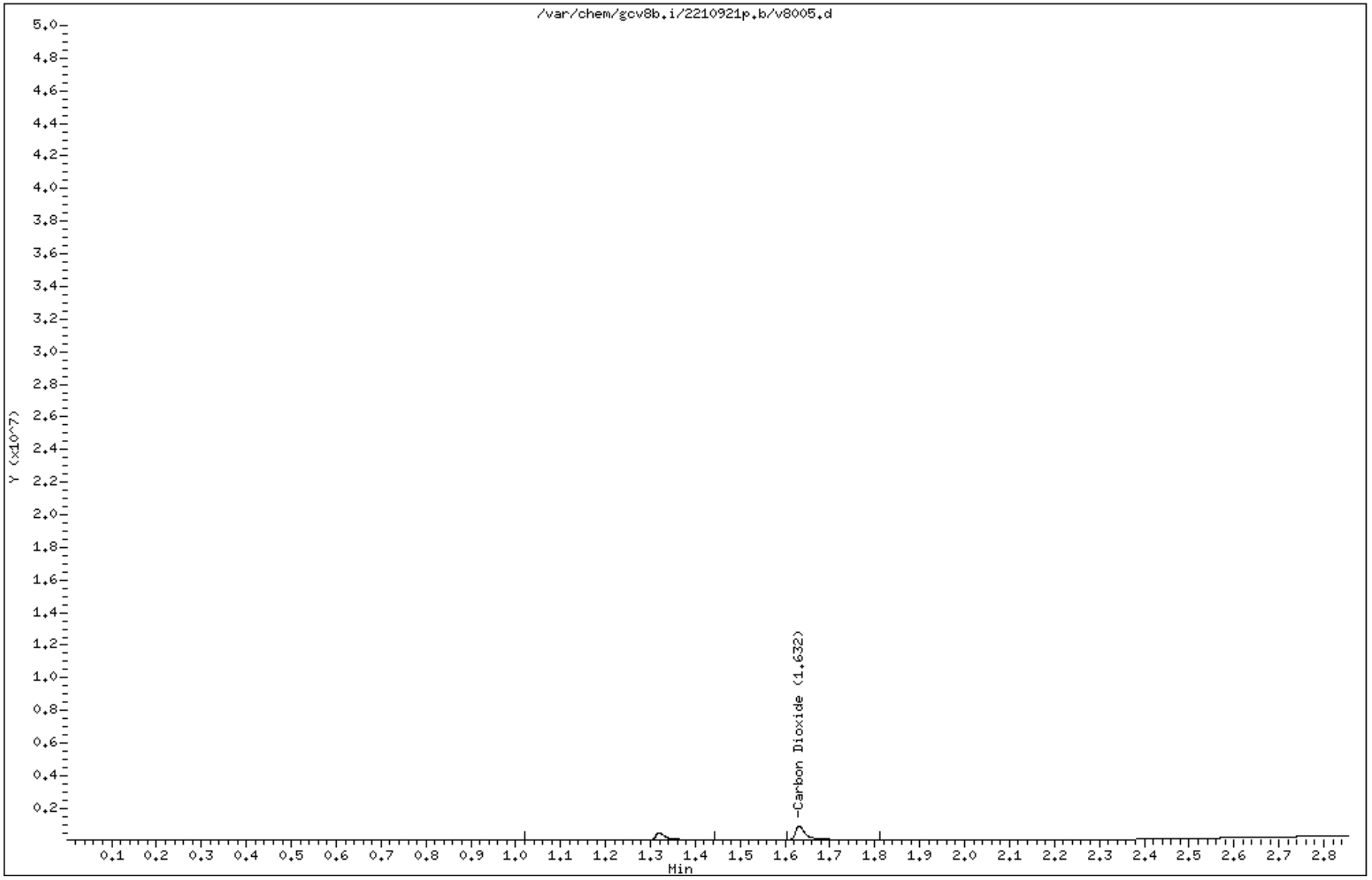
Instrument: gcv8b.i

Sample Info: 1203

Operator: BMR

Column phase: GS-Q-30

Column diameter: 0.53

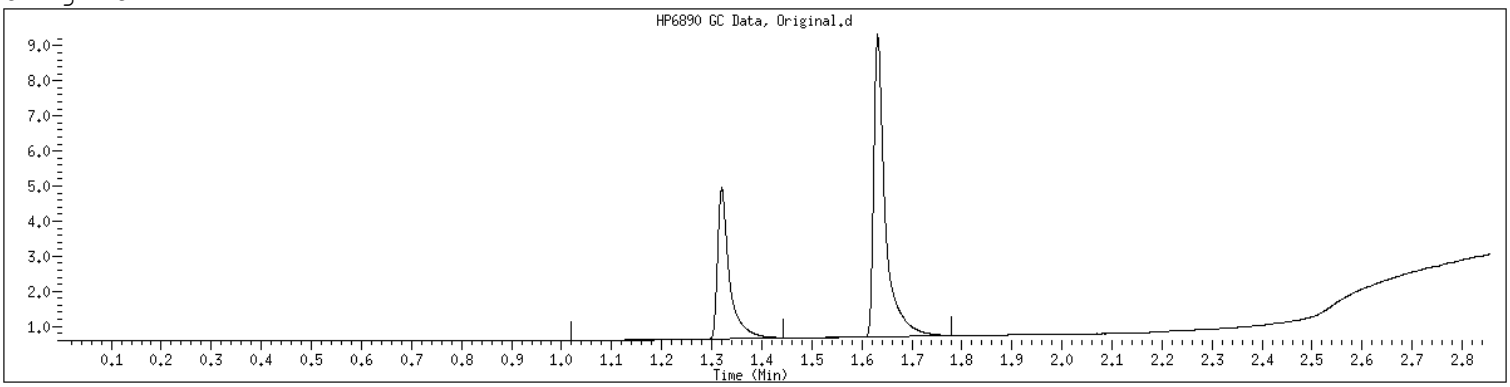


Data file : /var/chem/gcv8b.i/2210921p.b/v8005.d Page: 1
Report Date: 09/21/2021 15:58

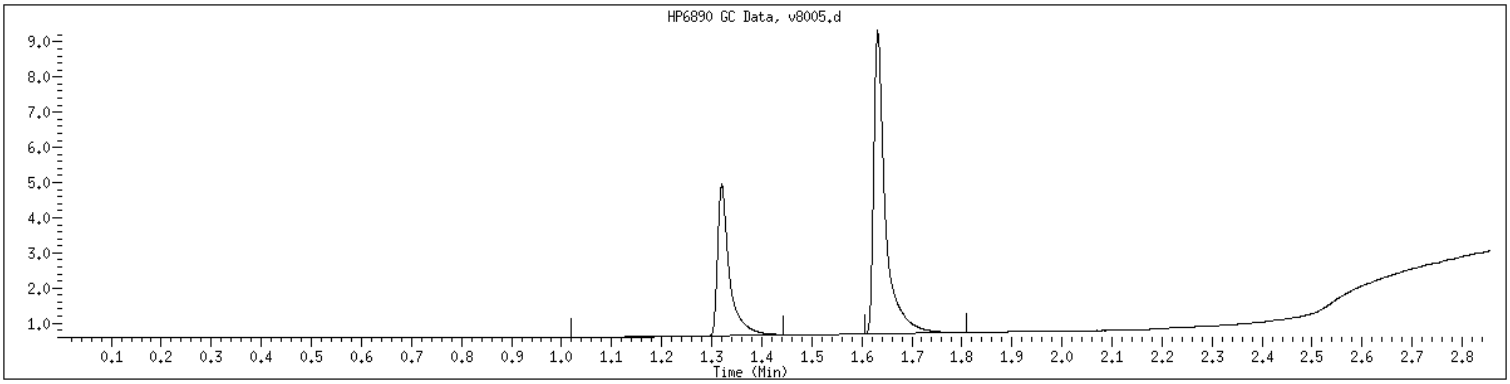
MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1203	SampleType	: CALIB_3
Injection Date	: 09/21/2021 12:06	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1203		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2

Original



Final



Data File: /var/chem/gcv8b.i/2210921p.b/v8006.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8006.d
Lab Smp Id: 1204
Inj Date : 21-SEP-2021 12:11
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1204
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:11 Cal File: v8006.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.629	1.629	0.000	43619426	13800.0	14600

Data File: /var/chem/gcv8b.i/2210921p.b/v8006.d

Date : 21-SEP-2021 12:11

Client ID:

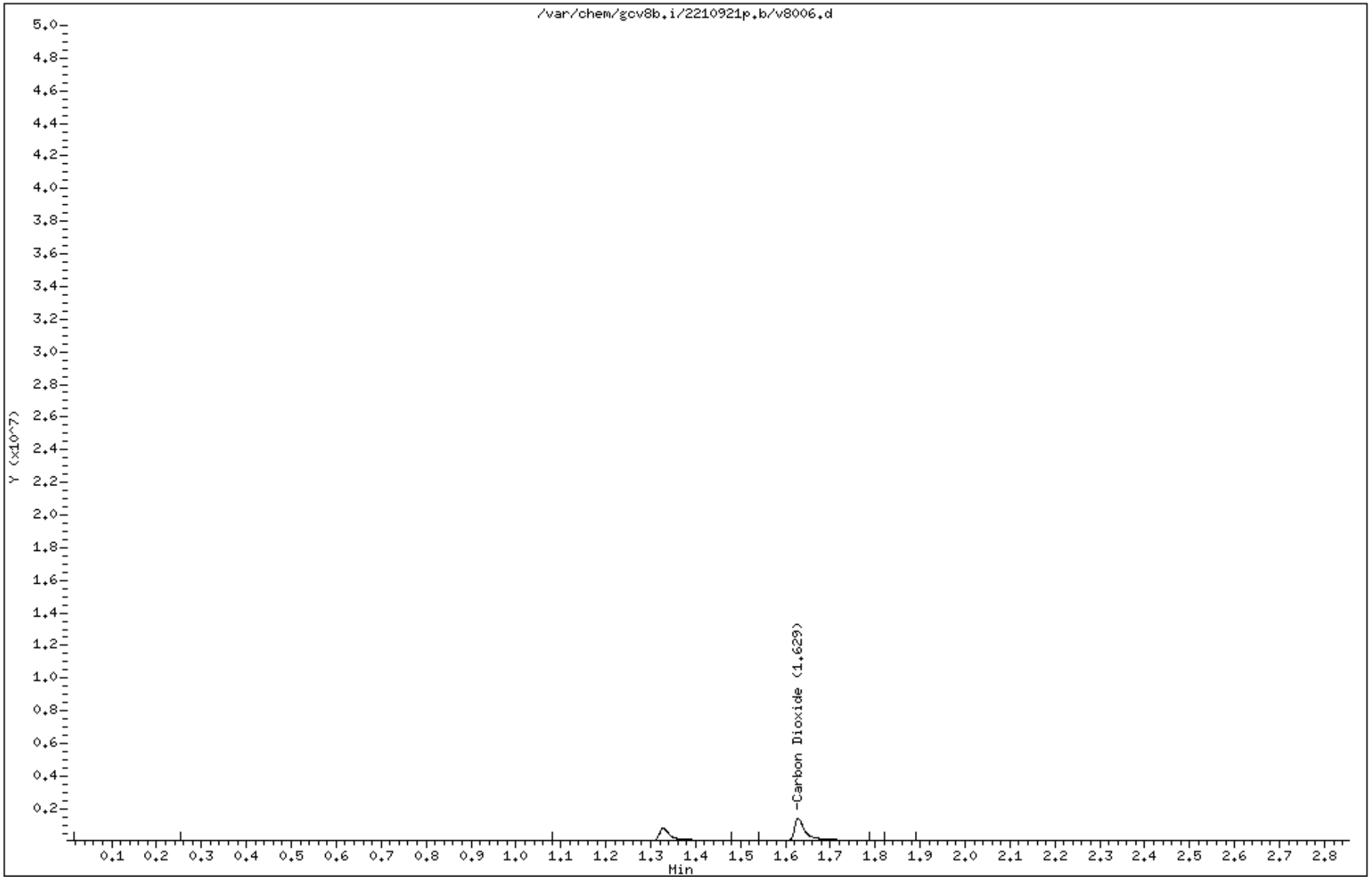
Instrument: gcv8b.i

Sample Info: 1204

Operator: BMR

Column phase: GS-Q-30

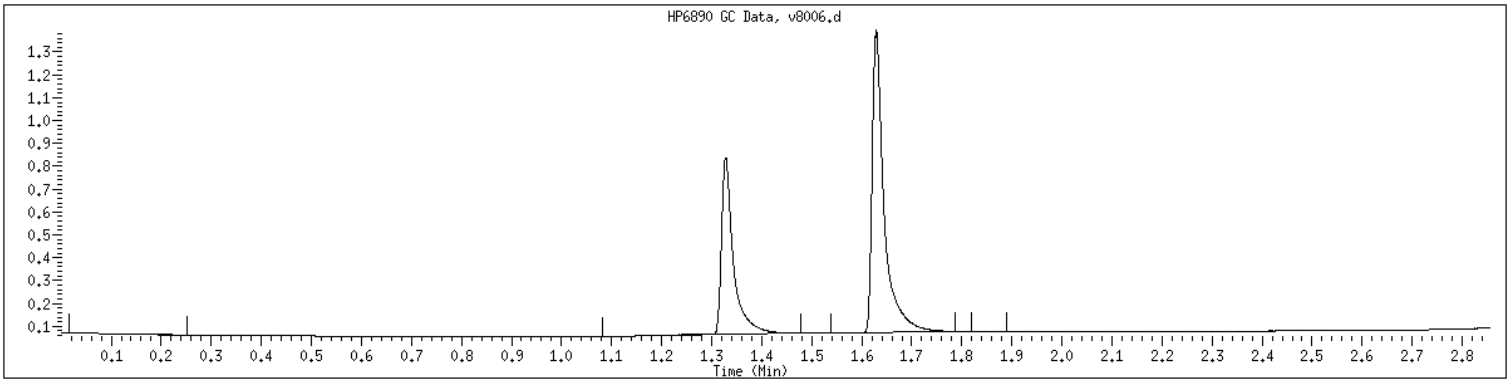
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2210921p.b/v8006.d Page: 1
Report Date: 09/21/2021 15:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1204	SampleType	: CALIB_4
Injection Date	: 09/21/2021 12:11	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1204		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2210921p.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

Data File: /var/chem/gcv8b.i/2210921p.b/v8007.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8007.d
Lab Smp Id: 1205
Inj Date : 21-SEP-2021 12:18
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1205
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.632	1.632	0.000	54483866	17300.0	18300

Data File: /var/chem/gcv8b.i/2210921p.b/v8007.d

Page 1

Date : 21-SEP-2021 12:18

Client ID:

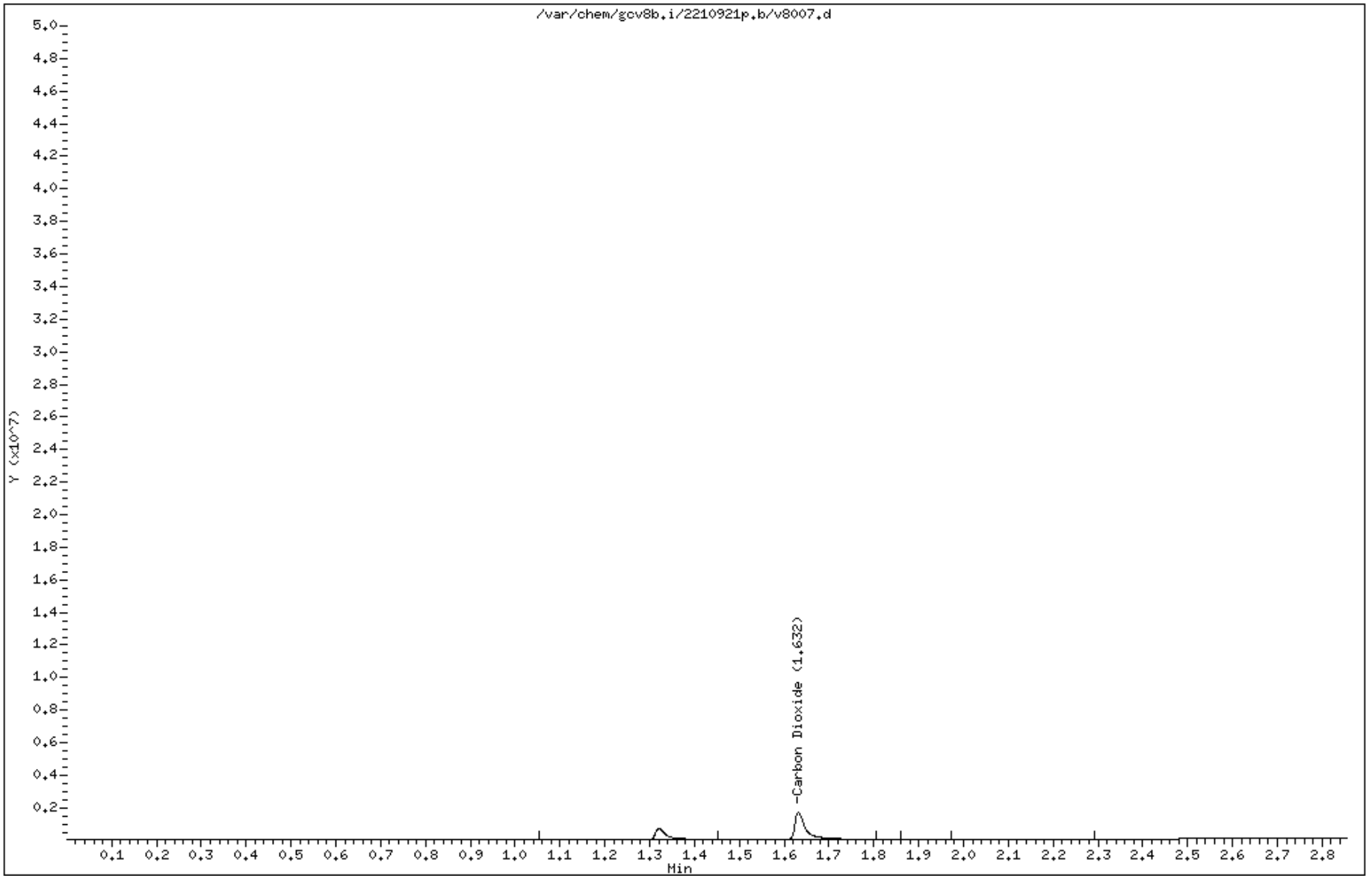
Instrument: gcv8b.i

Sample Info: 1205

Operator: BMR

Column phase: GS-Q-30

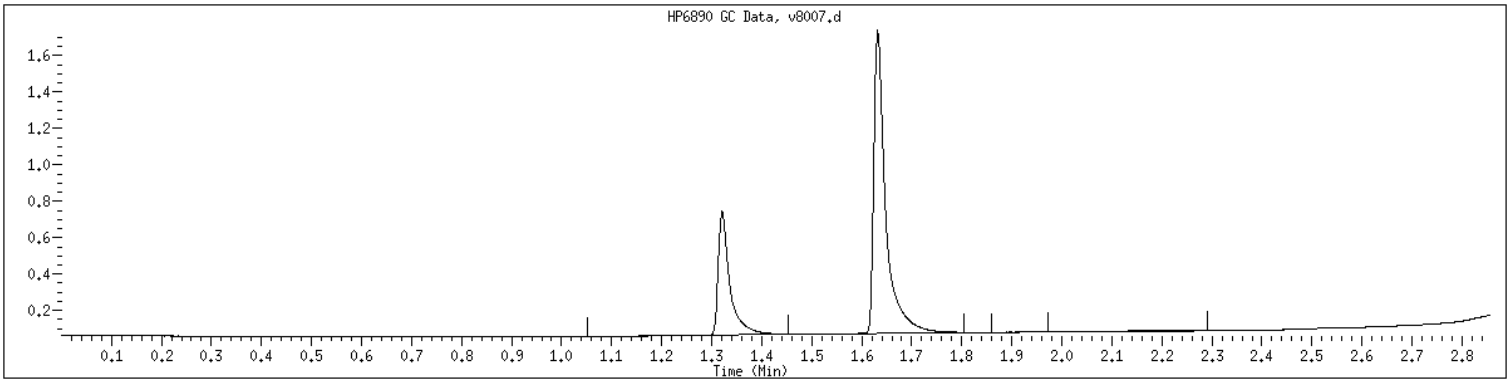
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2210921p.b/v8007.d Page: 1
Report Date: 09/21/2021 15:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1205 SampleType : CALIB_5
Injection Date: 09/21/2021 12:18 Instrument : gcv8b.i
Operator : BMR
Sample Info : 1205
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Dilution : 1.0
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

Form 6I

ICAL Verifications

6I

ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	221120825	Instrument ID:	GCV8B
Analysis Date:	09/21/21 1223	Lab File ID:	2210921p/v8008
Analytical Method:	EPA RSK-175	Analytical Batch:	721348

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*%REC*	*LCL*	*UCL*	*Q*
Carbon Dioxide	ug/L	8700	9200	106	80	120	

Data File: /var/chem/gcv8b.i/2210921p.b/v8008.d Page 1
Report Date: 21-Sep-2021 15:58

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2210921p.b/v8008.d
Lab Smp Id: 1600
Inj Date : 21-SEP-2021 12:23
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1600
Misc Info : 2125156
Comment :
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Meth Date : 21-Sep-2021 15:58 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Carbon Dioxide	1.641	1.632	0.009	27406998	9201.70	9200

Data File: /var/chem/gcv8b.i/2210921p.b/v8008.d

Date : 21-SEP-2021 12:23

Client ID:

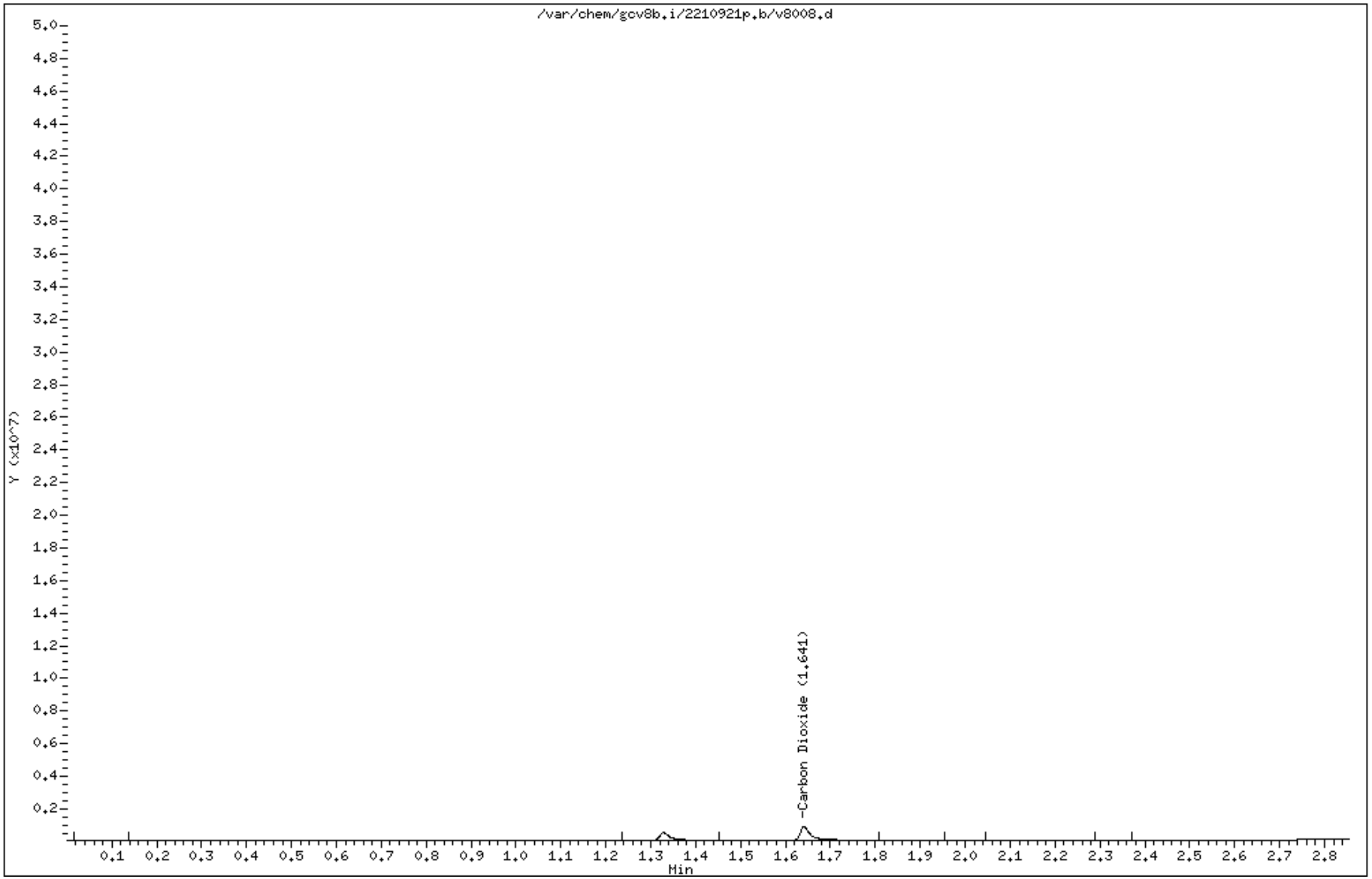
Instrument: gcv8b.i

Sample Info: 1600

Operator: BMR

Column phase: GS-Q-30

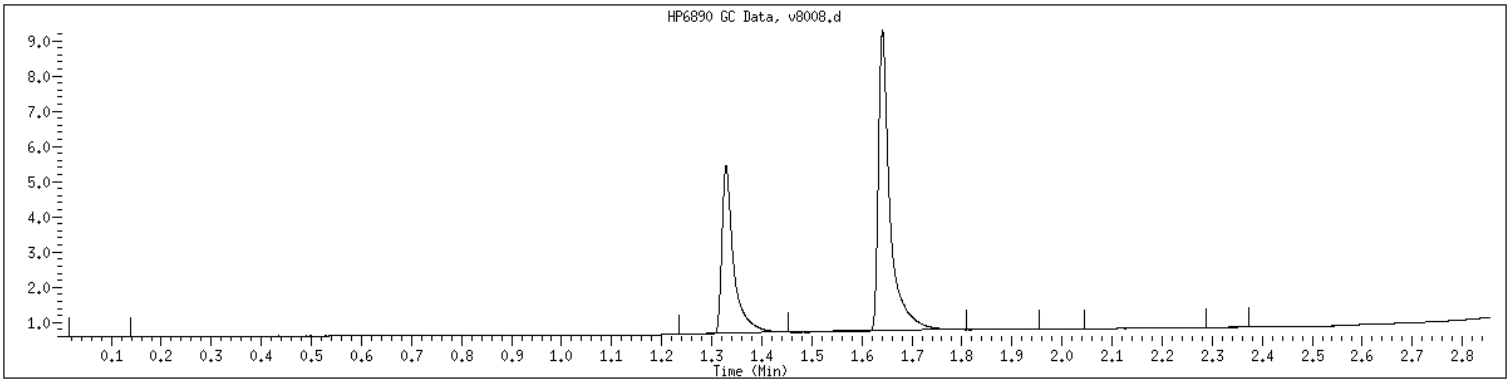
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2210921p.b/v8008.d Page: 1
Report Date: 09/21/2021 15:58

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1600 SampleType : LCS
Injection Date: 09/21/2021 12:23 Instrument : gcv8b.i
Operator : BMR
Sample Info : 1600
Misc Info : 2125156
Method : /var/chem/gcv8b.i/2210921p.b/CO2h.m
Dilution : 1.0
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

Form 7E

CCAL Verifications

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	221120825			CCAL ID:	1400
GC Column:	GS-Q-30	ID .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2211210/v8001
Init. Calib. Date 1:	09/21/21	Time 1: 1153		Analyst:	BMR
Init. Calib. Date 2:	09/21/21	Time 2: 1218		Analytical Batch:	729093
Analysis Date:	12/10/21	Time: 0942		Analytical Method:	RSK-175

ANALYTE	*$\overline{RRF}$*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	2978	2999	-.68	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2211210.b/v8001.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8001.d
Lab Smp Id: 1400
Inj Date : 10-DEC-2021 09:42
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.383	1.383	0.000	25908210	8640.00	8700

Data File: /var/chem/gcv8b.i/2211210.b/v8001.d

Page 1

Date : 10-DEC-2021 09:42

Client ID:

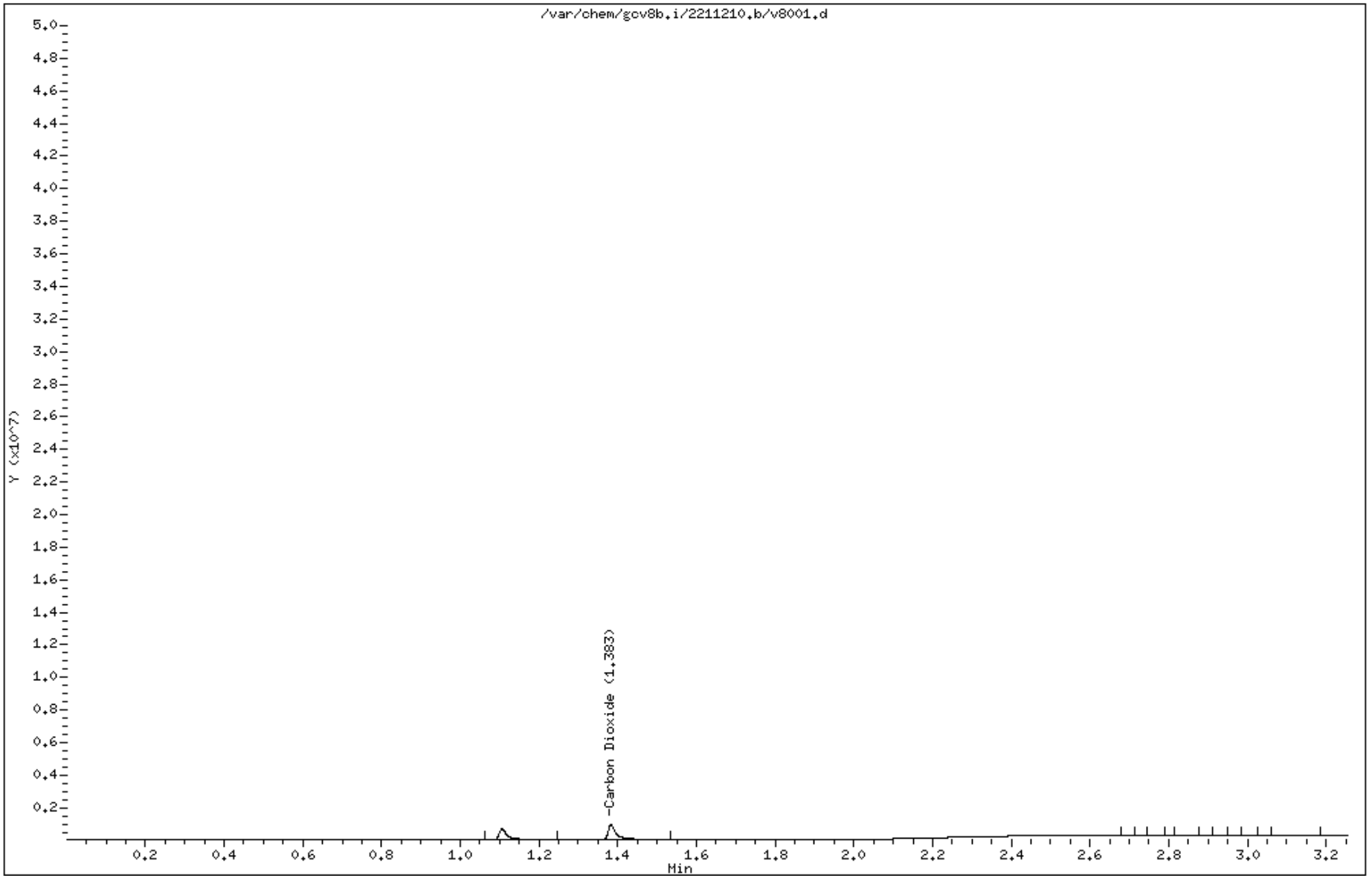
Instrument: gcv8b.i

Sample Info: 1400

Operator: BMR

Column phase: GS-Q-30

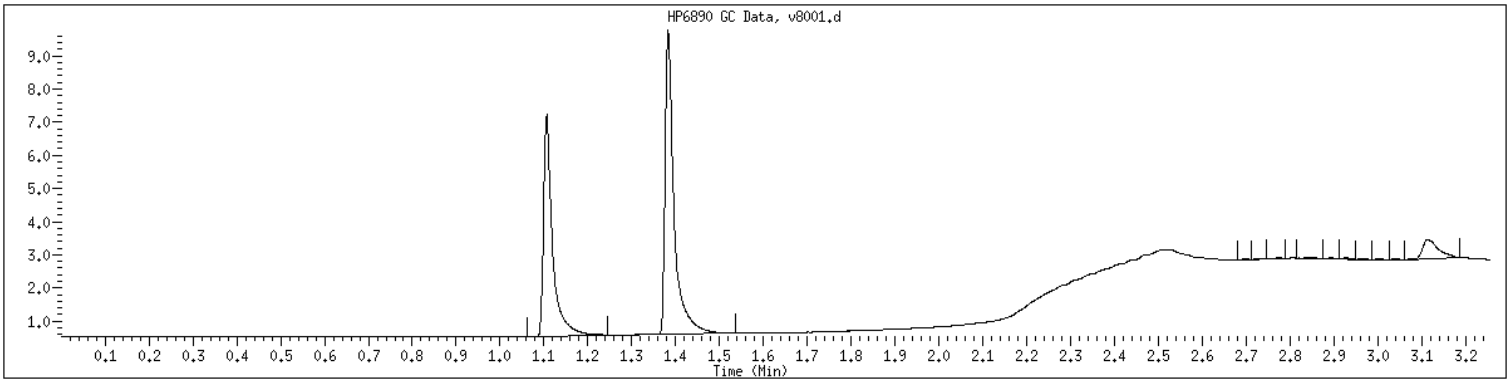
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8001.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 12/10/2021 09:42	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	221120825			CCAL ID:	1400
GC Column:	GS-Q-30	ID .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2211210/v8019
Init. Calib. Date 1:	09/21/21	Time 1: 1153		Analyst:	BMR
Init. Calib. Date 2:	09/21/21	Time 2: 1218		Analytical Batch:	729093
Analysis Date:	12/10/21	Time: 1345		Analytical Method:	RSK-175

ANALYTE	*RRF*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	2978	3072	-3.14	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2211210.b/v8019.d Page 1
Report Date: 10-Dec-2021 16:40

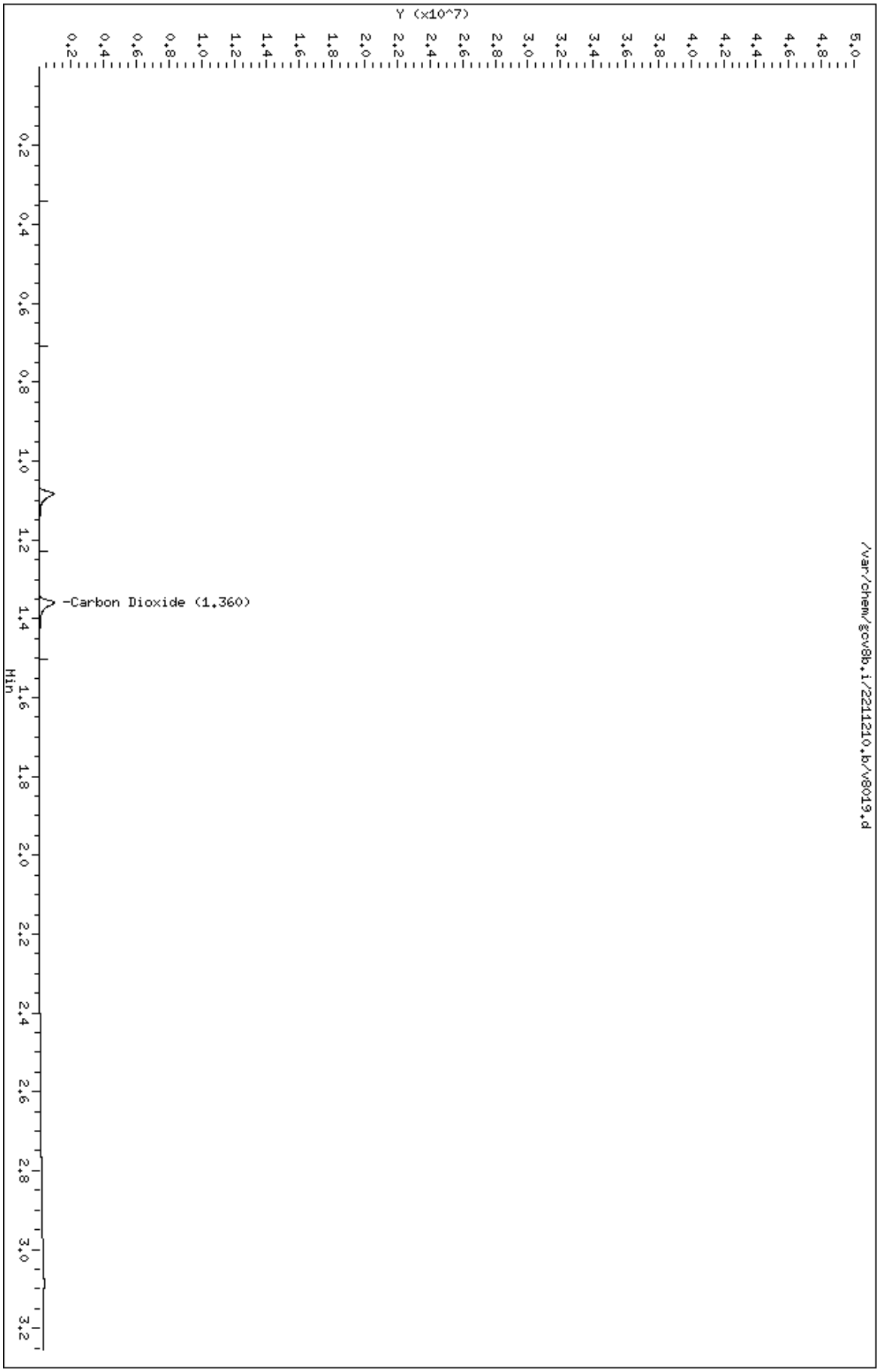
GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8019.d
Lab Smp Id: 1400
Inj Date : 10-DEC-2021 13:45
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:40 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

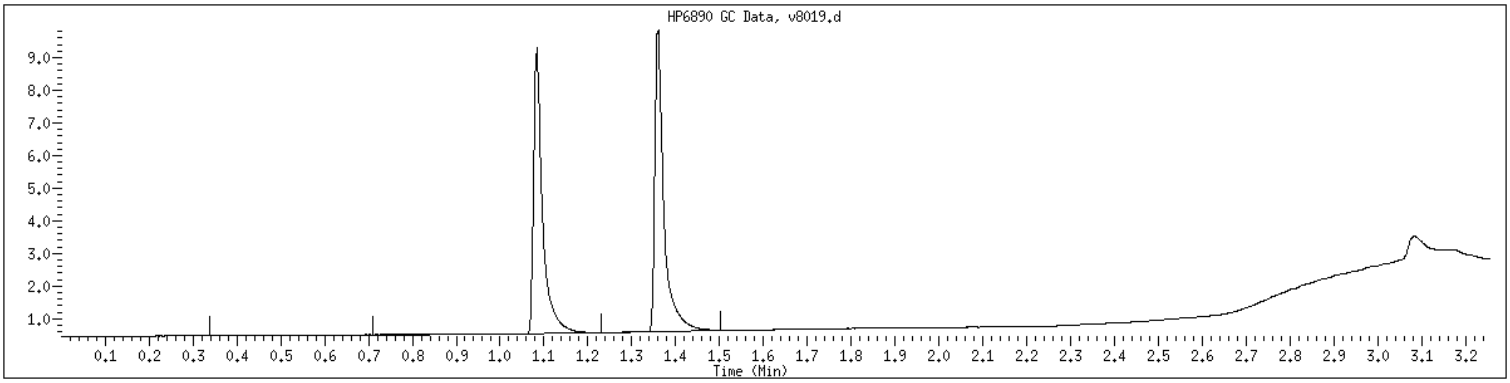
					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.360	1.360	0.000	26541758	8640.00	8910


Data File: /var/chem/gcv8b.i/2211210.b/v8019.d
Date : 10-DEC-2021 13:45
Client ID:
Sample Info: 1400
Column phase: GS-Q-30
Instrument: gcv8b.i
Operator: BHR
Column diameter: 0.53
Page 1
Y (x10^7)
-Carbon Dioxide (1.360)
/var/chem/gcv8b.i/2211210.b/v8019.d
Min

Data file : /var/chem/gcv8b.i/2211210.b/v8019.d Page: 1
Report Date: 12/10/2021 16:40

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID : 1400 SampleType : CCALIB_3
Injection Date: 12/10/2021 13:45 Instrument : gcv8b.i
Operator : BMR
Sample Info : 1400
Misc Info : 2125155
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Dilution : 1.0
Matrix : WATER
Integrator : HP Genie Compound Sublist: co2



NO MANUAL INTEGRATIONS

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	221120825			CCAL ID:	1400
GC Column:	GS-Q-30	ID .53	(mm)	Instrument ID:	GCV8B
Injection Vol.:	1.0		(µL)	Lab File ID:	2211210/v8033
Init. Calib. Date 1:	09/21/21	Time 1: 1153		Analyst:	BMR
Init. Calib. Date 2:	09/21/21	Time 2: 1218		Analytical Batch:	729093
Analysis Date:	12/10/21	Time: 1613		Analytical Method:	RSK-175

ANALYTE	*$\overline{RRF}$*	*RRF CCV*	*%D/%Drift*	*Max %D/ % Drift*	*TYPE*	*Q*
Carbon Dioxide	2978	2524	15.3	20	A	

FORM V II SV

Data File: /var/chem/gcv8b.i/2211210.b/v8033.d Page 1
Report Date: 10-Dec-2021 16:34

GCAL, Inc.

Data file : /var/chem/gcv8b.i/2211210.b/v8033.d
Lab Smp Id: 1400
Inj Date : 10-DEC-2021 16:13
Operator : BMR Inst ID: gcv8b.i
Smp Info : 1400
Misc Info : 2125155
Comment :
Method : /var/chem/gcv8b.i/2211210.b/CO2h.m
Meth Date : 10-Dec-2021 16:34 bmr Quant Type: ESTD
Cal Date : 21-SEP-2021 12:18 Cal File: v8007.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: co2.sub
Target Version: 3.50
Processing Host: org.gcal.com

Concentration Formula: Amt * DF * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Carbon Dioxide	1.355	1.355	0.000	21806467	8640.00	7320

Data File: /var/chem/gcv8b.i/2211210.b/v8033.d

Date : 10-DEC-2021 16:13

Client ID:

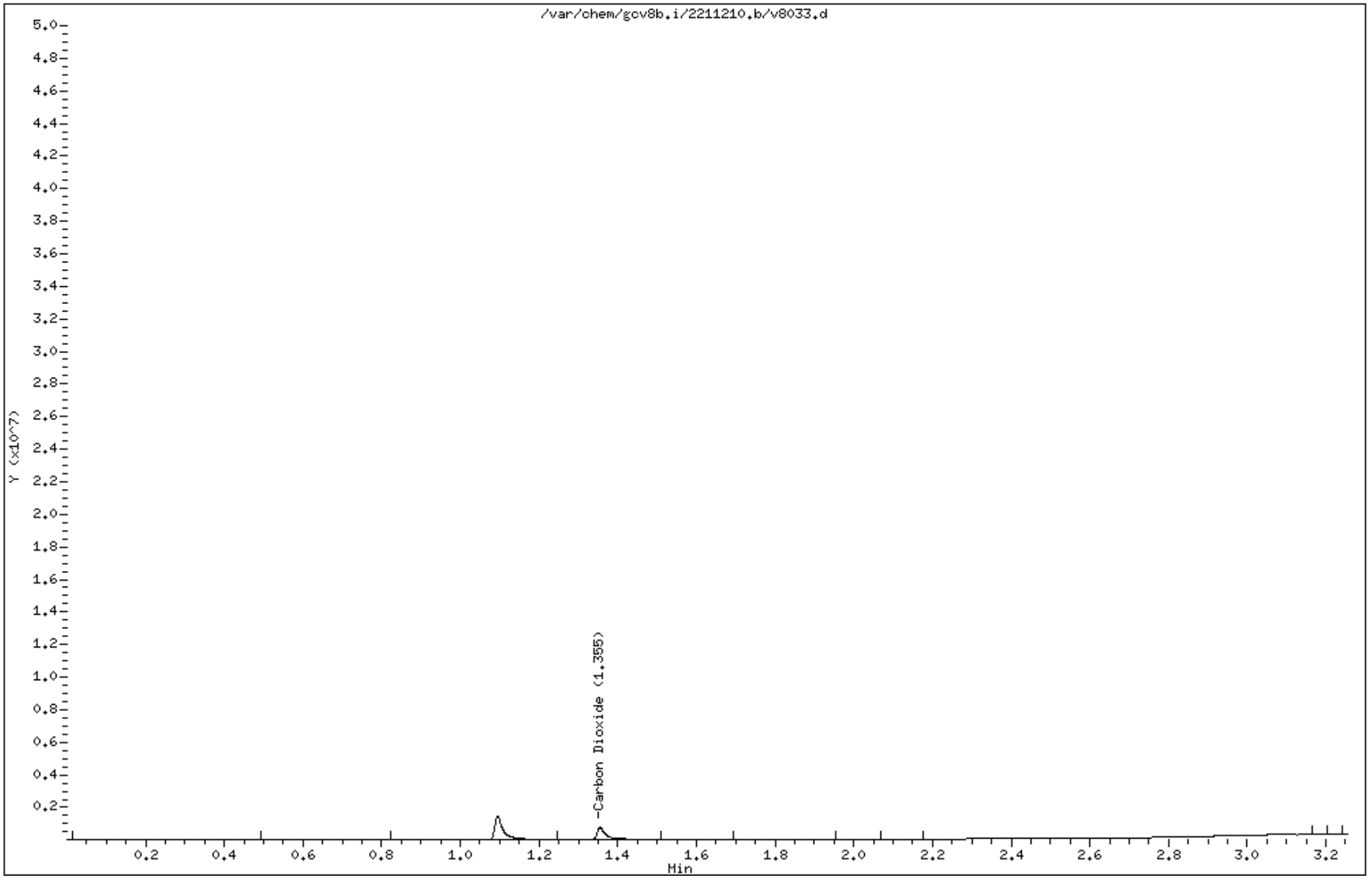
Instrument: gcv8b.i

Sample Info: 1400

Operator: BMR

Column phase: GS-Q-30

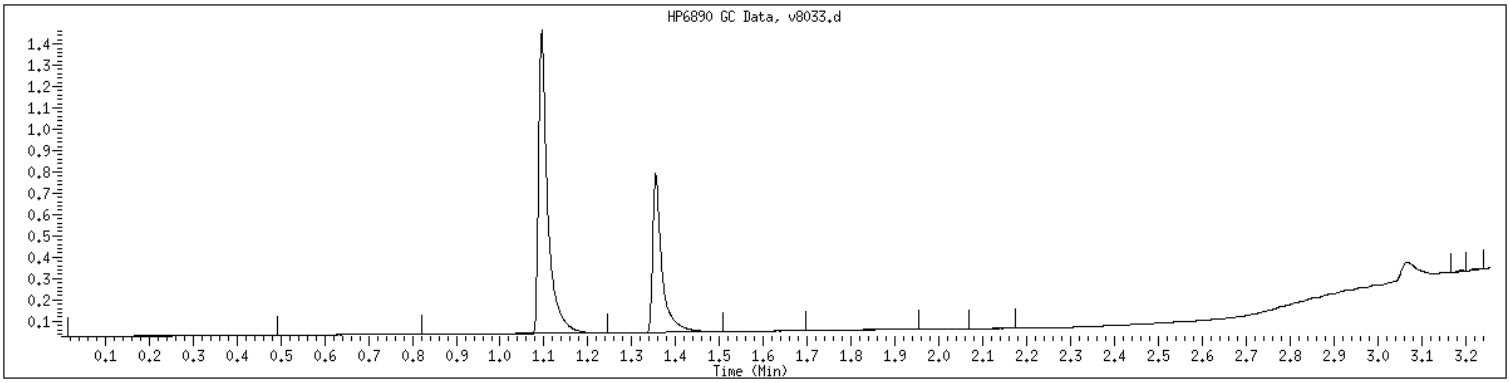
Column diameter: 0.53



Data file : /var/chem/gcv8b.i/2211210.b/v8033.d Page: 1
Report Date: 12/10/2021 16:34

MANUAL INTEGRATION GRAPHIC REPORT

Lab ID	: 1400	SampleType	: CCALIB_3
Injection Date	: 12/10/2021 16:13	Instrument	: gcv8b.i
Operator	: BMR		
Sample Info	: 1400		
Misc Info	: 2125155		
Method	: /var/chem/gcv8b.i/2211210.b/CO2h.m		
Dilution	: 1.0		
Matrix	: WATER		
Integrator	: HP Genie	Compound Sublist	: co2



NO MANUAL INTEGRATIONS

EPA RSK-175

RunLogs

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 09/21/2021
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2210921p.b/CO2h.m
Batch: /var/chem/gcv8b.i/2210921p.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1201	CO2h.m	v8001.d	0.00 ml	21-SEP-2021 11:44	1.0	BMR	1	co2
	CO2h.m	v8002.d	0.00 ml	21-SEP-2021 11:48	1.0	BMR	1	co2
1201	CO2h.m	v8003.d	0.00 ml	21-SEP-2021 11:53	1.0	BMR	1	co2
1202	CO2h.m	v8004.d	0.00 ml	21-SEP-2021 11:58	1.0	BMR	1	co2
1203	CO2h.m	v8005.d	0.00 ml	21-SEP-2021 12:06	1.0	BMR	1	co2
1204	CO2h.m	v8006.d	0.00 ml	21-SEP-2021 12:11	1.0	BMR	1	co2
1205	CO2h.m	v8007.d	0.00 ml	21-SEP-2021 12:18	1.0	BMR	1	co2
1600	CO2h.m	v8008.d	0.00 ml	21-SEP-2021 12:23	1.0	BMR	1	co2
2240651	CO2h.m	v8008L.d	0.00 ml	21-SEP-2021 12:23	1.0	BMR	1	co2
2240652	CO2h.m	v8009.d	0.00 ml	21-SEP-2021 12:30	1.0	BMR	1	co2
2240650	CO2h.m	v8010.d	0.00 ml	21-SEP-2021 12:43	1.0	BMR	1	co2
22109179001	CO2h.m	v8011.d	0.00 ml	21-SEP-2021 13:26	10.0	BMR	1	co2
22109179002	CO2h.m	v8012.d	0.00 ml	21-SEP-2021 13:33	10.0	BMR	1	co2
22109179003	CO2h.m	v8013.d	0.00 ml	21-SEP-2021 13:45	10.0	BMR	1	co2
22109179101	CO2h.m	v8014.d	0.00 ml	21-SEP-2021 13:53	10.0	BMR	1	co2
22109179102	CO2h.m	v8015.d	0.00 ml	21-SEP-2021 13:58	10.0	BMR	1	co2
22109179103	CO2h.m	v8016.d	0.00 ml	21-SEP-2021 14:04	10.0	BMR	1	co2
22109183001	CO2h.m	v8017.d	0.00 ml	21-SEP-2021 14:08	10.0	BMR	1	co2
22109183002	CO2h.m	v8018.d	0.00 ml	21-SEP-2021 14:13	10.0	BMR	1	co2
22109183003	CO2h.m	v8019.d	0.00 ml	21-SEP-2021 14:18	10.0	BMR	1	co2
22109183004	CO2h.m	v8020.d	0.00 ml	21-SEP-2021 14:23	10.0	BMR	1	co2
22109183005	CO2h.m	v8021.d	0.00 ml	21-SEP-2021 14:28	10.0	BMR	1	co2
22109190101	CO2h.m	v8022.d	0.00 ml	21-SEP-2021 14:33	10.0	BMR	1	co2
22109190102	CO2h.m	v8023.d	0.00 ml	21-SEP-2021 14:38	10.0	BMR	1	co2
22109190103	CO2h.m	v8024.d	0.00 ml	21-SEP-2021 14:43	10.0	BMR	1	co2
22109190104	CO2h.m	v8025.d	0.00 ml	21-SEP-2021 14:50	10.0	BMR	1	co2
22109190105	CO2h.m	v8026.d	0.00 ml	21-SEP-2021 14:54	10.0	BMR	1	co2
22109190106	CO2h.m	v8027.d	0.00 ml	21-SEP-2021 15:02	10.0	BMR	1	co2
1400	CO2h.m	v8028.d	0.00 ml	21-SEP-2021 15:07	1.0	BMR	1	co2

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 12/10/2021
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2211210.b/CO2_22.m
Batch: /var/chem/gcv8b.i/2211210.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1400	CO2_22.m	v8001B.d	0.00 ml	10-DEC-2021 09:42	1.0	BMR	1	co2
1400	CO2h.m	v8001.d	0.00 ml	10-DEC-2021 09:42	1.0	BMR	1	co2
2284693	CO2_22.m	v8002B.d	0.00 ml	10-DEC-2021 09:54	1.0	BMR	1	co2
2284464	CO2h.m	v8002.d	0.00 ml	10-DEC-2021 09:54	1.0	BMR	1	co2
2284694	CO2_22.m	v8003B.d	0.00 ml	10-DEC-2021 10:35	1.0	BMR	1	co2
2284465	CO2h.m	v8003.d	0.00 ml	10-DEC-2021 10:35	1.0	BMR	1	co2
2284695	CO2_22.m	v8004B.d	0.00 ml	10-DEC-2021 11:19	1.0	BMR	1	co2
2284466	CO2h.m	v8004.d	0.00 ml	10-DEC-2021 11:19	1.0	BMR	1	co2
22111293101	CO2_22.m	v8005.d	0.00 ml	10-DEC-2021 11:38	1.0	BMR	1	co2
22112037101	CO2h.m	v8006.d	0.00 ml	10-DEC-2021 11:57	10.0	BMR	1	co2
22112037101	CO2h.m	v8007.d	0.00 ml	10-DEC-2021 12:04	1.0	BMR	1	co2
22112037101	CO2h.m	v8008.d	0.00 ml	10-DEC-2021 12:09	10.0	BMR	1	co2
22112037101	CO2h.m	v8009.d	0.00 ml	10-DEC-2021 12:16	10.0	BMR	1	co2
22112037101	CO2h.m	v8010.d	0.00 ml	10-DEC-2021 12:29	50.0	BMR	1	co2
22112037102	CO2h.m	v8011.d	0.00 ml	10-DEC-2021 12:36	50.0	BMR	1	co2
22112037103	CO2h.m	v8012.d	0.00 ml	10-DEC-2021 12:41	50.0	BMR	1	co2
22112037104	CO2h.m	v8013.d	0.00 ml	10-DEC-2021 12:48	50.0	BMR	1	co2
22112037105	CO2h.m	v8014.d	0.00 ml	10-DEC-2021 12:57	50.0	BMR	1	co2
22112037106	CO2h.m	v8015.d	0.00 ml	10-DEC-2021 13:15	50.0	BMR	1	co2
22112061901	CO2h.m	v8016.d	0.00 ml	10-DEC-2021 13:28	50.0	BMR	1	co2
22112061902	CO2h.m	v8017.d	0.00 ml	10-DEC-2021 13:34	50.0	BMR	1	co2
22112061903	CO2h.m	v8018.d	0.00 ml	10-DEC-2021 13:39	50.0	BMR	1	co2
1400	CO2h.m	v8019.d	0.00 ml	10-DEC-2021 13:45	1.0	BMR	1	co2
22112061801	CO2h.m	v8020.d	0.00 ml	10-DEC-2021 13:56	5.0	BMR	1	co2
22112061801	CO2h.m	v8021.d	0.00 ml	10-DEC-2021 14:01	5.0	BMR	1	co2
22112061801	CO2h.m	v8022.d	0.00 ml	10-DEC-2021 14:06	20.0	BMR	1	co2
22112061802	CO2h.m	v8023.d	0.00 ml	10-DEC-2021 14:12	30.0	BMR	1	co2
22112082501	CO2h.m	v8024.d	0.00 ml	10-DEC-2021 15:00	20.0	BMR	1	co2
22112082501	CO2h.m	v8025.d	0.00 ml	10-DEC-2021 15:10	100.0	BMR	1	co2
22112082502	CO2h.m	v8026.d	0.00 ml	10-DEC-2021 15:16	100.0	BMR	1	co2
22112082503	CO2h.m	v8027.d	0.00 ml	10-DEC-2021 15:22	100.0	BMR	1	co2
22112082504	CO2h.m	v8028.d	0.00 ml	10-DEC-2021 15:31	100.0	BMR	1	co2
22112082505	CO2h.m	v8029.d	0.00 ml	10-DEC-2021 15:36	100.0	BMR	1	co2
22112082506	CO2h.m	v8030.d	0.00 ml	10-DEC-2021 15:42	100.0	BMR	1	co2
1400	CO2h.m	v8031.d	0.00 ml	10-DEC-2021 15:58	1.0	BMR	1	co2
1400	CO2h.m	v8032.d	0.00 ml	10-DEC-2021 16:08	1.0	BMR	1	co2

LABORATORY CHRONICLE: GCV DEPARTMENT

Date: 12/10/2021
Instrument: gcv8b.i
Method File: /var/chem/gcv8b.i/2211210.b/CO2_22.m
Batch: /var/chem/gcv8b.i/2211210.b
Column-Detector: GS-Q-30

Sample ID	Method	DataFile	Wgt/Vol	Injection Time	Dil	Anal	ALS	Comments
1400	CO2h.m	v8033.d	0.00 ml	10-DEC-2021 16:13	1.0	BMR	1	co2

294458.1

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

25

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **17563**

SUBCONTRACT TO:

Pace Analytical
7979 Innovation Park Drive
Baton Rouge, LA 70820

Phone: +1 225 769 4900

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Ragen Giga
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RagenP.Giga@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:	HS21120103
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE	
	ANALYSIS REQUESTED			DUE DATE	
1.	**HS21120103-01**	**35AWWW11_120121**	**Groundwater**	**01 Dec 2021 07:35**	1
	SUB_CO2			16 Dec 2021	
2.	**HS21120103-02**	**35AWWW23_120121**	**Groundwater**	**01 Dec 2021 08:25**	2
	SUB_CO2			16 Dec 2021	
3.	**HS21120103-03**	**35AWWW19_120121**	**Groundwater**	**01 Dec 2021 09:20**	3
	SUB_CO2			16 Dec 2021	
4.	**HS21120103-04**	**35AWWW07_120121**	**Groundwater**	**01 Dec 2021 10:10**	4
	SUB_CO2			16 Dec 2021	
5.	**HS21120103-05**	**35AWWW20_120121**	**Groundwater**	**01 Dec 2021 11:00**	5
	SUB_CO2			16 Dec 2021	
6.	**HS21120103-06**	**35AWWW06_120121**	**Groundwater**	**01 Dec 2021 11:55**	6
	SUB_CO2			16 Dec 2021	

Comments: Please analyze for the analysis listed above. Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Client ID: ALS Houston - ALS Environmental - Houston, TX

SDG: 221120825

PM: RWe

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 17563

Relinquished By: NA

Date/Time: 12.6.21 13.00

Received By: FedEx 12-7-21 1118
JH 12-7-21 1148

Date/Time:

Cooler ID(s):

Temperature(s):

5300 5225 8954

6.0E24

Client ID: ALS Houston - ALS Environmental - Houston, TX

SDG: 221120825

PM: RWe

Pace Analytical®

SAMPLE RECEIVING CHECKLIST

221120825

SAMPLE DELIVERY GROUP 221120825	
Client **PM** RWe ALS Houston - ALS Environmental - Houston, TX	**Transport Method** FEDEX
Profile Number 294458	**Received By** Roberts, George S.
Line Item(s) 1 - CO2	**Receive Date(s)** 12/07/21

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E34	Temp °C
530052258954		6.0

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

December 13, 2021 Service Request No:R2112623

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

Laboratory Results for: LHAAP / Site 58

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory December 02, 2021
For your reference, these analyses have been assigned our service request number **R2112623.**

All testing was performed according to our laboratory's quality assurance program and met the requirements of the TNI standards except as noted in the case narrative report. Any testing not included in the lab's accreditation is identified on a Non-Certified Analytes report. All results are intended to be considered in their entirety. ALS Environmental is not responsible for use of less than the complete report. Results apply only to the individual samples submitted to the lab for analysis, 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), and represented by Laboratory Control Sample control limits. Any events, such as QC failures or Holding Time exceedances, which may add to the uncertainty are explained in the report narrative or are flagged with qualifiers. The flags are explained in the Report Qualifiers and Definitions page of this report.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Brady.Kalkman@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Brady Kalkman
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

Narrative Documents

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

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: R2112623
Date Received: 12/02/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Six water samples were received for analysis at ALS Environmental on 12/02/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivoa GC:

No significant anomalies were noted with this analysis.

Approved by _____ Date 12/13/2021

ALS Environmental

SAMPLE DETECTION SUMMARY

CLIENT ID: 35AWW23_120121			Lab ID: R2112623-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Acetic Acid	3.9			1.0	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:**R2112623
Project: LHAAP / Site 58/NWO1312.0150

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R2112623-001	35AWW11_120121	12/1/2021	0735
R2112623-002	35AWW23_120121	12/1/2021	0825
R2112623-003	35AWW19_120121	12/1/2021	0920
R2112623-004	LHSMW07_120121	12/1/2021	1010
R2112623-005	35AWW20_120121	12/1/2021	1100
R2112623-006	35AWW06_120121	12/1/2021	1155

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

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)	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	Volatile Fatty Acids										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)			
35AWW11_120121	01 DEC 2021	0735	-	N		WG	1	X													
35AWW23_120121	01 DEC 2021	0825	-	N		WG	1	X													
35AWW19_120121	01 DEC 2021	0920	-	N		WG	1	X													
LHSMW07_120121	01 DEC 2021	1010		N		WG	1	X													
35AWW20_120121	01 DEC 2021	1100		N		WG	1	X													
35AWW06_120121	01 DEC 2021	1155	-	N		WG	1	X													
			-																		
			-																		
			-																		
			-																		
			-																		

COMMENTS: STANDARD TAT

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	12/1/21	1430	1.	12/2/21	10:35
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 =

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

R2112623 5
ALS Environmental - US
LHAAP / Site 58

Cooler Receipt and Preservation Check Form

R2112623 5
ALS Environmental - US
LHAAP / Site 68

Project/Client bhate Folder Number

Cooler received on 12/2/21 by: MM

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: 12/2/21 Time: 11:00 ID: IR#7 (IR#11) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	5.8						
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: Room by MM on 12/2/21 at 11:05
5035 samples placed in storage location: _____ by _____ on _____ at _____ within 48 hours of sampling? Y N

Cooler Breakdown/Preservation Check**: Date: 12/2/21 Time: 1804 by: (initials)

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 Y / N with MS Y / N 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: 90121-06
Explain all Discrepancies/ Other Comments:

HgPkg: 21482

HPROD	BULK
HTR	FLDT
SUB	HGFB
ALS	LL3541

Labels secondary reviewed by: (initials)
PC Secondary Review: _____

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

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 "Notes" 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 "immediate" 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 (≥100% Difference between two GC columns).
X	See Case Narrative for discussion.
MRL LOQ	Method Reporting Limit. Also known as: 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.

Rochester Lab ID # for State Accreditations[1]

NELAP States
Florida ID # E87674
New Hampshire ID # 2941
New York ID # 10145
Pennsylvania ID# 68-786
Virginia #460167

Non-NELAP States
Connecticut ID #PH0556
Delaware Approved
Maine ID #NY01587
North Carolina #36701
North Carolina #676
Rhode Island LAO00333

[1] Analyses were performed according to our laboratory's 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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Client: ALS Environmental - US **Service Request:** R2112623
Project: LHAAP / Site 58/NWO1312.0150

Non-Certified Analytes

Certifying Agency: New York Department of Health

Method	Matrix	Analyte
Organic Acids	Water	Acetic Acid
Organic Acids	Water	Butanoic Acid (Butyric Acid)
Organic Acids	Water	Lactic Acid
Organic Acids	Water	Propionic Acid
Organic Acids	Water	Pyruvic Acid

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Service Request: R2112623

Sample Name: 35AWW11_120121
Lab Code: R2112623-001
Sample Matrix: Water
Date Collected: 12/1/21
Date Received: 12/2/21

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name: 35AWW23_120121
Lab Code: R2112623-002
Sample Matrix: Water
Date Collected: 12/1/21
Date Received: 12/2/21

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name: 35AWW19_120121
Lab Code: R2112623-003
Sample Matrix: Water
Date Collected: 12/1/21
Date Received: 12/2/21

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name: UTSMW07_120121
Lab Code: R2112623-004
Sample Matrix: Water
Date Collected: 12/1/21
Date Received: 12/2/21

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

Sample Name: 35AWW20_120121
Lab Code: R2112623-005
Sample Matrix: Water
Date Collected: 12/1/21
Date Received: 12/2/21

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

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Analyst Summary report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150		

Sample Name:	35AWW06_120121	**Date Collected:**	12/1/21
Lab Code:	R2112623-006	**Date Received:**	12/2/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		AFELSER

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
9034 Sulfide Acid Soluble	9030B
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
7199	3060A
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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1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
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Semivolatile Organic Compounds by GC

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/01/21 07:35
Sample Matrix:	Water	**Date Received:**	12/02/21 10:35
Sample Name:	35AWW11_120121	**Units:**	mg/L
Lab Code:	R2112623-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.50	1	12/09/21 06:31	
Acetic Acid	ND U	1.0	1	12/09/21 06:31	
Butanoic Acid (Butyric Acid)	ND U	2.0	1	12/09/21 06:31	
Lactic Acid	ND U	1.0	1	12/09/21 06:31	
Propionic Acid	ND U	2.0	1	12/09/21 06:31	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/01/21 08:25
Sample Matrix:	Water	**Date Received:**	12/02/21 10:35
Sample Name:	35AWW23_120121	**Units:**	mg/L
Lab Code:	R2112623-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		MRL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.50	1	12/09/21 08:27	
Acetic Acid	**3.9**		1.0	1	12/09/21 08:27	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1	12/09/21 08:27	
Lactic Acid	ND	U	1.0	1	12/09/21 08:27	
Propionic Acid	ND	U	2.0	1	12/09/21 08:27	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/01/21 09:20
Sample Matrix:	Water	**Date Received:**	12/02/21 10:35
Sample Name:	35AWW19_120121	**Units:**	mg/L
Lab Code:	R2112623-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.50	1	12/09/21 09:06	
Acetic Acid	ND U	1.0	1	12/09/21 09:06	
Butanoic Acid (Butyric Acid)	ND U	2.0	1	12/09/21 09:06	
Lactic Acid	ND U	1.0	1	12/09/21 09:06	
Propionic Acid	ND U	2.0	1	12/09/21 09:06	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/01/21 10:10
Sample Matrix:	Water	**Date Received:**	12/02/21 10:35
Sample Name:	LHSMW07_120121	**Units:**	mg/L
Lab Code:	R2112623-004	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.50	1	12/09/21 09:42	
Acetic Acid	ND U	1.0	1	12/09/21 09:42	
Butanoic Acid (Butyric Acid)	ND U	2.0	1	12/09/21 09:42	
Lactic Acid	ND U	1.0	1	12/09/21 09:42	
Propionic Acid	ND U	2.0	1	12/09/21 09:42	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/01/21 11:00
Sample Matrix:	Water	**Date Received:**	12/02/21 10:35
Sample Name:	35AWW20_120121	**Units:**	mg/L
Lab Code:	R2112623-005	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.50	1	12/09/21 10:22	
Acetic Acid	ND U	1.0	1	12/09/21 10:22	
Butanoic Acid (Butyric Acid)	ND U	2.0	1	12/09/21 10:22	
Lactic Acid	ND U	1.0	1	12/09/21 10:22	
Propionic Acid	ND U	2.0	1	12/09/21 10:22	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/01/21 11:55
Sample Matrix:	Water	**Date Received:**	12/02/21 10:35
Sample Name:	35AWW06_120121	**Units:**	mg/L
Lab Code:	R2112623-006	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.50	1	12/09/21 11:00	
Acetic Acid	ND U	1.0	1	12/09/21 11:00	
Butanoic Acid (Butyric Acid)	ND U	2.0	1	12/09/21 11:00	
Lactic Acid	ND U	1.0	1	12/09/21 11:00	
Propionic Acid	ND U	2.0	1	12/09/21 11:00	

QC Summary Forms

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	12/01/21
Sample Matrix:	Water	**Date Received:**	12/02/21
		Date Analyzed:	12/9/21

Duplicate Matrix Spike Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	35AWW06_120121	**Units:**	mg/L
Lab Code:	R2112623-006	**Basis:**	NA
Analysis Method:	Organic Acids		

		Matrix Spike RQ2115821-13			Duplicate Matrix Spike RQ2115821-14					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	ND U	18.4	20.0	92	19.6	20.0	98	39-130	6	30
Acetic Acid	ND U	20.2	20.0	101	21.6	20.0	108	10-179	7	30
Butanoic Acid (Butyric Acid)	ND U	18.6	20.0	93	20.4	20.0	102	39-161	9	30
Lactic Acid	ND U	19.0	20.0	95	20.3	20.0	102	48-147	7	30
Propionic Acid	ND U	19.8	20.0	99	20.5	20.0	102	49-162	3	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.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R2112623
Project:	LHAAP / Site 58/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ2115821-02	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.50	1	12/08/21 14:37	
Acetic Acid	ND U	1.0	1	12/08/21 14:37	
Butanoic Acid (Butyric Acid)	ND U	2.0	1	12/08/21 14:37	
Lactic Acid	ND U	1.0	1	12/08/21 14:37	
Propionic Acid	ND U	2.0	1	12/08/21 14:37	

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dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58/NWO1312.0150
Sample Matrix: Water

Service Request: R2112623
Date Analyzed: 12/08/21

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					
		RQ2115821-03			RQ2115821-04					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	19.3	20.0	97	18.9	20.0	95	73-122	2	30
Acetic Acid	Organic Acids	21.7	20.0	108	20.9	20.0	105	80-130	4	30
Butanoic Acid (Butyric Acid)	Organic Acids	20.8	20.0	104	20.0	20.0	100	86-128	4	30
Lactic Acid	Organic Acids	21.5	20.0	107	21.3	20.0	107	75-125	<1	30
Propionic Acid	Organic Acids	19.7	20.0	98	19.1	20.0	96	63-153	3	30

HS21120243 LHAAP Site 58 Cover Page

ALS WO# HS21120243

ALS Environmental
ALS Group USA, Corp
10450 Stancliff Road, Suite 210
Houston, TX 77099
T : +1 281 530 5656
F : +1 281 530 5887
www.alsglobal.com

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

WorkOrder: HS21120243

LHAAP / Site 58

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

14-Jan-2022

HS21120243 LHAAP Site 58 Final

ALS WO# HS21120243

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 18, 2021

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS21120243**

Laboratory Results for: **LHAAP / Site 58**

Dear Marcia Olive,

ALS Environmental received 6 sample(s) on Dec 03, 2021 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
Ragen Giga
Project Manager

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Work Order: HS21120243

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21120243-01	35AWW24_120221	Groundwater		02-Dec-2021 08:05	03-Dec-2021 10:45	☐
HS21120243-02	35AWW05_120221	Groundwater		02-Dec-2021 08:55	03-Dec-2021 10:45	☐
HS21120243-03	35AWW15_120221	Groundwater		02-Dec-2021 09:35	03-Dec-2021 10:45	☐
HS21120243-04	LHSMW06_120221	Groundwater		02-Dec-2021 10:20	03-Dec-2021 10:45	☐
HS21120243-05	LHSMW06_120221_a	Groundwater		02-Dec-2021 10:20	03-Dec-2021 10:45	☐
HS21120243-06	Trip Blank	Water	CG-111221-74	02-Dec-2021 00:00	03-Dec-2021 10:45	☐

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Work Order: HS21120243

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R397742

Sample ID: VSTD050

- 2,2-Dichloropropane and Chloromethane exceeded %D limits for CCV .Samples are ND for these compounds.

Sample ID: VSTD050-END

- Acetone exceeded recovery limits for closing CCV.

Metals by Method SW6020A

Batch ID: 173565

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: 35AWW24_120221
Collection Date: 02-Dec-2021 08:05

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-01
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	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 19:55
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	15-Dec-2021 19:55
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	15-Dec-2021 19:55
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 19:55
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	15-Dec-2021 19:55
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Dec-21

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Site 58
Sample ID: 35AWW24_120221
Collection Date: 02-Dec-2021 08:05

ANALYTICAL REPORT
WorkOrder:HS21120243
Lab ID:HS21120243-01
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	15-Dec-2021 19:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Dec-2021 19:55
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	15-Dec-2021 19:55
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	15-Dec-2021 19:55
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	15-Dec-2021 19:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Dec-2021 19:55
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*15-Dec-2021 19:55*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*15-Dec-2021 19:55*
Surr: Dibromofluoromethane	*99.5*			**0**	*80-119*	*%REC*	*1*	*15-Dec-2021 19:55*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Dec-2021 19:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.